

Technical Advisory Bulletin (TAB)

Bulletin #: TBBEE1618A

December 21, 2017

Product: BERNINA E16

Implementation: ☐ Urgent ☐ Mandatory ☒ As Required ☐ Info Only

Reference: EC3374

Subject: 34801 Control Board Failures

This TAB applies only to Control Board P/N 34801 (or R34801) and NOT to P/N 34543.

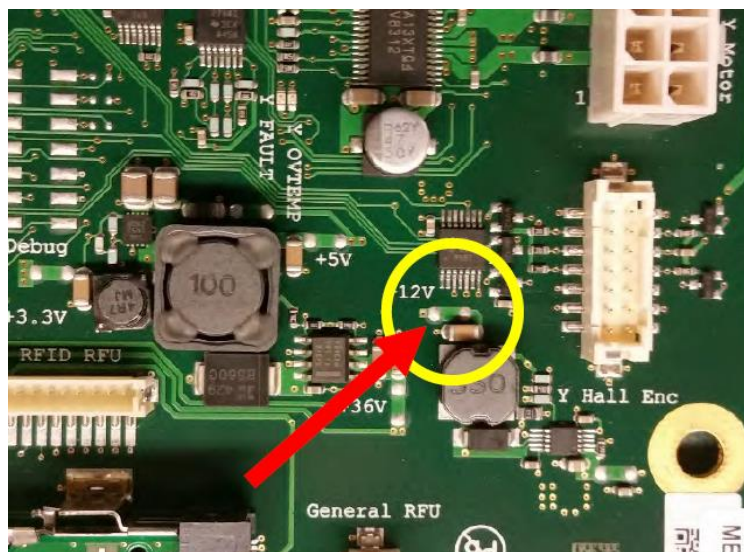
SITUATION:

We have been experiencing a few Control Board, P/N 34801, failures with symptoms being that machines stop to move in x (left to right) or mainly in y (front to back) direction. This can happen during machine operation, and also during the machine boot up process.

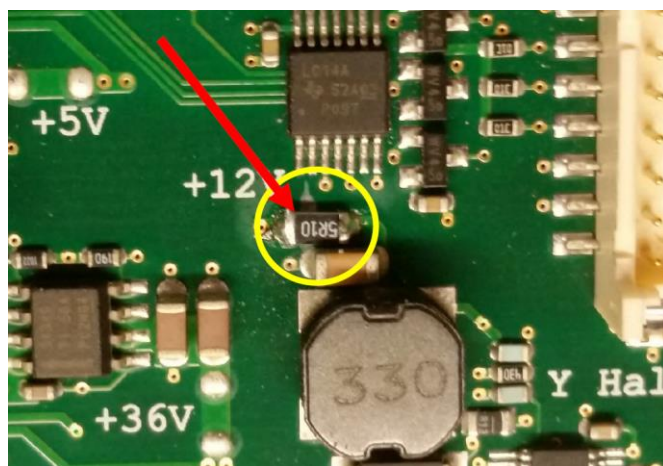
After considerable analysis the root cause is believed to be inrush current spikes that damage the motor driver chip, in most cases related to the y driver circuit.

SOLUTION:

For existing Control Boards on new BERNINA E16 machines, as well as refurbished Control Boards, a 5 Ohm resistor has been added to lower inrush currents, see example in pictures 1 and 2 below.



Pic. 1: Original PCBA



Pic. 2: Reworked PCBA with 5 Ohm Resistor

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Control Board rework (addition of the 5 Ohm resistor) started on September 6, 2017, and all spare boards shipped after this date have this rework implemented. These PCBAs are marked with a red dot as shown in image below.



