



## INSTALLATION INSTRUCTIONS

PART NUMBER	154-8870 & 154-8871
PART DESCRIPTION	KUSTODIAN MODEL A, B TO MODEL C UPGRADE
REV DATE	10/17/2012
MACHINE MODELS	KUSTODIAN MODEL A & B



Basic knowledge on ALL aspects of the lane machine, including mechanical, electrical and operating software

### TOOLS NEEDED:

Cutting Pliers  
Phillips Screwdriver

Wire Strippers  
3/8" Wrench

Joint Crimpers

### VERY IMPORTANT

**You must have the ability to upgrade the software at the conclusion of the hardware installation procedure!**



#### TECHNICAL NOTE

Please thoroughly read the instructions prior to performing the installation of this assembly.

To avoid any potential problems, if at any time during the process you have a question, stop and contact our Tech Support department at the numbers listed below.

Please visit our growing library of videos to see if these instructions are available!



[www.youtube.com/user/KegelBowling81](http://www.youtube.com/user/KegelBowling81)



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1. With the machine in the operating position, remove the fasteners from the Electrical plate and carefully unplug all the connections on the underside of the plate. Remove the plate from the machine.
2. Remove the relay bases that are in place on the din rail by pulling out on the orange tab and tilting back on the base and remove.
3. Unscrew the old din rail from the plate and discard it along with the fasteners.
4. Locate the new din rail from the Kit and put the new 10-32 x ¾ screws through the din rail and Electrical panel. Before fastening down with the new nylon 10-32 locknuts, flip the panel over and place the plate with the wago block and wires onto the 10-32 screws then fasten locknuts. Ensure that the wires flow smoothly behind the PLC and back to the topside with the Relay Tower.
5. Flip the Electrical panel back over and reinstall the old relay bases.
6. Remove all the wires on the top row of the Output side of the PLC with exception of the Brown + wire on the far left and the Orange wire to 10CH00 that is located right next to it.
7. Remove all the wires on the bottom row of the Output side of the PLC with the exception of the First 5 on the bottom row from the left.
8. On the 5<sup>th</sup> terminal you will find a Red common wire that jumps over to the number 8 terminal common and to the number 10 terminal common. Cut the jumpers off of the number 5 terminal so that you are left with a single Red wire going to 5 and remove and discard the other two wires that go to the number 8 and 10 terminal. (Refer to the picture for needed assistance).
9. Next, still on the bottom row, attach the following wires to the bottom of the Output side of the PLC. In the Kit, locate the Yellow wire with the three terminals and attach the longer wire of the jumper to the 2<sup>nd</sup> terminal along with the existing Yellow wire. Attach the other two terminals to the two 11CH commons which will be the 8<sup>th</sup> and 10<sup>th</sup> terminal from the left on the bottom.
10. Next, locate the single red wire coming from number 11 on the green relay tower. This will run from the tower and attach to the PLC Output side on the existing red common wire on the bottom terminal, 5<sup>th</sup> from the left.
11. Reattach the Black/Pink wire to 10CH05 and Yellow/Blue wire to 10CH07.
12. Next, on the top row attach the following wires. Green/Orange to 10CH01, Yellow/Violet to 10CH02, White/Red to 10CH03, White/Green to 10CH04, Yellow/Orange to 10CH06.



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13. Cut the wire ties that are holding the wires together in front of the relay bases. Locate the Blue/Black wire that was on the Output side of the PLC and cut the terminal off of it. Next, loosen the screw that attaches the other end of it to the relay base on relay 3 terminal 8. Remove and dispose of the wire.

14. The next step is to cut all the terminals off of the remaining wires. This should be the following colors:

- Yellow/Red
- White/Black
- Gray
- Green/Red
- Blue/White
- Red/Brown
- Green/Blue
- Red/Violet

15. Pull these wires back through the wire ties so that they can route behind the PLC and to the bottom of the Electrical panel. Cut the wires to length, strip the ends and insert them into the wago block, matching the colors on the opposite side of the wago block that was installed earlier. Do this carefully and neatly so that the wires may be traced if troubleshooting is needed in the future.

