

# OPERATOR'S MANUAL

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## OPERATOR'S MANUAL

### **AUTOMATIC CARBIDE ROD CUT OFF SAW Version #7.1 With Servo Drives**

#### TABLE OF CONTENTS

• OPERATOR INTERFACE SCREENS AND EXPLANATION;	See Page 2
• FAULT SCREENS	See Page 22
• ENGINEERING SCREENS	See Page 30
• Machine Sequences	See Page 49
• Appendix B: Error Codes	See page 50

# OPERATOR'S MANUAL

## Screen #1, Main Menu

AUTOMATIC CARBIDE CUT OFF SAW ~ VER 7					
~ MAIN MENU ~					
F2 = OPERATOR SETUP & MANUAL					
F3 = AUTO MODES OF OPERATION					
F4 = FAULTS if Flashing--> No Faults FAULTS !!					
ALARM	SETUP	MODES	FAULT	_____	ENG'R
F1	F2	F3	F4	F5	F6

This is the **Main Menu** Screen for the **Automatic Carbide Cut Off Machine**. When the machine is powered up either by choice or power failure, the "FAULTS!" prompt will be flashing. The Operator then needs to press the 'FAULT' Button (F3) and follow the prompts from the FAULT Screen. See page 21. When ALL Faults have been solved, the Operator will return back to this Screen. The "FAULTS!" prompt will be gone and "No Faults" prompt will be seen.

Next the Operator will be able to select:

**F1: ALARM** -- Clear any Input over limit values made by Operator. Press IF any Inverted (dark) Message is flashing at the very top of the Operator Screen.

**F2: SETUP** -- OPERATOR SETUP (See page 4)

**F3: MODES** -- MODES OF OPERATION (See page 15)

**F4: FAULT** -- VIEW AND CLEAR ANY FAULTS (See page 22)

**F5:** Not used.

**F6: ENG'R** -- Special Engineering Setup (See page 30)

# OPERATOR'S MANUAL

## Screen #2, OPERATOR SETUP SCREENS

OPERATOR SETUP FUNCTIONS					
F2 = Setup INFORMATION					
F3 = Manual WHEEL MOTOR & COOLANT					
F4 = Manual JOG Axis and CLAMPS					
F5 = HOME ALL AXIS					
MENU	INFO	WM+C	JOG	HOME	FAULT
F1	F2	F3	F4	F5	F6

**F1: MENU** - Return to Main Menu. (See page 2).

**F2: INFO** - Press this key to view the screens necessary to setup or revise the information to cut the carbide rods. (See page 4).

**F3: WM+C** - Press this key to view the screens necessary to Manually operate the Cutting Wheel Motor and Coolant Solenoid. (See page 13).

**F4: JOG** - Press this key to view the screens necessary to Manually Jog the Axis and operate the Vee Clamps. (See page 10).

**F5: HOME** - Press this key to "Home" the Rod Pusher and Wheel Head Axis.

**F6: FAULT** - Press this key if a "Faults!" is flashing.

# OPERATOR'S MANUAL

Screen #3, SETUP Screen 1

OPERATOR SETUP INFORMATION					
F3 for NIP Amount = x.xxx In.					
F4 for Cutting Wheel WIDTH = x.xxx In.					
F5 for Rod DIAMETER = x.xxx In.					
SETUP	_____	NIP	WIDTH	DIA	MORE
F1	F2	F3	F4	F5	F6

**F1: SETUP** - Press this key to return to Operator Setup. (See page 3).

**F2:** Not used.

**F3: NIP** --- Press this key to access the Nip Amount value and then use the numeric key pad to input the needed value. Valid values are 0.000" or 0.061" to 0.312". Then press the [↵] key to accept the new value.

**F4: WIDTH** -- Press this key to access the Cutting Wheel Width value and then use the numeric key pad to input the needed thickness. Then press the [↵] key to accept the new value.

**F5: DIA** -- Press this key to access the Rod Diameter value and then use the numeric key pad to input the needed diameter. Range is 0.032" to 1.062". Then press the [↵] key to accept the new value.

**F6: MORE** - Press this key to go to the next set of operator screens. (See page 5).

# OPERATOR'S MANUAL

Screen #4, SETUP Screen 2

OPERATOR SETUP INFORMATION					
F2 for PRIMARY Cut Length = x.xxx In.					
F3 for Number of Primary CUTS = xx Cuts					
F4 for SECONDARY Cut Length = x.xxx In.					
BACK	PRI	CUTS	SEC	_____	MORE
F1	F2	F3	F4	F5	F6

**F1: BACK** -- Press this key to go back 1 screen. (See page 4).

**F2: PRI** --- Press this key to access the Primary Cut Length value and then use the numeric key pad to input the needed value. Range is 0.032" to 14.500". Then press the [↵] key to accept the new value.

**F3: CUTS** -- Press this key to access the Number of Primary Cuts value and then use the numeric key pad to input the needed value. Measure rod to determine the number of primary cuts. Then press the [↵] key to accept the new value.

**F4: SEC** -- Press this key to access the Secondary Cut Length value and then use the numeric key pad to input the needed thickness. Range is 0.032" to 14.500". If not using a secondary cut, then make value 14.500". Then press the [↵] key to accept the new value.

**F5:** NOT USED.

**F6: MORE** - Press this key to go to the next set of operator screens. (See page 6).

# OPERATOR'S MANUAL

Screen #5, SETUP Screen 3

OPERATOR SETUP INFORMATION					
F2 for MAJOR Cut Speed = xx.xx I.P.M.					
F3 : TOGGLE Break Thru Speed ? [Yes/No]					
F4 for Break Thru Rod PERCENT = xx %					
F5 for Break THRU Speed = xx.xx I.P.M.					
BACK	MAJOR	TOGGL	PCENT	THRU	MORE
F1	F2	F3	F4	F5	F6

**F1: BACK** -- Press this key to go back 1 screen. (See page 5).

**F2: MAJOR** --- Press this key to access the Major Cut Speed value and then use the numeric key pad to input the needed speed in IPM. Range is 0.10 IPM to 4.00 IPM. Then press the [↵] key to accept the new value.

**F3: TOGGL** - Press this key to toggle the Break Through Speed option "No or Yes".

**F4: PCENT** - Press this key to access the Break Through Rod Percentage value and then use the numeric key pad to input the needed percent. This value is the percent of major cut speed. Range is 50% to 95%. Then press the [↵] key to accept the new value.

**F5: THRU** -- Press this key to access the Break Through Speed value and then use the numeric key pad to input the needed speed in IPM. This value should be from 0.10 IPM and less than the major cut speed. Then press the [↵] key to accept the new value.

**F6: MORE** - Press this key to go to the next set of operator screens. (See page 7).

# OPERATOR'S MANUAL

Screen #6, SETUP Screen 4

OPERATOR SETUP INFORMATION					
COMPENSATIONS -- See CHART for Settings +F2/-F3 for SENSOR to Wheel = x.xxx In If the First Cut Length is short, then increase Sensor value.					
BACK	+ SEN	- SEN	CHART	_____	MORE
F1	F2	F3	F4	F5	F6

**F1: BACK** -- Press this key to go back 1 screen. (See page 6).

**F2: + SEN** - Press this key to increase the Sensor to Wheel distance.

**F3: - SEN** - Press this key to decrease the Sensor to Wheel distance.

The Sensor to Wheel distance determines whether the first rod cut length is the correct amount. If the first rod cut length is short, then increase the Wheel to Sensor amount.

**F4: CHART** - Press this key to view the chart for the approximate offset distance factor from the mean sensing distance for each diameter listed. (See page 8). The engineering section sets the values for the chart.

**F5:** Not used.

**F6: MORE** - Press this key to go to the next set of operator screens. (See page 9).

# OPERATOR'S MANUAL

Screen #8, SETUP View Chart

Sensor to Wheel OFFSET Comp. Per O.D.					
Distance Ref. =x.xxx		3/8" OD = xx.xxx			
1/16" OD = xx.xxx		1/2" OD = xx.xxx			
1/8" OD = xx.xxx		3/4" OD = xx.xxx			
1/4" OD = xx.xxx		1" OD = xx.xxx			
BACK _____					
F1	F2	F3	F4	F5	F6

This is a chart with the approximate values for the listed diameters. The Supervisor or Engineer sets these values in the Engineering section.

