



## **PIPE BENDING MACHINES "STANDARD" For pipe from 6" (152 mm) to 36" (914 mm)**

Hydraulic controls give one operator complete command of all machine operations from a convenient platform.

Hydraulically driven winch moves the pipe through the machine. Pipe moves easily on contoured rollers.

Calibrated stiff back indicator rod allows the operator to make consistently uniform bends.

Pin-Up clamp automatically grips the pipe to prevent distortion. This feature is not used on 6-20 size pipe bender.

Conversion to another pipe size within the machine range is made simply by fitting an alternative bending set.

Any CRC-Evans Pipe Bending Machine, in good condition, is capable of bending all grades of currently available API-5L pipe within its range.

The machine frame is constructed from selected quality steel to give long life without fatigue failure.

Unitized construction makes for easy maintenance and repairs.

The towing eye is attached to the hydraulically actuated stiff back and may be raised and lowered to facilitate attachment to the towing tractor.

The machine may be towed on the right-of-way by a suitable tractor, normally the side boom feeding the pipe to the bending machine.

For each pipe size to be bent, a Bending Set, a Bending Die, a Mandrel, and a Bending Belt are required.

Refer to the following literature sheets for associated information:

- Sheet A2: Extra cost options are available to suit special applications
- Sheet A3: Information on recommended maximum bends and wall thicknesses
- Sheet A21: Information on working principles
- Sheet A22: Bending Sets and Pipe End Supports
- Section B: Bending Mandrels
- Section K: Bending Belt to load and control pipe (Steel Lined Choker Belt)

## PIPE BENDING MACHINES

### "STANDARD"

### SPECIFICATIONS

For pipe from 6" (168 mm) to 36" (914 mm)

| Model                                     | PB 6 - 20                             | PB 16 - 30                            | PB 22 - 36                            |
|---|---------------------------------------|---------------------------------------|---------------------------------------|
| NOMINAL† PIPE DIAMETER<br>inches (meters) | 6.625 - 20<br>(168 - 508)             | 16 - 30<br>(406 - 762)                | 22 - 36<br>(559 - 914)                |
| POWER UNIT<br>hp (kW)                     | Diesel<br>34<br>(25)                  | Diesel<br>119<br>(89)                 | Diesel<br>142<br>(106)                |
| LENGTH<br>inches (meters)                 | 13' - 4"<br>(4.06)                    | 22' - 8"<br>(6.91)                    | 24' - 2"<br>(7.37)                    |
| WIDTH<br>inches (meters)                  | 6' - 4"<br>(1.93)                     | 8' - 4"<br>(2.54)                     | 8' - 6"<br>(2.59)                     |
| HEIGHT<br>inches (meters)                 | 8' - 10"<br>(2.69)                    | 8' - 6"<br>(2.59)                     | 9' - 0"<br>(2.74)                     |
| NET WEIGHT (COMPLETE)<br>lb (kg)          | 9250<br>(4196)                        | 28450<br>(12905)                      | 38440<br>(17436)                      |
| UNDERCARRIAGE                             | Pneumatic Tires<br>11.0 X 16          | Track Type<br>CRCE-15T                | Track Type<br>CRCE-15T                |
| OUT-BOARD CYLINDER<br>BORE X STROKE       | Two - 7" x 11"<br>(178mm x 279mm)     | Two - 9" x 19.25"<br>(229mm x 489mm)  | Two - 11" x 19"<br>(279mm x 483mm)    |
| IN-BOARD CYLINDER<br>BORE X STROKE        | Two - 7" x 6"<br>(178mm x 152mm)      | Two - 7" x 5"<br>(178mm x 127mm)      | Four - 7" x 5"<br>(178mm x 127mm)     |
| HYDRAULIC SYSTEM<br>MAX. OPER. PRESSURE   | 2000 psi<br>(141 kg/cm <sup>2</sup> ) | 2000 psi<br>(141 kg/cm <sup>2</sup> ) | 2200 psi<br>(155 kg/cm <sup>2</sup> ) |

All power unit ratings are "continuous horsepower @ 2,000 RPM".

