

BETECH, INC.

Flanger Operators Manual

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Betech, Inc.

188 Continuum Drive
Fletcher, North Carolina 28732 U.S.A.

Phone: (828) 687-9917

Fax: (828) 687-7412

Caution

The manual must be made available to the operator.



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Proper Care of Equipment

This equipment and any of its components must not be altered without the prior written approval of BETECH Inc. The owner/user of this equipment has the sole responsibility for any malfunction that results from improper use, faulty maintenance, damage, improper repair or alteration by anyone other than the manufacturer or manufacturer designated service facility.

1. Safety

These safety instructions must be read and fully understood by all persons operating and maintaining the equipment or instructing personnel.

1.1 Warnings and Symbols

Safety instructions for this manual are marked with **Caution**, **Warning**, and **Danger**. These three terms correspond to different levels of safety alert.



Caution

CAUTION indicates a potentially hazardous situation, which if not avoided, may result in minor or moderate injury. It may also be used to alert against unsafe practices.



Warning

WARNING indicates a potentially hazardous situation, which if not avoided, could result in death or serious injury.



Danger

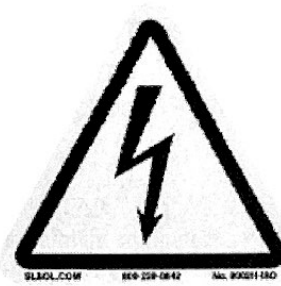
DANGER indicates an imminently hazardous situation, which if not avoided, will result in death or serious injury.

1.2 Legend of Danger Labels

Crush Hazard



Electrical Shock Hazard



Flammable Material Hazard



Heat & Hot Surface Hazard



Strong Magnetic Field Hazard



1.3 Safe Operating Conditions

These guidelines are directed at experienced operators familiar with production equipment. Unqualified personnel must not install, operate or maintain the equipment.



Warning

Failure to comply with these directions could result in death or serious injury.



Warning

DO NOT install, operate or maintain the equipment without having read and understood all directions or without taking all safety measures.

1.3.1 Personnel

Only qualified personnel may operate or maintain equipment. Age restrictions by federal law for Hazardous Occupations must be observed.

Operators must be trained and provided clear definitions of responsibilities for operating, setting, maintaining and repairing the equipment.

The operator must have the right to refuse instructions that are contrary to safety.

Electrical maintenance must only be done by qualified electrician, ensuring compliance with relevant electrical regulations.

**YOU MUST BE 18
TO OPERATE OR CLEAN
THIS EQUIPMENT**



1.3.2 Installation

Equipment and components must be installed by a qualified technician.

Always use properly rated lifting devices when moving heavy equipment. Never attempt to lift excessive weights by hand.

Equipment supplied by Botech, Inc is developed, manufactured and installed in accordance with the codes and standards published in USA (e.g. VDE, DIN, pr EN, EN, ISO, CE).



Warning

DO NOT lift heavy machinery or components without proper lifting device. Never get under elevated loads.

1.3.3 Operation

Equipment should only be operated within operational limits of the equipment, following all operational and safety procedures and practices. Equipment operators must always be alert and attentive to surrounding conditions. Never operate equipment in unsafe conditions or with bystanders in the work area. Never bypass or override safety devices. Never touch moving or rotating equipment parts. Observe system start and stop pilot lamps and alarms in accordance with operating instructions.

Safety Guards are equipped with safety interlock that prohibits equipment from operating when not engaged. All safety interlocks and safety equipment must never be removed or bypassed.

Regularly perform a safety inspection before operating the equipment. Immediately inform the supervisor, responsible department or personnel of any safety issues. Check that no other operators or bystanders are in the work area. Dangerous material must not be located in the working area. All operators must wear proper protective gear. Equipment safety devices must be in place and functioning properly. Make sure that all protective covers are correctly positioned and in a good condition. Safety devices and first aid equipment are in proper locations. Identify and rectify all other safety hazards in the work area. Do not operate equipment with any safety hazards present.

