DSP LASER PROTECTION DEVICE

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***** NOTE *****

Whenever Calibrating, Aligning or Adjusting the DSP Laser unit, always make sure that the RAM is in it's fully open position !!!!!!

Operational Instructions and Procedure Reference

Step by step instructions on :

Calibration;

Step #1 =

Make sure the ram (moving beam) is in it's fully open position.

Step #2 =

Position the DSP Transmitter laser with the laser shinning just below the tip of the upper tooling.

(Ensure that the 'V' shape of the laser matches up to the outline of the lower tip of the upper tooling !)

Step #3 =

Position the DSP Receiver to line up to the DSP Transmitting Laser.

(Ensure that all DSP Receiver receptacles are within the transmitting laser !)

Step #4 =

Activate program of press brake. (Press Start)

Step #5 =

Press **(for 2 second)** & release the (Red) Master Reset button normally located on the interface enclosure.

Step #6 =

Press **(for 2 second)** & release the (Yellow) MCS Reset button normally located on the interface enclosure.

Step #7 =

A. - Initiate movement of press brake using the foot pedal.

B. - Regardless if upper beam completes or fails to complete a full cycle, Make sure the moving beam is back to its fully open position and proceed to step # 7-C.

***NOTE *** It is recommended to place a scrap piece of material, (equal to the thickness of material referenced in the program), on top of the bottom die before proceeding the Step # 7-C.

C. - Using the TEST BLOCK , place the tallest section of the test block across the top of the lower tooling aligned to the center of the bend line!

**** NOTE **** When placing the TEST Block onto the lower tooling, it is recommended to use an extra lower tooling placed beside of existing lower tooling equivalent in height and positioned to not come in contact with upper tooling !

D. - Activate movement of press brake using the foot pedal until upper beam movement stops.

E. - Check the MCS display and ensure that it has registered and displayed a stop time. (Example = SA-01 / AV 014)

(If stop time is not displayed, repeat Steps # 5 through #7 until stop time is displayed.) (Example of Failure = xx-xx / xxxxx)

(If stop time is displayed, proceed to Step # 8.)

Step #8 =

A. - Using the TEST BLOCK , place the shortest section of the test block across the top of the lower tooling aligned to the center bend line .

B. - Activate movement of press brake using the foot pedal until upper beam stops movement.

C. - Slide the center (height) section of the TEST Block between the upper and lower tooling and wiggle the TEST Block.

(PASS = Middle section fits between upper and lower tooling with enough space to fit loosely)

(FAIL = Middle section does not fit between upper and lower tooling or is a tight fit between the tooling's)

Step #8 is completed resulting as a Pass, Calibration is now complete! Continue on to normal set-up procedures and operations !

**** NOTE **** If stop time fails or if any errors occur - Repeat Steps # 5 through # 7.

DO NOT forget to do the ' Mute Positioning ' before putting machine into production !

Mute Positioning ***(Nickel Test)***

Mute Positioning should be done when the lower tooling and/or the material thickness has been changed !

Mute Positioning' is the method in which assists the operator in achieving the proper set-point for the speed-change of the press-brake. The goal is to have enough distance above the top edge of the material ,(which is to be formed) for the laser to be able to start it's muting function and also be as close to the top edge of the material ,(which is to be formed) when the muting function completes.

(This is to ensure that we have the least amount of un-protected space above the top edge of material !)

Step - 1.

Place an addition bottom die onto lower beam. Position the additional bottom die to the side of the existing bottom die ensuring the upper tooling will not come in contact with the additional bottom die .

Step -2.

Place a scrap piece of material, (equal to the thickness of the material intended to be used) , on top of the additional bottom die. (We will call this the 'RAW MATERIAL')

Step -3.

Initiate movement of the beam.

(a) If the moving beam completes a cycle without stopping, place an additional scrap piece of material on top of existing 'RAW MATERIAL' and continue to step -3c . (We will call this additional material the 'SCRAP MATERIAL')

(additional scrap piece of material should be equal to the thickness of 1/8 " or less)

(b) If the moving beam stops and does not complete a cycle, proceed to Step -5 .

(c) If the moving beam completes a cycle without interruption, proceed to step -4.

Step -4

If the cycle was completed with the 'SCRAP MATERIAL' in place on top 'RAW MATERIAL' , then reduce the slow-down change-over position until the cycle will interrupt.

Step -5

Remove the 'SCRAP MATERIAL' from the top of the 'RAW MATERIAL' (DO NOT remove the 'RAW MATERIAL')

Step -6

(a) Initiate movement of the beam.

If the moving beam completes a cycle without interruption, proceed to step -8 .

