

| Step # | Technician | Start Time (h : m : s) | End Time (h : m : s) | Step Time (h : m : s) | Cum Time (h : m : s) | Prop Time (h : m : s) | Cum Pr Time (h : m : s) | Comments |
|--------|--|------------------------|----------------------|-----------------------|----------------------|-----------------------|-------------------------|---|
| 1 | Assist in reload of previous product at bundler | 06:05:00 | 06:07:05 | 00:02:05 | 00:02:05 | 00:00:00 | 00:00:00 | No tools reqd (move to op procedure - not for technician) |
| 2 | Movement from bundler to empty bottle infeed at filler | 06:07:05 | 06:07:37 | 00:00:32 | 00:02:37 | 00:00:00 | 00:00:00 | |
| 3 | Remove empty bottles from lines-removed a rail to run the bottles from the line | 06:07:37 | 06:08:53 | 00:01:16 | 00:03:53 | 00:00:00 | 00:00:00 | change design to not have to use tools (make op proc) |
| 4 | Filler static blower, assist in removal | 06:08:53 | 06:09:09 | 00:00:16 | 00:04:09 | 00:00:00 | 00:00:00 | |
| 5 | Back to removal of bottles | 06:09:09 | 06:11:50 | 00:02:41 | 00:06:50 | 00:00:00 | 00:00:00 | |
| 6 | Assist in removal of ionizer (static blower) | 06:11:50 | 06:13:42 | 00:01:52 | 00:08:42 | 00:00:00 | 00:00:00 | |
| 7 | Back to removal of empty bottles | 06:13:42 | 06:16:13 | 00:02:31 | 00:11:13 | 00:00:00 | 00:00:00 | 1-8 are all operator position and not part of the changeover |
| 8 | Start change over on bottle unscrambler - removed upper covers-lower covers, disc and chute were both removed | 06:16:13 | 06:18:45 | 00:02:32 | 00:13:45 | 00:00:00 | 00:00:00 | upgrade disc to new design, new chute placed adjacent-clip in design |
| 9 | Exchange size part in other room | 06:18:45 | 06:20:35 | 00:01:50 | 00:15:35 | 00:00:00 | 00:00:00 | can redesign disc and will not need to go to other room |
| 10 | Continue with change over of bottle unscrambler | 06:20:35 | 06:20:58 | 00:00:23 | 00:15:58 | 00:00:00 | 00:00:00 | |
| 11 | Search for new bottle size for mechanical set-up | 06:20:58 | 06:22:22 | 00:01:24 | 00:17:22 | 00:00:00 | 00:00:00 | |
| 12 | Found bottles, search for hi-lo to bring down pallet of bottles | 06:22:22 | 06:22:43 | 00:00:21 | 00:17:43 | 00:00:00 | 00:00:00 | |
| 13 | Advise Hi lo driver of pallet needed | 06:22:43 | 06:22:57 | 00:00:14 | 00:17:57 | 00:00:00 | 00:00:00 | |
| 14 | Retrieve empty plastic bag return to line | 06:22:57 | 06:24:00 | 00:01:03 | 00:19:00 | 00:00:00 | 00:00:00 | |
| 15 | Retrieve empty bottles for set-up, put on gloves | 06:24:00 | 06:27:17 | 00:03:17 | 00:22:17 | 00:00:00 | 00:00:00 | set up bottle kit (25 bottles) which are color coded so that they cannot be used as product but will be used for size setting. Air blowers have got to be calibrated (dedicated air jets-control selected). Orientation sensor -two positions |
| 16 | Continue change over of descrambler & bottle chute, adjust air blowers | 06:27:17 | 06:30:11 | 00:02:54 | 00:25:11 | 00:00:00 | 00:00:00 | lines 10-17 due to operator not having the proper bottles near him.Change chute to 4 quick clamps instead of two clamps and two bolts. Adjust air flow |
| 17 | Start of mechanical change over. Retrieve bottle grippers size parts | 06:30:11 | 06:31:27 | 00:01:16 | 00:26:27 | 00:00:00 | 00:00:00 | look at the size the grippers can handle. Look into the possibility of not having to change the grippers |
| 18 | Continue change over r&r grippers, set table height, test, run, install, guarding | 06:31:27 | 06:38:52 | 00:07:25 | 00:33:52 | 00:02:00 | 00:02:00 | total new time for steps 9-19 |
| 19 | Lunch | 06:38:52 | 07:15:02 | 00:36:10 | 01:10:02 | 00:00:00 | 00:02:00 | Lunch break-to be analyzed later |
| 20 | Adjust outfeed conveyors to down bottle guide (rail and down bottle guide) bottles need to be centered on the conveyor so you need to adjust both back and front screws (height and width) | 07:15:02 | 07:15:41 | 00:00:39 | 01:10:41 | 00:00:39 | 00:02:39 | alien key was used on rails-need to get these calibrated (training issues-ensure that the proper calibration methods are known, understood and followed) Get set up bottles for calibration. |
| 21 | Assist operator with caps stuck in rotary chute, remove caps | 07:15:41 | 07:17:53 | 00:02:12 | 01:12:53 | 00:00:00 | 00:02:39 | |
| 22 | Continue with adjustment of conveyors, makes manual adjustments to quick adjust rails (downed bottle to in front of filler) filler rail adjustments are all allen screws | 07:17:53 | 07:20:53 | 00:03:00 | 01:15:53 | 00:00:30 | 00:03:09 | calibrate quick adjustment rails |