16. Next, attach all the wires with the terminals on them that come from the back side of the Relay tower. Screw them securely in to the Output terminal strip in the following order:

Gray	11CH00
Yellow/Red	11CH01
White/Black	11CH02
Blue/White	11CH03
Green/Blue	11CH04
Green/Red	11CH05
Red/Brown	11CH06

17. Locate the Blue/Black wire coming from the 24V DC relay on the far right and attach it to 11CH07.

18. Using the wire ties in the kit, tie all the wires neatly together so that they can be traced if troubleshooting is needed at a later time.

19. Next, remove and dispose the Red wire that runs from CR3-6 to TB1-7. Attach the Red wire that is on CR11-6 into the TB1-7 spot.



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20. Next, remove and dispose the Gray/Red wire that runs from CR3-4 to the Vacuum fuse/Circuit Breaker. To help trace the wire use a voltmeter and check continuity through the wire to ensure the correct wire is removed.
21. Locate the new Gray/Red wire in the kit and attach it to the open terminal on the Fuse holder/Circuit breaker assembly. Follow the wire up and fasten the terminal end of the Gray/Red wire to CR11-4.
22. On CR11-7 you will find two Brown wires attached. Take the end with the fork terminal on it and attach this to the Output side of the PLC with the existing Brown wire and resistor. Be careful not to damage the resistor when doing this. Route the remaining Brown wire that is left over to the back side of the Green Relay tower. Strip the end off and fasten it to the terminal on the Relay Tower labeled A1+, directly below the Gray wire.
23. On CR1-5 there is a Blue/Yellow wire that runs down under the panel and connects to the Cleaner Pump fuse holder assembly. Remove the wire from the fuse holder and cut the connector off and pull the wire back through the harness back to the top side of the panel. The Blue/Yellow wire will route to the *front* side of the relays and to the number CR3-8 spot. Strip the wire back and attach a spade connector with heat shrink to it and fasten to the relay base on CR3-8.
24. Take the remaining Blue/Yellow wire off the fuse holder and cut the Right angle quick connect off of it and pull the wire back through the harness and route the wire *behind* the relays to CR3-3. Strip the wire back and attach a spade connector with heat shrink to it and fasten to the relay base at CR3-3.
25. Next, on the bottom of the panel you will find a row of multi-colored wago blocks. Locate the White/Orange wire that is on the Gray wago block and with a flat blade screwdriver press down on the block to release the wire from the block. Leave this wire exposed for the time being as this will be used in a later step.
26. Locate the 23" Red wire that has the right angle quick connect on it and push the quick connect onto the Cleaner pump fuse holder and run the wire up to the wago blocks and insert this into the TB1-10 spot on the wago block. This is also the same spot where the White/Orange wire was just removed.
27. Now, remove the Blue/Yellow and White/Orange wire with the Right angle quick disconnect on it from the kit. Push the Right angle connector onto the other blade on the Cleaner Pump fuse holder assembly. Route the Blue/Yellow wire through the wire harness and back up to the top of the panel and in front of the relays and attach it to CR3-5.



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28. The remaining White/Orange wire from the quick connect will route back through the harness and up to the exposed White/Orange wire that was removed from the wago block in step 25. Use the wire nut supplied in the kit to crimp the two wires together.
29. Use the wire ties supplied in the kit to neatly bundle the wires back together.
30. Carefully install the plate back into the lane machine.
31. You will now need to update the operating Software in the PLC.
32. Once complete, go through the outputs to check the operation of each component.

*If you are upgrading your Kustodian from a Model B to C, you have completed the installation process. If you are upgrading your Kustodian from a Model A to a C, please continue with the remaining steps.*

1. With the machine lying down, open the oil compartment lid then open the guard over the supply tank.
2. Unscrew the vent valve from the rear wall using a small tip Phillips screwdriver. Unplug hose from tank & lay the valve back on the spray pump.
3. Next step is to remove the supply tank (being careful not to make a mess). Unplug the hoses from the tank & remove the mounting bolts from the rear wall. Set tank aside to put back in later in instructions.
4. Unscrew the sensor top plate w/ sensor on it & hang over the rear wall. Remove cover over sensor disk w/ Phillips screwdriver. It may have silicone around it, & may need to be pried off. Remove the standoffs from block that the cover was screwed to using a ¼” wrench or nutdriver.
5. Using the small Phillips screwdriver, remove the three screws holding the disk to the hub. Note, you do NOT have to remove the hub from the shaft to do this.
6. Locate the 5-tooth disk in the kit w/ new screws and screw the disk to the hub using a drop of blue loc-tite on the threads.
7. Remove the sensor & sensor wire from the harness & Wago terminal block. Set aluminum mounts on the bench. Remove the mount plate from the top plate by removing the two screws, then replace w/ the new mount plate from the kit w/ the two screws.



