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3 Revised Bolt Driving Station Control

4 Additional internal variable declarations:

Variables	Address	Data Type	
Run	%M1	BOOL	On while station running
Int_Reset	%M2	BOOL	Internal reset
Step_1 to Step_13	%T1 to %T11	BOOL	Step-in-progress bits
In_Tmr		TON	Times engage cyl for bringing in pallet
Raise_Tmr		TON	Times raise of pallet
Push_Tmr		TON	Times push of bolts
Motor_Tmr		INT[3]	Times air motor rotation (retentive)
Lower_Tmr		TON	Times lower of pallet
Out_Tmr		TON	Times engage cyl for allowing out pallet

5 Start/stop and initial start. During reset prevent start.

6 START_PB %I00001 | Int_Reset %M00002 | STOP_PB %I00002 | Run %M00001 → Run %M00001

7 Run %M00001 | Step_1 %T00001 | Step_2 %T00002 | Step_3 %T00003 | Step_4 %T00004 | Step_5 %T00005 | Step_6 %T00006 | Step_7 %T00007 | Step_8 %T00008 | Step_9 %T00009 | Step_10 %T00010 | Step_11 %T00011 | Step_12 %T00012 | Step_13 %T00013 | Step_1 %T00001 (S)

8 Step 1 Wait for pallet

9 Step_1 %T00001 | PROX21 %I00004 | Run %M00001 → Step_1 %T00001 (R); Step_2 %T00002 (S)

10 Step 2 Allow one pallet in

11 Step_2 %T00002 → TON In_Tmr, IN, PT 3000, Q, ET → Step_2 %T00002 (R); Step_3 %T00003 (S)

12 Step 3 Raise pallet

13 Step_3 %T00003 → TON Raise_Tmr, IN, PT 1500, Q, ET | Run %M00001 → Step_3 %T00003 (R); Step_4 %T00004 (S); Step_6 %T00006 (S)

14 Step 4 Lower mechanism

15 Step_4 %T00004 | LS21_DN %I00008 → Step_4 %T00004 (R); Step_5 %T00005 (S)

16 Step 6 Push bolts

17 Step_6 %T00006 → TON Push_Tmr, IN, PT 1000, Q, ET | Run %M00001 → Step_6 %T00006 (R); Step_7 %T00007 (S)

18 Step 7 Close gate valves

19 Step_7 %T00007 | GVLV1_CLS %I00009 | GVLV2_CLS %I00010 | GVLV3_CLS %I00011 | GVLV4_CLS %I00012 | GVLV5_CLS %I00013 | GVLV6_CLS %I00014 | Run %M00001 → Step_7 %T00007 (R); Step_8 %T00008 (S)

20 Step 8 Convey bolts

21 Step_8 %T00008 | PROXB1 %I00015 | PROXB2 %I00016 | PROXB3 %I00017 | PROXB4 %I00018 | PROXB5 %I00019 | PROXB6 %I00020 | Run %M00001 → Step_8 %T00008 (R); Step_9 %T00009 (S)

22 Step 5 and Step 9 Wait for mechanism lowered and bolts in place.

23 Step_5 %T00005 | Step_9 %T00009 | Run %M00001 → Step_5 %T00005 (R); Step_9 %T00009 (R); Step_10 %T00010 (S)

24 Step 10 Run air motor

25 Step_10 %T00010 | Run %M00001 | Step_10 %T00010 | ONDTR TENTHS Motor_Tmr R 40 PV CV | R Step_10 %T00010 | S Step_11 %T00011

26 Step 11 Raise mechanism

27 Step_11 %T00011 | LS21_UP %I00007 | R Step_11 %T00011 | S Step_12 %T00012

28 Step 12 Drop Pallet

29 Step_12 %T00012 | TON Lower_Tmr IN Q 500 PT ET | Run %M00001 | R Step_12 %T00012 | S Step_13 %T00013

30 Step 13 Move out pallet

31 Step_13 %T00013 | TON Out_Tmr IN Q 3000 PT ET | Run %M00001 | R Step_13 %T00013 | S Step_1 %T00001

32 Reset - keep on until mechanism is up.

33 RESET_PB %I00003 | Run %M00001 | Int_Reset %M00002 | LS21_UP %I00007 | M Int_Reset %M00002 | R Step_1 %T00001 | R Step_2 %T00002 | R Step_3 %T00003 | R Step_4 %T00004 | R Step_5 %T00005 | R Step_6 %T00006 | R Step_7 %T00007 | R Step_8 %T00008 | R Step_9 %T00009 | R Step_10 %T00010 | R Step_11 %T00011 | R Step_12 %T00012 | R Step_13 %T00013

34 Physical Outputs

Hook controls. Cannot turn off when paused

35 Step_1 %T00001 | M ENGAGE_21_C... %Q00001

36 Step_13 %T00013 | M ENGAGE_22_C... %Q00002

37 Raise/lower mechanism

38 Step_11 %T00011 | Run %M00001 | Int_Reset %M00002 | LS21_UP %I00007 | M HEAD21_UP %Q00003

39 Step_4 %T00004 | Run %M00001 | M HEAD21_DOWN %Q00004

40 Push bolt solenoids

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41 Step_6 %T00006 — PBOLT1_CYL %Q00005; PBOLT2_CYL %Q00006; PBOLT3_CYL %Q00007; PBOLT4_CYL %Q00008; PBOLT5_CYL %Q00009; PBOLT6_CYL %Q00010

42 Gate valves

43 Step_7 %T00007 | Step_8 %T00008 — GVLV1 %Q00011; GVLV2 %Q00012; GVLV3 %Q00013; GVLV4 %Q00014; GVLV5 %Q00015; GVLV6 %Q00016

44 Convey valves

45 Step_8 %T00008 — CVLV1 %Q00017; CVLV2 %Q00018; CVLV3 %Q00019; CVLV4 %Q00020; CVLV5 %Q00021; CVLV6 %Q00022

46 Air motors

47 Step_10 %T00010 | Run %M00001 — AMOTOR1 %Q00023; AMOTOR2 %Q00024; AMOTOR3 %Q00025; AMOTOR4 %Q00026; AMOTOR5 %Q00027; AMOTOR6 %Q00028

48 Pallet up control. Maintain during pause

49 Step_3 %T00003 | Step_4 %T00004 | Step_5 %T00005 | Step_10 %T00010 | Step_11 %T00011 — PALL21_UP %Q00029

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