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**Troubleshooting Charts**

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### CHART 1 QUICK CHECKOUT PROCEDURE

9-20-95

DASHED SYMBOLS  
APPLY TO CE NORM  
EUROPEAN MACHINES  
ONLY

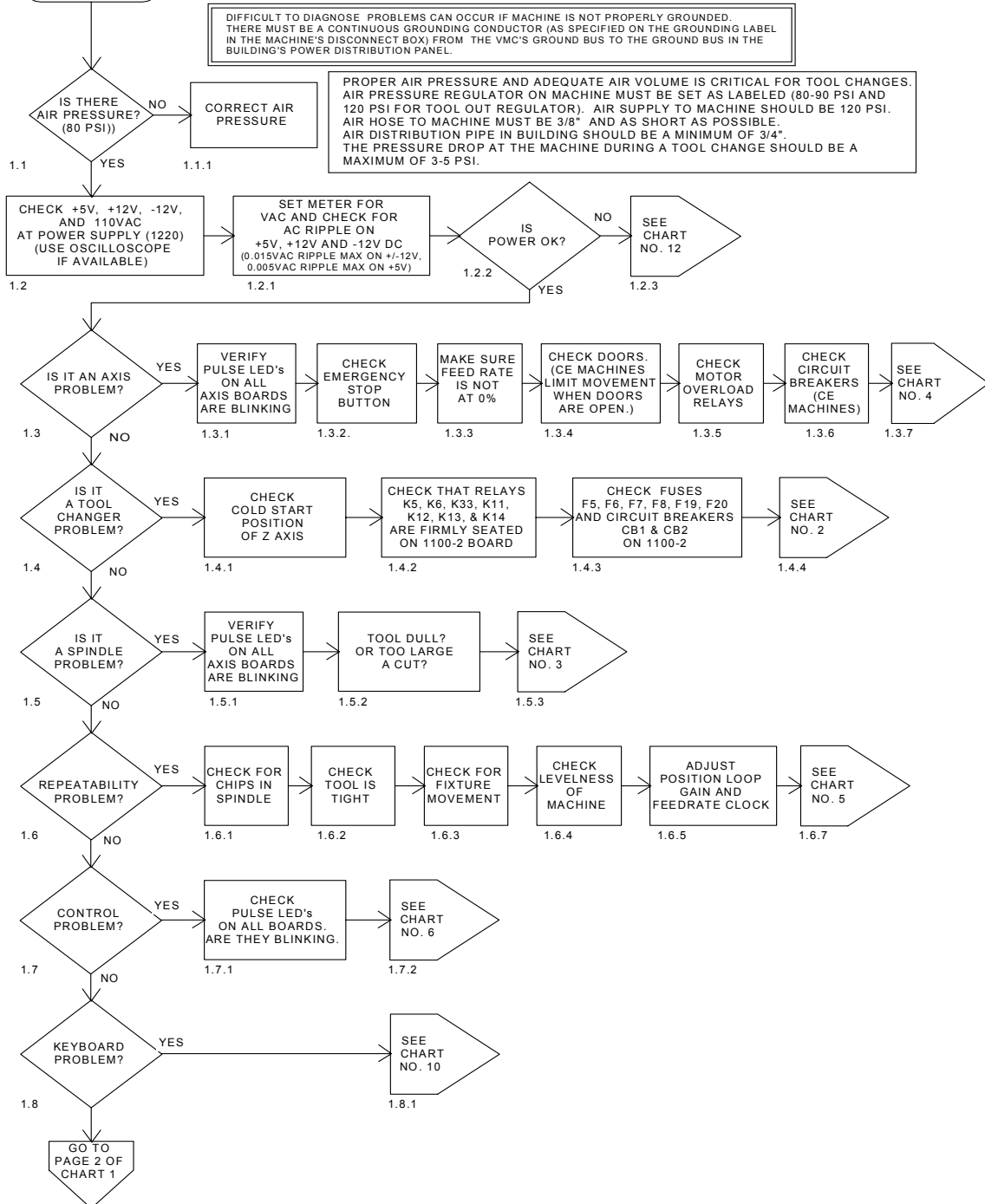


Figure 16-1 Quick Checkout Procedure

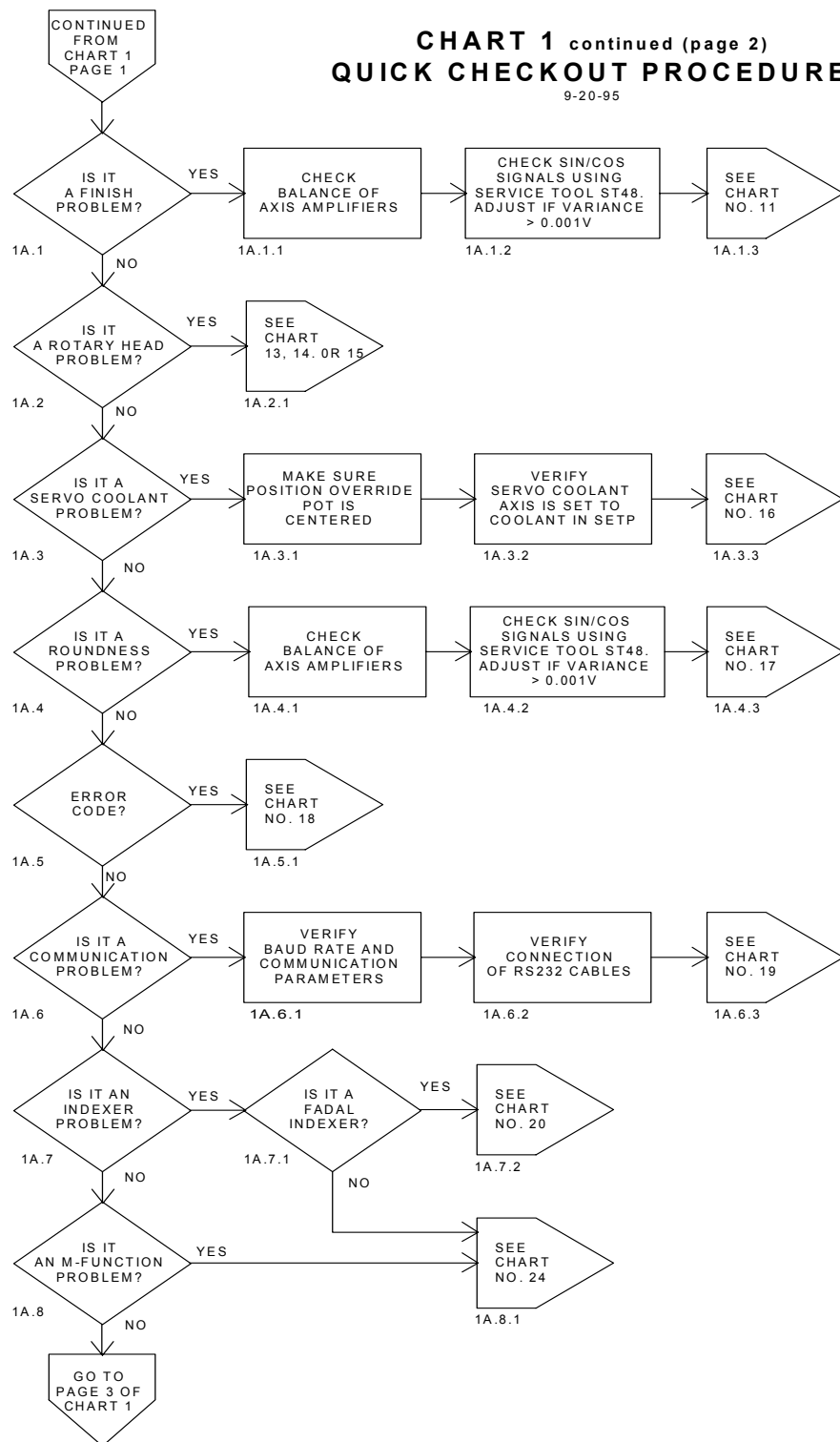
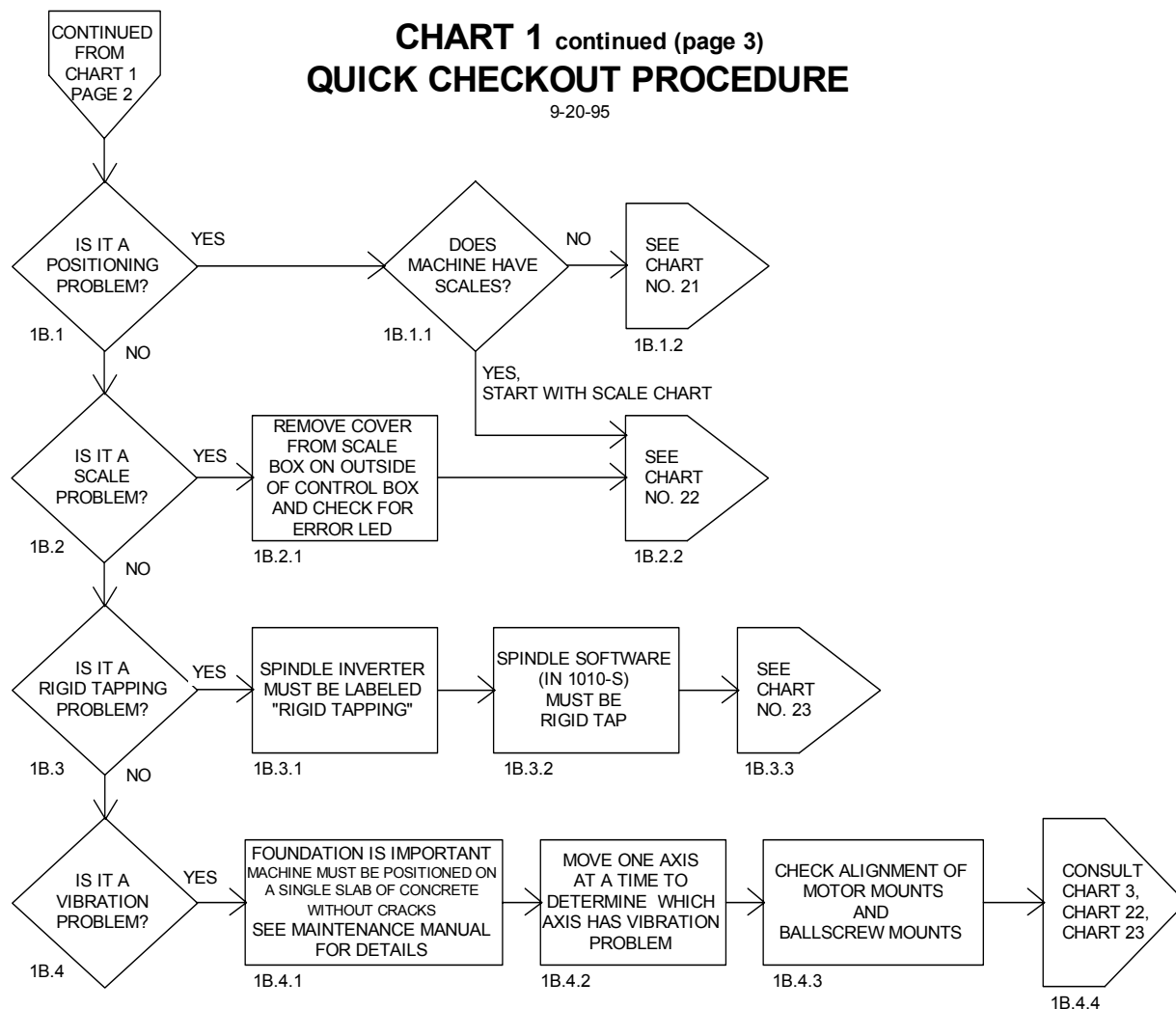


Figure 16-2 Quick Checkout Procedure (Continued)



*Figure 16-3* Quick Checkout Procedure (Continued)

**CHART 2**  
**AUTOMATIC TOOL CHANGER**

10-18-95

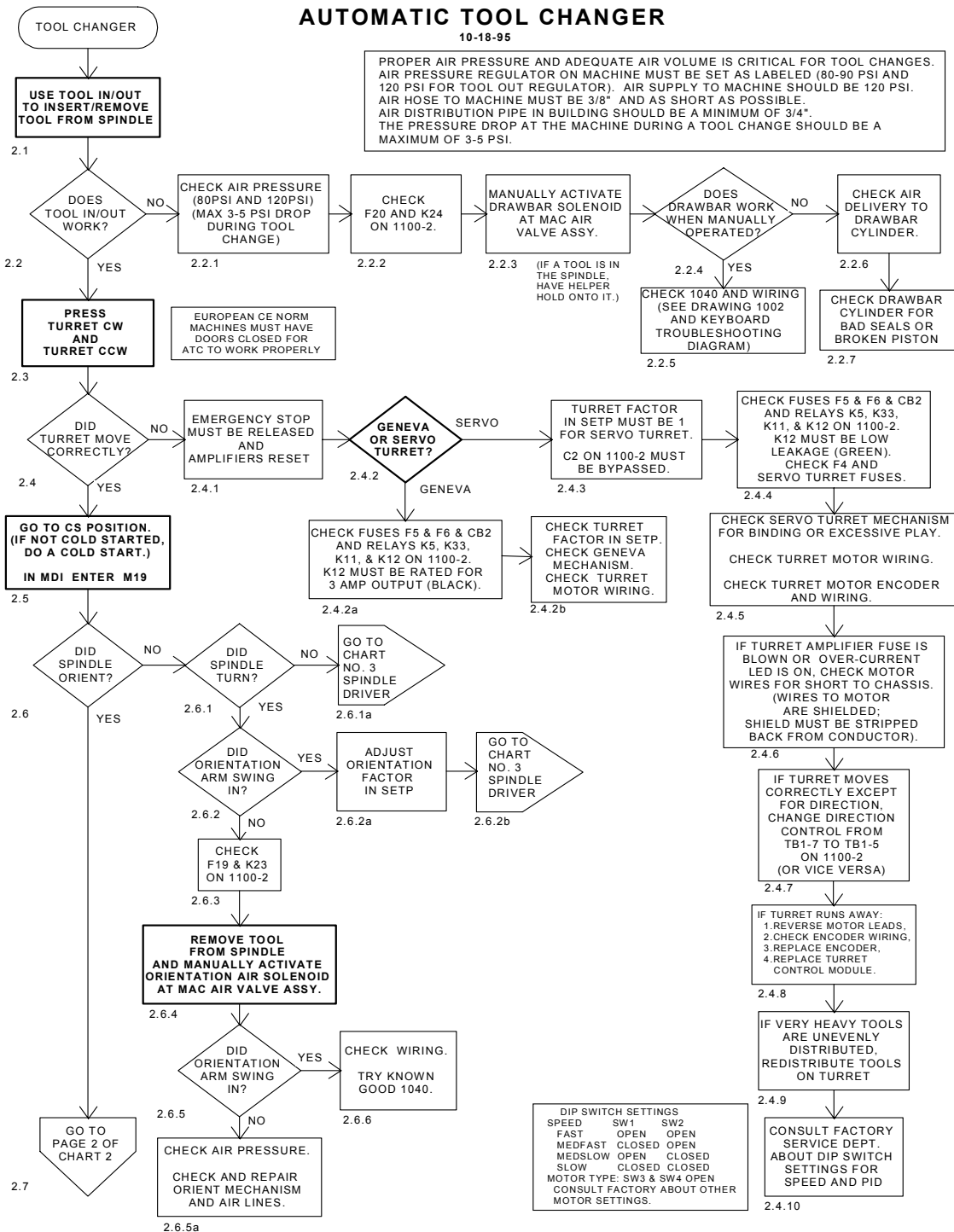
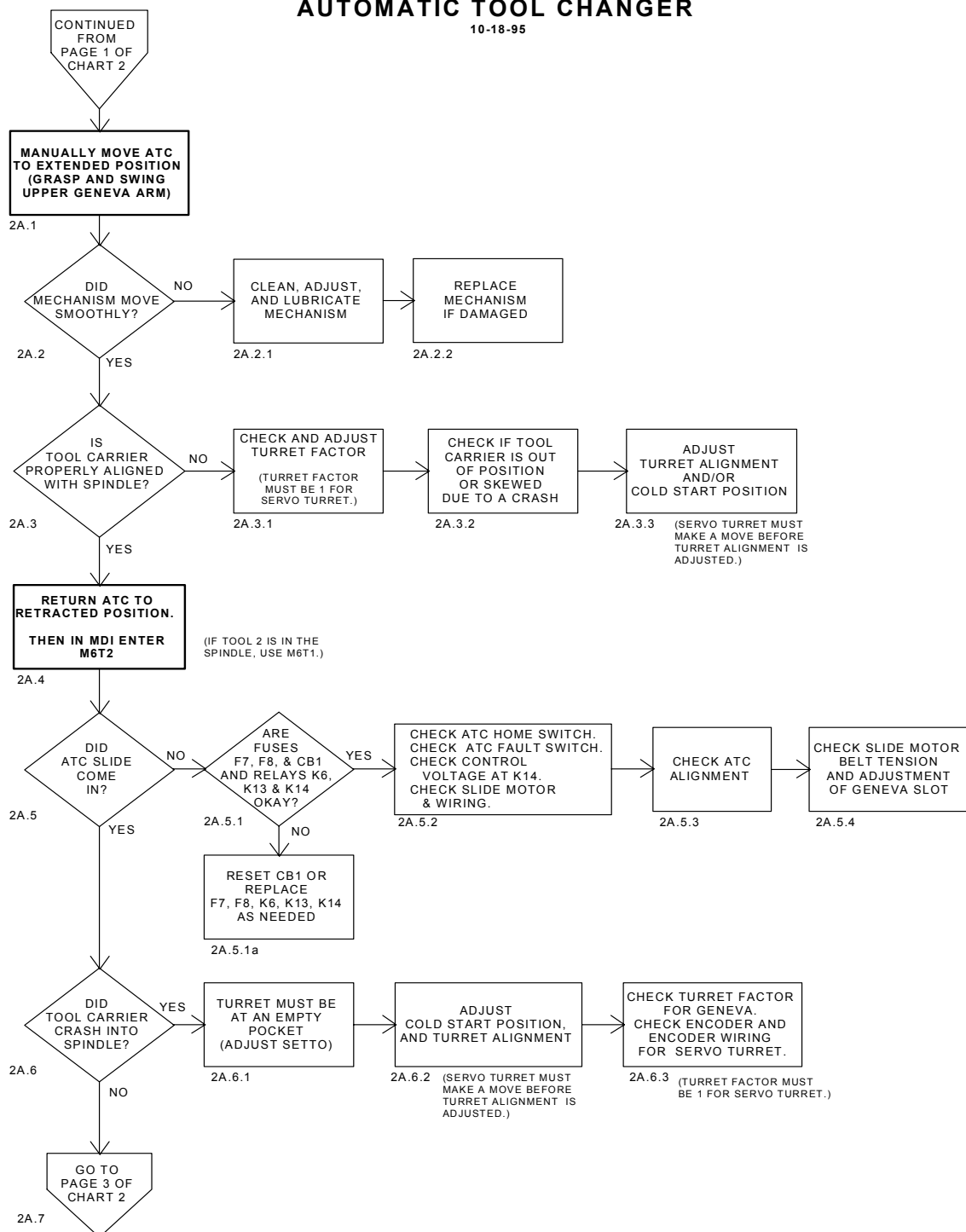


Figure 16-4 Automatic Tool Changer

**CHART 2** continued (page 2)  
**AUTOMATIC TOOL CHANGER**  
 10-18-95



*Figure 16-5 Automatic Tool Changer (Continued)*

### CHART 2 continued (page 3) AUTOMATIC TOOL CHANGER

10-18-95

PROPER AIR PRESSURE AND ADEQUATE AIR VOLUME IS CRITICAL FOR TOOL CHANGES. AIR PRESSURE REGULATOR ON MACHINE MUST BE SET AS LABELED (80-90 PSI AND 120 PSI FOR TOOL OUT REGULATOR). AIR SUPPLY TO MACHINE SHOULD BE 120 PSI. AIR HOSE TO MACHINE MUST BE 3/8" AND AS SHORT AS POSSIBLE. AIR DISTRIBUTION PIPE IN BUILDING SHOULD BE A MINIMUM OF 3/4". THE PRESSURE DROP AT THE MACHINE DURING A TOOL CHANGE SHOULD BE A MAXIMUM OF 3-5 PSI.