**F1: BACK** -- Press this key to go to screen #6. (See page 7).

**F2:** Not used.

**F3:** Not used.

**F4:** Not used.

**F5:** Not used.

**F6:** Not used.



# OPERATOR'S MANUAL

Screen #7, SETUP Screen 5

OPERATOR SETUP INFORMATION					
+F3/-F4 for WHEEL Wear Comp = x.xxx In If the Wheel does not cut through the Rod, then increase Wheel Wear value.					
F5 : To Reset Value to Default					
BACK	MENU2	+ WHL	- WHL	RESET	_____
F1	F2	F3	F4	F5	F6

**F1: BACK** -- Press this key to go back 1 screen. (See page 7).

**F2: MENU2** - Press this key to return to the Operator Setup Functions Menu Screen. (See page 3).

**F3: + WHL** -- Press this key to increase the amount of Wheel Wear.

**F4: - WHL** -- Press this key to decrease the amount of Wheel Wear.

The Wheel Wear value is the distance from the center of the Vee to the Cutting Wheel outside diameter. If the rod has not been cut through, then increase the wheel wear amount.

**F5: RESET** - Press this key to reset the Wheel Wear Compensation to its default value.

**F6:** Not used.

# OPERATOR'S MANUAL

Screen #9, JOG Tool Bed

Manual Jog: TOOL BED Axis [FAULTS!!]					
POSITION = xx.xxx In SPEED =[Fast/Slow]					
Jog Up/Back to Fill; Jog to Drop in Vee					
Limit Status: [Home] [+Over Travel]					
F3: Toggle Rod Vee CLAMPS =[CLOSED/OPEN]					
MENU2	SPEED	CLAMP	_____	FAULT	NEXT
F1	F2	F3	F4	F5	F6

This screen is used to allow the Operator to jog the Tool Bed Axis up or back to make room to load the rods to be cut on the flat bed. After filling the flat bed, then the Operator needs to jog the axis up until the rods falls onto the Pusher Vee. This will set the Tool Bed Axis starting position and the index timing.

**F1: MENU2** - Press this key to return to the Operator Setup Functions Menu Screen. (See page 3).

**F2: SPEED** - Press this key to toggle the Axis speed Fast or Slow.

**F3: CLAMP** - Press this key to toggle the Rod Vee Clamps state of either closed or open.

**F4: FAULT** - Press this key if "Faults!" is flashing.

**F5:** Not used.

**F6: NEXT** - Press this key for the next screen to operate the Rod Pusher Axis, or next again for the Wheel Head Axis. (See page 11).

# OPERATOR'S MANUAL

Screen #10, JOG Rod Pusher

Manual Jog: ROD PUSHER Axis [FAULTS!!]					
POSITION = xx.xxx In SPEED =[Fast/Slow]					
F4 : STARTING Position = xx.xxx In					
Limit Status: [Home] [+Over Travel]					
F3: Toggle Rod Vee CLAMPS =[CLOSED/OPEN]					
BACK	SPEED	CLAMP	STORE	FAULT	NEXT
F1	F2	F3	F4	F5	F6

The clamps must be open to use the Jog function.

**F1: BACK** -- Press this key to go back to the previous Axis screen. (See page 10).

**F2: SPEED** - Press this key to toggle the Axis speed Fast or Slow.

**F3: CLAMP** - Press this key to toggle the Rod Vee Clamps state of either closed or open.

**F4: STORE** - Press this key to store the actual position to the starting position. Jog the Rod Pusher Axis forward from the home limit switch to set the starting position to push the rod after has been dropped from the tool table.

**F5: FAULT** - Press this key if "Faults!" is flashing.

**F6: NEXT** - Press this key for the next screen to operate the Wheel Head Axis. (See page 12).

Optional on some models: Use the Jog slow forward when close to the rod edge sensor to determine the position that the sensor detects the rod. The axis will temporarily stop when the rod edge sensor detects the rod. Then, release the jog forward and press again to jog to the plus over travel limit.

# OPERATOR'S MANUAL

Screen #11, JOG Wheel Head

Manual Jog: WHEEL HEAD Axis [FAULTS!!]					
POSITION = xx.xxx In SPEED =[Fast/Slow]					
Limit Status: [Home] [+Over Travel]					
F3: Toggle Rod Vee CLAMPS =[CLOSED/OPEN]					
BACK	SPEED	CLAMP	_____	FAULT	JMENU
F1	F2	F3	F4	F5	F6

This screen is used to allow the Operator to jog the Wheel Head Axis forward or backward to change the Cut Off Wheel, to clear a jamb, or view the maximum forward travel distance to set the software over travel. The Jog function is also used to test the axis for trouble shooting problems.

The Clamps must be closed to jog this axis.

**F1: BACK** -- Press this key to go back to the previous Axis screen. (See page 11).

**F2: SPEED** - Press this key to toggle the Axis speed Fast or Slow.

**F3: CLAMP** - Press this key to toggle the Rod Vee Clamps state of either closed or open.

**F4:** Not used.

**F5: FAULT** - Press this key if "Faults!" is flashing.

**F6: JMENU** - Press this key to go to the Tool Bed Axis screen #9. (See page 10).

# OPERATOR'S MANUAL

Screen #12, MANUAL Motor & Coolant

OPERATOR SETUP; -- Manual --					
F3 : STOP/START					
Wheel Head Motor = [Status]					
F5 : Toggle COOLANT Solenoid					
Coolant Solenoid = [Status]					
BACK	_____	S / S	_____	COOL	_____
F1	F2	F3	F4	F5	F6

This screen is used to allow the Operator to manually stop or start the Wheel Head Motor to check the status of the Cut Off Wheel or to check the motor for noise.

Also, a new Vee Clamp assembly may need to be checked for clearance to allow the cut off wheel to move through the slot between the carbide wear strips. Use this and Manual Jog Axis function to check for clearance, left/right alignment, and parallel to slot.

**F1: BACK** -- Press this key to return to the Operator Setup screen. (See page 3).

**F2:** Not used.

**F3: S / S** - Press this key to stop or start the Wheel Head Motor. [Status] will show active state of [Off] or [On].

**F4:** Not used.

**F5:** Not used.

**F6: COOL** -- Press this key to toggle the Coolant Solenoid off or on. [Status] will show active state of [Off] or [On].

# OPERATOR'S MANUAL

Screen #13, SETUP, Spare

OPERATOR SETUP INFORMATION					
F2 = Back to Operator Setup Functions					
This is a spare screen for future use.					
This is a spare screen for future use.					
This is a spare screen for future use.					
BACK	MENU2	_____	_____	_____	_____
F1	F2	F3	F4	F5	F6

This is a spare screen set up for future use.

**F1: BACK** -- Press this key to go back 1 screen.

**F2: MENU2** - Press this key to return to the Operator Setup Functions Menu Screen.

**F3:** Not used.

**F4:** Not used.

**F5:** Not used.

**F6:** Not used.

# OPERATOR'S MANUAL

## Screen #14, Operator Modes

"AUTO MODES OF OPERATION"					
Select : ADJUST Compensation/Timers					
SINGLE Cut / Full AUTO					
[FAULTS!!]					
No Faults					
MENU	FAULT	_____	_____	ADJUS	S / A
F1	F2	F3	F4	F5	F6

**F1: MENU** --- Return to Main Menu. (See page 2)

**F2: FAULT** -- Select this Key if the "FAULTS!" prompt is flashing. (See page 22)

**F3:** Not Used.

**F4:** Not used.

**F5: ADJUS** - Press this key to access the screens to adjust the Wheel Wear compensation, Sensor to Cut Off Wheel, and Timers and Machine Oiler. (See page 19).

