

<b>2. To: (Receiving Organization)</b> DISTRIBUTION	<b>3. From: (Originating Organization)</b> F. M. Maiden	<b>4. Related EDT No.:</b> N/A
<b>5. Proj./Prog./Dept./Div.:</b> Interim Stabilization	<b>6. Design Authority/Design Agent/Cog. Engr.:</b> W. F. Zuroff/J. Lamphere	<b>7. Purchase Order No.:</b> N/A
<b>8. Originator Remarks:</b> Transmitted for release of the S-103 Skid "A" Software. This Documents Changes to the PLC Software Made Since the Completion of the OTP and Prior to the Release of the Software Configuration Management Plan (HNF-5034).		<b>9. Equip./Component No.:</b> N/A
		<b>10. System/Bldg./Facility:</b> Single Shell Tank Farm
		<b>12. Major Assem. Dwg. No.:</b> N/A
		<b>13. Permit/Permit Application No.:</b> N/A
<b>11. Receiver Remarks:</b>		<b>14. Required Response Date:</b> N/A
<b>11A. Design Baseline Document?</b> <input checked="" type="radio"/> Yes <input type="radio"/> No		

15. DATA TRANSMITTED					(F)	(G)	(H)	(I)
(A) Item No.	(B) Document/Drawing No.	(C) Sheet No.	(D) Rev. No.	(E) Title or Description of Data Transmitted	Approval Designator	Reason for Transmittal	Originator Disposition	Receiver Disposition
1	RPP-5962	ALL	0	S-103 Skid "A" PLC Software (Ladder Diagram)	N/A	1	1	1

16. KEY			
Approval Designator (F)	Reason for Transmittal (G)	Disposition (H) & (I)	
E, S, Q, D OR N/A (See WHC-CM-3-5, Sec. 12.7)	1. Approval 2. Release 3. Information 4. Review 5. Post-Review 6. Dist. (Receipt Acknow. Required)	1. Approved 2. Approved w/comment 3. Disapproved w/comment 4. Reviewed no/comment 5. Reviewed w/comment 6. Receipt acknowledged	

17. SIGNATURE/DISTRIBUTION (See Approval Designator for required signatures)											
(G) Reason	(H) Disp.	(J) Name	(K) Signature	(L) Date	(M) MSIN	(G) Reason	(H) Disp.	(J) Name	(K) Signature	(L) Date	(M) MSIN
2		Design Authority W. F. Zuroff	<i>[Signature]</i>	3/14/00	57-24						
2		Design Agent F. M. Maiden	<i>[Signature]</i>	3/14/00	57-12						
2		Cog. Eng. J. E. Lamphere	<i>[Signature]</i>	3/15/00	57-24						
2		Cog. Mgr. M. R. Koch	<i>[Signature]</i>	3/14/00	57-24						
		QA									
		Safety									
		Env.									

<b>18.</b> <i>[Signature]</i> FM Maiden Signature of EDT Originator	<b>19.</b> <i>[Signature]</i> MR Koch Authorized Representative for Receiving Organization	<b>20.</b> <i>[Signature]</i> MR Koch Design Authority/Cognizant Manager	<b>21. DOE APPROVAL (if required)</b> Ctrl No. _____ <input type="radio"/> Approved <input type="radio"/> Approved w/comments <input type="radio"/> Disapproved w/comments
3/12/00 Date	3/14/00 Date	3/14/00 Date	

# PLC SOFTWARE PROGRAM FOR S-103 PUMPING, INSTRUMENTATION AND CONTROL (PIC) SKID "A"

**Mike Koch**

Prepared by CH2MHILL Hanford Group, Inc.

Richland, WA 99352

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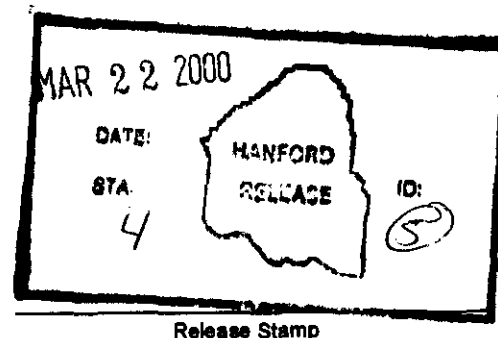
**Key Words:** S-103, SALT WELL, SOFTWARE, LADDER DIAGRAM, PLC, SKID,  
INTERIM STABILIZATION, PIC

**Abstract:** This document is a printout of the S-103 software for the Programmable Logic Controller (PLC) for Pumping, Instrumentation and Control Skid "A".

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Release Approval Date 3/21/00



**Approved For Public Release**

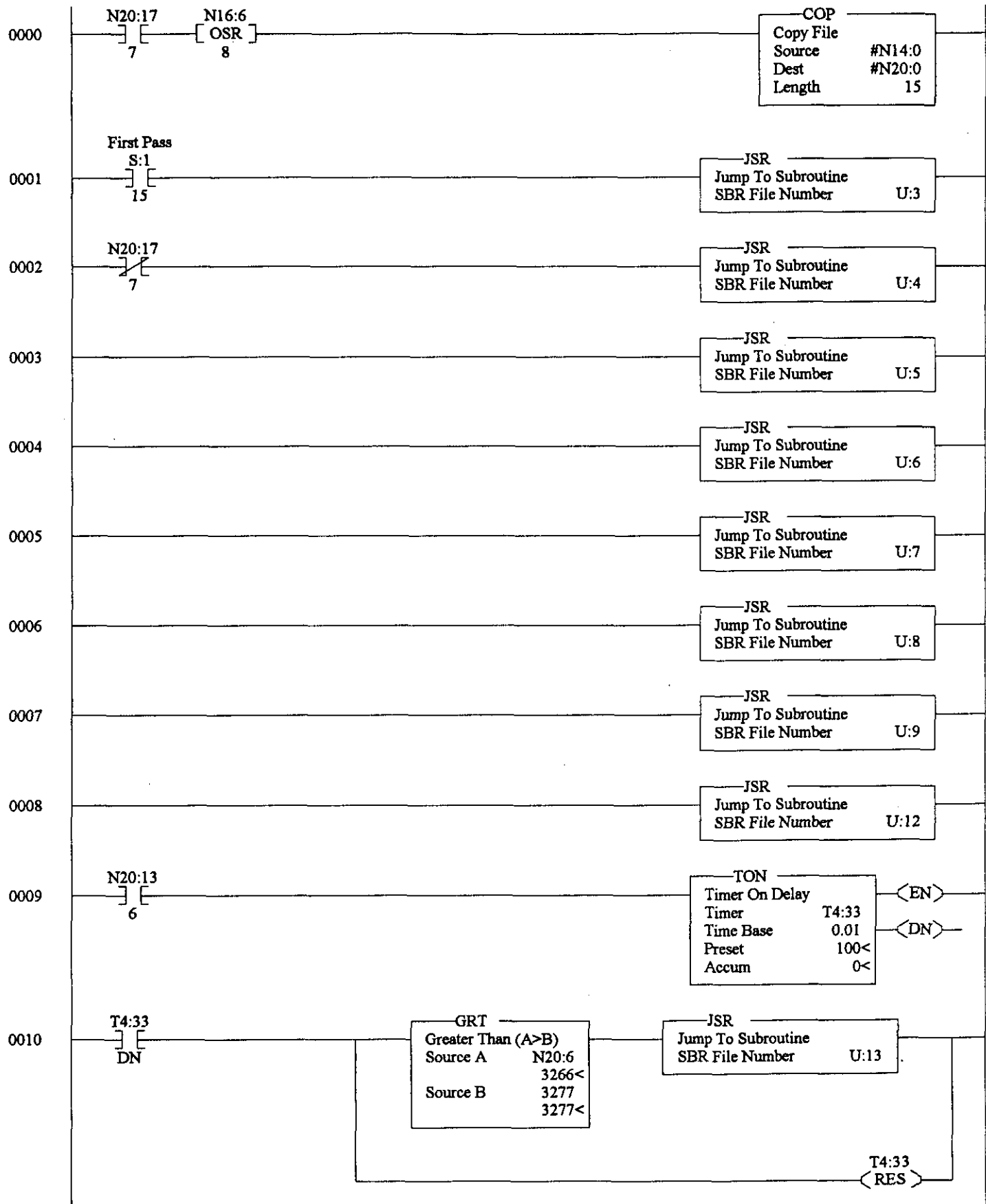
**S103NEW.RSS**

## Program File List

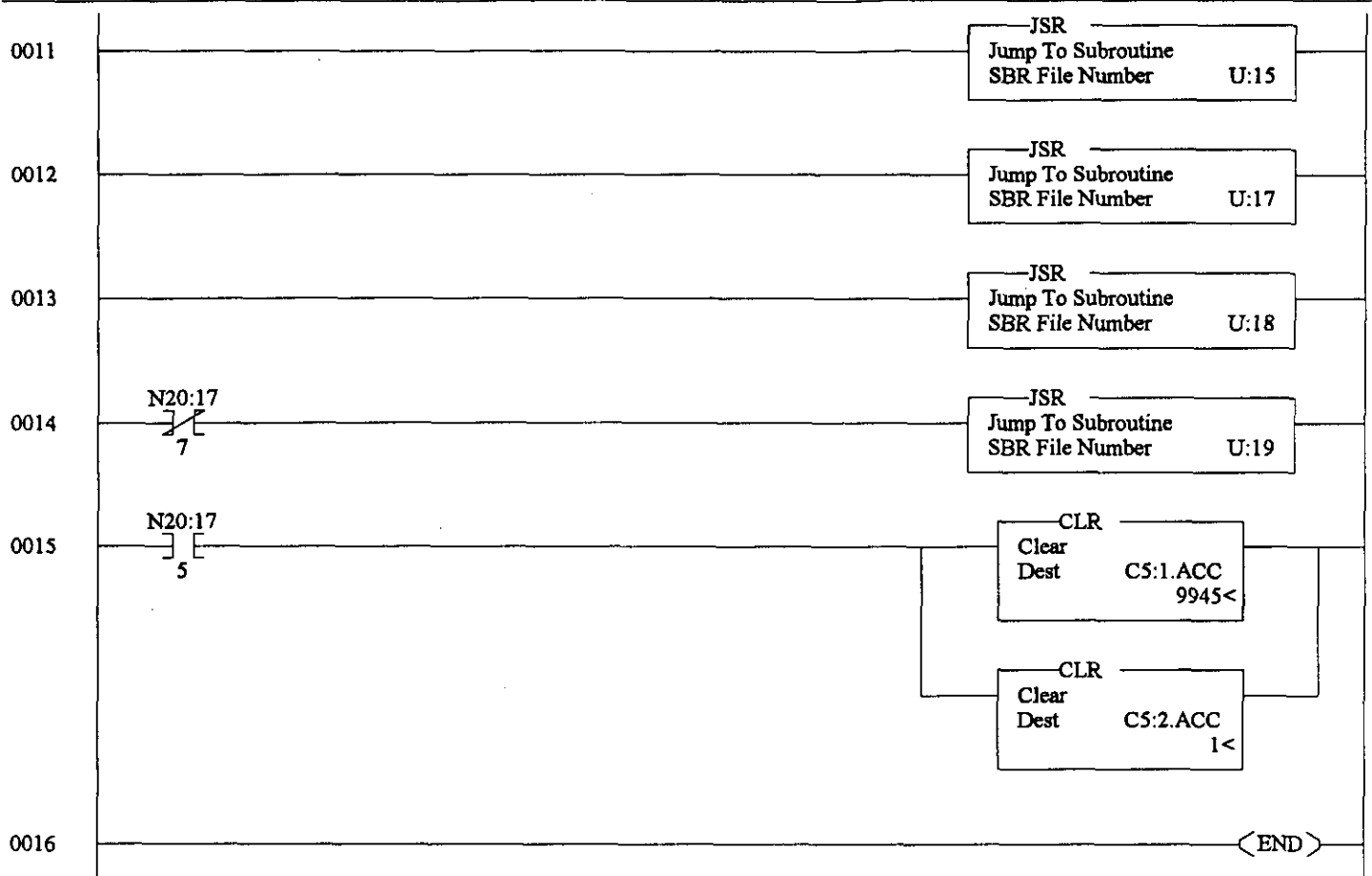
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	2	LADDER	17	No	254
	3	LADDER	16	No	344
	4	LADDER	6	No	229
	5	LADDER	115	No	3494
	6	LADDER	7	No	353
	7	LADDER	20	No	468
	8	LADDER	6	No	197
	9	LADDER	6	No	140
	10	LADDER	11	No	94
	11	LADDER	3	No	43
	12	LADDER	10	No	447
	13	LADDER	6	No	212
	14	LADDER	11	No	1688
	15	LADDER	16	No	329
	16	LADDER	6	No	212
	17	LADDER	66	No	1031
	18	LADDER	70	No	1556
	19	LADDER	6	No	118

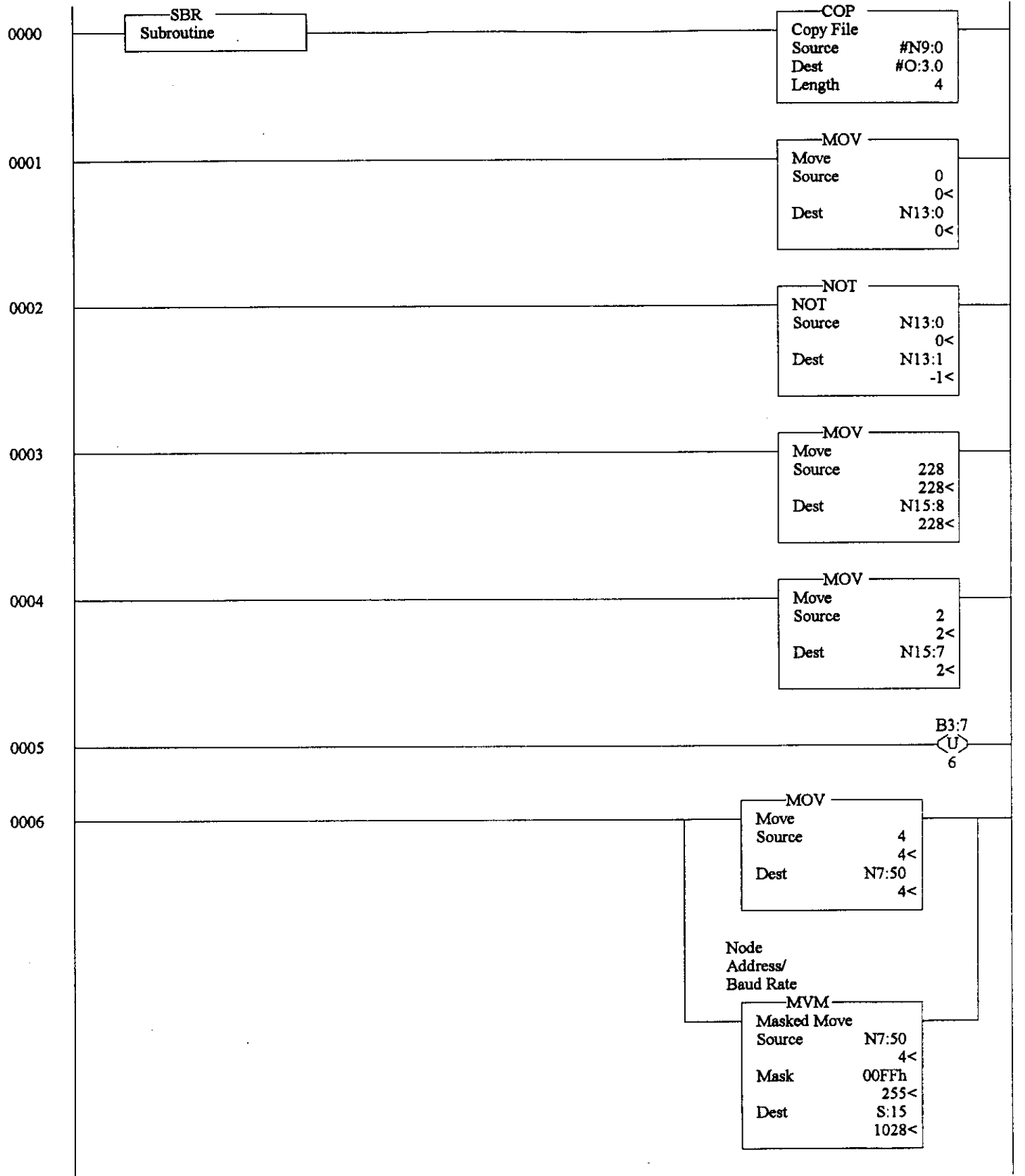
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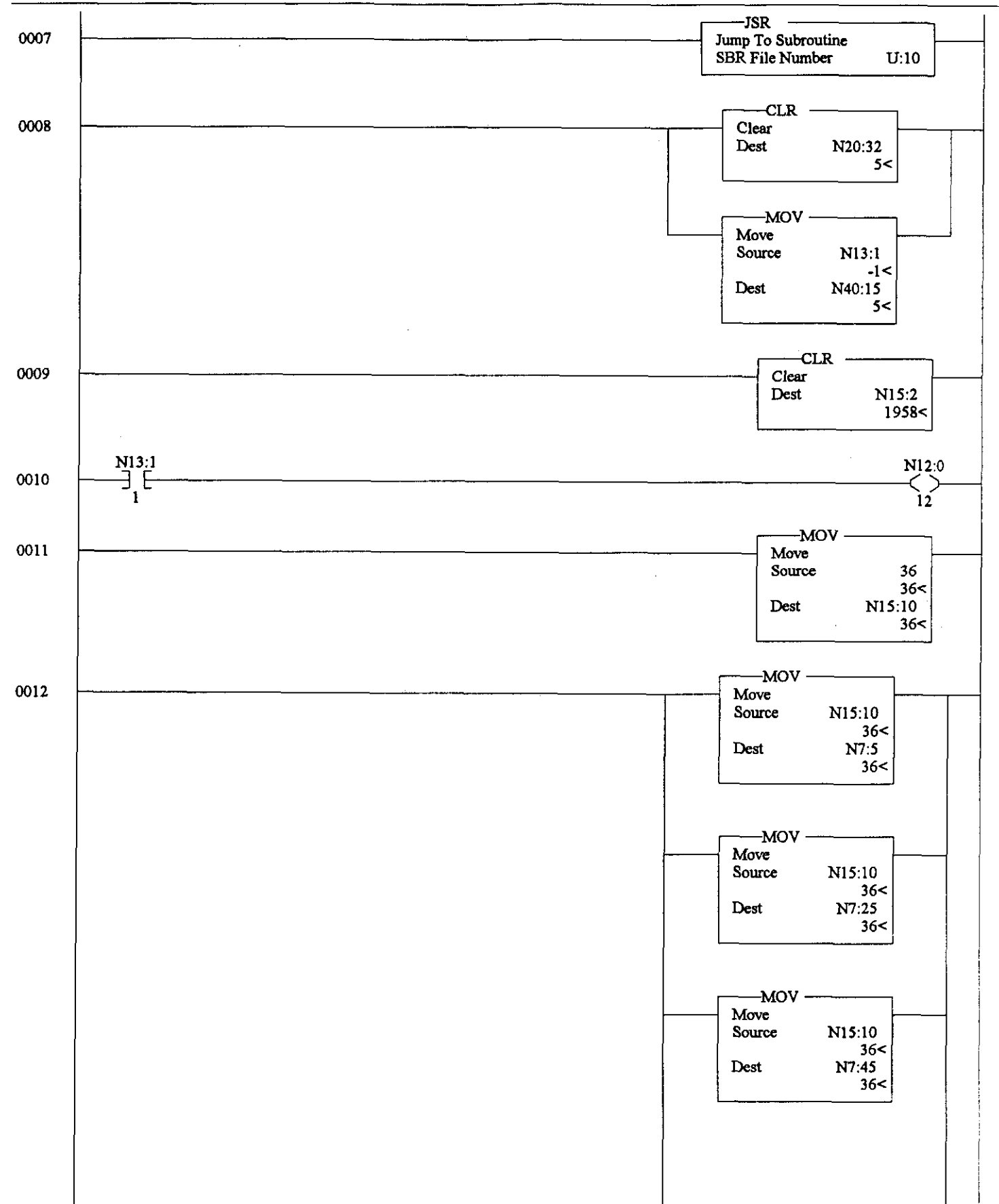
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LAD 3 - --- Total Rungs in File = 16

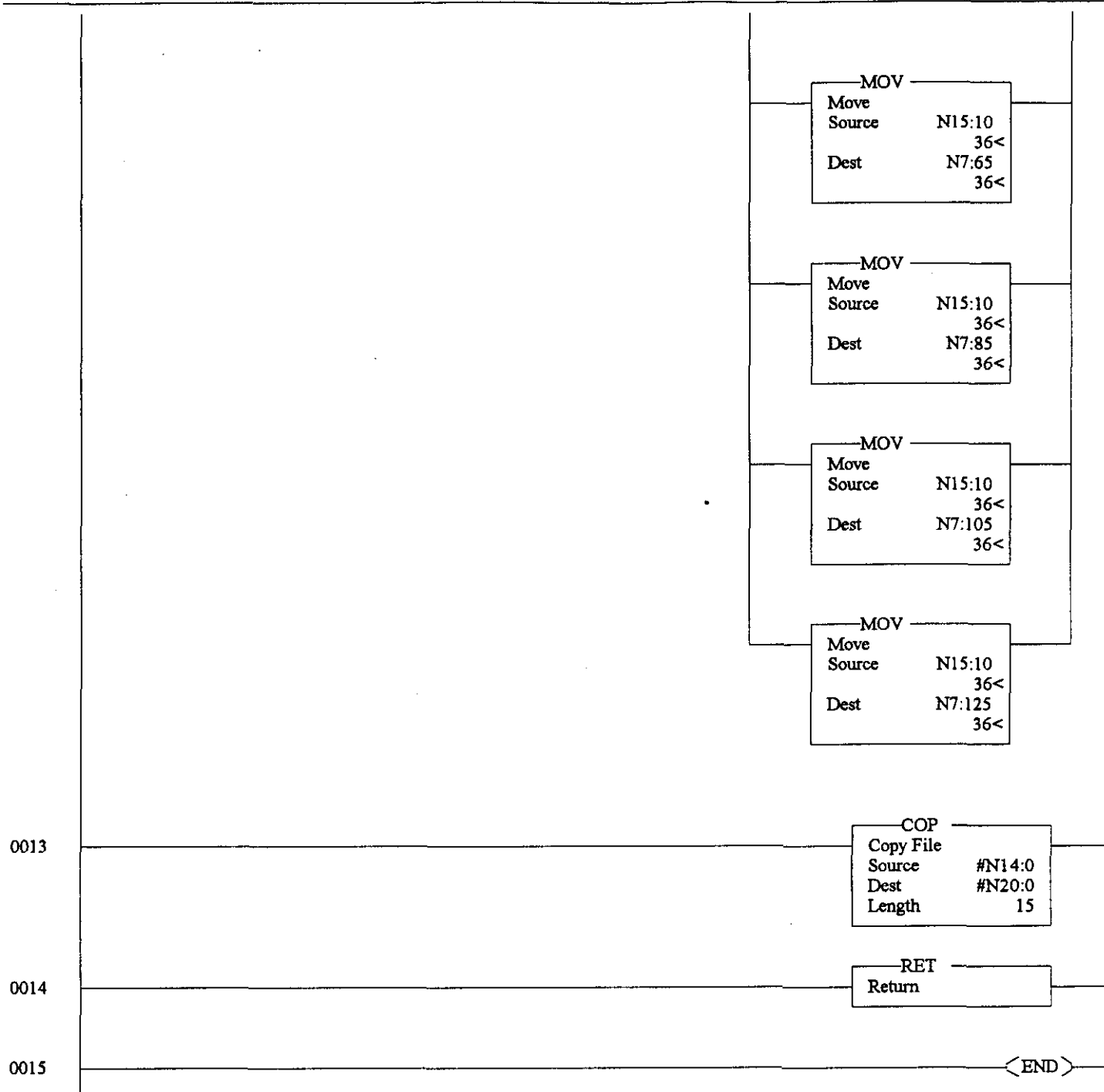


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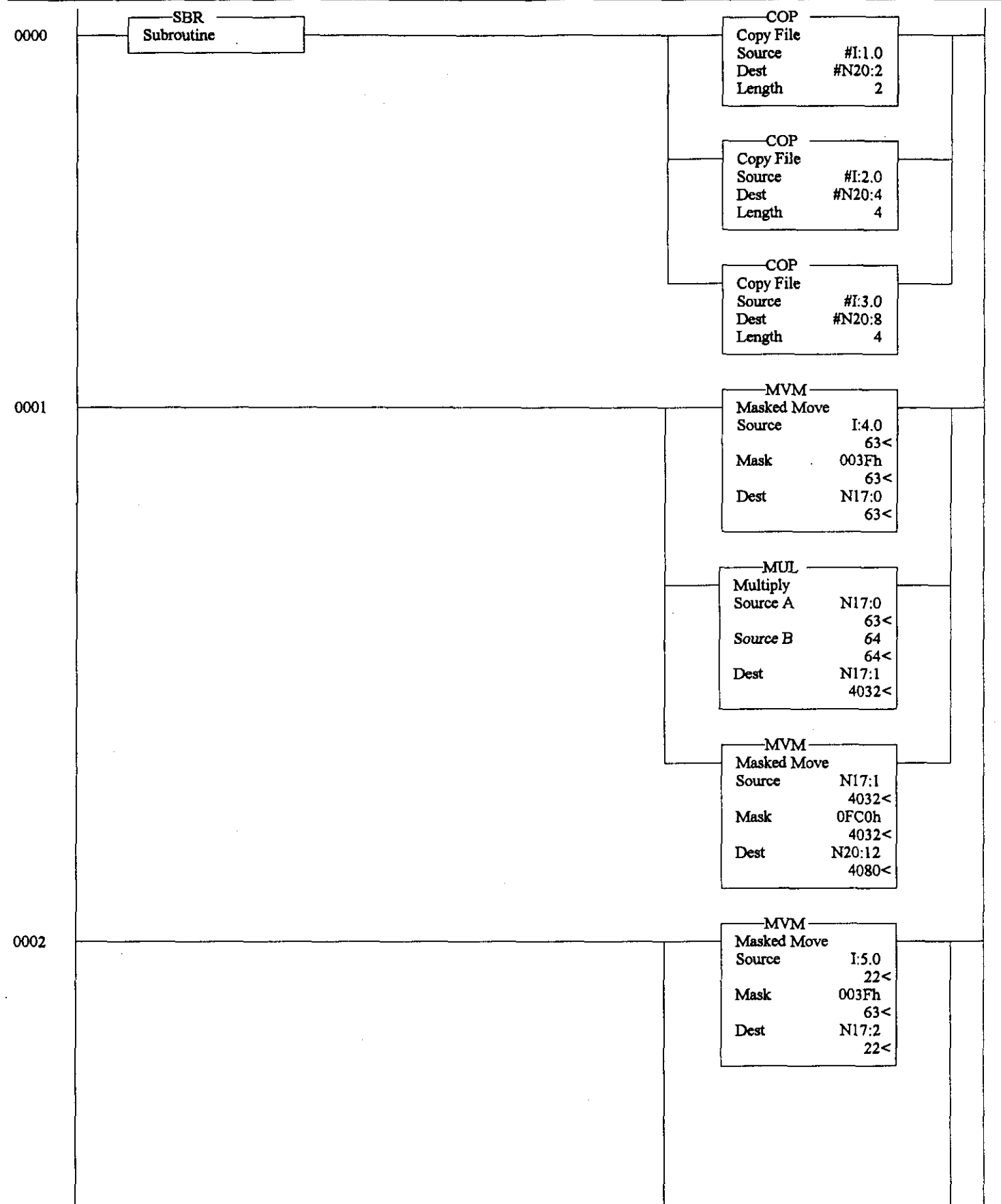




