



Doosan Infracore
Machine Tools

VMC Maintenance Manual (Alarm)

(DNM 500/F-0iMD)

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1. Emergency Alarm

1.1 **2001** OP Emergency Stop PB or LS Off

1) Description

The Emergency Stop push button on the main OP is pressed.

2) Cause of problem

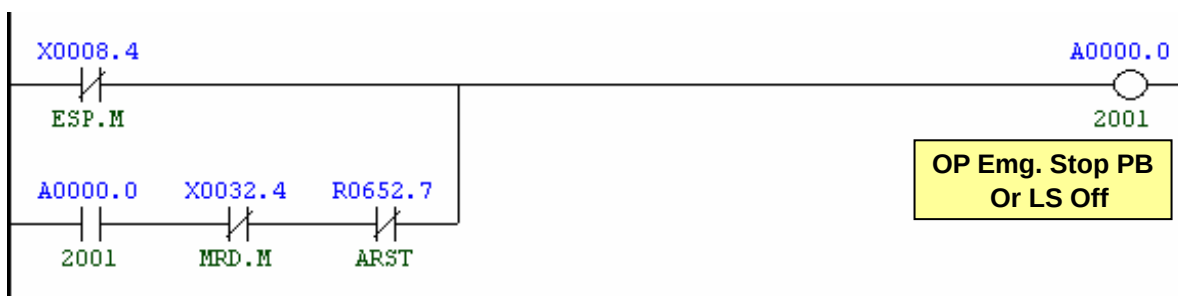
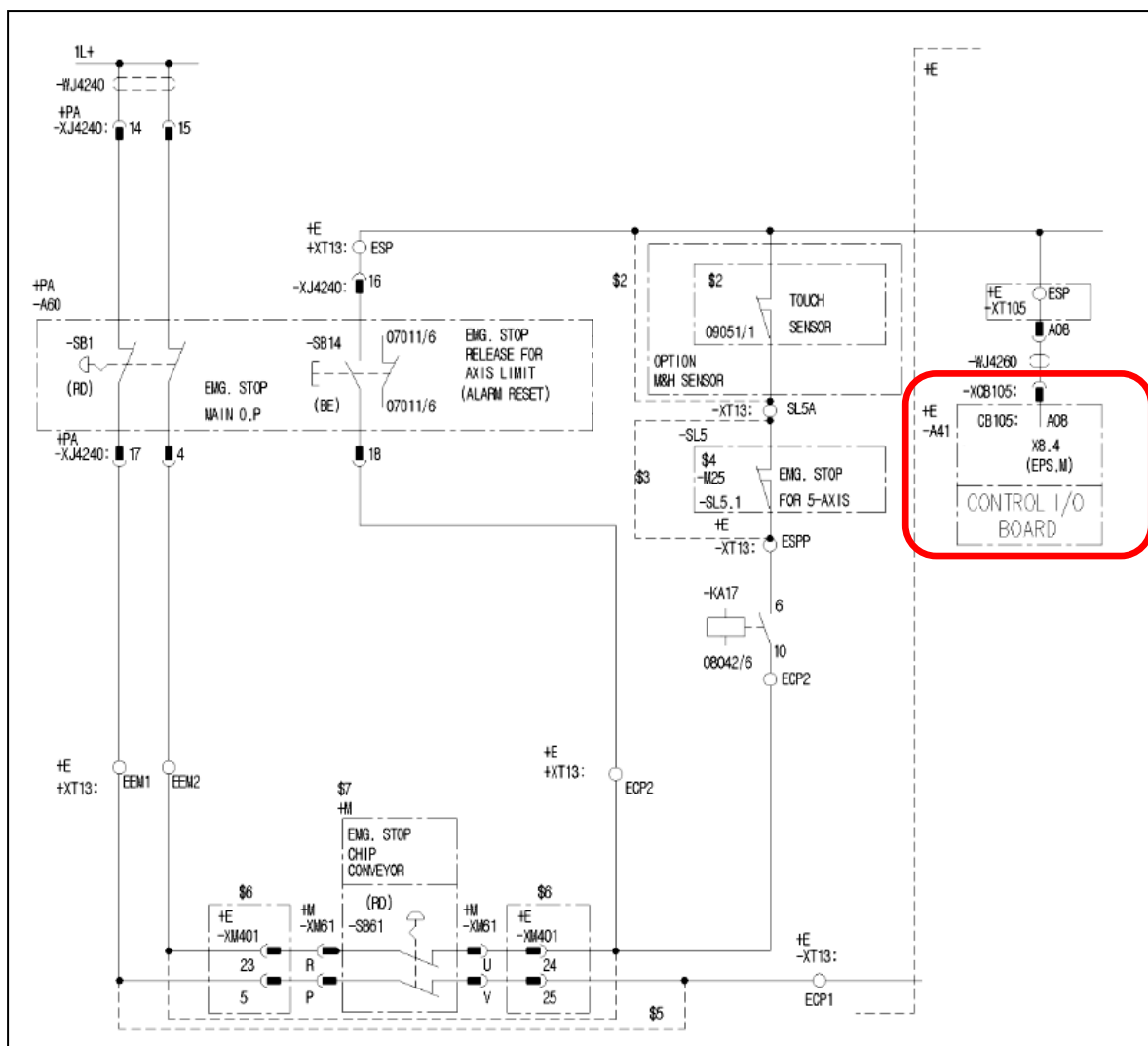
- ① The Emergency Stop push button on the OP (main OP, ATC OP, APC OP) is pressed down.
- ② Problem with the Emergency Stop button on the OP or other related parts
- ③ Short-circuit of the wiring

3) Action

- ① Check if the red mushroom push button on the OP (Main O.P, ATC O.P, Chip Conveyor O.P) is pressed down, and if so, turn the button counter clockwise to release it.
- ② Check the Emergency Stop button or related parts if they have a problem. If you find an error, repair or replace the defective one.
- ③ Short-circuit of the wiring
Refer to the circuit diagram and use the electric tester to check each terminal block. If you find an error, repair or replace the defective one.

Part Name	Part No.	Symbol	Spec.	Maker
Switch, Emergency P/B	ESWPB0439	SB1,14,61	B30-81L2B	KACON

Signal	Address	Device Symbol	I/O	Connector (Pin)	Numbering Tube
Emergency Stop Signal	X8.4 (ESP.M)	-SL1	Control I/O Board	XCB105 (A08)	ESP
Machine Ready	X32.4 (MRD.M)	-SB11	Distributed I/O Module A	XCE56A (A04)	SB11



Adress	Symbol	Coil Comment
X8.4	ESP.M	Emergency Stop
A0.0	2001	OP Emg. Stop or LS Off
X32.4	MRD.M	Machine Ready
R652.7	ARST	Alarm Reset

1.2 2002 Main Spindle Servo Alarm

1) Description

There occurred an alarm from the main spindle drive unit.

2) Cause of problem

- ① Error found in the main spindle drive unit
- ② Error found in the spindle motor, power cable or signal cables

3) Action

- ① Check the alarm number that is displayed on the main spindle drive unit of the electric cabinet. Take a necessary measure according to the alarm number.
 ➞ Refer to "Troubleshooting by the spindle amplifier alarm" in the appendix.
- ② Check the spindle motor for the 3-phase power source and the feedback cable if there is a problem.



Address	Symbol	Coil Comment
F45.0	ALMA	Spindle Alarm
A0.2	2002	Main Spindle Servo Alarm
R652.7	ARST	Alarm Reset



1.3 2003 Circuit Protector Trip

1) Description

The circuit protector that is installed in the electric cabinet is tripped (triggered).

2) Cause of problem

- ① The circuit protector is triggered. (abnormal signal detected)
- ② Error in power control
- ③ The circuit protector has an error itself.

3) Action

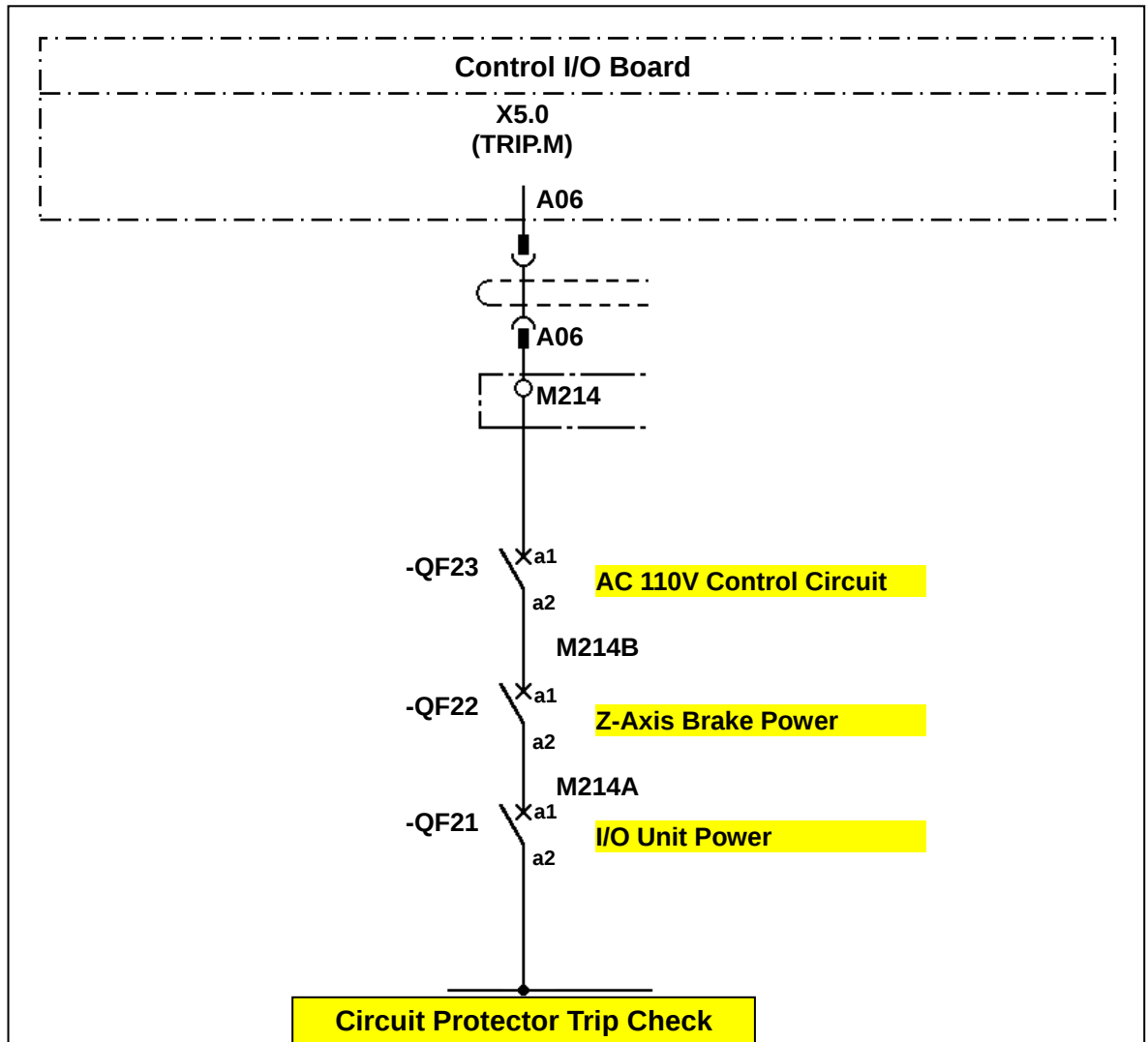
- ① Find out the cause that the circuit protector is tripped.
 - ☞ If QF22 is tripped, check the secondary circuit (L+) of QF22 if it's short-circuited, and take a necessary measure before turning the circuit protector back on.
- ② If the alarm occurs but no circuit protector is tripped, measure the resistance of each contact point, and find out the defective circuit protector, and replace it with a new one.
 - ☞ If you measure the resistance on the contact point of the circuit protector that is turned on, you will get "0" ohm if it's normal.
- ③ If you have found nothing wrong in steps ① and ② above, that is thought to be caused by the I/O circuit board. Check the I/O board and repair or replace it if necessary.

Part Name	Part No.	Symbol	Spec.	Maker
Protector, Auxiliary	ENFBX0290S	QF21, 22, 23	5SX9100(1A1B)	Siemens
Protector, Circuit	ENFBX0268S	QF21	5SX1206-7(6A)/1P	Siemens
Protector, Circuit	ENFBX0390S	QF22	5SX2102-7(2A)/1P	Siemens
Protector, Circuit	ENFBX0266S	QF23	5SX2103-7(3A)/1P	Siemens

Signal	Address	Device Symbol	I/O	Connector (Pin)	Numbering Tube
Circuit Protector Trip	X5.0 (TRIP.M)	-	Control I/O Board	XCB106 (A06)	M214



Address	Symbol	Coil Comment
X5.0	TRIP.M	Circuit Protector Trip Check
R820.2	2003	Circuit Protector Trip
R652.7	ARST	Alarm Reset



1.4 2005 Hyd. Pressure Down Alarm

1) Description

Hyd. pressure of the power unit falls below the setting value of the Hyd. pressure switch, causing the Hyd. pressure switch to be tripped.

2) Cause of problem

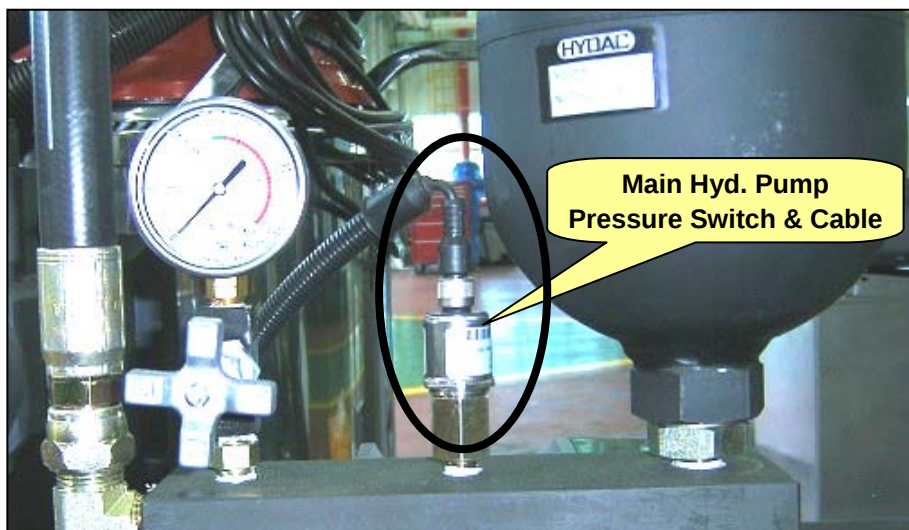
- ① The hydraulic power unit has an error or its pressure falls below 20kg/cm².
- ② Check the Hyd. pressure switch or if any of its parts is defective.

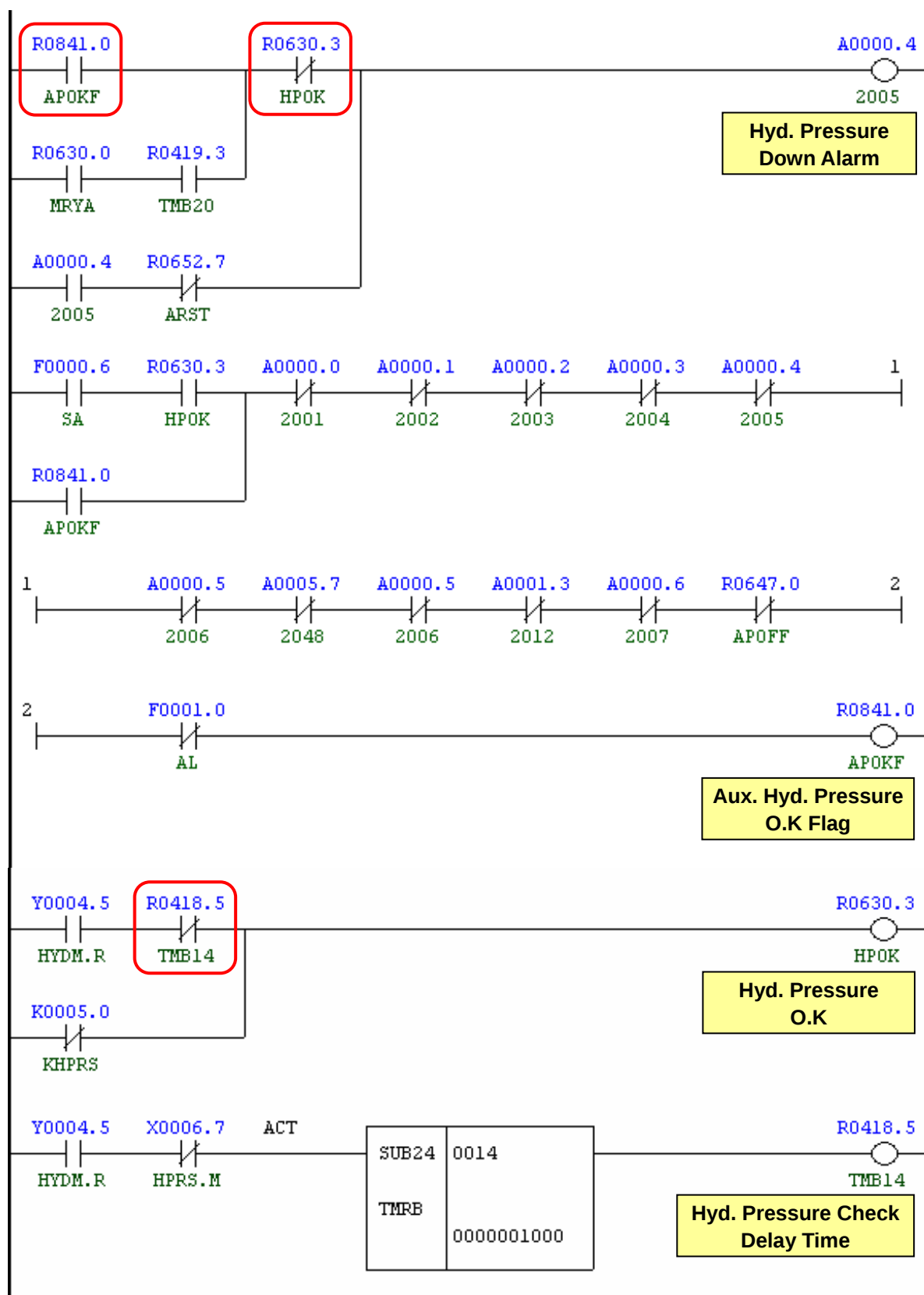
3) Action

- ① Turn the control valve of the Hyd. power unit clockwise to adjust the pressure to 50kg/cm².
- ② Check if the Hyd. power unit pressure switch has an error, or the wiring or related component parts are defective. Check the Hyd. power unit, press switch, and wiring from switch and electric cabinet as well as the I/O board, and make repair or replacement if you find a problem.

Part Name	Part No.	Symbol	Spec.	Maker
Cable, Pressure Switch	ECBLS0167F	-WK11	BKS B19-1-05	BALUFF
Switch Pressure	R37983	-SP01	EDS810-060-0-024	HYDACS

Signal	Address	Device Symbol	I/O	Connector (Pin)	Numbering Tube
Hyd. Pressure Check	X6.7 (HPRS.M)	-SP01	Control I/O Board	XCB106(B13)	SP01
Hydraulic Motor Run	Y4.5 (HYPM.R)	-KA31	Control I/O Board	XCB106(B18)	KA31





Address	Symbol	Coil Comment
R841.0	APOKF	Aux. Pressure OK Flag
R630.0	MRYA	Machine Ready Aux.
R419.3	TMB20	Hyd. Pump On Check Time
R630.3	HPOK	Hyd. Pressure OK
A0.4	2005	Hyd. Pressure Down Alarm
R652.7	ARST	Alarm Reset
F0.6	SA	Servo Ready
A0.0	2001	OP Emergency Stop PB or LS Off
A0.1	2002	Main Spindle Servo Alarm
A0.2	2003	Power Circuit Over current Detect
A0.3	2004	Hyd, Pump Motor Overload
A0.5	2006	Gear Shift Check SW Alarm
A5.7	2048	Spindle Stop Signal Alarm
A1.3	2012	Magazine Emergency State
A0.6	2007	Main Power Phase & ATC SW Error
R647.0	APOFF	Aux. Pressure OK Flag
F1.0	AL	NC Alarm
Y4.5	HYDM.R	Hydraulic Pump Motor
R418.5	TMB14	Hyd. Pressure Check D-Time
K5.0	KHPRS	Hyd. Pressure Switch Used
X6.7	HPRS.M	Hyd. Pressure Down Check

1.5 2007 Main Power Phase & ATC Switch Alarm

1) Description

Error in the power source supplied to the changer motor or the the tool clamp/unclamp command signal

2) Cause of problem

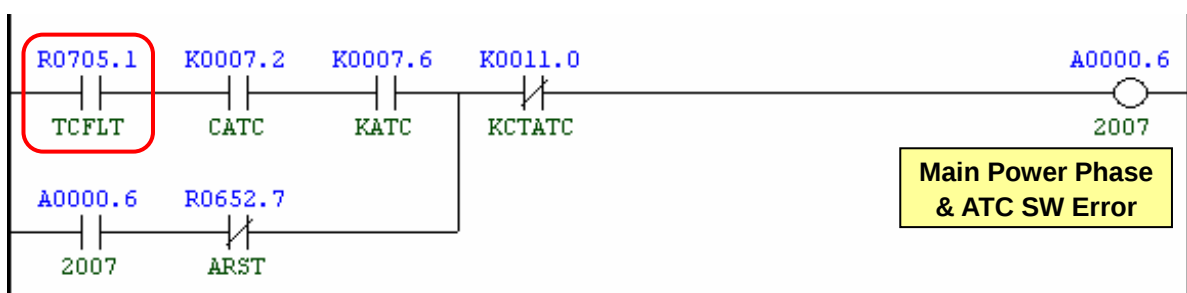
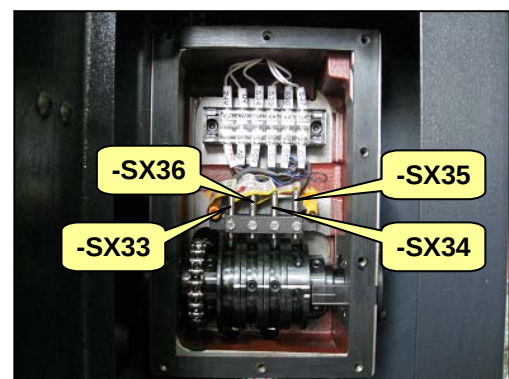
- ① The phases (R, S, T) of the main power supplied to the machine are switched with each other.
- ② The tool clamp command signal is detected in advance of the tool unclamp command signal during the tool change.

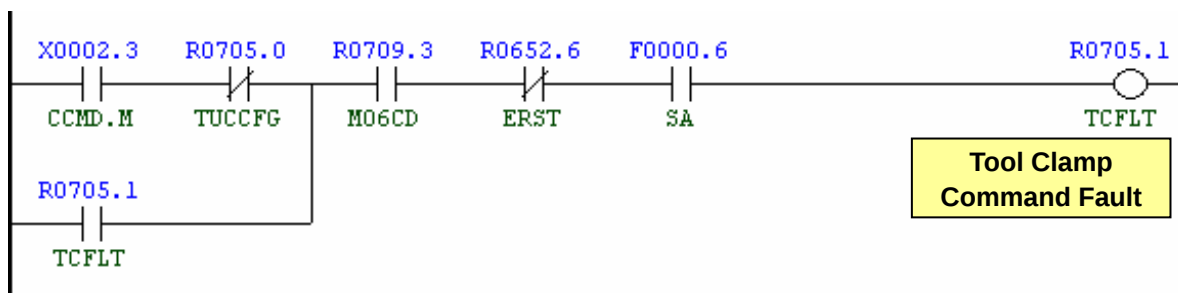
3) Action

- ① Check the rotation orientation of the changer motor and reverse it. While operating the changer motor in reverse, switch two phases (R, S, T) of the main power with each other.
- ② If this is not the cause of problem, check if the proximity switch of the tool clamp/unclamp signal is mis-wired.
If the wiring is just fine and correct, the proximity switch may be short-circuited or defective itself. Check the proximity switch and take a necessary measure.

※ Command Sensor

- SX33 : X2.2 (CAHP.M) Changer Arm Home Position
- SX34 : X11.4 (CAHS.M) Manual ATC Home Position
- SX35 : X2.3 (CCMD.M) Tool Clamp Command
- SX36 : X2.4 (UCMD.M) Tool Unclamp Command





Address	Symbol	Coil Comment
R705.1	TCFLT	Tool Clamp Command Fault
K7.2	CATC	Cam Type ATC (Only Minx Type)
K7.6	KATC	ATC Used
A0.6	2007	Main Power Phase & ATC SW Error
R652.7	ARST	Alarm Reset
K11.0	KCTATC	Keep Using Chain Magazine
X2.3	CCMD.M	Tool Clamp Command Fault
R705.0	TUCCFG	ATC Unclamp Command Flag
R709.3	M06CD	M06 Command
R652.6	ERST	External Reset
F0.6	SA	Servo Ready

1.6 2008 PSM Contact Check Error**1) Description**

The power supply module has a problem in operation.

2) Cause of problem

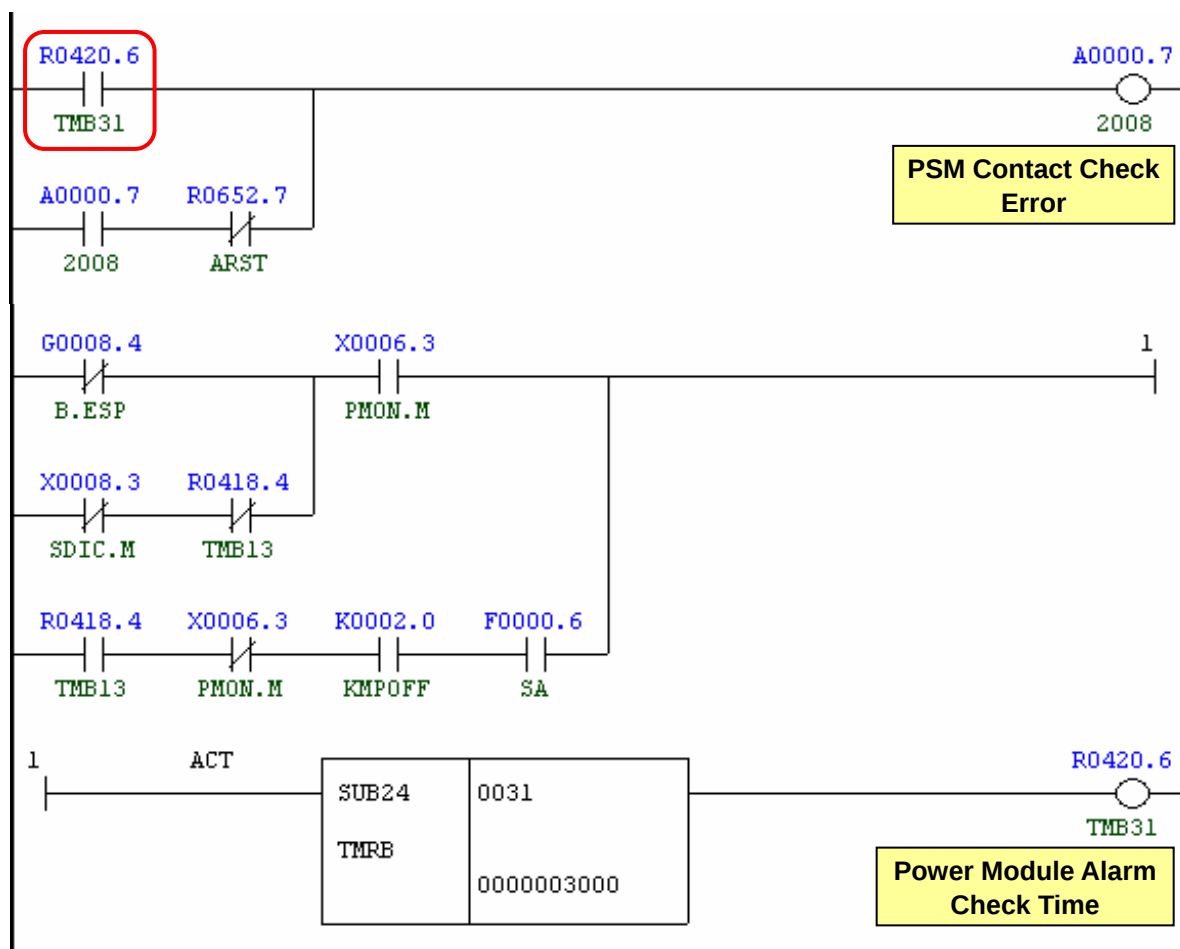
KM10 malfunctions, or there is a problem with the auxiliary contact point A.

3) Action

- ① Check the main contactor of KM10 magnetic contactor if it operates properly and the auxiliary contact point A turns on or off according to your command of ON/OFF.
 - ☞ KM10 magnetic contactor is supposed to turn on/off according to the signal of Machine Ready ON/OFF.
 - ☞ If you choose "K2.0=(1)" to take the command of Servo Power ON/OFF, KM10 magnetic contactor turns off if the door is open, and turns on if the door is close.
- ② Check the wiring from the auxiliary contact point through to the control I/O board, one by one.

Signal	Address	Device Symbol	I/O	Connector (Pin)	Numbering Tube
Front Door Interlock	X8.3 (SDIC.M)	-S23	Control I/O Board	XCB105 (B07)	SDIC
Power Supply Contact On	X6.3 (PMON.M)	-KM10	Control I/O Board	XCB106 (B11)	M215





Address	Symbol	Coil Comment
R420.6	TMB31	Power Module Alarm Check Time
A0.7	2008	PSM Contact Check Error
R652.7	ARST	Alarm Reset
G8.4	B.ESP	Emergency Stop
X8.3	SDIC.M	Splash Guard Door Interlock
R418.4	TMB13	Connect Delay Time Again
X6.3	PMON.M	Power Supply Contact On
K2.0	KMPOFF	Module Elec. Off D-Open
F0.6	SA	Servo Ready

2. Cycle Stop Alarm

2.1 **2032** External Feed Hold (OP Push Button Switch)

1) Description

Error in the signal of the feed hold switch while the program is running (in auto mode)

2) Cause of problem

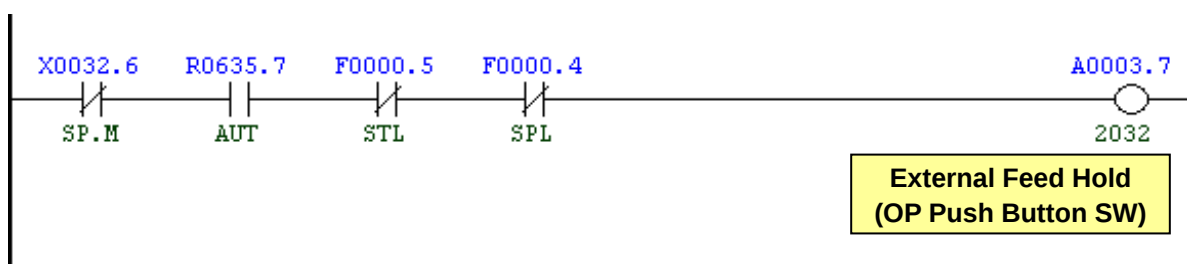
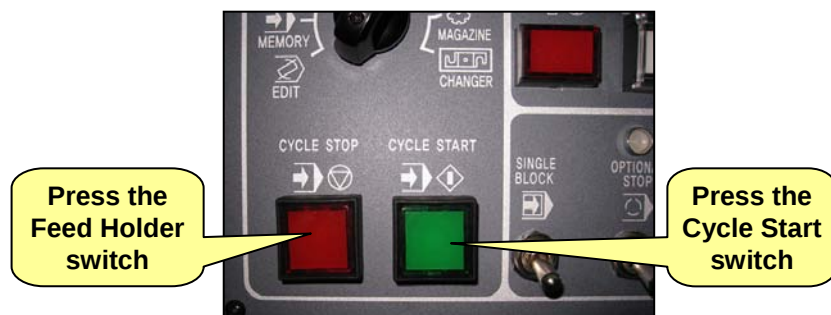
- ① The feed hold switch on the main OP is tripped.

☞ Note : The feed hold switch enables you to stop running the program instantly without instructing the emergency stop.

- ② Short-circuit or defective part in the feed hold switch

3) Action

- ① If you have pressed the feed hold switch by necessity, release the switch to set off the alarm. Then, you can press the Cycle Start switch to resume running the program.
- ② Turn the feed hold switch on/off manually and check if it works properly. If not, take a necessary action.



Address	Symbol	Coil Comment
X32.6	SP.M	Cycle Stop
R635.7	AUT	Auto Mode
F0.5	STL	Cycle Start
F0.4	SPL	Feed Hold
A3.7	2032	External Feed Hold (OP Push Button SW)

2.2 2033 Air Pressure down Alarm

1) Description

The air pressure switch is tripped because the air pressure falls below the specified value.

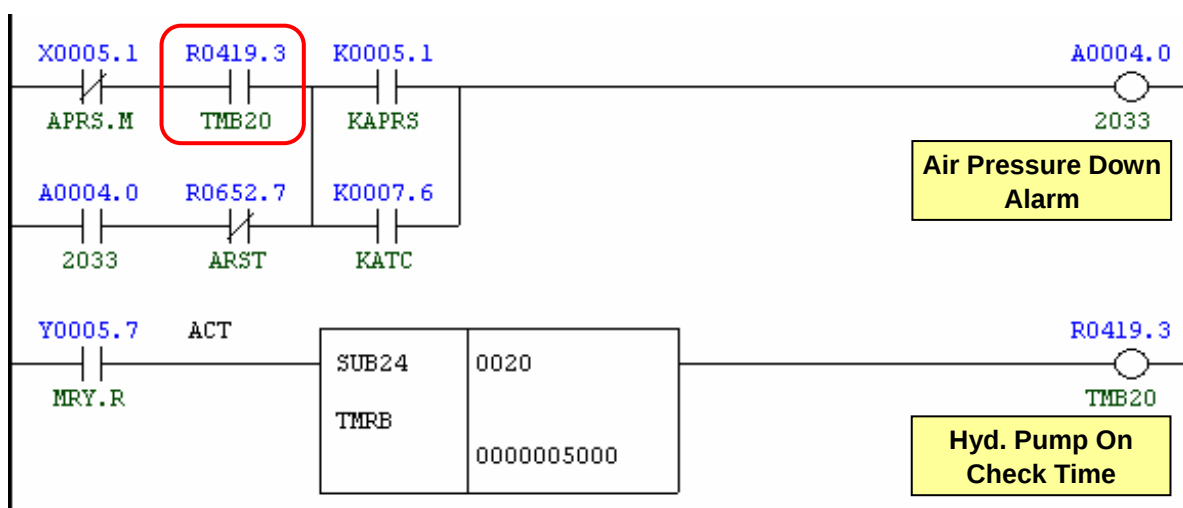
2) Cause of problem

- ① The factory-supplied air pressure falls below the standard (4kg).
- ② The air pressure switch or any of its parts is defective.

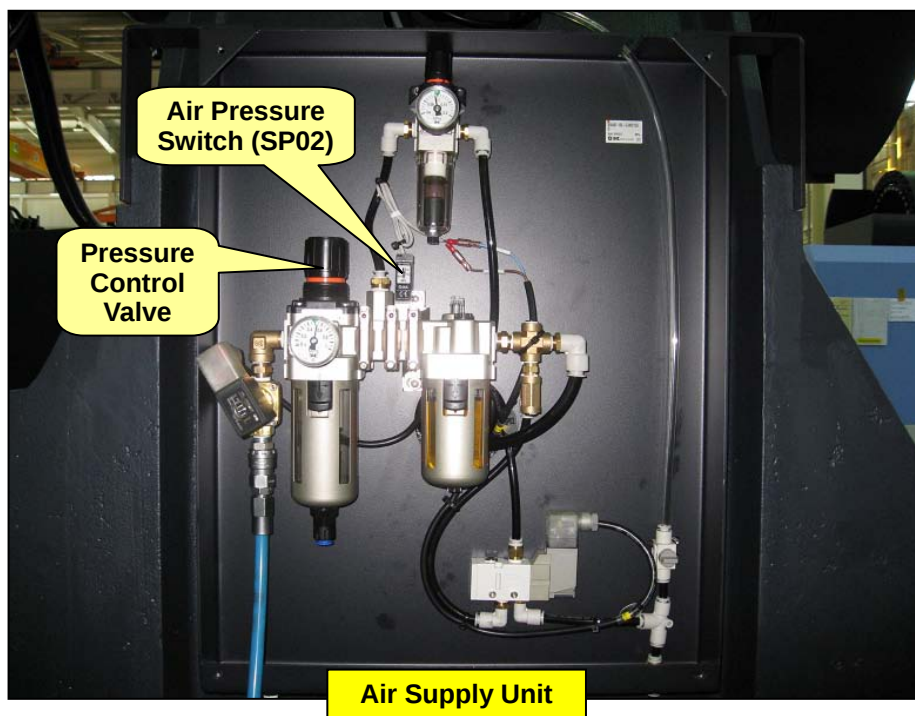
3) Action

- ① Increase the factory-supplied air pressure to more than 5kg/cm².
Check the air pressure measurement displayed on the gauge of the air service unit (located on the rear panel), and if it's below 4kg/cm², turn the air pressure handle to the right. If the gauge is no further increased, this indicates the current air pressure is not appropriate. Check the factory-supplied air pressure.
- ② Check the air pressure switch, wiring and I/O module if there is no error. And make repair or replacement if necessary.

