

NSK AE-3000 TB1 Field Installation

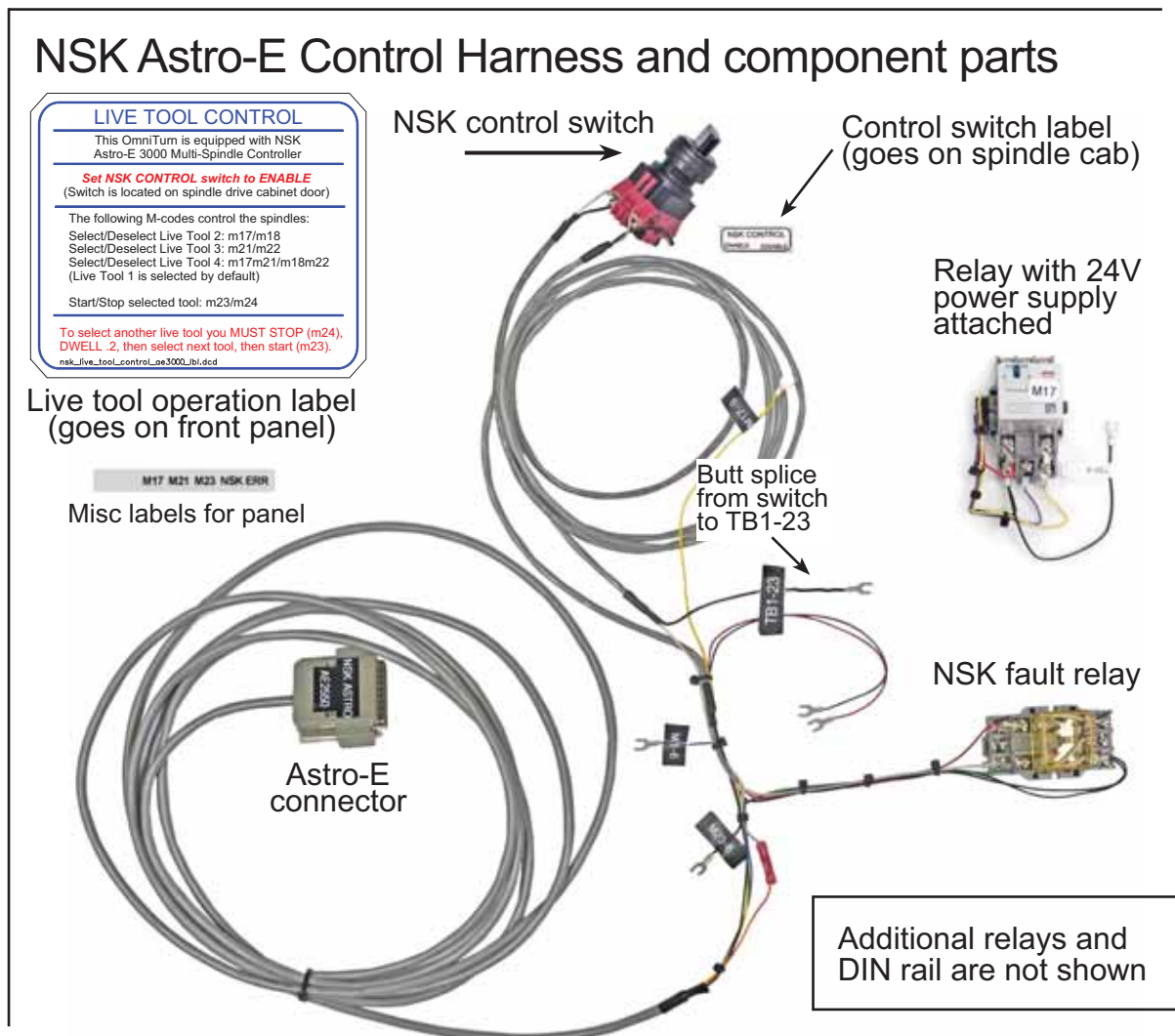
This document describes installation of a wiring harness (cable and connector) which enables M-function control of an NSK AE-3000 live tool controller mounted on an OmniTurn GT-75 lathe equipped with Spindle Cabinet Terminal Board (TB1).

