


2. To: (Receiving Organization) DISTRIBUTION	3. From: (Originating Organization) F. M. Maiden	4. Related EDT No.: N/A
5. Proj./Prog./Dept./Div.: Interim Stabilization	6. Design Authority/Design Agent/Cog. Engr.: W. F. Zuroff/J. Lamphere	7. Purchase Order No.: N/A
8. Originator Remarks: Transmitted for release of the S-102 Skid "E" 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).		9. Equip./Component No.: N/A
		10. System/Bldg./Facility: Single Shell Tank Farm
		12. Major Assem. Dwg. No.: N/A
		13. Permit/Permit Application No.: N/A
11. Receiver Remarks:	11A. Design Baseline Document? <input checked="" type="radio"/> Yes <input type="radio"/> No	14. Required Response Date: N/A

[illegible]

18. 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	

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

18.	19.	20.	21. DOE APPROVAL (if required)
 <u>FM Maiden</u> Signature of EDT Originator	<u>with mail</u> <u>MR Koch</u> Authorized Representative for Receiving Organization	<u>with mail</u> <u>MR Koch</u> Design Authority/ Cognizant Manager	Ctri No. _____ <input type="radio"/> Approved <input type="radio"/> Approved w/comments <input type="radio"/> Disapproved w/comments
<u>3/2/00</u> Date	<u>3/14/00</u> Date	<u>3/14/00</u> Date	

PLC SOFTWARE PROGRAM FOR S-102 PUMPING, INSTRUMENTATION AND CONTROL (PIC) SKID "E"

Mike Koch

Prepared by CH2MHILL Hanford Group, Inc.

Richland, WA 99352

U.S. Department of Energy Contract DE-AC06-99RL14047

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UC: 500

Cost Center: 47D00

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Total Pages: 67

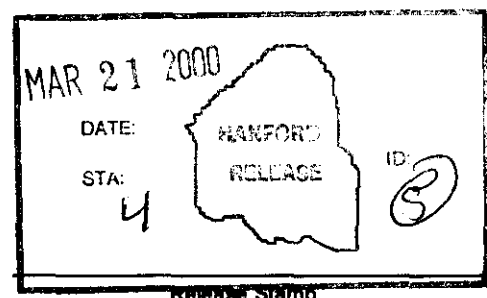
Key Words: S-102, SALT WELL, SOFTWARE, LADDER DIAGRAM, PLC, SKID,
INTERIM STABILIZATION, PIC

Abstract: This document is a printout of the S-102 software for the Programmable Logic Controller (PLC) for Pumping, Instrumentation and Control Skid "E".

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Release Approval Date



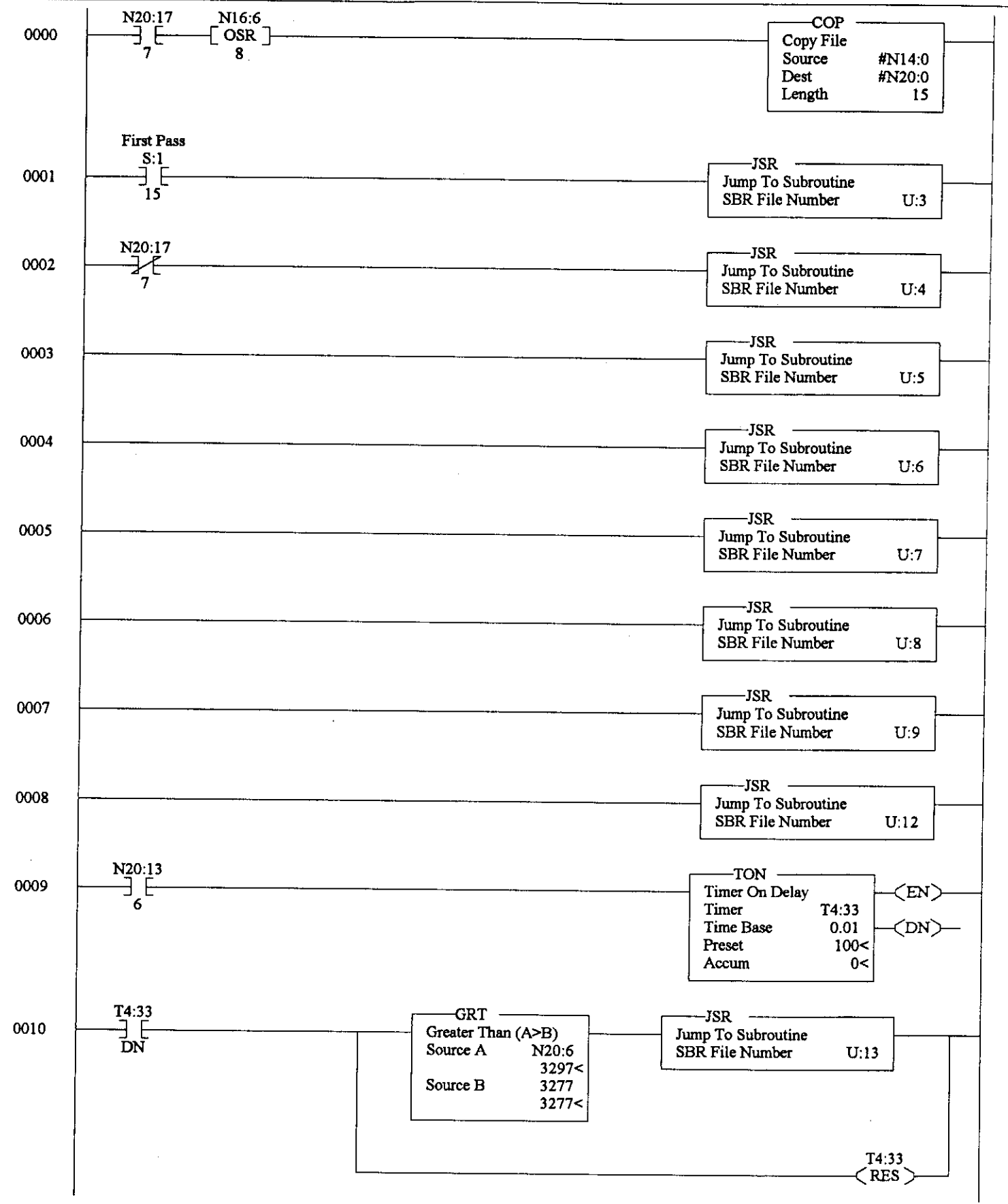
Approved For Public Release

S102NEW.RSS

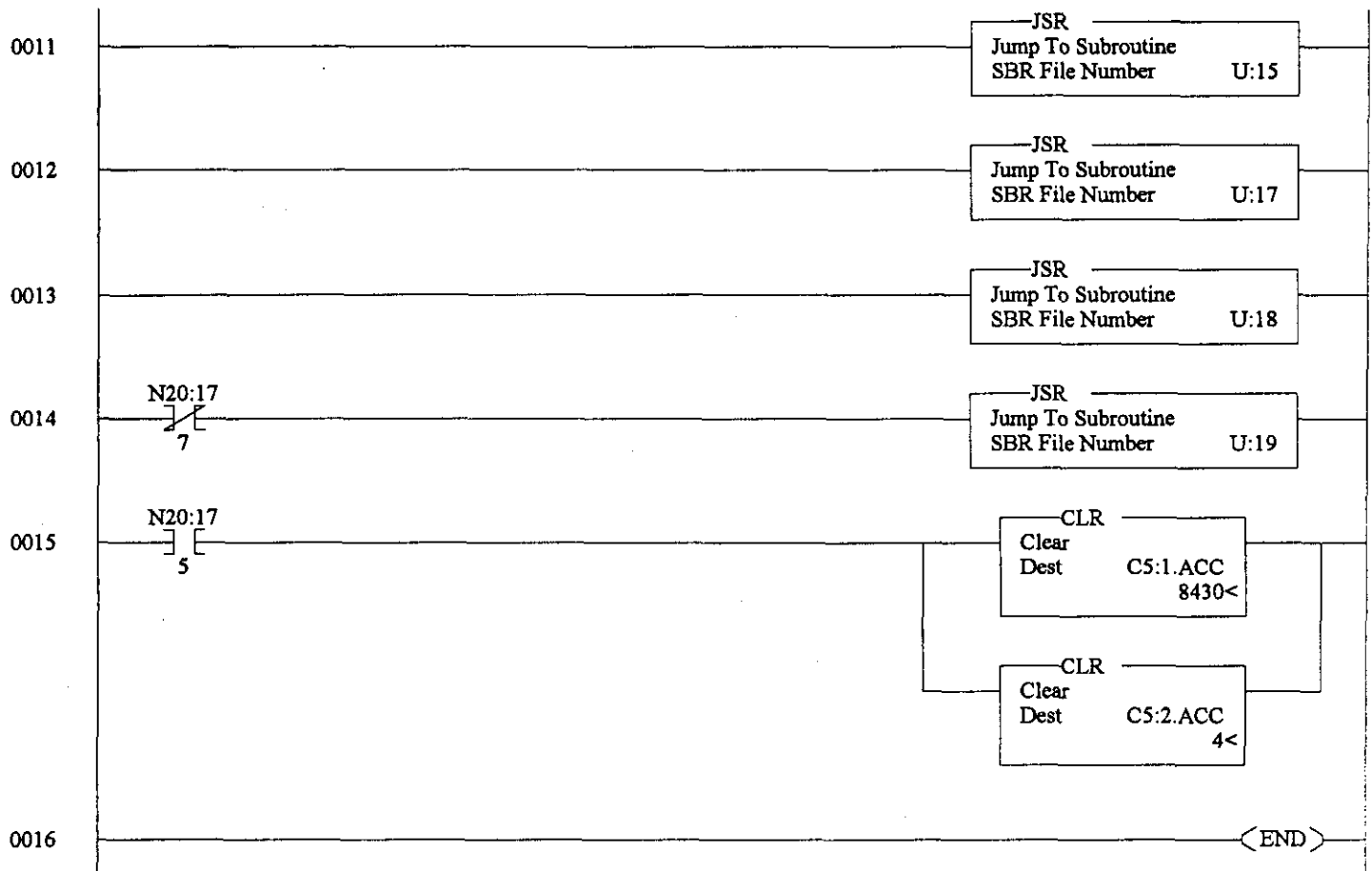
Program File List

Name	Number	Type	Rungs	Debug	Bytes
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	1	SYS	0	No	0
	2	LADDER	17	No	254
	3	LADDER	16	No	344
	4	LADDER	6	No	275
	5	LADDER	119	No	3618
	6	LADDER	7	No	353
	7	LADDER	20	No	477
	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	7	No	139

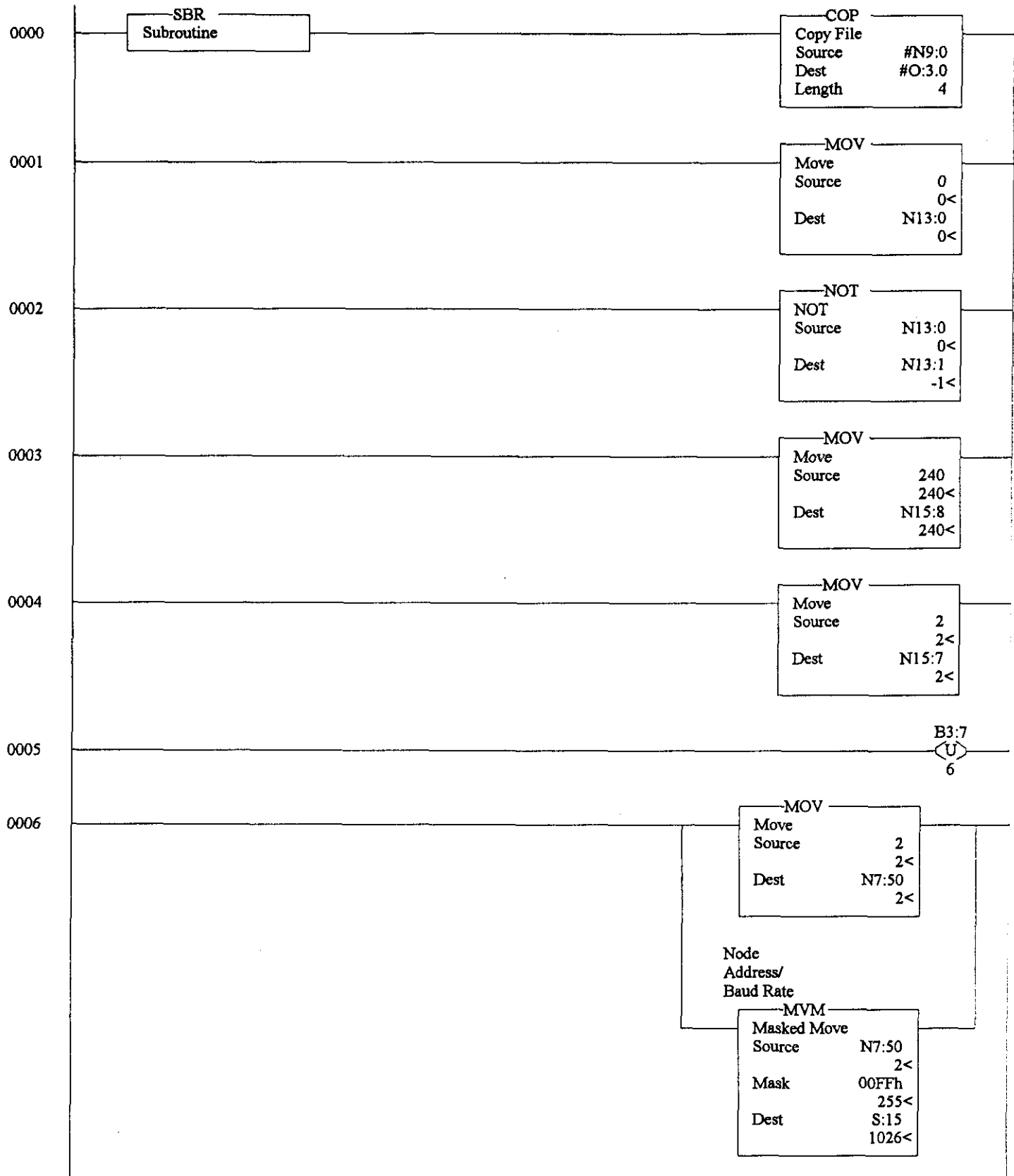
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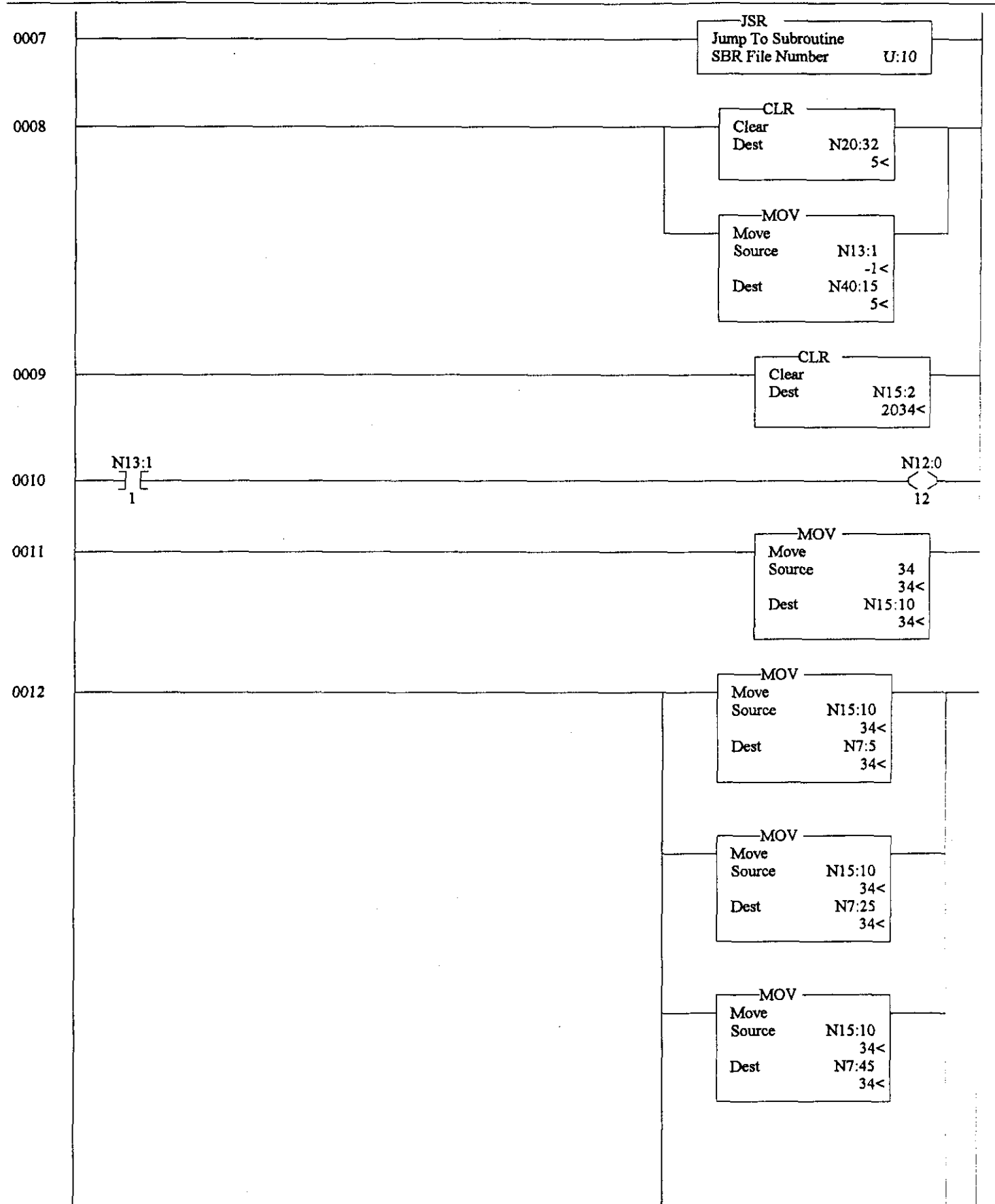
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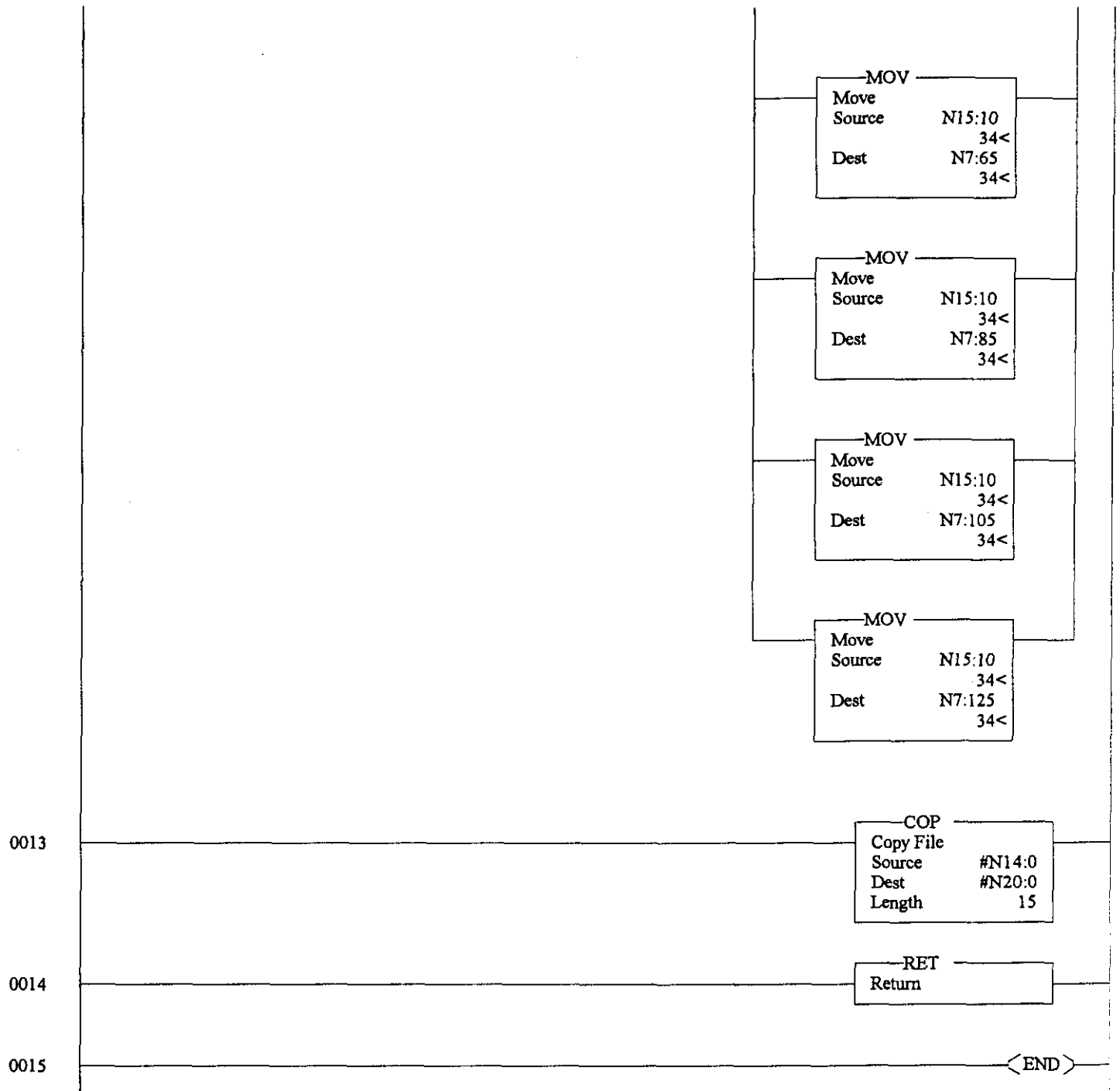
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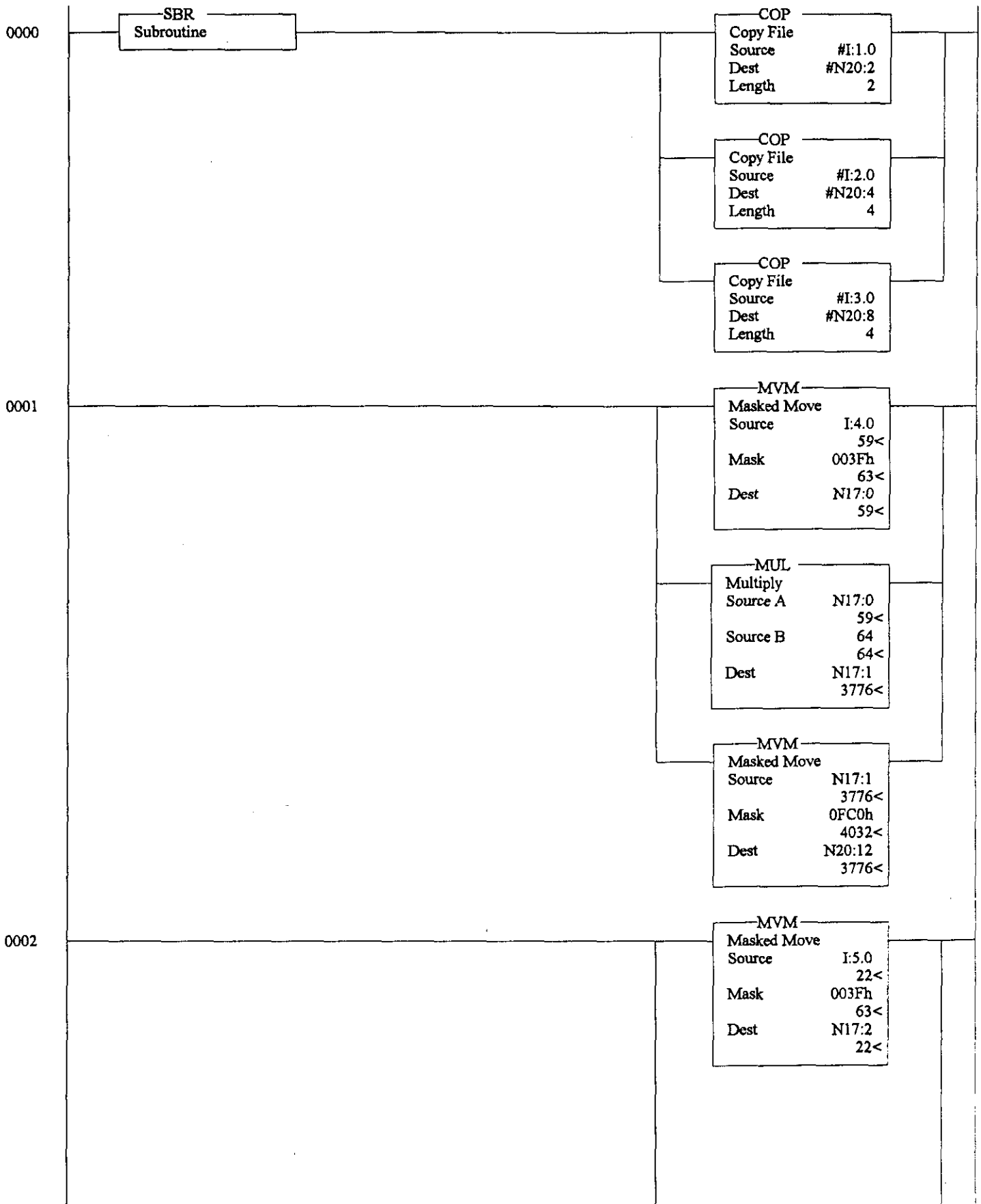
LAD 3 - --- Total Rungs in File = 16