Signal	Address	Device Symbol	I/O	Connector (Pin)	Numbering Tube
Air Pressure Check	X5.1 (APRS.M)	-SP02	Control I/O Board	XCB 106 (B06)	SP02



Address	Symbol	Coil Comment
X5.1	APRS.M	Air Pressure Check
R419.3	TMB20	Hyd. Pump On Check Time
A4.0	2033	Air Pressure Down Alarm
R652.7	ARST	Alarm Reset
K5.1	KAPRS	Air Pressure Switch Used
K7.6	KATC	ATC Used
Y5.7	MRY.R	Machine Ready



2.3 **2034** Coolant & Lub. & ATC Motor Overload

1) Description

Excessive electric current is detected in coolant motor, lubricant motor, pump motor, or ATC motor.

2) Cause of problem

- ① Burn in coolant motor, lubricant motor, pump motor, ATC motor or power cable.
- ② The circuit breaker that detects the excessive current is overloaded or defective itself.

3) Action

- ① Check the coolant motor, lubricant motor, pump motor, ATC motor or power cable, and repair or replace a defective one if found.
- ② Check the circuit breaker for the load settings and make correction if necessary. If the circuit breaker itself has an error, replace it with a new one.

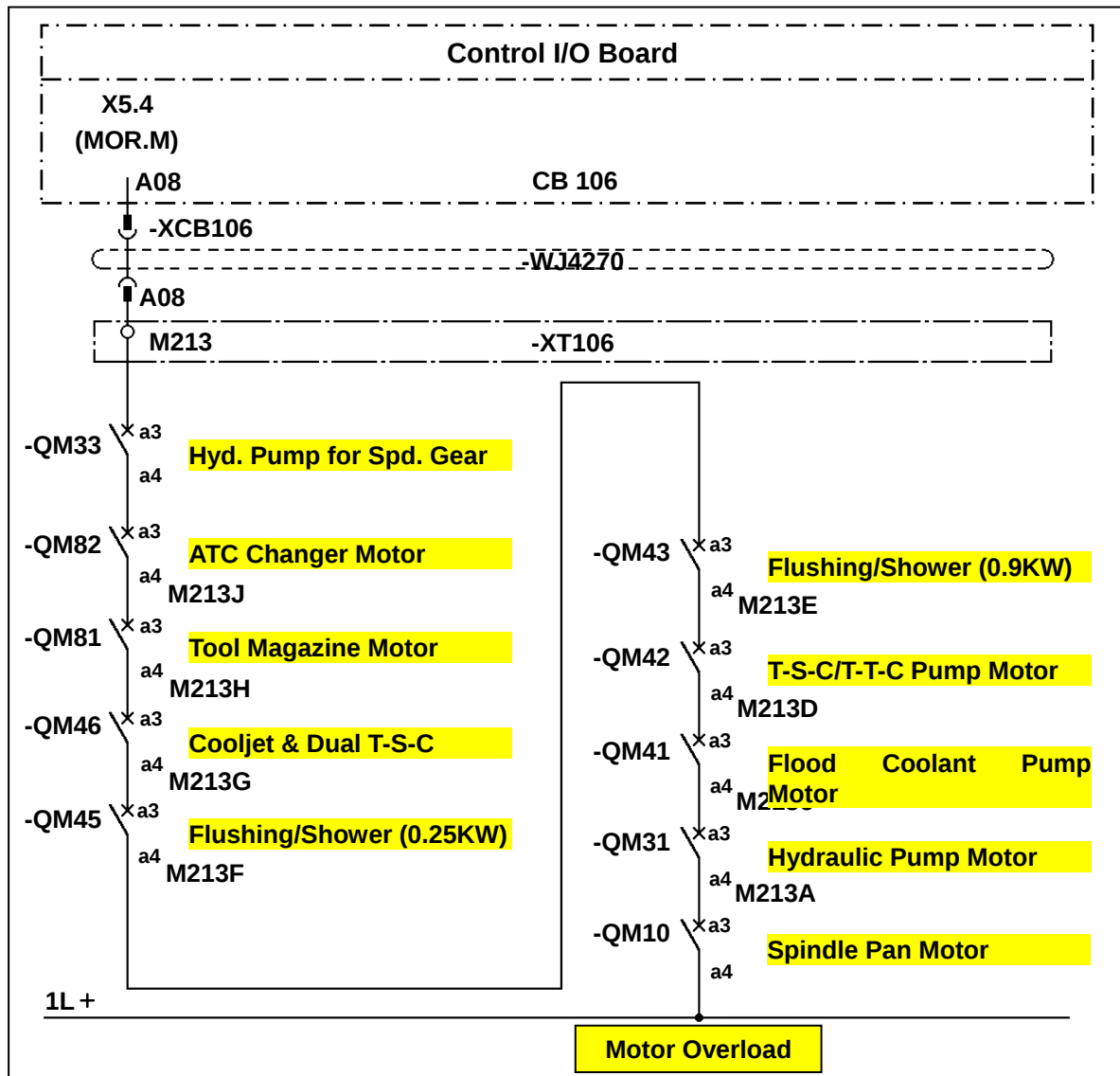
Breaker	Application	Load Specification
QM10	Spindle Servo Motor Fan Motor	1.5A
QM31	Hydraulic Pump Motor	11A (2.2KW)
QM41	Flood Coolant Pump Motor	1.6A (0.25KW)
QM42	TSC/TTC Coolant Pump Motor	7.0A (1.5KW)
QM43	Shower Coolant Pump Motor	6.0A (0.9KW)
QM45	Flushing/Shower Coolant Pump Motor	1.6A (0.25KW)
QM46	Cooljet & Dual TSC Pump Motor	15A (3.7KW), 20A (5.5KW)
QM81	Tool Magazine Motor	1.2A (0.2KW)
QM82	ATC Changer Motor	3.0A (0.4KW)

Part Name	Part No.	Symbol	Spec.
Breaker, Auxiliary	ENFBX0290R	QM10,31,41,42,43, QM45,46,81,82,33	3RV1901-1F(2NO)
Breaker, Motor Circuit	ENFBX0255R	QM10	3RV1011-1AA10(1.1-1.6A)
Breaker, Motor Circuit	ENFBX0285R	QM31,33	3RV1011-1JA10 (9-12A)
Breaker, Motor Circuit	ENFBX0255R	QM41,45,81	3RV1011-1AA10 (1.1-1.6A)
Breaker, Motor Circuit	ENFBX0259R	QM42	3RV1011-1JA10 (7-10A)
Breaker, Motor Circuit	ENFBX0258R	QM43	3RV1011-1GA10(4.5-6.3A)
Breaker, Motor Circuit	ENFBX0262R	QM46	3RV1021-4DA10(20-25A)
Breaker, Motor Circuit	ENFBX0257R	QM82	3RV1011-1EA10(2.8-4.0A)

Signal	Address	Device Symbol	I/O	Connector (Pin)	Numbering Tube
Motor Overload	X5.4 (MOL.M)	-	Control I/O Board	XCB106 (A08)	M213



Address	Symbol	Coil Comment
X5.4	MOL.M	Motor Overload
A4.1	2034	Coolant & Lub. & ATC Motor Overload
R652.7	ARST	Alarm Reset



2.4 2036 Coolant W/Tank or Level Switch Alarm**1) Description**

The separation chip conveyor or drum filter chip conveyor triggers the Coolant Level alarm.

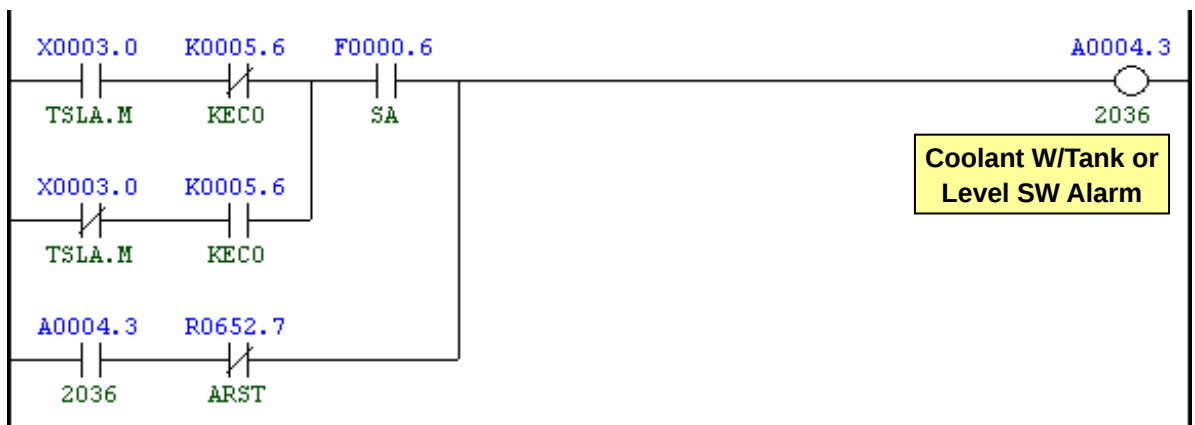
2) Cause of problem

- ① The coolant tank runs out of coolant.
- ② The Level switch has an error or the wiring has a problem.

3) Action

- ① Refill the coolant tank with coolant.
- ② Check the Level switch and wiring, and repair or replace a defective one if necessary.

Signal	Address	Device Symbol	I/O	Connector (Pin)	Numbering Tube
TSC Unit Alarm	X3.0 (TSLA.M)	-TX105	Control I/O Board	XCB105 (A02)	M221



Address	Symbol	Coil Comment
X3.0	TSLA.M	High T-S-C Low Level Check
K5.7	KEKO	ECO Type T-S-C Unit Used
F0.6	SA	Servo Ready
A4.3	2036	Coolant W/Tank Level Switch Alarm
R652.7	ARST	Alarm Reset

2.5 2040 Operator's Door Open Alarm

1) Description

The door in the main OP side is open.

2) Cause of problem

- ① The door in the operator's side is open.
- ② The safety switch has an error or the wiring has a problem.

3) Action

- ① Close the door.
- ② Check the operator's side safety switch as well as the wiring, and repair or replace a defective one if necessary.

Signal	Address	Device Symbol	I/O	Connector (Pin)	Numbering Tube
Front Door Interlock	X8.3 (SDIC.M)	-S23	Control I/O Board	XCB105 (B07)	SDIC



Address	Symbol	Coil Comment
X8.3	SDIC.M	Splash Guard Door Interlock
R649.3	DOPSTL	Door Open State During STL
R369.2	M250A	Door Interlock Bypass On Aux
A4.7	2040	Operator's Side Door Open



2.6 2048 Spindle Stop Signal Alarm

1) Description

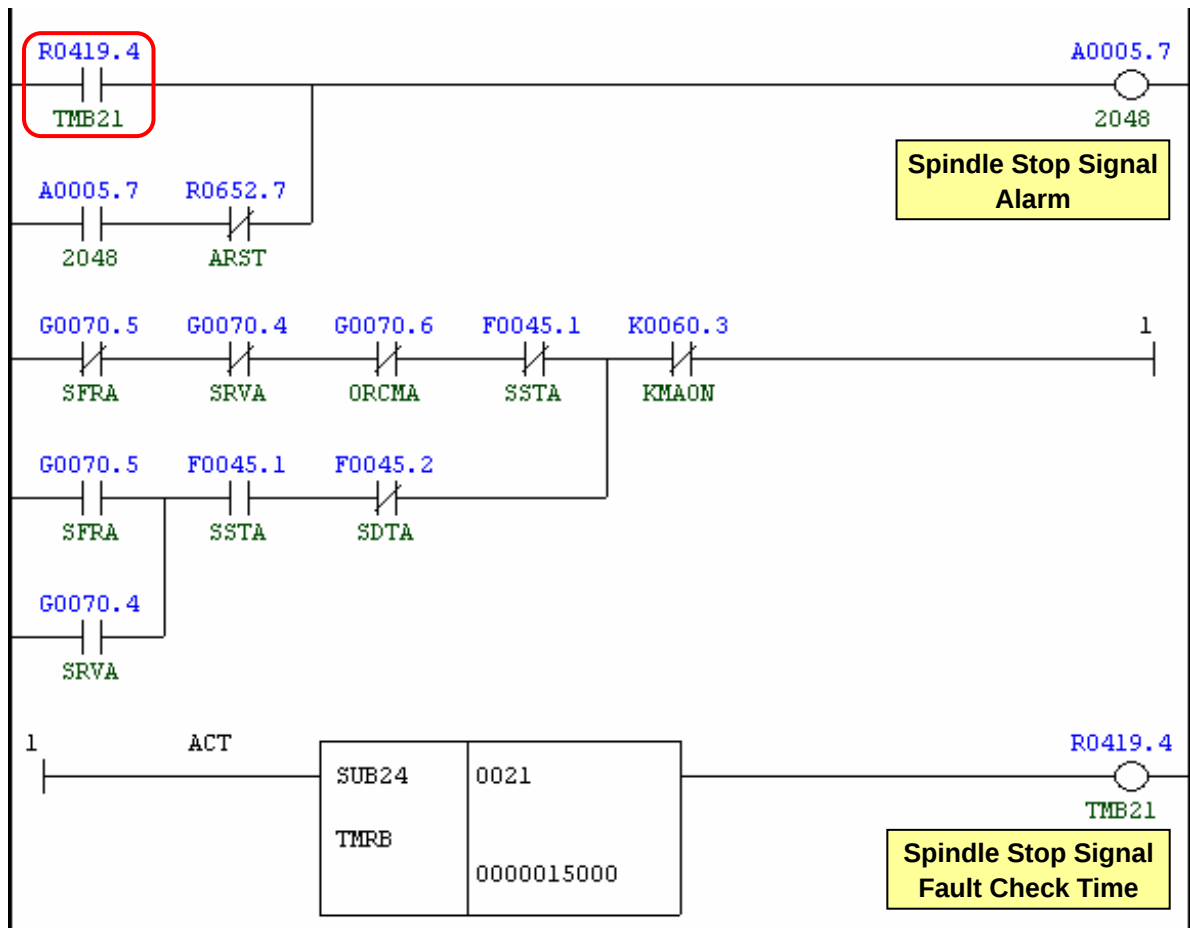
The main spindle drive unit causes an error in the stop signal of the spindle.

2) Cause of problem

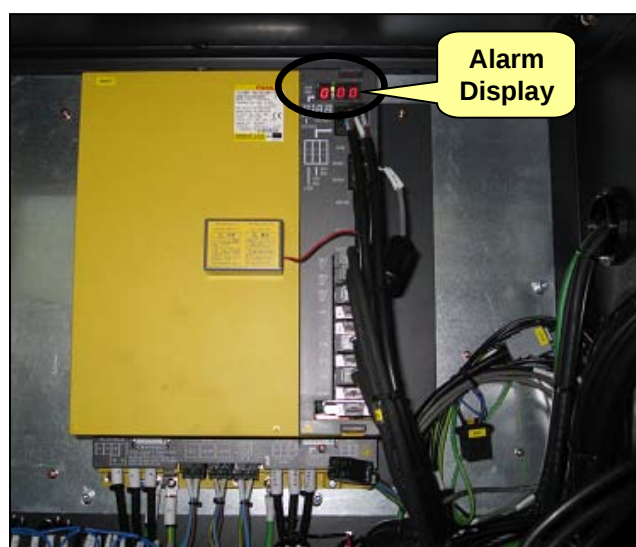
- ① Error found in the main spindle drive unit
- ② Error found in the spindle motor, power cable or signal cables

3) Action

- ① Check the alarm number that is displayed on the main spindle drive unit of the electric cabinet. Take a necessary measure according to the alarm number.
 Refer to "Troubleshooting by the spindle amplifier alarm" in the appendix.
- ② Check the spindle motor for the 3-phase power source and the feedback cable if there is a problem.



Address	Symbol	Coil Comment
R419.4	TMB21	Spindle Stop Signal Fault Check Time
A5.7	2048	Spindle Stop Signal Alarm
R625.7	ARST	Alarm Reset
G70.5	SFRA	Spindle Forward (S-Spindle)
G70.4	SRVA	Spindle Reverse (S-Spindle)
G70.6	ORCMA	Orientation Command (S-Spindle)
F45.1	SSTA	Spindle Stop Confirm
F45.2	SDTA	Spindle Speed Detection
K60.3	KMAON	NC Ready On Keep



2.7 **2049** Spindle Speed Arrival Alarm

1) Description

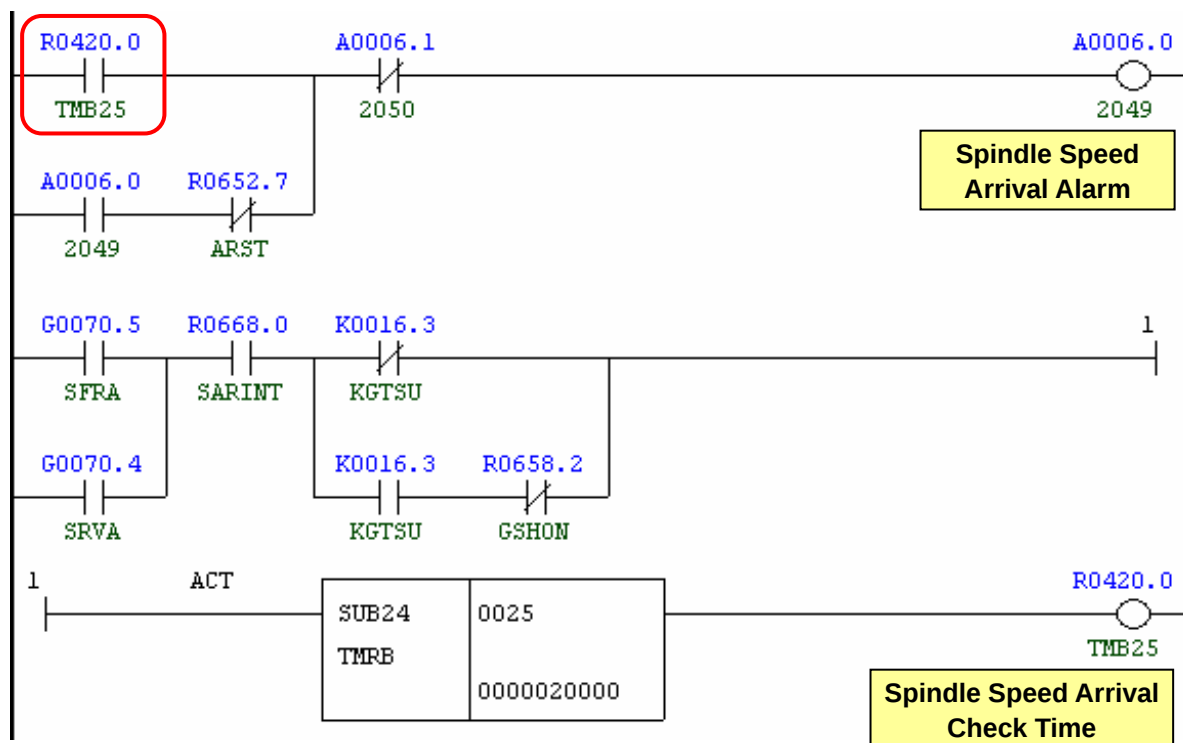
After the spindle rotation command (M03, M04) was instructed, the spindle has failed to reach the instructed revolutions within 20 seconds.

2) Cause of problem

- ① Error found in parameter settings related to the spindle
- ② Error found in the signal from the main spindle drive unit
- ③ Error found in the signal from the position coder

3) Action

- ① Refer to the parameter sheet that comes with the product and check the spindle-related parameters (N3700 ~ N4175). Take a necessary measure if an error is found. Check the alarm number that is displayed on the main spindle drive unit of the electric cabinet, and take a necessary measure according to the alarm number.
 - ☞ Refer to "Troubleshooting by the spindle amplifier alarm" in the appendix.
- ③ Set the parameter to ignore the position coder settings, and rotate the spindle to check if the position coder is set properly. If not, take an appropriate action.
 - ☞ For the parameter to ignore the position coder settings, change all bit numbers of N4001/N4002 to "0" and rotate the spindle after restarting the machine.
 - ☞ After correcting the settings of N4001/N4002, you should restore the default settings before restarting the machine.



Address	Symbol	Coil Comment
R420.0	TMB25	Spindle Speed Arrival Check Time
A6.0	2049	Spindle Speed Arrival Alarm
R652.7	ARST	Alarm Reset
A6.1	2050	Spindle Rotation Malfunction
G70.5	SFRA	Spindle Forward (S-Spindle)
G70.4	SRVA	Spindle Reverse (S-Spindle)
R668.0	SARINT	Spindle Speed Arrival Interlock
K16.3	KGTSU	Gear Type Spindle Used
R658.2	GSHON	Gear Shift On

(Note) Spindle-related NC Parameter Table

SERIAL NO. DM50GA1280BA05		NC PARAMETER TABLE				EDITION NO. DM50GA1280BA05	
PARAM NO.	DATA	PARAM NO.	DATA	PARAM NO.	DATA	PARAM NO.	DATA
03271	0	03461	0	03706	00000000	03904	0
03290	00000000	03465	0	03707	00000000	03910	0
03291	00000000	03466	0	03708	00000000	03911	0
03292	00000000	03471	X	03709	00000000	03912	0
03294	0		Y	03710	00000000	03913	0
03295	0		Z	03711	10000000	03914	0
03301	10000000	03472	0	03712	00000000	03920	0
03310	0	03475	0	03713	00000000	03921	0
03311	0	03476	0	03715	X	03922	0
03401	00000001	03477	X		Y	03923	0
03402	00000000		Y		Z	03924	0
03403	00000001		Z	03721	0	03930	0
03404	00100100	03480	0	03722	0	03931	0
03405	00000000	03481	0	03723	0	03932	0
03406	00000000	03482	0	03724	0	03933	0
03407	00000000	03483	0	03725	0	03934	0
03408	00000000	03484	0	03726	0	04000	S 00000000
03409	00000000	03485	0	03727	0	04001	S 00000000
03410	100	03490	0	03728	0	04002	S 00000001
03411	0	03601	00000000	03730	1000	04003	S 00000000
03412	0	03605	X	03731	0	04004	S 00000000
03413	0		Y	03732	0	04005	S 00000000
03414	0		Z	03735	0	04006	S 00000000
03415	0	03620	X	03736	3276	04007	S 00000000
03416	0		Y	03740	200	04008	S 00000000
03417	0		Z	03741	10000	04009	S 00000000
03418	0	03621	X	03742	0	04010	S 00000001
03419	0		Y	03743	0	04011	S 00011010
03420	0		Z	03744	0	04012	S 10000000
03421	0	03622	X	03751	10000	04013	S 00001100
03422	0		Y	03752	0	04014	S 00000000
03423	0		Z	03761	10000	04015	S 00000111
03424	0	03623	X	03762	0	04016	S 00000000
03425	0		Y	03770	0	04017	S 00000000
03426	0		Z	03771	50	04018	S 00000000
03427	0	03624	X	03772	10000	04019	S 00000100
03428	0		Y	03800	0	04020	S 10000
03429	0		Z	03801	0	04021	S 100
03430	0	03625	X	03802	0	04022	S 150
03431	0		Y	03811	0	04023	S 333
03432	0		Z	03812	0	04024	S 75
03435	0	03626	X	03820	0	04025	S 50
03450	00000000		Y	03821	0	04026	S 83
03451	00000000		Z	03822	0	04027	S 95
03452	00000000	03627	X	03831	0	04028	S 0
03454	00000000		Y	03832	0	04029	S 100
03455	X		Z	03850	0	04030	S 0
	Y	03700	00100000	03851	0	04031	S 0
	Z	03701	00000000	03852	0	04032	S 0
03456	X	03702	00000000	03900	0	04033	S 10
	Y	03703	00000000	03901	0	04034	S 0
	Z	03704	00000000	03902	0	04035	S 0
03460	0	03705	01001010	03903	0	04036	S 0

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SERIAL NO.			NC PARAMETER TABLE				EDITION NO.		
DM50GA1280BA05							DM50GA1280BA05		
PARA NO.	DATA		PARA NO.	DATA		PARA NO.	DATA		
04037	S	0	04090	S	90	04143	S	7000	
04038	S	0	04091	S	100	04144	S	0	
04039	S	0	04092	S	100	04145	S	25	
04040	S	10	04093	S	164	04146	S	595	
04041	S	10	04094	S	0	04147	S	220	
04042	S	10	04095	S	0	04148	S	200	
04043	S	10	04096	S	0	04149	S	311	
04044	S	20	04097	S	0	04150	S	23040	
04045	S	20	04098	S	0	04151	S	100	
04046	S	30	04099	S	400	04152	S	5000	
04047	S	30	04100	S	3900	04153	S	90	
04048	S	10	04101	S	80	04154	S	100	
04049	S	10	04102	S	3593	04155	S	0	
04050	S	10	04103	S	0	04156	S	0	
04051	S	10	04104	S	900	04157	S	5	
04052	S	60	04105	S	0	04158	S	0	
04053	S	60	04106	S	3250	04159	S	0	
04054	S	50	04107	S	0	04160	S	0	
04055	S	50	04108	S	0	04161	S	25700	
04056	S	100	04109	S	25	04162	S	0	
04057	S	100	04110	S	595	04163	S	0	
04058	S	100	04111	S	173	04164	S	0	
04059	S	100	04112	S	220	04165	S	31	
04060	S	1000	04113	S	280	04166	S	16198	
04061	S	1000	04114	S	0	04167	S	0	
04062	S	1000	04115	S	100	04168	S	0	
04063	S	1000	04116	S	5280	04169	S	0	
04064	S	100	04117	S	90	04170	S	0	
04065	S	2500	04118	S	100	04171	S	0	
04066	S	2500	04119	S	34	04172	S	0	
04067	S	2500	04120	S	0	04173	S	0	
04068	S	2500	04121	S	5	04174	S	0	
04069	S	3000	04122	S	0	04175	S	0	
04070	S	3000	04123	S	30	04176	S	00000000	
04071	S	3000	04124	S	0	04177	S	00000000	
04072	S	3000	04125	S	0	04178	S	00000000	
04073	S	0	04126	S	0	04179	S	00000000	
04074	S	0	04127	S	164	04180	S	00000000	
04075	S	10	04128	S	0	04181	S	00000000	
04076	S	33	04129	S	0	04182	S	00000000	
04077	S		04130	S	25700	04183	S	00000000	
04078	S	200	04131	S	0	04184	S	00000000	
04079	S	0	04132	S	0	04185	S	00000000	
04080	S	75	04133	S	300	04186	S	00000000	
04081	S	20	04134	S	130	04187	S	00000000	
04082	S	10	04135	S	0	04188	S	00000000	
04083	S	30	04136	S	0	04189	S	00000000	
04084	S	30	04137	S	63	04190	S	00000000	
04085	S	63	04138	S	1300	04191	S	00000111	
04086	S	100	04139	S	85	04192	S	00000000	
04087	S	115	04140	S	1500	04193	S	00000000	
04088	S	75	04141	S	95	04194	S	00000000	
04089	S	200	04142	S	3100	04195	S	00000000	

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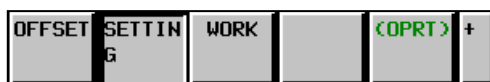
(Note) To change the parameter settings

- (1) Set the mode switch on the main OP to "MDI".



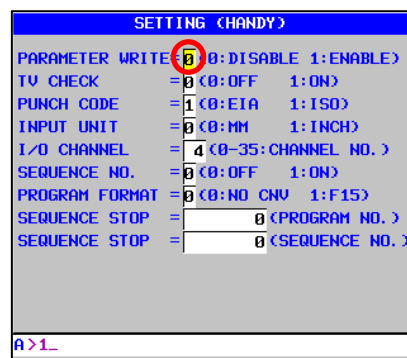
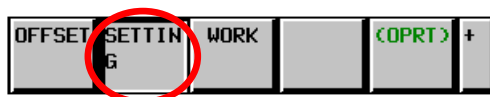
- (2) Press the "OFS/SET" button in the right side of the main OP monitor.

- The following options will be displayed in the button bar.



- (3) Press the [SETTING] button.

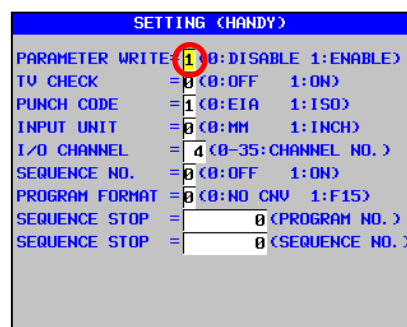
- The Setting menu appears where the cursor will be positioned to "PARAMETER WRITE" on the top.



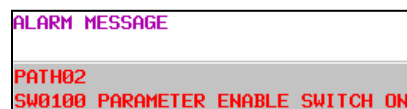
- ※ If the screen is not displayed as shown in the right picture, move to the first page of the Setting Parameter menu ("0" → "NO.SRH") and press the Page Up button three times. Then, you will see the right screen properly.



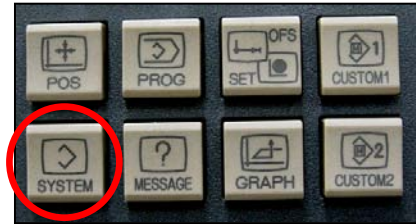
- (4) Enter a numeric of "1" and keep pressing the INPUT and EXEC buttons.



- ★ The "SW0100 Parameter Enable Switch ON" alarm will occur.



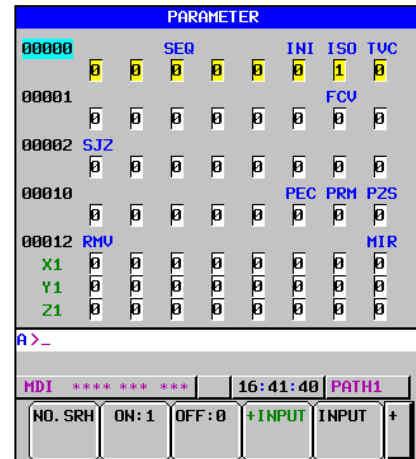
- (5) Press the “SYSTEM” button in the right side of the main OP monitor.
- The following options will be displayed in the button bar.



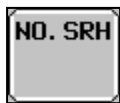
- (6) Press the [PARAMETER] button in the button bar.



- You will see the Parameter setting screen.



About Button Bar



Find a desired parameter number.

Ex) If calling parameter no.4175: Enter the number of "4175" and press the [NO.SRH] button in the navigation bar to move to the Parameter N4175 screen with the cursor positioned at the number.



Used to turn ON (1) the BIT-format parameter.

Ex) Press this to turn ON (1) only the highlighted BIT-format parameters.



Used to turn OFF (0) the BIT-format parameter.

Ex) Press this to turn OFF (0) only the highlighted BIT-format parameters.



Used to increase or decrease a word-format parameter by adding or subtracting data.

Ex) If you want to add to or subtract from the existing data included in the parameter, enter a data value to add or subtract (In subtraction, add "-" in front of the data value.) and press this button to perform the operation (addition or subtraction).



Used to enter a parameter value in the word format.

Ex) Regardless of the existing data, enter a data value and press this button. The data value will be entered immediately and properly.

- (7) Select a navigation button that is suitable to your needs, and use it to adjust the value as necessary.

- (8) When done, move back to “SETTING” and turn off “PARAMETER WRITE”(“1” “0”).
Then, press the “RESET” button to release the alarm.

2.8 2050 Spindle Rotation Malfunction

1) Description

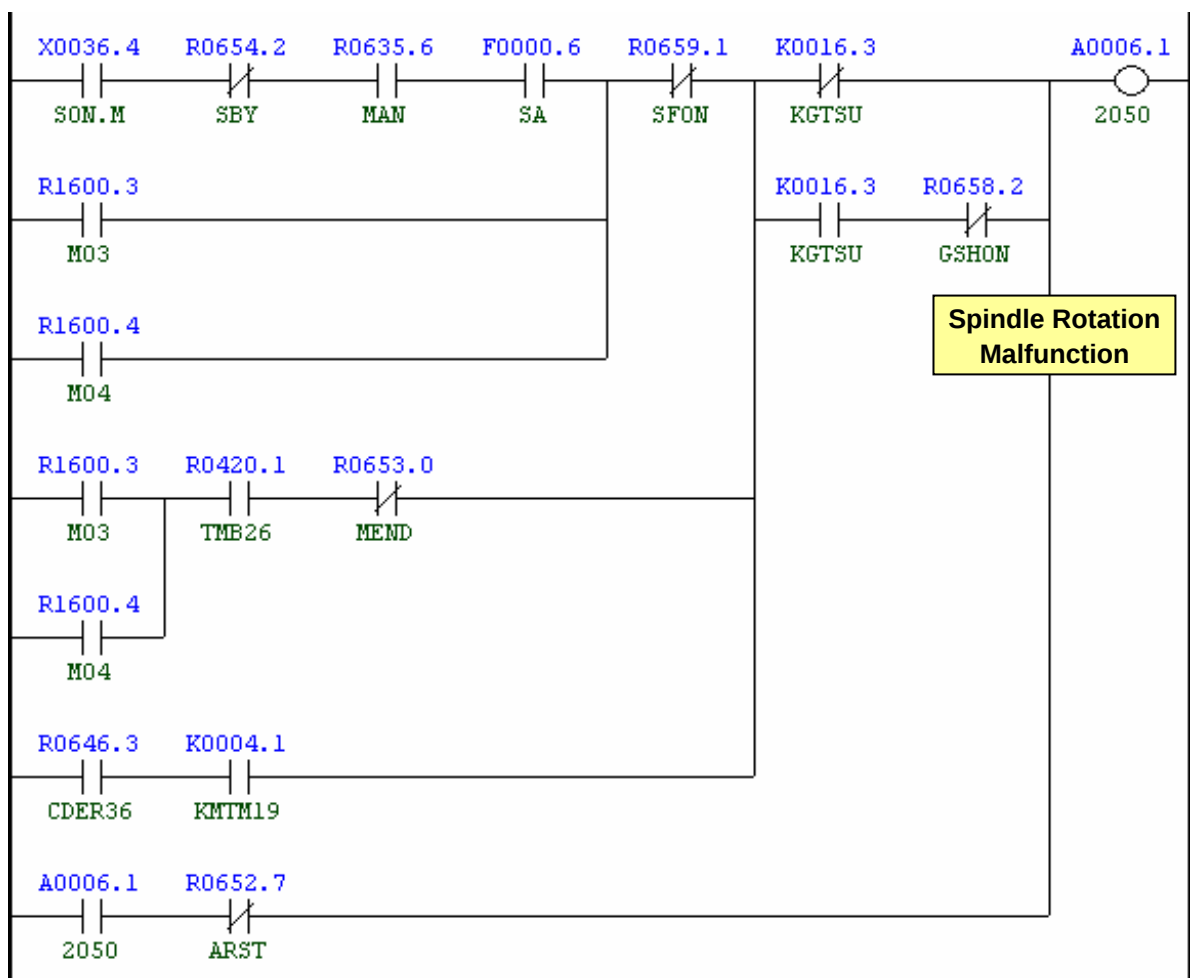
The spindle rotation command is instructed under the condition where the spindle is prohibited from rotating.

2) Cause of problem

- ① After the machine starts initially, the rotation command is instructed with no revolution (S-code command) specified.
- ② The rotation command is instructed without ensuring the tool clamping.

