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About the Regalia

The Regalia utilizes high-tech electronics and an innovative touch-pad user interface to offer greater functionality and ease of operation to home quilters than ever before conceived in the quilting industry. The Regalia quilting machine is a high quality machine that incorporates very robust design features and is very easy to service.

The Regalia machine is constructed following a specific sequence of operations, similar to the construction of a house. Walls cannot be erected until the foundation is in place. Similarly, this service manual has been written with an adjustment logic that is driven by the construction processes used to create the machine. If the service technician carefully follows the adjustment steps in the order presented, a well running machine is possible each and every time.

About the Manual and Support

The purpose of this service manual is to help the technician complete a repair on a machine accurately and quickly. The manual is complete with photographs and explanations that we hope will aid you in your repair efforts. In addition to the teaching aids found herein, you will also find all of the tools listed that are necessary for adjustments. If you need help in locating these tools for purchase, please contact Baby lock.

Service Manual Guidelines

• Adjustments shown in the manual should only be made if a setting deviates from the tolerance specified in the manual.

• Adjustments should be made only in the logical sequence shown and described in the manual. Do not jump ahead, or start in the middle of the adjustment sequence. This may cause additional or more serious problems than the original issue.

• Safety must be considered when working on any machine. Safety warnings are included throughout this manual where appropriate, but these warnings do not address all possible safety concerns that might confront the service technician.

• When working on or near any live electrical components or assemblies, the power cable must be removed from the machine.

• We urge you to observe the cautions in the manual.

⚠️ NOTE: The hand wheel must always be turned in the direction of normal rotation unless otherwise instructed. This is especially true when making the loop-lift timing and needle-height adjustment. Exceptions are removing thread locks or testing belt tension. The hand wheel may be rocked forward and reverse in these cases.
General Specifications

This Service Manual covers the Regalia and Forte machines. The Regalia machine went into production in November 2017 and the Forte machines went into production in February 2018.

Sewing Opening Dimensions: Regalia (228 mm X 521 mm) 9” X 20.5”

Sewing Speed: Manual Mode: Min 25 spm, Max 2500 spm
Regulated Mode: Min 0 spm, Max full speed

Stitches Per Inch: 4 – 24 spi

Basting Mode: One stitch per quarter inch, one stitch per half inch, one stitch per inch, one stitch per two inches, and one stitch per four inches

Needle System: 134 (135 X 7)

Needle Sizes, (recommended): 12/80 - 20/125

Hook System: Rotary, Horizontal, M-class bobbin

Bobbin Type: Aluminium, Class M

Bobbin Case: Type MF

Motor Type: Brush less DC

Needle Positioning: Up and down, walking stitch, on-screen handwheel

Electrical Power: 100-240VAC, 50-60 Hz, 1.5 - 3.3 A
This machine conforms to UL and international safety standards for sewing machines and US and international laws for electromagnetic compliance.

Outlet Power 120 watts maximum

Sew Foot Stroke/Lift: 5 mm

Needle Bar Stroke: 35.3 mm

Take-Up Stroke: 73 mm

Lubrication, main components: Kluber Lube, permanent

Lubrication of hook: Velocite 10, Texaco 22
Assembly Torque Specifications

The Torque Specifications apply to all internal and external fasteners in sizes 4.0, 5.0 and 6.0 mm in general at ISO 4762 Screw class 8.8. The torque specifications are also generally classified as soft-jointed and are listed according to size and placement in the machine.

1. 4 mm Allen socket head cap screws, Class 8.8 @ 2.5 Nm (uses 3 mm Allen tool)
   - Head-frame
   - bearing retainers
   - front cover small

2. 4 mm Allen set screw, class 8.8 @ 1.2 Nm (uses 2.0 mm Allen tool)
   - Tension assembly
   - 3 hole thread guide
   - motor pulley, hook

3. 5 mm Allen socket head cap screw class 8.8@ 5.6 Nm (uses 4 mm Allen tool)
   - Front cover large
   - Belt tensioner
   - Drive-train bracket

4. 5 mm Allen set screw, Class 8.8 @ 2.4 Nm (uses 2.5 mm Allen tool)
   - Main shaft timing pulley, hook-shaft timing pulley
   - Main shaft timing collar, hook-shaft timing collar

5. 6 mm Allen socket-head cap screws Class 8.8 @ 9.9 Nm. (Uses 5 mm Allen tool)
   An exception must be observed here since the screws are considered soft-jointed and shallow-threaded and are used externally. It is therefore advised that this torque specification not exceed 6 Nm.
   - Base plates
   - Handlebars

6. 6 mm Allen set screw, Class 8.8@ 4.5 Nm (Uses a 3 mm Allen tool)
   - Hand wheel
Lubrication Specifications
Rep Lube Kit Part# QM49262

Lubricant Type
#1. Kluber, Constant OY68 (Red)
#2. Kluber, Mikrozella G 8 OY (Blue)
#3. Kluber, GLY 2100 (Yellow)
#4. Kluber, NCA 15, Isoflex (Green)
#5. Kluber, GLY 151, Polylub (Orange)
#6. Conoco, Hydroclear R&O 32 (Purple) or similar white oil, i.e. Texaco 22, or Velocite 10

Machine Component
• All main bearings
• All main bearings
• Take-up lever, articulating link and needlebar driver
• Take-up caged needle bearings
• Hook race presser bar guide and plunger, lifting link and Pitman eccentric
• Hook race

HQ Lubricant Order Numbers

<table>
<thead>
<tr>
<th>Lubricant Type</th>
<th>Machine Component</th>
</tr>
</thead>
<tbody>
<tr>
<td>#1 Red OY 68</td>
<td>Replacement Lube</td>
</tr>
<tr>
<td>#2 Blue Mikrozella G 8 OY</td>
<td>Replacement Lube</td>
</tr>
<tr>
<td>#3 Yellow GLY 2100</td>
<td>Replacement Lube</td>
</tr>
<tr>
<td>#4 Green IsoFlex NCA-15</td>
<td>Replacement Lube</td>
</tr>
<tr>
<td>#5 Orange GLY 151</td>
<td>Replacement Lube</td>
</tr>
<tr>
<td>#6 Purple Texaco 22, hook race only</td>
<td>Replacement Lube</td>
</tr>
<tr>
<td>All the above in box with booklet</td>
<td>Rep Lube Kit Box</td>
</tr>
</tbody>
</table>

Lubricating Schedule
The Regalia lubricating schedule should be followed every 24 months or 10 million stitches whichever comes first.
Section 1: General Observation: Thread Mast and Thread Guides

The following observations, accompanied by necessary adjustments, will ensure trouble-free thread passage. Failure at any of these points will significantly affect thread tension.

Check:
1. The thread mast should be adjusted so that the eyelet loops are centered directly over the spool pins.

If a correction is necessary:
Loosen the jam nut on the thread mast, reposition and tighten the jam nut. (10 mm open end wrench)

2. Check/Inspect: Test the condition of the thread guides (1, 2, 3), thread stirrup (4), thread guide (5) and needle bar thread guide (6) for any abrasions, cuts, or electroplate blistering. Test each guide by flossing it with thread, left to right and front to back, in all directions, checking for any defects that may damage or cut the thread. Replace any damaged parts. (2 mm and 2.5 mm handle Allen)

3. Check the top tension assembly for the following:
Check between the tension discs for any foreign material that could prevent the discs from functioning properly.
Section 1: General Observation: Quick Set Tension Assembly - Replacing the Take-up Spring

1. Remove the following parts from the assembly: knob, detent washer, cone spring with long tail, spring base and two tension discs.

   **NOTE:** the detent washer is placed with the detents away from the knob on the Quick Set Tension assembly.

2. Loosen the set screw under the Quick Set Tension assembly on the front cover casting and pull the tension assembly out just far enough to loosen the set screw on the barrel (step 4), so the center split bolt can be removed from the assembly.

   **IMPORTANT:** Be careful not to pull the assembly out too far so as to pull off the wire tie internally, which protects the tension assembly cable from interfering with the take-up lever.

3. Loosen the set screw on the barrel, remove the center split bolt.

4. Wiggle and push in on the tail of the spring until the take-up spring pops out of the barrel.
5. Replace the damaged take-up spring with a new take-up spring (QM10197). It is recommended to have a few take-up springs in stock.

6. Replace the split bolt, adjust the take-up spring strength, see Five Checks on the next page. With the correct take-up spring strength, push the split bolt all the way in to the barrel and tighten the barrel set screw loosened in step 4.