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



LAD 4 - --- Total Rungs in File = 6



LAD 4 - --- Total Rungs in File = 6

0003

MUL
Multiply
Source A N17:2
22<
Source B 64
64<
Dest N17:3
1408<

MVM
Masked Move
Source N17:3
1408<
Mask 0FC0h
4032<
Dest N20:13
1417<

MVM
Masked Move
Source I:6.0
59<
Mask 003Fh
63<
Dest N17:4
59<

MUL
Multiply
Source A N17:4
59<
Source B 64
64<
Dest N17:5
3776<

MVM
Masked Move
Source N17:5
3776<
Mask 0FC0h
4032<
Dest N20:14
-28992<

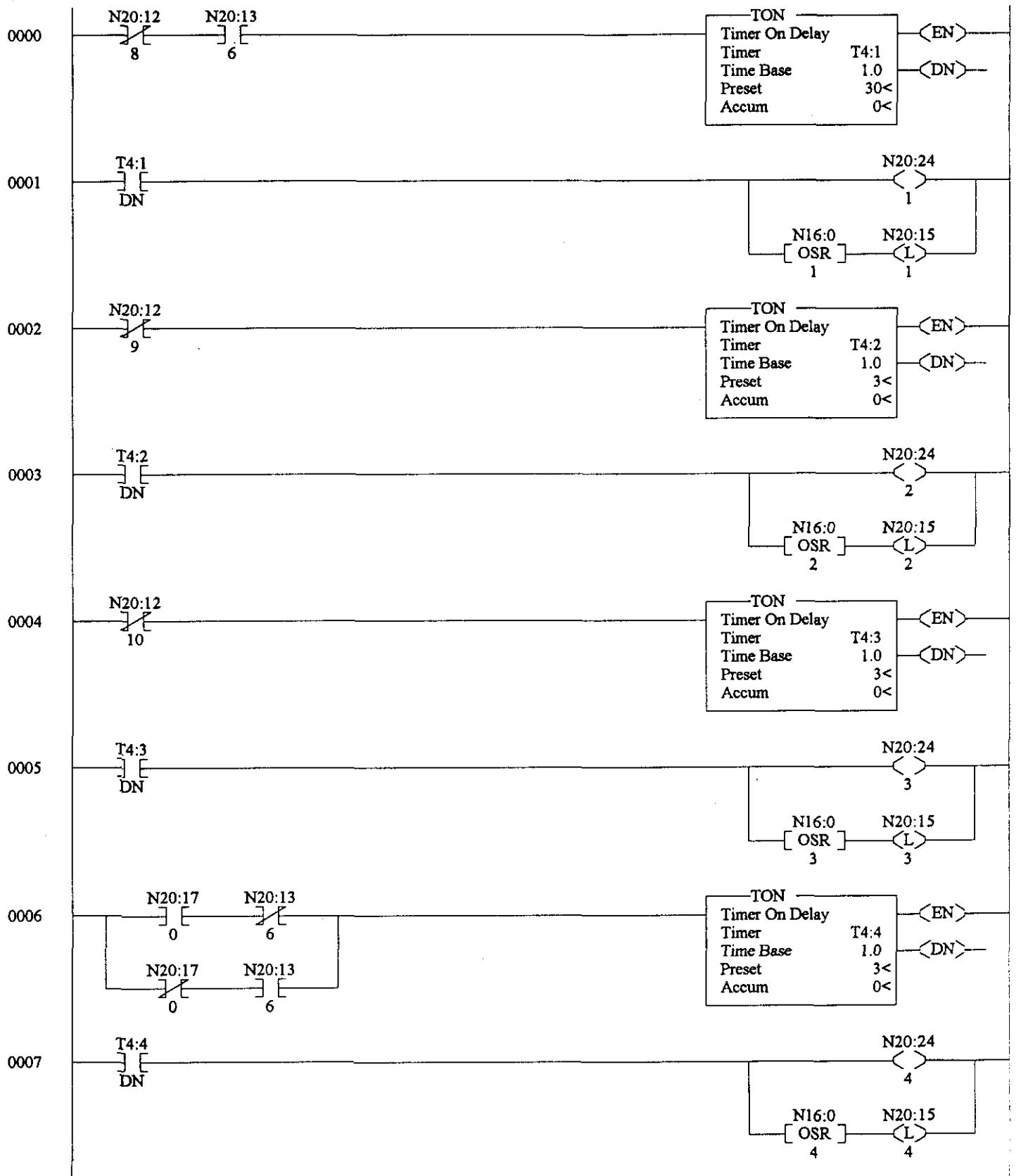
0004

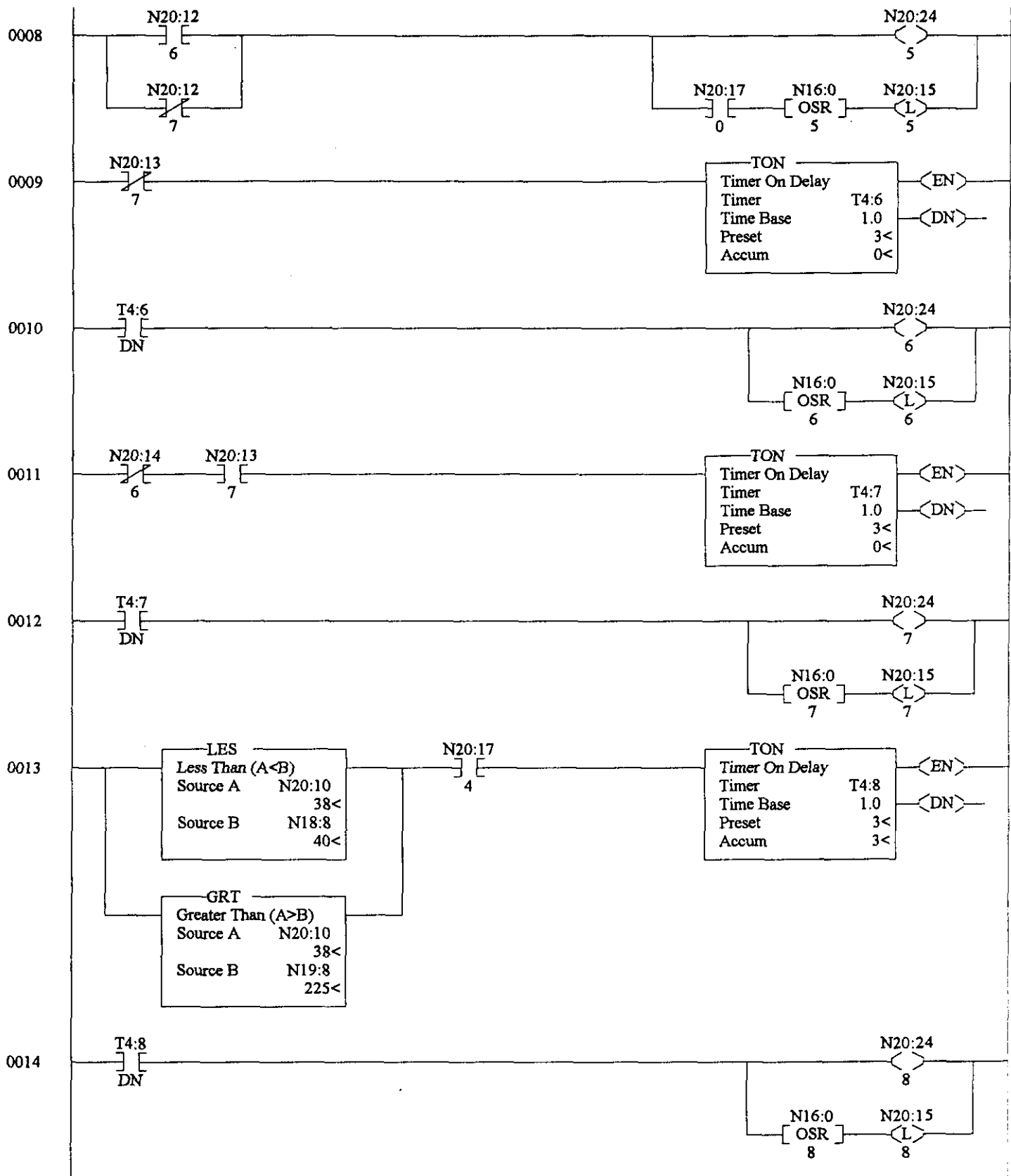
RET
Return

0005

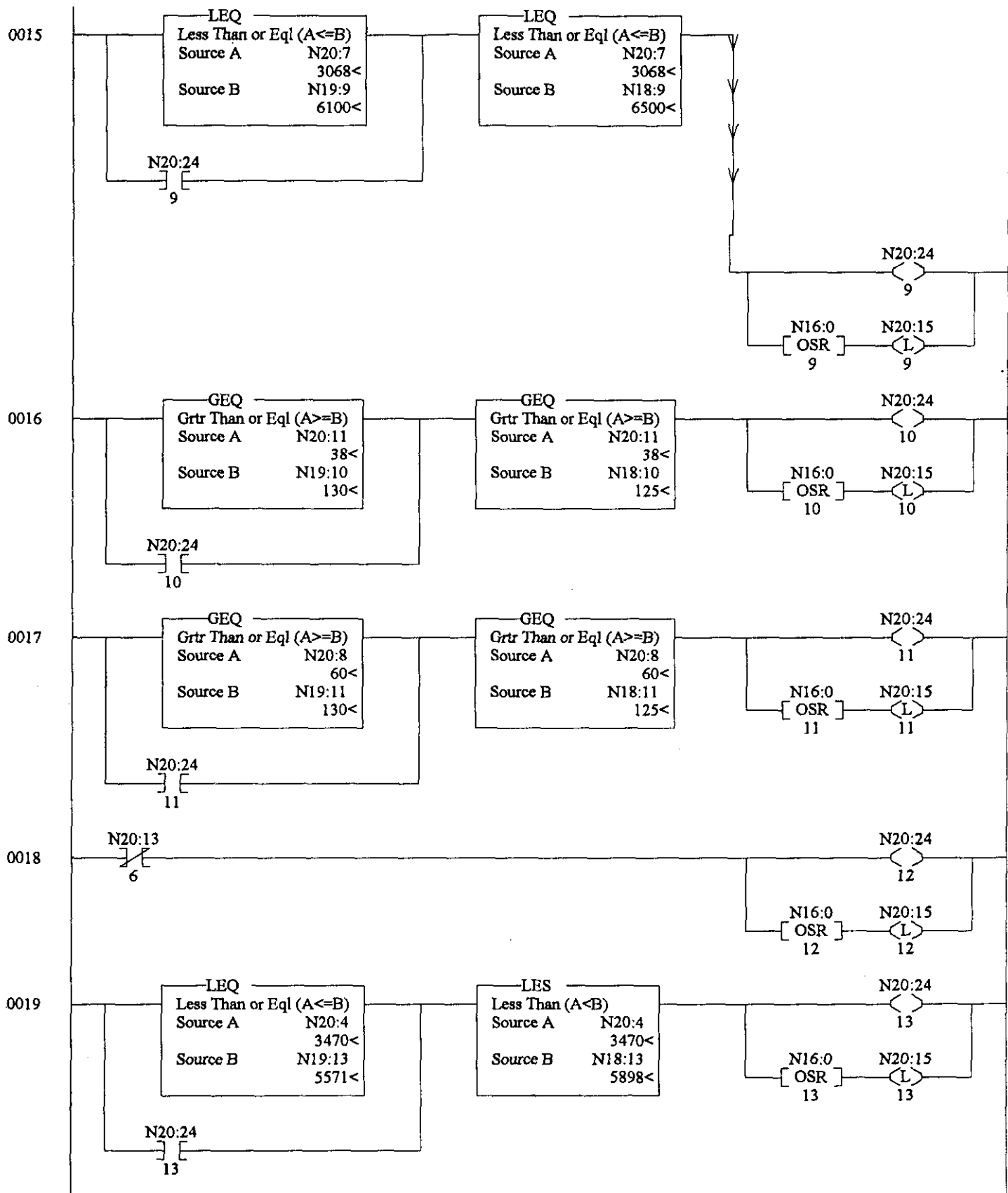
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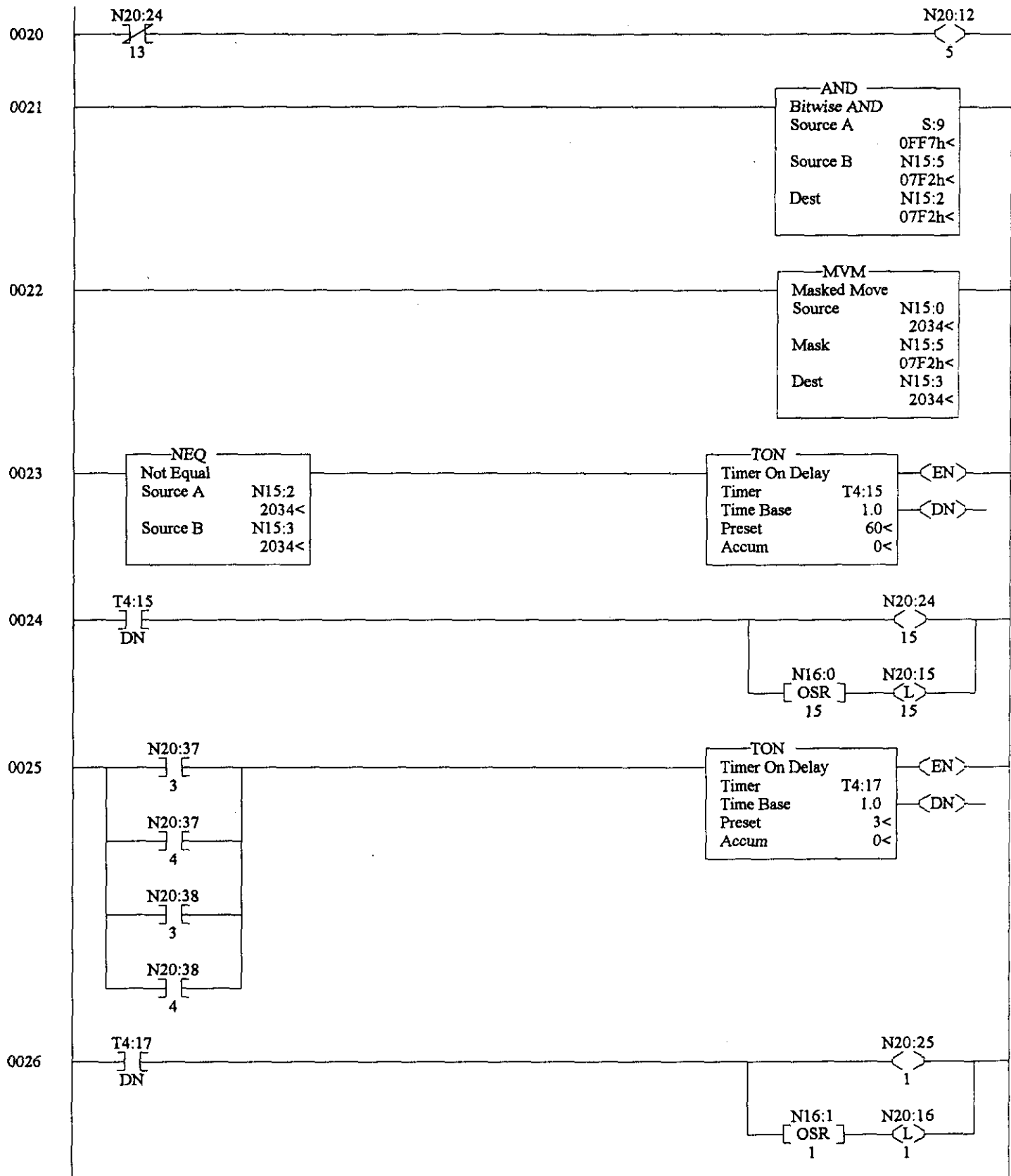
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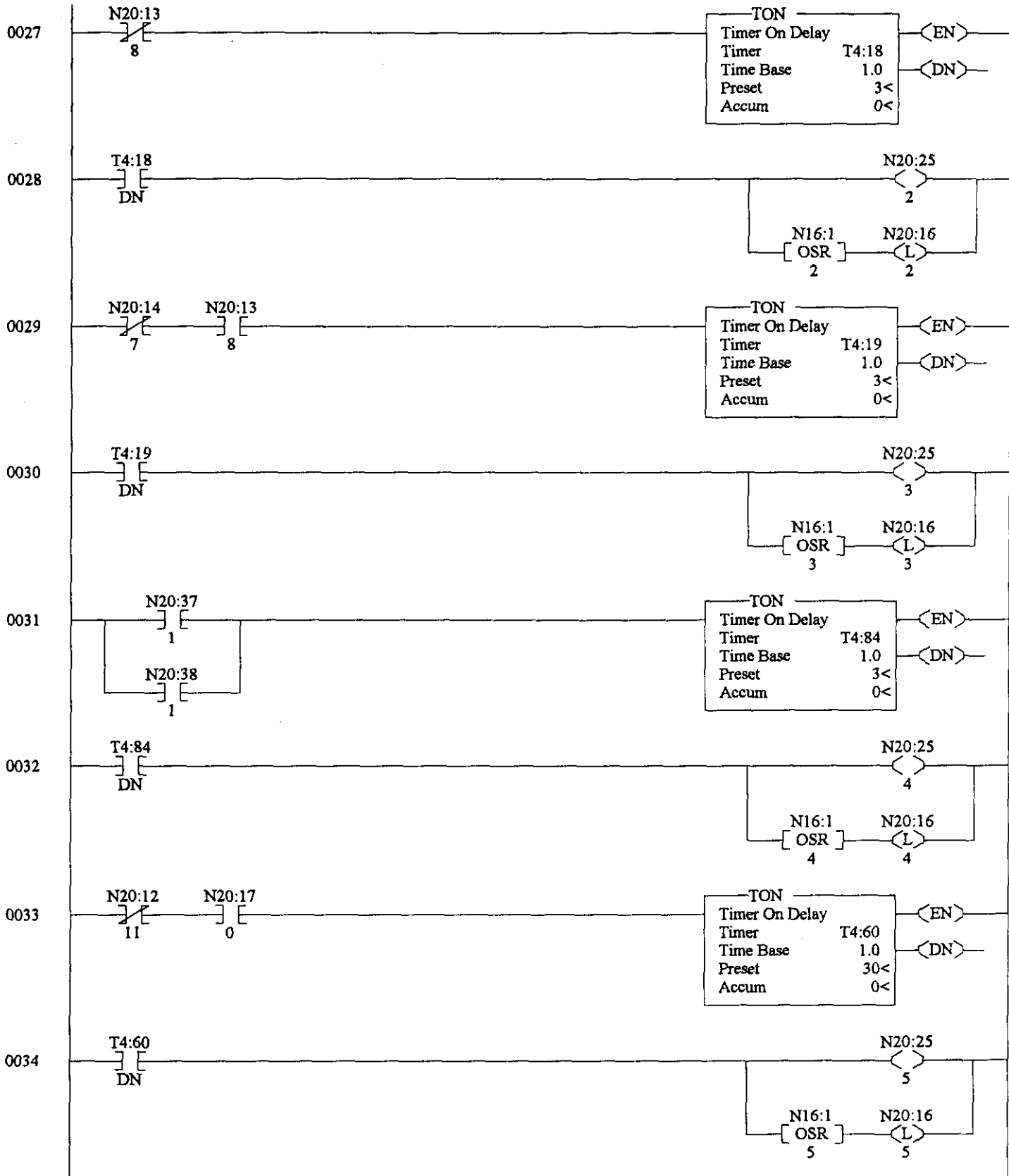


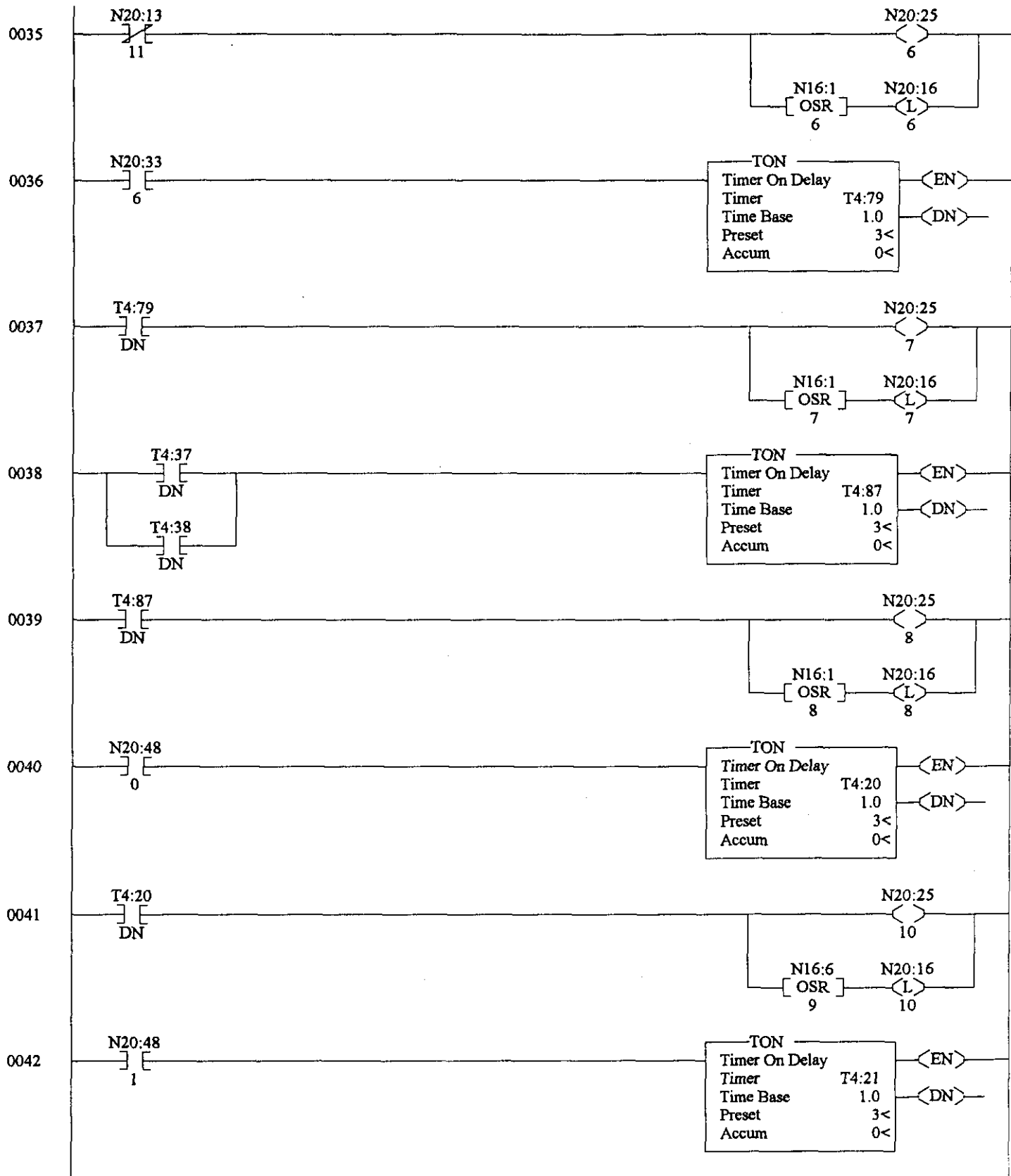
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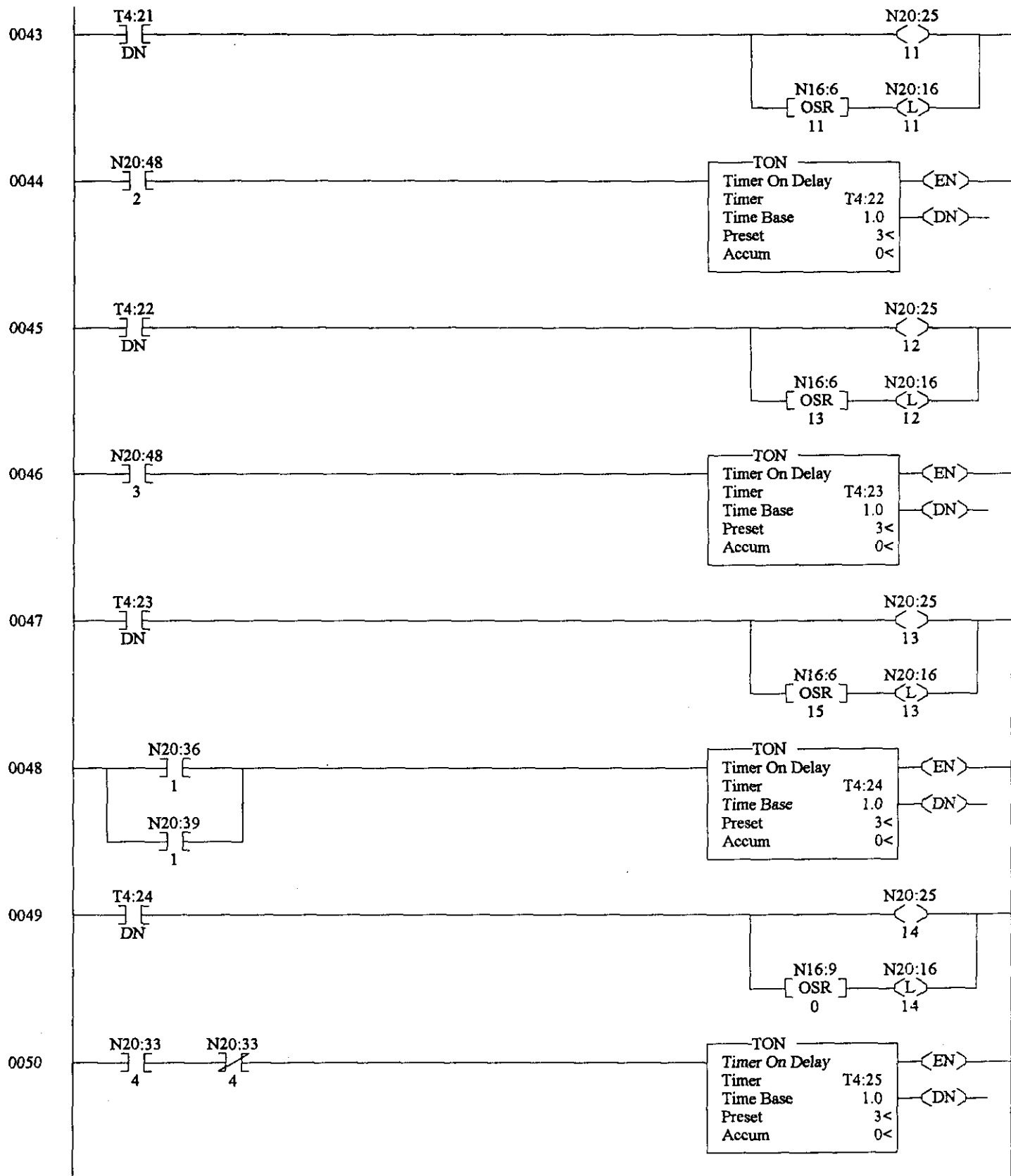