3) Action

- ① Instruct the spindle rotation command after instructing S-Code.
- ② Ensure that the spindle is tool clamped. (X6.0=1, X6.5=0)



Address	Symbol	Coil Comment
X36.4	SON.M	Spindle On
R654.2	SBY	Spindle Stand-By
R635.6	MAN	Manual Mode
F0.6	SA	Servo Ready
R1600.3	M03	Spindle Forward (CW) Rotation
R1600.4	M04	Spindle Reverse (CCW) Rotation
R659.1	SFON	Initial S-Function On
R420.1	TMB26	Spindle Rotation Overtime
R653.0	MEND	M-Function End
R646.7	CDER36	Command Error Over S360
K4.0	KMTM19	Multi Orientation Used
K16.3	KGTSU	Gear Type Spindle Used
R658.2	GSHON	Gear Shift On
A6.1	2050	Spindle Rotation Malfunction
R652.7	ARST	Alarm Reset

2.9 2051 Spindle Orientation Overtime

1) Description

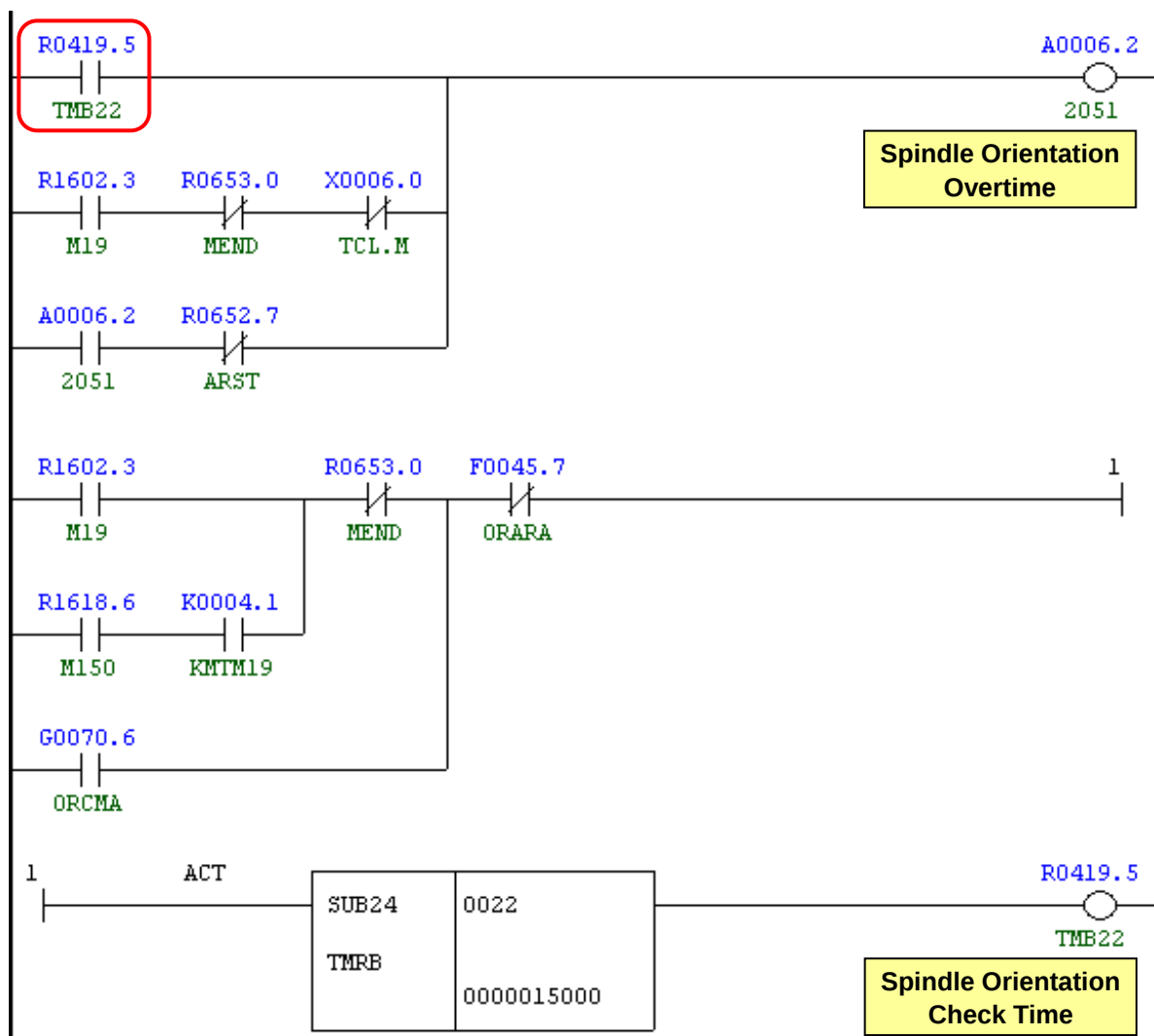
Since the spindle orientation command was instructed in manual or auto mode, no completion signal is output within 15 seconds.

2) Cause of problem

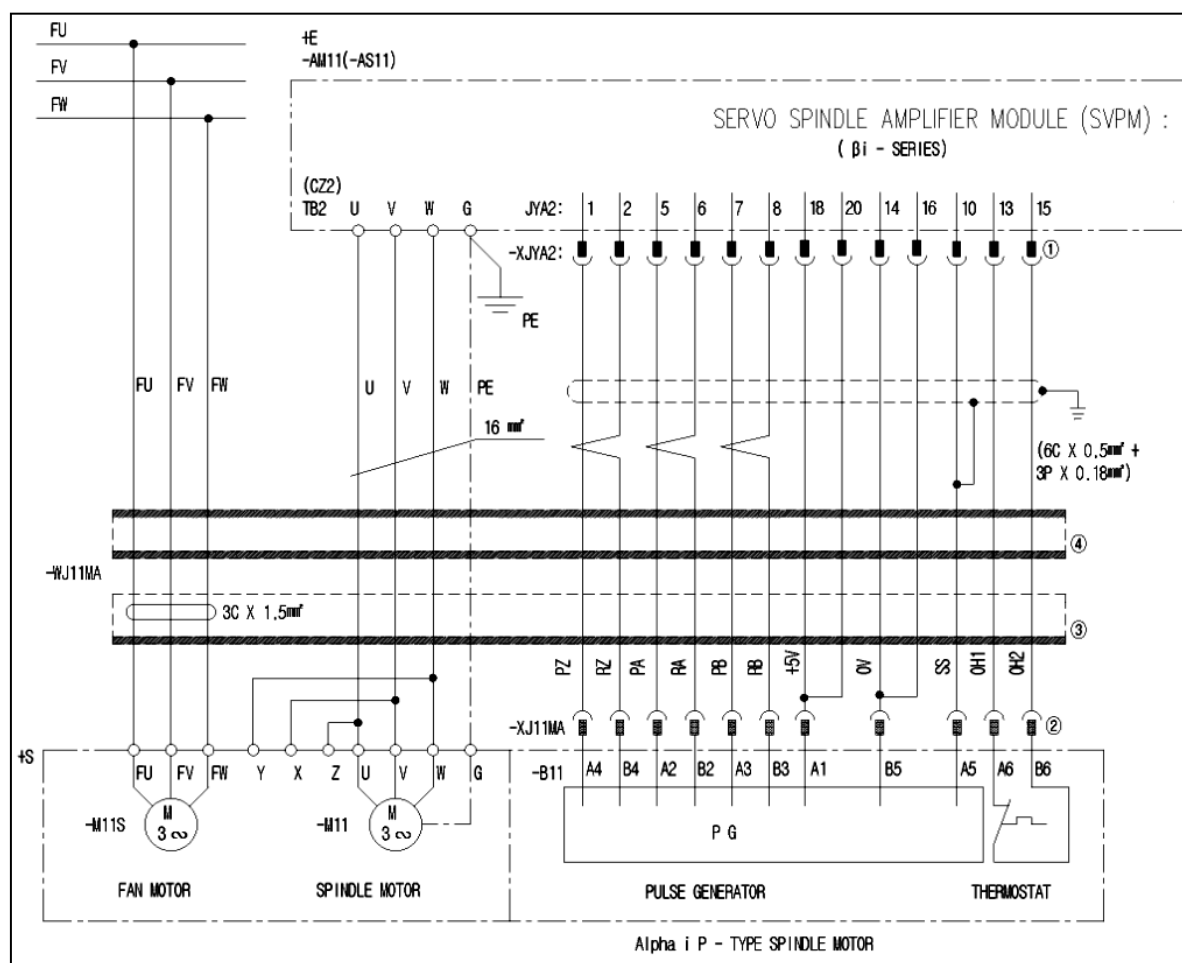
- ① Error in parameter settings related to the spindle orientation
- ② Error in the position coder or defect in feedback cable

3) Action

- ① Check the parameters (N4042 ~ N4080) related to spindle orientation if they are set properly. If not, change the settings as appropriate.
- ② Check the safety switch, and wiring between sensor and spindle head terminal box, and between terminal box and spindle drive unit of the electric cabinet, and make repair or replacement if you encounter a problem.



Address	Symbol	Coil Comment
R419.5	TMB22	Orientation Check Time
R1602.3	M19	Spindle Orientation
R653.0	MEND	M-Function End
X6.0	TCL.M	Spindle Tool Clamp Confirm
A6.2	2051	Spindle Orientation Overtime
R652.7	ARST	Alarm Reset
R1618.6	M150	Multi Orientation M-Code
K4.1	KMTM19	Multi Orientation Used
G70.6	ORCMA	Orientation Command (S-Spindle)
X4.2	OSDO.M	Machine Door Unlock By Key Switch
F45.7	ORARA	Spindle Orientation Complete



(Note) Spindle Orientation-related NC Parameter Table

SERIAL NO.			NC PARAMETER TABLE						EDITION NO.		
DM50GA1280BA05									DM50GA1280BA05		
PARA NO.		DATA	PARA NO.		DATA	PARA NO.		DATA	PARA NO.		DATA
04037	S	0	04090	S	90	04143	S	7000	04196	S	0
04038	S	0	04091	S	100	04144	S	0	04197	S	0
04039	S	0	04092	S	100	04145	S	25	04198	S	0
04040	S	10	04093	S	164	04146	S	595	04199	S	0
04041	S	10	04094	S	0	04147	S	220	04200	S	0
04042	S	10	04095	S	0	04148	S	200	04201	S	0
04043	S	10	04096	S	0	04149	S	311	04202	S	0
04044	S	20	04097	S	0	04150	S	23040	04203	S	0
04045	S	20	04098	S	0	04151	S	100	04204	S	0
04046	S	30	04099	S	400	04152	S	5000	04205	S	0
04047	S	30	04100	S	3900	04153	S	90	04206	S	0
04048	S	10	04101	S	80	04154	S	100	04207	S	0
04049	S	10	04102	S	3593	04155	S	0	04208	S	0
04050	S	10	04103	S	0	04156	S	0	04209	S	0
04051	S	10	04104	S	900	04157	S	5	04210	S	0
04052	S	60	04105	S	0	04158	S	0	04211	S	0
04053	S	60	04106	S	3250	04159	S	0	04212	S	0
04054	S	50	04107	S	0	04160	S	0	04213	S	0
04055	S	50	04108	S	0	04161	S	25700	04214	S	0
04056	S	100	04109	S	25	04162	S	0	04215	S	0
04057	S	100	04110	S	595	04163	S	0	04216	S	0
04058	S	100	04111	S	173	04164	S	0	04217	S	0
04059	S	100	04112	S	220	04165	S	31	04218	S	0
04060	S	1000	04113	S	280	04166	S	16198	04219	S	0
04061	S	1000	04114	S	0	04167	S	0	04220	S	0
04062	S	1000	04115	S	100	04168	S	0	04221	S	0
04063	S	1000	04116	S	5280	04169	S	0	04222	S	0
04064	S	100	04117	S	90	04170	S	0	04223	S	0
04065	S	2500	04118	S	100	04171	S	0	04224	S	0
04066	S	2500	04119	S	34	04172	S	0	04225	S	0
04067	S	2500	04120	S	0	04173	S	0	04226	S	0
04068	S	2500	04121	S	5	04174	S	0	04227	S	0
04069	S	3000	04122	S	0	04175	S	0	04228	S	0
04070	S	3000	04123	S	30	04176	S	00000000	04229	S	0
04071	S	3000	04124	S	0	04177	S	00000000	04230	S	0
04072	S	3000	04125	S	0	04178	S	00000000	04231	S	0
04073	S	0	04126	S	0	04179	S	00000000	04232	S	0
04074	S	0	04127	S	164	04180	S	00000000	04233	S	0
04075	S	10	04128	S	0	04181	S	00000000	04234	S	0
04076	S	33	04129	S	0	04182	S	00000000	04235	S	0
04077	S		04130	S	25700	04183	S	00000000	04236	S	0
04078	S	200	04131	S	0	04184	S	00000000	04237	S	0
04079	S	0	04132	S	0	04185	S	00000000	04238	S	0
04080	S	75	04133	S	300	04186	S	00000000	04239	S	0
04081	S	20	04134	S	130	04187	S	00000000	04240	S	0
04082	S	10	04135	S	0	04188	S	00000000	04241	S	0
04083	S	30	04136	S	0	04189	S	00000000	04242	S	0
04084	S	30	04137	S	63	04190	S	00000000	04243	S	0
04085	S	63	04138	S	1300	04191	S	00000111	04244	S	0
04086	S	100	04139	S	85	04192	S	00000000	04245	S	0
04087	S	115	04140	S	1500	04193	S	00000000	04246	S	0
04088	S	75	04141	S	95	04194	S	00000000	04247	S	0
04089	S	200	04142	S	3100	04195	S	00000000	04248	S	0

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2.10 2055 Spindle Tool CL/UNCL Overtime Alarm

1) Description

It has passed 3 seconds since the position sensor switch of the spindle tool unclamp cylinder did not match with the applicable instruction.

2) Cause of problem

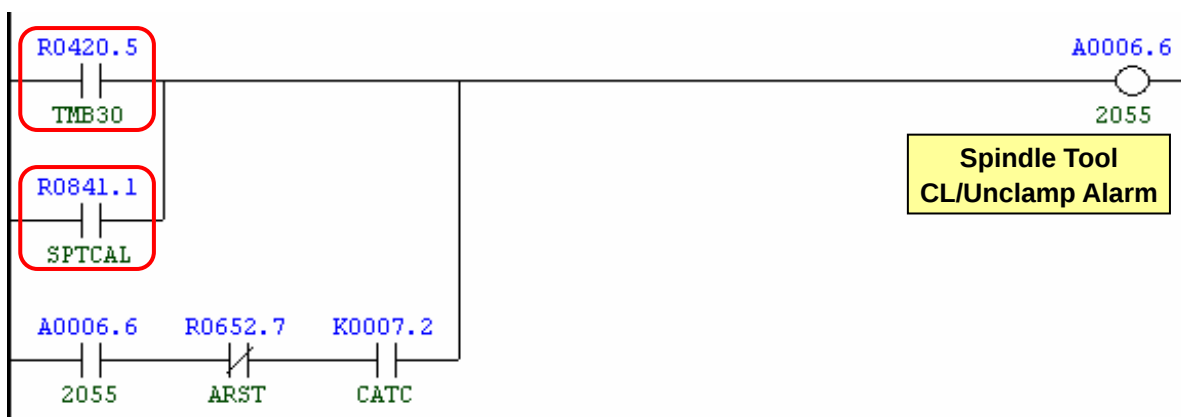
- ① Error in adjusting the position sensor switch
- ② Error in wiring or component parts

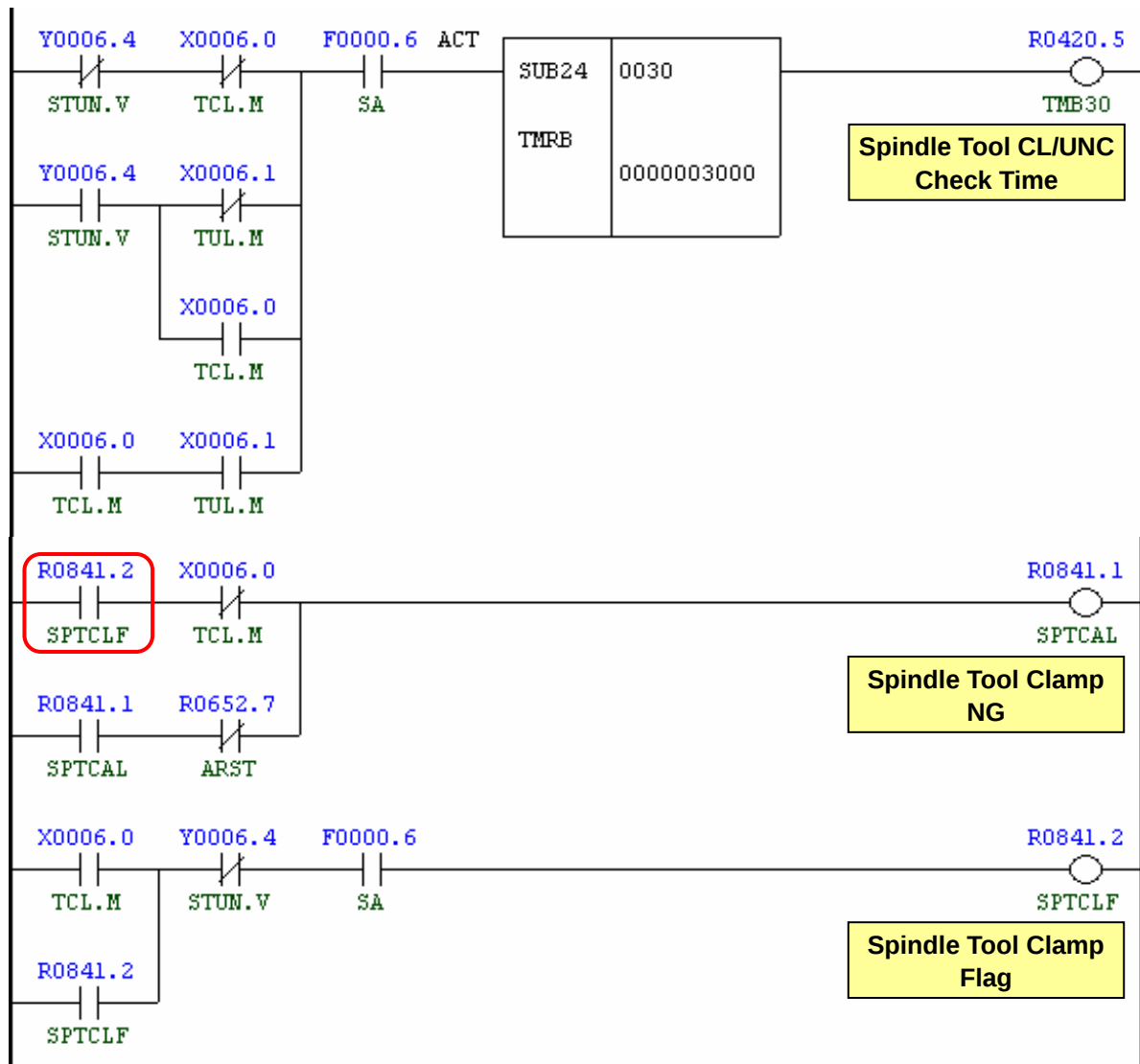
3) Action

- ① Error in adjusting the position sensor switch
Check the sensor indicator displayed on the proximity switch (located in the rear of the spindle tool unclamping cylinder) and correct it according to the indicator.
- ② Error in wiring or component parts
Check the followings in sequence: proximity switch, wiring between proximity switch and spindle head, between spindle head and electric cabinet, and the input module. And make repair or replacement if you encounter a problem.

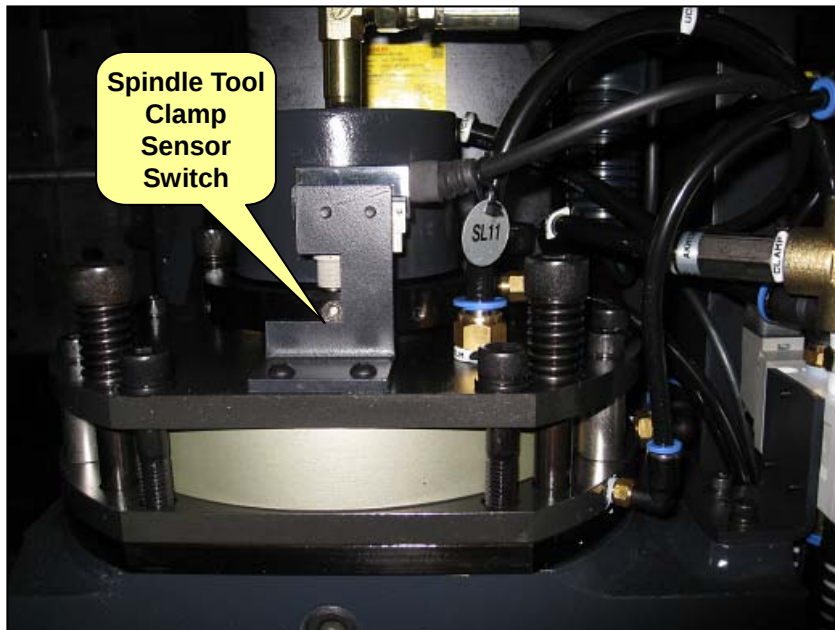
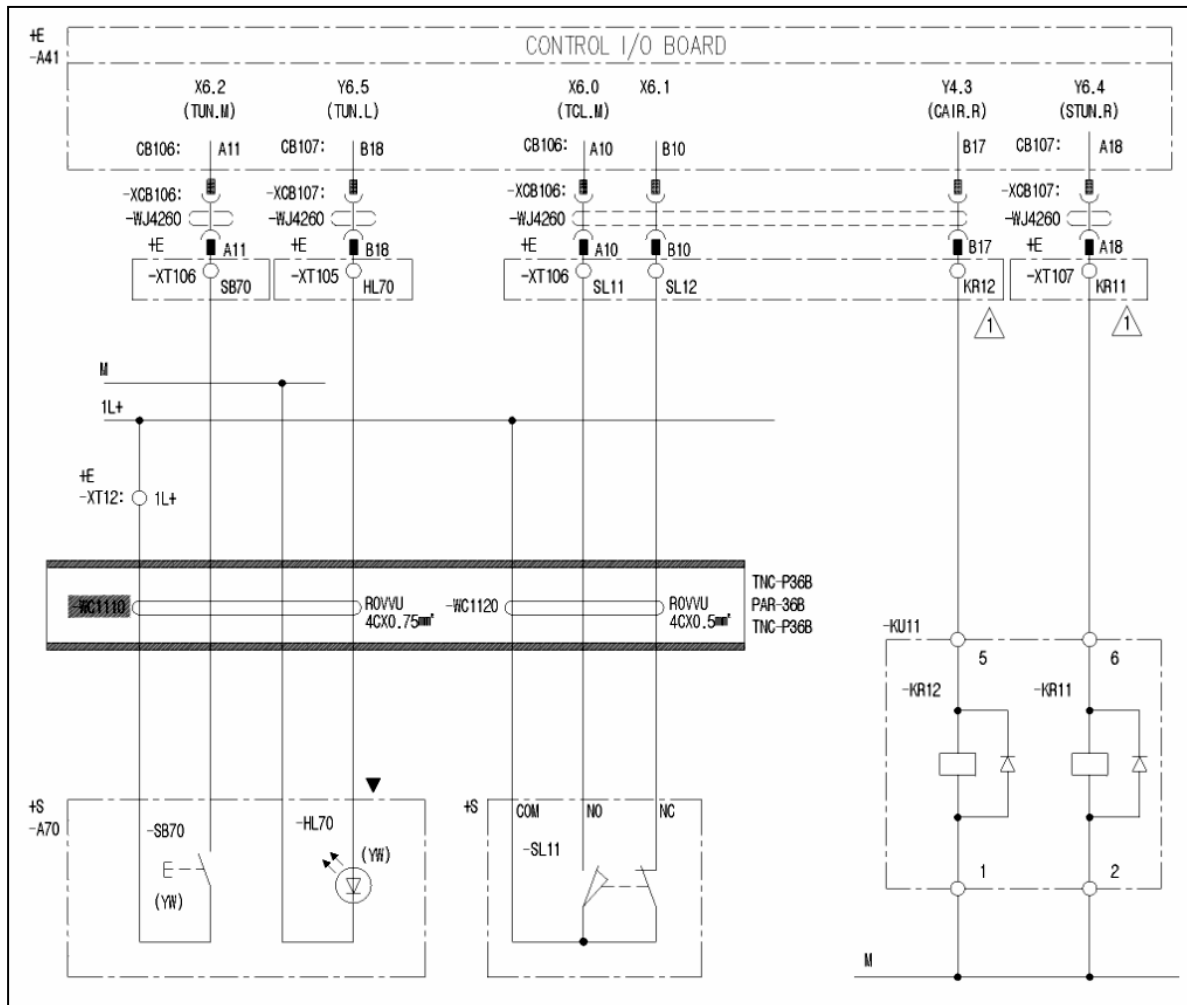
Part Name	Part No.	Symbol	Spec.	Maker
Limit Switch	ESWLM0053	-SL11	SHD55-01	

Signal	Address	Device Symbol	I/O	Connector (Pin)	Numbering Tube
Spindle Tool Clamp	X6.0 (TCL.M)	-SL11(NO)	Control I/O Board	XCB106 (A10)	SL11
Spindle Tool Unclamp	X6.1 (TUC.M)	-SL12(NC)	Control I/O Board	XCB106 (B10)	SL12
Spindle Tool Unclamp	Y6.4 (STUN.V)	YV11	Control I/O Board	XCB106 (A18)	KR11





Address	Symbol	Coil Comment
R420.5	TMB30	Spindle Clamp / Unclamp Check Time
R841.1	SPTCAL	Spindle Tool Clamp NG
A6.6	2055	Spindle Tool CL / UNCL Alarm
R652.7	ARST	Alarm Reset
K7.2	CATC	Cam Type ATC
Y6.4	STUC.V	Spindle Tool Unclamp
X6.0	TCL.M	Spindle Tool Clamp Confirm
X6.1	TUL.M	Spindle Tool Unclamp Confirm
F0.6	SA	Servo Ready
R841.2	SPTCLF	Spindle Tool Clamp Flag



2.11 2058 Tool No. Select Keep Relay Not Set**1) Description**

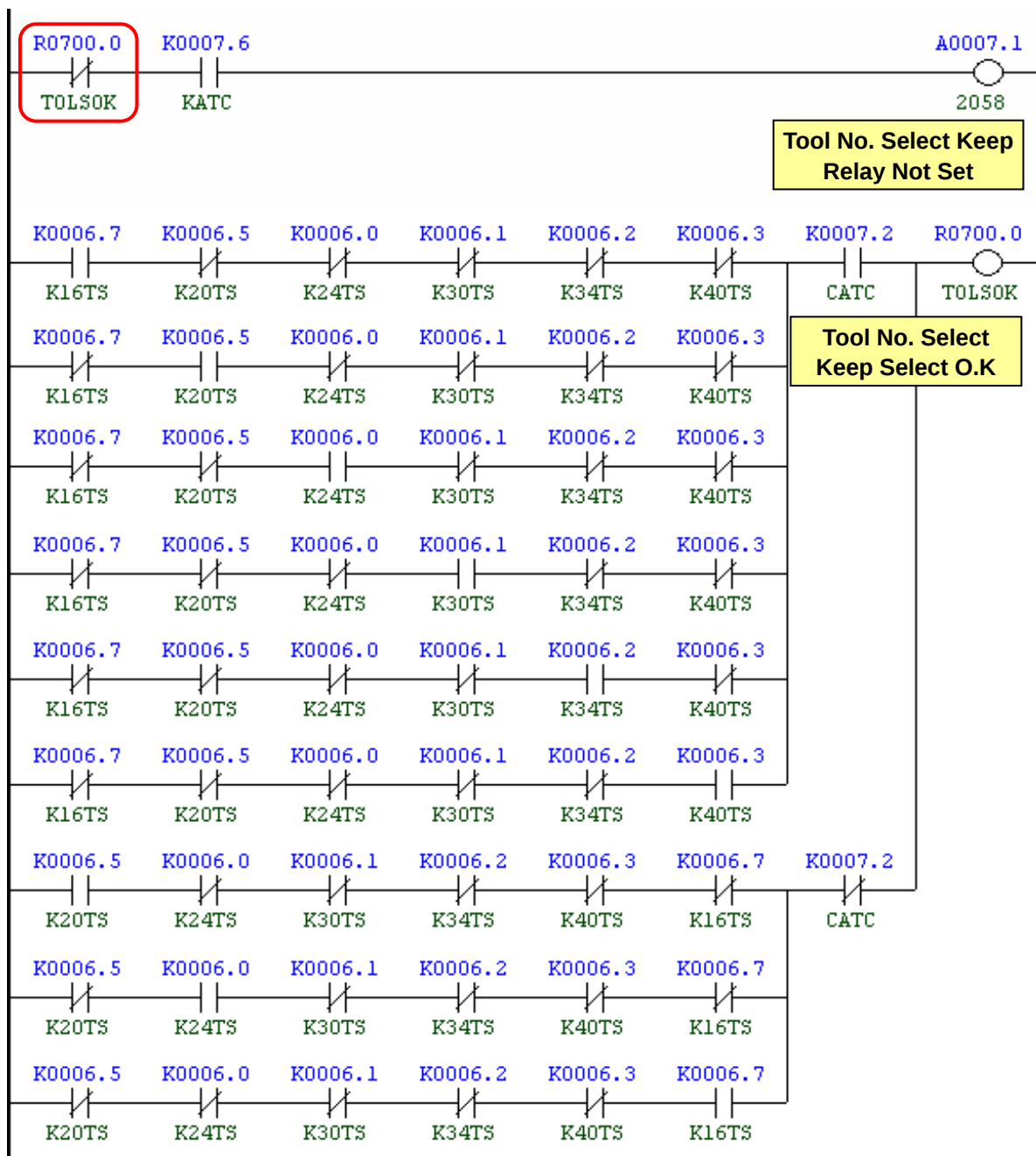
Error in the Keep Relay setting that specifies the maximum number of tool pots.

2) Cause of problem

The Keep Relay setting that enables you to select the maximum number of tool pots is not specified, or more than one setting is found.

3) Action

Check the Keep Relay settings and select a value appropriate to the machine.



Address	Symbol	Coil Comment
R700.0	TOLSOK	Tool Preset Keep Relay Select O.K
K7.6	KATC	ATC Used
A7.1	2058	Tool No. Select Keep Relay Not Set
K6.7	K16TS	Tool Magazine 16Tools Used
K6.5	K20TS	Tool Magazine 20Tools Used
K6.0	K24TS	Tool Magazine 24Tools Used
K6.1	K30TS	Tool Magazine 30Tools Used
K6.2	K34TS	Tool Magazine 34Tools Used
K6.3	K40TS	Tool Magazine 40Tools Used
K7.2	CATC	Cam Type ATC (Only Mynx Type)

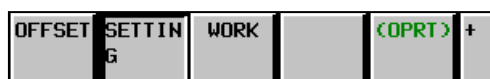
(Note) To change the Keep Relay setting

(1) Set the mode switch on the main OP to "MDI".



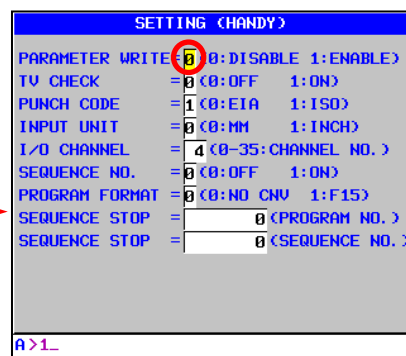
(2) Press the "OFS/SET" button in the right side of the main OP monitor.

- The following options will be displayed in the button bar.



(3) Press the [SETTING] button.

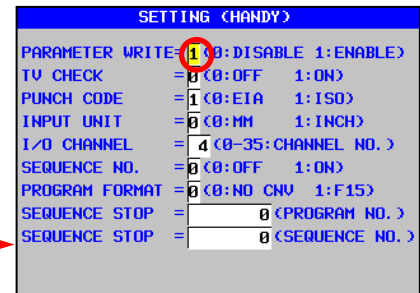
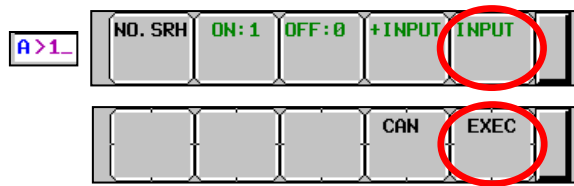
- The Setting menu appears where the cursor will be positioned to "PARAMETER WRITE" on the top.



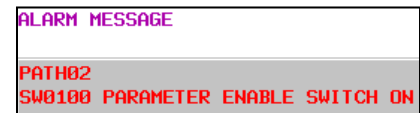
- ※ If the screen is not displayed as shown in the right picture, move to the first page of the Setting Parameter menu ("0" → "NO.SRH") and press the Page Up button three times. Then, you will see the right screen properly.



- (4) Enter a numeric of "1" and keep pressing the INPUT and EXEC buttons.



- ★ The "SW0100 Parameter Enable Switch ON" alarm will occur.



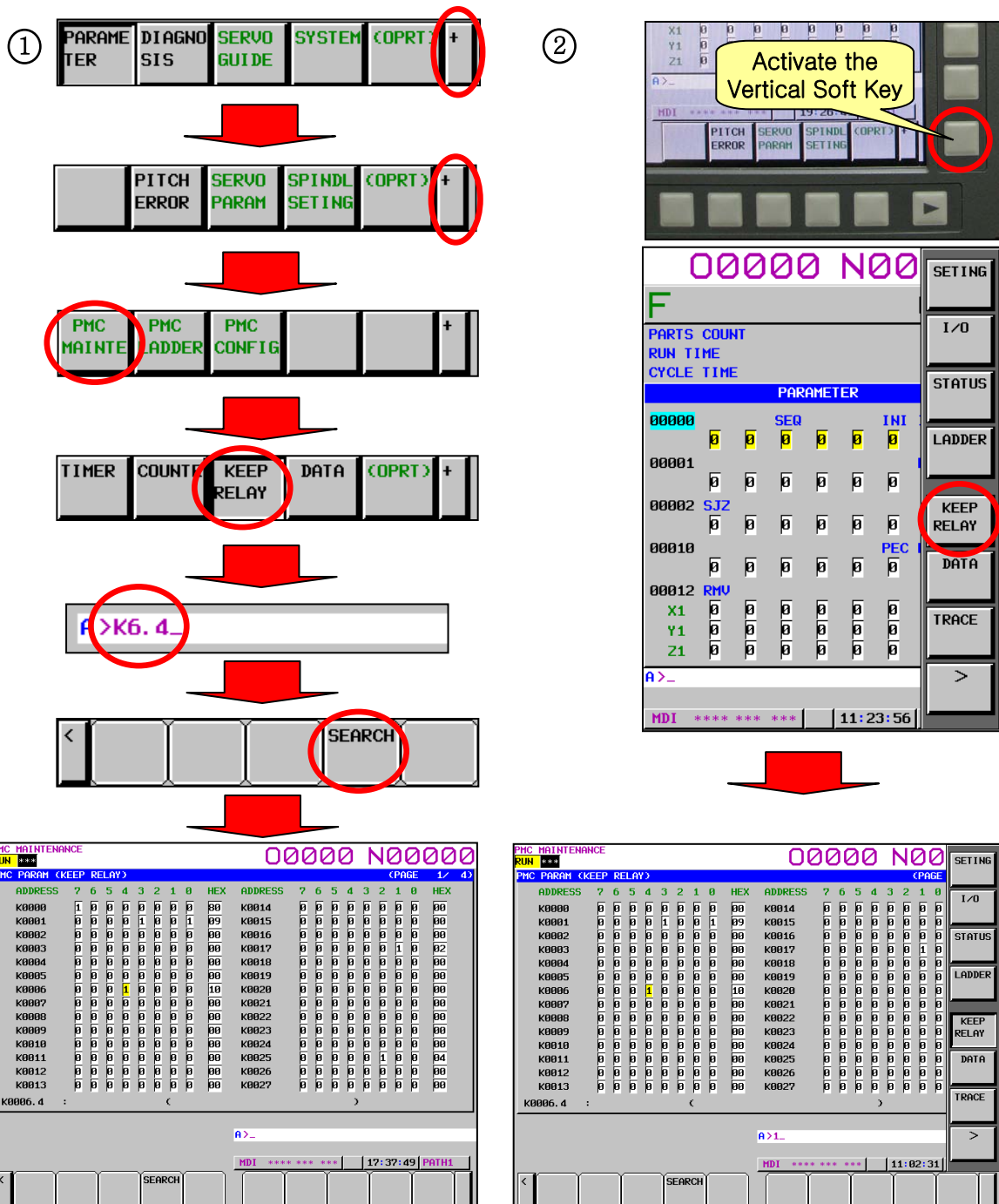
- (5) Press the "SYSTEM" button in the right side of the main OP monitor.

- The following options will be displayed in the button bar.



- (6) Move to the Keep Relay screen.

- ① Press the buttons one after another to move to the Keep Relay screen.
- ② Press the Vertical Soft Key in the lower right corner and press the [KEEP RELAY] button.



(7) Enter a desired Keep Relay number and press [SEARCH], or move the cursor to the Keep Relay item and enter 1 or 0. Then, press the INPUT button.

(8) When done, move back to “SETTING” and turn off “PARAMETER WRITE”(“1” ‘0’). Then, press the “RESET” button to release the alarm.

K-Relay	K6.7	K6.5	K6.4	K6.3	K6.2	K6.1	K6.0
Tool Count	16 Tools	20 Tools		40 Tools	34 Tools	30 Tools	24 Tools

2.12 2059 Tool Search Illegal Position**1) Description**

A tool is called (T__) in the condition where the changer arm not in the home position or the tool magazine is manually rotated in the condition where the waiting pot is not in the magazine side.