Components are described as follows:

1. The NSK Fault Relay (lower right) stops the OmniTurn lathe if the live-tool system faults.
2. The 24VDC power supply affixed to M17 relay socket provides NSK control voltage.
3. The NSK Control Switch (top center) allows the GT-75 to be used with live-tool system removed or turned off.
4. Front panel label describing M-functions.
5. The NSK Astro-E connector (lower left) plugs into NSK 'A' connector.

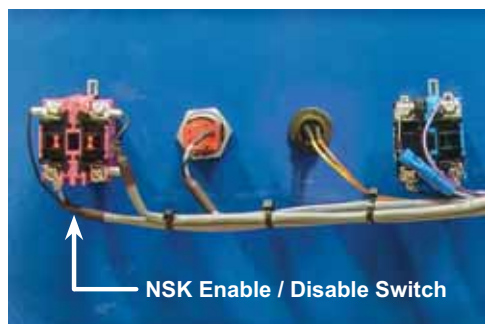
Installation is described in detail on the following pages, but the general steps are as follows:

1. Mount Control Switch in spindle-drive panel door.
2. Disassemble the Astro-E connector housing and route it out of the spindle-drive cabinet and up to back of CNC.
3. Mount the Fault Relay on panel.
4. Replace existing M17 relay socket with 24V unit.
5. Connect the spade lugs to appropriate terminals on the M-17, M-21 and M-23 relays and to appropriate terminals on TB1.



Spindle Panel Door

Use 1/2KO or 7/8" punch for NSK Control Switch installation. Route cables along with existing cables into the electronics cabinet.