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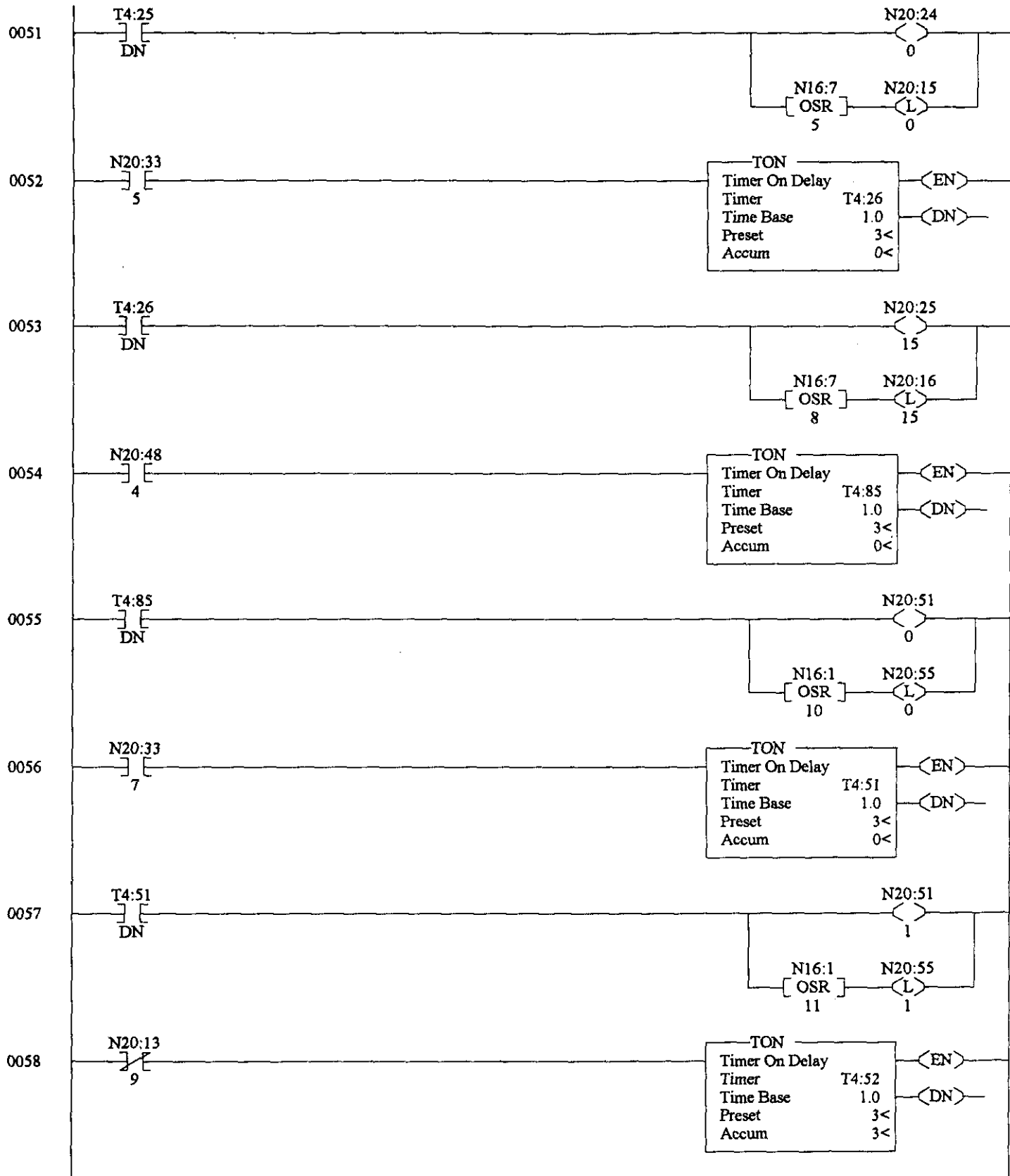


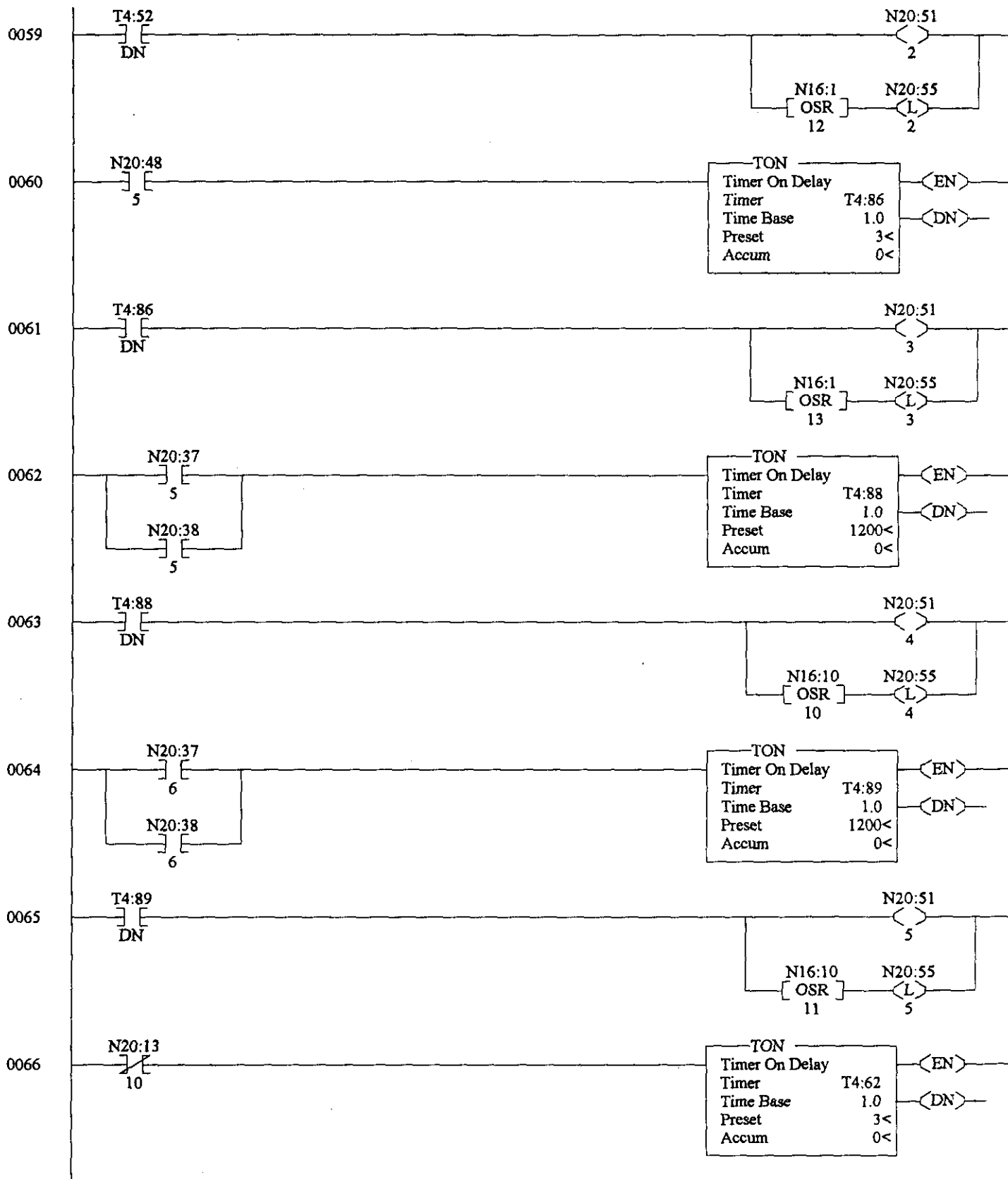


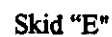
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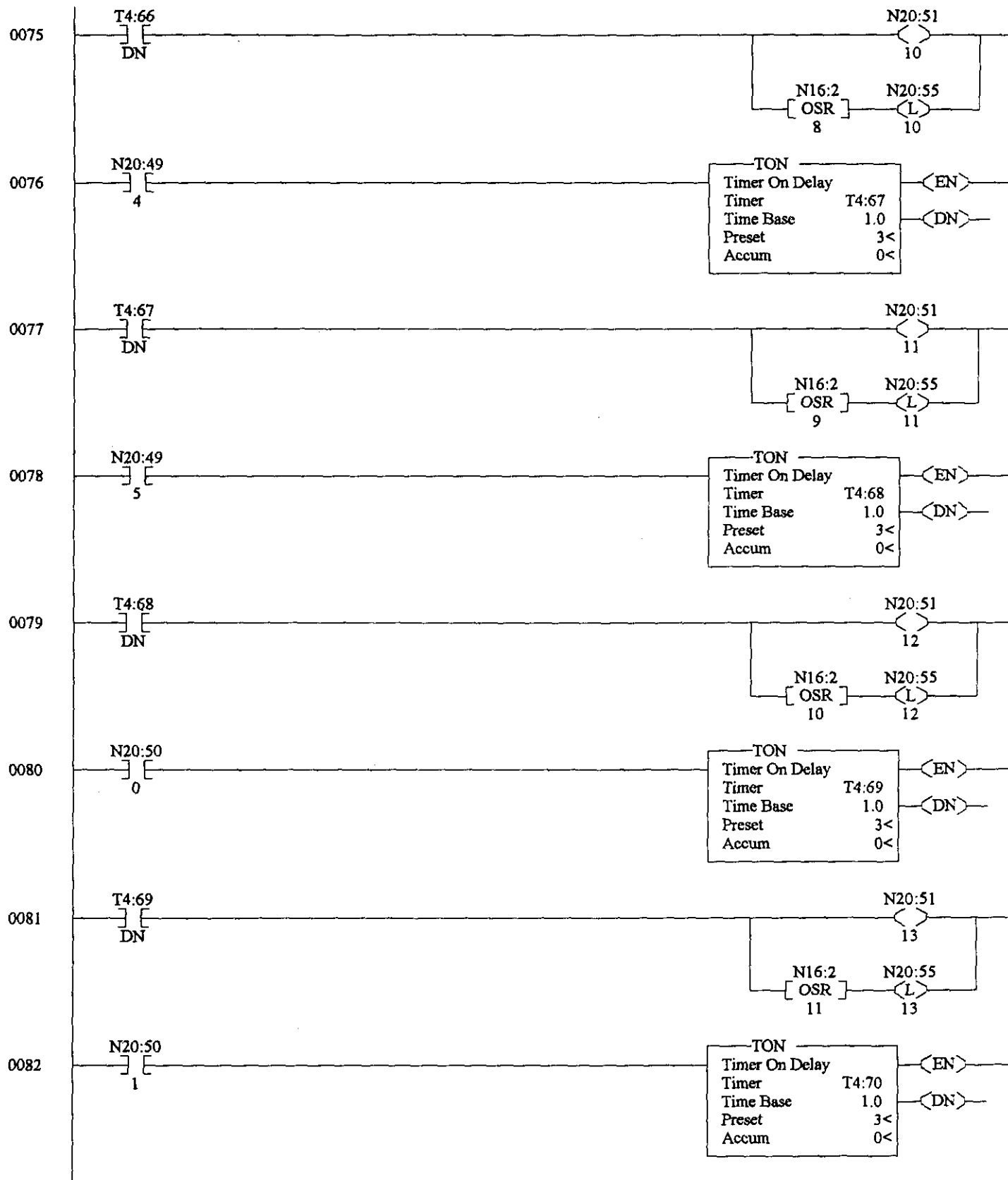
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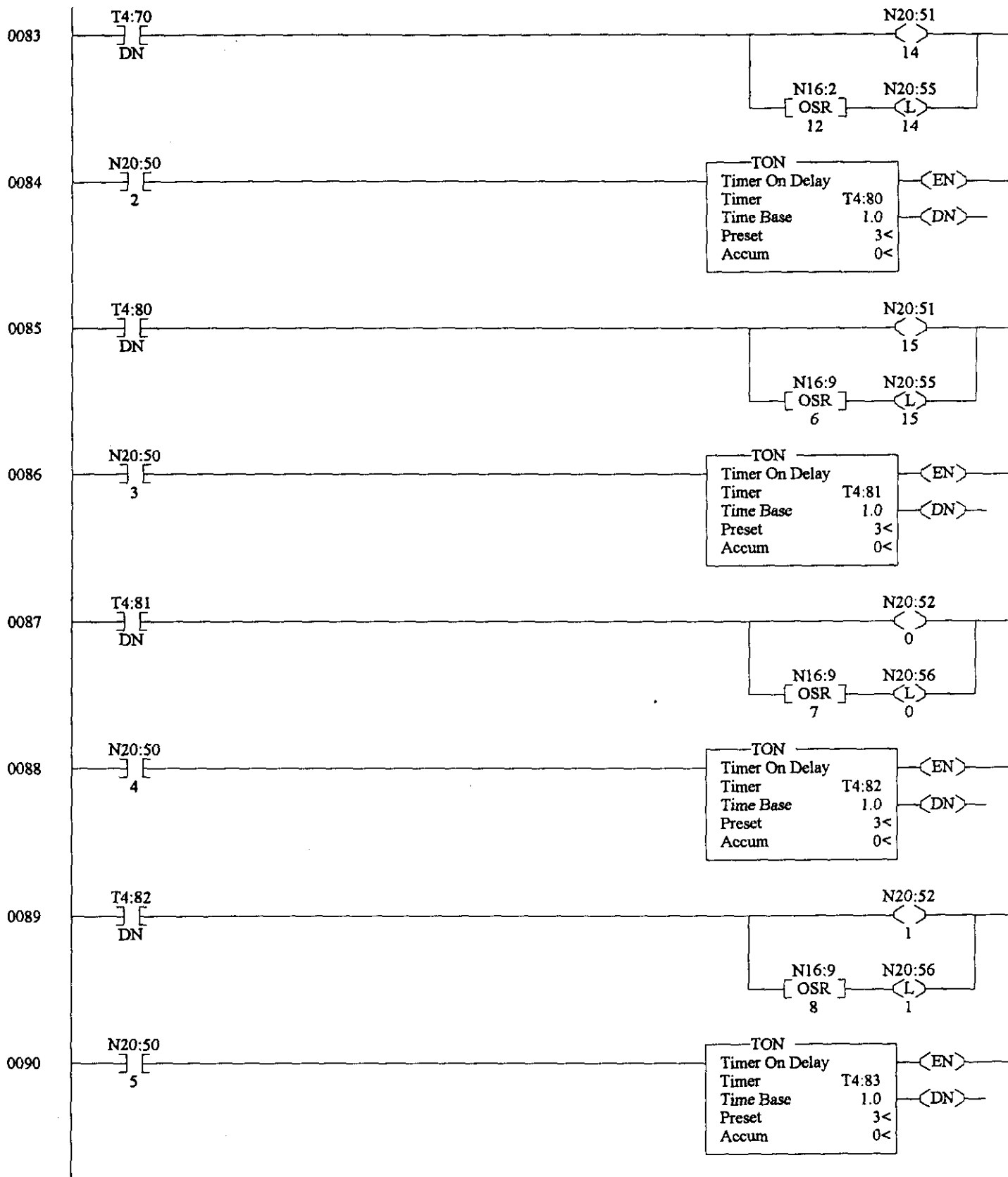




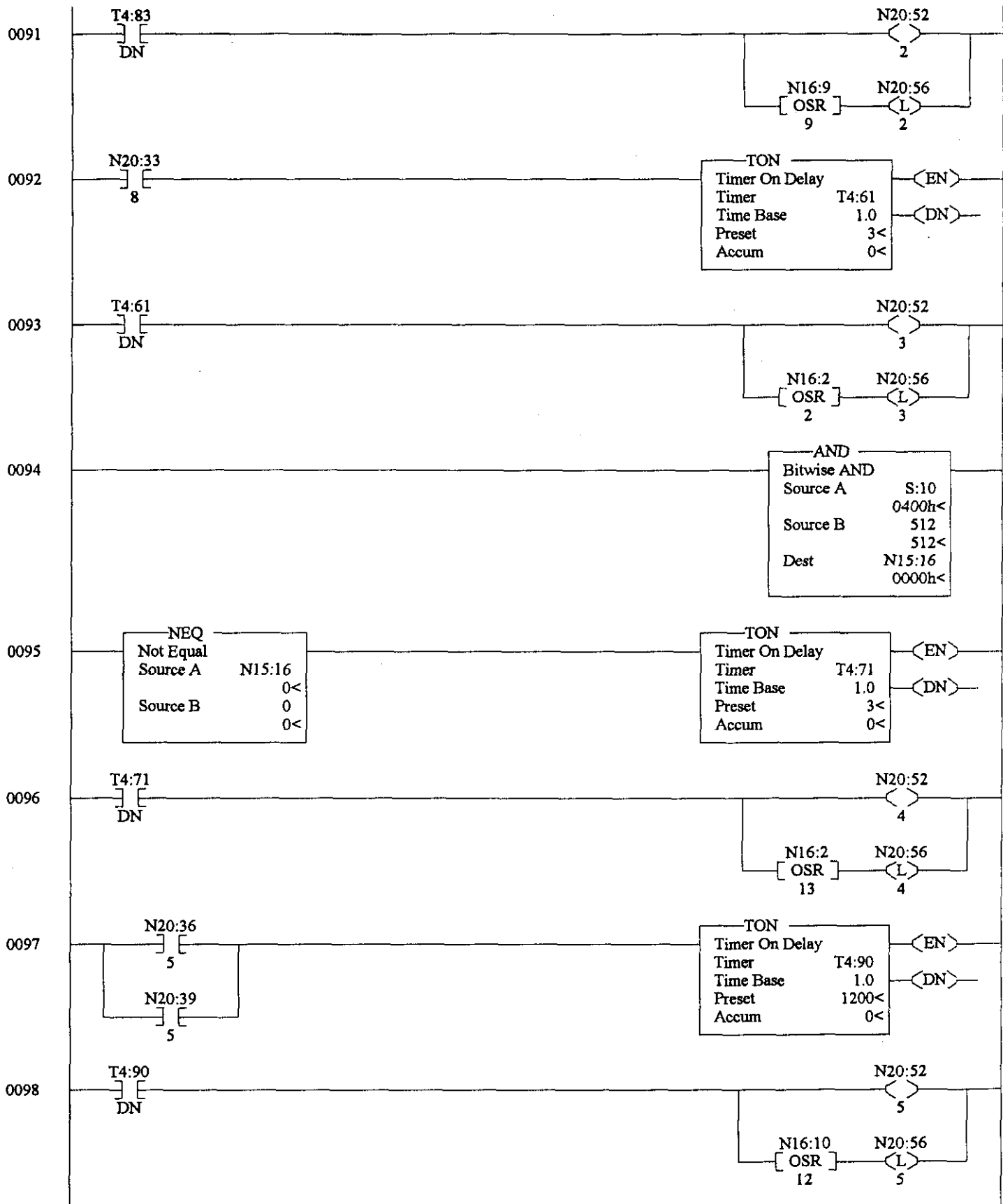
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LAD 5 - --- Total Rungs in File = 119