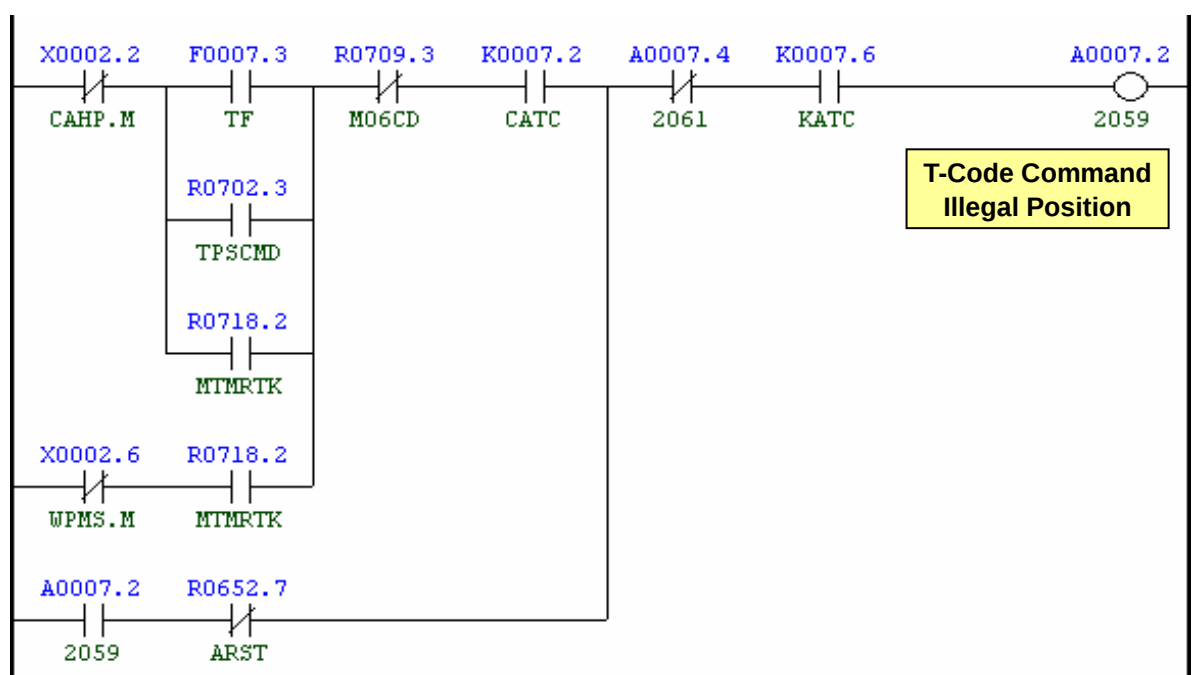
2) Cause of problem

- ① Error in adjusting the switch for ensuring that the changer arm is in the home position or the waiting pot is in the magazine side.
- ② Defective component part in the switch
- ③ Error in manipulating the magazine manually

3) Action

- ① Check if the switch works properly on the DGN screen, and adjust the distance from the dog as appropriate.
- ② Check the limit switch, wiring cables and control I/O board, and make repair or replacement if you encounter a problem.
- ③ Rotate the magazine manually after the waiting pot is moved from spindle side to magazine side. (adjust manually or instruct M232 : Waiting Pot Up)

Signal	Address	Device Symbol	I/O	Connector (Pin)	Numbering Tube
Chan. Am Home Pos.	X2.2 (CAHP.M)	-SX33	Control I/O Board	XCB104 (A11)	SX33
Wait. Pot Mag. Side	X2.6 (WPMS.M)	-SX5B	Control I/O Board	XCB104 (A13)	SX5B



Address	Symbol	Coil Comment
X2.2	CAHP.M	Changer Arm Home Position/Tool Detect
F7.3	TF	T Function Strobe
R702.3	TPSCMD	Tool Pot Search Command
R718.2	MTMRTK	Man Tool Magazine Rotation Keep
X2.6	WPMS.M	Waiting Tool Magazine Side
R709.3	M06CD	M06 Command
K7.2	CATC	Cam Type ATC (Only Mynx Type)
A7.2	2059	Tool Search Illegal Position
R652.7	ARST	Alarm Reset
A7.4	2061	T-Code Command Error
K7.6	KATC	ATC Used

(Note) How to read DGN (Diagnostic)

Ex) X 0007 0 0 1 1 0 0 1 0

Bit 1, 4 and 5 in Address X7 turn ON while Bit 0, 2, 3, 6 and 7 turn OFF.

Symbol	0	0	1	1	0	0	1	0
Bit No	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0

(Note) How to move to DGN (Diagnostic)

- (1) Press the “SYSTEM” button in the right side of the main OP monitor.

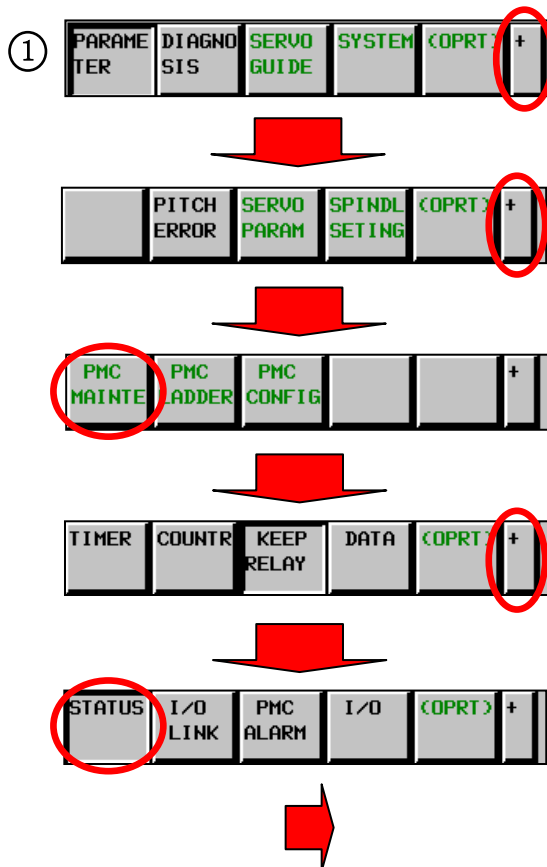
- The following options will be displayed in the button bar.

PARAME TER	DIAGNO SIS	SERVO GUIDE	SYSTEM	COPT	+
---------------	---------------	----------------	--------	------	---

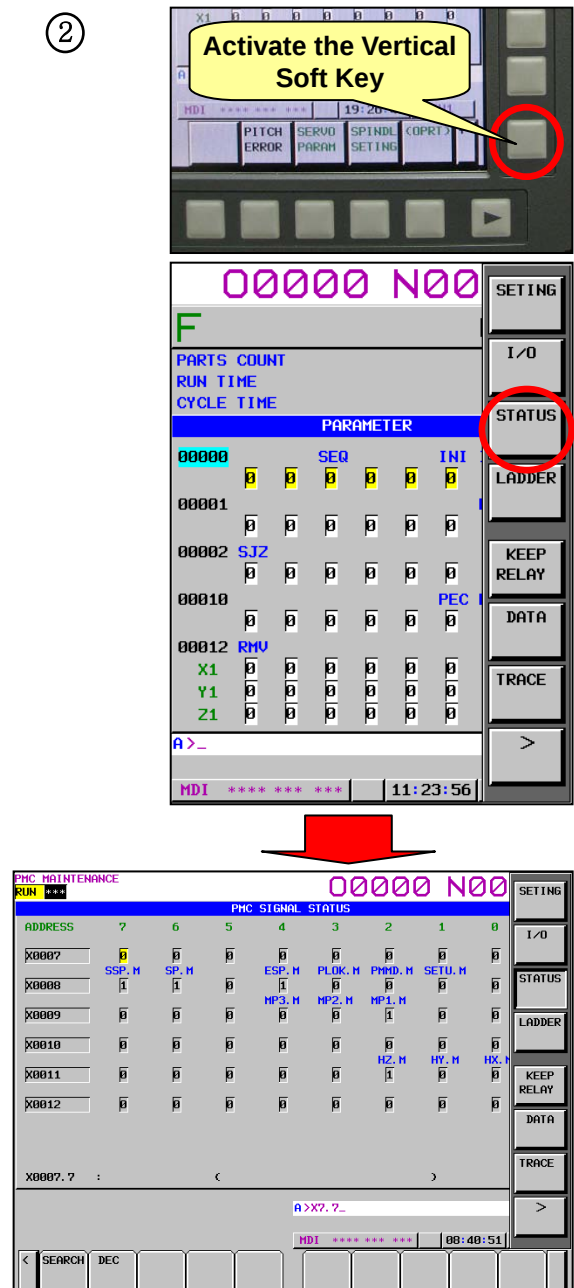


- (2) Move to the DGN screen.

- Press the buttons one after another to move to the DGN screen.
- Press the Vertical Soft Key in the right corner and press the [STATUS] button.

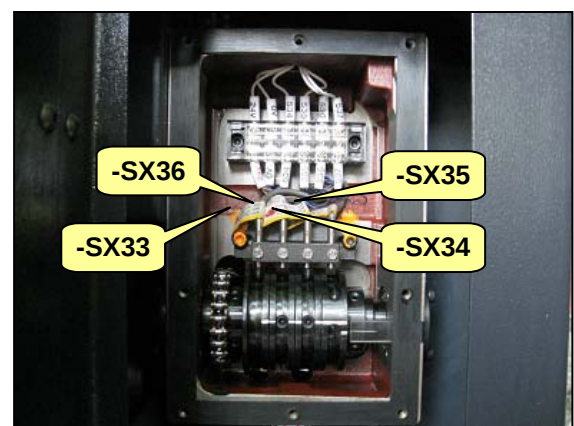


- (3) Enter a desired DGN address and press [SEARCH] to display the DGN screen of your choice.



2) Command Sensor

- SX33 : X2.2 (CAHP.M) Changer Arm Home Position
- SX34 : X11.4 (CAHS.M) Manual ATC Home Position
- SX35 : X2.3 (CCMD.M) Tool Clamp Command
- SX36 : X2.4 (UCMD.M) Tool Unclamp Command



2.13 2060 M06 Command Illegal Position

1) Description

A tool change was instructed in other than the initial position.

2) Cause of problem

- ① The tool magazine was instructed to change a large-diameter tool in an inappropriate state.
- ② The switch to detect the changer arm home position does not work properly. (The distance between switch and dog was mis-adjusted, or any of its parts is defective)
- ③ The macro program for tool changing is deleted or changed, or the parameter to call the macro program is set improperly.

3) Action

- ① Set the tool magazine according to the tool data table regarding the large-diameter tool settings.
- ② Check the switch on the DGN screen and adjust the distance from the dog as appropriate, or check the switch, wiring cables and control I/O board, and make repair or replacement if you encounter a problem.

(Note) ATC operation according to the change instruction of the large-diameter tool

- 1) If the spindle has a small-diameter tool inserted, the waiting pot has no tool inserted, and more than one pot next to the waiting pot have a large-diameter tool inserted
- You may encounter a conflict in changing the tool with "M06 Command Illegal Alarm".
In normal auto processing, any empty pot next to the large-diameter tool can be the waiting pot.
 - 2) If the spindle has a large-diameter tool inserted and either pot next to the waiting pot has a tool inserted
- Upon M06, the waiting pot will be Up right in the position (The waiting pot tool data will be saved) and the nearest magazine pot that can change a large-diameter tool will become the waiting pot.
 - Incoming pot : Center pot among three consecutive empty pots
: The center empty pot of three consecutive empty pots will perform the pot-down before starting the tool change.
- ① The first tool change is completed (The spindle has no (small-diameter) tool inserted)
 - ② The magazine rotates to locate the number of the tool inserted in the waiting pot before M06 was instructed.
 - ③ When the second tool change is completed, M06 will be Finned and the Cycle Start indicator turns off. (The indicator is not available in Manual mode)

- 3) If the spindle has a large-diameter tool inserted, and the center empty pot of three consecutive empty pots or an empty pot between left and right small-diameter tool pots is not located in the magazine when M06 is instructed
- "M06 Command Illegal Alarm" occurs.

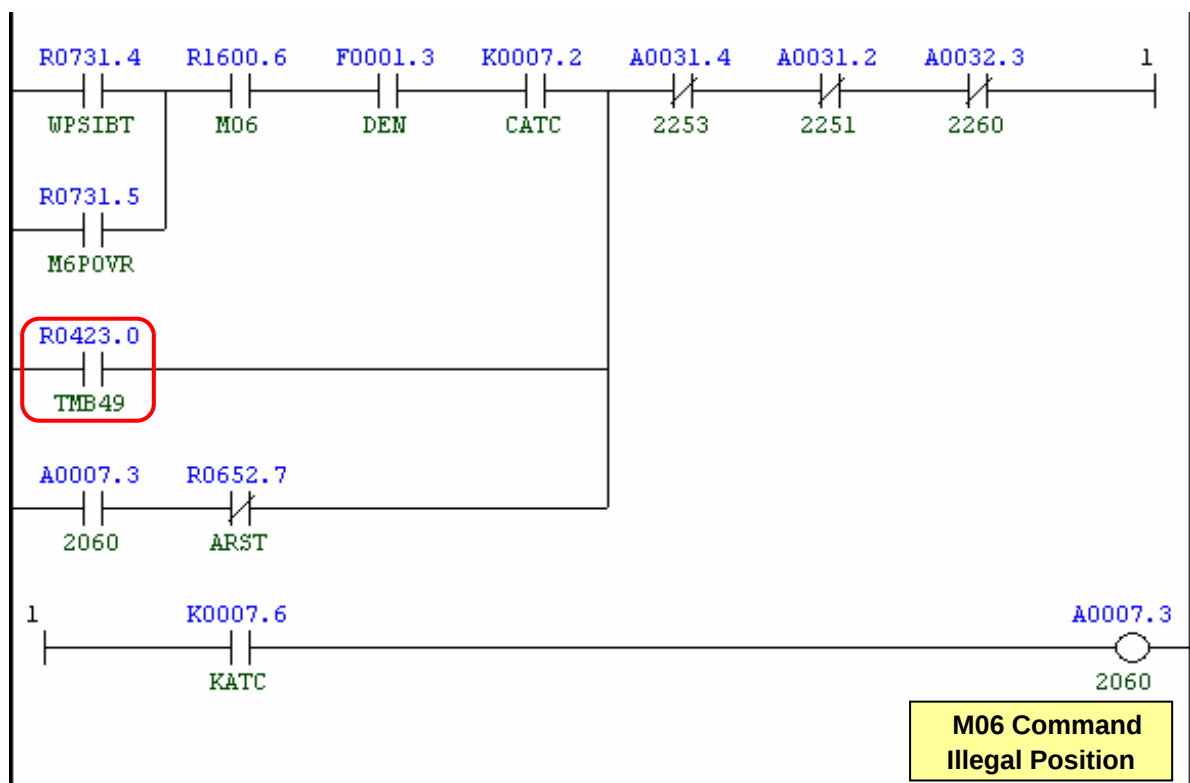
(Note) Macro Program for Tool Changing

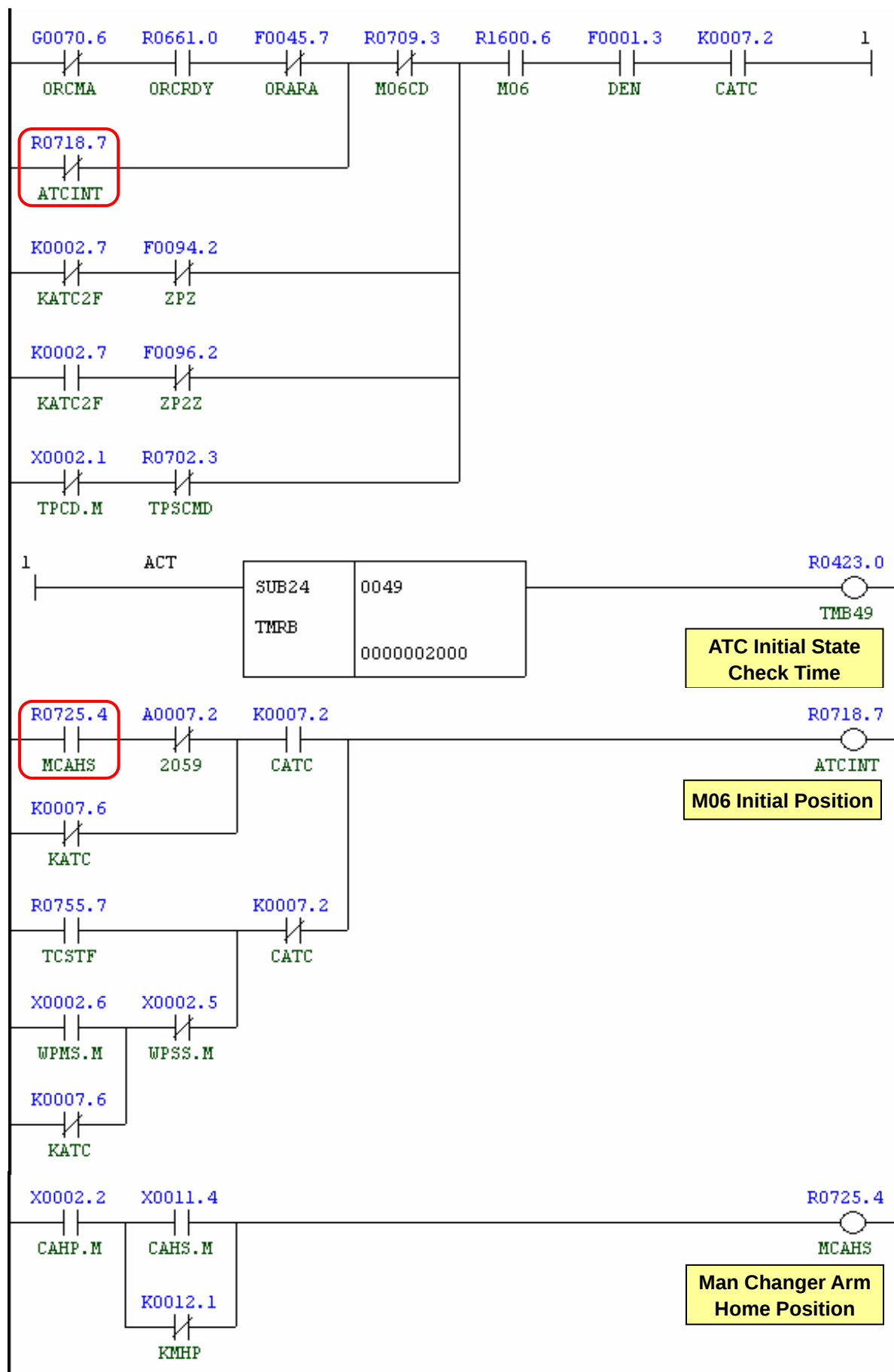
O9001(DNM/CAM TYPE, M06)
 N10G80G40
 N20M233
 N30G91G30Z0.M19
 N40M06
 N50G90
 N60M99

(Note) Parameters related to the macro program for tool changing

#6071 = 6 : M code used to call the subprogram of program number 9001

Signal	Address	Device Symbol	I/O	Connector (Pin)	Numbering Tube
Tool Pot Count Detect	X2.1 (TPCD.M)	-SX32	Control I/O Board	XCB104 (B10)	SX32
Chan. Arm Home Pos.	X2.2 (CAHP.M)	-SX33	Control I/O Board	XCB104 (A11)	SX33
Man. ATC Home Pos.	X11.4 (CAHS.M)	-SX34	Control I/O Board	XCB107 (A12)	SX34





Address	Symbol	Coil Comment
R731.4	WPSIBT	Wait. Pot Side Big Tool Error
R731.5	M6POVR	M06change Pot Counter Over
R1600.6	M06	ATC Change Call
F1.3	DEN	Distribution End
K7.2	CATC	Cam Type ATC (Only Mynx Type)
R423.0	TMB49	ATC Initial State Check Time
A7.3	2060	M06 Command Illegal Position
R652.7	ARST	Alarm Reset
A31.4	2253	Change Arm Position Check Alarm
A31.2	2251	ATC Overtime Alarm
A32.3	2260	ATC Magazine Rotation Overtime Alarm
K7.6	KATC	ATC Used
G70.6	ORCMA	Orientation Command (S-Spindle)
R661.0	ROCRDY	Orientation Command Ready
F45.7	ORARA	Spindle Orientation Complete
R718.7	ATCINT	ATC Interlock
R709.3	M06CD	M06 Command
K2.7	KATC2F	ATC 2 nd Reference Point Used
F94.2	ZPZ	Z-Axis 1st Reference Return
F96.2	ZP2Z	Z-Axis 2nd Reference Return
X2.1	TPCD.M	Tool Pot Count Detect
R702.3	TPSCMD	Tool Pot Search Command
R725.4	MCAHS	Man Changer Arm Home Position
A7.2	2059	Tool Search Illegal Alarm
R755.7	TCSTF	Tool Change Start Flag
X2.6	WPMS.M	Waiting Pot Magazine Side
X2.5	WPSS.M	Waiting Pot Spindle Side
X2.2	CAHP.M	Changer Home Position/Tool Detect
X11.4	CAHS.M	Manual ATC Home Position
K12.1	KMHP	Manual ATC Home Position Used

2.14 **2061** T-Code Command Over Alarm

1) Description

A T code that is not appropriate to the machine is instructed.

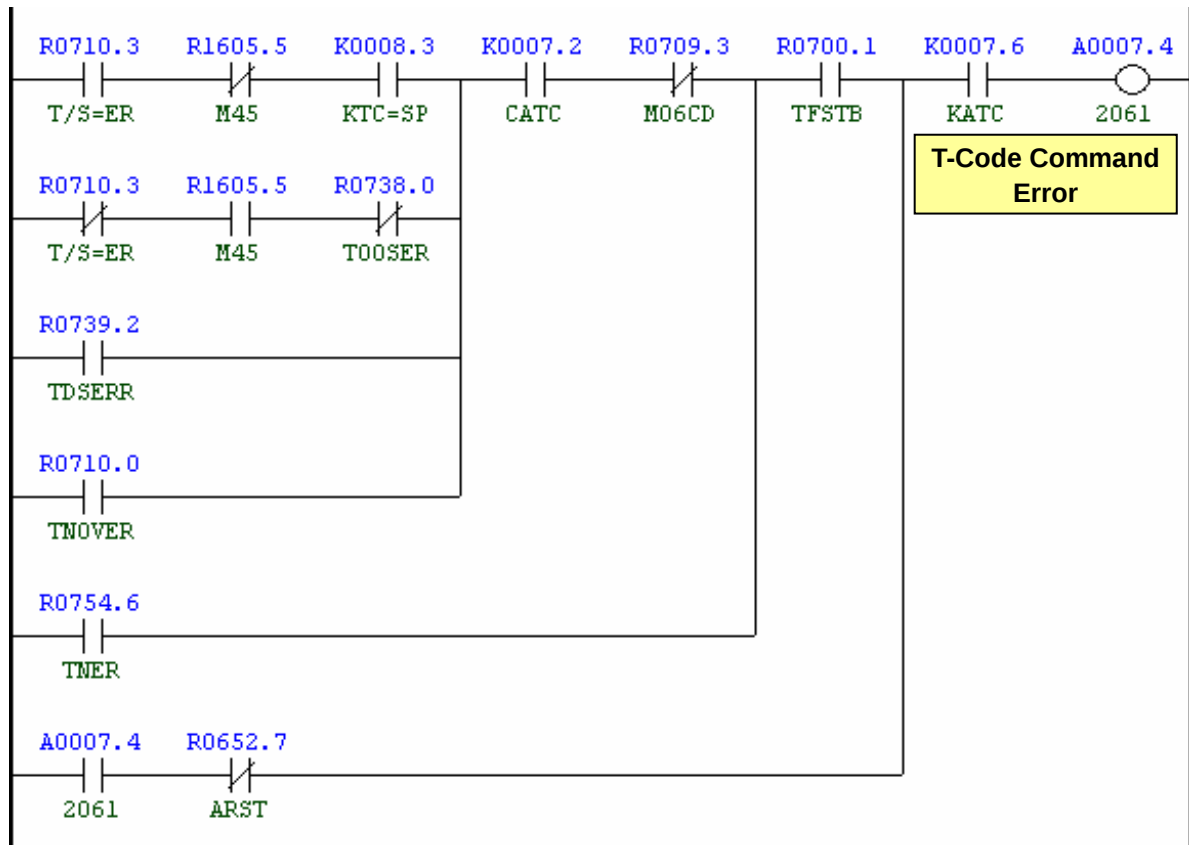
2) Cause of problem

- ① The tool number in the spindle is used to call the tool.
- ② A tool number not available in the spindle is used to instruct Spindle Tool No. Set (M45).
- ③ The Keep Relay setting of PMC does not match with the pot count of the applicable tool pot.
- ④ A larger POT number than the pot count available in the machine is called.
- ⑤ A decimal number (not an integer) is used to call a tool.

3) Action

- ①, ② Check the number of the spindle tool data and waiting tool data in "PMC" > "D-Data" and correct it appropriately and try again.
- ③ "Check the Keep Relay settings on PMC and select a value that fits the target tool pot.
- ④, ⑤ Select a correct tool number to create the macro program.

K-Relay	K6.7	K6.5	K6.4	K6.3	K6.2	K6.1	K6.0
Tool Count	16 Tools	20 tools		40 Tools	34 Tools	30 Tools	24 Tools



Address	Symbol	Coil Comment
R710.3	T/S=ER	T-Code=Spindle Tool Command Error
R1605.5	M45	Spindle Tool No. Set
K8.3	KTC=SP	T-Code=Spindle Tool Used Of Error
R738.0	TOOSER	Tool Data Search Error
R739.2	TDSERR	Tool Data Set or Search Error
R700.0	TNOVER	Tool No. Over Command Error
K7.2	CATC	Cam Type ATC (Only Mynx Type)
R709.3	M06CD	M06 Command
R754.6	TNER	Tool No. Command Error
R700.1	TFSTB	TF Strobe
A7.4	2061	T-Code Command Error
R652.7	ARST	Alarm Reset
K7.6	KATC	ATC Used

2.15 2062 M06 Command Overtime Alarm

1) Description

The tool change command (M06) was instructed but not completed within 7 seconds.

2) Cause of problem

In most cases, this happens if a tool is stuck in the changer arm while it is changed.

3) Action

Move the changer arm to the home position manually and find and resolve the cause of trouble.

※ ATC Troubleshooting

☞ If the changer arm is stopped for any reason while changing the tools (M06), you must return the changer arm to the home position manually.

However, the countermeasures may differ according to the cause of trouble. So please find out the exact cause before restoring or repairing the machine.

(1) If the changer arm is stuck while trying to pull out a tool from the spindle

In most cases, this happens when the changer arm is stuck in the spindle while trying to pull out a tool after tool unclamping is performed, causing to trigger the "2062 M06 Command Over Time" alarm.

(2) If the changer arm is stuck in the spindle after changing a tool

In most cases, this happens when the changer arm gripper is stuck in a tool after the changer arm changed the tool and performed the tool clamping, causing to trigger the "2062 M06 Command Overtime" alarm.

(3) If the changer arm has stopped operation irrelevantly to the spindle

This happens if the machine is emergency stopped or there occurs a power failure while performing the tool changing.

- 1) If this happens due to the emergency stop or power failure, take an appropriate measure to solve the problem and turn power back on before entering Machine Ready.



- 2) From the main OP, set the mode switch to “ATC Changer”.



- 3) Check how ATC changer arm is stopped for what reason and set the mode switch to either “ATC CW” or “CCW” accordingly.

- ① If the changer arm is stuck while trying to pull out a tool from the spindle

From the main OP, set the mode switch to “CCW”.

☞ If the machine is in the state of tool unclamping, manually perform the tool clamping before proceeding.

- How to confirm the state of tool unclamping
Check if the spindle emits the collet air (in MDI or Auto mode), or check if the button indicator of Unclamp on the spindle head turns on.



- ② If the changer arm is stuck in the spindle after it changed a tool

From the main OP, set the mode switch to “ATC CW”.

☞ If the machine is in the state of tool unclamping, manually perform the tool clamping before proceeding.



- ③ If the changer arm has stopped operation irrelevantly to the spindle

If the changer arm or tool is not interrupted by the spindle or workpiece, pull out the tool from the spindle and set the mode switch to “CCW”.

- How to pull out a tool from the spindle:
Hold the tool with hand and press the Tool Unclamp button on the spindle head to pull it out. Then, press the button again to perform the tool clamping again.



4) As selected above, press and release the "ATC CCW" or "CCW" button repeatedly until the changer arm moves to the home position.

(1) In case of ① above : In this case, the changer arm is stuck in the spindle for a reason while changing a tool. Return the changer arm to the home position and find the cause by performing the tool unclamping manually.

☞ If the manual tool unclamping does not work at all, gently impact on the tool to remove it with the hammer. Then, check the tool kick distance, the state of the unclamp cylinder, collet, and the tapering side of the spindle or tool to find out the cause of trouble and take a necessary measure.

(2) In case of ② above : This happens when the gripper of the changer arm is stuck in the tool. If the problem persists after following the steps below, use a rubber hammer to impact on the end of the changer arm so that the gripper can be removed. Then, pull out the changer arm and return it to the home position. Find out the cause of trouble and take a necessary action. (it happens mostly while realigning ATC)

(3) In case of ③ above : This kind of trouble shooting will be made manually while the tools are inserted in the changer arm. Just in case of a fall of the tool, prepare a shock absorber such as wood palette under the machine, so that it can protect the machine from the possible fall.

5) The changer arm will not move further when it reaches the home position.

☞ Changer Arm Home Position Check

X2.2 (CAHP.M) : Changer Arm Home Position, -SX33

X11.4 (CAHS.M) : Manual ATC Home Position, -SX34

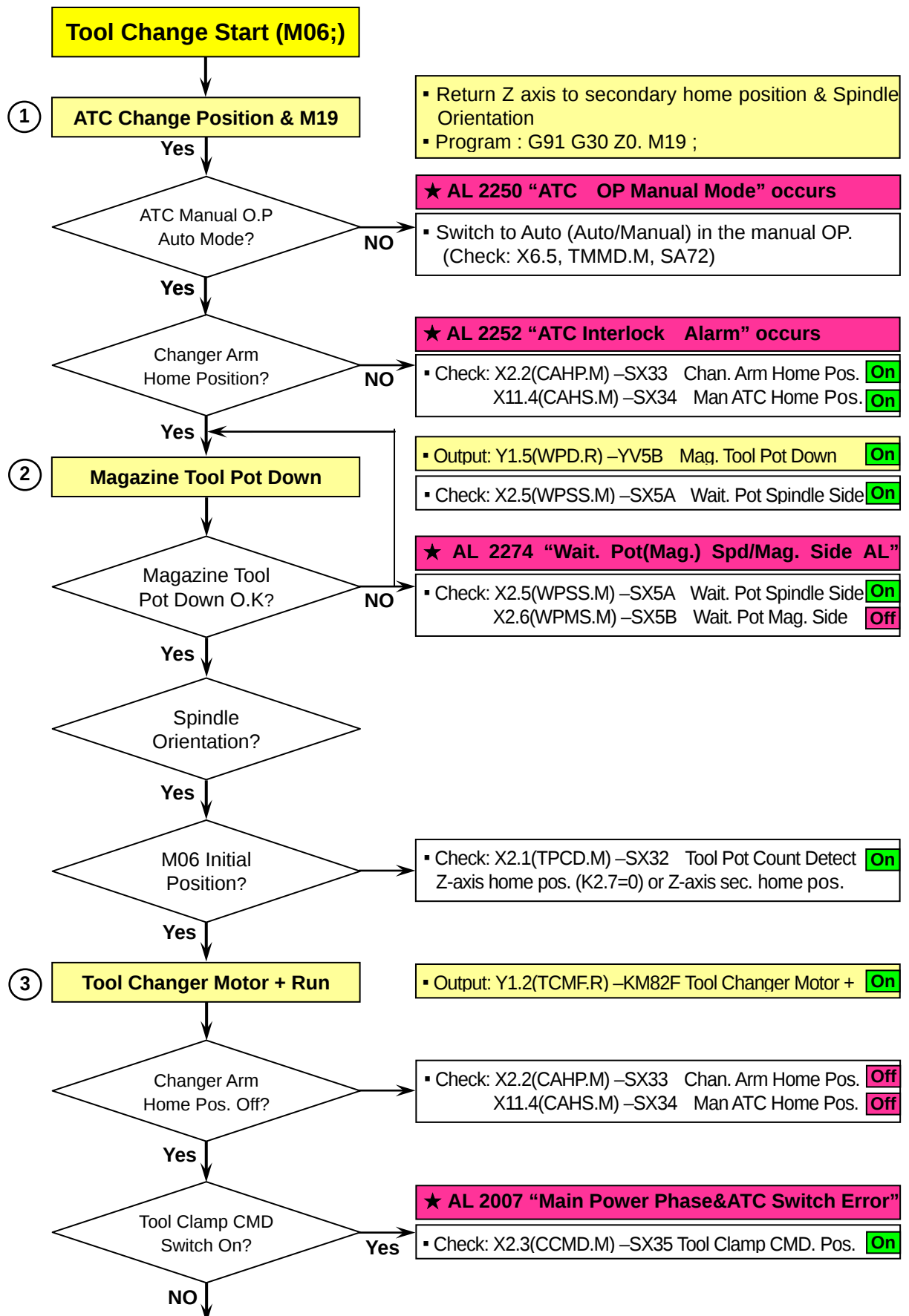
6) Select [SYSTEM] => [+] => [+] => [PMC MAINT] => [STATUS] => [DATA] in sequence and check the tool number (D450) in the spindle as well as the tool number (D452) in the waiting pot. Make correction if necessary.

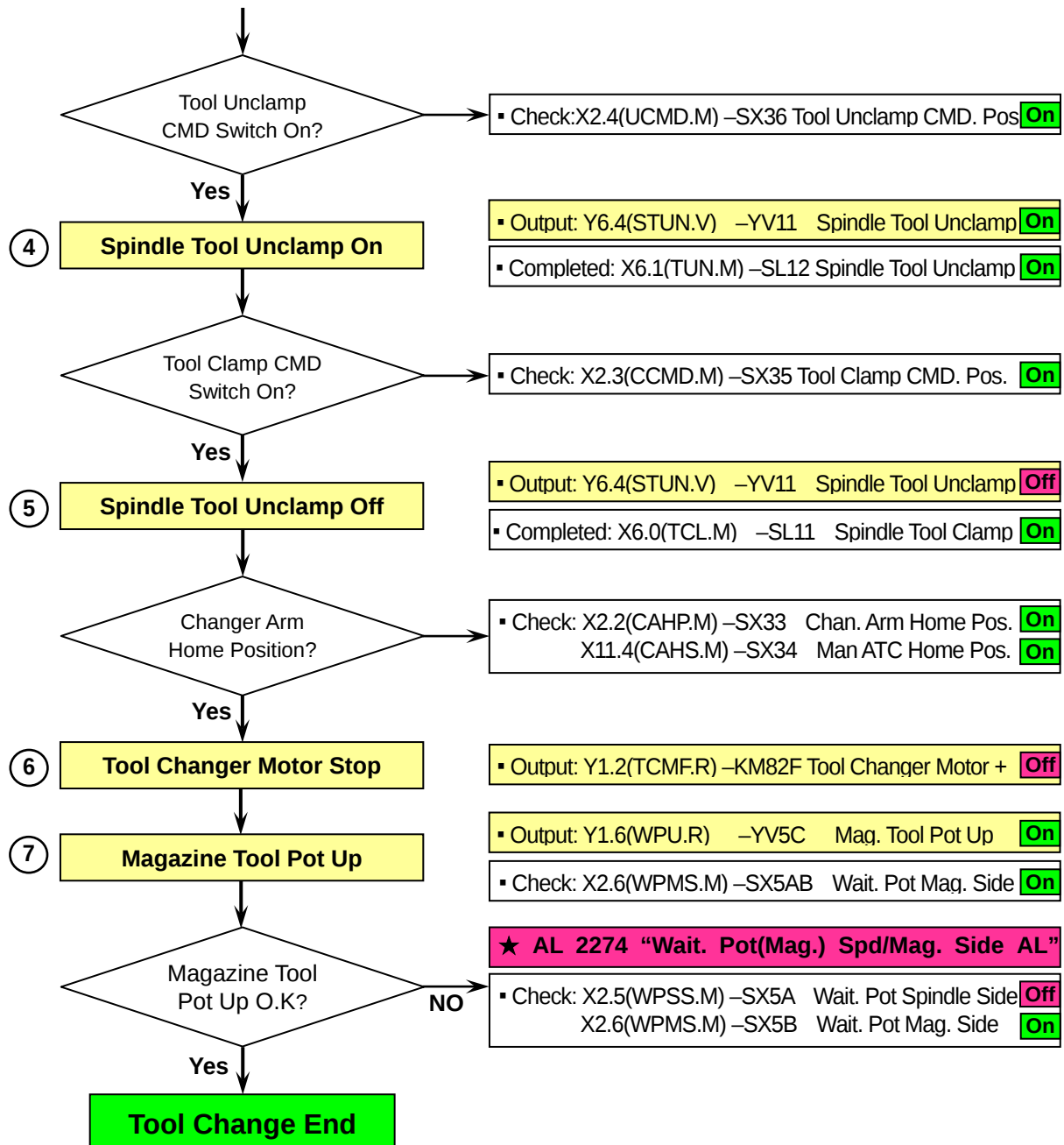
D450 : Tool number in the spindle

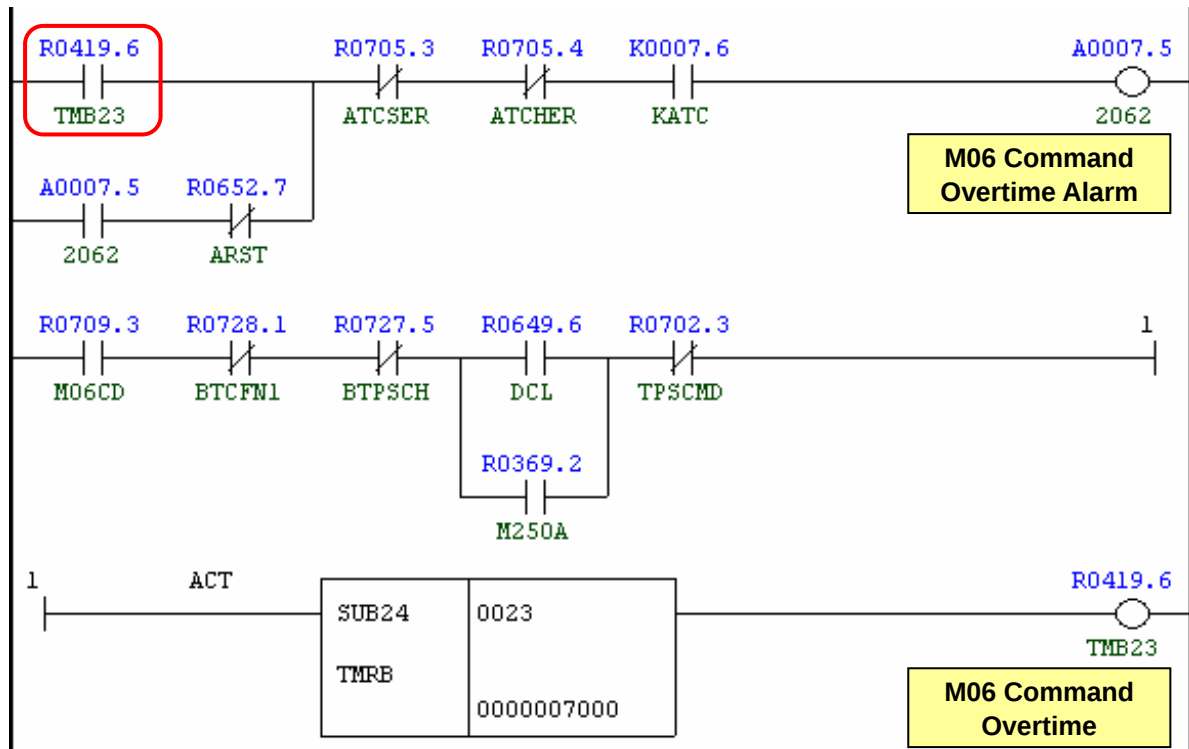
D452 : Tool number in the waiting pot

7) When each axis returns to their respective home position, ATC troubleshooting will be completed.