7. Ensure that the top tension barrel is pushed into the shoulder (Assembly is removed to allow view of shoulder.)

8. Align the straight vertical part of the take-up spring up at 12 o’clock when in its rest position.

9. Replace the parts removed in step 1.
Section 1: General Observation: Quick Set Tension Assembly - Replacing the Take-up Spring (Continued)

Five Checks When Replacing the Take-up Spring:

1. With the take up spring inside the barrel, reinstall the center split bolt.

2. Rotate the center split bolt clockwise to make the spring stronger or counterclockwise to make the spring weaker. To test: the spring should return all the way to the right end of the slot, regardless of how lightly it is moved to the left. The spring should be just strong enough to always return clockwise to the end of the slot.

   ✅ IMPORTANT: The strength of the spring is critical. If it is too weak or too strong, it will not take the thread up properly and this will cause stitching issues.

3. With the spring strength set properly, ensure the center split bolt is pushed firmly all the way into the barrel and tighten the barrel set screw onto the center split bolt.

4. Make sure the top tension assembly is pushed all the way into the shoulder on the front cover.

5. Rotate the entire tension assembly to set the straight part of the take-up spring up toward 12 o’clock when it is in its rest position, and then tighten the front cover set screw onto the tension assembly.
Section 2: Removal of the Front Cover

⚠️ CAUTION: Make sure the machine is unplugged from the wall before removing the front cover or whenever working on the machine.

Tools Required: 2 mm, 3 mm, 4 mm, 5 mm handle Allen, 4 mm L Allen, #3 flat screwdriver.

1. Remove the small hex screw on the back power inlet module closest to the three power prongs with a 2 mm hex tool.

2. Remove the nose cover screw with a 3 mm hex tool. Remove the nose cover.

3 Remove the needle plate screws with a #3 flat screwdriver. Remove the needle plate.

4. Loosen the levelling screw 1 full turn with a 5 mm handle hex tool. This will take any bind off the two large lower screws in the next step.
Section 2: Removal of the Front Cover (Continued)

5. Remove the two large lower frame screws with a 4 mm hex tool.

6. Remove the large center upper frame screw with a 4 mm hex tool.

7. Remove the two large and three small front cover screws (5 total) circled with 4 mm and 3 mm hex tools respectively.
Section 2: Removal of the Front Cover *(Continued)*

8. Remove the five large front cover screws (5 total) circled with 4 mm hex tool.)

9. Separate the front cover. Make sure the take-up lever does not get caught in the front cover slot.

⚠️ IMPORTANT: The take-up lever is very hard and will *break*, not bend.

10. Open the front cover carefully and remove the front wiring harness from the control board. This harness contains the wiring for the Quick Set Tension, the thread break sensor and the right throat light.

⚠️ NOTE: Once the front cover is removed and the wiring harness in the above step is disconnected, neither throat light will work because the right and left throat lights are wired in series.
Section 3: Regalia Lubrication

Lubrication Schedule The Regalia lubricating schedule should be followed every 24 months or 10 million stitches whichever comes first, to ensure top mechanical performance.

#1 Red
Use Lube #1 (Red) in the seven places shown below, on each side of the bearing, between the bearing and the shaft (7 places).

#2 Blue
Use Lube #2 (Blue) between the bearing outer diameter and the bearing support at one corner on each of the seven bearing retainers (7 places).
Section 3: Regalia Lubrication *(Continued)*

**Needle Bar and Presser Bar Bearings**

The needle bar and presser bar both have two bearings, an upper and lower.

Place one drop on the side of the needle and presser bars on the top two bearings and also on the bottom two bearings as shown in the bottom photo.

Work the oil up into the bottom two bearings by turning the hand wheel for the needle bar and pushing up on the presser bar to work the oil up into the bearings (4 places).

**Hopping Block Mechanism**

Place one drop on each side where the moving part is against the hopping block bearing (2 places).
Section 3: Regalia Lubrication (Continued)

#3 (Yellow) GLY 2100
One drop per orifice, articulating link, take-up lever and needle bar driver (3 places).

#4 (Green) IsoFlex NCA-15
Inside caged needle bearings (2 places).

#5 (Orange) GLY 151
Add grease sparingly to the presser-bar slide and plunger. Add a small amount between the stylus and cams of both the presser-bar lifting link and the hopping-mechanism lifting arm (4 places).
Section 3: Regalia Lubrication *(Continued)*

#6 Purple

Apply one drop of Lube #6 *(Purple)*, to the raceway of the bobbin case support two to three times per day or after each bobbin change. This application is based upon sewing for eight hours of machine time. If the machine is used less, lubricate the hook less frequently. After the lubrication of the hook, it is recommended that you sew on scrap material for a few inches before resuming sewing on the quilt. Failure to do so may result in oil stains on the quilt.
Section 4: Checking and Securing Flats and Screws

First Screw, First Position Rule

The first screw is 120 degrees before the 2nd screw when the handwheel is turned in the direction of rotation. The first screw in direction of rotation goes on the flat.

**NOTE:** First screw in direction of motion goes on the flat. The first screw is 120 degrees before the 2nd screw. The 2nd screw is 240 degrees before the 1st screw.

Hook-shaft timing pulley

**Tools needed: 2.5 mm handle hex tool**

**NOTE:** The hook-shaft timing pulley rotates in the opposite direction as the main shaft timing pulley. Carefully NOTE the labeled first screw.

**NOTE:** The hook-shaft collar normally does not have a flat, but on the Regalia machines it does; however it is not for timing. The hook shaft pulley first screw is fixed on another hook shaft flat.

**Important Hook-Shaft NOTEs**

The hook-shaft turns two times per stitch and rotates in the opposite direction as the main shaft. Please carefully NOTE which screw is the first screw in the direction of motion and on the flat.

The hook-shaft pulley is set to a specific setting from the end of the shaft to allow proper needle-to-hook distance adjustment. Adjust the collar to remove axial play, not the hook-shaft pulley. The setting can be thrown off, which may make needle-to-hook distance adjustment impossible.

The Regalia utilizes long collars with two screws in line to help prevent the collar from tipping when tightened, causing variation of tightness or play, as the collar rotates 360°. To ensure that there is no tightness or play, the collar should be checked through a full rotation until it has minimal tightness and minimal play.
Section 4: Checking and Securing Flats and Screws

The Regalia has been designed using flats and special screws to help prevent loop lift timing from slipping, except at the hook. If the hook cannot slip, then something would have to break when something goes wrong. The hook is designed to be adjusted without removing the front cover.

First check the torque specifications chart on page 5, then check the following locations, making sure that the first screw of a timed component has been fixed firmly on the respective flat on the shaft:

1. The hook-shaft timing pulley
   (2.5 mm handle hex).
2. The Pitman crank
   (5 mm L hex tool)
3. The take-up lever driving link
   (3 mm handle hex tool)
4. The main shaft timing pulley
   (2.5 mm handle hex tool)

**NOTE:** The screws are generally positioned 120 degrees apart. When the first screw in Direction of Motion (DOM) (Position 1) has been located and tightened on a flat, the second screw is then tightened, compounding the tightness of the first screw, thus securing and assuring that timing will not change.

**NOTE:** The brass counterweight position is critical both axially and rotationally.

**NOTE:** It is important to check that the brass counterweight tightening procedure did not create a tight arm shaft condition. If so, readjust the counterweight again until there is no tightness and minimal-to-no end-play. This is checked by rotating the shaft and checking a few times through a full 360° rotation of the shaft.

**Counterweight Timing**

The counterweight has a slit and can be adjusted. It is not set on a flat for timing. Set counterweight timing as follows:

- First Pitman screw straight up, pitman straight edge vertical and aligned parallel with the bearing retainer strap.
- The counterweight slit is straight up with screws on top facing straight out.
- Tighten very firmly with an L hex tool.
Section 5: Axial Play Check and Adjustment

Axial or end play on shafting can result in noise, wear and faulty sewing.

Check:
1. Check the main shaft by pushing and pulling on the hand wheel.

> NOTE: A small amount of main shaft axial play is permissible. Too much main shaft play may cause noise and/or stitching issues.

If a correction is necessary:
- Remove the front cover.
- Loosen the counterweight screws (3 mm handle Allen)
- Adjust so that minimal to no play is detected.
- Provisionally set the screws.
- Check that the shaft has minimal play and no tightness, from the collar being too tight, by rotating the shaft through a few 360° rotations.
- Check that the timing of the eccentric is still correct (see counterweight timing page 17).
- Fully tighten the screws.
- Check shaft again for play or tightness.

2. Check the hook shaft by pushing and pulling the hook.

If a correction is necessary:
- Remove the front cover.
- Remove the play by loosening the hook-shaft thrust collar (not the hook-shaft timing pulley) and adjusting out any axial play.
- Check for proper setting by rotating shaft through a few 360° rotations.
Section 6: Adjusting the Base-Plates and Rollers

Tools required: (5 mm handle Allen)

Check:
The machine must not rock on a flat surface and the wheels must be the same distance from each other front to back on both sides of the machine.