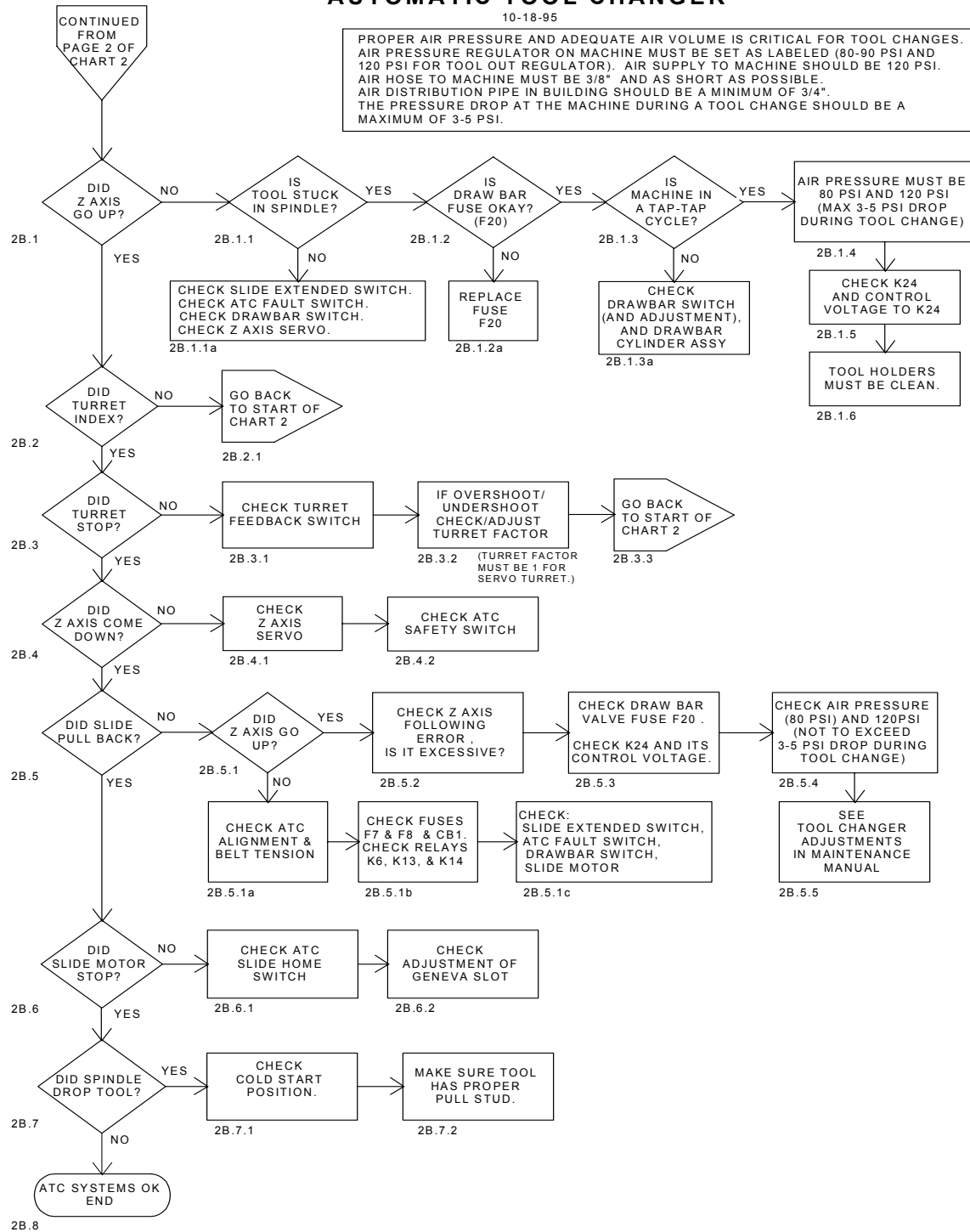


Figure 16-6 Automatic Tool Changer (Continued)

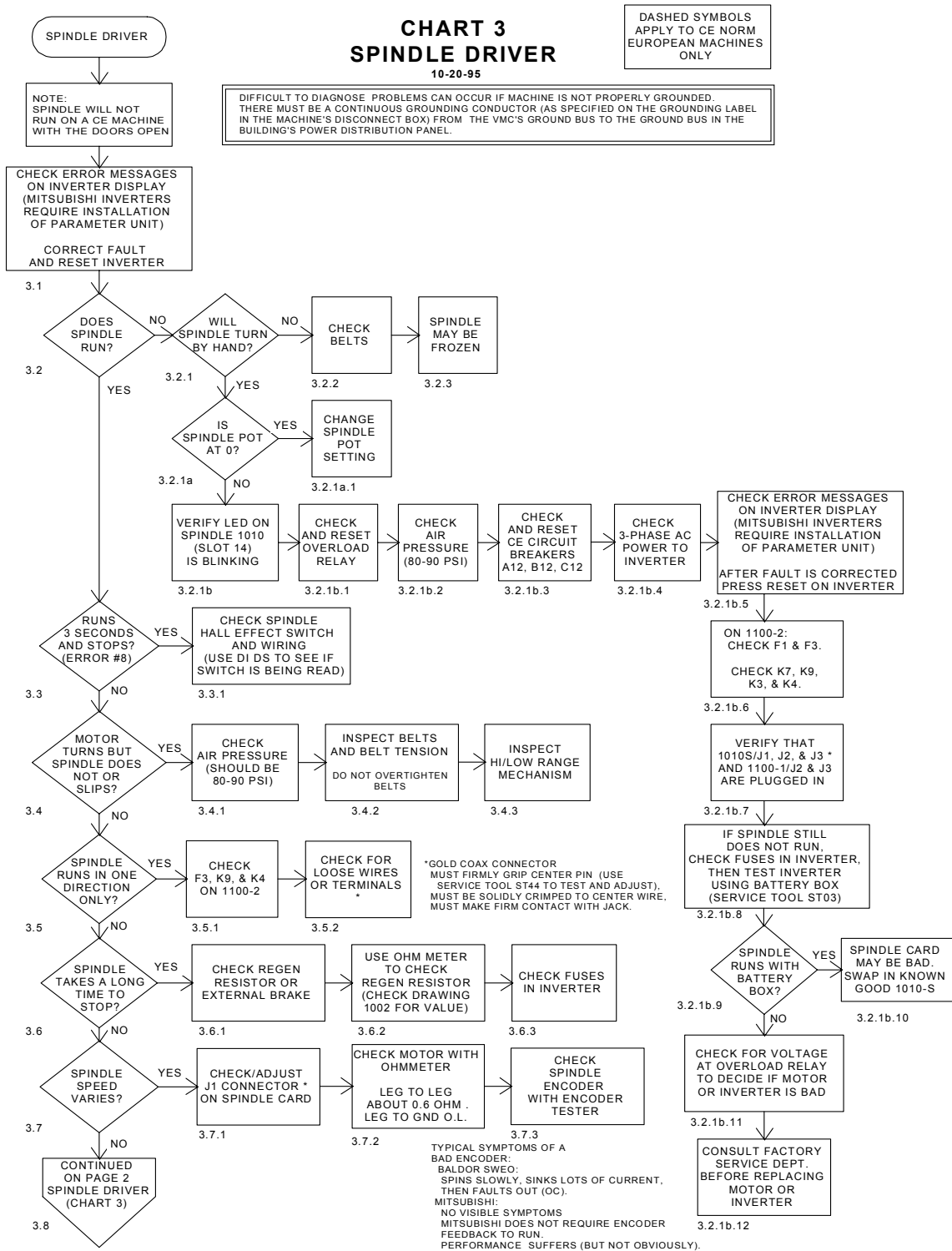
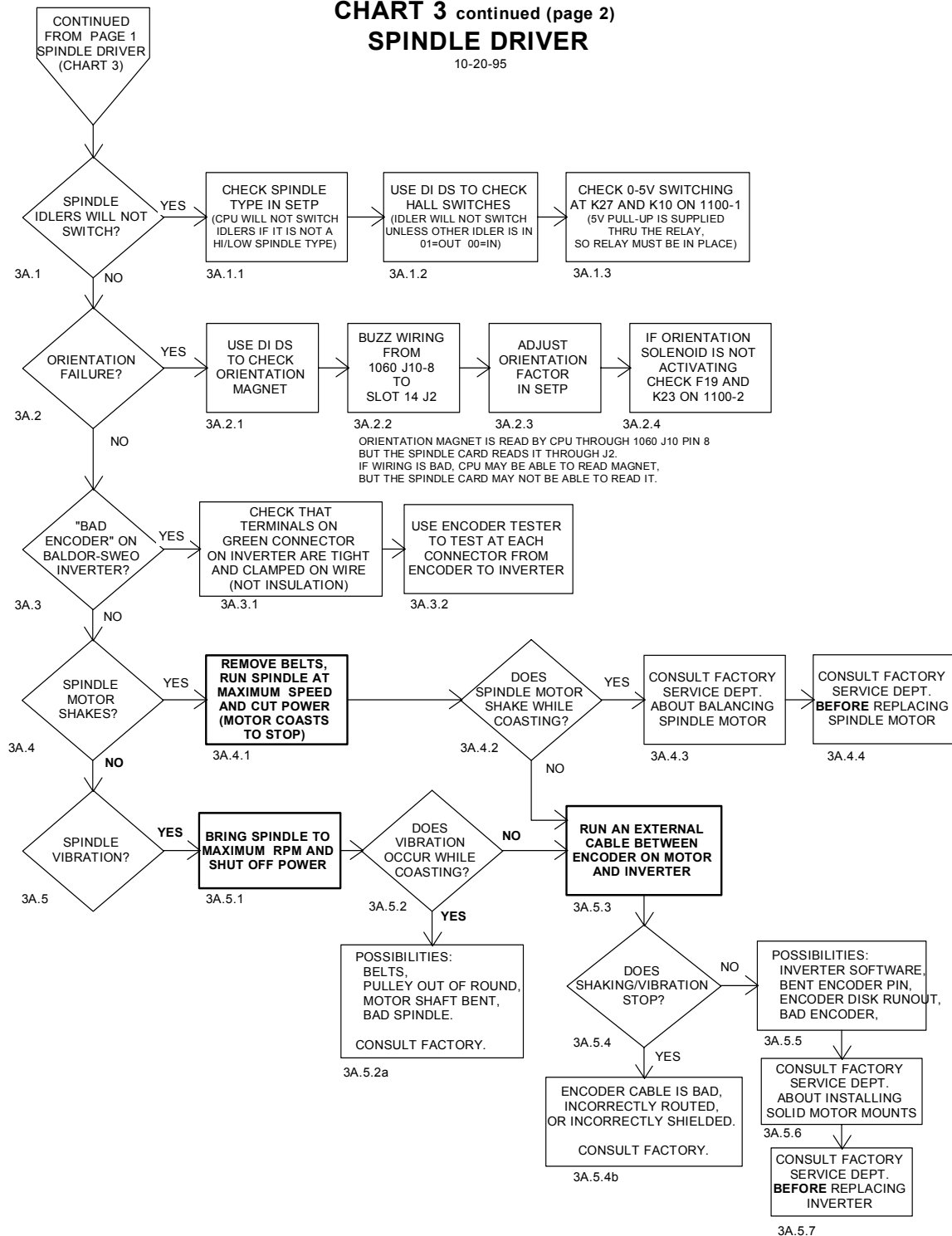


Figure 16-7 Spindle Driver



**CHART 3** continued (page 2)  
**SPINDLE DRIVER**

10-20-95



*Figure 16-8* Spindle Driver (Continued)

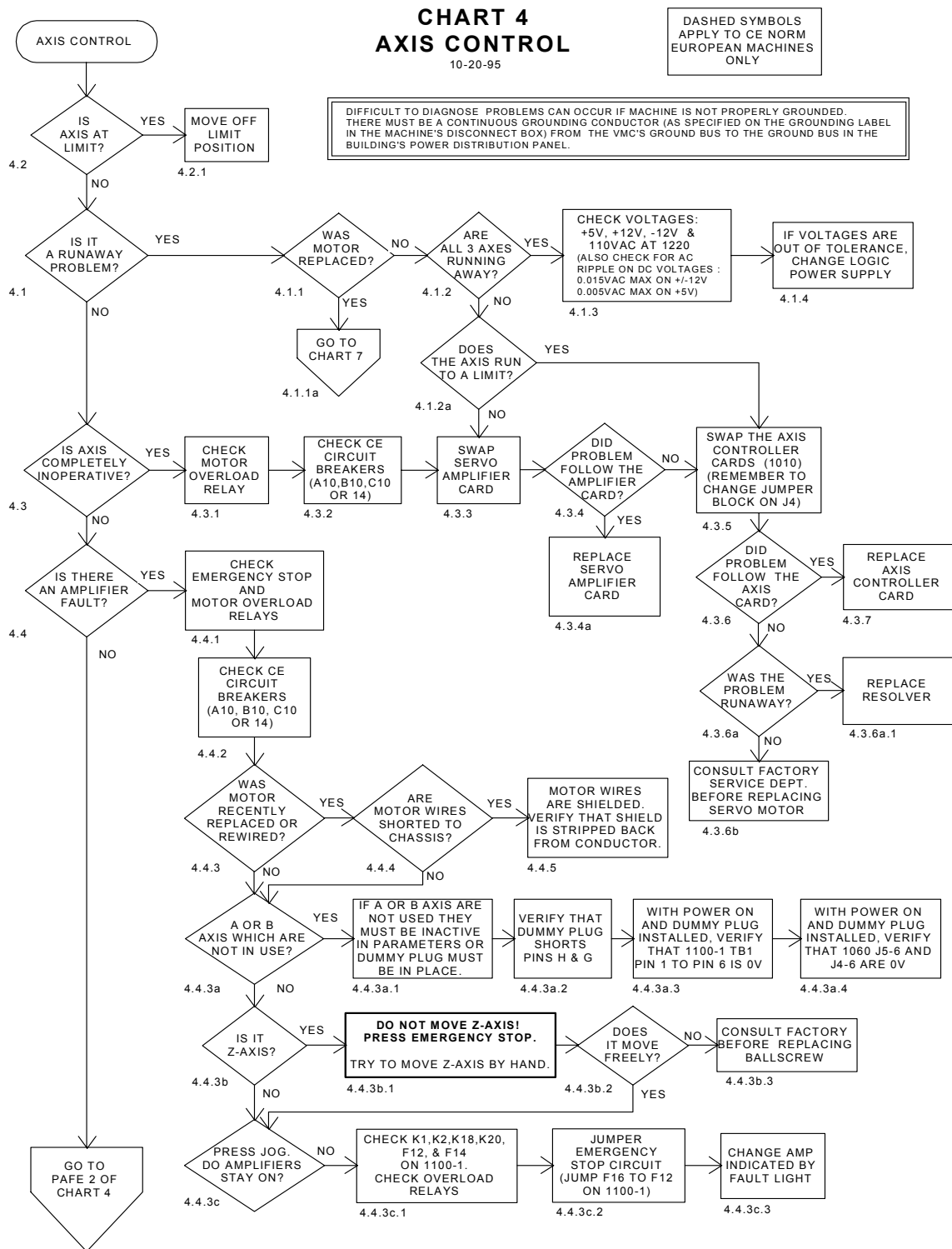


Figure 16-9 Axis Control

CHART 4 continued (page 2)

## AXIS CONTROL

10-20-95

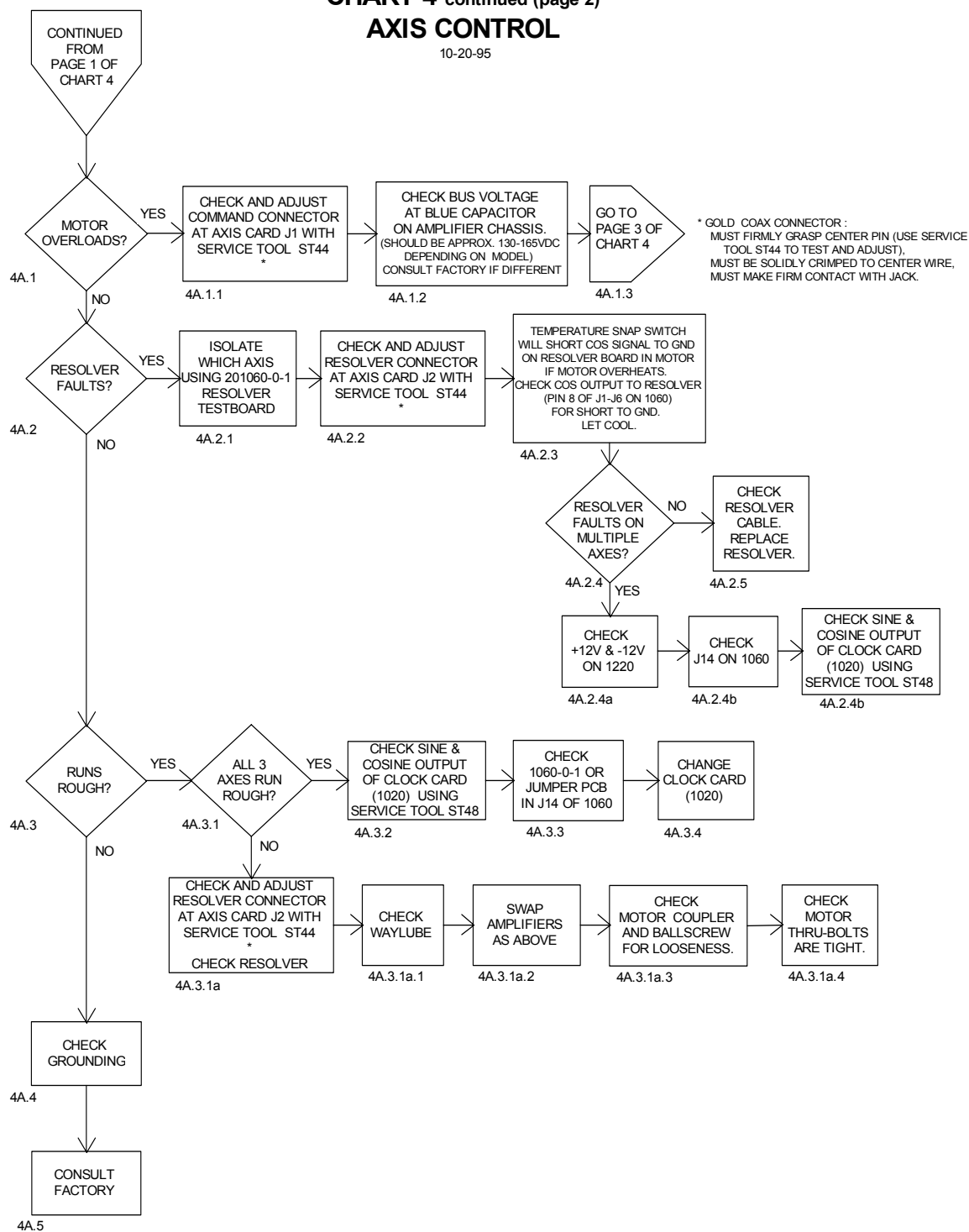
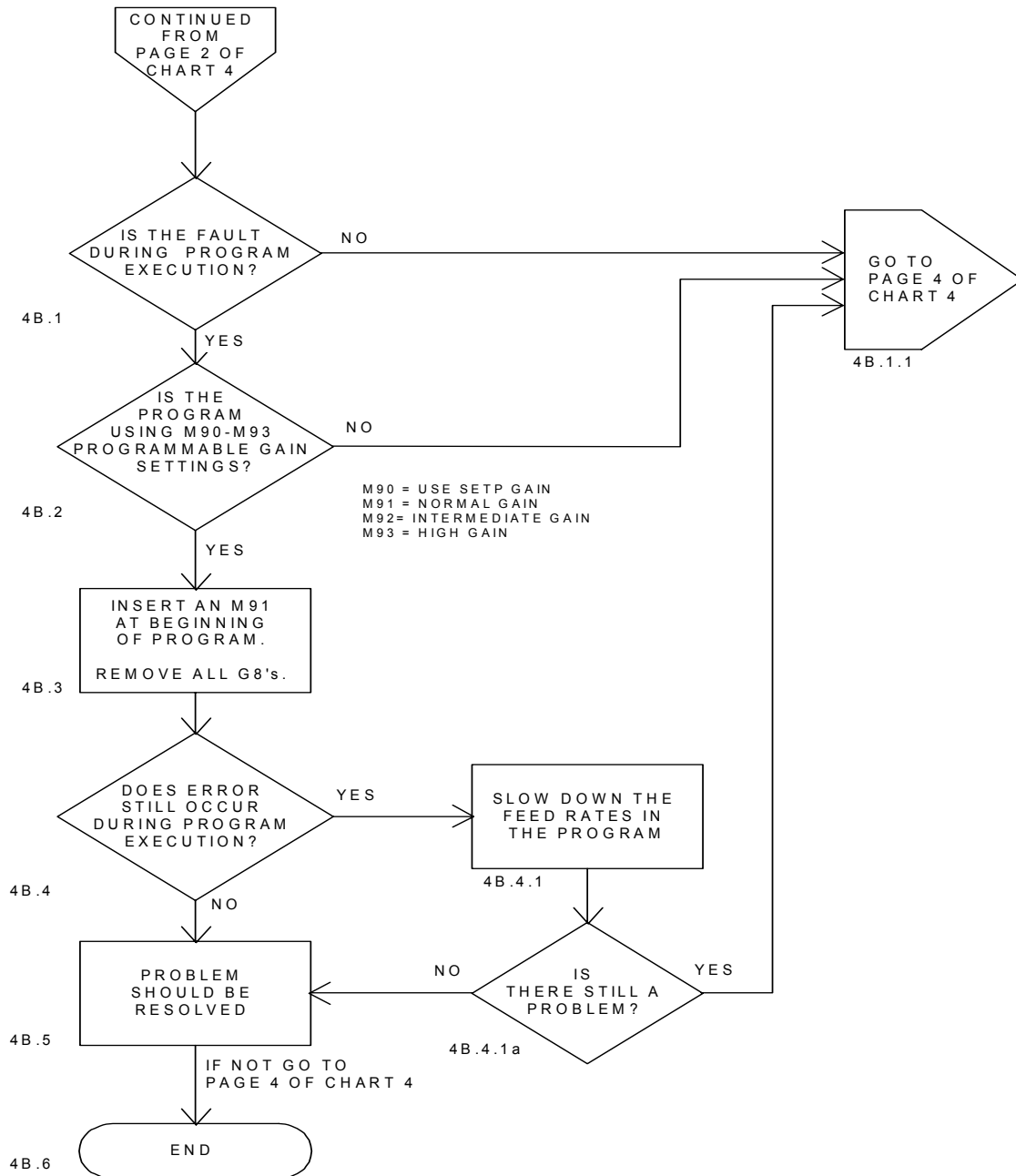