### EXTRA COST OPTIONS (FACTORY FITTED ONLY)

|  |  |
|--|--|
| Power units to customer specifications.      | Tracks to replace wheels on PB 6-20.                                   |
| Electric Motor.                              | Cold weather operating kit (-40°C or F).                               |
| Gasoline engine (as available).              | Cab.   |
| Stationary base to replace undercarriage.    | Hydraulic power take-off for either a plug mandrel or a wedge mandrel. |
| Wheels to replace tracks PB 16-30, PB 22-36. |  |

### EXTRA COST ATTACHMENTS

|                                     |   |
|-------------------------------------|---|
| Bending sets for out-of-range pipe. | Hydraulic power take-offs.                |
| Bending sets for specific coating.  | Bending belts (steel lined choker belts). |

†Pipe is generally referred to by Nominal Pipe Size, but it will be noted that on sizes up to 12", the actual outside diameter is somewhat greater than the nominal size. See sheet A23 for details.

## PIPE BENDING DATA (US)

## 6" - 36" PIPE BENDING DATA - ALL DIMENSIONS IN INCHES

| Nominal† Pipe O.D. | Maximum Wall Thickness by Grade |       |       |       |       | Recommended Bend    |             |                             |
|--------------------|---------------------------------|-------|-------|-------|-------|---------------------|-------------|-----------------------------|
| in                 | X52                             | X60   | X65   | X70   | X80   | Degree Arc per Foot | Radius Feet | Max degree per 40 ft. joint |
| <b>PB 6 - 20</b>   |                                 |       |       |       |       |                     |             |                             |
| 06-5/8             | -                               | -     | -     | -     | -     | 4.41                | 13          | 132.20                      |
| 08-5/8             | -                               | -     | -     | -     | -     | 3.82                | 15          | 114.60                      |
| 10-3/4             | 2.018                           | 1.518 | 1.327 | 1.183 | .975  | 2.86                | 20          | 85.80                       |
| 12-3/4             | 1.036                           | .861  | .780  | .712  | .608  | 2.30                | 25          | 69.00                       |
| 14                 | .798                            | .673  | .613  | .564  | .485  | 1.70                | 34          | 51.00                       |
| 16                 | .573                            | .489  | .448  | .413  | .358  | 1.51                | 38          | 45.30                       |
| 18                 | .437                            | .375  | .394  | .318  | .277  | 1.10                | 52          | 33.00                       |
| 20                 | .347                            | .298  | .274  | .254  | .221  | 0.83                | 69          | 24.90                       |
| <b>PB 16 - 30</b>  |                                 |       |       |       |       |                     |             |                             |
| 16                 | 3.243                           | 2.391 | 2.079 | 1.847 | 1.517 | 1.51                | 38          | 40.80                       |
| 18                 | 1.908                           | 1.558 | 1.400 | 1.272 | 1.077 | 1.10                | 52          | 29.70                       |
| 20                 | 1.380                           | 1.156 | 1.050 | .962  | .824  | 0.90                | 64          | 24.40                       |
| 22                 | 1.072                           | .909  | .830  | .763  | .658  | 0.80                | 72          | 21.60                       |
| 24                 | .867                            | .740  | .677  | .625  | .541  | 0.75                | 76          | 20.25                       |
| 26                 | .720                            | .617  | .566  | .523  | .454  | 0.70                | 82          | 18.90                       |
| 28                 | .610                            | .524  | .481  | .445  | .387  | 0.65                | 88          | 17.60                       |
| 30                 | .525                            | .451  | .415  | .384  | .335  | 0.60                | 96          | 16.20                       |
| <b>PB 22 - 36</b>  |                                 |       |       |       |       |                     |             |                             |
| 22                 | 2.068                           | 1.704 | 1.537 | 1.400 | 1.190 | 0.80                | 72          | 21.60                       |
| 24                 | 1.598                           | 1.340 | 1.218 | 1.117 | .958  | 0.75                | 76          | 20.30                       |
| 26                 | 1.294                           | 1.096 | 1.000 | .920  | .793  | 0.70                | 82          | 18.90                       |
| 28                 | 1.078                           | .918  | .840  | .775  | .670  | 0.65                | 88          | 17.60                       |
| 30                 | .917                            | .784  | .719  | .664  | .576  | 0.60                | 95          | 16.20                       |
| 32                 | .792                            | .679  | .623  | .576  | .501  | 0.58                | 99          | 15.60                       |
| 34                 | .692                            | .595  | .546  | .506  | .440  | 0.55                | 104         | 14.80                       |
| 36                 | .611                            | .526  | .484  | .448  | .390  | 0.50                | 115         | 13.50                       |

