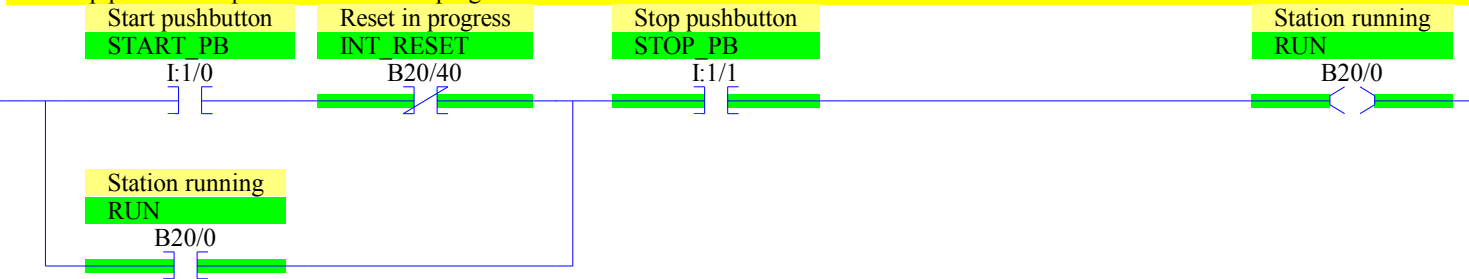


Example 6.4 - Engine Inverter Control with Simulation

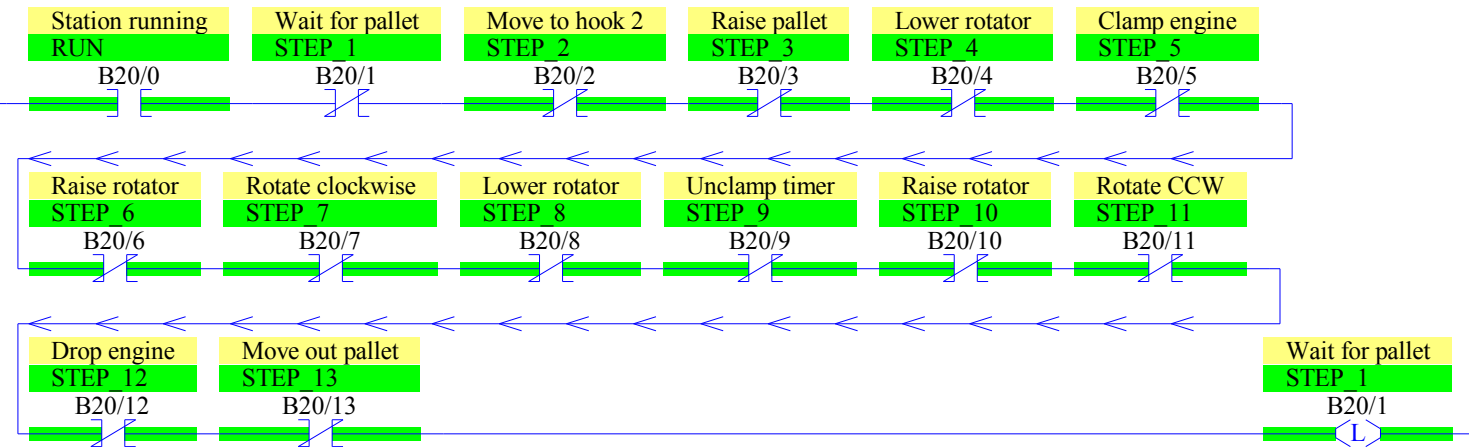
Copyright (c) 2015 Dogwood Valley Press, LLC