Figure 16-10 Axis Control (Continued)

# **CHART 4** continued (page 3) **AXIS CONTROL**

6-15-95

## **MOTOR OVERLOADS**



*Figure 16-11* Axis Control (Continued)

## MOTOR OVERLOADS

## CHART 4 continued (page 4)

## AXIS CONTROL

6-15-95

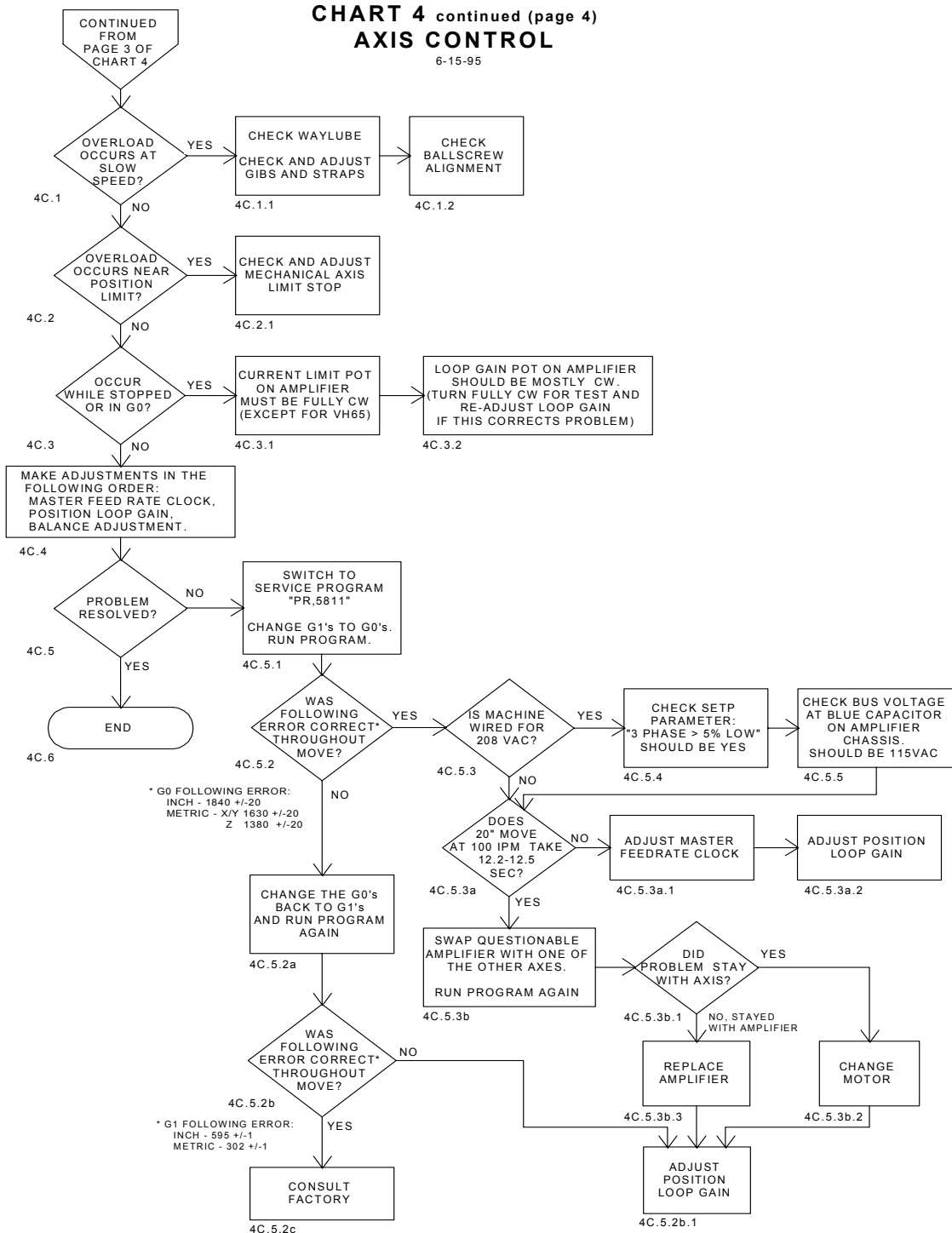


Figure 16-12 Axis Control (Continued)

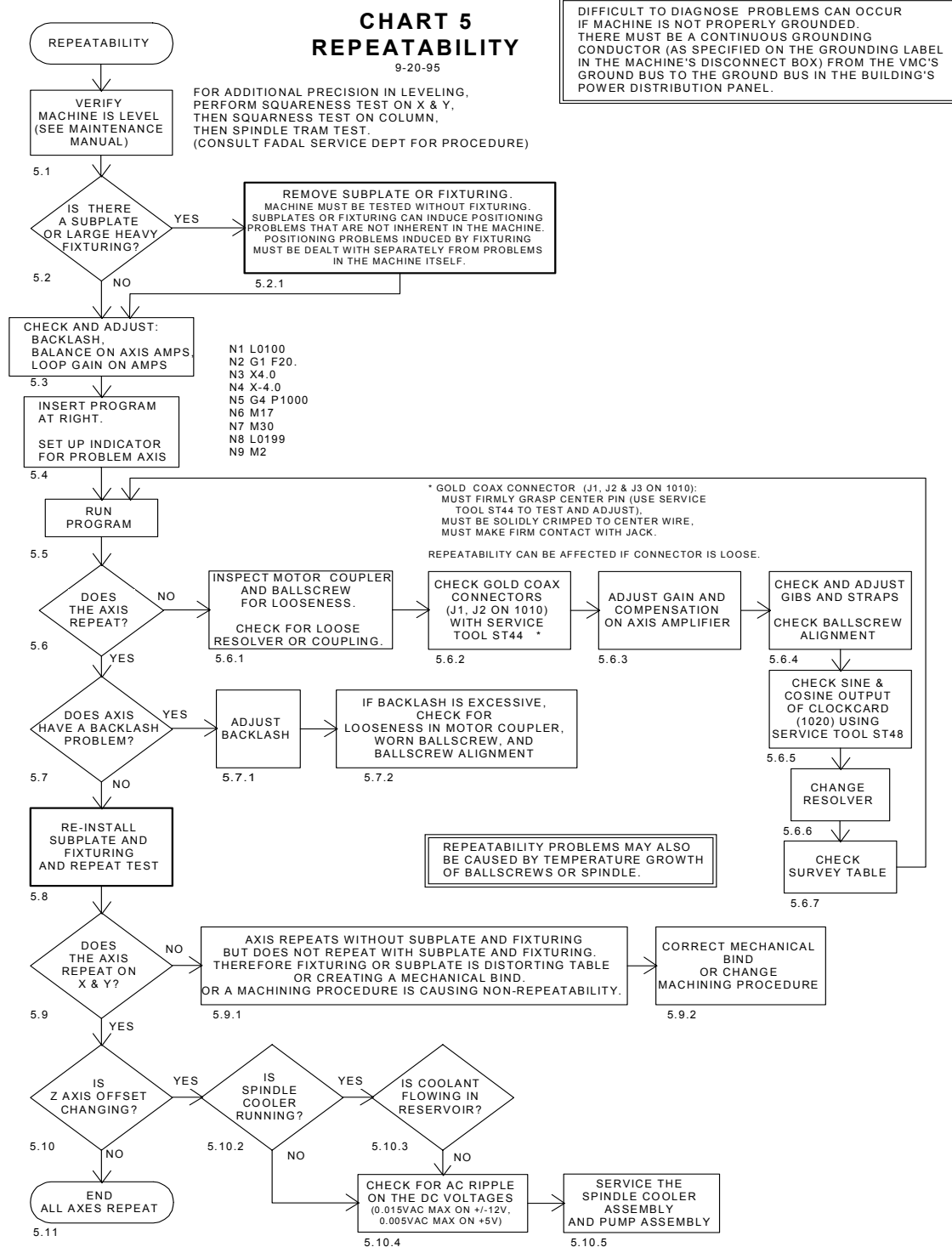


Figure 16-13 Repeatability

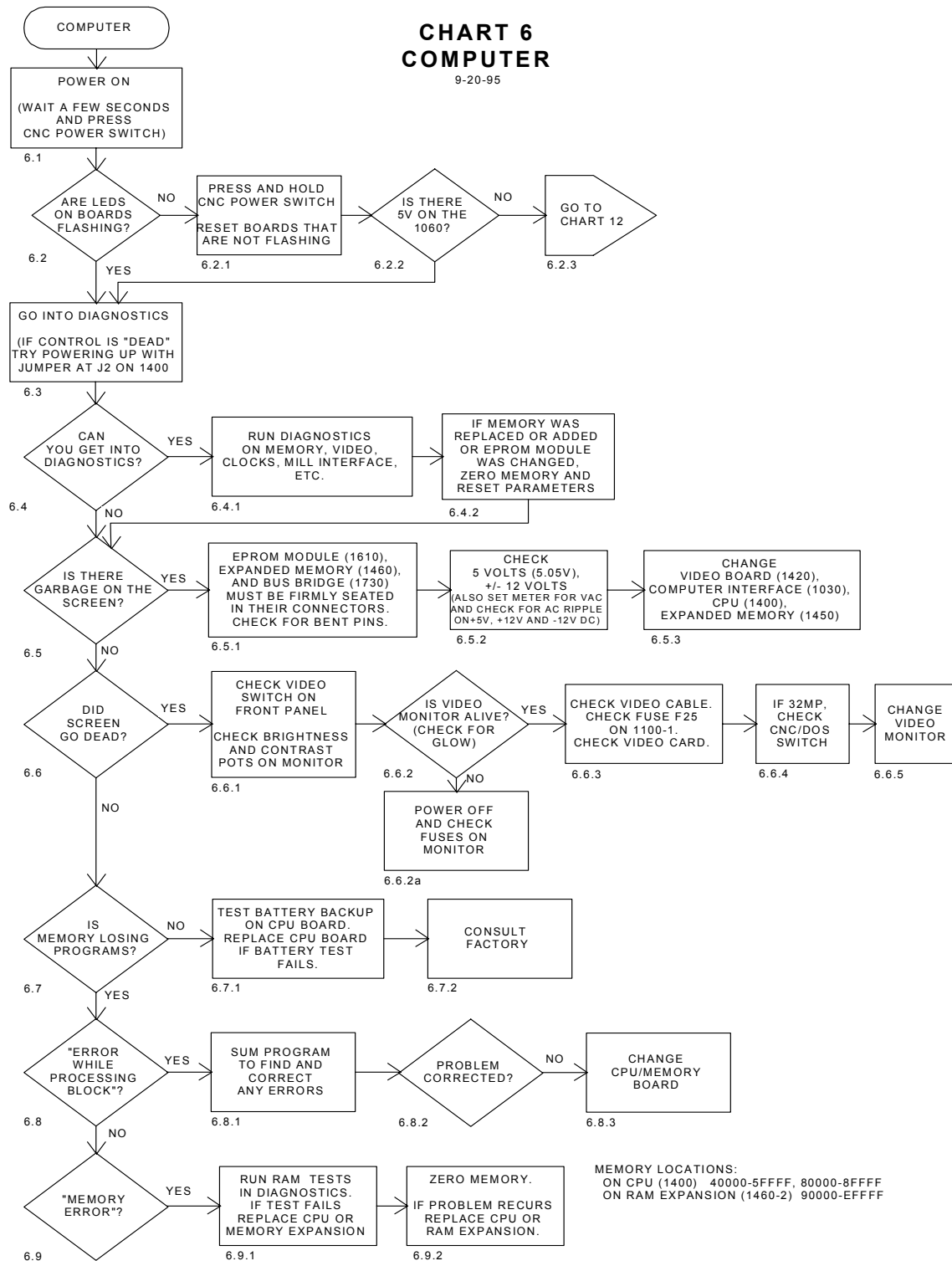


Figure 16-14 Computer

## CHART 7 AXIS MOTOR RUNAWAYS

6-15-95

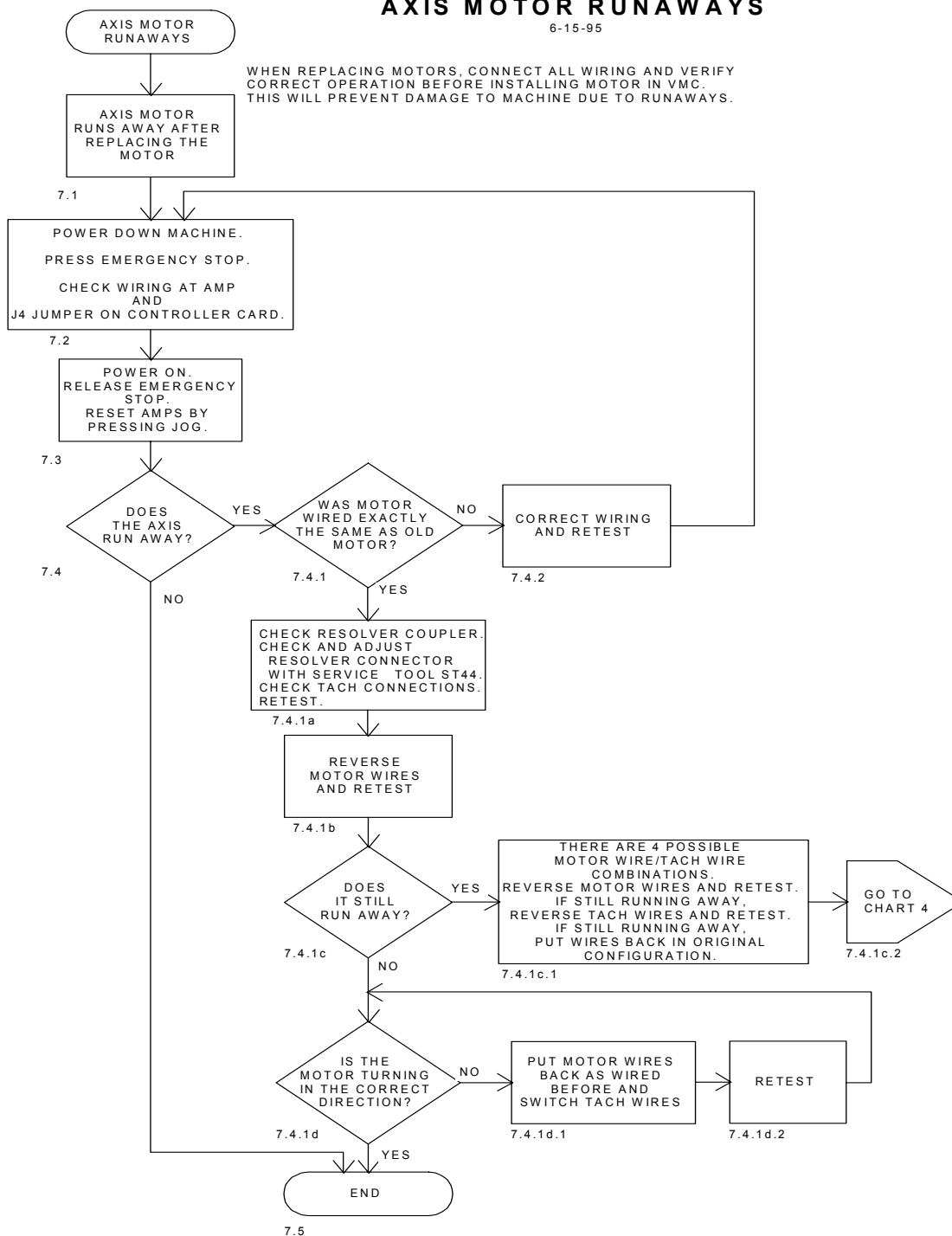


Figure 16-15 Axis Motor Runways



**Table 1: Baldor SWE0 Spindle Drive Error Messages**

DESCRIPTION	ALARM DISPLAY
This fault occurs when the main bus supply voltage has gone too low, even momentarily.	DCLO
This fault occurs when the main bus supply voltage has gone too high, even momentarily.	DCHI
These faults are usually the result of an excessive load on the drive output. The fault condition can be permanent, occurring when the drive is enabled, or intermittent, occurring randomly during normal operation.	PH-1 PH-2 PH-3
Motor is over temperature.	OH E
Baldor SWE0 drive is over temperature.	OH C
Overspeed on the motor has been detected.	OSP
The Baldor SWE0 power supply has momentarily experienced a reduction of the +/- 15 volts below allowable levels.	15DC
Spindle motor has overloaded.	OL
Spindle motor is not properly connected, to torque.	I LO
Drive cannot follow the speed command within the error band setting.	F. ERR
Parameters need to be reloaded.	PAR
Power has been interrupted.	UP
EPROMs have faulted.	PROG

**Table 2: Z200/Z300 Spindle Drive Error Messages**

DESCRIPTION	ALARM DISPLAY
Inverter output current exceeded the overcurrent limit during acceleration.	EOC1
Inverter output current exceeded the overcurrent limit during constant speed operation.	EOC2
Inverter output current exceeded the overcurrent limit during deceleration.	EOC3
Braking regenerative power from motor exceeded the regenerative overvoltage limit.	EOVT
Electronic thermal relay in the inverter was activated (current is below 150% of preset current).	ETHM
Electronic thermal relay in the inverter was activated (current is over 150% of preset current).	ETHT
Instantaneous power failure protective function was activated.	EIPF
Temperature of transistor heatsink exceeded the specified limit.	EFIN
Brake transistor fault detection.	E BE