**F6: S / A** - Select this Key to access the Single Cut and Full Auto Cut Options and the select Single or Full Auto. (See page 16)

# OPERATOR'S MANUAL

Screen #15, Operator Mode, Cut Options 2

--SINGLE CUT / FULL AUTO OPTIONS --					
F2 : for Major Cut Speed = x.xx I.P.M					
F3 : for Break Thru Speed = x.xx I.P.M					
F4 : SENSOR-WHEEL Distance = x.xxx In					
BACK	MAJOR	BREAK	SEN-W	_____	SINGL
F1	F2	F3	F4	F5	F6

**F1: BACK** - Press this key to go back 1 screen for other options. See page 15.

**F2: MAJOR** - Press this key to access the Major Cut Speed value to modify it.

**F3: BREAK** - Press this key to access the Break Through Speed value to modify it.

**F4: SEN-W** - Press this key to modify the value of the Sensor to Wheel distance.

**F5:** Not used.

**F6: SINGL** - Press this key to access the Single Cut operation screen. See page 17.



# OPERATOR'S MANUAL

Screen #16, Operator Mode, Single Cut

-SINGLE CUT -            Wheel Head Pos= xx.xxx					
F1 = STOP - Axis, Cycle, Motor, Coolant					
F2 = CYCLE START /REPEAT					
No Faults					
[FAULTS!!]            F6 : Go to Full Auto					
STOP	START	_____	BACK	FAULT	AUTO
F1	F2	F3	F4	F5	F6

**F1: STOP** -- STOP Single Cut Cycle, axis movement, wheel motor, and coolant. Then return to the Auto Modes of Operation screen. (See page 15).

**F2: START** - START Single Cut Cycle and repeat single cut cycle.

**F3:** Not used.

**F4: BACK** -- Press this key to go back to Options. (See page 16)

**F5: FAULT** - Press this key if "Faults!" is flashing. This will return to the Auto Modes of Operation screen. (See page 15)

**F6: AUTO** -- Press this key to go to the Full Auto Mode. If the Single Cut has been started, the Auto cycle will be active to make the next cut. (See page 18)

**Faults status:** displays either "No Faults" or "FAULTS!" flashing.

# OPERATOR'S MANUAL

Screen #17, Operator Mode, Full Auto

-FULL AUTO -            Wheel Head Pos= xx.xxx					
F1 = CYCLE STOP After Cut Complete					
F2 = CYCLE START					
F3 : Finish Rod & Stop			No Faults		
F6 : Back to Single Cut			[FAULTS!!]		
STOP	START	FINI	_____	FAULT	SINGL
F1	F2	F3	F4	F5	F6

**F1: STOP** -- Cycle Stop after the rod cut is complete.

**F2: START** - START Auto Cycle or restart after a cycle stop.

**F3: FINI** -- Press this key to finish the Rod being Cut and Stop. This will cause cycle stop and shut down the machine.

**F4:** Not used.

**F5: FAULT** - Press this key if "Faults!" is flashing. This will return to the Auto Modes of Operation screen. (See page 15)

**F6: SINGL** - Press this key to go to the Single Cut Mode. If a cut is in progress, it will finish and then be ready to restart or stop. (See page 17)

**Faults status:** displays either "No Faults" or "FAULTS!" flashing.

# OPERATOR'S MANUAL

Screen #18, ADJUST COMPENSATION, SENSOR

COMPENSATION					
+F2/-F3 for SENSOR to WHEEL = x.xxx In.					
If the First Cut Length is short, then increase SENSOR to WHEEL value.					
MENU2	+ SEN	- SEN	_____	_____	MORE
F1	F2	F3	F4	F5	F6

**F1: MENU2** - Press this key to return to the Auto Modes of Operation Menu Screen. (See page 15)

**F2: + SEN** -- Press this key to increase the Sensor to Wheel distance.

**F3: - SEN** -- Press this key to decrease the Sensor to Wheel distance.

The Sensor to Wheel distance determines whether the first rod cut length is the correct amount. If the first rod cut length is short, then increase the Wheel to Sensor amount.

**F4:** Not used.

**F5:** Not used.

**F6: MORE** - Press this key to go to the next set of operator screens. (See page 20).

# OPERATOR'S MANUAL

Screen #19, ADJUST COMPENSATION, WHEEL WEAR

COMPENSATION					
+F2/-F3 for WHEEL Wear Comp = x.xxx In					
If the Wheel does not cut through the					
rod, then increase Wheel Wear value.					
BACK	+ WHL	- WHL	_____	_____	MORE
F1	F2	F3	F4	F5	F6

**F1: BACK** -- Press this key to go back 1 screen. (See page 19).

**F2: + WHL** -- Press this key to increase the amount of Wheel Wear.

**F3: - WHL** -- Press this key to decrease the amount of Wheel Wear.

The Wheel Wear amount determines whether the cutting wheel passes through the rod. If the rod has not been cut through, then increase the wheel wear amount.

**F4:** Not used.

**F5:** Not used.

**F6: MORE** - Press this key to go to the next set of operator screens. (See page 21).

# OPERATOR'S MANUAL

Screen #20, ADJUST COMPENSATION, Sensor/Oiler

TIMER/COUNTER					
F3 : Find Sensor Distance = x.xxx In					
F4 : OIL After ?(0 to 1000): xxxx Cycles					
F5 : SHOTS of Oil ? (1 to 5)= x Shots					
BACK	MENU2	FIND	OIL	SHOTS	_____
F1	F2	F3	F4	F5	F6

**F1: BACK** -- Press this key to go back 1 screen. (See page 20).

**F2: MENU2** - Press this key to return to the Auto Modes of Operation Menu Screen. (See page 15)

**F3: FIND** - Press this key to revise the amount of distance to allow the Rod Pusher to push a rod to find the rod edge Sensor. The valid range is 1.000" to 2.000".

**F4: OIL** --- Press this key to access the value of cycles for the machine to make before turning on the Machine Oiler.

**F5: SHOTS** - Press this key to access the value of shots of oil that the machine oiler will make. The run time for the oiler is set in the engineering section.

**F6:** Not used.

# OPERATOR'S MANUAL

## Screen #21, FAULTS Main Screen

GENERAL FALUTS: F6 for detailed Errors					
Axis = OK [Message]					
[Reserved For Exclusive Fault Messages]					
E-STOP Error = None [E-Stop DOWN]					
MENU	HOME	CLEAR	POWER	_____	DTAIL
F1	F2	F3	F4	F5	F6

**F1: MENU** -- Return to the Main Menu. (See page 2)

**F2: HOME** - Press this key to home the axis.

**F3: CLEAR** - Press this key to home the axis if the "Home Required" status is flashing or if message displays Press Clear key.

**F4: POWER** -- Select this Key when "POWER UP ERROR" is flashing.

**F5:** Not used.

**F6: DTAIL** - Press this key for detailed screens of errors if needed. (See page 23.)

**Fault status:** [None or OK] = No faults, take no action.

**Reserved for exclusive fault messages:** Perform action as stated. This area will prompt the operator for a key to press.

When "E-Stop DOWN" is Flashing, **PULL E-STOP.**

# OPERATOR'S MANUAL

Screen #22, FAULTS Screen 2

AXIS	Fault = None	[Axis Faults]
OVER	Load Fault = None	[M.S. Over Loads]
Clamp Closed Pressure Sw.	=	[Status]
	Rod End Sensor	= [Status]
	Pusher Jamb Prox. Sw.	= [Status]
BACK	AXIS	OVERL
F1	F2	F3
		F4
		F5
		F6

**F1: BACK** -- Return to the Fault Menu. (See page 22)

**F2: AXIS** --- Select this Key when "Axis Faults" is flashing. (See page 24)

**F3: OVERL** -- Select this Key when "M.S. Over Loads" is flashing. (See page 28)

**F4:** Not used.

**F5:** Not used.

**F6:** Not used.

**Fault status:** [None] = No faults, take no action.

[Fault Type Flashing] = Fault active, select proper Key.