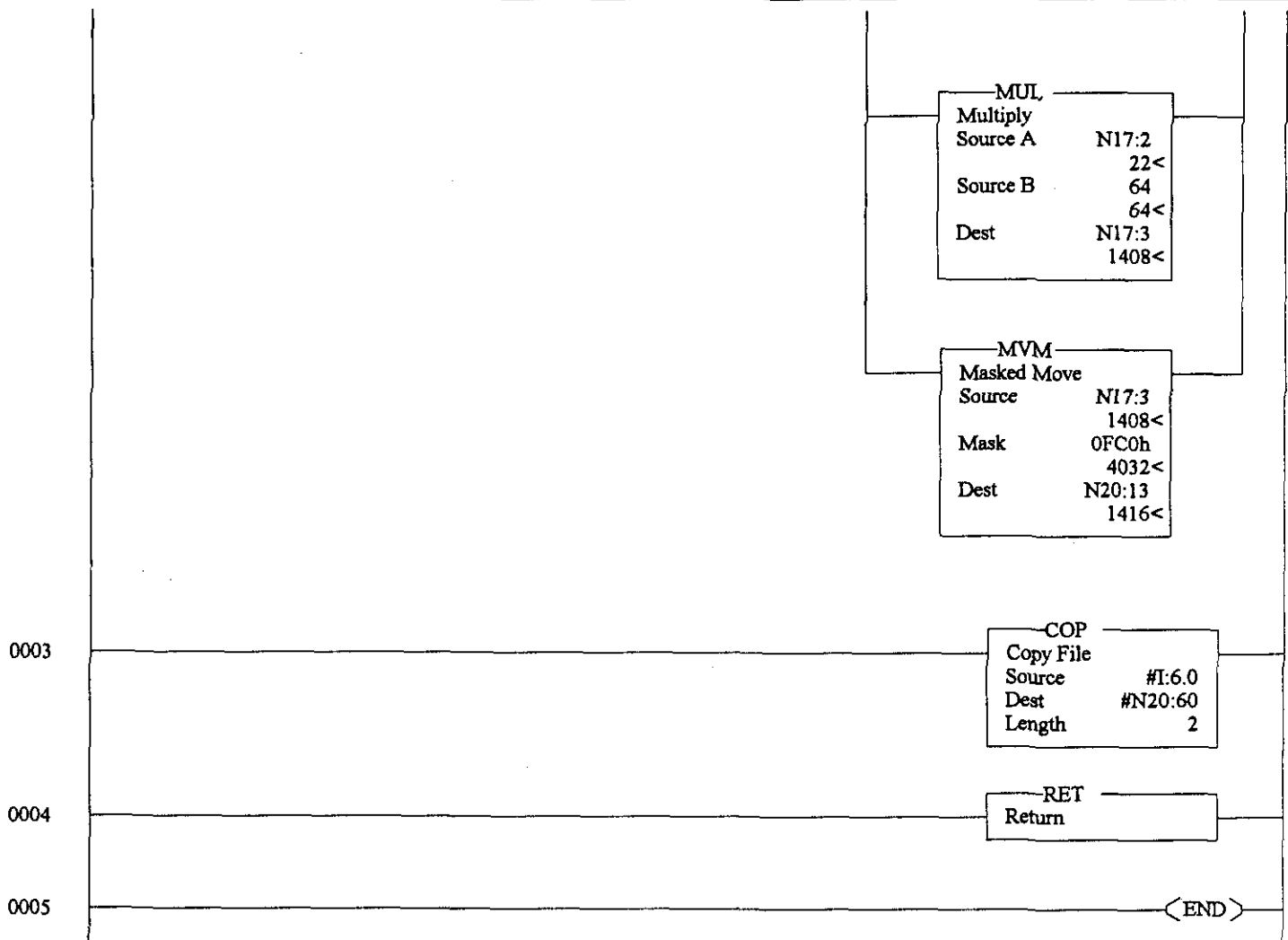
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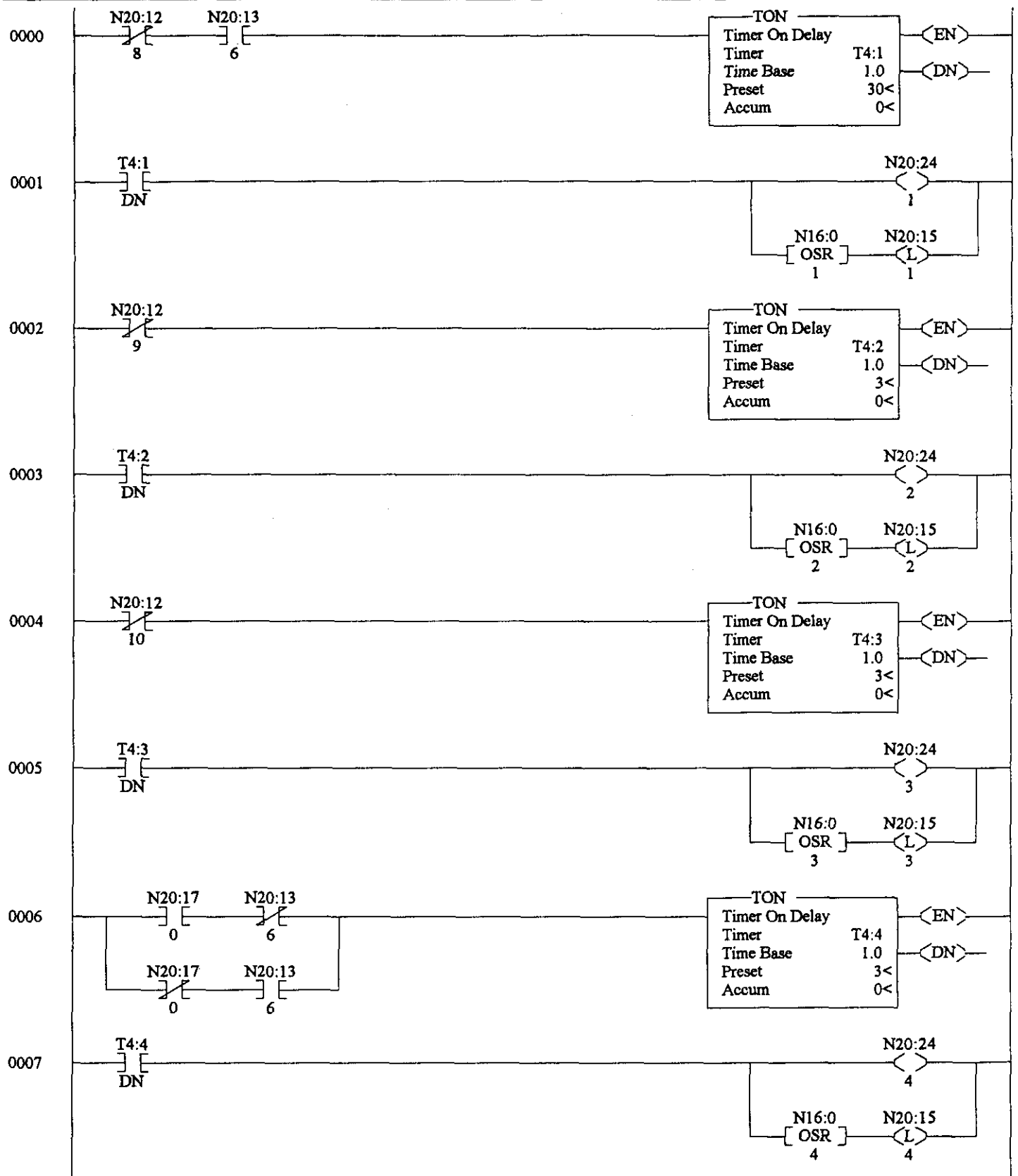
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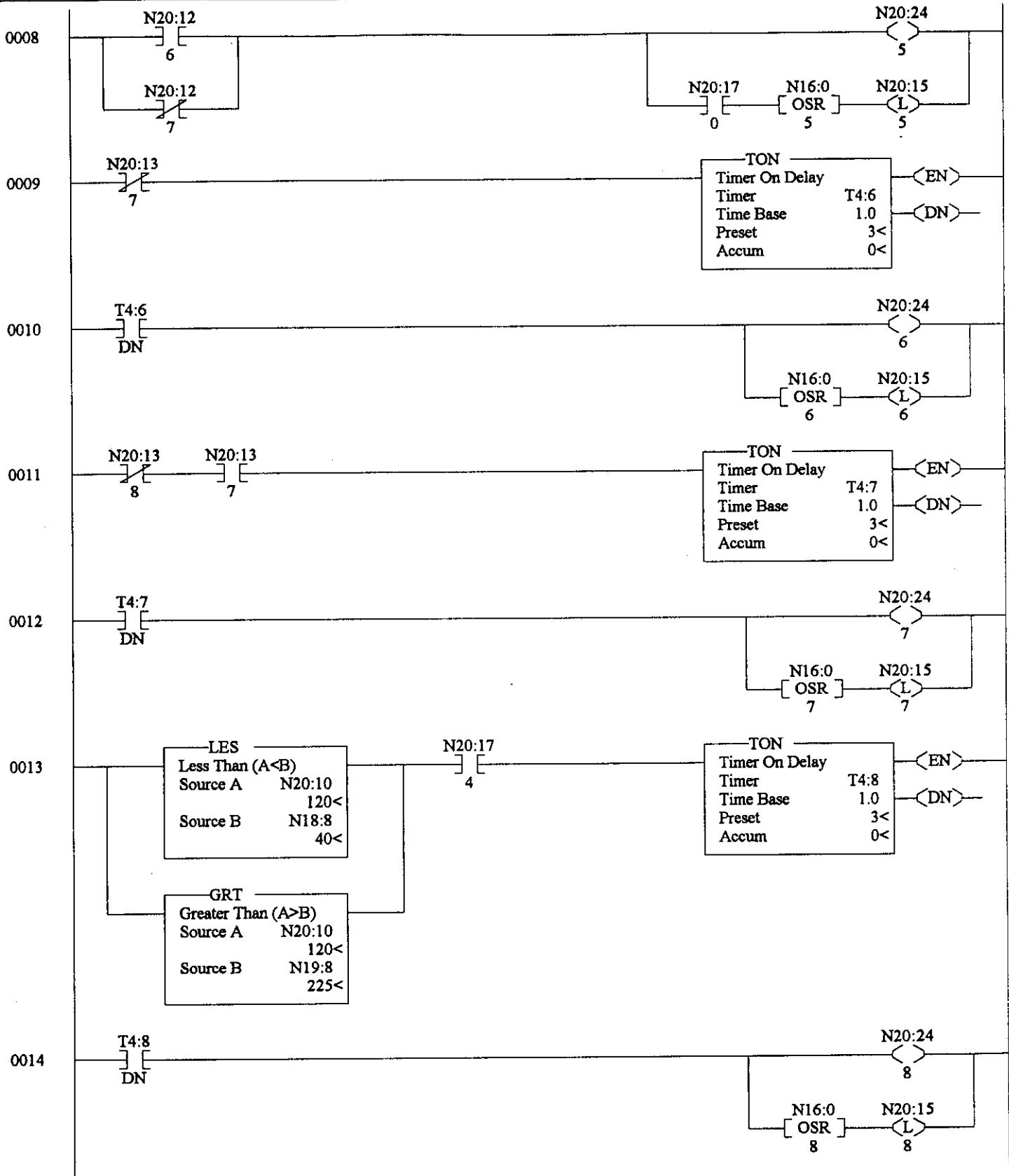
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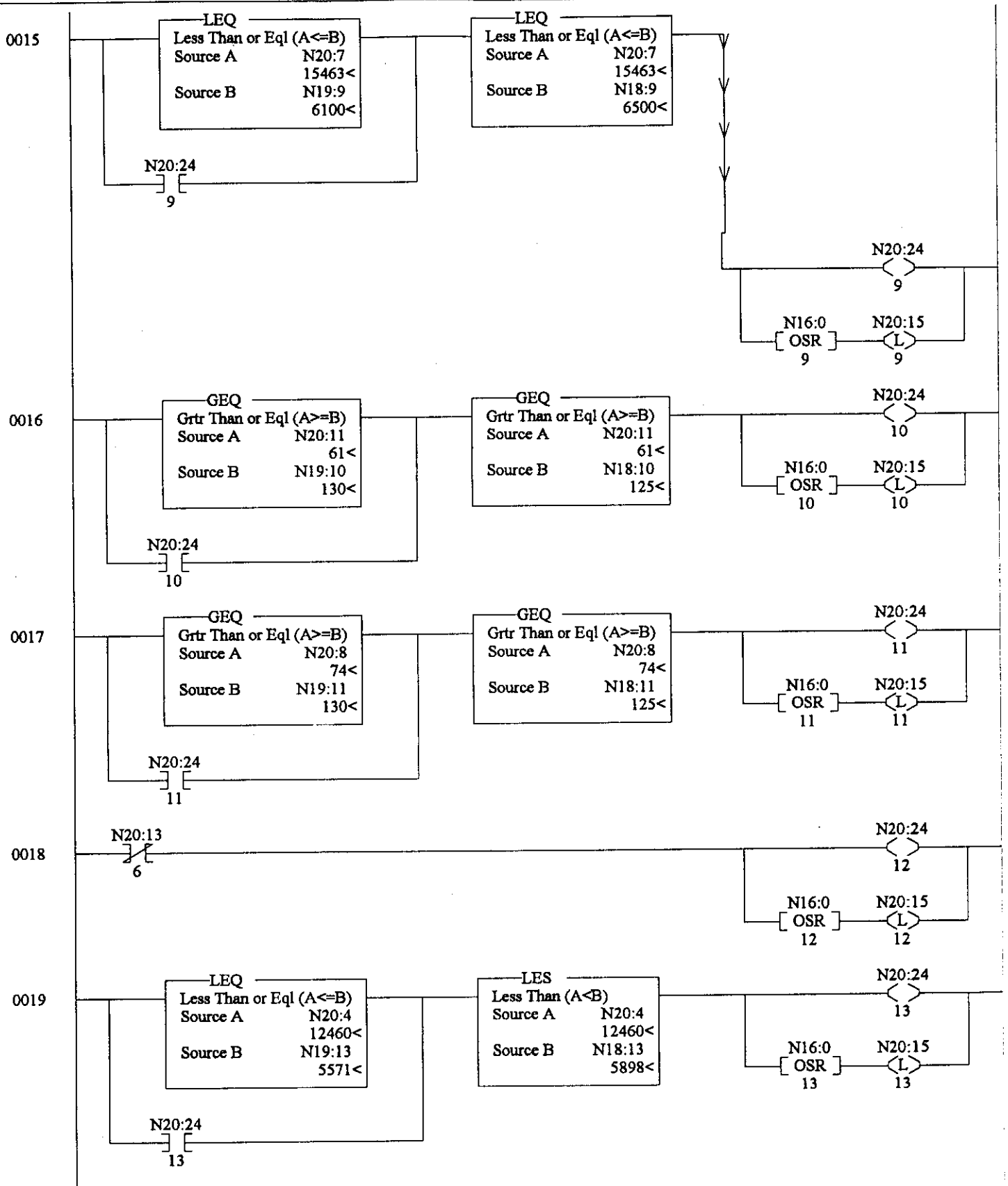
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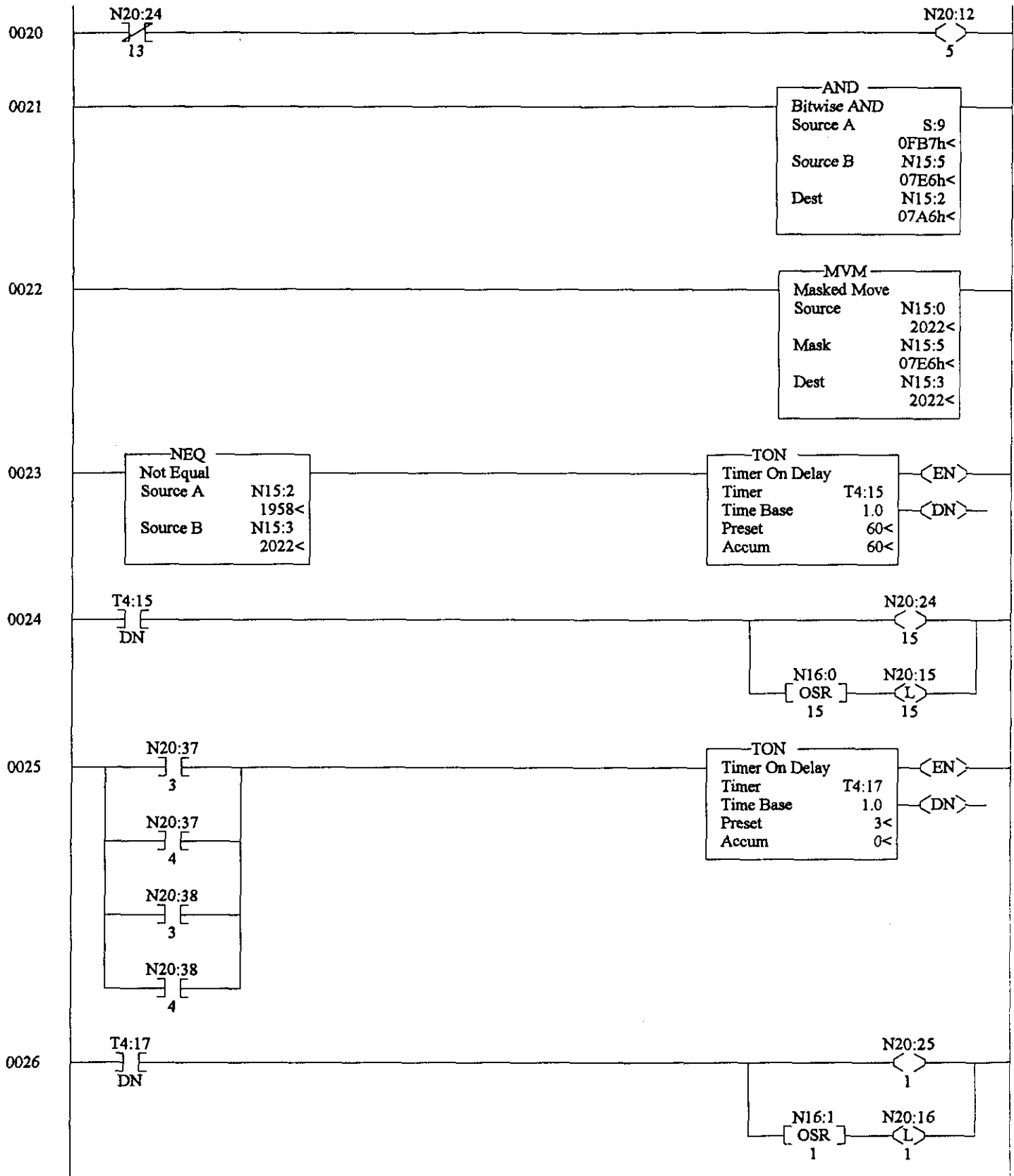
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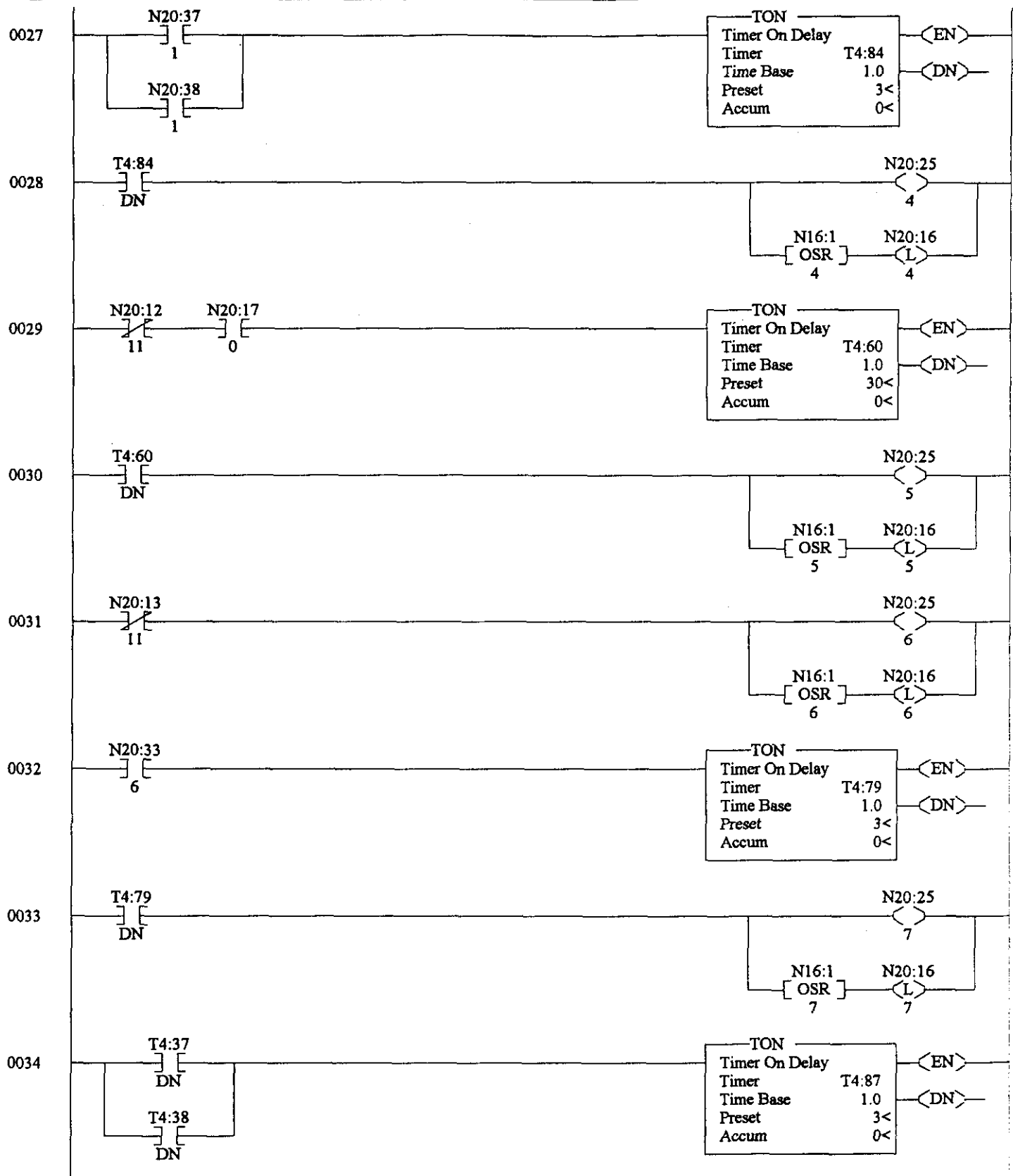
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LAD 5 - --- Total Rungs in File = 115

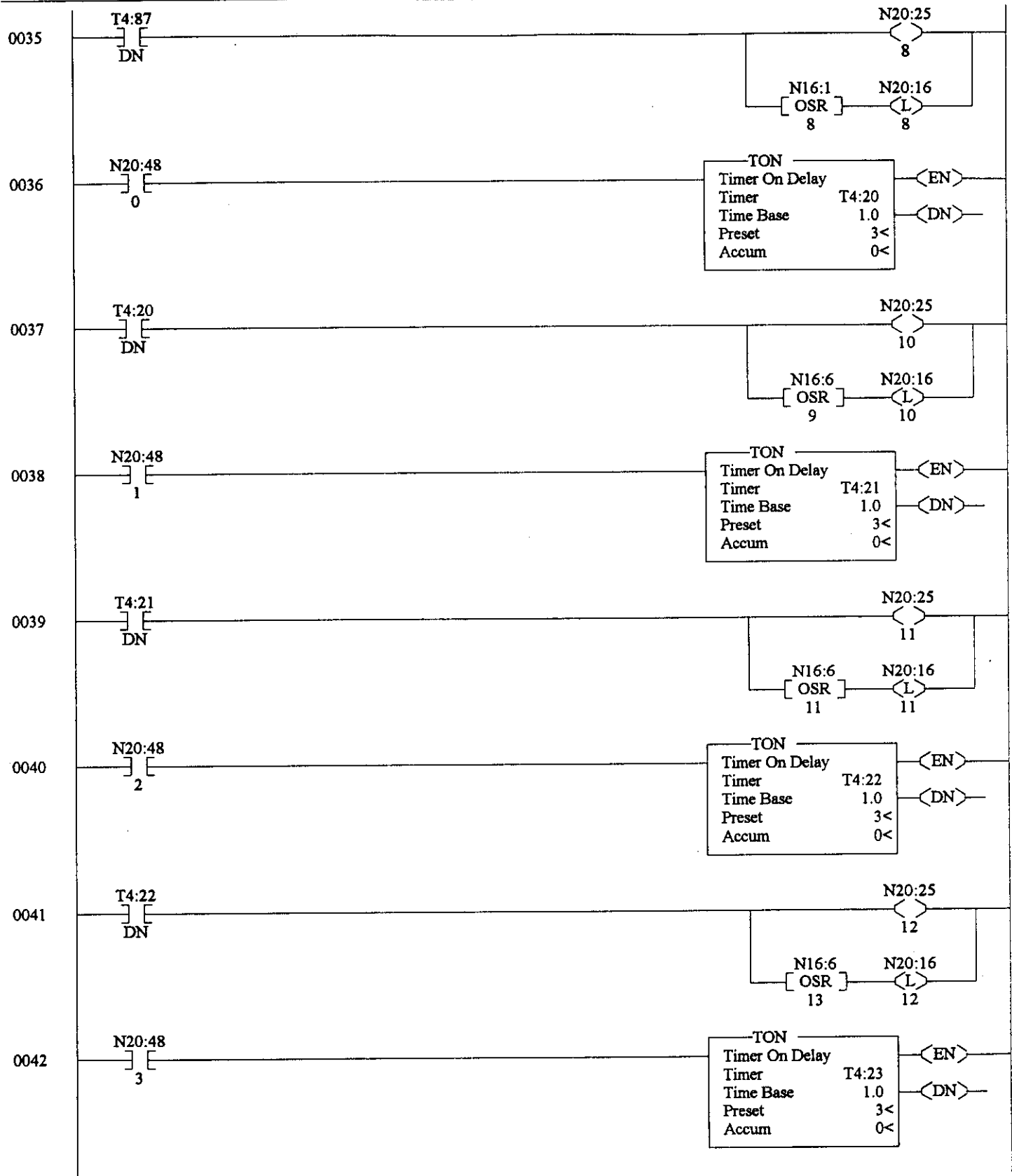


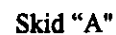
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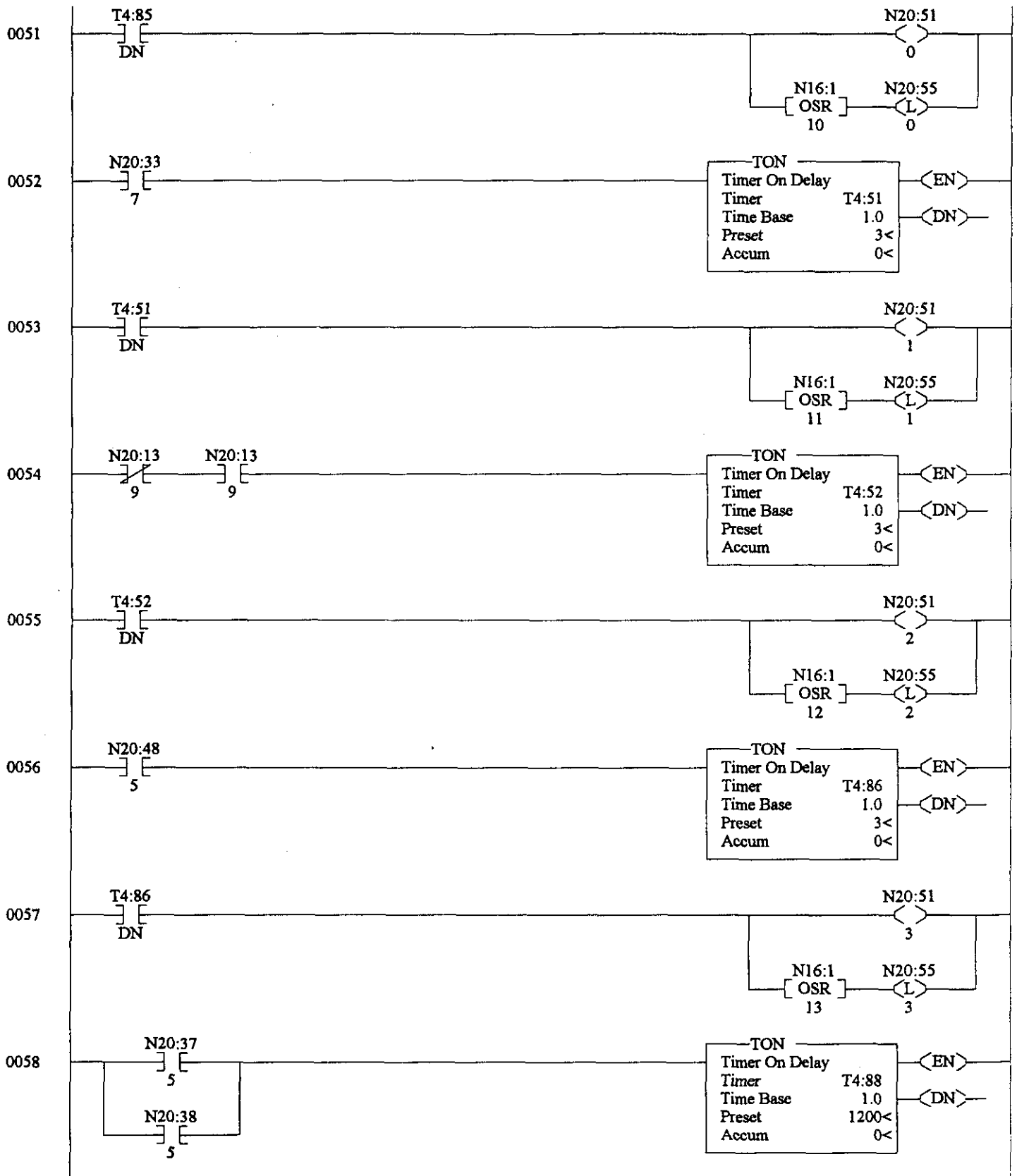