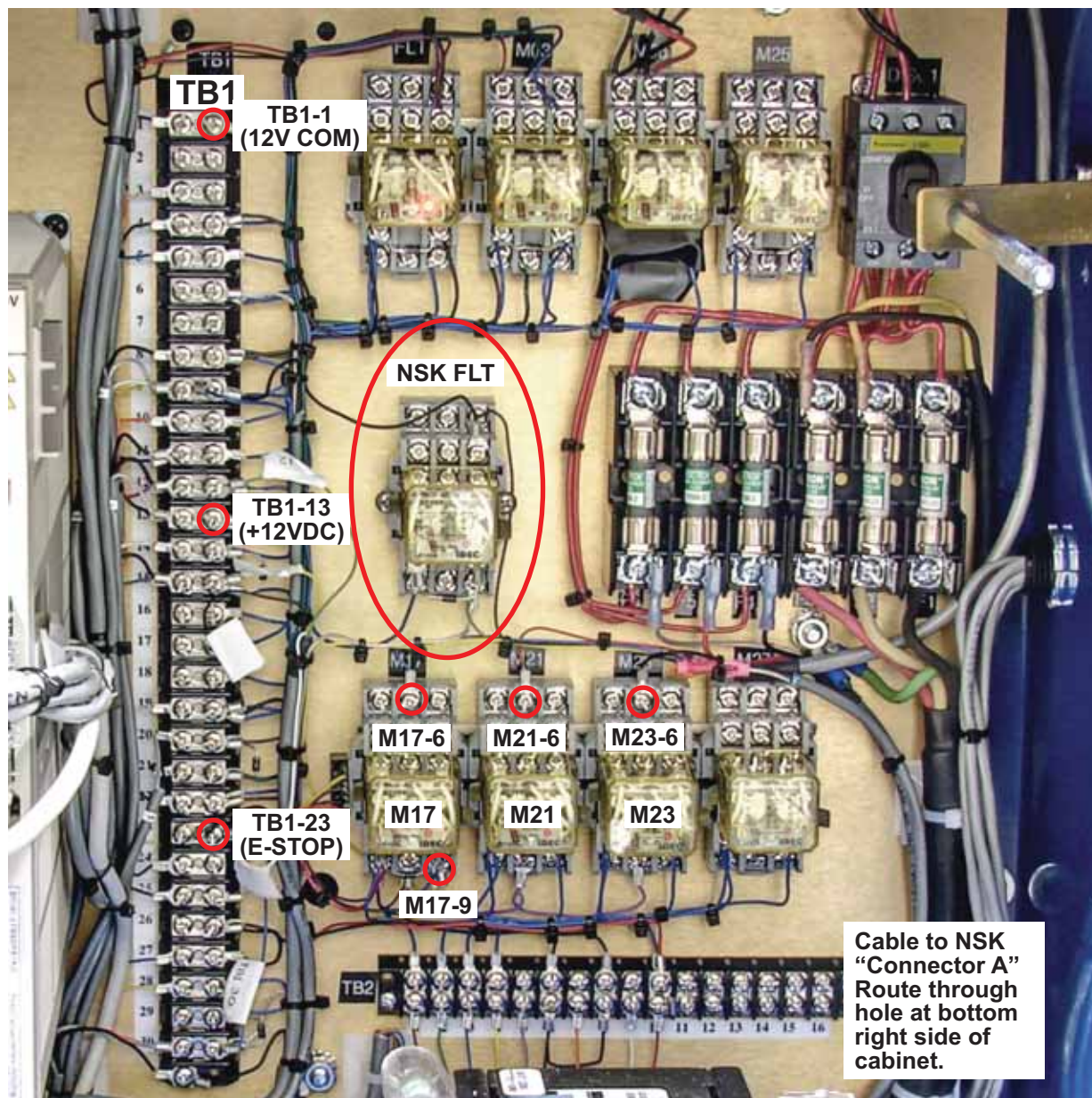


Route individual wires

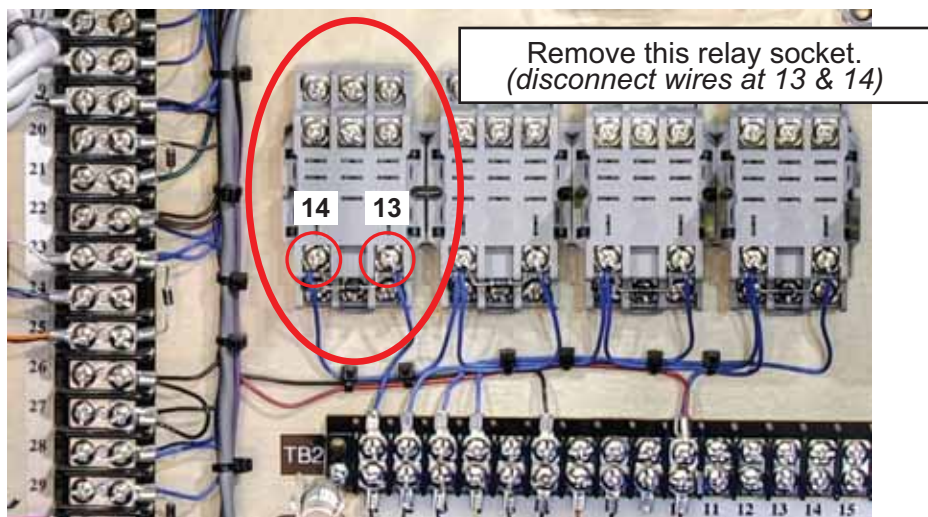
There are (7) spade lugs to connect, illustrated on spindle panel at right:

TB1-1 (BLK)	TB1-13 (RED)
TB1-23 (BLU)	M17-6 (RED)
M17-9 (YEL)	M21-6 (BRN)
M23-6 (BLK)	

