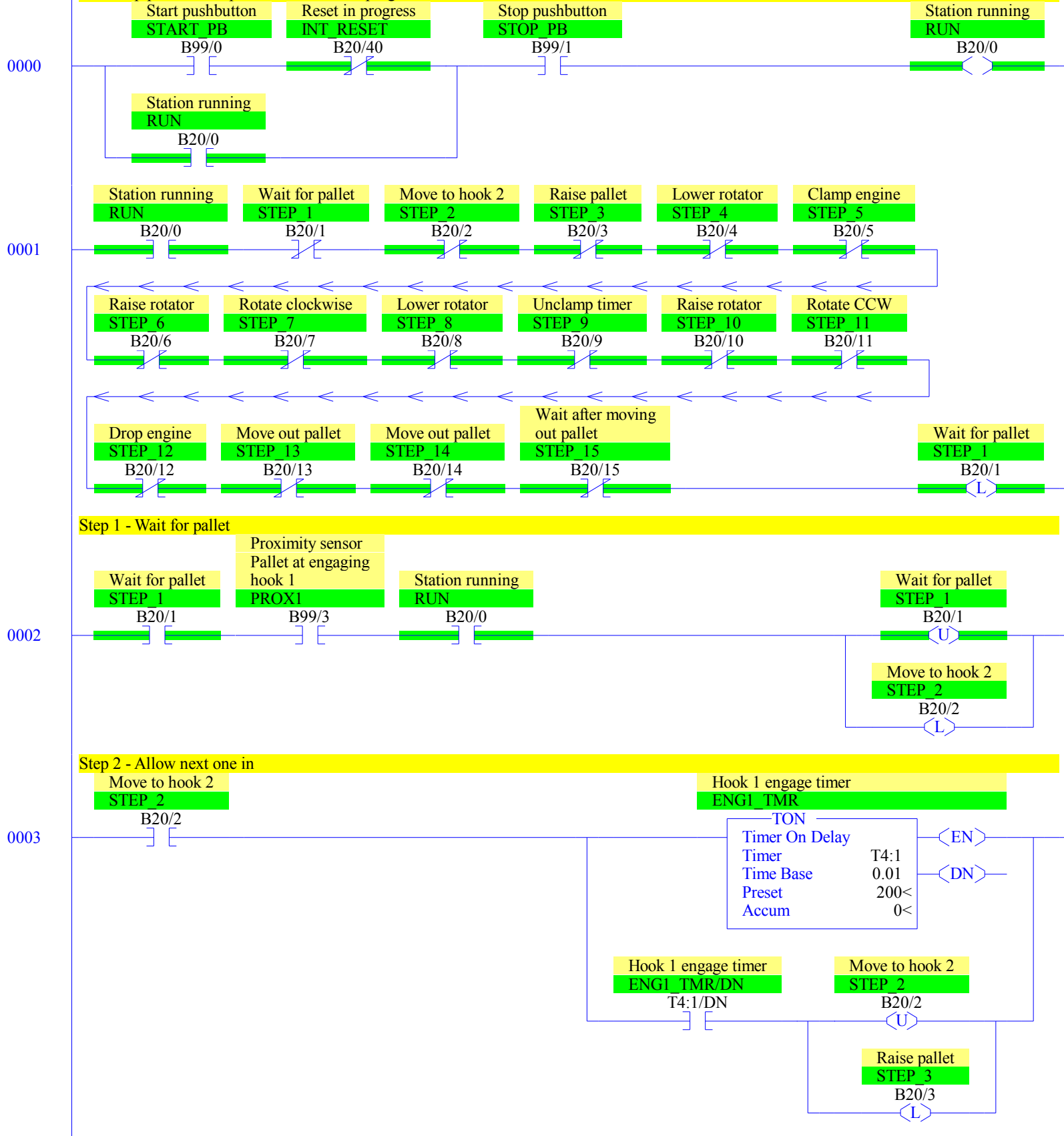
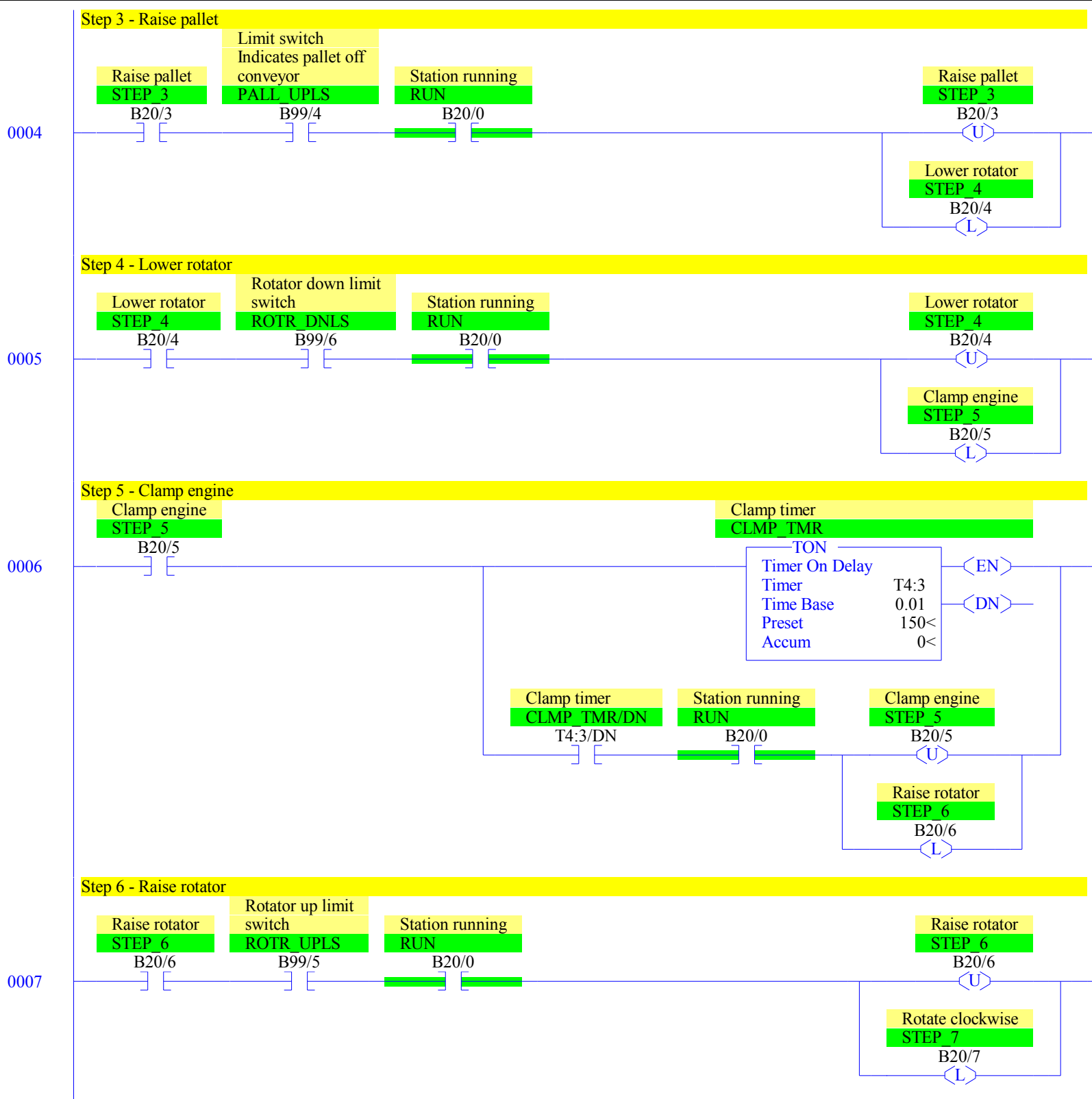