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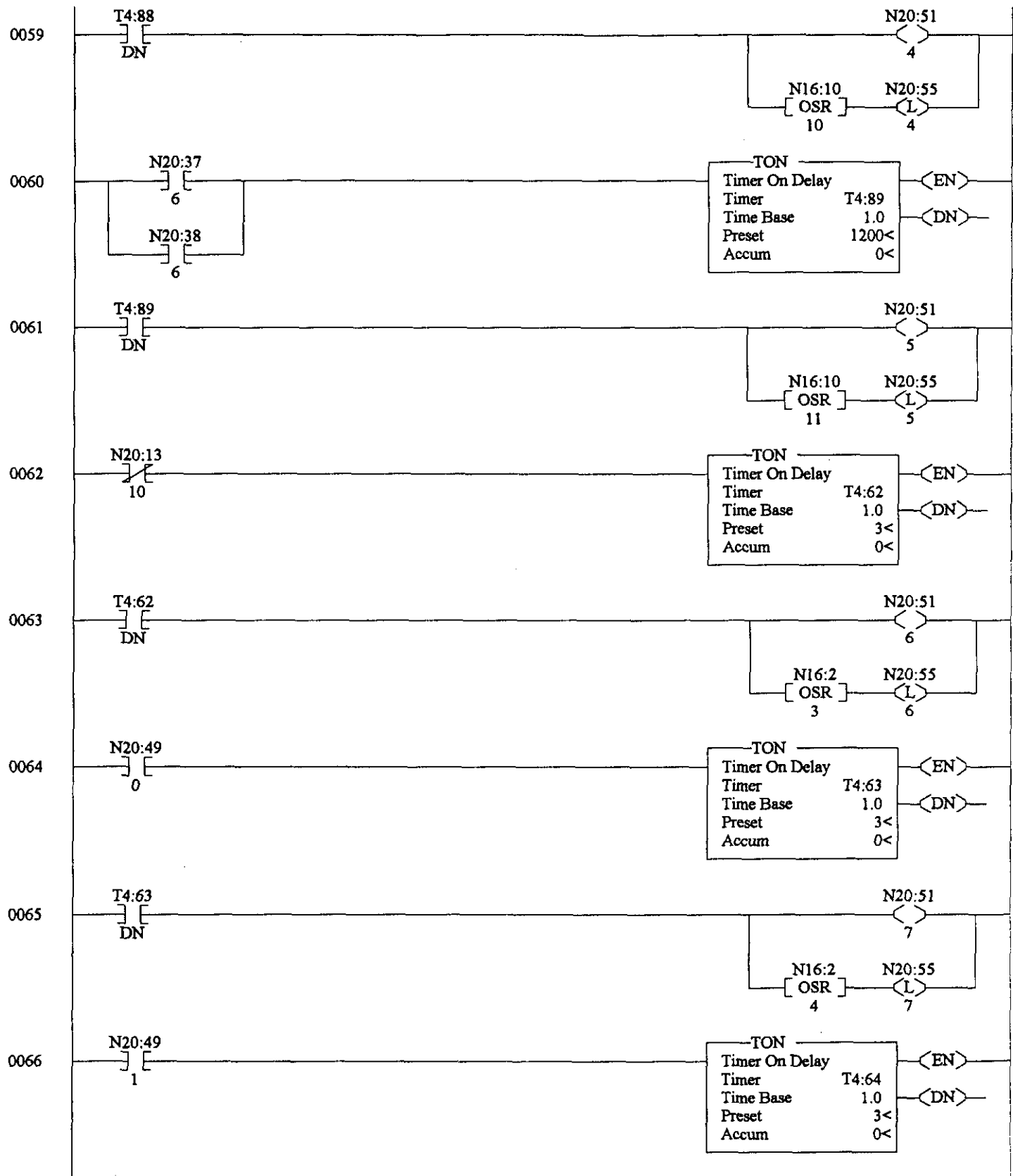




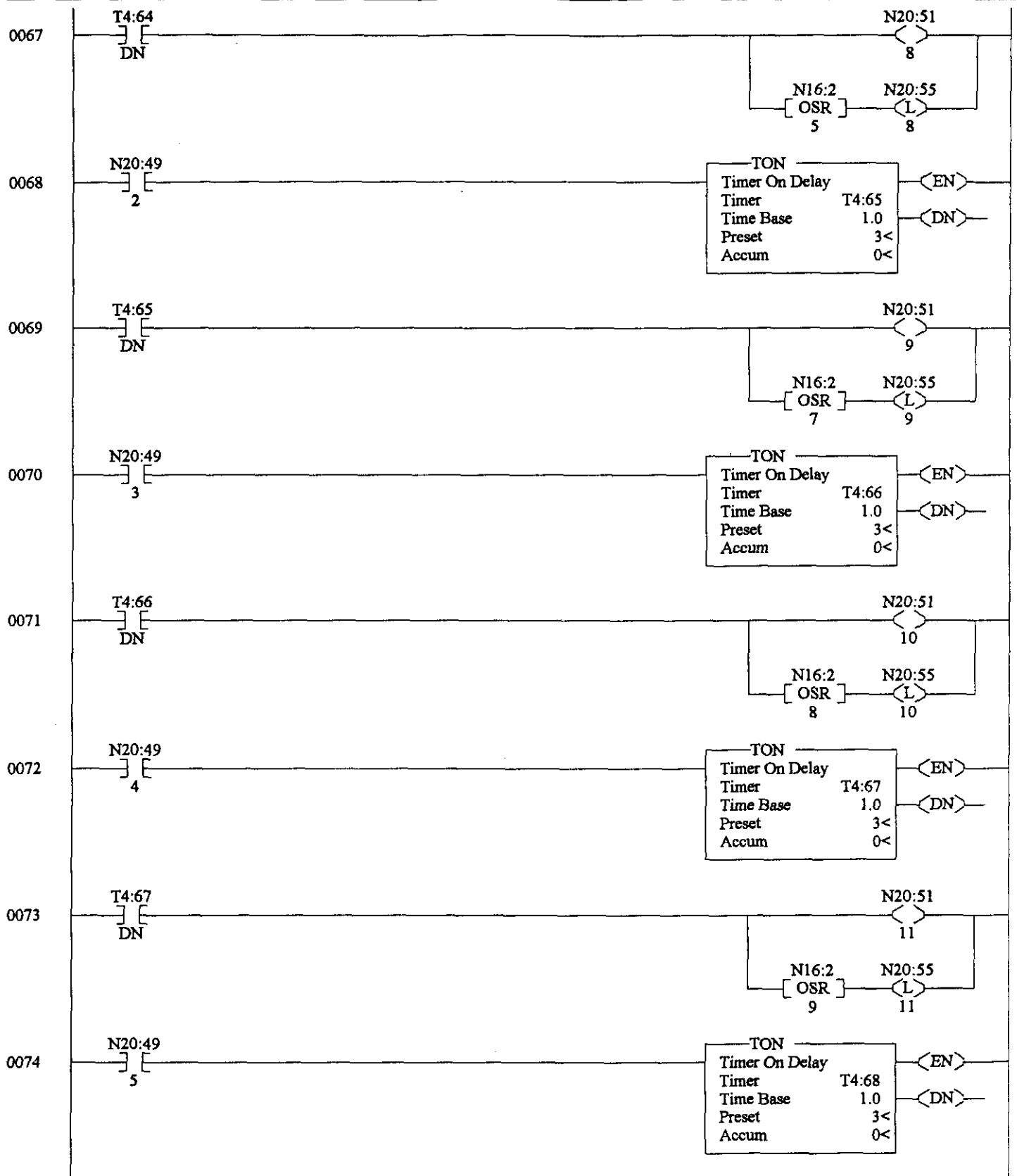
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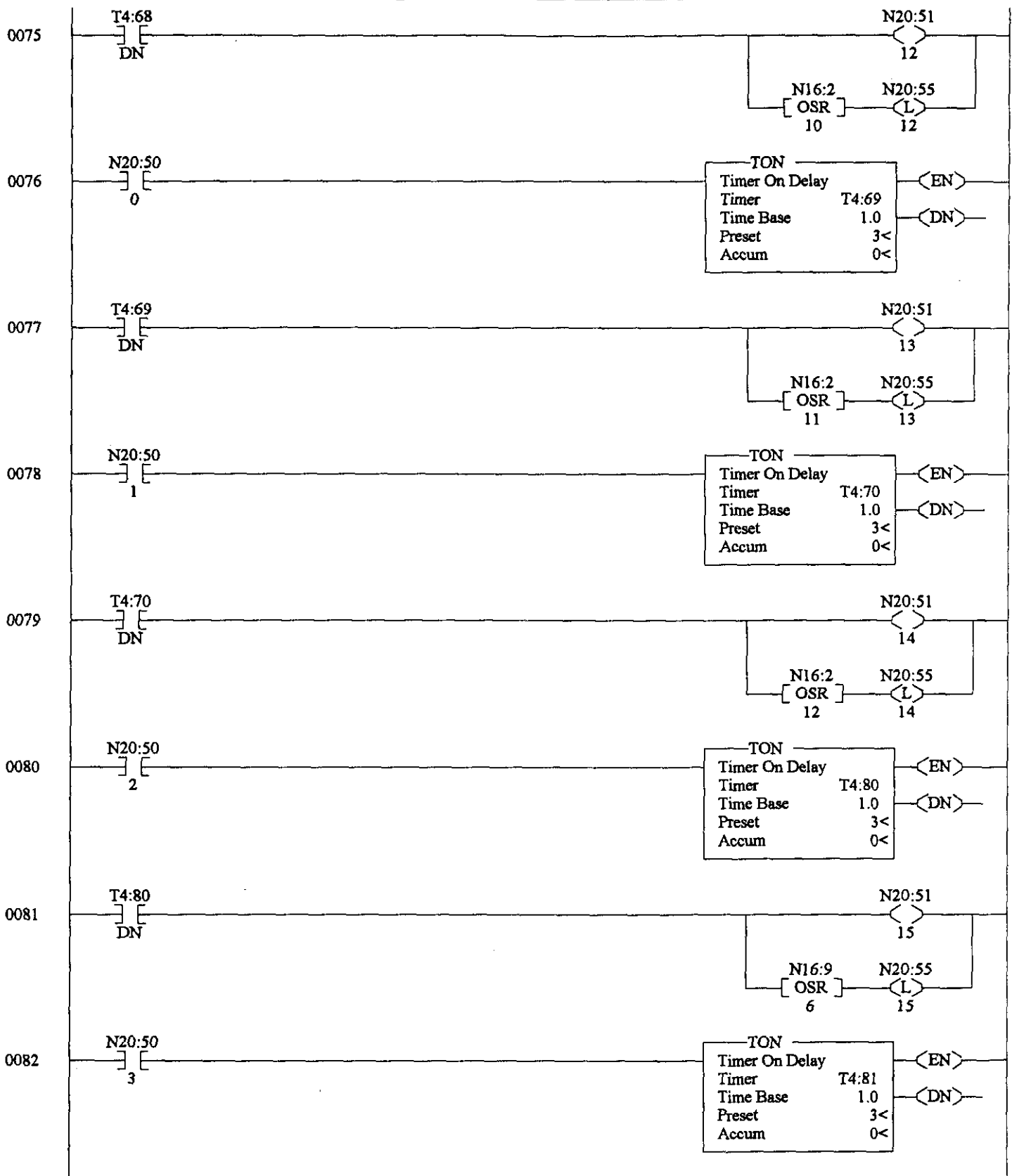
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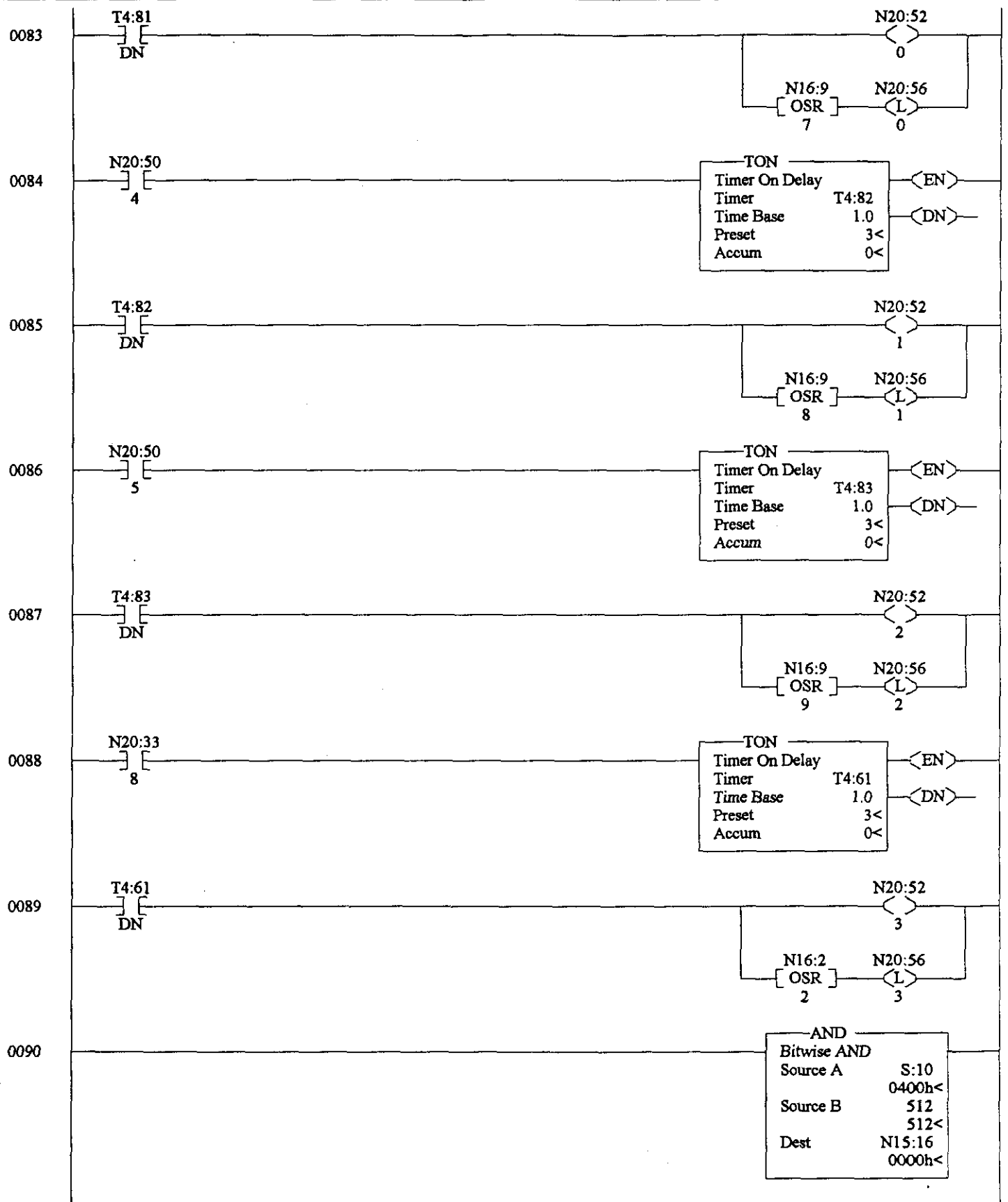
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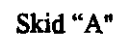


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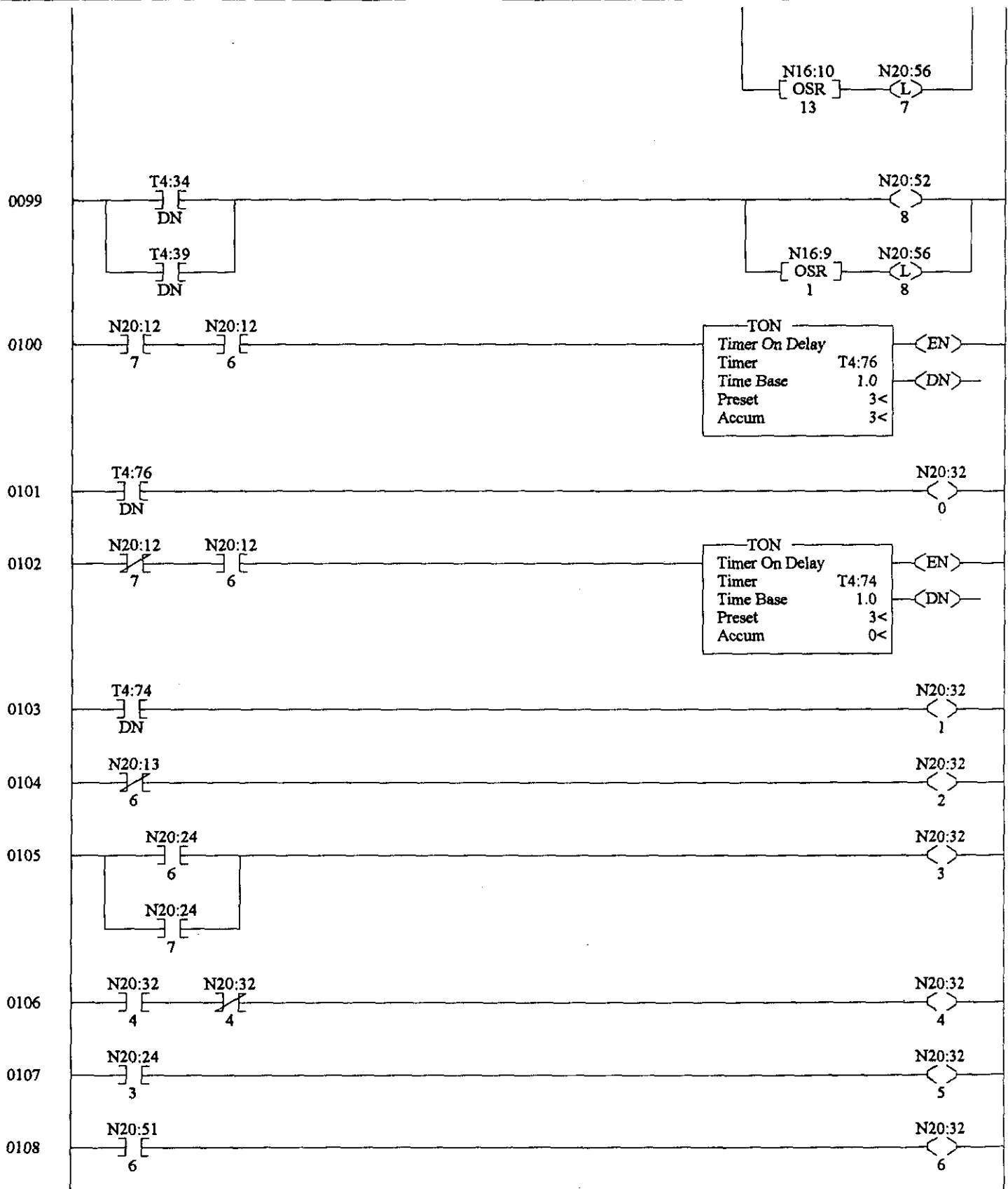
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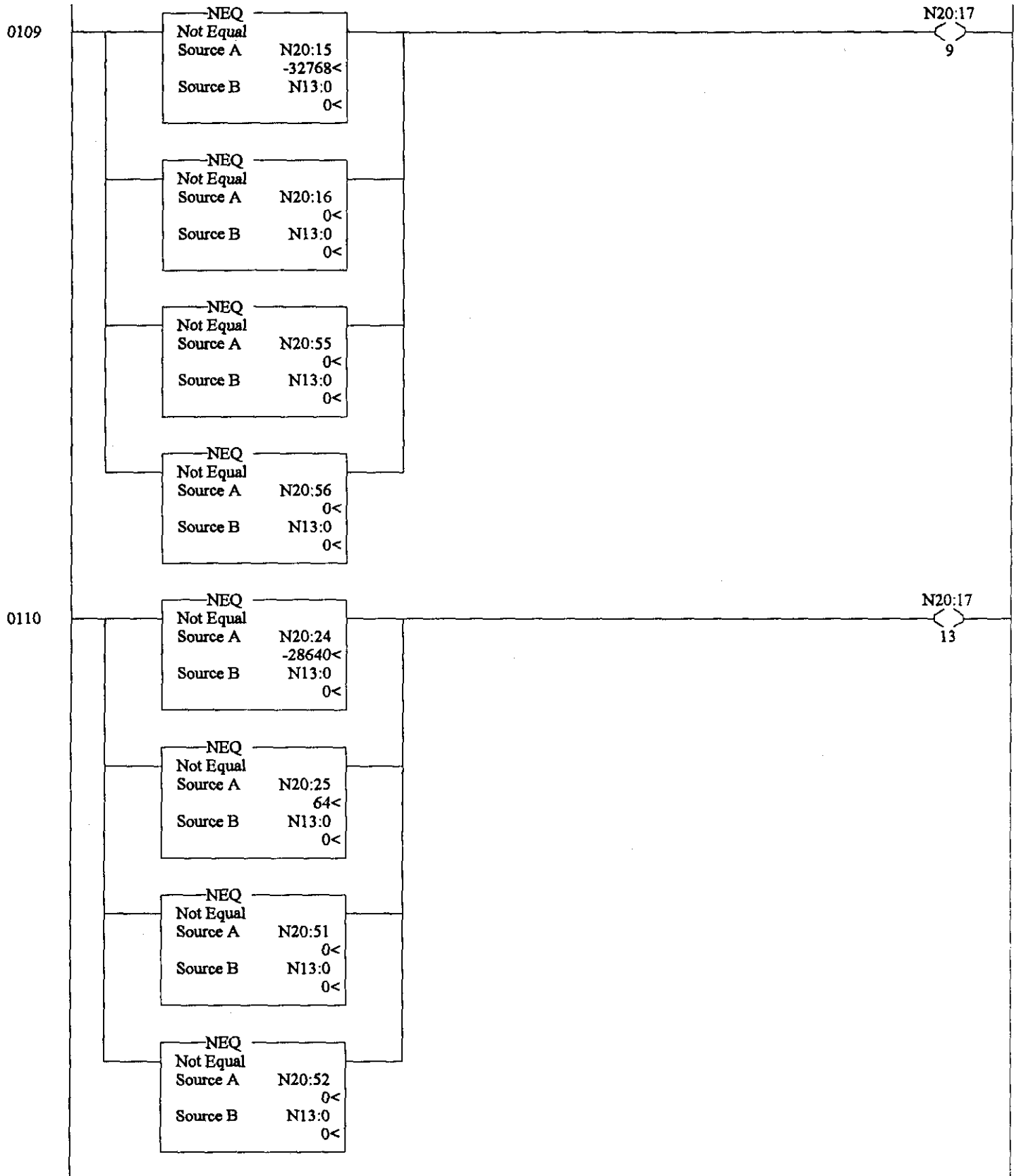