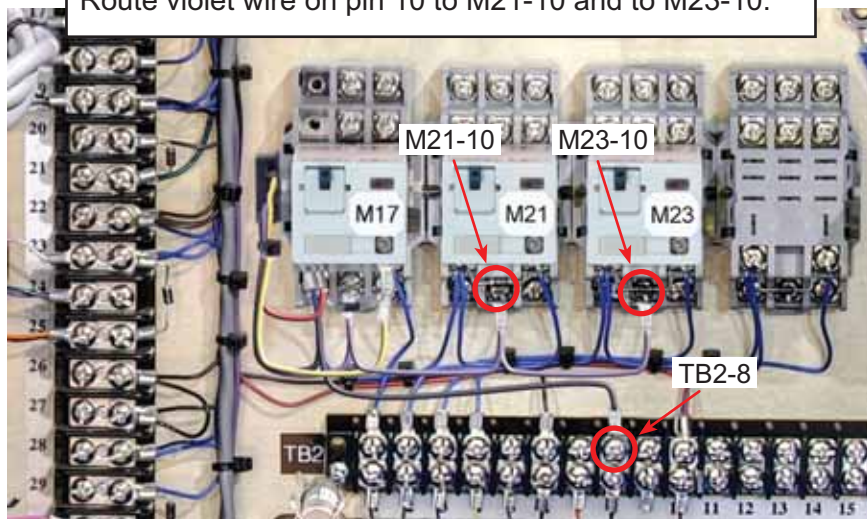
Spindle Panel



Cable to NSK "Connector A" Route through hole at bottom right side of cabinet.



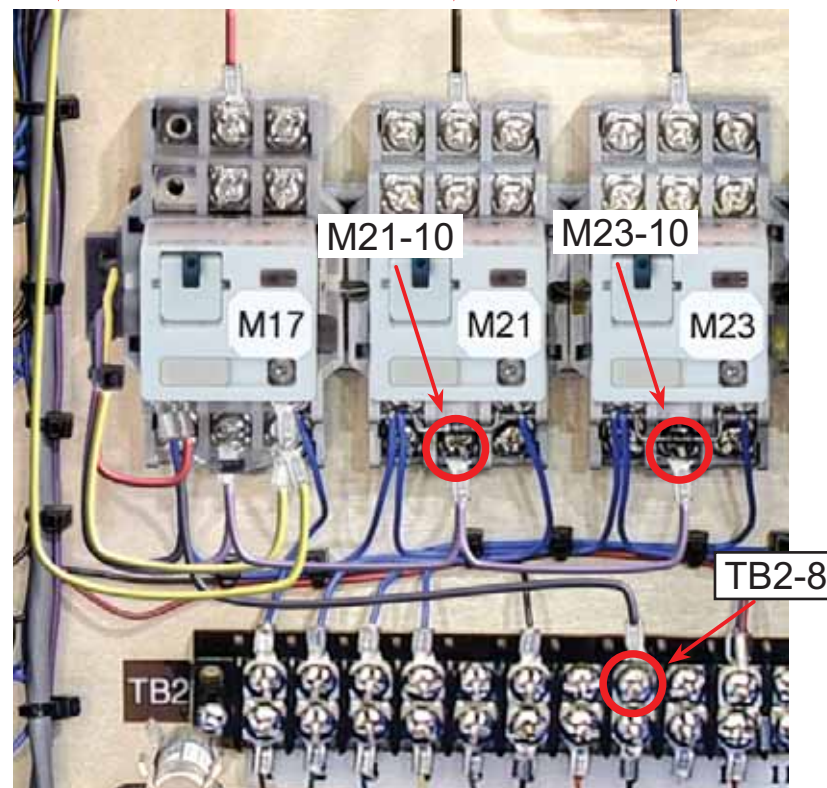
Replace with this relay & socket (M17).
Add M21 and M23 relays as shown.
Reconnect wires to 13 & 14 (13 routes from TB2-1)
Route black wire on pin 12 to TB2-8
Route violet wire on pin 10 to M21-10 and to M23-10.