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

0000

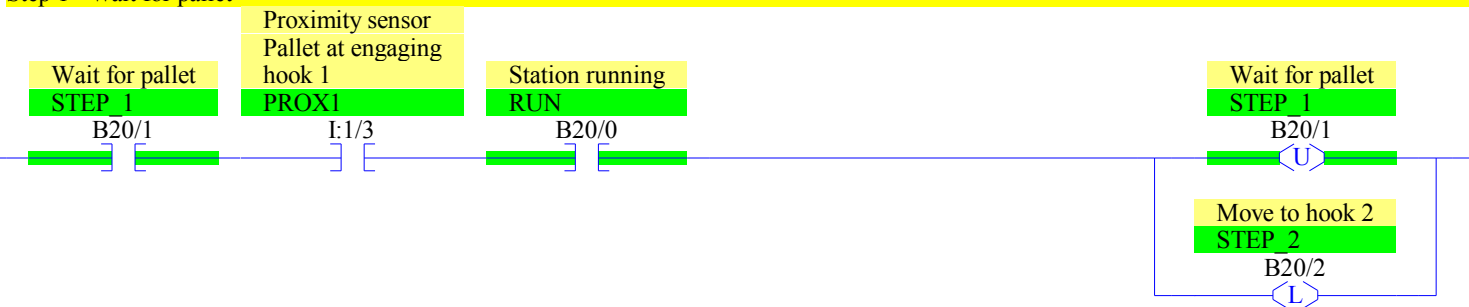


0001



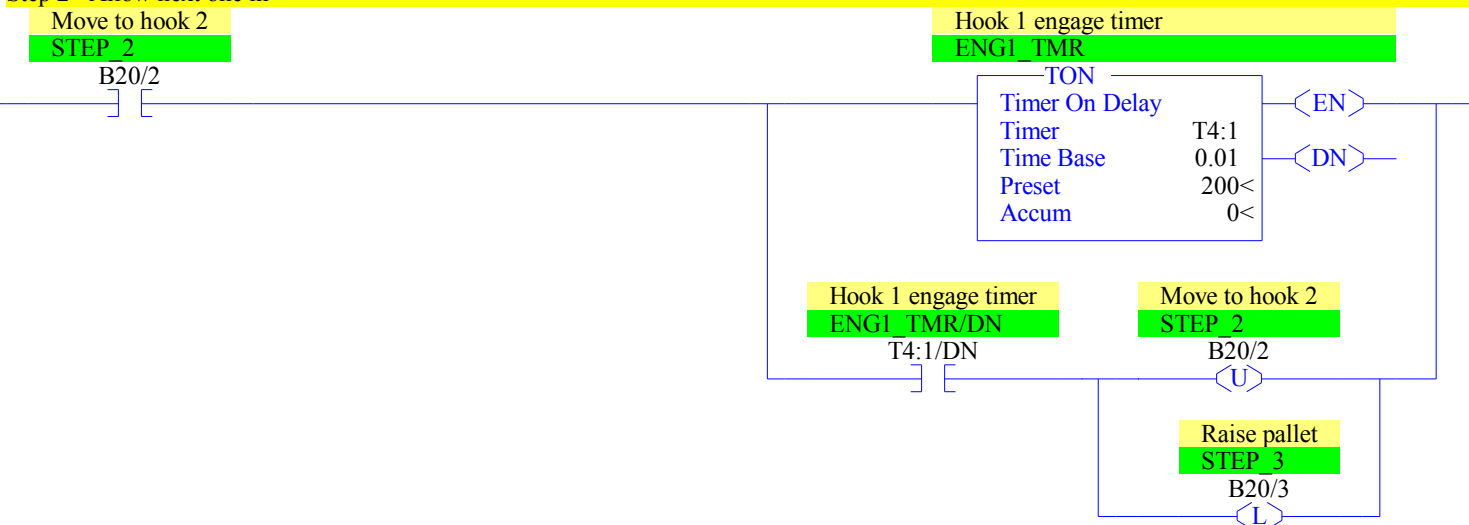
Step 1 - Wait for pallet

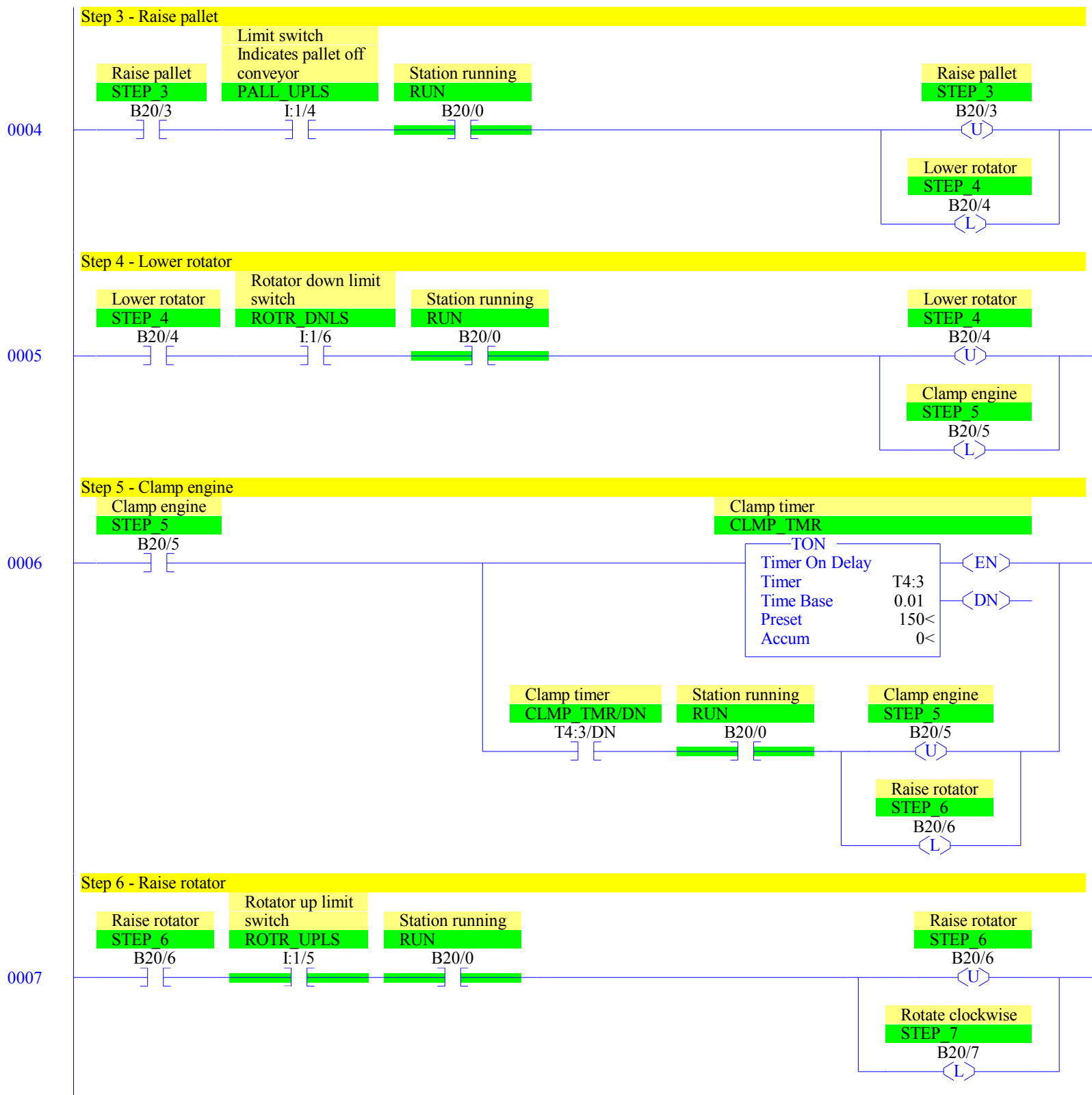
0002

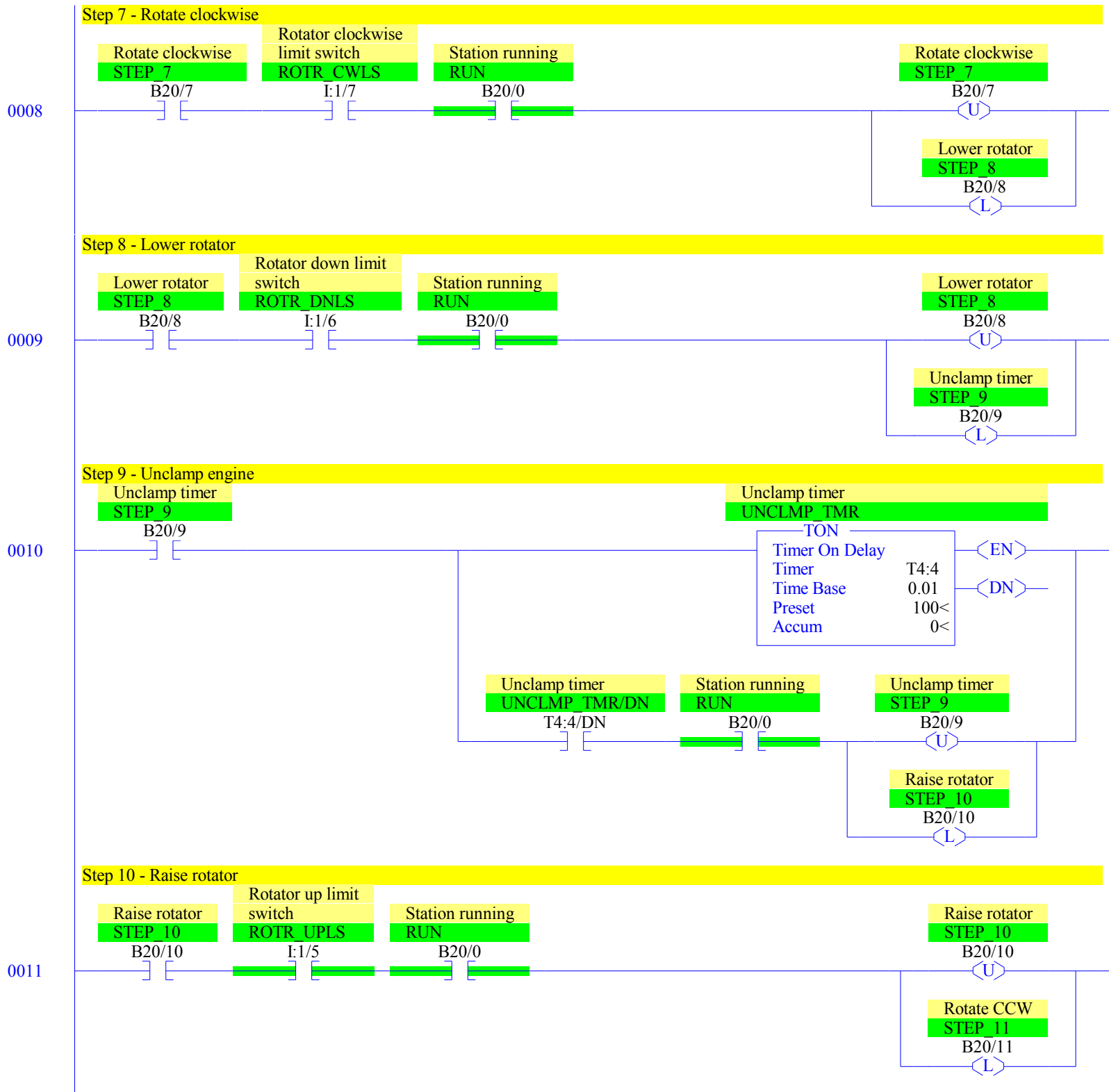