NOTE: This is done on a precision surface plate at the factory during assembly.

If a correction is necessary:

• The rear base plate should be as straight to the machine as possible. The three baseplate screws should be tight.

• The front cover baseplate should be as square to the machine as possible. The two baseplate screws should be tight on the back casting.

Check:
Use a ruler or tape measure to check the distance from the front to rear wheel. The distance should be the same on both sides of the machine.

If a correction is necessary:

• Slightly loosen the two front base plate screws and adjust.

• Tighten the two screws firmly before proceeding to the next step.

IMPORTANT: The two front baseplate screws must be tightened before tightening the leveling screw on the front cover casting.

NOTE: If the front cover has been removed to service the machine, the M10 adjustment screw should be flush or recessed in the front cover casting before the front cover is installed onto the machine.
Section 6: Adjusting the Base - Plates and Rollers (Continued)

Place the machine on a flat surface or the carriage tracks. Use a 5 mm hex driver, down through the casting hole, to lower the front right wheel until the machine does not rock.

⚠️ IMPORTANT: If the two front base plate screws are not tight, or if the M10 screw is extended out of the casting when the front base plate is installed and tightened, then backing of the screw to raise the front right wheel, will make the front baseplate mounting screws too loose. These three screws need to be in tension against each other.
Section 7: Adjusting the Motor Drive/Timing Belt Tension

The Regalia machine utilizes a single motor drive/timing belt system. The belt is a double-sided round-tooth belt.

Tools required: 5 mm handle hex tool and 13 mm open end wrench.

**Check:** With the machine front cover removed. Check the belt tension for tautness by pressing it with your index finger. Press the vertical center of the belt with light pressure. The belt should deflect about ½”. Proper belt tension provides for some belt flexibility under light finger pressure, but should not be so tight as to bind the machine.

Double-check the tension by rotating and rocking the hand wheel. Confirm that there is no backlash or play between the belt teeth and any of the driven components. Confirm, also, that there is an **Immediate Transfer of Motion** between the handwheel and the hook.

**IMPORTANT:** Do not over-tighten the belt as this will make the machine difficult to turn and may cause other undesirable issues, including more belt noise.

**If a correction is necessary:**

- Insert a 5 mm handle Allen tool into the fixing screw in the center of the tensioner, and loosen it until you can turn the outside of the tensioner with the 13 mm open end wrench.

- Turn the tensioner with the 13 mm wrench clockwise to tighten or slightly counter clockwise to loosen the belt tension.

3. Tighten the center fixing screw with the 5 mm handle hex tool firmly.

**IMPORTANT:** Do not tighten the belt by turning the 13mm wrench counter clockwise as this will pinch the belt in the small area between the tensioner pulley and the motor pulley. Only tighten the belt by turning the 13mm wrench clockwise.
Section 8: Adjusting the Hopping Foot and Presser Bar Height

Tools required: 8 mm open end wrench.

Adjusting the Hopping Foot

The Regalia features the KinetiQuilt hopping mechanism; allowing the hopping foot to move (hop) up, down and dwell on the fabric when the needle is in the fabric. This allows fabric to move through the machine similar to a normal sewing machine with a feed dog. The dwell time allows for a longer hesitation of the hopping foot on the fabric and completion of the stitch cycle. The results are better tension, less needle breakage and increased hook life.

The initial setting of the presser bar height is 1.5” from the bottom of the jam nut to the needle plate surface with the needle and presser bar in their lowest position. This helps set the proper internal spring pressure on the presser bar along with the setting on the presser bar guide block inside the machine. When properly set, the spring tension will be sufficient to hold the fabric properly during stitching and also keep the presser bar from knocking at high speeds.

The customer may be tempted to change the foot height at the jam nut to sew a thick quilt or one with thick seam allowances. This can cause stitch and noise issues.

Check: There should be about 7 (6 to 8) threads showing below the jam nut on the quick change mount adaptor. If this has been screwed way in or out it will affect the spring tension on the presser bar.

If a correction is necessary:
- Hold the hopping foot firmly, loosen the jam nut with an 8 mm open end wrench, and screw the foot until it has 7 threads showing below the jam nut (5 mm from jam nut to top of foot). Make sure the foot is centered on the needle plate hole.
- Tighten the jam nut firmly while holding the foot firmly, being careful not to scratch the foot or mount adaptor.

NOTE: This is the initial setting of the presser bar, not the final setting.
Section 8: Adjusting the Hopping Foot and Presser Bar Height (Continued)

Tools required: 3 mm handle Allen, 0.5 mm feeler gauge QM40133.

Check: When the needle bar is in its lowest position, the sewing foot should be no higher than 0.5 mm above the needle plate. It is permissible for the sewing foot ring to lightly touch the needle plate.

NOTE: It is important to check how far the foot or foot adapter is screwed into the presser bar before resetting the presser bar height internally at screw C. This is in case the end user has changed the foot height by screwing the foot in or out a number of times. This will negatively affect the amount of presser bar spring tension on the hopping foot and consequently create stitching problems including skipped stitches. (It is not recommended that the customer change the hopping foot height, for this reason) See previous page.

If a correction is necessary:

- Turn the hand wheel until the needle bar is at its lowest position. This is the position where the presser bar is also in its lowest position.

- Place the 0.5 mm feeler gauge (Part # QM40133) under the hopping foot.

- Loosen screw C through the machine front cover access hole (3 mm Allen driver).

- Wiggle the presser bar up or down to the desired position. Tighten screw C firmly while pushing down lightly on the tool blade towards the table. This will ensure that the lifting link and hopping block mechanism make appropriate contact inside the machine for the hopping foot to work properly.

IMPORTANT: When screw C is loosened, the presser bar guide block and the lifting link can move up off the hopping block mechanism. In this case the hopping foot will not function properly or be the correct height above the needle plate.

5. Confirm the ring of the foot is centered on the needle when the screw C is re-tightened.
Section 8: Adjusting the Hopping Foot and Presser Bar Height (Continued)

**Final Hopping Foot Check:** When the machine is run full speed without fabric under the hopping foot, with the bottom of the hopping foot set at .5 mm above the needle plate, the machine should not knock loudly inside on the hopping block mechanism. If the presser bar spring inside the presser bar is not compressed enough it is possible for knocking to occur at higher speeds.

**NOTE:** If knocking occurs at high speeds after adjusting the machine as per the previous instructions, you need to add a little more pressure to the presser bar spring, as described below.

**If a correction is necessary:**

- Turn the handwheel until the needle bar is at its lowest position. This is the position where the presser bar is also at its lowest position.
- Place the 0.5 mm feeler gauge (Part # QM40133) under the hopping foot.
- Loosen screw C through the machine front cover access hole (3 mm Allen driver)
- While holding the tool in screw C, and pushing down on the tool to maintain internal assembly contact, push up on the presser bar and hopping foot to be slightly above the .5 mm feeler gauge to tighten the presser bar spring. Firmly tighten screw C. Repeat this process a couple of times until the internal knocking is minimized or eliminated. The foot will now be too high above the needle plate.

**NOTE:** It may be helpful to add a business card along with the gage to aid in raising the hopping foot slightly more each time until the spring has the correct tension.

- To make the final hopping foot height setting, loosen the jam nut on the presser bar and rotate the foot down to 0.5 mm or less above the needle plate. Center the hopping foot ring over the needle plate hole and firmly tighten the jam nut while holding the foot firmly.

**IMPORTANT:** One of the main causes of skipped stitches besides timing is the hopping foot being set too high above the needle plate.
Section 9: Needle Position Y / Front to Back, Check, & Adjustment

Tools required: (3 mm and 4 mm handle Allen).

The needle position adjustment is the most important of all adjustments in the machine. Needle position provides the foundation for which all other settings are made.

Once the needle position has been completed, great care must be maintained to keep this setting. It is important that the sewing machine be transported carefully, so as to not allow bumping or dropping.

Check: Use a new System 134/Size 100 needle. Check the needle for straightness on a flat surface such as the needle plate. Press down on the shank and roll the needle watching for the tip to wobble. The tip will not wobble if the needle is straight. The needle must be centered in the stitch hole of the needle plate. Check with needle eye flush with the needle plate, do not check with needle in the lowest position.

Adjustment for Y axis (front to back): Cover Off

NOTE: The Y (front to back) adjustment is done with the front frame cover off.

If a correction is necessary:
• Loosen first screws D and G
• Then loosen screw A and B
• While pushing the head frame back into the main casting, gently slide the head frame left or right to correct as necessary.
• Tighten screws A and B

NOTE: If needle position changes, repeat the process. Do not tighten screw D or G at this time. They will need to be loose to adjust the X axis in the next step.
Section 10: Replacing Front Cover

Replace the front cover before adjusting the X axis needle position.

