PRESS BRAKE®
SAFETY
SERVICE

FIESSLER
ELEKTRONIK

AKAS

Active **O**ptical **P**rotective **D**evice

Press Brake Point Of Operation Laser Safety System

Operators Manual v2.0

01/26/2018

PRESS BRAKE®
SAFETY
1-800-901-1193
www.pressbrakesafety.com

ANSI B11.3 - 2012

American National Standard for Machines –

Safety Requirements for Power Press Brakes

Secretariat and Accredited Standards Developer:
B11 Standards, Inc.
POB 690905
Houston, TX 77269

APPROVED: 20 JULY 2012

by the American National Standards Institute

Approved American National Standard
ANSI

Safety is NO accident!

Job Safety and Health
It's the law!

OSHA
Occupational Safety and Health Administration
U.S. Department of Labor

EMPLOYEES:

- You have the right to notify your employer or OSHA about workplace hazards. You may ask OSHA to keep your name confidential.
- You have the right to request an OSHA inspection if you believe that there are unsafe and unhealthful conditions in your workplace. You or your representative may participate in that inspection.
- You can file a complaint with OSHA within 30 days of retaliation or discrimination by your employer for making safety and health complaints or for exercising your rights under the *OSH Act*.
- You have the right to see OSHA citations issued to your employer. Your employer must post the citations at or near the place of the alleged violations.
- Your employer must correct workplace hazards by the date indicated on the citation and must certify that these hazards have been reduced or eliminated.
- You have the right to copies of your medical records and records of your exposures to toxic and harmful substances or conditions.
- Your employer must post this notice in your workplace.
- You must comply with all occupational safety and health standards issued under the *OSH Act* that apply to your own actions and conduct on the job.

EMPLOYERS:

- You must furnish your employees a place of employment free from recognized hazards.
- You must comply with the occupational safety and health standards issued under the *OSH Act*.

This free poster available from OSHA –
The Best Resource for Safety and Health

Free assistance in identifying and correcting hazards or complying with standards is available to employers, without citation or penalty, through OSHA-supported consultation programs in each state.

1-800-321-OSHA
www.osha.gov

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CHAIRMAN
Alan Metelsky
The Gleason Works
1000 University Ave.
Rochester, NY 14692
PH: 585-784-6927
Fax: 585-241-4047
ametelsky@gleason.com

VICE CHAIRMAN
Barry Boggs
Toyota Motor Manufacturing NA
1001 Cherry Blossom Way
M/C: PESAF-NA/K
Georgetown, KY 40324
Phone: 502-868-2367; 502-868-2829 (F)
barry.boggs@tema.toyota.com

SECRETARY
David Felinski
B11 Standards, Inc.
POB 690905
Houston, TX 77269
Phone: 832-446-6999
Fax: 703-893-1151
dfelinski@b11standards.org

Dear ANSI B11.3 Subcommittee Writers

On behalf of the entire B11 Accredited Standards Committee and the B11 ASC Executive Committee, we should like to acknowledge and express our sincere and heartfelt gratitude for all of your tireless and unselfish effort in bringing to fruition, a substantive revision of the ANSI B11.3 American National Standard, which was approved by ANSI on **20 July, 2012**. This standard effectively replaces the version approved 14 February 2002.

It is through your efforts and dedication to the safety and well-being of others, and often the very generous support of your employer, that made such a valuable contribution as this standard possible.

Enclosed is your complementary copy of this newly revised and published American National Standard. Additional copies of this standard may be ordered directly from www.B11standards.org or a variety of licensees including ANSI, AMT, Omron STI, SAI Global, Thompson Reuters, IHS Global and Document Center.

Again, our deep appreciation for your outstanding contribution.

Cordially yours,

Dave

David Felinski
ANSI B11 Secretariat

The Fiessler AKAS design operates in accordance with the 10mm/s (.39 in/s) safe ram speed standard discussed on page 45, section 6.3.4.7 and many other pages throughout the ANSI B11.3-2012 in an effort to help operators stay safe.

To understand more, Purchase a copy of this informative press brake safety standard.

ANSI-Accredited Standards Developer and Secretariat – B11 STANDARDS, Inc.
Post Office Box 690905 – Houston, Texas 77269 - (832) 446-6999

ANSI B11.3-2012 available from www.B11standards.org

Foreward & Cautionary Notes

Don't ever expect other people or things to keep you safe. Staying safe is a very personal responsibility that must be constantly on your mind, every waking moment. Safety is mostly a matter of staying focused on the task at hand and not losing concentration or forgetting your circumstances. If you walk into an area frequently traveled by fork trucks, moving cautiously, keeping watch all around you, observing traffic lanes and listening are all important factors in staying safe.

Hydraulic press brakes strike silently. New models are even quieter. Adding a safety system doesn't change the importance of knowing how the press operates, skillfully loading and properly using the correct tools, developing a "feel" of the control system, moving cautiously, keeping watch all around you, observing adjacent areas and listening are all important factors in staying safe. Safety is NO accident and your safety ultimately depends upon you acting safely in a dangerous environment.

Note: at this time AKAS® Laser Safety Systems are retrofitted to standard two speed hydraulic and servo press brakes that operate in accordance with ANSI B11.3-2012 recommendations. The AKAS® will not operate properly or meet safety standards unless the press brake is completely operational, the speed change is used correctly and the ram repeats reliably and consistently. Additionally to ensure the highest level of safety classification certain aspects of the machine's interface cannot be compromised, modified or changed. *It must be clearly understood that the AKAS® only monitors the press brake and acts to halt movement when it determines there is a need. Additionally when the ram moves at 10mm/s (0.39in/s) or slower interruption of the laser beams will not cause the ram to stop. Once the punch enters the mute zone, interruption of the laser beams will not cause the ram to stop. Refer to the AKAS manual for the recommended settings for the speed change position. All other functions are provided by the press brake control. At the time of installation the AKAS® is adjusted to match the overrun characteristics of the ram. For correct operation, the speeds can never be adjusted after these settings have been programmed into the Fiessler AKAS system.*

The Purchasing Entity or "end user" *will not be granted* the right to change, modify or otherwise alter the equipment, methods or procedures that are required for proper and safe installation in accordance with the manufacturers requirements in addition to local, state or Federal mandates. The Purchasing Entity agrees that it will perform as necessary to meet these afore mentioned requirements. The Purchasing Entity agrees to eliminate any deterrents or access constraints to areas of the press brake that would normally be used by the AKAS® retrofit components. This includes removal or modification of current guarding systems, procedures, methods, die loading zones or other obstructions as necessary to facilitate unencumbered use.

2 Different key sets (2 each) provided

Two (2) Receiver keys - used when finding the punch nose

Two (2) Interface box keys – AKAS protection **On** or **Off**

A set of each are provided to a management or a maintenance authority for safe keeping. These keys turn On or Off the AKAS® protection circuits and should never be used except in case of an emergency, the installation of a robot operator, or troubleshooting by qualified personnel. Refer to page 10 & 15 for a more complete explanation of their use.

Type selection

FIESSLER ELEKTRONIK

finding the optimal device:

Fiessler Elektronik safety solutions for pressbrakes consist of an optical safety device and a safety control. The components are CE type tested, (c)UL listed and comply with many more national and international standards.

Operating principle of optical protective device:

A three-dimensional laser protective field between the AKAS® transmitter and AKAS® receiver monitors the hazardous area underneath the clamped upper tool.

The special type of beam configuration guarantees protection directly up to hazardous area.

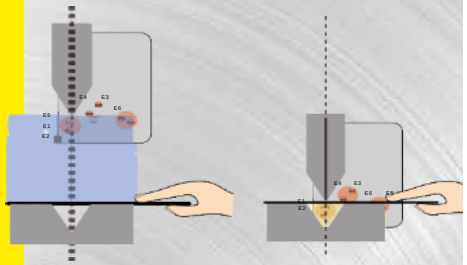
Depending on the machine performance („stopping distance of the blanking press"), the press can be operated at high speed. Shortly before the upper tool touches the sheet metal to be bent.

The result: maximum safety at maximum productivity.

The AKAS® press brake safety system is offered in various versions and can therefore be optimally adapted to the respective situation.

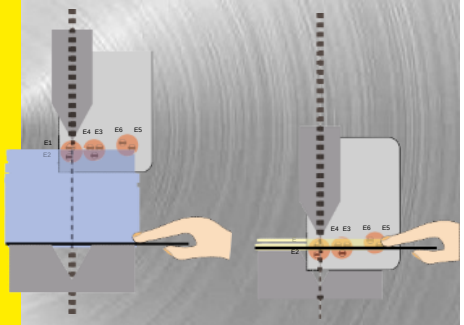
Safe area: Protected zone (any intervention into this area shuts down the closing movement of the press).

AKAS® 3 PM **AKAS® 3 PF**



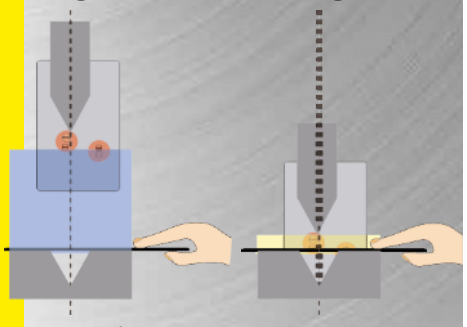
Fast speed up to clamping point

AKAS® 3 M **AKAS® 3 F**



Fast speed up to 5 mm

AKAS® II M **AKAS® II F**



Fast speed up to 10 mm

Product choice

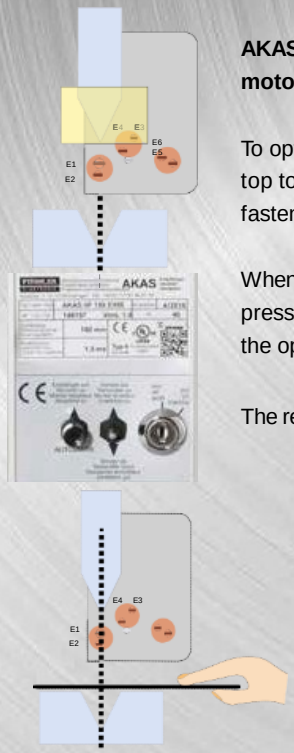
FIESSLER ELEKTRONIK

AKAS®
fully automatic adjustment

Different tools can be used at pressbrakes, depending on the application. To enable the necessary adjustment after changing tools with differently sized tools without losing time, the AKAS® system has a fully automatic electromotive support for the transmitter and receiver.

Version	M (Safety-PLC required)	F (integrated safety control in the AKAS® receiver)	150 1)	190 1)	290 1)	390 1)	490 1)	/8 (increased range)
AKAS® II	M	F	150	190	290	390	490	/8
AKAS® 3								
AKAS® 3P	M	F	150	190	290	390	490	

1) (Traversed distance of electromotive supports) for an over tool difference between the highest and lowest top tool of xxx mm

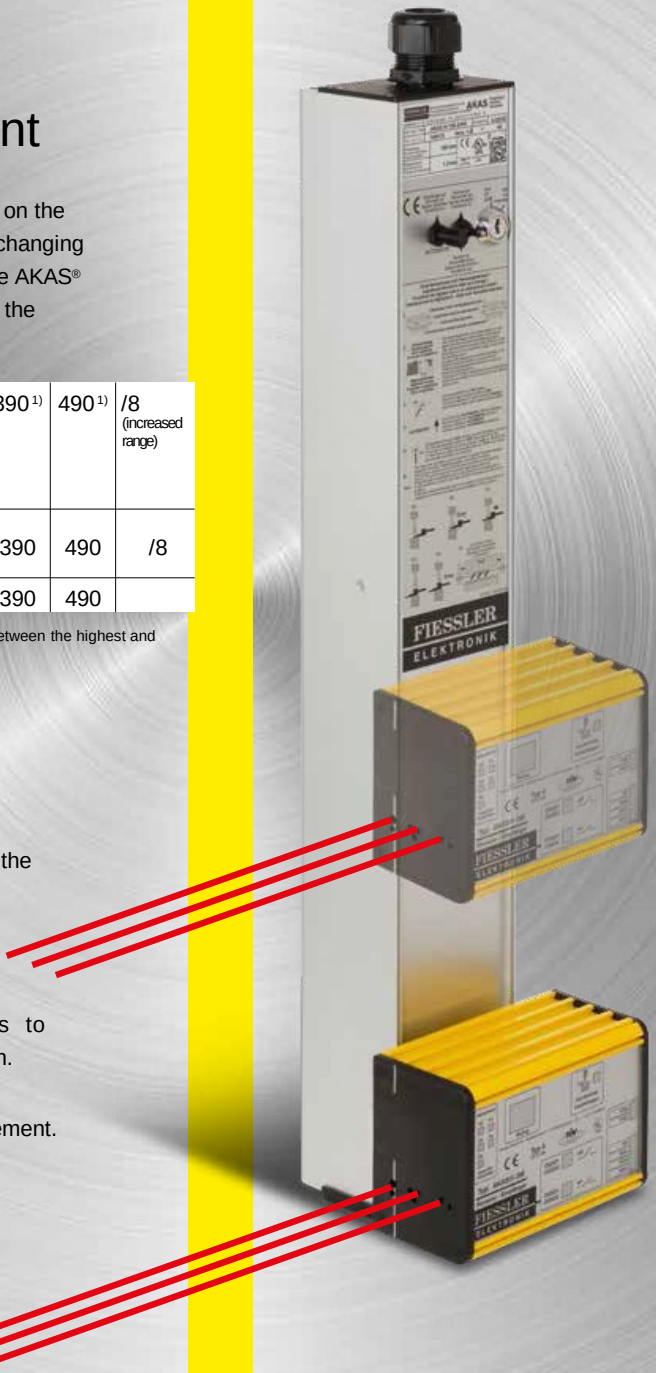


AKAS® with fully automatic motor adjustment:

To optically broaden the tip of the top tool, a magnetic lamina is fastened to the upper tool.

When the automatic switch is pressed, the transmitter moves to the optimal monitoring position.

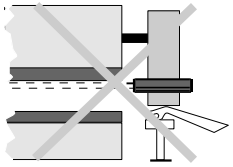
The receiver follows this movement.



Safety Instructions & Other Considerations

WARNING:

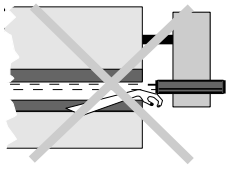
No protection by AKAS®



PictureS2/1

WARNING: The shelters that protect the worker getting inside the pressbrakes danger-zone have to be modified in a way that there are no possibilities to get inside in the danger-zone and to get squeezed between the machine, the safety equip- ment and parts or material .

