A V L L O O M S
AVL Looms, Incorporated

2360 Park Avenue, Chico, California 95928-8305
Phone: 530-893-4915 Fax: 530-893-1372 www.avlusa.com

Jacq3G™ Module Troubleshooting &Adjustment Guide

This document provides information regarding troubleshooting and adjustment of the Jacq3G hook modules. The points covered in this document address a very large percentage of potential issues and adjustments that the user may encounter. However, not all potential concerns are addressed by this guide. Please consult with your AVL technical support representative if you cannot solve your issue from this guide. Additionally,

CAUTION: The Jacq3G hook module has both pinch and electrical shock hazards. The pinch hazards include: bearing surfaces, between knives and module frame, and between cables and stationary frame. The electrical shock hazards are anywhere on the printed circuit board, at the solenoid connectors and at the power entry connection. Working around these areas while the loom is powered and mechanisms are moving requires special care. Keep hands and tools away from these areas to avoid injury. Power down the loom or disconnect power to the module to eliminate electrical shock hazard.

There are two primary causes for hook inaccuracy or weaving errors: threading errors and equipment issues. You might be surprised how often people have an issue with their warp – even with very experienced weavers. From our experience, it is by far the most common cause of weaving errors. We think this is partially due to the fact that Jacquard machines, whether it be an AVL or some other brand, are much more 'warp' sensitive than harness looms, requiring very high accuracy in warping, threading and sleying. Jacquard looms, do not tolerate twisted threads behind or in front of the hooks, steep side-to-side angles coming off the beam or from the reed, or even large variations in thread tension across the warp. This is the place to begin your troubleshooting. Look for mis-threading, mis-sleying or thread crossover by weaving tabby and observing the opening shed. You want to be extra certain to solve any warp related issues before proceeding with equipment testing and fixes.

Equipment Tests

We have put together the following tests to diagnose equipment issues. You will need to closely observe the equipment behavior to distinguish causes. Because you may not be accustomed to observing machinery, you may need to perform several iterations of the tests in order to really see what is occurring.

Test #1: Observe the solenoid plunger without power to the loom. Tap on the plunger. Does it spring out quickly and easily? Does it stick in or move sluggishly? If it does not spring out easily, then you have a misalignment issue. Proceed to **Test 1a**.

Test #1a: Check plunger action of the hooks surrounding. If the issue is isolated to a single hook, the individual solenoid may be misaligned. Verify by comparing with the surrounding solenoids. If the issue seems to affect several solenoids, you have a guide alignment issue.

A V L L O O M S
AVL Looms, Incorporated

2360 Park Avenue, Chico, California 95928-8305
Phone: 530-893-4915 Fax: 530-893-1372 www.avlusa.com

Test #2: Observe the solenoid plunger without power to the loom. Tap on the plunger. Does the spring feel stronger or weaker than those around it? If so, you have a bad plunger spring.

Test #3: Observe the solenoid plunger in action. Does the solenoid remain activated when treadling a null pick, or never activate when it should? In either case, you have a bad solenoid.

Test #4: Observe the misbehaving hook at rest in center-shed position. Does the hook sit significantly closer to the upper knife than the others? If so, you have a bad plunger spring or a bad hook.

Test #5: Observe the rear most hooks at rest in center-shed position. Do the hooks clear the upper knife? If not, you have an upper knife alignment issue.

Test #6: Observe the misbehaving hook at open shed with all hooks down. Does it want to stay turned more than the other hooks? If you lightly run your finger drawing towards you along the short segment of the hooks, does the misbehaving hook feel stiffer/offer more resistance? If yes, you have a short segment crossover.

Test #7: Observe the misbehaving hook in action. Is it frequently crossing over/under with a neighboring hook? Does it have abnormal movement side-side or front-back as it slides up and down through the guides? If so, it or possibly the adjacent hook is bad.

Test #8: Observe the hook in action and listen carefully. Are the hooks vibrating significantly on this module than on others? Are you hearing squeaking? The hooks and/or slide bearings need lubrication.

Test #9: Compare upper and lower knives on all modules at open shed with all hooks down. Are they the same heights and angles? An observable angle difference is a red flag, which must be corrected immediately or it will result in bearing failure. Small variations in knife heights of less than ¾" are not of concern. Larger knife height variations mean that you have a knife alignment issue.

If you pass these tests but still have a problem, you have a solenoid bar placement issue.

