

A L L T E Q
i n d u s t r i e s

MECHANICAL/ELECTRICAL
PREVENTIVE MAINTENANCE
TRAINING OUTLINE



MECHANICAL/ELECTRICAL - ADJUSTMENTS

Introduction

The basic adjustments described in the sections below are Rear Rail, Gripper Fingers, Elevator to Conveyor Alignment - Horizontal and Mode 999 (for Models 3010,3060,1510/20,1530/31 only) for Elevator to Conveyor Alignment - Vertical. **"Note: Procedures are factory set, due to shipping & handling some adjustments may be altered. It is recommended that Mode 999 be checked for proper operation of machine."**

<u>INDEX</u>	<u>Page</u>
1. Rear Rail Adjustments	3
2. Upper & Lower Gripper Finger Description	6
3. Elevator to Conveyor Alignment-Horizontal	8
4. Elevator Parameters	10
5. Elevator to Conveyor Alignment-Vertical	12
6. Bent Leadframe Detector	15
7. Bias Solenoid	17
8. Diagnostics & troubleshooting	19
9. Preventive Maintenance	21

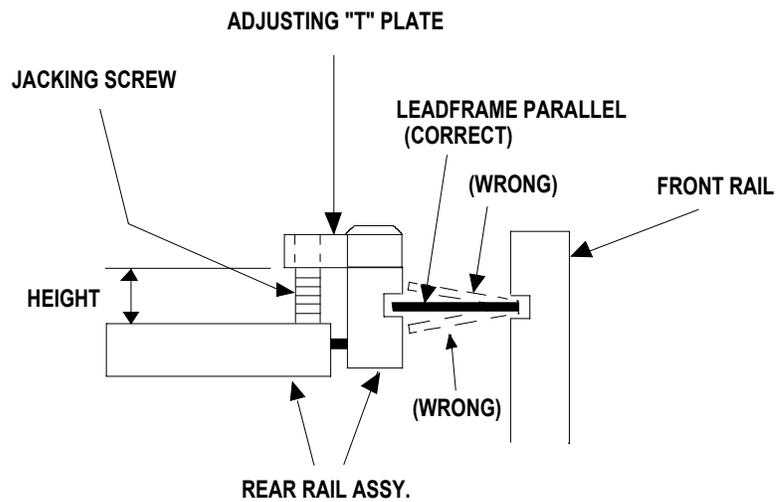
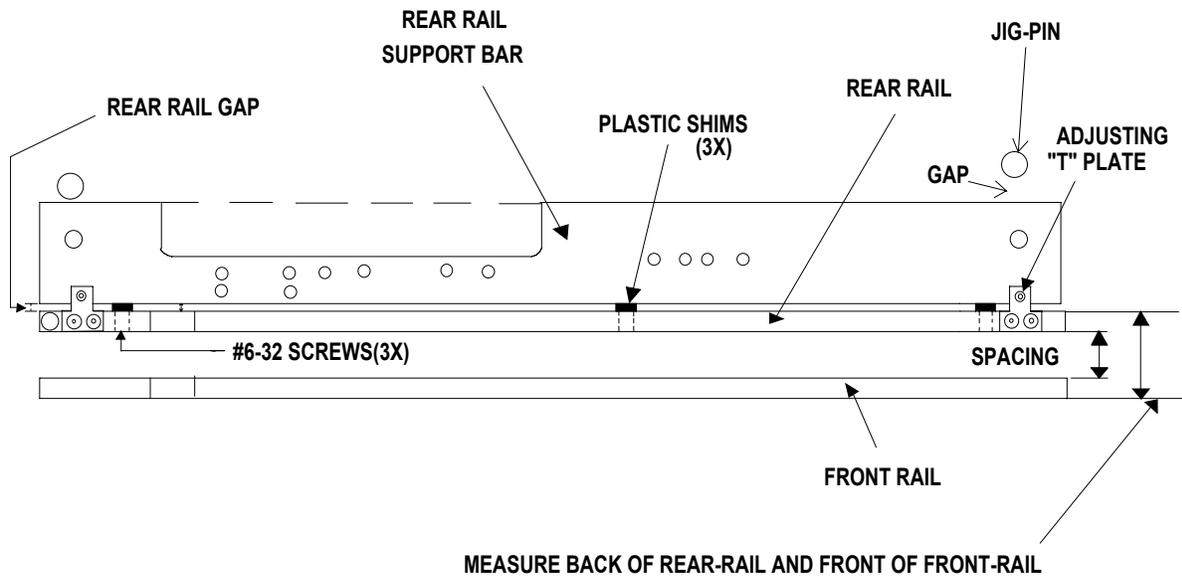
Rear Rail Adjustments