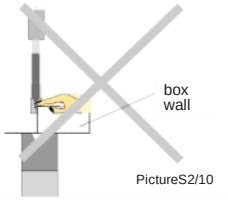
No protection by AKAS®



PictureS2/2

WARNING: The distance between the front edge of the AKAS® systems and the pressbrake should be >100mm to avoid injuries while power reducing.
(see also Picture21/ 1)

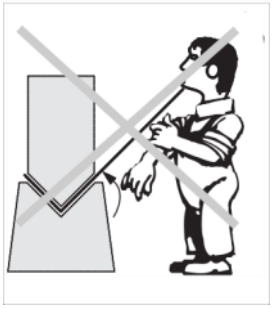
No protection by AKAS®



PictureS2/10

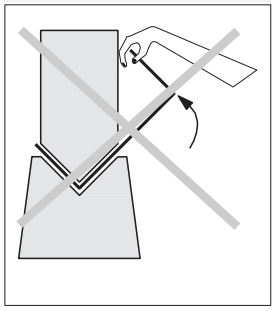
WARNING: The pressbrake safety system AKAS® provides not a full protection when slipping with finger or hand on the upper edge of a box wall during the downwards of the upper die. When the receiver element E2 is already below the upper edge.

No protection by AKAS®



PictureS2/3

No protection by AKAS®

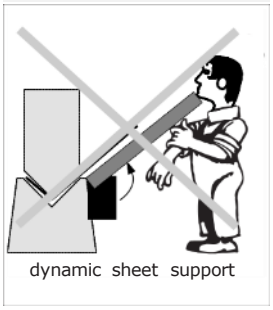


PictureS2/4

No protection by AKAS®

PictureS2/5

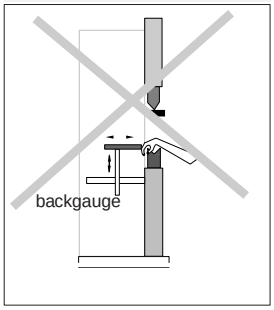
No protection by AKAS®



PictureS2/6

WARNING: The pressbrake safety system AKAS® does not protect against the movements of the dynamic sheet support.

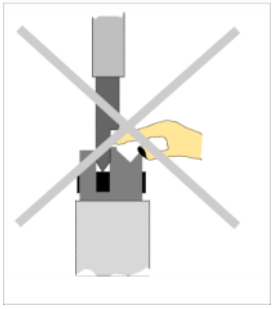
No protection by AKAS®



PictureS2/7

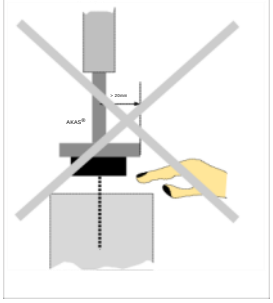
WARNING: The pressbrake safety system AKAS® does not protect against all movements of the backgauge.

No protection by AKAS®



PictureS2/8

No protection by AKAS®



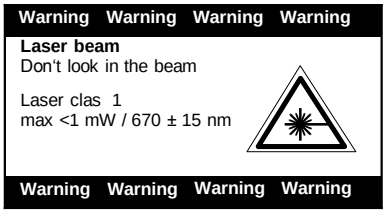
PictureS2/9

WARNING: The pressbrake safety system AKAS® does not protect against bending punches larger than 20 mm from the bending line.

Safety Instructions & Other Considerations

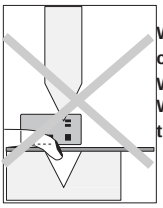
NEVER look directly into the laser beams that come from the AKAS Transmitter Use a test block placed into the path of the beam to observe a dull laser reflection.

The transmitter generates two or three modulated visible laser light beams.



PictureS3/ 1

WARNING:
The AKAS® does not protect,
- **if the machine runs only in work speed, i.e. no more than 10mm/s**
- **if the machine runs in workspeed (no more than 10mm/s)**
- **if the overrun traverse of the machine comes to more than 10mm**
- **if the pressbrake works only in a single speed.**
- **if more than one machine is monitored by one single AKAS® system e.g. tandem pressbrakes. Use the AKAS® only on one machine.**



PictureS3/ 2

WARNING: The front beam which is turned to the operator does not protect, if the case-bending function has been activated earlier.
WARNING:
With activated function of case-bending the finger is not detected as shown in picture S3/2 !

The protection of a pressbrake by the AKAS® does not permit a bending in the bottom of a case inside one case in fast motion.
On pressbrakes equipped with AKAS® protection only tools of equal height may be used in one fixing. All tools fixed together may have only one common bending line.
Stoppers, which are mounted at the matrix, lead to a premature switching-off of the downward move- ment.

The pressbrake safety system AKAS® can only be used when the following requirements are fullfilled:
The machine or system can be electronically controlled and it must be possible to stop the hazardous motion at any time.
The pressbrake safety system AKAS® is a special safety systems only for hydraulik pressbrakes.
See also chapter 3 "**Prerequisites for using the Pressbrakes protection AKAS® "**
1 Muting contact: free of potential, may be closed only at a lifting speed ≤ 10 mm/s and 23 mm before the bending punch meets the sheet metal till the lifting end. It must comply with safety category 4 according EN 954.
The overrun traverse including the safety equipement must be less than 10 mm.
The pressbrake is equiped with an automatique overruncontrol for the first stroke after bringing the machine under tension.
The part of control system of the machine which is responsible for the stopp of the machine must full fil the requirements of category 4 according EN 954.

Both muting signals must be connected by separate cables in order to exclude any short circuit, or the layout of cables must be effected in a way that no mechanical damage of the cable may occur, thus ex- cluding any short circuit of the lead of the cable.

To use the pressbrake safety system AKAS® the following requirements must be met:
— The guarded press brake must be able to stop anywhere in its cycle. Do not use a pressbrake safety system AKAS® on a press with a full-revolution clutch.
— The guarded machine must not present a hazard from flying parts.
— The guarded machine must have a consistent stopping time and adequate control mechanisms.
—Severe smoke, particulate matter and corrosives may degrade the efficiency of the pressbrake safety system AKAS®. Do not use the the pressbrake safety system AKAS® in this type of environment.

AKAS® Protection ON/OFF Switch

The AKAS® Protection ON/OFF Switch is only to be used when troubleshooting faulty machine functions. Otherwise this switch is intended to remain on and the keys to be controlled by the appropriate responsible party rather than the operator of the press brake. When the press brake is on the AKAS® lasers will be on.

When this switch is in the **ON** position the AKAS® laser safety system is fully functioning and integrated into the press brake functions as designed and described. ON is the preferred default position for the key switch.

When the AKAS® Protection ON/OFF Switch is in the **OFF** position the power is removed from the AKAS® circuits, ***no laser functions are protecting the operator*** and the press brake circuits have been reconnected. This key switch when in the OFF position will only allow the ram to move in slow forming speed through the entire stroke as a safety precaution.

Anytime the AKAS® has been powered on, you must

follow the reset instructions at TOS to establish the ram position

24VDC Power Reset & Ram Overrun Check

When the AKAS protection switch is in the OFF position the press brake circuits are reconnected. The ram will only move in slow speed while OFF. Use the reset button when circumstances require it. Depressing the reset button for 10 seconds disconnects all power to the AKAS® laser safety system. The AKAS® system cannot be used after a reset or power on/off without performing a ram overrun check first.

To use properly, depress the yellow reset button, hold for 10 seconds, then release.

1.**Immediately** raise the ram to the upper most position (TOS).

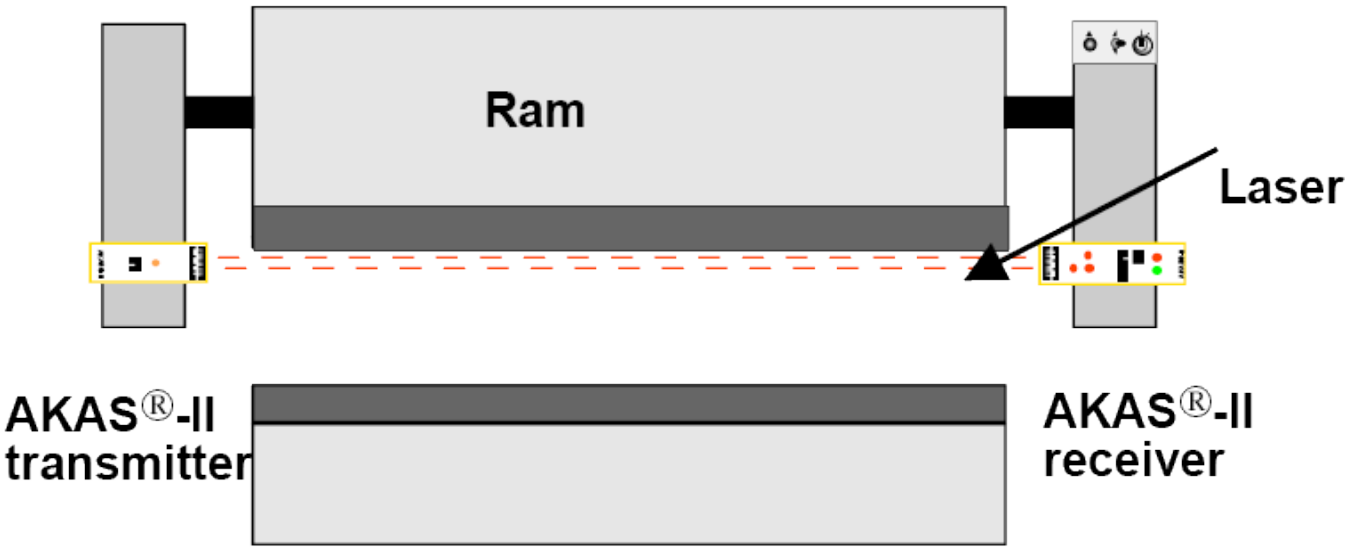
2. Bring the ram down until it stops by itself after only 1 or 2 inches to check the overrun.

3. **Raise the ram to TOS. If overrun was accepted then a normal stroke will turn the mute light on right above material. If not, perform the ram overrun check again starting at #1.**

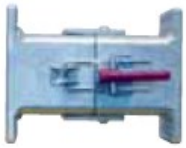
4. Next, set the laser beams to find the installed punch nose using the 5 steps on page 15.

When completed use the press brake normally. If the bending stroke stops short the overrun setting didn't match. Attempt the overrun check at TOS again. A completed ram stroke means the overrun check test was accepted.

Typical AKAS Installation Mounting



The AKAS® is a suitable retrofit safety appliance for hydraulic down acting press brakes using standard v-die and punch combinations. **Punching of any kind, offset nose punches and oddly shaped tooling that doesn't maintain the centerline of the ram is not suitable.** In some cases a horizontal way option retrofitted to the side of the press can overcome minor variations for hazardous zones that shift from the center line of the moving beam.

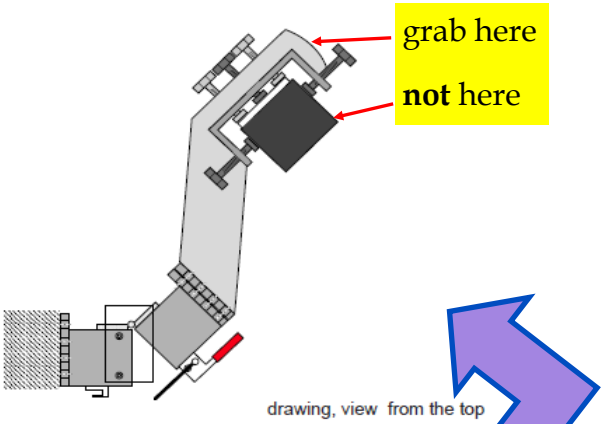


closed fig. 18/6

open fig. 18/7

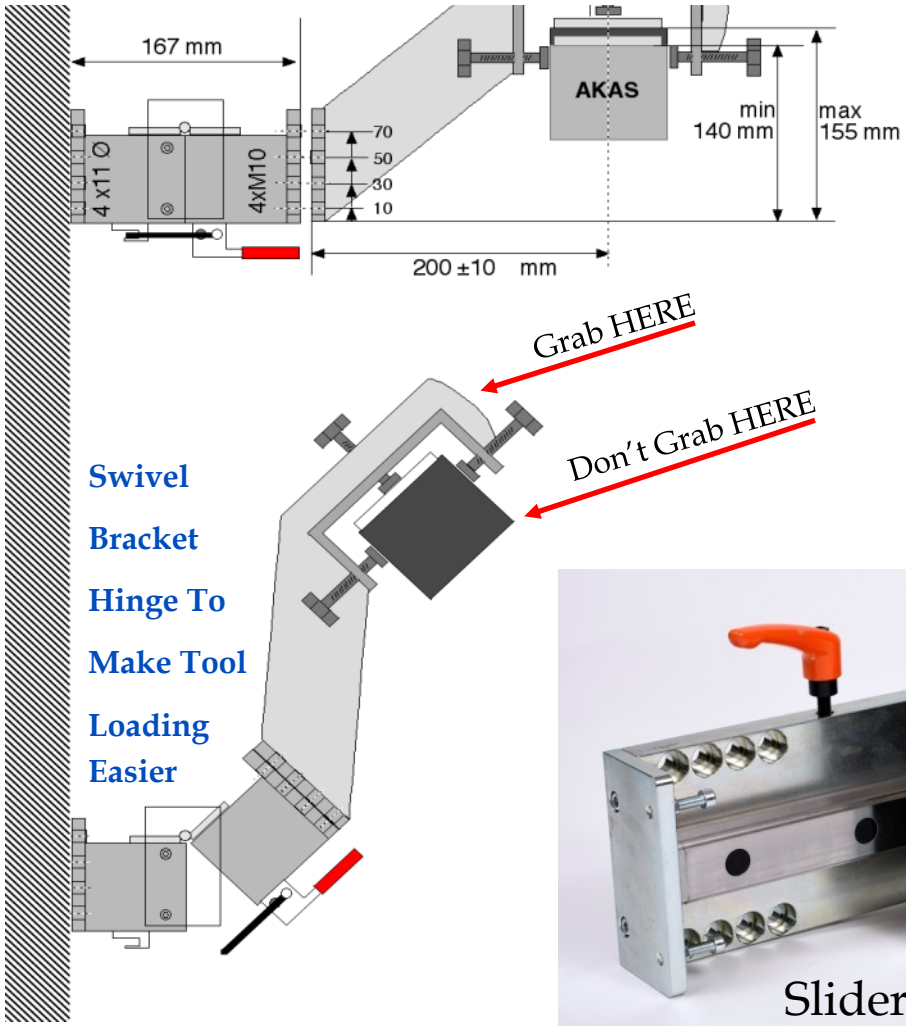
This is an example of a typical installation. A hinged spacer shown as fig. 2 in this diagram is added between the AKAS® receiver arm and the ram. When unhinged the AKAS® arm can be moved to a safer position during tool changes. The arms are extended beyond the bed to prevent damage during vertical movements, traveling up and down with the ram so the laser beams can lead the punch nose.

