



Phone # (423)-231-2070  
e-mail ; smartservices@charter.net  
[www.safeguardingmachinery.com](http://www.safeguardingmachinery.com)

## AKAS LASER PROTECTION DEVICE

- AKAS II
- AKAS 2 F Series
- AKAS 3 F Series
- AKAS 2 M Series
- AKAS 3 M F Series

**\*\*\*\*\* NOTE \*\*\*\*\***

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

**Also, when opening or closing hinge, grasp unit on or near the arm mount !!!!**

## Operational Instructions and Procedure Reference

Step by step instructions on :

- 1. CALIBRATING LASER ( Page # 1 )
- 2. MANUAL ADJUSTMENT ( Page # 2 )
- 3. MUTE POSITIONING ( Page # 3 )
- 4. MUTE LAMP / BOX BEND / NOTES ( Page # 4 )
- 5. MANUAL STOP DISTANCE TEST ( Page # 5 & # 6 )
- Additional Information = 6. START-UP TEST ( Page # 7 )
- Additional Information = 7. AUTOMATIC STOP TEST ( Page # 7 )
- Additional Information = 8. CHECKING LASER ALIGNMENT ( Page # 8 )
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- Additional Information = 10. TROUBLE - SHOOTING ( Page # 9 )

## Calibration;

### Step #1 =

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

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### Step #2 =

Place magnet on the lower tip of the upper tooling. (punch) (Make sure it is flush & parallel )

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### Step #3 =

Turn the calibration key switch, located on the receiver base, to the ' ON ' position.

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### Step #4 =

Press (for one second) and release the black push button located on the receiver base.

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### Step #5 =

When you see the lasers shining on all the receiver receptacles, (located on the receiver head) push the toggle switch upward for one second and release. ( located at the top of the receiver base)

**\*\* NOTE \*\* ( If you allow the laser to be interrupted by the lower tooling or anything below the upper tooling, it will cause the laser to loose it's position ) ( One side will be at the top and the other will go to the bottom )**

**If the laser has lost it's position, ( One side will be at the top and the other will go to the bottom ), refer to 'Manual Adjustment !**

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### Step #6 =

Return the calibration key switch to the ' OFF ' position.

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**\*\*\*\* NOTE \*\*\*\***

**Remember , DO NOT Interrupt the laser while it is calibrating !**

**MAKE SURE THAT THE LASERS ARE LOCATED BELOW THE TIP OF THE UPPER TOOLING BEFORE OPERATING MACHINE !**

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### Step #7 =

When calibration is complete, remove the magnet from the punch and place it on the ram ( upper beam ).

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Calibration is now complete !

Continue on to normal set-up procedures and operations !

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

## Manual adjustment ;

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Step #1 =

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

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Step #2 =

Push the laser reset button ( located on the side of the AKAS interface ) for three (3) seconds and then release !

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Step #3 =

Turn the calibration key switch, located on the receiver, to the ' ON ' position.

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### \*\*\*\*\* DECRPTION OF MOVEMENT \*\*\*\*\*

To make the receiver travel downward.

Press and release the black push button, located on the receiver.

To make the receiver travel upward.

Press and hold the black push button, located on the receiver.

To make the Transmitter travel downward, Push the toggle switch downward, located on the receiver.

To make the Transmitter travel upward, Push the toggle switch upward, located on the receiver.

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Step #4 =

Using the toggle switch, located on the receiver, position the primary laser (rear laser) approximately 1/2" from the tip of the upper tooling !

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Step #5 =

Now, push and hold the black button until the receiver's receptacles are located within the laser circles !

**DO NOT interrupt laser before it has been calibrated !**

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Step #6 =

Proceed to Calibration !

### \*\*\*\* NOTE \*\*\*\*

Remember , the machine will not operate unless the laser has been calibrated and the key switch, located on the receiver, is in the ' OFF ' position !  
adjust the laser to shine on all the receiver receptacles .

## 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 die will not come in contact with the additional bottom die .

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### *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' )

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### *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.
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### *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.

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### *Step -5*

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

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### *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.
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### *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 .