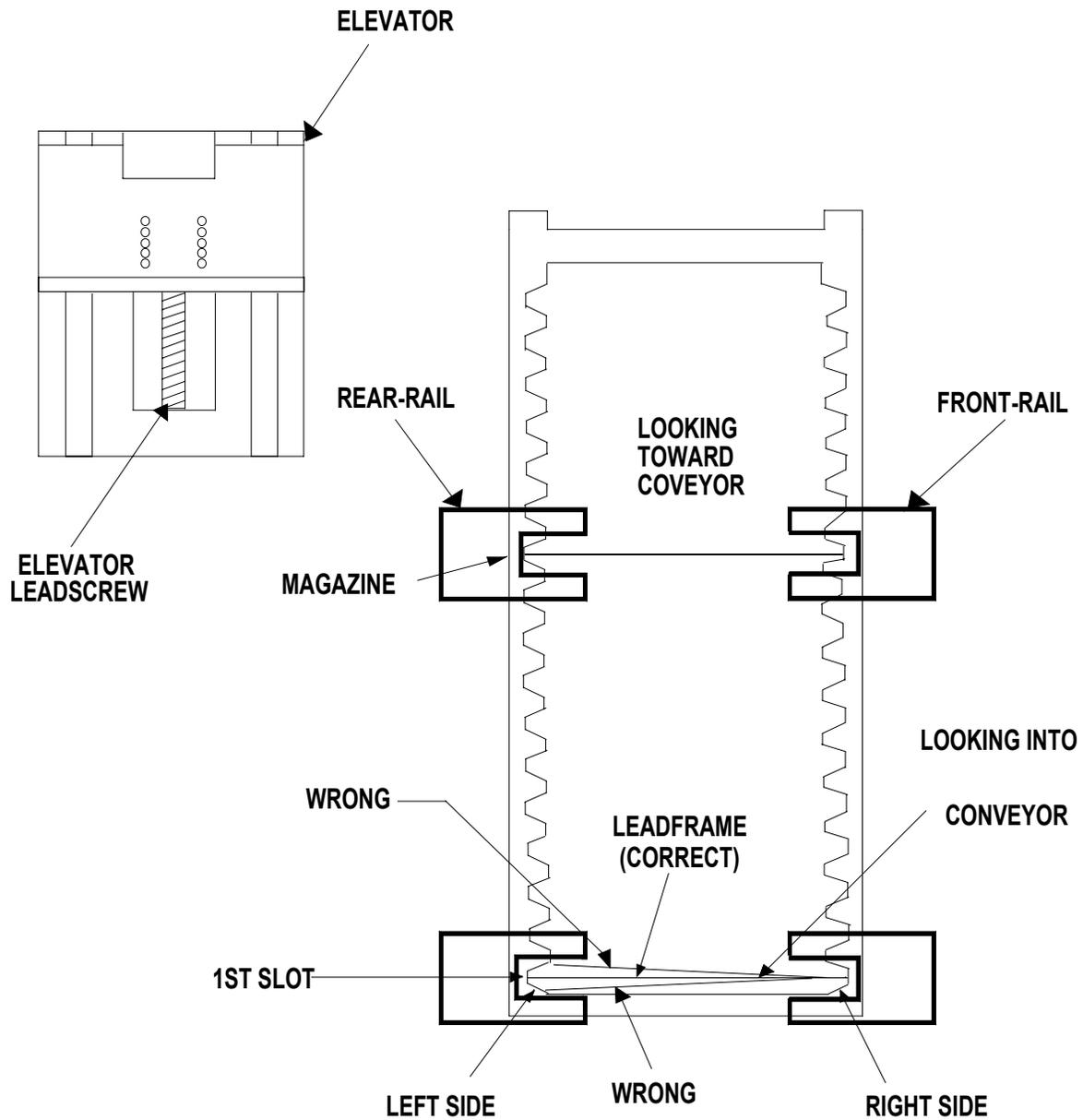
“TWO” adjustments must be made to properly locate Rear-Rail. First, is to set “**Conveyor Width**”; second, is to set “**Conveyor Parallel to Elevator**”. You will also notice that there are Plastic Shims between Rear-Rail and Rear-Rail mounting plate (See page-4). The “**Shims**” are used to set the proper Conveyor width. In addition, you will notice that there is 2-adjusting “**T-Plates**” with “**JACKING SCREWS**” mounted on each end of the Rear-Rail assembly. These “**JACKING SCREWS**” are used to set the height of Rear-rail (See page 4).

Specification on Conveyor width is that the clearance between a leadframe and Conveyor is to be (0.027 +/- 0.002 mils). **NOTE: If Rear-Rail Revision letter is “P” or under, the clearance is to be (.023” +/- 0.002 mils).** This width is set by placing proper plastic shims between Rear-Rail and Rear-Rail support bar (See page-4). To check this alignment, Push the “**MODE**” key, clear the existing mode and enter “**920**”. Then push the two key, (2)Indexer, (2)Move Right, move Gripper Fingers to middle of Conveyor. Insert a leadframe from each end of Conveyor. Loosen thumbscrews that allow the Rear-Rail assembly to move and take up all play between the Rear-Rail and leadframe. “**Do not Bend or Bow leadframe**“. Lock down Rear-Rail assembly. Use a set of feeler gauges or equivalent. Using feeler gauges, check gap between Jig-Pins and Rear-Rail support bar. If no feeler gauges are used, measure the distance from the back of the Rear-Rail and the front of the Front-Rail. Write down the measured value, then with the Rear-Rail up against the Jig-Pins subtract the high measured value from the low measured value, the specification should be within the listed range above.

This gap should be within the specifications listed. If it is not, shims must be added or removed from in between Rear-Rail and Rear-Rail Support Bar. If the rear-rail gap is lower then 0.025” mils and have a revision level letter of “**Q**” or below, shims need to be removed. If the rear-rail gap is lower then 0.020” mils with a revision level letter of “**P**” and below, shims must be removed. If gap is over 0.029” for Revision “**Q**” and over 0.024 for “**P**”, shims are added.

To verify the parallelism of the Conveyor to Elevator (See page-5). This is the “**Vertical**” adjustment of the Rear-Rail. Move the Gripper Fingers all the way to the right side of Conveyor and insert a leadframe into the Conveyor and install magazine onto the Elevator. Manually turning the Elevator Leadscrew, bring down the Elevator to the height where leadframe is, preferably in the middle of the first slot of the magazine, on right side or side closest to you (See page-5). This can be accomplished by looking into magazine toward Conveyor or from the side of the magazine. The leadframe should be in middle of the slot using the left side of the magazine as a reference. If it is not, the Rear-Rail must be adjusted “**Vertically**”. To adjust, slightly loosen the three (3) 6-32 Rear-Rail mounting screws (See page-4). You will notice two (2) adjusting “**T**” plates with “**Jacking Screws**” (See page-4). These “**Jacking Screws**” are used to raise and lower the Rear-Rail. Raise or lower the Rear-Rail using the “**Jacking Screws**” until leadframe is parallel or in the middle of the magazine slot on the opposite or far side of the magazine (See page-5). Measure the height of the Rear-Rail with respect to Rear-Rail support bar, on left side of the rail and set Rear-Rail height on right side to match (See page-5). Once this is done, tighten Rear-Rail mounting screws (3x). The adjustment of Rear-Rail is now complete