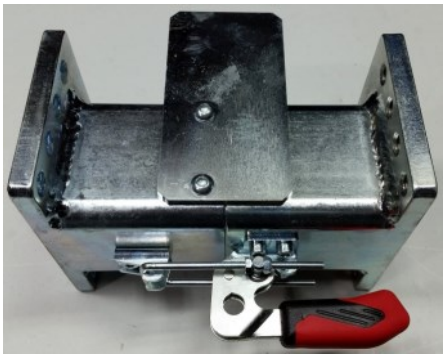
Anytime you are in doubt raise the ram and start over. Even if the tooling doesn't change when the job does, make it a habit to find the punch nose so this important step is never forgotten.

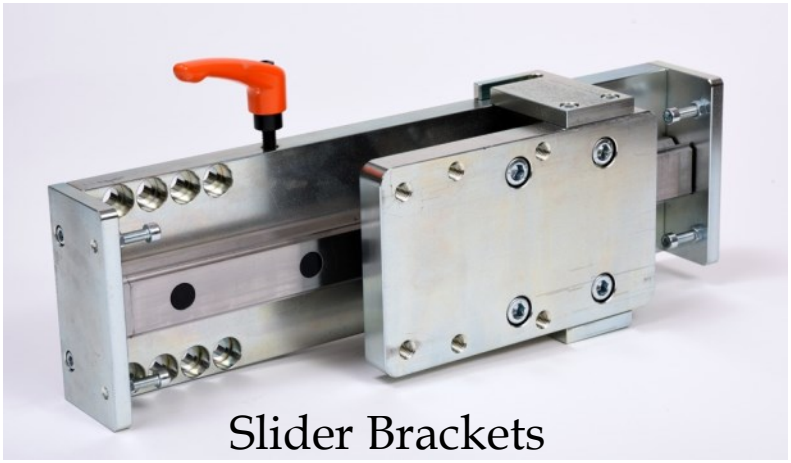


NEVER grab the AKAS aluminum housing.
Always grab the chromed steel support!

Typical AKAS Installation Mounting devices that help with tool changes






Slider Brackets

Typical AKAS Installation Mounting

2. design of the holders
void if Fiessler holding Devices are used

-The dimensions of the self-supplied holders must be individually laid out according to the dimensions of the press brake.
- **The self-supplied holders must be made of torsion-free rigid material, e.g. steel tubes 80 x 50 x 5 mm.**
- **They must be sufficiently long so that the largest and the shortest tool are still within the detection range of the AKAS® .**

-If frequent tool change requires the presence of a swivable holder, this should be installed at the receiver arm, in order to leave the precise adjustment of the transmitter arm unchanged.

3. Mounting of the holders at the ram

a) The holders must be mounted at the ram in a way that the marks on transmitter and receiver correspond exaclty to the bending line. The receiver elements E5 (AKAS®3 fig. 20/3) and E1 (AKAS®-IIM fig. 20/2) must face the operator and E1 (AKAS®3 fig. 20/3) respectively E2 (AKAS®-IIM fig. 20/2) must remain free when the highest tool is utilized. (Fig. 20/ 2 u. /3)
d) The lowest edge of both supports must be at the same level.
c)The gap between the front edge of the AKAS®systems and the press brake should be > 100mm in order to prevent injuriers while closing the press.
d)The existing mechanical guards of the machine must be modified in a way that any by-passing of the safety equipment by the operator is not possible. Likewise, any danger of geeting caught between grids and safety equipment must be excluded.

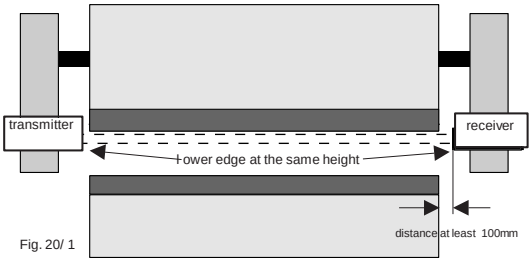
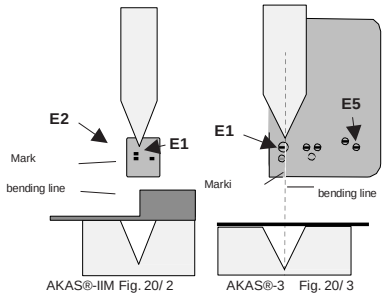


Fig. 20/ 1

Flange for fastening the item at the ram

Fiessler holder fig. 20/4



AKAS®-IIM Fig. 20/ 2 AKAS®-3 Fig. 20/ 3

please observe!

Transmitter and receiver of the AKAS® must not be subject to mechanical stress (nothing must not be placed on top of it).

Make sure that no material or solid parts are placed in the clearance beneath the AKAS® and the holders, in order to exclude any collision caused by the closing movement of the press brake. Fig. 20/ 5

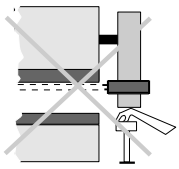


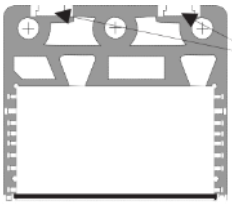
Fig. 20/ 5

Typical AKAS Installation Mounting

4. Mounting of the AKAS® on the holders

a) AKAS®-3...
AKAS®-II...
Fiessler holder

a) Support with tenon blocks at the rear



2 M5 s liding tenon blocks are located in each groove for fastening

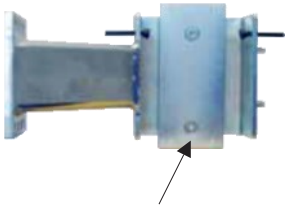
The adjustment is made with the help of the holders.

Fig. 21/ 1

Remove the fastening plate from the Fiessler holder and tighly fasten it by using the tenon blocks at the AKAS®.

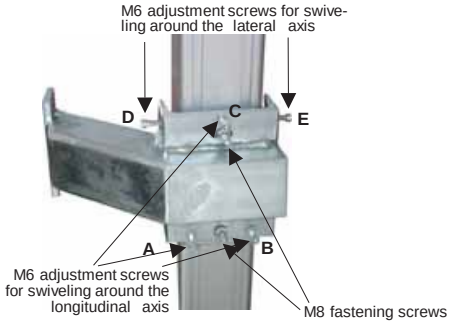
Choose a mounting position according to the directions given in chapter 5.7 **Adjustment of the AKAS® during first installation.**

Pay attention to avoid any deformation of the profile.



fastening plate

Fiessler holder front view fig. 21/2



Fiessler holder rear view fig. 21/3

Mounting on self-supplied holders

b) **Support with fastening angles at the upper and lower side** (as option)

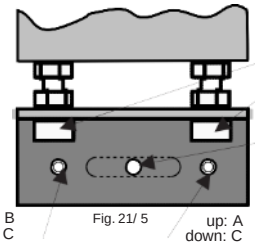


Fig. 21/ 5

screws with locknuts for height fine adjustment

upper fastening angle:
Boring 8,1 mm for fastening

lower fastening angle:
slot for pivoting around the lateral axis and for fastening.

The M8 fastening screws must be equipped with washers.

M6 adjustment screws with locknuts for pivoting around the longitudinal axis

Fig. 21/ 4

To guarantee a trouble-free operation, the supports of both the receiver and the transmitter must be fixed at solid, defor- mation-free plane-parallel constructions at the ram.

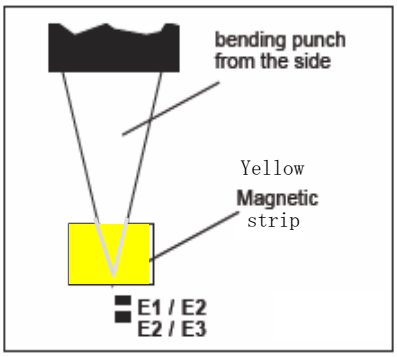
The adjustment screws must be easily accessible. Wihen pivoting around the longitudinal axis, the locknuts of the lower M 10 screw at the angle bracket should be unscrewed, the other M10 locknuts must be tightened.

Pay attention to avoid any deformation of the profile. By unsrewing the M10 screws, fine height adjustment is enabled.

Finding The Punch Nose At Each Job Change

When starting a new job calibrate to the punch nose to be safe, count the **5** steps on one hand.

Raise the ram to it's full open position (TOS).

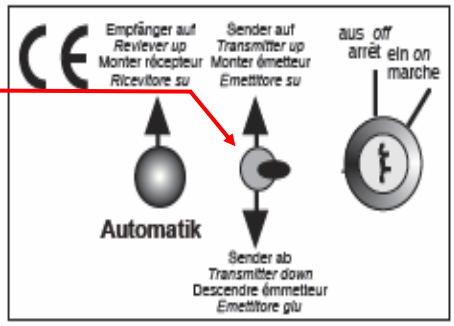


1. Place the yellow magnetic strip on the punch nose end closest the receiver. This expands the punch radius allowing the laser to see it faster.

2. Turn the calibration key switch, located on the receiver to the "**on**" position and don't step on the foot pedal.

3. Press and release the black Automatik button on the far left. You should see the transmitter and receiver move downward.

4. When both of the red laser beams fully appear on the receiver push the toggle switch upward and hold it for a half second, then release.



5. Immediately turn the calibration key switch back to the vertical "**off**" position. Do not interrupt the laser beams while this process is taking place. *You will know when calibration is complete because the mute light flashes intermittently.*

There are only 5 Steps to calibrate the punch. Do it at every job change even if you don't change the punch just to make it a habit. It's too late to have forgotten to do this once you have your hands at the forming tools.

After the mute light flashes intermittently to show the system is ready, remove the magnet from the punch end and store in a convenient place on the ram. If the magnet becomes lost any similar material of the same size and color will function just as well.

To recap the 5 steps.

1. After moving the ram to TOS, place the magnet on the punch radius to make it wider.
2. Turn the calibration key to the on position.
3. Press the black button once.
4. Push the toggle switch UP when you see the lasers below the punch nose.
5. Turn the key switch to the OFF position. Make parts when the ready light flashes.

Always return the key switch to the off position.
The system will not function otherwise.

Moving The Transmitter/Receiver Manually

The transmitter and or the receiver can be made to move independently. If the transmitter and receiver get severely out of alignment this procedure may help them get together again.

A. Raise the ram to it's full open position, then place the magnet on the punch nose

B. On the receiver turn the key switch right to the "on" position.

C. Push the toggle downward, then release. The receiver will drop to the bottom. Control the transmitter using the toggle.

D. Depress and hold the black push button to make the receiver move upward, or release to make it move downward.

D. Push the toggle switch upward or downward to make the transmitter move accordingly.

E. Using the push button and the toggle switch together the transmitter and receiver movements can be controlled so that any out of position condition can be corrected. After they optically couple, they move together so you can calibrate to the punch after a reset.

Recap: key switch on, then push toggle switch down
depress and hold black button to raise receiver
toggle held up or down moves transmitter

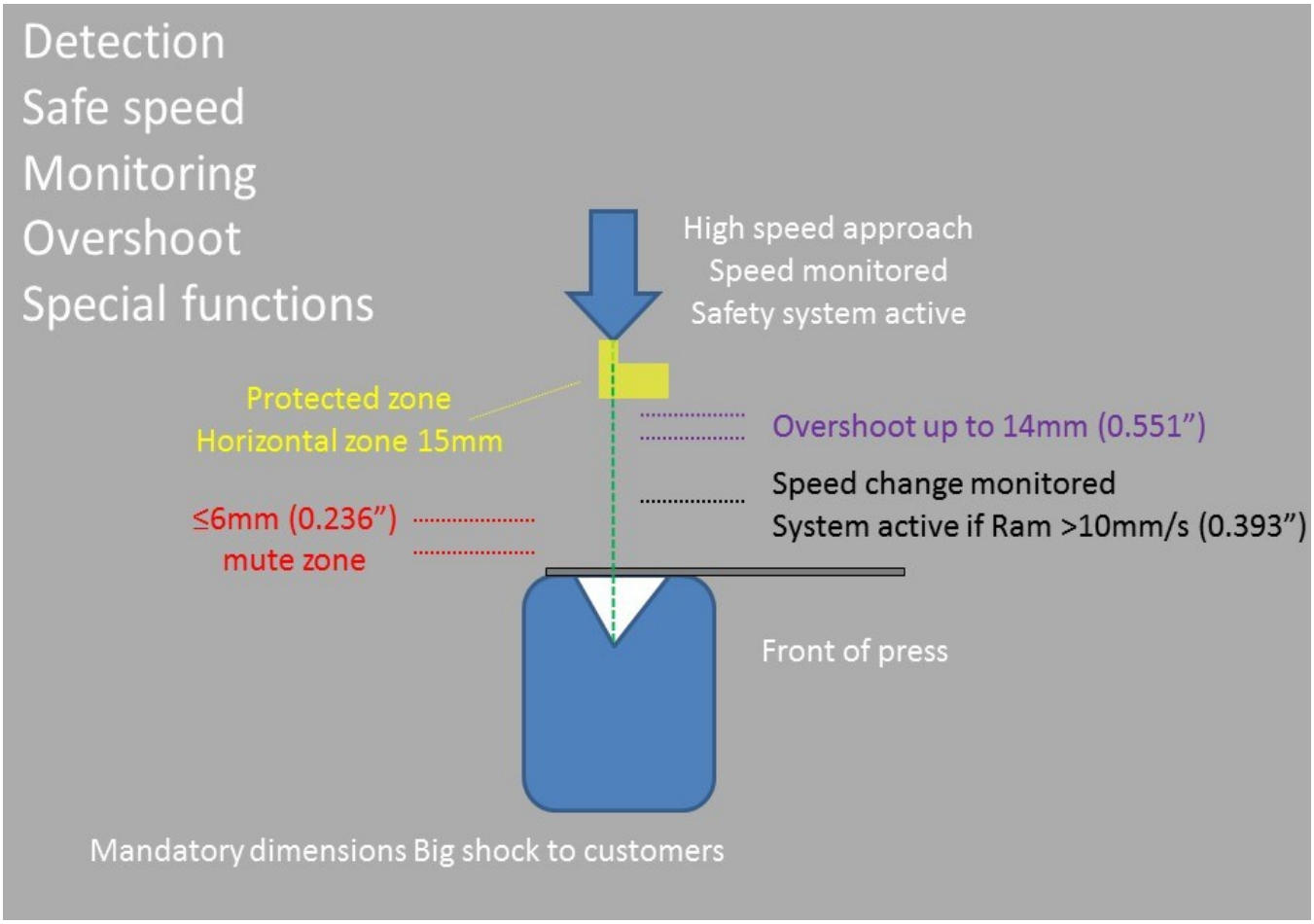
laser beams must cover small receiver holes before transmitter can move

Device	Direction	Take Action (but BE PATIENT)
Receiver	Down	Automatically moves down
Receiver	Up	Push & *hold* black button
Transmitter	Down	Push & *hold* toggle switch *DOWN*
Transmitter	Up	Push & *hold* toggle switch *UP*

Understanding Speed Change & Mute Positioning

The selected or programmed speed change point and the tested ram **overrun** determine the mute position necessary to establish a safe working zone. This safety work zone allows fast speed ram approaches by setting speed change points in accordance with the Fiessler guidelines on page 18. *If the ram speed change setting occurs at a position correctly above the sheet material, then as the punch nears the die there will be a position above the die where the lasers will not be functional. This area is called the mute zone wherein breaking the laser beams will* ***NOT*** *stop the ram movement. A brightly lit mute lamp on the operators control panel shows when the ram is traveling in this muted zone.* The muted area can be moved up or down in conjunction with the speed change setting. Ram speed, direction and distance is determined using the encoder scales mounted to the rear of the ram, near each hydraulic cylinder. The next page shows the correct speed change position when the overrun measurement has been determined.