Table 2: Z200/Z300 Spindle Drive Error Messages

DESCRIPTION	ALARM DISPLAY
Stall preventative function was activated during constant speed operation and stopped the motor.	EOLT
Memory in the inverter is corrupted.	E PE
Inverter input voltage fell below the specified limit.	EUVT
Overcurrent due to earth fault on the inverter output side.	E GF
Externally installed thermal relay activated (overheat).	EOHT
Built-in optional unit connection failure during operation	EOPT

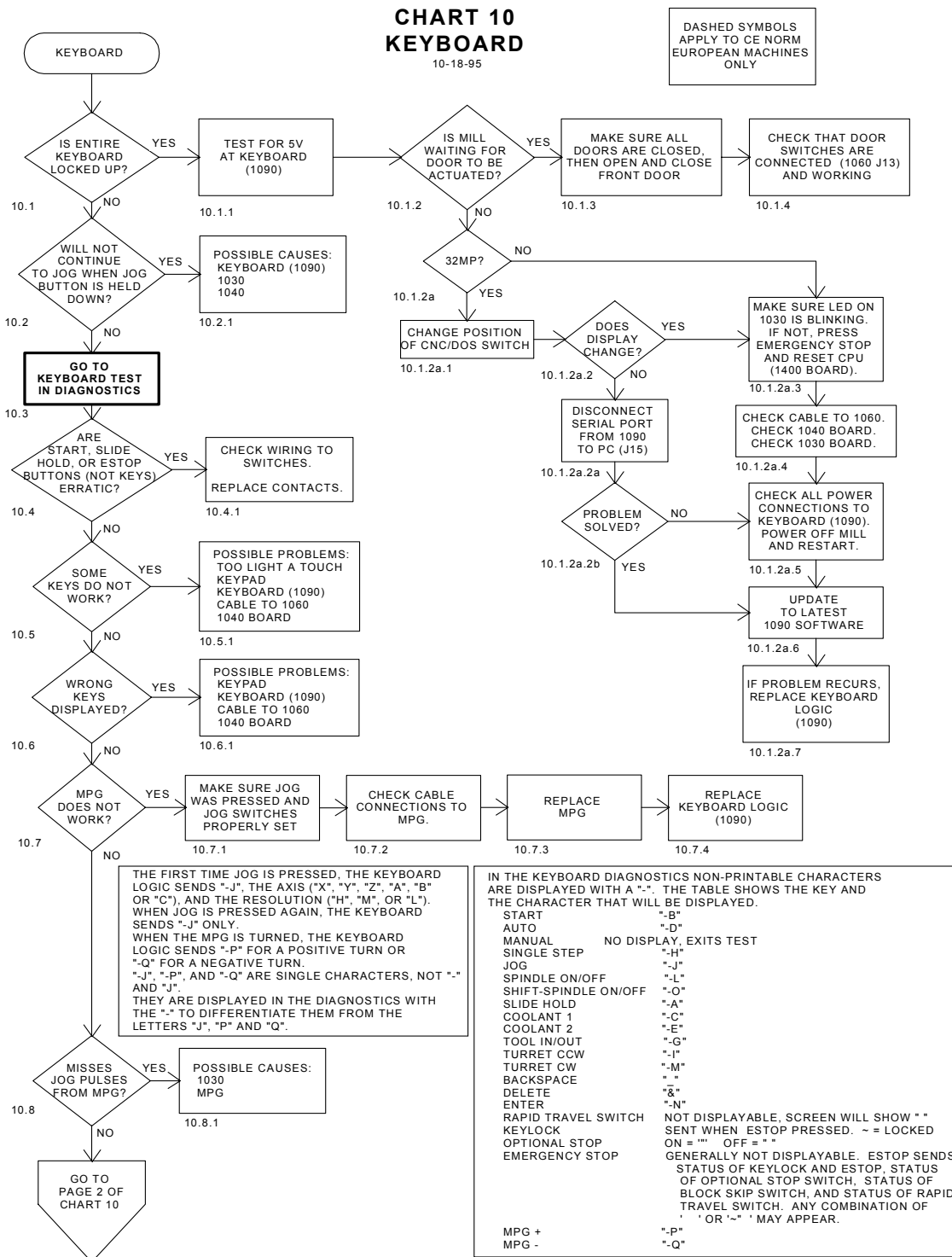


Figure 16-16 Keyboard

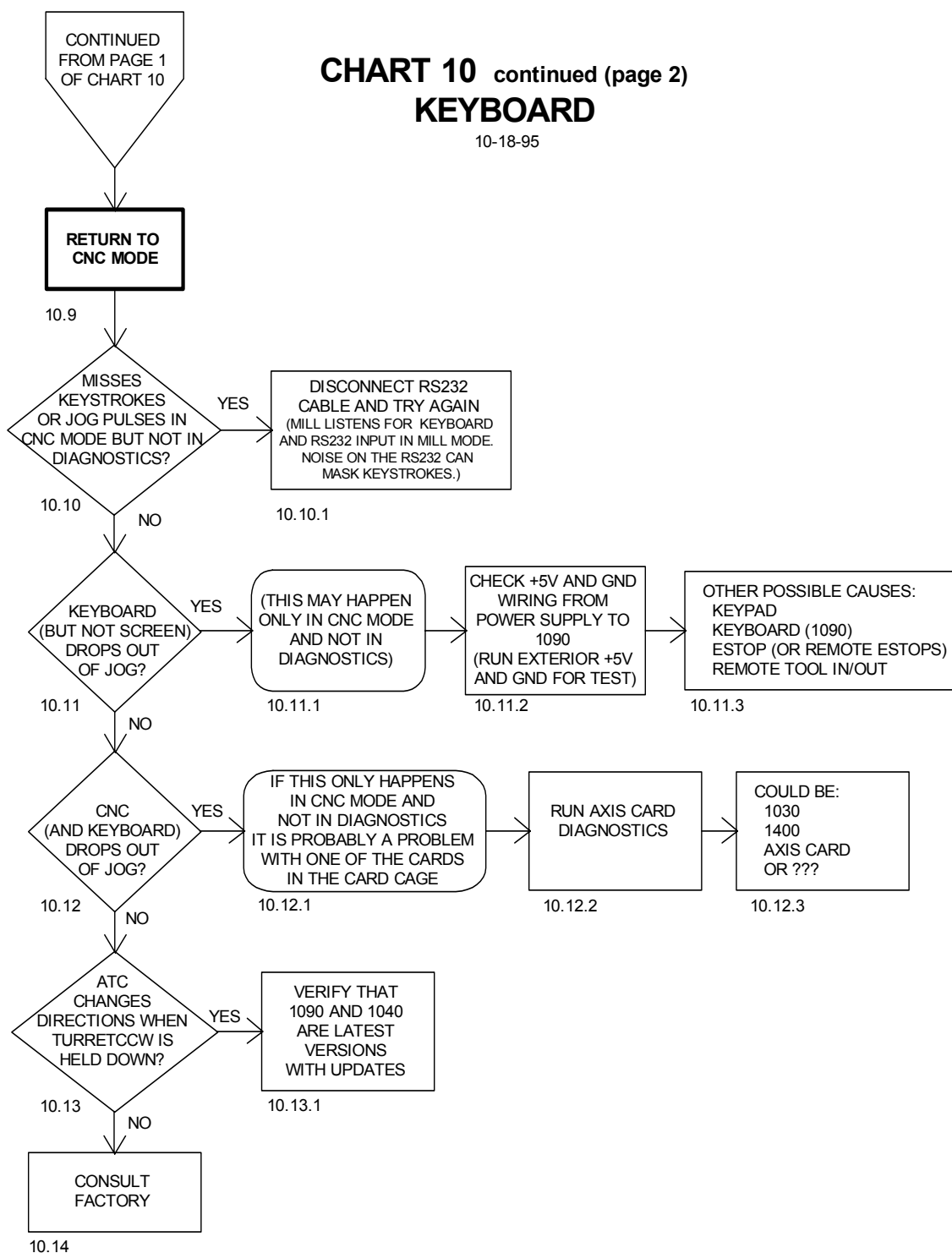


Figure 16-17 Keyboard (Continued)

## CHART 11 FINISH PROBLEMS

10-20-95

DIFFICULT TO DIAGNOSE PROBLEMS CAN OCCUR IF MACHINE IS NOT PROPERLY GROUNDED. THERE MUST BE A CONTINUOUS GROUNDING CONDUCTOR (AS SPECIFIED ON THE GROUNDING LABEL IN THE MACHINE'S DISCONNECT BOX) FROM THE VMC'S GROUND BUS TO THE GROUND BUS IN THE BUILDING'S POWER DISTRIBUTION PANEL.

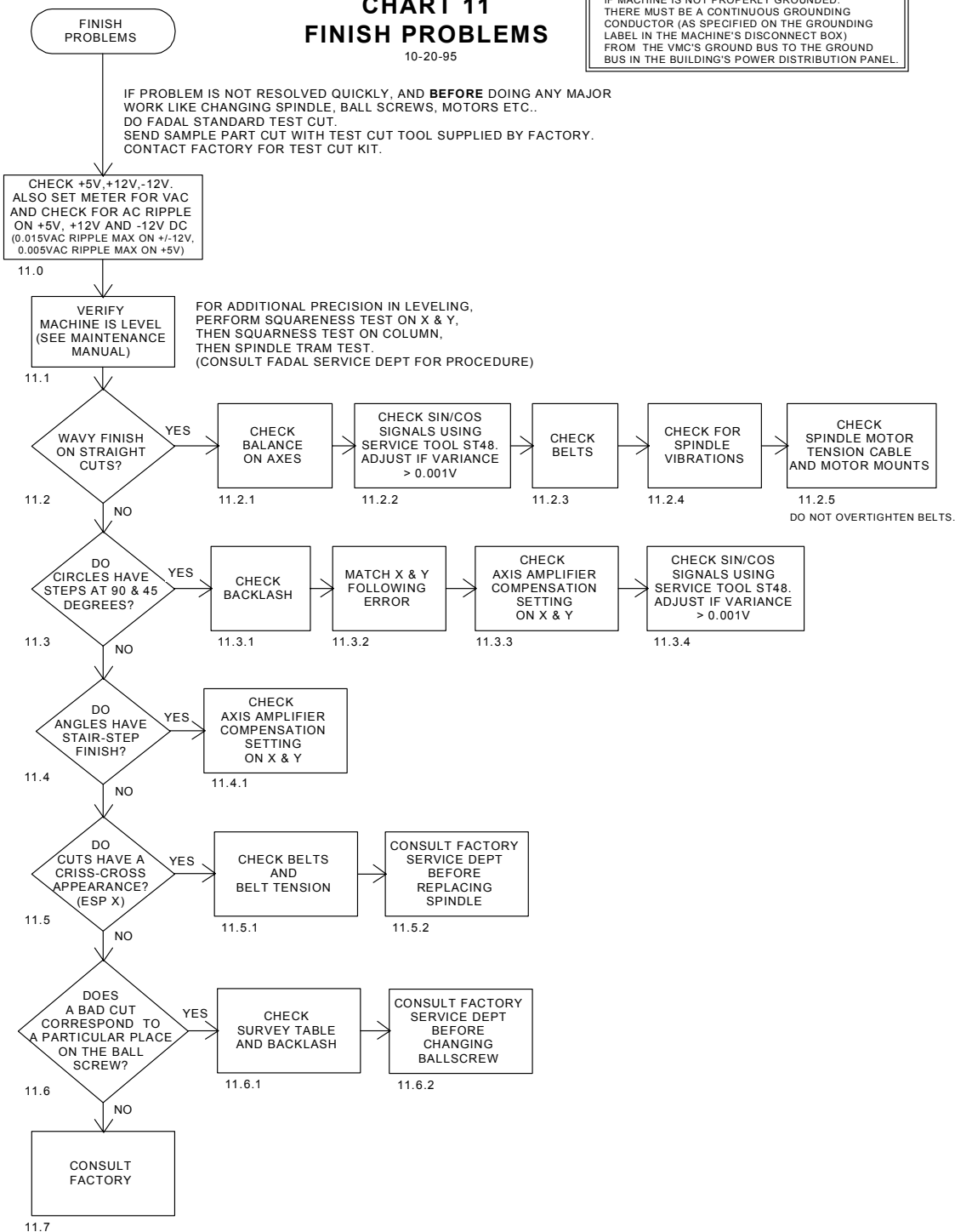


Figure 16-18 Finish Problems

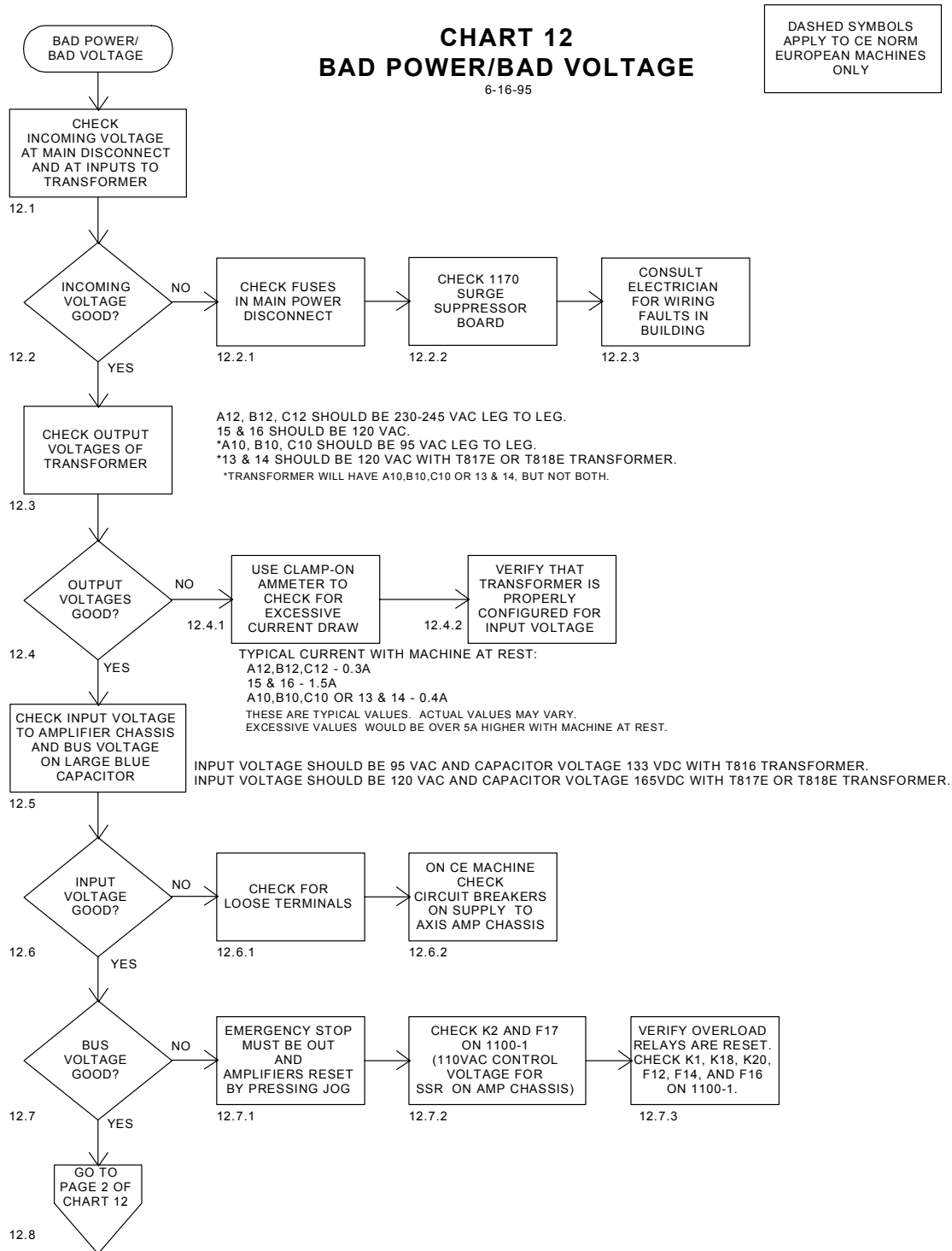
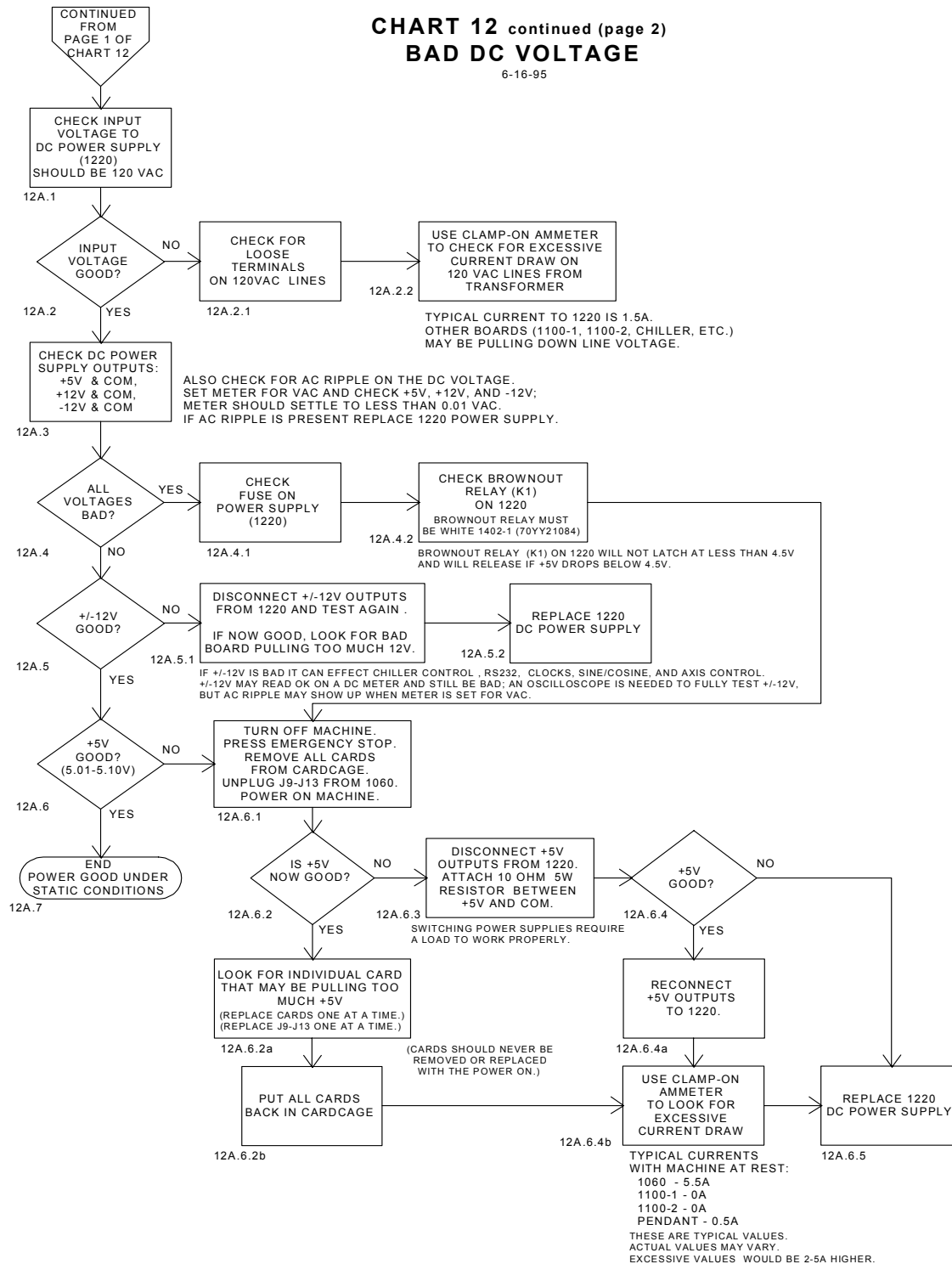