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### *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 ' !**

## Mute Lamp ;

( Applies only to the 'F' Series Lasers ! )

The mute lamp indicates the following ; ( Located on the center of the receiver )

1. When it is very dim flashing rapidly , this indicates that the laser is in a ready state . ( On Cincinnati installs, the ready indicator is a green light, activated after pressing and releasing the foot pedal one time)
2. When it is bright flashing rapidly , this indicates that the laser has an error .  
Critical error ( To correct = push the laser reset button for three (3) seconds and then release )
3. When it is bright flashing slowly, this indicates that the laser has an error .  
Low-level error ( usually means that the safety system requires a 'Stop Distance Test' )  
( to correct = Open the ram to its maximum position , advance the ram until it stops automatically = It should stop within one (1) inch of travel )  
If needed ( push the laser reset button for three (3) seconds and then release and then repeat the last step )
4. When it is bright and on solid , this indicates that the laser is in a muted state .

\*\*\*\* 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 )

5. When lamp is not on at all , this indicates that either (a) the calibration key is in the 'on' position or (b) the laser is requiring a reset/stop test .

## Box Bend :

The front or forward laser(s) can be temporarily turned off for bending a flanged part such as a box or an enclosure.

To temporarily turn off the forward laser(s), just press and release either the box bend pedal or the box bend push button !

Your system may have one or the other or both !

Some newer machines may have capability of setting a parameter to allow the machine to automatically engage the box mode !

## CAUTION :

## Notes ;

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 is the third hit of the machine's foot pedal, not the second, which is the over-ride signal! )

[ This over-ride signal is for the 'Wavy Material Over-ride' ]

The 'Wavy Material Over-ride' will only work properly when the 'Mute Positioning' is set correctly !

## **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 !

S.M.A.R.T. Services recommes the test to be done whenever the machine has been left unattended for more than twenty (20) minutes !

### **Manual Stop Distance Test ( MSD ) ;**

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Step #1 =

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

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Step #2 =

Turn the calibration key switch, located on the receiver, to the ' ON ' position.

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Step #3 =

Using the "MSD" Test Block,

Place the round handle up against the lower tip of the upper tooling . If AKAS unit shows an obstruction , then it is a go ! ( Pass ) If the AKAS 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 )

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 !
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Step #4 =

**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 thickest part of the MSD on the top of the die .

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

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Step #5 =

Return the calibration key switch to the off position .

In operational mode , press the foot pedal to advance the moving beam, using the fast approach speed.

Once the moving beam stops, position the block between the upper tooling and the material

that is on the lower tooling and check the distance between the bottom tip of the punch 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 punch 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 meet )

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 punch and the material that is on the die .

Check the distance between the bottom tip of the punch 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 punch touches the top of the MSD Block, or if the MSD Block will not fit between the punch and 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 !

***Service ;***

Information provided by ; Smart Services (423)-231-2070  
( [www.Safeguardingmachinery.com](http://www.Safeguardingmachinery.com) )

***Manufacturer ;***

In reference to ; AKAS Laser protection units .  
Manufactured by : Fiessler Elektroniks  
( [www.fiessler.de](http://www.fiessler.de) )

***Parts ;***

Associated with ; Advanced Manufacturing Solutions ( AMS ) (941)-637-6660  
( [www.pressbrakesafety.com](http://www.pressbrakesafety.com) )

**Additional Information :**

## **Start-up Test and Stop Test**

The newer generations of AKAS lasers are equipped with an automatic start-up test which ensures the system is operating properly by performing a self-diagnostics. This ' Start-up Test ' is initiated by three actions !

- (1) when the power is cycled or system is powered up .
- (2) After the ' Laser Reset ' has been pressed and released .
- (3) If the system has been in operation consecutively, non-stop for the complete time length of the manufacturer's preset !

With-in this self-diagnostics, the system will also perform a test known as a ' Stop Distance Test ' .

The ' Stop Distance Test ' is the test which measures the distance from the point in which the stop comand 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 ' !

## **Forcing an Automatic Start-up / Stop Test**

The following is the correct procedure in forcing an automatic stop test.

- (1) Open the ram to its maximum open position or at least to where it will have a minimum distance of movement in fast approach of 2 ½ " or more ! ( Be sure the ram moves at least this distance in fast approach speed ! )
- (2) Press and hold the AKAS reset button for at least three seconds and then release !
- (3) Activate the ram movement downward in fast approach.  
( The ram should move downward just a small distance and then stop on its own while you are still holding the approach signal active )
- (4) Once the ram stops its downward movement ( on its own )
- (5) Then open the ram back to its maximum open position!

**NOTE :**

If the Stop test is accepted , then the next cycle should follow through in a normal sequence !

If it fails, then it will either move downward just a small distance and then stop on its own again or

It will move downward and then stop just before the top of the material!

Make sure the Ram Movement Sensors are in alignment!

Also, If the Mute lamp is bad, the system will not complete a cycle!