| 23 | Test run bottles through descrambler & rails up to filler | 07:20:53 | 07:21:28 | 00:00:35 | 01:16:28 | 00:00:00 | 00:03:09 | won't need to do this after calibration |
| 24 | Assist operator in old bottle retrieval | 07:21:28 | 07:22:27 | 00:00:59 | 01:17:27 | 00:00:00 | 00:03:09 | Look into the amount of time spent helping operators with odd tasks |
| 25 | Clean up tools | 07:22:27 | 07:22:57 | 00:00:30 | 01:17:57 | 00:00:00 | 00:03:09 | |
| 26 | Put away bottle gripper size parts in cabinet at line | 07:22:57 | 07:23:56 | 00:00:59 | 01:18:56 | 00:00:00 | 00:03:09 | |
| 27 | Adjust rails in front of filler and bottle stop | 07:23:56 | 07:26:35 | 00:02:39 | 01:21:35 | 00:01:00 | 00:04:09 | Adjust rail to new style. dedicated stops based on bottle size? Training would be required. New manifolds may be needed |
| 28 | Talk with maintenance about slat vibrator | 07:26:35 | 07:27:50 | 00:01:15 | 01:22:50 | 00:00:00 | 00:04:09 | |
| 29 | Adjust rails after filler | 07:27:50 | 07:28:29 | 00:00:39 | 01:23:29 | 00:00:20 | 00:04:29 | |
| 30 | Remove cover, adjust bottle spacing wheels for check weigher | 07:28:29 | 07:30:20 | 00:01:51 | 01:25:20 | 00:00:00 | 00:04:29 | check weigher is being removed-no longer used |
| 31 | Talk to maintenance about vibrator problem | 07:30:20 | 07:31:45 | 00:01:25 | 01:26:45 | 00:00:00 | 00:04:29 | |
| 32 | Back to adjustment if spacing wheels & check operation | 07:31:45 | 07:33:41 | 00:01:56 | 01:28:41 | 00:00:00 | 00:04:29 | |
| 33 | Adjustment of conveyor at spacing wheels & glue unit | 07:33:41 | 07:36:45 | 00:03:04 | 01:31:45 | 00:00:30 | 00:04:59 | look into adapting this - feed screw/star wheel/ spacing wheel |
| 34 | Talk to maintenance operation of vibrator is OK | 07:36:45 | 07:37:50 | 00:01:05 | 01:32:50 | 00:00:00 | 00:04:59 | |
| 35 | Check bottle flow from filler to capper | 07:37:50 | 07:39:30 | 00:01:40 | 01:34:30 | 00:00:00 | 00:04:59 | |
| 36 | Start change over capper | 07:39:30 | 07:40:00 | 00:00:30 | 01:35:00 | 00:00:00 | 00:04:59 | |
| 37 | Locate caps to perform change over, walk to the other line | 07:40:00 | 07:42:17 | 00:02:17 | 01:37:17 | 00:00:00 | 00:04:59 | |
| 38 | Continue capper change over set height, width check torque, r&r all 4 heads to check | 07:42:17 | 07:49:47 | 00:07:30 | 01:44:47 | 00:07:30 | 00:12:29 | need to look at a way to reduce the amount of loose caps getting down the line. Look into the possibility to check the torque on the line. This will be part of a separate investigation |
| 39 | Assist at filler with maintenance about gap at slats for vibration | 07:49:47 | 07:51:28 | 00:01:41 | 01:46:28 | 00:00:00 | 00:12:29 | |
| 40 | Back to capper change over done | 07:51:28 | 08:01:07 | 00:09:39 | 01:56:07 | 00:09:39 | 00:22:08 | This will be part of a separate investigation |
| 41 | Set up height cap, no cap detection | 08:01:07 | 08:02:12 | 00:01:05 | 01:57:12 | 00:00:30 | 00:22:38 | look at making this a quick adjustment |
| 42 | Adjust rails between capper and induction unit | 08:02:12 | 08:03:13 | 00:01:01 | 01:58:13 | 00:00:30 | 00:23:08 | quick change rails |
| 43 | Maintenance check vibrator operation | 08:03:13 | 08:04:22 | 00:01:09 | 01:59:22 | 00:00:00 | 00:23:08 | |
| 44 | Continue with rail adjustment | 08:04:22 | 08:04:46 | 00:00:24 | 01:59:46 | 00:00:00 | 00:23:08 | 43 and 45 are continuing tasks |
| 45 | Adjust inductive seal unit & test | 08:04:46 | 08:06:12 | 00:01:26 | 02:01:12 | 00:01:00 | 00:24:08 | |

| Step # | Technician | Start Time (h : m : s) | End Time (h : m : s) | Step Time (h : m : s) | Cum Time (h : m : s) | Prop Time (h : m : s) | Cum Pr Time (h : m : s) | Comments |
|--------|--|------------------------|----------------------|-----------------------|----------------------|-----------------------|-------------------------|---|
| 46 | Retrieve paperwork for capper torques | 08:06:12 | 08:07:44 | 00:01:32 | 02:02:44 | 00:00:15 | 00:24:23 | can get this filled out ahead of time so that only the torques have to be filled in-ensure that it is placed in a location where it does not have to be searched for- perhaps make part of the batch record |
| 47 | Wait for operator to finish cleaning capper | 08:07:44 | 08:08:30 | 00:00:46 | 02:03:30 | 00:00:00 | 00:24:23 | |
| 48 | Talk with John | 08:08:30 | 08:09:15 | 00:00:45 | 02:04:15 | 00:00:00 | 00:24:23 | |