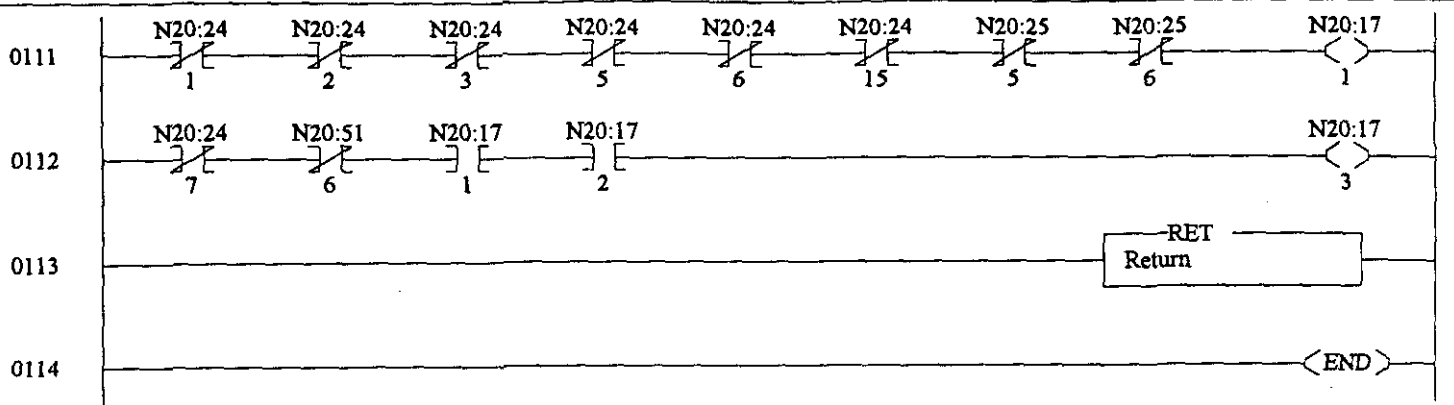


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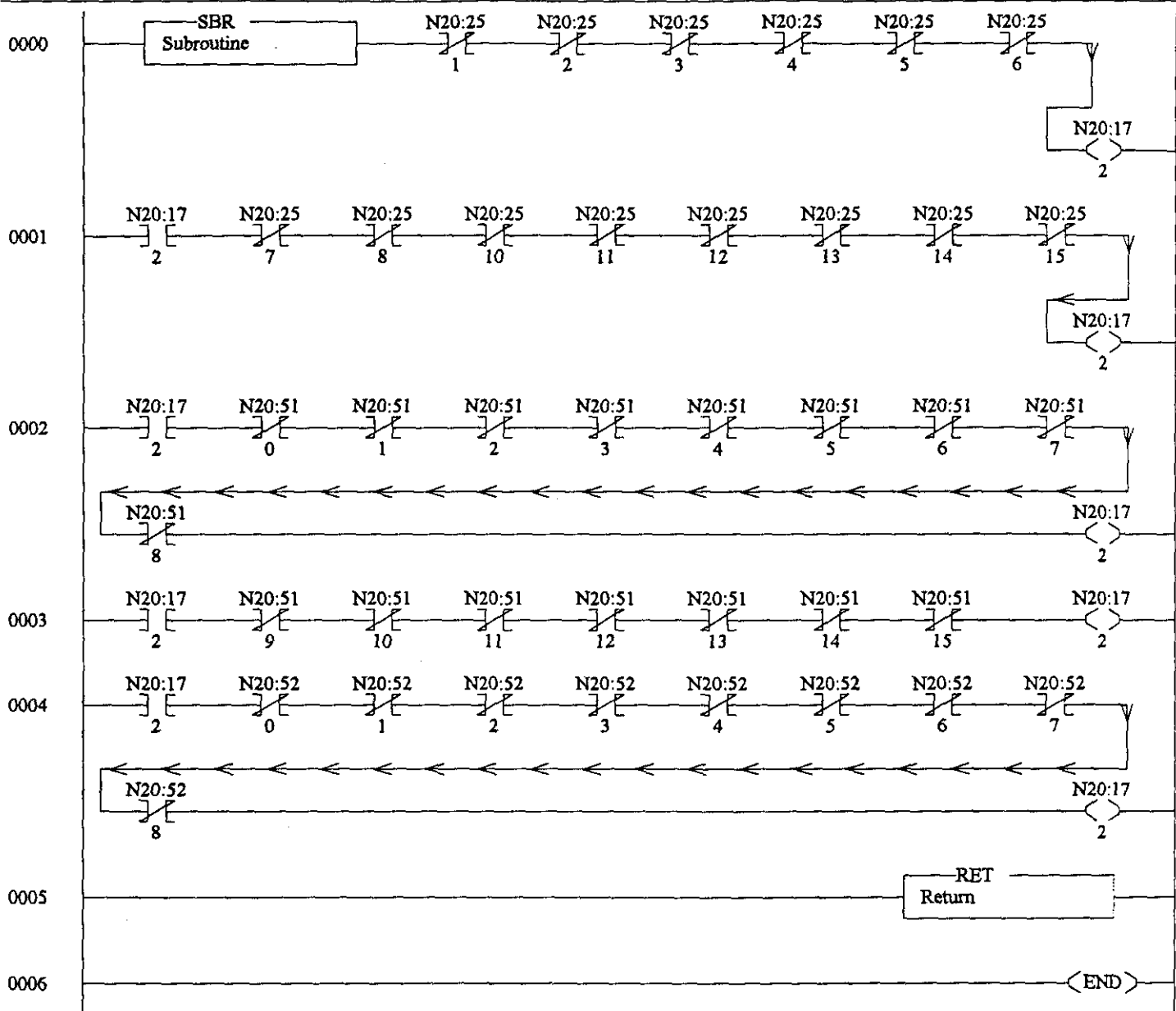


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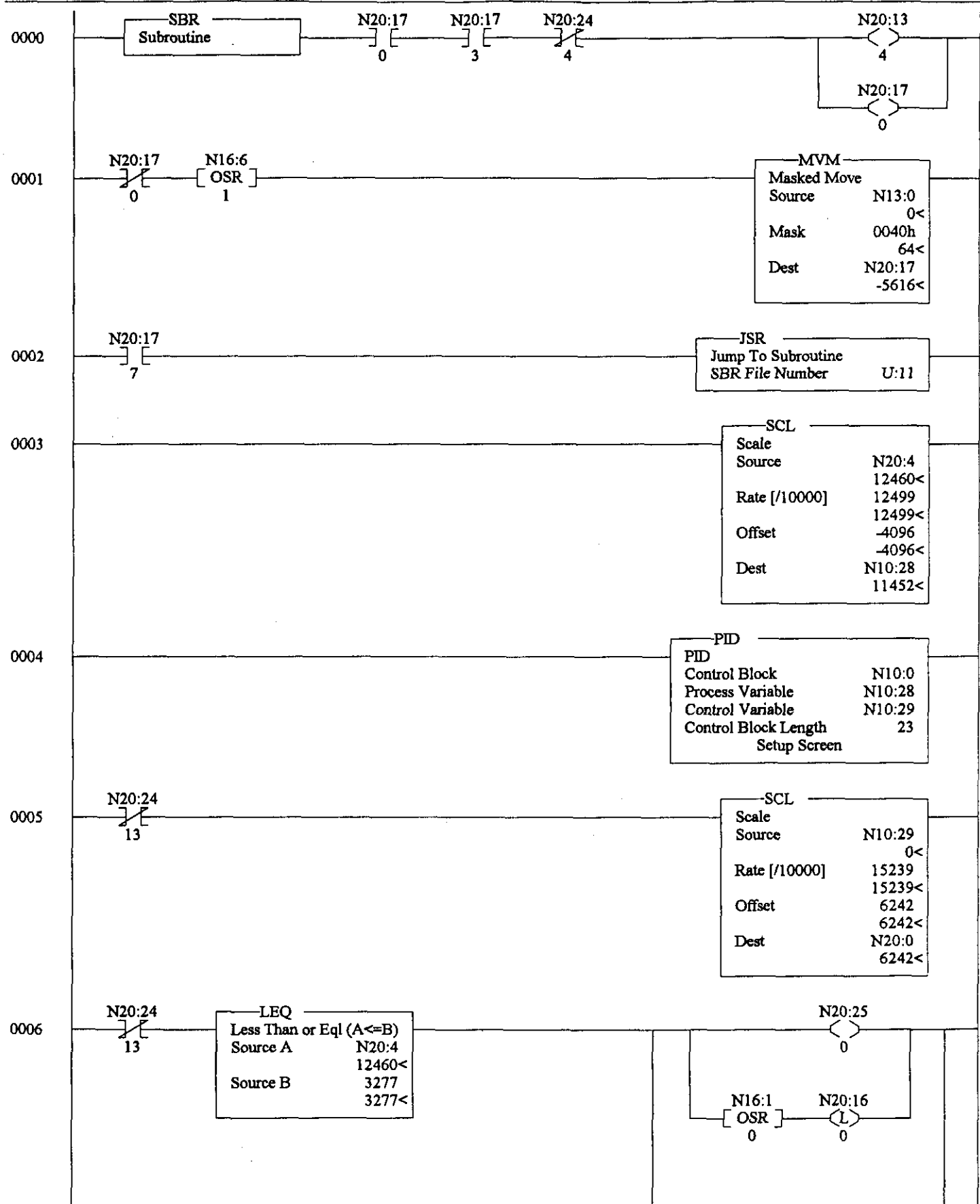


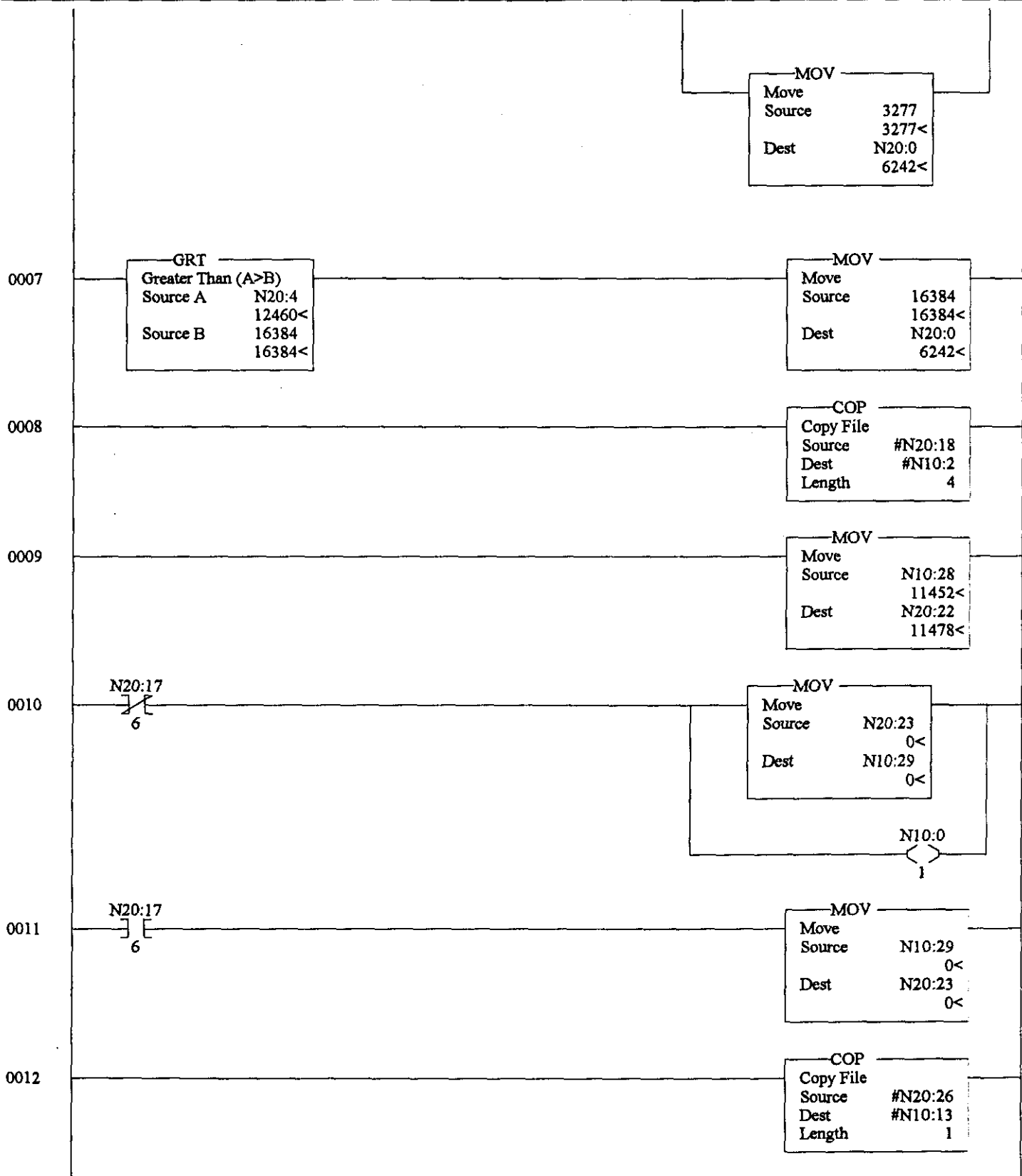


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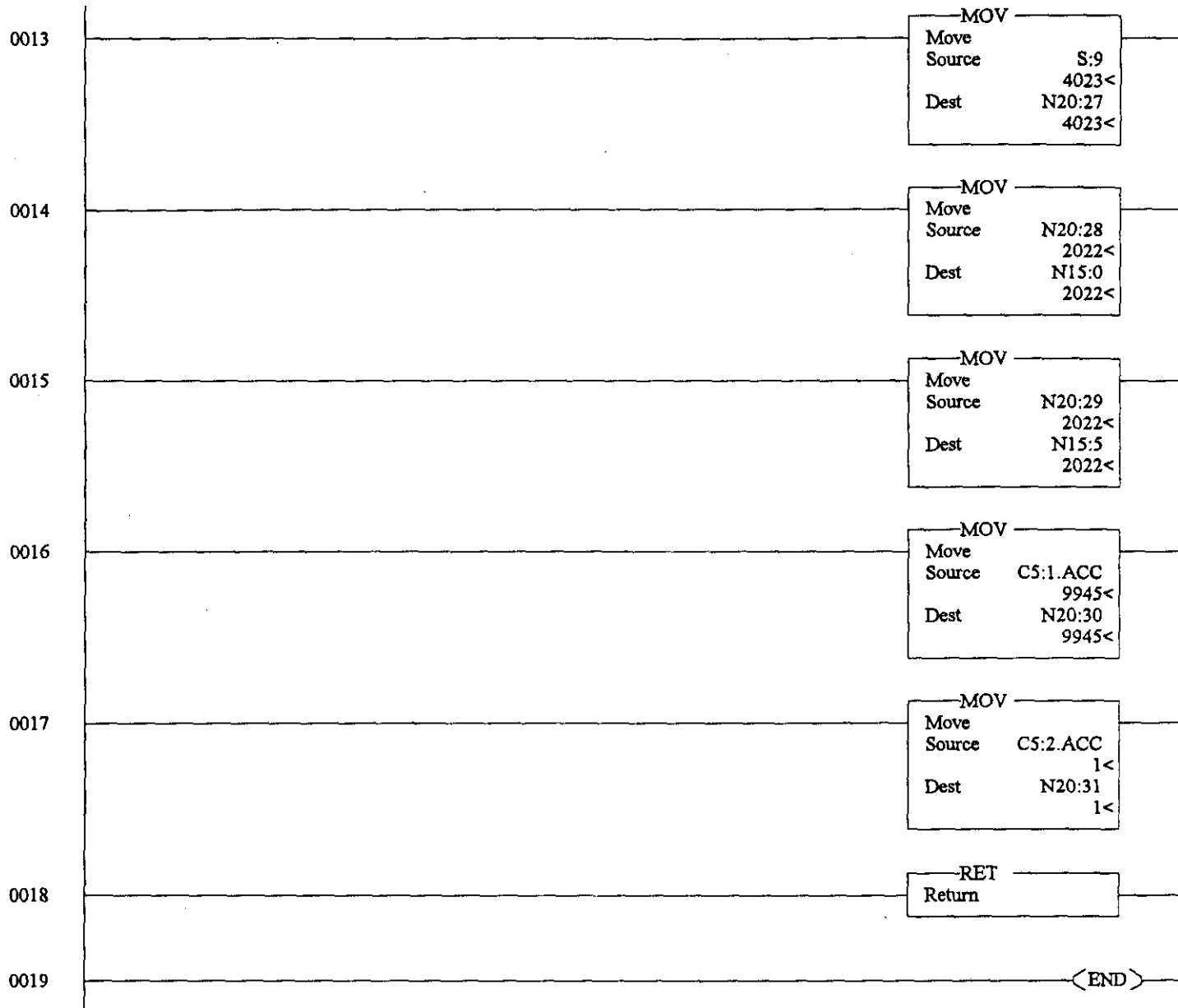


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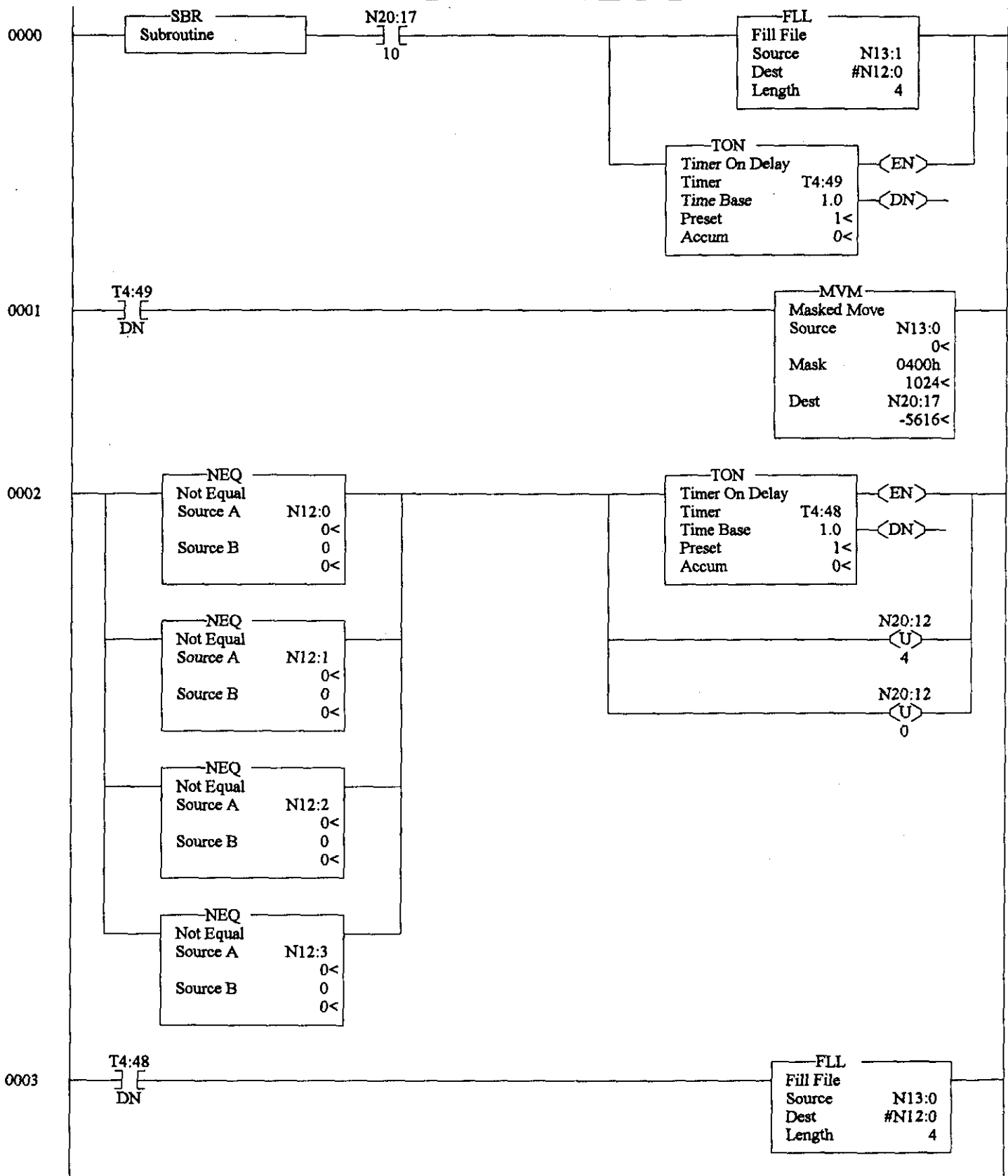




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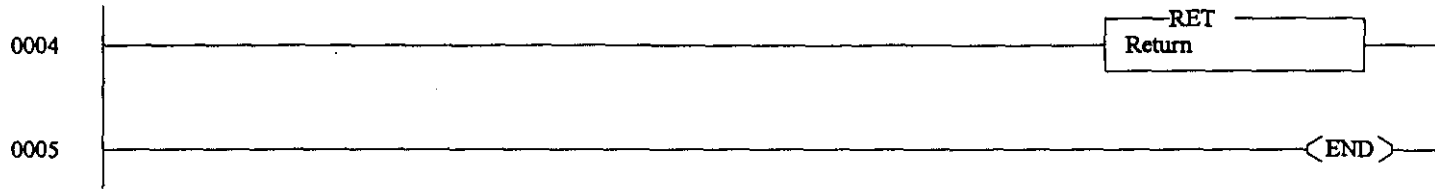


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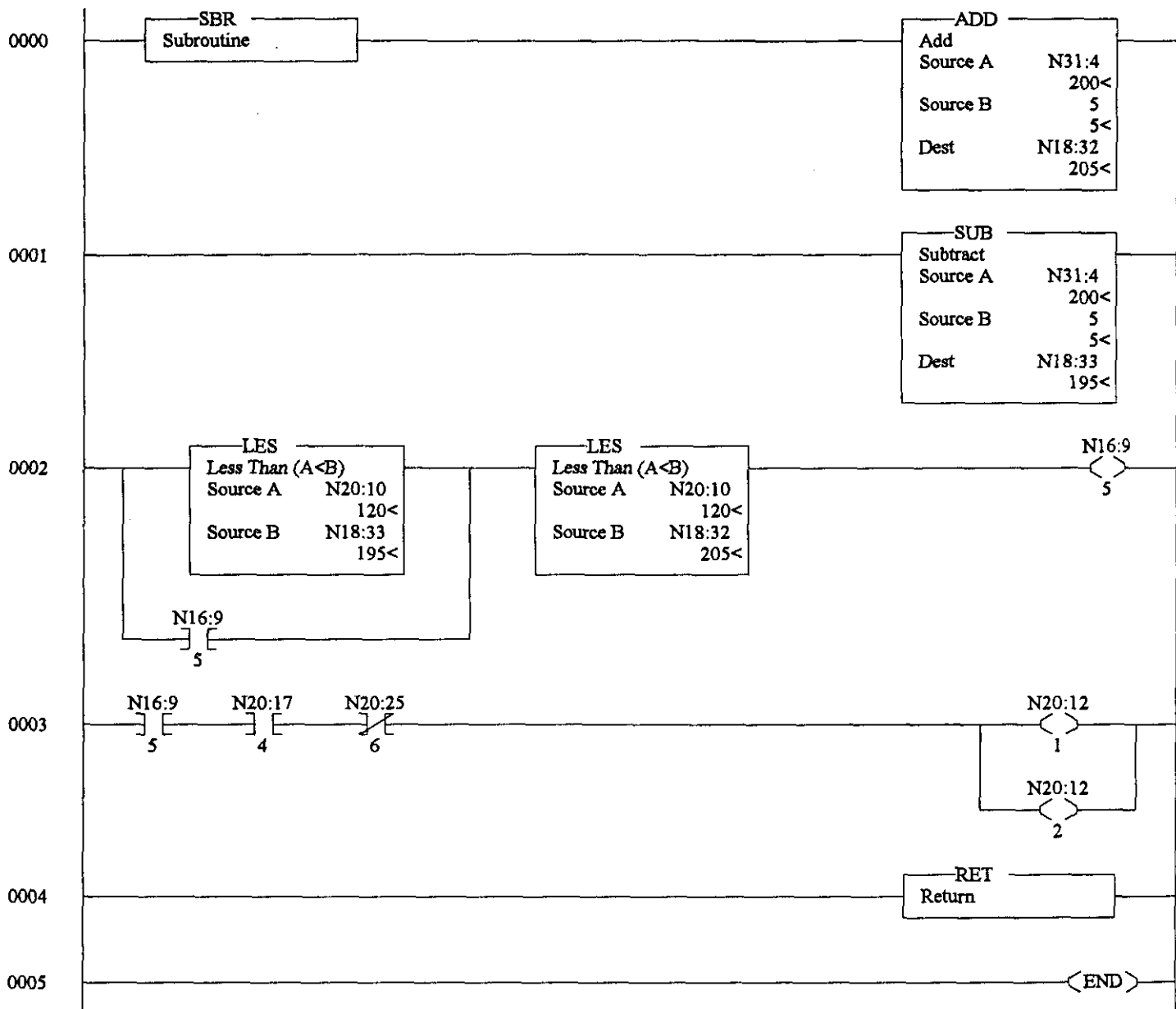