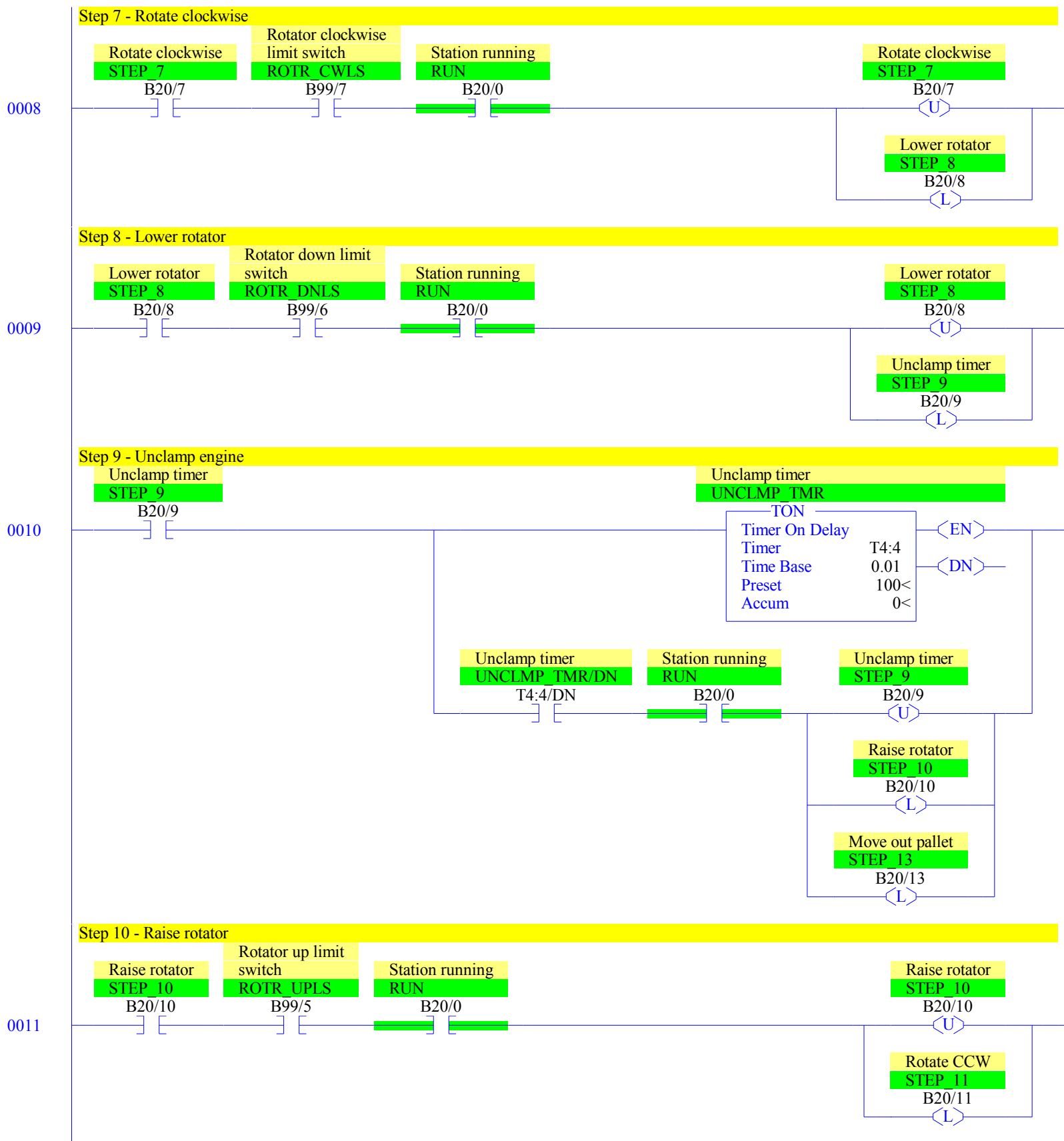
Example 6.5 - Engine Inverter Control with Parallel Branches with Simulation

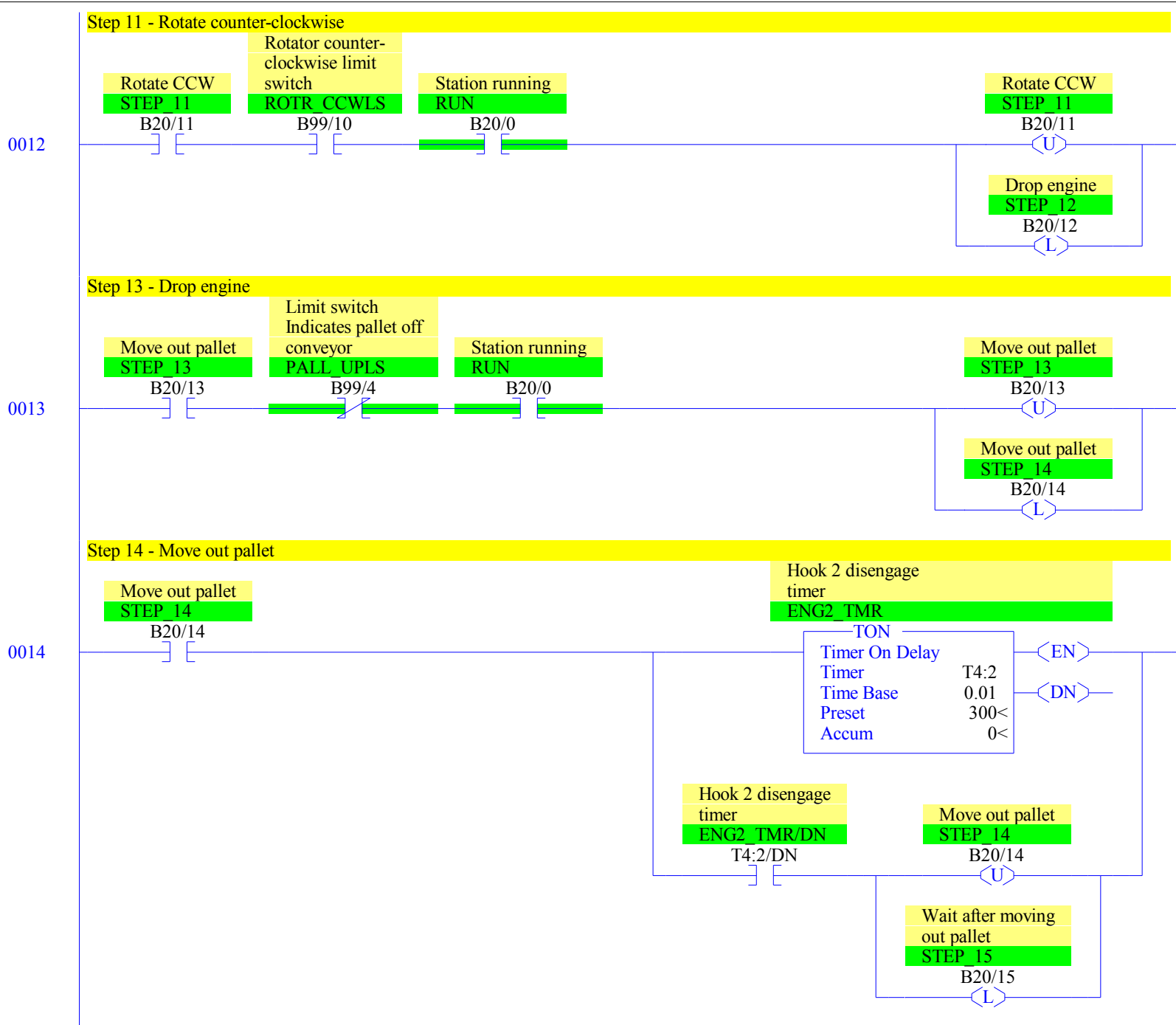
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Start/stop/pause. Start prevented if reset in progress.



