Instructions for fitting Ahha system to Bridgeport Boss

Please note these instructions are for guidance. If you have any doubt on any particular point please check with us. If you have any difficulties in getting your machine running give us a call. We can always get your machine running, hopefully without an engineers visit and any great expense. If you find any part of this documentation unclear or spot any errors PLEASE let us know. We constantly revise and add to our documentation in order to make fitting Ahha control as straight forward as possible. We suggest you read the document right through before following the detailed instructions.

We supply the following:-

1 Ahha IF card that fits in the PC as per the Ahha instruction manual.

1 EMT F0598 IF Card that fits in with the machine electrics.

1 EMT F0605 Bridgeport IF card that fits above the F0598 Card.

2 Cables that connect the Ahha card to the EMT card. We supply 2 so that they can be joined through a slot cut in the cabinet wall saving having to make 37 connections!

Mounting plates, limit switches, Push buttons, cable and glands.

Suggested Procedure

Switch off the Bridgeport and Isolate from the mains!

Unscrew bezel holding red illuminated push button on original Bridgeport control panel.

Remove Panel allowing button to drop through panel.

Unplug cables from back of panel and discard panel.

Disconnect (pull off spade terminals) the wires from the push button making a careful note of where wire 40 and 127 connect across the light. Keep the push button and bezel for future use.

Remove the arm letting the wire all pass back down the tube. The only wires normally used are the 6 that were on the push button.

If there is a tube left projecting up from the cabinet make a suitable cap and seal the top. If you are left with a hole on the top of the cabinet make a plate and secure with the existing screws. Make sure any holes are sealed so that any coolant that splashes onto the top of the cabinet cannot drip through onto the electronics.

Remove the tape reader and its power lead

Cut all the wires going to the switches on the narrow panel mounted above the tape reader. The switches could be removed and the holes blanked off as the switches have no further purpose.

Locate the old external interface sockets on the left of the cabinet and cut all the wires. The sockets could be removed and the holes blanked off as they have no further purpose.

Carefully pull the wiring loom out of the cabinet and disconnect from the old logic boards.

At this stage you can discard all wires that have been disconnected both ends which should leave the cabinet fairly tidy.

Fit a new panel with 2 holes in place of the tape reader inside the plastic door on the front of the cabinet.

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Fit the old illuminated push button in one hole and reconnect wire no 40 & wire no 127 This now serves to indicate only that the machine drives are off . Limit switch actuation is now shown on the PC screen

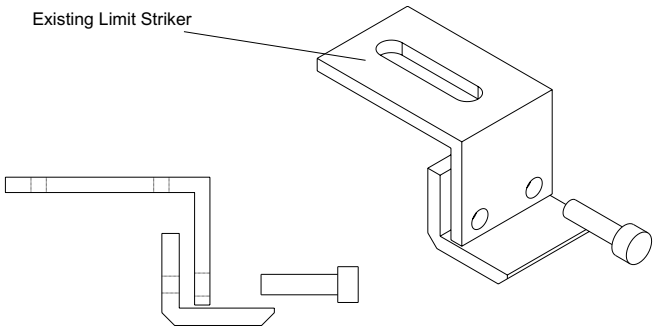
Fit a new push button with 2 N/O (Normally open) and 1 N/C (Normally closed) contact.

Connect wire 39 & 115 from the old red button across the N/C contacts

Connect wire 211 & 214 from the old red button across one of the N/O contacts

Locate the original terminal block above the logic rack. There should be a block of terminals numbered 39 and a block numbered 40. The terminals numbered 40 are 24 volts. Connect a wire from here to one of the last NO contact on the push button and connect a wire from the other side with sufficient length to reach right down to the bottom of the right hand cabinet.

Turn your attention to the head of the machine and remove the panel to gain access to the limit switches. We only need the 2 limit switches mounted on the right. Disconnect the wires on the N/O contact of the switches and reconnect onto the N/C. Locate the wires from the limit switches in the right hand cabinet and disconnect them from the logic boards and terminal strip at the bottom of the cabinet. Coil them up for connection to our 24V interface card at a later stage. We recommend you remove the surplus switch completely and either



Drill 2 holes in existing limit striker
and fit new limit dog with M4 screws

remove the wires if they run separately or insulate the ends and secure if they are part of a cable. Initially make sure the 2 limit switches are set so they operate well before the end of the Z traverse is reached

If you are replacing the X limit switch with new double switches remove the old cable completely and run a new signal cable with at least 3 wires from the switch location into the machine cabinet using the hole vacated by the old wire. If you are using our plates remove the head of the existing switch and drill out the hole to approximately 10mm. The rectangular plate is X and is trapped by the body of the existing micro switch. Mount the switches with the rollers togther in the middle. Connect the wires from the sealed switches to the cable in the body of the old micro switch using crimps or terminal blocks. The unused wires from the switches must be isolated as they are live when the switch is operated.