(b) If moving beam does not complete a cycle , proceed to Step -7.

Step -7

If moving beam does not complete the cycle , increase the slow-down position until the moving beam will complete a cycle and proceed to Step -3 .

Step - 8

If moving beam does not complete the cycle with the 'SCRAP MATERIAL' on top of the RAW MATERIAL' , then remove the 'SCRAP MATERIAL' and try to complete the cycle.
If the cycle completes with the 'RAW MATERIAL 'only, then mute position set-up is complete !

**** NOTE *: Changing the speed change set-point and/or the slow speed can alter the result of the ' Mute Positioning ' !**

***** NOTE *****

When the laser is in a muted state , the protection is disengaged !

(Make sure to pay extra close attention to the pinch-point area when the laser is in a muted state)

Forced Muting ;

Slow Speed Override :

When all Laser receptacles are blocked at the same time, the movement of the moving beam is forced to ONLY move in slow speed ! (This feature allows the operator the form products which may have oversized flanges !)

WARNING !!!! When using the slow speed override - The protective laser is disengaged !

Box Bend :

The front or forward laser(s) can be turned off for bending a flanged part such as a box or an enclosure.
This mode may require pressing the foot pedal twice before movement is permitted !

F & R : (Used when external slow speed request signal is present) - Not available on all applications !

When operating in F & R mode, ONLY the Primary laser receptacles are active.
This mode requires pressing the foot pedal twice before movement is permitted !
When operating press brake, keep in mind that the first hit of the machine's foot pedal is an activation signal.
The second hit of the machine's foot pedal is an over-ride signal.
(On some press brakes, it may require a third hit of the machine's foot pedal, not the second, which is the over-ride signal!)

CAUTION :

Notes ;

When operating press brake, the DSP Protective Laser is MUTED while moving beam is advancing in slow speed !

Manual Stop Distance Test

It is recommended that the Manual Stop Distance Test (MSD) be done at least once per shift, preferable at the beginning !

Manual Stop Distance Test (MSD) ;

Step #1 =
Make sure the moving beam is in it's fully open position.

Step #2 =
Using the "MSD" Test Block,
Place the round handle up against the lower tip of the upper tooling . If the Laser unit shows an obstruction , then it is a go ! (Pass) If the Laser unit shows no obstruction , then it is a no-go ! (Fail)
(An ' obstruction ' is when the round handle interferes or interrupts at least one of the receiver's receptacles, located on the receiver's head)

Receiver Head is located on the right side of the press brake !

If the unit shows a failure , check the following ;

1. Calibrate Laser !
2. Check alignment .
3. If both calibration and alignment are correct, call for support !

BEFORE proceeding to next step !

It is recommended to have material equal to the thickness of what is to be formed, underneath the test block during this test !

Step #3 =
Using the "MSD" Test Block, place the thickest part of the MSD on the top of the material resting on top of lower die .
(Preferable to the side of the contact point in which the punch and die would not meet . Use additional lower die if necessary !)

Step #4 =
In operational mode , press the foot pedal to advance the moving beam, using the fast approach speed.
Once the moving beam stops, with the block positioned between the upper tooling and the material
that is on the lower tooling - check the distance between the bottom tip of the upper tooling and the top of the MSD Block.
If there is enough room between the two allowing the block to wiggle freely, then the test is a go. (Pass)
If the tip of the upper tooling touches the top of the MSD Block, then the test is a no-go . (Fail)
If the unit shows a failure , check the following ;

1. Calibrate Laser !
2. Check the alignment .
3. Check the speed of the machine .

** NOTE ** (Faster momentum of a machine can cause poor stop distance time !)

4. Call for support !

(When doing the following test, ensure that the 'box-bend' mode is 'on' !)

Step #6 =

Make sure the moving beam is in it's fully open position.

It is recommended to have material equal to the thickness of what is to be formed, underneath the test block during this test !

Using the "MSD" Test Block, place the thinnest part of the MSD on the material on top of the die .

(Position the smallest step of the test block to where it will be across the bending line, and with the handle pointing to the front)

(Preferable to the side of the contact point in which the punch and die would not contact)

In operational mode , press the foot pedal to advance the moving beam .

Once the moving beam stops, move the MSD Block to a position so that the middle section of the block is between the upper tooling and the material that is on the die .

Check the distance between the bottom tip of the upper tooling and the top of the MSD Block.