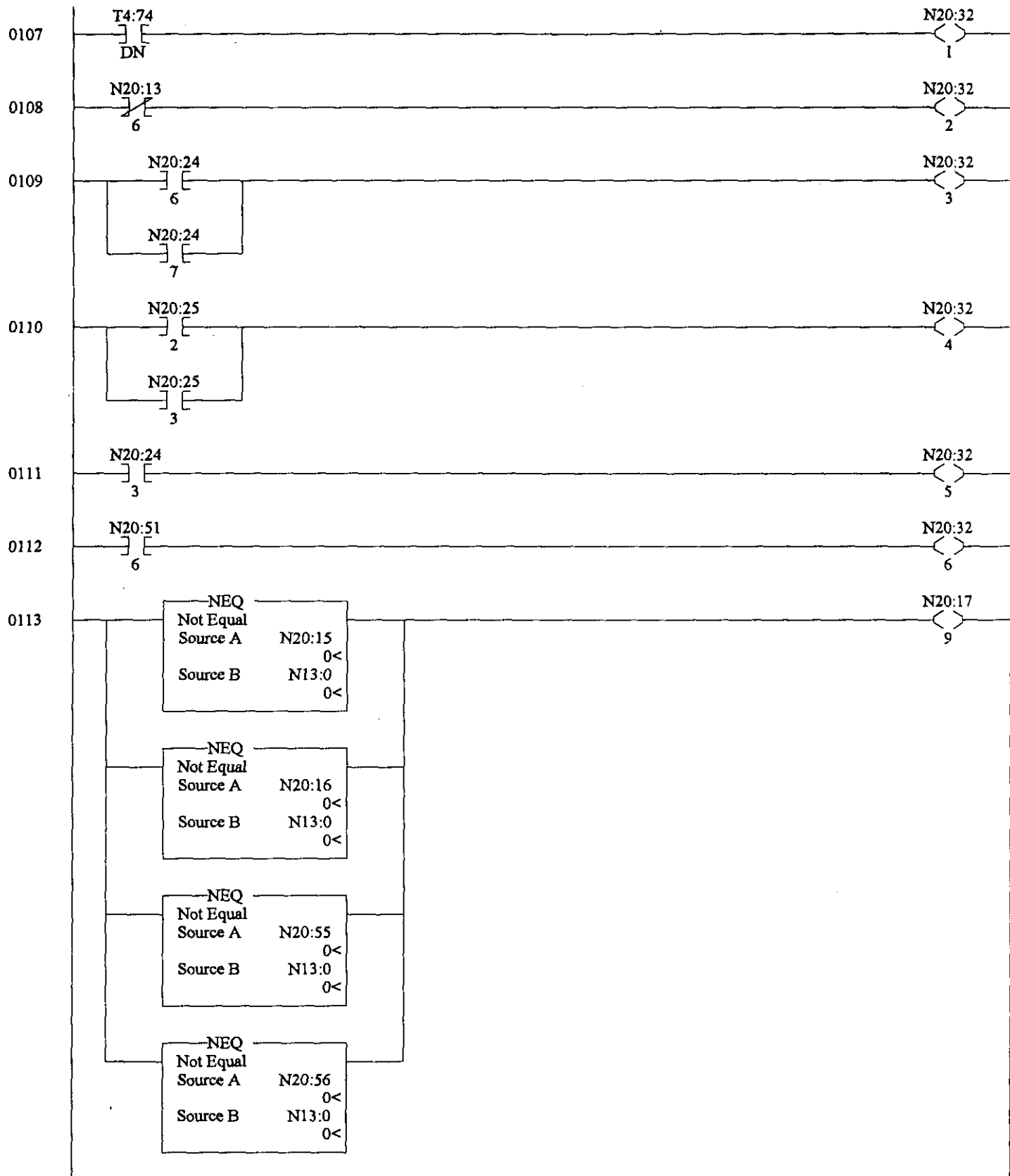


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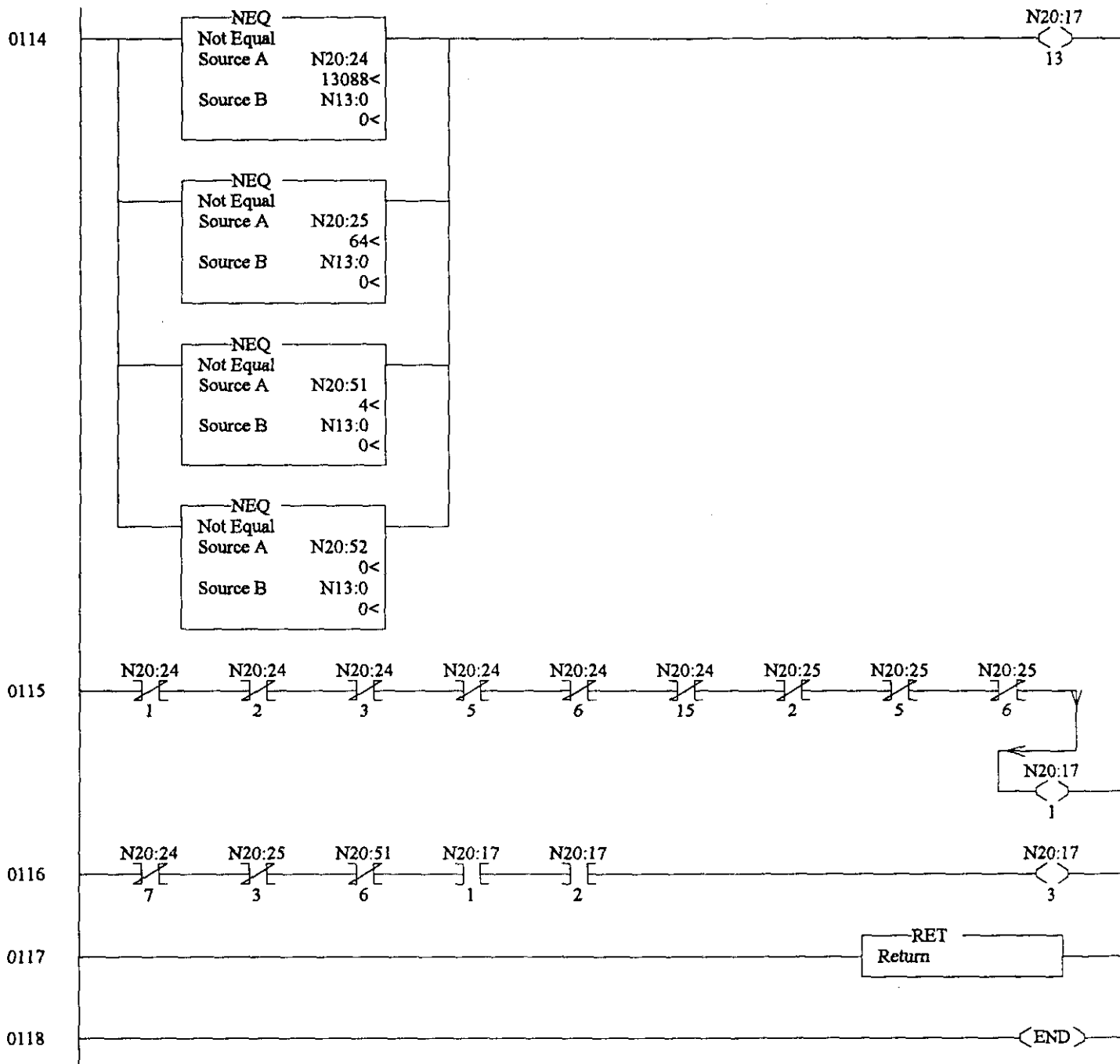


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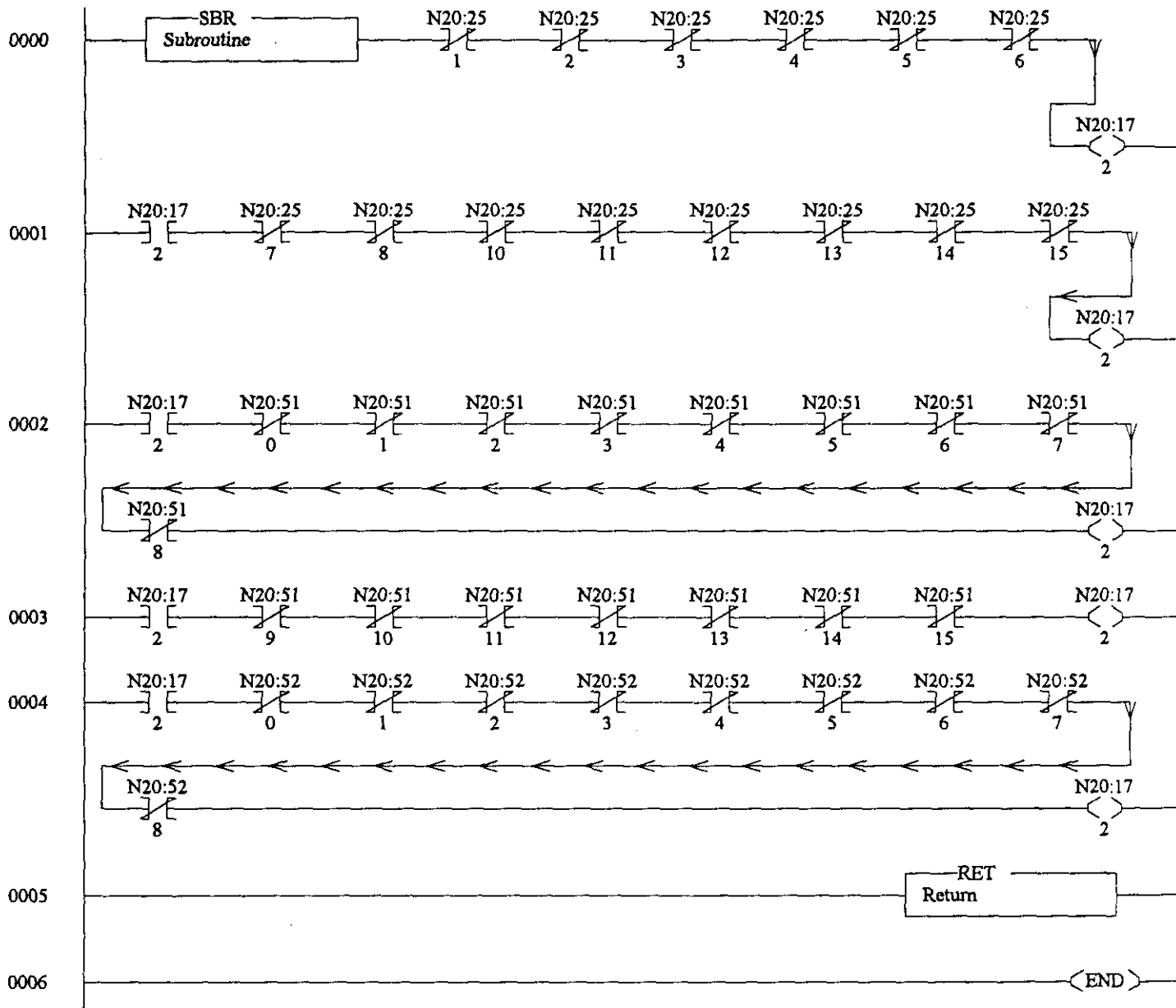
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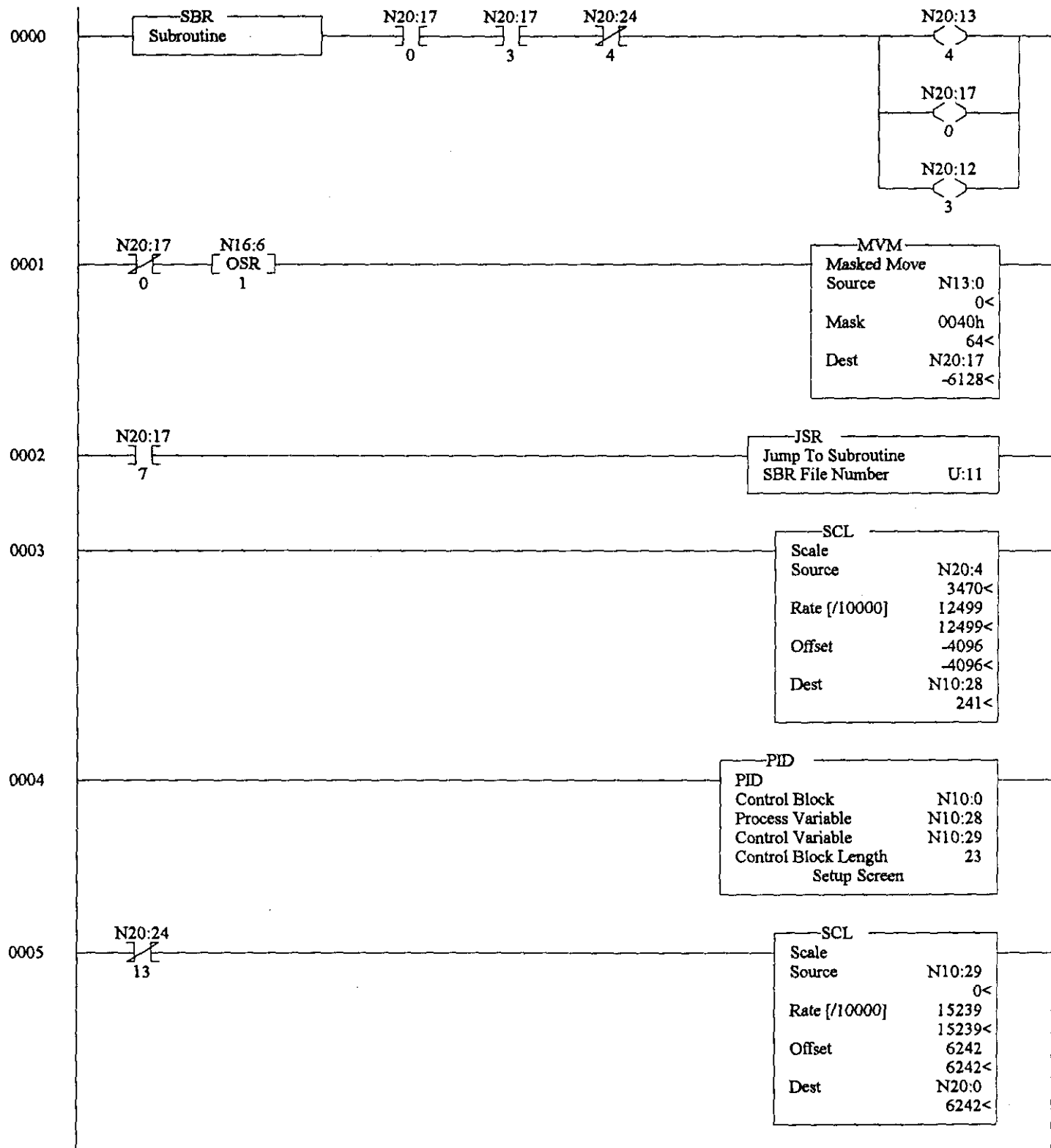
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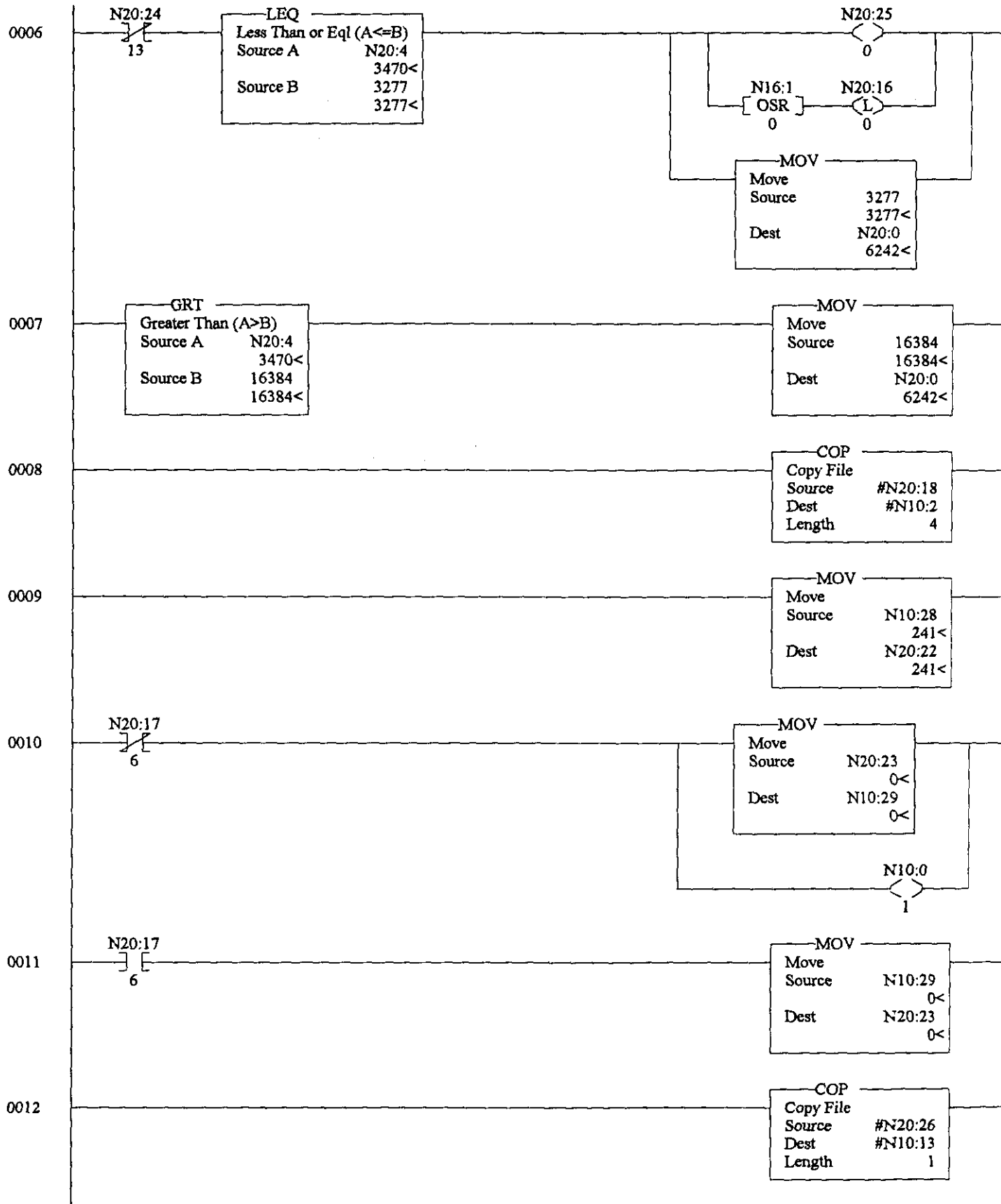
LAD 6 - --- Total Rungs in File = 7



LAD 7 - --- Total Rungs in File = 20



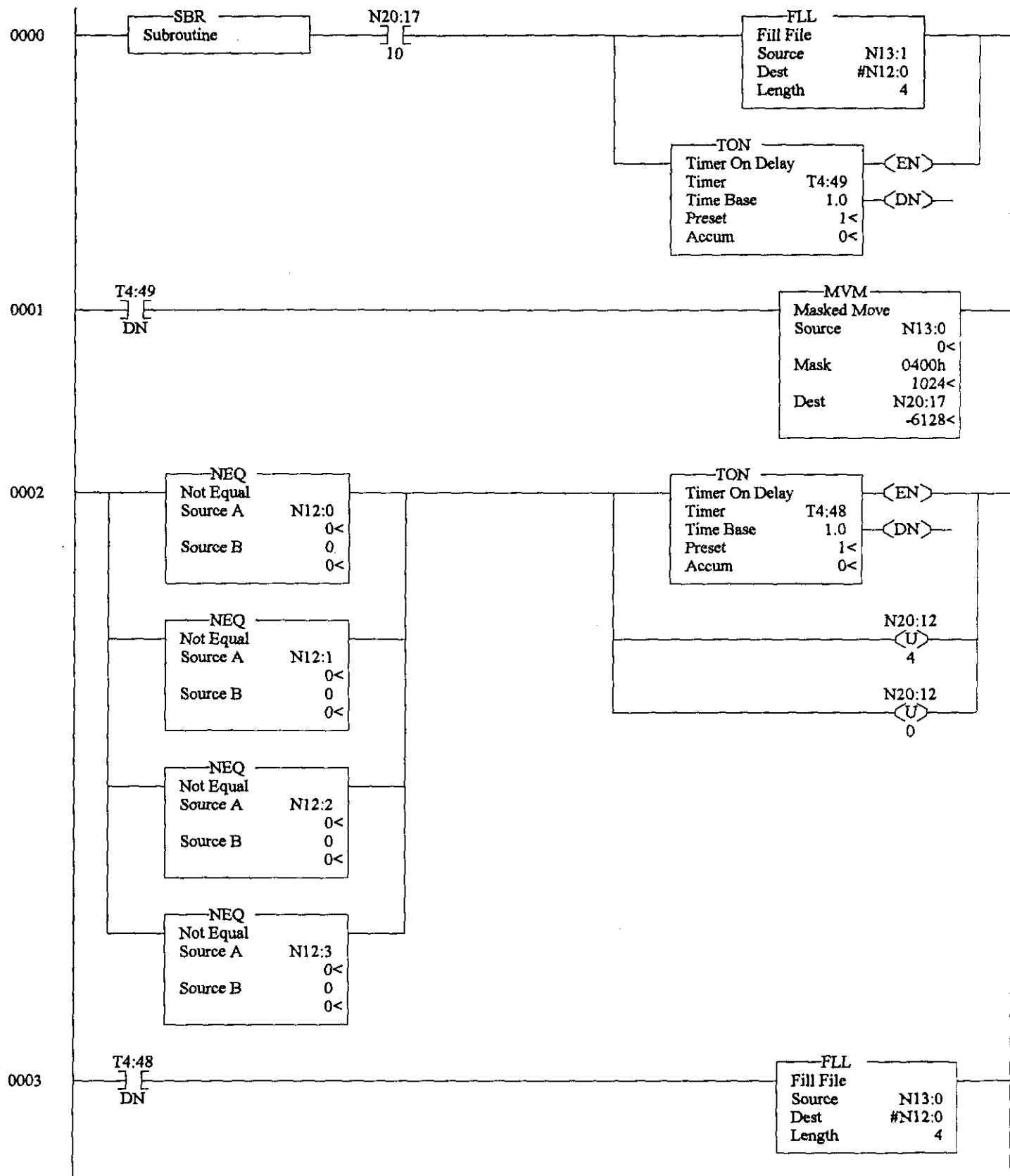
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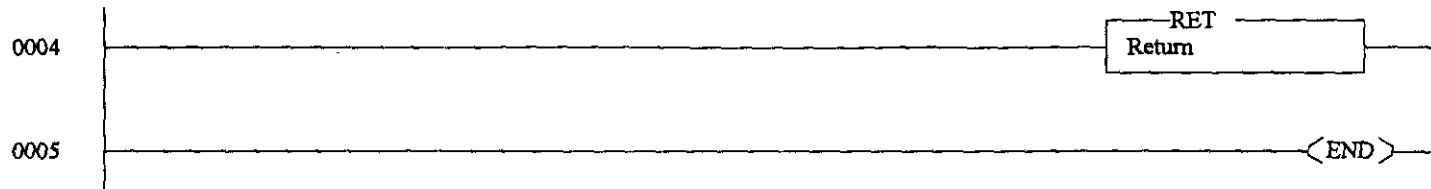
LAD 7 - --- Total Rungs in File = 20

0013	<div>MOV Move Source S:9 4087< Dest N20:27 4087<</div>
0014	<div>MOV Move Source N20:28 2034< Dest N15:0 2034<</div>
0015	<div>MOV Move Source N20:29 2034< Dest N15:5 2034<</div>
0016	<div>MOV Move Source C5:1.ACC 8430< Dest N20:30 8430<</div>
0017	<div>MOV Move Source C5:2.ACC 4< Dest N20:31 4<</div>
0018	<div>RET Return</div>
0019	(END)