Regularly perform equipment inspection for visible damage. Immediately inform the supervisor, responsible department, or personnel about any damage.

Regularly perform equipment function inspection when starting production and during production. Equipment must operate smoothly, without excessive noise or vibrations. If equipment is not functioning properly, immediately stop the equipment. Immediately inform the supervisor, responsible department or personnel of function irregularities. Make sure that repairs or adjustments are made before resuming production.

Record any information on adjustment, maintenance and inspection activities, the inspection schedule, as well as information on replacement of parts.

When handling components and larger pieces, carefully attach them to lifting devices. Only use appropriate and properly rated lifting devices. Do not work under suspended loads. Only trained personnel must operate lifting devices.



Warning

Equipment must only be operated with all guards and safety devices in place. Keep hands and loose articles clear of moving parts and materials.



Warning

DO NOT operate equipment in unsafe operating conditions. Perform regular inspections for unsafe operating conditions. Warning

1.3.4 Materials

Strip or sheets may be sharp or have burrs that can cause injury. Keep clear of all moving materials.

Larger formed pieces can be heavy and unstable.



Personal protective equipment must be used at all times while operating equipment or handling materials.

1.3.5 Maintenance

All lockout/tagout procedures must be followed and all systems must be de-energized or depressurized prior to any maintenance work. If necessary close off repair area spaciously. Refer to OSHA Standards and document OSHA 3120.

Do not modify the equipment. Only use factory approved original replacement parts.

When working overhead, use appropriate and safe climbing aids or working platforms, Never climb on equipment. When carrying out maintenance work above, fall protection equipment is required.

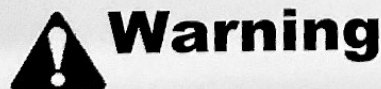
When handling components and larger pieces, carefully attach them to lifting devices. Only use appropriate and properly rated lifting devices. Do not work under suspended loads. Only trained personnel must operated lifting devices.

Keep work areas clean. Before cleaning the equipment with cleaning agents, cover all openings so cleaning agent does not enter equipment. Motors and switch cabinets are particularly susceptible to damage. After cleaning, completely remove any such covers applied to openings.

Tighten any screws loosened during maintenance and repair. Remove oil, fuel or preservative agents from the equipment, its connections and screwed unions before starting maintenance and repair work. Never use any aggressive cleaning agents. Use lint-free cloths.

If safety equipment has to be disassembled for maintaining and repairing the equipment, it must be reinstalled and checked immediately after work is finished.

Make sure that processed materials and replaced parts are disposed of in a safe manner that is not harmful to the environment.



All equipment must be de-energized and depressurized before maintenance or repair work is started. Follow all lock-out/tag-out procedures.

1.3.6 Electrical Energy

All lockout/tagout procedures must be followed and all systems must be de-energized prior to any maintenance work. Refer to OSHA Standards and document OSHA 3120.

Electrical maintenance must only be done by qualified electrician, ensuring compliance with relevant electrical regulations.

Regularly inspect the electrical components of the equipment. Immediately repair any damaged components. Parts of the equipment that are to be inspected, maintained and repaired must be de-energized before maintenance. Only use insulated tools.

To protect the modules of the programmable controller from static electricity discharges, operators must discharge electronically before opening switch cabinets or control stations.



Warning

Failure to interrupt all system power supplies before any maintenance work could result in death or serious injury.

1.3.7 Oils, Greases and Cleaning Agents

When using oils, greases and cleaning agents, make sure that the manufacturer's safety regulations of the product are followed. Before operating equipment, clean equipment and work area of oils, greases and combustible material. Disposal and handling of such products must be in accordance with Federal, State or Local regulations.



Warning

Combustion from oils, grease or other compounds in work area could result in death or serious injury.

1.3.8 Noise

It is not necessary to use sound insulation equipment with the equipment (VGB 121).