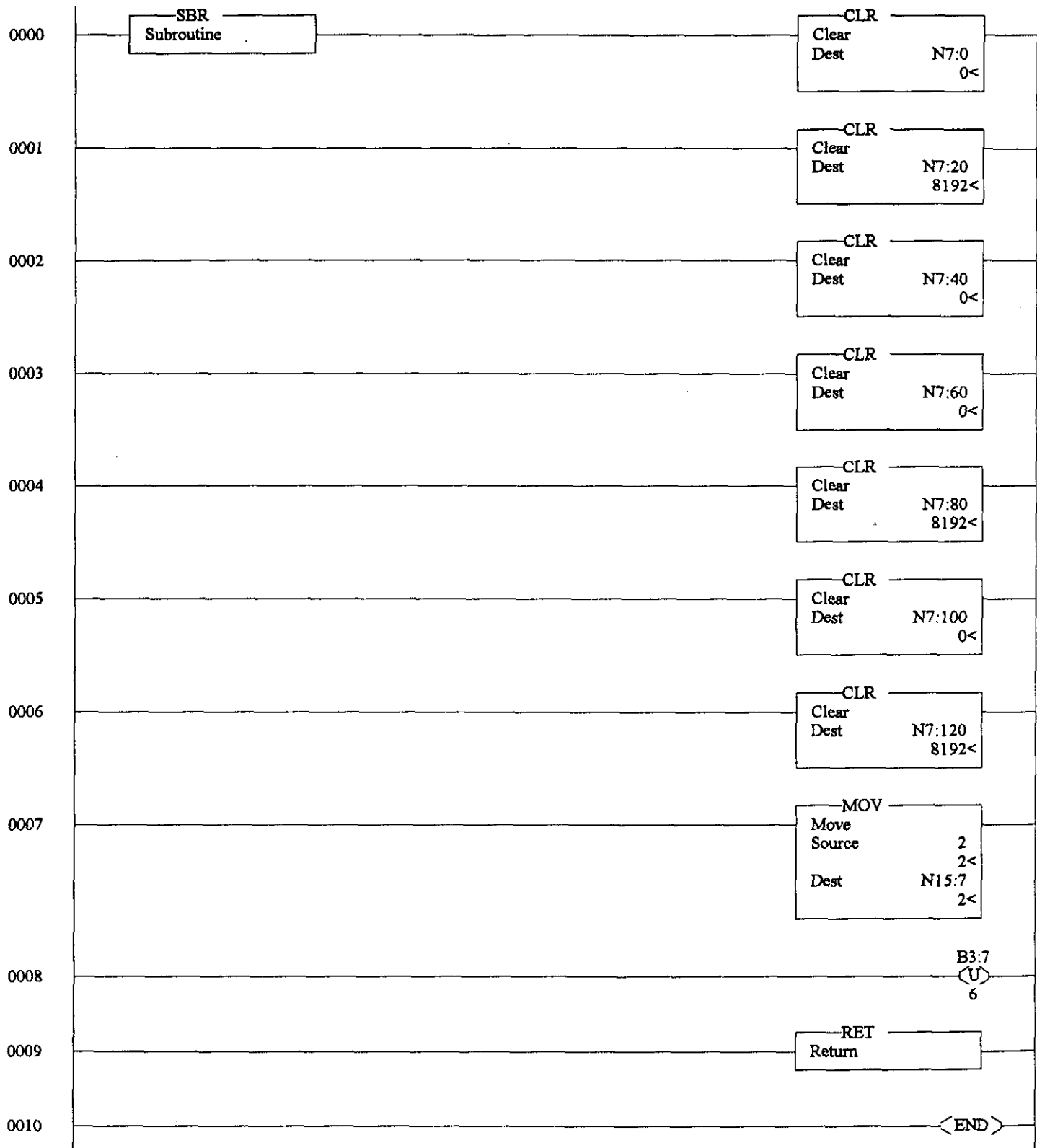
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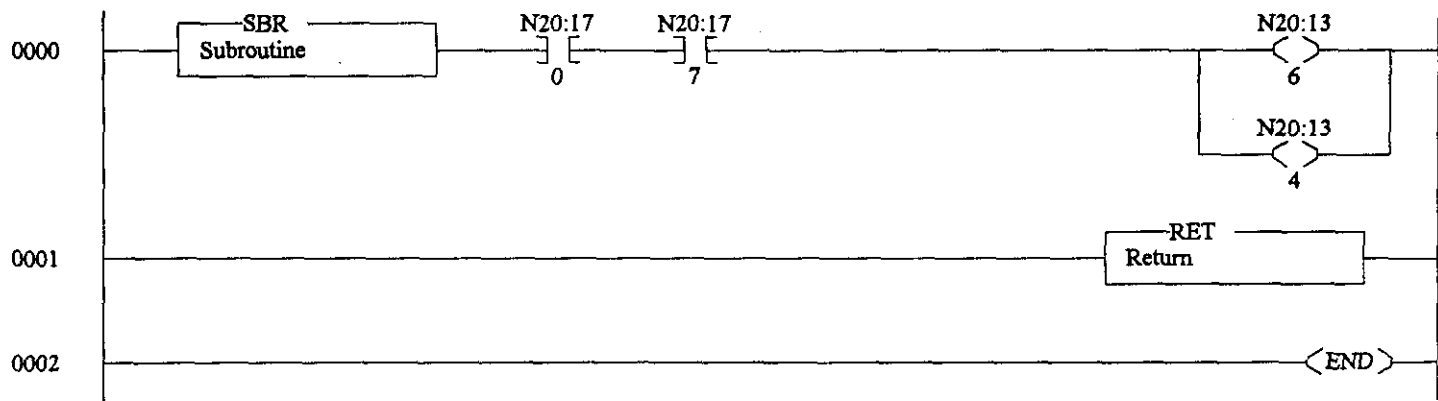
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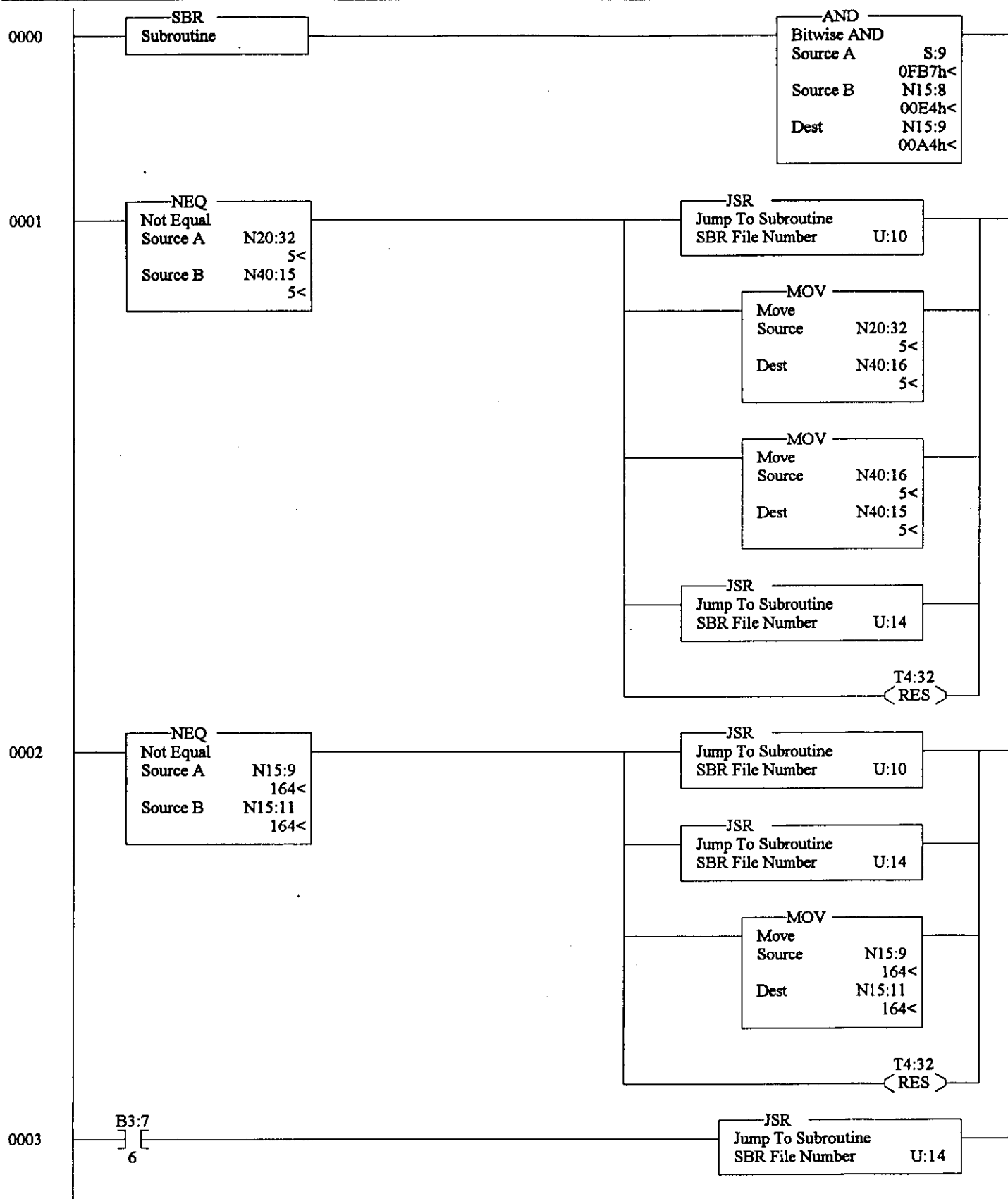
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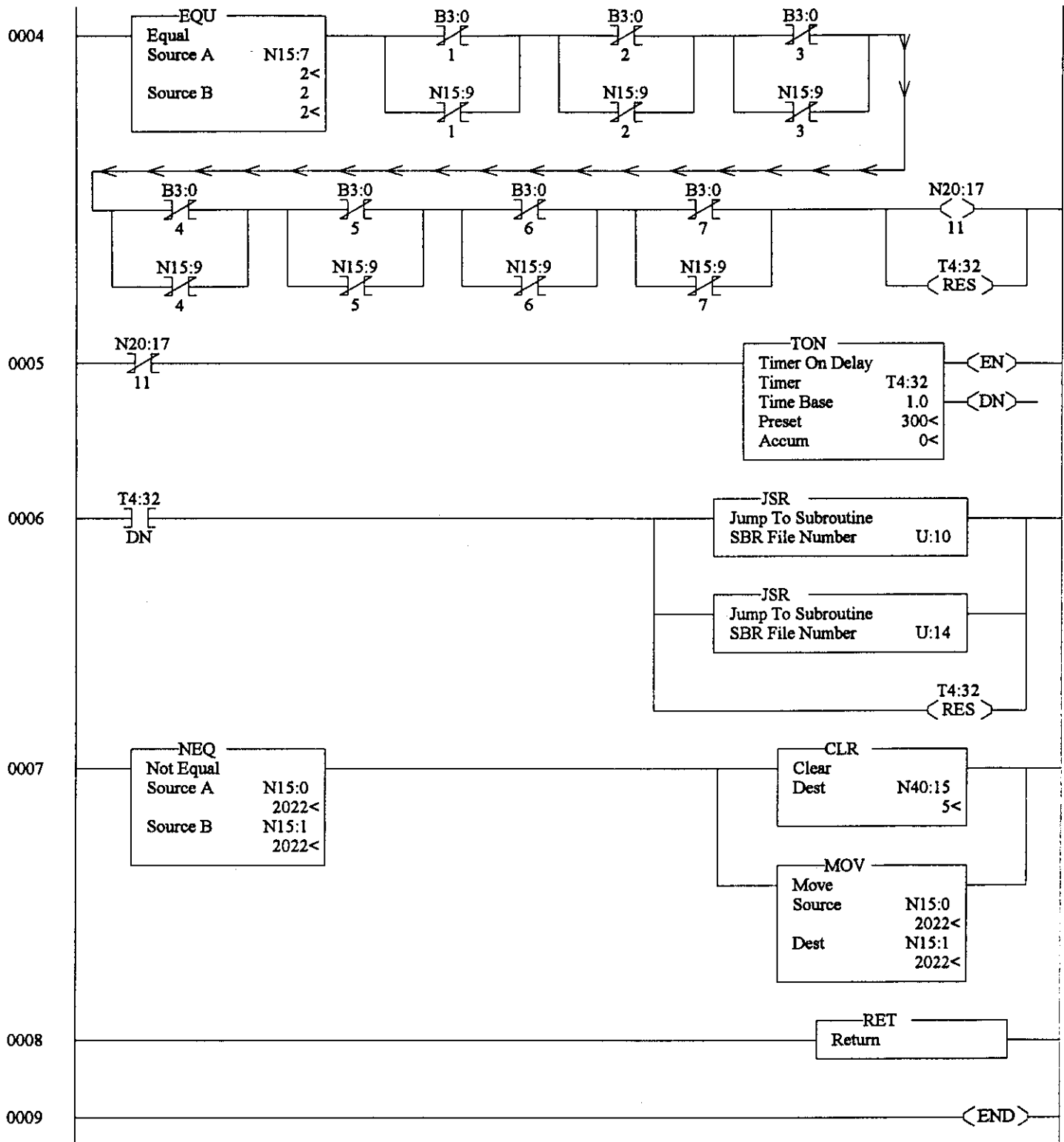
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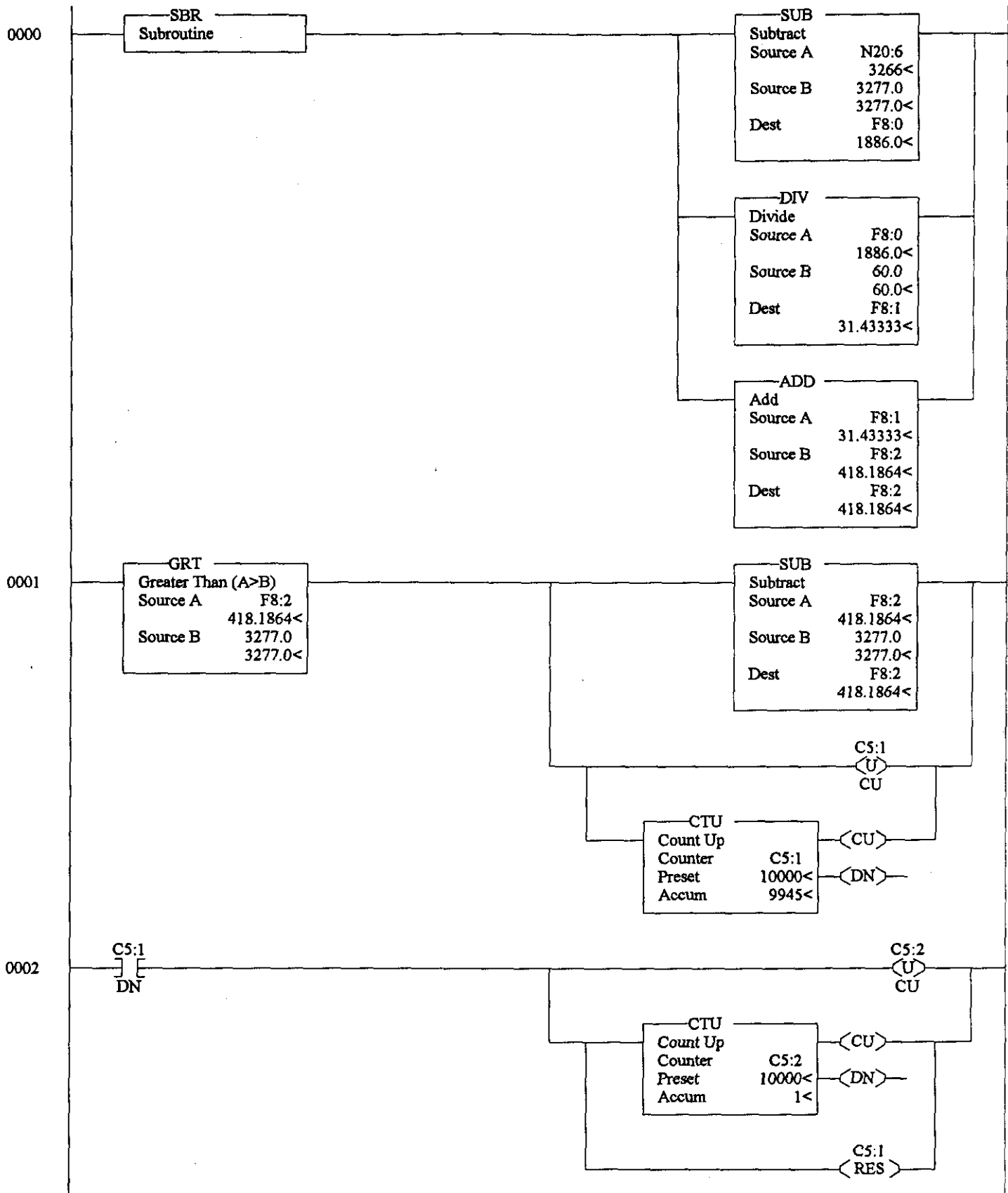
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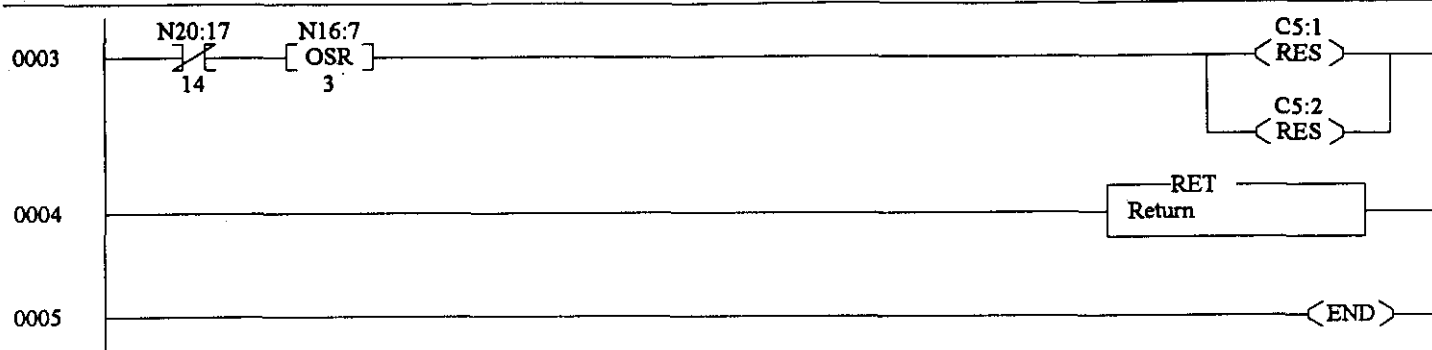


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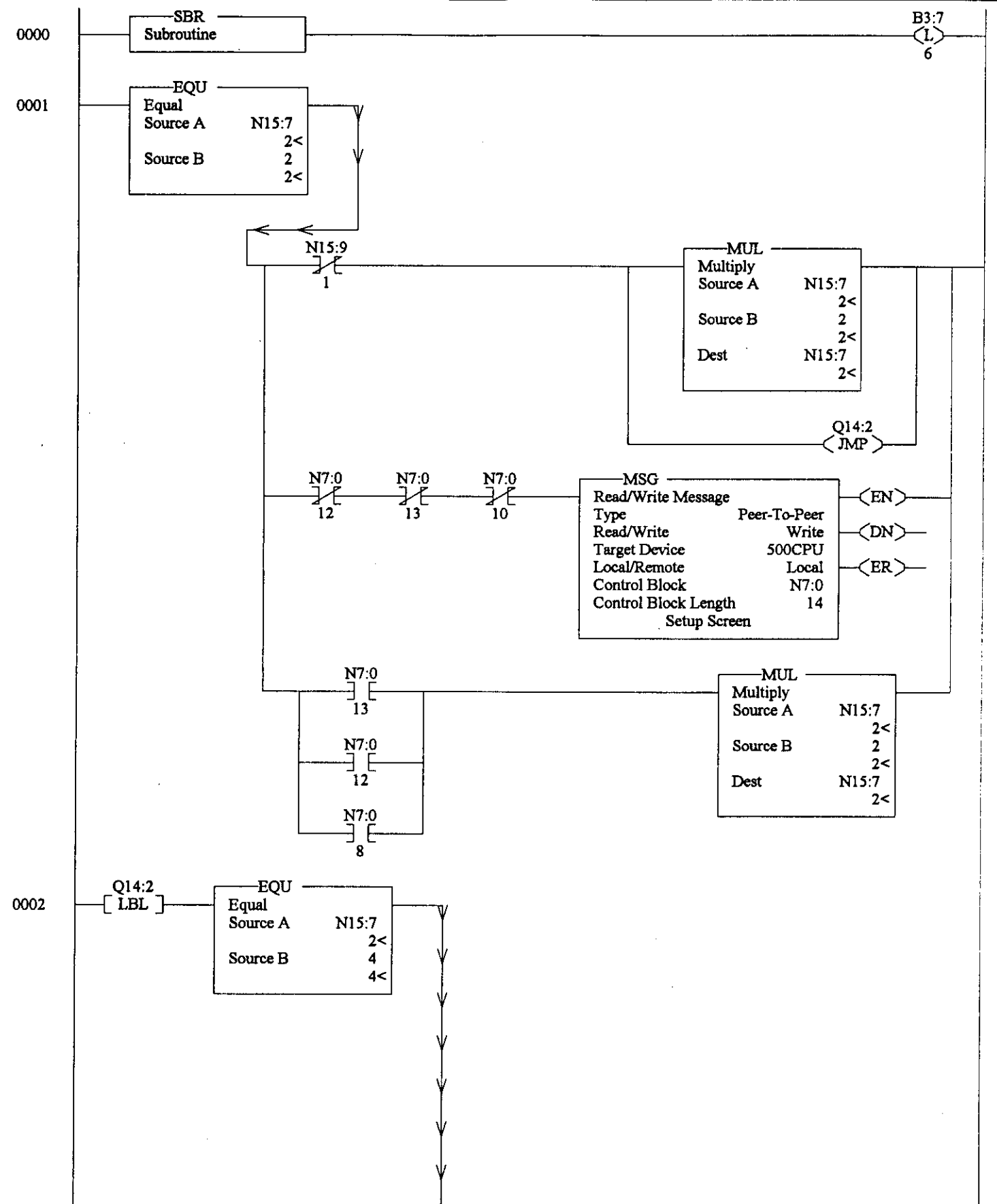
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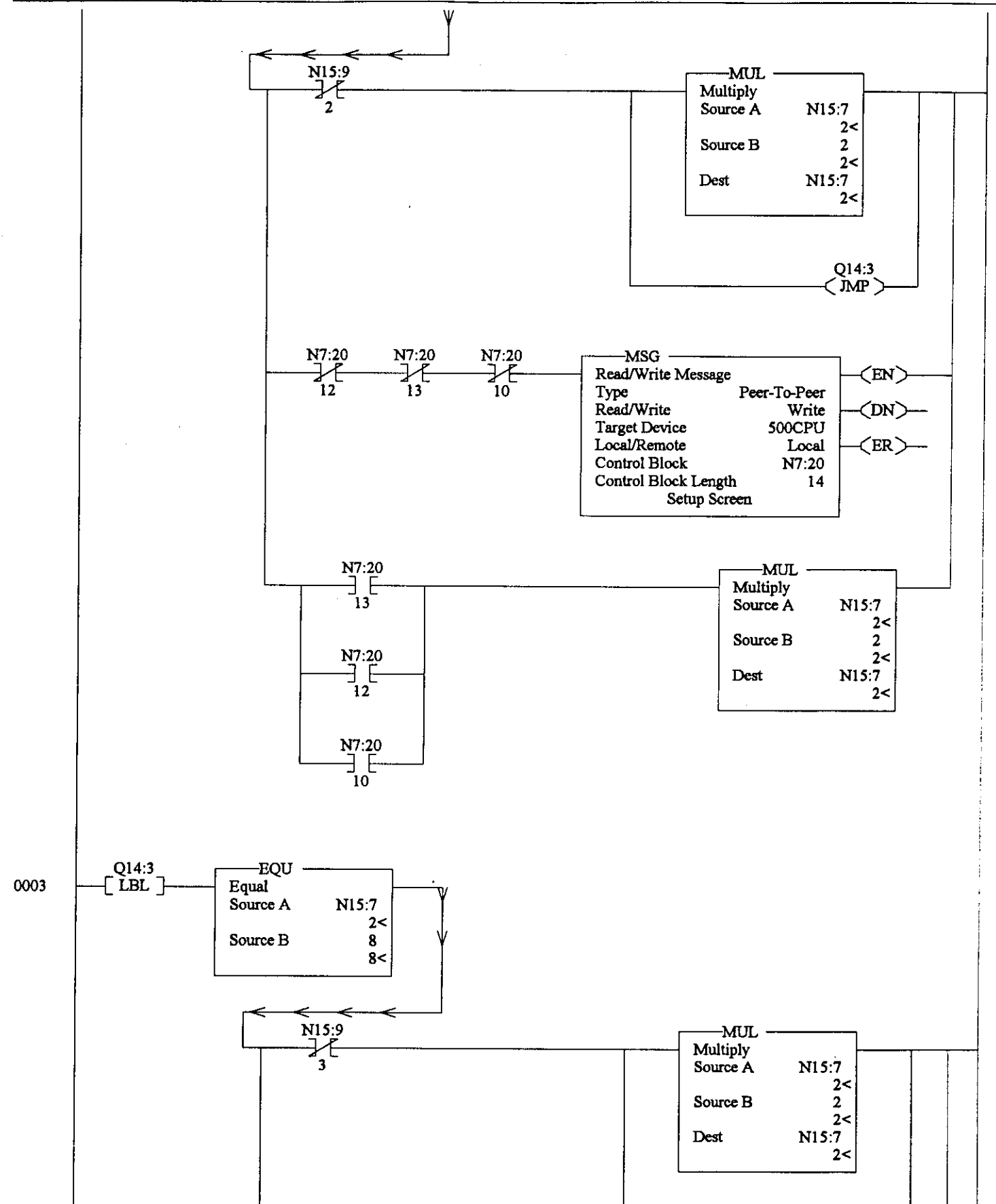




