Power On

Initialize OIT &
Servo Power **S0**

Timer
8 Seconds

Servo ALM?

YES

NO

Cycle Power
Servo Reset

Timer
20 Seconds

Home Required **S1**
F1 F2 F3 F4 F5 F6

CONTINUE CYCLE
NO   YES **S2**
F1 F2 F3 F4 F5 F6

**F1
BACK
(Typ.)**

Verify
Home & Reset **S3**
F1 F2 F3 F4 F5 F6

Verify
Home & Continue **S4**
F1 F2 F3 F4 F5 F6

Interlocks
OK?   NO

YES
Reset
Cycle Flags

Interlocks
OK?   NO

YES

Cycle
In Prog?   YES

NO

Servo FWD
Pre-Home Cycle **S6**

60000 Counts
(Fixed)

**- Cycle Pause & Abort
- FWD Over-Travel**

Servo REV
Home Cycle **S5**

Servo Zero
@ Home Prox
Trailing Edge

Home Complete
Pusher Locate
Position = 0

Cycle
Continue?   YES

NO
Reset

Cartridge Lower **S8**

Cartridge
Lowered

Mode Choices
Man Auto Cnc Help **S10**
F1 F2 F3 F4 F5 F6

Servo GoTo
Last Cycle
ABS Position **S9**

Servo Zero
@ Home Prox
Trailing Edge

**Cycle Continues
Where Last Cycle
Left Off**

**S27
M490
RST**
Man
Home
F1 F2 F3 F4 F5 F6

**S20
M490
RST**
Man
Jog
F1 F2 F3 F4 F5 F6

S21
Man
Cart
F1 F2 F3 F4 F5 F6

S23
Man
Cnc
F1 F2 F3 F4 F5 F6

Man Choices
Home Jog Cart
Cnc **S11**
F1 F2 F3 F4 F5 F6

Cnc Setup **S13**
F1 F2 F3 F4 F5 F6

Help Choices
Man Auto Cnc **S14**
F1 F2 F3 F4 F5 F6

Help
Man **S15**
F1 F2 F3 F4 F5 F6

Help
Auto **S16**
F1 F2 F3 F4 F5 F6

Help
Cnc **S17**
F1 F2 F3 F4 F5 F6

**NEXT PAGE 2
S30 (Auto)**

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PAGE 3 - S27

FROM
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Read
Recipe

Auto:Ready toStart
Read   Start
F1 F2 F3 F4 F5 F6   **S30**

Interlocks
OK?   NO

YES

Pusher Length 24"
Change   Keep
F1 F2 F3 F4 F5 F6   **S31**

Set Pusher
Bar=24"
                OK
F1 F2 F3 F4 F5 F6   **S32**

Load RST M400 /
No Load SET M400

Cycle RST M401 /
Single SET M401

New Bar
12"orLess
Cycle Load
Start
F1 F2 F3 F4 F5 F6   **S33**

Interlocks
OK?   NO

YES
SET M490

Load Bar?   NO

YES

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PAGE 3 - S27

Cartridge UP
Block Gravity Feed   **S40**

Cartridge
Up Adj.?   NO

YES   Cartridge
            Raised
            Feed Height

Servo FWD To P1
(Push Bar-1"
or Greater)   **S42**

Servo = P1

P1
Taught?   NO

YES
Auto Cycle
In Progress

Bar Load Posn 1
Change   Teach
F1 F2 F3 F4 F5 F6   **S43**

Teach P1
SET M501

Man Jog P1
        Done
F1 F2 F3 F4 F5 F6   S24,25,26

Cartridge
Up Max?   NO

YES   Cartridge
            Raised
            Max Height

Cartridge DOWN
(Manually Remove Bar)   **S41**

Cartridge
Lowered Down

Adj. Prox Not Seen
        Retry
F1 F2 F3 F4 F5 F6   **S41**

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PAGE 1 - S10**

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Auto Cycle Servo
Go to "0" Position   **S27**

Servo Count
"0" Position

Cartridge
Up?

NO

YES

Cycle
Stop?

YES
RST
M490

**TO PAGE 2
S30 (Auto)**

NO

Cartridge DOWN   **S47**

Open CNC Collet
Energize 5CR

Cartridge
Lowered Down

Collet is Open
CNC Energizes 3CR

Bar Load
Detected?

YES

Load Bar
Cycle?

YES

NO

**TO PAGE 2
S40 (Load Bar)**

NO

No Bar Load
Detect
Retry   **S48**

F1 F2 F3 F4 F5 F6

NO

Servo FWD To P2
(P 1-PBar
or Greater)   **S52**

Servo = P2

Cartridge UP
Block Gravity Feed   **S48**

Cartridge
Up?

