➢ **To manually load tool to spindle.**

1. Jog.
2. SBH switch on then open side doors.
3. Machine.
4. Menu Select.
5. TBT.
6. Machine setup.
7. Semi – functions
8. Cursor to tool conventional.
9. Auto.
10. Release.
11. –Action.
12. Ok will begin to flash.
13. Make sure spindle and feed start are on.
14. Take the remote into the machine.
15. Grip the spindle tool in one hand.
16. Press the two side buttons on the remote simultaneously.
17. Ok release stops flashing.
18. Remove tool.
19. Put next tool in spindle.
20. Cursor to tool conventional
21. +Action.
22.  Ok will begin to flash.
23. Make sure spindle and feed start are on.
24. Take the remote into the machine.
25. Grip the spindle tool in one hand.
26. Press the two side buttons on the remote simultaneously.
27. Ok clamp stops flashing.
28. Parameter.
29. Tool Management.
30. Buffer Location.
31. Tab (goes to spindle tool)
32. Tool Management.
33. Re-locate.
34. Magazine number 9998.
35. Position 1.

➢ **Unload tool from the magazine.**

1. Machine.
2. Menu Select.
3. Parameter.
4. Tool Management.
5. Tool list list.
6. Cursor to tool to be unloaded.
7. Unload.
8. From magazine.

➢ **Load tool to magazine.(Load new tool)**

1. Machine.
2. Menu Select.
3. Parameter.
4. Tool Management.
5. Tool list.
6. New tool.
7. Name & number of tool.
8. Input after name.
9. Open up tool description.
10. Cursor down to correct name.
11. Input.
12. Input:-  to status enable.
13. Cutting edge data.
14. Input.
15. Tool list.
16. Load.
17. Find empty location.
18. Start.
19. Load tool to carousel.

➢ **Re – locate the active spindle tool to the magazine.**

1. Machine.
2. Menu Select.
3. Parameter.
4. Tool Management.
5. Buffer Location.
6. Tab (goes to spindle tool)
7. Tool Management.
8. Re-locate.
9. Automatic selection of empty pocket.
10. Start if okay.

➢ **Clear the active tool from the spindle.**

1. Machine.
2. Menu select.
3. Program.
4. Part program.
5. Tool _ T0.
6. Select.
7. Auto.
8. Cycle Start.

> **Reset a tool change fault.**

1. Jog.
2. Machine.
3. Menu Select.
4. T.B.T.
5. Machine Setup.
6. Tool mag.
7. Retract.
8. Auto.
9. Semi functions
10. Fault tool change reset.
11. + Action.

> **Input tool information.**

1. Machine.
2. Menu Select.
3. Parameter.
4. Tool Management.
5. Tool details
6. Tool list
7. Cursor to tool required
8. Tool details.
9. Cutting edge data.
10. Shift 'W' opens up $2^{nd}$ window for incremental offset change.
11. Adjust then press input twice.

> **Activating the I.T.S. bar as the spindle tool.**

1. Machine.
2. Menu Select.
3. Parameter.
4. Tool Management.
5. Magazine list.
6. Cursor to I.T.S. tool
7. Relocate.
8. Magazine number 9998.
9. Input location 1.
10. Start.
11. Tab.

➢ **De-activating the I.T.S. bar as the spindle tool.**

1. Machine.
2. Menu Select.
3. Parameter.
4. Magazine list.
5. Tab button.
6. Relocate to empty location.
7. Tool now unloaded.
8. Tool list.
9. Cursor to next tool.
10. Load.
11. Find empty location.
12. Start.
13. Tool now loaded to magazine.
14. Relocate.
15. Magazine number 9998.
16. Input location number 1.
17. Start:-  Tool is now active in the spindle

➢ **Input tool information when using the I.T.S. bar.**

1. Machine.
2. Menu Select.
3. Parameter.
4. Tool Management.
5. Tool details.
6. New tool.
7. Name the tool.
8. Duplo 1.
9. End mill.
10. Input to enable.
11. Select. (Blue button).
12. Cutting edge data.

➢ **Release 'W' axis docking position.**

1. Machine.
2. Menu Select.
3. T.B.T.
4. Machine Setup.
5. 'W' axis docking position
6. − Auto action. (Unlocks tool).
7. Re-tooling position.
8. + Auto action.

> ➤ **I.T.S. zero position (docking position):-   W1 =88.868.**

> ➤ **Index Revolver.**

  1. Machine.
  2. Menu Select.
  3. T.B.T.
  4. Machine setup.
  5. Semi-functions
  6. Revolver.
  7. Drilling or conventional.
  8.  Action + or – to activate.

> ➤ **To Restart.**

  1. Machine.
  2. Menu Select.
  3. Auto.
  4. Block search.
  5. Cursor to 'T'=
  6. Without calculation.
  7. Cycle start.

> ➤ **Changing tool offsets for the I.T.S. bar while program is active.**

  1. N…… M5 M67.
  2. G290:- Changes to Siemens control.
  3. D0.
  4. STOPRE: - Stops reading information to allow tool offset change.
  5. M0.
      a.  Check dimensions of test profile.
      b.  Adjust offsets to suit.
  6. D1.
  7. G291:- Changes to ISO control.
  8. N….. G96 S….