Upper Gripper Finger

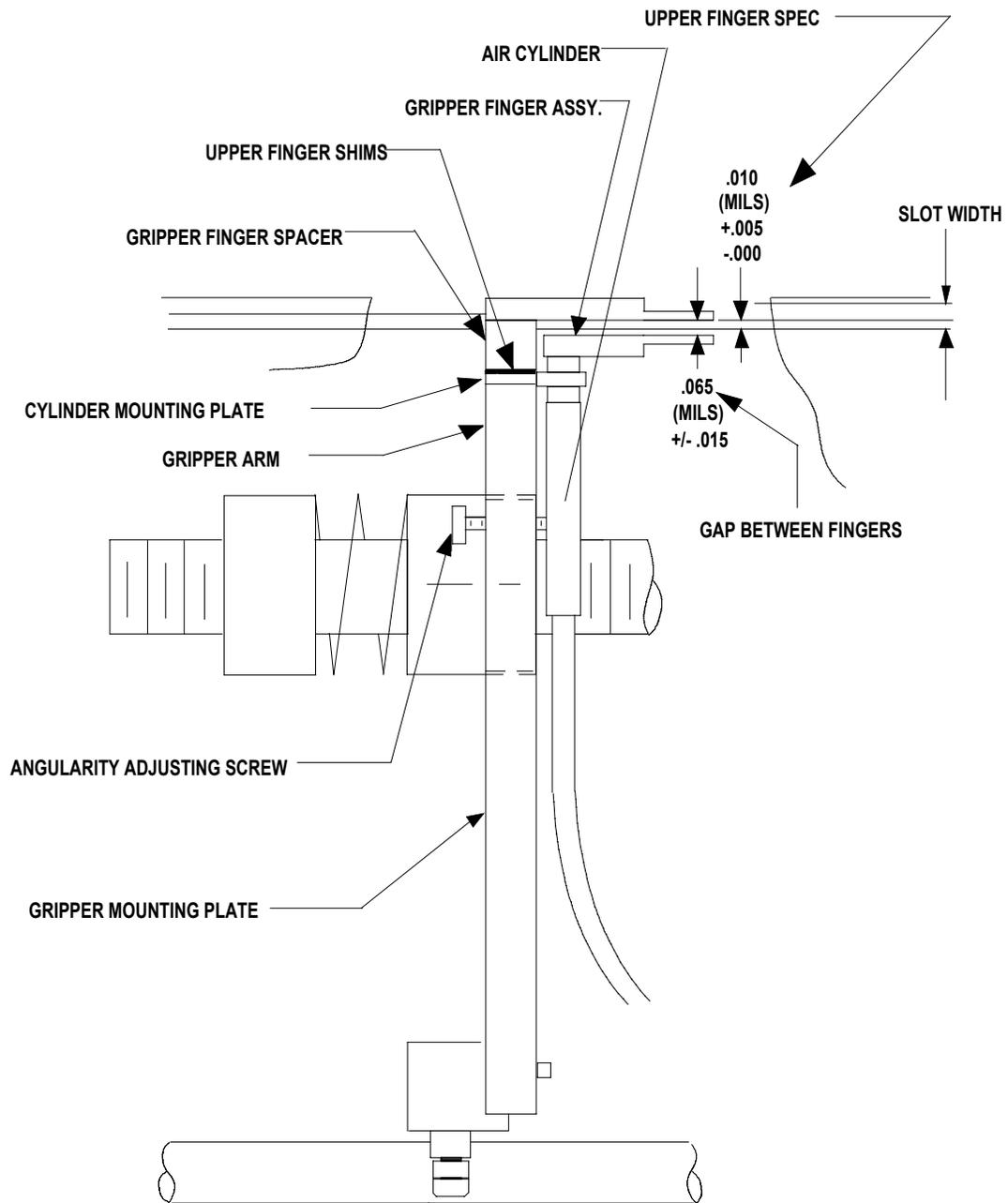
Upper Gripper Finger is fixed and is preset at the factory. It requires no adjustment in the field unless fingers need to be replaced or if the specification setting is incorrect. Specification of **Upper Gripper Finger** is that, the bottom side of **Upper Gripper Finger**, is to be 0.010" (+0.005", -0.000 mils) above the bottom of the Conveyor Front-Rail slot (See page-7). **NOTE: This specification is for a .010 mil Leadframe.** To change the position of Upper Gripper Finger is obtained by inserting the proper amount of shims between the Upper Gripper Finger and the **Gripper Finger spacer** (See page-3). Using mode 920, move Gripper Fingers to the middle of the Conveyor. Insert a Straight/Flat leadframe into the Conveyor and slide it toward the **Gripper Finger**, the leadframe should slide under Upper Gripper Finger, if it does not, shims need to be added. If shims are needed Allteq can provide the shims; the part numbers are 40001943-005 (.005 mil), 40001943-007 (.007 mil) and 40001943-009 (.009 mil). Remove the leadframe from the Conveyor and stack two or put (2) leadframes on top of each other and repeat the above procedure. Two (2) leadframes should slide or go under the Upper Gripper Finger, if they do, shims need to be removed. **NOTE: Make this adjustment until one- (1) leadframe just slides under the finger. This may take several attempts".**

Lower Gripper Finger Assembly

The **Lower Gripper Finger Assembly** is the moving finger and it has "Two" mutually dependent adjustments. The final gap specification, which the spacing between the Upper and Lower Gripper Fingers is measured at the tips and should be approximately **.065 +/- 15 mils** (see page-7).

The *first* adjustment is setting the height of the Lower Gripper Finger, this is accomplished by turning the Air Cylinder clockwise to increase the finger gap and counterclockwise to decrease the finger gap. In addition, another method of increasing and decreasing the gap is by turning the Air Cylinder Mounting plate, clockwise to decrease and counterclockwise to increase. **NOTE: If more than 0.015 mils of shims are removed or added, then reset finger gap to proper specification (see page-7).**

The *second* adjustment of the Lower Gripper Finger Assembly is setting its angularity. The Lower Gripper Finger Assembly must be set at a negative angle, so that the tips of the Upper and the Lower Gripper Fingers come together first when the Lower Gripper Finger is actuated. **NOTE: If fingers do not open or close, backout the angularity adjusting screw, by ¼ turns.**