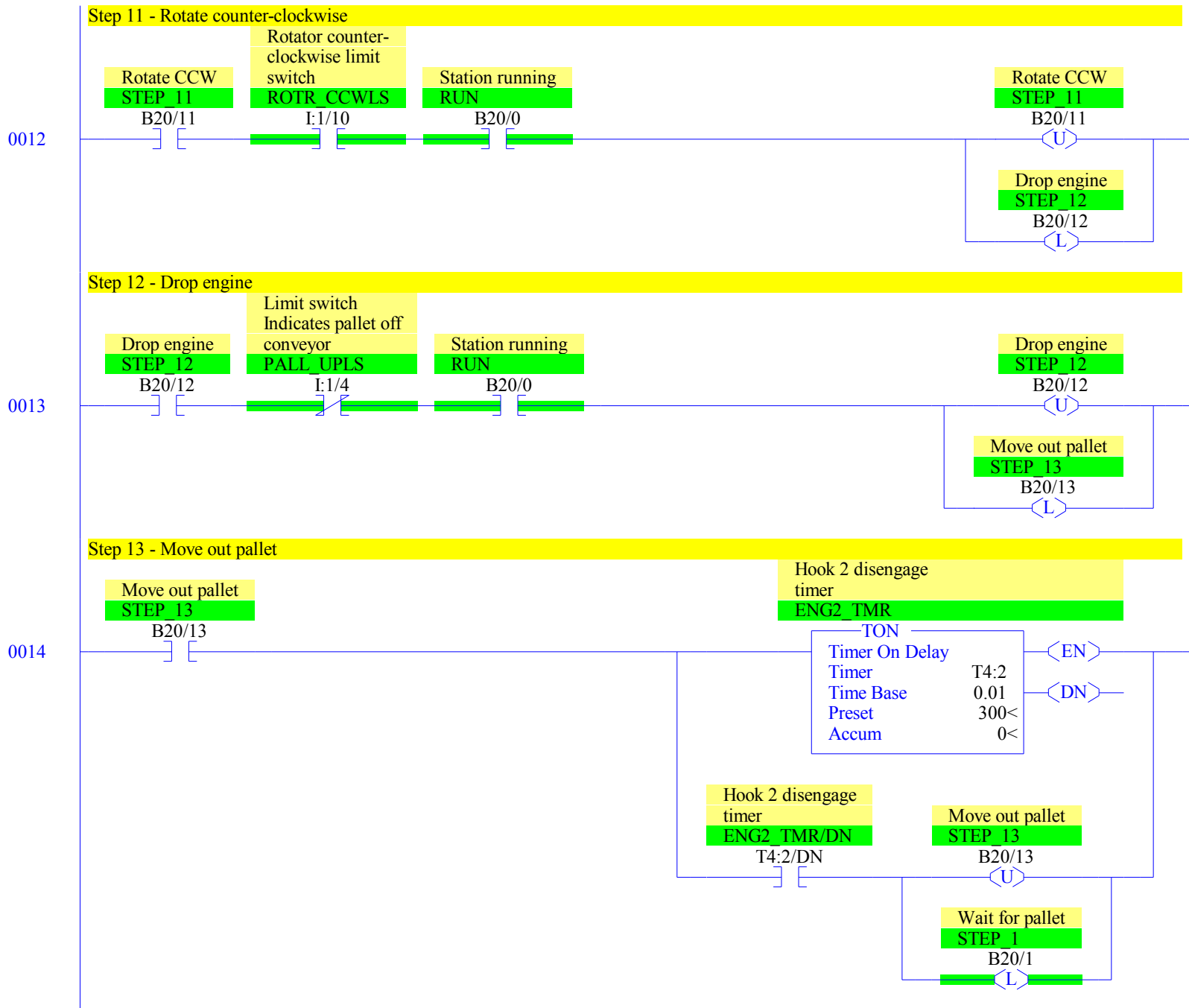
Step 2 - Allow next one in

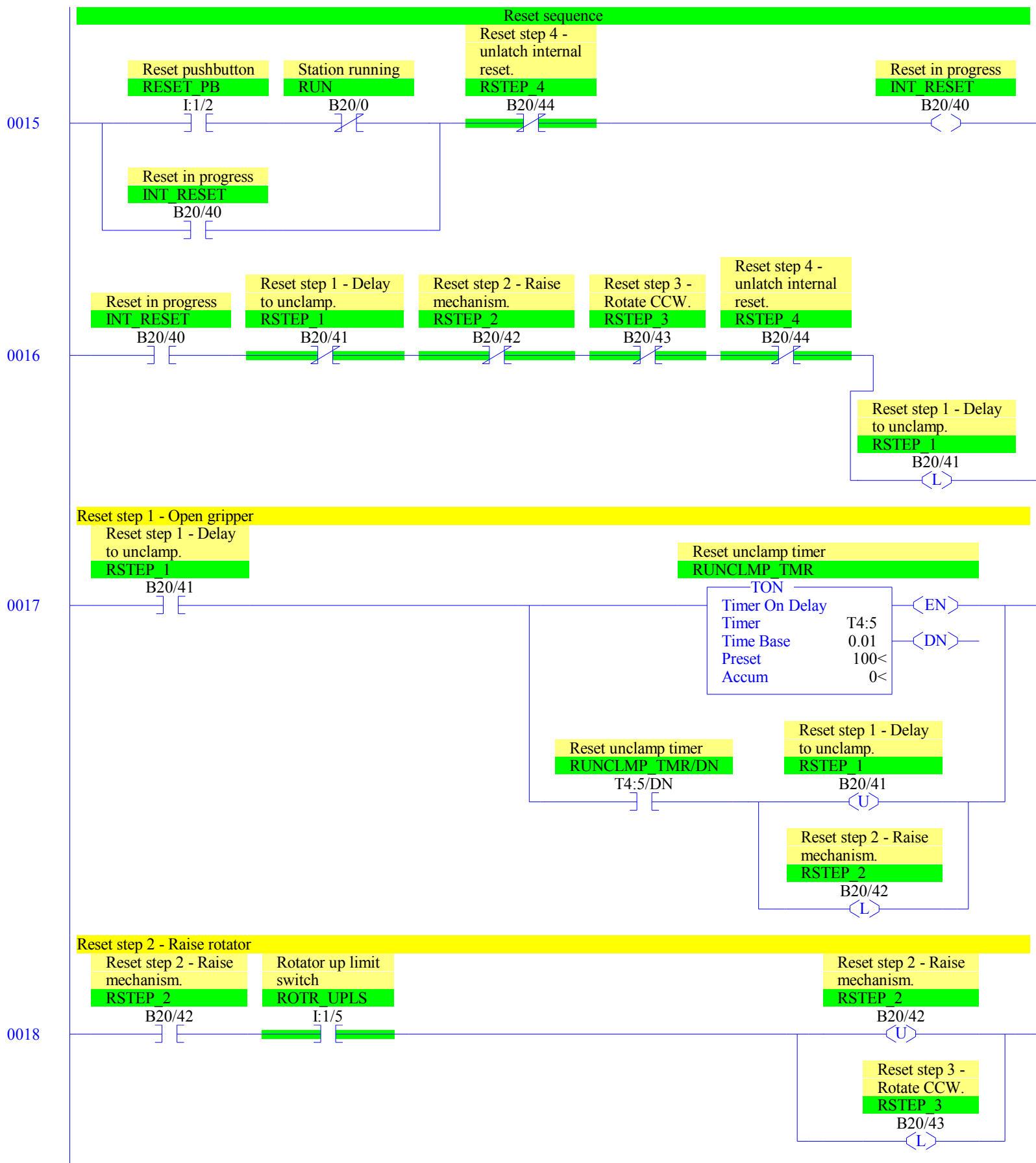
0003

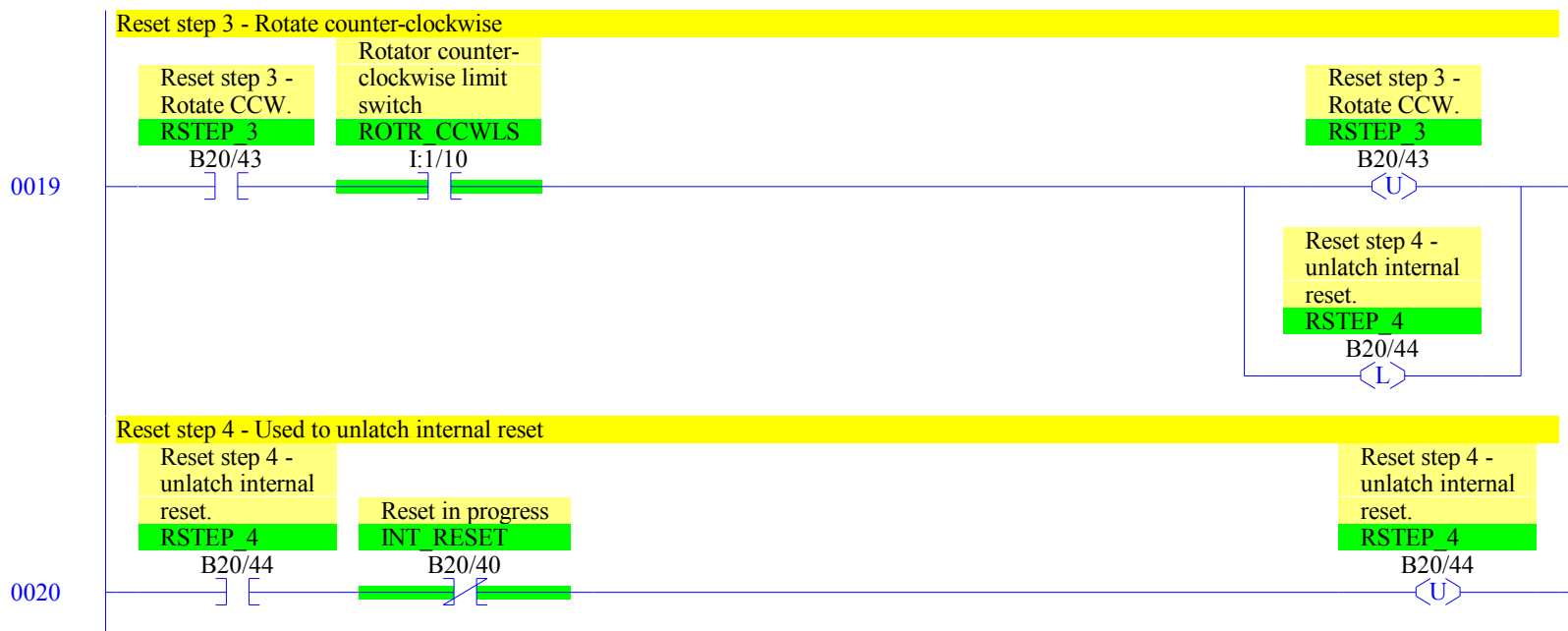












0021

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

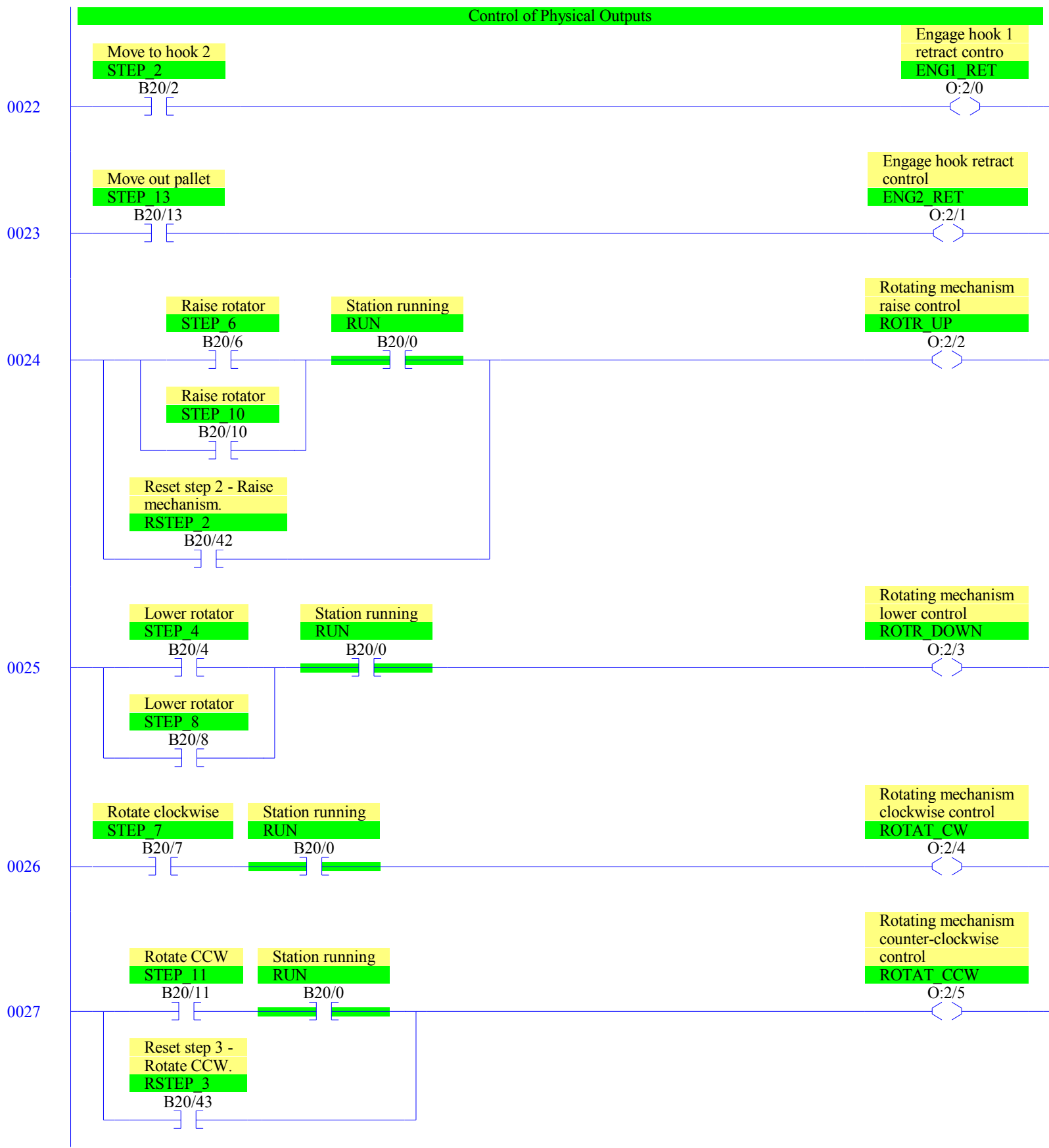
STEP 12