**Clamp Closed Pressure Switch** displays the status of "Clamp Closed" or "Clamp Opened".

**Rod End Sensor** displays the status of "Sensor Off" or "Sensor On".

**Pusher Jamb Proximity Switch** displays the status of "Prox. Off" or "Prox. On".

# OPERATOR'S MANUAL

Screen #23, FAULTS - Axis

AXIS FAULTS:      Select Axis to View					
TOOL Bed Axis Faults					
ROD Pusher Axis Faults					
WHEEL Head Axis Faults					
BACK	_____	TOOL	ROD	WHEEL	_____
F1	F2	F3	F4	F5	F6

**F1: BACK** -- Back to Detailed Fault Screen. (See page 23)

**F2:** Not Used.

**Status:** There will be no status of active or none for the axis.

**F3: TOOL** -- Select this Key to view the Tool Bed axis fault screen. (See page 25)

**F4: ROD** --- Select this Key to view the Rod Pusher axis fault screen. (See page 26)

**F5: WHEEL** - Select this Key to view the Wheel Head axis fault screen. (See page 27)

**F6:** Not used.



# OPERATOR'S MANUAL

Screen #24, FAULTS - Tool Bed Axis

TOOL BED Axis Position = xxx.xxx In					
Error Code= rrrr		Axis Enable=[stat]			
Drive Enabled= [stat]					
Position Valid= [stat]					
Axis Limits= [Home stat] [+Over Travel]					
BACK	CLEAR	ENABL	FHOME	_____	_____
F1	F2	F3	F4	F5	F6

**F1: BACK** -- Back to Axis Fault screen. (See page 24)

**F2: CLEAR** - Press this Key if an Error Code value other than Zero is displayed. This will clear the error. If not a list of error codes in hex values is provided at the end of this manual. The displayed error code will be a decimal value. The displayed value must be converted to a hex value.

**F3: ENABL** - Press this key if Drive Enabled status is Not Enabled.

**F4: FHOME** - Press this key if Position Valid status is not valid.

**F5:** Not Used.

**F6:** Not Used.

The axis status are shown below:

Axis Limit = a status of "HOME" or "Not Home" for the Home proximity switch. The axis cannot be jogged passed the home limit.

Axis Limit = a status of "+ Over Travel" for the + Over Travel means the axis has reached it's programmed over travel value. The axis cannot be jogged passed the + over travel limit.

Current Position Valid = a status of Ok or Not Valid.

Axis Enabled = a status of Not Enabled or Enabled. If Not Enabled is displayed the axis may not have any 3 phase or 24 Vdc power.

# OPERATOR'S MANUAL

SCREEN #25; FAULTS - SCREENS - Rod Pusher Axis

ROD PUSHER Axis Position = xxx.xxx In					
Error Code= rrrr		Axis Enable=[stat]			
Drive Enabled= [stat]					
Position Valid= [stat]					
Axis Limits= [Home stat] [+Over Travel]					
BACK	CLEAR	ENABL	FHOME	_____	_____
F1	F2	F3	F4	F5	F6

**F1: BACK** -- Back to Axis Fault screen. (See page 24)

**F2: CLEAR** - Press this Key if an Error Code value other than Zero is displayed. This will clear the error. If not a list of error codes in hex values is provided at the end of this manual. The displayed error code will be a decimal value. The displayed value must be converted to a hex value.

**F3: ENABL** - Press this key if Drive Enabled status is Not Enabled.

**F4: FHOME** - Press this key if Position Valid status is not valid.

**F5:** Not Used.

**F6:** Not Used.

The axis status are shown below:

Axis Limit = a status of "HOME" or "Not Home" for the Home proximity switch. The axis cannot be jogged passed the home limit.

Axis Limit = a status of "+ Over Travel" for the + Over Travel means the axis has reached it's programmed over travel value. The axis cannot be jogged passed the + over travel limit.

Current Position Valid = a status of Ok or Not Valid.

Axis Enabled = a status of Not Enabled or Enabled. If Not Enabled is displayed the axis may not have any 3 phase or 24 Vdc power.

# OPERATOR'S MANUAL

SCREEN #26; FAULTS - SCREENS - Wheel Head Axis

WHEEL HEAD Axis Position = xxx.xxx In					
Error Code= rrrr		Axis Enable=[stat]			
Drive Enabled= [stat]		+OT=xx.xxx			
Position Valid= [stat]					
Axis Limits= [Home stat] [+Over Travel]					
BACK	CLEAR	ENABL	FHOME	_____	_____
F1	F2	F3	F4	F5	F6

**F1: BACK** -- Back to Axis Fault screen. (See page 24)

**F2: CLEAR** - Press this Key if an Error Code value other than Zero is displayed. This will clear the error. If not a list of error codes in hex values is provided at the end of this manual. The displayed error code will be a decimal value. The displayed value must be converted to a hex value.

**F3: ENABL** - Press this key if Drive Enabled status is Not Enabled.

**F4: FHOME** - Press this key if Position Valid status is not valid.

**F5:** Not Used.

**F6:** Not Used.

The axis status are shown below:

Axis Limit = a status of "HOME" or "Not Home" for the Home proximity switch. The axis cannot be jogged passed the home limit.

Axis Limit = a status of "+ Over Travel" for the + Over Travel means the axis has reached it's programmed over travel value. The axis cannot be jogged passed the + over travel limit.

Current Position Valid = a status of Ok or Not Valid.

Axis Enabled = a status of Not Enabled or Enabled. If Not Enabled is displayed the axis may not have any 3 phase or 24 Vdc power.

# OPERATOR'S MANUAL

SCREEN #27; FAULTS - SCREENS Continued

AC MOTOR OVER LOAD STATUS					
CONTACTOR Wheel Motor: OK [TRIPED]					
CONTACTOR Coolant Motor: OK [TRIPED]					
BACK	_____	_____	_____	_____	_____
F1	F2	F3	F4	F5	F6

**F1: BACK** -- Back to Detailed Fault screen. (See page 23)

**CONTACTOR Wheel Motor:** - "OK" or if "TRIPPED" then check Coolant  
Overload Relay.

**CONTACTOR Coolant Motor:** - "OK" or if "TRIPPED" then check Coolant  
Overload Relay.

# OPERATOR'S MANUAL

SCREEN #28; FAULTS - SCREENS Continued

SPARE FAULT PAGE#28					
LINE2					
LINE3					
LINE4					
LINE5					
_____	_____	_____	_____	_____	_____
F1	F2	F3	F4	F5	F6

# OPERATOR'S MANUAL

## SCREEN #29; ENGINEERING SCREENS

ENGINEERING SECTION					
PRESS F1					
Info: DataDesigner System Software:					
v52016v.cmd					
_____	_____	_____	_____	_____	_____
F1	F2	F3	F4	F5	F6

**F1: MASKED** -- RETURN TO MAIN MENU. (See page 2)

**F4: MASKED** -- GOTO ENGINEERING (See page 31)

# OPERATOR'S MANUAL

SCREEN #30; ENGINEERING SCREENS

"ENGINEERING SETUP FUNCTIONS"					
F5 ;Exit to Program Operator Interface					
F6 ;MORE -To Change More Resister Values					
MENU	_____	_____	ALARM	PROG	MORE
F1	F2	F3	F4	F5	F6

This screen and the following screens are to be accessed by a SUPERVISOR or ENGINEERING ONLY!

**F1: MENU** -- Return to the Main Menu. (See page 2)

**F2:** Not used.

**F3:** Not used.

**F4: ALARM** - Reset Any Alarm Tag that Exceeds an Over or Under Value.

**F5: PROG** - Press this key to exit the run mode of the Operator Interface and enter the Setup/Program mode.

**F6: MORE** - Press this key to view more screens to change Register Values to customize for each Machine. (See page 32)

# OPERATOR'S MANUAL

SCREEN #31; ENGINEERING SCREENS

Rod Pusher Distance to Find Sensor Distance to push = xx.xxx In Spare Future Timer Constant = ?? Sec ; Preset = ?? Sec "ENGINEERING Functions"					
BACK	_____	FIND	TMR-2	_____	MORE
F1	F2	F3	F4	F5	F6

**F1: BACK** -- Return to the previous screen. (See page 31)

**F2:** Not Used.

**F3: FIND** - Press this key to access the register to write a New Value. This value is the distance the Rod Pusher will move the rod to find the rod edge sensor and then fault out. This distance needs to be 1.000" to 2.000".