※ Tool Changing (M06;) Sequence Chart







Address	Symbol	Coil Comment
R419.6	TMB23	M06 Command Overtime
A7.5	2062	M06 Command Overtime Alarm
R652.7	ARST	Alarm Reset
R705.3	ATCSER	ATC Clamp Command Switch Error
R705.4	ATCHER	ATC Home Switch Error
K7.6	KATC	ATC Used
R709.3	M06CD	M06 Command
R728.1	BTCFN1	Big Tool Change 1 Fin
R727.5	BTPSCH	Big Tool Pot Search
R649.6	DCL	Operator Door Close Confirm
R369.2	M250A	Door Interlock Bypass On Aux.
R702.3	TPSCMD	Tool Pot Search Command

2.16 2066 Spindle Air Pressure Down Alarm (Option)

1) Description

The pressure of air supplied to the spindle bearing lubricant tank falls below the setting of the air pressure switch.

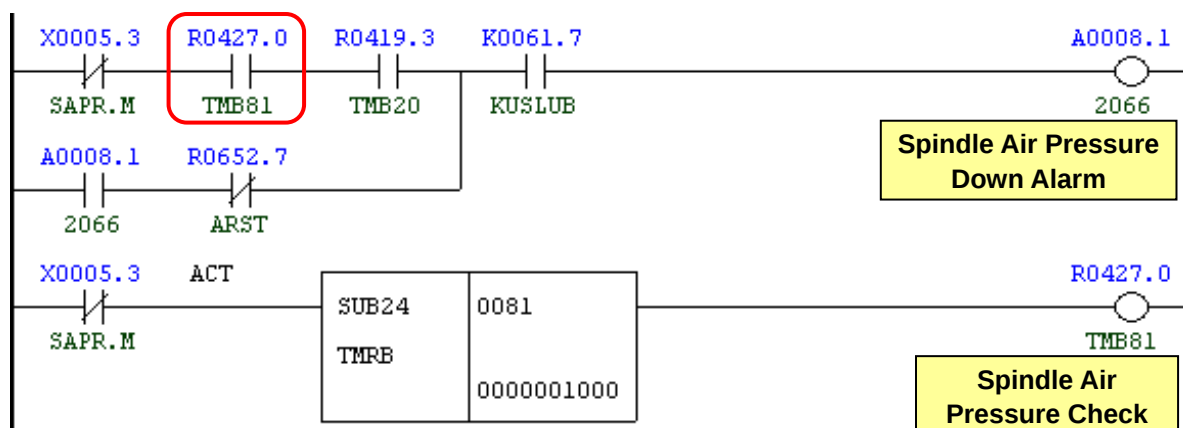
2) Cause of problem

- ① The air pressure for the tank falls below the specification (below 4kg).
- ② The air pressure switch or any of its parts is defective.

3) Action

- ① Increase the factory-supplied air pressure to more than 5kg/cm².
Check the air pressure measurement displayed on the gauge of the air service unit (located on the rear panel), and if it's below 4kg/cm², turn the air pressure handle to the right. If the gauge is no further increased, this indicates the current air pressure is not appropriate. Check the factory-supplied air pressure.
- ② Check the air pressure switch, wiring cables, and control I/O board. Make repair or replacement if you encounter a problem.

Signal	Address	Device Symbol	I/O	Connector (Pin)	Numbering Tube
Spindle Lubrication Air Pressure Check	X5.3 (SAPR.M)	-SP22	Control I/O Board	XCB 106 (B07)	SP22



Address	Symbol	Coil Comment
X5.3	SAPR.M	Spindle Air Pressure Check
R427.0	TMB81	Spindle Air Pressure Check
R419.3	TMB20	Hyd. Pump On Check Time
A8.1	2066	Spindle Air Pressure Down Alarm
R652.7	ARST	Alarm Reset
K61.7	KUSLUB	Keep Using Spindle Lub.

2.17 2133 Man Axis Moving Interlock**1) Description**

Any of the axes (X, Y, Z) has tripped Axis Interlock. As a result, the Handle or Jog mode of the tripped axis is disabled.

2) Cause of problem

- ① Where the splash guard door safety switch is turned off, any of X, Y or Z axis is operated in Jog or Handle mode.
- ② In the state of ATC interlock, the Z axis is operated in Jog or Handle mode.

※ Check the status of ATC Interlock

- (1) Changer Arm Home Position : X2.2(CAHP.M)
- (2) Manual ATC Home Position : X11.4(CAHS.M)

3) Action

- ① Check the splash guard door safety switch.
- ② Check the status of ATC Interlock.

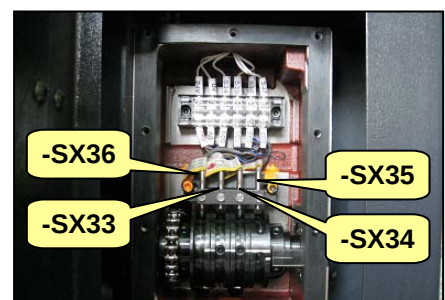
Signal	Address	Device Symbol	I/O	Connector (Pin)	Numbering Tube
Chan. Am Home Pos.	X2.2 (CAHP.M)	-SX33	Control I/O Board	XCB104 (A11)	SX33
Man ATC Home Pos.	X11.4 (CAHP.M)	-SX34	Control I/O Board	XCB107 (A12)	SX34
Unlock By Key Switch	X8.1 (MDIT.M)	-S23	Control I/O Board	XCB105 (B06)	22
S/G Door Interlock	X8.3 (SDIC.M0)	-S23	Control I/O Board	XCB105 (B07)	S23A

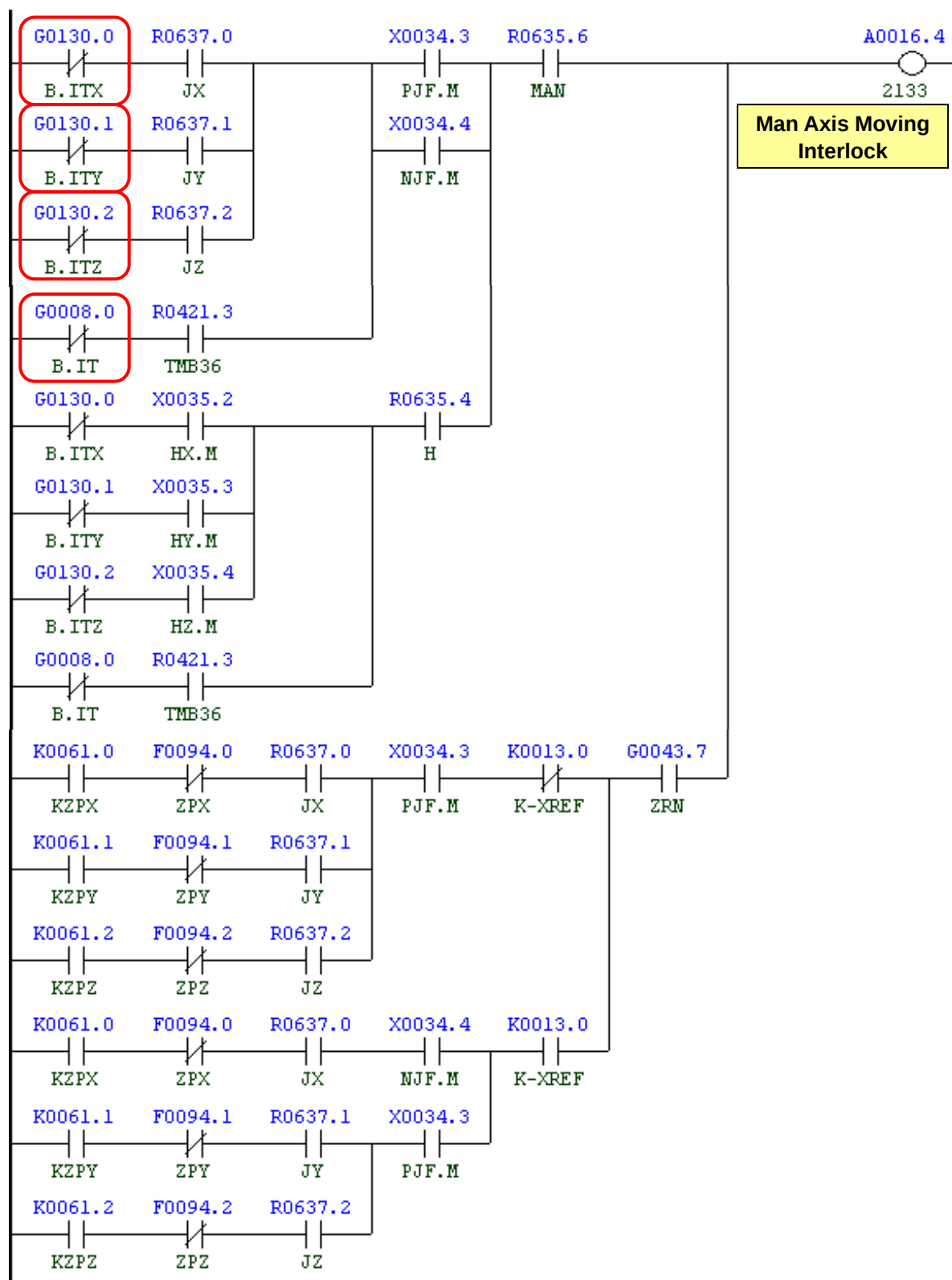
※ Splash Guard Door Safety Switch

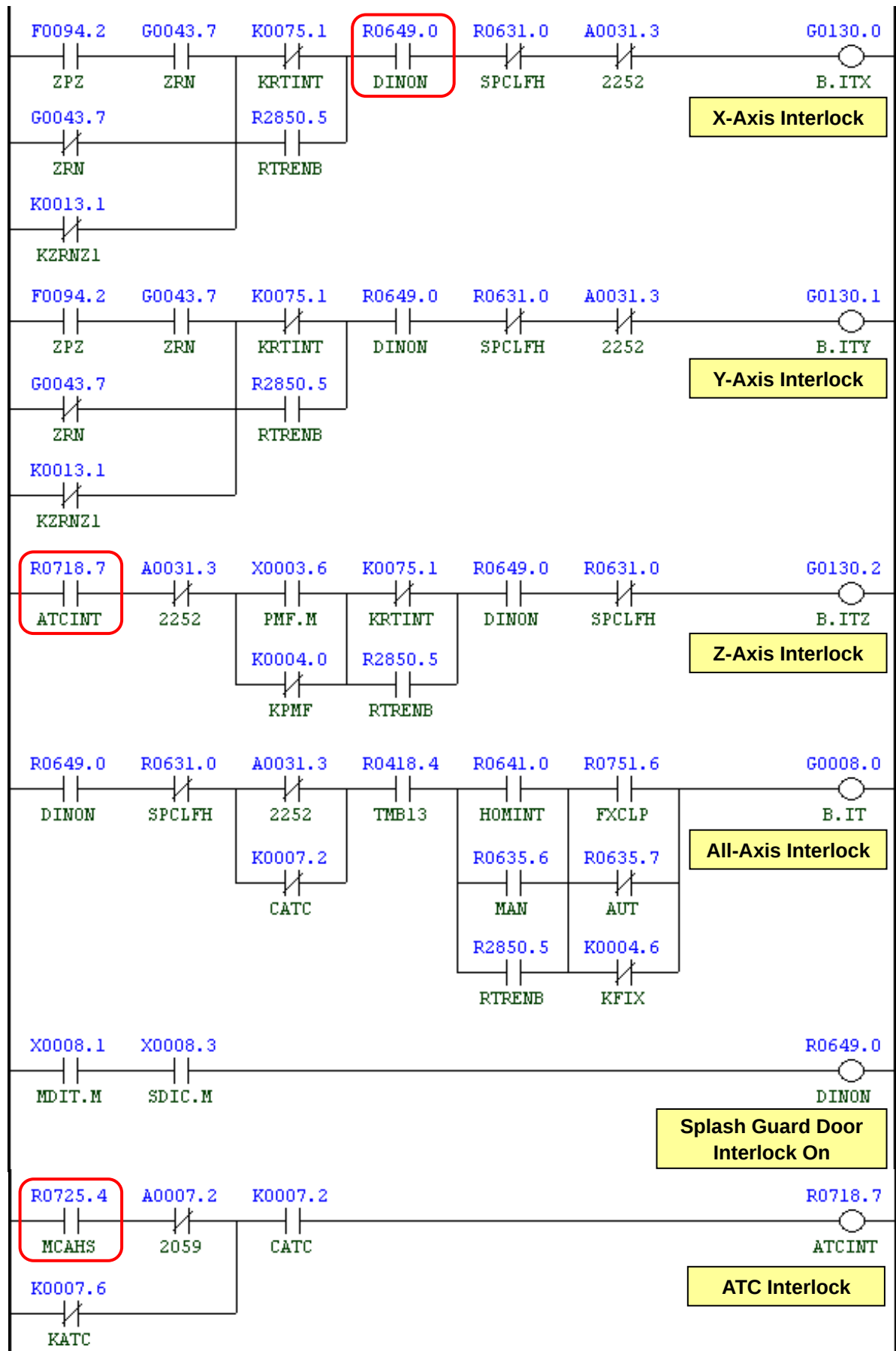


※ ATC Command & Home Position Sensor

- SX33 : X2.2 (CAHP.M) Changer Arm Home Pos.
- SX34 : X11.4 (CAHS.M) Manual ATC Home Pos.
- SX35 : X2.3 (CCMD.M) Tool Clamp Command
- SX36 : X2.4 (UCMD.M) Tool Unclamp Command









Address	Symbol	Coil Comment
G130.0	B.ITX	X-Axis Interlock
R637.0	JX	Jog X-Axis Select
G130.1	B.ITY	Y-Axis Interlock
R637.1	JY	Jog Y-Axis Select
G130.2	B.ITZ	Z-Axis Interlock
R637.2	JZ	Jog Z-Axis Select
G8.0	B.IT	All Axis Interlock
R412.3	TMB36	Door Lock Timer
X34.3	PJF.M	Jog Feed +Direction
X34.4	NJF.M	Jog Feed -Direction
X35.2	HX.M	Handle X-Selection
X35.3	HY.M	Handle Y-Selection
X35.4	HZ.M	Handle Z-Selection
R635.4	H	Handle Mode
R635.6	MAN	Manual Mode
K61.0	KZPX	X-Axis Ref. Point Return Keep
F94.0	ZPX	X-Axis 1st Ref. Return
K61.1	KZPY	Y-Axis Ref. Point Return Keep
F94.1	ZPY	Y-Axis 1st Ref. Return
K61.2	KZPZ	Z-Axis Ref. Point Return Keep
F94.2	ZPZ	Z-Axis 1st Ref. Return
K13.0	K-XREF	Keep Using -X Ref. Return
G43.7	ZRN	Ref. Point Return
K13.1	KZRNZ1	Keep Using Ref. Return Z1
K75.1	KRTINT	Rigid Tap Interrupt memory
R2850.5	RTRENB	Rigid Tape Retract Enable
R649.0	DINON	Splash Guard Door Interlock On

Address	Symbol	Coil Comment
R631.0	SPCLFH	Spindle & Coolant At Feed Hold
A31.3	2252	ATC Interlock Alarm
R718.7	ATCINT	ATC Interlock
X3.6	PMF.M	Power Back-Up Module On Check
K4.0	KPMF	Power Back-Up Module is Used
K7.2	CATC	Cam Type ATC (Only Mynx Type)
R418.4	TMB13	Connect Delay Time Again
R641.0	HOMINT	Home Position Interlock
R751.6	FXCLP	Fixture Clamp State
R635.7	AUT	Auto Mode
K4.6	KFIX	Fixture Cl/Uncl Used
X8.1	MDIT.M	Unlock By Key Switch
X8.3	SDIC.M	Splash Guard Door Interlock
R725.4	MCAHS	Manual Changer Arm Home Position
A7.2	2059	Tool Search Illegal Alarm
K7.6	KATC	ATC Used
X2.2	CAHP.M	Changer Arm Home Position (Tool Detect)
X11.4	CAHS.M	Manual ATC Home Position
K12.1	KMHP	Manual ATC Home Position Used

3. Single Block Alarm

3.1 2160 Lubrication Oil Level Low

1) Description

The lubricant tank has insufficient lubricant.

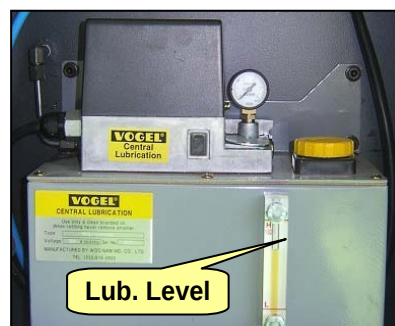
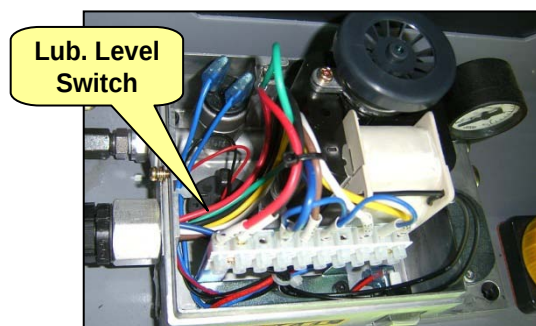
2) Cause of problem

- ① The lubricant tank has insufficient lubricant.
- ② Error in the lubricant level switch of the tank or related parts, or problem with the wiring cables

3) Action

- ① Refill the lubricant tank in the rear of the machine with lubricant (way lubricant). (it is recommended to make a rule to refill the tank once every 3 or 4 days (based on 8 hours per day))
- ② Check the lubricant tank, connection line between tank and terminal block of the electric cabinet, and input module, and make repair or replacement if you encounter a problem.

Signal	Address	Device Symbol	I/O	Connector (Pin)	Numbering Tube
Lub. Level Check	X5.5 (LUB.M)	-SV51	Control I/O Board	XCB106 (B08)	7



Address	Symbol	Coil Comment
X5.5	LUB.M	Lubrication Oil Level Check
A19.7	2160	Lubrication Oil Level Low
R652.7	ARST	Alarm Reset

3.2 **2161** Lub. Pressure Alarm

1) Description

The lubricant tank that supplies lubricant to machine components such as L/M guide, ball screw, or bearings has run out of or insufficient lubricant; or the pressure does not increase to a specified level (15Kg/cm²) after the lubricant motor started driving, or it does not fall to the specified level within 10 seconds after that.

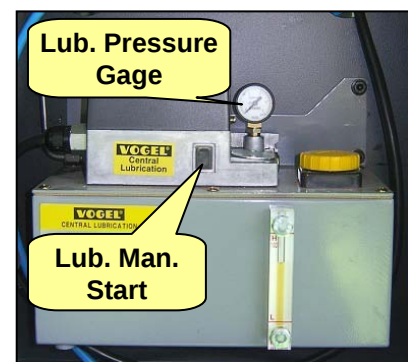
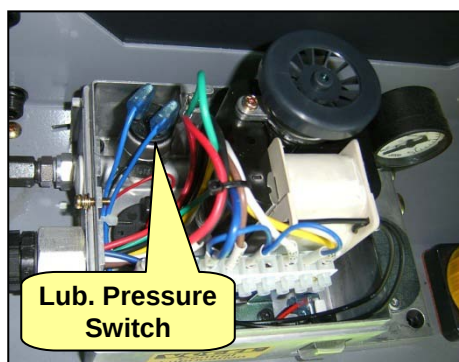
2) Cause of problem

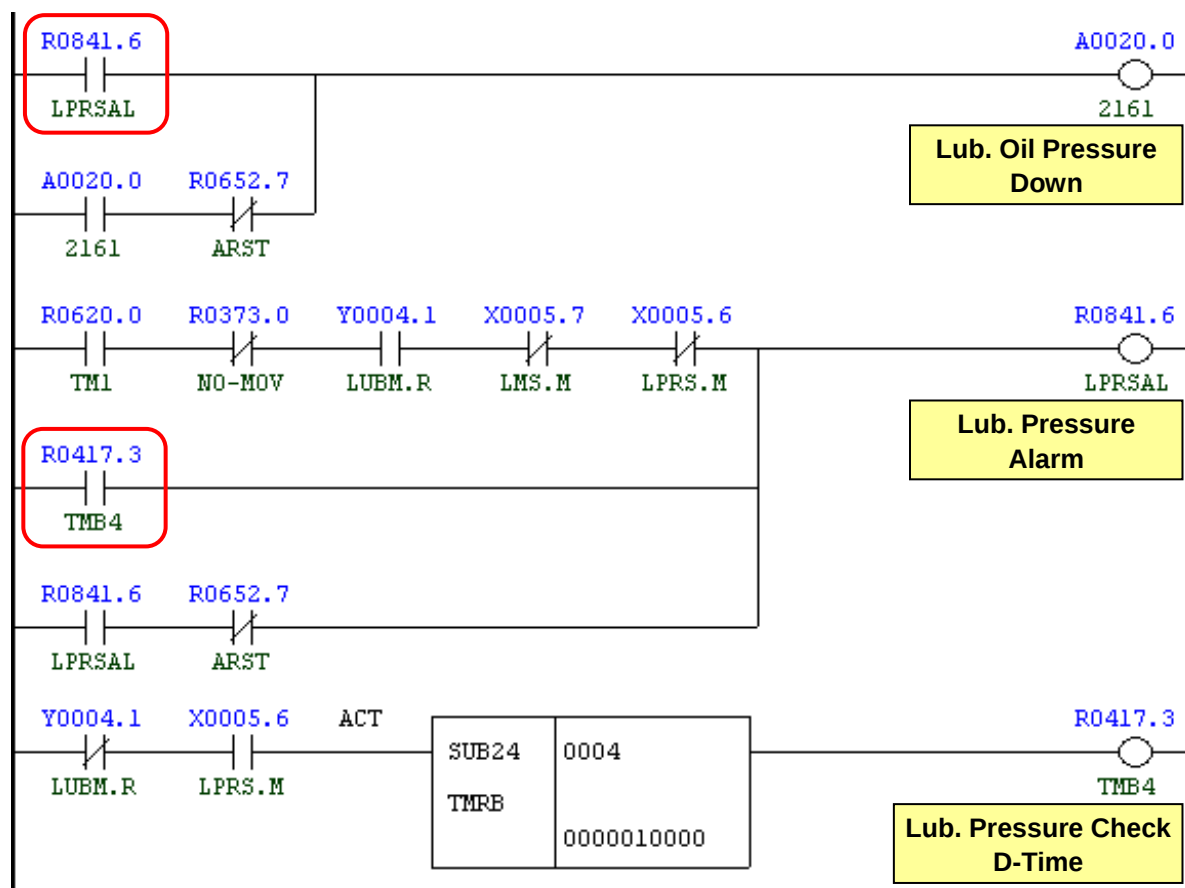
- ① The lubricant supply line (Lub. Hose, Lub. Pipe, Lub. Tube) is loose or has a leak.
- ② Error in the distributor value
- ③ Error in the lubricant tank or related parts, or problem with the wiring cables

3) Action

- ① Check the lubricant supply line (Lub. Hose, Lub. Pipe, Lub. Tube) and make repair or replacement if necessary.
- ② If there is no particular problem with the lubricant supply line but the lubricant is supplied intensively to a specific component, this is thought to be caused by a defective distributor valve. If this is the case, replace it with a new one.
- ③ Check the lubricant tank, connection line between tank and terminal block of the electric cabinet, and control I/O board, and make repair or replacement if you encounter a problem.

Signal	Address	Device Symbol	I/O	Connector (Pin)	Numbering Tube
Lub. Pressure Down	X5.6 (LPRS.M)	-SP51	Control I/O Board	XCB106 (A09)	9
Lub. Manual Start	X5.7 (LMS.M)	-SB51	Control I/O Board	XCB106 (A01)	4





Address	Symbol	Coil Comment
R841.6	LPRSAL	Lub. Pressure Alarm
A20.0	2161	Lubrication Oil Pressure Down
R652.7	ARST	Alarm Reset
R620.0	TM1	Guide Way Lub. Motor On Time
R373.0	NO-MOV	No Movement Each Axis
Y4.1	LUBM.R	Lubrication Pump Motor Run
X5.7	LMS.M	Lubrication Manual Start
X5.6	LPRS.M	Lubrication Pressure Down
R417.3	TMB4	Lub. Pressure Check D-Time

3.3 2162 Parts Count End Alarm

1) Description

The parts count reaches the limit.

2) Cause of problem

The count of the machined parts reaches the maximum value.

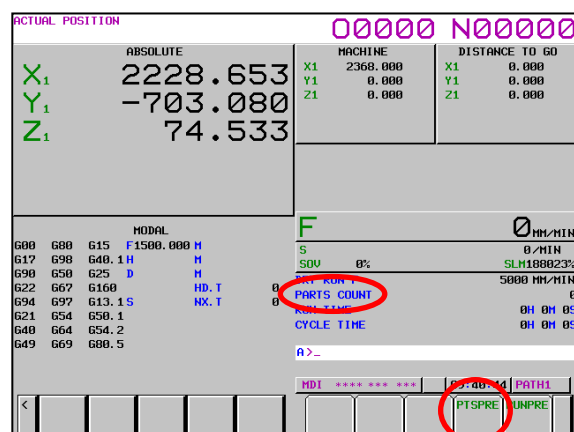
3) Action

Change the parts count setting, or reset it.

※ How to reset the parts count setting

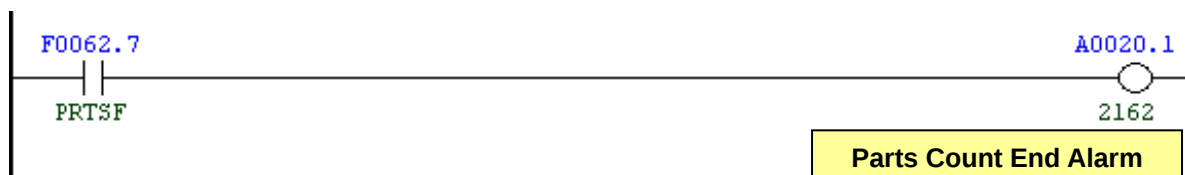
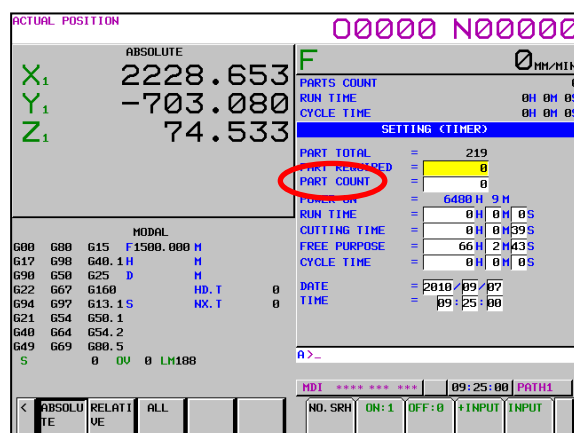
① Position screen

Press [POS] → [(OPRT)] to display the screen containing “Parts Count” in the bottom right corner. Press [PISPRE] “0” → [INPUT] → [EXCE] in sequence to reset the parts count.



② Setting screen

Press [SET/OFS] → “0” → [NO. SRH] → [PAGE↑] → [PAGE↑] in sequence to display the screen containing “Parts Count”. Move down to the “Parts Count” input box and press “0” → [INPUT] → [EXCE] in sequence to reset the parts count.



Address	Symbol	Coil Comment
F62.7	PRTSF	Parts Count(NC) Max
A20.1	2162	Parts Count End Alarm

3.4 2164 Oil Cooling Unit Alarm

1) Description

An error occurred in the oil cooling unit that cools down the main spindle.

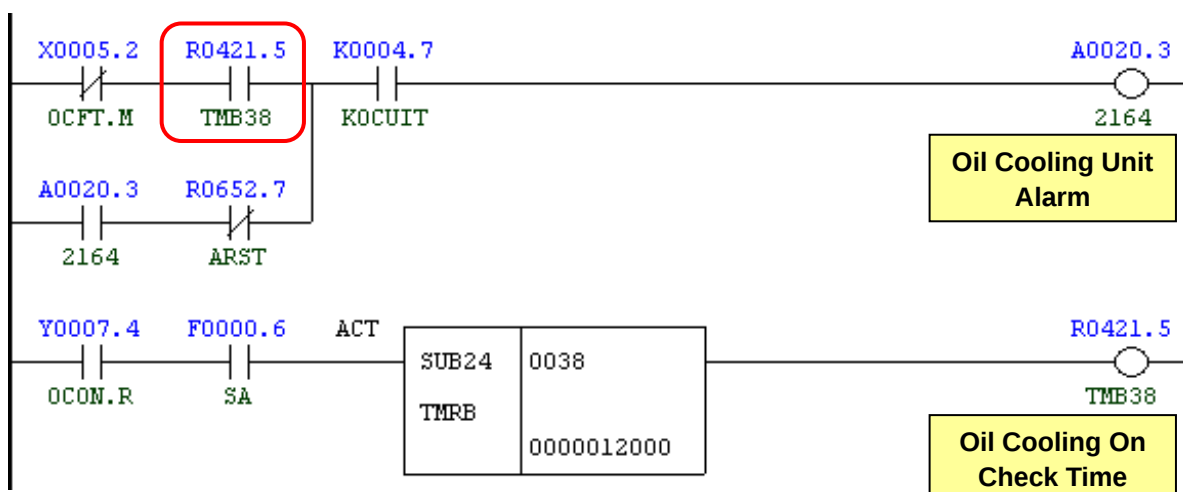
2) Cause of problem

An error in the oil cooling unit

3) Action

Refer to the oil cooling unit's manual, and check the alarm description and take a necessary action.

Signal	Address	Device Symbol	I/O	Connector (Pin)	Numbering Tube
Oil Cooling Unit Fault	X5.2 (OCFT.M)	-	Control I/O Board	XCB106 (A07)	M226



Address	Symbol	Coil Comment
X5.2	OCFT.M	Oil Cooling Unit Fault
R421.5	TMB38	Oil Cooling On Check Time
A20.3	2164	Oil Cooling Unit Alarm
R652.7	ARST	Alarm Reset
K4.7	KOCUIT	Oil Cooling Unit Used

 Troubleshooting for oil cooler alarms

RUN	No.	Cause	Action
•	AL 1	Overload of the oil motor pump	Refer to the user manual of the pump and check the oil circuit.
•	AL21	The circuit protector “F2” or “S40” is tripped.	Refer to the user manual and clean the air filter
•	AL 4	The temperature switch for protecting the heater is tripped. (only applied to the heater-equipped models)	
•	AL 61	Short-circuit of the master temperature sensor	▪ Check the sensor if short-circuited ▪ Check the connector if contacted loose ▪ Replace with a new sensor
	AL 62	Short-circuit of the slave temperature sensor	
	AL 63	Short-circuit of the reference temperature sensor	
•	AL 71	Error in the CPU of the control board	Replace the control board
	AL 73	Communication error of the control board	Refer to the user manual and check DIP switch #1
The “H” and current temperature indicators blink		▪ The controlled temperature exceeds the specified upper limit. ▪ It exceeds the alarm limit.	
The “45” indicator blinks.		The controlled temperature exceeds 45°C.	
The “L” and current temperature indicators blink		▪ The controlled temperature exceeds the specified lower limit. ▪ It goes below the alarm limit.	
The “5” indicator blinks.		The controlled temperature goes below 5°C.	
The “FIL” indicator blinks		It's time to clean the filter.	Clean the filter and reset the machine

The “•” symbol above indicates that the indicator is turned off.

 Troubleshooting for Kaukan Oil Cooler alarms

Item	No.	Cause	Action
1	The machine turns on but no response is made.	1) The PCB is defective.	Replace the PCB
		2) Fuse A1 for power supply (SMCC-233) is defective.	Replace the fuse.
		3) The power supply module SMCC-233 is defective.	Replace SMCC-233
		4) The transformer is defective.	Replace the transformer
2	E01	1) Negative sequence wiring of the power supply unit	Reconnect any two phases of 3 power phases (see Ch4-4)
		2) Reconnect only two power phases of 3 phases	Check if three power phases are correctly wired.
		3) Out of AC220±15%	Check the AC power source.
3	E02	2) The pump motor overload breaker has triggered.	Reset the QFP switch to release the breaker. (Push button)
		2) Resetting the QFP switch does not work (push button not released)	This is because the overload breaker is damaged. Replace QFP.
		3) The pump motor is defective.	Replace the motor.
4	E03	1) The compressor motor overload breaker has triggered.	Reset the QFP switch to release the breaker. (Push button)
		2) Resetting the QFP switch does not work (push button not released)	This is because the overload breaker is defective. Replace QFP.
		3) The compressor motor is defective.	Replace the motor.
5	E04	1) The pressure switch of the refrigerant is defective.	Replace the switch.
		2) Out of effective range (-10℃~45℃)	Wait until the temperature falls in the effective range.
		3) The air filter is clogged.	Clean the air filter.
		4) The condenser is clogged.	Clean the condenser.
6	E05	1) The input pipe is not connected properly.	Tighten up the pipe.
		2) The input/output pipes are switched with each other.	Reconnect and tighten up the pipe.
		3) The oil/water quantity is too low.	Find out the cause and make a refill.
		4) The woodruff key of the pump or the rotor shaft of motor is worn out.	Replace the pump or motor.
		5) Unable to adjust the pump	Replace the pump.

Item	No.	Cause	Action
		pressure	
		6) Defective oil/water pressure switch	Replace the switch.
		7) Hose, oil/water filter is clogged.	Clean the hose, replace the oil/water filter (optional).
		8) Excessive pump pressure	Adjust the pump pressure properly, or check and clean the oil/water filter if necessary.
7	E06	1) The oil/water is insufficient.	Refill the tank with the oil/water.
8	E07	1) The water in the pipe is not circulating.	The input/output pipe is clogged. Cleaning
		2) The float switch is burnt out.	Replace the switch.
9	E08	1) The oil/water temperature is below zero(0℃).	Turn off the power and wait until the temperature increases.
		2) The refrigerant switch is defective.	Replace the switch.
10	E09	The oil/water sensor is defective.	Replace the sensor.
11	E10	The room temperature sensor is defective.	Replace the sensor.
12	E11	Excessive oil/water temperature (adjust the effective range of STC45℃ by a technician)	Contact a technician to adjust the temperature range or improve the cooling capacity.
13	E12	1) Insufficient refrigerant	Refill the refrigerant.
		2) The current cooler has comparably insufficient cooling capacity.	Replace it with a larger-capacity cooler.

☞ If you encounter that the oil/water cooler is overheated during its operation, refill the refrigerant regularly.

☞ Use only the refrigerant that is specified in the nameplate, or consult with a professional.

Troubleshooting for Daikin oil cooler alarms

1) If no alarm occurs but the cooler works abnormally

Item	No.	Cause	Action
1	Does not work at all (The power indicator of the control panel does not turn on)	① The main power is not supplied, or the power line (L1, L2) is improperly connected.	Check the power supply line if it is connected properly.
2	The pump does not operate at all.	① The remote control items [10] and [11] are deactivated.	Check if the remote control items are active.
		② The pump is locked on operation. (The pump is locked on operation by factory default)	Release the lock at the control panel.
3	The pump operates but no oil flows. Oil circulation is insufficient with a lot of noise.	① The intake pipe of the pump is loose.	Tighten the packing of the piping.
		② The intake strainer is clogged.	Unclog the intake strainer. If the oil in the oil tank is contaminated, replace with new oil.
		③ The oil quantity level in the oil tank has lowered.	Refill the tank with the oil
		④ The pressure loss of the oil discharge pipe is great, and the pump relief valve is activated.	Replace the oil pipe with a larger-diameter one, and make the length of the pipe shorter.
		⑤ The pressure loss of the oil intake pipe is great, and the pump is cavitating.	---
4	The pump is working but the compressor is not operating.	① The compressor is stopped under the temperature control.	Check if it resumes working properly after the timer setting time.
		② The anti-restart timer for the compressor is ticking.	Check if it works properly when the oil temperature on the mouth is 5℃ or higher.
		③ The low oil temperature protection system (below 2℃ on the mouth) is active.	Check if it works properly when the oil temperature on the mouth is 5℃ 이상에서 or higher.
		④ The low ambient temperature blocking system (below -2℃ in room temperature) is active.	Check if it works properly when the room temperature is 0℃ or higher.
		⑤ The capacity is set to 10% in	Switch to a proper operation

Item	No.	Cause	Action
		mode 9.	mode.
5	Both pump and compressor are operating but no oil is cooling.	① There is an obstacle near the air intake/exhaust port.	Remove the obstacle.
		② The air filter is clogged.	Clean the air filter,
		③ The room temperature is high and the pump/compressor is load performing.	Check the catalog for the temperature range available for each model. Select an appropriate model to what you need to use.
		④ The heat load is great.	
		⑤ The temperature is set high.	Set the temperature to a proper degree.
		⑥ If the temperature of the exhaust air is almost equal to the room temperature while the compressor is operating, this is because the refrigerant is insufficient.	Turn off the fail-safe switch (SW1) on the control board.
6	Operational settings are not allowed.	① If "---" is displayed on the data screen, the sensor used in the applicable operation mode is not properly connected.	Connect the temperature sensor properly.
		② If "---" is displayed temporarily when you press the ENT button (right utmost), this is because the fail-safe switch is turned on.	Turn off the fail-safe switch (SW1) on the control panel.
7	The alarm [64] and [65] are displayed and performed differently from the previous models.	① The signal connection of the alarm output is changed partially.	The alarms [60] and [63] are compatible with the previous models (AKS5 and AKZ6 series). However, [64] and [65] are changed in the message and connection method differently from the 7 series. For more details, refer to the "How to use old models" section at the end of each instruction manual.