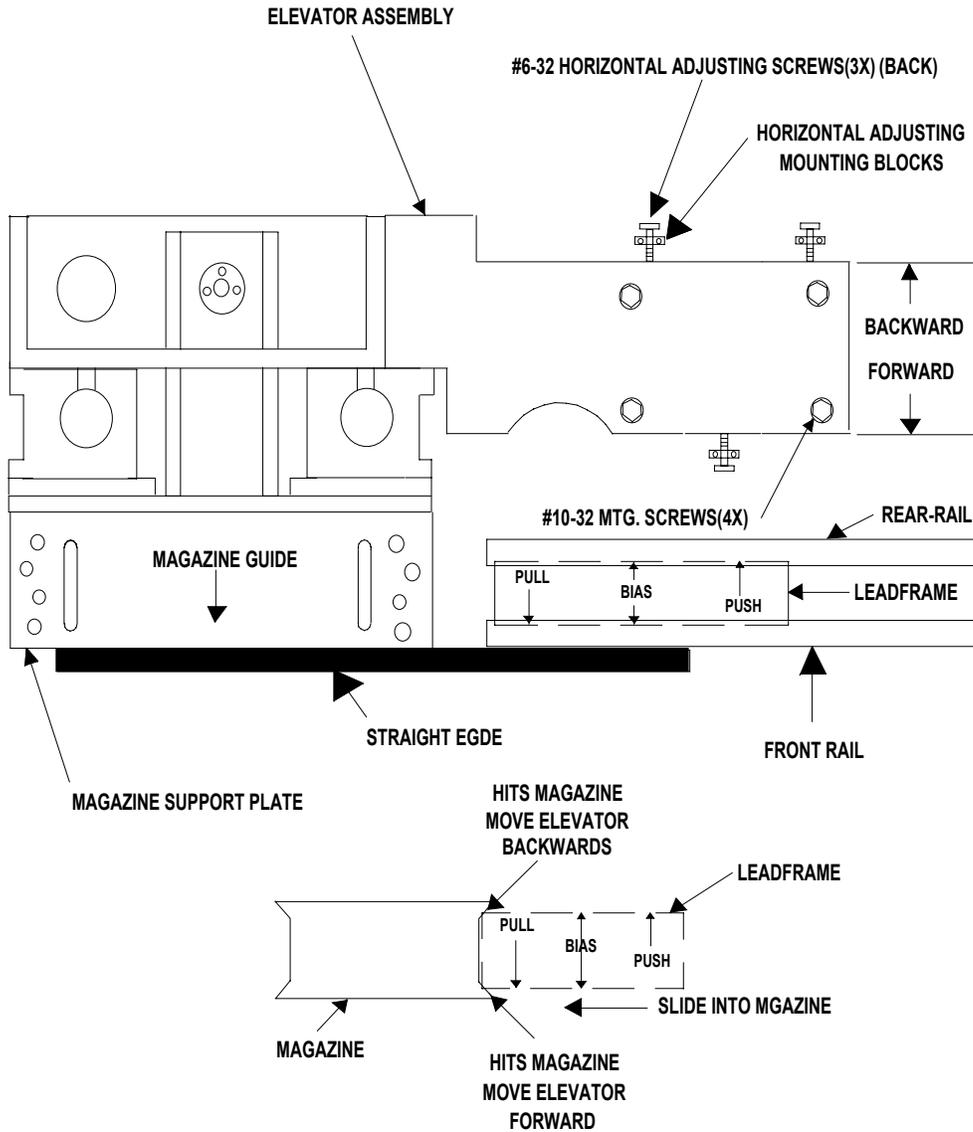


REAR VIEW

Elevator to Conveyer Alignment - Horizontal

Adjustment of Elevator requires a magazine and a leadframe in good condition (Flat and Straight). With machine turned **"On"** and **"Programmed"** for the leadframe being used, install a magazine onto Elevator and push the **"ENTER"** key and enter the number for the **"Middle Slot"** of magazine and the number for the "Last Device" (**example 40 slot magazine-Slot 20, 10 device leadframe, Device-10**), then when machine has indexed down to correct slot and last device, turn power off. Now looking in from the end of the magazine, manually lower or raise the elevator leadscrew until leadframe is in the middle of the magazines slot (See page-19). Bias or pull leadframe toward front of the machine and slide the leadframe **"IN"** and **"OUT"** of the magazine. If it hits the magazine, the Elevator needs to be moved forward or toward you. Bias or push the leadframe toward the rear or away from you and slide the leadframe **"IN"** and **"OUT"** of magazine. If it hits the magazine, Elevator needs to be moved backwards or away from you. To adjust Elevator, loosen the four (4) mounting screws that mounts the Elevator Assembly (See page-9). Also, there are three (3) horizontal adjusting mounting screws in three (3) horizontal adjusting mounting blocks, two (2) in the back and one (1) in the front (See page-9). If the Elevator needs to be moved forward, turn the front horizontal mounting screw 180 degrees or a ½ turn counterclockwise and turn the two (2) rear horizontal mounting screws clockwise equal amounts until they are tight. If Elevator needs to move backwards, turn rear screws each 180-degrees or a ½ turn clockwise and turn front screw, until they it is tight. This will move the Elevator forward or backwards equal amounts and approximately .015 mils. Recheck the movement **"IN"** and **"OUT"** of the magazine and continue adjusting until the leadframe does not hit the magazine, perform this check on First, Middle and Last Slots of the magazine, **example (#1st, #20th, and #40th, slots)**. To check that the Elevator and Conveyer are parallel, remove the Elevator's Magazine Guide and place a straight edge along the front of the Conveyer and then check the gap along Elevator (See page-9). The horizontal alignment is now correct and the four Elevator mounting screws can be tightened. Turn on machine.

TOP VIEW



ELEVATOR Parameters

It is very important that the machine be programmed using Mode 999. These controls are in the "PARAMETER SELECT" key, **Home**, **Pitch** and **Slots** (See page-11). The display will look as shown below.

ELEVATOR mils	Home *525.	Pitch 100.	Slots 40	Dir N
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Home

The Home parameter is the distance from the bottom of the magazine to the center of the first slot. These dimensions can be in either English or Metric as like the other leadframe parameters.

Pitch

The **Pitch** parameter is the distance from one slot to the next slot. It is **VERY IMPORTANT** that this parameter be precise as any error will accumulate as the magazine is indexed from slot to slot. This requirement for precision means that if the magazine's dimensions are specified in metric then the machine must be programmed in metric also. This gives more accurate indexing of the magazine.

The units selected for the magazine parameters are independent of the units selected for the leadframe parameters. This allows the magazine units and the leadframe units to be different. Since it is very important that the machine be programmed in the specified units and the magazine and leadframes units can be different the ability to program the magazine units independently is required. When changing the units for any of the magazine parameters the units for the leadframe parameters are **NOT** changed.

Slots

The **Slots** parameter is the number of slots to be indexed, usually the total number of slots in the magazine. When the cursor is at this parameter using the "MD" key will alternate the **Elevator Index Direction Setting**.