**F4: TMR-2** - Future use, press to Write New Value.

**F5:** Not Used.

**F6: MORE** -- Press this key to view more screens to change Register Values to customize for each Machine. (See page 33)



# OPERATOR'S MANUAL

## SCREEN #32; ENGINEERING SCREENS

Tool Bed -- "Index Time" variable PLC calculates; Rod Dia/Time= [Velocity] Range: 2.0 sec [Fast] to 6.0 sec [Slow] Default = 4.0 Sec ; Preset = x.x Sec "ENGINEERING Functions"					
BACK	ENG'R	_____	TIME	_____	MORE
F1	F2	F3	F4	F5	F6

**F1: BACK** -- Return to the previous screen. (See page 32)

**F2: ENG'R** -- Back to Engineering Screen. (See page 31)

**F3:** Not Used.

**F4: TMR-3** - Spare Timer: Select to Write New Value.

**F5: TMR-4** - Spare Timer: Select to Write New Value.

**F6: MORE** -- Press this key to view more screens to change Register Values to customize for each Machine. (See page 34)

# OPERATOR'S MANUAL

## SCREEN #33; ENGINEERING SCREENS

Minimum ROD DIAMETER; Default = 0.062 Dia ; Preset = x.xxx Dia Maximum ROD DIAMETER;Range = 0.500-1.062 Default = 1.062 Dia ; Preset = x.xxx Dia "ENGINEERING Functions"					
BACK	ENG'R	_____	MIN	MAX	MORE
F1	F2	F3	F4	F5	F6

**F1: BACK** -- Return to the previous screen. (See page 33)

**F2: ENG'R** -- Back to Engineering Screen. (See page 31)

**F3:** Not Used.

**F4: MIN** --- Select to key to write new value for the Minimum Rod Diameter.

**F5: MAX** --- Select to key to write new value for the Maximum Rod Diameter.

**F6: MORE** -- Press this key to view more screens to change Register Values to customize for each Machine. (See page 35)

# OPERATOR'S MANUAL

## SCREEN #34; ENGINEERING SCREENS

Minimum CUT LENGTH; Default = 0.060 In ; Preset = xx.xxx In Maximum CUT LENGTH;Range = 10.000-15.000 Default = 14.500 In ; Preset = xx.xxx In "ENGINEERING Functions"					
BACK	ENG'R	_____	MIN	MAX	MORE
F1	F2	F3	F4	F5	F6

**F1: BACK** -- Return to the previous screen. (See page 34)

**F2: ENG'R** -- Back to Engineering Screen. (See page 31)

**F3:** Not Used.

**F4: MIN** --- Select to key to write new value for the Minimum Rod Cut Length.

**F5: MAX** --- Select to key to write new value for the Maximum Rod Cut Length.

**F6: MORE** -- Press this key to view more screens to change Register Values to customize for each Machine. (See page 36)

# OPERATOR'S MANUAL

## SCREEN #35; ENGINEERING SCREENS

Minimum CUT SPEED; Default = 0.10 IPM ; Preset = xx.xx IPM Maximum CUT SPEED; Range = 3.00-5.00 Default = 4.00 IPM ; Preset = xx.xx IPM "ENGINEERING Functions"					
BACK	ENG'R	_____	MIN	MAX	MORE
F1	F2	F3	F4	F5	F6

**F1: BACK** -- Return to the previous screen. (See page 35)

**F2: ENG'R** -- Back to Engineering Screen. (See page 31)

**F3:** Not Used.

**F4: MIN** --- Select to key to write new value for the Minimum Cut Speed.

**F5: MAX** --- Select to key to write new value for the Maximum Cut Speed.

**F6: MORE** -- Press this key to view more screens to change Register Values to customize for each Machine. (See page 37)

# OPERATOR'S MANUAL

## SCREEN #36; ENGINEERING SCREENS

Minimum NIP AMOUNT;      0.062 to 0.312 Default = 0.125 In ; Preset = xx.xxx In Oiler cycle Time Per Shot of Oil (5-60) Default 5 Minutes ; Preset = xx Minutes "ENGINEERING Functions"					
BACK	ENG'R	_____	NIP	MINUT	MORE
F1	F2	F3	F4	F5	F6

**F1: BACK** -- Return to the previous screen. (See page 36)

**F2: ENG'R** -- Back to Engineering Screen. (See page 31)

**F3:** Not Used.

**F4: NIP** -- Select this key to write a value for the Minimum Nip amount.

**F5: MINUT** - Press this key to write a value for the cycle time of the oiler motor from the specifications.

**F6: MORE** -- Press this key to view more screens to change Register Values to customize for each Machine. (See page 38)

# OPERATOR'S MANUAL

SCREEN #37; ENGINEERING SCREENS

Minimum BREAK THRU (%) of Rod Diameter Default = 50 % ; Preset = xx % Maximum BREAK THRU (%) of Rod Diameter Default = 95 % ; Preset = xx % "ENGINEERING Functions"					
BACK	ENG'R	_____	MIN	MAX	MORE
F1	F2	F3	F4	F5	F6

**F1: BACK** -- Return to the previous screen. (See page 37)

**F2: ENG'R** -- Back to Engineering Screen. (See page 31)

**F3:** Not Used.

**F4: MIN** --- Select to key to write a new value for the Minimum Break through percentage of the rod diameter. The valid range is 50% to 75%.

**F5: MAX** --- Select to key to write a new value for the Maximum Break through percentage of the rod diameter. The valid range is 80% to 95%.

**F6: MORE** -- Press this key to view more screens to change Register Values to customize for each Machine. (See page 39)

The Break thru percent value is the distance the wheel will cut at the major cut speed.

# OPERATOR'S MANUAL

## SCREEN #38; ENGINEERING SCREENS

WHEEL WEAR Compensation will change with each +/- key by the Incremental amount of Default = 0.001 In ; Preset = x.xxx In "ENGINEERING Functions"					
BACK	ENG'R	_____	INCR	_____	MORE
F1	F2	F3	F4	F5	F6

**F1: BACK** -- Return to the previous screen. (See page 38)

**F2: ENG'R** -- Back to Engineering Screen. (See page 31)

**F3:** Not Used.

**F4: INCR** - Press this key to access the register to change the *incremental* value for the Wheel Wear Compensation amount.

**F5:** Not Used.

**F6: MORE** -- Press this key to view more screens to change Register Values to customize for each Machine. (See page 40)

# OPERATOR'S MANUAL

## SCREEN #39; ENGINEERING SCREENS

Rod End Sensor to Wheel Side Compensation will change with each +/- key by the Incremental amount of: Default = 0.002 In ; Preset = x.xxx In "ENGINEERING Functions"					
BACK	ENG'R	_____	INCR	_____	MORE
F1	F2	F3	F4	F5	F6

**F1: BACK** -- Return to the previous screen. (See page 39)

**F2: ENG'R** -- Back to Engineering Screen. (See page 31)

**F3:** Not Used.

**F3:** Not Used.

**F4: INCR** - Press this key to access the register to change the *incremental* value for the Rod Edge Sensor to Wheel Side compensation amount.

**F5:** Not Used.

**F6: MORE** -- Press this key to view more screens to change Register Values to customize for each Machine. (See page 41)



# OPERATOR'S MANUAL

## SCREEN #40; ENGINEERING SCREENS

WHEEL HEAD Over Travel Software Limit: Default = 1.500 In ; Preset = x.xxx In WHEEL HEAD Back Off Compensator: Default = 0.250 In ; Preset = x.xxx In "ENGINEERING Functions"					
BACK	ENG'R	_____	WH-OT	WH-BC	MORE
F1	F2	F3	F4	F5	F6

**F1: BACK** -- Return to the previous screen. (See page 40)

**F2: ENG'R** - Back to Engineering Screen. (See page 31)

**F3:** Not Used.

**F4: W-O-T** - Press this key to access the register to change the Wheel Head Over Travel Software Limit. This distance should be the measured distance from a new wheel, with the Wheel Head axis at home, to the coolant nozzle less 1/16".

**F5: W-B-C** - Press this key to access the register to change the Wheel Head Back Off Compensation. This is the distance the wheel head will back from the rod diameter for safety clearance.

**F6: MORE** -- Press this key to view more screens to change Register Values to customize for each Machine. (See page 42)

# OPERATOR'S MANUAL

## SCREEN #41; ENGINEERING SCREENS

Wheel to Rod Advance Safety Air Gap: Default = 0.050 In ; Preset = x.xxx In Wheel Over Cut of Rod amount: Default = 0.050 In ; Preset = x.xxx In "ENGINEERING Functions"					
BACK	ENG'R	_____	AIR-G	OVCUT	MORE
F1	F2	F3	F4	F5	F6

**F1: BACK** -- Return to the previous screen. (See page 41)

**F2: ENG'R** -- Back to Engineering Screen. (See page 31)

**F3:** Not Used.

**F4: AIR-G** - Press this key to access the register to change the Wheel to Rod Advance Safety Air Gap amount. This is the amount of gap that remains after the rapid travel toward the rod.