Based on 85% efficiency and maximum strength =  $1.2 \times X\# \times 1000$ .

Blank spaces indicate unlimited wall thickness.

These figures are recommended only and do not constitute a warranty.

All bends shown include the use of CRC-Evans Bending Mandrels. The figures given are "average". They will vary due to

The wall thickness of the pipe.

The actual (as opposed to the nominal) yield of the pipe.

Skill of the operator in handling the bending machine and the mandrel.  
The origin of the pipe (pipe mill, plate mill, etc.) and quality of the pipe.

The type of pipe. Spiral seam pipe will normally accept only 75% of the recommended bend.

The type of die and/or bending set being used (e.g., polyurethane lining or special radius dies).

An unbent end (tangent) is produced at each end of the pipe where the pipe contacts the stiff back Normal unbend tangent for PB 6-20 is 5 feet; PB 16-30 and PB 22-36 is 6-1/2 feet.

† Pipe is generally referred to by Nominal Pipe Size, but it will be noted that on sizes up to 12", the actual outside diameter is somewhat greater than the nominal size. See sheet A23 for details.

## PIPE BENDING DATA (METRIC)

## 6" - 36" PIPE BENDING DATA - ALL DIMENSIONS IN MILLIMETERS

| Nominal Pipe<br>O.D. | Maximum Wall Thickness by Grade |       |       |        |       |                         |       | Recommended Bend |                                     |
|----------------------|---------------------------------|-------|-------|--------|-------|-------------------------|-------|------------------|-------------------------------------|
| mm                   | X52                             | X60   | X65   | X70    | X80   | RATIO<br>Radius to O.D. |       | Radius<br>Meters | Max degree<br>per 12<br>meter joint |
|                      |                                 |       |       |        |       | m/m                     | deg/m |                  |                                     |
| PB 6 - 20            |                                 |       |       |        |       |                         |       |                  |                                     |
| 168                  | -                               | -     | -     | -      | -     | 23.6                    | 14.5  | 3.96             | 132.20                              |
| 219                  | -                               | -     | -     | -      | -     | 20.9                    | 12.5  | 4.57             | 114.60                              |
| 273                  | 51.26                           | 38.56 | 33.71 | 30.05  | 24.77 | 22.3                    | 9.4   | 6.10             | 85.80                               |
| 324                  | 26.31                           | 21.87 | 19.81 | 18.08  | 15.44 | 23.5                    | 7.5   | 7.62             | 69.00                               |
| 356                  | 20.27                           | 17.09 | 15.57 | 14.33  | 12.32 | 29.1                    | 5.6   | 10.36            | 51.00                               |
| 406                  | 14.55                           | 12.42 | 11.38 | 10.49  | 9.09  | 28.5                    | 5.0   | 11.58            | 45.30                               |
| 457                  | 11.10                           | 9.53  | 10.01 | 8.08   | 7.04  | 34.7                    | 3.6   | 15.85            | 33.00                               |
| 508                  | 8.81                            | 7.57  | 6.96  | 6.45   | 5.61  | 41.4                    | 2.7   | 21.03            | 24.90                               |
| PB 16 - 30           |                                 |       |       |        |       |                         |       |                  |                                     |
| 406                  | 82.36                           | 60.72 | 52.81 | 46.90  | 38.53 | 28.5                    | 5.0   | 11.58            | 40.80                               |