B20/12

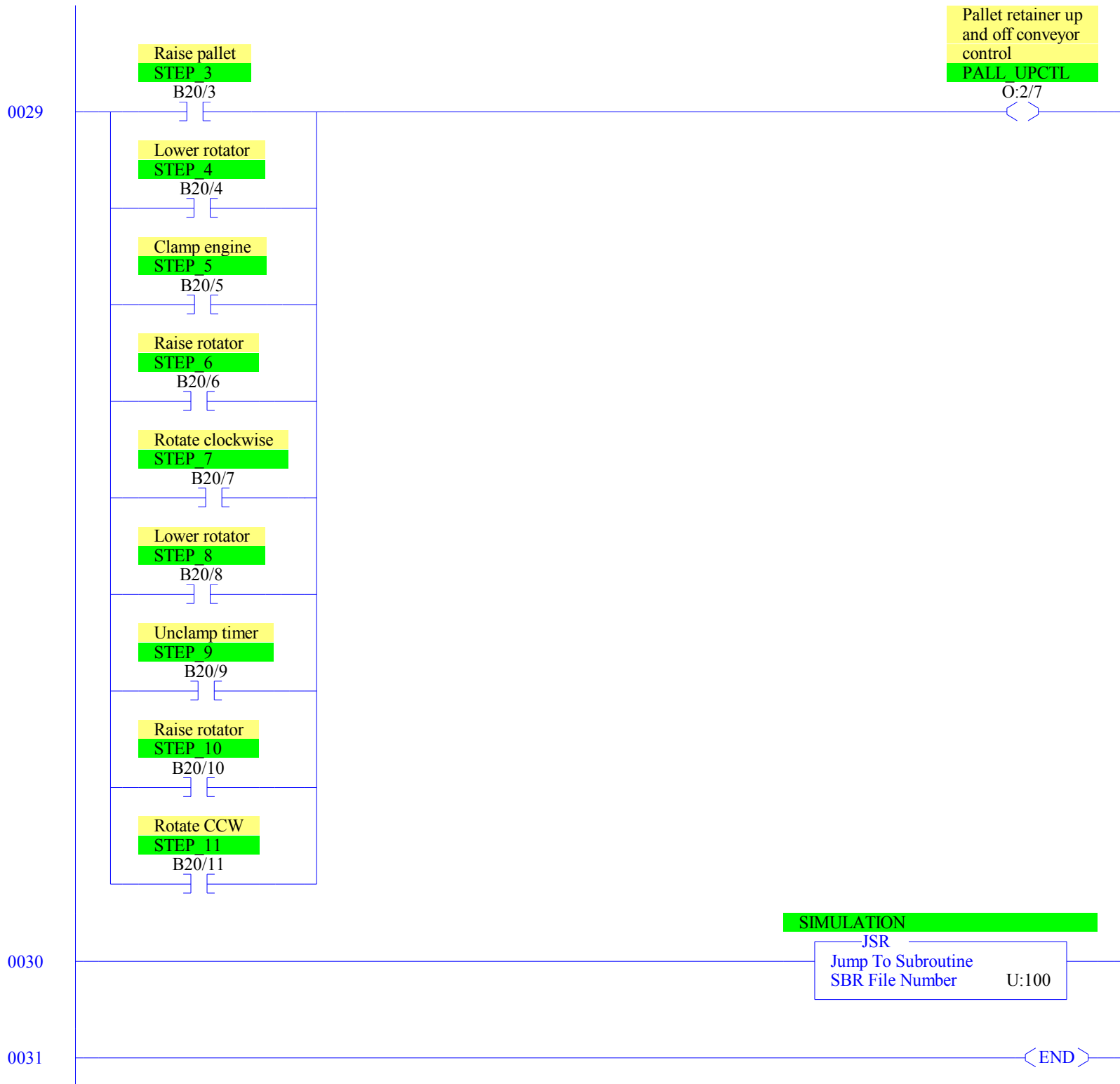
Move out pallet

STEP 13

B20/13





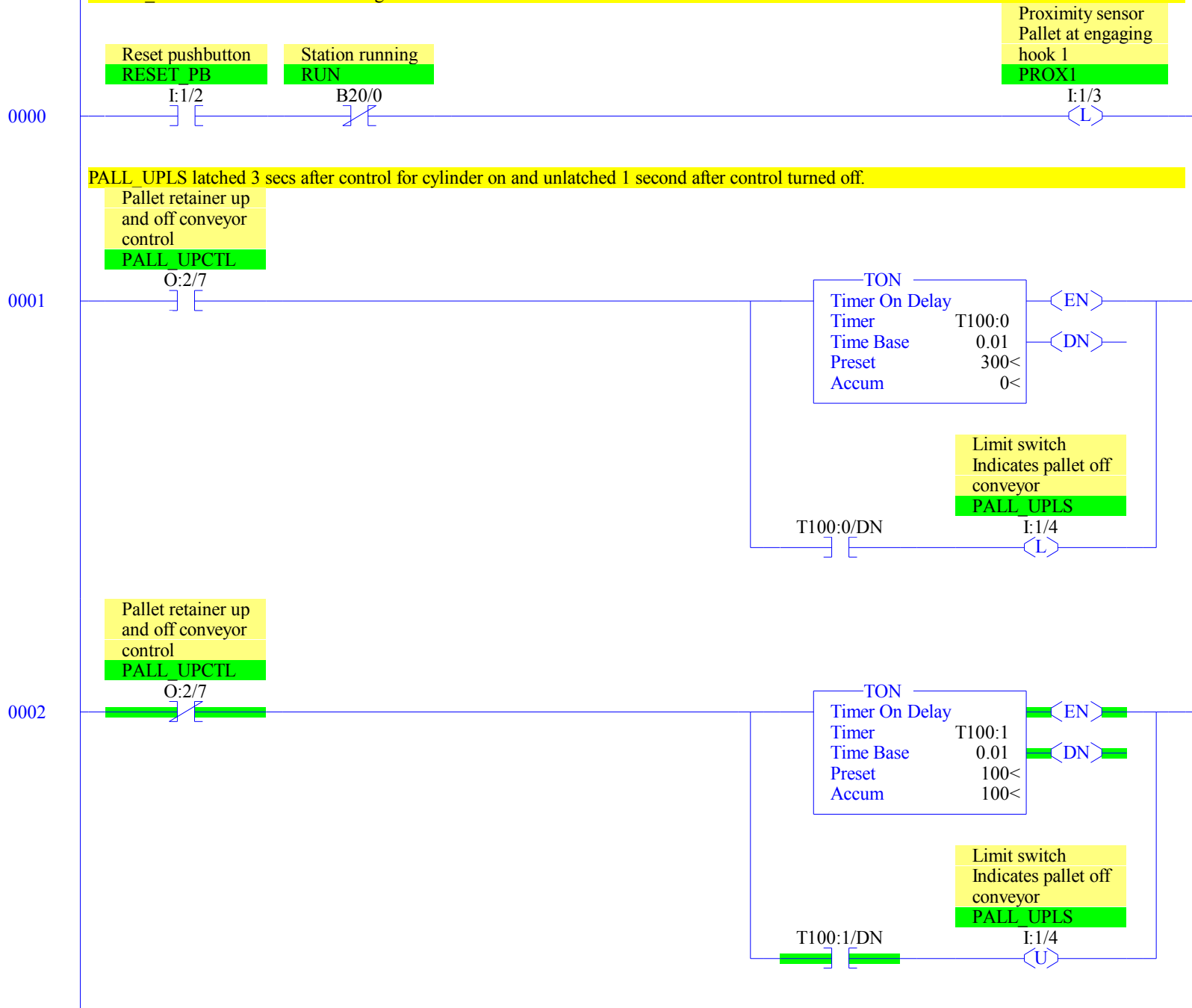


Simulation of engine inverter process

Copyright (c) 2015 Dogwood Valley Press, LLC

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.

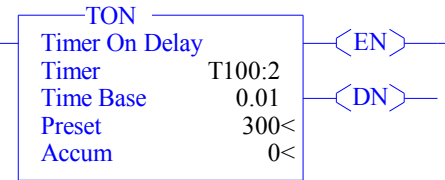
Up LS latched 3 secs after up control active and unlatched immediately when down control active.

Rotating mechanism

lower control

ROTR_DOWN

O:2/3

Rotator down limit
switch

ROTR_DNLS

T100:2/DN

I:1/6

<L>

Rotator up limit
switch

ROTR_UPLS

I:1/5

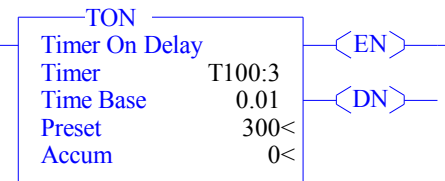
<U>

Rotating mechanism

raise control

ROTR_UP

O:2/2

Rotator up limit
switch

ROTR_UPLS

T100:3/DN

I:1/5

<L>

Rotator down limit
switch

ROTR_DNLS

I:1/6

<U>

Clockwise/Counterclockwise limit switches.