Equipment Fixes

Solenoid bar placement: Incrementally adjust/test the solenoid mount bar until issue goes away. Incremental adjustment is typically ½-1 turn of the nut; test with tabby with alternately activates the upper and lower solenoid bars. Adjustment can be made independently at front and back hardware, however it is a good idea to loosen both front and back before making the adjustment to avoid binding/bowing of the solenoid bar. Pick the side that is closest to the bad hook. If the bad hook is relatively centered, adjust both sets of hardware. Adjust the solenoid mount bar away from the knife if the hook is lifting when it should not; in when the hook does not lift.

A V L L O O M S
AVL Looms, Incorporated

2360 Park Avenue, Chico, California 95928-8305
Phone: 530-893-4915 Fax: 530-893-1372 www.avlusa.com

Bad solenoid: Replace the bad solenoid. Note that when pulling the electrical wires from the black plastic connector; gently pry out the tab in the connector with a pin to release the solenoid wire. CAUTION: Make sure you do not accidentally drop the plunger spring onto the printed circuit boards while it is powered or you risk shorting the printed circuit board.

Bad hook: Replace the bad hook. CAUTION: Make sure you do not accidentally drop the plunger spring onto the printed circuit boards while it is powered or you risk shorting the printed circuit board.

Bad plunger spring: Replace the bad plunger spring. CAUTION: Make sure you do not accidentally drop the plunger spring onto the printed circuit boards while it is powered or you risk shorting the printed circuit board.

Solenoid alignment: See if you can identify which direction the solenoid is cocked. Loosen solenoid screws, carefully turn the solenoid into the proper alignment then retighten the screws.

Middle guide alignment: In the center shed position, loosen the three middle guide screws. Adjust the middle guide until the short and long hook segments are perfectly in alignment. Check this alignment at front, back and middle of the module, then retighten the screws.

Upper guide alignment: If the hooks show any forward or rearward lean, adjust hex nuts for the upper guide until the hooks are vertical. Loosen the outer hex nuts, then cycle hooks up & down with null picks. Looking down from above while at open shed and hooks down (null pick), observe the hook alignments in relation to each other and the upper guide. If the hooks appear paired, the solenoid mount bars are misaligned from front to back. Determine which solenoid mount bar is incorrect by observing hook leaning forwards or backwards, loosen its hex nuts, slide the solenoid mount bar until the hooks are no longer paired, then retighten the solenoid mount bar hardware. Loosen the outer hex nuts for the upper guide. Recycle the hooks up & down with null picks. Align the upper guide with slightly more gap between the hooks and guide towards the back of the loom. Retighten hardware.

Short segment crossover: If you examine a bare hook, you see that it has a longer and shorter segment both terminating in short u-bends, with the two segments joined by a u-bend. The short segment can become trapped behind the long segment or adjacent hook long segments. When this occurs, the hook will have a strong tendency to turn. Observation and fixing at a tight sett can be difficult, so opening the sett may be required. To fix, simply move the short segment from behind to its proper position.

Lubrication: See Jacq3G Lubrication Schedule document.

Knife alignment:

A V L L O O M S
AVL Looms, Incorporated

2360 Park Avenue, Chico, California 95928-8305
Phone: 530-893-4915 Fax: 530-893-1372 www.avlusa.com

1) Knife angle: If the angle of a knife is observably different from the neighboring modules it must be remedied before any further loom use. Failure to do so will cause bearing failure. The knife angle and knife height alignment procedures are the same -- see below.
2) Knife height: ***Knife alignment procedure requires that the heddle springs be released from the anchors at the bottom of the loom and that the loom be at center shed. Once complete, reconnect the springs and reset the shedding programming to double shed.***
    a) Upper knife angle adjustment: Loosen the button head cap screws for the drive cable clamps mounted to the knife. The upper knife should slide smoothly without damaging the cable sheathing. Slide the knife until the front and rear inner bearing carriers are in contact with the hardware at the bottom of it bearing travel. If the outer bearing carrier touches the hardware first, apply additional force to overcome the inner to outer carrier force until the inner bearing carrier is in the correct position. Retighten the button head cap screws.
    b) Lower knife angle adjustment: Loosen the button head cap screws for the drive cable clamps mounted to the knife. The lower knife should slide smoothly without damaging the cable sheathing. Slide the lower knife until the front and rear inner bearing carriers are ¾" from the hardware at the top of it bearing travel. If the outer bearing carrier is hitting the hardware and preventing the inner carrier from reaching the measurement, apply additional force to overcome the inner to outer carrier force until the inner bearing carrier is in the correct position (¾" from the hardware at the top of it bearing travel). Retighten the button head cap screws.

Note: We will be adding pictures to this document at a later date.