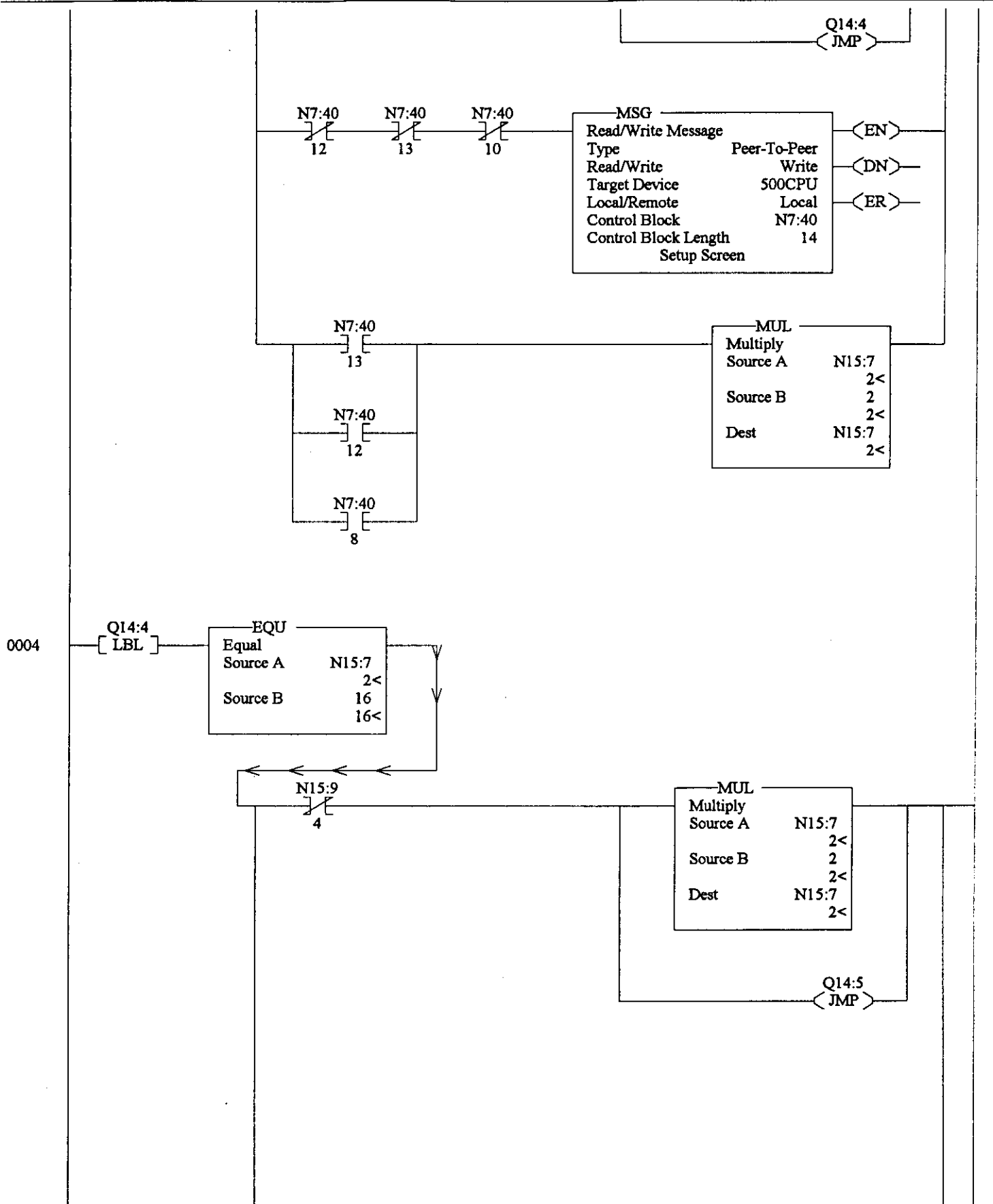
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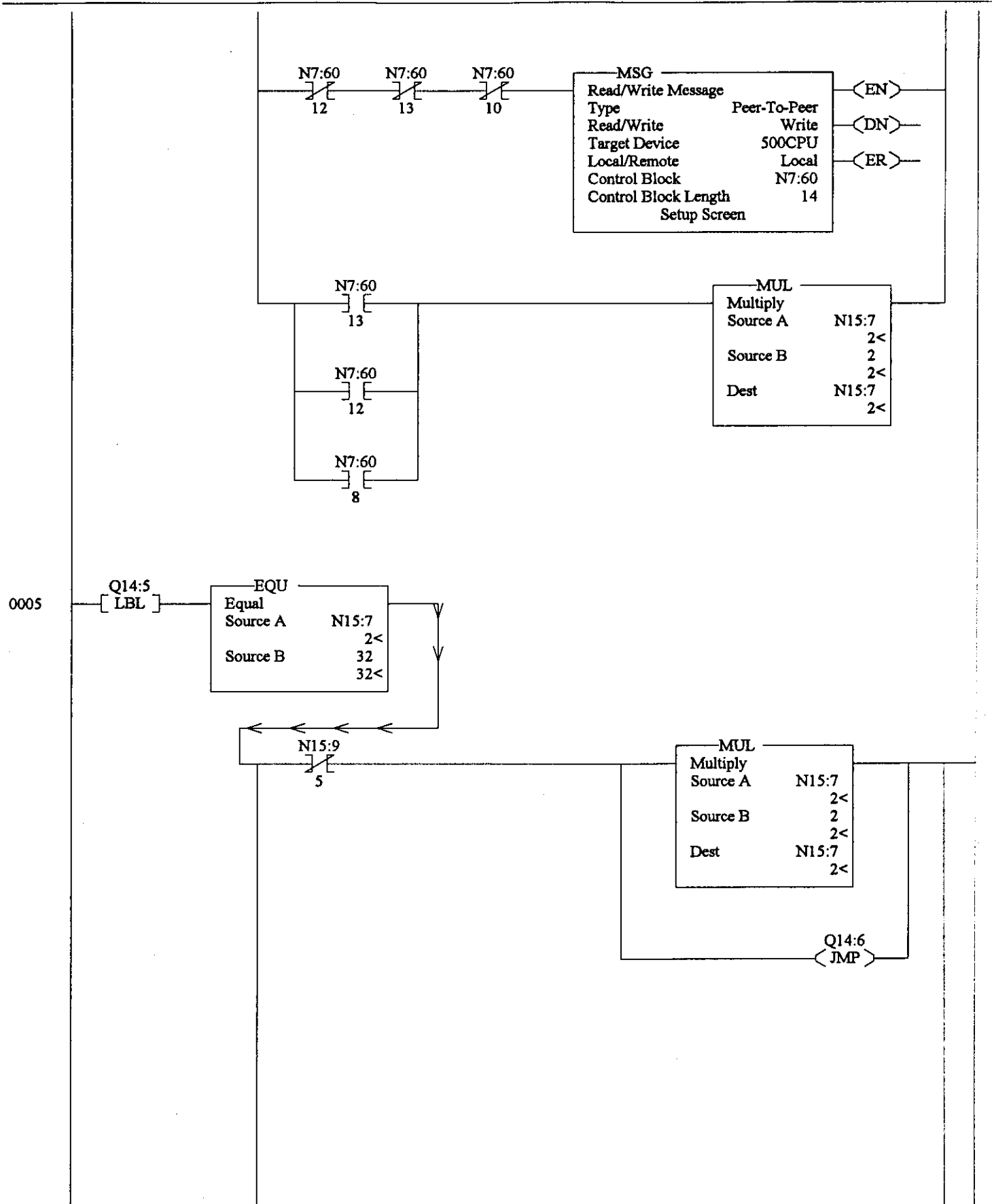
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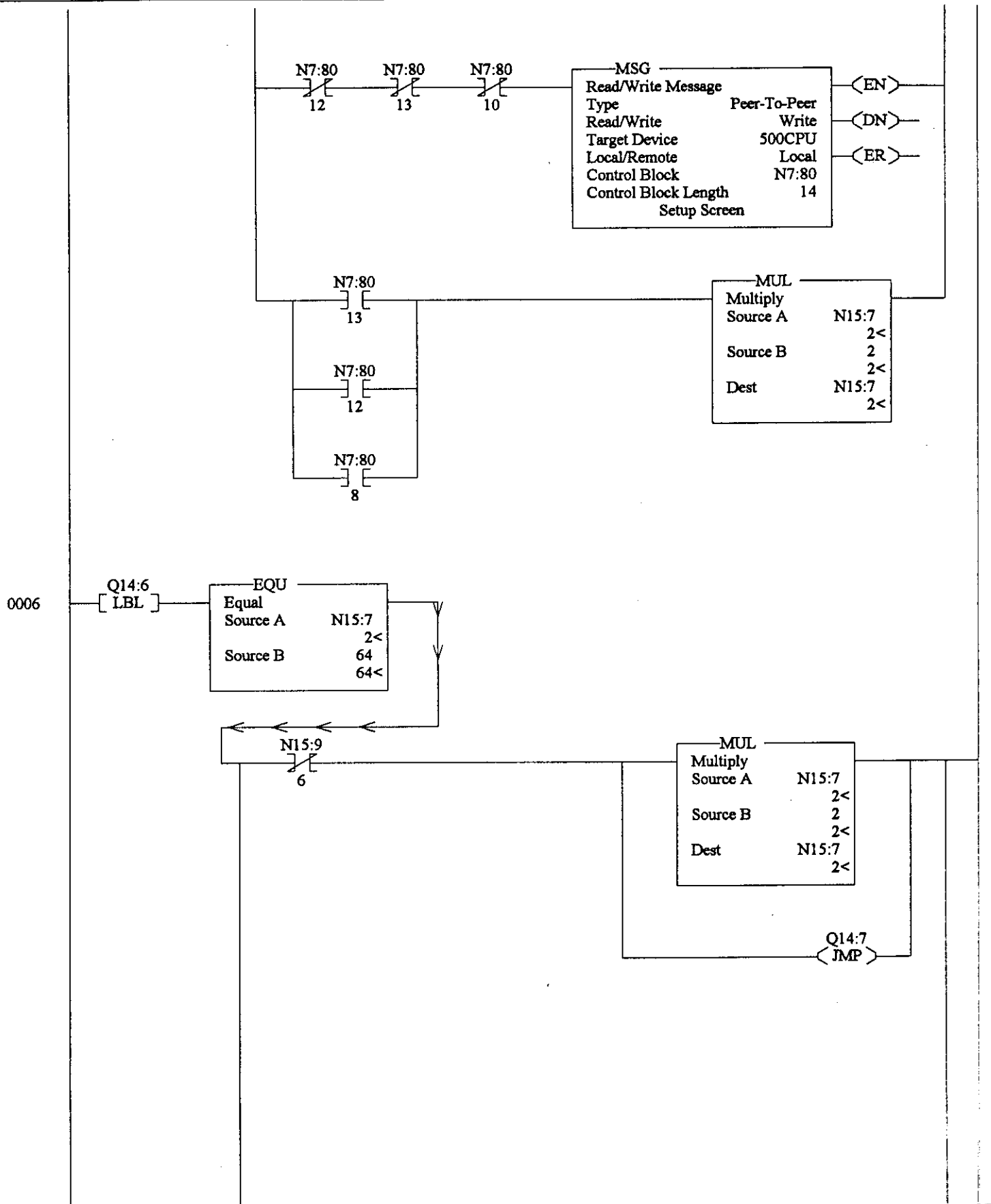
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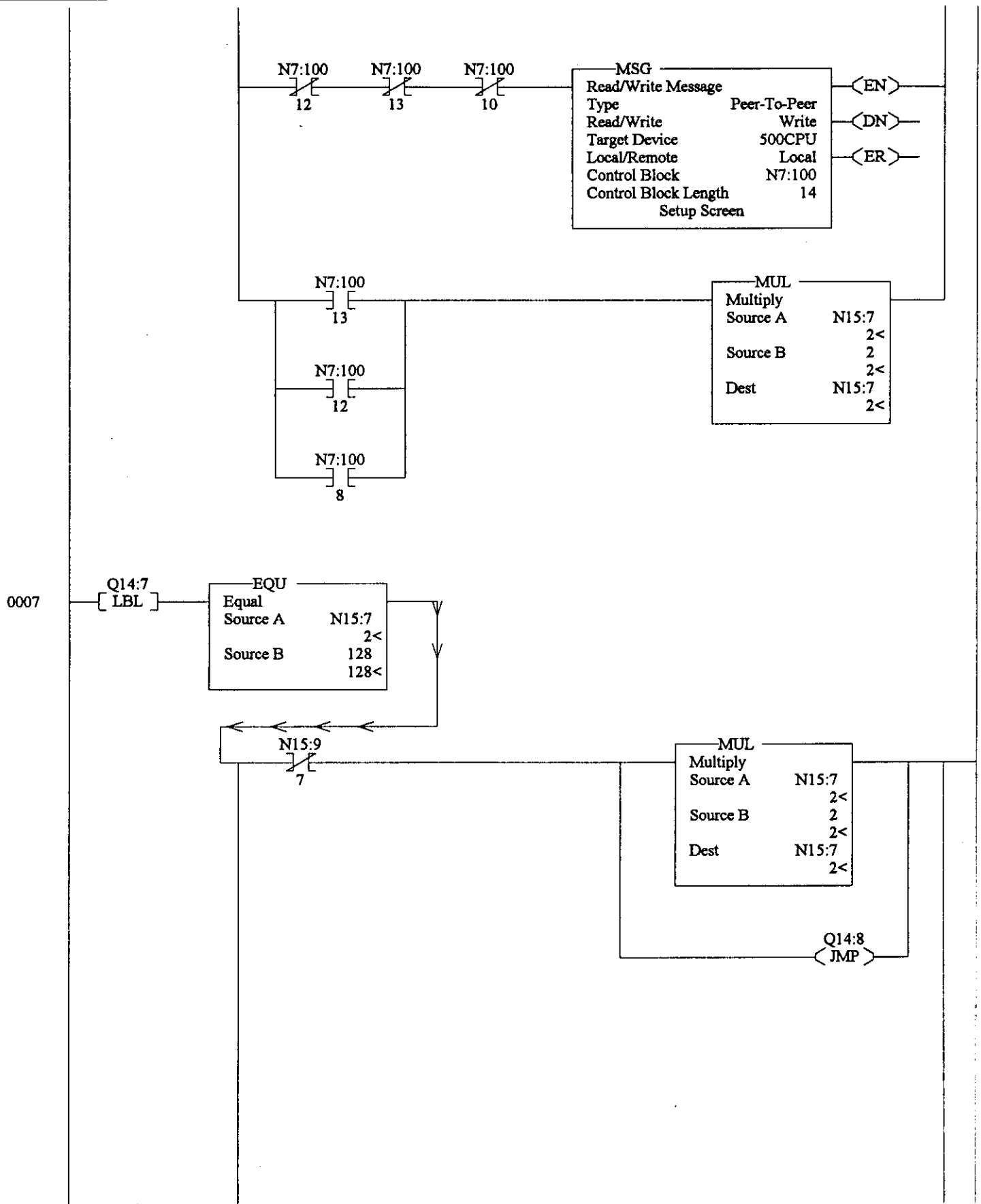
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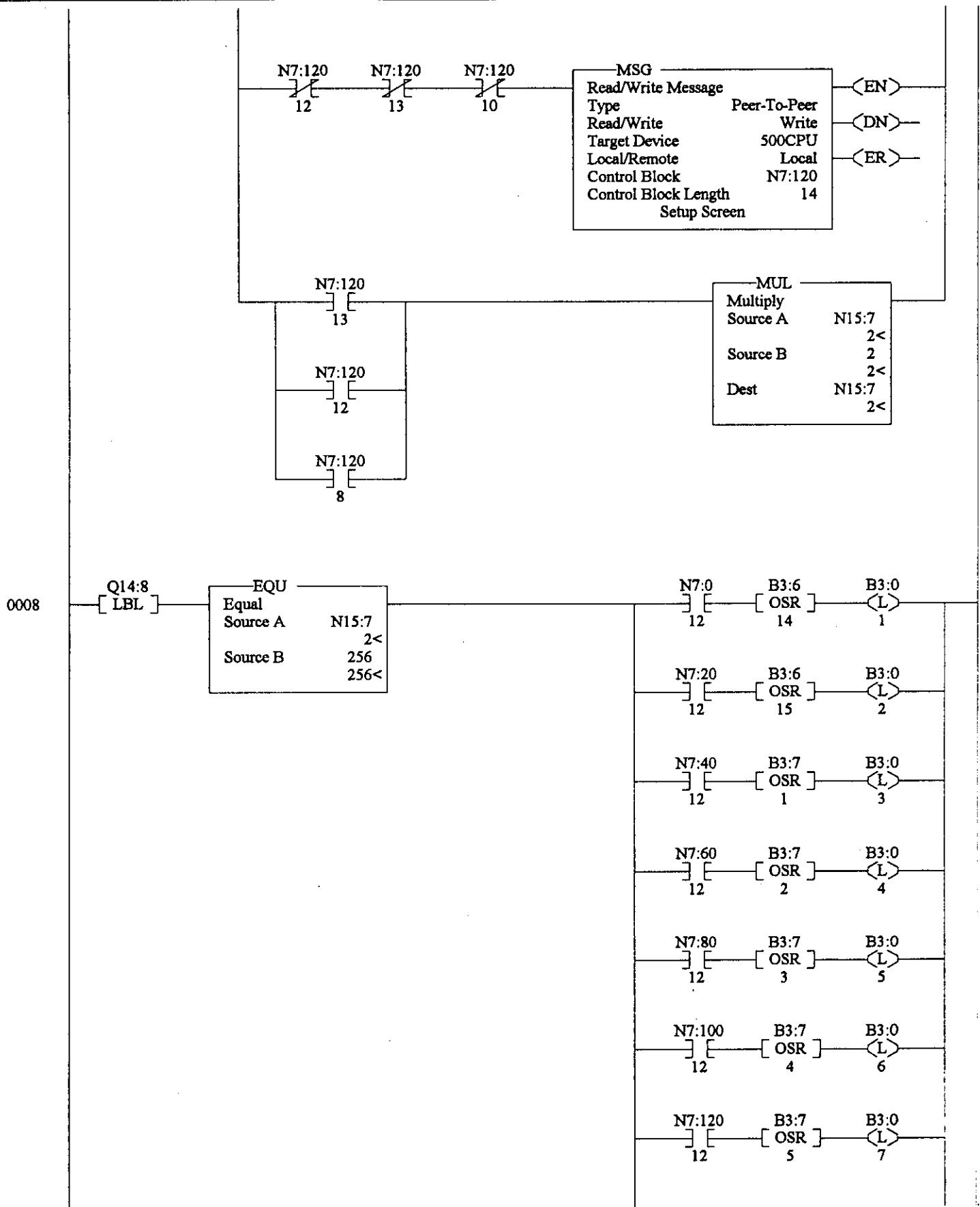
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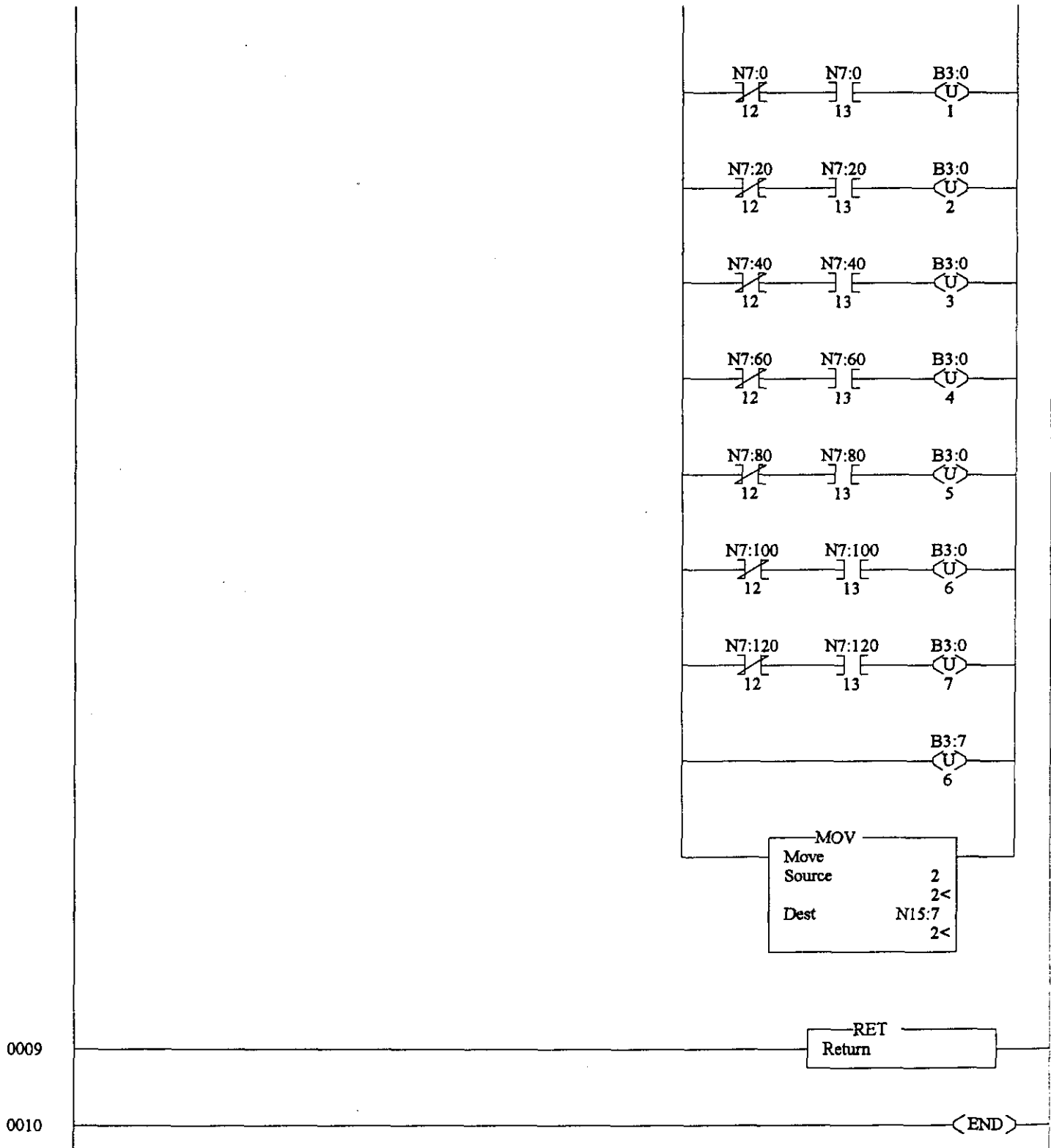
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LAD 14 - --- Total Rungs in File = 11

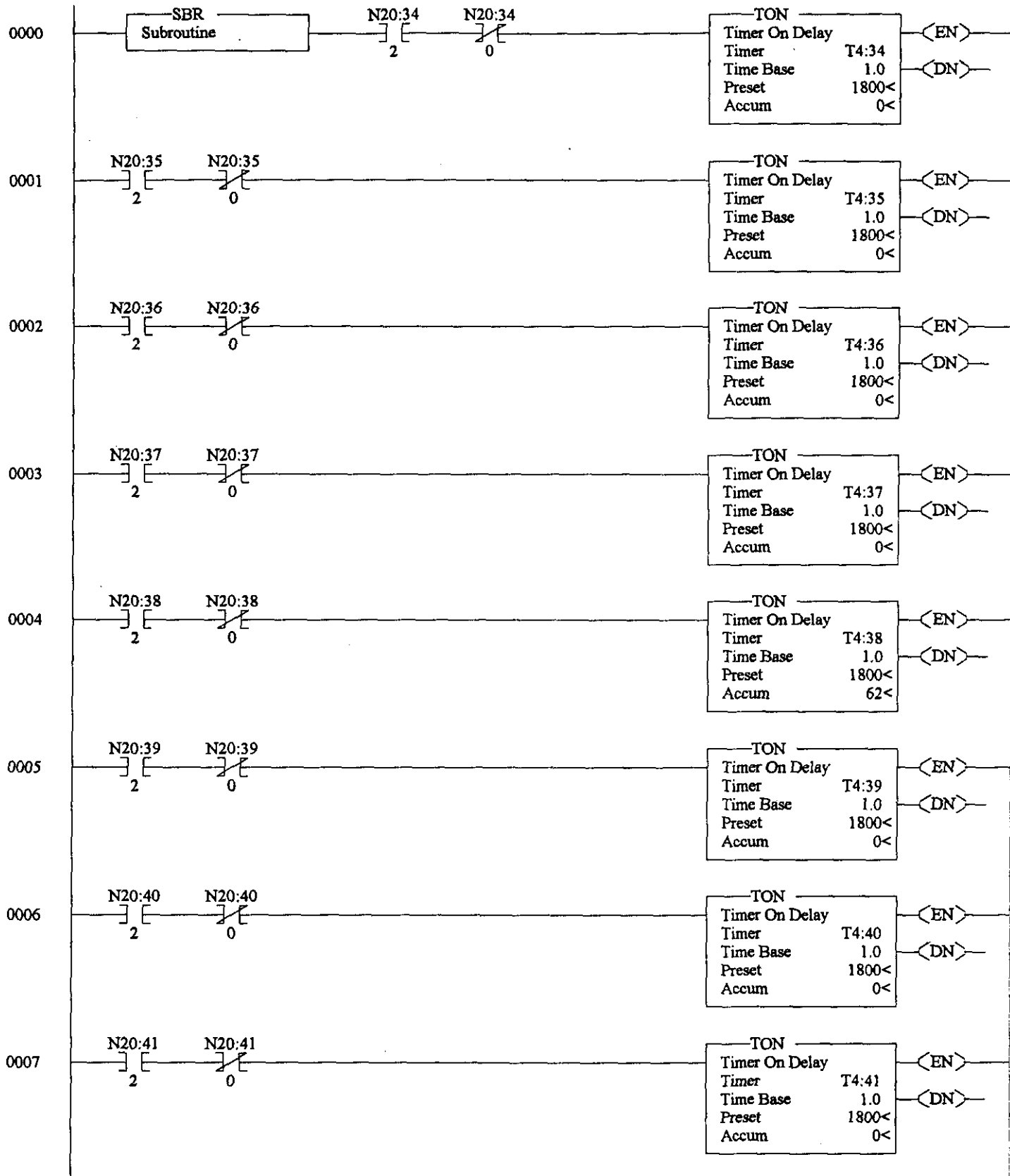


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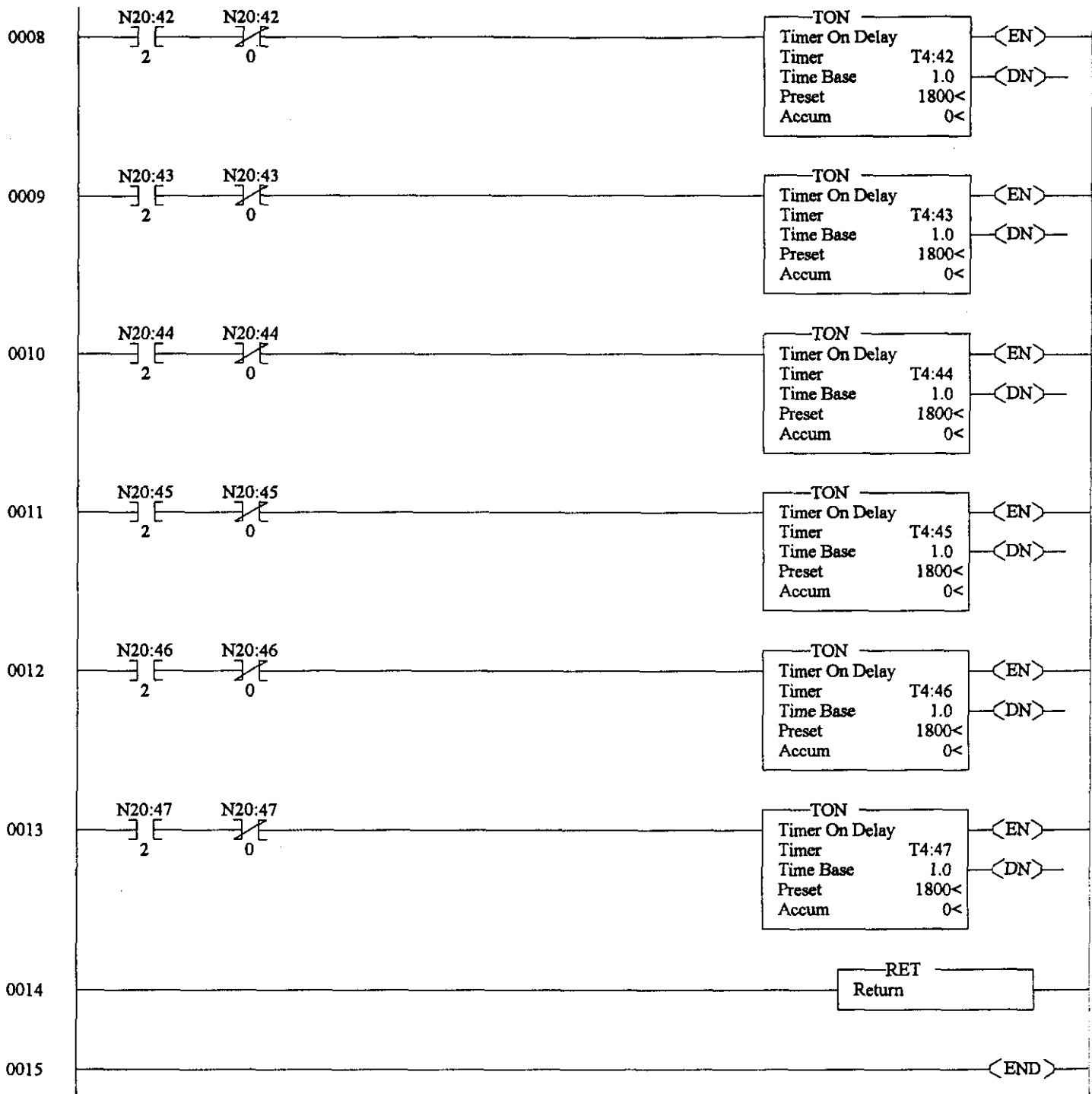