2) If an alarm occurs, (turn off the machine and restart it if you want to set off the alarm)

Alarm Code	Alarm Level	Description	Cause	Action
AA	2	Heater overloaded (S4B1:CN4) (applicable to heater-installed models only)	① For AKZ type, no oil is running.	Check if the hydraulic circuit is connected properly, and the pump is operating normally.
			① For AKZJ type, the tank has insufficient oil quantity.	Refill the oil.
A6	2	DC motor is not locked	① DC fan motor is defective.	Replace the DC fan motor.
			① There is a problem in communications between fan motor and control device.	Check the connector, check for any short circuit, and replace the control device.
E1	1	System error	① The internal parameter settings are invalid.	Replace the control board.
E3	2	High pressure (high-pressure switch (S3PH:CN6) is tripped)	① The oil or room temperature is beyond the working range.	Use the machine within the working temperature range.
			② There is an obstacle near the intake/exhaust opening.	Do not place any object within 500mm near the intake/exhaust port.
			③ The filter is clogged or the condenser is contaminated.	Refer to Item 8 above, and clean the air filter.
			④ Others	Contact us (Daikin) at the customer service team.
E5	2	The compressor is overheated. (Thermo TH6 on the emission pipe is tripped) (Compressor head thermo (S2B:CN) is tripped)	① The oil or room temperature is beyond the working range.	Use the machine within the working temperature range.
			② There is an obstacle near the intake/exhaust opening.	Do not place any object within 500mm near the intake/exhaust port.
			③ The filter is clogged or the condenser is contaminated.	Refer to Item 8 above, and clean up the air filter.
E6	2	The compressor (M2C) is locked.	① The compressor is defective (needs to be replaced).	Replace the compressor.

Alarm Code	Alarm Level	Description	Cause	Action
EH	1	Pump high-currented Circuit Breaker (S1B:CN3) is tripped.	① The pump is overloaded due to use of the high-viscosity oil.	Use only the operating fluid that has the viscosity range of 4 ~ 200 mm ² /s within the working temperature range.
			② The pump motor is over-currented because the power voltage is lower than the effective range.	Check if the power voltage is lower than the effective range, or check if there occurs a sudden voltage drop for few seconds at the startup of peripheral equipment.
			③ Disconnected wiring of the pump motor	Replace the pump motor.
			④ The pump is clogged with debris or the motor is defective.	Replace the pump motor.
EJ	1/2	Optional protective device is activated (OP).	① Any optional protection device is activated. (For the unit, there are some devices connected by factory default)	Check the result of detection that is performed by the protective device.
H1	2	Error in the air temperature sensor (TH5: Gas Sync Sensor) (TH3: Ambient Temp Sensor)	① The air sensors used in the control system is short-circuited.	Check if there is any defective sensor on the monitor of the operation panel ("99.9" will be displayed for a defective sensor), and check also if the sensors are connected correctly.
FH	2	The temperature on the intake opening exceeds 60°C.	① The heat of the main body exceeds the cooling capacity of the oil corn. (choice of an inappropriate model)	If the compressor is operating at 100% of its capacity in normal conditions (check this on the monitor), select a model one size bigger.
			② There is an obstacle near the inlet/outlet opening, which causes deteriorating the	Do not place any object within 500mm near the intake/exhaust port.

Alarm Code	Alarm Level	Description	Cause	Action
			cooling capacity.	
			③ The unit is running under capacity suppressing control because it has exceeded the standard temperature (room temp: 35℃, oil temp: 35℃), causing deteriorated cooling capacity.	If beyond the standard temperature, the cooling capacity is lowered than the nominal capacity by the load control system. Make sure that the capacity of the oil cooling unit exceeds the heat generation of the main unit in the entire operating temperature range.
			④ Temperature control is disabled as the machine is operating in mode 9 (capacity direct designation mode)	Switch to a proper operation mode. (In capacity direct designation mode, feedback control of temperature is not enabled.)
			⑤ The refrigerant gas is leaking.	If the temperature of the emission air is equal to the room temperature, there is a risk of leak of the refrigerant gas. If this is the case, contact us to the customer service team.
JH	2	Error in oil temp sensor (TH2: outlet oil temp sensor) (TH4: inlet oil temp sensor)	① Short circuit of the oil temp sensors used in the control system	Check if there is any defective sensor on the monitor of the operation panel ("99.9" will be displayed for a defective sensor), and check also if the sensors are connected correctly.
J3	2	Error in the temp thermistor on the emission pipe	① Short circuit or disconnection of the temperature thermistor of the condenser.	Check if the thermistor is connected correctly.
J5	2	Error in the EV valve outlet opening temp thermistor	① Short circuit or disconnection of the EV valve outlet opening temperature thermistor.	Check if the thermistor is connected correctly.

Alarm Code	Alarm Level	Description	Cause	Action
J6	2	Error in the temp thermistor of the condenser	① Short circuit or disconnection of the temperature thermistor of the condenser.	Check if the thermistor is connected correctly.
L0	2	Error in the compressor line of the inverter	① Defective compressor or inverter	Replace the control system or the compressor.
LC	2	Communication error between inverter and temp control CPU.	① There occurred a communication error between temperature control MICOM and inverter MICOM.	Replace the control system, or improve the power supply condition (such as noise reduction).
P3	2	Error in the temp thermistor on the cooling fin	① Short circuit or disconnection of the temperature thermistor of the control box.	Check if the thermistor is connected correctly.
P4	2	Error in the temp thermistor on the cooling fin	① Short circuit or disconnection of the temperature thermistor on the heat sink.	Check if the thermistor is connected correctly.
U0	2	Insufficient gas	① The refrigerant piping is damaged due to excessive vibration in its transportation, leading to a leak of the refrigerant gas.	Repair the damaged refrigerant piping, and refill the refrigerant gas.
U1	1	Power supply reverse-phase connection	① The power supply circuit is connected in reverse phase.	Switch the reverse phases with each other.
			② The L3 phase is open.	Make sure that the L3 phase is properly connected to the power supply terminal block.
U2	2	Sudden power failure • Insufficient power	① The power voltage is below about 70V.	Check if there occurs an instantaneous voltage drop at the startup of peripheral equipment.
U9	2	Communication error	① Communications error	Check if the

Alarm Code	Alarm Level	Description	Cause	Action
		ons error in other systems (communication error between slave and master)	with a slave device.	communication line is properly established with the slave device. (this error occurs only if the slave device does not make response in master-slave communication.)
UH	2	System line failure (EEPROM error)	① The parameter settings that are saved in the control board are invalid.	Replace the control board.
UJ	1/2	OP2 activated	① Any optional protection device is activated. (For the unit, there are some devices connected by factory default)	Check the result of detection that is performed by the protection device.
1E ~	-	Temperature range warning 1	① The temperature of the target to be monitored has exceeded the specified range. (not a fault of the oil cooling unit)	Check the warning message.
5E	-	Temperature range Warning 5		

3.5 **2166** Coolant Filter Change Alarm

1) Description

The filter of the high-pressure coolant unit (TSC) is clogged, which needs to be replaced.

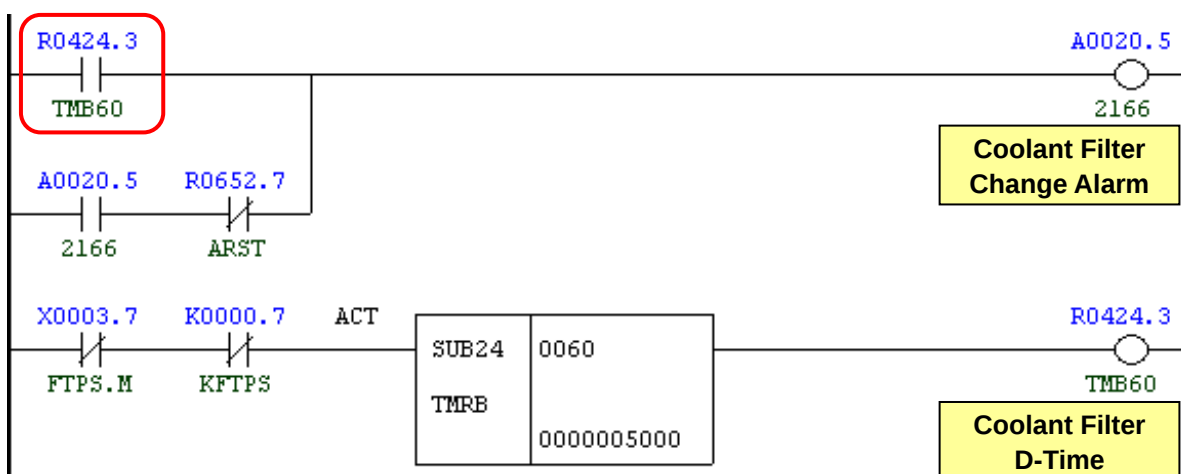
2) Cause of problem

- ① The filter of the high-pressure coolant unit (TSC) is clogged.
- ② Error in the filter sensor, possible disconnection of the wiring through to the terminal block of the electric cabinet, or defective component parts.

3) Action

- ① Replace the filter with a new one.
- ② Check the filter unit, and wiring between filter unit and terminal block of the electric cabinet as well as the control I/O board, and make repair or replacement if you encounter a problem.

Signal	Address	Device Symbol	I/O	Connector (Pin)	Numbering Tube
Coolant Filter Pressure Check	X3.7 (FTPS.M)	-SP09	Control I/O Board	XCB105 (B05)	SP09



Address	Symbol	Coil Comment
R424.3	TMB60	Coolant Filter D-Time
A20.5	2166	Coolant Filter Change Alarm
R652.7	ARST	Alarm Reset
X3.7	FTPS.M	Coolant Filter Pressure Check
K0.7	KFTPS	Ignore Filter Change Alarm

3.6 2167 Flow Indicator Abnormal Alarm

1) Description

The high-pressure coolant unit (TSC) has insufficient coolant.

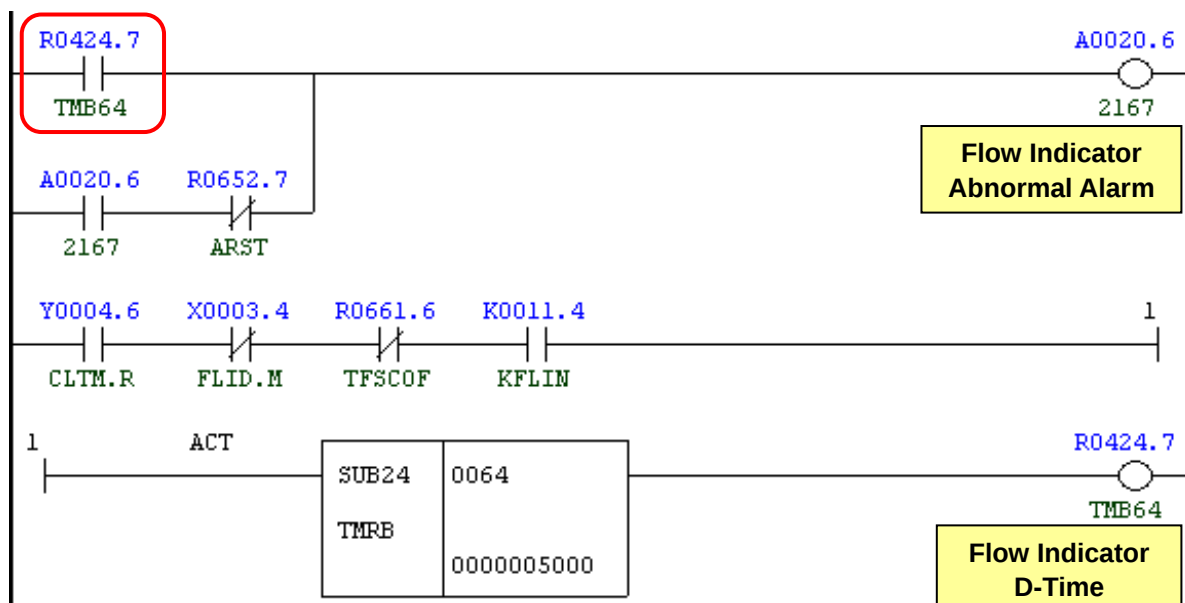
2) Cause of problem

- ① The filter or pump of the high-pressure coolant unit (TSC) is defective
- ② Error in the coolant flow sensor, possible disconnection of the wiring through to the terminal block of the electric cabinet, or defective component parts.

3) Action

- ① Check TSC pump & motor, filter and wiring cables, and make repair or replacement if necessary.
- ② Check the connection line between flow switch and terminal block of the electric cabinet, and the control I/O board. Make repair or replacement if you encounter a problem.

Signal	Address	Device Symbol	I/O	Connector (Pin)	Numbering Tube
Abnormal Flow Indicator Check	X3.7 (FLID.M)	-SF01	Control I/O Board	XCB105 (A04)	SF01



Address	Symbol	Coil Comment
R424.7	TMB64	Flow Indicator D-Time
A20.6	2167	Flow Indicator Abnormal Alarm
R652.7	ARST	Alarm Reset
Y4.6	CLTM.R	Through The Tool Coolant Motor
X3.4	FLID.M	Abnormal Flow Indicator Check
R661.6	TFSCOF	TSC Flow S/W Checking Off
K11.4	KFLIN	Flow Indicator Switch Used

3.7 2168 Coolant Pressure Down Alarm

1) Description

The coolant pressure alarm has occurred from the high-pressure TSC unit (with tank type or cool jet & dual, middle TSC).

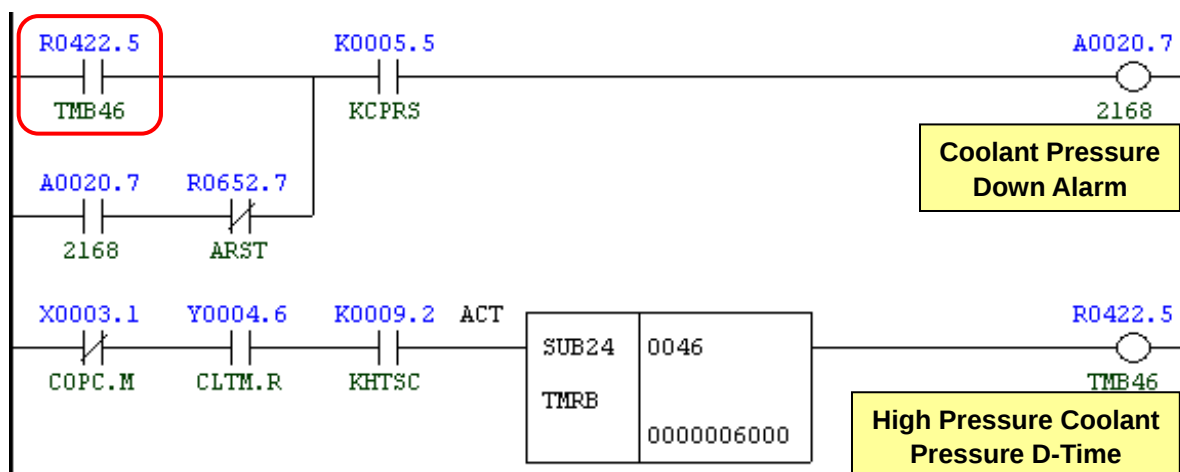
2) Cause of problem

- ① Insufficient coolant
- ② Check the recovery pump motor of the coolant tank, coolant pump & motor and pressure sensor if they work properly. Check the wiring through to the electric cabinet and make repair or replacement if necessary.

3) Action

- ① Refill the tank with the coolant.
- ② Check the pump motor, and wiring between pressure sensor of TSC unit and OP, and between OP and terminal block of the electric cabinet as well as the control I/O board. Make repair or replacement if you encounter a problem.

Signal	Address	Device Symbol	I/O	Connector (Pin)	Numbering Tube
Coolant Filter Pressure Check	X3.1 (FTPS.M)	-	Control I/O Board	XCB105 (B02)	M222



Address	Symbol	Coil Comment
R422.5	TMB46	High Press. Coolant D-Time
A20.7	2168	Coolant Pressure Down Alarm
R652.7	ARST	Alarm Reset
K5.5	KCPRS	Coolant Pressure SW Used
Y4.6	CLTM.R	Through The Tool Coolant Motor
X3.1	COPC.M	TSC P/S check & Pump Overload
K9.2	KHTSC	High T-S-C W/Tank Used

3.8 **2170** Tool Life Management End Alarm

1) Description

The tool change signal (of tool lifecycle management) is detected.

2) Cause of problem

The tool has reached its lifecycle specified in Tool Life Management, triggering the tool change request signal.

3) Action

Take an action according to the Tool Life Management instructions.



Address	Symbol	Coil Comment
F64.0	TLCH	Tool Change Request
A21.1	2170	Tool Life Management Alarm
R652.7	ARST	Alarm Reset
K4.3	KTLIFE	New Tool Change Alarm In T-Life Used

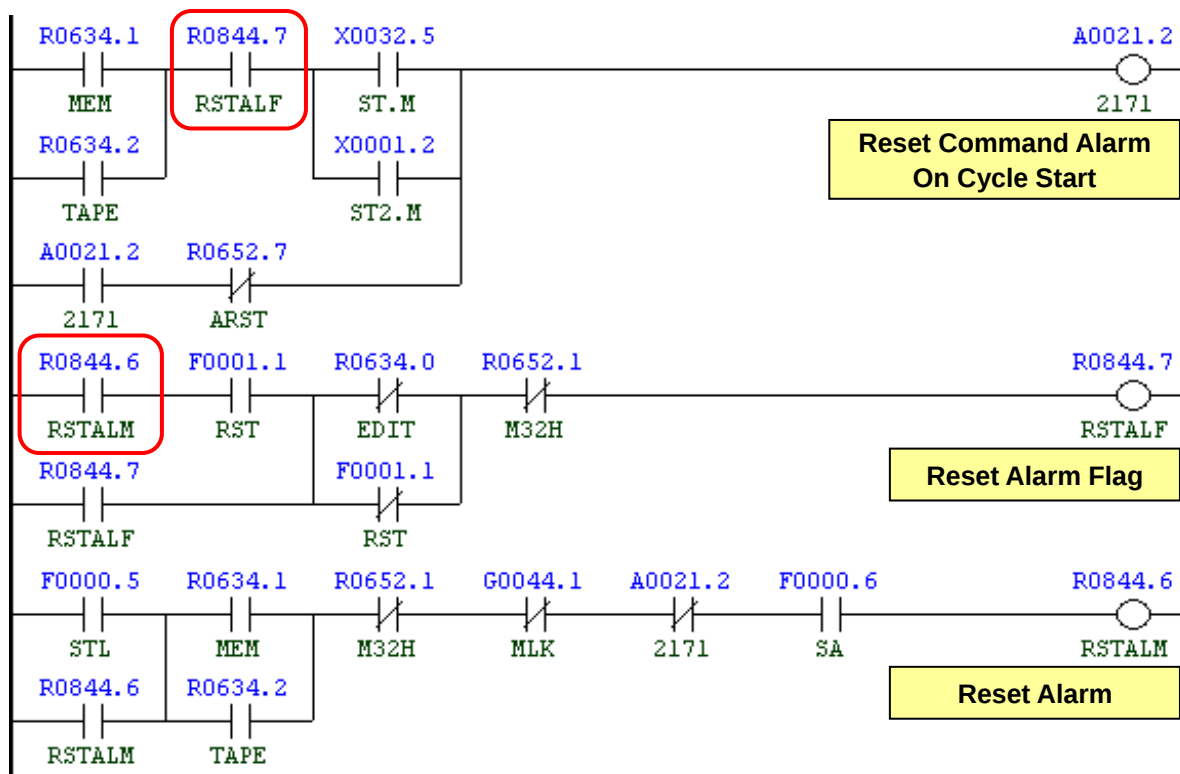
3.9 2171 RST Command Alarm On STL

1) Description

Immediately after NC Reset during the auto operation, the cycle start is performed in Auto mode.

2) Action

If NC reset is performed in auto operation, you must reset it again in Edit mode and then locate the program block before performing the cycle start in Auto mode.



Address	Symbol	Coil Comment
R634.1	MEM	Memory Mode
R634.2	TAPE	Tape Mode
R844.7	RSTALF	Reset Alarm Flag
X32.5	ST.M	Cycle Start
X1.2	ST2.M	Cycle Start 2
R652.1	M32H	M02/M30 Hold
A21.2	2171	Reset Command Alarm On Cycle Start
R652.7	ARST	Alarm Reset
R844.6	RSTALM	Reset Alarm
F1.1	RST	NC Reset

Address	Symbol	Coil Comment
R634.0	EDIT	Edit Mode
F0.5	STL	Cycle Start
G44.1	MLK	All Axis Machine Lock
F0.6	SA	Servo Ready

3.10 2182 Side Window Door Open

1) Description

Any one or both of the left/right maintenance side doors is or are open.

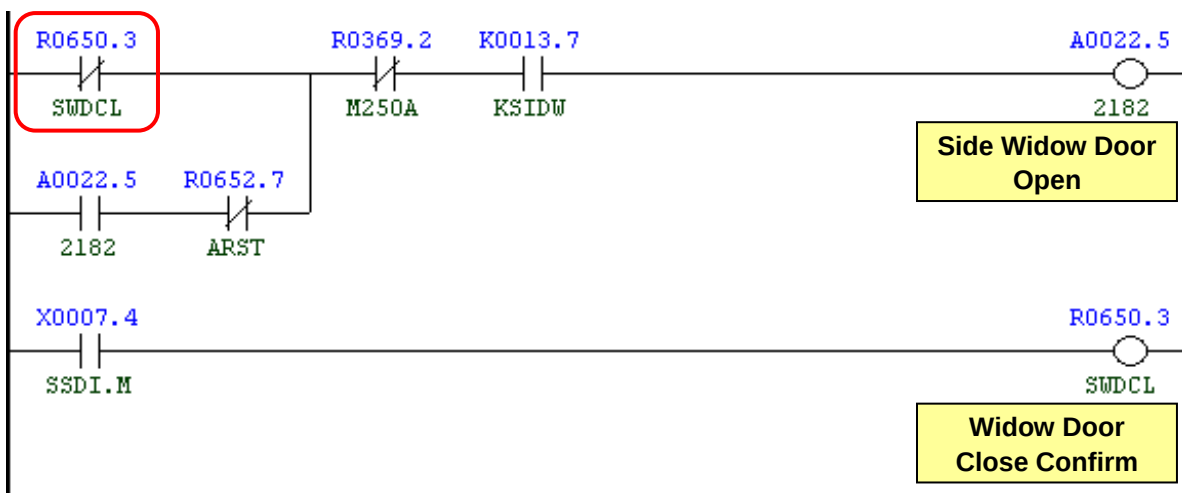
2) Cause of problem

- ① The side door is open.
- ② Error in the side door sensor, wiring between switch and electric cabinet, or any of its component parts

3) Action

- ① Close the opened side door.
- ② Check the side door sensor, and wiring between sensor switch and electric cabinet as well as the control I/O board. Make repair or replacement if you encounter a problem.

Signal	Address	Device Symbol	I/O	Connector (Pin)	Numbering Tube
Side Door Interlock	X7.4 (SSDI.M)	-S24, -S25	Control I/O Board	XCB107 (B02)	S24G S25G



Address	Symbol	Coil Comment
R650.3	SWDCL	Window Door Close Confirm
A22.5	2182	Side Window Door Open
R652.7	ARST	Alarm Reset
R369.2	M250A	Door Interlock Bypass On Aux
K13.7	KSIDW	Use Side Maintenance Door Interlock
X7.4	SSDI.M	Side Door Interlock

4. Massage Alarm

4.1 **2190** Drum Filter Chip Coolant Low Level

1) Description

Insufficient coolant signal from the drum filter chip conveyor

2) Cause of problem

- ① The coolant is insufficient.
- ② Error in the coolant level switch of the drum filter chip conveyor or its terminal box; error in wiring between terminal box and electric cabinet, or any of its component parts

3) Action

- ① Refill the tank with the coolant.
- ② Check the coolant level switch of the drum filter chip conveyor and its terminal box; wiring between terminal box and electric cabinet, and the control I/O board. Make repair or replacement if you encounter a problem.

Signal	Address	Device Symbol	I/O	Connector (Pin)	Numbering Tube
Drum Filter Chip Low Level	X3.3 (DCLW.M)	-	Control I/O Board	XCB105 (B03)	M250



Address	Symbol	Coil Comment
X3.3	DCLW.M	Drum Filter Chip Conveyor Low Level
K9.1	KCHIP	Chip Conveyor Used
A23.5	2190	Drum Filter Chip Conveyor Low Level

4.2 **2192** Tool Monitor Warning Alarm

1) Description

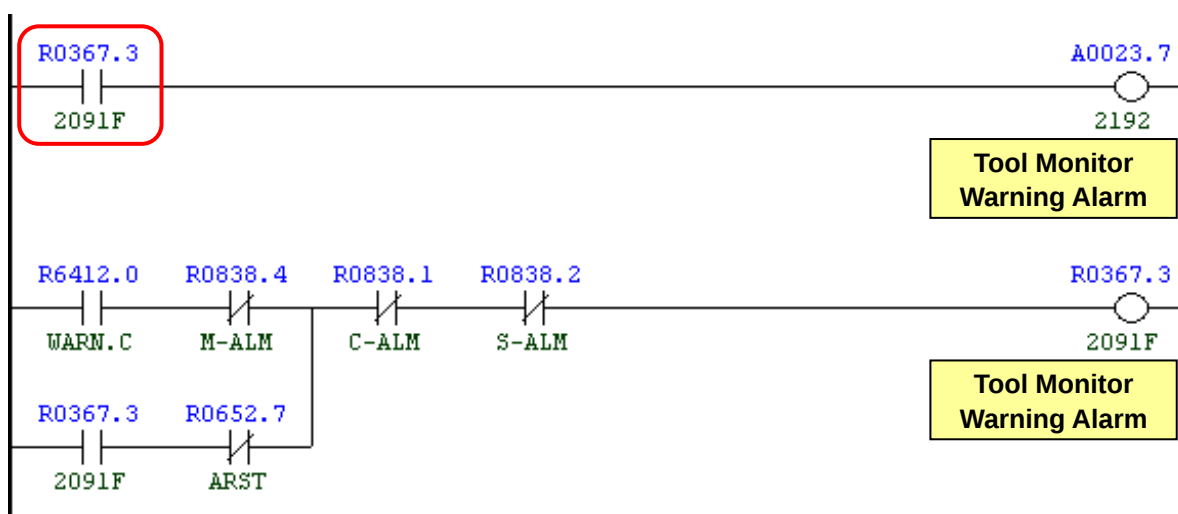
The warning alarm has occurred during tool monitoring.

2) Cause of problem

An error has occurred during the tool monitoring.

3) Action

Refer to the tool monitoring instructions and take a necessary measure.



Address	Symbol	Coil Comment
R367.3	2091F	Tool Monitor Warning Alarm
A23.7	2192	Tool Monitor Warning Alarm
R6412.0	WARN.C	TM Display Alarm Warning
R838.4	M-ALM	Message Alarm
R652.7	ARST	Alarm Reset
R838.1	C-Alarm	Cycle Stop Alarm
R838.2	S-Alarm	Single Alarm

4.3 2193 Safety Switch Locking Alarm

1) Description

The release key of the splash guard's door-close check safety switch is opened.

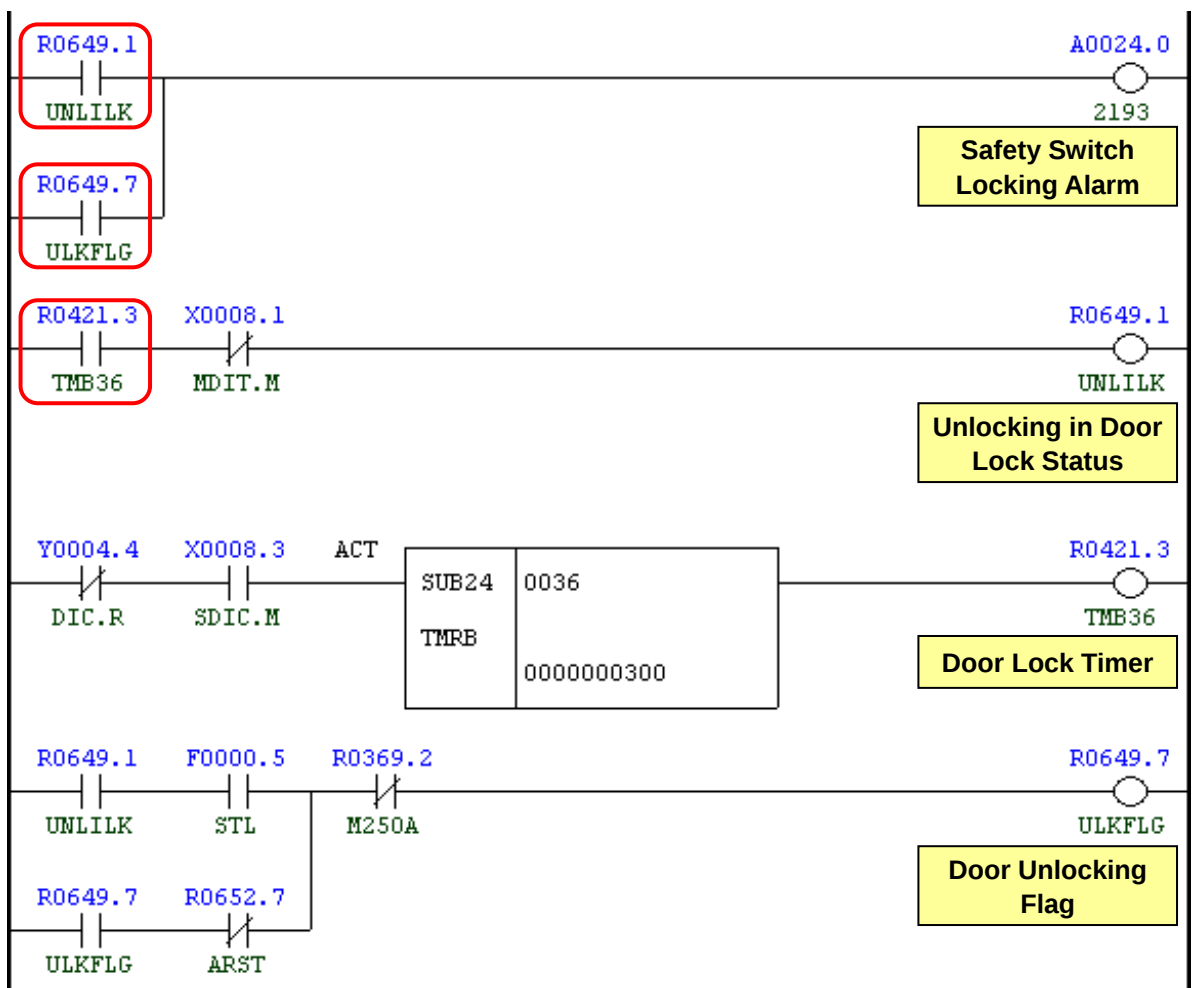
2) Cause of problem

- ① The release key of the safety switch is tripped.
- ② The safety switch has an error or the wiring has a problem.

3) Action

- ① Turn the release key of the safety switch to set it off.
- ② Check the operator's side safety switch as well as the wiring, and repair or replace a defective one if necessary.

Signal	Address	Device Symbol	I/O	Connector (Pin)	Numbering Tube
Unlock By Key Switch	X8.1 (MDIT.M)	-S23	Control I/O Board	XCB105 (B06)	22
S/G Door Interlock	X8.3 (SDIC.M)	-S23	Control I/O Board	XCB105 (B07)	S23A



4.4 2195 OP-Door Close, Must By D-Open**1) Description**

With the operator door closed, the Tool Unclamp push button is pressed.

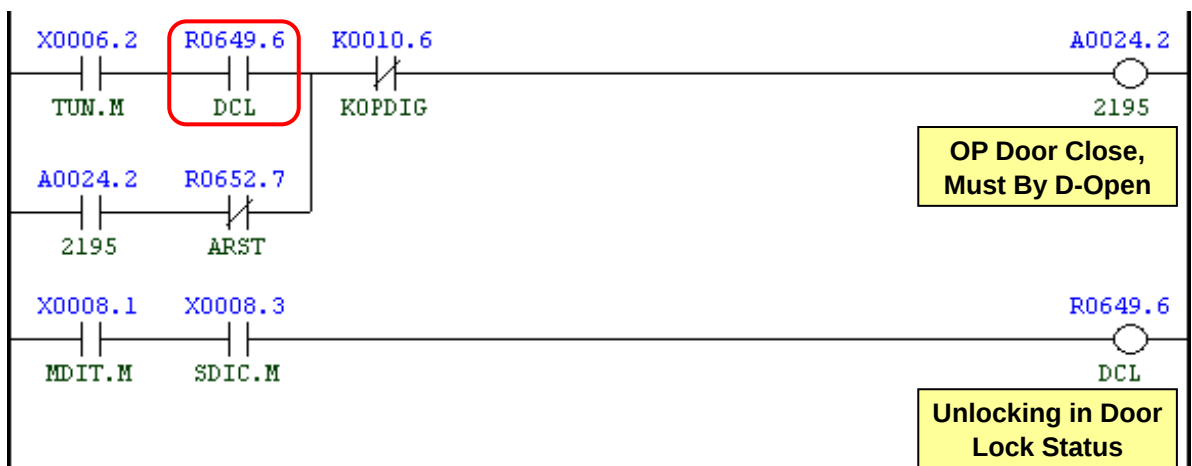
2) Cause of problem

With the operator door closed, the Tool Unclamp push button is pressed.

3) Action

- ① You must open the operator door closed before pressing the Tool Unclamp push button.
- ② If the problem persists even after you opened the door, check the door safety switch and repair or replace it if necessary.

Signal	Address	Device Symbol	I/O	Connector (Pin)	Numbering Tube
Spindle Tool Unclamp Push SW	X6.2 (TUN.M)	-SB70	Control I/O Board	XCB106 (A11)	SB70
Unlock By Key Switch	X8.1 (MDIT.M)	-S23	Control I/O Board	XCB105 (B06)	22
S/G Door Interlock	X8.3 (SDIC.M)	-S23	Control I/O Board	XCB105 (B07)	S23A



Address	Symbol	Coil Comment
X6.2	TUN.M	Spindle Tool Unclamp Push SW
R649.6	DCL	Operator Door Close Confirm
A24.2	2195	OP Door Close, Must By D-Open
R652.7	ARST	Alarm Reset
K10.6	KOPDIG	Operator's Door Interlock Ignore
X8.1	MDIT.M	Unlock By Key Switch
X8.3	SDIC.M	Splash Guard Door Interlock

4.5 **2196** Screw Conveyor / Oil Mist Overload

1) Description

The screw conveyor or oil mist pump motor is over-currented.

2) Cause of problem

- ① The screw conveyor, oil mist pump motor or power cable is defective.
- ② The circuit breaker that detects the excessive current is overloaded or defective itself.

3) Action

- ① Check the screw conveyor, oil mist pump motor or power cable and make repair or replacement if necessary.
- ② Check the circuit breaker for the load settings and make correction if necessary. If the circuit breaker itself has an error, replace it with a new one.

