CADMAN® Touch
Power at your finger tips

LVD's new generation CADMAN® Touch control employs the latest in infrared touch screen technology on a Windows® embedded PC based control unit, combining the power of the CNC control with the speed and simplicity of touch screen programming.

Key features:

Powerful – A multitasking control features on board integration with LVD's CADMAN-B 3D offline software, seamlessly linking the online intelligent bending database with the offline bending software.

Intuitive – A totally new user interface minimizes input to the control.

Fast 'Art to Part' – CADMAN® Touch has been designed to minimise the operators input from drawing to part.

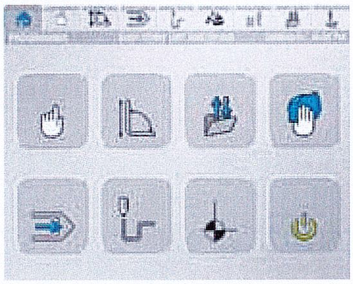
Flexible – 2D and 3D files can be input directly at the machine control, allowing the flexibility to program parts both on and offline.

Easy to use – CADMAN® Touch's intuitive icon driven interface ensures that operators find using CADMAN® Touch easy and productive.

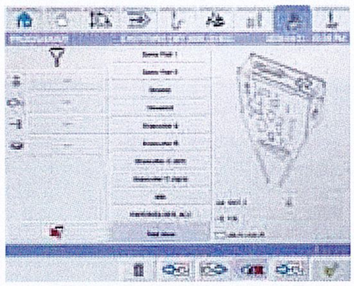
Highly reliable – the infrared touch screen technology used in the CADMAN® Touch control is a robust industrial design, successfully at work in other LVD products.

Network compatible – CADMAN® Touch is fully network capable, permitting integration to CADMAN-B 3D offline and workshop networks for programming and backup. This also enables access to LVD's Teleservice remote service system.

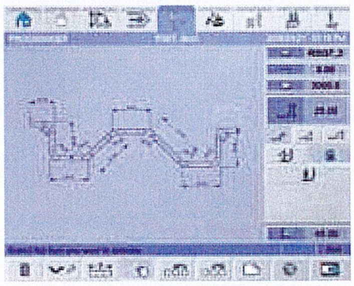
Press brakes equipped with the CADMAN® Touch control also feature a jog button on the foot pedal, allowing the operator to 'jog' individual axes of the machine for fine adjustments.



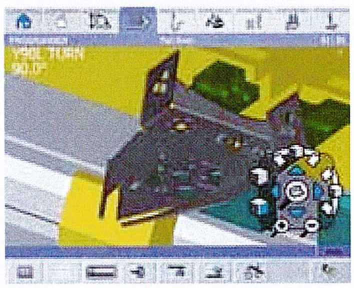
Graphic user interface



Part database



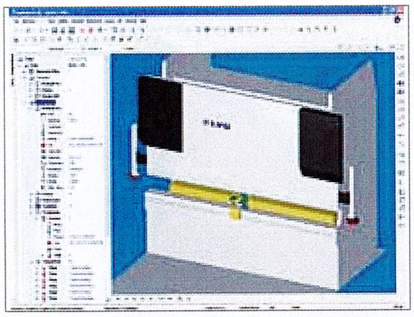
Fast 2D part programming



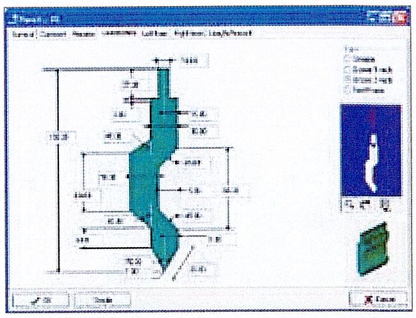
Bending simulation

CADMAN®-B 3D simplifies the programming of formed parts and automatically determines the correct unfolding of the part, the bend sequence, gauging positions and tool selection, all optimized for minimum tool stations and part turns. By utilizing an "intelligent" database shared with the press brake, CADMAN-B 3D ensures that a correct part is achieved from the first part.