Figure 16-19 Bad Power/Bad Voltage

**CHART 12 continued (page 2)**  
**BAD DC VOLTAGE**

6-16-95



*Figure 16-20* Bad DC Voltage (Continued)

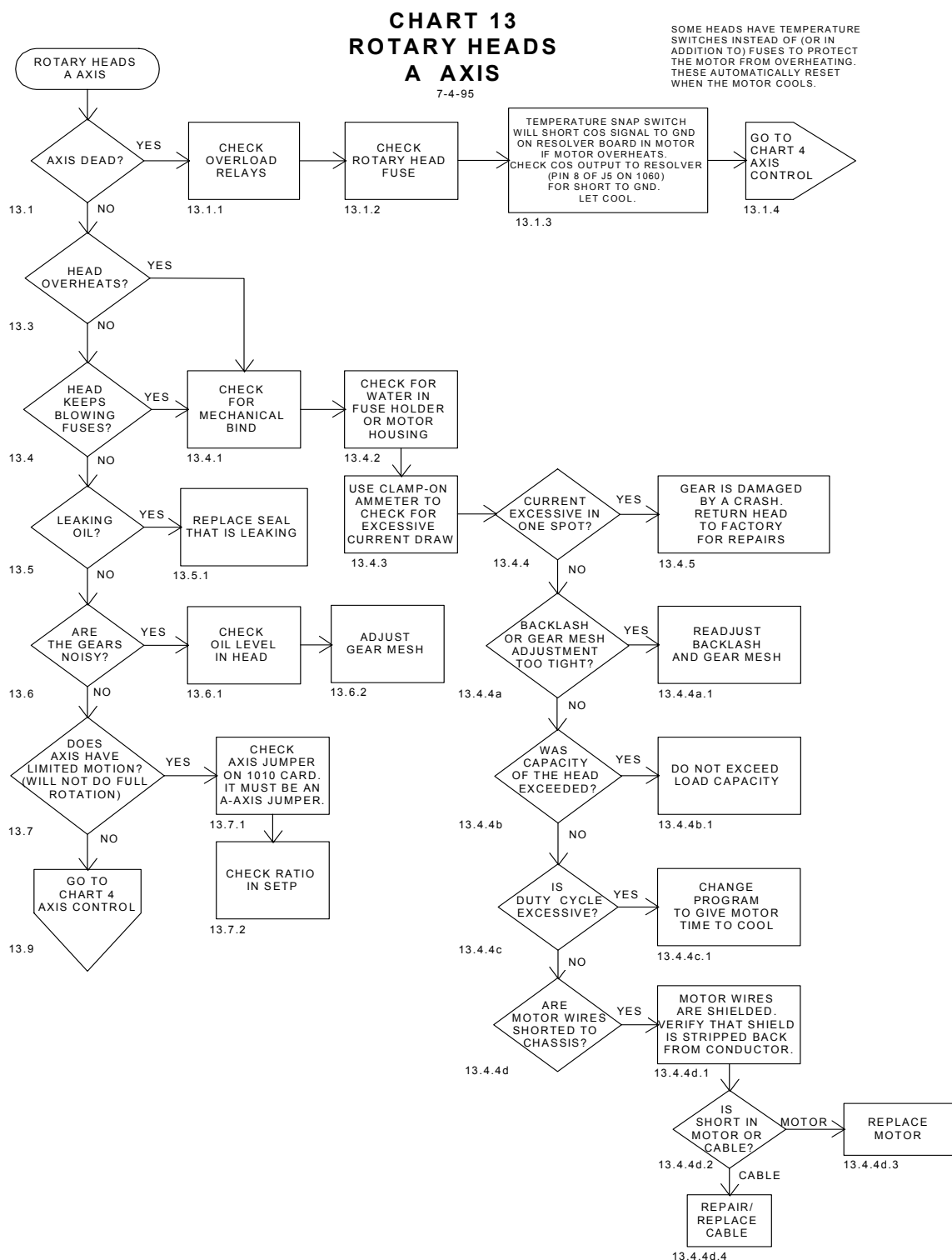


Figure 16-21 Rotary Heads A Axis



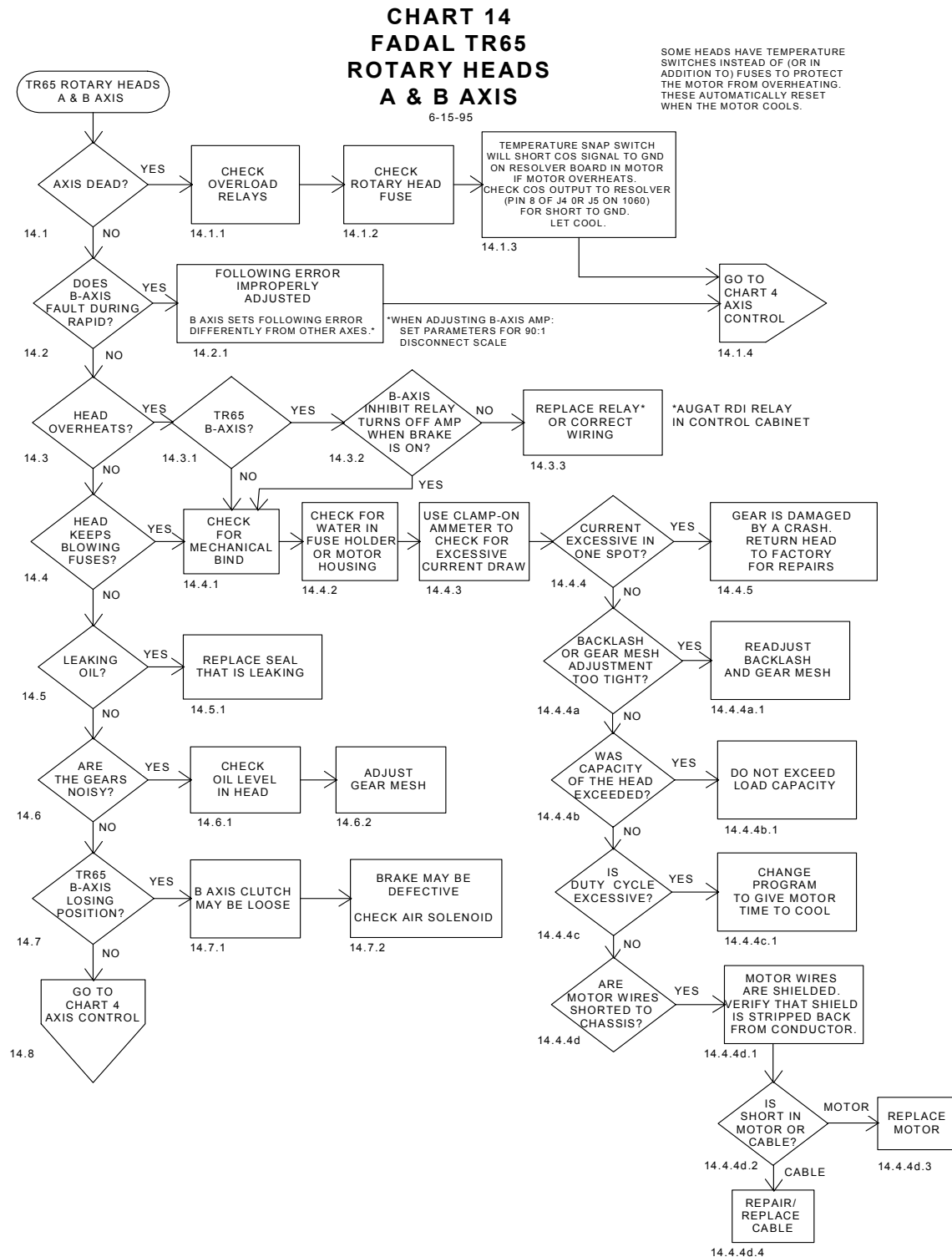


Figure 16-22 TR65 Rotary Heads A & B Axes

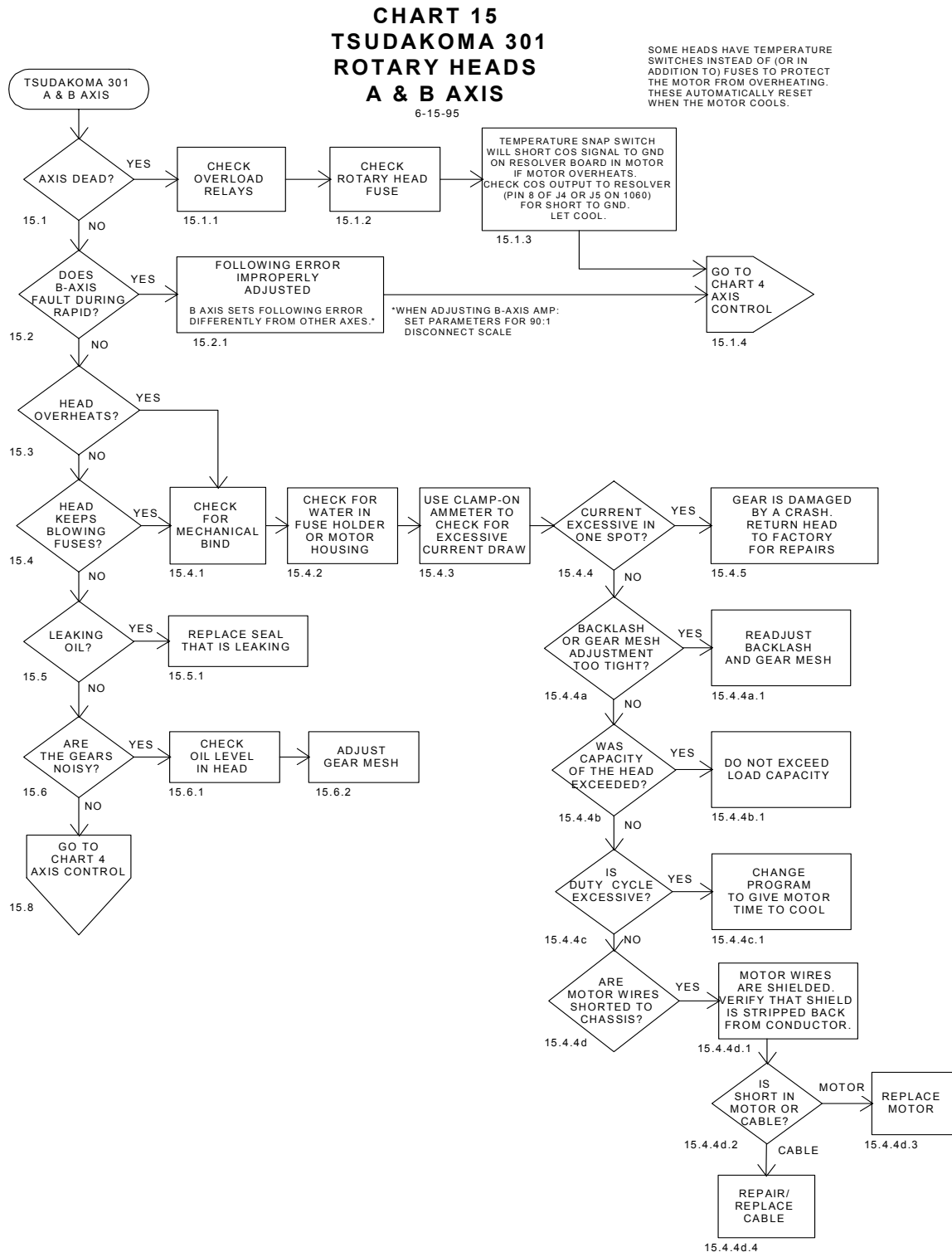


Figure 16-23 Tsudakoma 301 Rotary Heads A &amp; B Axes

## CHART 16 SERVO COOLANT CONTROL

12-5-95

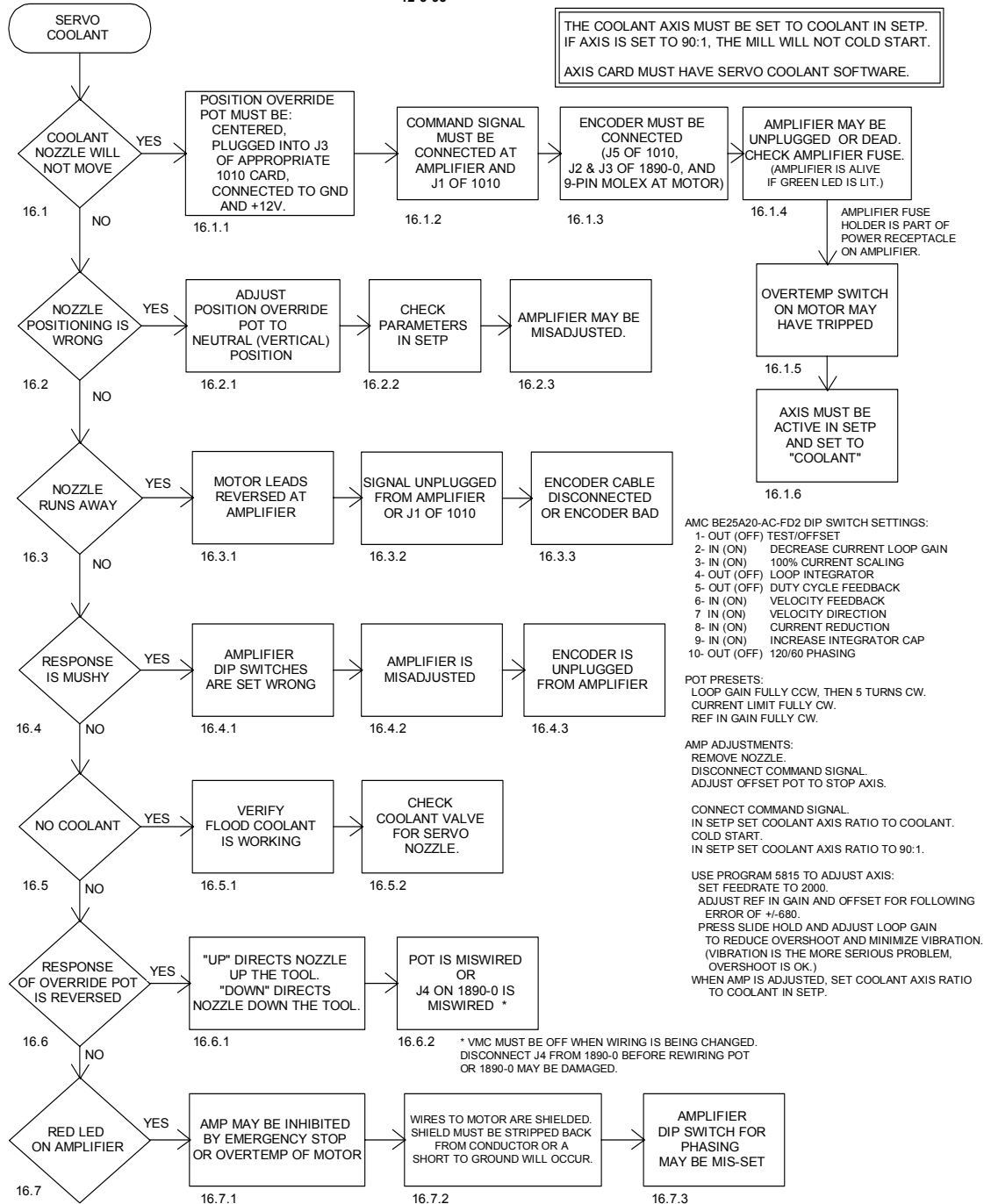


Figure 16-24 Servo Coolant Control

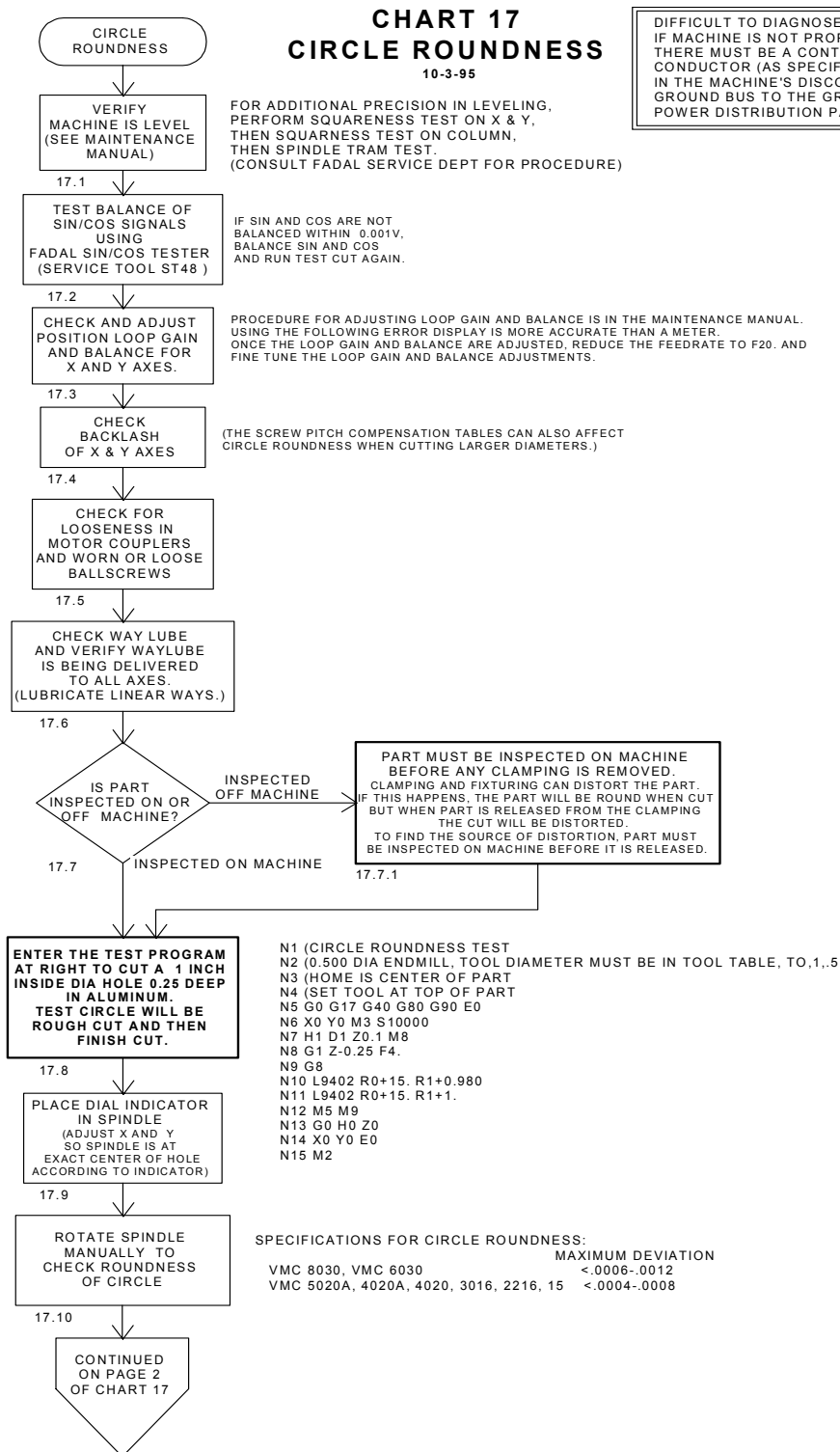
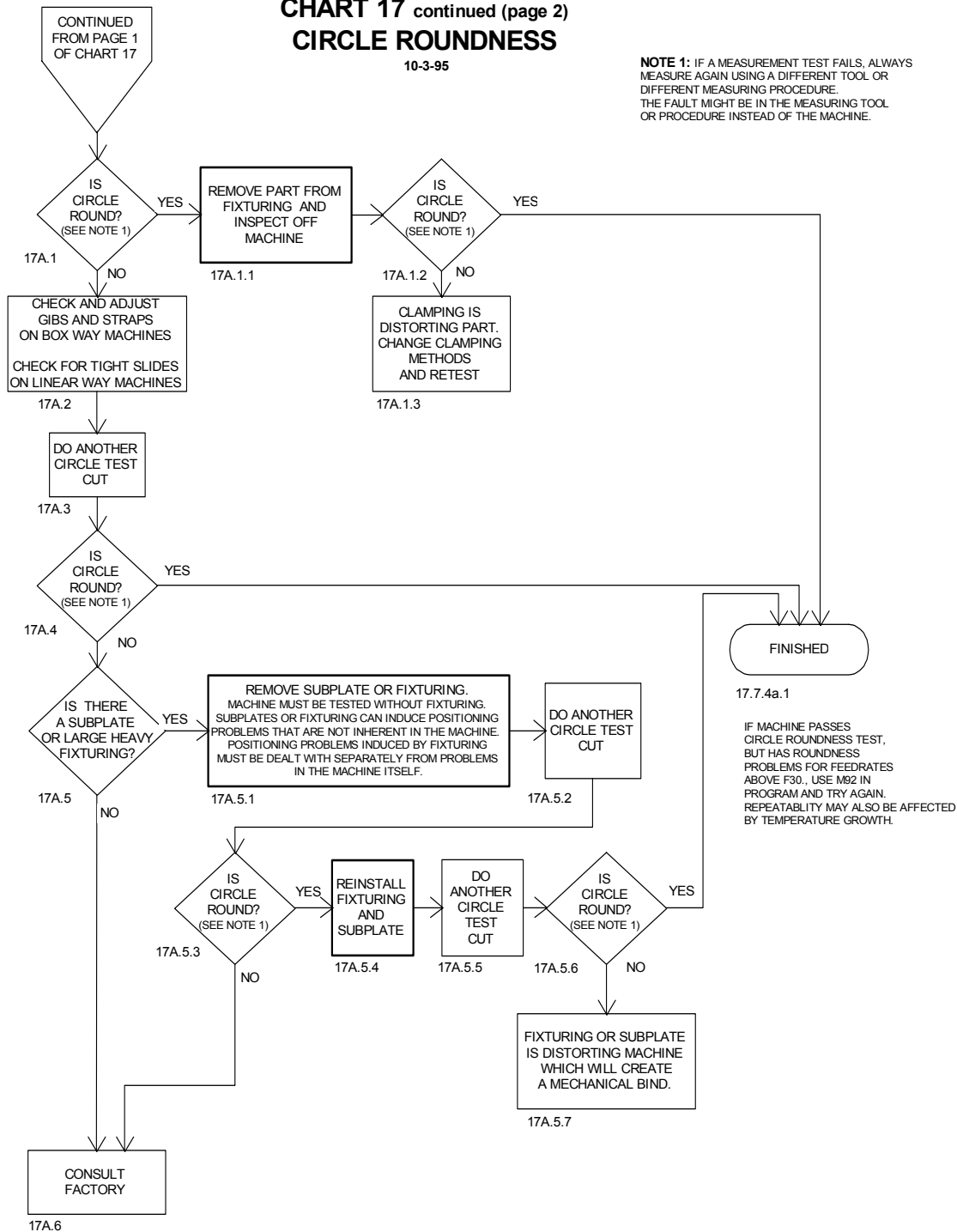