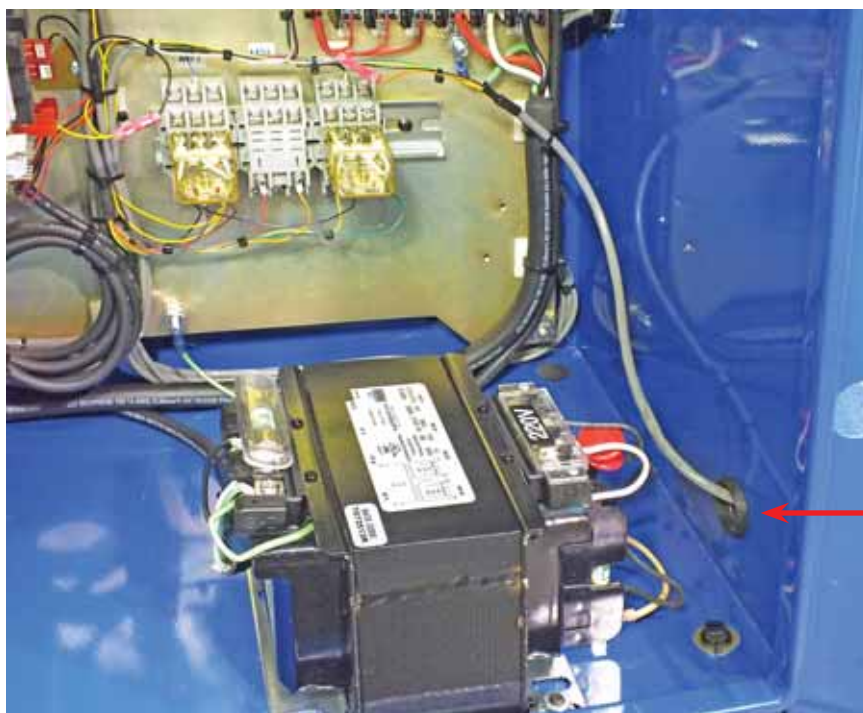
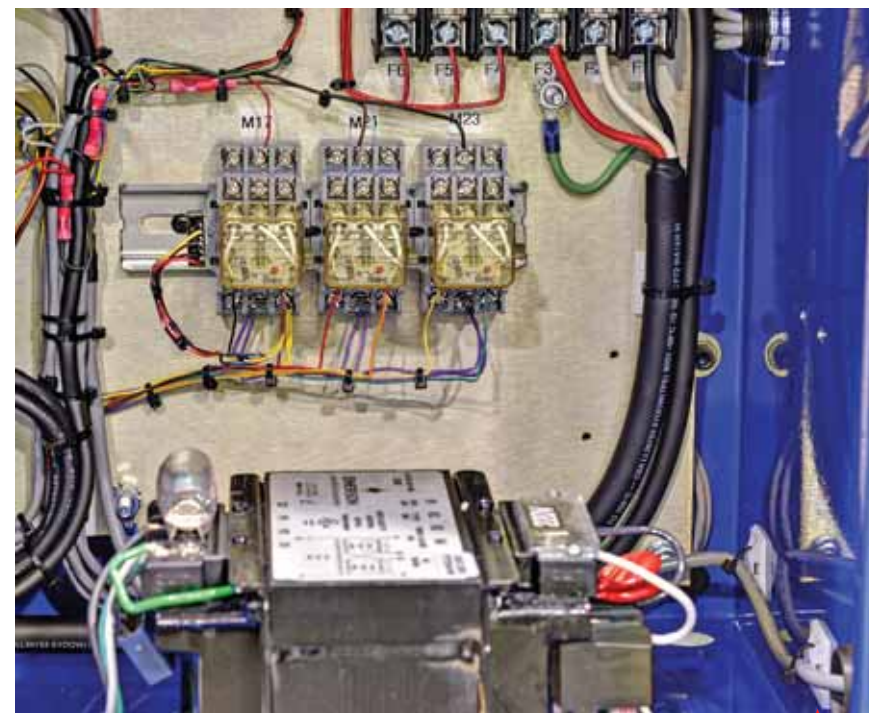
Relay Socket Installation Details

CONNECTIONS TO M17, M21 & M23

M17-6 (RED) M21-6 (BRN) M23-6 (BLK)
M17-9 (YEL)