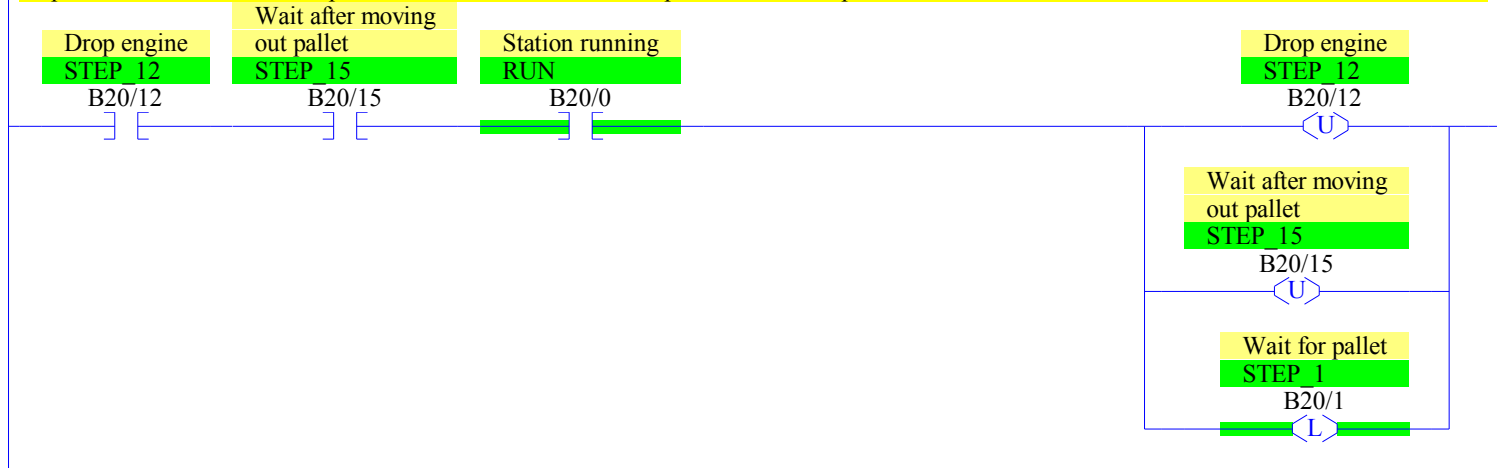


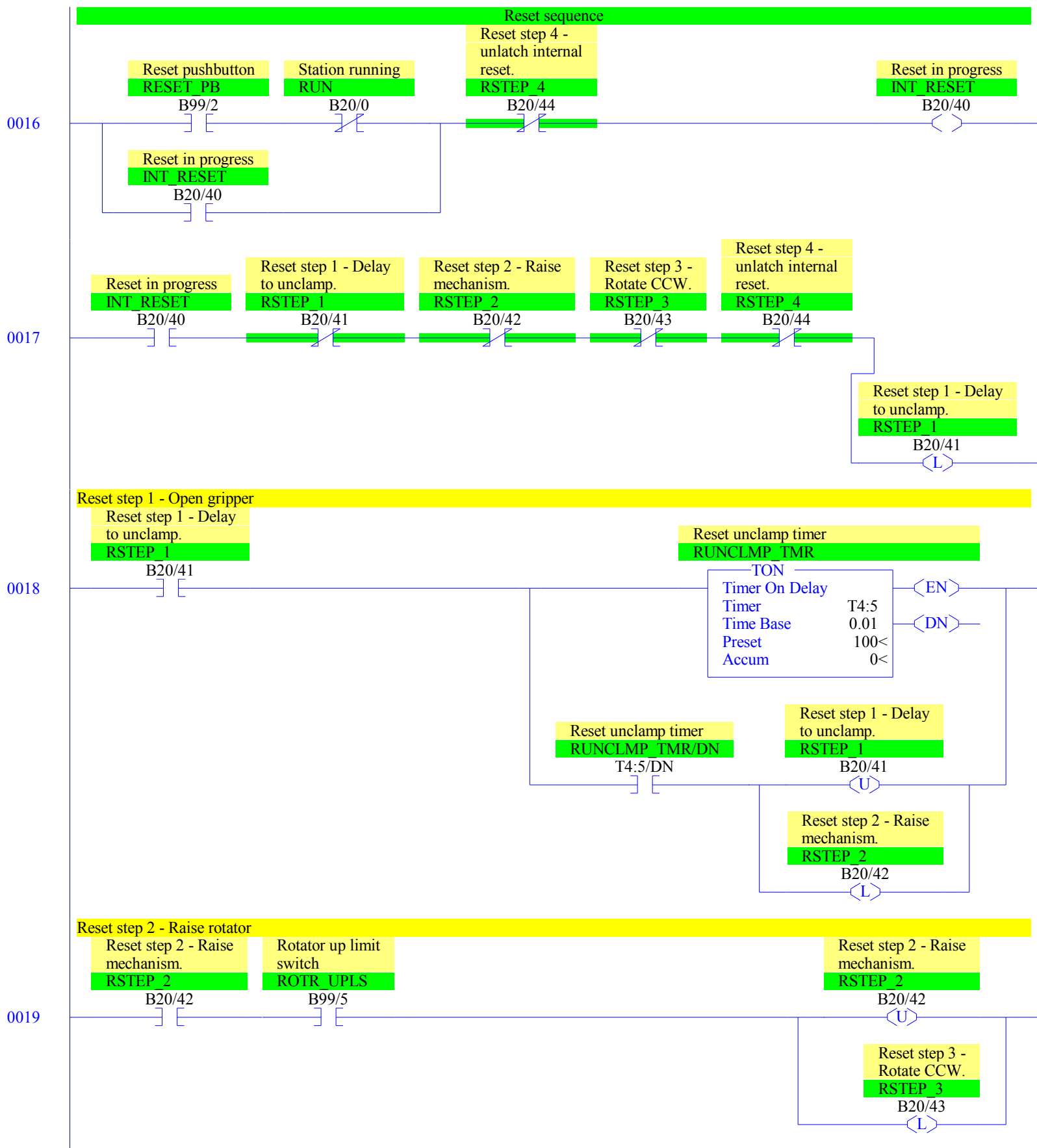


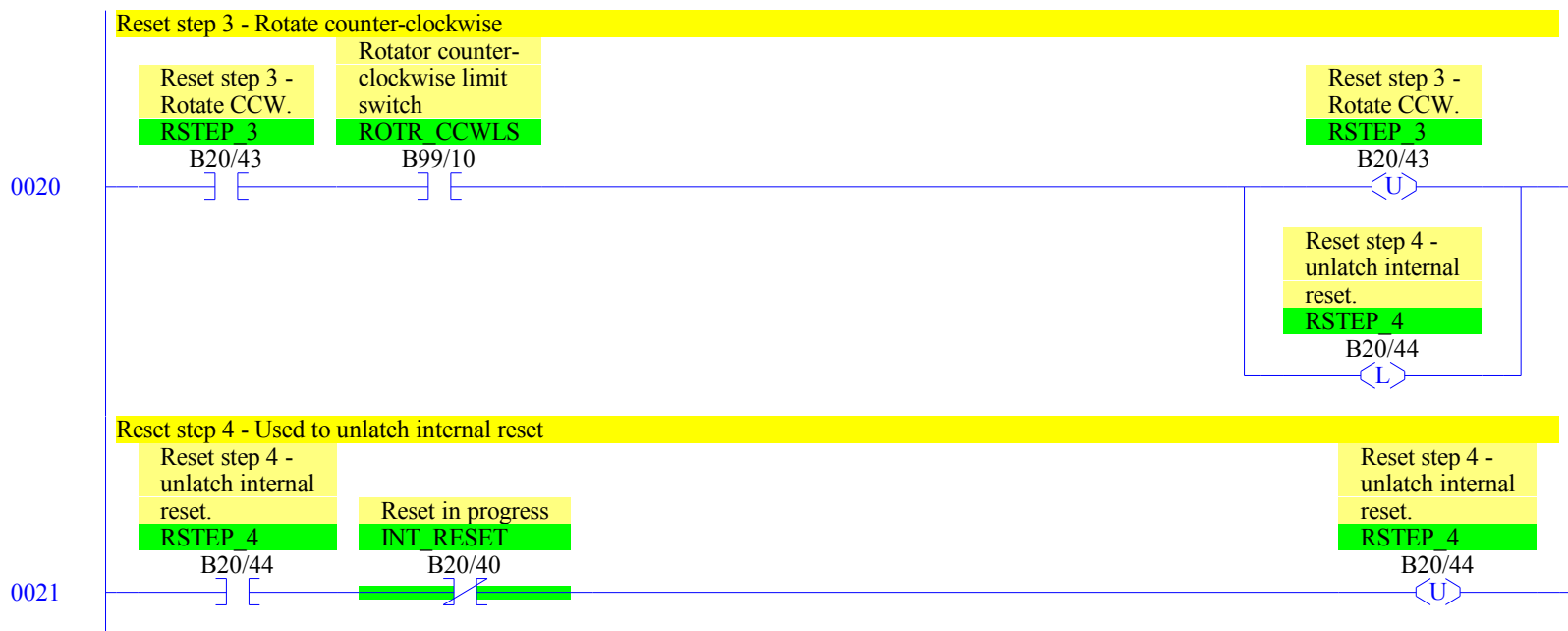


0015

Steps 12 & 15 - Wait at end of parallel branches. Transition to step 1 when both steps active.