1.3.9 Organizational Measures

Always keep operating instructions near the equipment and available to the operator.

Inform operators before carrying out work or maintenance.

Apart from these operating instructions, any general legal and other obligatory provisions for accident prevention and environmental protection must be observed and instructed.

Such obligations may also refer to the use of hazardous material or the provision /use of personal protection or traffic regulations.

Supplement the present operating instructions by further instructions, including those regarding the obligation to supervise and report to take into consideration company-related particularities, e.g. work organization, processes, appointed personnel, etc.

The persons charged with operating the equipment must have read these instructions before starting their work.

Make sure that operators know where fire safety equipment is kept and its operation. Check regularly if safety equipment is available, if it functions properly.

Check proper function of equipment or system's emergency stop switches.

Occasionally check whether the operators follow these operating instructions, apply the relevant safety measures and are aware of any danger involved with their work.

Operators must not wear their hair loose or loose clothing and jewelry.

Observe all danger and safety instructions applied at the equipment. Make sure that all safety and danger instructions at the equipment are legible.

Provide communication channels to report operating performance changes to the responsible department or personnel.

Do not modify, supplement or retrofit the equipment. This also applies to the installation and adjustment of safety equipment, safety switches and modifications to the supporting structure

Only use original Botech, Inc spare parts or spare parts approved by Botech, Inc. This is the only way to preserve the equipment's reliable function and performance. Please observe the spare parts lists and wiring diagrams. The use of other spare parts that are neither original nor approved by Botech may negatively affect the equipment's constructional features and thus impair its safe operation. The manufacturer does not warrant for damages resulting from the use of spare parts that are not approved by the manufacturer.

Do not modify the program (software) of the programmable control units. Botech, Inc supplies one single license for the loaded software. If the software is disclosed to third parties, copied, modified or used in any other way, Botech, Inc is entitled to shut down the complete system until the violation of contract is settled legally.

Botech, Inc. continuously improves our equipment and systems. We therefore reserve the right to modify the design of the equipment without notice. Please understand that it is not possible to provide information on information and instructions included in these operating instructions.

A serial number plate has been attached to the electrical control panel. When contacting customer service, please indicate the model and serial number.

2.4 General Overview of Equipment

The Botech, Inc Flanger is manufactured mainly for the flanging, Ventilation, and Air Conditioning systems for the distribution of round and flat oval duct flanges. The equipment uses a combination of the electric and mechanical controls to produce round and flat oval duct flanges by using various

2. General Information

2.1 Preliminary Note

Thank you for purchasing a Flanger. BETECH Inc. has a new generation of metal spiral duct and component equipment. Our state-of-the-art equipment is subject to constant improvement. BETECH Inc. equipment meets all requirements regarding operating safety, speed, reliability and ease of operation.

Only use the equipment that is in good working order. Only use it safely according to its intended purpose while taking into consideration any possible danger. When working with the equipment, observe these operating instructions and safety alerts.

The equipment is to be used for its intended purpose only. Different or more extensive applications are not considered as the intended purpose. The manufacturer or supplier does not warrant for defects resulting from such use.

2.2 Address

In case of commercial and technical questions, please contact us:

Betech, Inc
188 Continuum Drive
Fletcher, North Carolina 28732 U.S.A.
Telephone: (828) 687-9917
Fax: (828) 687-7412
E-Mail: Betech@ATT.net

2.3 Important Information

Ensure that these operating instructions are read completely before installing and starting up the system to avoid operating errors or equipment damage. All safety instructions must be followed.

Instructions can serve the purpose only if they are available to the equipment operator. Please make sure that these instructions are available to the operators at all times.

The information included in these instructions may neither be copied nor disclosed to third parties without having prior approval from Betech Inc. Contact Betech if additional copies of this manual are required.

We constantly improve our equipment and systems. We therefore reserve the right to modify the scope of delivery with regard to form, technology and equipment. Please understand that it is not possible to enter claims on information and illustrations included in these operating instructions.