Figure 16-25 Circle Roundness

# **CHART 17 continued (page 2)** **CIRCLE ROUNDNESS**

10-3-95

**NOTE 1:** IF A MEASUREMENT TEST FAILS, ALWAYS MEASURE AGAIN USING A DIFFERENT TOOL OR DIFFERENT MEASURING PROCEDURE. THE FAULT MIGHT BE IN THE MEASURING TOOL OR PROCEDURE INSTEAD OF THE MACHINE.



**Figure 16-26** Circle Roundness (Continued)

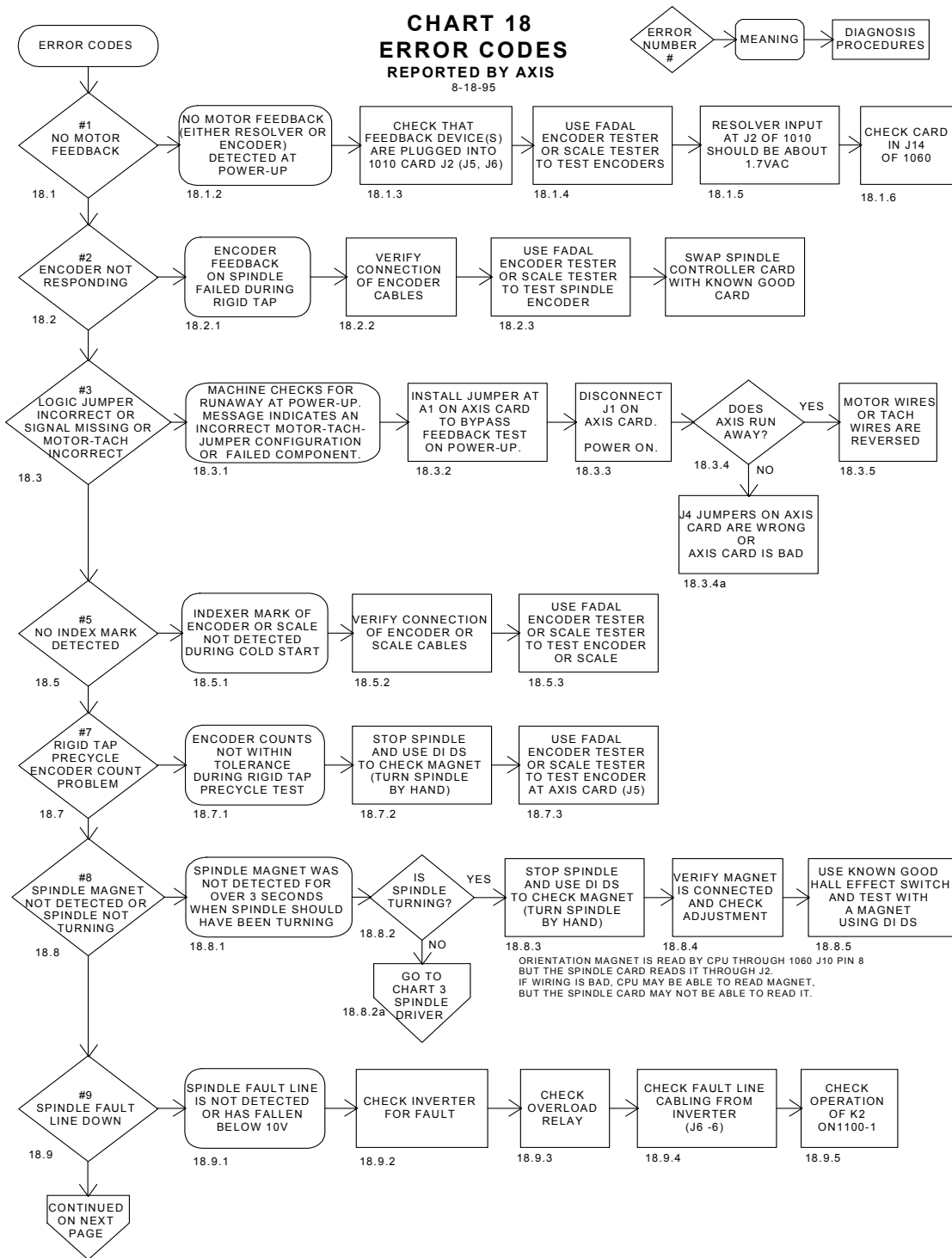


Figure 16-27 Error Codes

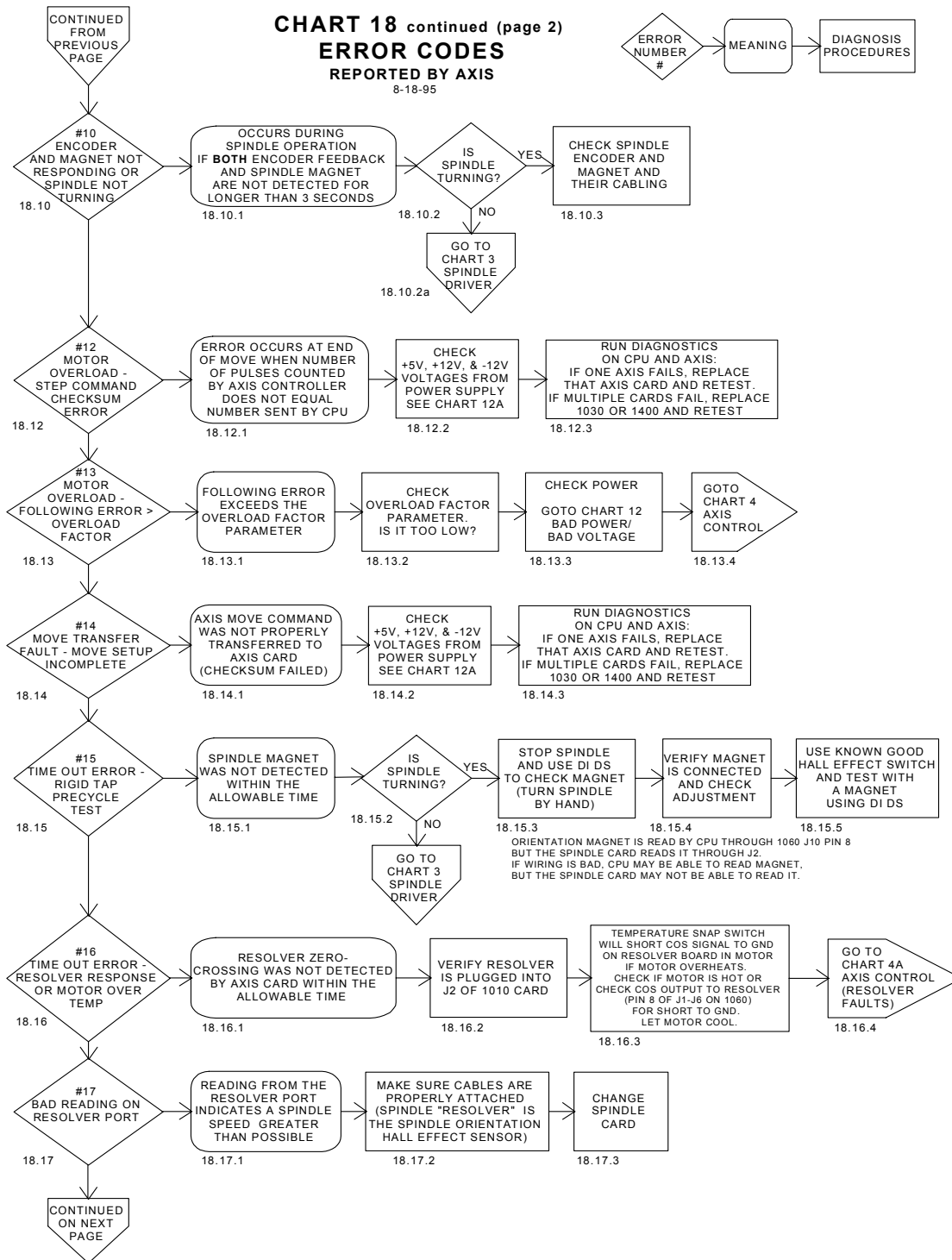


Figure 16-28 Error Codes (Continued)

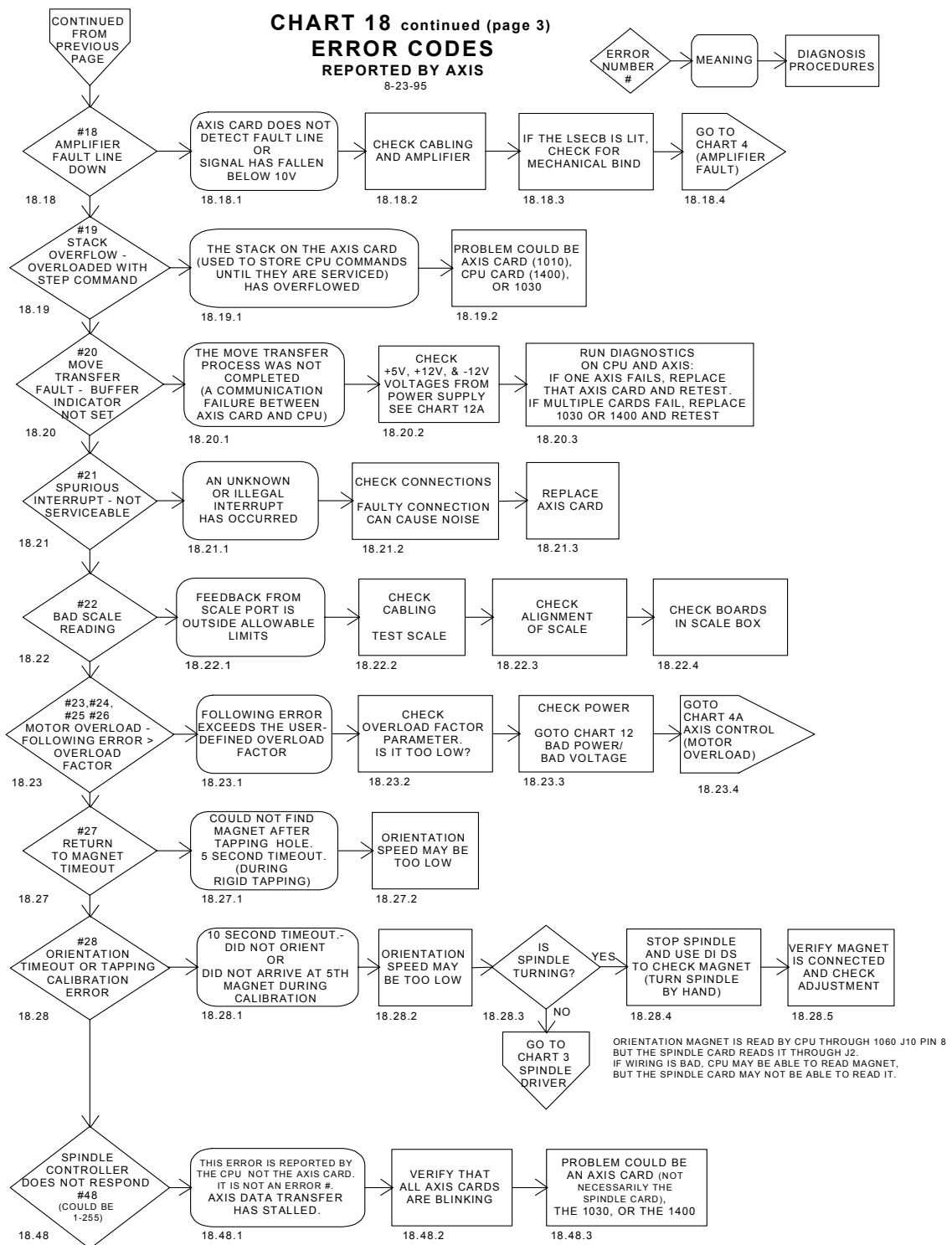
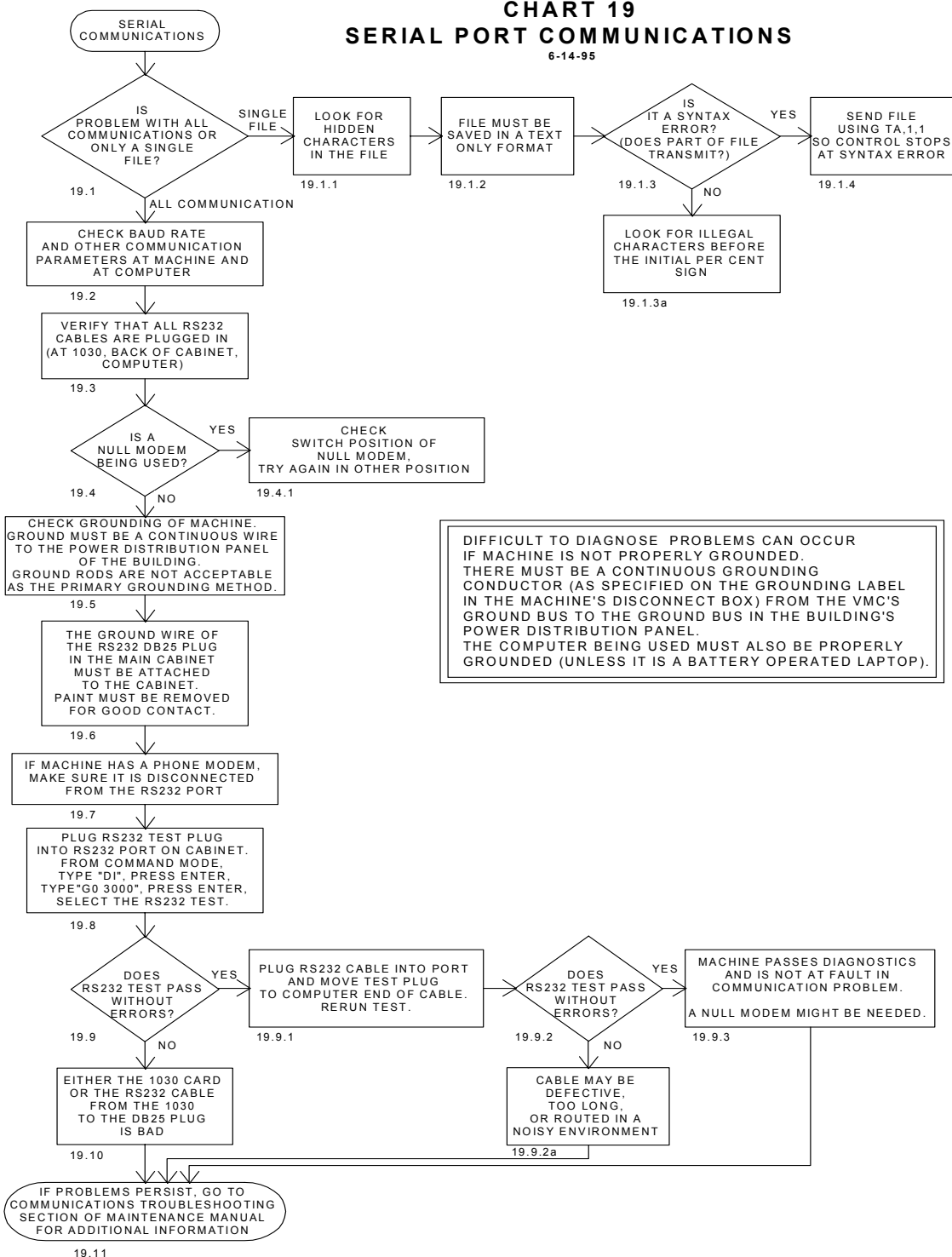