CW LS latched 3 secs after CW control active and unlatched immediately when CCW control active.

CCW LS latched 3 secs after CCW control active and unlatched immediately when CW control active.

Rotating mechanism
clockwise control

ROTAT_CW

O:2/4

TON
Timer On Delay
Timer T100:4
Time Base 0.01
Preset 300<
Accum 0<

Rotator clockwise
limit switch

ROTR_CWLS

T100:4/DN

I:1/7

Rotator counter-
clockwise limit
switch

ROTR_CCWLS

I:1/10

Rotating mechanism
counter-clockwise
control

ROTAT_CCW

O:2/5

TON
Timer On Delay
Timer T100:5
Time Base 0.01
Preset 300<
Accum 0<

Rotator counter-
clockwise limit
switch

ROTR_CCWLS

T100:5/DN

I:1/10

Rotator clockwise
limit switch

ROTR_CWLS

I:1/7

Generate next engine present by latching PROX1. Each subsequent engine appears 5 seconds after second engage hook goes back up.

Engage hook retract
control

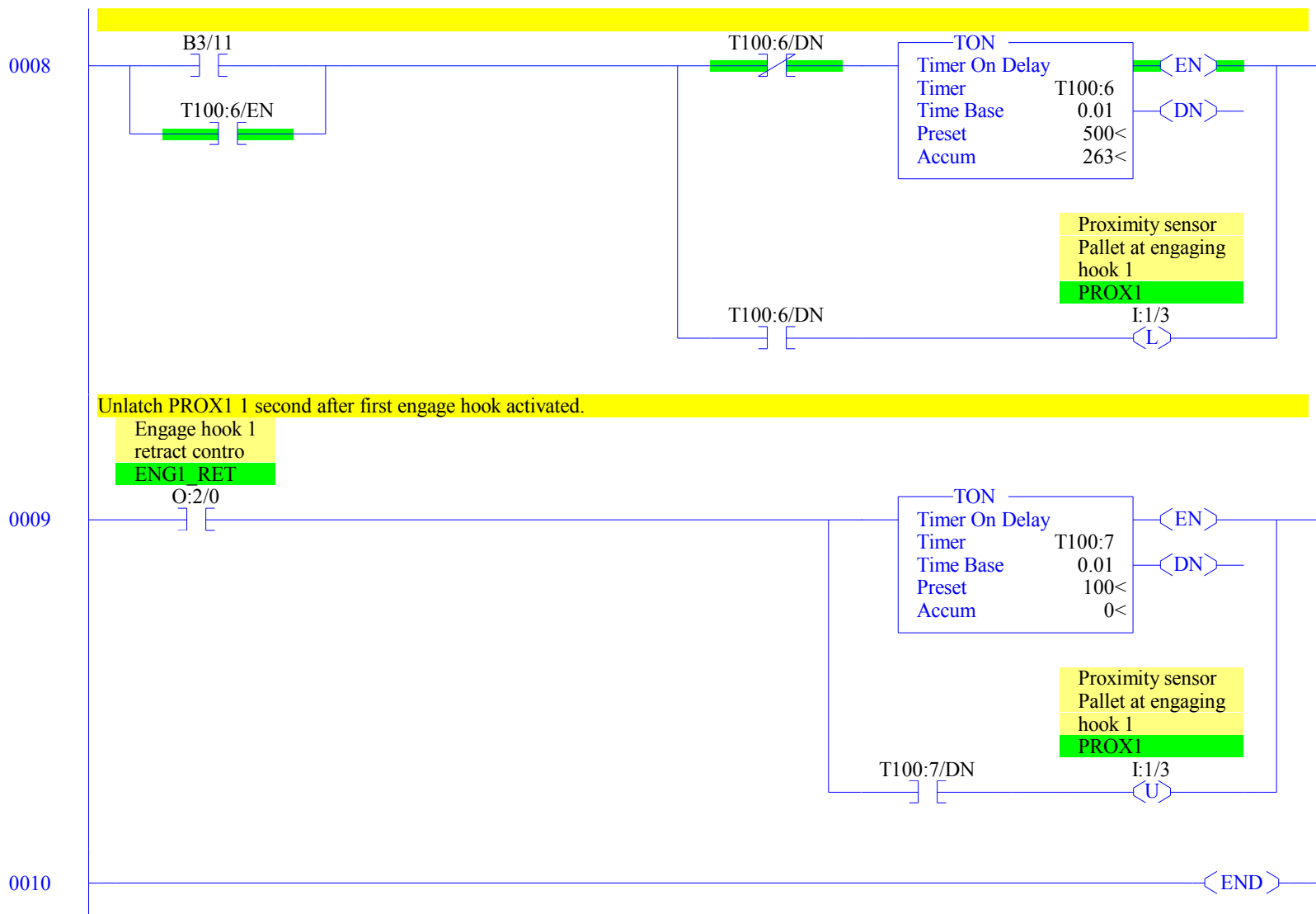
ENG2_RET

O:2/1

B3/10

OSR

B3/11



RSLogix 500 Cross Reference Report - Sorted by Address

O:2/0	- {ENG1_RET} Engage hook 1 retract contro
	OTE - File #2 - 22
	XIC - File #100 SIMULATE - 9
O:2/1	- {ENG2_RET} Engage hook retract control
	OTE - File #2 - 23
	XIO - File #100 SIMULATE - 7
O:2/2	- {ROTR_UP} Rotating mechanism raise control
	OTE - File #2 - 24
	XIC - File #100 SIMULATE - 4
O:2/3	- {ROTR_DOWN} Rotating mechanism lower control
	OTE - File #2 - 25
	XIC - File #100 SIMULATE - 3
O:2/4	- {ROTAT CW} Rotating mechanism clockwise control
	OTE - File #2 - 26
	XIC - File #100 SIMULATE - 5
O:2/5	- {ROTAT_CCW} Rotating mechanism counter-clockwise control
	OTE - File #2 - 27
	XIC - File #100 SIMULATE - 6
O:2/6	- {GRIP CLOS} Gripper close control
	OTE - File #2 - 28
O:2/7	- {PALL_UPCTL} Pallet retainer up and off conveyor control
	OTE - File #2 - 29
	XIC - File #100 SIMULATE - 1
	XIO - File #100 SIMULATE - 2
I:1/0	- {START_PB} Start pushbutton
	XIC - File #2 - 0
I:1/1	- {STOP_PB} Stop pushbutton
	XIC - File #2 - 0
I:1/2	- {RESET_PB} Reset pushbutton
	XIC - File #2 - 15
	File #100 SIMULATE - 0
I:1/3	- {PROX1} Proximity sensor Pallet at engaging hook 1
	OTL - File #100 SIMULATE - 0, 8
	OTU - File #100 SIMULATE - 9
	XIC - File #2 - 2
I:1/4	- {PALL_UPLS} Limit switch Indicates pallet off conveyor
	OTL - File #100 SIMULATE - 1
	OTU - File #100 SIMULATE - 2
	XIC - File #2 - 4
	XIO - File #2 - 13
I:1/5	- {ROTR_UPLS} Rotator up limit switch
	OTL - File #100 SIMULATE - 4
	OTU - File #100 SIMULATE - 3
	XIC - File #2 - 7, 11, 18
I:1/6	- {ROTR_DNLS} Rotator down limit switch
	OTL - File #100 SIMULATE - 3
	OTU - File #100 SIMULATE - 4
	XIC - File #2 - 5, 9
I:1/7	- {ROTR_CWLS} Rotator clockwise limit switch
	OTL - File #100 SIMULATE - 5
	OTU - File #100 SIMULATE - 6
	XIC - File #2 - 8
I:1/10	- {ROTR_CCWLS} Rotator counter- clockwise limit switch
	OTL - File #100 SIMULATE - 6
	OTU - File #100 SIMULATE - 5
	XIC - File #2 - 12, 19
B3/10	- OSR - File #100 SIMULATE - 7
B3/11	- OTE - File #100 SIMULATE - 7
	XIC - File #100 SIMULATE - 8
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