Be reminded that moving objects do not stop instantly. There will be a time difference between when the stop command is given, the electrical circuits operate and the moving parts actually stop moving. The overrun once determined must be repeatable within a narrow range so don't change ram speed settings after an AKAS installation. ***Overrun*** **is the distance difference between when a ram stop command is given and when the ram actually stops all movement. These tests help predict ram movement for a given speed.**



Understanding Speed Change & Mute Positioning

1a. Overrun Traverse Measurement

After the installation the press brake stopping ability during a high speed approach has to be tested. The test consists of sending a stop command to the ram during a high speed approach and measuring the distance until the ram actually stops. This difference is the overrun and if that value is repeatable each stroke then determining how to keep the operator safe becomes more predicable. When using a AMS board the overrun of the press brake must be determined during the first stroke immediately after system power up. Accurpress Edge & Accell use a limit switch and cam method. A cam lobe is used to determine the acceptable overrun distance. If the limit switch remains on the cam lobe during the overrun test the preprogrammed Beckhoff controller accepts it.

The other method is by using the Fiessler AMS system and counting the flashes of L1 or L2. After system power up, move to TOS then foot pedal down until a ram auto stop occurs at a inch or two. Foot pedal is released to watch L1 & L2 flash once for each millimeter of overrun needed. Perform test 10 times, accept highest value. Program AMS PCB DIP1 & 2 with binary value of overrun +1. Reset power to accept. Verify correct settings by using the test block shown on next page. If the results of 10 consecutive measurements are larger than 15mm for AKAS®-LC, 14mm for AKAS®-II vF or 13mm for AKAS®-3, then the high speed approach must be reduced.

1b. adjustment of the dip switches
only AKAS®-II...
and AKAS®-3...

According to the induvidual overrun traverse of each machine, 8 different distances Z (=gap betrween uppermost receiver element and bending punch, see Fig. 19/1 u. Fig. 19/2) can be programmed via 3 dip switches at the receiver. The adjustment of the Z distance is carried out automatically at the conclusion of finding the punch nose.

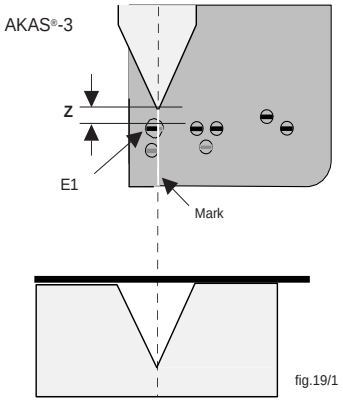


fig.19/1

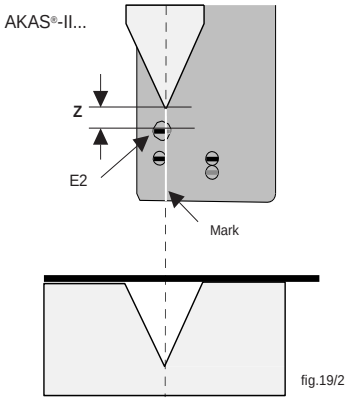


fig.19/2

match machine overrun value	**distance Z** after completed auto adjustment	find the tested average overrun value for AKAS model type in columns below **AKAS®-II... / AKAS®-3...**		Dip switch Position inside Receiver 1 2 3	recommended change-over point (U) from fast speed into slow speed* above the part surface **AKAS®-II... / AKAS®-3...**	
	13 mm	14 mm	13 mm	off / on	22 mm	16 mm
	11 mm	12 mm	11 mm	off / on	20 mm	14 mm
	9 mm	10 mm	9 mm	off / on	18 mm	12 mm
	8 mm	9 mm	8 mm	off / on	17 mm	11 mm
	7 mm	8 mm	7 mm	off / on	16 mm	10 mm
	6 mm	7 mm	6 mm	off / on	15 mm	9 mm
	5 mm	6 mm	5 mm	off / on	14 mm	8 mm
	4 mm	5 mm	4 mm	off / on	13 mm	7 mm

*** by this, a tolerance in sheet metal waviness of about 2mm is given.**

Table19/1

Performing Ram Stop Test Before Start Of Each Shift

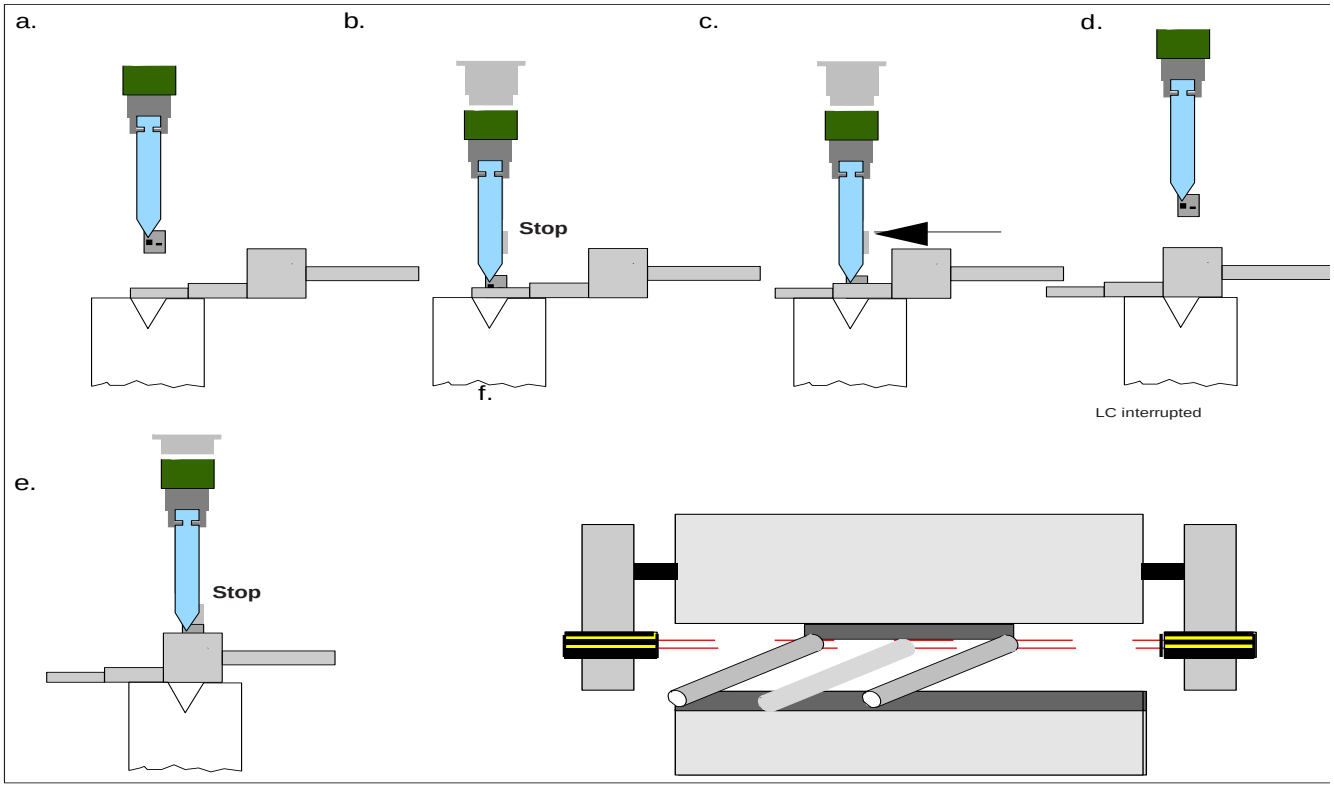
Test the ram stopping ability at the beginning of each shift, break or tool change. The provided black plastic, stepped test device should be then used as shown in the diagram below. Off set the punch from the bottom die to prevent damaging the test tool. Check both sides of the ram under the cylinders for more accuracy.

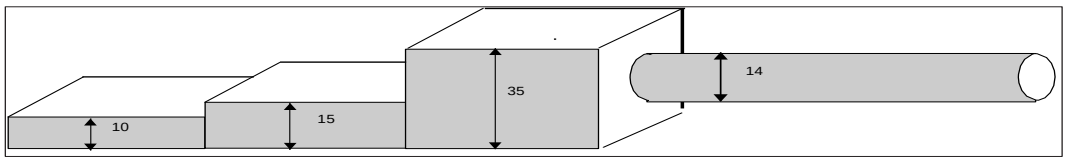
Bring the ram down on the lowest level of the test block.

Without raising the ram push the test block in to the second level to check for "wiggle room" ensuring that a finger would not have been crushed had it remained in the danger zone between the forming tools.

Raise the ram, bring the ram down on the 3rd position and check for "wiggle room."

Use the handle to verify consistent laser beam position on the punch left to right.



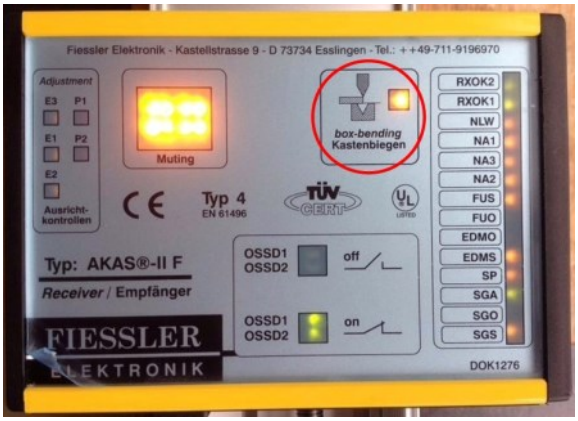


When Wavy Material Interrupts The Laser

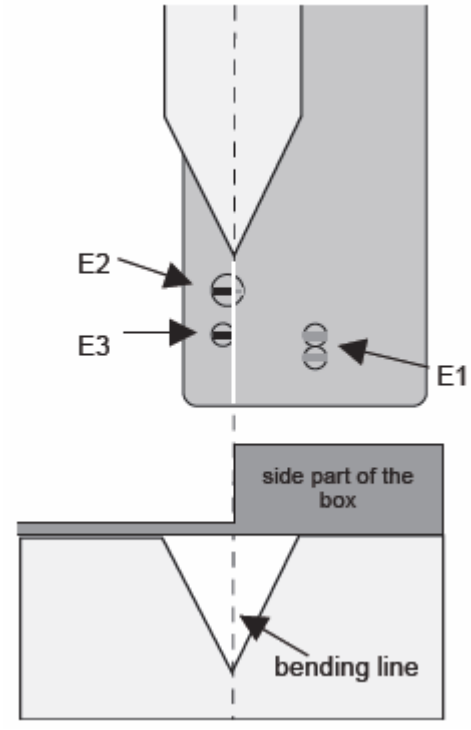
Even after the AKAS is interrupted by the wavy sheet if the operator releases the foot pedal and then immediately steps back on the pedal, the AKAS accepts that the operator chose to release the press brake and continue forming without further protective interruption. Note that the speed of the moving beam would only be in slow forming speed equal to 10mm/sec or slower regardless of the height the interruption occurred. During this operation the mute lamp would be showing a steady bright glow.

Use Box Bending When Flanges Stop Ram

This function can be activated by using a button mounted nearby the operator but most often it is wired into the AKAS system using the more convenient foot switch.



Depressing the pedal once activates the function as noted on the receiver indicator panel box bending light. Depressing the pedal twice more turns the function off.



Box bending must be activated for each stoke where the beam might interrupted prematurely.

Once activated the horizontal laser beam receiver (E1) closest to the operator is muted so the formed box flange does not prevent forming. The beams under the punch nose remain on until the mute position is achieved during the forming movement.

Even with box bending turned on, if the previously formed flange extends beyond the punch center bending line, then both beams would be interrupted and the ram would stop. To avoid this move the ram to the pinch point, insert the part and continue bending. Alternatively once the flange breaks the laser beam releasing the foot pedal and then depressing the foot pedal again will cause the ram to proceed in slow regardless of where the speed change point should have been.

Use Box Bending When Flanges Stop Ram

Description of box-bending or bending of small workpieces close to the tooling

If a box is bent, the previously bent side part of the box interrupts the ligh beam of the receiver element E1 right before this one will be muted by the muting order of the machine. The hazardous motion is interrupted, althougl there is no part of the body in the dangerous area. To prevent this, the operating mode "box-bending" must be announced to the system by operating the "box-bending" button before bending a box. When releasing the buttor the box-bending demand will be activated and the receiver element E1 gets muted and deactivated. This condition is shown by two green LEDs at the front plate of the receiver. However, the interruption of the light beam of E1 by the walls of the box does not lead to a switching off of the downward movement (Fig. 11/2.2). The other receiver elements remain active until the muting signal mutes the receiver. After this flange is formed the box- bending feature is reset to off and would have to be reactivated or the next stroke if needed again.

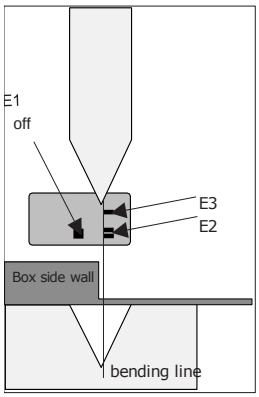


Fig.11/ 1

When forming small pieces which must be held by the fingers, select the box-bending feature, otherwise the finger would likely
interrupt E1 thereby stopping the ram!

With activated function of box-bending the finger is <u>not</u> detected and the forming process continues unhampered without the ram stopping as shown in the example below!