A serial number plate has mounted on the electrical control panel. When contacting customer service, always indicate the model and serial number.

2.4 General Overview of Equipment

The Betech, Inc Flanger is manufactured primarily for the Heating, Ventilation, and Air Conditioning industry for the fabrication of round and flat oval duct flanges. This equipment uses a combination of electrical and mechanical controls to produce round and flat oval duct flanges for most standard sizes.

3. Receiving and Setup

Upon receipt, visually inspect the Flanger for any shipping damage. Report any damage to the Freight Company, be sure to note damage on your freight bill, also call Betech, Inc and report any damages (828)-687-9917.

Remove shipping and packing material that have been used in shipping the equipment and its components. The Flanger has forklift slots intended for safely lifting and carrying the equipment. Use these when unloading or moving the equipment. Only move equipment with properly rated fork lift or material handling equipment.

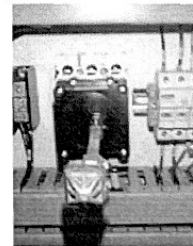
3.1 Base Machine

The Flanger requires ample room for operation and operator access. Selected installation location must allow ample room around the machine for loading and unloading of material and product.

3.2 Electrical Connection

Only a qualified electrician must make the power connection to the Flanger and all wiring should be done according to the NEC. To determine the voltage and amperage refer to the serial number plate located on the electrical control panel.

- Make sure the disconnect switch is off (the disconnect switch has a safety interlock so the door can not be opened with disconnect turned on).
- Drill a hole for the conduit connector, being careful not to hit any electrical components with the bit while drilling. All of the electrical components in the cabinet should be protected from metal shavings while drilling. Clean up of all the metal shavings from drilling is also required.
- Route the wires into the panel and make connections at the top of the disconnect switch. Secure wire in panel opening with proper cord grip or strain relief. Verify that the connections are tight. There must be a ground wire connected from the ground block on the equipment to the building ground.

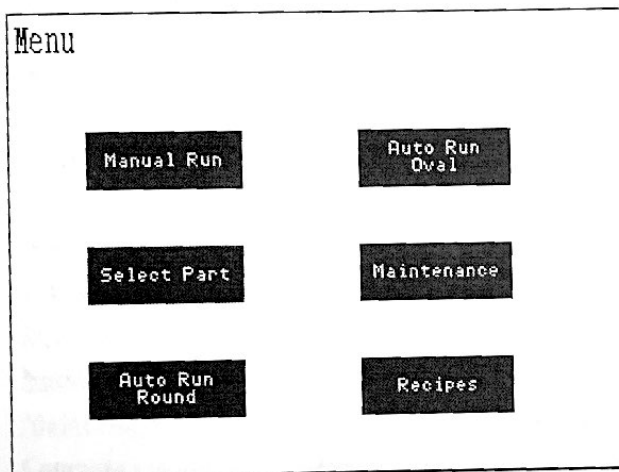


4. Operating the Flanger

4.1 Start Up

The black handle on the on the back of the equipment is the power disconnect, turn it to the ON (I) position. The touch screen will go through a start up sequence. Then press the green reset button on the control panel below the touch screen. Press the **Menu** button. Navigate from the **Menu** to the **Maintenance** screen and Home the Forming Drive. Then Return to the **Menu** screen.

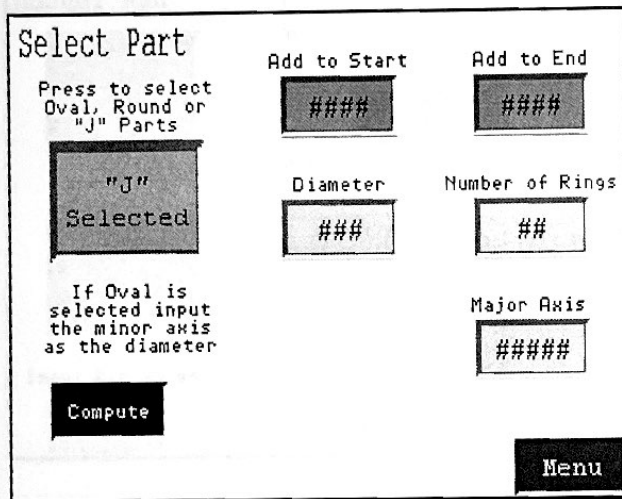
4.2 Menu Screen



From this screen the user can navigate to the displayed screens.