**F5: OVCUT** - Press this key to access the register to change the Wheel Over Cut amount. This is the extra amount of Wheel Head travel that will be applied to the rod diameter distance.

**F6: MORE** -- Press this key to view more screens to change Register Values to customize for each Machine. (See page 43)

# OPERATOR'S MANUAL

## SCREEN #42; ENGINEERING SCREENS

ORIGINAL Distance from the VEE CENTER to the O.D. of a 8" Cut Off Wheel is: Default = 1.187 In ; Preset = x.xxx In Press F5 to accept value above x.xxx In "ENGINEERING Functions"					
BACK	ENG'R	_____	VEE-W	SET	MORE
F1	F2	F3	F4	F5	F6

**F1: BACK** -- Return to the previous screen. (See page 42)

**F2: ENG'R** -- Back to Engineering Screen. (See page 31)

**F3:** Not Used.

**F4: VEE/W** - Press this key to access the register to change the Original Vee Center to New Wheel Outside Diameter amount. The PLC uses this dimension to calculate the moves to perform on the rods.

**F5: SET** - Press this key after setting or changing the Wheel to Vee center value.

**F6: MORE** -- Press this key to view more screens to change Register Values to customize for each Machine. (See page 44)

# OPERATOR'S MANUAL

## SCREEN #43; ENGINEERING SCREENS

Sensor to Wheel Comp. Values Per O.D.					
Sensor to Wheel DISTANCE = x.xxx In					
1/16" OD ; Ref. = xx.xxx In					
1/8" OD ; Ref. = xx.xxx In					
1/4" OD ; Ref. = xx.xxx In					
BACK	REF.	1/16"	1/8"	1/4"	MORE
F1	F2	F3	F4	F5	F6

**F1: BACK** -- Return to the previous screen. (See page 43)

**F2: REF.** - Press this key to write the value of Sensor to Wheel distance for Rod diameter to be used. The operator can change this value when they look up the references from their chart.

**F3: 1/16"** - Press this key to write the value of the Sensor to Wheel distance for a 1/16" diameter rod.

**F4: 1/8"** -- Press this key to write the value of the Sensor to Wheel distance for a 1/8" diameter rod.

**F5: 1/4"** -- Press this key to write the value of the Sensor to Wheel distance for a 1/4" diameter rod.

**F6: MORE** -- Press this key to view more screens to change Register Values to customize for each Machine. (See page 45)

Find these distances by pressing and holding the jog forward Push button for the Rod Pusher axis. Use the slow rate when close to the limit target. The axis will stop when Rod Edge Sensor sends a signal to the PLC logic. To jog on ahead, release the jog forward push button and press again.

# OPERATOR'S MANUAL

## SCREEN #44; ENGINEERING SCREENS

Sensor to Wheel OFFSET Comp. Per O.D.					
3/8" OD ; Offset = xx.xxx In					
1/2" OD ; Offset = xx.xxx In					
3/4" OD ; Offset = xx.xxx In					
1" OD ; Offset = xx.xxx In					
BACK	3/8"	1/2"	3/4"	1"	NEXT
F1	F2	F3	F4	F5	F6

**F1: BACK** -- Return to the previous screen. (See page 44)

**F3: 3/8"** -- Press this key to write the value of the Sensor to Wheel distance for a 3/8" diameter rod.

**F4: 1/2"** -- Press this key to write the value of the Sensor to Wheel distance for a 1/2" diameter rod.

**F5: 3/4"** -- Press this key to write the value of the Sensor to Wheel distance for a 3/4" diameter rod.

**F6: 1"** -- Press this key to write the value of the Sensor to Wheel distance for a 1" diameter rod.

**F6: ENG'R** - Back to Engineering Screen. (See page 46)

Find these distances by pressing and holding the jog forward Push button for the Rod Pusher axis. Use the slow rate when close to the limit target. The axis will stop when Rod Edge Sensor sends a signal to the PLC logic. To jog on ahead, release the jog forward push button and press again.

# OPERATOR'S MANUAL

## SCREEN #45; ENGINEERING SCREENS

TOOL BED +OVER TRAVEL					
Value to be 16.625 or Less = xx.xxx In					
May need to adjust Home Limit Target to					
obtain a distance from 16.000 to 16.625					
"ENGINEERING Functions"					
BACK	ENG'R	_____	TB+OT	_____	NEXT
F1	F2	F3	F4	F5	F6

**F1: BACK** -- Return to the previous screen. (See page 45)

**F2: ENG'R** -- Back to Engineering Screen. (See page 31)

**F3:** Not Used.

**F4: TB+OT** - Press this key to access the register to change the Tool Bed +Over Travel limit. This distance is the measured value of the pushing plate from Home position to the end of the table's flat portion. The PLC uses this dimension to calculate the moves to perform on the rods. The Tool Bed finished zone is the + Over Travel - (1/2 Rod diameter).

**F5:** Not Used.

**F6: NEXT** -- Press this key to view more screens to change Register Values to customize for each Machine. (See page 47)

# OPERATOR'S MANUAL

SCREEN #46; ENGINEERING SCREENS

ROD PUSHER +OVER TRAVEL					
Value to be 19.500 or Less = xx.xxx In					
ROD PUSHER DONE POSITION					
Value to be Between = xx.xxx In					
[ (+OT) - 0.250 ] and [ (+OT) - 0.500 ]					
BACK	ENG'R	RP+OT	_____	DONE	_____
F1	F2	F3	F4	F5	F6

**F1: BACK** -- Return to the previous screen. (See page 46)

**F2: ENG'R** -- Back to Engineering Screen. (See page 31)

**F3:** Not Used.

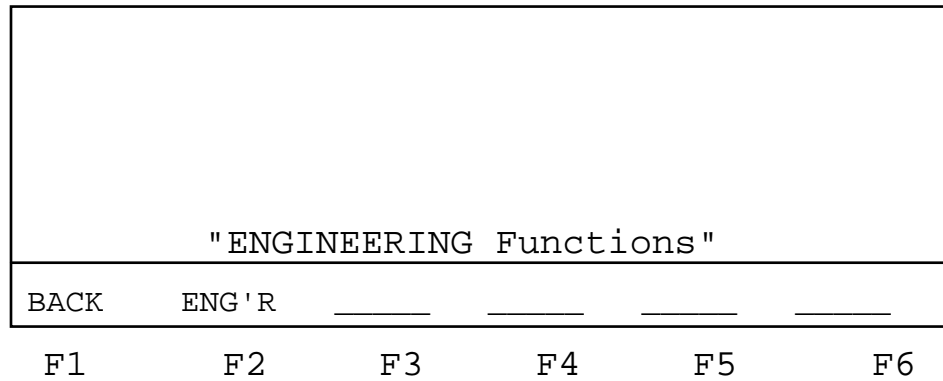
**F4: RP+OT** - Press this key to access the register to change the Rod Pusher +Over Travel position. This position should be where the "Rod Pusher Assembly" is at least 1/8" away from the clamps and the "Rod Pusher end tip has crossed the "Vee Wheel slot" by 1/8". This position is where the axis will push the last piece of the rod across the slot in the Vee.

**F5: DONE** - Press this key to access the register to change the Rod Pusher Done position. This position should be where the Rod Pusher end tip is at least 1/8" away from the Vee slot. This position has a limited range from the positive over travel.

**F6: NEXT** - Press this key to view more screens to change Register Values to customize for each Machine. (See page 48)

# OPERATOR'S MANUAL

SCREEN #47; ENGINEERING SCREENS



**F1: BACK** -- Return to the previous screen. (See page 47)

**F2: ENG'R** -- Back to Engineering Screen. (See page 31)

**F3:** Not Used.

**F4:** Not Used.

**F5:** Not Used.

**F6:** Not Used.



# OPERATOR'S MANUAL

## Machine Sequences

Find Rod End, push first length and cut first length.

M0225, SEQ-SA1, Check status to find rod end sequence, all home.

M0226, SEQ-SA2, Open clamp.

M0227, SEQ-SA3, Load Rod if needed.

M0228, SEQ-SA4, Move Rod Pusher up to starting position if needed.

M0229, SEQ-SA5, Push rod to Rod Edge Sensor, stop and go to next stage or fault.