Dir

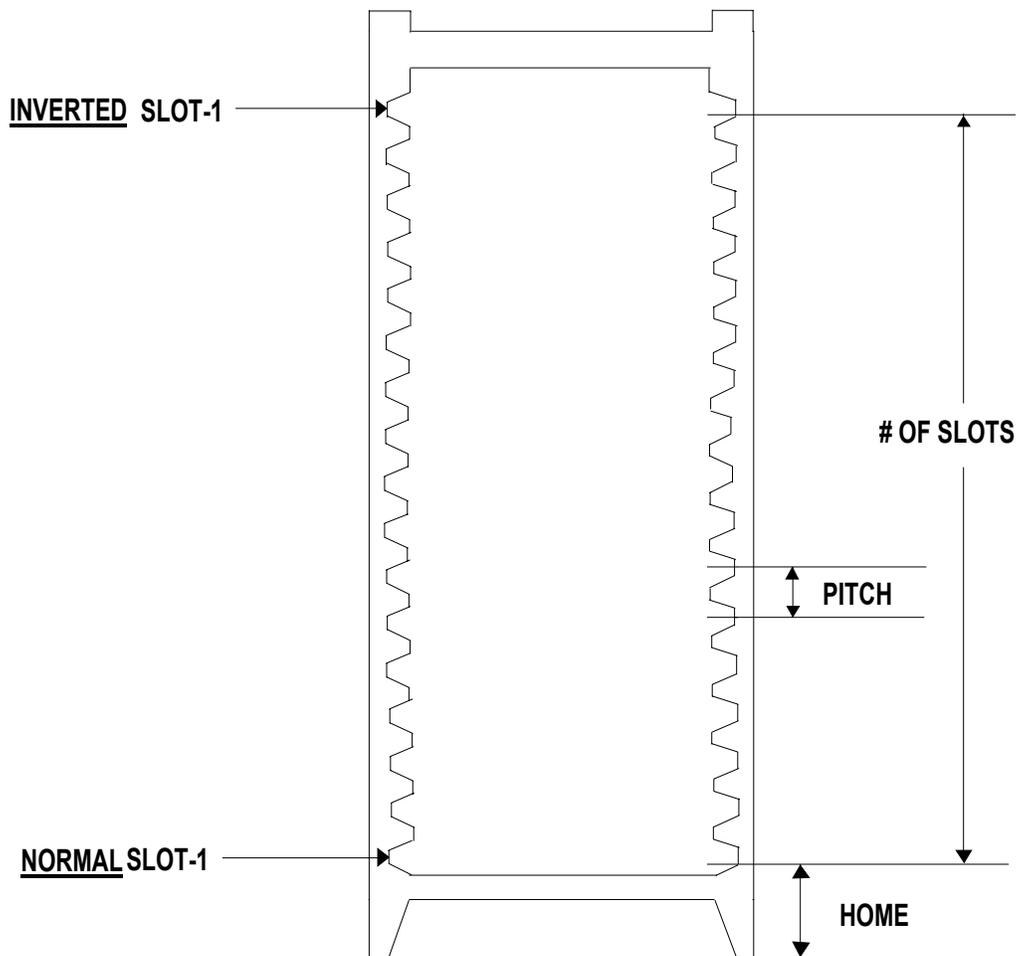
The **Dir** setting tells the machine which direction to run the elevator. If the setting is "N" (normal) then the bottom slot of the magazine is considered Slot 1 and it is indexed to first. If the setting is "I" (inverted) then the top slot of the magazine is considered Slot 1 and it is indexed to first. The setting is changed by using the "MD" key when the cursor is at the "Slots" position (see page 11).

MAGAZINE REFERENCES

HOME - BOTTOM OF MAGAZINE TO BOTTOM OF 1ST SLOT

PITCH - CENTER TO CENTER OF SLOTS.

SLOT - # OF SLOTS IN MAGAZINE.



Elevator to Conveyor Alignment – Vertical

To assure proper feeding of the leadframe into Conveyor and back into magazine, vertical alignment procedure must be performed. The software developed allows for “**Two**” adjustments, **First** is the vertical position of Elevator to be set at different heights for pulling leadframes out of magazine and **Second**, is for returning leadframes to the magazine (See page-14). This allows Elevator to be set at optimum heights for each condition.

A magazine and leadframe in good condition (**flat and straight**) are required to make this adjustment. The machine should be turned on. A magazine with leadframes should be installed on machine and the correct parameters should be entered into the machine, including Home, Pitch & Slot (See page-10 and 11), to insure that the proper calibration of “ **Mode 999** “ function. After entering “ **Mode 999** “, the display will be shown below:

WARNING- Set-up Mode PLEASE SEE MANUAL!
Push ENTER to Continue or CLEAR to Exit.

To continue push the “**ENTER**” key or “**CLEAR**” key to exit. If you continue the display will be shown below:

The Elevator can be adjusted at any slot
Enter Slot Number to be used -

If leadframe is in Slot 1, push the “**1**” key then the “**ENTER**” key. Elevator will now index down to Slot 1 and the display will shown below:

Move Finger IN use key 1, OUT use Key 2;
NEXT - UP, LAST - DOWN; ENTER when Done

To adjust the vertical position, push leadframe out of magazine approximately 1/8 inch (See page-14), then by pushing the “1” or “2” key, move the Gripper Fingers until the leadframe is slightly into the Gripper Fingers. At this point, the Elevator can be adjusted vertically by pushing the “NEXT” or “LAST” key. Adjust Elevator so that the leadframe is in the middle of the Gripper Fingers.

Once the vertical height is set correctly, push the “ENTER” key. The display will be shown below:

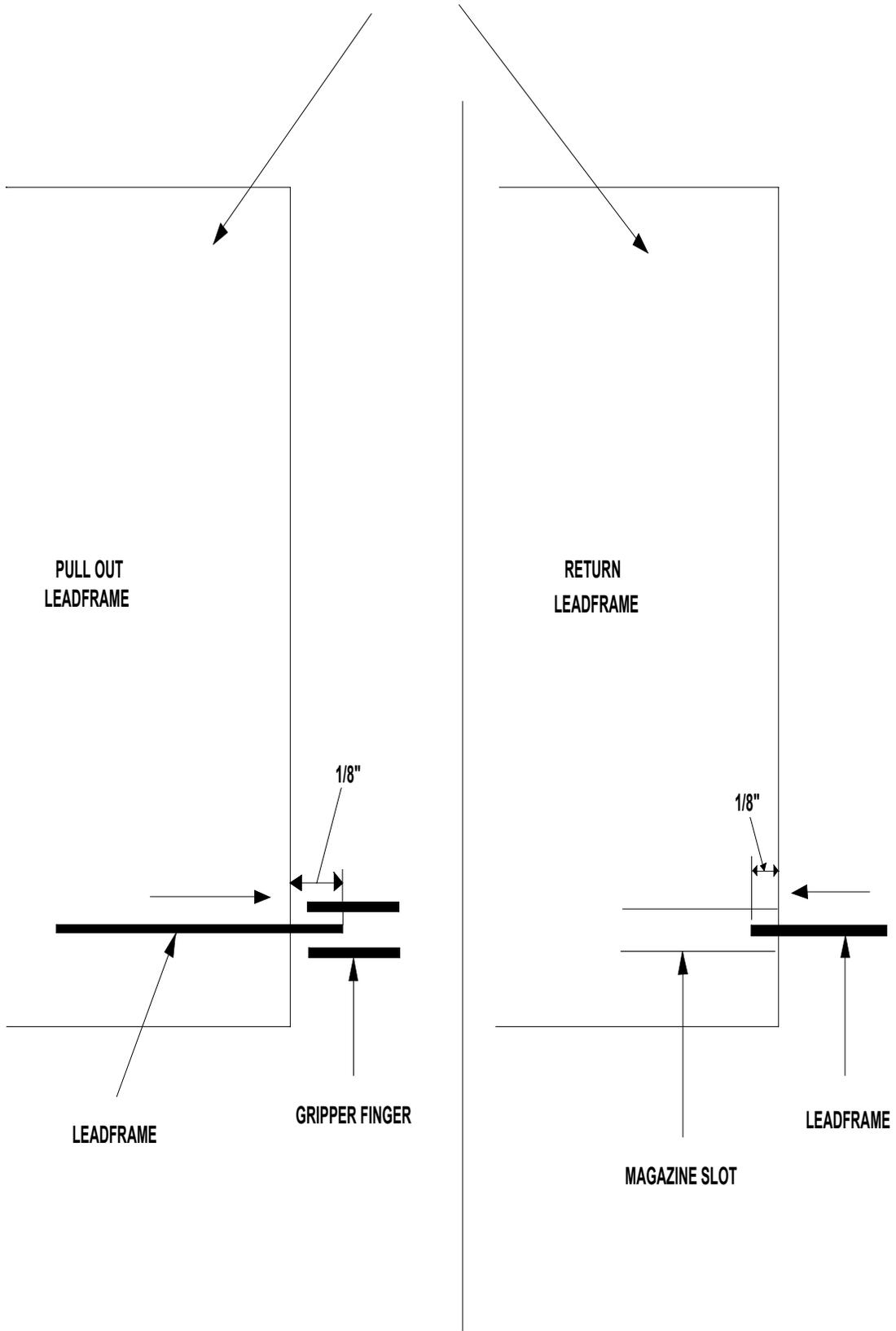
**Now adjust Elevator’s return position:
NEXT - UP, LAST - DOWN; ENTER when Done**