Schematic process with box-bending

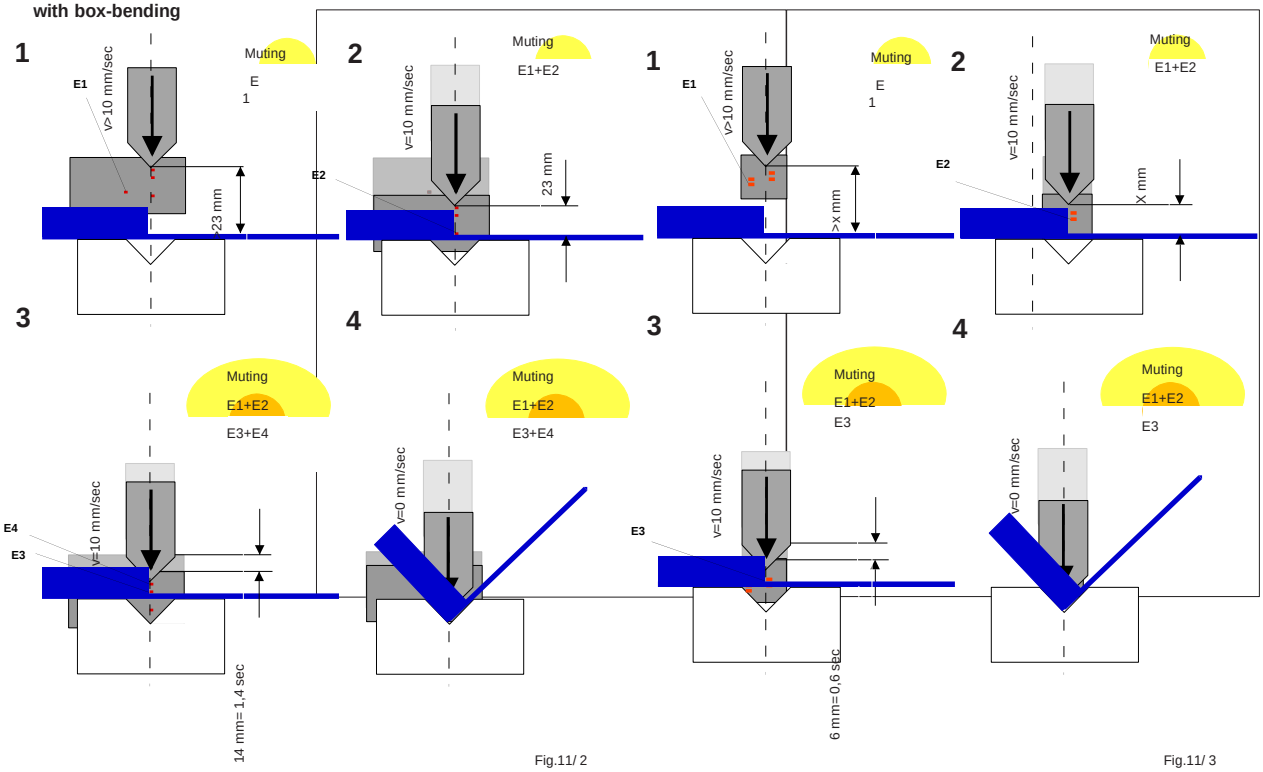
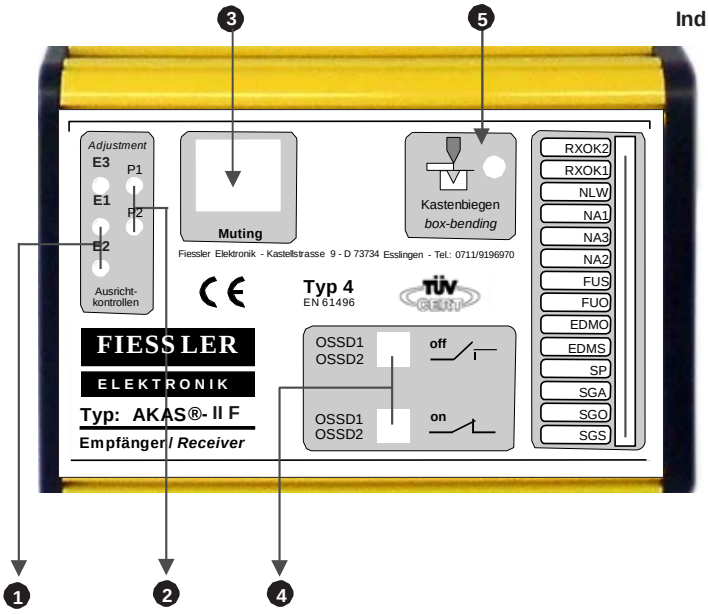


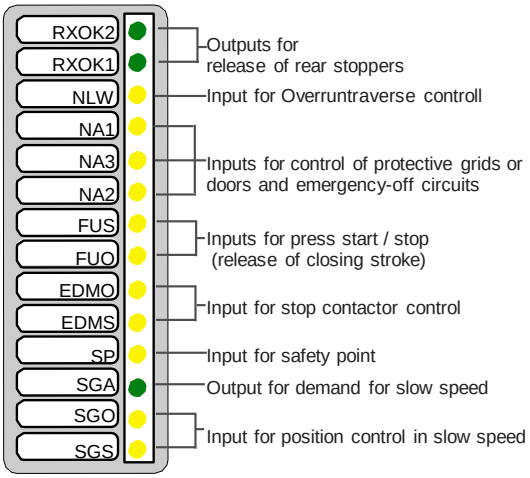
Fig.11/ 2

Fig.11/ 3

Operator Indicator Lights On Frontpanel

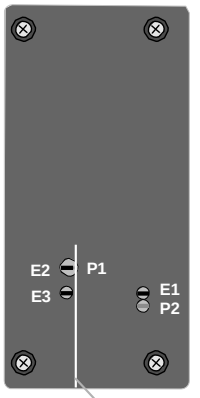


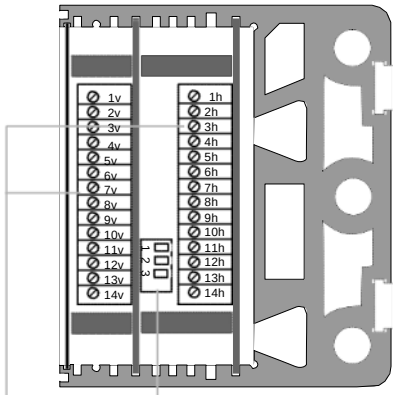
Indicator lights for in- and outputs



1. ajustment control Leds of the receiver elements E1, E2, E3 LEDs are on if the laser beams activate sensor elements
2. ajustment control Leds P1, P2 for self-acting ajustment after tool change LEDs are on if the laser beams activate sensor elements
3. integrated mutinglamp lamp is on if the protective field of the AKAS is not activated lamp is flashing if EDM or SP input signals are wrong
4. LEDs for safety outputs (OSSDs, Fail-Safe PNP) red LEDs are on if the OSSDs are in OFF status green LEDs are on if the OSSDs are in ON status
5. LED is on if box bending function is activated, depress twice to de-activate this function

view of the receiver elements





view after removing the connection lid on the receiver support

3 Mute Lamp Messages

Condition of mute lamp	Message
Flashing dimly fast	**Ready for normal operation**
Flashing brightly slow	Error condition – **LP Off**
Flashing brightly fast	Error condition – **LP Off**
Bright steady on	**Laser protection is OFF**

Known Usage Exceptions

The Fiessler AKAS system is designed to provide point of operation guarding for press brakes using standard v-die configurations of tooling. The system can only function when the laser beams are not obstructed from triggering the receiver sensor array. Tools that are custom, home made, rotary, spring loaded, of different heights, offset or other odd tooling varieties may prevent the lasers from optically coupling with the receiver properly and therein preventing normal safe system operation. To this end our extensive experience proves that not all operations can expect 100% functional suitability to every forming requirement given the use is outside the AKAS design parameters.

When Does Breaking The Laser Beam NOT Stop The Ram?

There are two (2) times when breaking the laser beam does NOT stop the ram movement. The **first** is when Mute point is achieved. When the ram moves to the mute position above the sheet material and the Mute light glows bright and steady on the receiver *breaking any of the beams won't stop the ram movement.* At some point the ram has to be released to bend the part. The mute position allows the tools to close enough that body parts can not enter the danger zone so the ram will ignore the laser interruption and turns the lamp on to tell you.

Also when the ram is moving at closing speeds equal to or slower than 10mm/sec or 0.393"sec. the ram won't stop if the beams are broken. This forming speed is considered slow enough for operators to be able to react as they would during a forming operation and has long been considered a plausible minimum safety alternative by ANSI when used in conjunction with a 3 position safety foot pedal.

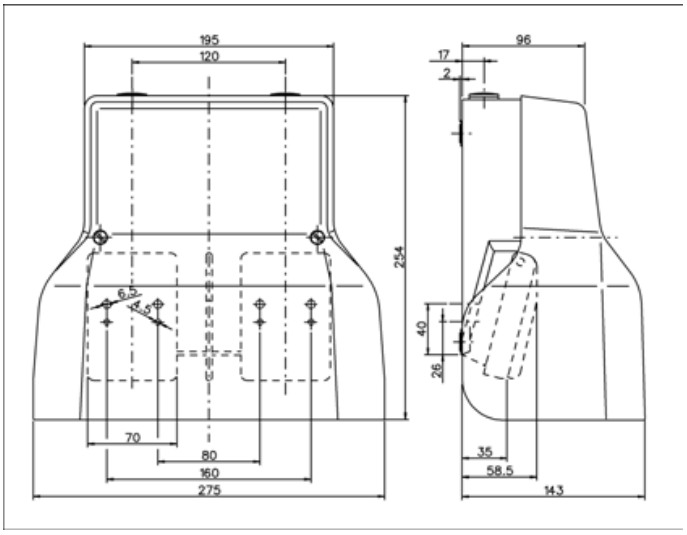
Objects Covering The Die

Because the laser beams must be detected at the receiver for proper system operation, objects or tooling that block the beams inadvertently can cause malfunctions. Covering dies with rubber or material coatings that can pop up or peal off, blocking the lasers prematurely. Foreign objects within the beam path must be removed or secured with magnets to the forming tools until the ram mute position has been reached.

Making Repairs

Don't do it. There are no user serviceable parts inside and it often costs more to repair after you're finished. This equipment is class 4, the highest certification for safety equipment and isn't designed to be serviced without special tools and factory certified parts. Fiessler won't sell you parts but we do provide a US based service center so you don't have to ship it to Germany anymore. See page 33 for details on shipping units to the service center or page 34 to have us to come to your facility for service or training. To determine which is most prudent for you call us to discuss it. **800-901-1193 #3, ask for Andrew Litton**.

3 Position Red Safety Foot Pedal and electrical connection diagram

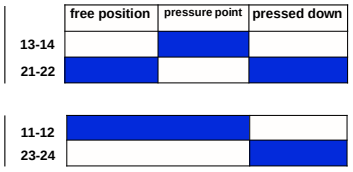


The safety foot pedal FE-FS2-U1/SU1ASDU1-U-RD use safety switches.
The left foot pedal have two positions (free position and pressed down position). It may e.g. be used for the selection of AKAS® Box bending function or opening of a press. The right foot pedal have 3 positions, with a pressure point, to control dangerous movements (for instance get down of a press brake ect.). It has 2 working contacts (1NC+1NO) to drive the movement and one safety switch (1 positive opening NC contact + 1NO) to stop the movement. Pressing the foot pedal, till the pressure point, allows the changeover of the 2 working contacts. Once the pressure point is got over, the 2 working contacts return to their first position and the positive opening safety contact is activated in order to initiate immediately the dangerous movement.Thus a redundant information for the safety circuit is available.
A restart of the machine is only possible after releasing the foot switch.

Left pedal:

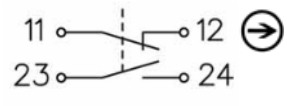
Right pedal:

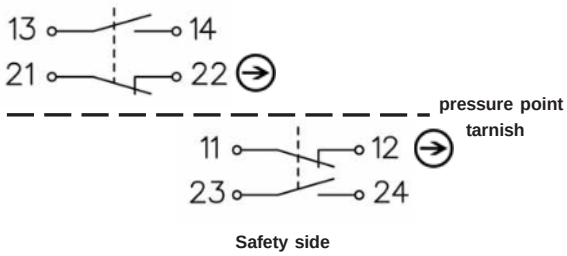
Switching diagram:



Contact closed
Contact open

Switching elemnts:





Safety side

Fiessler Elektronik GmbH & Co. KG
Kastellstr. 9 D-73734 Esslingen
Telefon: 0711 / 91 96 97-0 Internet: http://www.fiessler.de
Telefax: 0711 / 91 96 97-50 eMail: info@fiessler.de

Doku Nr. 1370 Stand 9.8.2013 / Aui

Troubleshooting

5. Technical data	
Safety category	4
Protection type	AMS3 must be mounted inside a cabinet of protection type IP54
Protection class	III
Ambient operating temperature	-10 to 50 °C
Storage temperature	-25 to 70 °C
Supply voltage	24 V DC, ±20%, (SELV). The external supply voltage must be able to bridge brief power failures for up to 20 ms according to EN 60 204.
Current consumption	Max. 250 mA.
Outputs	**FUS_o, FUO_o, SGS, SGO, SGW and SP_o :** PNP outputs, max. 0.5 A,
Inputs	**FUO_i, FUS_i, SGA, SP_i and HUSP** : 0 V / 24V DC +/- 20 %, 10 mA
Connection cable	max. 1.5 mm^2
protection from incorrect connection	Protection against all possibilities of errors is **not** provided
cable arrangement	Cables to be laid separately from high-voltage calbes. The cable laying must be arranged in a way that no mechanical damage is possible.

Faults / Possible causes / Remedies

Fault	Possible causes	Remedies
Overrun test does not show the measurement result.	Footpedal was released after the machine stopped	Keep footpedal activated to see the measurement result (L3/L4 flashing).
After overrun test is finished, SP_OUTPUT is flashing.	After AMS showed the overrun value with L3/L4 footpedal is still pressed.	Release the footpedal. Press footpedal again for down movement.
After overrun test has stopped the machine, SP_OUTPUT is flashing.	Overrun test failed. Machine did not stop within the limit.	Repeat overrun test. Reduce HS ram approach if test fails.
AMS LEDs L1 and L2 flashing 12 times after power on	Different operation modes selected on DIP_1 and DIP_2	Select the same operation mode on both dipswitch and restart
AMS LEDs L1 and L2 flashing once after two complete strokes	Fast down ram movement Y1 and Y2 is more than 15mm out of sync	Check machine hydraulic. Maybe also one scale sensor out of order.
Units won't calibrate to punch and move in different directions	Lasers on aligned with receiver or not being seen by receiver elements	If problem is resolved when lens covers are removed, change lens set
Ram won't move downward to make stroke.	Lasers cover all receiver elements before AKAS will release ram	Realign lasers to cover all receiver elements as foot pedal is depressed
Ram won't make a bending stroke, no bend, returns to open height	Speed change not set far enough above material, no room to stop	Raise speed change position higher above the part making room to stop
Key switch doesn't always turn on the laser beams to find punch nose	If key switch works correctly only sometimes the switch is faulty	Contact us, then follow directions to return units for quote and repair
During punch nose calibration, one unit moves and the other does not	A failed motor power amp, motor or transmission is most likely	Contact us, then follow directions to return units for quote and repair

Troubleshooting continued

Many of the lights on both the AKAS receiver in inside the interface box turn on and off during normal operation. What is not normal is a constant flashing light as this is a common method of getting attention during an error condition.