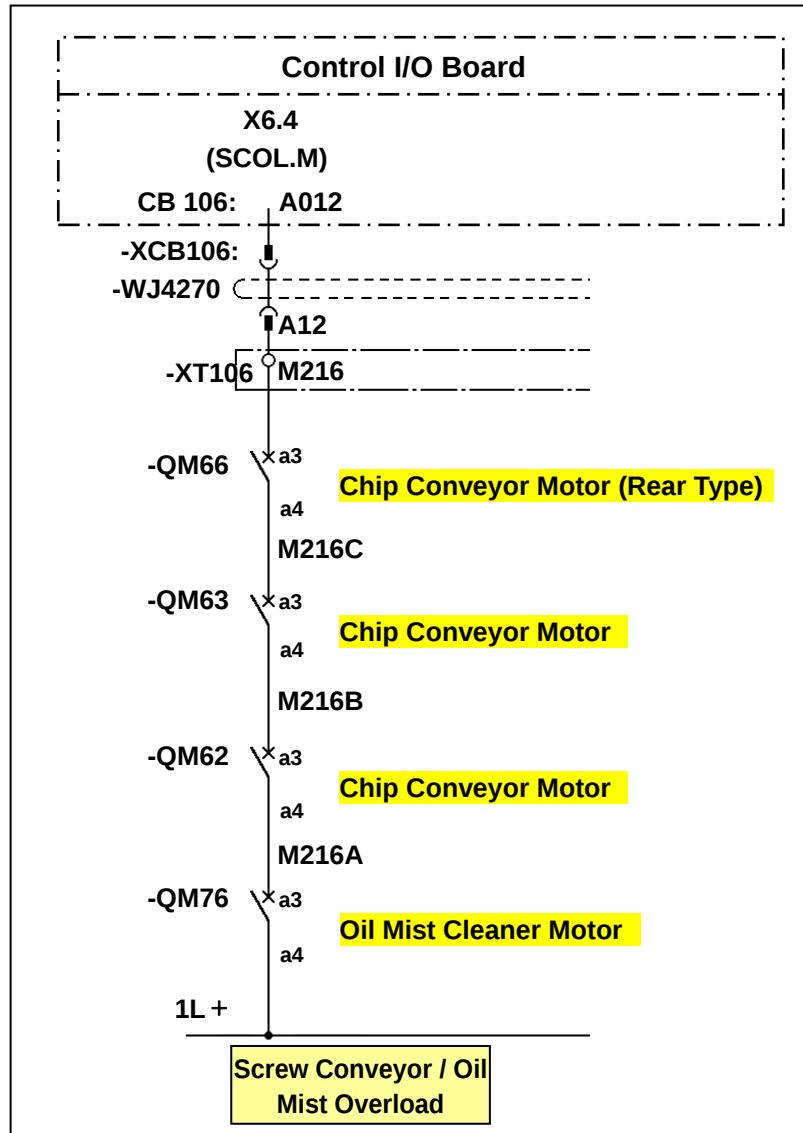
Breaker	Application	Load Specification
QM62	Screw Conveyor Motor	1.6A (0.2KW)
QM63	Screw Conveyor Motor	1.6A (0.2KW)
QM66	Screw Conveyor Motor (Rear Type)	1.6A (0.2KW)
QM76	Oil Mist Cleaner Motor	7.0A (1.5KW), 10A (2.2KW)

Part Name	Part No.	Symbol	Spec.
Breaker, Auxiliary	ENFBX0290R	QM62, 63, 66, 76	3RV1901-1F(2NO)
Breaker, Motor Circuit	ENFBX0255R	QM62, 63, 66	3RV1011-1AA10(1.1-1.6A)
Breaker, Motor Circuit	ENFBX0259R	QM67	3RV1011-1JA10 (7-10A)
Breaker, Motor Circuit	ENFBX0285R	QM67	3RV1011-1JA10 (9-12A)

Signal	Address	Device Symbol	I/O	Connector (Pin)	Numbering Tube
Screw Conveyor / Oil Mist Overload	X6.4 SCOL.M	-	Control I/O Board	XCB106 (A12)	M216



Address	Symbol	Coil Comment
X6.4	SCOL.M	Screw Conveyor/Oil Mist Overload
A24.3	2196	Screw Conveyor/Oil Mist Overload



4.6 **2197** Chip Conveyor Alarm

1) Description

An alarm signal is detected from the chip conveyor.

2) Cause of problem

Error in the chip conveyor

3) Action

See the user of the chip conveyor and take a necessary measure.

Signal	Address	Device Symbol	I/O	Connector (Pin)	Numbering Tube
Chip Conveyor Fault	X8.0 (CCFT.M)	-	Control I/O Board	XCB105 (A06)	M241



Address	Symbol	Coil Comment
X8.0	CCFT.M	Chip Conveyor Fault
A24.4	2197	Chip Conveyor Alarm

4.7 **2198** Auto Power Off Ready

1) Description

The toggle switch for Auto Power Off is turned on.

2) Cause of problem

The toggle switch for Auto Power Off in the main OP is turned on.

3) Action

To cancel the operation, turn back off the toggle switch.

☞ Auto Power Off turns NC off 2 seconds after the toggle switch is turned on. Then, the main NFB will be tripped according to the TM1 settings (max. 5 seconds).

Signal	Address	Device Symbol	I/O	Connector (Pin)	Numbering Tube
Auto Power Off Manual On	X34.7 (APOF.M)	-SA35	Distributed I/O Module(A)	XCE75A (B13)	SA35



Address	Symbol	Coil Comment
X34.7	APOF.M	Auto Power Off Manual On
A24.5	2198	Auto Power Off Ready



4.8 2200 The Warming Up is Not Complete

1) Description

The spindle has not been used for more than 9 hours.

2) Cause of problem

The spindle has not been used for more than 9 hours.

3) Action

In MDI mode, instruct **"M102;"** (start spindle warming-up) to start warming up the spindle.

※ Spindle Warming Up

1) Relevant M code

M102 : Start warming up

2) Steps of the spindle warming-up

- ① If the spindle has not been used for between more than 9 hours and less than 7 days:

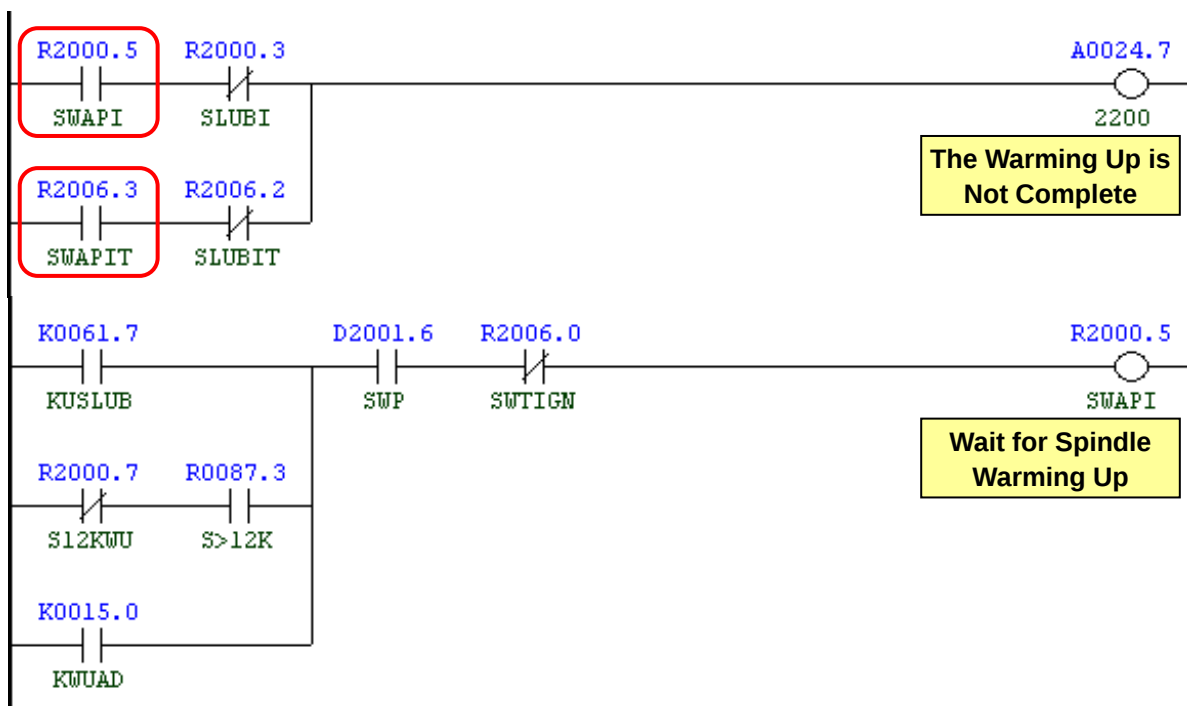
Spindle Motor Max. rpm : 10% (4 min) → 30% (3 min) → 50% (3 min)

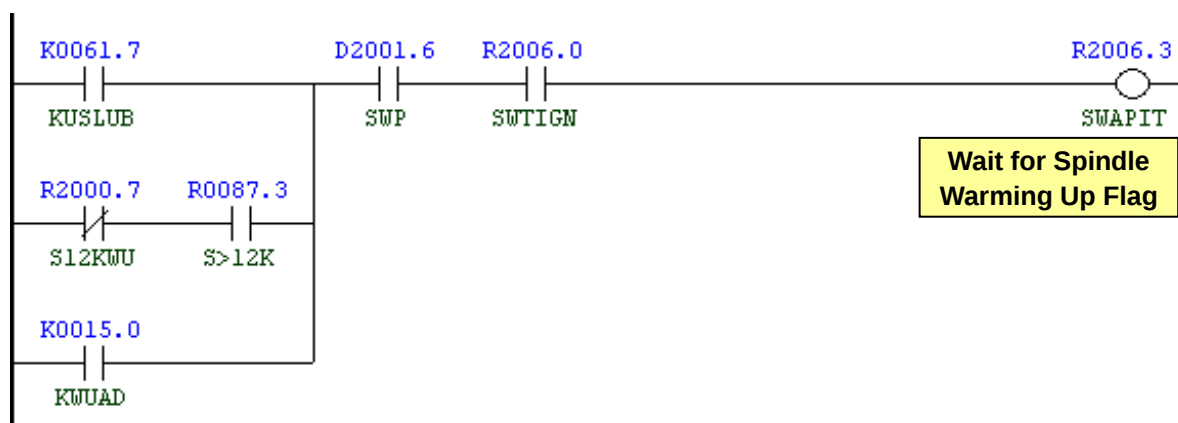
- ② If the spindle has not been used for more than 7 days:

Spindle Motor Max. rpm : 10% (10 min) → 30% (10 min) → 50% (10 min)

- The use of the spindle warming-up operation will be checked automatically, depending on the machine and spindle models.

(Regardless of the revolutions (rpm) of the machine, use of the warming-up unit will be determined according to the existence of the spindle of the oil-air lubrication unit.)





Address	Symbol	Coil Comment
R2000.5	SWAPI	Wait for Spindle Warm Up
R2000.3	SLUBI	Wait for Spindle Lubrication
R2006.3	SWAPIT	Wait for Spindle Warm Up Flag
R2006.2	SLUBIT	Wait for Spindle Lubrication Flag
A24.7	2200	The Warming Up is Not Complete
K61.7	KUSLUB	Keep Using Spindle Lub.
R2000.7	S12KWU	Only 12000 rpm Spindle Warm Up
R87.3	S>12K	Spindle rpm > 12000
K15.0	KWUAD	Keep Using Grease Warming-Up
D2001.6	SWP	Spindle Warm-Up
R2006.0	SWTIGN	Spindle Warm-Up Temporarily Ignore

4.9 **2201** Wait for Spindle Lubrication

1) Description

If you switch a machine that has been turned off for more than 72 hours to Machine Ready, the above alarm will be displayed and the pre-lubrication will be started automatically.

2) Cause of problem

The machine has been turned off or emergency stopped for more than 72 hours.

3) Action

The pre-lubrication will be performed automatically.

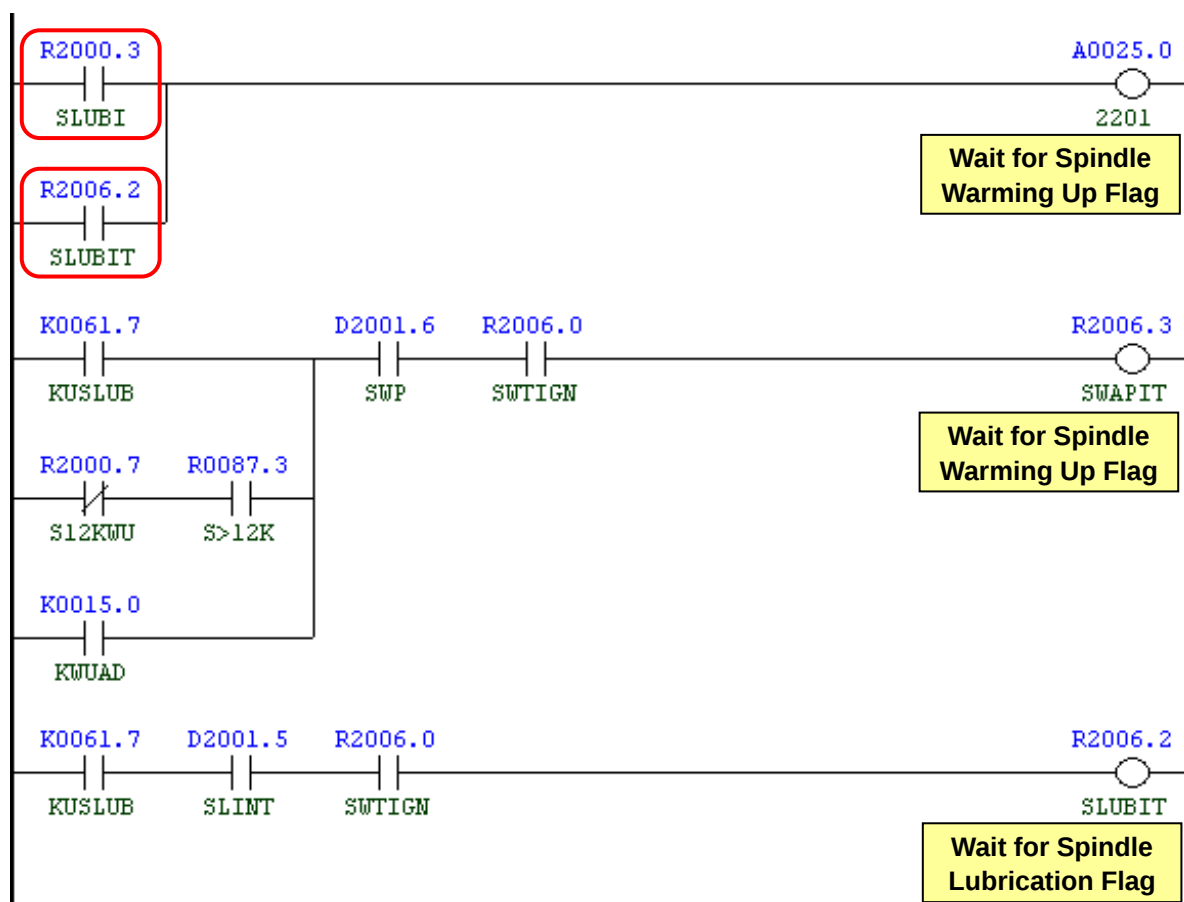
※ **Pre-Lubrication**

1) Spindle lubrication system (applied only to oil-air lubrication) : It operates for 10 minutes after the initial Machine ready.

2) If alarm 2201 occurs, the spindle will be deactivated.

- The use of the spindle warming-up operation will be checked automatically, depending on the machine and spindle models.

(Regardless of the revolutions (rpm) of the machine, use of the warming-up unit will be determined according to the existence of the spindle of the oil-air lubrication unit.)



Address	Symbol	Coil Comment
R2000.3	SLUBI	Wait for Spindle Lubrication
R2006.2	SLUBIT	Wait for Spindle Lubrication Flag
A25.0	2201	Wait for Spindle Lubrication
K61.7	KUSLUB	Keep Using Spindle Lub.
D2001.5	SLINT	Spindle Lub. Initial
R2006.0	SWTIGN	Spindle Warm-Up Temporarily Ignore

4.10 2202 Machine Lock on Status

1) Description

The Machine Lock Key switch on the main OP is turned on.

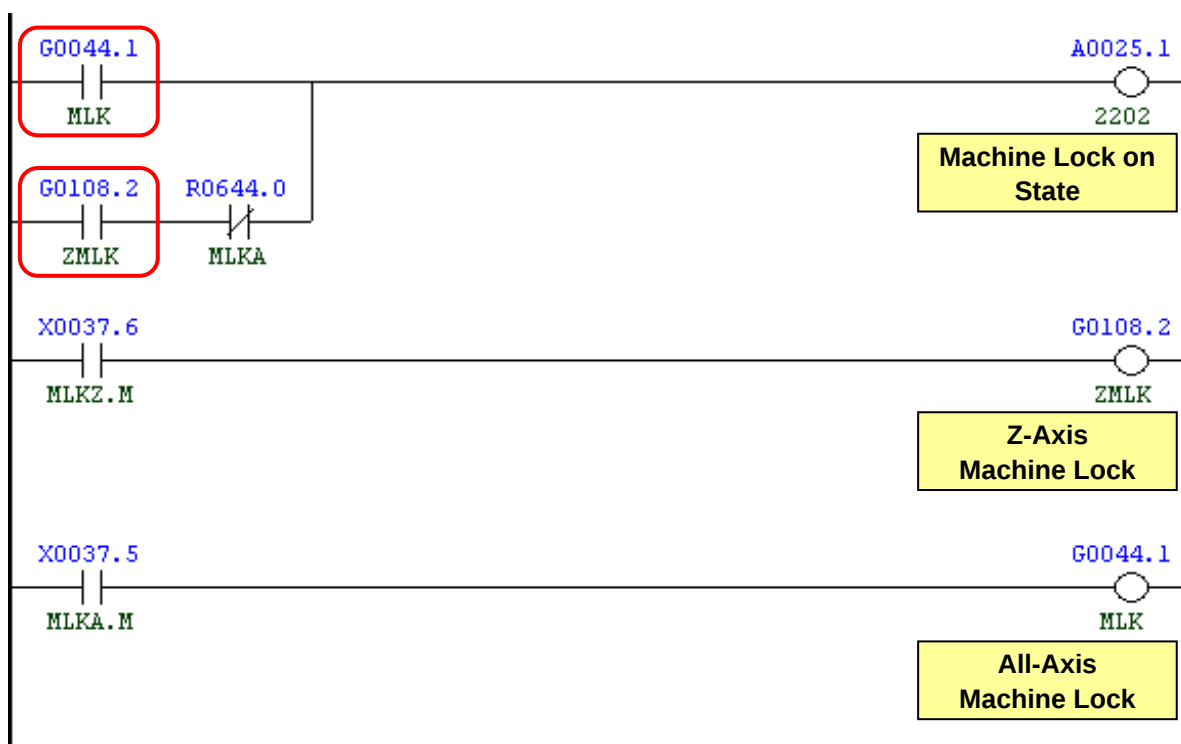
2) Cause of problem

- ① The Machine Lock Key switch on the main OP is set to All Axis or Z-Axis.
- ② Error in the Machine Lock Key switch, wiring cables or any of its component parts

3) Action

- ① Turn off the Machine Lock Key switch and manually restore the home position.
- ② Check the state of the followings: Machine Lock Key switch (-SK22), soldering inside the OP (-WJ4220), connector (-XCE57A), and pin fixation. And check also the wiring between OP and electric cabinet. Make repair or replacement if necessary.

Signal	Address	Device Symbol	I/O	Connector (Pin)	Numbering Tube
All Axis Machine Lock	X37.5 (MLKA.M)	-SK22	Distributed I/O Module(A)	XCE75A (B12)	SK22A
Z- Axis Machine Lock	X37.6 (MLKZ.M)	-SK22	Distributed I/O Module(A)	XCE75A (A13)	SK22B



Address	Symbol	Coil Comment
G44.1	MLK	All Axis Machine Lock
G108.2	ZMLK	Z- Axis Machine Lock
R644.0	MLKA	Machine Lock All Axis
X37.5	MLKA.M	All Axis Machine Lock
X37.6	MLKZ.M	Z- Axis Machine Lock



4.11 2204 Feedrate Override 0%

1) Description

The Feedrate Override switch on the main OP is set to 0%.

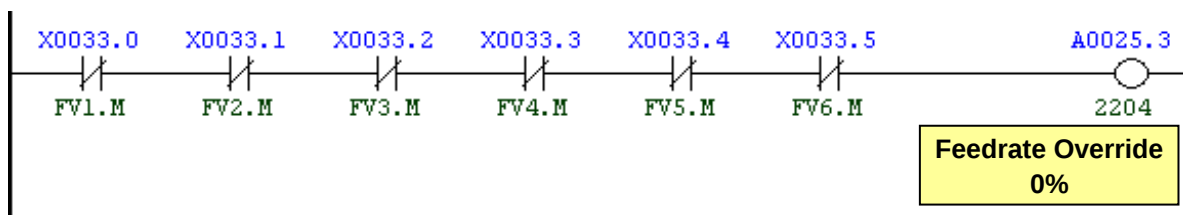
2) Cause of problem

- ① The Feedrate Override switch on the main OP is set to 0%.
- ② Error in the Feedrate Override switch on the main OP, wiring cables or any of its component parts

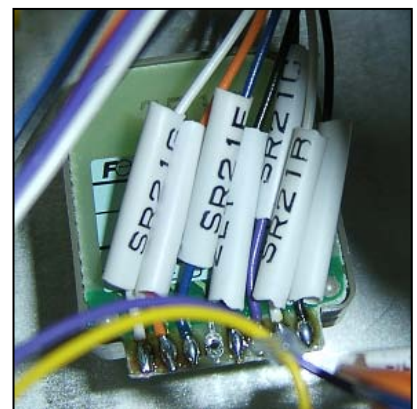
3) Action

- ① Change the Feedrate Override switch on the main OP to other than 0%.
- ② Check the state of the followings: Feedrate Override switch (-SR21), soldering inside the OP (-WJ4210) and connector (-XCE56A). And check also the wiring between OP and electric cabinet. Make repair or replacement if necessary.

Signal	Address	Device Symbol	I/O	Connector (Pin)	Numbering Tube
Feedrate Override 1	X33.0 (FV1.M)	-SR21	Distributed I/O Module(A)	XCE56A (A06)	SR21A
Feedrate Override 2	X33.1 (FV2.M)	-SR21	Distributed I/O Module(A)	XCE56A (B06)	SR21F
Feedrate Override 3	X33.2 (FV3.M)	-SR21	Distributed I/O Module(A)	XCE56A (A07)	SR21B
Feedrate Override 4	X33.3 (FV4.M)	-SR21	Distributed I/O Module(A)	XCE56A (B07)	SR21E
Feedrate Override 5	X33.4 (FV5.M)	-SR21	Distributed I/O Module(A)	XCE56A (A08)	SR21C
Feedrate Override 6	X33.5 (FV6.M)	-SR21	Distributed I/O Module(A)	XCE56A (B08)	SR21G



Address	Symbol	Coil Comment
X33.0	FV1.M	Feedrate Override 1
X33.1	FV2.M	Feedrate Override 2
X33.2	FV3.M	Feedrate Override 3
X33.3	FV4.M	Feedrate Override 4
X33.4	FV5.M	Feedrate Override 5
X33.5	FV6.M	Feedrate Override 6



4.12 2251 ATC Overtime

1) Description

The Feedrate Override switch on the main OP is set to 0%.

2) Cause of problem

- ① The tool magazine is still rotating after 45 seconds.
- ② The tool magazine is instructed to rotate but fails to perform the instruction actually.
- ③ The tool number is not counted properly.

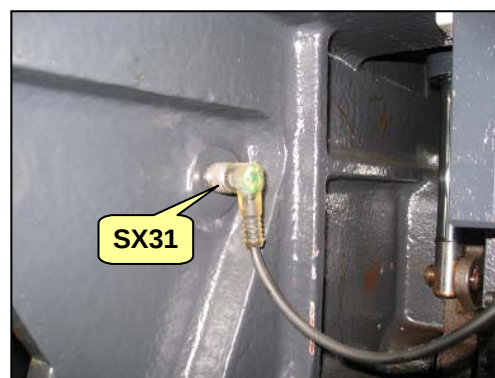
3) Action

- ① If the tool magazine is still rotating, check if the tool number is being counted properly.
- ② If the tool magazine fails to rotate, check if the magnet KM81F or KM81R used for rotating the tool magazine CW or CCW is operating properly. In particular, check if there is any disconnected wire due to loose contacts.
 - ☞ Check if the terminals of U81, V81 and W81 output AC 220V (alternating current), and if Y81 and Y81A output PC 90V (pulsating current) while the magnet is operating.
- ③ Check the tool pot counting switch or the first tool pot detection switch.

Signal	Address	Device Symbol	I/O	Connector (Pin)	Numbering Tube
Tool 1st Pot Detect	X2.0 (TPT1.M)	-SX31	Control I/O Board	XCB104 (A10)	SX31
Tool Pot Count	X2.1 (TPCD.M)	-SX32	Control I/O Board	XCB104 (B10)	SX32
Tool Pot Count 2	X2.7 (TPC1.M)	-SX32A	Control I/O Board	XCB104 (B13)	SX32A
Tool Magazine CW	Y1.0 (TMF.R)	-KM81F	Control I/O Board	XCB104 (A20)	KM81F
Tool Magazine CCW	Y1.1 (TMR.R)	-KM81R	Control I/O Board	XCB104 (B20)	KM81R

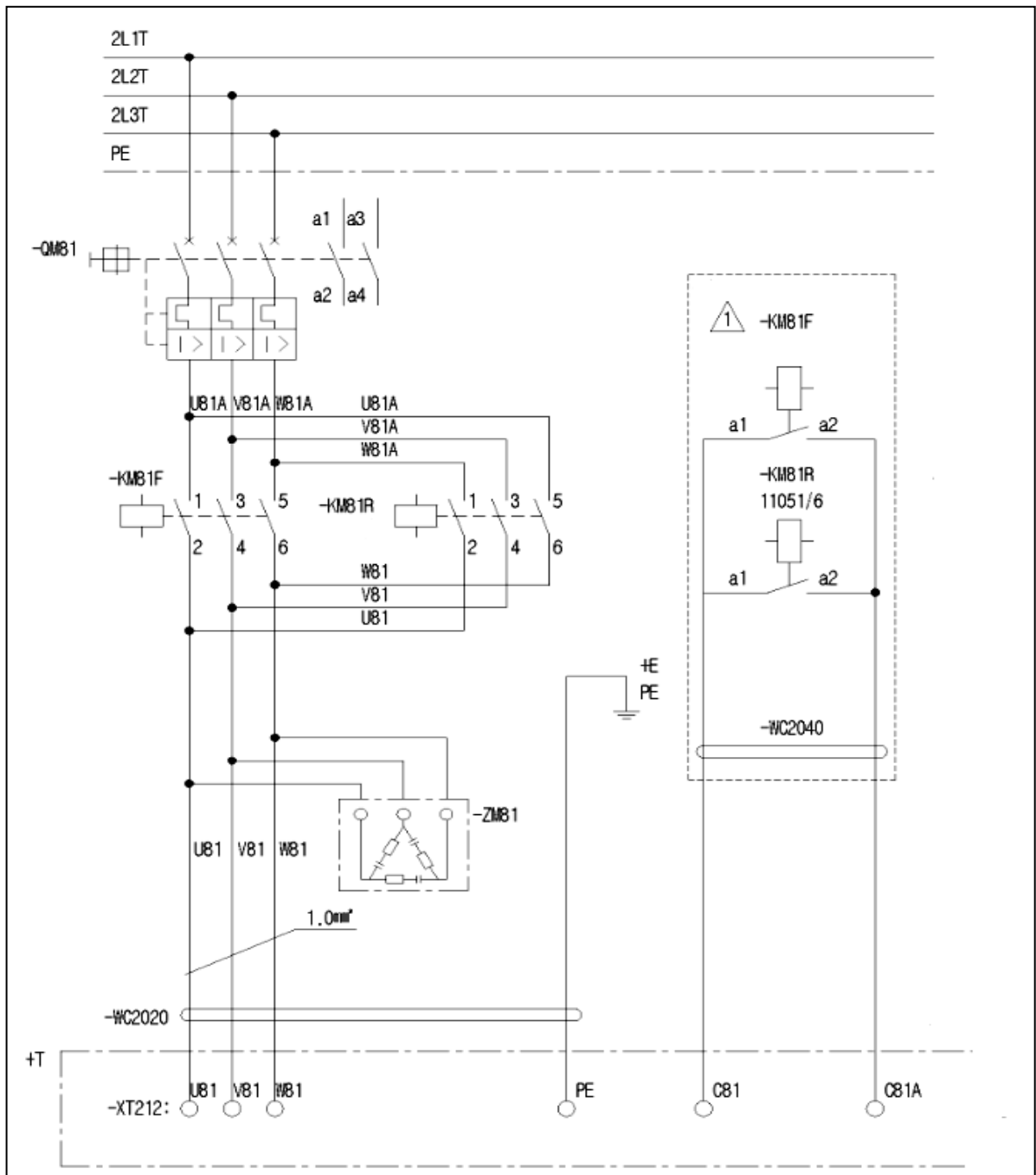
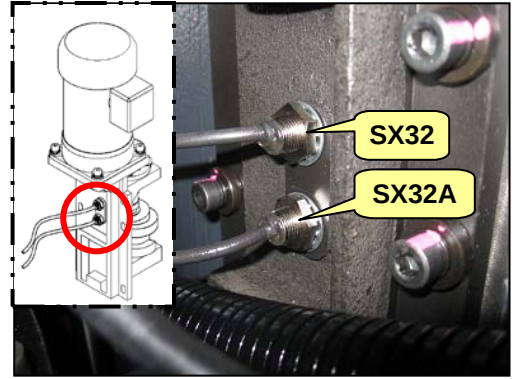
※ 1st Tool Pot Detection

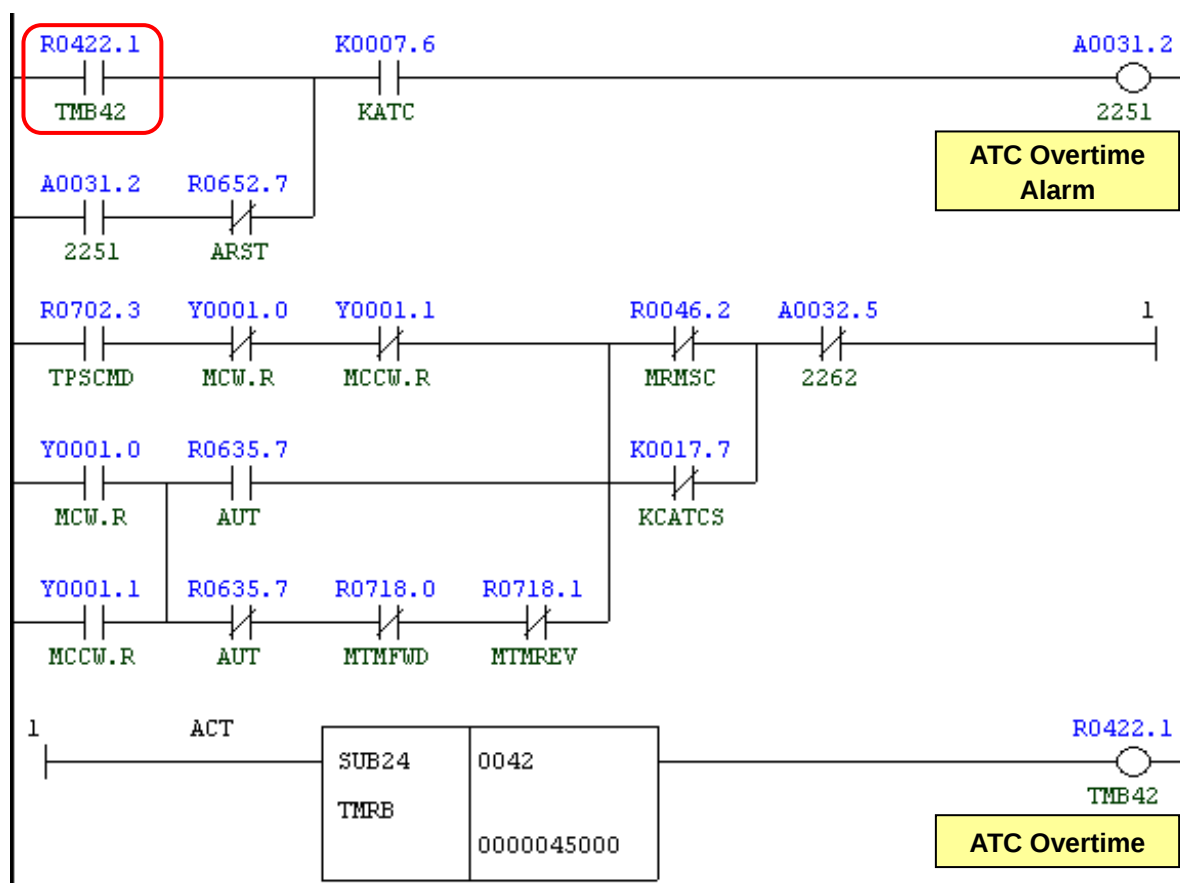
- ESWPX0307 Proximity Switch
- SX31 : X2.0 (TPT1.M)



① Tool Pot Count

- ESWPX0307 Proximity Switch
- SX32 : X2.1 (TPCD.M) Tool Pot Counter
- SX32A : X2.7 (TPC1.M) Tool Pot Counter 2





Address	Symbol	Coil Comment
R422.1	TMB42	ATC Overtime
A31.2	2251	ATC Overtime Alarm
R652.7	ARST	Alarm Reset
K7.6	KATC	ATC Used
R702.3	TPSCMD	Tool Pot Search Command
Y1.0	MCW.R	Tool Magazine CW
Y1.1	MCCW.R	Tool Magazine CCW
R635.7	AUT	Auto Mode
R718.0	MTMFWD	Man Tool Mag. Forward
R718.1	MTMREV	Man Tool Mag. Reverse
R46.2	MRMSC	Mag. Rot. Moving Stop Command
K17.7	KCATCS	Hold Magazine CW/CCW For Cut
A32.5	2262	ATC Magazine Guard Door Open

4.13 2252 ATC Interlock Alarm**1) Description**

In Auto mode, ATC is not in the home position.

2) Cause of problem

Distancing error in the proximity switch that checks ATC home position, or defective component parts

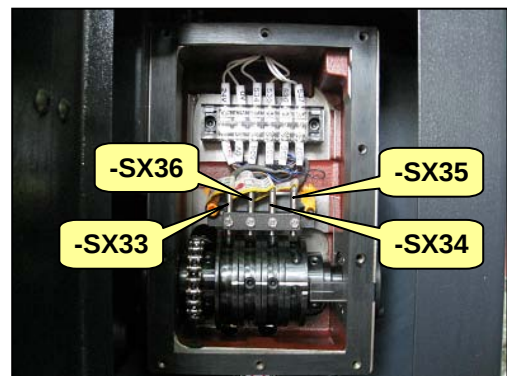
3) Action

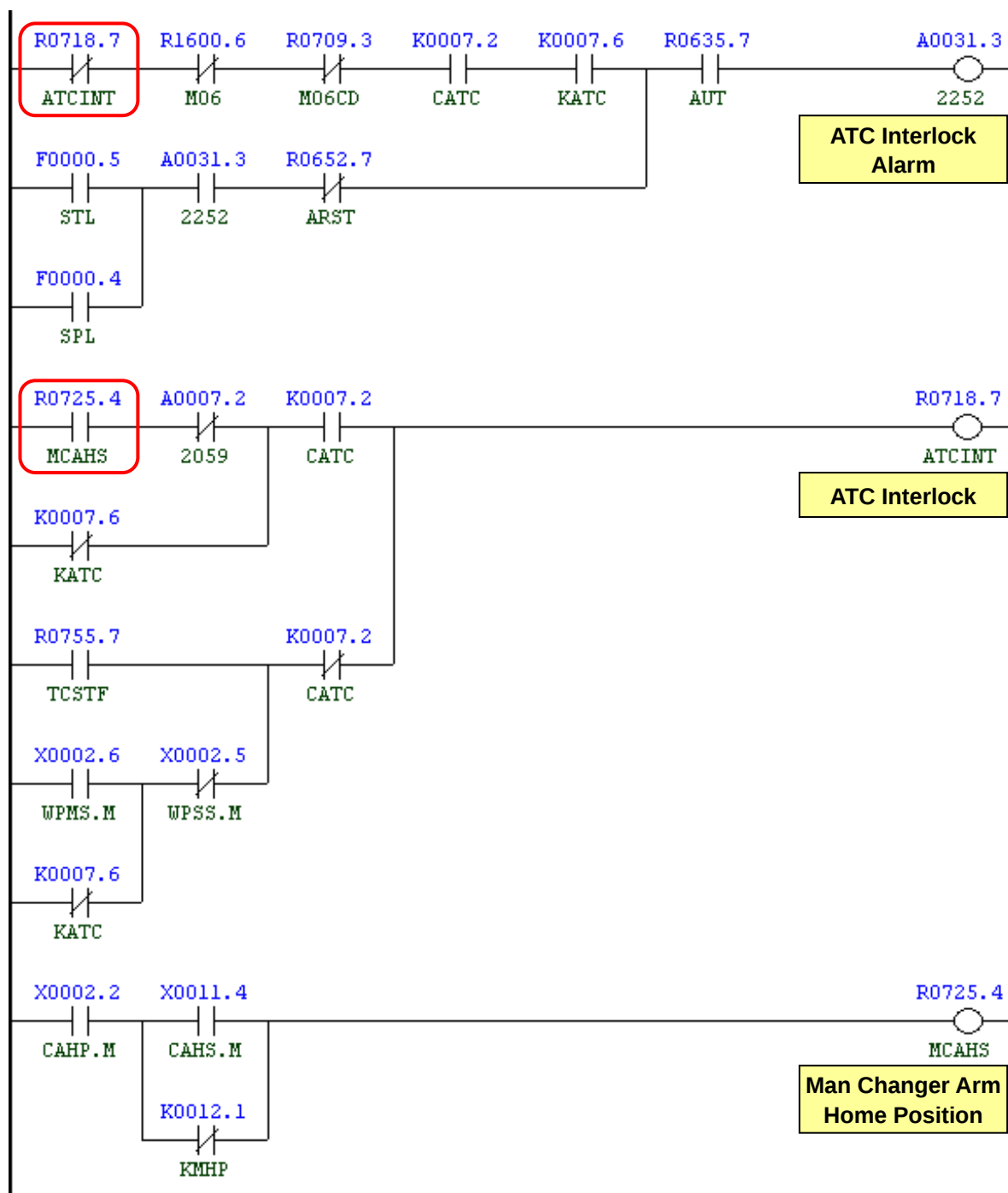
Check the problem signal on PMC DGN or in the ladder sequence screen, and adjust the distance of the trouble-making switch or replace a component part if defective.