⚠️ IMPORTANT: Take special care to not pinch any wiring when replacing the front cover.

- Plug the front cover wiring harness into the Main Control board at the rear of the machine.

Check: Assure the small throat LED light strip connection on the back frame casting will not be pinched when the cover is replaced.

Check: Assure the small throat LED light strip connection on the front cover will not be pinched when the cover is replaced.

NOTE: There is extra cable slack inside the machine to allow the replacement of the light strips and reconnection without removing the front cover of the machine. Take care to keep the slack inside the machine and not where the front cover meets the back frame.
Section 10: Replacing Front Cover *(Continued)*

**Check:** Assure the four wires from the front of the machine going to the nose cover board pass through the hole in the castings without being pinched.

**Check:** Assure the three wires from the front handle bar connection board, the needle laser, and light ring do not cover the head frame needle position adjustment screws and will not be pinched when the front cover is installed.

**Check:** Assure the wire in the bottom of the free arm, that goes from the back of the machine to the front of the machine, for the bobbin area light, is run properly and will not be pinched when the front cover is installed.
Section 10: Replacing Front Cover (Continued)

- Start all the screws through the back frame casting into the front cover. Stagger tighten the screws so the front cover will go on evenly and not bind.

**NOTE: Back frame casting screw and tool sizes**

- Back Screws: M5x80 (five quantity).
- Middle Screws: M5 x 55 top and M5x80 bottom. (1 each)
- Front Large Screws: M5 x55 (three quantity)
- Front Small Screws: M4 x 44 (three quantity)
- M5 screws use a 4 mm hex driver
- M4 screws use a 3 mm hex driver
Section 11: Needle Position X / Left to Right, Check & Adjustment

Tools required: (2.5 mm and 4 mm handle Allen).

Adjustment for X axis: Cover On

>Note: adjustment is done with the front frame cover on. The picture shows the cover off for illustration purposes only!

The primary adjustment is accomplished using the right side of the head frame. The screws on the left side are loosened to allow movement of the head frame.

If a correction is necessary:

- Loosen screws F, G and H through access holes two or three turns.
- Loosen screws D and E two or three turns and back off screw C a little.
- Push the head frame back against the main frame so that screw C touches the main frame. Adjust screw C to bring the needle to center in the needle plate.
- Gently tighten screw E until it lightly touches the main frame.
- Tighten screw D.

>Note: If the needle changes, repeat the process.

- Repeat the process on the left side of the head frame.

>Note: If the needle changes, repeat the process.
Section 12: Checking Loop Lift and Needle Distance

**Tools required:** Loop Lift clamp (part #QM40199), 2.2 mm forked feeler gauge (part #QM40136), 2 mm ball end L Allen wrench, 2 mm handle Allen wrench and #3 flat screwdriver.

**IMPORTANT:** The timing and needle distance adjustment must be done with the front machine cover on.

Loop Lift is a universal hook and timing term for all lock-stitch sewing machines. When the needle lifts a specified distance from the BDC (bottom dead center), the hook point is set to coincide with the needle. This is the radial position of the hook called Loop Lift, commonly referred to as timing. Another part of timing is the Needle Distance. This is the axial distance from the hook point to the needle. Loop Lift is the radial setting of the hook and Needle Distance is the axial setting of the hook. Both of these are set on the hook and fixed with the same set screws. Since two things are being set at the same time, this can be a little difficult until practiced.

**NOTE:** The loop lift clamp used must have a plastic protective compression pad, so as not to damage the coating on the needle bar.

**Check and Observe the following:**
- Remove the needle plate.
- Turn the hand wheel until the needle bar is at its lowest position or BDC (bottom dead center).
- Place the loop lift clamp (with special protective compression pad) on the needle bar and set the thumbscrew lightly.
- Place the 2.2 mm feeler gauge between the clamp and the bottom of the head frame bearing surface.
- Raise, reset and tighten the clamp, pinching the 2.2 mm feeler gauge in between the clamp and projected bearing. This step may need to be repeated a few times to remove all excess play between the clamp and gauge.
- Remove the 2.2 mm feeler gauge.
- Rotate the hand wheel in the direction of motion, This is very important! until the clamp lightly touches the gauging surface.

**IMPORTANT:** If the hand wheel is turned too hard, the clamp may slip, making the check invalid.

- Check the position of the hook point relative to the needle.
- Check the distance between the needle and the hook point. The hook point should lightly touch (brush) the needle inside the needle scarf. Too much needle distance or improper loop lift settings may cause shredding and skipped stitches. Too little distance will cause the needle to bend during sewing and cause other issues.

**NOTE:** This is explained in more detail on page 35.)
Section 13: Adjustment of the Loop Lift and Needle Distance

**IMPORTANT:** The timing and needle distance adjustment must be done with the front machine cover on.

If correction of loop lift or needle distance is necessary, then the basket must first be rotated down:

Rotating basket down:

**NOTE:** With the bobbin case basket in the normal position, the basket needle guard may deflect the needle, making it difficult to accurately adjust the needle distance between the hook point and the back of the needle scarf. It is important that the basket needle guard be rotated down, out of the way, to allow correct adjustment of the needle distance setting.

Rotate the basket out of the way to facilitate the needle distance adjustment.

**IMPORTANT:** After moving the stop-finger, you need to hold the basket in place when turning the hand wheel, to prevent the needle from hitting the basket.

- Loosen the stop-finger screw with the 2.5 mm handle Allen tool.
- Slide the stop-finger out of the basket groove, until the basket can be rotated.

**NOTE:** You may need to remove the stop-finger. In this case, don’t worry about reinstalling it until after you are finished with the timing adjustments

- Snug the stop-finger screw.
- Rotate the basket 180 degrees until large cutout is up towards needle. You will now need to hold the basket in that position. (See important NOTE above.)
- Adjust needle distance (and loop lift) as directed in the next section (beginning on page 34).
Section 13: Adjustment of the Loop Lift and Needle Distance (Continued)

NOTE: If the needle bar has been removed or changed, the needle bar height will need to be at least roughly set first, or it will not be possible to set needle distance correctly, because the hook point will not align with the needle scarf.

If a correction is needed:

• If still in place from the check, remove the clamp.

• The basket must be rotated down in order to make setting the needle distance possible.

See previous page for information and pictures on rotating the basket down.

NOTE: Once the basket has been turned down it must be held while turning the hand wheel to prevent it from turning and colliding with the needle.

NOTE: When the hook screws have been loosened, the adjustments of the loop lift and needle distance are possible since the hook can be moved radially as well as axially.

NOTE: Some hooks are tighter than others on the hook-shaft. You may be tempted to pry on the hook mechanism. If you pry on the hook it may become damaged, irreparable and unusable.

• Loosen the two screws on the hook base. 2 mm handle Allen. Replace the clamp and reset with the 2.2 mm feeler gauge as described on page 32, making sure to turn the hand wheel in the direction of motion.

• Set the hook to the correct position by sliding the hook axially (needle distance) on its shaft, as well as radially (loop lift), setting the hook point relative to the needle, as described on the next page. Radial position of loop lift.
Section 13: Adjustment of the Loop Lift and Needle Distance (Continued)

- Adjust the needle distance by sliding the hook axially on the hook shaft toward the needle until the hook barely touches (lightly brushes) inside the needle scarf.

  **NOTE:** Because the fabric can displace the needle during multi-directional sewing, it is necessary for the needle to lightly brush the hook inside the needle scarf. Too much needle distance may cause skipped stitches and other stitching problems. If the hook brushes heavily against the hook, it can wear the needle guard on the hook basket.

- Check that the needle distance is correct by tapping on the needle with a small tool, e.g. the 2 mm ball hex tool, to see if the needle moves. If it is touching it will make a hard metal on metal sound. If the needle is lightly touching then it will move when the needle bar is pressed lightly on the back side towards the front of the machine. If you have to push hard to get the needle to deflect then the needle is brushing hard against the hook. The needle should only lightly brush against the hook to prevent undesirable hook wear.

- Lightly tighten the first screw with the 2 mm ball end L Allen tool, while providing resistance against the adjustment, by holding the hook in place with your other hand. Carefully rotate the hook on the hook-shaft to set the loop lift. Carefully snug and then tighten the first screw.

- Remove the clamp.

- While holding the basket in the down position and from turning, rotate the hand wheel until the second hook screw is accessible. Carefully snug, then tighten the second screw. If you push on the tool while tightening, the hook may move, throwing the settings off.

- Tighten both screws tight with the 2 mm handle Allen tool.

- Reset the loop lift clamp and gauge again to check that loop lift and needle distance are still correct.