| 457                  | 48.47                           | 39.58 | 35.57 | 32.32  | 27.36 | 34.7                    | 3.6   | 15.85            | 29.70                               |
| 508                  | 35.06                           | 29.36 | 26.67 | 24.44  | 20.94 | 38.4                    | 3.0   | 19.51            | 24.40                               |
| 559                  | 27.24                           | 23.08 | 21.07 | 19.39  | 16.72 | 39.3                    | 2.6   | 21.95            | 21.60                               |
| 610                  | 22.03                           | 18.79 | 17.21 | 15.87  | 13.74 | 38.0                    | 2.5   | 23.16            | 20.25                               |
| 660                  | 18.30                           | 15.67 | 14.38 | 13.28  | 11.53 | 37.9                    | 2.3   | 24.99            | 18.90                               |
| 711                  | 15.50                           | 13.31 | 12.23 | 11.31  | 9.83  | 37.7                    | 2.1   | 26.82            | 17.60                               |
| 762                  | 13.33                           | 11.46 | 10.54 | 9.76   | 8.50  | 38.4                    | 2.0   | 29.26            | 16.20                               |
| PB 22 - 36           |                                 |       |       |        |       |                         |       |                  |                                     |
| 559                  | 52.53                           | 43.28 | 39.03 | 35.57  | 30.23 | 39.3                    | 2.6   | 21.95            | 21.60                               |
| 610                  | 40.59                           | 34.05 | 30.95 | 28.37  | 24.33 | 38.0                    | 2.5   | 23.16            | 20.30                               |
| 660                  | 32.86                           | 27.83 | 25.40 | 23.37  | 20.15 | 37.9                    | 2.3   | 24.99            | 18.90                               |
| 711                  | 27.38                           | 23.32 | 21.35 | 19.678 | 17.03 | 37.7                    | 2.1   | 26.82            | 17.60                               |
| 762                  | 23.28                           | 19.91 | 18.26 | 16.86  | 14.62 | 38.0                    | 2.0   | 28.96            | 16.20                               |
| 813                  | 20.11                           | 17.24 | 15.83 | 14.62  | 12.72 | 36.7                    | 1.9   | 29.87            | 15.60                               |
| 864                  | 17.58                           | 15.10 | 13.88 | 12.84  | 11.17 | 36.7                    | 1.8   | 31.70            | 14.80                               |
| 914                  | 15.52                           | 13.35 | 12.28 | 11.37  | 9.90  | 38.3                    | 1.6   | 35.05            | 13.50                               |

Based on 85% efficiency and maximum strength =  $1.2 \times X\# \times 1000$ .

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All bends shown include the use of CRC-Evans Bending Mandrels. The figures given are "average". They will vary due to

The wall thickness of the pipe.

The actual (as opposed to the nominal) yield of the pipe.

Skill of the operator in handling the bending machine and the mandrel.

The origin of the pipe (pipe mill, plate mill, etc.) and quality of the pipe.

The type of pipe. Spiral seam pipe will normally accept only 75% of the recommended bend.

The type of die and/or bending set being used (e.g., polyurethane lining or special radius dies).

An unbent end (tangent) is produced at each end of the pipe where the pipe contacts the stiff back Normal unbend tangent for PB 6-20 is 1.5 meters; PB 16-30 and PB 22-36 is 1.98 meters.

t Pipe is generally referred to by Nominal Pipe Size, but it will be noted that on sizes up to 12", the actual outside diameter is somewhat greater than the nominal size. See sheet A23 for details.