Signal	Address	Device Symbol	I/O	Connector (Pin)	Numbering Tube
Changer Arm Home Position	X2.2 (CAHP.M)	-SX33	Control I/O Board	XCB104 (A11)	SX33
Manual ATC Home Position	X11.4 (CAHS.M)	-SX34	Control I/O Board	XCB104 (A12)	SX34

※ Command Sensor

- SX33 : X2.2 (CAHP.M) Changer Arm Home Position
- SX34 : X11.4 (CAHS.M) Manual ATC Home Position
- SX35 : X2.3 (CCMD.M) Tool Clamp Command
- SX36 : X2.4 (UCMD.M) Tool Unclamp Command





Address	Symbol	Coil Comment
R718.7	ATCINT	ATC Interlock
R1600.6	M06	ATC Change Call
R709.3	M06CD	M06 Command
K7.2	CATC	Cam Type ATC(Only Mynx Type)
K7.6	KATC	ATC Used
F0.5	STL	Cycle Start

Address	Symbol	Coil Comment
F0.4	SPL	Feed Hold
A31.3	2252	ATC Interlock Alarm
R652.7	ARST	Alarm Reset
R635.7	AUT	Auto Mode
R725.4	MCAHS	Man Changer Arm Home Position
A7.2	2059	Tool Search Illegal Alarm
R755.7	TCSTF	Tool Change Start Flag
X2.6	WPMS.M	Waiting Pot Magazine Side
X2.5	WPSS.M	Waiting Pot Spindle Side
X2.2	CAHP.M	Change Arm Home position/Tool Detect
X11.4	CAHS.M	Manual ATC Home Position
K12.1	KMHP	Manual ATC Home Position Used

4.14 **2253** Changer Arm Position Check Alarm

1) Description

More than two switches of three that sense: ATC arm home position, tool clamp command, and tool unclamp command are actuated, or the ATC arm is instructed to perform M06 when not in the home position.

2) Cause of problem

- ① Distancing error in the switches that detect ATC arm home position, tool clamp command and tool unclamp command.
- ② Error in the switches or wiring, or defective component parts

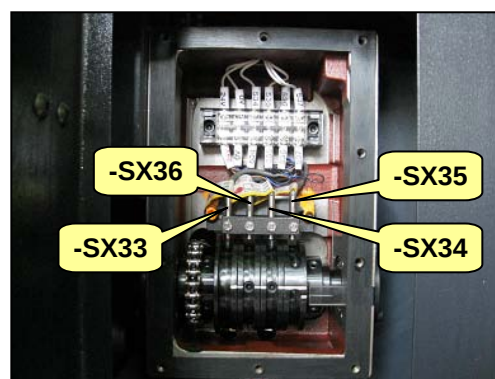
3) Action

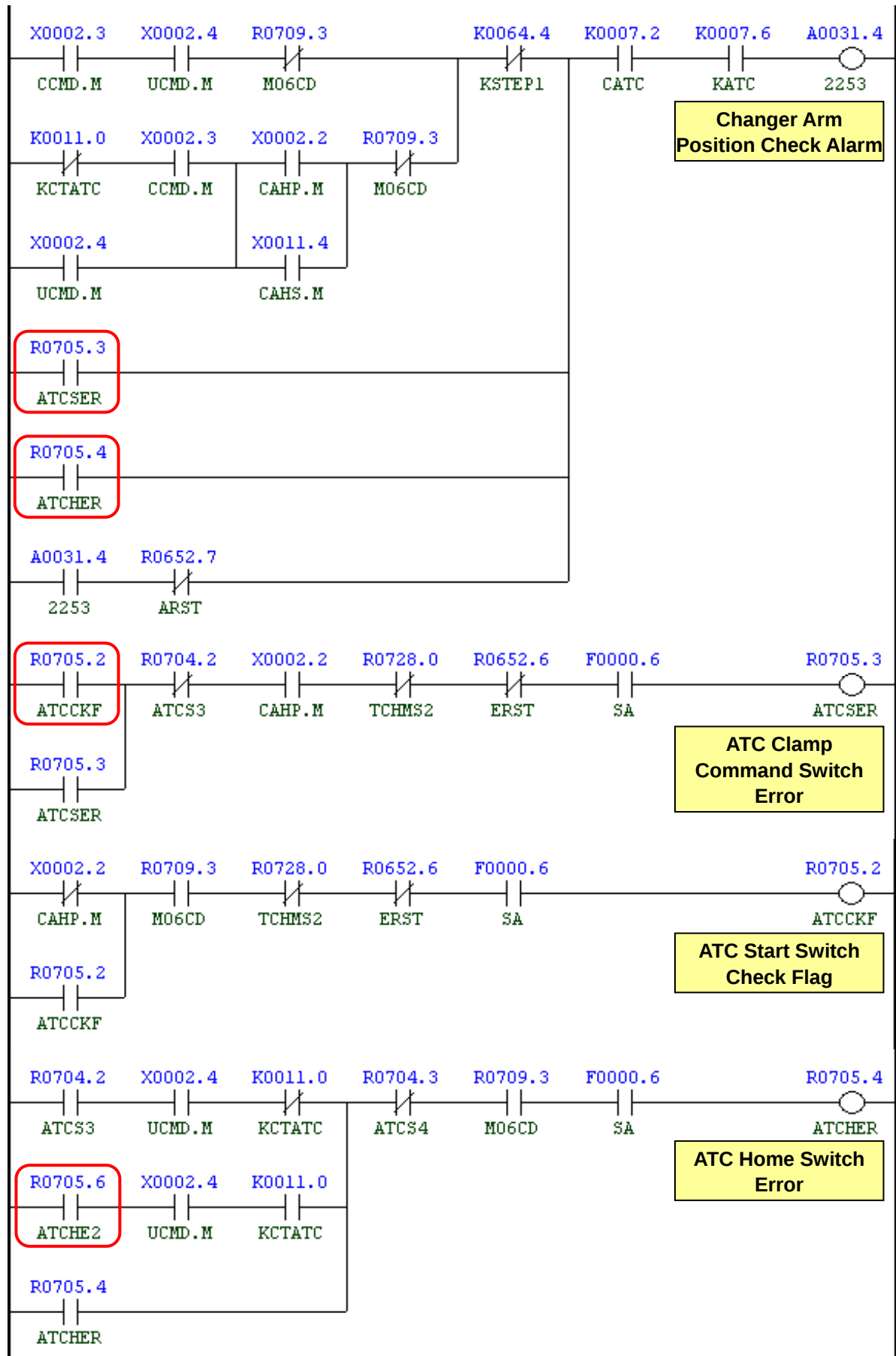
- ① Adjust the distance across the switches.
- ② Check the followings in sequence: proximity switch, wiring between proximity switch and ATC terminal box and between ATC terminal box and electric cabinet as well as the control I/O board. And make repair or replacement if you encounter a problem.

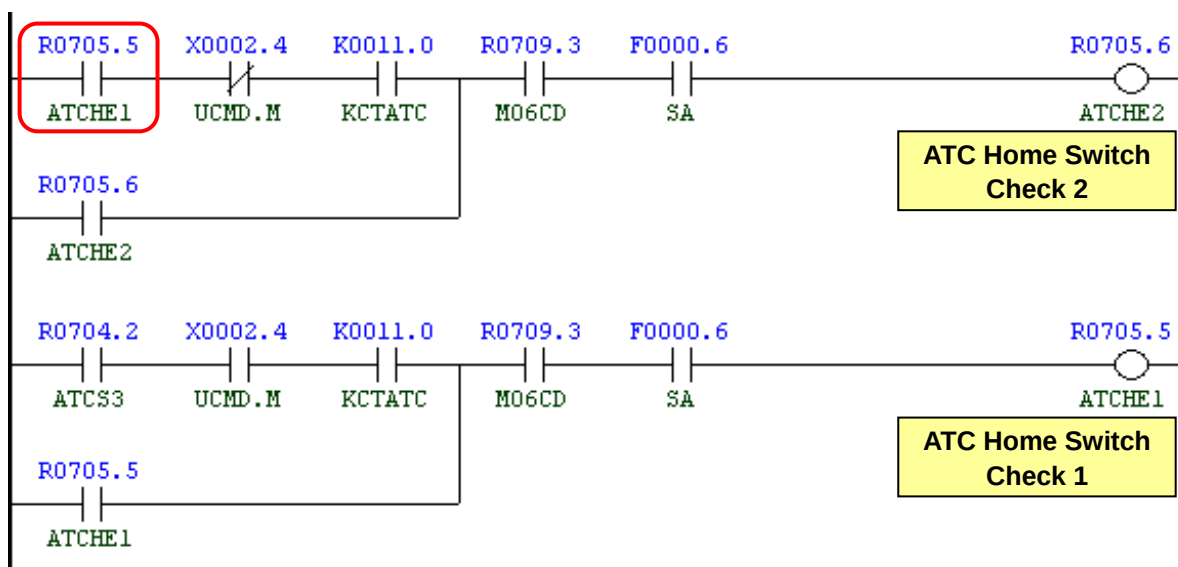
Signal	Address	Device Symbol	I/O	Connector (Pin)	Numbering Tube
Changer Arm Home Position	X2.2 (CAHP.M)	-SX33	Control I/O Board	XCB104 (A11)	SX33
Manual ATC Home Position	X11.4 (CAHS.M)	-SX34	Control I/O Board	XCB107 (A12)	SX34
Tool Clamp Command	X2.3 (CCMD.M)	-SX35	Control I/O Board	XCB104 (B11)	SX35
Tool Unclamp Command	X2.4 (UCMD.M)	-SX36	Control I/O Board	XCB104 (A12)	SX36

※ Command Sensor

- SX33 : X2.2 (CAHP.M) Changer Arm Home Position
- SX34 : X11.4 (CAHS.M) Manual ATC Home Position
- SX35 : X2.3 (CCMD.M) Tool Clamp Command
- SX36 : X2.4 (UCMD.M) Tool Unclamp Command







Address	Symbol	Coil Comment
X2.3	CCMD.M	Tool Clamp Command Position
X2.4	UCMD.M	Tool Unclamp Command Position
R7.9.3	M06CD	M06 Command
K11.0	KCTATC	Keep Using Chain Magazine
X2.2	CAHP.M	Change Arm Home position/Tool Detect
X11.4	CAHS.M	Manual ATC Home Position
K64.4	KSTEP1	ATC Step (-) Keep
R705.3	ATCSER	ATC Clamp Command Error
R705.4	ATCHER	ATC Home Switch Error
A31.4	2253	Changer Arm Position Check Alarm
R652.7	ARST	Alarm Reset
K7.2	CATC	Cam Type ATC(Only Mynx Type)
K7.6	KATC	ATC Used
R705.2	ATCCKF	ATC Start Switch Check Flag
R704.2	ATCS3	Do.3 (Tool Clamp)
R728.0	TCHMS2	Tool Change Stop 2
R652.6	ERST	External Reset
F0.6	SA	Servo Ready
R705.6	ATCHE2	ATC Home Switch Check 2
R704.3	ATCS4	Do4 (ATC Home Check
R705.5	ATCHE1	ATC Home Switch Check 2

4.15 2260 ATC Magazine Rot. Overtime Alarm**1) Description**

The tool magazine fails to complete the rotation within 230 seconds after instructed to do so by the operation signal (CW: Y39.0, CCW: Y39.1).

2) Cause of problem

Distancing error in the tool pot counting switch or the first tool pot detection switch, or defective component parts

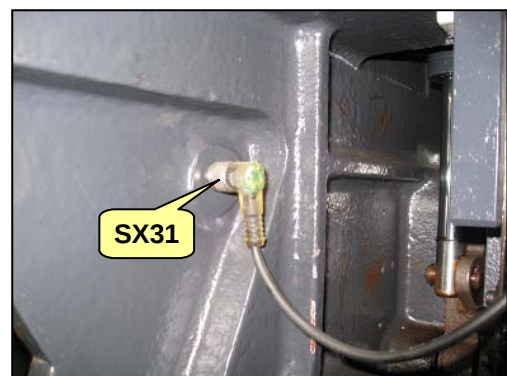
3) Action

- ① For a distancing error, adjust the distance between proximity switch and dog; for a defective part, check the followings: proximity switch, wiring between proximity switch and terminal box of the tool magazine or between terminal box of the tool magazine and electric cabinet, and control I/O module. And make repair or replacement if you encounter a problem.
- ② Check if the magnet and the motor brake are wired properly.
 - ☞ Check if the terminals of U81, V81 and W81 output AC 220V (alternating current), and if Y81 and Y81A output PC 90V (pulsating current) while the magnet is operating.

Signal	Address	Device Symbol	I/O	Connector (Pin)	Numbering Tube
Tool 1 st Pot Detect	X2.0 (TPT1.M)	-SX31	Control I/O Board	XCB104 (A10)	SX31
Tool Pot Count	X2.1 (TPCD.M)	-SX32	Control I/O Board	XCB104 (B10)	SX32
Tool Pot Count 2	X2.7 (TPC1.M)	-SX32A	Control I/O Board	XCB104 (B13)	SX32A
Tool Magazine CW	Y1.0 (TMF.R)	-KM81F	Control I/O Board	XCB104 (A20)	KM81F
Tool Magazine CCW	Y1.1 (TMR.R)	-KM81R	Control I/O Board	XCB104 (B20)	KM81R

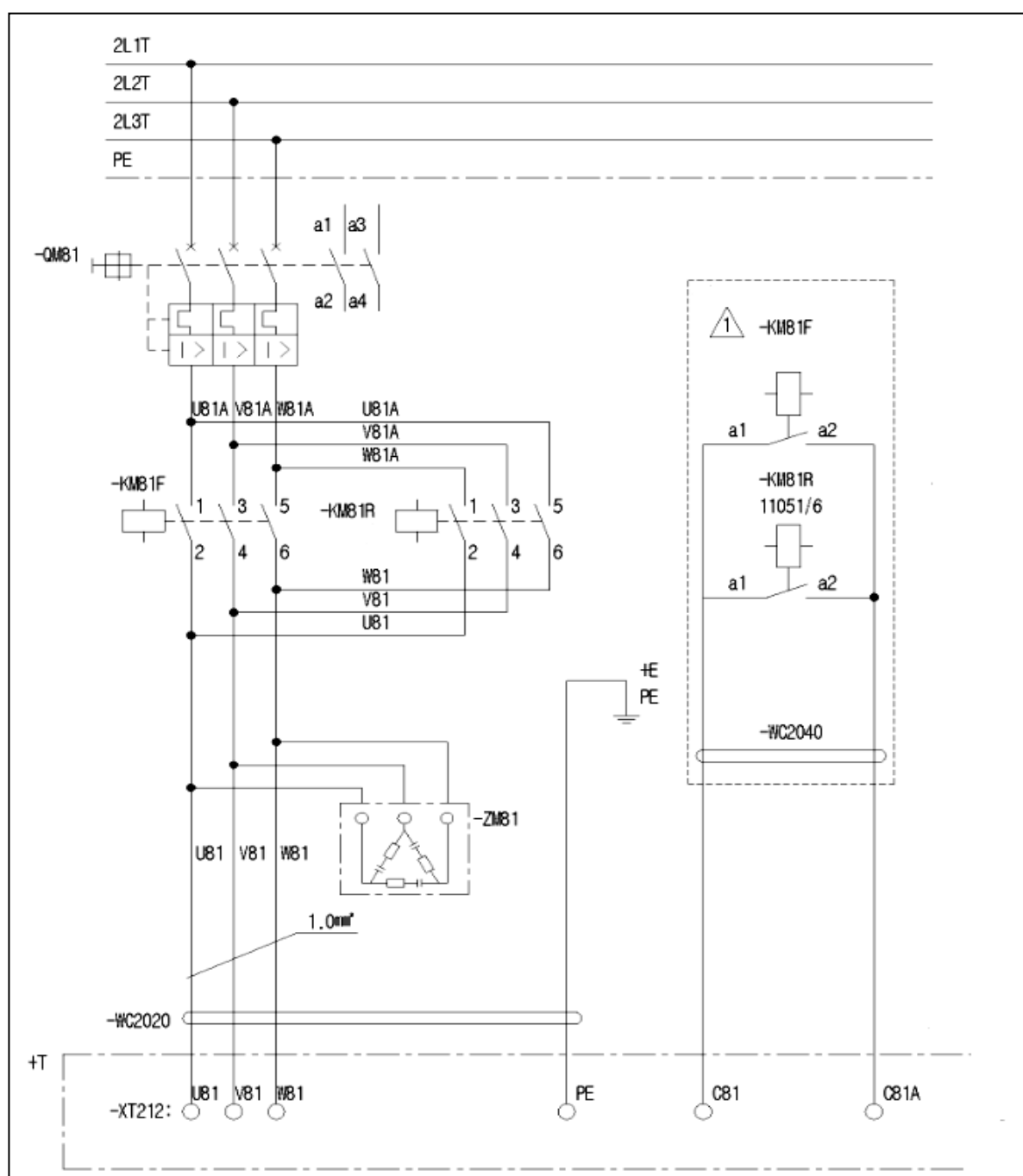
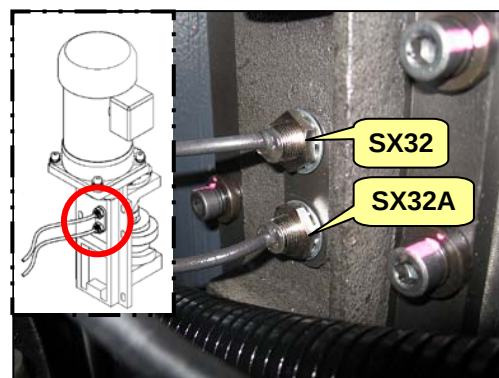
※ ATC Magazine Rotation-related Sensors

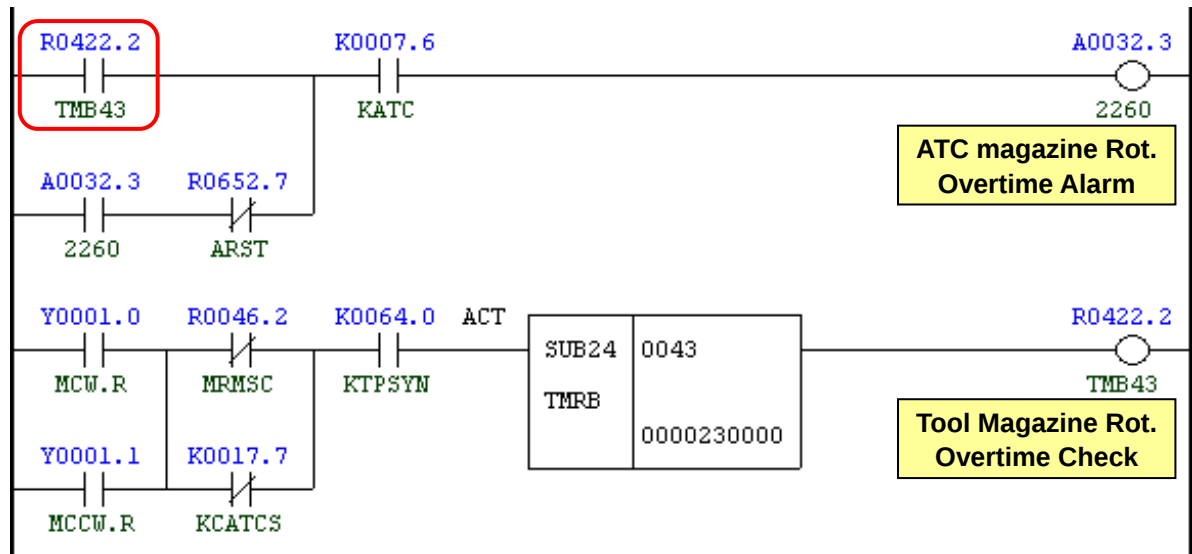
- ① 1st Tool Pot Detection
 - ESWPX0307 Proximity Switch
 - SX31 : X2.0 (TPT1.M)



② Tool Pot Count

- ESWPX0307 Proximity Switch
- SX32 : X2.1 (TPCD.M) Tool Pot Counter
- SX32A : X2.7 (TPC1.M) Tool Pot Counter





Address	Symbol	Coil Comment
R422.2	TMB43	Tool Magazine Rot. Overtime Check
A32.3	2260	ATC Magazine Tot. Overtime Alarm
R652.7	ARST	Alarm Reset
K7.6	KATC	ATC Used
Y1.0	MCW.R	Tool Magazine CW
Y1.1	MCCW.M	Tool Magazine CCW
R46.2	MRMSC	Mag. Rot. Moving Stop Command
K17.7	KATCS	Hold Magazine CW/CCW for Cut
K64.0	KTPSYN	Tool 1 st Pot Synchro Keep

4.16 **2261** Tool Magazine Synchro Malfunction

1) Description

The tool count of the tool magazine saved in NC is cleared.

2) Cause of problem

The tool magazine has stopped rotating due to an error.

Distancing error in the tool pot counting switch or the first tool pot detection switch, or defective component parts

3) Action

Manually rotate the tool magazine CW so that it passes through the first tool pot to change.

☞ Then, the number in the tool magazine should be reset to "1".

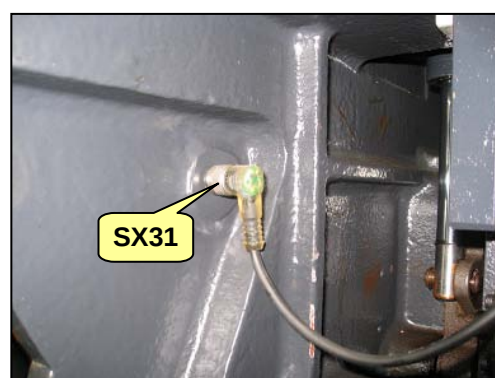
Check the followings: first detection proximity switch, tool count switch, wiring between switch and tool magazine terminal box or between tool magazine terminal box and electric cabinet. And make repair or replacement if you encounter a problem.

Signal	Address	Device Symbol	I/O	Connector (Pin)	Numbering Tube
Tool 1 st Pot Detect	X2.0 (TPT1.M)	-SX31	Control I/O Board	XCB104 (A10)	SX31
Tool Pot Count	X2.1 (TPCD.M)	-SX32	Control I/O Board	XCB104 (B10)	SX32
Tool Pot Count 2	X2.7 (TPC1.M)	-SX32A	Control I/O Board	XCB104 (B13)	SX32A

※ ATC Magazine Rotation-related Sensors

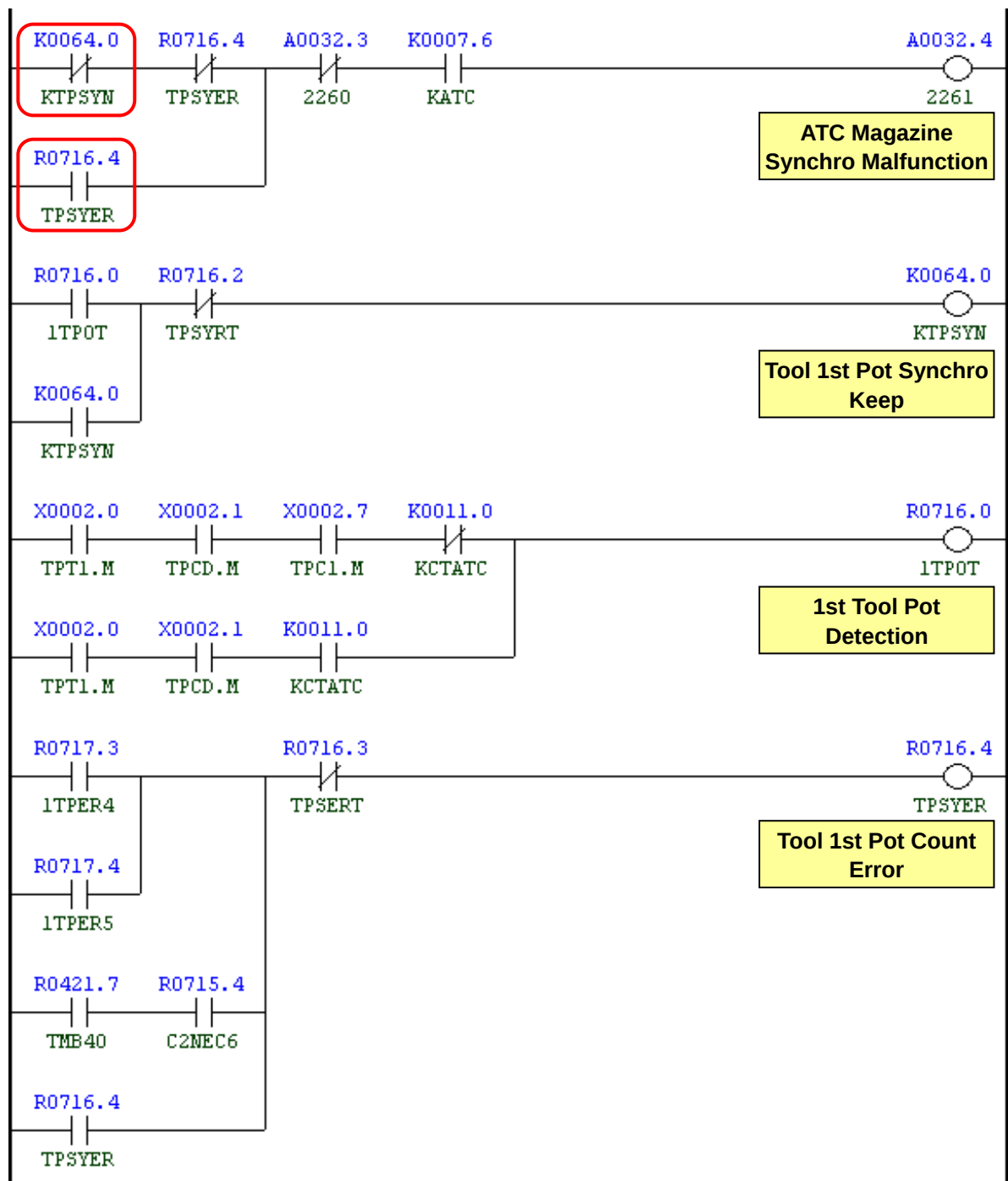
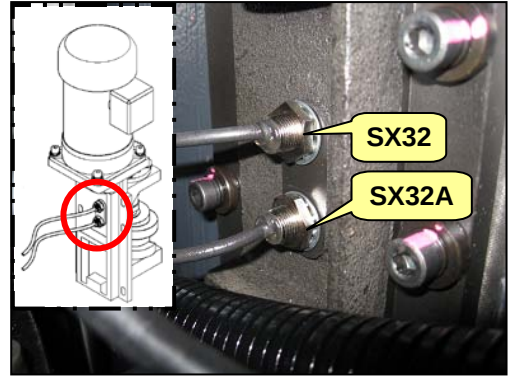
① 1st Tool Pot Detection

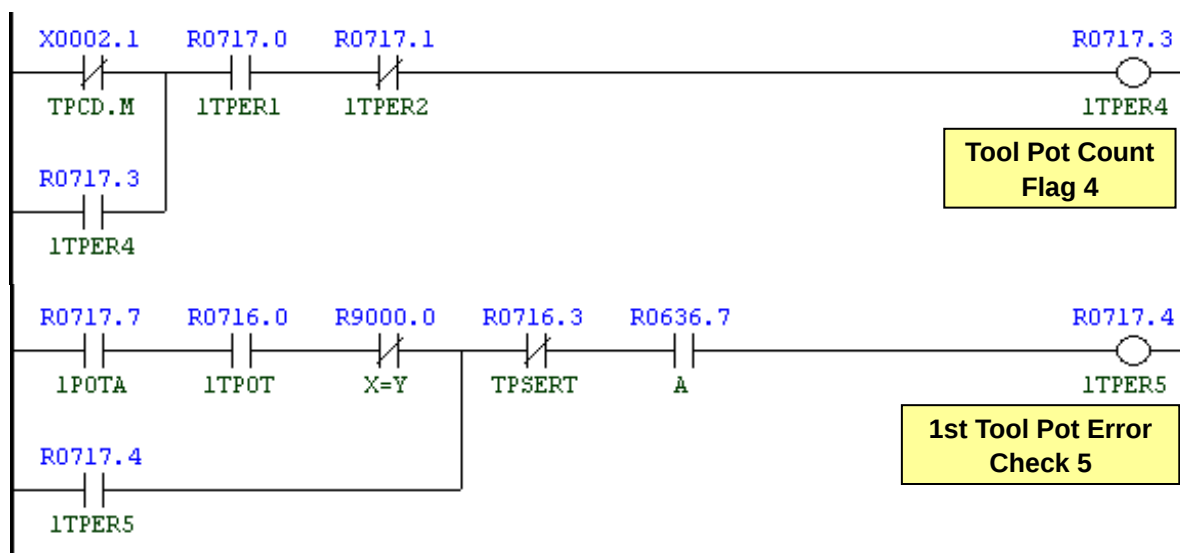
- ESWPX0307 Proximity Switch
- SX31 : X2.0 (TPT1.M)



② Tool Pot Count

- ESWPX0307 Proximity Switch
- SX32 : X2.1 (TPCD.M) Tool Pot Counter
- SX32A : X2.7 (TPC1.M) Tool Pot Counter





Address	Symbol	Coil Comment
K64.0	KTPSYN	Tool 1 st Pot Synchro Keep
R716.4	TPSYER	Tool 1 st Pot Count Error
A32.3	2260	ATC Magazine Rot. Overtime Alarm
K7.6	KATC	ATC Used
A32.4	2261	Tool Magazine Synchro Malfunction
R716.0	1TPOT	1 st Tool Pot Detect
R726.2	TPSYRT	Tool Pot Synchro Reset
R717.3	1TPER4	Tool Pot Count Flag 4
R717.4	1TPER5	1 st Tool Pot Error Check 5
R421.7	TMB40	Tool Moving Motor Overtime
R715.4	C2NEC6	Tool Pot Not EQ C2/C6
R716.3	TPSERT	Tool Pot Synchro Error Reset
X2.1	TPCD.M	Tool Pot Count Detect
R717.0	1TPER1	1 st Tool Pot Check Flag 1
R717.1	1TPER2	1 st Tool Pot Check Flag 2
R717.7	1POTA	First Tool Pot Count Flag
R9000.0	X=Y	Function Command Result X=Y

4.17 2274 Wait. Pot(Mag.) Spd/Mag. Side Alarm**1) Description**

Two position sensors of the waiting tool pot are actuated simultaneously, or it has passed 10 seconds since the operation did not match with the instruction.

2) Cause of problem

Improper distancing across the position sensors that detects the vertical position (up/down) of the waiting pot.

Error in the sensors, wiring cables, or related parts

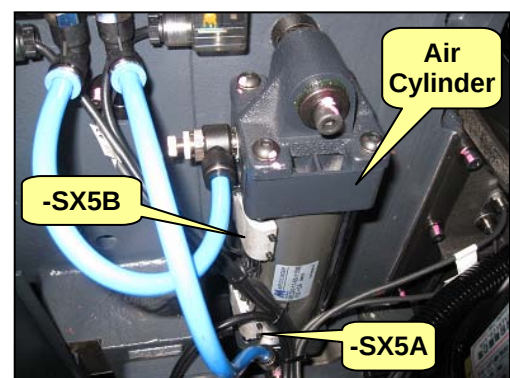
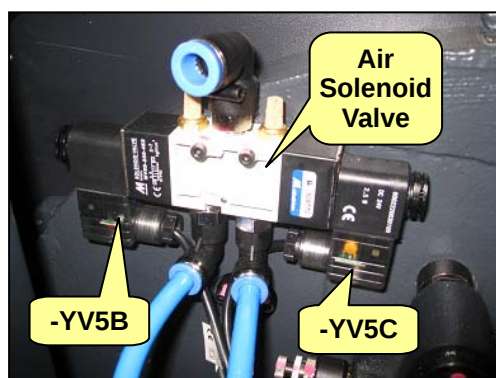
3) Action**① Improper distance adjustment across position sensors**

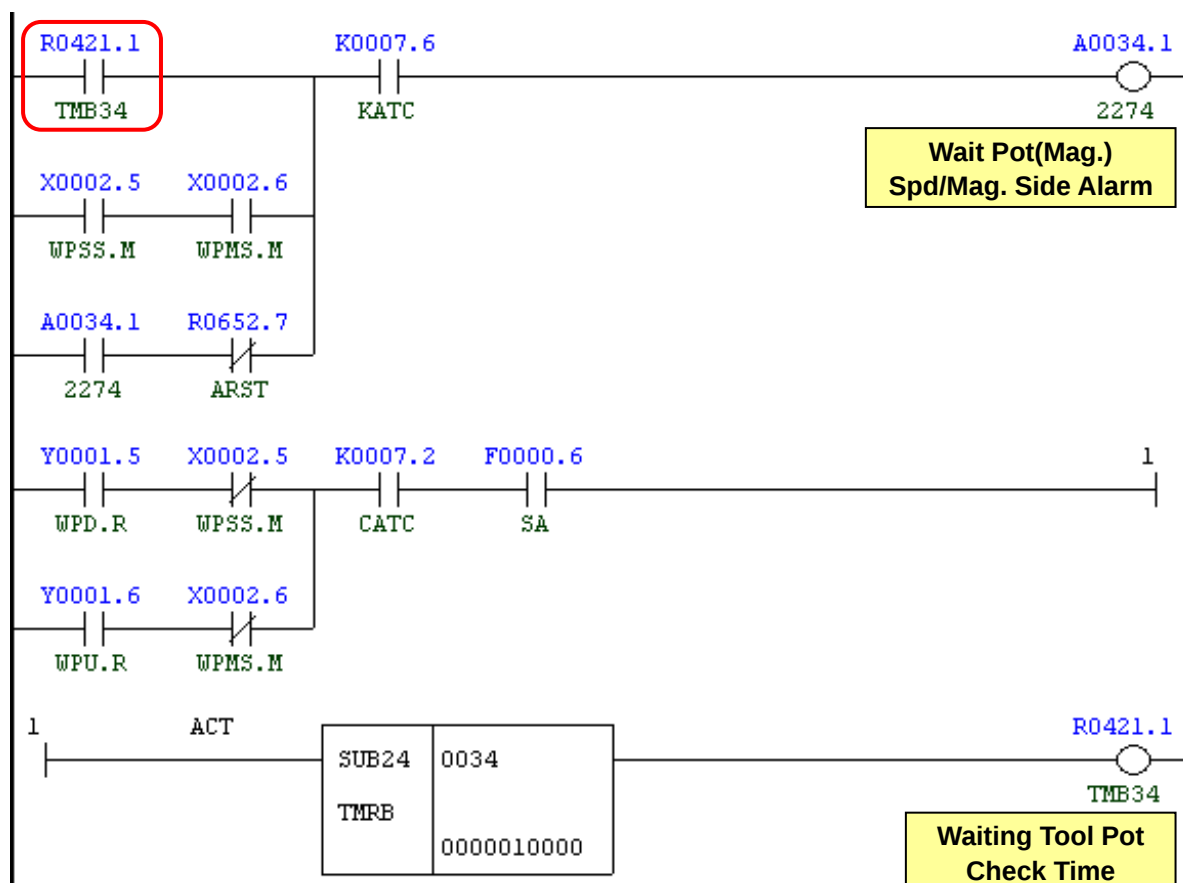
☞ While checking the indicator lamps of the reed switch installed on the cylinder where the waiting pot is moving up/down, loosen the bolts of the reed switch bracket and make adjustment as necessary.

② Error in wiring or component parts

☞ Check the followings in sequence: proximity switch, wiring between proximity switch and ATC terminal box and between ATC terminal box and electric cabinet as well as the control I/O board. And make repair or replacement if you encounter a problem.

Signal	Address	Device Symbol	I/O	Connector (Pin)	Numbering Tube
Waiting Pot Spindle Side	X2.5 (WPSS.M)	-SX5A	Control I/O Board	XCB104 (B12)	SX5A
Waiting Pot Magazine Side	X2.6 (WPMS.M)	-SX5B	Control I/O Board	XCB104 (A13)	SX5B
Tool Pot Down	Y1.5 (WPD.R)	-KR5B -YV5B	Control I/O Board	XCB104 (B22)	KR5B YV5B
Tool Pot Up	Y1.6 (WPU.R)	-Kr5C -YV5C	Control I/O Board	XCB104 (A23)	KR5C YV5C





Address	Symbol	Coil Comment
R421.1	TMB34	Waiting Tool Pot Check Time
X2.5	WPSS.M	Waiting Pot Spindle Side
X2.6	WPMS.M	Waiting Pot Magazine Side
A34.1	2274	Wait. Pot(Mag.) Spd./Mag. Side Alarm
R652.7	ARST	Alarm Reset
K7.6	KATC	ATC Used
Y1.5	WPD.R	Tool Pot Down
Y1.6	WPU.R	Tool Pot Up
K7.2	CATC	Cam Type ATC(Only Mynx Type)
F0.6	SA	Servo Ready

Revision History
VMC Maintenance Manual DNM 500(Alarm)

Version	Year/Month	Revision history	Created by
01	2010. 10	Official draft(DNM500ALE0A)	Jeong, Sam Young
02			
03			
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