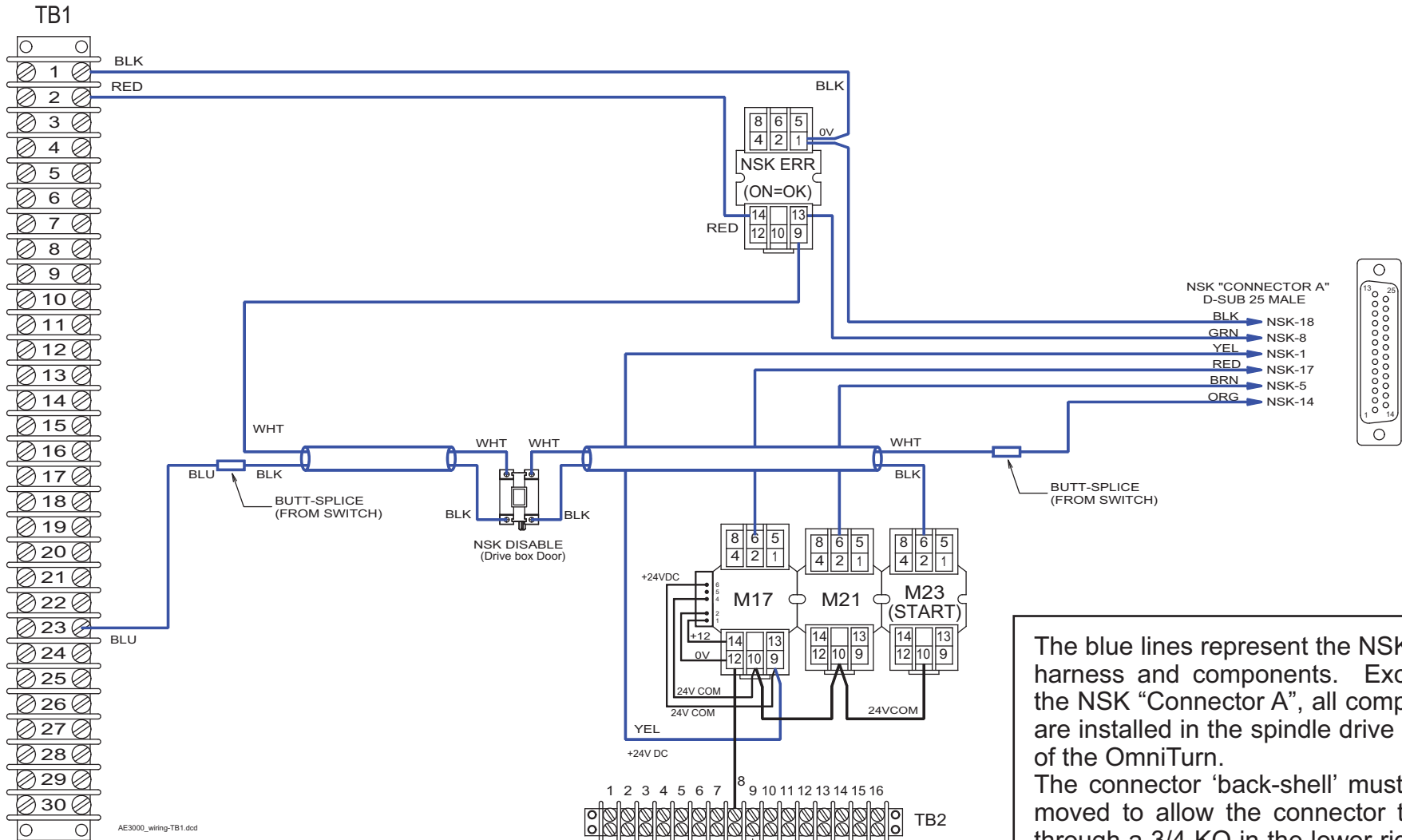
To route cable out of spindle-drive cabinet



Remove rubber plug at side of spindle-drive cabinet. Route connector through hole. Cut slot in rubber plug and push connector through.

Replace plug, and route cable along back panel of GT-75 and up through any hole in white hopper, then up through any hole in top panel behind CNC.