## **PIPE BENDING MACHINES "CENTURION"**

**For pipe from 22" O.D. (559 mm) to 36" O.D.(914 mm)**

The New Centurion Bender offered by CRC-Evans is the next generation of the state-of-the-art Bending Machines. Following is a list of new features which truly highlight the superiority of our design.

Outboard cylinder travel is now 68% faster than our standard machine by improvement to the hydraulic system design.

Bending cylinder force is now 39% greater than standard machine by increased cylinder size and higher pressure rating.

Through re-engineering efforts a stronger frame was designed to now offer increased bending capacity. ( See Sheet A6 for improved specifications )

\* Hydraulic pump automatically adjusts output and pressure to engine horsepower, thus obtaining maximum benefit in speed and bending force under all conditions.

Rated pressure has been raised from 2200 psi to 2500 psi.

Newly supplied diesel engine designed for rugged dependability under all weather conditions.

The hydraulic system has a larger hydraulic tank and incorporates a hydraulic oil cooler allowing cooler hydraulic oil operating temperatures.

By mounting the engine and air compressor platform, ( Air Compressor Optional ) on the sides, the center of gravity is lower. This greatly increases stability of the machine.

The Stiff-back and tongue have been re-engineered to allow for mandrel storage.

Use of standard tie rod type bending cylinders for ease of maintenance and availability of parts.

\* Optional Two Stage Pump Available.

Refer to the following literature sheets for associated information:

Sheet A11: Information on recommended maximum bends and wall thicknesses

Sheet A10: Extra cost options are available to suit special applications

Sheet A21: Information on working principles

Sheet A22: Bending Sets and Pipe End Supports

Section B: Bending Mandrels

Section K: Bending Belt to load and control pipe (Steel Lined Choker Belt)

## PIPE BENDING MACHINES "CENTURION"

### SPECIFICATIONS

For pipe from 22" (559 mm) to 36" (914 mm)

| Model                                       | PBS 22 - 36                             |
|---|---|
| NOMINAL† PIPE DIAMETER<br>inches (meters)   | 22 - 36<br>(559mm - 914mm)              |
| POWER UNIT<br>hp<br>(kW)                    | DIESEL<br>142 hp<br>(106 kW)            |
| LENGTH<br>feet (meters)                     | 24' - 2"<br>(7.37)                      |
| WIDTH<br>feet (meters)                      | 8' - 6"<br>(2.59)                       |
| HEIGHT<br>feet (meters)                     | 8' - 10-1/2"<br>(2.71)                  |
| NET WEIGHT<br>(Complete)                    | 46000 lb<br>(20866 kg)                  |
| UNDERCARRIAGE                               | Tracks<br>CRCE-15T                      |
| OUT-BOARD CYLINDER<br>BORE X STROKE         | Four - 9" x 19-1/4"<br>(228mm x 489 mm) |
| IN-BOARD CYLINDER<br>BORE X STROKE          | Four - 7" x 5"<br>(203mm x 127 mm)      |
| HYDRAULIC SYSTEM<br>MAX. OPERATING PRESSURE | 2500 psi,<br>(176 kg/cm <sup>2</sup> )  |

### EXTRA COST OPTIONS

(Available at time of manufacture)

|   |  |
|---|--|
| Power units to customer specifications.   | Cold weather operating kit (-400C or F).                               |
| Electric Motor.                           | Hydraulic driven Air Compressor and Tank to operate pneumatic mandrel. |
| Gasoline Engine (as available).           | Hydraulic power take-off for either a plug mandrel or a wedge mandrel. |
| Stationary base to replace undercarriage. |  |
| Dual Tires or Tracks                      |  |

### EXTRA COST ATTACHMENTS

|                                     |                            |
|-------------------------------------|----------------------------|
| Bending sets for out-of-range pipe. | Hydraulic power take-offs. |
| Bending sets for specific coating.  |                            |