**IMPORTANT:** If loop lift, needle distance and needle height are not adjusted accurately, the machine may skip stitches, shred thread or not sew.
Section 14: Adjusting the Needle Height

Tools required: (#3 Flat screwdriver)

NOTE: This adjustment must be completed with the front frame cover on. Important

NOTE: Shown with cover off for illustration purposes only!

IMPORTANT: Needle bar height must be set first with a gauge before the hook is installed or visually checked with the hook installed and timed correctly first. The most common check is the visual check because the hook does not have to be removed. Needle bar height cannot be checked visually unless timing has first been set correctly.

Check: The needle height must be set so that when viewed from behind as shown, and with the hook point flush with the right side of the needle, the bottom of the hook point should be 1.0 mm above the top of the needle eye.

If a correction is necessary:

• Remove the nose cover screw.

• Lower the needle bar to its lowest position to access the needle bar driver screw.

• Insert a screwdriver through the access hole

• Hold the needle bar with your other hand to provide resistance against the adjustment, so the needle bar will not fall down, out of the driver.

• While holding the needle bar with one hand, loosen the screw slightly so that the needle bar can be wiggled up or down to the correct position.
Section 14: Adjusting the Needle Height (Continued)

- Ensure that the needle-bar thread guide hole is straight towards the front of the machine.

- If correction is necessary, slightly loosen the needle bar driver screw while holding the needle bar with the other hand. Rotate radially until the hole is at front and re-tighten the driver screw firmly.

**NOTE:** The position of the needle clamp screw is not straight out to the side of the machine, but is angled toward the back of the machine. This is to prevent the needle clamp screw from inadvertently catching the thread from the take-up lever above it.

**NOTE:** Under NO circumstance should the needle bar clamp screw be completely loosened. Failure to observe this caution can result in the uncoupling of the needle bar from the needle bar driver. If this happens, do not run the machine. Remove the front frame cover, reassemble the needle bar to the needle bar driver and readjust.
Section 15: Adjustment of the Stop-Finger

Tools required: (2.5 mm handle Allen)

Check: The engagement of the stop-finger and throat of the bobbin case support basket must have a clearance of 0.8 mm to 1.0 mm. This clearance ensures that adequate space exists for thread escapement during the sewing process.

NOTE: If set with too much needle clearance, the basket will be noisy and can also more easily slip out of adjustment. If set too tight, the thread will get stuck around the stop-finger and may jam the machine and damage the hook.

If an adjustment is necessary:

• Loosen screw A and adjust the stop-finger so the proper clearance is achieved.

IMPORTANT: Ensure that the stop-finger stays up tight against the machined edge at the left of the stop-finger as shown in the first image on this page.

NOTE: This view is from the under side looking up, not from the top side looking down.

• The machined edge helps support the stop-finger from twisting to the side, so that the basket will not spin out of position, be hit by the needle or damaged.

• Tighten screw A firmly.
Section 16: Adjusting the Needle Height with Cylinder Height Gauge QM40131

Tools required: Flat screwdriver, #3 x 150 mm in length, needle-height cylinder tool.

The Cylinder Height Gauge is used to set needle bar height first, before the hook has been installed during production of the machine or when the hook or needle bar have been removed for some reason during servicing of the machine.

- NOTE: If loop lift is out of adjustment then needle bar height will also appear to be out of adjustment when checked by eye.

- NOTE: The hook must be removed to use the needle height with the cylinder height gauge so loop lift and needle distance will then need to be reset.

- NOTE: The Needle Height Cylinder Tool (part number QM40131 REV.C) fits all Baby lock machines to date (January 2018).

This adjustment can be completed with the front frame cover on or off.

Check: When the machine timing is correct the needle height should look like the first picture on this page when the hook point reaches the far edge of the needle. If not, you may wish to set needle bar height with the cylinder height gauge.

- Remove the needle plate, stop finger, and hook assembly.

- Turn the handwheel to bring the needle to its highest position.

- Slide the cylinder height gauge onto the hook shaft with the flat up. You may have to tap it onto the shaft a few times to get the air out of the gauge.
Section 16: Adjusting the Needle Height with Cylinder Height Gauge (Continued)

- Slide the cylinder tool gently out, to be against the needle.

- Sight through the needle eye and compare the upper and lower levels of the eye with the cylinder tool groove. The eye should be aligned with the white groove of the gauge. If an adjustment is necessary, hold onto the needle bar with one hand, while loosening the screw with your other hand. Raise or lower the needle bar as needed.

- Rotate the needle bar until the hole in the needle bar clamp thread guide is straight forward.

- Reinstall the hook and set loop lift at 2.2 mm and reset needle distance. (See Adjustment of the Loop Lift and Needle Distance Section 13, page 33.)

- Reinstall the stop finger and needle plate.

- Rotate the cylinder height gauge until the flat is down.

- Rotate the handwheel until the needle is in the lowest position.
Section 17: Electronic Information - System Power

The Regalia operates at voltage levels between 100 and 240VAC, 50-60 Hz. This means it can be run in most countries as long as the appropriate power cord or adapter plug is used. If an adapter plug is used, please be sure the adapter connects the Earth Ground as well as the Line and Neutral prongs of the plug. An improper or nonexistent earth ground connection will lead to sporadic and potentially dangerous operating conditions.

An auxiliary AC power outlet is available directly above the main power inlet on the machine. This outlet will supply 1 Amp of current at the supplied AC voltage. Outlet Power is 120 watts maximum.

 Pru IMPORTANT: The Regalia power supply has a remote on/off power control located at the front of the machine on the left side of the nose cover. The machine will have no power if the front nose cover and its connections are removed. Both the rear and front power switches must be on for the machine to power on.

Fuse

The machine uses a replaceable (QM20059) 4.0 A slow blow fuse, 5 mm x 20 mm, (250V) located in the fuse holder at the back of the machine between the power cord input and the on/off switch.

Symptoms of a Blown Fuse

With power connected to the machine and with both the rear power switch and front power switch turned on, there will be no power to the machine or the machine auxiliary power if the fuse is blown.
Auxiliary power outlet and rear connection plate.

No Machine Power

If the machine has no power, check the most obvious things first:

- Power at source outlet
- Cord connected properly at source outlet and machine
- Power switch on at rear of machine
- Power switch on at front of machine. If the nose cover has been removed along with its connections the machine will not power on.
- Fuse
- Power supply connections
- Power supply
- Power filter and connections

Drive Train Assembly with power supply, power filter, control board, motor driver board, needle position sensor board, motor, motor encoder, bracket and fan.
Power Supply

The Regalia machine uses a 500 watt 48VDC output power supply, mounted inside the machine on the drive train assembly. The power supply has two 48VDC outputs, one for the control board and one for the motor driver board. These two boards are also mounted to the drive train assembly.

At the top of the power supply there is a connection for the remote power switch located at the front left of the machine (see top right - small white connector with black and red wires). The other end of this remote power switch is on the bottom left on the control board at J5 (circled in white).

If the power supply has failed, there will be no power at all to the machine (no handlebar screens, no lights, etc.). However, it is more likely that the fuse has blown, if there is no power to the machine than that the power supply has failed. Refer to page 41 for fuse information.

Symptoms of a Failed Power Supply

If the power supply totally fails there will be no power to any system in the machine.

If the power supply fails to provide 48VDC then the machine will not run because it requires 48VDC to operate.

NOTE: It is also possible that power that is converted by the control board to 5V and 3.3V for other systems in the machine could fail, rendering those systems inoperative. In this case the control board would need to be replaced.
The main shaft needle position sensor disc mounts to the main shaft near the hand wheel. It is composed of an aluminium disk with a cutout for needle up and needle down positions. This disk is set on a flat on the Amara/Forte machines; however it does not follow the first screw in direction of motion rule. The second screw is the one set on the flat. The sensor board is mounted directly to the top of the control board.

With the take-up lever in its highest position, the first screw is at the front and the edge of the cutout is aligned with the sensor. The 2nd screw is on the flat.

The disk is centered front to back in the sensor slot.

The take-up lever is up at this time.

There is a forked circuit board containing an emitter and a receiver for the encoder region. With the front cover removed, the cables connected and the machine powered on, the green “NEEDLE” LED on the right of the control board can be seen. It will turn on when the take-up lever is at its highest position, and stay on until the needle is at its lowest position. The LED is off until the take-up lever once again reaches its highest position and then turns on again. The main shaft encoder board (# QM20052) does not have any LEDs on the board.
Section 17: Electronic Information - Removing Handwheel

The handwheel can be removed to see some of the LEDs inside the machine without removing the machine front cover.

- While holding the handwheel firmly remove the handwheel screw with a 5 mm hex tool counterclockwise. You may want to use the “L” hex tool for more leverage.