## Checking Laser Alignment

### **Explanation of Alignment :**

The goal to the Laser Alignment is to make sure that the primary laser ( Laser closest to the rear of the machine ) is in line with the center-point of the bending process ( tip of the upper tooling ).

Ensure that the primary 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 primary laser to a position at the edge of the tip of the upper tooling

Step # 4 : Using a piece of paper or magnet , view the laser at the 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 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 refer to the ' LASER ALIGNMENT PROCEDURE ' .

Step # 7 : Fine-tune the Receiver by aligning the white 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 !!!!**

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## 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 !

Calibrating Screws should be lubricated every two to four months using sewing machine oil or 3-in-one oil only!

**( NEVER USE ANY TYPE OF GREASE OR ANY OTHER TYPE OF OIL OTHER THAN STATED ABOVE !!!!!!!!!!! )**

**( NEVER USE ' WD-40 ' AS A LUBRICANT !!!!!!!!!!! )**

Sensor Rails should be wiped down , to remove any magnetic dust , every two to four months or when-ever needed !

Loading Hinge should be checked on a daily basis to ensure that it is tight and secure !

**Any type of loose movement should be addressed immediately !!!!**

## **Trouble-Shooting**

**Note ; Any flashing LED s inside the AKAS Interface Enclosure indicates an error !**

**Also, the 'Mute Lamp' flashing brightly indicates an error !**

If an error has occurred, simply reset Laser by holding the ' AKAS RESET BUTTON ' for 3 to 5 seconds.

If an error re-appears after the reset , then call for support!

### **Ram will not move**

Step # 1 : Make sure the key switch located on the receiver is in the 'OFF' position .

Step # 2 : Calibrate Laser ( refer to ' CALIBRATION ' )

Step # 3 : Ensure that there are no obstructions in the line-sight of the laser

Step # 4 : Reset Laser by holding the ' AKAS RESET BUTTON ' for 3 to 5 seconds.

**\*\*\*Warning \*\*\* Ensure that Ram is in it's fully open position before resetting !!!!**

Step # 5 : Ensure that the Laser alignment is set properly ! ( Refer to ' Laser Alignment ' )

**If the problem still exists, then call for assistance !**

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### **Ram moves downward and stops after 1 to 2 inches of travel after pressing the foot pedal .**

Step # 1 : Clean Laser lens on transmitter using a dry and soft clothe

**( NEVER USE LIQUIDS WHEN CLEANING THE LASER LENS !!! )**

Step # 2 : Make sure the hinge clamp is tight ( It should snap or pop into place )

Step # 3 : Reset Laser by holding the ' AKAS RESET BUTTON ' for 3 to 5 seconds.

**\*\*\*Warning \*\*\* Ensure that Ram is in it's fully open position before resetting !!!!**

Step # 4 : Ensure that the Laser alignment is set properly ! ( Refer to ' Laser Alignment ' )

**If the problem still exists, then call for assistance !**

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### **Ram closes to a point just above the top edge of material and then stops.**

Step # 1 : Clean Laser lens on transmitter using a dry and soft clothe

**( NEVER USE LIQUIDS WHEN CLEANING THE LASER LENS !!! )**

Step # 2 : Make sure the hinge clamp is tight ( It should snap or pop into place )

Step # 3 : Make sure the slow speed is moving at a rate of 10 mm or less

Step # 4 : Ensure that the speed change set-point is set properly !

( Refer to ' Mute Positioning / Nickel Test ' to set the proper speed change set-point )

Step # 5 : Ensure that the Laser alignment is set properly ! ( Refer to ' Laser Alignment ' )

Step # 6 : Reset Laser by holding the ' AKAS RESET BUTTON ' for 3 to 5 seconds.

**\*\*\*Warning \*\*\* Ensure that Ram is in it's fully open position before resetting !!!!**

Step # 6 : After resetting the AKAS ,then try operating press brake again .

**If the problem still exists, then call for assistance !**

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**\*\*NOTE \*\* If your system has an external ' mute lamp ' , make sure the bulb is good !**

( Some of the older systems will have an external mute lamp which complete the muting circuit )

( If this mute lamp is bad, it will cause the downward movement to stop just above the top of the material )

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Information provided by ; Smart Services

( [www.Safeguardingmachinery.com](http://www.Safeguardingmachinery.com) )

In reference to ; AKAS Laser protection units . Manufactured by : Fiessler Elektroniks

( [www.fiessler.de](http://www.fiessler.de) )

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