Do the same with Y. If using our plates the L shaped bracket is mounted on the cover of the existing switch with the new micro switches to the front of the machine. You will need to drill and tap 2 M5 holes to secure the plate.

The existing strikers will need holes drilling in them and new limit dogs as our drawing F0614-1 fitted. Depending on the axis the new dogs may have to be reversed or fitted the other side of the existing striker to get the switch operation correctly adjusted. Initially set the switches so they are activated well before the end of traverse is reached.

At this stage it is a good idea to remove all the other wires and plugs from the logic cards. They can all be coiled up and insulated with tape or traced to a terminal block and removed apart from socket K8 which is the

drive circuit which will be connected to our board. If you have 2 K8 leads it is the one removed from the BOSS control ERS circuit board that is still used.

Remove all the old logic cards and the bottom plastic guide rails.

Mount the EMT I/F card and the EMT Bridgeport IF card in the machine cabinet on the right of the machine. The most convenient way is to fix the panel across the face of the metalwork that contained the original logic cards. Drill and tap M5 using the mounting panel as a template. Then fit the stand-offs into the mounting plate and screw the plate on. Fit washers behind the plate on the top 2 screws to avoid distorting the plate. Then mount the boards on to the stand-offs. Fit the small board above the larger board with the two edges that are close to the 26 way pin connectors next to each other. Connect the 2 boards with the ribbon cable supplied.

At this point check that the full step link JR1 and the E stop link JR3 on the EMT I/F card are fitted. This ensures the output will be in full step mode to match the Bridgeport stepper drives. We are fairly sure running in half step mode does no damage but we know from hard won experience it does cause confusion when you try to set the machine up.

Connect the Bridgeport cable with the socket K8 onto the pins on the EMT Bridgeport IF card. The K8 socket should have pin 2 clearly marked and this should be facing out and 1 pin below pin 1 marked on our card. As a double check the K8 socket has a protrusion on one side only and this should be at the back.

Make a second connection using 0.5mm cable from original terminal 40 to our I/F terminal T3-1 (The EMT I/F terminals are numbered from the bottom in 4 blocks. T3 means the 3rd block up and the 1 means the lowest terminal on that block. It is clearly marked +24VDC. If it is not you have identified the WRONG terminal DO NOT CONNECT and check again until you fully understand our terminology).

Terminals 39 are the 24V return, make a connection to EMT terminal T1-1.

Connect the last remaining wire running from the new push button on the panel to EMT terminal T1-10 (RESET)

Connect the limit switches including the existing wires from the Z axis to the EMT IF board. as per the circuit diagrams supplied. All the connections on the board are clearly identified. Note the common connection is connected to the +24v as the limits switch 24V to operate.

If you are not using any guards with interlock switches this is a good time to link out the built in guard circuit by fitting a link between EMT terminal T1-11 and any convenient +24v.

Cut a slot in the right hand side of the cabinet to accept the 37 way socket on one of the 2 37 way cables along with 2 holes to accept the retaining studs. The slot **must** be big enough for the external plug metal shield to fit through freely. The holes for the studs must be drilled 4.0mm so that only the hexagonal part of the stud is projecting from the cabinet face. The plastic cover on the internal cable must be trimmed so that the metal part of the socket fits flush against the cabinet The screws are removed but the 2 metal plates are retained and fitted under the stud nuts. Failure to do this properly will result in the cables not connecting fully and all manner of spurious effects.

Check the fit of the Bridgeport cover panel.
The inner metal filter mesh will need to be cut away so that it does not press on the 7 large relays on the EMT I/F card. The filter itself may still touch the relays but this has never been a problem.

Remove the front cover containing the existing E stop switch and spindle start switch. Run a new signal cable with at least 8 wires from this box into the main right hand machine cabinet where our board is mounted.

The next stage is to wire up the emergency stop circuit using the switch fitted to the head of the Bridgeport. The way the Emergency stop works is that we need a permanent +24v connection to EMT terminal T1-12 and if this

is open nothing will run. There should be a wire numbered 214 on the existing E stop switch and if a parallel connection is made to EMT T1-12 the existing E stop will control our IF electrics as well as the existing Bridgeport electrics.