Pic. 3: PCBA reworked by Bernina – Addition of 5 Ohm Resistor

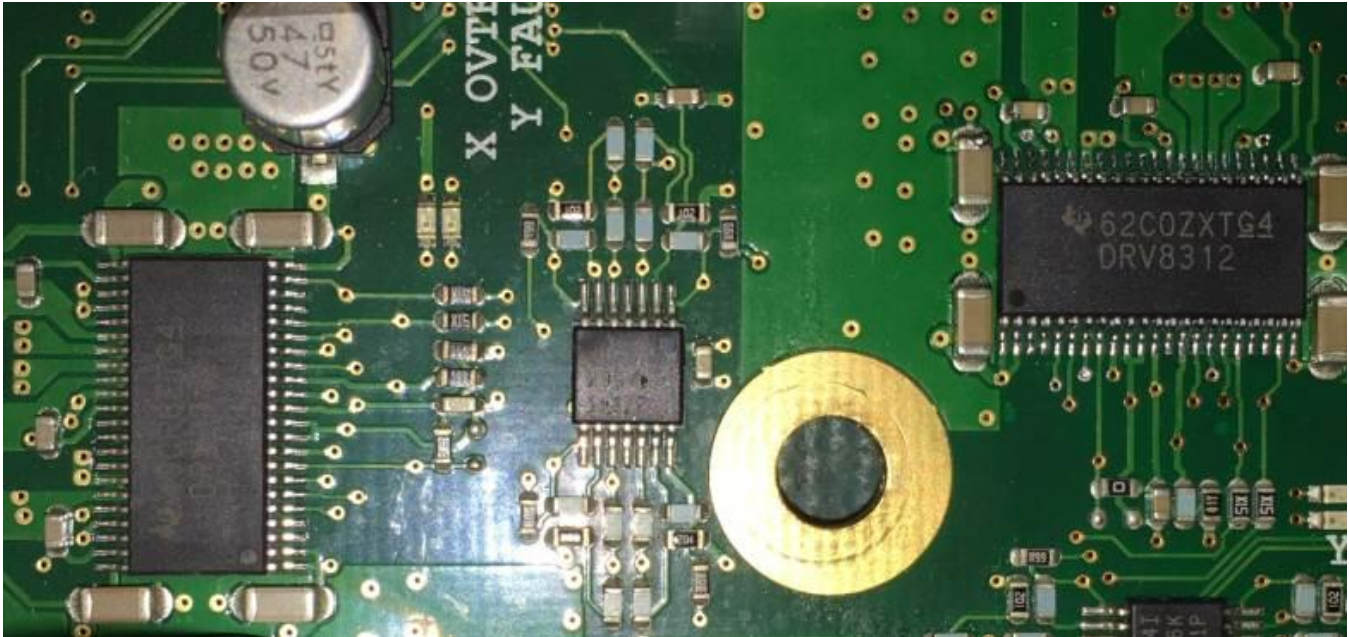
The Supplier started reworking brand new Control Boards on September 25, 2017, and new reworked Control Boards will be assembled into machines starting with SN 120361219. These boards are marked with an “R” label as shown in image below.



Pic. 4: PCBA reworked by PCBA supplier

Unfortunately we have seen some of the reworked boards fail with the same symptoms. It is believed that the reason for these repeated failures is the fact that the driver chip had been somewhat compromised prior to the resistor rework being applied to boards that had already been run in machines.

For this reason Bernina started to replace the y-motor driver chip, in addition to adding the resistor, on all refurbished boards, starting on November 8, 2017. These boards are also marked with a red dot but can be distinguished by the somewhat irregular solder distribution around the y-motor chip pins, see picture below. Due to the quality of the rework, and therefore the fact that it is hard to tell whether the motor driver chip had been replaced, in case one of these second wave reworked boards fails in the field, the board in question needs to be sent back to Bernina for final determination/analysis.



Pic. 5: Original Driver Chip on the left and re-soldered new driver chip on the right

Boards that have a replaced y-motor driver chip and the added resistor, with ship dates from Bernina starting on December 7, are marked with two (2) red dots.

In a further step Bernina started to replace both the y-motor and x-motor driver chips, in addition to adding the 5 Ohm resistor, on refurbished boards with ship date starting on December 12. These boards are marked with three (3) red dots.

A circuit board design change has been implemented with the manufacturer of the bare PCB that will add four (4) 5 Ohm resistors each to both the x-motor and y-motor driver circuits. We expect these boards to go into production machines roughly by the beginning of February, 2018.

Bernina continues to further analyze board failures and circuit design optimization. Additional changes might be implemented based on future findings.

RECOMMENDED ACTION:

Machines that fail with a symptom listed under “Situation” will need to get a replacement Control Board. It is recommended that, in case a replaced board fails again, to replace the board plus the related motor (x or y) at the same time.