NO

P2
Taught?

NO

YES

YES
Auto Cycle
In Progress

Bar Load Posn 2
Change   Teach   **S43**

F1 F2 F3 F4 F5 F6

Teach P2
SET M502

Man Jog P2

Done

F1 F2 F3 F4 F5 F6   S24,25,26

**NEXT PAGE 4
S59
(Ready to Index)**

**FROM
PAGE 3 - S52**

Open Collet
Energize 5CR
(& Index Calcs) **S59**

Collet Is Open
CNC Energizes 3CR

Repeat Index Cycle

Servo Push Fwd
(2nd) Index Feed **S60**

Servo = Fwd
Index Position

PROX 3
Control Feed — **YES**

**TO PAGE 3
S27 (P 0)**

NO

Bar Feed
Preset Count

NO
Increment
Index Count

YES
Reset
Index Count

De-Energize 5CR
Close Collet **S62**

Collet Closed
CNC Energizes 3CR

Adjustable
Dwell Timer
(Delay Reverse)

Timer
Times Out

CNC "Start"
Energize 1CR
(Momentary)

Energize 1CR
Momentary

Servo Rev
.010" or
Password Dist. **S64**

Servo = Rev
Position

CNC Done
Energize 2CR
(Momentary) **S66**

Energize 2CR
Momentary

Servo Fwd
To Bar Position **S70**

Servo = Fwd
Position

Open Collet
Energize 5CR **S72**

Collet is Open
CNC Energizes 3CR

A) **LOADING OF BAR STOCK**

    1) Cartridge is DOWN, bar stock blocked into machine by Load Cyl(s) Extend.

    2) Cartridge is UP, bar stock load into machine by Load Cyl(s) Retract.

    3) PROX 2 " Bar Load Detect", only detects gravity feed between (mid-point) the bar stock tray & the machine load position (as cartridge is lowering). If bar stock tray is present (cartridge lowered), and power is off, the first bar feed WILL NOT have been detected when power is switched on. If power is switched on before bar stock tray is present (cartridge lowered), the first bar feed WILL be detected. It is up to the operator to ensure that a bar is in the machine for first cycle. Every subsequent cycle will check for Load Cyl(s) feed bar (mid-point) and stop the automatic repeat cycle if no bar has been detected.

INTERLOCKS

A) **START**

    1) Main Power 230VAC is ON.

    2) "Power ON" 1SS; 24vdc MCR - PLC Power & 4CR - Servo Power N.O. (Y5 ON).

    3) Servo has NO "Servo Alarm" N.C. (X0 ON).

    4) Servo "Fwd Overtravel" LS1 is NOT actuated N.C. (X3 ON).

    5) Servo "Rev Overtravel" LS2 is NOT actuated N.C. (X5 ON).

    6) Servo Rotor Lock SON is on and holding position N.O. (Y2 ON).

    7) Servo "Home Cycle" completed and Servo is at Home "0 Count" position.

    8) CNC "Start" 24vdc 1CR Signal OFF N.O. (Y4 OFF)

    9) "Air Pressure" Switch PS1 at minimum pressure N.O. (X4 ON).

    10) "Emergency Stop" 1PB is in the Pulled or Reset position N.C. (X2 ON).

    11) "Cartridge Down" reed switch RS1 is made N.O. (X7 ON)

    12) "Cartridge Up" reed switch RS2 is not made N.O. (X10 OFF).

    13) "Bar Detect" Prox 2 is Unobstructed N.O. (X6 OFF).

    14) "Control Feed" Prox 3 (Adjustable) is Unobstructed N.O. (X11 OFF).

    15) "Close CNC Collot" 24vdc Signal to 5CR OFF (Y10 OFF).

    16) "CNC Collet Closed" 24vdc Signal to 3CR OFF N.O. (X13 OFF).

    17) "CNC Done" 24vdc Signal to 2CR OFF N.O. (X12 OFF).

B) **HOME**

    1) Cartridge must be UP (Y6 ON, Y7 OFF) making RS2 (X10 ON).

    2) "Emergency Stop" 1PB is in the Pulled or Reset position N.C. (X2 ON).

    3) Servo has NO "Servo Alarm" N.C. (X0 ON).

    4) Servo "Fwd Overtravel" LS1 is NOT actuated N.C. (X3 ON).

    5) Servo "Rev Overtravel" LS2 is NOT actuated N.C. (X5 ON).