0022

Reset unlatches all normal operation step-in progress bits

Reset in progress

INT RESET

B20/40

Wait for pallet

STEP 1

B20/1



Move to hook 2

STEP 2

B20/2



Raise pallet

STEP 3

B20/3



Lower rotator

STEP 4

B20/4



Clamp engine

STEP 5

B20/5



Raise rotator

STEP 6

B20/6



Rotate clockwise

STEP 7

B20/7



Lower rotator

STEP 8

B20/8



Unclamp timer

STEP 9

B20/9



Raise rotator

STEP 10

B20/10



Rotate CCW

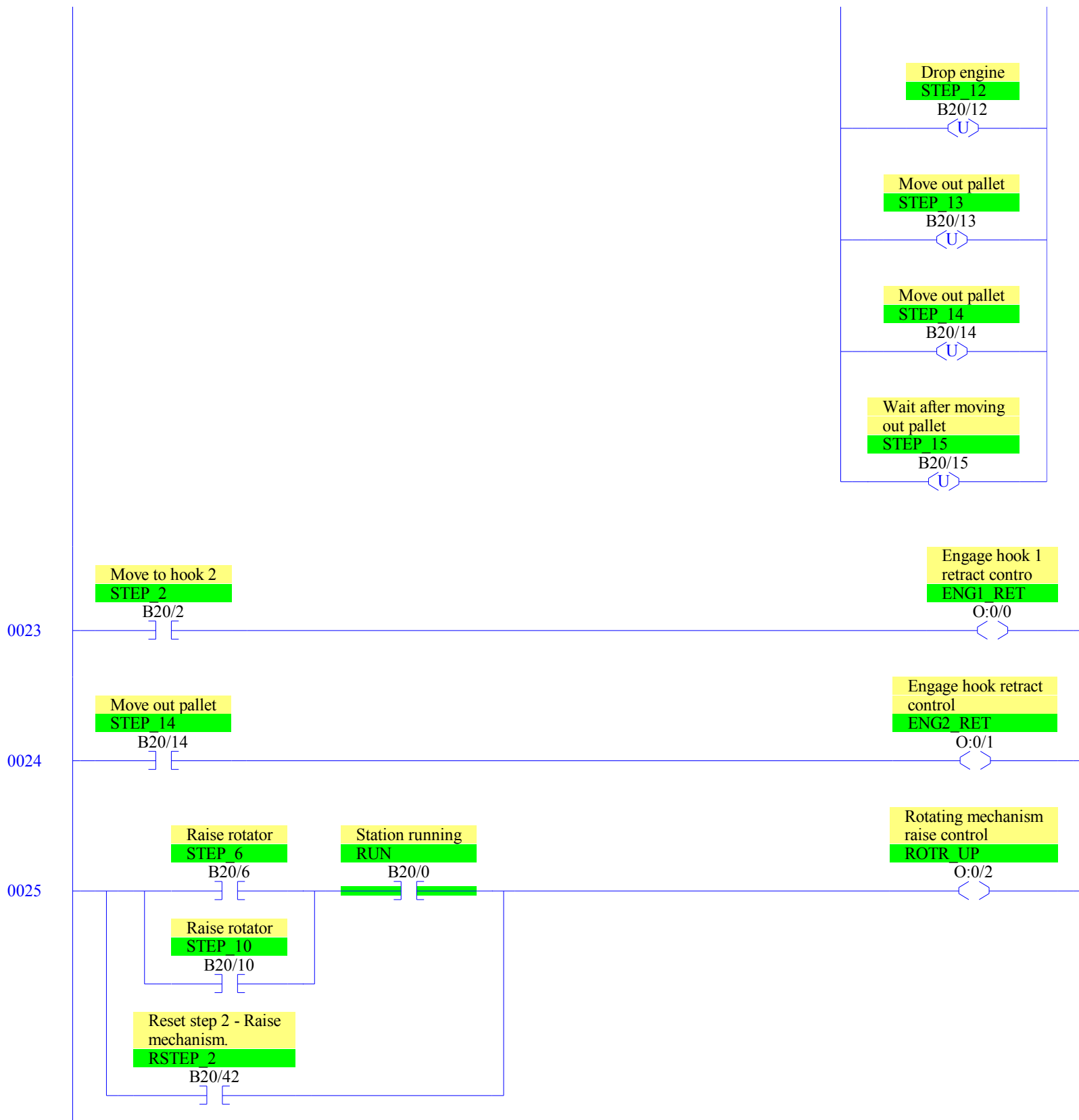
STEP 11

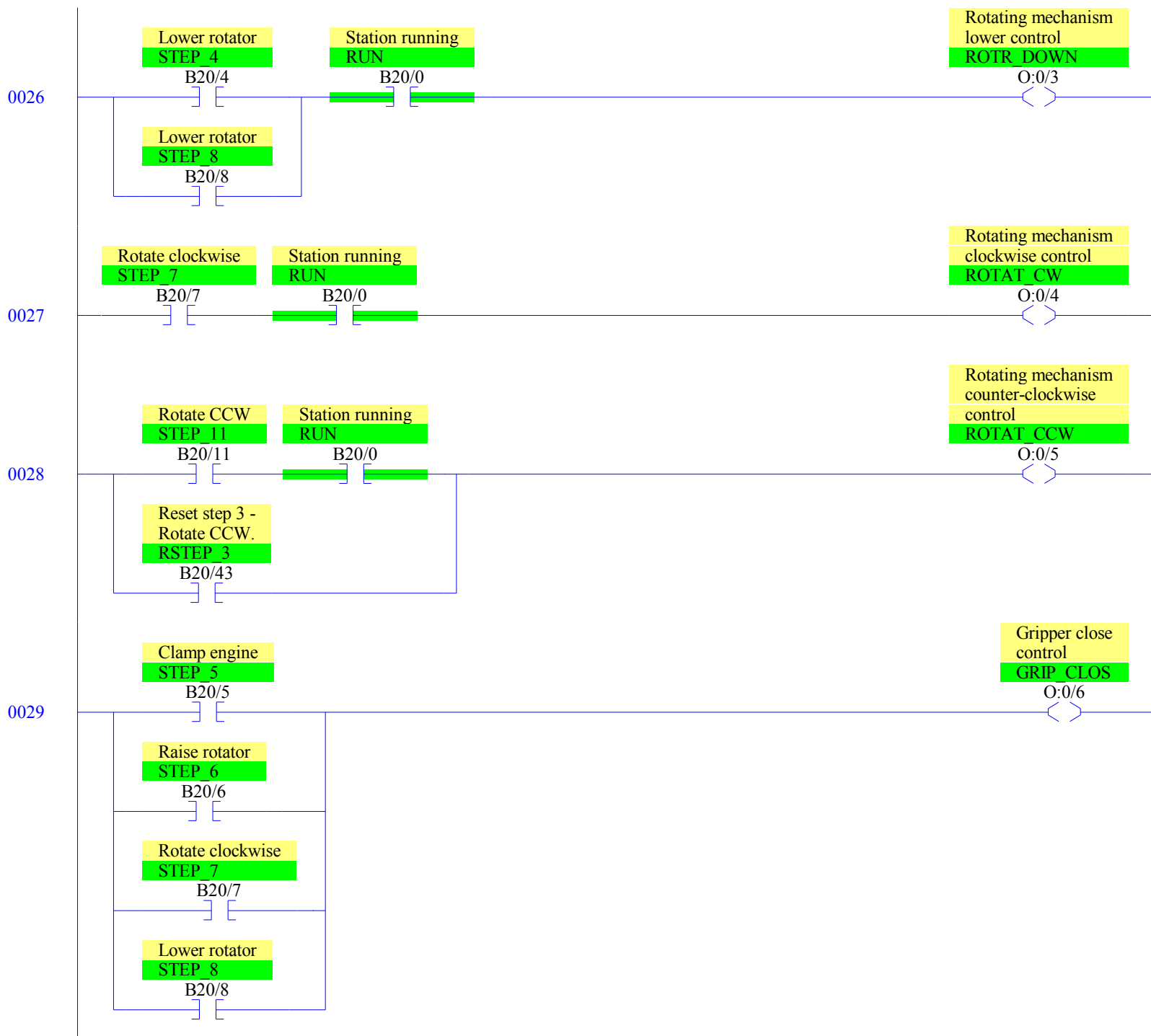
B20/11



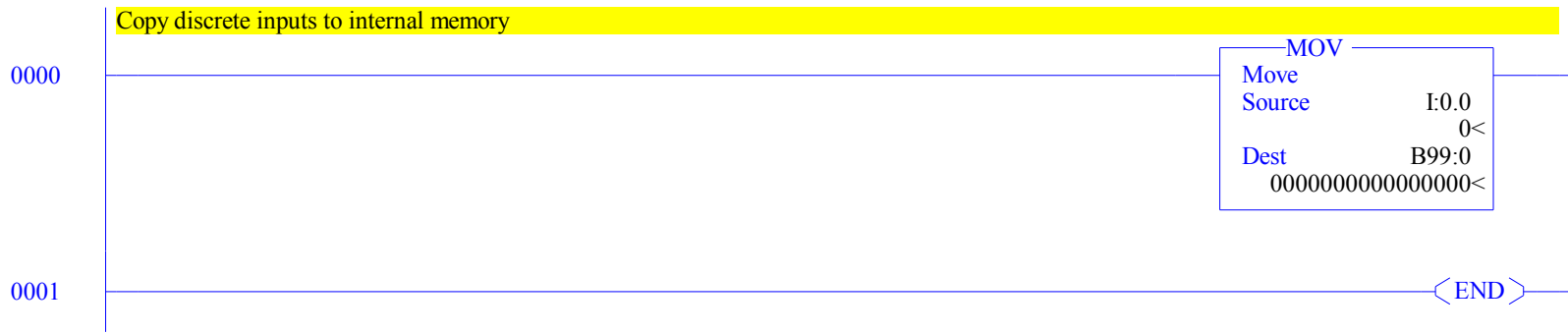