- Locate an 8 mm Studio2 Frame or Gallery2 Frame screw to thread into the handwheel to remove it.

- Install the 8 mm frame screw into the handwheel while holding the handwheel firmly. Tighten the screw (clockwise) with a 5 mm hex tool until the screw pulls the handwheel off the main shaft tapered end.
Section 17: Electronic Information - Removing Handwheel *(Continued)*

- Handwheel with 8 mm frame screw. Handwheel fixing screw and washer at the side.

- Back of machine with handwheel removed.

- Rear LEDs and circuit boards visible with handwheel removed.
Section 17: Electronic Information - Replacing Handwheel

- While holding the handwheel firmly replace the screw and washer and tighten the screw firmly with a 5 mm hex tool to insure the handwheel is well seated once again.
Near the top of the Control Board are two green LEDs (D10, D11). The control board receives an input of +48V at J6 (circled) from the power supply and it converts this voltage into two different voltage levels. The left LED, D10, indicates that the 5V power is functioning for the front and rear displays (as well as other circuitry). The right LED, D11, indicates that the 3.3V power is functioning for the Control Board main processor (as well as other circuitry).

**IMPORTANT:** The machine should be turned off when wiring is being unplugged or plugged back in during all testing.

**IMPORTANT:** Proper ESD (electrostatic discharge) precautions should be observed to prevent any latent or catastrophic damage to the electronic circuitry of the machine.

If either of these LEDs is not on when both power switches are on and all cables are connected firmly:

- Turn off the power switch
- Disconnect all cables from the control board other than the red and black power cable at the top (J6).
- Unplug the remote on/off wire on the power supply.
Section 17: Electronic Information - Control Board LEDs (Continued)

• Replace the remote on/off wire with a QM20204 jumper on the power supply remote on/off switch connection. This will bypass the remote power switch and wiring. (Figure 17.20)

• Turn on the machine. If the LEDs are still not on, then there may be an issue with the power supply or the control board. If the LEDs both begin working again, this may indicate that one of the peripherals or its cabling is shorting out the control board.

• If a volt meter indicates that 48V is present at the Control Board power connector and the Control Board LEDs are off when everything is unplugged except for power at J6 and the QM20204 jumper on the power supply, then the Control Board should be replaced.

• If the LEDs come back on with everything unplugged but the above two items; begin plugging the cables back in one at a time (powering off between the connection of each cable) until you find the cable or peripheral that is causing the issue.

The Control Board has four labelled LEDs down the right edge of the board. These can be seen by removing the handwheel, without removing the machine front cover.

• D23, KEYPRS: Toggles on and off as the take-up spring passes the thread break sensor.

• D22, OVRSPD: Used by Engineering during testing/development.

• D21, NEEDLE: LED is on from when the take-up lever is at its highest position until the needle is at bottom dead center. LED is off from needle bottom dead center until the take-up lever is at its highest position.

• D20, HEARTBT: Indicates the main Control Board processor has power and is functioning when it is beating like a heartbeat.
Located near the bottom of the control board are two connections, one for the front handlebar display communications and one to the rear connection panel for the rear handlebar display communications.

The two small LEDs (D36 and D37) above the front handlebar connection on the left will flash every few seconds to indicate whether send/receive communication is occurring between the front handlebar display and the Control Board. (Circled in picture on the left). The two small LEDs (D38, D39) above the connection to the rear panel on the right for the rear handlebar connection, function the same as the front.

Troubleshooting Communication Issues

Handlebar display power, display information and communications is provided by the mini USB connection at the bottom of the display.

If a handlebar communication cable is disconnected, has a bad connection or is damaged, the display may still boot up past the splash screen. However, the touch screen will not update or change anything when touched. The handlebar switches are connected with the big white connectors with many white and yellow wires at the Control Board. Handlebar functions may work when the buttons are pushed on the handlebar, but the displays will not update without communications. These big connectors also enable power to be sent to the displays, so, if they are damaged you may not have any display or switch control.

Possible Solutions:

• Try re-booting the machine to see if the problem is corrected.

• If not, inspect the communications cable that connects to the front board. (circled, bottom)

• Check the cable connection at the front board at both the front board inside the nose cover, and at the display. (circled, top)

• If necessary open the machine front cover and check the front and rear communication cable connections on the Control Board.
Section 17: Electronic Information - Handlebar Communication LEDs

Rear HB Display Communication Connections

- The two small LEDs (D38, D39) above the connection to the rear panel on the right for the rear handlebar connection, function similar to those on the previous page for the front, but for the rear. The right connector on the control board is the communication cable at the Control Board for the rear handlebar display. The cable runs to the rear control panel connection J3 (second image on this page).

- J3 connection for communications cable for rear handle bar from Control Board (circled).
Section 17: Electronic Information - LED Summary

Motor Driver Board QM20031

- D20, +5V from control board
- D17, D18, D19, motor hall sensors
- D8, Combined hall sensor signal
- D13, +15V motor drive (FET gate device)
- D14, +5V for motor drive signal isolation ICs

Control Board QM20032

- D34, Pro-Stitcher transmit signal to carriage motors
- D35, Pro-Stitcher receive signal from carriage motors
- D36, Transmit signal to front display/Pro-Stitcher
- D37, Receive signal from front display/Pro-Stitcher
- D38, Rear display receive signal
- D39, Rear display transmit signal
- D10, +5V system power
- D11, +3.3V system power
- D18, Debug, shows when front display is connected
- D19, Debug, shows when rear display connects
- D20, Heart beat, Labelled HEARTBT
- D21, Needle up/down (main shaft sensor), labelled NEEDLE
- D22, Labelled OVRSPD (over speed), debug, (lit when no common between control board and motor driver board)
- D23, Labelled KEYPRS, used for Thread Break Sensor
Section 17: Electronic Information - Handlebar Front Membrane Switch Connection

Connection for the front handle bar membrane switch controls is as follows:

• J7 Control Board QM20032 left connector receptacle.

• Widest large white connector (circled left) with multiple white and yellow wires to Control Board J7 left receptacle.

• The wires from the large connector at the Control Board J7 split off to supply the front nose cover board QM20034 at J1, the front light ring, and the front handlebar connection board QM20035 mounted on the inside of the back machine frame casting. (Circled left)

• Two mini USB connectors for front handlebar connection on the main machine frame casting at front left, for front handlebar membrane switch controls.

**NOTE:** The bottom connection on the side of the machine is for the left side handlebar membrane switch and the top connection is for the right side handlebar membrane switch.
Section 17: Electronic Information- Handlebar Rear Membrane Switch Connection

Control Board connection for the rear handle bar membrane switch controls is as follows:

- J9, Control Board right connector receptacle.

- Large white connector (circled) with multiple white and yellow wires to J9 Control Board right receptacle.

- Multiple white and yellow wires from Control Board to J4 on the rear connection panel board (circled at the bottom of image to the left).

- Rear connection panel. Left is for display power and communications, center is an RJ45 network type cable for the rear handlebar membrane switch controls and right is the Pro Stitcher pass through 24V power to the front Pro Stitcher black box for tablet power and Pro Stitcher carriage motor RS232 communications.
Section 17: Electronic Information - Rear Connection Panel Board

Rear Connection Panel Board: QM20033:

- J4, From control board with 5V power for rear display and control for rear handlebar membrane switches.

- J8, 24V pass through power from Pro Stitcher Top right connection. Goes to front nose cover board. Once the Pro Stitcher output cable is installed (comes with Pro Stitcher) to the front nose cover board, the cable connects the board to the Pro Stitcher front black box to power the Pro Stitcher tablet.

- J6, Connection for Carriage/X encoder. Must be pushed in all the way or it will not work.

**IMPORTANT:** The two mini connectors for the Carriage/X encoder and the Machine/Y encoder have a tip and three rings. All four conductors must make contact or the encoders will not work. The cable must be plugged in all the way.

- J7, Connection for Machine/Y encoder. Must be pushed in all the way or it will not work.

- J3, Connection from Control Board to rear connection panel, white connector with 5 wires. This is the rear display communications cable.

- J10, Laser connection for the optional pantograph laser.

- J2 Not shown, USB Power Only, accessory power

Circled, three connections at top of rear connection panel

- J1, Left: Rear display power and communication

- J5, Center: Handlebar membrane control switch connection and power

- J9, Right: 24V from Pro Stitcher, pass through power and communications to PS black box.
Pro Stitcher Power and Communications Connection:

The Regalia has a built-in accessory power outlet to power the Pro Stitcher. Once the Pro Stitcher is powered, it provides power for the computer tablet via the Pro Stitcher connection at the top right of the Regalia rear connection panel.