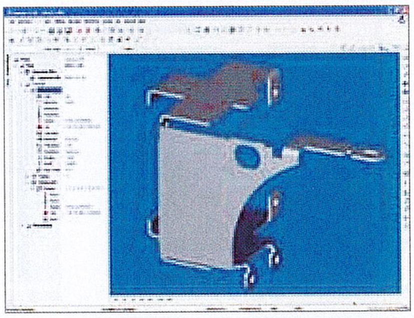
- Automatically calculates the optimum bend sequences using 3D data
- Model matching of imported 2D unfolded parts based on the bending technology
- Automatically calculates the optimum station set-up and provides a complete graphical set-up report for the press brake operator
- Utilizes a true 3D solid model of your press brake and all its options to check interference and collision between the part, tools and machine
- Generates a complete 3D bending simulation, automatically downloaded to your LVD press brake for easy reference during bending production
- Provides automatic definition of inclined, parallel and multi-bends and simplified definition of hemming bends and preliminary bends
- Complete flexibility to manually or semi-automatically sequence, gauge and bend parts



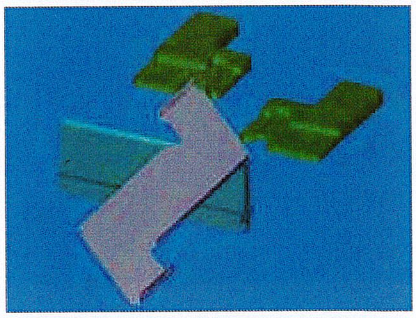
Virtual bending simulation



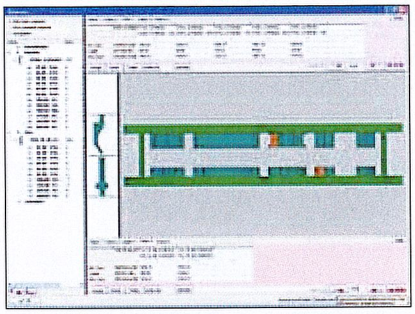
Parametric tooling



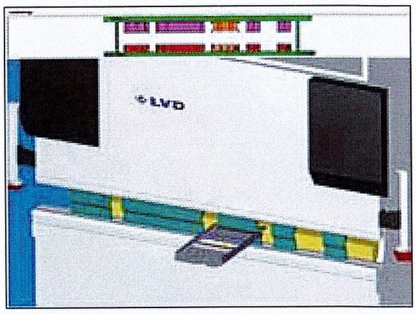
Product tree



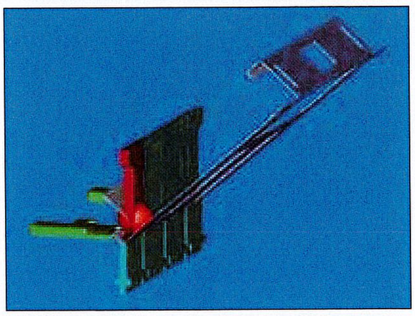
Three point gauge fingers



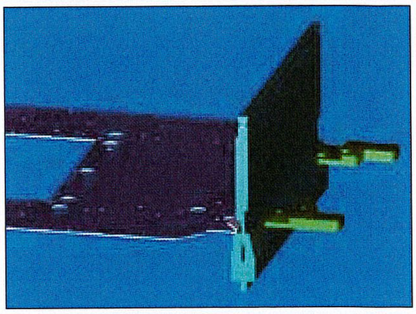
Tool setup



3D view for part & tooling



Automatic collision detection



3D simulation of hemming bends

Criteria for bending

Regardless of the application and use of available technologies, the production of accurate parts with minimum set-up time must meet and maintain five basic bending criteria. *See fig 1.* These are:

1. **Accurate bend angles**
2. **Constant bend angle over the full bend length**
3. **Accurate flange length**
4. **Parallelism of flange length**
5. **Correct position of internal details**

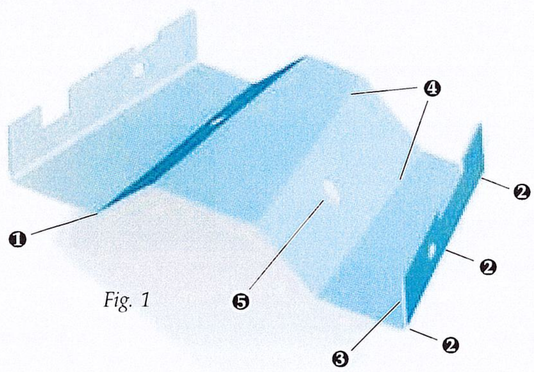


Fig. 1

1. Bend angle

Press brake ram repeatability has always been a key element in producing an accurate bend angle, however the focus on maintaining critical angular tolerances in bending today is no longer the repeatability of the press brake.

The focus is on the non-uniformity and varying dimensional tolerances inherent in all materials. Material variation will continue to be a concern in achieving both first article results and consistent parts throughout a production run. If it were possible to control the press brake repeatability to ±"0", this still would not solve the problems effected by varying material conditions.