Figure 16-29 Error Codes

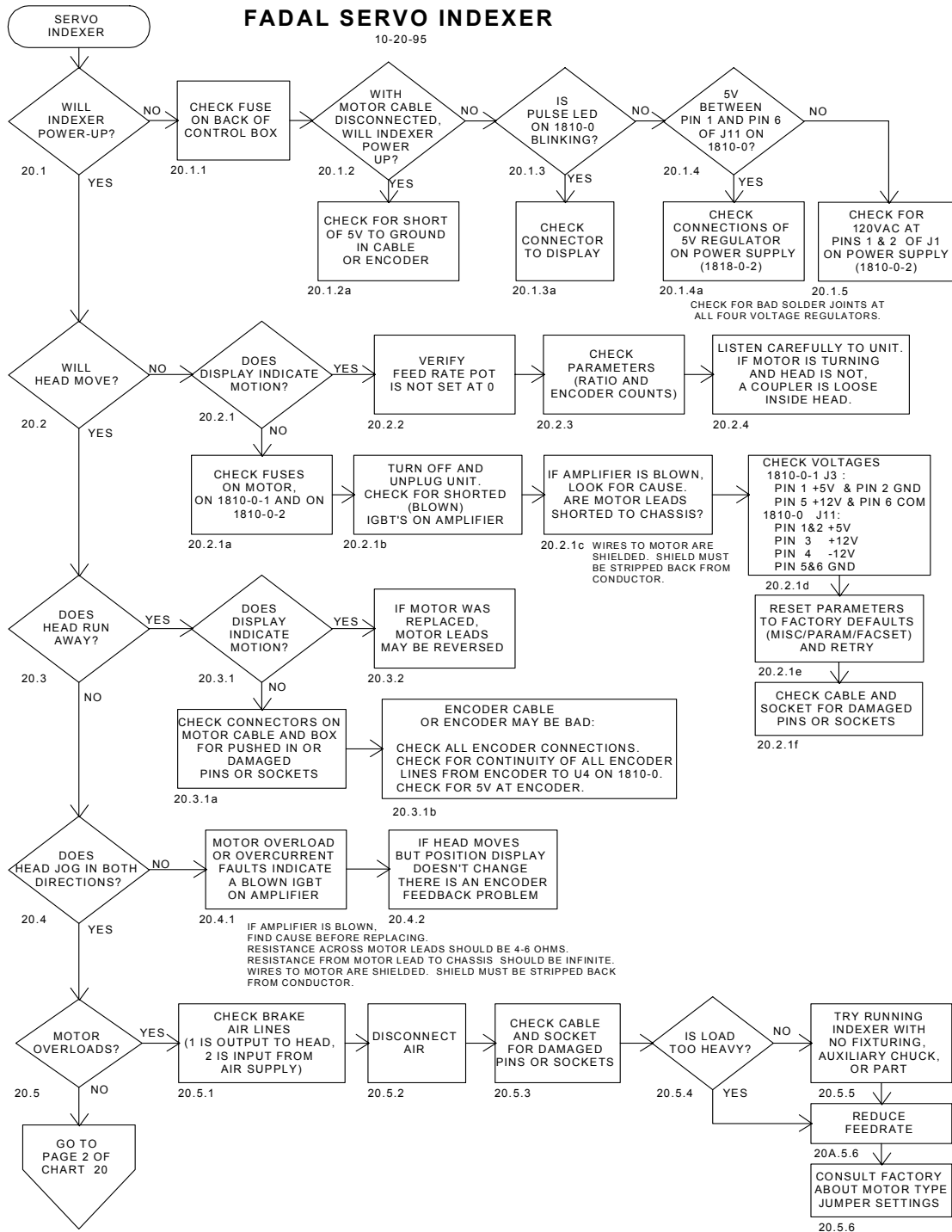


**CHART 19**  
**SERIAL PORT COMMUNICATIONS**  
6-14-95



*Figure 16-30* Serial Port Communications

**CHART 20**  
**FADAL SERVO INDEXER**



*Figure 16-31 Servo Indexer*

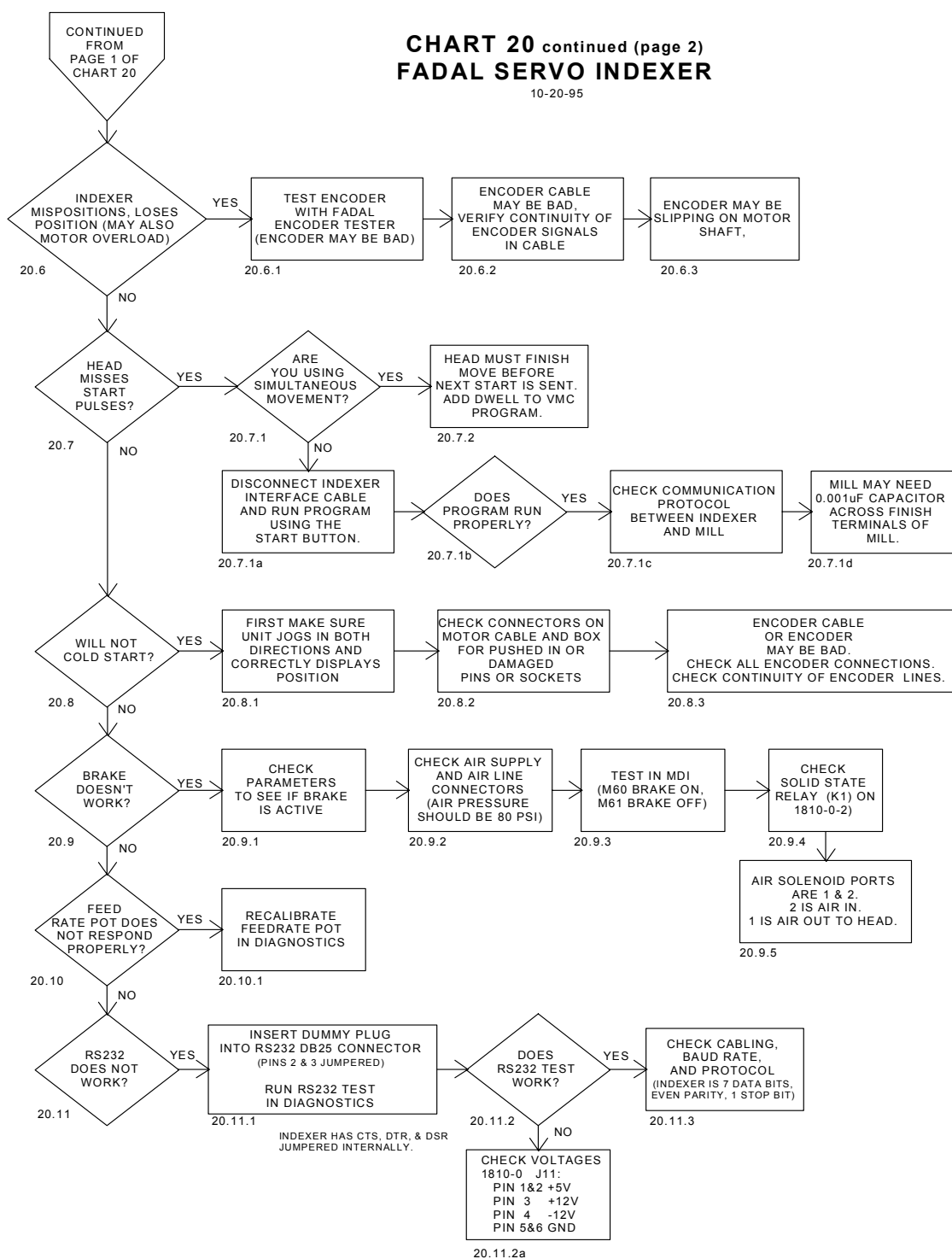


Figure 16-32 Servo Indexer (Continued)

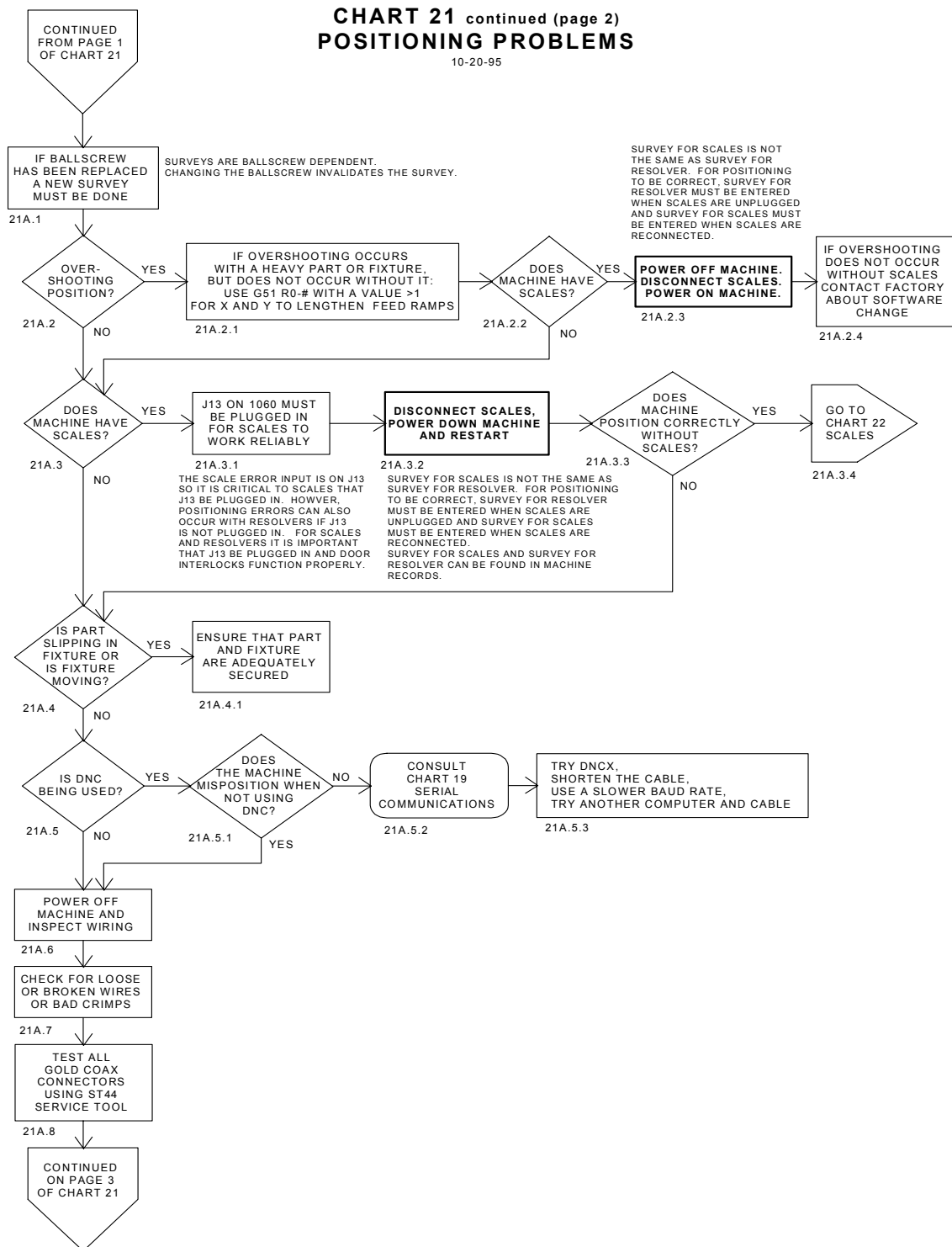


Figure 16-33 Positioning Problems

# **CHART 21 continued (page 3)** **POSITIONING PROBLEMS**

10-20-95

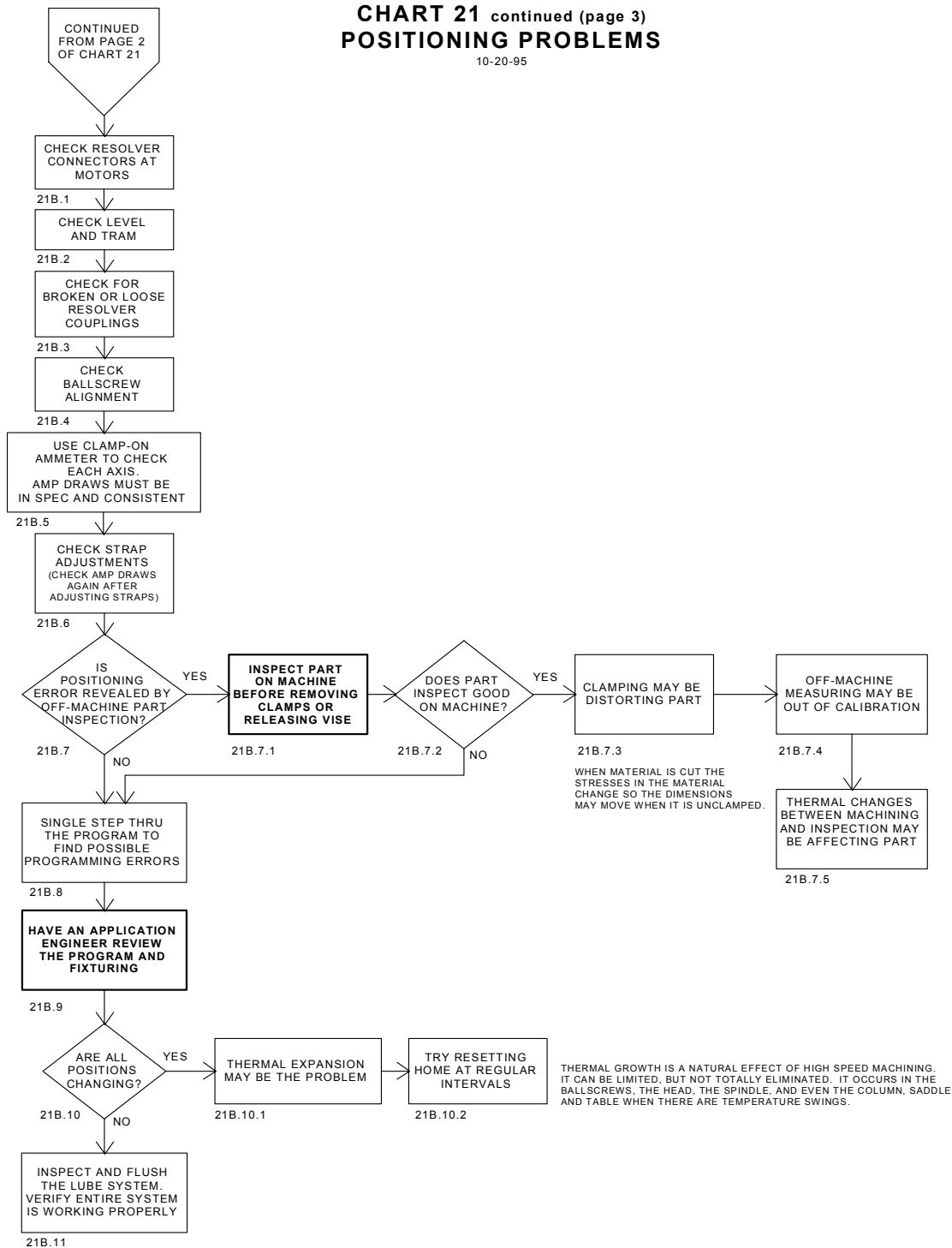


Figure 16-34 Positioning Problems

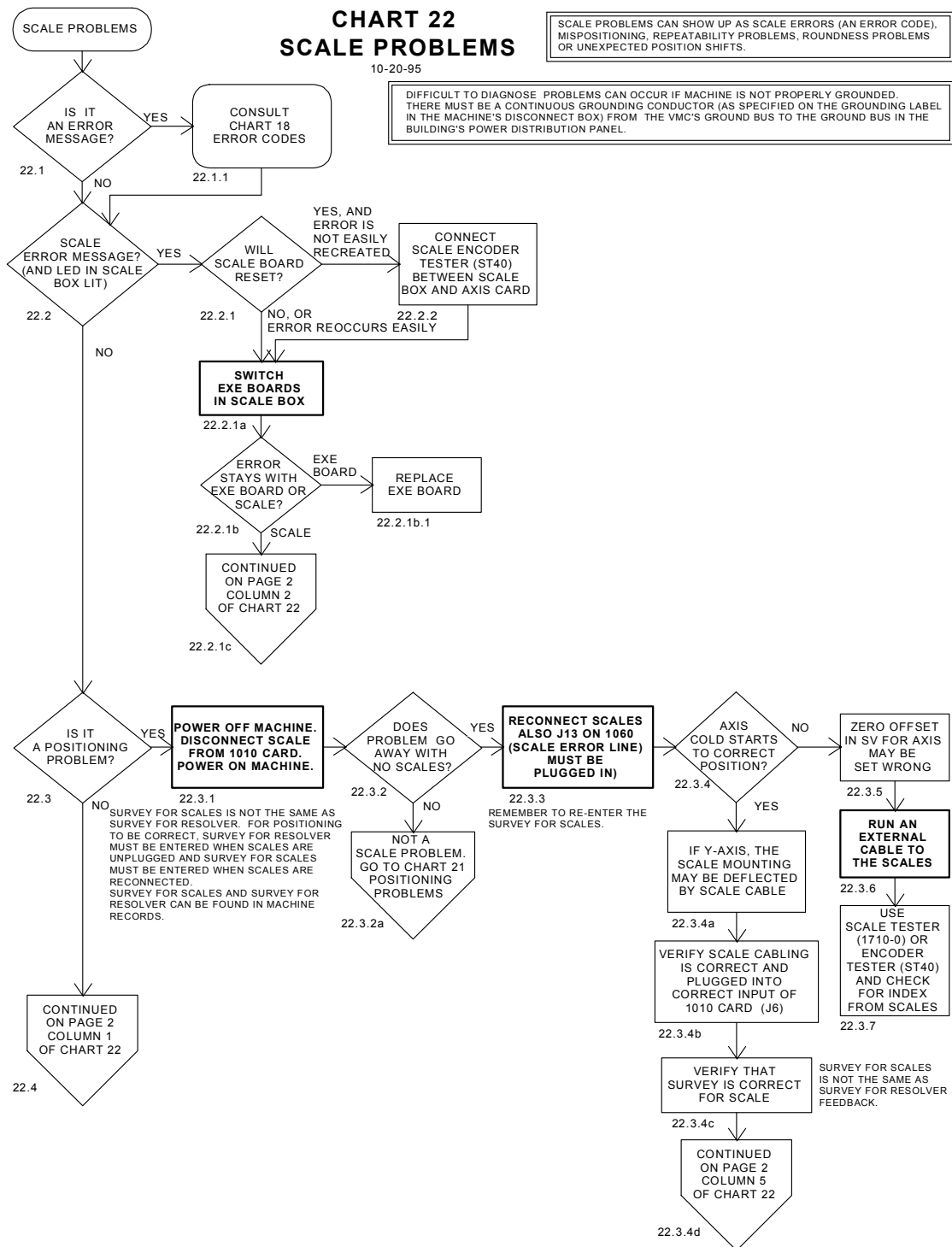


Figure 16-35 Scale Problems

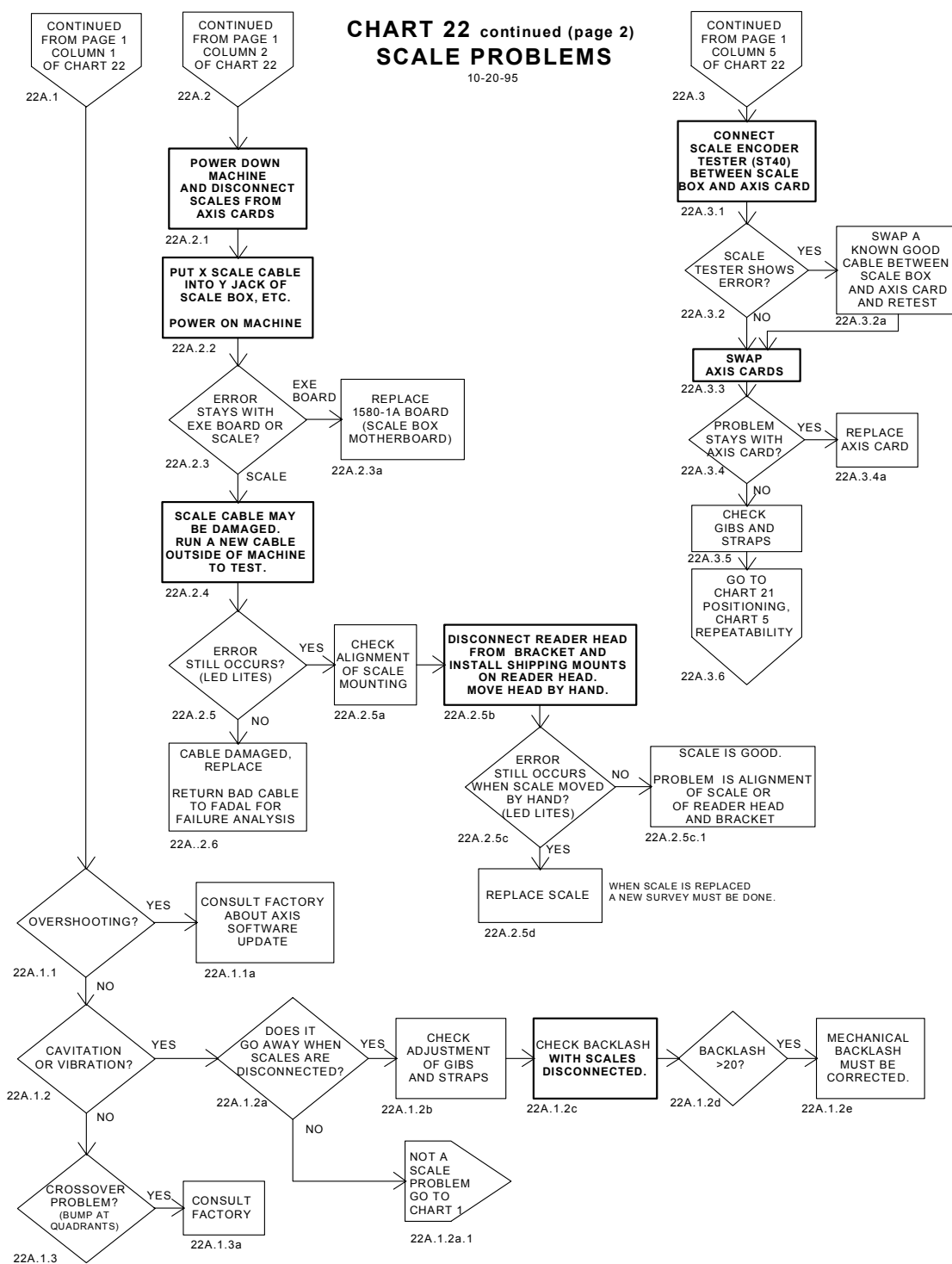


Figure 16-36 Scale Problems (Continued)