A N/O push button needs to be fitted to act as the spindle enable button and we normally fit a small button in the box on the head of the machine just above the existing switches. Connect this new switch and the spindle control wiring as per the circuit diagram supplied using the 6 wires previously run into the box.. Note the purpose of the enable button is to prevent the spindle running just from the PC control. Whenever the control issues a spindle command the programme operation is suspended until the enable button is pressed which also starts the spindle. To be used the Block allow parameter must be mapped to 202 which is output 2.. If you use a NO switch the polarity for output 2 must be set in parameters to LOW=TRUE. These parameters are found in Setup (Alt S)CNC System Configuration (8 on the menu) Line Polarity (L on the menu) Output Polarities (G on the menu). If you are going to use the remote cycle start and feed hold 2 more push buttons need to be fitted at a convenient position and wired back to the EMT board. Use AUXIN3 for feed hold and AUXIN 4 for cycle start. These must be mapped in the parameters to 203 (Output 3) and 204 (Output 4) respectively. Again you use a NO switch the polarity must be set in parameters to LOW=TRUE and for a NC switch HIGH=TRUE. We strongly recommend NO switches for Enable and Cycle Start and NC switch for Feed Hold

The last three connections to be made are from the existing spindle switch to EMT T1-2, to EMT T1-3 and to EMT T1-4 exactly as shown in the drawing.

Fit the card supplied with the software into the PC as the Ahha instructions and connect the PC board and the machine interface using the 2 cables supplied joining the cables at the slot already cut in the cabinet.

Check that the machine is connected correctly to the 3 phase mains and most important that the earth connection is properly made and of an adequate size. At this stage it should be safe to switch on the Bridgeport but take care in case any mistakes have been made in the new wiring. If all is well you can now press the new on button which will switch on both the Bridgeport electrics and the new interface card. You should now see red LEDS on indicating RLE1 is on and all the green LEDS for limits that have been connected are on. If this is not the case switch off and carefully go through all the connections you have made looking for any errors.

When all is well switch on the PC and load the software

Installing The Software

From DOS (Never Windows)

Insert Floppy Disc in Drive A and log onto A by typing in A: and pressing the ""Enter"" key.

Type GO and press "Enter"

When the self-extracting process is complete you can run the software.

Eject the floppy disk and switch the computer off and then after 2-3 seconds switch on again to reboot the computer. You should get an option screen enabling you to run the latest Artisan version , the previous versions of Artisan or DOS. The option to run the previous versions of Artisan is only applicable if you have the old version and have upgraded.

We have supplied a PCK file on the software disk. (This is the parameter file to match your machine)

To install do the following:-

After Running Ah-ha software and for the first time go into setup (ALT S) and then into the CNC timing menu and make a note of the Linear master timer rate and circular timer rate. These are generated to match the speed of your computer.

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Insert the disk with the PCK file and log onto A by typing in A: and pressing the "Enter" key.

If you have a Boss 4 or 5 (No air operated brake) Type GO5 and press "Enter". This will copy the appropriate PCK file.

If you have a Boss6 (air operated brake) Type GO6 and press "Enter". This will copy the appropriate PCK file.

Run the software again by typing CNC40 followed by the "Enter" key and then change the timer rates to the value previously noted (If necessary).

Make sure you have the output polarities set correctly for any custom inputs or outputs you have fitted.

Most Important

When you have the Computer set up copy all the PCK files to 2 floppy disks and LOCK one of them away with the original software disk for safety.

To do this log onto C if necessary by typing in C: and press "Enter". Type CD \CNC40 and press "Enter". Insert the floppy disk. Log onto A by typing in A: and press "Enter".

Type Copy C:*.PCK and press "Enter".

Log back onto C by typing in C: and press "Enter".

We also include a tiny programme to do this. Insert a floppy disk and type PCK2A and press "Enter".

For you convenience we also include a tiny programme to copy all user programmes to a floppy. Insert a floppy disk and type AGC2A and press "Enter".

If you have any difficulties we can be contacted by telephone 01297-446000, fax 01297-446001 or email sales@eagland.co.uk

Setting the machine the first time:-

Check all the limit switches are wired correctly by jogging onto them. X and Y are controlled by the curser keys and Z by “Page Up” and “Page Down” keys. You should be able to jog off the switches in the opposite direction.