1. If the system exhibits an error, open the moving beam to maximum TDC.
2. Then attempt to operate normally.
3. If the problem remains perform a system reset as described on page 10.
4. Then attempt to operate normally. If the error persists recheck all functions and any programmed settings. Raise the speed change point significantly higher.
5. Perform a system reset as described on page 10.
6. Then attempt to operate normally. If the error persists call for service 800-901-1193 #3

The ram won't move…

1. Turn on the key switch to see if the laser beams cover the small openings in the receiver.
2. Ensure there are no objects interrupting the laser beams and that they are in the correct position on the receiver.
3. If not reposition the transmitter using the steps on page or perform a realignment.

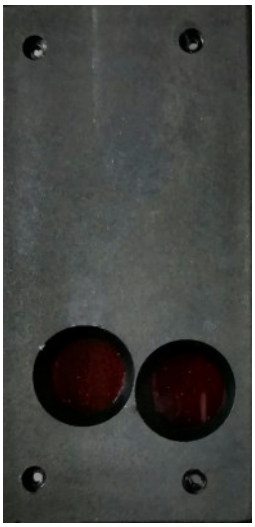
The ram moves down, stays there or it comes right back up…

1. Look for any premature interruption of the laser beams.
2. Has the speed of the ram been adjusted to run faster? Overshoot no longer matches ram speed. Readjust ram to slower speed or call for non-warranty service for re-programming.
3. Verify the calibrate key switch is in the off position after punch nose calibration.
4. Verify that the press brake control is in the run position.
5. Verify the ram has been calibrated, if not raise to upper most limit and see page 10.
6. Verify that without using material the forming operation cycles through the bending sequence without error.
7. Verify that the mute light shines bright during the dry run time when the punch nose is inserted into the die. If not raise the speed change position 1" and cycle ram again.
8. Looking inside the interface box, do the L1 & L2 lights on the AMS3 circuit board remain bright and steady on the ram downstroke and completely off on the ram return stroke?
9. Are the magnetic sensor strips dirty and are the sensors positioned correctly?

Periodic Maintenance

There are only three items that require maintenance. Since each shop environment is different we suggest you observe each of these during a set time period to determine the appropriate schedule for each PM.

1. Wipe the *deposit* of magnetic particles from the scale cover mounted to the back of the ram. When you notice the silver cover show lines similar to a ruler it is time to wipe both of them. Be extremely careful not to disturb the sensors, as their position is very critical and a slight mis-adjustment will cause the system to error. Use a clean dry cloth.



2. The transmitter lens has several large holes where the laser beams are created. Behind the holes sits a red plastic lens that often gets dirty. This causes a decrease in the amount of light sent to the receiver. Blow the larger particles of dirt off of the lens with your breath. Never use compressed air. Then use the twisted end of a dry, clean, soft, cotton cloth. Do not push on the red plastic lens very hard as it is only pressed into place and you do not want it to shift position. The frequency of when the lens needs cleaning depends upon how often they get dirty. It's easier to see them when the laser is on, turn the key switch to ON. NEVER use liquids as they can react with the plastic and often leave residues. ***We suggest changing both lens every 2 years to avoid problems.***

3. During a period where you have calibrated the AKAS to your smallest set of tools, notice the threaded screw below both the transmitter and receiver. Wipe this area if dirty with a clean cloth. Then apply in two areas near the top of the exposed screw a small amount of your preferred lubrication. Clean and reapply as conditions indicate. The transmitter also has a bearing way that sits behind the screw be sure to put some lubrication on the front and sides.

Alignment Instructions

6. Adjustment of the AKAS® at the first installation

-AKAS®-3... / AKAS®-II...

both supports must be mounted in a way that:

1.the highest (biggest) bending punch and the smallest bending puch is within the range of the supports.

2.using the smallest bending punch, the receiver element E2 + Z (**AKAS®-II** see fig. 19/2**)** , i..e. E1+Z (**AKAS®-3** see fig. 19/1) are covered by the punch at the highest range position of the support.

3.using the highest bending punch, the receiver element E2 + Z (**AKAS®-II** see fig. 19/1**)** , i..e. E1+Z (**AKAS®-3** see fig. 19/1) can still be positioned correctly at the lowest position within the range of the suppoort.

Transmitter and receiver must be mounted at the same height if both are installed in the lowest position of the supports.

-AKAS®-LC...

To guarantee a trouble-free operation, the mecanical fixtions of both the receiver and the transmitter must be fixed at solid, deformation-free plane-parallel constructions at the ram.

The fastening brackets are designed for the fastening and adjustment of the AKAS®-LC.

Together with the sliding tenein blocks, the brackets allow a universal fastening.

Transmitter and receiver must be mounted in a way that the receiver element E2 remains free when the bending punch is fixed .

Fig. 23/1

The receiver and the transmitter must be swiveled around the longitudinal axis in a way that their housings are plane parallel to the ram. With pivoting around the longitudinal axis, the adjustment screw or the locknut that counteracts the screwing movements, must be loosened.

adjustment of the receiver

Adjust the support with the help of a spirit level vertically, i.e. parallel to the guiding rails of the ram.

Drop a perpendicular line from the bending line of the bending punch and adjust optically the receiver with the help of M6 adjustment screws so that the mark is located vertically at the front of the receiver.

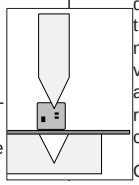


Fig. 23/ 2

Check this over during the whole travel of the support of the receiver by turning the key-operated switch to "EIN" (="ON") and carrying the receiver upwards with pressing the button "EMPFÄNGER AUF"(="RECEIVER UP"). For doing this, the adjustment mode must be in manual mode s. chap. 5.8.). During the upward movement of the receiver, repeatedly turn the key-operated switch to "AUS" (="OUT") and check the distance between the mark and the perpendicular (bending line) to make sure that the receiver is carried up parallelly to the bending line. The displacement by the motor is not intended for nonstop carrying up and down. In this case the thermal protection switches off the motors. After letting go the button and a short brake you may continue the carrying procedure.

If a height-adjustable support is used, adjust the support with the help of a spirit level vertically, i.e. parallel to the guiding rails of the ram.

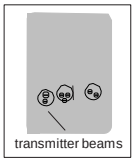
Drop a perpendicular from the bending line of the bending punch and adjust optically the receiver with the the help of M4 adjustment screws so that the mark (centre of the receiver elements) is located vertically at the front of the receiver. When using a manually movable support for transmitter and receiver, make this test along the entire displacement area.

Check the distance between the mark and the perpendicular (bending line) to make sure that the receiver is carried up parallelly to the bending line.

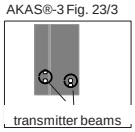
adjustment of the transmitter

The transmitter must be mounted in a way that its marks are located perpendicularly to the bending line, the same way as the receiver is positioned. Adjustment must dbe made just the way like the receiver.

The red transmitting beams should meet the receiver like it is shown in the opposite illustration. When doing so, please observe that the receiver stays in the lower stop of the support. To check this, cover the transmitter entirely. Then the receiver should not move further downwards. The adjustment mode must be in manual mode (s. chap.5.8.)



AKAS®-3 Fig. 23/3

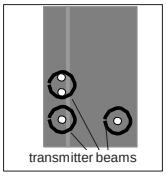


AKAS®-II Fig. 23/4

The transmitter must be mounted in a way that its marks are located perpendicularly to the bending line, the same way as the receiver is positioned.

If a support is used, adjust the support with the help of a spirit level vertically, i.e. parallel to the guiding rails of the ram.

The red transmitting beams should meet the receiver like it is shown in the opposite illustration.



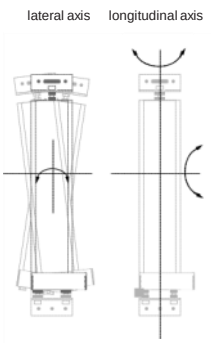
AKAS®-LC Fig. 23/5

Alignment Instructions

fine adjustment

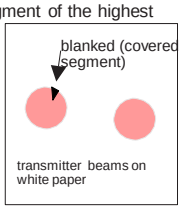
-AKAS®-3... / AKAS®-II...

The support of the transmitter must be turned around both the longitudinal and vertical axis until the laser beams are aligned parallel to the ram.



angluar fastening: When turning around the longitudinal axis the lock nut of the single M10 screw which is located at the angle must be loosened. (Otherwise there is a danger of deformation of the support housing!)
For checking whether the laser beams are parallel to the ram, a tool may be clamped alternately in front of the transmitter and the receiver (Fig. 24/5).

The transmitter is moved upwards to the ram until the tip of the ram covers a small segment of the highest transmitting beam (Fig. 24/3). This will be in the 1o'clock posiiion. When moving the **AKAS®-II** for the first mounting, the manual mode has to be selected .



AKAS®-II Fig. 24/3

If the tool is mounted completely on the left or on the right hand side, there must be always the same projection (Fig. 24/3) on a sheet of paper held behind the tool (Fig. 24/5).

This check must be done with the highest (biggest) and lowest (smallest) tool.

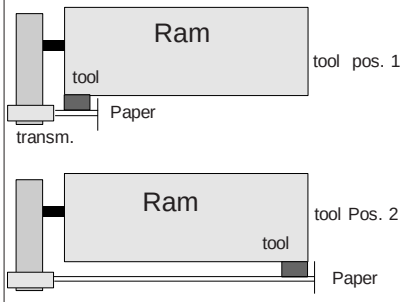


Fig. 24/5

Then, the transmitter is carried upwards by pressing the button "**Sender auf/ab**" (="transmitter up/down"). This action makes the receiver follow.

When the highest highest position is reached, please check whether the receiver is also free (***"LS Frei"***) and whether the transmitting beams meet the receiver as shown in Fig. 24/3. By this it is guaranteed that both transmitter and receiver move parallel to each other and to the bending line.

-AKAS®-LC...

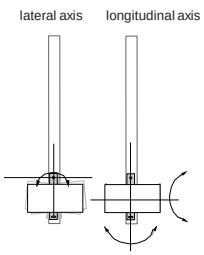


Fig. 24/2

Aligning the laser to intersect the punch at the 1 o'clock position as shown in this picture is critical for proper function of the box bending feature.

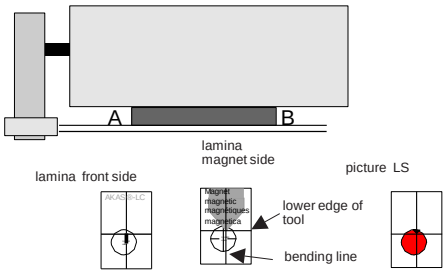


Fig. 24/6

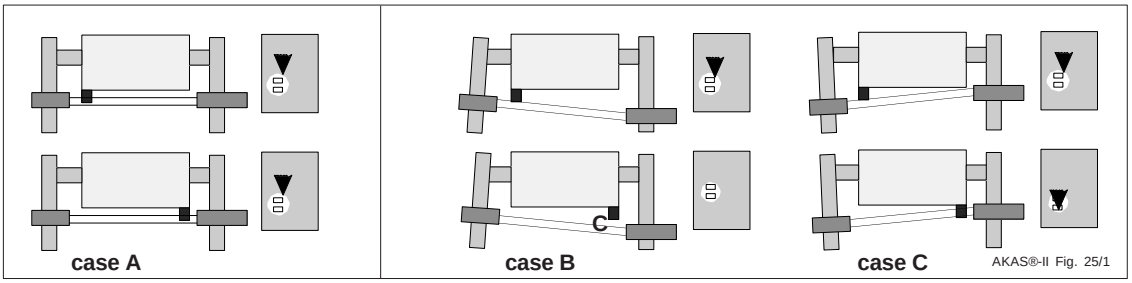
When using large tools, the AKAS®-LC transmitter is adjusted as follows:

1.Place the special AKAS®-LC magnetic lamina with its magnetic side at the spot marked "A".
2.Adjust the transmitter in a way that the picture "LS" can be seen at the front side of the lamina..
3.Then place the special AKAS®-LC magnetic lamina with its magnetic side at the spot marked "B".
4.2. Adjust the transmitter in a way that the picture "LS" can be seen at the magentic side of the lamina.
5.Repeat the steps 1-4 until at both positions A and B the picture LS can be seen.