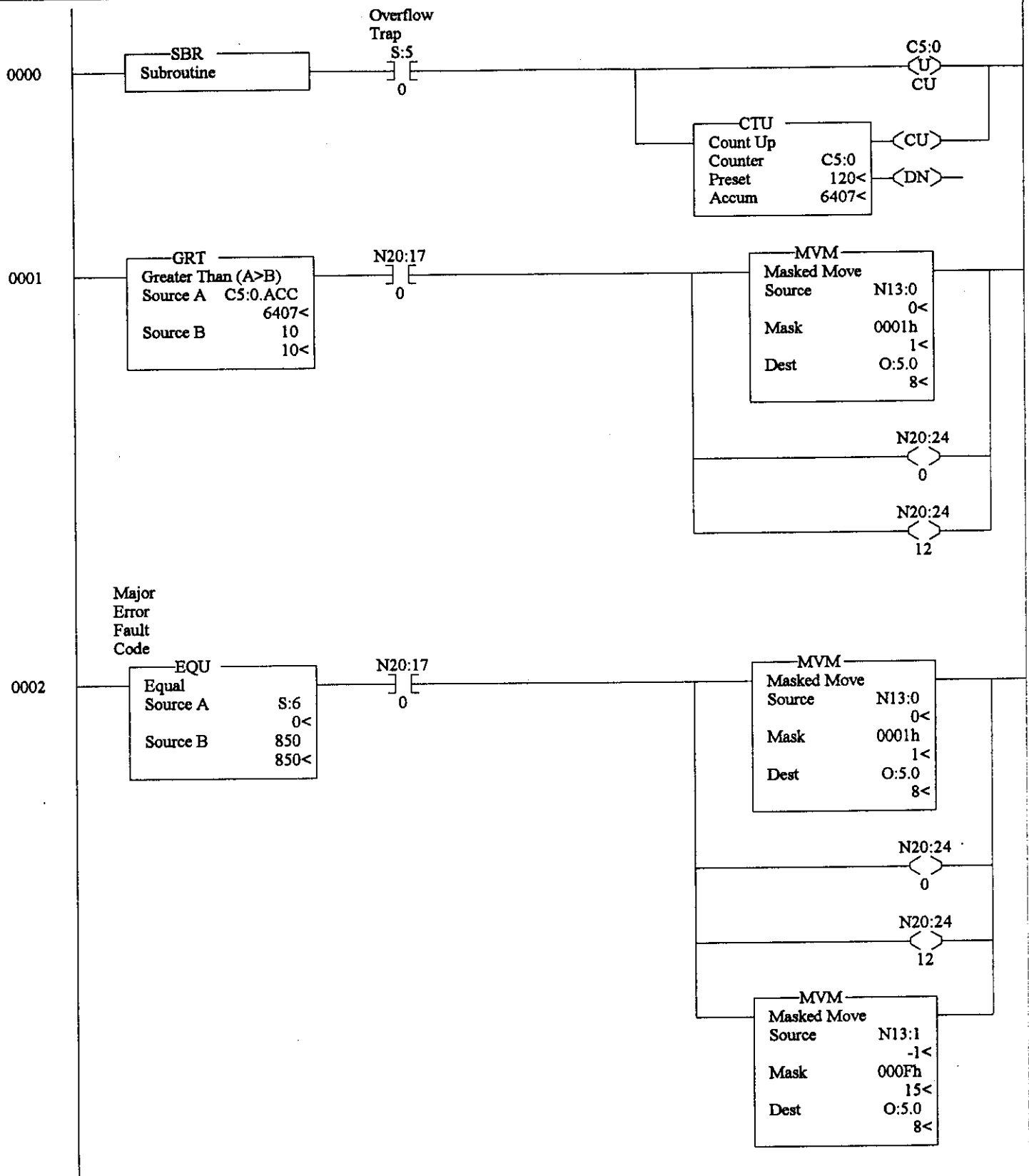
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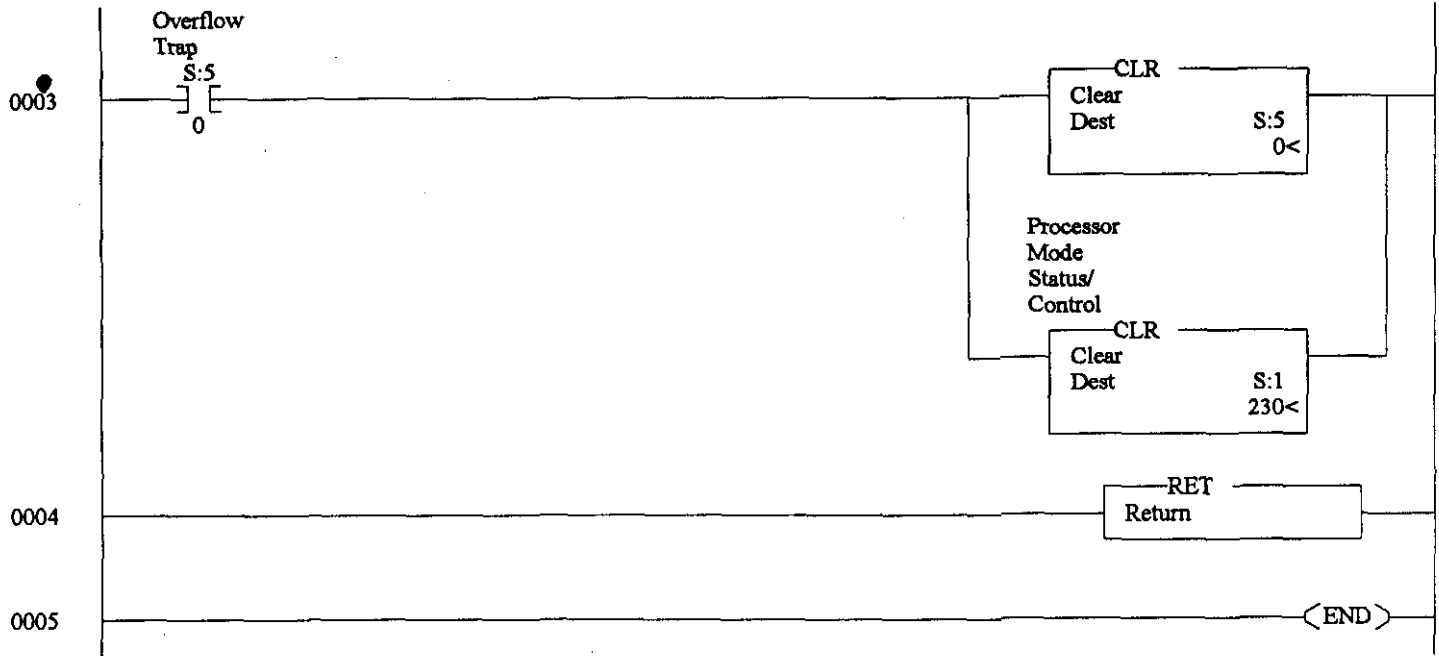
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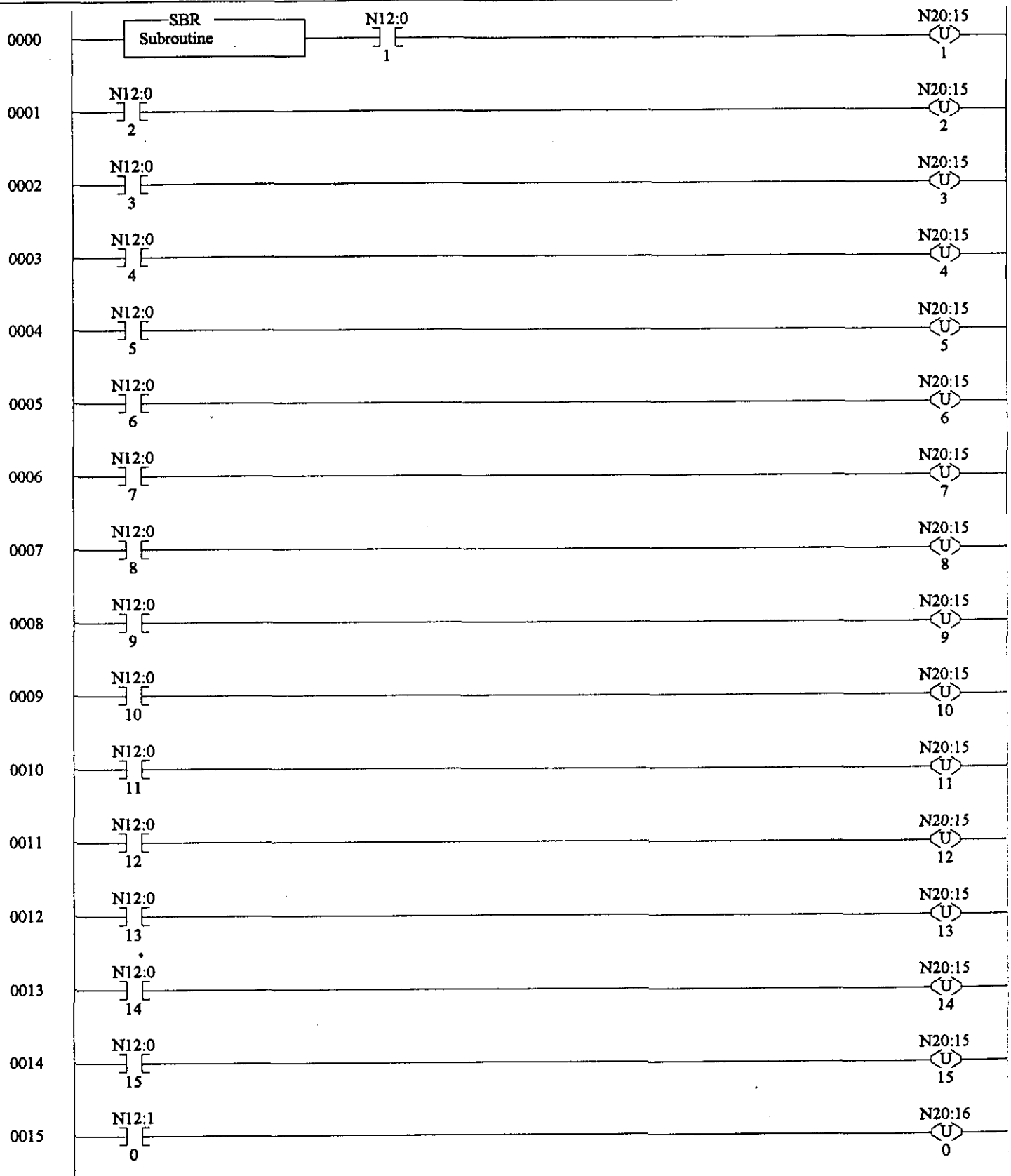
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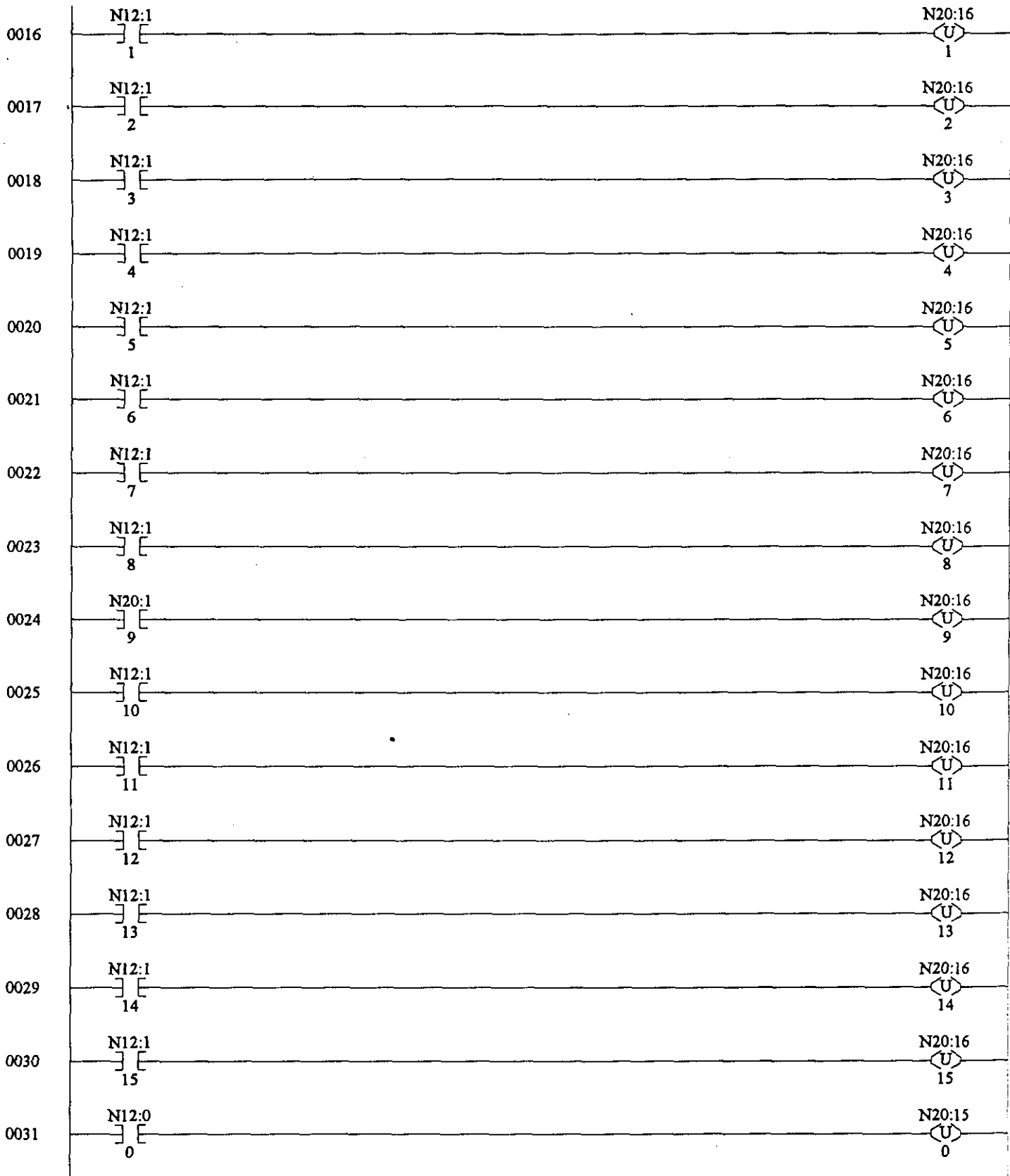
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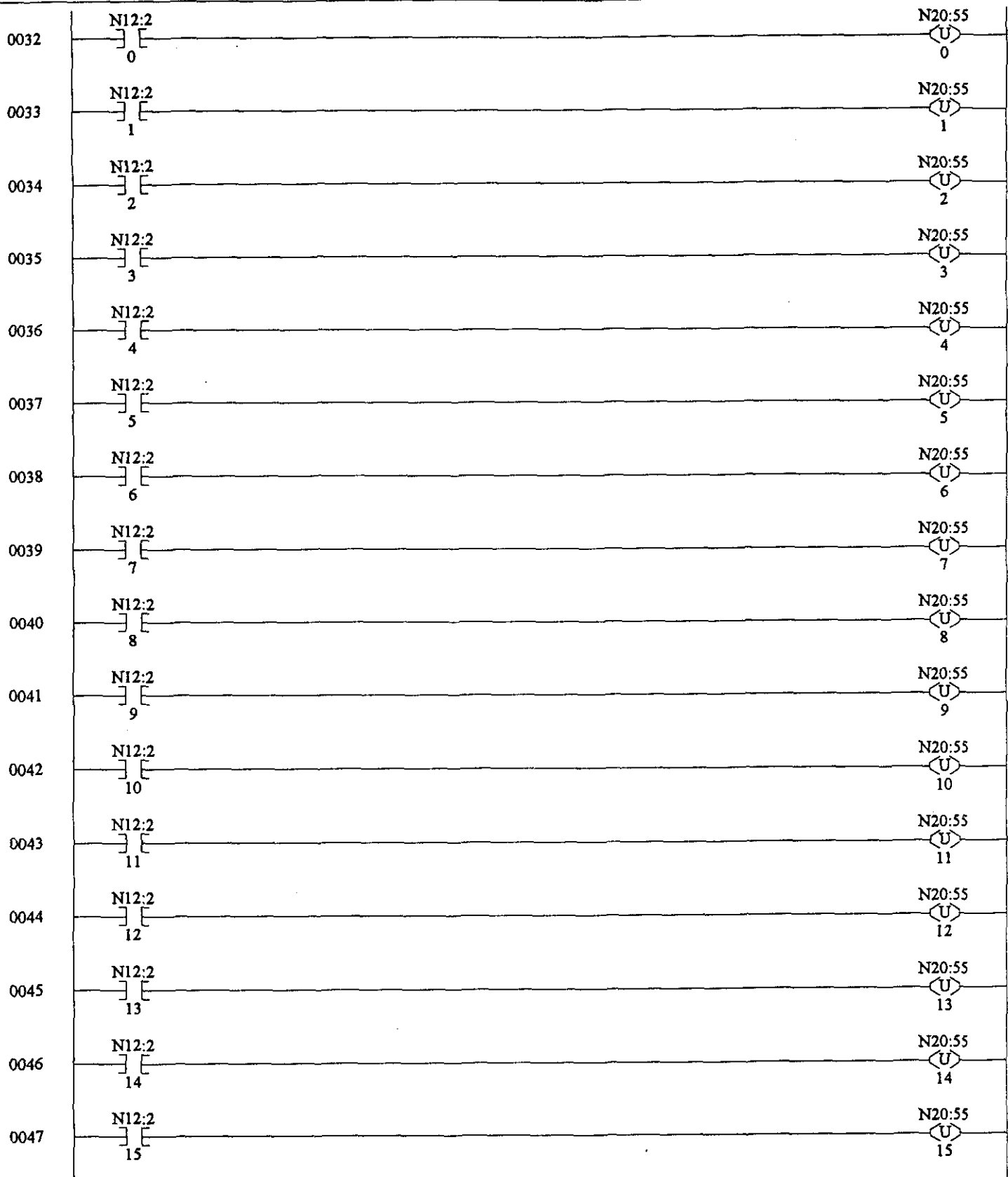
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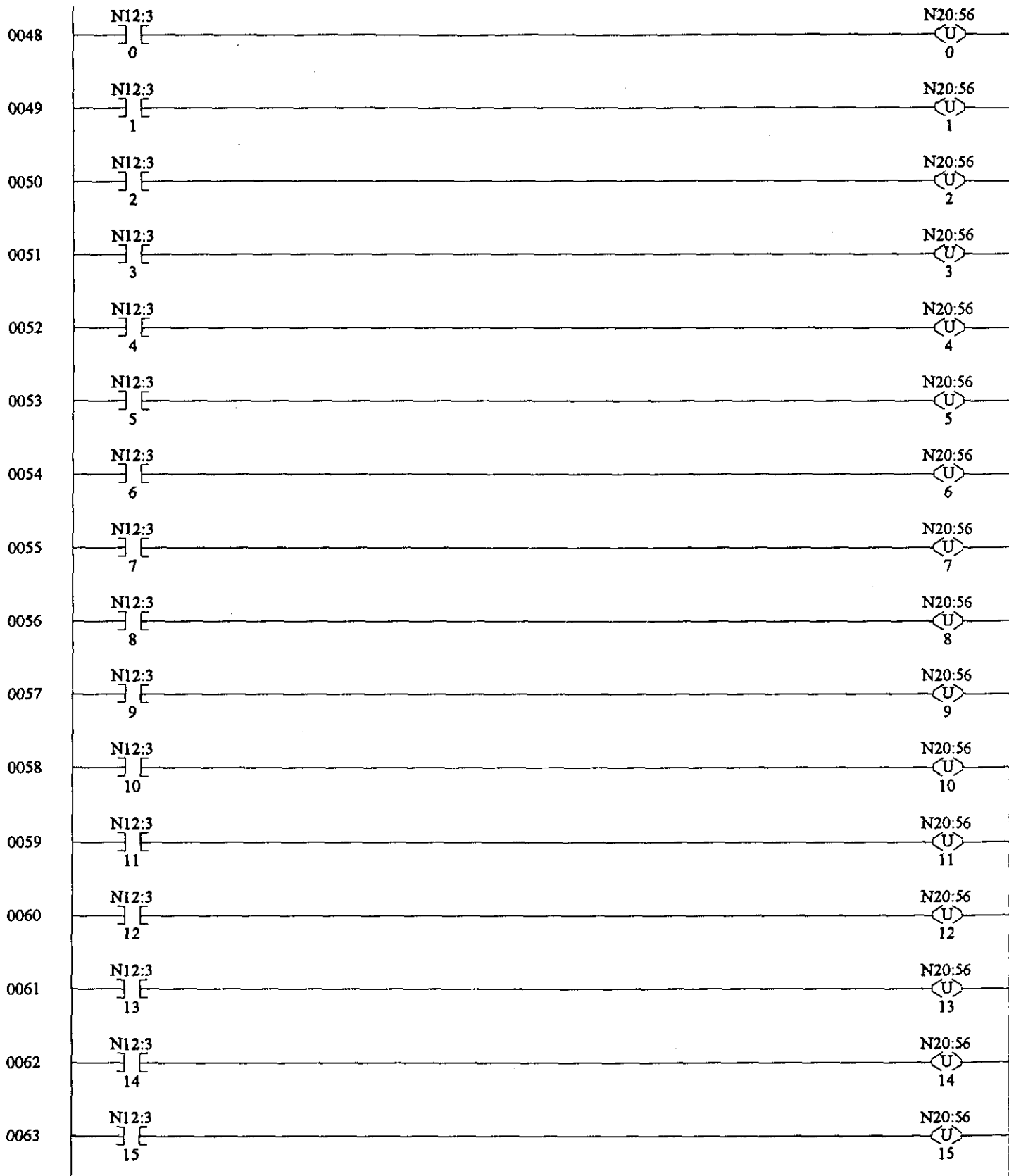
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LAD 17 - --- Total Rungs in File = 66

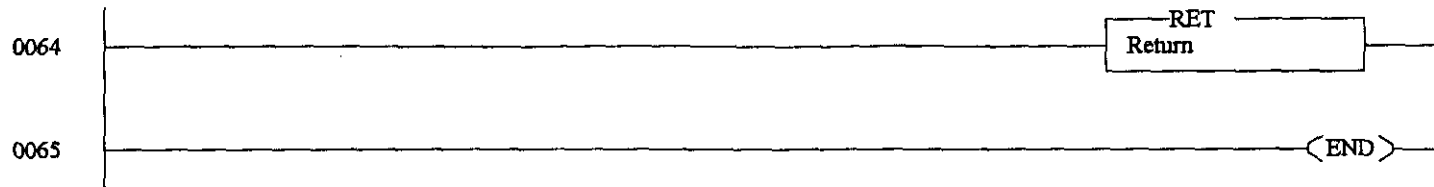


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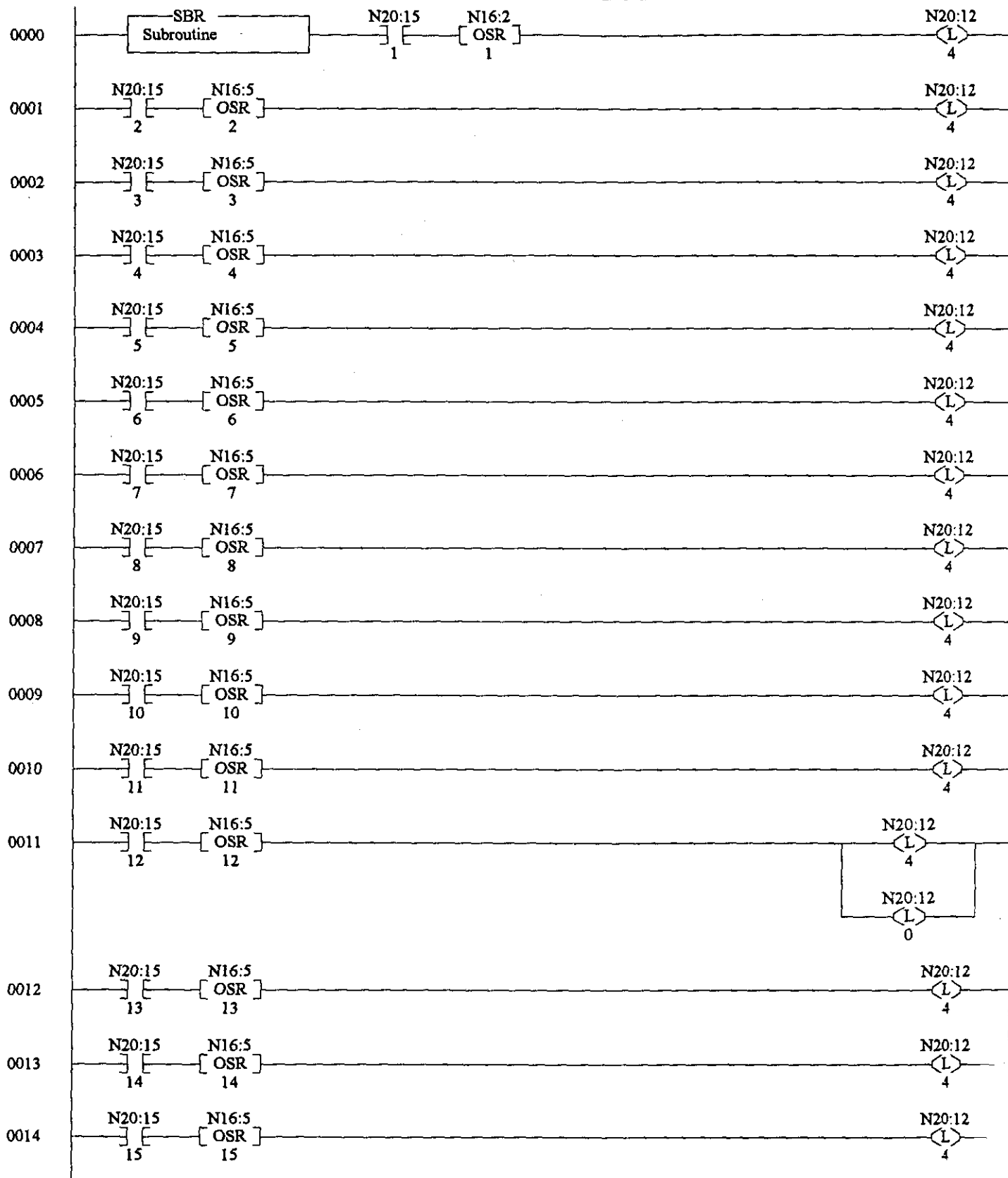