M0230, SEQ-SA6, Move rod first cut length or nip amount.

M0231, SEQ-SA7, Go to Cut Sequencer, Cut first length.

M0232, SEQ-SA8, Go to next rod length subroutine and hold stage until reset from all home.

Push remaining lengths after first cut.

M0193, SEQ-B01, Check conditions to cut next length; SEQ-SA8, SEQ-G11, and auto cycle or Start Push Button.

M0194, SEQ-B02, Push next cut length and then go to next stage if not done or no jamb.

M0195, SEQ-B03, Go to Cut Sequencer. Wait for auto reset; SEQ-B03 and SEQ-G11 or SEQ-SA1 and SEQ-G01.

## Cut Rod Sequence

M0129, SEQ-G01, Check conditions to cut rod.

M0130, SEQ-G02, Null stage, go to next stage.

M0131, SEQ-G03, Close Rod Clamp.

M0132, SEQ-G04, Move Wheel Head to clearance position.

M0133, SEQ-G05, Energize Coolant Solenoid.

M0134, SEQ-G06, Move Wheel Head Major Cut distance.

M0135, SEQ-G07, Move Wheel Head Break through distance if used or skip to next stage.

M0136, SEQ-G08, Move Wheel Head to Back Out position; Rod radius plus Back out distance.

M0137, SEQ-G09, Null Stage, go to next stage.

M0139, SEQ-G10, Wait for reset; SEQ-B02 or SEQ-SA1.

# OPERATOR'S MANUAL

## Appendix B: Servo Axis Error Codes Section

### Response Methods

1. **Status Only Errors:** Set the *Module Error Present* %I bit and *Module Status Code* or *Axis Error Code* %AI word, but do not affect motion.

#### Note

Unless otherwise noted, any command which causes a Status Only Error is ignored.

2. **Stop Normal Errors:** Perform an internal abort of any current motion using current **Jog Acceleration** and **Jog Acceleration Mode** (LINEAR or S-CURVE). The *Drive Enabled* and *Axis Enabled* %I bits are turned OFF after the configured **Drive Disable Delay**.

3. **Stop Fast Errors:** Instantly abort all motion by setting the servo velocity command to zero. The *Drive Enabled* and *Axis Enabled* %I bits are turned OFF after the configured **Drive Disable Delay**.

# OPERATOR'S MANUAL

GFK-1464 Appendix B Error Reporting B-3

Table B-1. DSM302 Error Codes

**Error Number  
(Hexadecimal)**

**Response Description Error Type**

**00** None No Error All

**Configuration Errors**

**02** Status Only -- Scaled data too big, maximum value in range used -- Axis

**03** Status Only -- Home Position > Positive EOT, Positive EOT used -- Axis

**04** Status Only -- Home Position < Negative EOT, Negative EOT used -- Axis

**Configuration Parameter Errors**

**10** Status Only -- Position Loop Time Constant too large, Immediate command ignored -- Axis

**11** Status Only -- Position Loop Time Constant too small, Immediate command ignored -- Axis

**12** Status Only -- Position Loop Time Constant computation overflow, reduced to non-overflow value -- Axis

**1E** Status Only -- Immediate command Jog Velocity out of range, command ignored -- Axis

**1F** Status Only -- Immediate command Jog Acceleration out of range, command ignored -- Axis

**Program Errors**

**20** Status Only -- Program Acceleration overrange, defaults to 16.7 million cts/sec/sec -- Axis

**21** Status Only -- Program Acceleration too small, defaulted to 32 cts/sec/sec -- Axis

**22** Status Only -- Scaled Velocity greater than 1 million cts/sec, 1 million cts/sec is used -- Axis

**23** Status Only -- Program Velocity is zero, defaulted to 1 count/sec used -- Axis

**24** Stop Normal -- Program Position too large -- Axis

**25** Stop Normal -- Unconditional Jump Destination not found -- Axis

**26** Stop Normal -- Jump Mask error -- Axis

**27** Stop Normal -- Wait Mask error -- Axis

**28** Stop Normal -- Parameter Position too large -- Axis

**29** Status Only -- Dwell time greater than 60 seconds, 5 seconds used -- Axis

**Position Increment Errors**

**2C** Status Only -- Position Increment Overrange error, increment ignored -- Axis

**Find Home Errors**

**30** Status Only -- Find Home while Drive Not Enabled error -- Axis

**31** Status Only -- Find Home while Program Selected error -- Axis

**32** Status Only -- Find Home while Force Digital Servo Velocity error -- Axis

**33** Status Only -- Find Home while Jog error -- Axis

**34** Status Only -- Find Home while Move at Velocity error -- Axis

**36** Status Only -- Find Home while Abort bit set error -- Axis

**Move at Velocity Errors**

**39** Status Only -- Move at Velocity while Drive Not Enabled error -- Axis

**3A** Status Only -- Move at Velocity while Program Selected error -- Axis

**3B** Status Only -- Move at Velocity while Home Cycle active error -- Axis

**3C** Status Only -- Move at Velocity while Jog error -- Axis

**3D** Status Only -- Move at Velocity while Abort All Moves bit is set error -- Axis

**3E** Status Only -- Move at Velocity Data greater than 8,388,607 user units/sec -- Axis

**3F** Status Only -- Move at Velocity Data greater than 1 million cts/sec error -- Axis

# OPERATOR'S MANUAL

*B-4 Motion Mate™ DSM302 for Series 90™-30 PLCs User's Manual – October 1997 GFK-1464*

Table B-1. – Continued – DSM302 Error Codes

**Error Number  
(Hexadecimal)**

**Response Description Error Type**

**Jog Errors**

- 40 Status Only -- Jog while Find Home error -- Axis
- 41 Status Only -- Jog while Move at Velocity error -- Axis
- 42 Status Only -- Jog while Force Digital Servo Velocity error -- Axis
- 43 Status Only -- Jog while Program Selected and not Feedholding error -- Axis

**Force Digital Servo Velocity Errors**

- 47 Status Only -- Force Digital Servo Velocity while Jog error -- Axis
- 48 Status Only -- Force Digital Servo Velocity while Move at Velocity error -- Axis
- 49 Status Only -- Force Digital Servo Velocity while Program Selected error -- Axis
- 4A Status Only -- Force Digital Servo Velocity while Follower Enabled error -- Axis

**Set Position Errors**

- 50 Status Only -- Set Position while Program Selected error -- Axis
- 51 Status Only -- Set Position Data overrange error -- Axis
- 52 Status Only -- Servo Axis 1,2: Set Position while not In Zone error Aux Axis 3: Set Position while ENC3 Velocity > 128 error-- Axis
- 53 Status Only -- Attempt to initialize position before digital encoder passes reference point. -- Axis
- 54 Status Only -- Digital encoder position invalid, must use Find Home or Set Position. -- Axis

**End of Travel and Count Limit Errors**

- 56 Status Only -- Commanded Position > Positive End of Travel or High Count Limit -- Axis
- 57 Status Only -- Commanded Position < Negative End of Travel or Low Count Limit -- Axis
- 58 Status Only -- (Absolute Position + Position offset) > Positive End of Travel or High Count Limit -- Axis
- 59 Status Only -- (Absolute Position + Position offset) < Negative End of travel or Low Count Limit -- Axis

**Drive Disable Errors**

- 5B Stop Normal -- Drive Disabled while Moving -- Axis
- 5C Stop Normal -- Drive Disabled while Program Active -- Axis

**Software Errors**

- 5F Status Only -- Software Error (Call GE Fanuc Field Service) -- Axis

**Program and Subroutine Errors**

- 60 Status Only -- Absolute Encoder Rotary Position Computation error -- Axis
- 61 Stop Normal -- Subroutine not in list -- Axis
- 62 Stop Normal -- Call Error (subroutine already active) -- Axis
- 63 Stop Normal -- Subroutine End command found in Program -- Axis
- 64 Stop Normal -- Program End command found in Subroutine -- Axis
- 65 Stop Normal -- Sync subroutine encountered by non-sync program -- Axis