Alignment Instructions

possible maladjustment AKAS®-I, AKAS®-II	remedy AKAS®-II, AKAS®-3	possible maladjustment AKAS® LC	remedy AKAS®-LC
Position of dark (=covered) section is not in 1 o'clock position but 12 o'clock or earlier.	By unscrewing all M6 adjustment screws that are responsible for the longitudinal adjustment, (A,B,C) the support must be positioned further away behind the bending line.	The beam misses the target circle of the magentic lamina at both of the tool tips and meets at the right hand side of the circle.	By unscrewing all M4adjustment screws (Fig. 22/2) the support must be positioned further away behind the bending line. i.e. push the Fiessler holders in their slots further to the front.
Position of dark section is not in 1 o'clock position but 2 o'clock or later.	By tightening all M6 adjustment screws that are responsible for the longitudinal adjustment, (A,B,C) the support must be put closer to the bending line.	The beam misses the target circle of the magentic lamina at both of the tool tips and meets at the left hand side of the circle.	By tightening all M4adjustment screws (Fig. 22/2) the support must be put closer to the bending line, i.e. push the Fiessler holders in their slots further to the front. .
If the position of dark section is not located in 1 o'clock position but earlier when using the lowest tool, and if it is in the 1 o'clock position when using the highest tool, the support stands too close to the bending line.	By unscrewing the upper M6 adjustment screws that are responsible for the longitudinal adjustment, (A,B,C) the support must be positioned further away behind the bending line.	--	--
If the position of dark section is not located in 1 o'clock position but later when using the lowest tool, and if it is in the 1 o'clock position when using the highest tool, the support is too far away from the bending line.	By tightening the lower M6 adjustment screws that are responsible for the longitudinal adjustment the support must be put closer to the bending line.	--	--
In the left tool position the dark section is bigger than in the right tool position = case **B Fig. 25/1**	The support of the transmitter must be swiveled to the right in the slot.	The beam hits the target circle at the left tool end, at the right tool end the beam edge is lower than the target circle = **case B Fig. 25/1**	The transmitter must be turned to the right in the slot, i.e. on the Fiessler holders, the inclination adjustment screw mzust be tightened. .
In the left tool position the dark section is smaller than in the right position = case **C Fig. 25/1.**	The support of the transmitter must be swiveled to the left in the slot.	The beam hits the target circle at the left tool end, at the right tool end the beam edge is further up than the target circle = **case C Fig. 25/1**	The transmitter must be turned to the left in the slot, i.e. on the Fiessler holders, the inclination adjustment screw must be looseend.
In the left tool position the dark section is located in the 1 o'clock position, in the right tool position in an earlier position.	After unscrewing the M6 adjustment screws B and after readjusting the upper right M6 adjustment screws A , the support must be swiveled clockwise around its longitudinal axis.	The beam hits the target circle at the left tool end, and at the right tool end the beam it hits a spot at the left outside of the target circle	After unscrewing the upper left M4 adjustment screws and after readjusting the right M4 adjustment screws the transmitter (Fig. 22/2) must be turned clockwise around its longitudinal axis, i.e. at the Fiessler holders, the swiveling is carried out counterclockwise by loosening of the front swiveling adjustment screw and by tightening of the rear swiveling adjustment screw
In the left tool position the dark section lies in the 1 o'clock position, in the right tool position in an earlier position.	After unscrewing the upper left M6 adjustment screw A and after readjusting the M6 adjustment screws B the support must be swiveled counterclockwise.	The beam hits the target circle at the left tool tip, and at the right tool end the beam it hits a spot at the right, outside of the target circle	After unscrewing the upper left M4 adjustment screws and after readjusting the right M4 adjustment screws the transmitter (Fig. 22/2) must be turned counterclockwise, i.e. at the Fiessler holders, the swiveling is carried out counterclockwise

correct transmitter adjustment **in correct transmitter adjustment**



AKAS®-II Fig. 25/1

PRESS BRAKE SAFETY SERVICE

1-800-903-1193 #3

Tools Needed

Two -10mm open end wrenches
13mm Socket & rachet
Small torpedo level
Johnson #160 40-0205 stud finder or equivlent

1. Ensure ram is at full open height

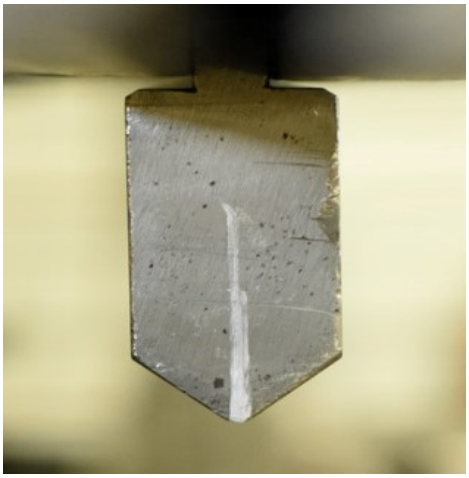


Figure A

2. Draw a line on both ends of the punch w/ a square, from the center of the radius up. (FIG.A)
3. Use one full length piece of tooling or 2 shorter pieces (same size) on both ends. If using goose neck tooling, change to standard V die.
4. Place alignment tool, level down, on end of tool ensuring that the tip of the tool is in the middle of the alignment slot, just visible then use bubble level to level the device. (FIG.B)

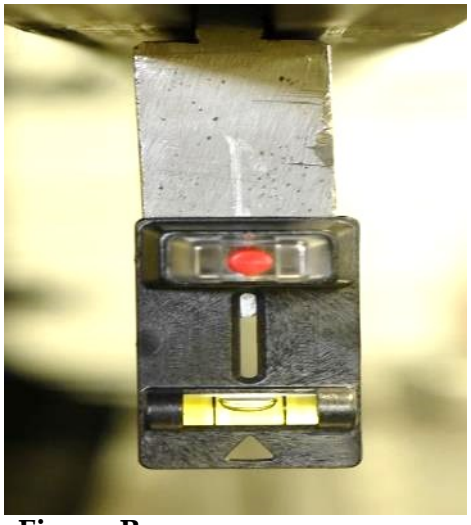


Figure B

5. Using a small torpedo level on the aluminum case, level the AKAS transmitter and then the receiver in all directions by adjusting the 5 table screws shown in figure 21/3 on page 14 of this manual .
6. Once transmitter and receiver are leveled, turn the key switch on the receiver to the on position to activate the lasers, and put the AKAS system in-to “Manual Adjustment” Mode.
7. Begin aligning the transmitter so that the beam is favoring the left most side of the first alignment tool, ensuring that the second tool has no beam bleed (FIG.C & D)

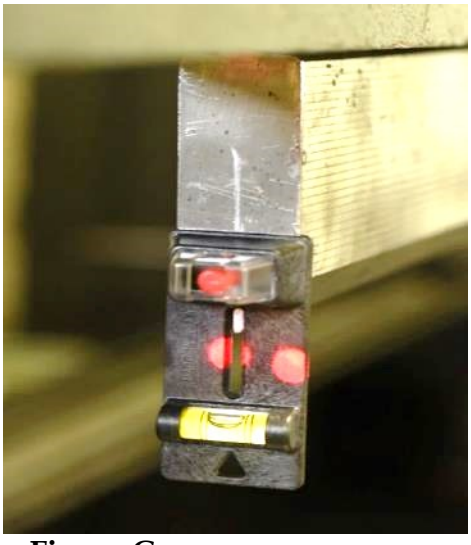


Figure C

(Note: Press brakes wider than 10ft beam bleed on the second alignment tool may be unavoidable, this is okay. The bleed must be even on both sides of the alignment slot.) (FIG.D)

8. Begin aligning the receiver fore and aft so that the small rectangle beam that is projected lines up perfectly with the silver line on the receiver. Take care that the receiver doesn't become twisted in the holder and that lens of the receiver is aimed directly at the transmitter. (FIG.F)
9. Once the transmitter and receiver are aligned, raise the alignment tools so that the beam is projected through the small triangle window below the level. Ensuring that both tools are moved equal distance up, remain on the center-line, and are level. (FIG. F) (If one tool is moved higher than the other, the system WILL NOT be aligned properly)
10. Move the laser beam up, or down so that there is no beam bleed on the second alignment tool.
11. Tighten all nuts, then place both alignment tools back in the step 8 position and ensure that the beams haven't moved, readjustment of laser fore and aft may be needed.
12. Remove the alignment tools and calibrate to the punch. (Refer to page 15 to reference the punch properly)
13. While the AKAS system is calibrating, watch the receiver and confirm that the beams are not moving off target while traversing. (FIG. G)
14. After automatic calibration, use the Fiessler provided test block on both the left and right side of the punch to verify the lasers alignment. The laser must be parallel to the punch, both left and right, as well as up and down.

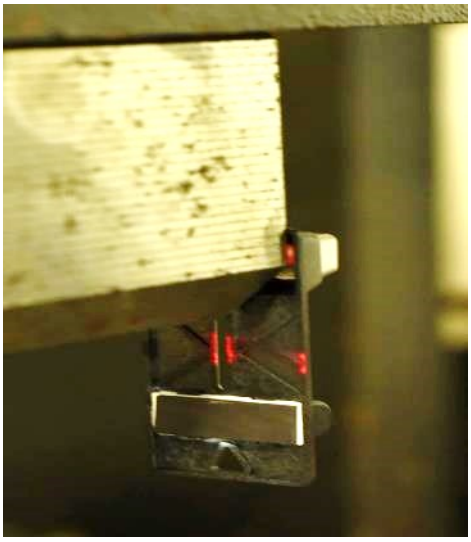


Figure D

Figure E

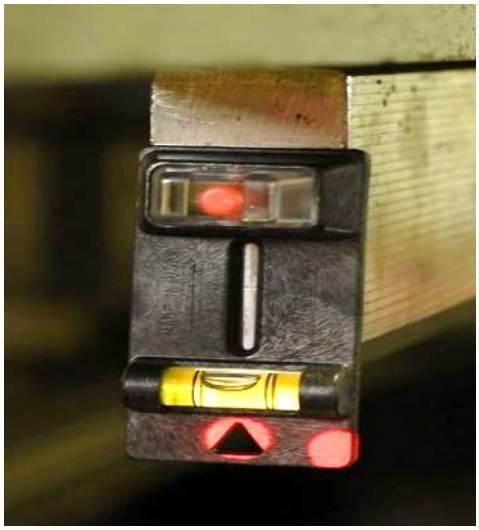


Figure F

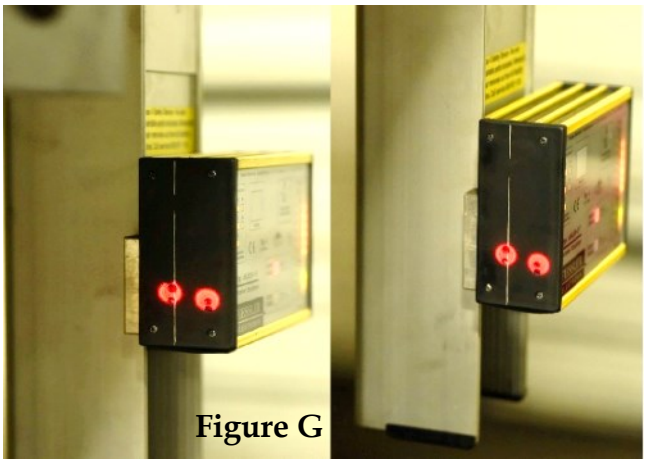


Figure G

PRESS BRAKE® SAFETY SERVICE

1-800-903-1193 #3 **Call us FIRST!**

Instructions for preparing, removing and shipping Fiessler AKAS lasers for repair

When you want to send the Fiessler AKAS system here is what to do.

Have your people mark the position of the steel backing plate that is used to attach the aluminum arm to the mounting structure. By doing this you will be able to re-install the arms and make the alignment much easier.

Remove the black plastic cover on the top of each arm by removing and then saving the 4 Phillips screws in each corner. Unplug each connector. Each is color coded and differently configured so they can't be plugged back in wrong. Secure the wiring harness in such a way that they won't be damaged or contaminated.

Slightly loosen the table screws that help hold the arms in position on the left and right. *Do not touch the other screws.*

Grab the extrusion from the bottom & while using a 4mm Allen wrench loosen the 4 corner screws in the steel backing plate. It only takes one complete turn to loosen them.

Carefully slide the extrusion downward out of the holder.

Follow the same procedure for the other device. **We don't need mounting hardware!**

Wrap and package the devices to avoid shipping damage. ***Include paperwork identifying a contact by phone and email, include a brief description of the failure and your UPS account number for cheaper rates on return shipping.***

Ship by UPS to: (add andrew@pressbrakesafety.com to the ship notifications)

Andrew Litton
5693 Federalist Ct.
Indianapolis, IN 46254

PRESS BRAKE® SAFETY SERVICE

If your AKAS isn't working correctly, you need a service visit or additional training, we can provide those services. Our products and services conform to OSHA requirements and ANSI standards. We are the only Fiessler AKAS authorized repair facility outside of Germany. Send them UPS for repair, refurbishment and a quick lower cost turn around.

Services Offered

Transmitter & receiver realignments

Magnetic scale service

Traversing screw maintenance

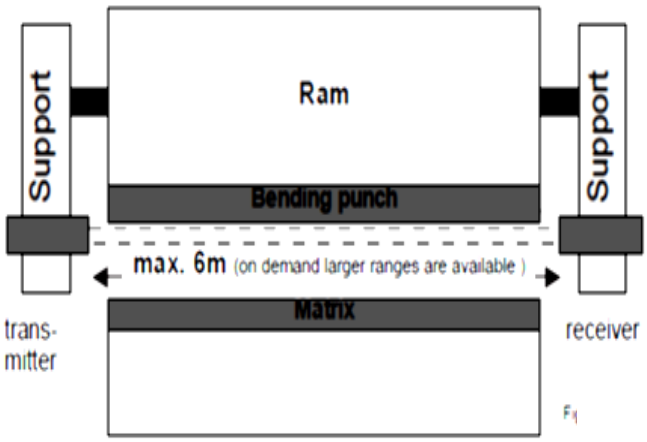
Laser lens replacement service

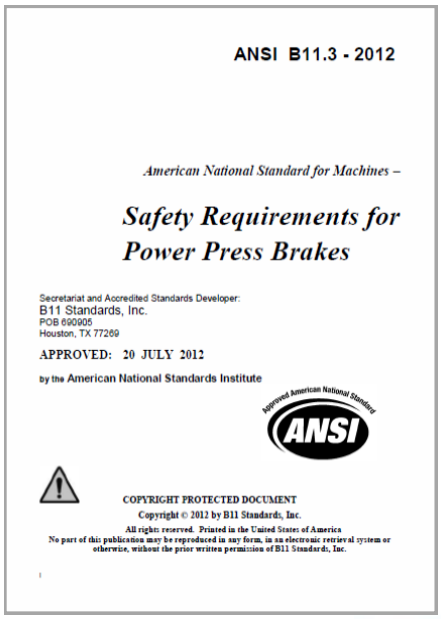
Faulty control panel switch repairs

Operation and maintenance training

Complete overhaul & part replacement

Mechanical collision damage repair exchanges




ANSI B11.3 - 2012

American National Standard for Machines –

Safety Requirements for Power Press Brakes

Secretariat and Accredited Standards Developer:
B11 Standards, Inc.
POB 690905
Houston, TX 77269

APPROVED: 20 JULY 2012

by the American National Standards Institute

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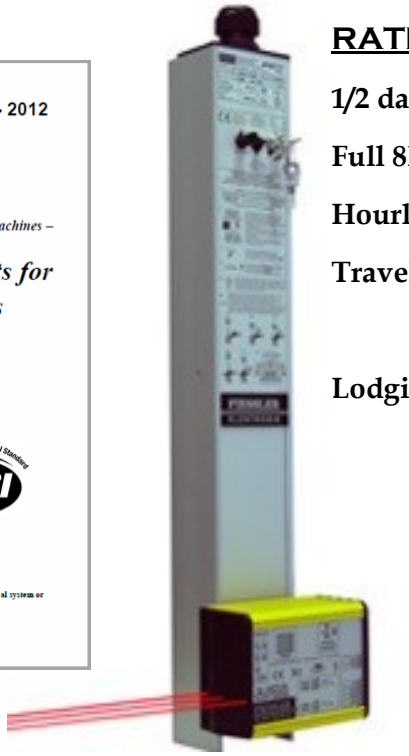