Power for the Pro-Stitcher tablet goes into the 4 pin connection on the rear connection panel to the rear panel board. It passes through the rear panel board J9 connection to the control board J8 connection. From there, a long cable takes the power to the front nose cover board J2 connector.

Power then passes from the front nose cover board to the Pro Stitcher black box via a cable provided with the Pro Stitcher. The black box is also provided with the Pro Stitcher and mounts behind the computer tablet at the front of the machine providing system connections. (See J8 and J9 on previous page for more info)

IMPORTANT: The USB connections at the front left side of the Regalia machines and the one USB connection at the rear left of the machines are for USB powered accessories only. They do not have full USB capability, just power. Use the USB connections on the side of the Pro Stitcher black box for the USB stick, patterns, updating, etc.
Section 17: Electronic Information - Front Nose Cover Board Connection

Front Nose Cover Board: QM20034

- J6, USB Power Only, accessory power
- J7, USB Power Only, accessory power
- J8, Speaker connection
- J1, Multiple white and yellow wire connection from Control Board
- J2, Pass through power from rear connection power to front nose cover board.
- J3, Front Display communication from Control Board.
- J9, Needle laser connection
- J10, Power for future use. (Do not use this for Pro-Stitcher! This comes with a dummy plug inserted to discourage improper use).
- J5, Front display power and communication out to display.
- J4, Pro Stitcher pass through power out to black box.
Section 17: Electronic Information - Control Board Connection

Control Board: QM20032

- J4, Rear display communications via rear connection panel board (J3)
- J3, Front display communications via front nose cover board (J3)
- J11, Control Board to Motor Driver Board connection
- J13, Power Supply remote connection from power supply to Control Board and on from Control Board to the front nose cover board remote on/off switch. The machine will not turn on without this connection.
- J8, Front machine casting cover wire harness (contains right LED light strip connection, Quick Set Tension connection, Thread Break Sensor connection.
- J7, Large white connector for wire harness with many white and yellow wires for front machine control. Harness goes from Control Board to front nose cover board J1, front handlebar membrane switch connection board QM20035, and front LED light ring board QM20037.
- J9, Large white connector for wire harness with many white and yellow wires for rear machine control. Wire harness goes from Control Board J9 to rear connection panel board J4.
- J6, Black and Red power cable from power supply providing 48VDC power to control board.
- J5, Engineering Debug connector
- J1, Unused plug
- J12, Bobbin area LED board
17. Electronic Information - Motor Driver Board Connection and LEDs

**Motor Driver Board: QM20031**

- J2, 5 pin connector for small motor wires to motor driver board (Red: 5VDC (powers three hall sensors); Black is Ground; Blue/Yellow/White are for the hall sensors.)
- J6, 3 pin connector for large motor wires to motor driver board which provides 3 phase DC power to brush less DC motor.
- J5, 2 pin Black and Red power connection from power supply.
- J3, 4 pin motor encoder to motor driver board.

> **NOTE:** if this is disconnected from the motor driver board the machine will run full speed when the start/pause button is pressed.

- J1, 7 pin connection to Control Board

**Motor Driver Board LEDs:**

- D17, D18, D19 are LEDs for the hall sensors and flash when the handwheel is turned. *(Circled top center)*
- D8 is the sum LED for D17, D18, and D19 above. *(Circled top right)*
- D20 is 5VDC power from control board to motor driver board? *(Circled top left)*
- D13, 15VDC on motor driver board *(Circled bottom right)*
- D14, 5VDC on motor driver board *(Circled bottom left)*

> **IMPORTANT:** All the LEDs listed above (D17, D18, D19, D8, D20, D13, D14) must be on for the Motor Driver Board to function.
Section 17: Electronic Information - Cable Assemblies

- QM20038, Cable, DC Power Gen3. (From power supply to Control Board).

- QM20026-1, Cable, Control Board to Front Gen3. (From Control Board to front nose cover board, front handlebar connection board and LED light rear strip).

  **NOTE:** The front and rear LED light strips are wired in series - both must be plugged in to work

- QM23017, Cable, Control to Hook Light DM. (From Control Board to bobbin area LED light).

- QM20043, Cable, Display USB Gen3. (Power and communications from front nose cover board to front display; rear display uses same cable).
Section 17: Electronic Information - Cable Assemblies

- QM20026-2, Cable, Front Pro Stitcher Power. (From rear connection board to front nose cover board for Pro Stitcher black box tablet power, when connected with an additional cable provided with the Pro Stitcher at front nose cover board)

- QM20026-3, Cable, Front USB Control Board Gen3. (Communications from Control Board to front nose cover board).

- QM21852, Cable, GND Signal Earth 24.

- QM20056, Cable, LED Strip Gen3. (From LED light strip to harness, front and rear LED strip).
Section 17: Electronic Information - Cable Assemblies

- QM20045, Cable, Outlet GND Gen3.
- QM20051, Cable, Power MD to PSDC Gen3. (From power supply to motor driver board).
- QM20029, Cable, Rear Main Gen 3. (From Control Board to rear connection panel board).
- QM20030, Cable, Rear USB Gen3. (Communications from Control Board to rear connection panel board).
Section 17: Electronic Information - Cable Assemblies

- QM20040, Cable, Remote Power Gen3. (Remote power on/off from power supply to Control Board).

- QM20027, Cable, Wiring Harness Front Casting (From Control Board to Quick Set Tension, thread-break sensor and LED light rear strip).

**NOTE:** The front and rear LED light strips are wired in series; both must be plugged in to work.
Section 17: Electronic Information - Quick-Set Tension Calibration / Setting Zero

**IMPORTANT:** When the top tension is installed into the machine, it is calibrated to set the zero tension position. This does not need to be done again unless the tension is replaced or re-calibrated incorrectly.

Calibrating the tension is setting or resetting the zero tension setting-position of the tension; therefore, it is recommended that this only be done when the top tension assembly has been replaced or when it has been calibrated incorrectly by someone.

**IMPORTANT:** Because the zero setting will be reset, when the calibration button is pressed, it is very probable that any customer recorded tension and thread settings will also change.

The customer may be tempted to recalibrate tensions thinking that it will fix tension issues. Calibrating the tensions when not needed, or incorrectly will more likely cause more, not less tension issues. Recorded information on tensions and threads may also be lost or rendered useless.

Share this information with customers so they will be aware of the consequences of calibrating the top tension when not needed. Let them know if you have reset calibration and that their recorded tension info may have changed.

- Select Tools on the Regalia main screen.
- Select the tension calibration box at the bottom of the screen.
- Loosen the top tension knob until the spring is no longer touching the top tension disc.
- Push the spring until it just touches the tension discs.
- Touch the center tension calibration button to calibrate.
- Replace the top tension knob.
- Reset the top tension and sew test for proper tension balance.
Section 17: Electronic Information - Thread Break Sensor

**IMPORTANT:** The thread break sensor will not function properly if the tensions are set too loose. The tensions must be tight enough to move the take-up spring past the sensor in order to toggle the sensor on and off. When the thread breaks, the take-up spring stops going past the sensor and activates the alarm.

**IMPORTANT:** The thread break sensor housing is very delicate and can be crushed by the set screw and shorted internally if tightened too much. A special nylon tip screw is used to help, however, it is critical that the screw be just tight enough to hold the sensor’s position.

If the Thread Break Sensor is not functioning properly, check the following:

- The thread break sensor has a built-in LED in the back of its barrel.

- Remove the front nose cover screw (3 mm hex tool)

- With the cables still connected, push the cover and wires aside at the hole where the wires enter the machine. The LED could be always on or always off.

- Thread the machine through the top tension, the take-up spring, under the stirrup and through the take-up lever.

- Pull the thread down at the take-up lever and watch the sensor to see if it activates on when the wire is near the sensor and off when it is not, while looking through the hole in the front of the machine.

- If the LED does not go on and off, loosen the special set screw slightly and try again.

- If the LED still does not go on and off, loosen the screw and adjust the sensor in or out until it toggles on and off.

- If it still does not go on and off, replace the sensor.

- If the LED activates in the front, but there is still an issue, remove the handle wheel (see page 45).