| 49 | Tape ran out, tape # 2. Paperwork for capper | 08:09:15 | 08:10:38 | 00:01:23 | 02:05:38 | 00:00:00 | 00:24:23 | video tape-unrelated |
| 50 | Run bottles through capper & induction seal unit | 08:10:38 | 08:11:11 | 00:00:33 | 02:06:11 | 00:00:33 | 00:24:56 | need to test torque after the capper, and retorquer |
| 51 | Test the torque on 3 bottles & place bottles back on line | 08:11:11 | 08:11:57 | 00:00:46 | 02:06:57 | 00:00:00 | 00:24:56 | reconfirm whether this is a duplicate activity |
| 52 | Remove induction seal from a cap | 08:11:57 | 08:12:44 | 00:00:47 | 02:07:44 | 00:00:47 | 00:25:43 | testing the rejection-no foil challenge |
| 53 | Put altered cap on bottle and pass under sensor test-OK | 08:12:44 | 08:12:59 | 00:00:15 | 02:07:59 | 00:00:15 | 00:25:58 | |
| 54 | Retrieve marker and label bottle as a tested piece, place induction seal unit | 08:12:59 | 08:13:32 | 00:00:33 | 02:08:32 | 00:00:30 | 00:26:28 | |
| 55 | Move paper work and tools from line to tool box | 08:13:32 | 08:13:45 | 00:00:13 | 02:08:45 | 00:00:13 | 00:26:41 | |
| 56 | Take caps from tool box top (acquired earlier) & install in capper chute | 08:13:45 | 08:14:18 | 00:00:33 | 02:09:18 | 00:00:33 | 00:27:14 | |
| 57 | Place capper in Jog, Jog machine and check adjustments | 08:14:18 | 08:14:37 | 00:00:19 | 02:09:37 | 00:00:19 | 00:27:33 | |
| 58 | Close rear guard door on cottoner | 08:14:37 | 08:15:30 | 00:00:53 | 02:10:30 | 00:00:00 | 00:27:33 | |
| 59 | Return to jogging of capper, test run bottles, adjust width of gapping rollers | 08:15:30 | 08:15:55 | 00:00:25 | 02:10:55 | 00:00:25 | 00:27:58 | |
| 60 | Move upstream and install top guard back on spacing wheels for check weigher | 08:15:55 | 08:16:12 | 00:00:17 | 02:11:12 | 00:00:00 | 00:27:58 | |
| 61 | Turn on conveyor and run test bottles up until capper, remove and discard all bottles except for 7 left on line | 08:16:12 | 08:16:55 | 00:00:43 | 02:11:55 | 00:00:00 | 00:27:58 | |
| 62 | Jog 7 bottles through capper, induction unit & onto accumulation table | 08:16:55 | 08:17:15 | 00:00:20 | 02:12:15 | 00:00:20 | 00:28:18 | |
| 63 | Move to tool box with 3 bottles and recheck torque of bottles after running them through induction sealer, log torque settings onto paperwork return bottles to conveyor | 08:17:15 | 08:18:28 | 00:01:13 | 02:13:28 | 00:01:13 | 00:29:31 | was step 52 needed if this step is performed here? |
| 64 | Move tool box down line near labeler | 08:18:28 | 08:18:49 | 00:00:21 | 02:13:49 | 00:00:21 | 00:29:52 | |
| 65 | proceed to line and adjust conveyor at exit of accumulation table | 08:18:49 | 08:19:03 | 00:00:14 | 02:14:03 | 00:00:14 | 00:30:06 | |
| 66 | Proceed to tool box and gather tools for adjusting conveyor, standard allen keys, some wrenches, E-stop conveyor | 08:19:03 | 08:19:27 | 00:00:24 | 02:14:27 | 00:00:24 | 00:30:30 | |
| 67 | Adjust spacing wheel width | 08:19:27 | 08:20:58 | 00:01:31 | 02:15:58 | 00:00:00 | 00:30:30 | look into redesigning the quick change systems (and non-quick change systems) presently occurring (68-69) |
| 68 | Adjust small tedious rails not user friendly | 08:20:58 | 08:22:53 | 00:01:55 | 02:17:53 | 00:01:00 | 00:31:30 | |
| 69 | Adjust retorquer wheel & rail widths-gripper belts | 08:22:53 | 08:23:56 | 00:01:03 | 02:18:56 | 00:01:03 | 00:32:33 | |
| 70 | Cross over conveyor | 08:23:56 | 08:24:04 | 00:00:08 | 02:19:04 | 00:00:08 | 00:32:41 | |
| 71 | Adjust height of over head with crank handle to a marked spot | 08:24:04 | 08:24:18 | 00:00:14 | 02:19:18 | 00:00:14 | 00:32:55 | |
| 72 | Adjust small tedious rails again & check with bottle | 08:24:18 | 08:25:22 | 00:01:04 | 02:20:22 | 00:00:00 | 00:32:55 | |
| 73 | Cross over conveyor | 08:25:22 | 08:25:30 | 00:00:08 | 02:20:30 | 00:00:08 | 00:33:03 | |
| 74 | Fine tune adjustments on retorquer & small rail | 08:25:30 | 08:26:19 | 00:00:49 | 02:21:19 | 00:00:20 | 00:33:23 | |
| 75 | Start conveyors and test run bottle through retorquer while fine tuning. No jog button for set up had to cycle. Machine will e-stop/pull power button, lock adjustments | 08:26:19 | 08:27:08 | 00:00:49 | 02:22:08 | 00:00:00 | 00:33:23 | |
| 76 | Run machine in auto and pass bottles through | 08:27:08 | 08:28:04 | 00:00:56 | 02:23:04 | 00:00:56 | 00:34:19 | |
| 77 | Loosen caps on 3 bottles and test torque | 08:28:04 | 08:28:44 | 00:00:40 | 02:23:44 | 00:00:40 | 00:34:59 | |