RATES

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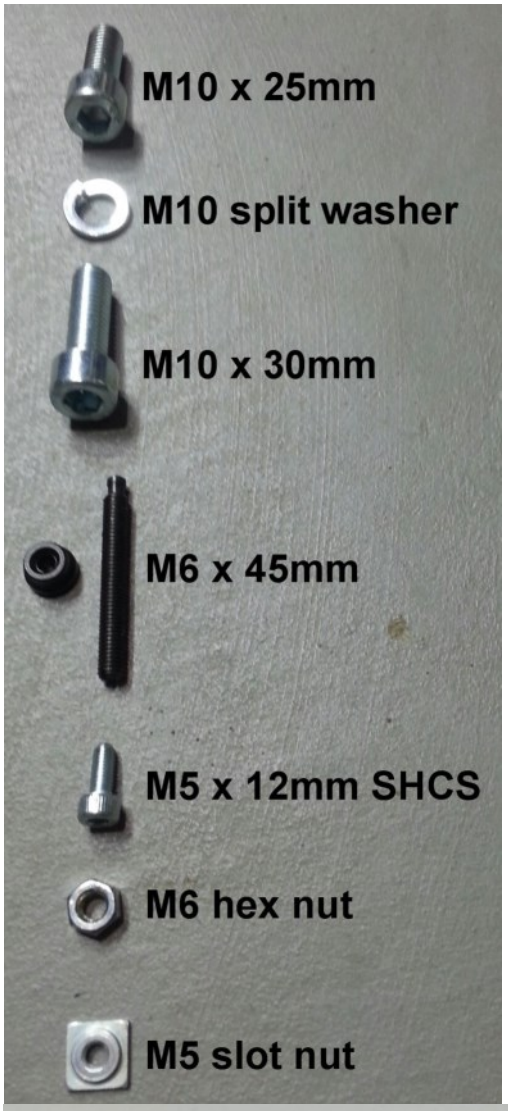
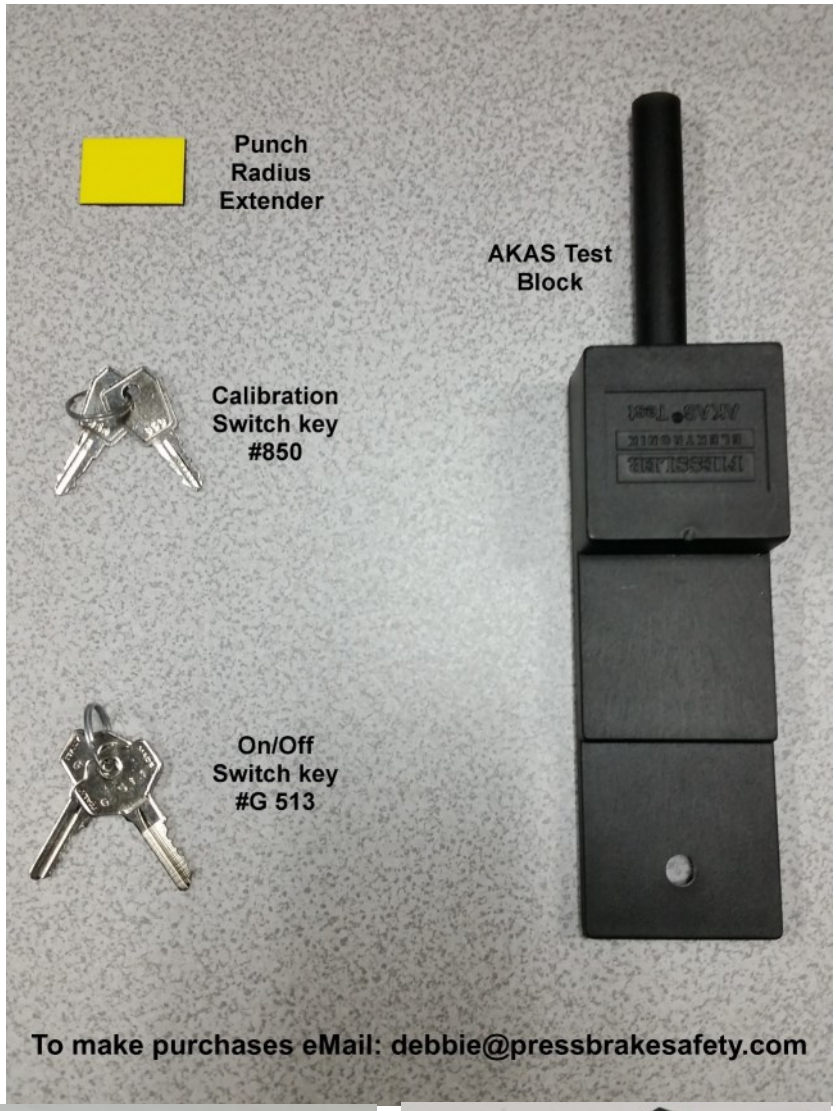
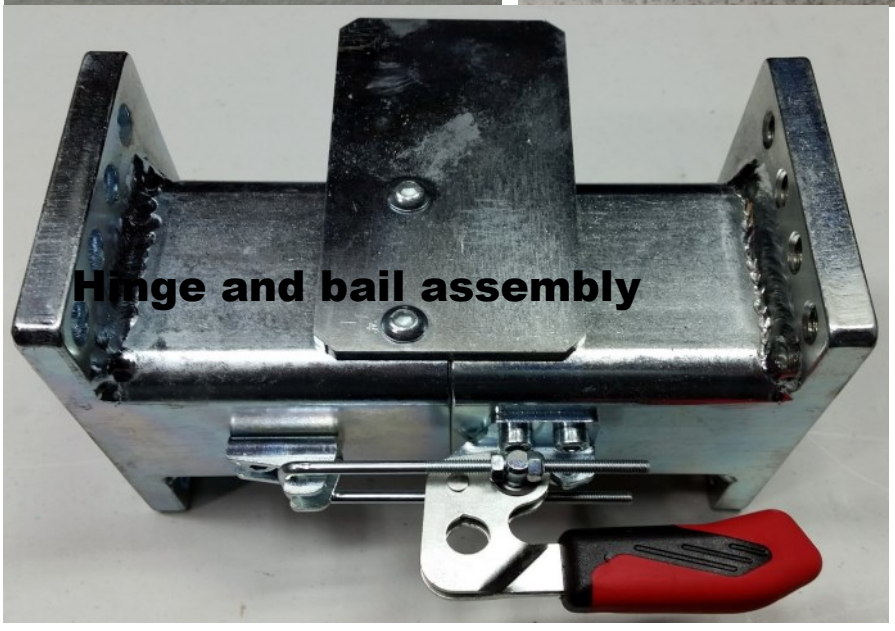
	+ $0.575 mile to & from
Lodging if required	**$150 nightly**

Contact: Andrew Litton
800-901-1193 press #3
andrew@pressbrakesafety.com

Hardware and Connectors







Are Your Press Brakes Safe?

Fabricators often utilize press brakes without fully considering the entire safety system or even the most obvious point of operation hazards. Press brake fabrication generally requires the operator to hold the work piece in close proximity to the point of operation while bending, forming, notching, or punching is performed. Point of operation guarding is complicated by the close proximity of the operator to a pinch point and the potential for complex operational sequences. Fabricators often employ lower cost, used or refurbished equipment where the primary controls system and/or condition of the machine and its safety system may be suspect. When fabricators are able to purchase new equipment they should make safety system criteria an equal priority to the production and setup characteristics of the machine. Original equipment manufacturers (OEM's) generally consider the point of operation aspect of the safety system to be the user's responsibility. Fabricators may not have anyone on staff that has safety system or safeguarding competency. As a result risk assessment is seldom considered or completed.

Press Brakes Must Comply with OSHA & ANSI Performance Specifications

Unlike the relatively similar power press, press brakes are exempt from Occupational Safety and Health Act (OSHA) standard 1910.217. Instead press brakes need to comply with OSHA's machine guarding performance specification 1910.212 general requirements for all machines. "One or more methods of machine guarding shall be provided to protect the operator and other employees in the machine area from hazards such as those created by point of operation, ingoing nip points, rotating parts, flying chips and sparks. Examples of guarding methods are barrier guards, two-hand tripping devices, electronic safety devices, etc." (Occupational Safety and Health Administration, n.d., ¶ 1910.212(a)(1)). The only safety system standard specifically applicable to power press brakes used in America is American National Standards Institute (ANSI) B11.3. ANSI reaffirmed B11.3 Safety Requirements for Power Press Brakes in 2007 and 2012. The standard is "intended to devise and propose ways to minimize risks of the potential hazards." An overall risk assessment that considers hazard severity, frequency of exposure, and probability of injury, as suggested by ANSI B11.3-2012 is likely a better and more comprehensive approach to establish a safe and effective power press brake safety system. However, such an assessment is likely to require a third party safety expert. A typical press brake application used in a fabrication shop will likely pose many identifiable risks such as catastrophic point of operation hazards resulting in amputation, crushing, and/or death. The ANSI B11.3 standard discusses hazards associated with the point of operation at length and identifies alternative guards and devices. These can be gen-

erally categorized as follows: fixed and interlocked barrier guards, moveable and/or sliding barrier guards, electro-optical presence sensing devices, pull-backs, restraints, two hand controls, and two-hand down/foot through controls. Another safeguarding concept, safe distance guarding, is neither a guard nor device but a method employed with restriction. "Because of constraints imposed by certain manufacturing or fabricating processes, safeguarding by maintaining a safe distance from the point of operation may be acceptable but only when safeguarding by physical barrier or physical devices is not feasible. "Safe distance" means the clearance between an employee (typically his or her fingers holding and supporting a piece part) and the power press brake point of operation." (Occupational Safety and Health Administration, 1997, ¶ D.5)

Safety – Point of Operation Guarding Options

Fixed and interlocked barrier guards as well as two hand controls are not a functional alternative for fabricators as the work piece is hand held in close proximity to the point of operation during the braking process and whips up as bending takes place. Pull-backs and restraints are possible alternatives but are restrictive and have limitations; besides operators hate them. Either device shackles the operator to the machine and restricts mobility. Furthermore they must be adjusted and inspected at each shift change, operator change, and die change. Most are not the least bit comfortable to wear for long periods. A two hand down/ foot through device will work in some cases. Here the operator initiates a stroke with a two-hand control and the ram moves to a stroke stop position leaving a .250 inch opening (an opening deemed small enough to be safe). Assuming the work piece profile allows, the operator positions the work in the tool and completes the stroke using the foot switch. This method raises ergonomic issues and it is very slow.

The electro-optical light curtain or laser beam device method is the most functional alternative; however, both require a special purpose device. A light curtain system must be designed to remember part profiles and have a muting circuit to (bypass) the system during the non-hazardous (upstroke) portion of the cycle. Laser optical devices are designed to be press brake specific and work with fast stopping hydraulic machines. Press brakes are operator intensive – sometimes involving multiple operators – and their behavior is not always predictable. Setup people and material handlers add to the potential for unexpected behaviors and outcomes. Operators may bypass guarding systems to facilitate setup or increase production rates. Tying back a kick plate on a foot switch is a typical example of this. Setup people may not follow lockout-tag out procedures, or material handlers may not use personal protection equipment. Some of these problems are easily foreseen but may not be easy to control or overcome while maintaining a profitable production environment.

Author unknown

How else can we help protect you?

PRESS BRAKE SAFETY
1-800-901-1193
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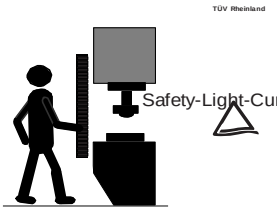
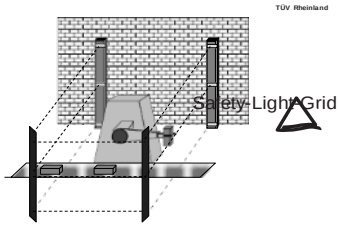
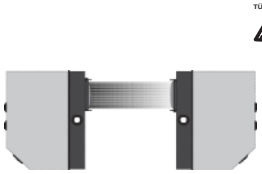


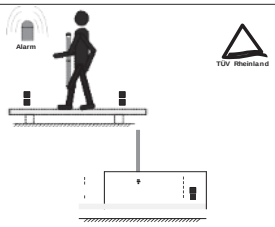
Safety-Light-Curtain



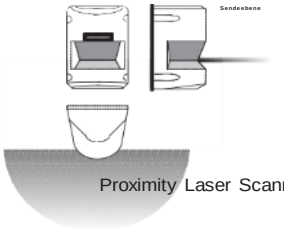
Safety-Light-Grid



Single-Saftey-Beam

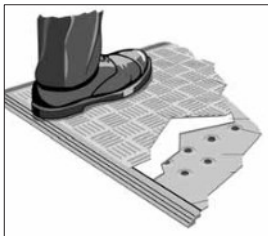


Safety-Light-Grid with muting function



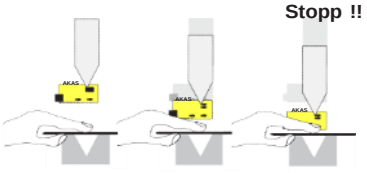
Proximity Laser Scanner

Saftey Mats



AKAS®

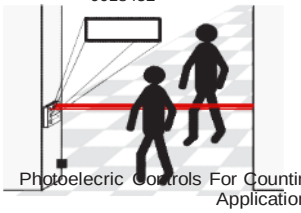
Stopp !!



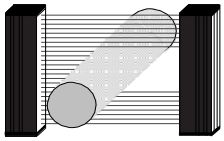
The innovative finger guard for press brakes

Saftey-Footpedal

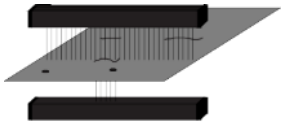
0018452


Photoelecric Controls For Counting Applications

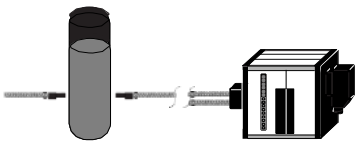
Switching And Analogue Light-Curtain



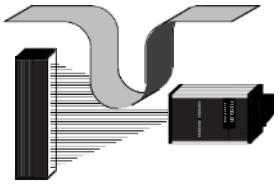
Hole-Detector



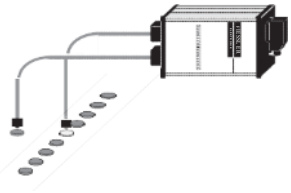
Cloudiness-Detector



Analogue Loop-Detector

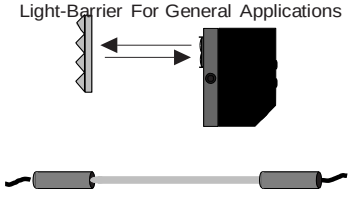


Reference-Sensor



EX-Light-Barriers

Light-Barrier For General Applications




Your Application or Problem