- If the front LED goes on and off at the sensor but does not toggle at the KEYPRS LED, D22, on the Control Board, (see page 52), then the issue may be with the Control Board.
Section 17: Electronic Information - Machine Power-Up Sequence & Code Updates

Normal Machine Power-Up Sequence with 7” display:

1. The main power cord must be plugged into an active power outlet and into the back of the machine.
2. The rear power switch must turned on.
3. The front power switch must be turned on. It has a blue light around the end of the black button when it is powered on.
4. The lights turn on immediately when the switches are both turned on, if they have not been individually switched off in the menu screen. If they have been switched off, it is normal for them to flash and then turn off, when the machine is turned on.
   ✪ IMPORTANT: If the right lighting override switch on the lighting screen has been used to turn off the light ring and throat lighting, the lights will turn back on each time the machine is powered off and then back on again.
5. It is normal for the bobbin area light to always be on.
6. The “Baby Lock” Screen displays.
7. The machine will do a long beep which indicates the machine Control Board processor is running and systems are being initialized.
8. The “Regalia” screen displays and does a little 4 tone music type ring.
9. If the machine does not beep, then there is an issue with the Control Board or possibly with one of its connections.
10. The red play button goes to a green pause button. (The play button will be red until communications between the display and the machine have been established, then it will change to a green pause button.)

✪ IMPORTANT: You must have communications between the display and the machine to update the machine from the display screen.

✪ IMPORTANT: To update the machine software you must use the front display USB port.

✪ IMPORTANT: To update the machine software you must use the front display USB port.

✪ IMPORTANT: You must have communications between the display and the machine to update the machine from the display screen.
Section 17: Electronic Information - Deleting and Manually Updating the Regalia Display Software

If two or three tries to update the display software as shown on page 68 through 70 are unsuccessful, then on rare occasions it may be necessary to uninstall the Regalia display software and manually update the software.

1. After downloading the updated display software from the baby lock website to a USB drive, insert the USB drive into the USB port on the bottom-right side of the display.
2. Press the triangle icon left of the battery icon in the lower right corner of the display.
3. On the pop-up menu select settings (3 parallel lines).
4. On the 2nd pop-up menu select settings again.
5. Select Apps.
6. Select Regalia.
7. Select uninstall.
8. Do you want to uninstall this app? Select OK.
9. Select the Home on the task bar, bottom left, 2nd icon from left. This will take you to the A20 screen.
10. Select the circle with 6 squares inside it.
11. Select the file manager.
12. Select USB. (The USB icon is at the top and is the fourth icon from the left)
13. Open USB Host.
14. Select the display update you wish to install.
15. Do you want to install this application? Select Install.
16. App Installed Select Done.
17. Select Home on the task bar.
18. Select HQ Regalia.
19. Select Always.
Regalia™ Software Updates

Software Updates

From time to time baby lock releases a software update for our machines. This update feature enables you to take advantage of the latest new capabilities added to machines. When an update is released, download the updated file(s) to a USB drive using a computer that is connected to the Internet.

• Touch the Tools button in the Toolbar on the front display. Then touch the Update button along the bottom of the screen.

![Regalia Display](image)

• After downloading the updated software to a USB drive, insert the drive in the designated USB port on the bottom-right side of the front display. Look for the message in the bottom bar that confirms a USB drive has been inserted. If it doesn’t appear, reinsert the USB drive. Then touch the Update button. Press the Home button to return to the Main screen.

To update the machine’s software

 سورية IMPORTANT: If you are running the Regalia from a Pro-Stitcher tablet computer, the Update screen has only the machine icon because you update the machine software only. The Regalia display software is part of the Pro-Stitcher software. Make sure you are also using the latest version of Pro-Stitcher.

To update the display software

You will need to update the display on both the front and rear.
1. Insert the USB drive into the USB port on the bottom-right side of the display. Then touch the display icon to update the display's software.

NOTE: To update the rear display, insert the USB drive with the update into the bottom-right of the rear display. After updating, remove the USB drive from the display.

2. You will be prompted to choose the file you want to use to update the display software. Touch the Select Version box and then select the filename of the update file you downloaded.

3. Be patient as this will take a few minutes.

4. When complete, the machine will beep. Remove the USB and restart the machine.

1. After inserting the USB drive into the USB port on the bottom-right side of the display, touch the display icon to update the display’s software.

NOTE: To update the rear display, insert the USB drive with the update into the bottom-right of the rear display. After updating, remove the USB drive from the display.

2. You will be prompted to choose the file you want to use to update the display software. Touch the Select Version box and then select the filename of the update file you downloaded.
3. When the message box appears, select **New** and **Install**.

4. Be patient as this will take a few minutes.

5. Confirm that you want to overwrite the current software with the new software by choosing **Install**. If you decide not to update the software, choose **Cancel**.
Needle and Thread Information

Use the correct needle system (134). Choose from sizes 12 through 21, according to the type of thread used. A guide to help you choose the correct combination of needle and threads is always available on the Regalia. From the Home screen, tap the System Information button and choose the Needle and Thread Guide button.

To Thread the Regalia

1. Place thread cone onto spool post (1), thread through thread-mast eyelet (2) from back to front and pass through thread guide (3).

2. Continue to three-hole thread guide (4). Wrap all three holes from back to front, being careful not to cross threads. If delicate threads are breaking, skip one or two holes to lessen tension.

3. Pass through thread guide (5) and continue down to tension assembly (6). Ensure that the thread is flossed between the two tension discs.

4. Catch the take-up spring (7) with thread and pull it down under the stirrup thread guide (8).

5. Bring the thread up and through the hole of the take-up lever (9) from back to front, and then through the lower thread guide (10). Finally, thread through the needle bar thread guide hole (11).

6. Follow the groove down the front of the needle and insert thread through the eye of the needle (12) from front to back. While pulling thread through the eye, be careful that the thread does not twist around the needle.

Customize Handlebar Buttons

Select the Settings button, then select the Handlebar button.*

Select the Settings button, then select the Handlebar button.*

Cycles the needle up or down

Increases or decreases stitching speed (Manual mode)

Programmable button

Increases or decreases stitches per inch (Regulated mode)

Programmable button

Starts or stops stitching

Programmable button

*Left/Right Swap should be determined before applying button membranes during setup.
Baby Lock Regalia Screen Buttons

Stitching Modes

Manual Stitching Mode: Touch the Manual button and then specify the stitches per minute (SPM) by pressing the (+) or (-) button or selecting one of the three SPM presets. The faster you move the machine, the longer the stitches become.

Regulated Stitching Mode: Touch the Regulated button and then select either Cruise or Precision stitch regulation. A consistent stitch length (stitches per inch) will be maintained regardless of how fast the machine is moved, unless moved too fast for the machine to keep up.

Cruise Stitch Regulation: Touch the Cruise button and specify the stitches per inch (SPI) and stitches per minute (SPM) cruise settings. Machine starts to stitch immediately, at the chosen SPM cruise speed, when the Start/Stop button on the handlebars is pressed. When you begin to move the machine, a consistent stitch length will be maintained (SPI). Press Start/Stop again to stop stitching.

Precision Stitch Regulation: In this mode, the machine stitches only when the machine is moved. Touch the Precision button and specify the stitches per inch (SPI). Press the Start/Stop button on the handlebars and move the machine to start quilting. When you stop moving the machine, the needle will pause in mid-stroke. Move the machine to resume stitching.

△ CAUTION: While in Precision mode, stitching can happen accidentally if the machine is bumped. To prevent inadvertent stitches, press the Start/Stop button on the handlebars when not actively quilting. The needle will return to the currently selected Up/Down position.

Main Screen Buttons

Tie-off: Perform a tie-off at the start or finish of a line of stitching by touching the button and gently moving the machine to perform the preset number of stitches. Number can be changed in the settings menu.

Needle-stop: Touch to toggle between having the needle stop in the up or down position when you stop stitching. It does not affect the needle at the time you touch the button. Your choice displays in green.

Quick-Set Tension: The number on the button indicates the current tension, which is set by manually turning the tension knob.

Reset-bobbin: If you are using the low-bobbin alarm, press this button after a bobbin change to reset the reading to indicate that you have inserted a full bobbin. The number that appears on the button shows an estimate of how much thread remains on the bobbin. The closer to zero, the less thread remains on the bobbin.

NOTE: Number does not indicate yards. See To add new bobbin configuration and record bobbin capacity in the Toolbar Options section of the online user manual.

On-screen hand wheel: Rotate the back hand wheel and cycle the needle and hopping foot from the screen by dragging your finger down the icon in the direction of the arrows.

△ CAUTION: Do not drag in the opposite direction.

Machine Tools

These buttons are available after selecting the Machine Tools button.

Machine Settings

These buttons are available after selecting the Machine Settings button.
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Regalia System Block Diagram - Rear Interface Board

Note: This board contains no active circuits.

Approved: gjk

baby lock

Wednesday, December 27, 2017

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Regalia System Block Diagram - Light Ring and Front Interface Board

Wednesday, December 27, 2017
Section 17: Electronic Information - Burn-In

To Start Burn-in:

1. Press the Minus key and the Diamond key on the handlebar. The machine will run the burn-in process; starting slow to full speed in steps and then back to slow again in steps, over and over, until turned off

2. To stop burn-in turn the power switch to off.