| 78 | Pick up tools and proceed to adjust rails at exit or retorquer | 08:28:44 | 08:29:28 | 00:00:44 | 02:24:28 | 00:00:20 | 00:35:19 | look into quick adjust rails |
| 79 | E-stop conveyor, adjust down bottle guides, width & height | 08:29:28 | 08:30:35 | 00:01:07 | 02:25:35 | 00:00:00 | 00:35:19 | |
| 80 | Start up conveyor check for proper operation | 08:30:35 | 08:31:16 | 00:00:41 | 02:26:16 | 00:00:00 | 00:35:19 | |
| 81 | Adjust rails at exit of down bottle guide | 08:31:16 | 08:31:38 | 00:00:22 | 02:26:38 | 00:00:22 | 00:35:41 | |
| 82 | Start change over on labeler | 08:31:38 | 08:32:02 | 00:00:24 | 02:27:02 | 00:00:00 | 00:35:41 | look into a cart/trolley to hold all of the equipment needed for the mechanic in one place-moveable |
| 83 | Move tool box set tools | 08:32:02 | 08:32:47 | 00:00:45 | 02:27:47 | 00:00:25 | 00:36:06 | look into tool belt |
| 84 | Remove 1st labeler feed screw | 08:32:47 | 08:33:19 | 00:00:32 | 02:28:19 | 00:00:32 | 00:36:38 | |
| 85 | Remove 2nd feed screw (shorter) why 2 feed screws? | 08:33:19 | 08:34:15 | 00:00:56 | 02:29:15 | 00:00:56 | 00:37:34 | look into why 2 feed screws ensure that the parts are on the line where they should be so that technician will not have to hunt for them |
| 86 | Bring both feed screws to change over cabinet on other side of line, locate new feed screws & put away old ones | 08:34:15 | 08:34:40 | 00:00:25 | 02:29:40 | 00:00:25 | 00:37:59 | |
| 87 | Move out of the way so Hi-Lo could pass by | 08:34:40 | 08:35:24 | 00:00:44 | 02:30:24 | 00:00:00 | 00:37:59 | |
| 88 | Continue at cabinet locating feed screw | 08:35:24 | 08:36:04 | 00:00:40 | 02:31:04 | 00:00:00 | 00:37:59 | |
| 89 | Move back to labeler & place parts on machine | 08:36:04 | 08:36:16 | 00:00:12 | 02:31:16 | 00:00:00 | 00:37:59 | |
| 90 | Assist operator with labels that are located on this side of the line | 08:36:16 | 08:37:00 | 00:00:44 | 02:32:00 | 00:00:00 | 00:37:59 | |
| 91 | Back at labeler remove 3 labels, brush block, bring to cabinet | 08:37:00 | 08:37:13 | 00:00:13 | 02:32:13 | 00:00:13 | 00:38:12 | |
| 92 | Exchange for new size parts & return to machine and install | 08:37:13 | 08:37:27 | 00:00:14 | 02:32:27 | 00:00:14 | 00:38:26 | |
| 93 | Remove 3 pusher blocks & exchange for new size part & install | 08:37:27 | 08:37:52 | 00:00:25 | 02:32:52 | 00:00:25 | 00:38:51 | |
| 94 | Remove label guard assembly & inspect peel plate | 08:37:52 | 08:38:50 | 00:00:58 | 02:33:50 | 00:00:00 | 00:38:51 | |
| 95 | Retrieve screw driver at tool box | 08:38:50 | 08:39:09 | 00:00:19 | 02:34:09 | 00:00:00 | 00:38:51 | |
| 96 | Tighten fastener on new guide & install on machine | 08:39:09 | 08:39:49 | 00:00:40 | 02:34:49 | 00:00:00 | 00:38:51 | |
| 97 | Put old guide away | 08:39:49 | 08:39:56 | 00:00:07 | 02:34:56 | 00:02:00 | 00:40:51 | steps 95-98 - look at an operator performing these functions |

| Step # | Technician | Start Time (h : m : s) | End Time (h : m : s) | Step Time (h : m : s) | Cum Time (h : m : s) | Prop Time (h : m : s) | Cum Pr Time (h : m : s) | Comments |
|--------|--|------------------------|----------------------|-----------------------|----------------------|-----------------------|-------------------------|---|
| 98 | Install large feed screws | 08:39:56 | 08:41:26 | 00:01:30 | 02:36:26 | 00:00:30 | 00:41:21 | this should have been sequenced properly |
| 99 | Move to operator side of line & move control panel for Hi-low | 08:41:26 | 08:41:40 | 00:00:14 | 02:36:40 | 00:00:00 | 00:41:21 | |
| 100 | Install 2nd feed screws | 08:41:40 | 08:42:06 | 00:00:26 | 02:37:06 | 00:00:26 | 00:41:47 | |
| 101 | Loosen top rail fasteners and adjust height using bottle to set, adjusted with ratcheting box wrench | 08:42:06 | 08:43:36 | 00:01:30 | 02:38:36 | 00:01:30 | 00:43:17 | |
| 102 | Adjust feed screw widths and time them | 08:43:36 | 08:44:36 | 00:01:00 | 02:39:36 | 00:00:00 | 00:43:17 | steps 103-106 should have been done with other steps-proper sequencing again is an issue |
| 103 | Run test bottle and re-time work gears - no keyway | 08:44:36 | 08:45:02 | 00:00:26 | 02:40:02 | 00:00:00 | 00:43:17 | verify overload clutch operation |
| 104 | Run test bottle & re-time worm gears | 08:45:02 | 08:45:55 | 00:00:53 | 02:40:55 | 00:00:00 | 00:43:17 | |
| 105 | Run test bottle & re-time - OK | 08:45:55 | 08:47:07 | 00:01:12 | 02:42:07 | 00:01:00 | 00:44:17 | set these steps up to be sequenced properly |