- Select Part** - first step when setting up a new part
- Manual Run** - this screen lets the operator control each motor independently
- Recipe** - displays previously saved parts for selection or selection of a save location.
- Auto Run Round** - automatically controls machine when running round parts
- Auto Run Oval** - automatically controls machine when running oval parts
- Maintenance** - allows operator to reset drive faults and home forming motor

4.3 Select Part Screen



Select part screen aids in first time setup for a particular part by calculating theoretical values.

Oval, Round, "J" Parts - selects the type of part to be run

Add to Start - adds material to beginning of flange

Add to End - adds material to end of flange

Diameter - selects diameter of round part and the minor axis of an oval part or "J"

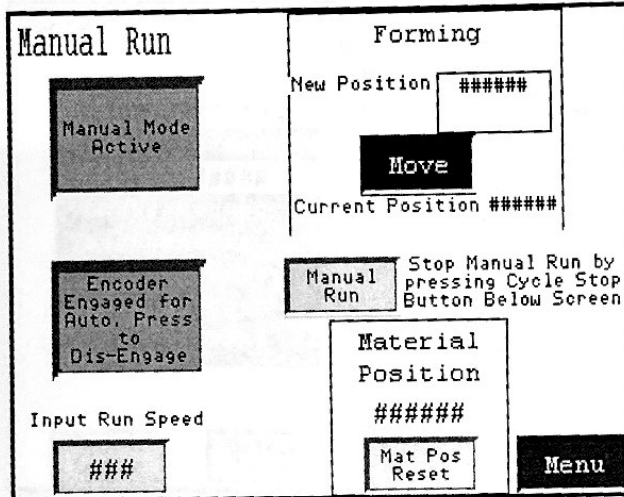
Number of Rings - number of revolutions of material in a round part

Major Axis - the size of the ovals major axis

Compute - calculates theoretical settings to aid in part run

Menu - returns to main menu screen

4.4 Manual Run Screen



Manual Mode Active - indicates that the system is in manual mode

Auto Mode Active - indicates that the system is in auto mode

Encoder Engaged - indicates that the Encoder Wheel is against the material. If pressed will change and move the Encoder wheel away from the material

Encoder NOT Engaged - indicates that the Encoder Wheel is away from the material. If pressed will change and move the Encoder wheel against the material

Manual Run - if in Manual Mode starts the material drive motor running at the selected Input Run Speed. To stop the Cycle Stop button below the screen will stop the motion

Input Run Speed - is the percentage of full speed the material drive will run if Manually Running or Jogged by the button below the Touch Screen or by the Foot Pedal.

Forming :

New Position - operator enters desired destination of forming roll position

Move - moves the forming rolls to "New Position"

Current Position - displays actual position of forming rolls

Material :

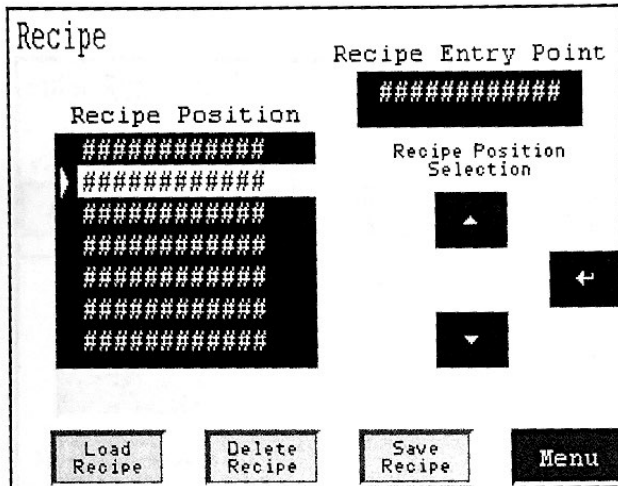
Position - displays amount of material that has gone thru the forming rolls