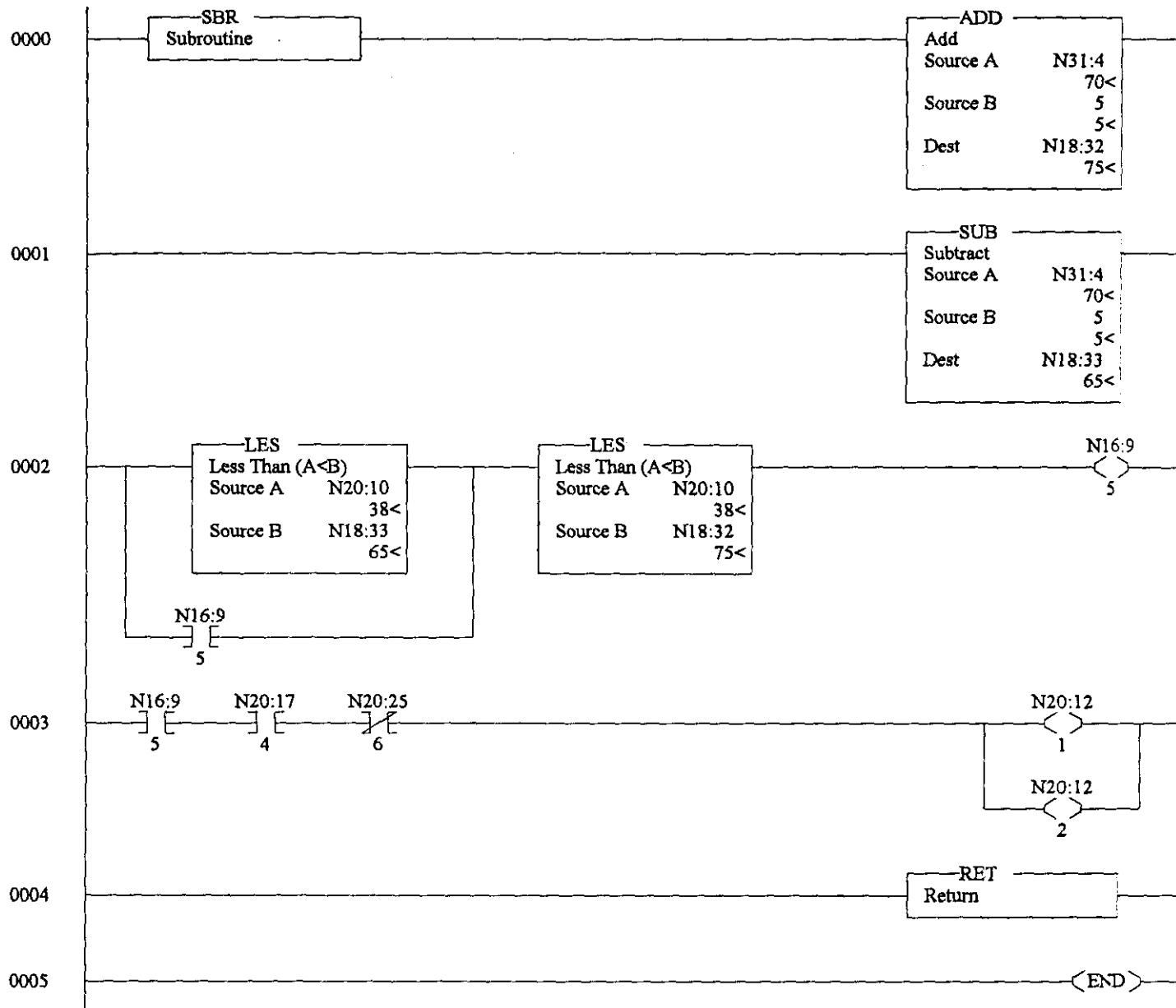
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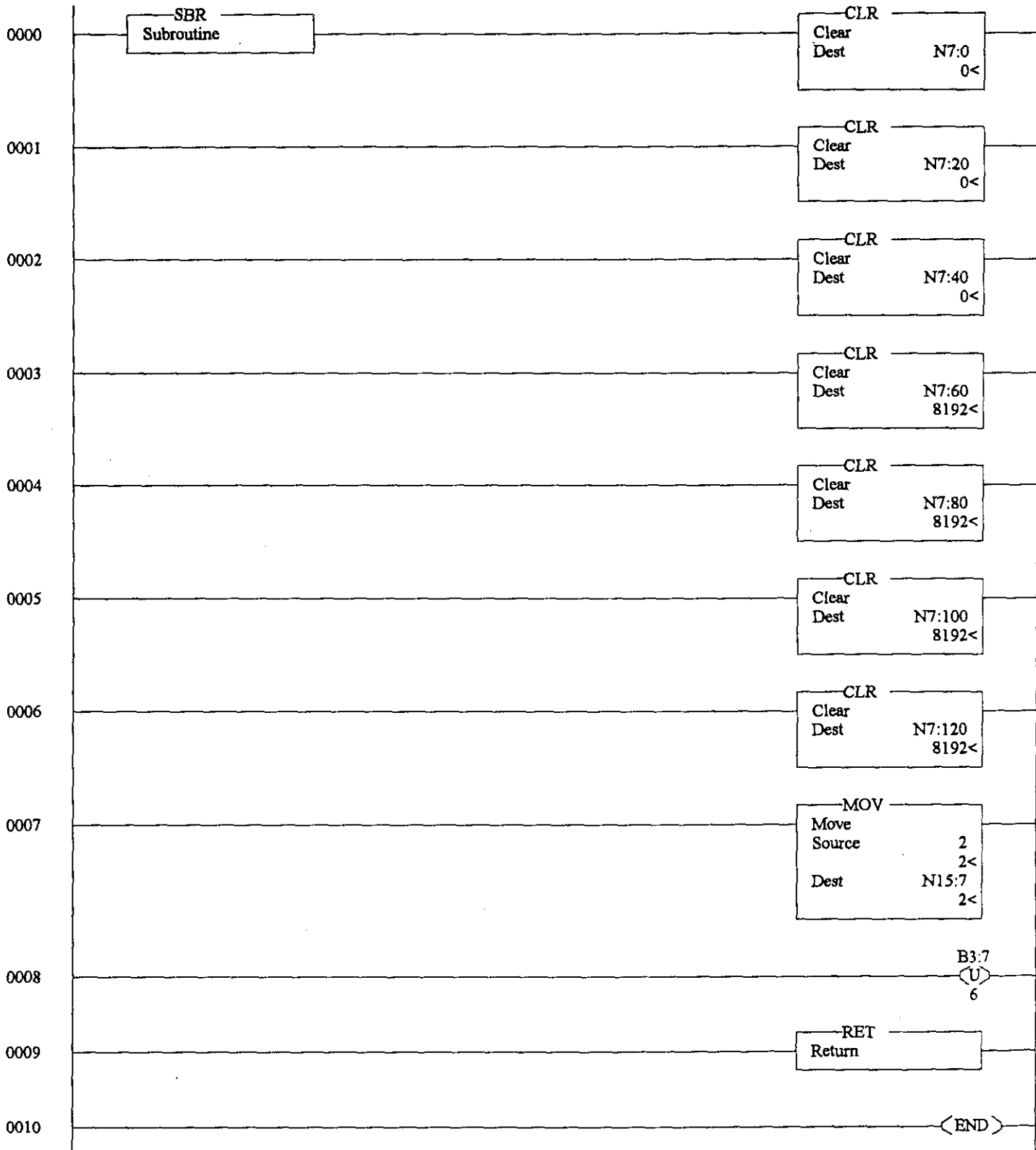
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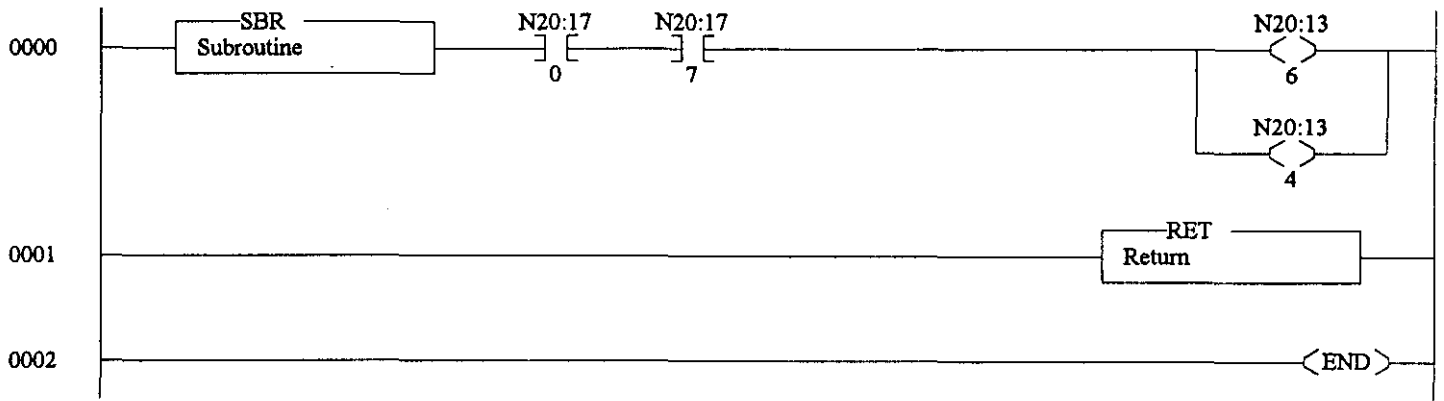
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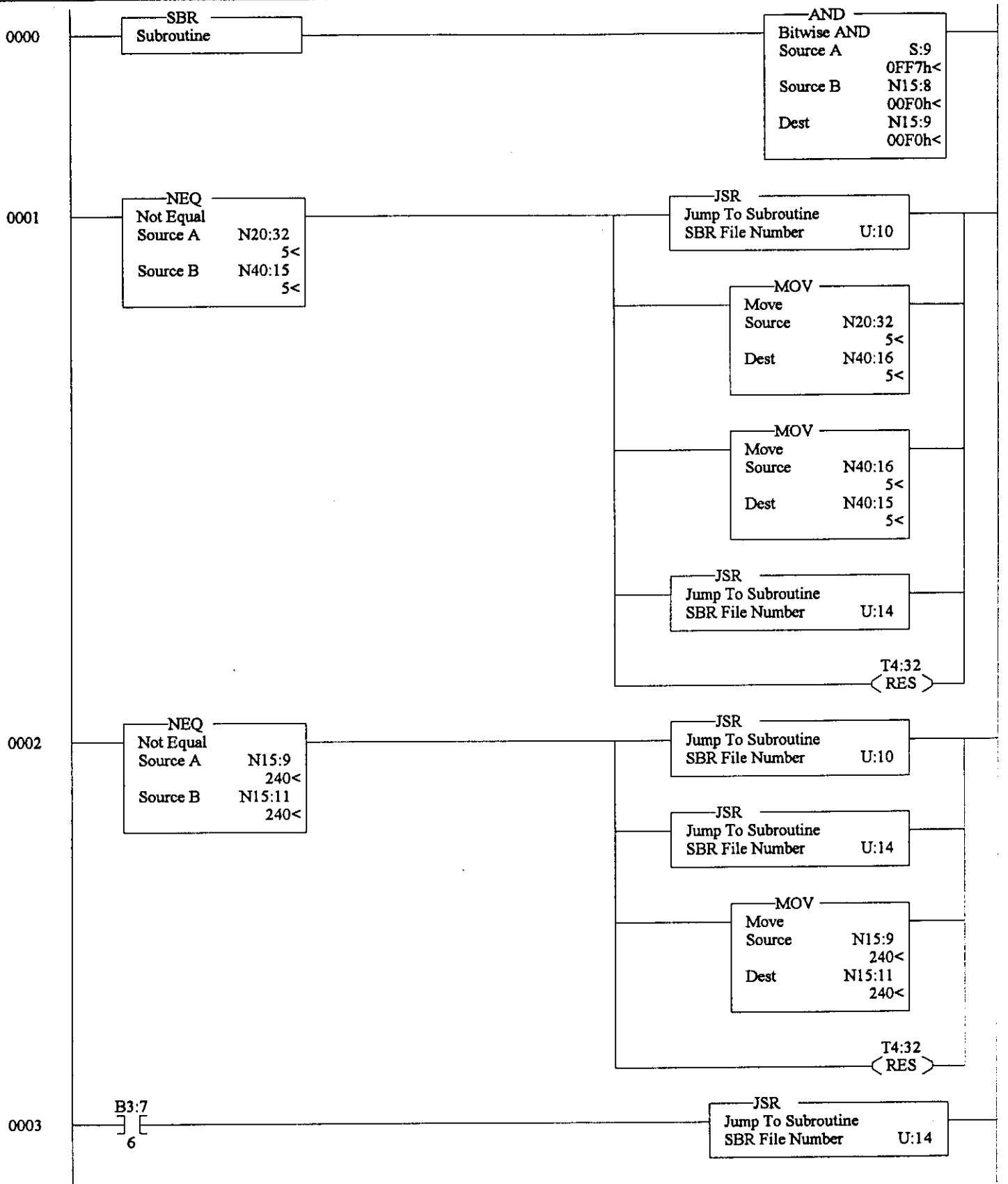
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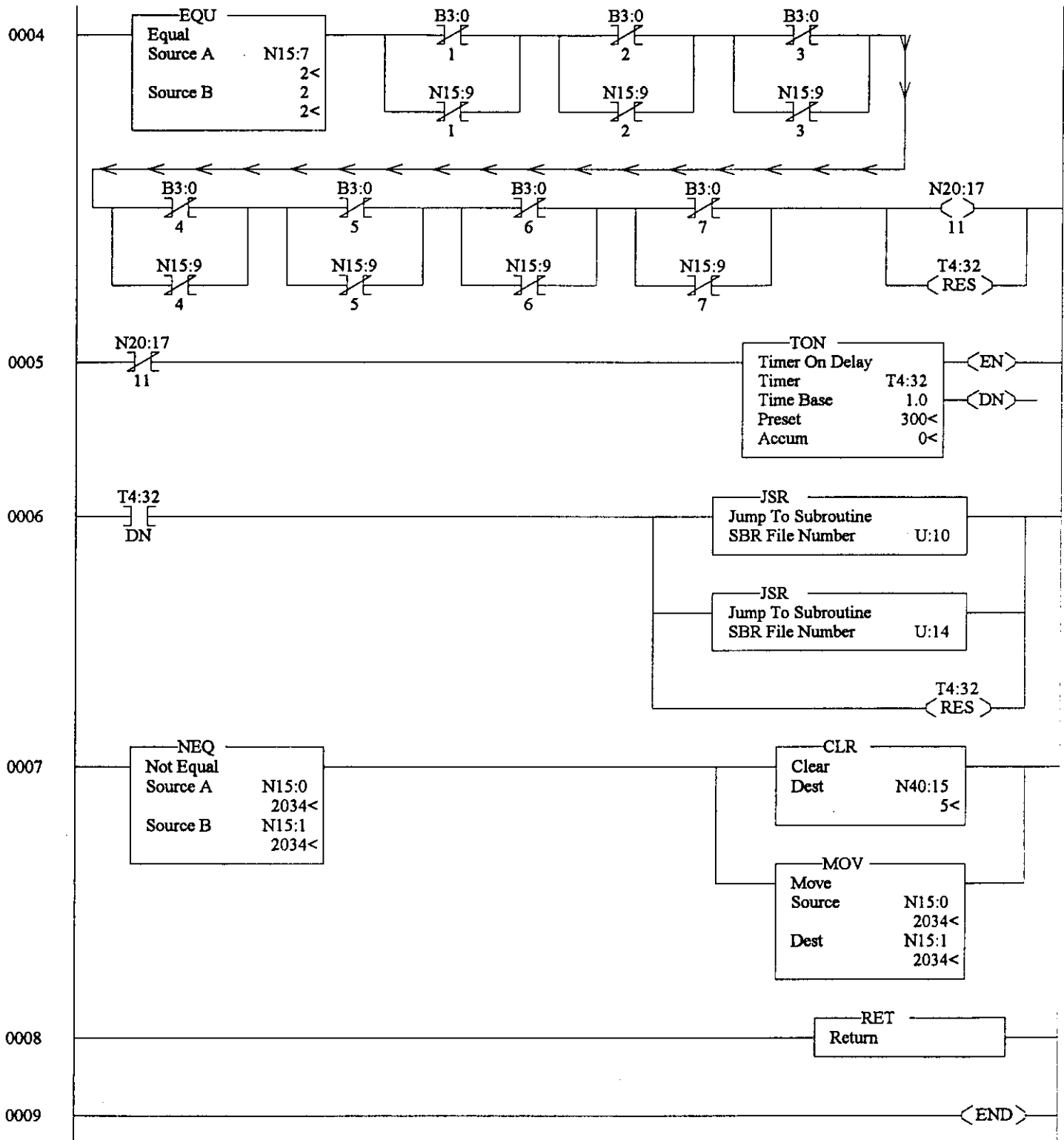
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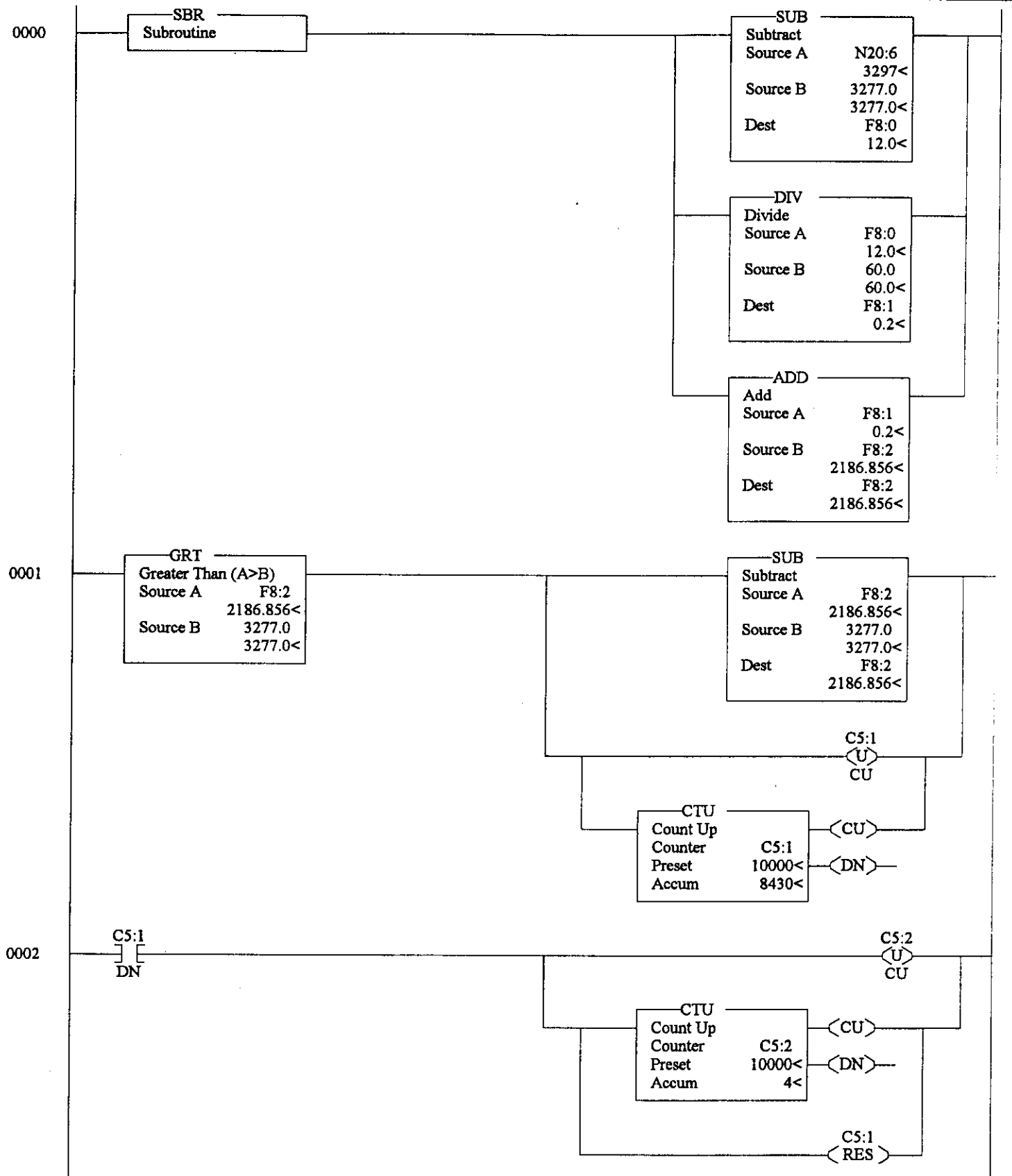


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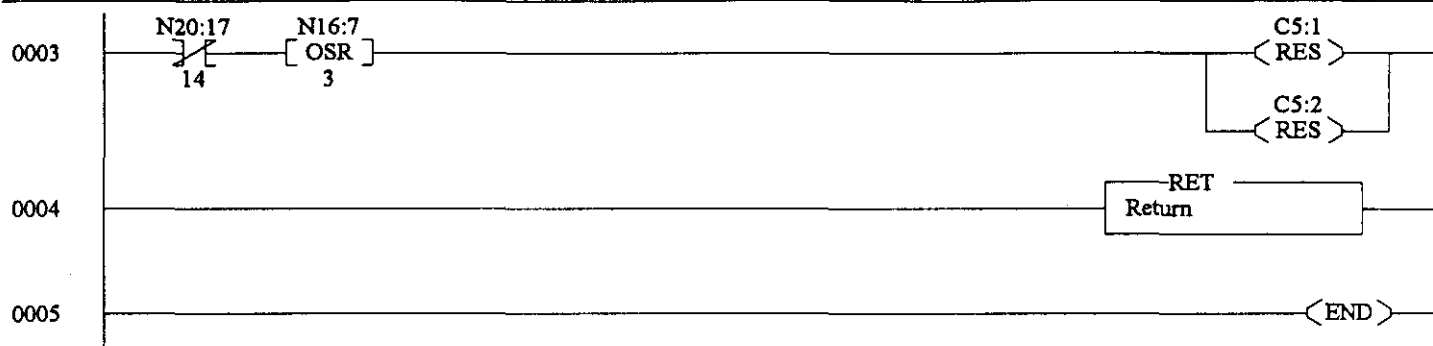


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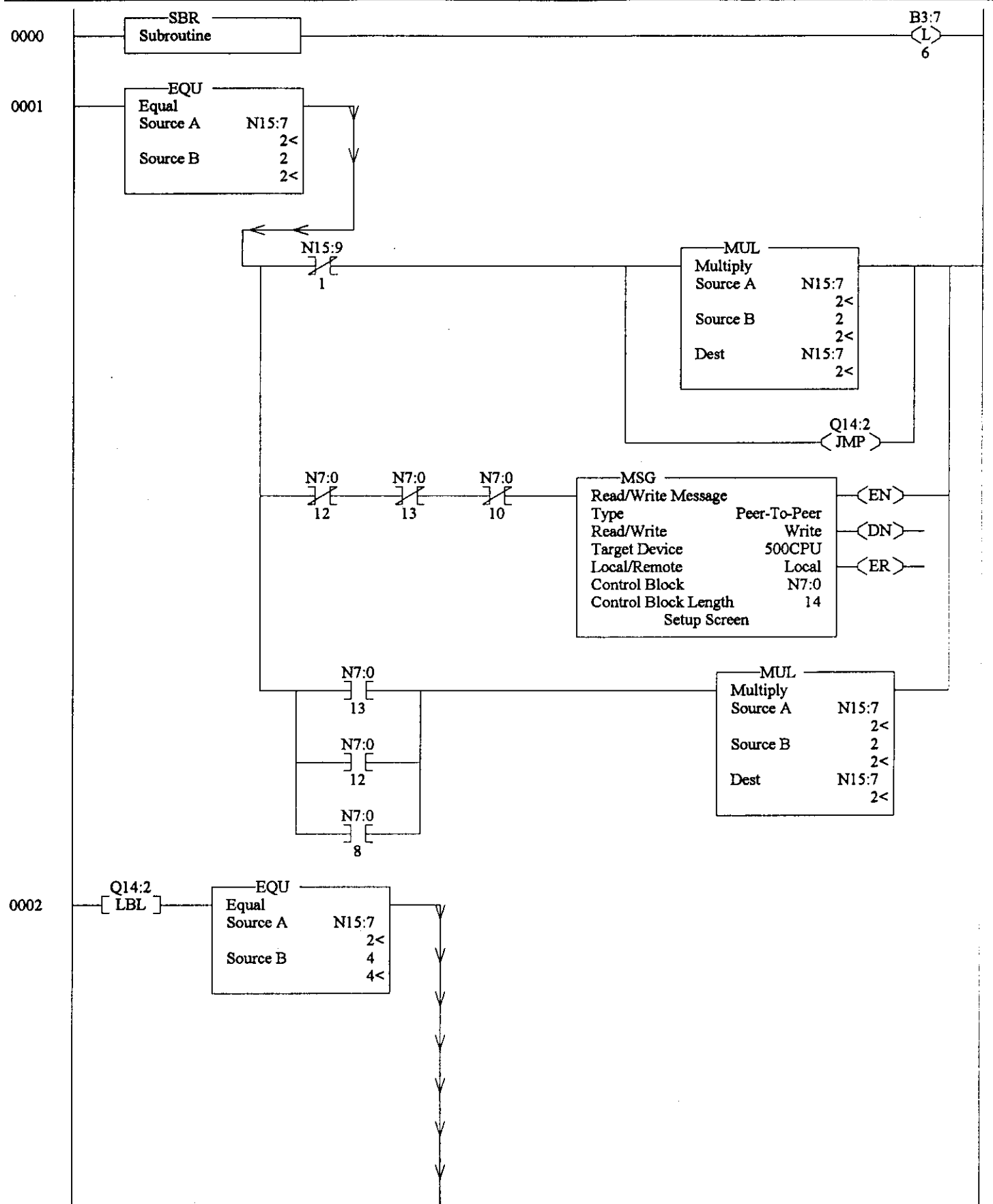