| 106 | Answer phone & talk | 08:47:07 | 08:47:56 | 00:00:49 | 02:42:56 | 00:00:00 | 00:44:17 | |
| 107 | leave to fix problem on Line 5 | 08:47:56 | 08:52:35 | 00:04:39 | 02:47:35 | 00:00:00 | 00:44:17 | look into additional timing needed for unrelated tasks |
| 108 | Run labeler & adjust outsert | 08:52:35 | 8:53:60 | 00:01:25 | 02:49:00 | 00:01:25 | 00:45:42 | look into this step (look into tape to see if you can reduce) |
| 109 | Move to other side of line | 8:53:60 | 08:54:11 | 00:00:11 | 02:49:11 | 00:00:11 | 00:45:53 | |
| 110 | Adjust labeler height & position of arm (peel plate) with guide unit | 08:54:11 | 08:55:31 | 00:01:20 | 02:50:31 | 00:01:20 | 00:47:13 | |
| 111 | Walk away look in label cabinet retrieve book of labeler setting out of tool box | 08:55:31 | 08:56:28 | 00:00:57 | 02:51:28 | 00:00:00 | 00:47:13 | put this on a cart or on the machine? |
| 112 | Use book to change settings | 08:56:28 | 08:56:47 | 00:00:19 | 02:51:47 | 00:00:19 | 00:47:32 | |
| 113 | Move to operator side of line | 08:56:47 | 08:57:08 | 00:00:21 | 02:52:08 | 00:00:21 | 00:47:53 | |
| 114 | Use book to change more settings | 08:57:08 | 08:57:20 | 00:00:12 | 02:52:20 | 00:00:12 | 00:48:05 | |
| 115 | Retrieve labels from top of cabinet | 08:57:20 | 08:57:47 | 00:00:27 | 02:52:47 | 00:00:27 | 00:48:32 | |
| 116 | Install labels on machine remove section of labels from backing so label can be routed through machine | 08:57:47 | 08:58:52 | 00:01:05 | 02:53:52 | 00:01:05 | 00:49:37 | look into additional timing needed for unrelated tasks |
| 117 | Remove and give operator code digit block | 08:58:52 | 08:59:10 | 00:00:18 | 02:54:10 | 00:00:00 | 00:49:37 | |
| 118 | Route label through machine and adjust for a wider label | 08:59:10 | 09:03:18 | 00:04:08 | 02:58:18 | 00:04:00 | 00:53:37 | steps 119-122 handling of labels should be looked into |
| 119 | Jog labels through, install cover | 09:03:18 | 09:03:46 | 00:00:28 | 02:58:46 | 00:00:00 | 00:53:37 | |
| 120 | Answer phone | 09:03:46 | 09:04:00 | 00:00:14 | 02:59:00 | 00:00:00 | 00:53:37 | |
| 121 | Repair tear in the web with tape & re-route label | 09:04:00 | 09:07:16 | 00:03:16 | 03:02:16 | 00:00:00 | 00:53:37 | |
| 122 | Continue to jog labels through machine and set stopping position | 09:07:16 | 09:07:53 | 00:00:37 | 03:02:53 | 00:00:37 | 00:54:14 | |
| 123 | Place label on outside of garbage bag - tailings bag for labels | 09:07:53 | 09:08:01 | 00:00:08 | 03:03:01 | 00:00:08 | 00:54:22 | |
| 124 | Change code digits on hot stamp, unit was still hot- had to be done because it was incorrect | 09:08:01 | 09:11:33 | 00:03:32 | 03:06:33 | 00:00:00 | 00:54:22 | |
| 125 | Install hot stamp on machine | 09:11:33 | 09:11:39 | 00:00:06 | 03:06:39 | 00:00:00 | 00:54:22 | |
| 126 | Wait for hot stamp to heat up so the machine will jog, while waiting wind web on table up wheel | 09:11:39 | 09:13:04 | 00:01:25 | 03:08:04 | 00:00:00 | 00:54:22 | |
| 127 | Place 1 bottle on line, test run through labeler, inspect quality of label | 09:13:04 | 09:13:52 | 00:00:48 | 03:08:52 | 00:00:48 | 00:55:10 | |
| 128 | Same as above | 09:13:52 | 09:14:22 | 00:00:30 | 03:09:22 | 00:00:30 | 00:55:40 | |
| 129 | Check transition of bottles at infeed worm | 09:14:22 | 09:14:46 | 00:00:24 | 03:09:46 | 00:00:24 | 00:56:04 | |
| 130 | Adjust label code digit positioning arm | 09:14:46 | 09:15:09 | 00:00:23 | 03:10:09 | 00:00:23 | 00:56:27 | |
| 131 | Adjust label backing plate | 09:15:09 | 09:15:18 | 00:00:09 | 03:10:18 | 00:00:09 | 00:56:36 | |
| 132 | Test run labels (jogging) & discard labels | 09:15:18 | 09:15:50 | 00:00:32 | 03:10:50 | 00:00:32 | 00:57:08 | |
| 133 | Test run labels and discard | 09:15:50 | 09:16:20 | 00:00:30 | 03:11:20 | 00:00:30 | 00:57:38 | |
| 134 | Move to vision system control panel & start set up | 09:16:20 | 09:18:14 | 00:01:54 | 03:13:14 | 00:01:54 | 00:59:32 | |
| 135 | Move to cabinet, retrieving binder book & reference laminated pages | 09:18:14 | 09:18:48 | 00:00:34 | 03:13:48 | 00:00:00 | 00:59:32 | |
| 136 | Assist with question from peer | 09:18:48 | 09:19:35 | 00:00:47 | 03:14:35 | 00:00:00 | 00:59:32 | |
| 137 | Back to binder book, used info to set height of camera lamp | 09:19:35 | 09:19:54 | 00:00:19 | 03:14:54 | 00:00:19 | 00:59:51 | |
| 138 | Back to camera control panel for set up | 09:19:54 | 09:20:44 | 00:00:50 | 03:15:44 | 00:00:50 | 01:00:41 | |