Reset - zeros the position display

Menu - returns to main menu screen

Jog Button - located below the screen and will cause the material motor to run

4.5 Load Recipe Screen



Recipe Position - displays saved recipes of parts

Recipe Position Selection - moves cursor up and down the list and highlights a position

Recipe Entry point - allows user to name the part

Load Recipe - loads values of selected recipe into computer

Delete Recipe - deletes a recipe permanently

Save Recipe - Saves the part information in the Recipe position highlighted under the name put into the Recipe Entry Point

Menu - returns to main menu screen

Once a part has been run and verified. To save the part information select an empty Recipe Position with the cursor and highlight it by pressing the enter button. Then press the block below the "Recipe Entry Point" and enter a descriptive name for the part in the Recipe Entry Point. Then press the Save Recipe button. The settings that were used to make that part are now saved in the location that was selected and the name entered is in that location as well.

4.6 Auto Run Round Screen

When all information has been entered for a part to be run in Auto Mode navigate to the Manual Screen , reset material position, verify Auto Mode of operation and the Encoder Wheel Engaged. Press the Auto Run button below the screen to begin running the part. The Cycle Stop button below the screen is to be used to stop the part from being run automatically.

Start Forming – adds material to beginning of flange

End Forming – adds material to the end of the flange

Encoder Engaged - indicates that the Encoder Wheel against the material. If pressed will change and move the Encoder wheel away from the material

Encoder NOT Engaged - indicates that the Encoder Wheel is away from the material. If pressed will change and move the Encoder wheel against the material

Forming Posit - set point of the forming rolls while forming the flange

Driving Posit - set point of the forming rolls while driving stock through the machine and not forming the flange

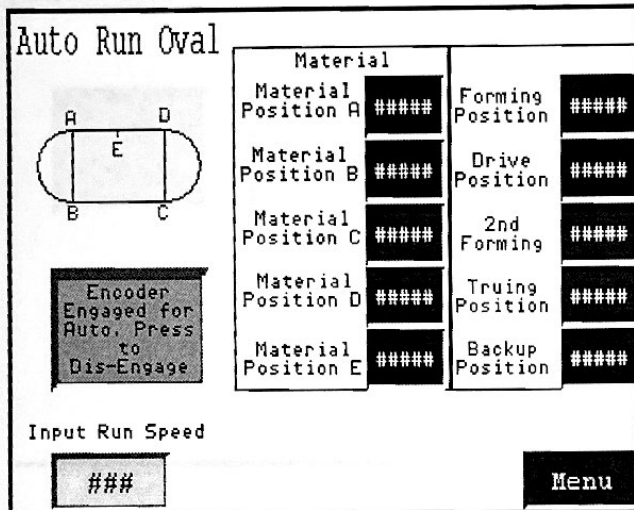
Truing Posit - indicator reading on the truing roller adjustment for the operator to manually set

Backup Posit - indicator reading on the backup truing roller adjustment for the operator to manually set

Input Run Speed - is the percentage of full speed the material drive will run

Menu - returns to main menu screen

4.7 Auto Run Oval Screen



When all information has been entered for a part to be run in Auto Mode navigate to the Manual Screen , reset material position, verify Auto Mode of operation and the Encoder Wheel Engaged. Press the Auto Run button below the screen to begin running the part. The Cycle Stop button below the screen is to be used to stop the part from being run automatically.