Drop engine

STEP 12







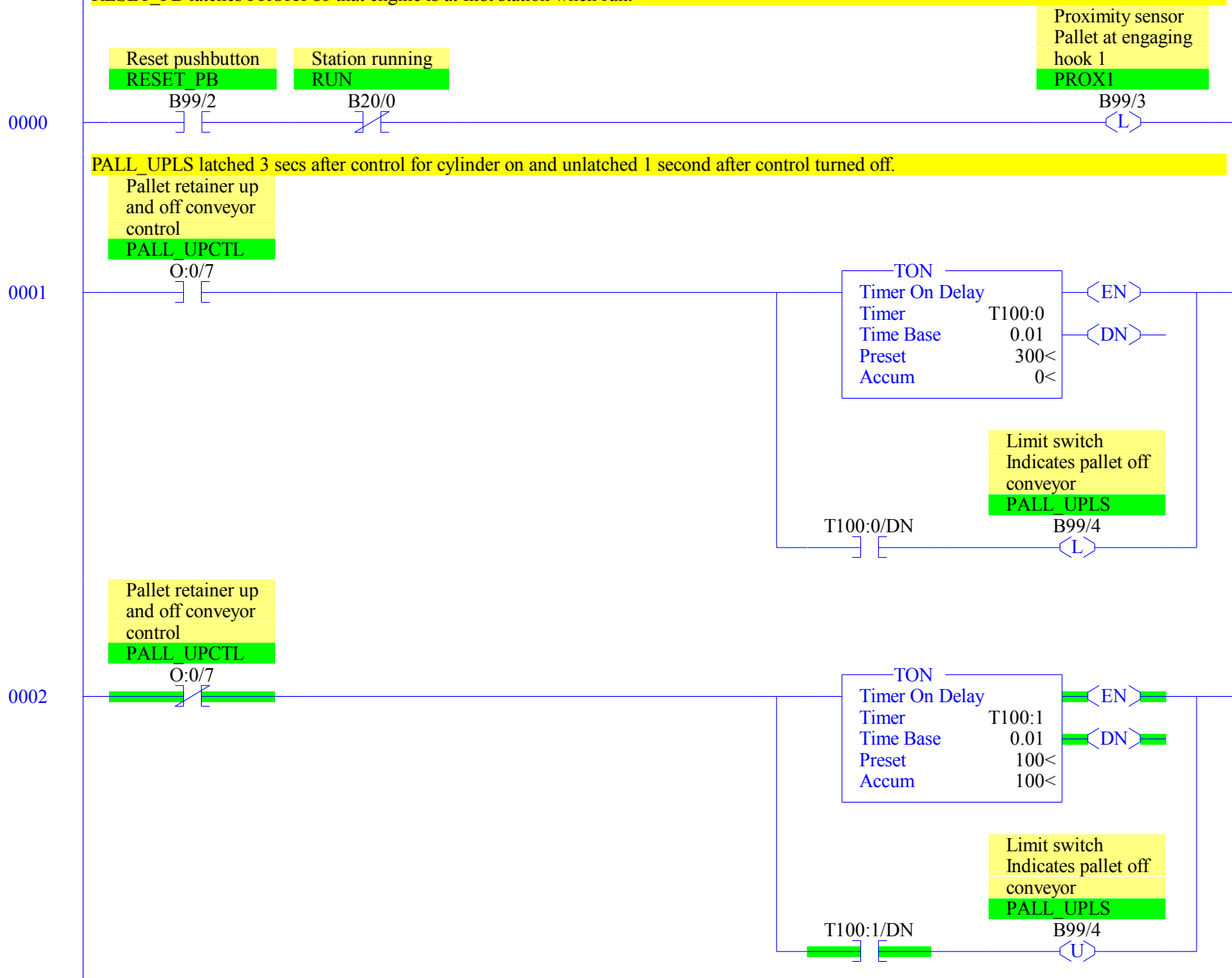


Tieback Logic for Simulation

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This version uses RESET_PB to generate first engine. Each subsequent engine appears 5 seconds after second engage hook goes back up.

RESET_PB latches PROX1 so that engine is at first station when run.



Up/Down limit switches.

Down LS latched 3 secs after down control active and unlatched immediately when up control active.

Up LS latched 3 secs after up control active and unlatched immediately when down control active.