If you can it is safe to try homing the machine. Make sure the screen position display is set to Abs. If not press the “A” key. The “A” key toggles between Abs and Rel. Abs shows the distance from the Home position (also called machine zero) and Rel shows the current position from the Relative zero (Also called Programme zero).

It is recommended that during all normal operations you are in Rel display

Press the “Home” key and when the message window pops up press "Enter".

The machine will move to the home position, trip the limit switches and move off very slowly. When the switch releases that position is set to home. The accuracy depends on the switch precision and is usually good enough for commercial work. If in doubt always check!

At this point we normally set Z relative zero the same as machine zero never normally to be altered.

To do this press the “S” key. A window opens asking if you wish to continue with a default of Y. We recommend you use the "Enter" key to accept this. You are then given a choice of which axes to set. At this stage press “Z”.

Now jog the machine to the X and Y job datum position (The position chosen as the programme zero on the job you are about to machine) by whatever means you normally use.

Press “S” and "Enter" then the “X” or “Y” key

Press “S” and "Enter" then the other key. DO NOT USE the “A” key for all unless the Z axis is still at zero otherwise you will move the Z zero to the current position which you probably do not intend to do.

Press the “A” key to switch to Rel display. At this time the Axes do not display zero. Jog a tiny distance away in X or Y and press the “G” key. The Axes should now position themselves at the job datum just set and all the displays read zero. The “G” key is very useful as it will take you back to programme zero from any position.

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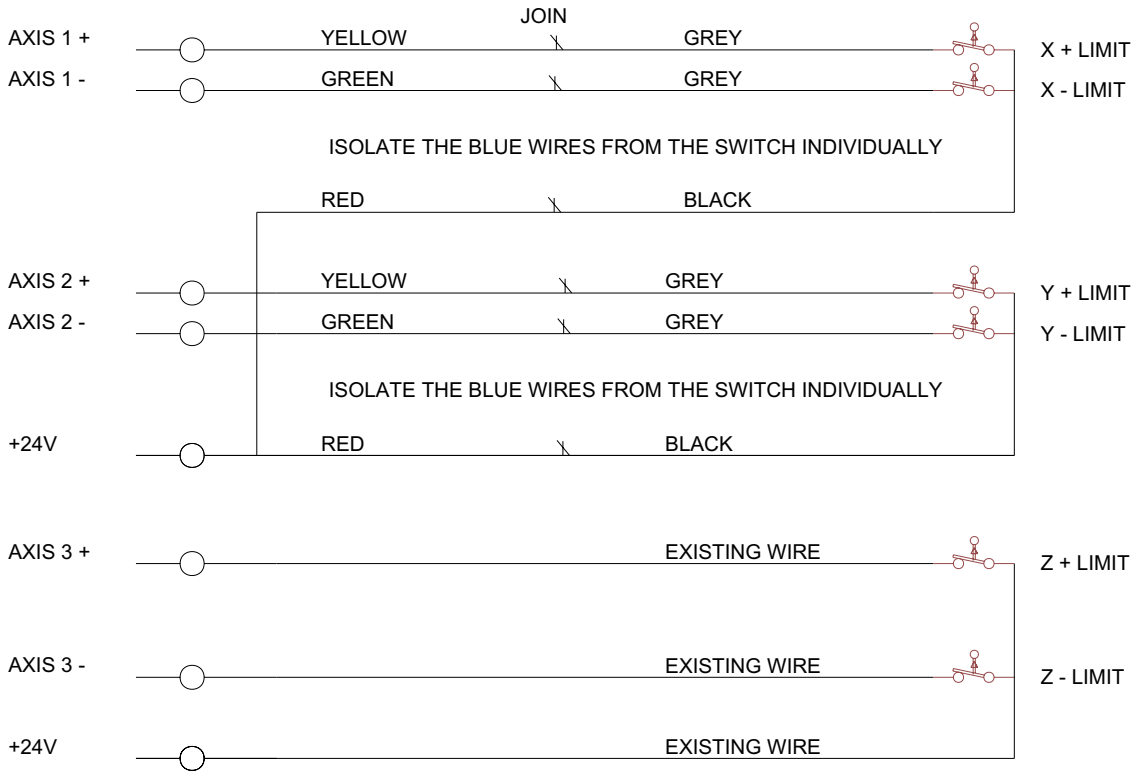


At least I limit per axis needed for Home operation

COLOURS FOR RS 320-528
SEALED SWITCH

NB
During Home (Datum) cycle
the limit switches are used
as Home switch
Which one depends on Home
direction set in software