Material :

Material Position. A - material position of start of first radius

Material Position. B - material position of end of first radius

Material Position. C - material position of start of second radius

Material Position. D - material position of end of second radius

Material Position. E - material position of end of part

Menu - returns to main menu screen

Forming Position - set point of the forming rolls while forming the flange

Drive Position - set point of the forming rolls while driving stock through the machine and not forming the flange

2nd Forming - set point of the forming rolls when making a second form on an Oval flange

Truing Posit - indicator reading on the truing roller adjustment for the operator to manually set

Backup Posit - indicator reading on the backup truing roller adjustment for the operator to manually set

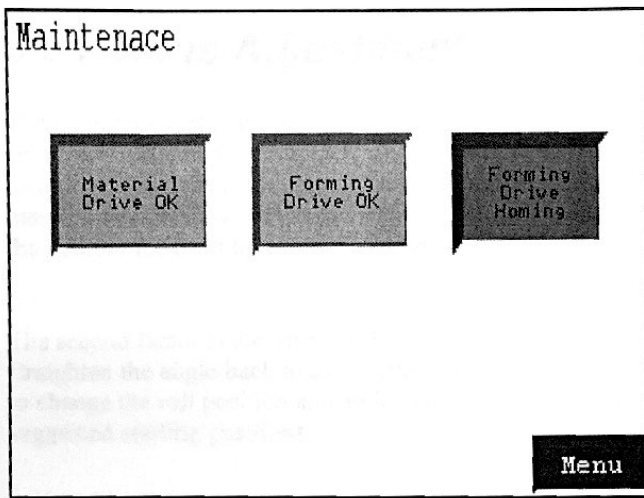
Encoder Engaged - indicates that the Encoder Wheel against the material. If pressed will change and move the Encoder wheel away from the material

Encoder NOT Engaged - indicates that the Encoder Wheel is away from the material. If pressed will change and move the Encoder wheel against the material

Input Run Speed - is the percentage of full speed the material drive will run

Menu - returns to main menu screen

4.8 Maintenance



- Reset Material Fault** - resets fault on drive motor inverter
- Material Drive OK** - indicates there is not a fault on the Material Drive
- Reset Forming Fault** - resets fault on forming motor inverter
- Forming Drive OK** - indicates there is not a fault on the Forming Drive
- Home Forming** - sends forming motor to home position
- Menu** - returns to main menu screen

4.9 Radius Adjustments

The main factor of determining flange size is the forming wheel position. This position is determined by entering a value in the computer, which controls the forming motor. When running the machine from the “Auto” screens, the computer suggests a starting position. This position is only a suggestion because the material thickness as well as the lengths of the angle legs contributes to the resultant diameter. The higher the number for forming position, the smaller the resultant flange.

The second factor is the truing roller location. The truing roll acts against the forming wheel process to straighten the angle back to a consistent size. This adjustment is made by manually turning a treaded shaft to change the roll position and an indicator displays the current location. See Truing Position chart for suggested starting positions.

The third factor is used only for round rings, and this is the truing backup roll location. When running oval flanges this roll is backed completely out of the work area. By using the truing roller to act in one direction (increasing diameter) and using the truing backup roll to oppose the truing roll, a very consistent size is formed. This adjustment is made by manually turning a treaded shaft to change the roll position and an indicator displays the current location. See Truing Backup Position chart for suggested starting positions.

There are two adjustments for differing material. The first are the “Material Guide Rollers”. These rollers guide the material into the forming rolls and should be firmly against the material. The second adjustment is the “Material Adjustment”. Once material is in the forming rolls the encoder wheel needs to be moved against the material. This is done by pressing the red “Encoder NOT Engaged for Auto, Press to Engage” button. The button will then turn green and indicate “Encoder Engaged for Auto, Press to Dis-Engage”

5. Maintenance

5.1 Electrical Components

Only a qualified Botech technician should service the PLC. Contact by telephone at 828-687-9917 if service is required

5.2 Mechanical Components

Properly grease gears, chains and all grease fittings.

Truing Position