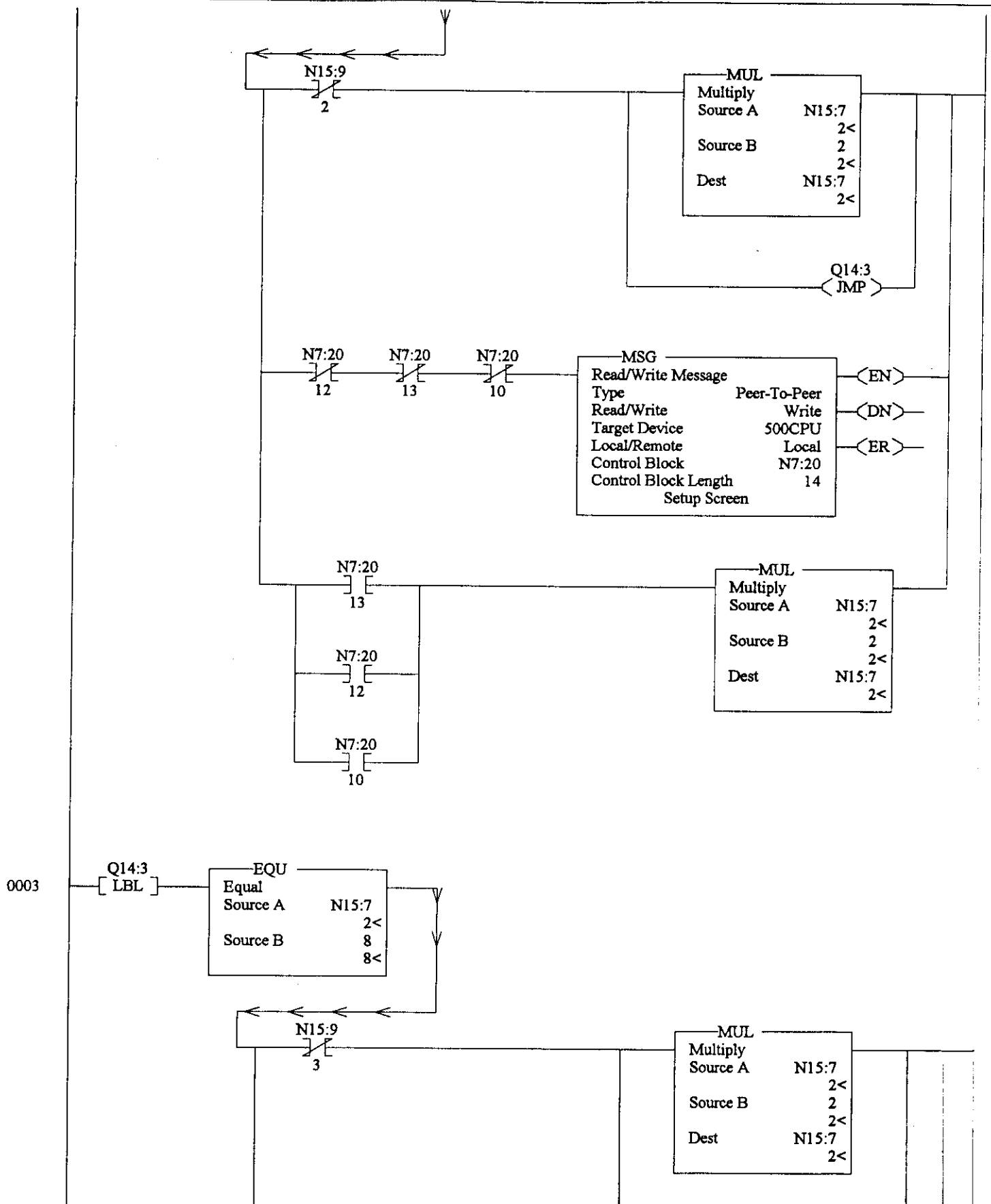
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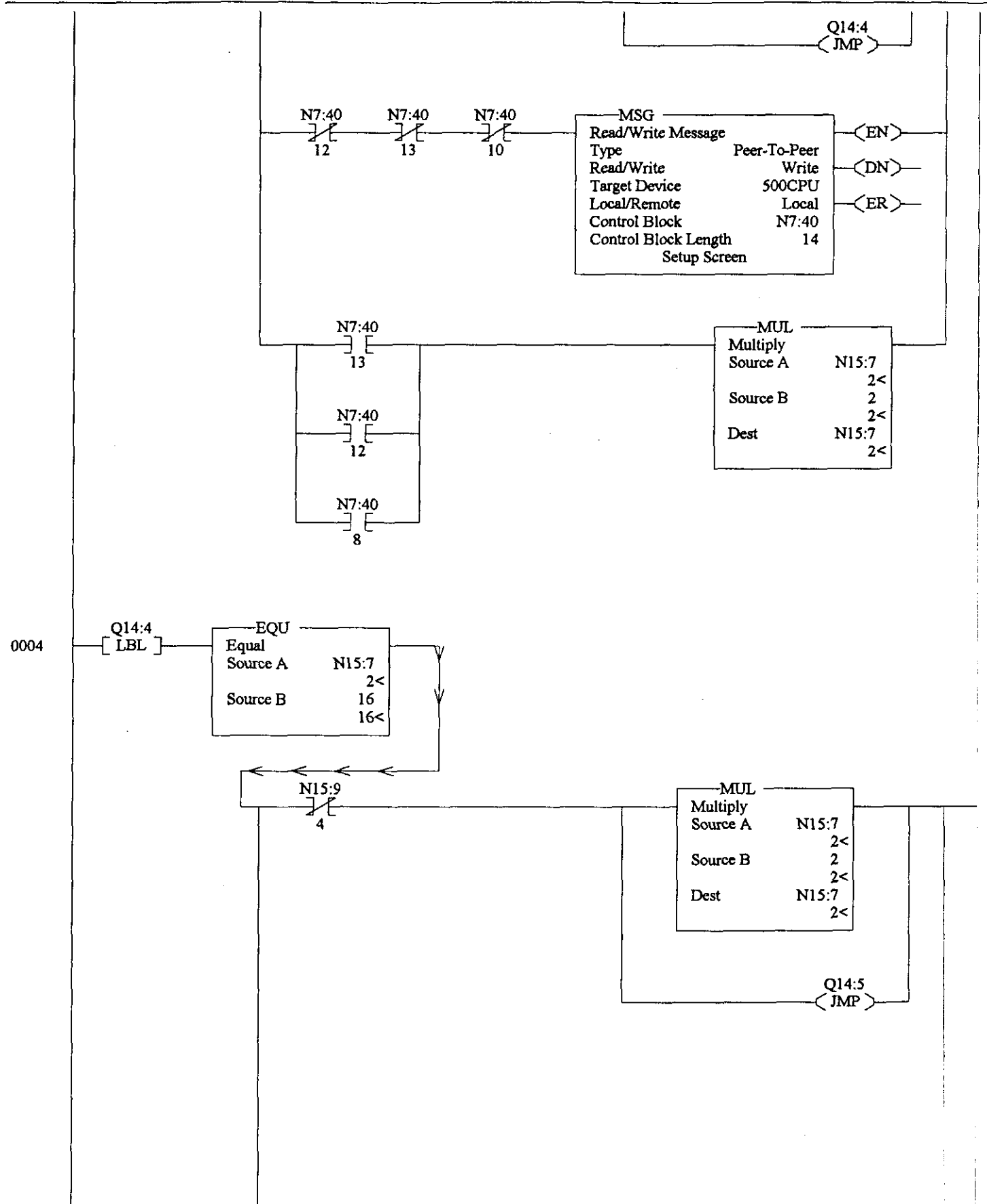
LAD 14 - --- Total Rungs in File = 11



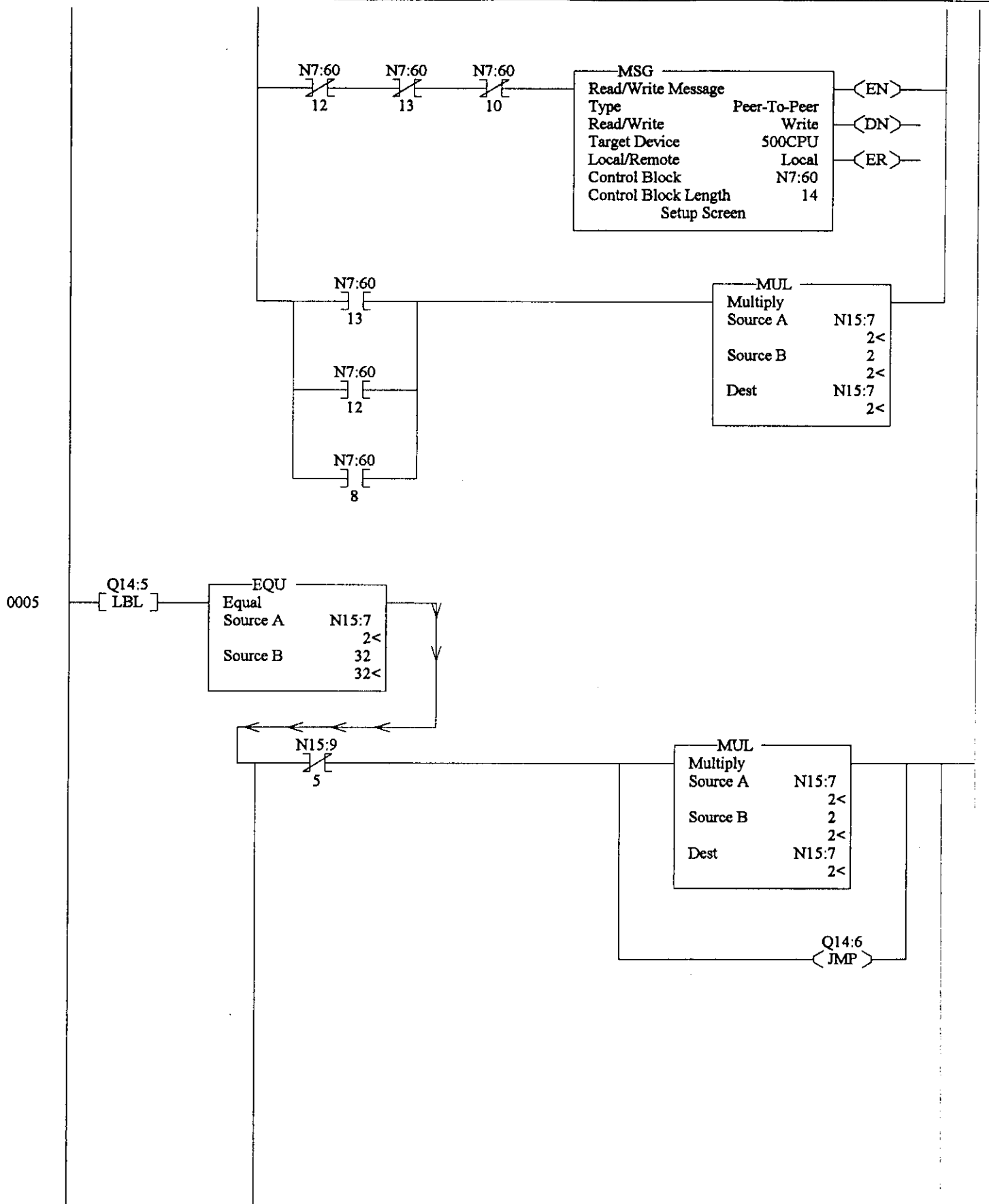
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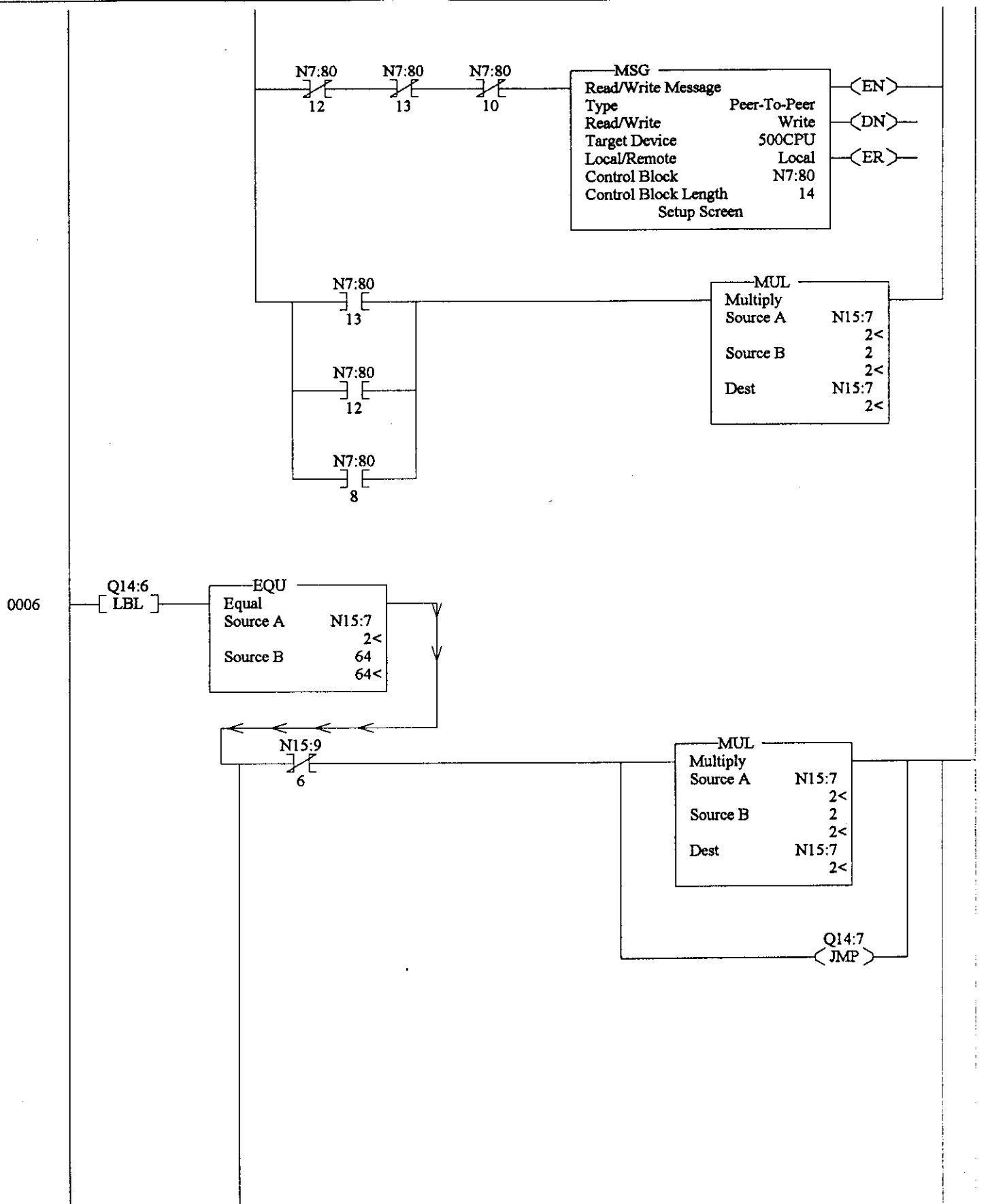


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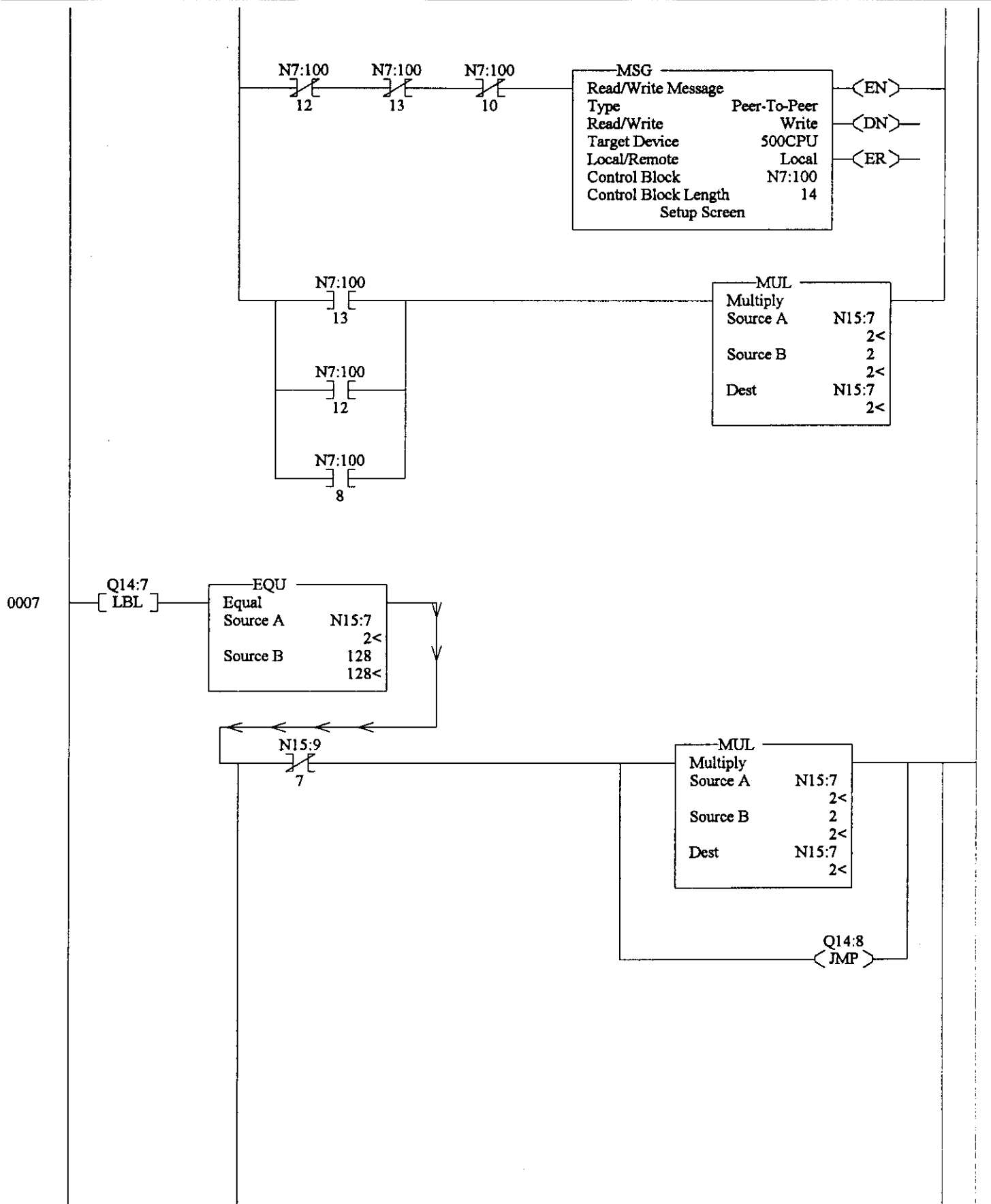


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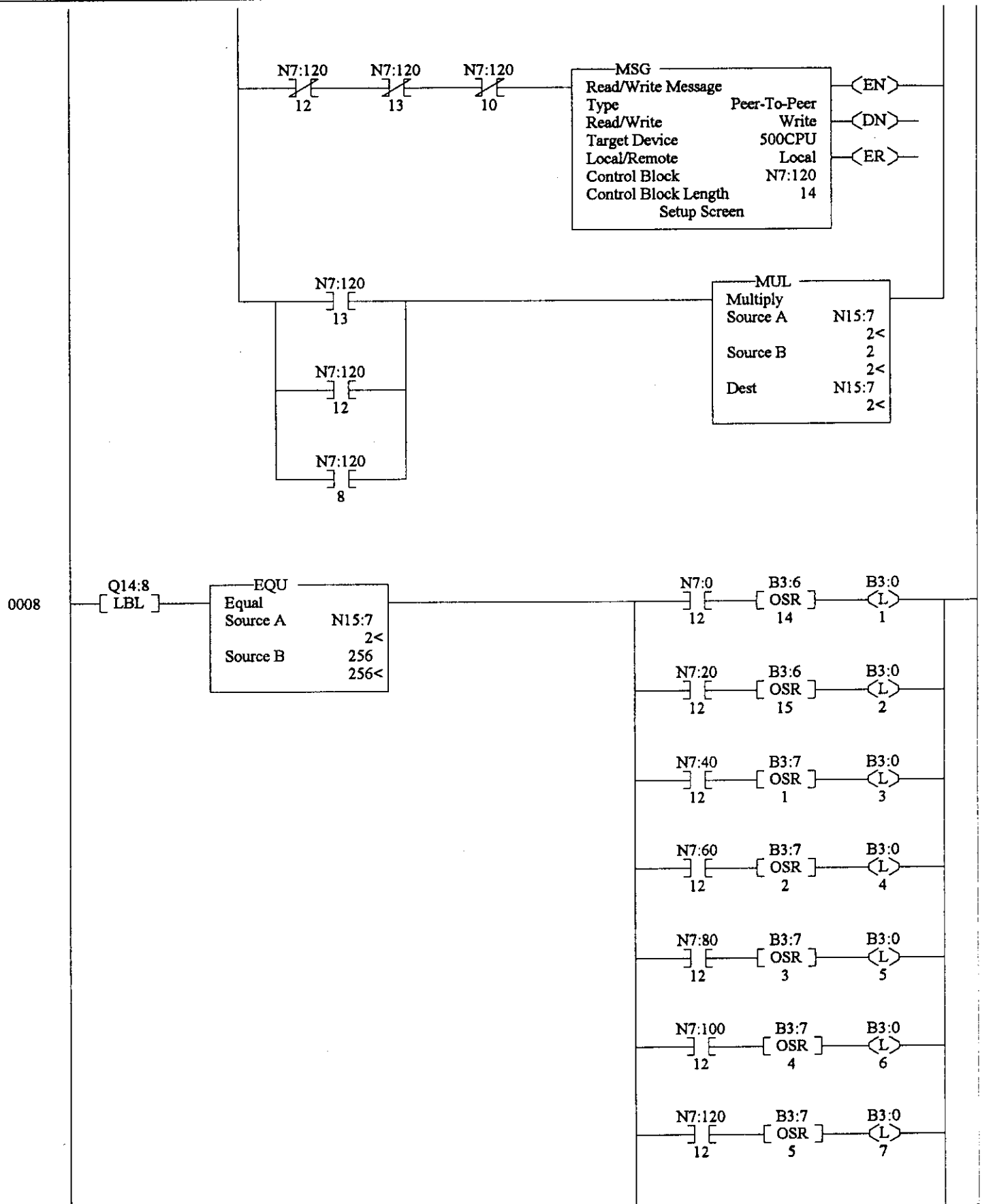