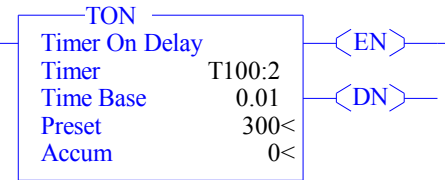
Rotating mechanism

lower control

ROTR_DOWN

O:0/3

0003

Rotator down limit
switch

ROTR_DNLS

T100:2/DN

B99/6

<L>

Rotator up limit
switch

ROTR_UPLS

B99/5

<U>

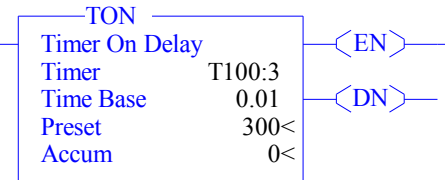
Rotating mechanism

raise control

ROTR_UP

O:0/2

0004

Rotator up limit
switch

ROTR_UPLS

T100:3/DN

B99/5

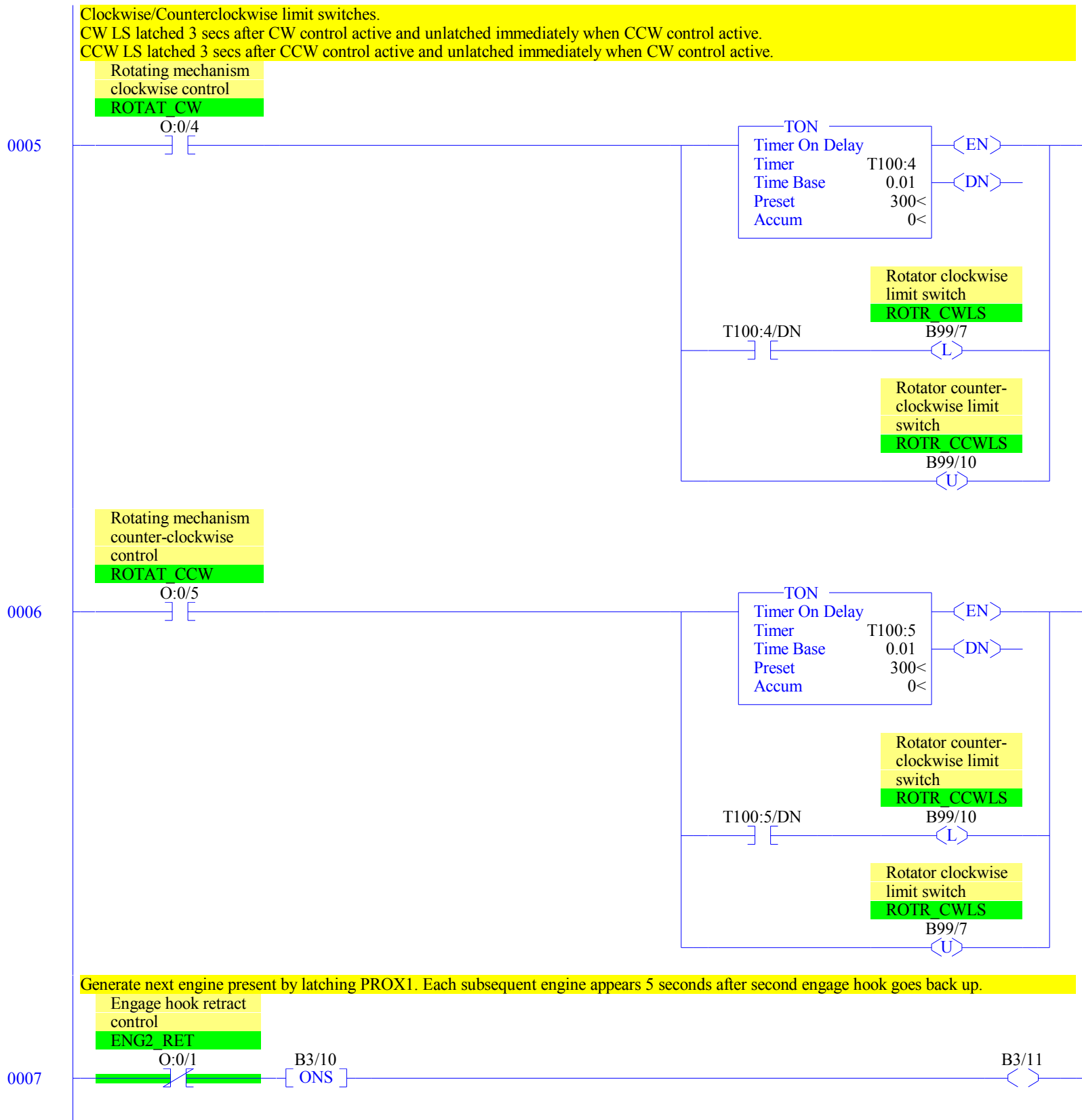
<L>

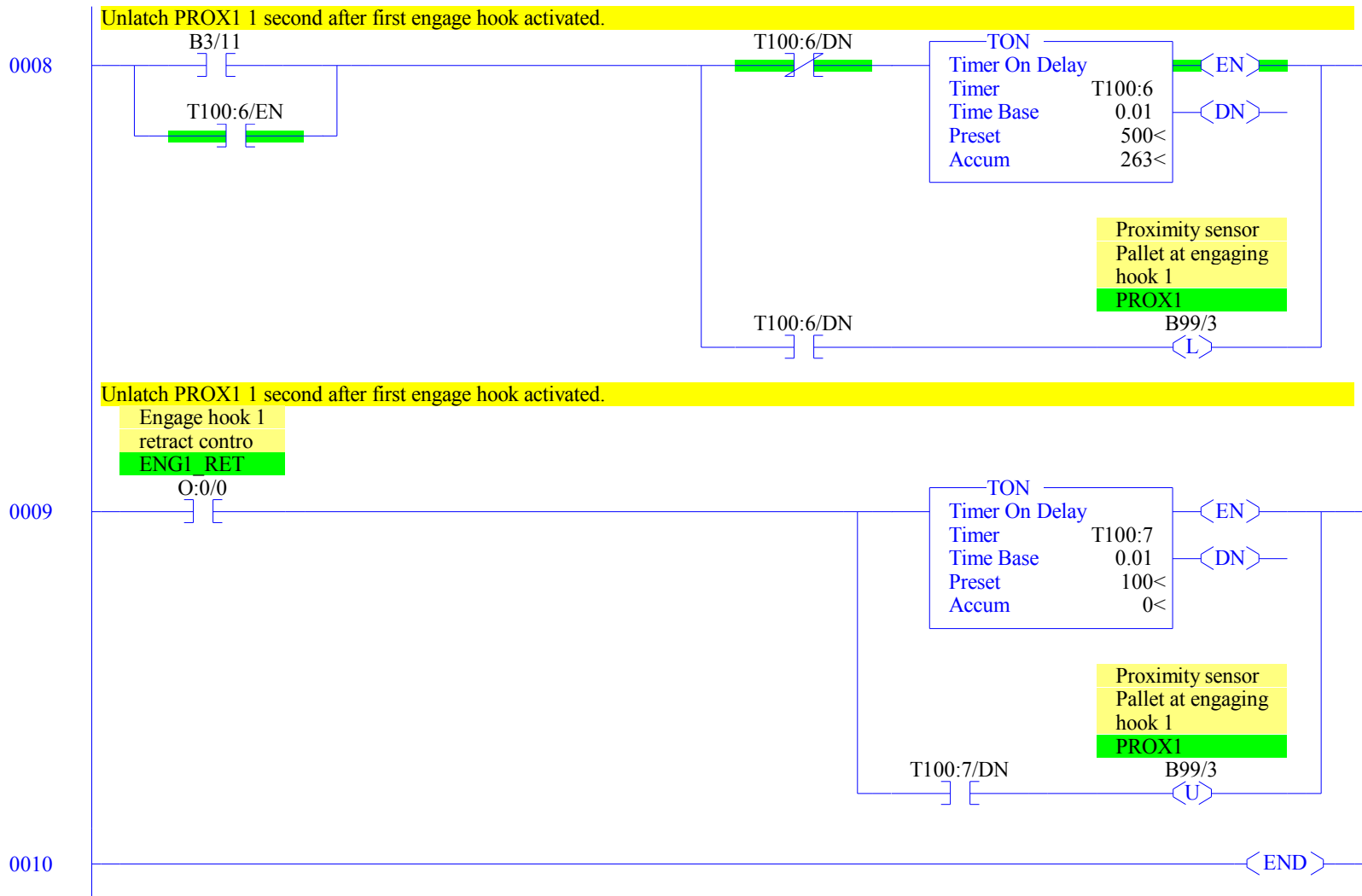
Rotator down limit
switch

ROTR_DNLS

B99/6

<U>





RSLogix 500 Cross Reference Report - Sorted by Address

```

O:0/0      - {ENG1_RET} Engage hook 1 retract contro
            OTE - File #2 - 23
            XIC - File #100 SIMULATION - 9
O:0/1      - {ENG2_RET} Engage hook retract control
            OTE - File #2 - 24
            XIO - File #100 SIMULATION - 7
O:0/2      - {ROTR_UP} Rotating mechanism raise control
            OTE - File #2 - 25
            XIC - File #100 SIMULATION - 4
O:0/3      - {ROTR_DOWN} Rotating mechanism lower control
            OTE - File #2 - 26
            XIC - File #100 SIMULATION - 3
O:0/4      - {ROTAT CW} Rotating mechanism clockwise control
            OTE - File #2 - 27
            XIC - File #100 SIMULATION - 5
O:0/5      - {ROTAT_CCW} Rotating mechanism counter-clockwise control
            OTE - File #2 - 28
            XIC - File #100 SIMULATION - 6
O:0/6      - {GRIP CLOS} Gripper close control
            OTE - File #2 - 29
O:0/7      - {PALL_UPCTL} Pallet retainer up and off conveyor control
            OTE - File #2 - 30
            XIC - File #100 SIMULATION - 1