| 139 | Move to labeler, jog labels through, discard labels | 09:20:44 | 09:22:10 | 00:01:26 | 03:17:10 | 00:01:26 | 01:02:07 | may be a more efficient way to do this step. May want to look into this process offline |
| 140 | Run bottle through & test for reject | 09:22:10 | 09:22:30 | 00:00:20 | 03:17:30 | 00:00:00 | 01:02:07 | |
| 141 | Break Time | 09:22:30 | 09:49:28 | 00:26:58 | 03:44:28 | 00:00:00 | 01:02:07 | |
| 142 | Set up 2nd vision system camera, plus in monitor to CPU | 09:49:28 | 09:50:04 | 00:00:36 | 03:45:04 | 00:00:00 | 01:02:07 | should already be set up |
| 143 | View display of code date | 09:50:04 | 09:50:21 | 00:00:17 | 03:45:21 | 00:00:00 | 01:02:07 | |
| 144 | Adjust trigger photo eye | 09:50:21 | 09:50:55 | 00:00:34 | 03:45:55 | 00:00:00 | 01:02:07 | |
| 145 | Move to operator side of line | 09:50:55 | 09:51:15 | 00:00:20 | 03:46:15 | 00:00:20 | 01:02:27 | |
| 146 | Open case of outserts from pallet to move 2 sleeves of outserts to machine | 09:51:15 | 09:51:36 | 00:00:21 | 03:46:36 | 00:00:21 | 01:02:48 | would have been done by an operator if the outserts were the same size-look into harmonising outserts |
| 147 | Answer question from unknown | 09:51:36 | 09:53:14 | 00:01:38 | 03:48:14 | 00:00:00 | 01:02:48 | |
| 148 | Place outserts in feeder | 09:53:14 | 09:54:06 | 00:00:52 | 03:49:06 | 00:00:52 | 01:03:40 | operator would have done this if there was no adjustment needed |
| 149 | Give operator a label that he earlier had saved | 09:54:06 | 09:54:14 | 00:00:08 | 03:49:14 | 00:00:08 | 01:03:48 | |
| 150 | Check status of transfer tape roll & routing | 09:54:14 | 09:54:32 | 00:00:18 | 03:49:32 | 00:00:18 | 01:04:06 | |
| 151 | Turn on tape machine and observe set up | 09:54:32 | 09:55:11 | 00:00:39 | 03:50:11 | 00:00:39 | 01:04:45 | |
| 152 | Adjust the rail width at the outsert magazine | 09:55:11 | 09:58:38 | 00:03:27 | 03:53:38 | 00:02:00 | 01:06:45 | if this is standardized, it could possibly become a quick change setting. Dedicate magazines for particular sizes. Perhaps put an insert in for smaller labels that will be removed for larger labels |
| 153 | Close guard, test transfer of outserts | 09:58:38 | 09:58:58 | 00:00:20 | 03:53:58 | 00:00:20 | 01:07:05 | |
| 154 | Adjust spacing of outserts on transfer tape (too much space done with a DIP. switch, runs machine while adjusting) | 09:58:58 | 09:59:57 | 00:00:59 | 03:54:57 | 00:00:59 | 01:08:04 | |
| 155 | Show me troubled magnetic brake unit | 09:59:57 | 10:00:04 | 00:00:07 | 03:55:04 | 00:00:07 | 01:08:11 | |
| 156 | Adjust over hang of outsert and check for proper position by jogging | 10:00:04 | 10:01:44 | 00:01:40 | 03:56:44 | 00:01:40 | 01:09:51 | |
| 157 | Test run 3 bottles through labeler & check position of outsert | 10:01:44 | 10:02:53 | 00:01:09 | 03:57:53 | 00:01:09 | 01:11:00 | |

| Step # | Technician | Start Time (h : m : s) | End Time (h : m : s) | Step Time (h : m : s) | Cum Time (h : m : s) | Prop Time (h : m : s) | Cum Pr Time (h : m : s) | Comments |
|--------|--|------------------------|----------------------|-----------------------|----------------------|-----------------------|-------------------------|---|
| 158 | Adjust rail at exit of labeler | 10:02:53 | 10:03:07 | 00:00:14 | 03:58:07 | 00:00:14 | 01:11:14 | |
| 159 | Adjust rail back support for bottle rotation | 10:03:07 | 10:03:19 | 00:00:12 | 03:58:19 | 00:00:12 | 01:11:26 | look into redesigning this - not compatible with the bundler |
| 160 | More rail adjustments & check bottle movement | 10:03:19 | 10:05:16 | 00:01:57 | 04:00:16 | 00:00:30 | 01:11:56 | |
| 161 | Move to control panel and turn on machine/conveyors | 10:05:16 | 10:05:42 | 00:00:26 | 04:00:42 | 00:00:26 | 01:12:22 | |
| 162 | Observe bottle running through labeler, rails & at rotation point | 10:05:42 | 10:06:16 | 00:00:34 | 04:01:16 | 00:00:00 | 01:12:22 | |
| 163 | Fine tune rail adjustments | 10:06:16 | 10:06:42 | 00:00:26 | 04:01:42 | 00:00:00 | 01:12:22 | |
| 164 | 2nd tape ran out | 10:06:42 | 10:07:56 | 00:01:14 | 04:02:56 | 00:00:00 | 01:12:22 | |
| 165 | Checking bottle rotation point for correct operation | 10:07:56 | 10:08:18 | 00:00:22 | 04:03:18 | 00:00:00 | 01:12:22 | |
| 166 | Start machine place bottle on conveyor, check for reject verification | 10:08:18 | 10:09:08 | 00:00:50 | 04:04:08 | 00:00:50 | 01:13:12 | |
| 167 | Check for bottle rotation again | 10:09:08 | 10:09:14 | 00:00:06 | 04:04:14 | 00:00:00 | 01:13:12 | |