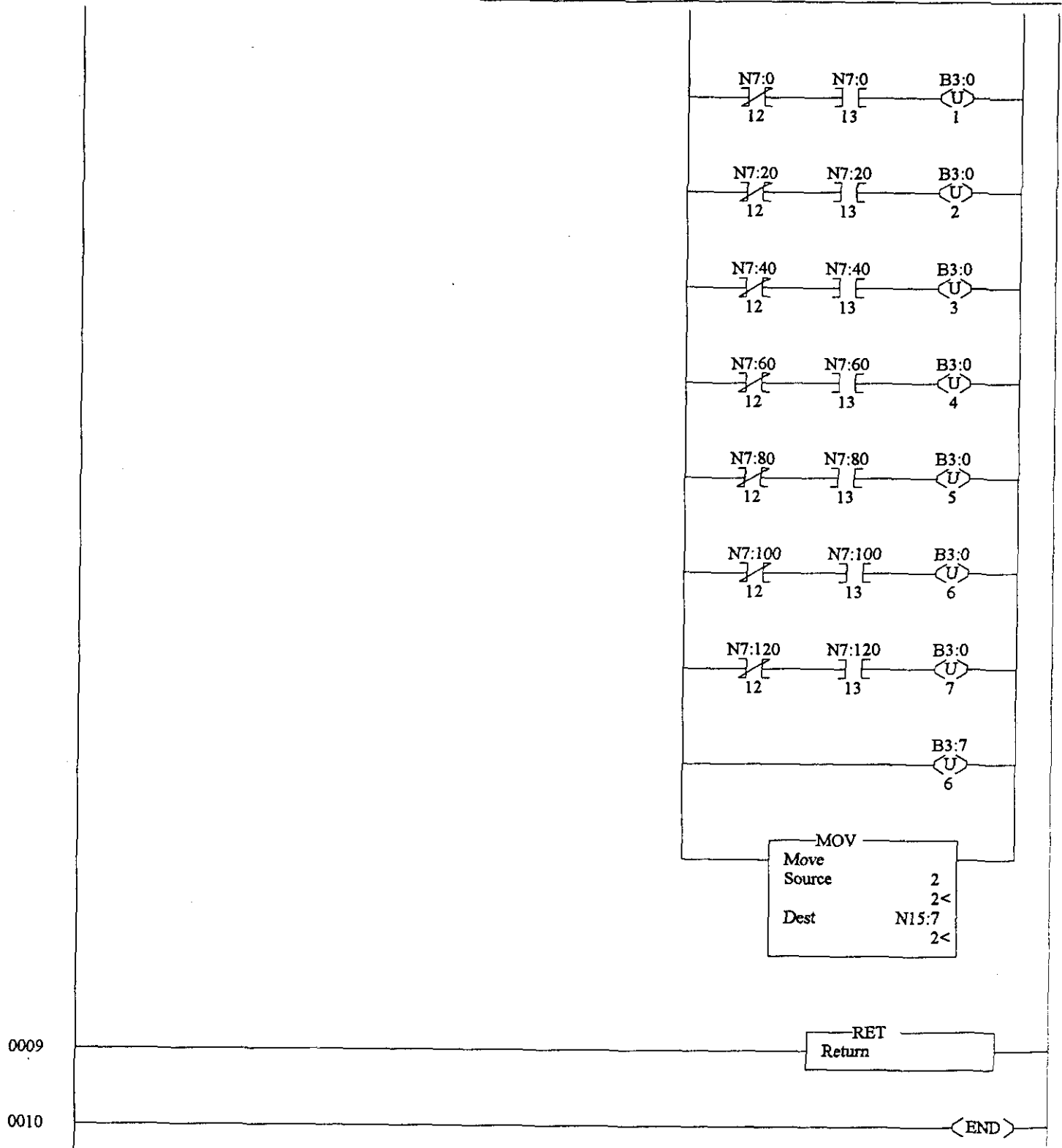
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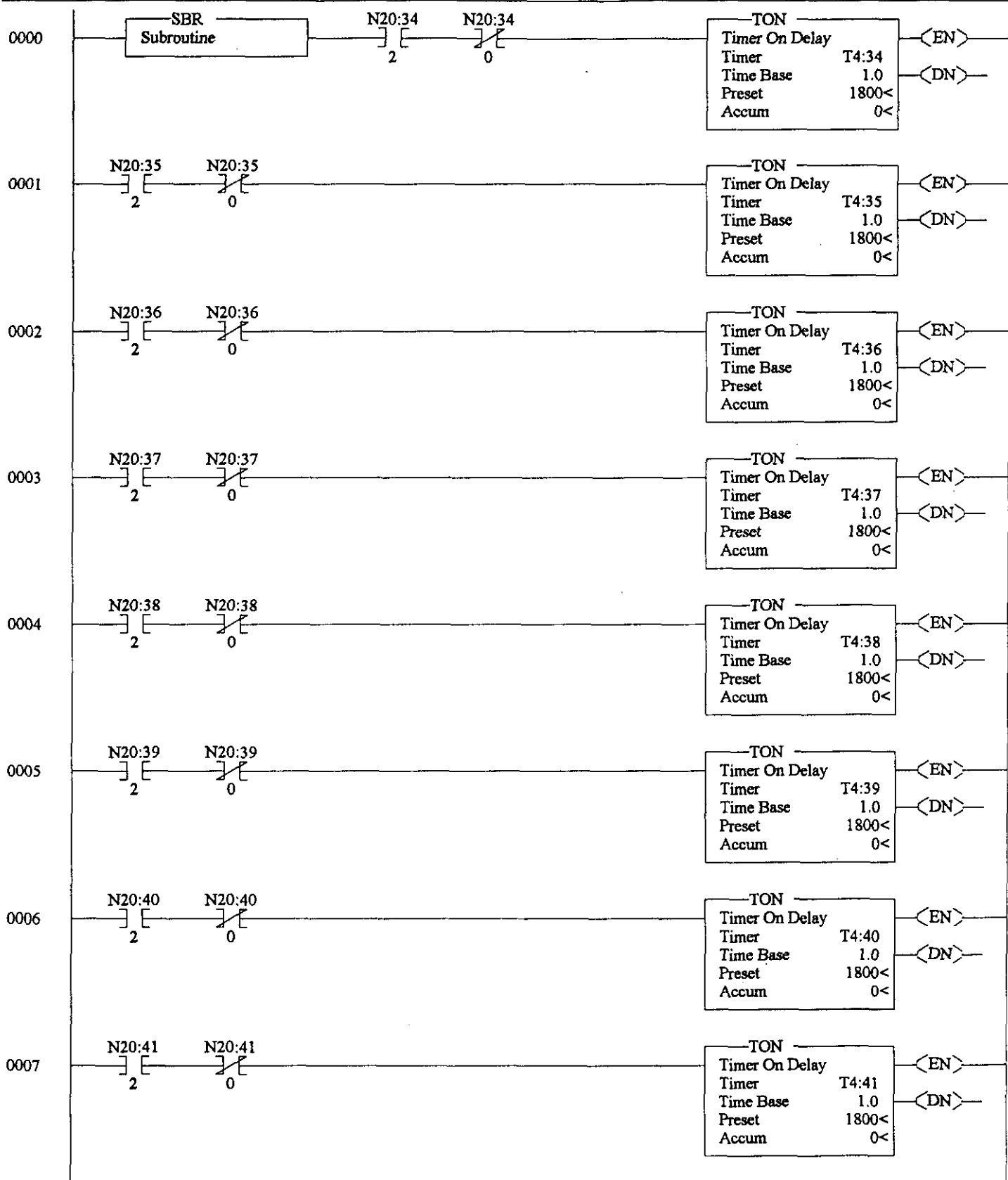
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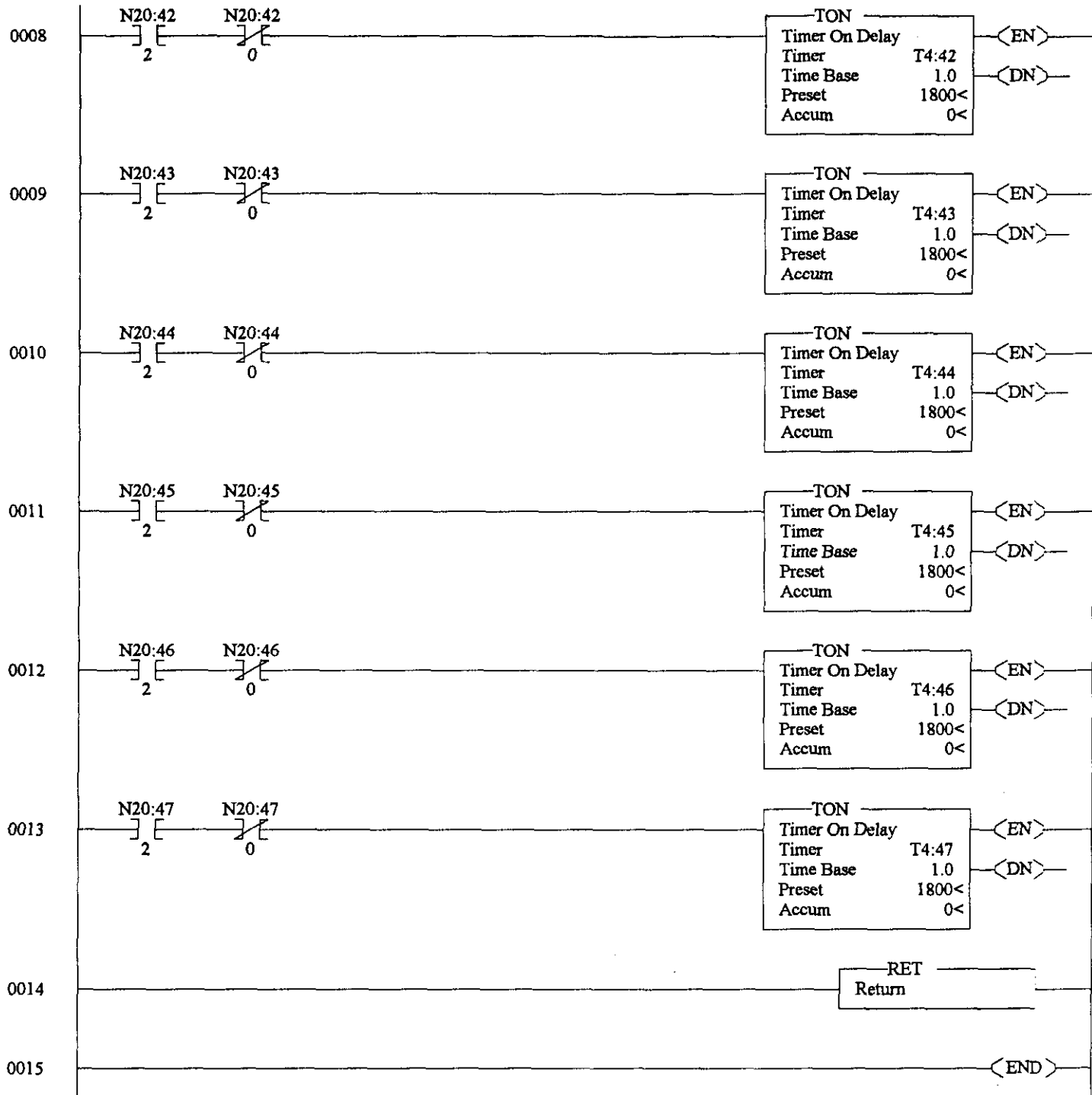
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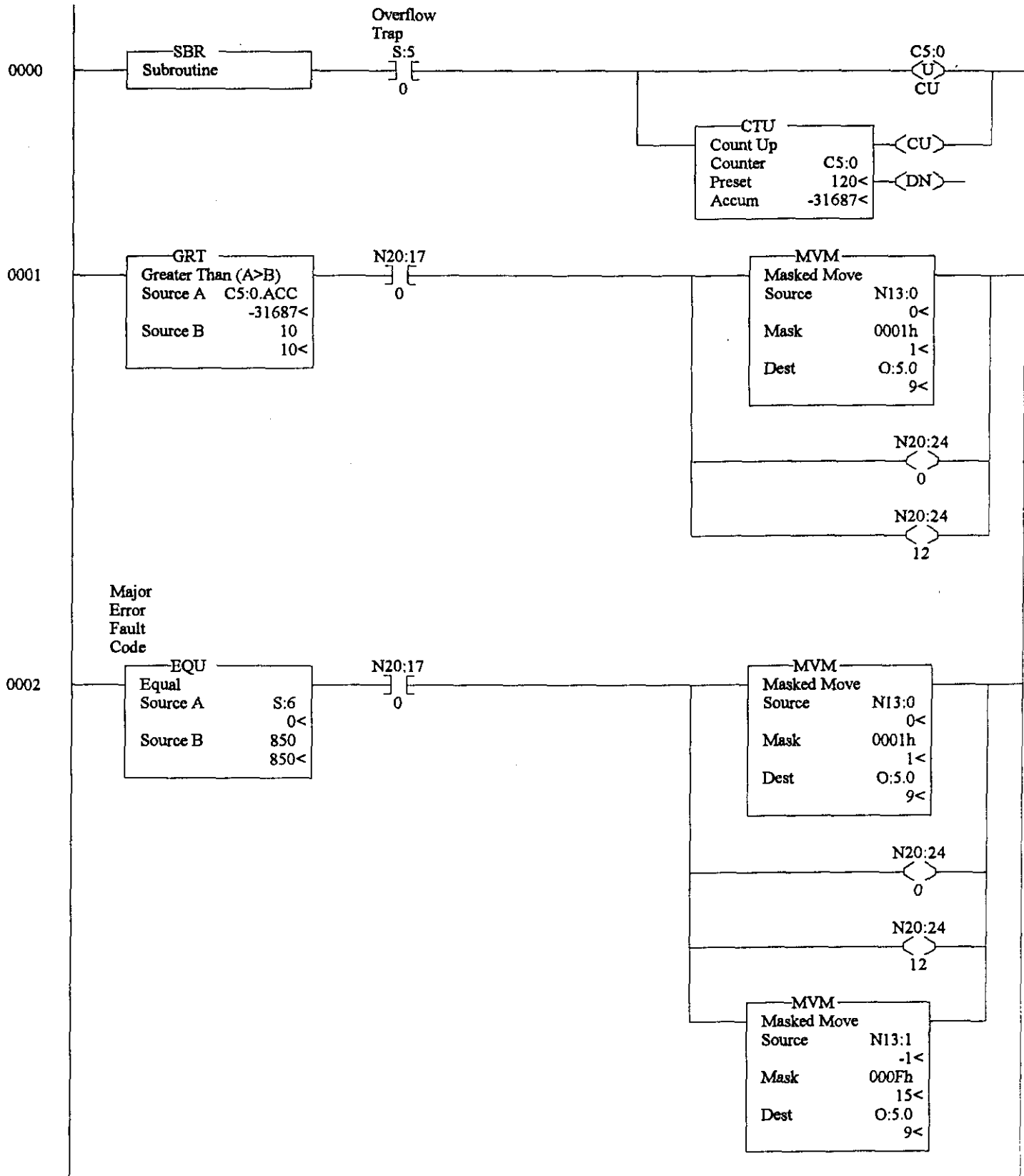
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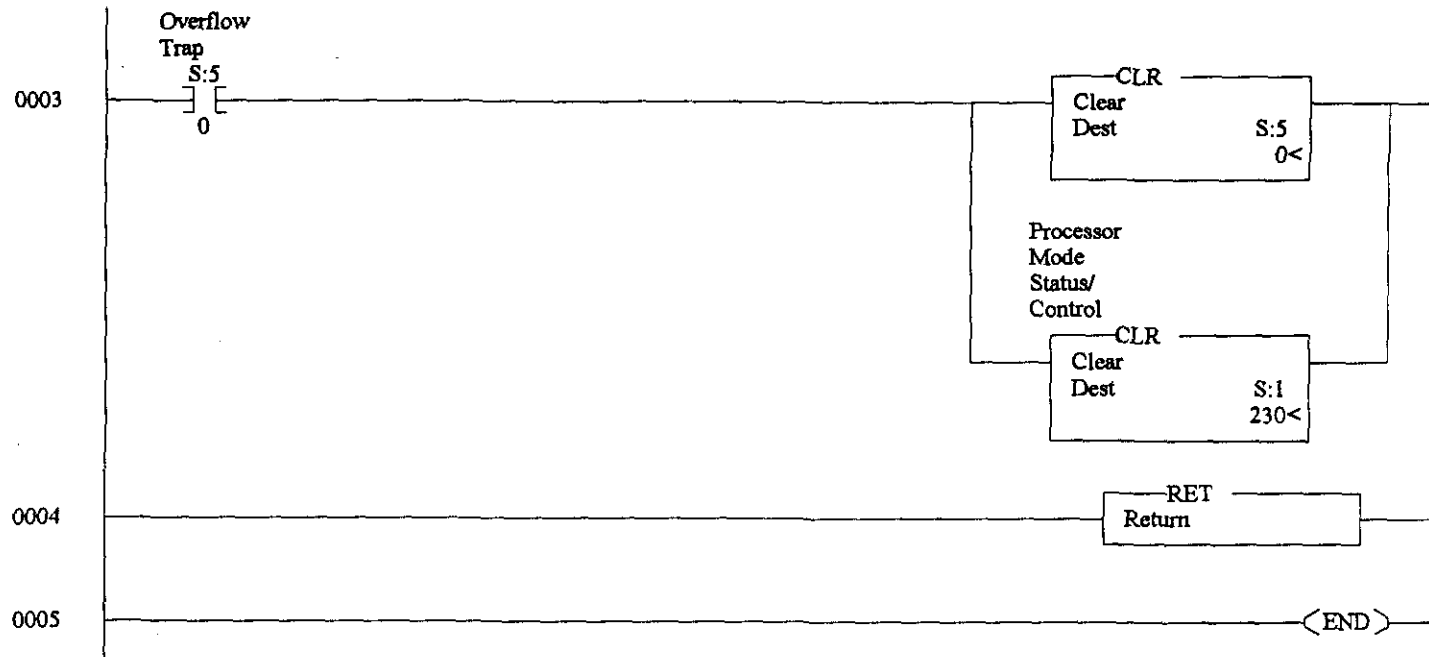
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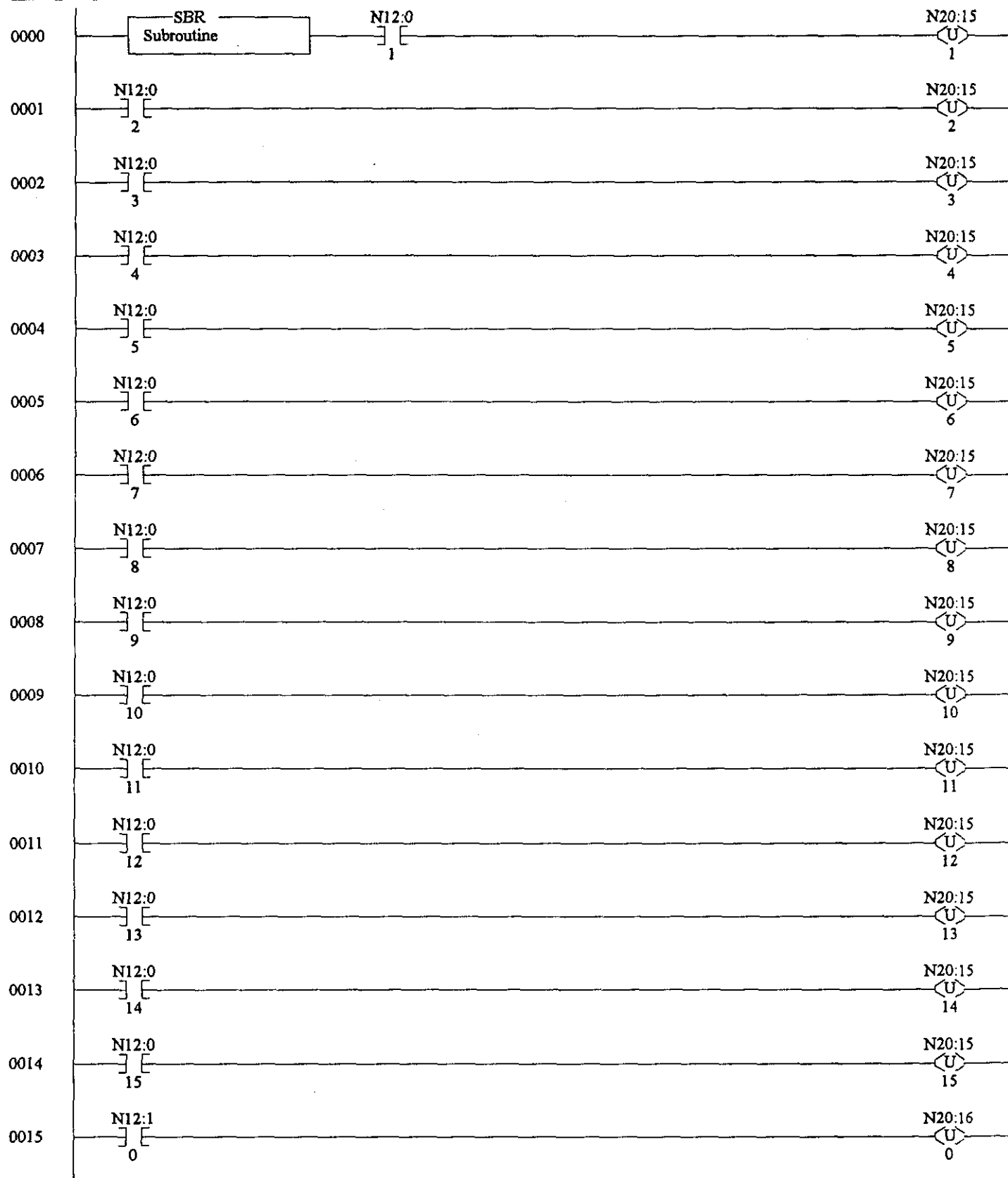
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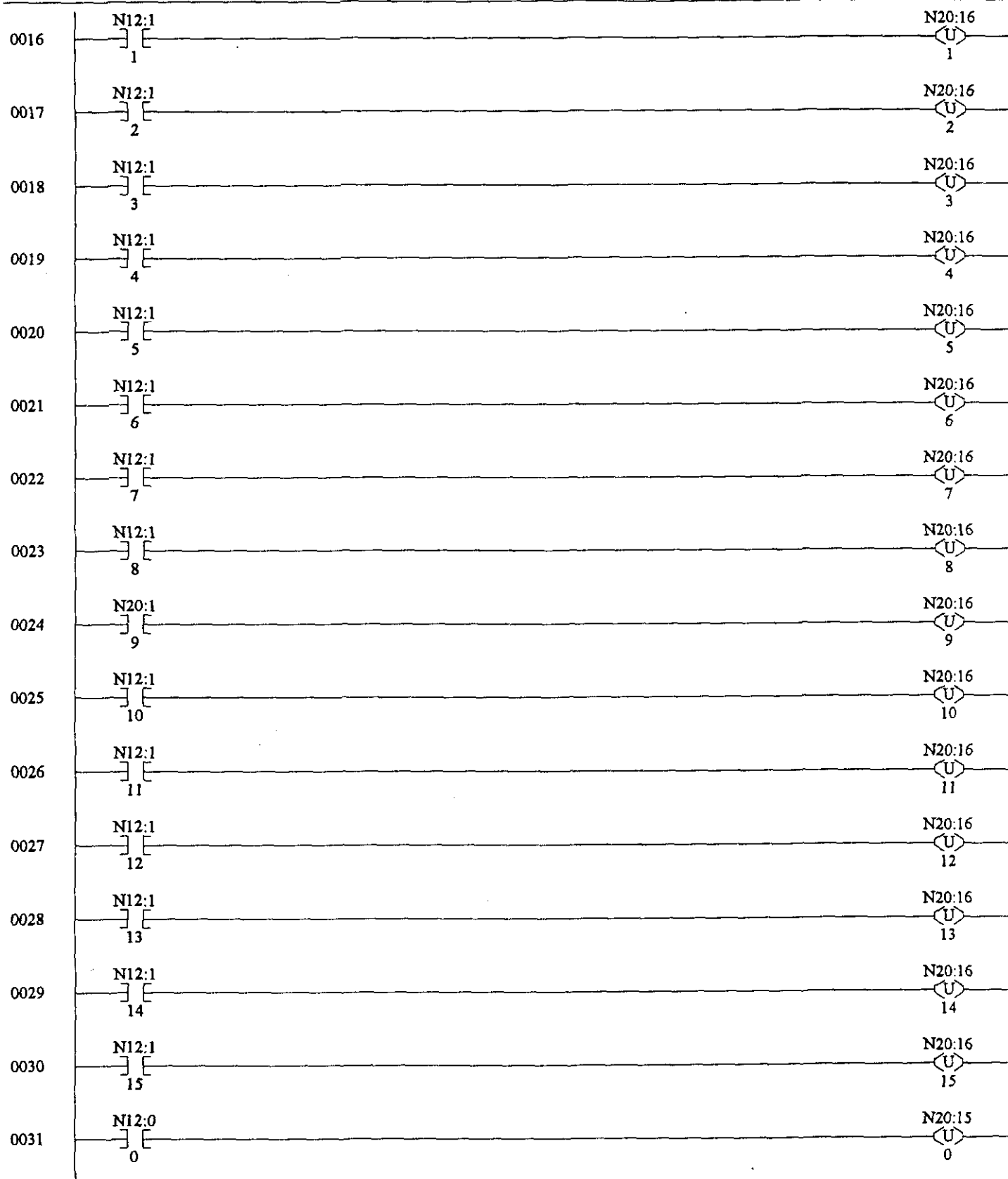
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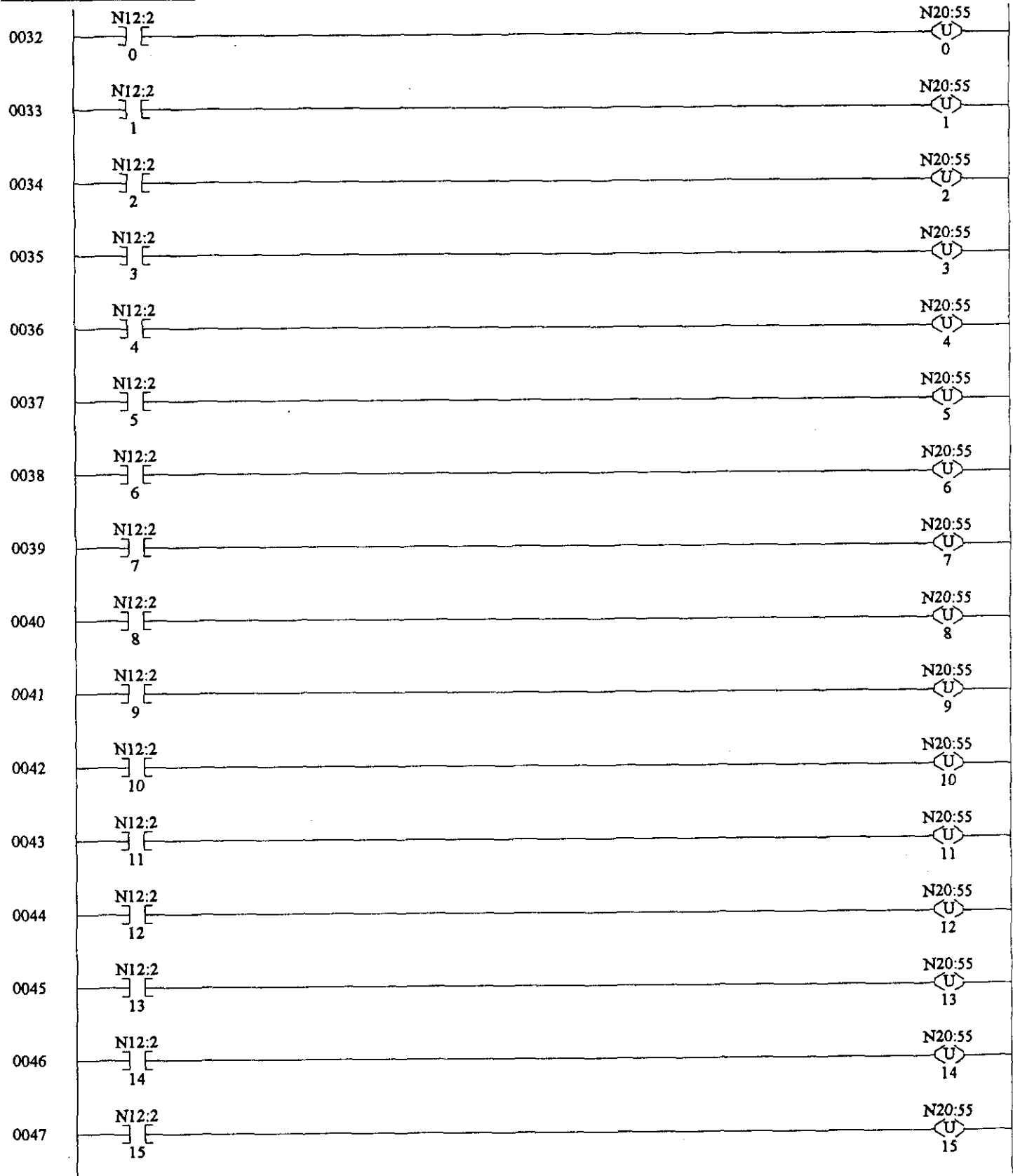
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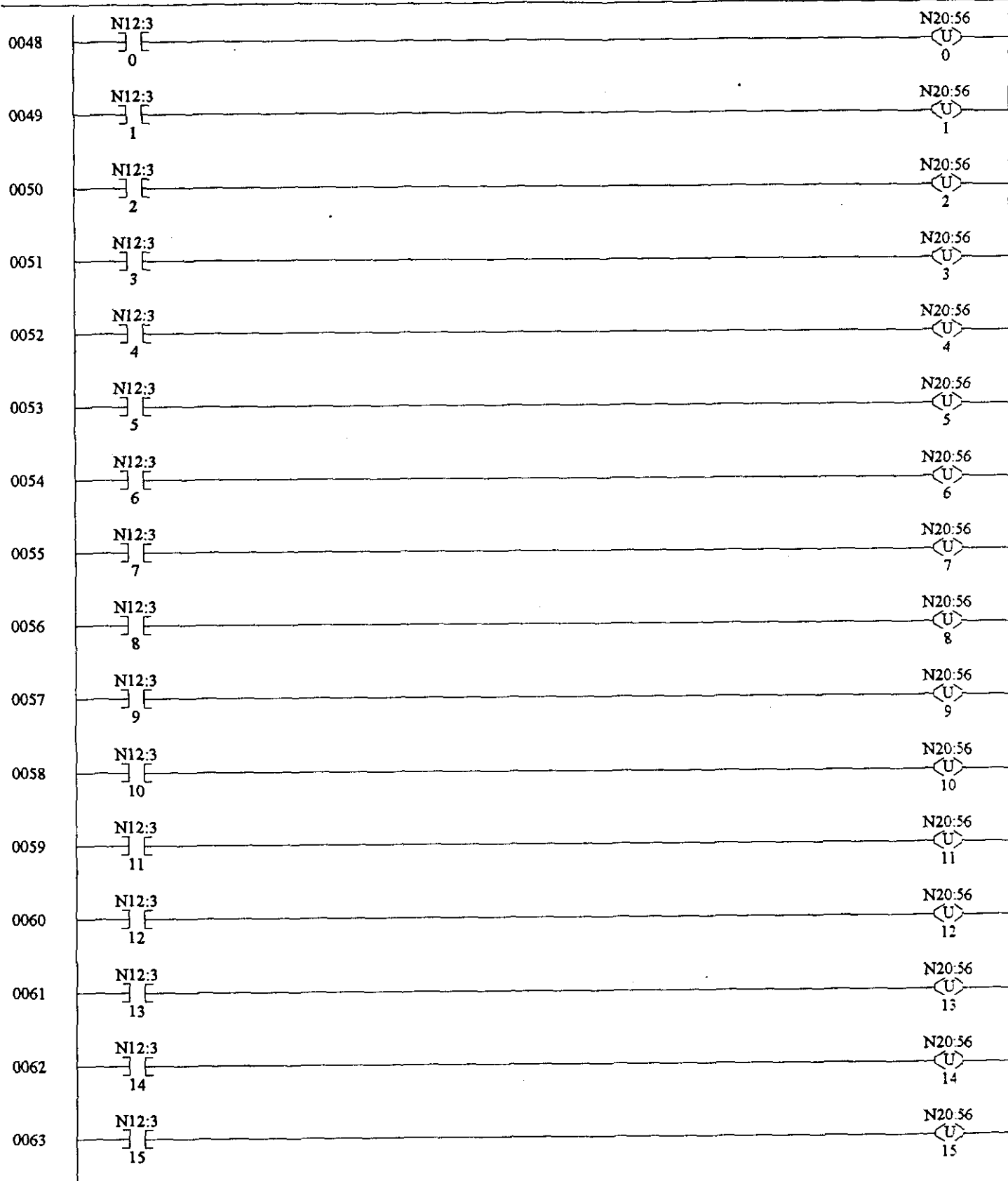
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LAD 17 - --- Total Rungs in File = 66