Move the Gripper Finger assembly all the way to the right of Conveyor by pushing the “2” key. Manually push leadframe out of magazine onto the Conveyor until leadframe is fully out of magazine. Looking from the side of the magazine (See page-14), move leadframe manually into the magazine approximately 1/8”.

The leadframe should enter the magazine in the center of the magazine slot. If it does not, adjust the Elevators “Up” and “Down” position using the “NEXT” or “LAST” key, do this until the leadframe is centered in the magazine slot (see page-14). Once completed return leadframe to magazine and push the “ENTER” key. The Elevator Vertical adjustments for both “Pull-Out” and “Return” positions of the leadframes are now completed. The machine will now return to the “Ready” state. **NOTE: Elevator calibration is now set. It is recommended that a full magazine with leadframes be cycled through the machine before the unit is using good parts.**

Beside the functions indicated in the display, several other operations can be done at this time. Pushing the “Clear” key will cause the current adjustment value to be set to “0” with the Elevator moving to reflect the change. This is useful to return the calibration value to a known starting point. In addition, some magazines exist which require the mechanical positioning of the Elevator back plate to be different from the standard position. If your machine is one of those, then you will see that the Gripper Fingers may not line up to the programmed slot. If the error between the center of the Fingers and leadframe in the programmed slot is greater than +/- 150 mils. after the “Clear” key has been pushed, then it may mean that the Elevator has been positioned to the non-standard location. If this is true, then pushing the “MD” key will move the calibration 375 mils down, which should position the Elevators programmed slot within the 150 mil calibration window. In addition, if a new MPU card (J5) is installed into the machine the Elevator calibration, “Mode 999” will need to be reset. In this case, push the “Reset” key and ALL calibration values are cleared to “0” at the same time. This should be done first if there are any questions as to the various calibration options that may be needed for the machine.

MAGAZINE



Bent Leadframe Detector

In order for the **BLFD** to be adjusted you will need to use "**Mode 995**". If the 1500 or 3010 does NOT have a "**REV**" levels "**4F**" for **3010**, "**3I**" for **1510/20**, "**1B**" for **1520e**, and "**4I**" for **3060** or higher then this feature is not available, unless you upgrade your software. To adjust the **BLFD**, the machine must be in the "**Ready**" state. Press the "**MODE**" key on the Front Panel and clear the existing mode, then enter "**995**", then the display will be shown below:

Sensor Status - Select 1 or MODE to Exit
(1)BLD

Once the "**1**" key has been pushed the display will read as follows:

BLD Sensor Status - **SENSOR IS NORMAL**
Use Clear Key for Top Menu; Mode to Exit

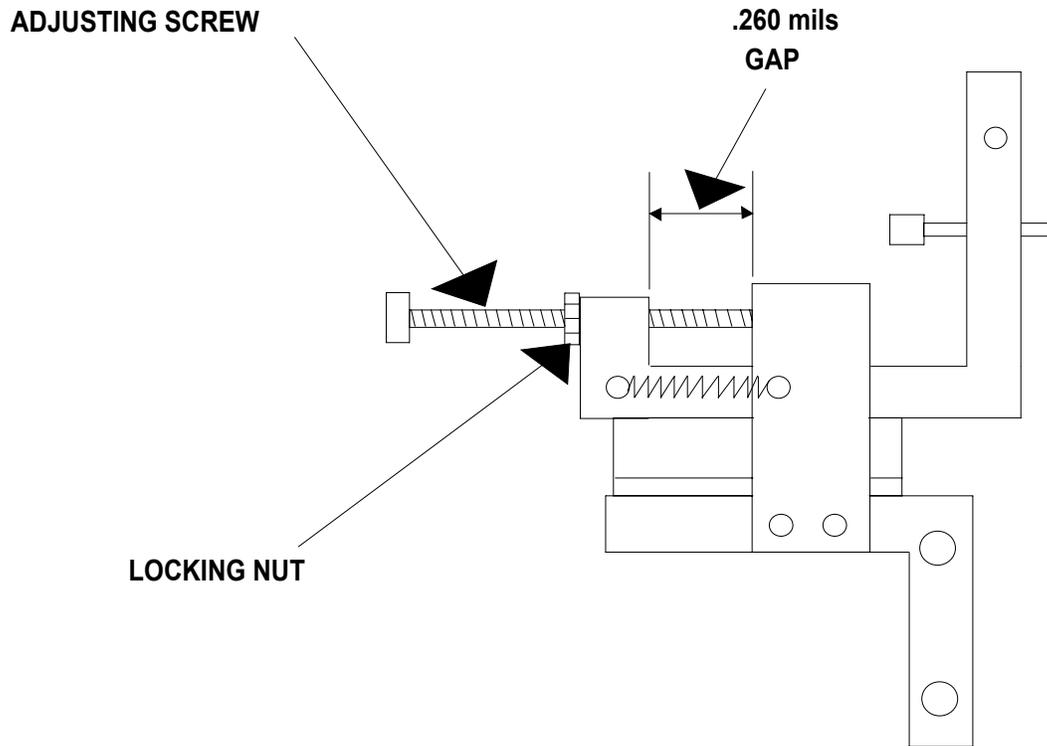
This adjustment will fine-tune the sensitivity of the **BLFD**. First, is to loosen the locking nut (**See page 3**) turning the adjusting screw clockwise until display read as follows:

BLD Sensor Status - **SENSOR IS ACTIVATED**
Use Clear Key for Top Menu; Mode to Exit

Now turn the adjusting screw counterclockwise until display just reads "**SENSOR IS NORMAL**" once this is accomplished, turn the adjusting screw counterclockwise again, 1-½ turns. At this time, the **BLFD** is adjusted and the locking nut can be now be locked tightened. (**NOTE: This adjustment should ONLY be done if BLFD is not working properly or a new BLFD has been installed.**)

For units that do not have the **Mode "995" feature**, the adjustment must be done manually. The adjustment is done using the same steps as above without any display readings, objective is to adjust the screw until the gap is **0.260 mils** (See page-16).

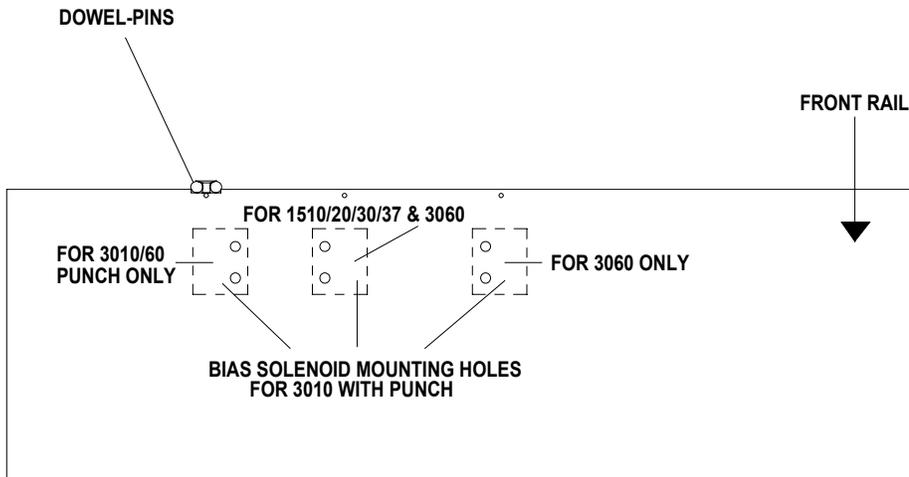
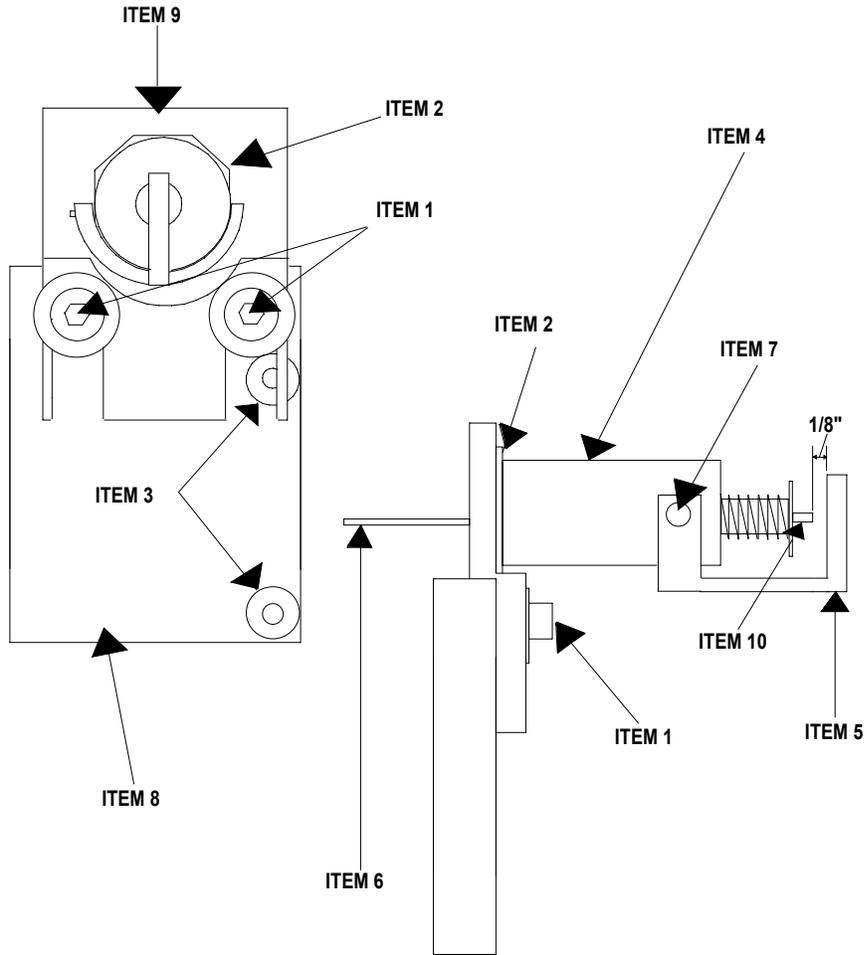
BENT LEADFRAME DETECTOR



Bias Solenoid

To adjust Bias Solenoid Assembly, loosen Item 1 and Item 2 ("**DO NOT LOOSEN ITEM-3**"). Slide a leadframe from the right side of the Conveyor up to where the Bias Solenoid is. In mode 920, push (3) Solenoid, then (2)Frame Bias, the solenoid should now activate and move the Pin inward against the leadframe. If Pin does not move, loosen Item-1 and adjust so that there is no binding. **NOTE: Do not allow PIN to slide OVER or UNDER leadframe.** Once adjusted, tighten Item-1. "**WARNING DO NOT OVER TIGHTEN OR BRACKET MAY MOVE AND CAUSE BINDING, BENDING OR BOWING OF PIN! "** (NOTE: This may take several attempts.) At this time, the Pin Item-6, should make contact with the leadframe and bias it against the Rear-Rail. The leadframe should not **BOW** or **BEND** leadframe, if this occurs, turn Solenoid Item-4, counterclockwise to backout Solenoid Pin. Activate (2)Frame Bias a few times and check for binding by rotating Item-6. Once completed, tighten nut, Item-2. "**WARNING DO NOT OVER TIGHTEN OR BRACKET MAY MOVE AND CAUSE BINDING, BENDING OR BOWING OF PIN! "** (NOTE: This may also take several attempts). The last adjustment is the Pin Stop Bracket Item-5. With the Pin Item-6 biased against the leadframe, adjust Pin Stop Bracket, Item-5, by loosening set-screw, Item-7 and adjusting the bracket, so approximately .125 mils is between End Pin, Item-10 and Pin Stop Bracket, Item-5. Once completed tighten setscrew Item-7 (See page 18)

BIAS SOLENOID



Diagnostics & Troubleshooting

Problem: “X-Y Stage will not home properly”

- 1) Check if lock down bolt is still installed. (This is located on left side of machine inside left top cover.