Furthermore, changes in grain direction generally result in the creation of different bend radii. This will result in varying bend angles if the ram position is not adjusted. *See fig 2.*

2. Factors affecting bend angle over the full length

Deflection: The difficulty in maintaining uniform bend angles along the entire length of the bend line is mainly the result of deflection in the machine frame. If the upper and lower beam do not remain parallel during the bending process, the bend angle will differ along the length of the part.

Tooling: If the tooling is not precise or is unevenly worn along its length, the result will be a variation in the angle produced.

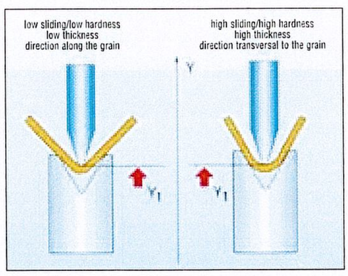


Fig. 2

3. Precise flange dimensions

To produce the correct flange length, the backgauge position must be accurately determined according to bend angle, bend radius, bend allowance, die geometry and material type.

4. Parallel flanges

Valuable time can be wasted setting up the backgauge to assure the production of parallel bends. In some instances, parts may require the bend lines to be non-parallel, in which case additional complexity will be added, and additional time will be spent setting up the backgauge. Other problems may also hamper the quick and accurate production of either condition. These include tool misalignment, tool wear, or a backgauge that is damaged, inaccurate or out of calibration.

5. Unfolded length & correct position of internal detail

Position of internal detail within a part depends primarily on the accurate application of the bend allowance. Bend allowance or K-factor calculations derived from different sources and used to determine blank development may vary. If the formulas used for calculations vary, blank uniformity will also vary.

All the criteria previously mentioned will effect the position of internal part detail and the development of the precise blank.

LVD Solutions

These features of LVD press brake technology address the problems of bending and ensure the quality of every end product produced.

1. Bend Angle

Precision Engineering: The LVD PPEB precision hydraulic press brakes are designed by "finite elements analysis." All models are equipped with bed-referenced linear encoders and the latest servo-controlled hydraulic systems to ensure precise control of the upper beam position and repeatability.

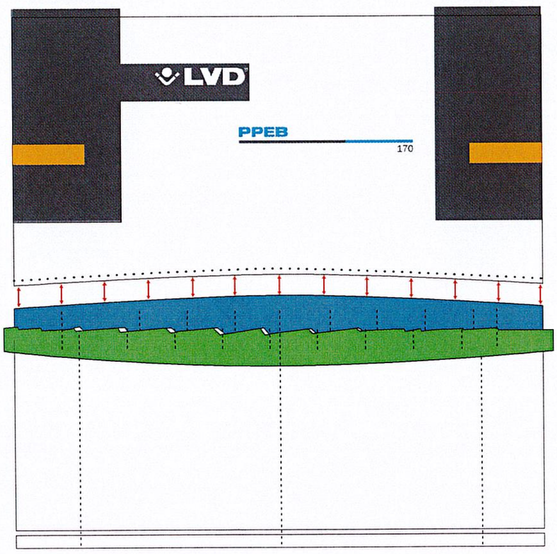


Fig. 3

CADMAN® Control/Software: The LVD CADMAN® Touch press brake control assures first time bend angle results by the automatic application of the exclusive CADMAN angle correction database. Previous bending data experience on specific tools and materials are cross-referenced and automatically applied.

Easy-Form®Laser: The patented Easy-Form Laser angle control system controls the bend angle in real time without slowing the bending process.

2. Factors affecting bend angle over full length

Deflection compensation system, V-Axis: The LVD CNC two-piece wedge deflection compensation system corrects the non-parallel condition of the bed/ram relationship created by deflection of the machine during bending. *See fig 3.*

Tooling: LVD precision-ground tooling, with the patented STONE® radius, assures accurate bend angles along the entire bending length. STONE tooling is produced with a progressive radius on both sides of the V-opening, allowing the material to flow into the die more evenly and with less drag.