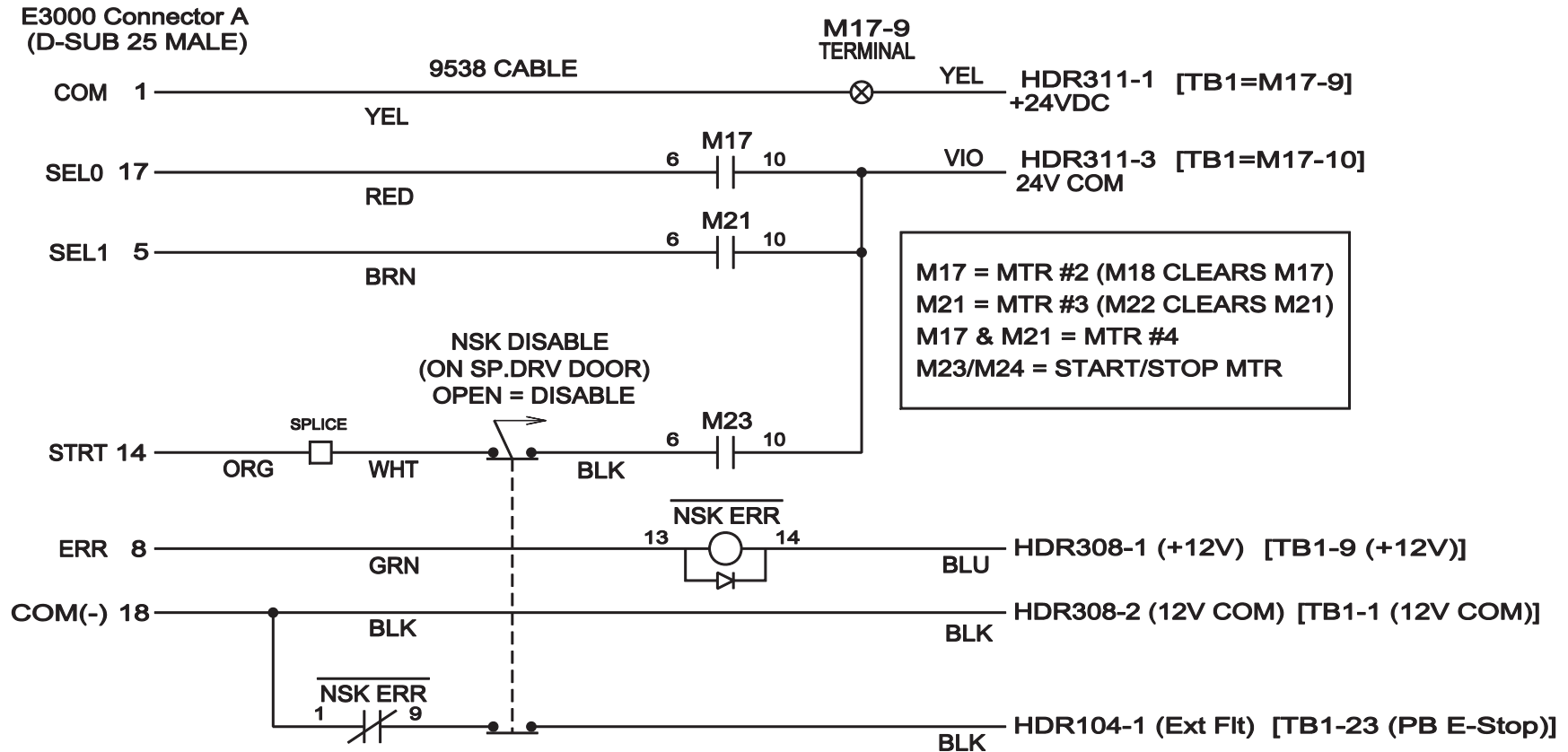
AE-3000 Wiring Diagram



The blue lines represent the NSK wiring harness and components. Except for the NSK "Connector A", all components are installed in the spindle drive cabinet of the OmniTurn.

