

**GbX® BACKPLANE and DAUGHTERCARD  
INSTALLATION and REPAIR TOOLING  
Order No. 62202-2099  
Operation Manual**

- Description
- Operation
- Maintenance

## **WARNING**

**NEVER** OPERATE, SERVICE, INSTALL, OR ADJUST THIS TOOL WITHOUT PROPER INSTRUCTION AND WITHOUT FIRST READING AND UNDERSTANDING THE INSTRUCTIONS IN THIS MANUAL.

## **WORK SAFELY AT ALL TIMES**

**For Service, Contact Your  
Local Molex Sales Office**

**Molex Application Tooling Group**  
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Lisle, Illinois 60532  
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- 1 General Description and Available Presses
- 2 Installation and Operation
- 3 Maintenance, Spare Parts, Perishable Parts and Problem Checklist
- 4 Available Tooling
- 5 Repair and Replacement Procedures

## Section 1

### General Description and Available Presses

- 1.1 Description
- 1.2 Features
- 1.3 Technical Specifications
- 1.4 Delivery Check
- 1.5 Tools
- 1.6 Press Requirements

## General Description

### 1.1 Description

This manual covers the tooling available to press Molex GbX® Back plane Power Modules, Back plane Connectors, and Daughtercard Modules into printed circuit boards. Repair tools and custom tools are also covered. The tooling is designed to go into a flat platen press. Operation is simple: Position a printed circuit board on the customer supplied support. Then manually insert a connector(s) into the pc board. Position the loading head into the connector. Actuate the press to press the connector pins into the board.

### 1.2 Features

The press-in tooling is designed so that one module will press in one connector, or several modules can be mounted in a tool holder and be used to press in any combination of connectors in one operation. See Section 4-2 (Ordering Instructions) for details.

### 1.3 Technical Specifications

#### Dimensions and Weight

The dimensions and weight depend on the tooling used and the size of the pc board support.

#### Rate

90 connectors pressed in (one at a time) per hour depending on operator skill.

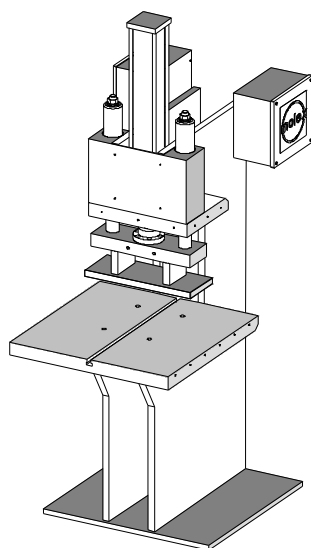


Figure 1-1  
62202-3800 8-TON PRESS

### 1.4 Delivery Check

Carefully remove the tooling from its shipping container and check to be sure what was received matches the purchase order and no damage has occurred.

### 1.5 Tools

A metric hex wrench set will be required to assemble or disassemble tooling mounted in rails.

#### Molex Presses

Molex offers a press that is suitable for this application. It is:

62201-3800 8-ton Pneumatic Flat Platen Press  
See Figure 1-1.

### 1.6 Press Requirements

This tooling is designed to fit in a flat platen (or flat rock) press, capable of 66N (15 lbs) of force per pin.

Letter	Description	Dimension (min)
A	Upper Platen	51by 102 by 25.4mm (2 by 4 by 1")
B	Opening	89mm (3.5")
C	Throat	150mm (6")

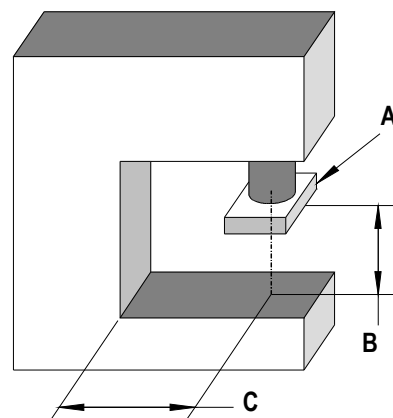


Figure 1-3  
PRESS THROAT DIMENSIONS

## Section 2

### Installation and Operation

- 2.1 Backup for printed circuit boards
- 2.2 Press stroke adjustment
- 2.3 Installation
- 2.4 Operation

## 2.1 Printed Circuit Board Support

The GbX® tooling requires up to 10 lb. per pin of force to press the connectors into the printed circuit boards. Therefore, a backup or support is required to prevent damage to the P.C. board. The support fixture should have clearance for the connector terminals when they protrude through the underside of the P.C. board. It is also recommended that the support fixture have locating pins. Due to the custom nature of each application, Molex does not supply support and locating fixtures, the customer normally supplies them.