| 168 | Observe labeler machine area. Adjust height of camera lamp | 10:09:14 | 10:09:28 | 00:00:14 | 04:04:28 | 00:00:00 | 01:13:12 | |
| 169 | Place bottle on conveyor, check for smooth transition, remove bottle | 10:09:28 | 10:09:50 | 00:00:22 | 04:04:50 | 00:00:00 | 01:13:12 | |
| 170 | Continue adjustments of rails further downstream using bottle as a guide | 10:09:50 | 10:11:14 | 00:01:24 | 04:06:14 | 00:00:30 | 01:13:42 | |
| 171 | Start adjustments at infeed guide to bundler | 10:11:14 | 10:11:46 | 00:00:32 | 04:06:46 | 00:00:32 | 01:14:14 | |
| 172 | Move upstream for tool & key & return to bundler panel | 10:11:46 | 10:12:13 | 00:00:27 | 04:07:13 | 00:00:00 | 01:14:14 | |
| 173 | Insert key in panel, start machine | 10:12:13 | 10:12:17 | 00:00:04 | 04:07:17 | 00:00:04 | 01:14:18 | |
| 174 | Move to other side of bundler | 10:12:17 | 10:12:31 | 00:00:14 | 04:07:31 | 00:00:14 | 01:14:32 | |
| 175 | Reset alarm on machine | 10:12:31 | 10:12:47 | 00:00:16 | 04:07:47 | 00:00:16 | 01:14:48 | alarm will go off after jogging or the machine has been stopped-doors opened (triggered e-stop) |
| 176 | Reset alarm on machine | 10:12:47 | 10:13:05 | 00:00:18 | 04:08:05 | 00:00:18 | 01:15:06 | |
| 177 | Empty cycle machine | 10:13:05 | 10:13:16 | 00:00:11 | 04:08:16 | 00:00:11 | 01:15:17 | |
| 178 | Look at rail adjustments | 10:13:16 | 10:13:23 | 00:00:07 | 04:08:23 | 00:00:07 | 01:15:24 | |
| 179 | Move away from bundler get bottle, return to bundler | 10:13:23 | 10:13:42 | 00:00:19 | 04:08:42 | 00:00:19 | 01:15:43 | triggered by eyes |
| 180 | Start machine, put down bottles | 10:13:42 | 10:13:52 | 00:00:10 | 04:08:52 | 00:00:10 | 01:15:53 | |
| 181 | Move to operator side of line | 10:13:52 | 10:14:13 | 00:00:21 | 04:09:13 | 00:00:21 | 01:16:14 | |
| 182 | Arrive at labeler control panel & start up | 10:14:13 | 10:14:31 | 00:00:18 | 04:09:31 | 00:00:18 | 01:16:32 | |
| 183 | Fiddle with wire at conveyor & return to control panel | 10:14:31 | 10:14:44 | 00:00:13 | 04:09:44 | 00:00:00 | 01:16:32 | |
| 184 | Move upstream to accumulation table, pick up down test bottles | 10:14:44 | 10:15:01 | 00:00:17 | 04:10:01 | 00:00:17 | 01:16:49 | |
| 185 | Observe bottles running through retorquer and test down bottle guide | 10:15:01 | 10:15:33 | 00:00:32 | 04:10:33 | 00:00:32 | 01:17:21 | |
| 186 | Test run 1 bottle through labeler & check for ejection | 10:15:33 | 10:15:51 | 00:00:18 | 04:10:51 | 00:00:18 | 01:17:39 | |
| 187 | Move to operator panel & reset fault counters | 10:15:51 | 10:16:04 | 00:00:13 | 04:11:04 | 00:00:13 | 01:17:52 | |
| 188 | Move to other side of line | 10:16:04 | 10:16:16 | 00:00:12 | 04:11:16 | 00:00:00 | 01:17:52 | |
| 189 | Jog labels | 10:16:16 | 10:16:31 | 00:00:15 | 04:11:31 | 00:00:00 | 01:17:52 | |
| 190 | Move to operator side of line (Check with Don?) | 10:16:31 | 10:17:01 | 00:00:30 | 04:12:01 | 00:00:30 | 01:18:22 | |
| 191 | Test run several bottles through labeler area & check for no rejects (Check with Don?) | 10:17:01 | 10:17:35 | 00:00:34 | 04:12:35 | 00:00:34 | 01:18:56 | |
| 192 | Make adjustments to rear worm gear width (Check with Don?) | 10:17:35 | 10:17:49 | 00:00:14 | 04:12:49 | 00:00:00 | 01:18:56 | |
| 193 | Check bottle transfer from worm gear to top guide | 10:17:49 | 10:18:36 | 00:00:47 | 04:13:36 | 00:00:00 | 01:18:56 | |
| 194 | Re-time front worm gear & adjust width | 10:18:36 | 10:19:22 | 00:00:46 | 04:14:22 | 00:00:00 | 01:18:56 | |
| 195 | Test bottle transfer from worm gears to top guide | 10:19:22 | 10:19:49 | 00:00:27 | 04:14:49 | 00:00:27 | 01:19:23 | |
| 196 | Move to other side of line | 10:19:49 | 10:20:11 | 00:00:22 | 04:15:11 | 00:00:00 | 01:19:23 | |
| 197 | Look upon labeler (Check with Don?) | 10:20:11 | 10:20:55 | 00:00:44 | 04:15:55 | 00:00:00 | 01:19:23 | |
| 198 | Move to camera panel | 10:20:55 | 10:21:10 | 00:00:15 | 04:16:10 | 00:00:00 | 01:19:23 | |
| 199 | Move back to bundler | 10:21:10 | 10:21:40 | 00:00:30 | 04:16:40 | 00:00:30 | 01:19:53 | |
| 200 | Use bottle to adjust in recd pivot guide at bundler | 10:21:40 | 10:23:04 | 00:01:24 | 04:18:04 | 00:01:24 | 01:21:17 | |
| 201 | Move to camera panel | 10:23:04 | 10:23:08 | 00:00:04 | 04:18:08 | 00:00:04 | 01:21:21 | |
| 202 | Insert position of code and test run labels to check code reading | 10:23:08 | 10:24:28 | 00:01:20 | 04:19:28 | 00:01:20 | 01:22:41 | |
| 203 | Adjust sensor for camera trigger and re-test | 10:24:28 | 10:25:28 | 00:01:00 | 04:20:28 | 00:01:00 | 01:23:41 | |