The connector 'back-shell' must be removed to allow the connector to pass through a 3/4 KO in the lower right side of the cabinet. Enough cable is provided to route this connector to the upper right side of the GT-75 behind the CNC.

AE-3000 Wiring & Test

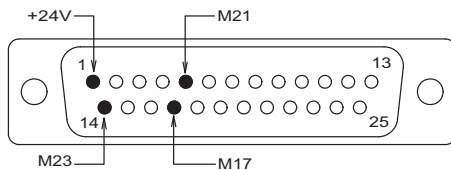


TO TEST:

EACH M-FUNCTION PULLS TO 24V COM

- REMOVE NSK ERR RELAY; SET NSK CONTROL SWITCH TO "ENABLE"
- PUT RED LEAD ON PIN 1: PINS 5, 14 AND 17 SHOULD READ 0V TO BLACK LEAD
PIN 8 SHOULD READ ABOUT 20V; PIN 18 SHOULD READ ABOUT 33V
- ISSUE M17: PIN 17 SHOULD NOW READ ABOUT 20V (RED LEAD ON PIN 1)
- ISSUE M21: PIN 5 SHOULD NOW READ ABOUT 20V (RED LEAD ON PIN 1)
- ISSUE M23: PIN 14 SHOULD NOW READ ABOUT 20V (RED LEAD ON PIN 1)
- REPLACE NSK ERR RELAY: VERIFY EXTERNAL FAULT EXISTS (SPINDLE FAULT LIGHT LIT)
- SHORT PIN 8 TO PIN 18: VERIFY NO EXTERNAL FAULT (SPINDLE FAULT LIGHT NOT LIT)
- SET NSK CONTROL SWITCH TO "DISABLE"
- VERIFY NO EXTERNAL FAULT (SPINDLE FAULT LIGHT NOT LIT)

NSK AE3000 CONNECTOR 'A'



DB25(M) FRONT VIEW

NSK AE3000 Interface

The NSK AE3000 control interfaces to the OmniTurn CNC via M-code relay closures as follows:

m23. Start selected spindle (#1 selected by default)
m24. Stop selected spindle
m17 / m18. Select/Deselect spindle #2
m21 / m22. Select/Deselect spindle #3
m17m21 / m18m22. Select/Deselect spindle #4

Before selecting another spindle, you MUST STOP the current spindle, dwell, select next spindle, then start the spindle. The code to switch from spindle #1 to #2 looks like this:

m24 (Stop spindle)
g04f.2 (Dwell 0.2 second)
m17 (Select spindle #2)
m23 (Start spindle)

The OmniTurn will E-Stop if the NSK control unit faults for any reason. The OmniTurn spindle and X-Z slide will stop. The OmniTurn slides cannot be moved until the NSK fault is cleared. If it is necessary to jog the OmniTurn while the NSK is in fault condition, set the “NSK Control” switch to “DISABLE”. The “NSK Control” switch is mounted on the OmniTurn spindle drive door.

If the NSK AE2280 control is removed from the OmniTurn, or switched off, the OmniTurn WILL NOT JOG. Set the “NSK Control” switch to “DISABLE” if the NSK is switched off or removed. Set the switch to “ENABLE” when the NSK control is in the ready mode.

OmniTurn provides only the electrical interface for the live tool controller. We recommend that cooling air be provided by NSK Air Line Kit AL-0201.

LIVE TOOL CONTROL

This OmniTurn is equipped with NSK
Astro-E 3000 Multi-Spindle Controller

Set NSK CONTROL switch to ENABLE

(Switch is located on spindle drive cabinet door)

The following M-codes control the spindles:

Select/Deselect Live Tool 2: m17/m18

Select/Deselect Live Tool 3: m21/m22

Select/Deselect Live Tool 4: m17m21/m18m22
(Live Tool 1 is selected by default)

Start/Stop selected tool: m23/m24

**To select another live tool you MUST STOP (m24),
DWELL .2, then select next tool, then start (m23).**

nsk_live_tool_control_ae3000_lbl.dcd

NSK CONTROL
ENABLE DISABLE