> ➤ **To load programs.**

  1. Machine.
  2. Menu Select.
  3. Services.
  4. Data in.
  5. R232C.

➢ **To upload programs.**

1. Machine.
2. Menu Select.
3. Services.
4. Data out.
5. Cursor to the required program.
6. R232C. P.B.
7. Click on Upload Directory.
8. Leave cursor on the File Path not on a Programme.
9. on DNC
10. Input a file name. (Same as Programme name in TBT control)
11. Click on Upload
12. Click on OK (TBT control)
13. Open file (DNC)

➢ **To call up program.**

1. Machine.
2. Menu select.
3. Program.
4. Cursor to the required program.
5. Select.
6. Input to read.
7. Close editor
8. Ready to cycle start.

➢ **To copy programs.**

1. Machine.
2. Menu select.
3. Program.
4. Cursor to required program
5. Manage programs.
6. Copy.
7. Cursor to folder required.
8. Insert.
9. Change name.
10. Okay.
11. Input to open. (now in editor)

➢ **To block search.**

1. Machine.
2. Auto
3. Block search.
4. Cursor to Tool call
5. Line T…..
6. Without calculation.
7. Cycle start. (twice)

➢ **To block search to check for program errors.**

1. Machine.
2. Auto
3. Block search.
4. Go to line required to search to.
5. Or end of program. M17 or M30.
6. Ensure skip block is active. (Found in program control.)
7. Calculate contour.

➢ **Program stop with re-positioning.**

1. Single block.
2. Allow tool to rapid clear.
3. Feed stop.
4. Spindle stop.
5. Cycle stop.
6. Jog.
7. Open guard doors.
8. +W to allow access.
9. Clear cuttings, inspect etc.
10. Shut guard doors.
11. Auto.
12. Spindle start.
13. Feed start.
14. Cycle start.
15. Automatic repositioning will take place.

➢ **To unclamp the steady.**

1. Machine.
2. Menu Select.
3. T.B.T.
4. Jog.
5. Cursor to steady.
6. - Action and rapid to release.

➢ **To activate skip block.**

1. Machine.
2. Menu select.
3. Program control.
4. Cursor to skip block.
5. Select.

➢ **To set the probe block reference position.**

1. Load setting block.
2. Manually clock up bore.
3. Act Val. Mcs.
4. Machine.
5. Menu Select.
6. Start-up
7. Machine data.
8. Axis MD.
9. Select axis.
   a) Axis +
   b) Axis –
10. Search 34210.
11. 1 input.
12. Reset.
13. Ref. Point.
14. Reset.
15. Select axis.
16. Reset.
17. + (next to rapid).
18. Display changes to Z.
19. 34100 to change Ref. Position.

➢ **Disconnecting C2 & steady.**

1. Machine.
2. Menu Select.
3. T.B.T.
4. Machine setup.
5. Semi – functions.
6. Auto.
7. C2 axis and back rest.
8. – Action.
9. Machine off.
10. Start-up.
11. NCK reset.
12. Yes.
13. Reset stop.
14. Machine on.
15. Machine off.
16. Purge hydraulic pressure.
    a) Red P.B. at back of machine.
17. Disconnect 3-off hoses.
    a) Two green and one yellow.
18. Remove the holding bracket.
    a) 2-off screws.
19. Disconnect the 4-off black hoses.

➢ **Process monitoring.**

1. Machine.
2. Menu select.
3. T.B.T.
4. Coolant.
5. Set coolant volume / spindle load monitors.

    a) Small diameter drills – high pressure / low volume.
    b) Large diameter drills – low pressure / high volume.

➢ **To carry out the safety test.**

1. Machine.
2. Menu Select.
3. T.B.T.
4. Jog.
5. Machine setup.
6. Manual functions.
7. Cursor to Safety Integrated Test Stop.
8. + Action. (keep P.B. depressed until fault light begins to flash)
9. Now press the following P.B.'s in the given order.
10. Reset Stop. – Reset. – Machine Off. – Machine On.

➢ **To view coolant volume and spindle efficiency during the drilling cycles.**

    1. Machine.
    2. Menu Select.
    3. T.B.T.
    4. Coolant.
    5. Cursor to any value requiring adjustment.
    6. Input new value.


➢ **'R' Parameters.**

    1. R320 = Overall length of job.
    2. R991 = B – axis position.
    3. ?
    4. ?
    5. ?

➢ **'M' Functions.**

    1. M41 – up to1250 revs.
    2. M42 – up to a maximum of 5000 revs.
    3. M66 – Through spindle coolant on.
    4. M67 - Through spindle coolant off.
    5. M68 - Flood coolant on.
    6. M69 – Flood coolant off.


➢ **Work shift.**

    1. Trans X or Y or Z etc. Following the main datum offset. (G54, G55 etc)


➢ **The home position is X -24.21.**


➢ **G500 cancel work offsets.(only if no value is set in G500)**
➢ **G53 cancel work offsets from G54…….G599.**


➢ **Shift V to insert a forward slash to skip blocks.**

    1. Example :- / N300

> **MDI to turn C or B axis.**

1. G0   G90 Z=R5
2. G54 G0 G90 B1=0, 90, etc.
3. G54 G0 G90 B1=0, 90, etc.