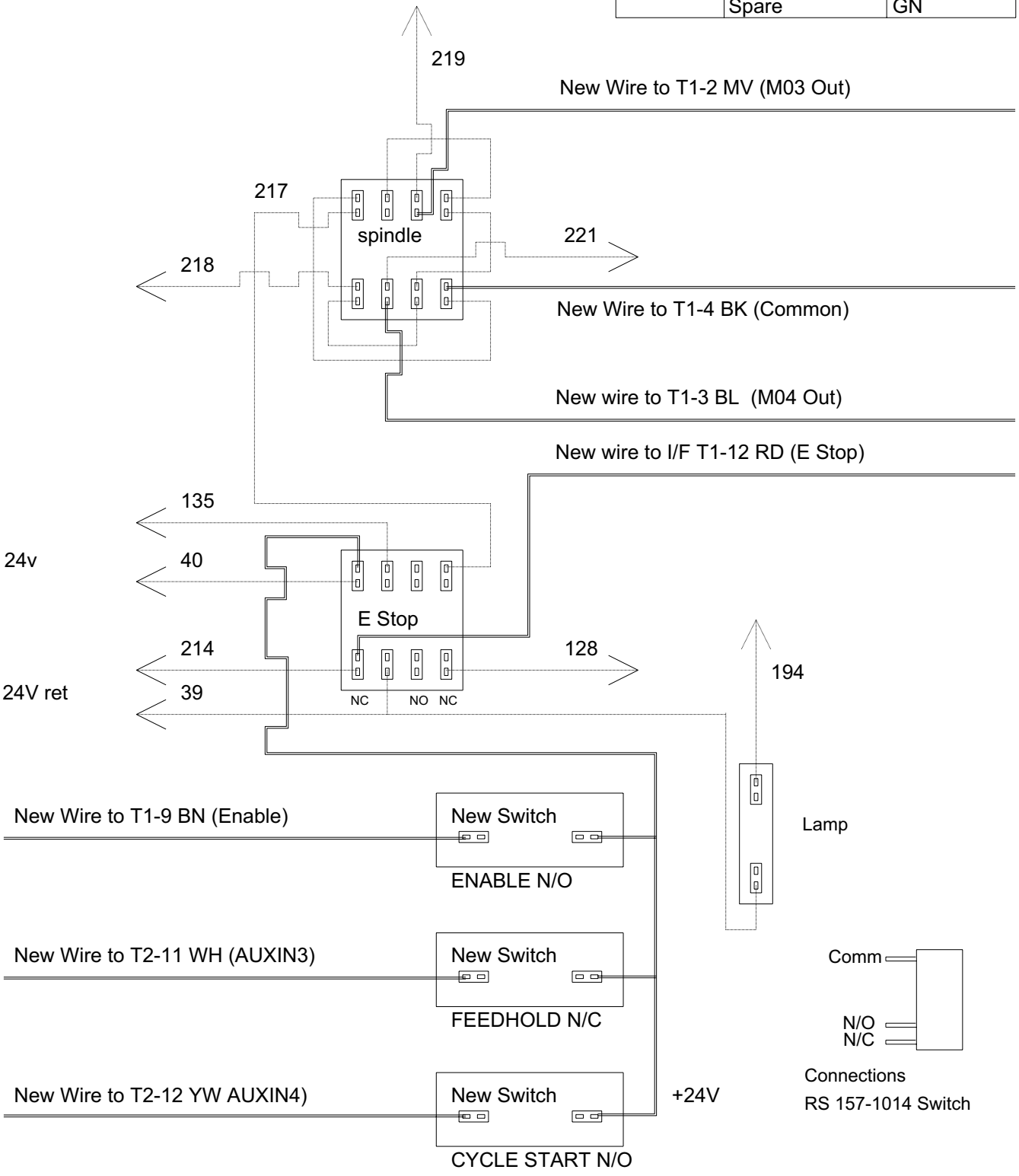
Bridgeport Wiring Modifications for E Stop and Spindle With EMT Card Rev. D Onwards

Thin lines are original wires
Thick Lines are new wires

Colours are for standard 8 core cable and are suggestions only

Ahha Card Termination Table

Terminal	Description	Core
T2 - 12	Aux In 4	YW
T2 - 11	Aux In 3	WH
T1 - 12	E - Stop	RD
T1 - 9	Enable	BN
T1 - 4	Common	BK
T1 - 3	M04 Out	BL
T1 - 2	M03 Out	MV
	Spare	GN



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