            XIO - File #100 SIMULATION - 2
I:0.0      - MOV - File #99 DUPLIC INS - 0
B3/10      - ONS - File #100 SIMULATION - 7
B3/11      - OTE - File #100 SIMULATION - 7
            XIC - File #100 SIMULATION - 8
B3/200     - {ENAB_SIMULATION} Enable simulation logic
            XIC - File #2 - 31
            XIO - File #2 - 32
T4:1       - {ENG1_TMR} Hook 1 engage timer
            TON - File #2 - 3
T4:1/DN    - XIC - File #2 - 3
T4:2       - {ENG2_TMR} Hook 2 disengage timer
            TON - File #2 - 14
T4:2/DN    - XIC - File #2 - 14
T4:3       - {CLMP TMR} Clamp timer
            TON - File #2 - 6
T4:3/DN    - XIC - File #2 - 6
T4:4       - {UNCLMP_TMR} Unclamp timer
            TON - File #2 - 10
T4:4/DN    - XIC - File #2 - 10
T4:5       - {RUNCLMP TMR} Reset unclamp timer
            TON - File #2 - 18
T4:5/DN    - XIC - File #2 - 18
B20/0      - {RUN} Station running
            OTE - File #2 - 0
            XIC - File #2 - 0, 1, 2, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 15
                25, 26, 27, 28
            XIO - File #2 - 16
                File #100 SIMULATION - 0
B20/1      - {STEP_1} Wait for pallet
            OTL - File #2 - 1, 15
            OTU - File #2 - 2, 22
            XIC - File #2 - 2
            XIO - File #2 - 1
B20/2      - {STEP_2} Move to hook 2
            OTL - File #2 - 2
            OTU - File #2 - 3, 22
            XIC - File #2 - 3, 23
            XIO - File #2 - 1
B20/3      - {STEP_3} Raise pallet
            OTL - File #2 - 3
            OTU - File #2 - 4, 22
            XIC - File #2 - 4, 30