This unique design of the V-die reduces the friction between the material and the die encountered when bending, by creating a rolling condition as the material enters the die. *See fig 4a & b.*

STONE® tooling also provides:

- Reduced tool wear
- Tool interchangeability
- Reduced residue on stainless steel
- Improved material control
- Reduced tonnage requirements
- Symmetric bending

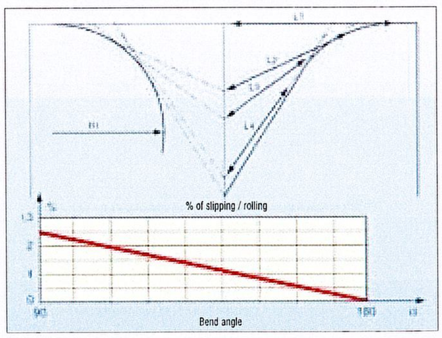


Fig. 4a. Normal radius

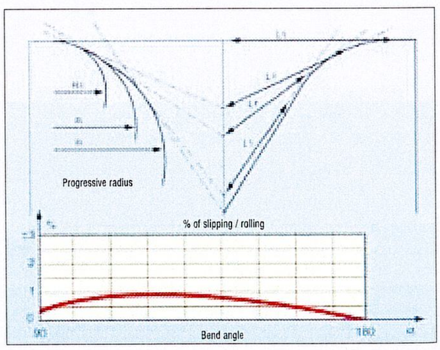


Fig. 4b. STONE radius

3. Precise flange dimensions

Intelligent database: LVD uses this method to obtain the correct position of the backgauge (with consideration for the bend allowance).

A piece of material of known data (*e.g.* 1,2 mm mild steel, 100 x 100 mm) is entered onto a setup page on the control. *See fig 5a.* After performing a 90-degree bend, the control requests the following information: length of leg 1, length of leg 2 and inside radius. This information is then stored in a database. *See fig 5b.*

When programming parts of the same material and tooling parameters, the database information is automatically used to give precise flange lengths the first time. This is possible because the database contains actual proven values and not theoretical values. LVD has performed tests on various types and thicknesses of material, using different V-dies.

This intelligent database which is preloaded on all machines together with a tooling library, can be extended with actual bending results.

4. Parallel and non-parallel flanges

Tool alignment: The LVD design assures precision alignment of the upper punch and lower V-die, allowing quick set-up and changeover time. The latest technology AC drives and encoders are used to ensure the highest possible accuracy and repeatability.

Backgauge accuracy: LVD backgauge systems offer the ultimate in flexibility in the production of both parallel and non-parallel flanges. The unique three-point gauge fingers allow automatic calculation and setting of both the backgauge and side stop positions for accurate part production. *See fig 6.*

5. Unfolded length and correct position of internal detail

LVD's CADMAN software: Automatically applies information from the bend allowance database, making it possible for the user to determine exact positions of internal details and the correct dimensions for the undeveloped blank.

Having proven data from the press brake in advance of blank production means no alterations are necessary to the part throughout its production. Accurate blank development, laser or punch press processing and bending are assured by using proven data provided by the CADMAN software. *See fig 7.*

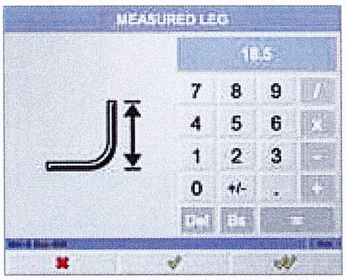


Fig. 5a

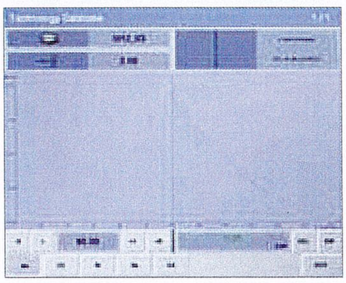


Fig. 5b

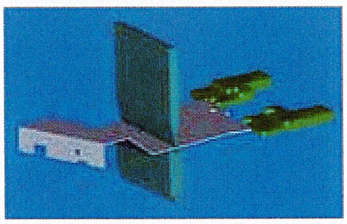


Fig. 6 Three-point gauge fingers

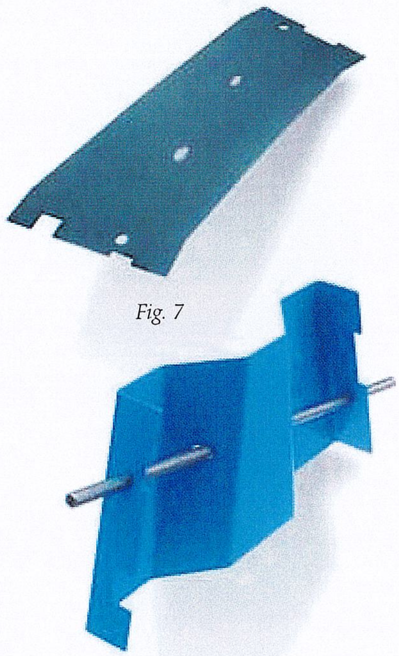


Fig. 7