| 204 | Place bottle on line to re-test | 10:25:28 | 10:25:29 | 00:00:01 | 04:20:29 | 00:00:01 | 01:23:42 | |
| 205 | Adjust UV sensor, test senses label presence | 10:25:29 | 10:26:24 | 00:00:55 | 04:21:24 | 00:00:55 | 01:24:37 | |
| 206 | Trouble with down bottle, had to adjust guide plate at infeed worm gear, and re-time front worm. Ran numerous test bottles | 10:26:24 | 10:29:58 | 00:03:34 | 04:24:58 | 00:03:34 | 01:28:11 | |
| 207 | Move back to bundler | 10:29:58 | 10:30:02 | 00:00:04 | 04:25:02 | 00:00:04 | 01:28:15 | |
| 208 | Insert guard bypass key | 10:30:02 | 10:30:09 | 00:00:07 | 04:25:09 | 00:00:07 | 01:28:22 | |
| 209 | Move to operator side of line | 10:30:09 | 10:30:25 | 00:00:16 | 04:25:25 | 00:00:16 | 01:28:38 | |
| 210 | Set tool and return to other side | 10:30:25 | 10:30:52 | 00:00:27 | 04:25:52 | 00:00:00 | 01:28:38 | |
| 211 | Return to change over on bundler | 10:30:52 | 10:38:38 | 00:07:46 | 04:33:38 | 00:07:46 | 01:36:24 | |
| 212 | Gather bottles and place before bundler to test | 10:38:38 | 10:40:34 | 00:01:56 | 04:35:34 | 00:01:56 | 01:38:20 | |
| 213 | Jam in machine adjust some rails, clear jam | 10:40:34 | 10:43:04 | 00:02:30 | 04:38:04 | 00:00:00 | 01:38:20 | |
| 214 | Test run bundler, clean up tools, remove guard bypass | 10:43:04 | 10:46:41 | 00:03:37 | 04:41:41 | 00:02:30 | 01:40:50 | |
| 215 | Back to Vision system (camera) control panel | 10:46:41 | 10:47:54 | 00:01:13 | 04:42:54 | 00:00:00 | 01:40:50 | |
| 216 | Observe line, clean glue from bottle rotator | 10:47:54 | 10:48:39 | 00:00:45 | 04:43:39 | 00:00:00 | 01:40:50 | |
| 217 | Move to operator side of line | 10:48:39 | 10:49:05 | 00:00:26 | 04:44:05 | 00:00:00 | 01:40:50 | |
| 218 | Collect tools from line and clean up | 10:49:05 | 10:49:50 | 00:00:45 | 04:44:50 | 00:00:45 | 01:41:35 | |
| 219 | Collect and deface labels on all test bottles | 10:49:50 | 10:51:02 | 00:01:12 | 04:46:02 | 00:01:00 | 01:42:35 | |
| 220 | Recheck torque of bottles, forgot valve | 10:51:02 | 10:51:59 | 00:00:57 | 04:46:59 | 00:00:00 | 01:42:35 | |
| 221 | Paperwork, fill out torque sheet | 10:51:59 | 10:55:05 | 00:03:06 | 04:50:05 | 00:03:06 | 01:45:41 | |
| 222 | Change over clean up done, Harry waits for start-up, wait | 10:55:05 | 11:00:55 | 00:05:50 | 04:55:55 | 00:03:00 | 01:48:41 | Change over complete |
| 223 | Assist operator at filler, adjust speed | 11:00:55 | 11:02:40 | 00:01:45 | 04:57:40 | 00:01:00 | 01:49:41 | |
| 224 | Harry waits, inspects area, moves tool box, killing time | 11:02:40 | 11:06:41 | 00:04:01 | 05:01:41 | 00:00:00 | 01:49:41 | |

| Step # | Technician | Start Time (h : m : s) | End Time (h : m : s) | Step Time (h : m : s) | Cum Time (h : m : s) | Prop Time (h : m : s) | Cum Pr Time (h : m : s) | Comments |
|--------|--|------------------------|----------------------|-----------------------|----------------------|-----------------------|-------------------------|------------------------------------|
| 225 | Back at filler, verifying proper function of vibrator, killing time | 11:06:41 | 11:07:43 | 00:01:02 | 05:02:43 | 00:00:00 | 01:49:41 | |
| 226 | Waiting - Tape runs out | 11:07:43 | 11:38:21 | 00:30:38 | 05:33:21 | 00:00:00 | 01:49:41 | |
| 227 | (Tape #4, waiting for new tape) adjusts no bottle sensor sensitivity at filler conveyor | 11:38:21 | 11:52:55 | 00:14:34 | 05:47:55 | 00:00:00 | 01:49:41 | |
| 228 | Wait | 11:52:55 | 11:57:00 | 00:04:05 | 05:52:00 | 00:00:00 | 01:49:41 | |
| 229 | Adjust air cylinder, position for infeed pivot chute | 11:57:00 | 12:05:17 | 00:08:17 | 06:00:17 | 00:08:17 | 01:57:58 | Included as change over activity |
| 230 | Stopped taping | | | | 06:00:17 | | 01:57:58 | |
| | | | | | | | | |
| | | | | | | | | © Jim McCallum Publishing Ltd 2012 |
| | performed by another person. Perhaps take the person who second checks using the torch to perform these tasks. Also you have one person clean a line and then two additional people inspect a line. Look at the way manufacturing and MES work with the one person clean and one person inspect and see if this is a viable option | | | | | | | |
| | Blue outline deals with tasks that were performed that don't relate to tasks that should be performed on the line, but they were issues that needed to be addressed during the process. These tasks have to be addressed to see how much time was spent dealing with issues unrelated to ideal running situations | | | | | | | |