Problem: “Gripper won’t pick leadframes from Elevator“

- 1) Check to see that the magazine is biased toward Conveyor and up against the elevator end plate.
- 2) Check to see that the leadframes are biased to the front end of magazine toward Conveyor.
- 3) Check that Home/Pitch parameters are correctly entered. **(See page-10)**
- 4) Check that the Gripper Fingers are operating properly by using Mode 920, (3)SOLENOID, (1)FINGER. Check for Lower Gripper-Finder binding (angularity screw is too tight or gripper-finger air cylinder faulty) **(See page-6)**. Check that the Jig-Pins are in the proper locating holes on the Elevator and Conveyor templates. **“ W A R N I N G “** Jig-Pins should always be used.

Problem: “Leadframe making noise.”

- 1) Check that the Elevator **Horizontal** and **Vertical** adjustments are set properly. **(See page-8)**
- 2) Check that the Rear-Rail Conveyor **Width** and **Parallelism** adjustments are set properly. **(See page-3)**
- 3) Check that the Upper and Lower Gripper Fingers adjustments are set properly. **(See page-6)**
- 4) Check for a **Bowed** or **Bent** leadframe. Replace leadframe.
- 5) Check that the Leadframe Support **(if applicable)** is not too high. The leadframe should just be raised approximately 10-15 mils.
- 6) Check that the Bias Solenoid Pin (if applicable), is not binding or sticking. **(See page-17)**

Diagnostics & Troubleshooting

Problem: “Gripper Fingers picks leadframe from magazine, but slips off once on the Conveyor.”

- 1) Check that the input air source is 70-psi min (5 Kg/ sq. cm).
- 2) Check that the Jig-Pins is in the correct holes of the Elevator and Conveyor templates. “**W A R N I N G** “ Jig-Pins should always be used.
- 3) Check that the Rear-Rail Conveyor Width and Parallelism adjustments are set properly. **(See page-3)**
- 4) Check that the Elevator Horizontal and Vertical adjustments are set properly. **(See page-8)**
- 5) Check that the Leadframe Support (if applicable) is not too high. The leadframe should just be raised approximately 10-15 mils.
- 6) Check that the Bias Solenoid Pin (if applicable), is not binding or sticking. **(See page-17)**
- 7) Check that there is “**No obstruction** “ in Front and Rear rail slots, punched leads etc.. Remove any foreign objects.

Problem: “Leadframe hits or jams entering into magazine“

- 1) Check that Home/Pitch parameters are correctly entered. **(See page-10)**
- 2) Check that the Elevator Horizontal and Vertical adjustments are set properly. **(See pages-8 and 12)**
- 3) Check for a Bowed or Bent leadframe. Replace leadframe.

Problem: “Conveyor does not go to the Home position and display is blank”.

- 1) Check that the Bent leadframe Detector is properly adjusted. **(See page-15)**

Preventive Maintenance Schedule

The PM procedure is to maintain a fully functional operational machine. These steps should be done on quarterly (every 3 months) year schedule and should be done by a fully trained PM technician or an Allteq Field Service Engineer. This to prevent unnecessary adjustment or inadequate PM problems. If any parts need to be removed or/and cleaned, refer to your Maintenance & Diagnostics section of your machine manual. This will insure that the steps needed to remove and installed parts are properly taking care during the PM procedure and all necessary machine adjustment is done properly. If any problems arise, please contact your nearest Allteq representative to assist you in any problems do to improper PM procedure.

- 1) Elevator, Conveyor and XYZ leadscrews should be cleaned with alcohol or equivalent solvent using a clean lint free cloth. Next, lubricate with light machine oil. Remove any covers/plates needed to do this step. **NOTE: "DO NOT USE ANY TYPES OF GREASES ON THE LEADSCREWS THIS WILL CAUSE YOU TO POSSIBLE HAVE INDEXING PROBLEMS"**
- 2) Wipe off Elevator and Conveyor shafts with lint free cloth, no lubricant needed.
- 3) Remove/clean any debris that might be inside the machine such as excessive die coating materials, cotton tips, finger cots, pens, pencils, etc. If there is a Lead Punch installed on your unit, vacuum/clean out punched leads that may have fallen inside the unit. The PCB Sensor 30001016-410 mounted to the Conveyor may need to be removed and check for die coating material or punched leads that may have fallen onto it.
- 4) Check for any obstruction in or on the Wheel Guides grooves of the XY, Z-Stage and the Z-Head. For example, die coating material or punched leads. This can cause stiffness during the die coating process.
- 5) The Bias Solenoid Shaft for Leadframe Biasing may need to be clean and lubricated. The in/out movement causes dust particles to accumulate and may cause the shaft to incorrectly operate. Use alcohol to clean the shaft and use light machine oil to lubricate.
- 6) Inspect and clean the Vacuum Pull-Down Assembly if needed (die coaters only). Die Coating materials may have fallen/dripped inside where the Vacuum Pull Down suction cup is located.
- 7) Remove any debris inside the Front and Rear Rail slots, such as die coating material or punched leads. This can cause leadframe indexing problem, leadframe jamming and improper rail wear. **NOTE: If the Conveyor or Rear-Rail Assembly needs to be remove and cleaned refer to your manual or a qualified Allteq Service Engineer to ensure proper installation and/or setups, alignments and adjustments. If this is not done more problems could arise do to lack of knowledge of Special Adjustments need to maintain proper machine operation.**
- 8) Clean/vacuum exhaust fans located inside for machine. After a period of time these collect dust and if not properly maintained can cause fans to function improperly.

- 9) Remove Frame Sensor Assembly from machine and with an Air Nozzle, blow out Frame Sensor light hole for any dust/debris that may have accumulated over time, if a hole gets obstructed, indexing problems can occur. **NOTE: TRY NOT TO BEND THE LIGHT OR LED ON FRAME SENSOR PCB.**
- 10) Clean Trackball ball with a lint-free cloth to remove any dirt/oils that may have accumulative over time on the ball.
- 11) Clean outside of machine with only soaps and water type of cleaning agents. Inspect outside unit for any broken/damaged items that may have occurred over a period of time. Repair as needed.
- 12) Check/clean air filter on back of machine.