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8. Take the proximity sensor from the kit & push wire through hole in top of plate (just like old sensor was). Screw prox to the plate w/ the new 4-40 x 7/8" MS supplied w/ a washer but do not tighten prox down yet. Screw the top plate back onto the LDS block. Using a .010" feeler guage and measure a .010" gap between the prox & the high point of the disk tooth. Tighten prox screws at this time.
9. Run the prox wire around to the terminal block as the sensor was run. Refer to the manual drawing & wire prox into wago.
10. Plug hoses into supply tank and remount on rear wall. Screw the vent valve back into the rear wall. Wire tie all loose wires together.
11. Stand the machine back up into the transport position.
12. Remove the Tach sensor guard from the side of the machine. It may have silicone around it, & may need to be pried off.
13. Unscrew the sensor & wire clamp from the side wall. Remove the three screws holding the disk to the hub. Note, you do NOT have to remove the hub from the shaft to do this.
14. Remove the bolts holding the drive shaft to the wall & slide block towards the drive wheel. Remove the standoffs & the screws that secure the standoffs to the wall. Bolt drive shaft block back to the wall.
15. Using the paper template from the kit, match the holes to the paper. Center punch new holes & drill out to sizes indicated.
16. Take the new 5-tooth timing disk & the new 4-40 x 1/2" screws & apply a small amount of blue loc-tite on the threads & screw to the hub. Bolt the prox to the wall in the new holes w/ two 4-40 x 1-1/2 screws w/ 4-40 locknuts (do not yet tighten). Using the .010" feeler guage , measure .010" gap between prox & highest disk tooth & tighten mount screws.
17. Screw wire clamp to frame to secure wires. Bolt on new cover to the new holes using two 8-32 screws & locknuts.
18. Lay machine back down in the operating position. Open lid to see electrical compartment. Remove the old sensor wires from the terminal block & run new wires through the grommet to the terminal block. Refer to manual, TB-3 and rewire into block. Wire tie neatly. Compare all wire terminal connections w/ the diagrams.



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19. There is a new 6.0 mf capacitor included w/ the upgrade kit. THIS CAPACITOR IS FOR 115V MACHINES ONLY. Replace the original head drive motor capacitor w/ the new one if your machine is 115V.
20. Refer to the Program Instructions included w/ the kit to program the machine.
21. Run a few test lanes w/ the machine to ensure everything is working properly.



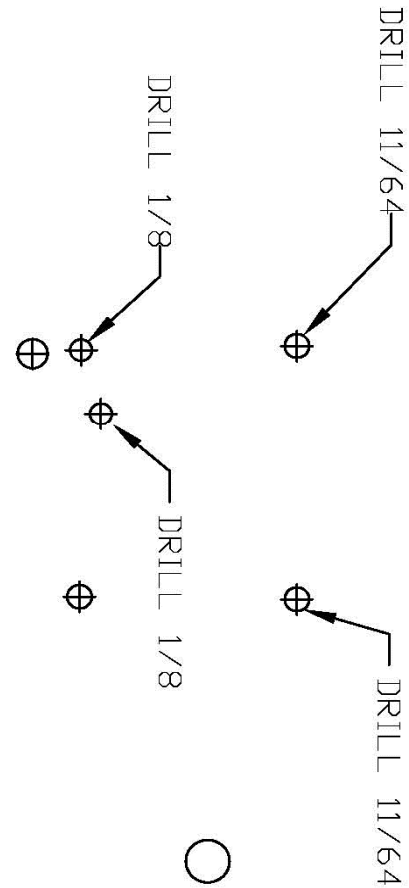
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EXISTING HOLES  
 USE AS TEMPLATE  
 MOUNT TO DRILL  
 NEW HOLES



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