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



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

0064

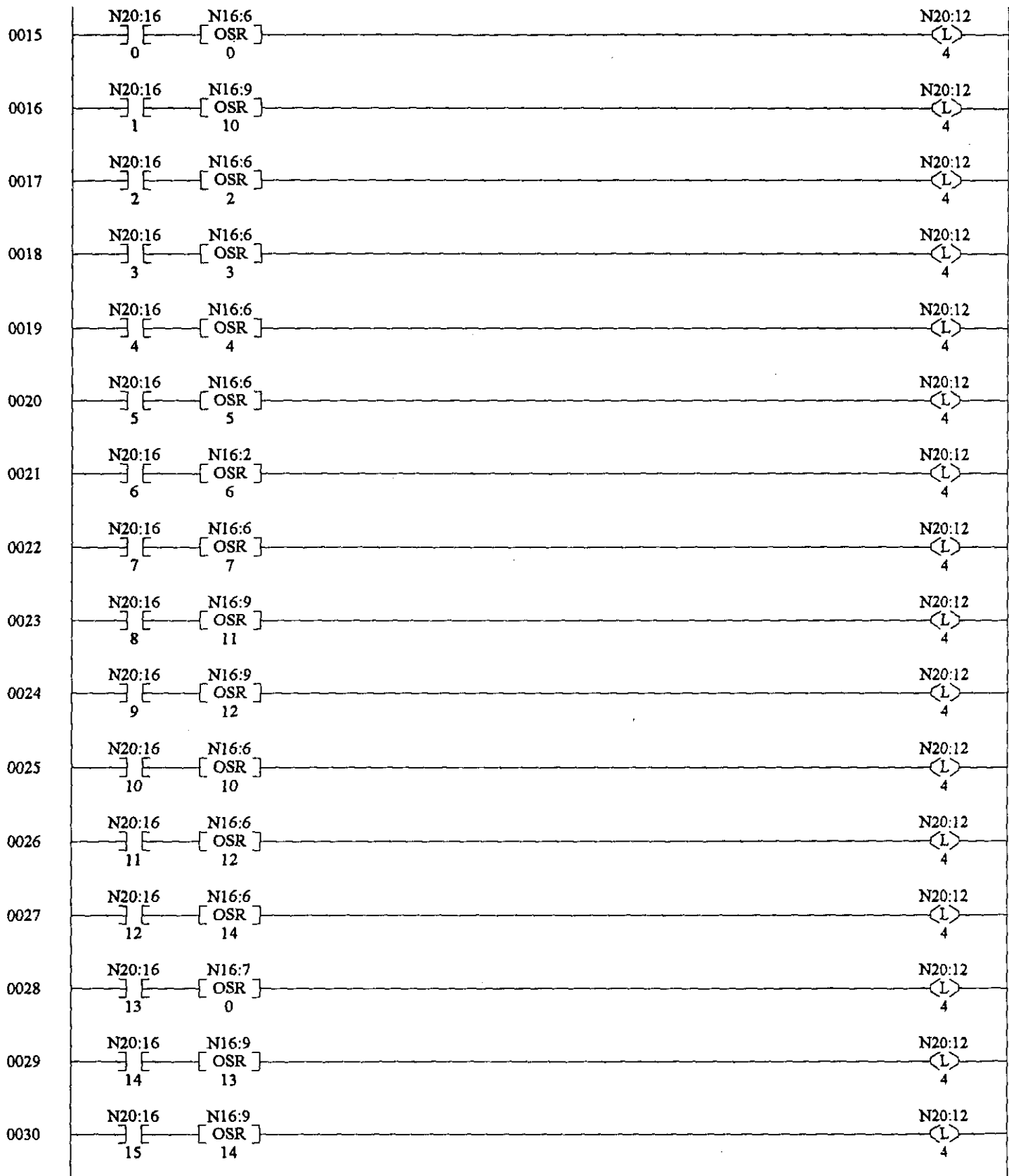
RET
Return

0065

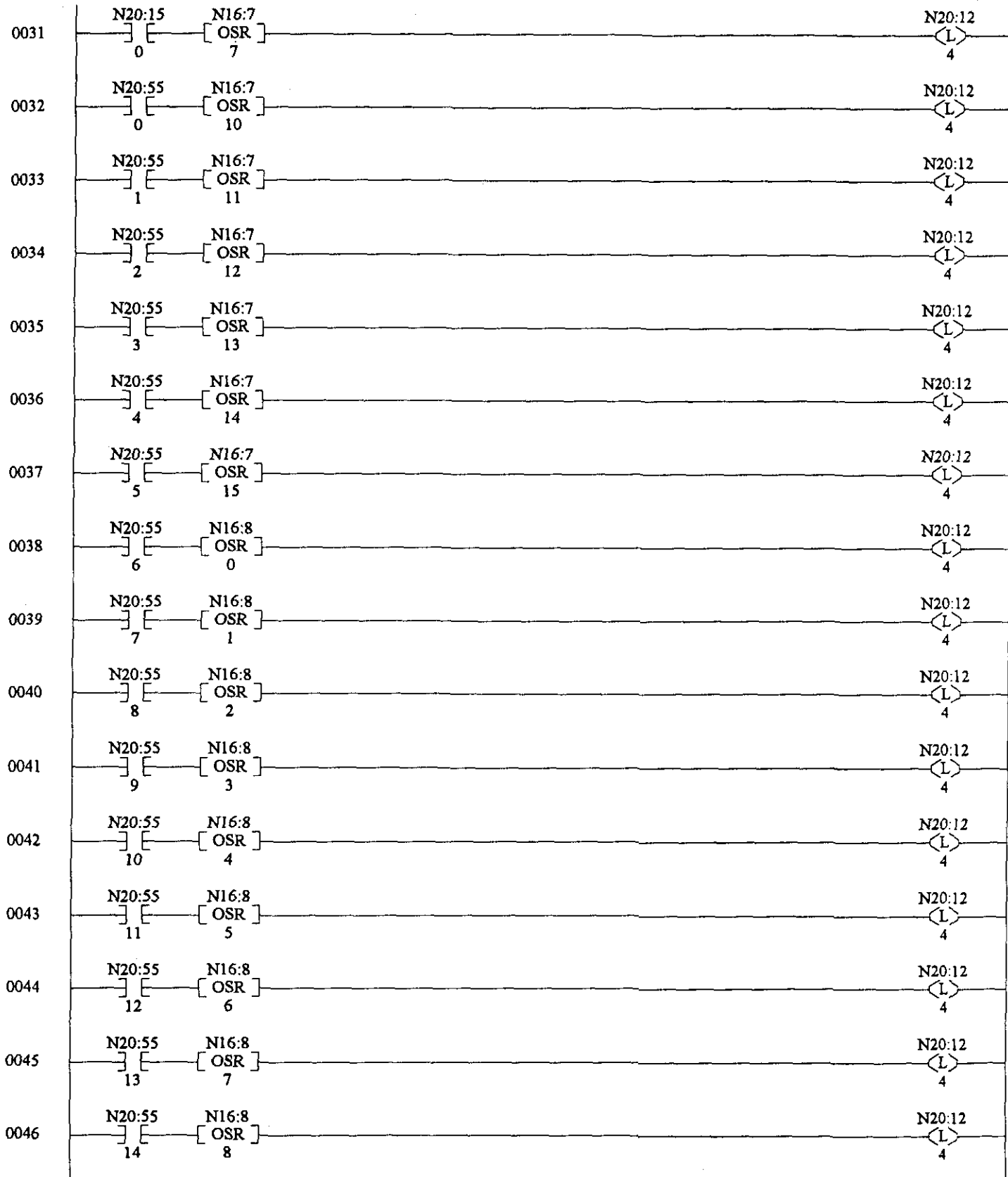
END



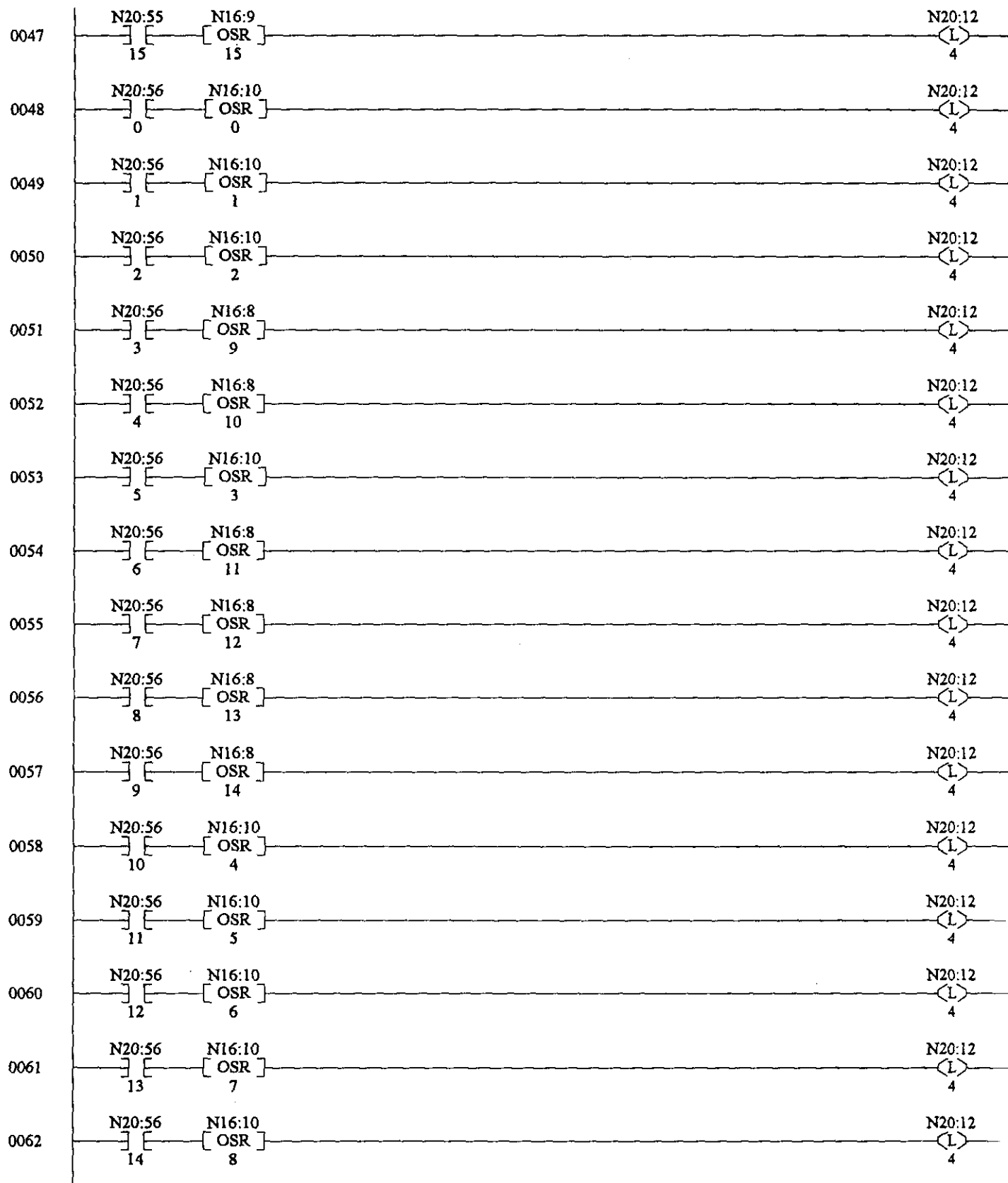
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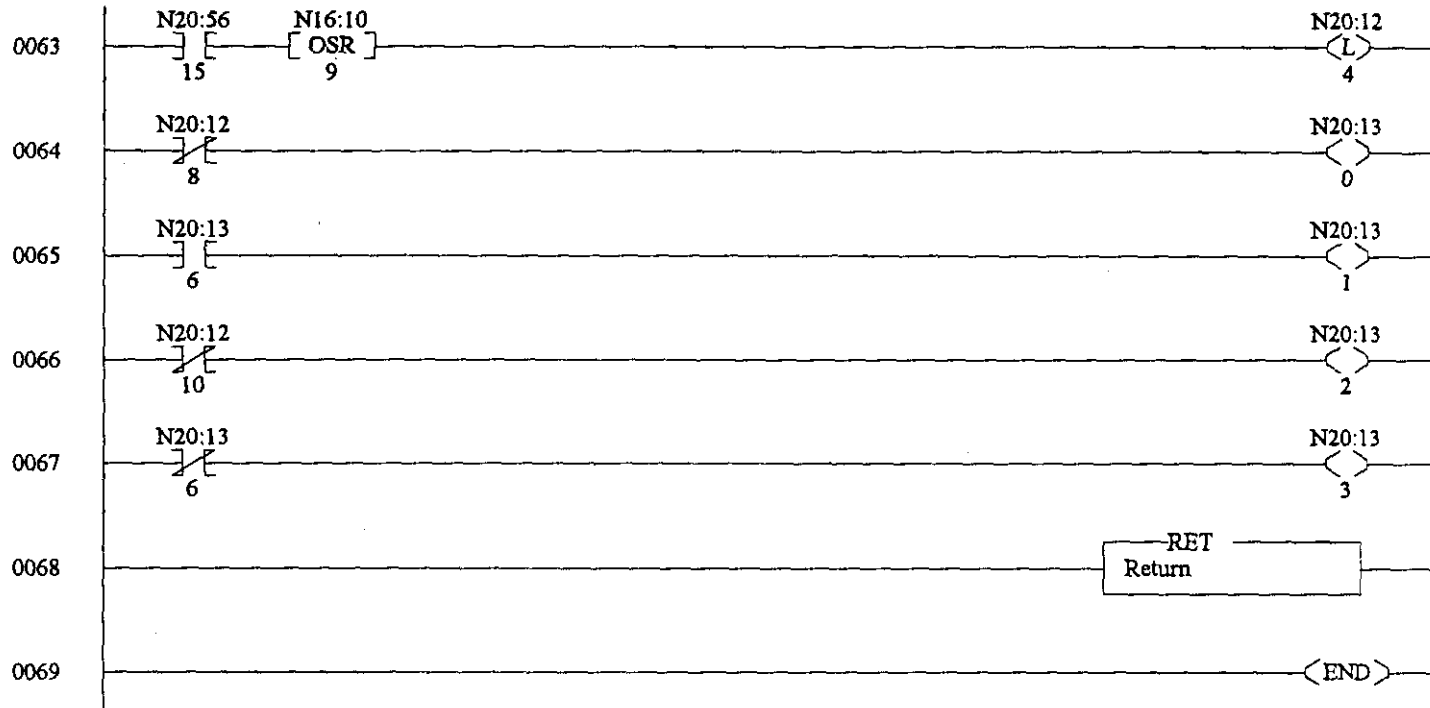
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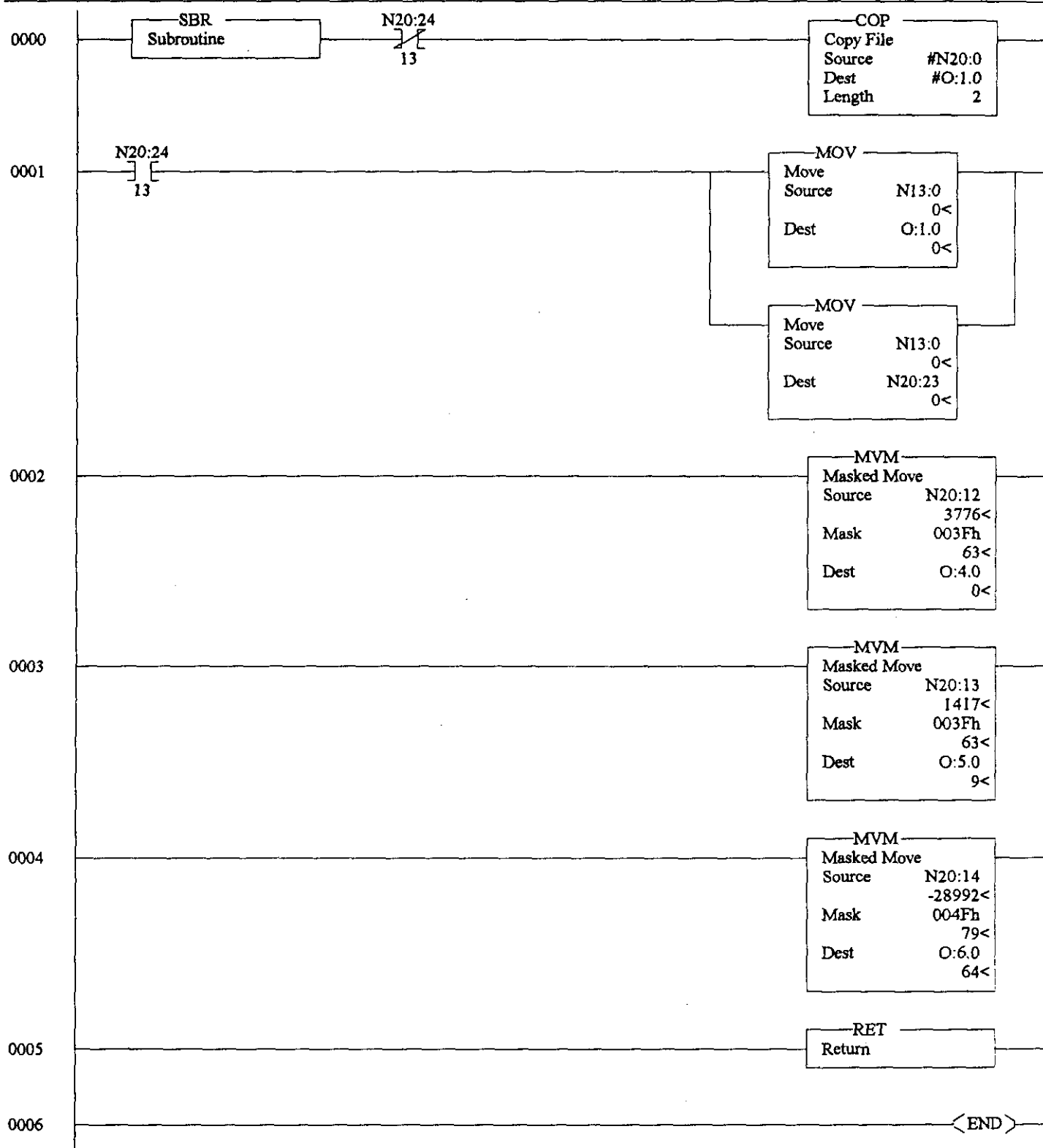
LAD 18 - --- Total Rungs in File = 70



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



LAD 19 - --- Total Rungs in File = 7



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.			
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-6001A	N20:8	Instrument Enclosure Temp	Air Compar enclsr temp Hi		
I:3.1	T/C	TE-6001J	N20:9	Pump Temp			
I:3.2	T/C	TE-6002J	N20:10	Jumper Temp			
I:3.3	T/C	TE-6004A	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	DILPMP	N20:12/3	Dilution water pump and sol valve			
O:4.4	DO	ST-1	N20:12/4	Strobe light			
O:4.5	DO	EV-1	N20:12/5	True if Air to DOV			
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	LD-2	N20:13/8	Leak detector 2			
I:5.3	DI	DILWTR	N20:13/9	Dil tank water level LOW			
I:5.4	DI	Recirc-prs	N20:13/10	Recirc Flush pressure alarm			
I:5.5	DI	FGM	N20:13/11	FGM			
O:6.0	DO	SPARE	N20:14/0				
O:6.1	DO	SPARE	N20:14/1				
O:6.2	DO	SPARE	N20:14/2				
O:6.3	DO	SPARE	N20:14/3				
O:6.4	DO	SPARE	N20:14/4				
O:6.5	DO	SPARE	N20:14/5				
I:6.0	DI	LDC1	N20:14/6	Leak detect TROUBLE 1			
I:6.1	DI	LDC2	N20:14/7	Leak detect TROUBLE 2			
I:6.2	DI	SPARE	N20:14/8	Reserve for PS-2 (ask Chuck for detail)			
I:6.3	DI	Seismic	N20:14/9	Seismic Switch			
I:6.4	DI	SSC	N20:14/10	Safety Shutdown Circuit			
I:6.5	DI	DOME	N20:14/11	Dome Pressure			
		ALARM	ALARM ACKNOWLEDGE				DTAM
		1=alarm	1=ACK				1=Ack
		0=no alarm	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
		N20:24/7	N20:15/7	Pump pit Leak Trouble	Pump pit Trouble	I:6.0/0	N12:0/7

					node 4=S103		
			N20:17/4	Heater On	node 5=SX104		
			N20:17/5	Clear Counter	node 6=SX106		
			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			
		N10:26	N20:22	PROCESS VARIABLE			
		N10:29	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	Flush Press Hi			
			N20:32/6	Recirc Press Hi			
			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-01a 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 Flush press Hi			
		N20:34/6	Node #2 Recirc press Hi			
		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 LEAK 1			
		N20:36/4	NODE #4 LEAK 2			
		N20:36/5	Node #4 Flush press Hi			
		N20:36/6	Node #4 Recirc press Hi			
		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 Flush press Hi			
		N20:37/6	Node #5 Recirc press Hi			
		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 #6		
			N20:38/0	NODE #6 PRIME		
			N20:38/1	NODE #6 FLUSH		
			N20:38/2	NODE #6 SHUTDOWN		
			N20:38/3	NODE #6 LEAK 1		
			N20:38/4	NODE #6 LEAK 2		
			N20:38/5	Node #6 Flush press HI		
			N20:38/6	Node #6 Recirc press HI		
			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 Flush press HI		
			N20:39/6	Node #7 Recirc press HI		
			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 (input2)		
			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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Project Title/Work Order	Project Number	Project Manager	Project Start Date	Project End Date	Project Status	Project Budget	Project Actuals	Project Variance	Project Comments
Project A	101	John Doe	2023-01-01	2023-03-31	Completed	\$100,000	\$100,000	\$0	Project A completed successfully.
Project B	102	Jane Smith	2023-04-01	2023-06-30	In Progress	\$200,000	\$150,000	-\$50,000	Project B is currently in progress.
Project C	103	Mike Johnson	2023-07-01	2023-09-30	On Hold	\$150,000	\$0	-\$150,000	Project C is currently on hold.
Project D	104	Sarah Brown	2023-10-01	2023-12-31	Planned	\$120,000	\$0	-\$120,000	Project D is currently planned.
Project E	105	David White	2024-01-01	2024-03-31	Planned	\$80,000	\$0	-\$80,000	Project E is currently planned.

RPP-5960 PLC SOFTWARE PROGRAM FOR S-102 PUMPING, INSTRUMENTATION AND CONTROL (PIC) SKID "E".

EDT No. 624886

ECN No.

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