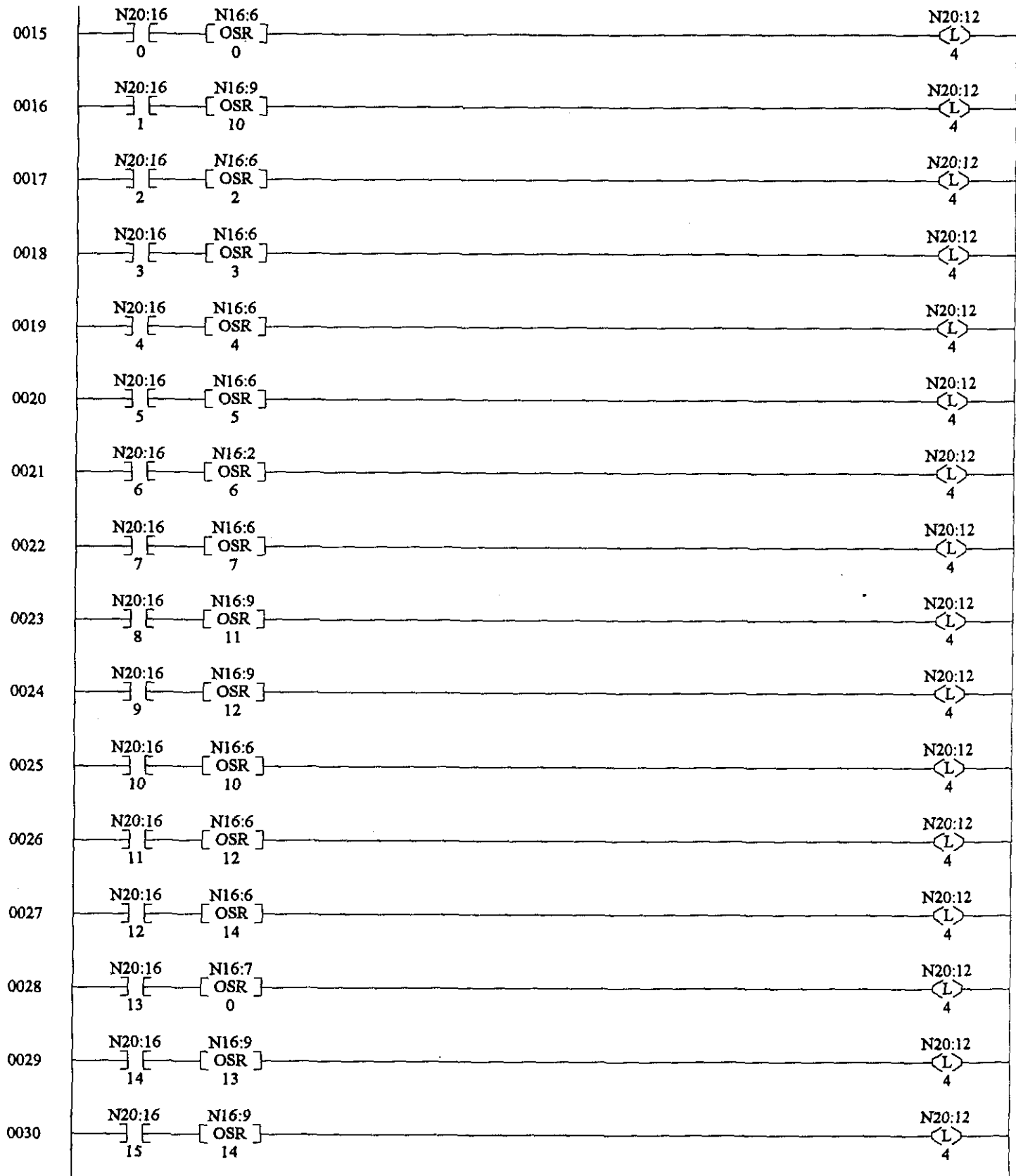
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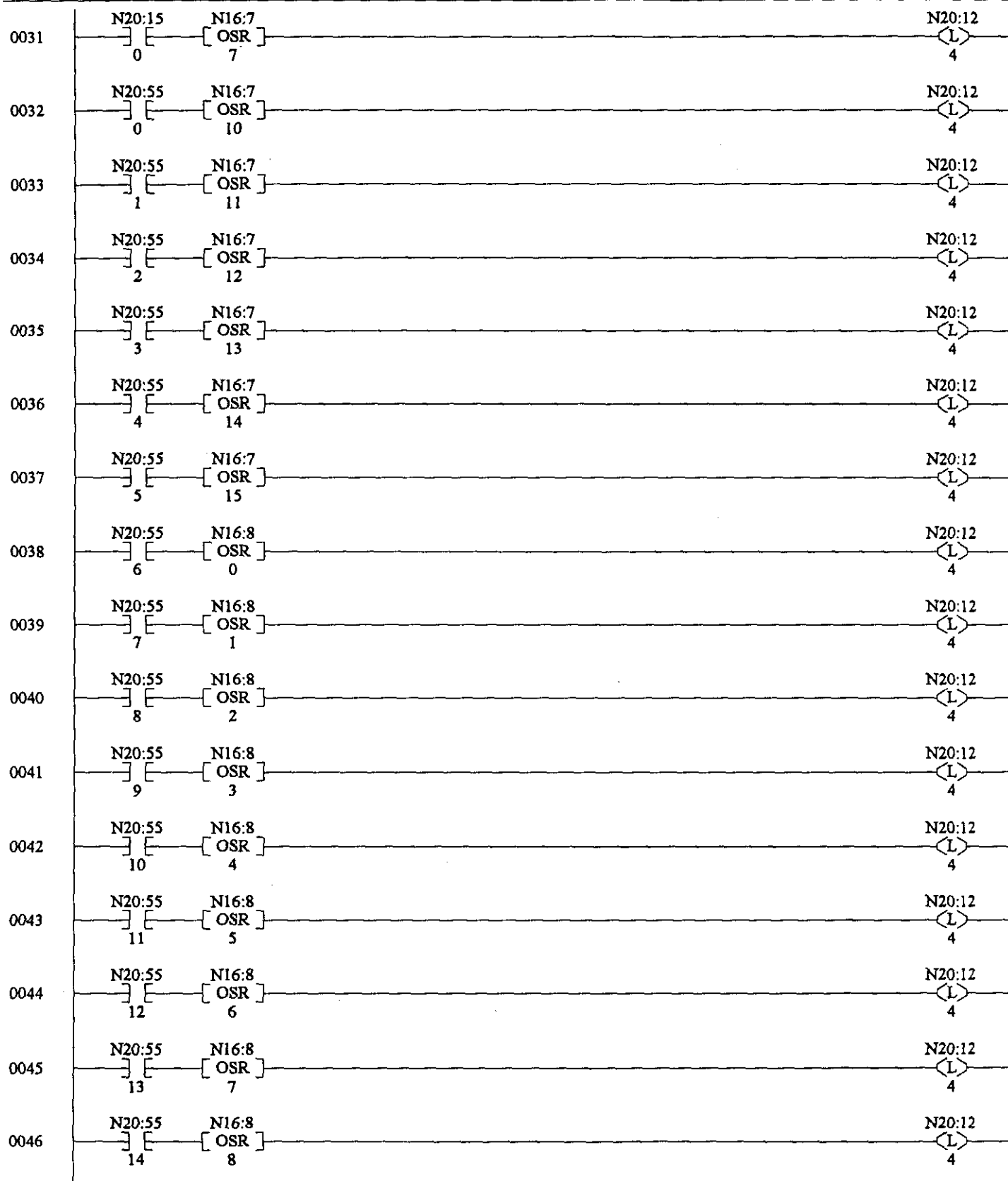
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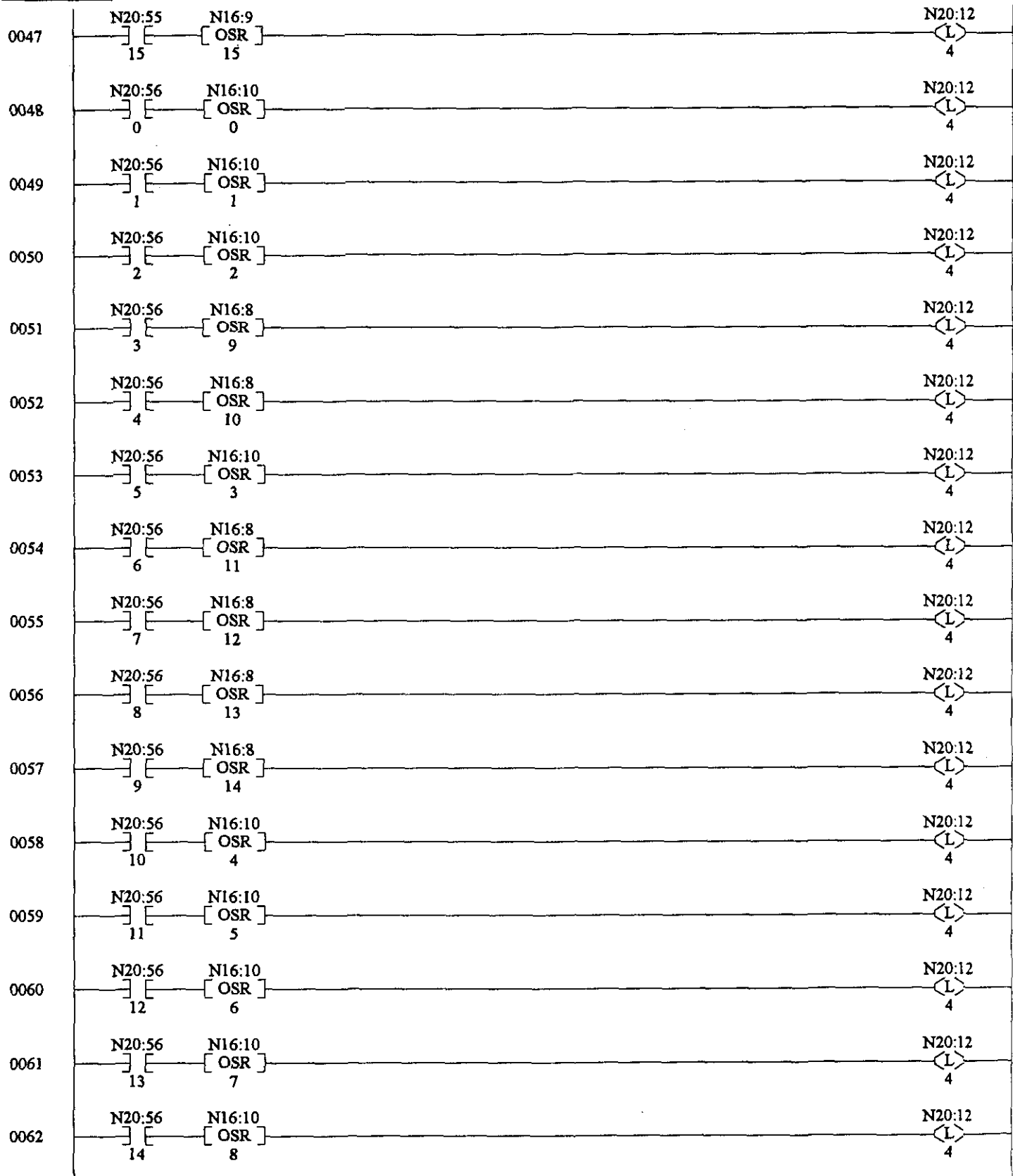
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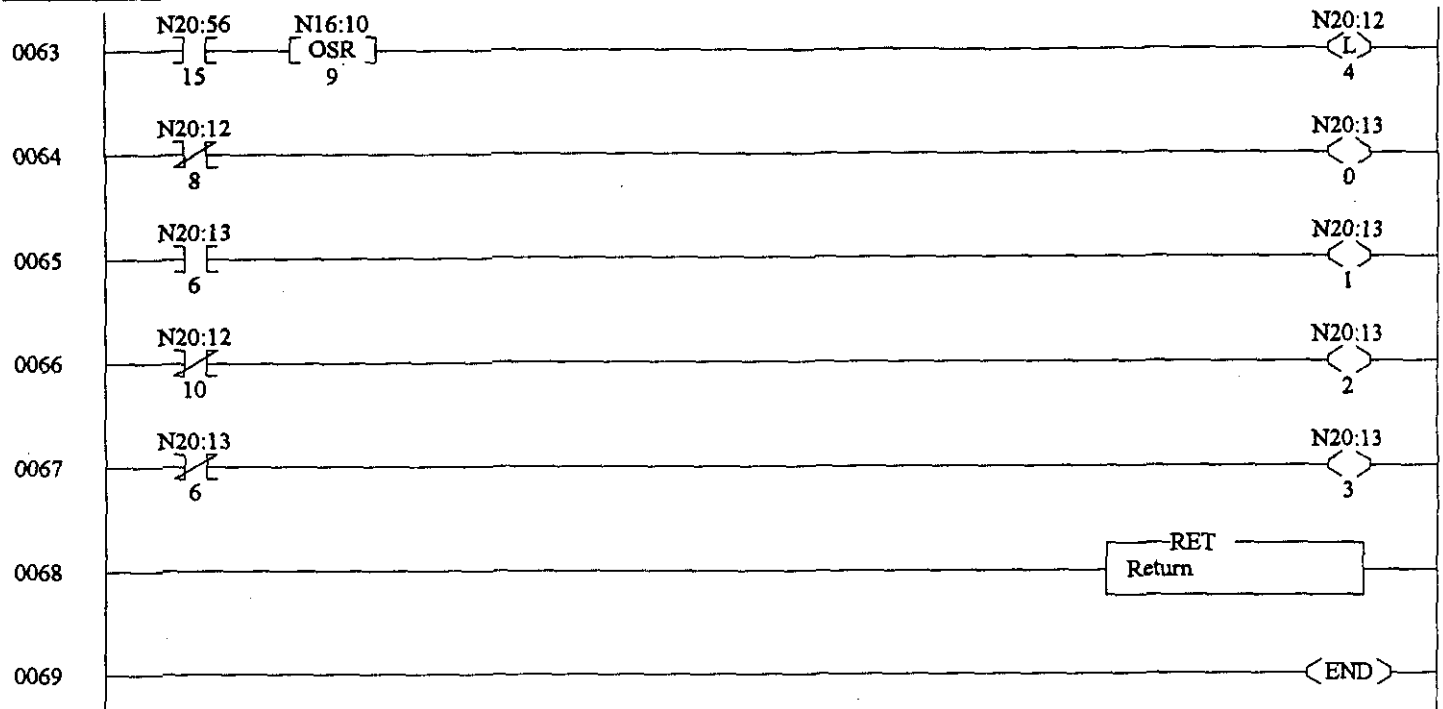
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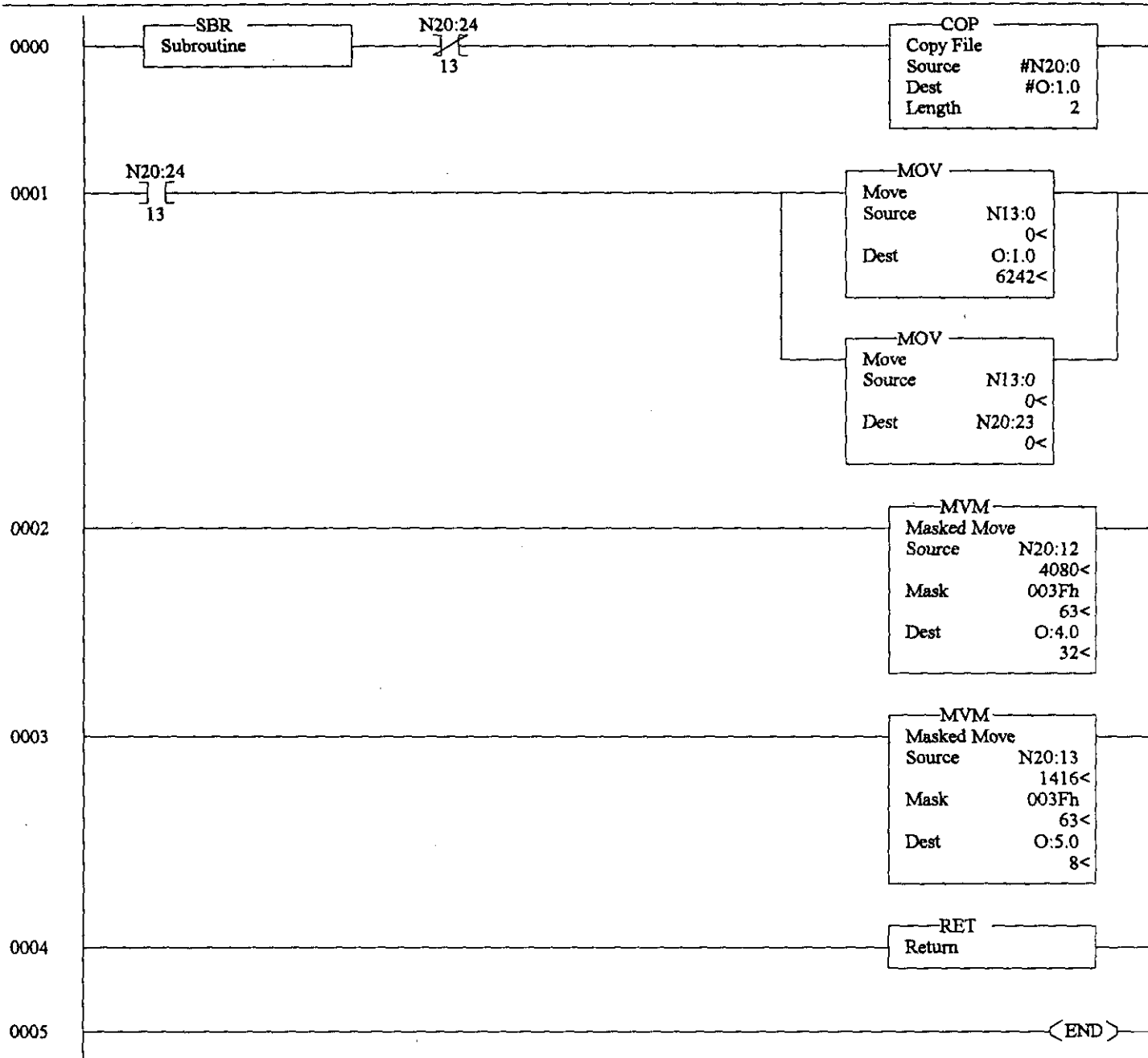
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LAD 18 - --- Total Rungs in File = 70



LAD 19 - --- Total Rungs in File = 6



term	sig	tag	move	description	Message		
O:1.0	AO	DOV	N20:0	DOV output			
O:1.1	AO	DILUTION	N20:1	Dilution control (future)			
I:1.0	AI	FGM	N20:2	FGM (analog)			
I:1.1	AI	Discharge	N20:3	Pump Discharge Pres (0-200psi)			
I:2.0	SGT	N20:4	N20:4	SGT specific grav 0-20 in H2O			
I:2.1	WFT	N20:5	N20:5	WFT weight factor tank 0-500 in H2O			
I:2.2	CVT	N20:6	N20:6	CVT flow meter (0 to 4 gpm)			
I:2.3	WTL	N20:7	N20:7	WTL water tank level 0-50 in H2O			
I:3.0	T/C	TE-8001A	N20:8	Instrument Enclosure Temp	Air Comper enclosr temp Hi		
I:3.1	T/C	TE-8001J	N20:9	Pump Temp			
I:3.2	T/C	TE-8002J	N20:10	Jumper Temp			
I:3.3	T/C	TE-8004A	N20:11	Instrument Cab Temp	Cmptr Enclsr tmp Hi		
O:4.0	DO	HORN	N20:12/0	Horn			
O:4.1	DO	DO-2	N20:12/1	Jumper Heat trace On	Self regulate heat trace		
O:4.2	DO	DO-3	N20:12/2	Jumper Heat trace Hi shutoff	Self regulate heat trace		
O:4.3	DO	SPARE	N20:12/3	spare			
O:4.4	DO	ST-1	N20:12/4	Strobe light			
O:4.5	DO	SPARE	N20:12/5	Spare			
I:4.0	DI	LS-1	N20:12/6	Limit switch 1 (LS-1)			
I:4.1	DI	LS-2	N20:12/7	JR-1 in flush Pos. (LS-2)			
I:4.2	DI	PS-1	N20:12/8	Lo Press xfer shut down			
I:4.3	DI	PS-1-1	N20:12/9	Hi Press xfer shut down			
I:4.4	DI	PS-2	N20:12/10	Hi Press flush shut down			
I:4.5	DI	REC-ALR	N20:12/11	Recirc Alarm			
O:5.0	DO	PL-1	N20:13/0	Light 1 LT-1			
O:5.1	DO	LN-1	N20:13/1	Light 3 LT-3			
O:5.2	DO	FPH-1	N20:13/2	Light 2 LT-2			
O:5.3	DO	XPH-1	N20:13/3	Light 4 LT-4			
O:5.4	DO	MS-1	N20:13/4	Pump motor switch On			
O:5.5	DO	SPARE	N20:13/5	SPARE			
I:5.0	DI	MR-1	N20:13/6	power monitor			
I:5.1	DI	LD-1	N20:13/7	Leak detector 1			
I:5.2	DI	LDC-1	N20:13/8	Leak detector trouble			
I:5.3	DI	SPARE	N20:13/9	Spare			
I:5.4	DI	Recer-prs	N20:13/10	Recerc Flush pressure alarm			
I:5.5	DI	FGM	N20:13/11	FGM			
I:6.0	AI	FGM2	N20:60	FGM (dome) analog			
I:6.1	AI	SPARE	N20:61				
I:6.2	AI	SPARE	N20:62				
I:6.3	AI	SPARE	N20:63				
		ALARM	ALARM ACKNOWLEDGE				DTAM
		1=alarm	1=ACK				1=Ack
		0=no alrm	0=NOT ACK				0=No ack
		N20:24/0	N20:15/0	(spare)	MPSD		N12:0/0
		N20:24/1	N20:15/1	PS-1 Low Press Xfer	PS-1	I:4.2	N12:0/1
		N20:24/2	N20:15/2	PS-1-1 HI Press Xfer	PS-1-1	I:4.3	N12:0/2
		N20:24/3	N20:15/3	PS-2 HI Press Flush	PS-2	I:4.4	N12:0/3
		N20:24/4	N20:15/4	Pump Trouble	PUMP PROBLEM	I:5.0/0	N12:0/4
		N20:24/5	N20:15/5	JR-1 in Flush	FLUSH	I:4.1	N12:0/5
		N20:24/6	N20:15/6	Pump pit Leak	Pump pit Leak	I:5.0/1	N12:0/6



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		N20:17/2	INTERLOCK	node 2=S102		
		N20:17/3	Sub interlock	node 3=EM-2		
				node 4=S103		
		N20:17/4	Heater On	node 5=5X104		
		N20:17/5	Clear Counter	node 6=5X106		
		N20:17/6	auto/manual	node 7=S106		
		N20:17/7	SIMULATE	node 8=Leak dect station#2, s farm		
				node 9=Leak dect station#3, sx farm		
		N20:17/8	Send Message	node 10=Leak dect station#1, s farm		
		N20:17/9				
		N20:17/10	Master Acknowledge			
		N20:17/11	Transmit Trouble			
		N20:17/12	Retry Message			
		N20:17/13				
		N20:17/14				
		N20:17/15	Reset Counter			
	N10:2	N20:18	PID SET POINT			
	N10:3	N20:19	PID GAIN			
	N10:4	N20:20	PID RESET			
	N10:5	N20:21	PID RATE			
	N10:28	N20:22	PROCESS VARIABLE			
	N10:28	N20:23	PID OUTPUT			
	N10:13	N20:26	LOOP UPDATE			
	S:9	N20:27	STATION ON DH485			
	S:10		Watch for Exhaust skid			
	N15:0	N20:28				
	N15:5	N20:29				
	C5:1.ACC	N20:30	TOTAL 1			
	C5:2.ACC	N20:31	TOTAL 2			
		N20:32/0	PRIME			
		N20:32/1	FLUSH			
		N20:32/2	SHUTDOWN			
		N20:32/3	LEAK1			
		N20:32/4	LEAK2			
		N20:32/5	Hi Press Flush			
		N20:32/6	Hi Press Recirc			
		N20:32/7				
		N20:32/8				
		N20:32/9				
		N20:32/10				
		N20:32/11				
		N20:32/12				
		N20:32/13				
		N20:32/14				
		N20:32/15				
			242S SLC NODE #1			
		N20:33/0				
		N20:33/1				
		N20:33/2				
		N20:33/3				
		N20:33/4	MASTER PUMP SHUTDOWN			
		N20:33/5	Leak Station Trouble (Station2 node 8)			
		N20:33/6	Leak Station Trouble (Station3 node 9)			
		N20:33/7	Leak Station Trouble (station1 node 10)			
		N20:33/8	SY Leak	sy-02a input 0		
		N20:33/9		sy-b input 1		
		N20:33/10		sy-a input 5		
		N20:33/11				
		N20:33/12				
		N20:33/13				
		N20:33/14				
		N20:33/15				

			S-102 SLC NODE #2			
		N20:34/0	NODE #2 PRIME			
		N20:34/1	NODE #2 FLUSH			
		N20:34/2	NODE #2 SHUTDOWN			
		N20:34/3	NODE #2 LEAK 1			
		N20:34/4	NODE #2 LEAK 2			
		N20:34/5	Node #2 Hi Press Flush			
		N20:34/6	Node #2 Hi Press Recirc			
		N20:34/7				
		N20:34/8				
		N20:34/9				
		N20:34/10				
		N20:34/11				
		N20:34/12				
		N20:34/13				
		N20:34/14				
		N20:34/15				
			EM-2 SLC NODE #3			
		N20:35/0	NODE #3 PRIME			
		N20:35/1	NODE #3 FLUSH			
		N20:35/2	NODE #3 SHUTDOWN			
		N20:35/3	NODE #3 LEAK 1			
		N20:35/4	NODE #3 LEAK 2			
		N20:35/6				
		N20:35/7				
		N20:35/8				
		N20:35/9				
		N20:35/10				
		N20:35/11				
		N20:35/12				
		N20:35/13				
		N20:35/14				
		N20:35/15				
			S-103 NODE #4			
		N20:36/0	NODE #4 PRIME			
		N20:36/1	NODE #4 FLUSH			
		N20:36/2	NODE #4 SHUTDOWN			
		N20:36/3	NODE #4 LEAK1			
		N20:36/4	NODE #4 LEAK 2			
		N20:36/5	Node #4 Hi Press Flush			
		N20:36/6	Node #4 Hi Press Recirc			
		N20:36/7				
		N20:36/8				
		N20:36/9				
		N20:36/10				
		N20:36/11				
		N20:36/12				
		N20:36/13				
		N20:36/14				
		N20:36/15				
			SX-104 NODE #5			
		N20:37/0	NODE #5 PRIME			
		N20:37/1	NODE #5 FLUSH			
		N20:37/2	NODE #5 SHUTDOWN			
		N20:37/3	NODE #5 LEAK 1			
		N20:37/4	NODE #5 LEAK 2			
		N20:37/5	Node #5 Hi Press Flush			
		N20:37/6	Node #5 Hi Press Recirc			
		N20:37/7				
		N20:37/8				
		N20:37/9				
		N20:37/10				

			N20:37/11			
			N20:37/12			
			N20:37/13			
			N20:37/14			
			N20:37/15			
			N20:37/16			
			N20:37/17			
				SX-106 NODE #8		
			N20:38/0	NODE #8 PRIME		
			N20:38/1	NODE #8 FLUSH		
			N20:38/2	NODE #8 SHUTDOWN		
			N20:38/3	NODE #8 LEAK 1		
			N20:38/4	NODE #8 LEAK 2		
			N20:38/5	Node #8 Hi Press Flush		
			N20:38/6	Node #8 Hi Press Recirc		
			N20:38/7			
			N20:38/8			
			N20:38/9			
			N20:38/10			
			N20:38/11			
			N20:38/12			
			N20:38/13			
			N20:38/14			
			N20:38/15			
				S-106 NODE #7		
			N20:39/0	NODE #7 PRIME		
			N20:39/1	NODE #7 FLUSH		
			N20:39/2	NODE #7 SHUTDOWN		
			N20:39/3	NODE #7 LEAK 1		
			N20:39/4	NODE #7 LEAK 2		
			N20:39/5	Node #7 Hi Press Flush		
			N20:39/6	Node #7 Hi Press Recirc		
			N20:39/7			
			N20:39/8			
			N20:39/9			
			N20:39/10			
			N20:39/11			
			N20:39/12			
			N20:39/13			
			N20:39/14			
			N20:39/15			
				241S Leak detector station NODE #8		
			N20:48/0	SC Valve Pit Leak (input 0)		
			N20:48/1	SC Valve Pit Leak Trouble (input 1)		
			N20:48/2	SD Valve Pit/OGT Leak (input 2)		
			N20:48/3	SD Valve Pit/OGT Trouble (input 3)		
			N20:48/4	COB (odd) Leak (input 4)		
			N20:48/5	COB (odd) Trouble (input 5)		
			N20:48/6	S107 Leak (input 6)		
			N20:48/7	S107 Leak Trouble (input 7)		
			N20:48/8			
			N20:48/9			
			N20:48/10			
			N20:48/11			
			N20:48/12			
			N20:48/13			
			N20:48/14			
			N20:48/15			
				241SX Leak detector station NODE #9		
			N20:49/0	SX-A Leak (input 0)		
			N20:49/1	SX-A Leak trouble (input 1)		
			N20:49/2	SX-B Leak (input 2)		

		N20:49/3	SX-B Leak trouble (input 3)			
		N20:49/4	Cob #16,18,20,22 Leak (input 6)			
		N20:49/5	Cob #16,18,20,22 Leak trouble (input 7)			
		N20:49/6				
		N20:49/7				
		N20:49/8				
		N20:49/9				
		N20:49/10				
		N20:49/11				
		N20:49/12				
		N20:49/13				
		N20:49/14				
		N20:49/15				
			Leak Detector Station 4 NODE #10			
		N20:50/0	SA valve pit LEAK (input 0)			
		N20:50/1	SA valve pit TROUBLE (input 1)			
		N20:50/2	SB valve pit LEAK (input 2)			
		N20:50/3	SB valve pit TROUBLE (input 3)			
		N20:50/4	OGT (SBvp) LEAK (input 4)			
		N20:50/5	OGT (SBvp) TROUBLE (input 5)			
		N20:50/6				
		N20:50/7				
		N20:50/8				
		N20:50/9				
		N20:50/10				
		N20:50/11				
		N20:50/12				
		N20:50/13				
		N20:50/14				
		N20:50/15				

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