If there is enough room between the two allowing the block to wiggle freely, Then the test is a go. (Pass)

If the tip of the upper tooling touches the top of the middle section of the MSD Block, or if the second section will not fit between the upper tooling and lower die , then the test is a no-go . (Fail)

If the unit shows a failure , check the following ;

1. Calibrate Laser !
2. Check the alignment .
3. Check the speed change set point .
4. Check the speed of the machine .

(Faster momentum of a machine can cause poor stop distance time !)

5. Call for support !

Parts & Service ;

Information provided by ; Smart Services (423)-231-2070

(www. Safeguardingmachinery.com)

Additional Information :

Forcing a Stop Test

Whenever the MCS units power has been cycled off and back on, the yellow reset button must be pressed for at least 2 seconds !
The yellow MCS reset button is normally located on the DSP Laser interface !
After a MCS reset, a stop time test must be performed !

The ' Stop Distance Test ' is the test which measures the distance from the point in which the stop command is activated and the point in which the ram actually comes to a complete stop !

This ' Stop Distance Test ' is a requirement by O.S.H.A. with all safety devices which are mounted on press brakes !

NOTE ** Excessive speed can cause or effect the result of a ' Stop Distance Test ' !

Stop Test Procedure

The following is the correct procedure in forcing a stop test.

.(1) Open the ram to its maximum allowable open position
(Be sure the ram moves at least this distance in fast approach speed !)
.(2) Press and hold the MASTER reset button for at least three seconds and then release !
.(3) Press and hold the MCS reset button for at least three seconds and then release !
.(4) Activate the ram movement downward in fast approach. (Must allow a minimum of 3" in high speed movement !)
(The ram should move downward and then stop whenever the laser has been obstructed while
you are still holding the approach signal active)
(5) Once the ram stops its downward movement (on its own)
(6) Then open the ram back to its maximum open position!
.(7) Check the MCS Display to ensure that the stop time was accepted !

NOTE :
If the Stop test is accepted , then the proceed to the ' Initial Start-up Procedure'!
If the 'Stop Distance" fails, then it will move downward just a small distance and then stop on its own again !

INITIAL START-UP Procedure

Step #1 A 'Stop Test' must be completed and accepted before proceding !

Step #2 Position the moving beam to maximum available open position.

Step #3 Place a piece of material on top of lower tooling, which is the equivelent thickness of material in which the program is set up to form !

Step #4 Activate movement of moving beam and hold. (This is to set initial contact point for laser to material)

Step #5 After the moving beam stops, remove activation and imediately reactivate movement !
(This is to set the 'End of Bend Position' for the laser)
NOTE - It may take several re-hits of activation to complete movement to End of Bend !

If programming is successful - As the laser approaches the material after speed change - the blue light on the Laser receiver will iluminate and when the first set of recepticles mute - the blue light flashes slow and becomes more rapid as the muting progresses !

:he laser fails to mute, Press the 'Master Reset Button' for three seconds, then release and re-attempt the Stop Test & Start-up Procedure !

Additional Information :

Checking Laser Alignment

Explanation of Alignment :

The goal to the Laser Alignment is to make sure that the laser is in line with the center-point of the bending process (tip of the upper tooling).
Ensure that the DSP laser is in a straight line from the left side of the press to the right side of the press .
Also make sure that the laser is at the same distance from the tip of the upper tooling on the right side and on the left side of the press !

Note ** Alignment should only be attempted by trained personnel ONLY !!!!

Step # 1 : Ensure that the ram is in the fully open position
Step # 2 : Insert two sections of upper tooling (equal in height) into the ram and clamp into place
(One section should be inserted to the far right of the ram and the other inserted to the far left of the ram !)
Step # 3 : Adjust the transmitting laser to a position of alignment to the left side edge of the tip of the upper tooling
Step # 4 : Using a piece of paper or magnet , view the laser at the lower tip of the upper tooling on the left side of the press.
(Note where the laser is positioned on the left side of the press)
Step # 5 : Then move the paper or magnet to the right side of the press and view the laser at the lower tip of the upper tooling.
(The laser position should be almost identical on both the left and right sides of the press)
Step # 6 : If the alignment is not accurate , then adjust accordingly .
Step # 7 : Fine-tune the Receiver by aligning the white dotted line, located on the receiver's receptacle head, with the center-point of the bending process (tip of the upper tooling).

Note *** Alignment should only be attempted by trained personnel ONLY !!!!

Unit Maintenance

Operator should wipe off transmitter Laser lens on a daily basis or when-ever necessary with a dry and soft clothe !
(NEVER USE ANY TYPE OF LIQUID WHEN WIPING OFF TRANSMITTER LENS OR RECEIVER RECEPTICLES !!!!!!!!!!)

Using a Q-tip, the receiver's receptacles should be wiped off every two to four months or when-ever necessary !

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