**Program Execution Errors**

- 71 Status Only -- Too many programs requested in same PLC sweep -- Module
- 72 Status Only -- Request Program 0-10 with multi-axis program active -- Module
- 73 Status Only -- Request two programs on same sweep with program active -- Module
- 74 Status Only -- Request two programs for same axis, lower number program executed -- Module
- 75 Status Only -- Empty or Invalid Program requested -- Module
- 76 Status Only -- AQ Move Command Position Out of Range -- Axis

# OPERATOR'S MANUAL

GFK-1464 Appendix B Error Reporting B-5

Table B-1. - Continued - DSM302 Error Codes

**Error Number  
(Hexadecimal)**

**Response Description** Error Type

**Program Execution Conditions Errors**

- 80** Status Only -- Execute Program while Home Cycle active -- Axis
- 81** Status Only -- Execute Program while Jog -- Axis
- 82** Status Only -- Execute Program while Move at Velocity -- Axis
- 83** Status Only -- Execute Program while Force Digital Servo Velocity -- Axis
- 84** Status Only -- Execute Program while Program Selected -- Axis
- 85** Status Only -- Execute Program while Abort All Moves bit set -- Axis
- 86** Status Only -- Execute Program while Position Valid not set -- Axis
- 87** Status Only -- Execute Program while Drive Enabled not set -- Axis
- 88** Status Only -- Execute Program with active Error Stop (Axis Enabled off) -- Axis

**Program Synchronous Block Errors**

- 8C** Status Only -- Sync Block Error during CMOVE -- Axis
- 8D** Status Only -- Sync Block Error during Jump -- Axis

**EEPROM Errors**

- 90** Status Only -- Flash EEPROM memory programming failure -- Module

**Hardware Limit Switch Errors**

- A0** Stop Fast -- Limit Switch (+) error -- Axis
- A1** Stop Fast -- Limit Switch (-) error -- Axis

**Hardware Errors**

- A8** Stop Fast -- Out of Sync error -- Axis
- A9** Stop Fast -- Encoder Loss of Quadrature or Linear Feedback Loss of Signal error -- Axis

**Digital Servo Alarms**

- B0** Stop Normal -- Main DC power supply overvoltage -- Axis
- B1** Stop Normal -- Control power undervoltage -- Axis
- B2** Stop Normal -- Dynamic brake failure Axis
- B3** Stop Normal -- Main DC power supply undervoltage -- Axis
- B4** Stop Normal -- CNV Overload -- Axis
- B5** Stop Normal -- Cooling fan failure -- Axis
- B6** Stop Normal -- Over current -- Axis
- B7** Stop Normal -- Regenerative discharge energy error; resistor thermal switch open -- Axis
- B9** Stop Normal -- Control power undervoltage -- Axis
- BA** Stop Normal -- Error detected by IPM circuit -- Axis
- BB** Stop Normal -- Main DC power supply undervoltage -- Axis
- BD** Stop Normal -- Cooling fan failure -- Axis
- BE** Stop Normal -- Over current -- Axis

# OPERATOR'S MANUAL

*B-6 Motion Mate™ DSM302 for Series 90™-30 PLCs User's Manual – October 1997 GFK-1464*

## **Table B-1. - Continued - DSM302 Error Codes (Continued)**

### **Error Number**

**(Hexadecimal)**

**Response Description** Error Type

### **Encoder Alarms**

**C0** Stop Fast Servo not ready when MCON command is on - may be caused by E-STOP input to amplifier.

Axis

**C1** Status Only -- Serial Encoder Battery Low -- Axis

**C2** Stop Normal -- Serial Encoder Battery Failed -- Axis

**C3** Stop Normal -- Servo Motor Over Temperature -- Axis

**C4** Stop Fast -- Servo Motor Over Current -- Axis

**C5** Stop Fast -- Loss of Encoder -- Axis

**C6** Stop Fast -- Error in encoder pulse detection -- Axis

**C7** Stop Fast -- Encoder counter error -- Axis

**C8** Stop Fast -- -- Encoder LED is disconnected -- Axis

**C9** Stop Fast -- Encoder CRC checksum failure -- Axis

**CA** Stop Fast -- Unsupported encoder, linear or Type A -- Axis

**CB** Stop Fast -- Unsupported encoder, Type C -- Axis

### **DSP Alarms**

**D1** Stop Fast -- Over current Detected -- Axis

**D2** Stop Fast -- Loss of Analog Feedback -- Axis

**D3** Stop Fast -- Over Acceleration Detected -- Axis

**D4** Stop Fast -- Over Velocity Detected -- Axis

**D5** Status Only -- KpVelFix Too Large -- Axis

**D6** Status Only -- IntGainFix Too Large -- Axis

**D7** Status Only -- Alpha Calculation Overflow -- Axis

**D8** Status Only -- IntGain Calculation Overflow -- Axis

**D9** Status Only -- Kp Calculation Overflow -- Axis

**DA** Stop Fast -- FPGA Error Detected -- Axis

### **Special Purpose Errors**

**E0** Status Only Custom Loop Type Mismatch Axis

**E2** Stop Fast DSP Interrupt failure Module

### **Follower Errors**

**F1** Status Only -- Follower Position Error Limit Encountered -- Axis

**F2** Status Only -- Follower Velocity Limit Condition Encountered -- Axis

**F3** Status Only -- Follower Ratio B value = 0 -- Axis

**F4** Status Only -- Follower Ratio B value < 0 -- Axis

**F5** Status Only -- Follower Ratio A/B or B/A > 32 -- Axis

### **Winder Errors**

**F6** Status Only -- A/B Change Not Allowed in Winder Mode With Follower Enabled -- Axis

**F7** Status Only -- Set Winder Position Immediate Command Out of Zone -- Axis

**F8** Status Only -- Zone Length Out of Range or Zone Length Change Exceeded 25% -- Axis

**F9** Status Only -- Zone Length Change Not Accepted; Previous Change Still in Effect -- Axis

### **Internal Errors**

**FD** Stop Fast -- System software error -- Axis

**FE** Stop Fast -- Unrecognized encoder, not supported -- Axis

# OPERATOR'S MANUAL

GFK-1464 Appendix B Error Reporting B-7

## LED Indicators

There are seven LEDs on the DSM302 module which provide status indications. These LEDs are described below.

**STAT** Normally ON. FLASHES to provide an indication of operational errors. Flashes *slow* (four times/second) for Status-Only errors. Flashes *fast* (eight times/second) for errors which cause the servo to stop.

*ON*: When the LED is steady ON, the DSM302 is functioning properly. Normally, this LED should always be ON.

*OFF*: When the LED is OFF, the DSM302 is not functioning. This is the result of a hardware or software malfunction which will not allow the module to power up.

*Flashing*: When the LED is FLASHING, an error condition is being signaled.

*Constant, CFG LED ON*:

The LED flashes slow (four times / second for Status Only errors and fast (eight times / second for errors which cause the servo to stop. The operational error code will be placed in one of the first four %AI status words and the *Module Error Present %I* status bit will be ON.

*Constant, CFG LED Flashing*:

If the STAT and CFG LEDs both flash **together** at a constant rate, the DSM302 module is in boot mode waiting for a new firmware download. If the STAT and CFG LEDs both flash **alternately** at a constant rate, the DSM302 firmware has detected a software watchdog timeout due to a hardware or software malfunction.

*Irregular, CFG LED OFF*:

If this occurs immediately at power-up then a hardware or software malfunction has been detected. The module will blink the STAT LED to display two error numbers separated by a brief delay. The numbers are determined by counting the blinks in both sequences. Record the numbers and contact GE Fanuc for information on correcting the problem.

**OK** The OK LED indicates the current status of the DSM302 module.

*ON*: When the LED is steady ON, the DSM302 is functioning properly. Normally, this LED should always be ON.

*OFF*: When the LED is OFF, the DSM302 is not functioning. This is the result of a hardware or software malfunction which will not allow the module to power up.

**CFG** This LED is ON when a valid module configuration has been received from the PLC. Flashes *slow* (four times/second) during the Motion Program Store function. Flashes *fast* (eight times/second) during the Write User RAM to EEPROM operation.

**EN1** When this LED is ON, the servo drive for Servo Axis 1 is enabled.

**EN2** When this LED is ON, the servo drive for Servo Axis 2 is enabled.

**EN3** When this LED is ON, the *Force Analog Output* command for Aux Axis 3 is active.

**EN4** When this LED is ON, the *Force Analog Output* command for Aux Axis 4 is active.