```

RSLogix 500 Cross Reference Report - Sorted by Address

B20/4	- XIO - File #2 - 1 - {STEP_4} Lower rotator OTL - File #2 - 4 OTU - File #2 - 5, 22 XIC - File #2 - 5, 26, 30 XIO - File #2 - 1
B20/5	- {STEP_5} Clamp engine OTL - File #2 - 5 OTU - File #2 - 6, 22 XIC - File #2 - 6, 29, 30 XIO - File #2 - 1
B20/6	- {STEP_6} Raise rotator OTL - File #2 - 6 OTU - File #2 - 7, 22 XIC - File #2 - 7, 25, 29, 30 XIO - File #2 - 1
B20/7	- {STEP_7} Rotate clockwise OTL - File #2 - 7 OTU - File #2 - 8, 22 XIC - File #2 - 8, 27, 29, 30 XIO - File #2 - 1
B20/8	- {STEP_8} Lower rotator OTL - File #2 - 8 OTU - File #2 - 9, 22 XIC - File #2 - 9, 26, 29, 30 XIO - File #2 - 1
B20/9	- {STEP_9} Unclamp timer OTL - File #2 - 9 OTU - File #2 - 10, 22 XIC - File #2 - 10, 30 XIO - File #2 - 1
B20/10	- {STEP_10} Raise rotator OTL - File #2 - 10 OTU - File #2 - 11, 22 XIC - File #2 - 11, 25 XIO - File #2 - 1
B20/11	- {STEP_11} Rotate CCW OTL - File #2 - 11 OTU - File #2 - 12, 22 XIC - File #2 - 12, 28 XIO - File #2 - 1
B20/12	- {STEP_12} Drop engine OTL - File #2 - 12 OTU - File #2 - 15, 22 XIC - File #2 - 15 XIO - File #2 - 1
B20/13	- {STEP_13} Move out pallet OTL - File #2 - 10 OTU - File #2 - 13, 22 XIC - File #2 - 13 XIO - File #2 - 1
B20/14	- {STEP_14} Move out pallet OTL - File #2 - 13 OTU - File #2 - 14, 22 XIC - File #2 - 14, 24 XIO - File #2 - 1
B20/15	- {STEP_15} Wait after moving out pallet OTL - File #2 - 14 OTU - File #2 - 15, 22 XIC - File #2 - 15 XIO - File #2 - 1
B20/40	- {INT RESET} Reset in progress OTE - File #2 - 16 XIC - File #2 - 16, 17, 22 XIO - File #2 - 0, 21
B20/41	- {RSTEP_1} Reset step 1 - Delay to unclamp.

RSLogix 500 Cross Reference Report - Sorted by Address

```

      OTL - File #2 - 17
      OTU - File #2 - 18
      XIC - File #2 - 18
      XIO - File #2 - 17
B20/42 - {RSTEP_2} Reset step 2 - Raise mechanism.
      OTL - File #2 - 18
      OTU - File #2 - 19
      XIC - File #2 - 19, 25
      XIO - File #2 - 17
B20/43 - {RSTEP_3} Reset step 3 - Rotate CCW.
      OTL - File #2 - 19
      OTU - File #2 - 20
      XIC - File #2 - 20, 28
      XIO - File #2 - 17
B20/44 - {RSTEP_4} Reset step 4 - unlatch internal reset.
      OTL - File #2 - 20
      OTU - File #2 - 21
      XIC - File #2 - 21
      XIO - File #2 - 16, 17
B99:0 - MOV - File #99 DUPLIC_INS - 0
B99/0 - {START_PB} Start pushbutton
      XIC - File #2 - 0
B99/1 - {STOP_PB} Stop pushbutton
      XIC - File #2 - 0
B99/2 - {RESET_PB} Reset pushbutton
      XIC - File #2 - 16
      File #100 SIMULATION - 0
B99/3 - {PROX1} Proximity sensor Pallet at engaging hook 1
      OTL - File #100 SIMULATION - 0, 8
      OTU - File #100 SIMULATION - 9
      XIC - File #2 - 2
B99/4 - {PALL_UPLS} Limit switch Indicates pallet off conveyor
      OTL - File #100 SIMULATION - 1
      OTU - File #100 SIMULATION - 2
      XIC - File #2 - 4
      XIO - File #2 - 13
B99/5 - {ROTR_UPLS} Rotator up limit switch
      OTL - File #100 SIMULATION - 4
      OTU - File #100 SIMULATION - 3
      XIC - File #2 - 7, 11, 19
B99/6 - {ROTR_DNLS} Rotator down limit switch
      OTL - File #100 SIMULATION - 3
      OTU - File #100 SIMULATION - 4
      XIC - File #2 - 5, 9
B99/7 - {ROTR_CWLS} Rotator clockwise limit switch
      OTL - File #100 SIMULATION - 5
      OTU - File #100 SIMULATION - 6
      XIC - File #2 - 8
B99/10 - {ROTR_CCWLS} Rotator counter- clockwise limit switch
      OTL - File #100 SIMULATION - 6
      OTU - File #100 SIMULATION - 5
      XIC - File #2 - 12, 20
T100:0 - TON - File #100 SIMULATION - 1
T100:0/DN - XIC - File #100 SIMULATION - 1
T100:1 - TON - File #100 SIMULATION - 2
T100:1/DN - XIC - File #100 SIMULATION - 2
T100:2 - TON - File #100 SIMULATION - 3
T100:2/DN - XIC - File #100 SIMULATION - 3
T100:3 - TON - File #100 SIMULATION - 4
T100:3/DN - XIC - File #100 SIMULATION - 4
T100:4 - TON - File #100 SIMULATION - 5
T100:4/DN - XIC - File #100 SIMULATION - 5
T100:5 - TON - File #100 SIMULATION - 6
T100:5/DN - XIC - File #100 SIMULATION - 6
T100:6 - TON - File #100 SIMULATION - 8
T100:6/DN - XIC - File #100 SIMULATION - 8

```

RSLogix 500 Cross Reference Report - Sorted by Address

	XIO - File #100 SIMULATION - 8
T100:6/EN	- XIC - File #100 SIMULATION - 8
T100:7	- TON - File #100 SIMULATION - 9
T100:7/DN	- XIC - File #100 SIMULATION - 9
U:99	- JSR - File #2 - 32
U:100	- {TIEBACK}
	JSR - File #2 - 31