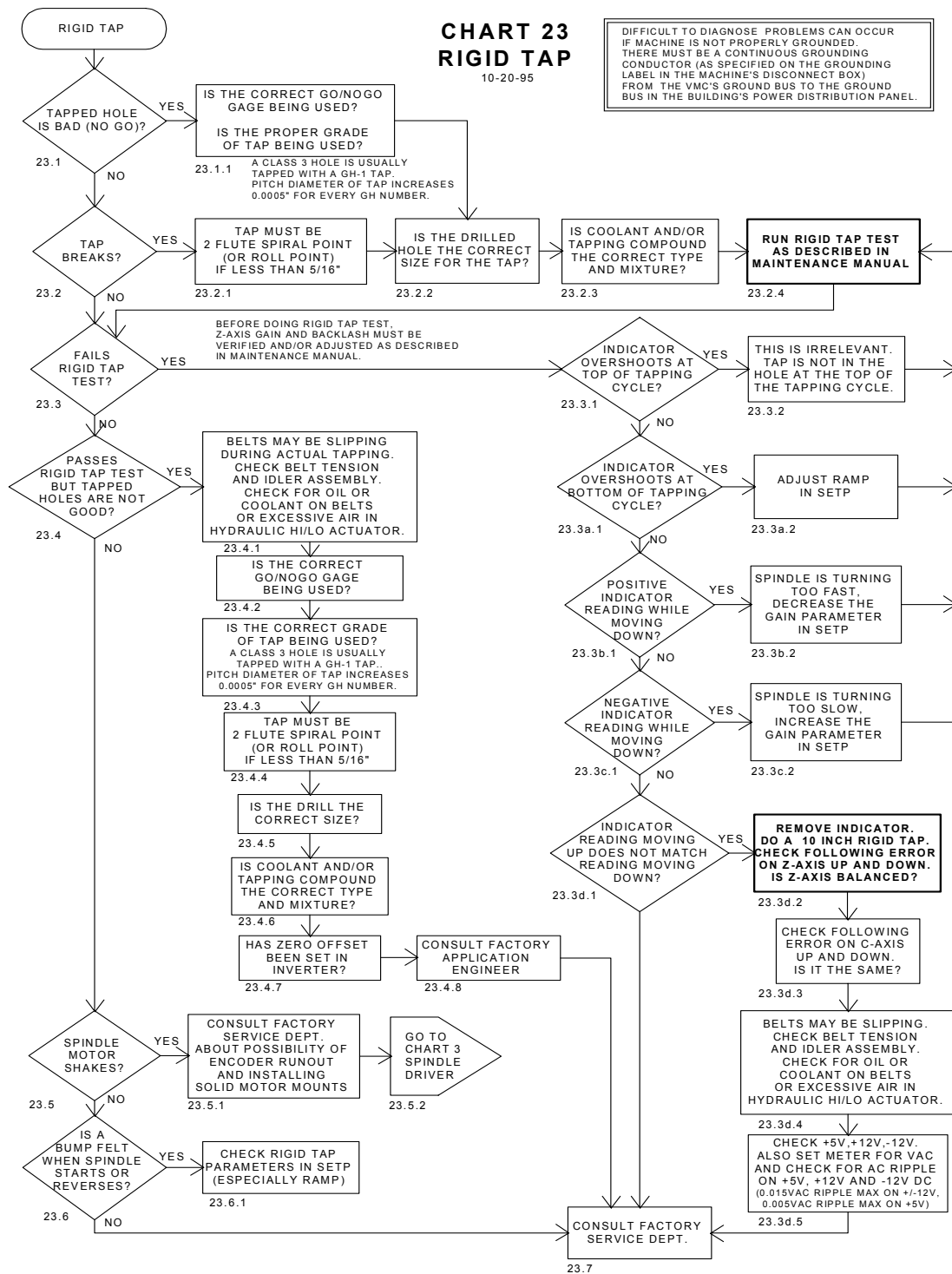


Figure 16-37 Rigid Tap



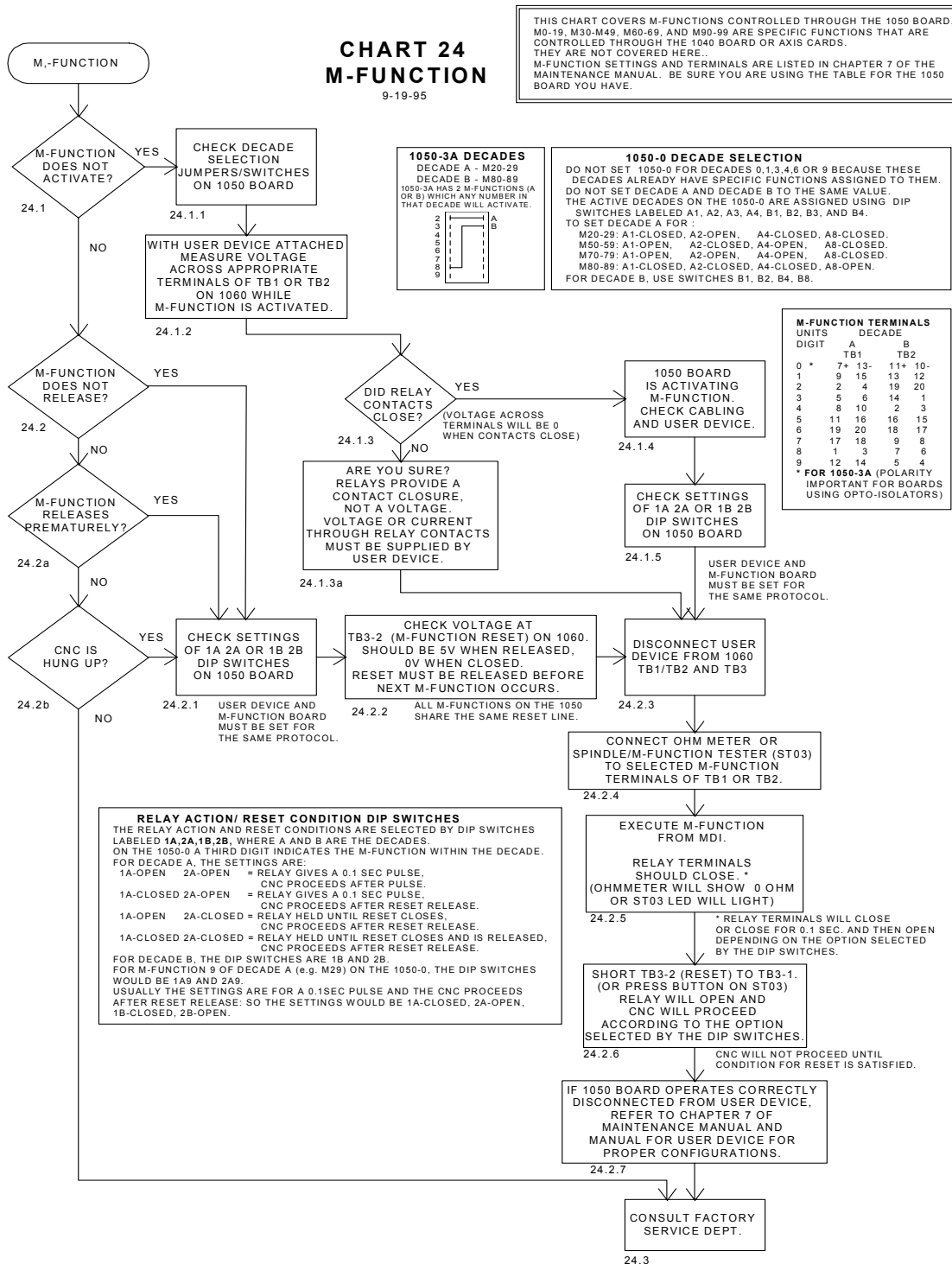
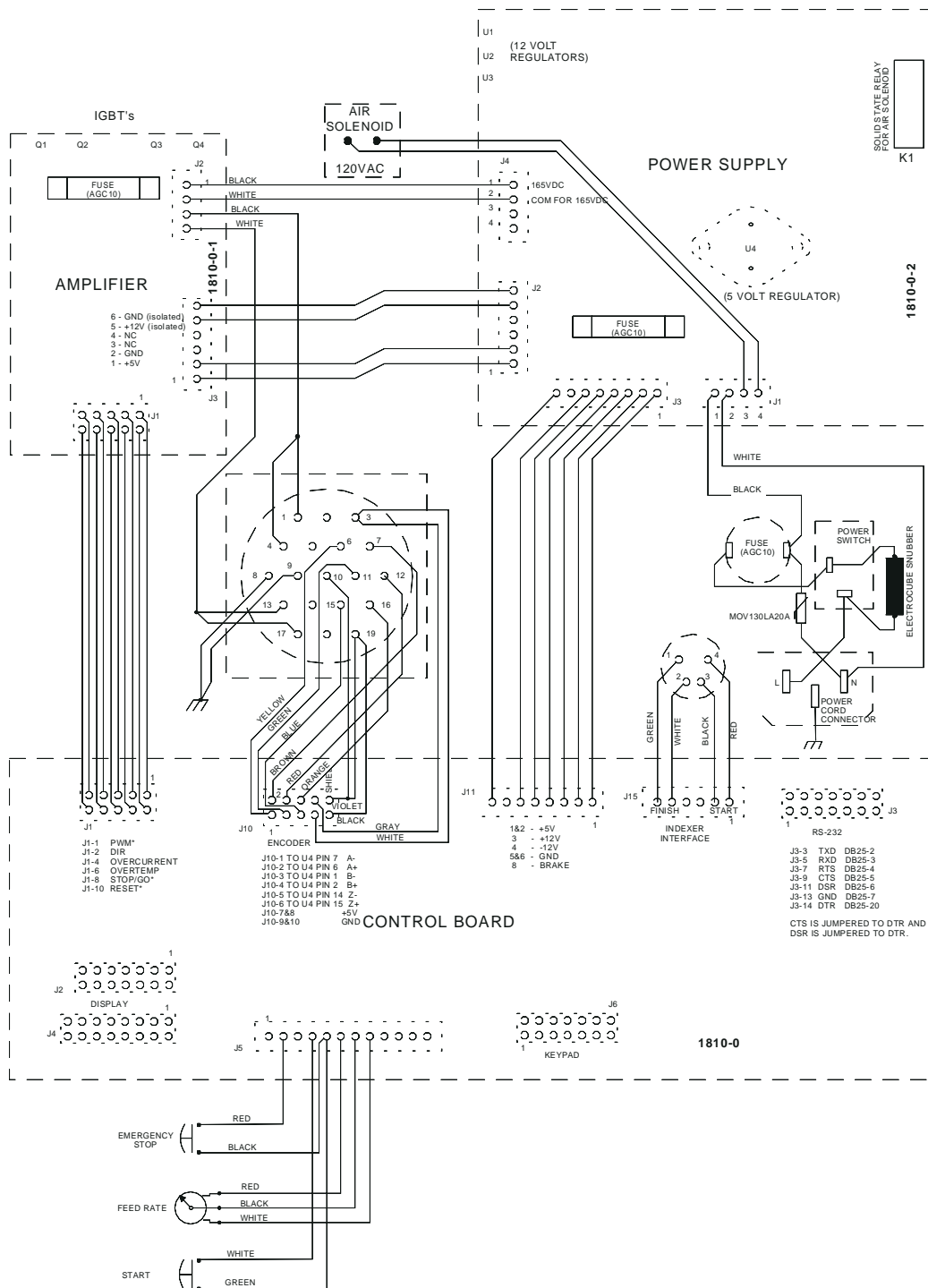
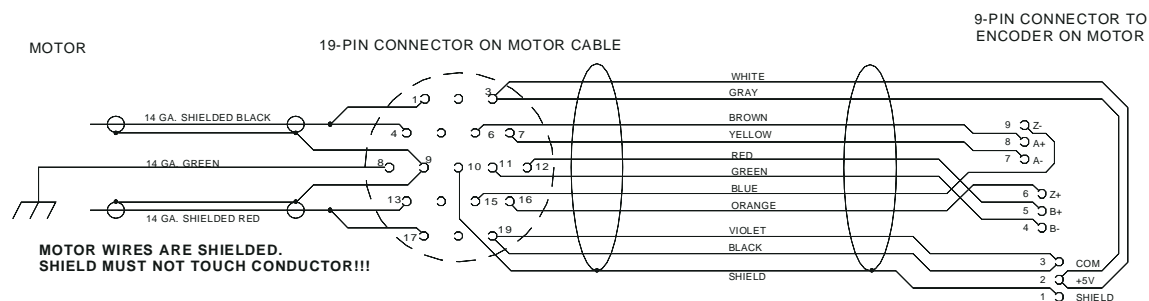


Figure 16-38 M-Function

## INDEXER WIRING DIAGRAM

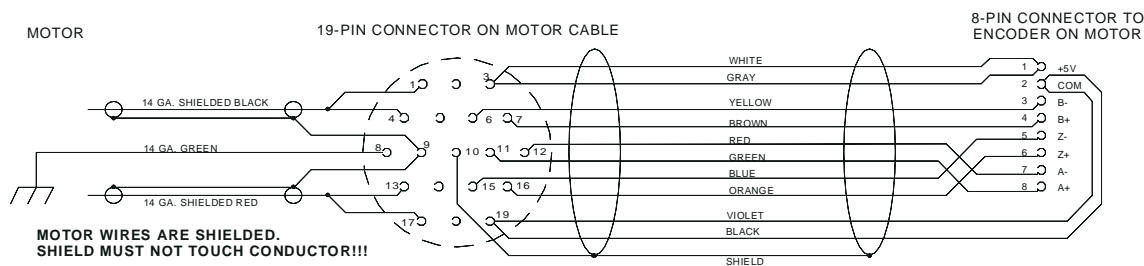
10-20-95





### MOTOR CABLE WIRING FOR VH-5C INDEXER

4-6-95



### MOTOR CABLE WIRING FOR VH-65 INDEXER

4-6-95

### BULKHEAD CONNECTOR WIRING FOR CLOCKWISE POSITIVE MOTION

6-20-95

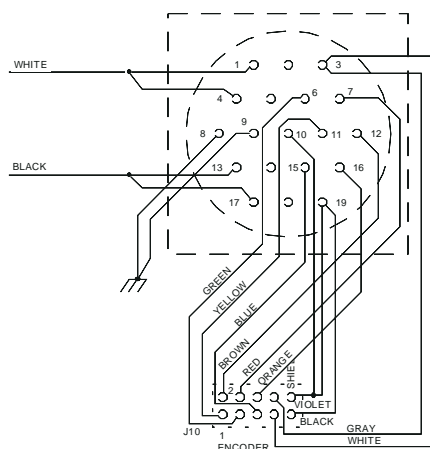
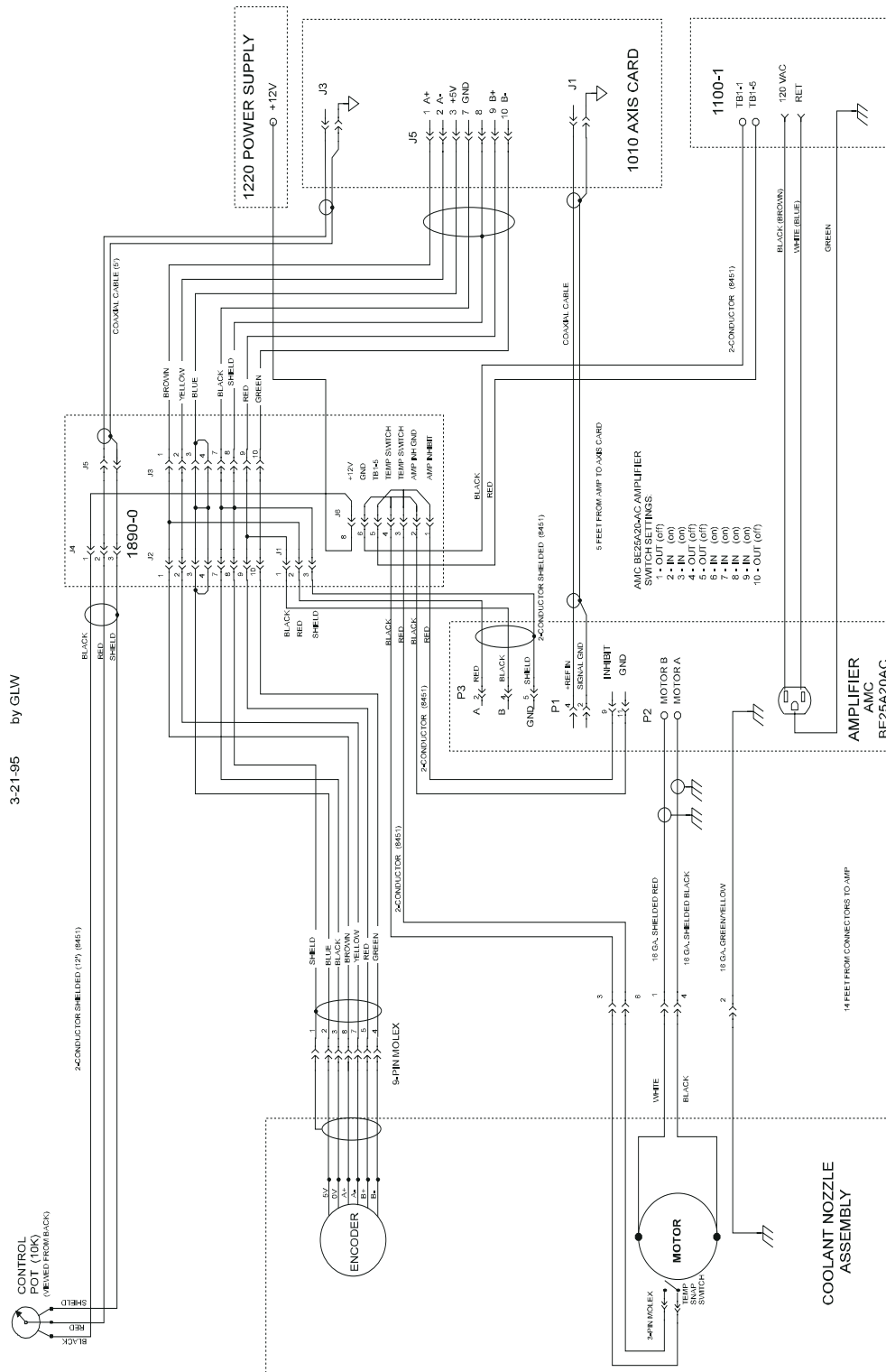


Figure 16-40 Motor Cable Wiring & Bulkhead Connector Wiring

## SERVO COOLANT WIRING

3-21-95 by GLW



**Figure 16-41** Servo Coolant Wiring