RSLogix 500 Cross Reference Report - Sorted by Address

	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 - 17
T4:5/DN	- XIC - File #2 - 17
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, 24
	25, 26, 27
	XIO - File #2 - 15
	File #100 SIMULATE - 0
B20/1	- {STEP_1} Wait for pallet
	OTL - File #2 - 1, 14
	OTU - File #2 - 2, 21
	XIC - File #2 - 2
	XIO - File #2 - 1
B20/2	- {STEP_2} Move to hook 2
	OTL - File #2 - 2
	OTU - File #2 - 3, 21
	XIC - File #2 - 3, 22
	XIO - File #2 - 1
B20/3	- {STEP_3} Raise pallet
	OTL - File #2 - 3
	OTU - File #2 - 4, 21
	XIC - File #2 - 4, 29
	XIO - File #2 - 1
B20/4	- {STEP_4} Lower rotator
	OTL - File #2 - 4
	OTU - File #2 - 5, 21
	XIC - File #2 - 5, 25, 29
	XIO - File #2 - 1
B20/5	- {STEP_5} Clamp engine
	OTL - File #2 - 5
	OTU - File #2 - 6, 21
	XIC - File #2 - 6, 28, 29
	XIO - File #2 - 1
B20/6	- {STEP_6} Raise rotator
	OTL - File #2 - 6
	OTU - File #2 - 7, 21
	XIC - File #2 - 7, 24, 28, 29
	XIO - File #2 - 1
B20/7	- {STEP_7} Rotate clockwise
	OTL - File #2 - 7
	OTU - File #2 - 8, 21
	XIC - File #2 - 8, 26, 28, 29
	XIO - File #2 - 1
B20/8	- {STEP_8} Lower rotator
	OTL - File #2 - 8
	OTU - File #2 - 9, 21
	XIC - File #2 - 9, 25, 28, 29
	XIO - File #2 - 1
B20/9	- {STEP_9} Unclamp timer
	OTL - File #2 - 9
	OTU - File #2 - 10, 21
	XIC - File #2 - 10, 29
	XIO - File #2 - 1
B20/10	- {STEP_10} Raise rotator
	OTL - File #2 - 10
	OTU - File #2 - 11, 21
	XIC - File #2 - 11, 24, 29
	XIO - File #2 - 1
B20/11	- {STEP_11} Rotate CCW
	OTL - File #2 - 11

RSLogix 500 Cross Reference Report - Sorted by Address

```

      OTU - File #2 - 12, 21
      XIC - File #2 - 12, 27, 29
      XIO - File #2 - 1
B20/12 - {STEP_12} Drop engine
      OTL - File #2 - 12
      OTU - File #2 - 13, 21
      XIC - File #2 - 13
      XIO - File #2 - 1
B20/13 - {STEP_13} Move out pallet
      OTL - File #2 - 13
      OTU - File #2 - 14, 21
      XIC - File #2 - 14, 23
      XIO - File #2 - 1
B20/40 - {INT_RESET} Reset in progress
      OTE - File #2 - 15
      XIC - File #2 - 15, 16, 21
      XIO - File #2 - 0, 20
B20/41 - {RSTEP_1} Reset step 1 - Delay to unclamp.
      OTL - File #2 - 16
      OTU - File #2 - 17
      XIC - File #2 - 17
      XIO - File #2 - 16
B20/42 - {RSTEP_2} Reset step 2 - Raise mechanism.
      OTL - File #2 - 17
      OTU - File #2 - 18
      XIC - File #2 - 18, 24
      XIO - File #2 - 16
B20/43 - {RSTEP_3} Reset step 3 - Rotate CCW.
      OTL - File #2 - 18
      OTU - File #2 - 19
      XIC - File #2 - 19, 27
      XIO - File #2 - 16
B20/44 - {RSTEP_4} Reset step 4 - unlatch internal reset.
      OTL - File #2 - 19
      OTU - File #2 - 20
      XIC - File #2 - 20
      XIO - File #2 - 15, 16
T100:0 - TON - File #100 SIMULATE - 1
T100:0/DN - XIC - File #100 SIMULATE - 1
T100:1 - TON - File #100 SIMULATE - 2
T100:1/DN - XIC - File #100 SIMULATE - 2
T100:2 - TON - File #100 SIMULATE - 3
T100:2/DN - XIC - File #100 SIMULATE - 3
T100:3 - TON - File #100 SIMULATE - 4
T100:3/DN - XIC - File #100 SIMULATE - 4
T100:4 - TON - File #100 SIMULATE - 5
T100:4/DN - XIC - File #100 SIMULATE - 5
T100:5 - TON - File #100 SIMULATE - 6
T100:5/DN - XIC - File #100 SIMULATE - 6
T100:6 - TON - File #100 SIMULATE - 8
T100:6/DN - XIC - File #100 SIMULATE - 8
      XIO - File #100 SIMULATE - 8
T100:6/EN - XIC - File #100 SIMULATE - 8
T100:7 - TON - File #100 SIMULATE - 9
T100:7/DN - XIC - File #100 SIMULATE - 9
U:100 - {SIMULATION}
      JSR - File #2 - 30

```