The following is one simple way of making a P.C. board support and locating fixture:

1. Locate a suitable piece of material for the backup. It should be approximately 3/4 inch thick and same size or a little larger than the printed circuit board to be used. While aluminum could be used, a rigid nonconductive material such as a phenolic is preferred. (A stack of scrap P.C. boards of suitable size could be fastened together and used.)
2. Obtain a scrap P.C. board like the ones to be assembled. Attach this board to the material from step 1.
3. Using an oversize drill bit, drill through each hole where a pin from the connector will go. Drill deep enough into the lower material to be certain the pins do not bottom out when inserted (at least 5mm [0.20in] deep).
4. Locate two (2) holes on the P.C. board to use as locating points. Drill for and mount suitably sized dowel pins in these two locations on the support fixture.
5. Clear out the support for any components mounted on the underside of the printed circuit board.
6. Place a P.C. board on top of the support, located by the two pins, and check that the holes for the connector pins are aligned.
7. Pre-insert a connector in the P.C. board in the correct position.
8. Insert the press-in tool of proper size into the connector.
9. Place the support with the P.C. board under the press ram.

10. Press the connector into the P.C. board and observe for any deflection of the board when the ram is at the bottom of its stroke.

## 2.2 Press Stroke Adjustment

Most presses have some means of adjusting the stroke; please refer to the appropriate manual (for the press being used) for press stroke adjustments. The stroke should be adjusted so that when the press ram stops in the down position, the bottom of the connector is flush to .25mm (.010 in.) above the surface of the P.C. board. See Figure 2-1.

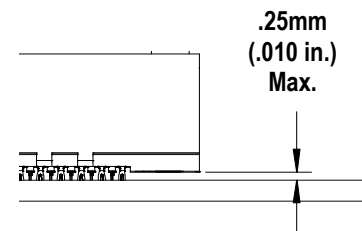


Figure 2-1  
MAXIMUM CLEARANCE WHEN  
CONNECTOR FULLY SEATED

## 2.3 Installation

The only installation required is when you need to install insertion modules into a tooling holder. To do this, use the following procedure:

1. Along the lower edge of the tooling holder is a row of M3 set screws, (See Figure 2-2), back these out so that they do not protrude into the inside of the holder.

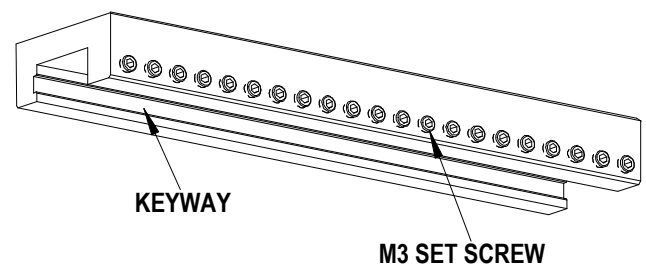


Figure 2-2  
TOOLING HOLDER

2. Slide the insertion modules into the tooling holder in the proper order. See Figure 2-3. The modules are keyed so that they cannot be put in backwards.

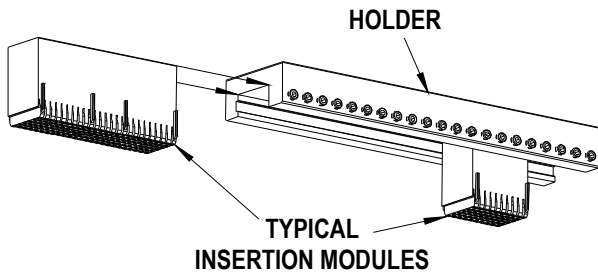


Figure 2-3  
MOUNTING INSERT MODULE IN A MOUNTING BLOCK

- Now tighten the M3 set screws against the modules with one (1) screw against each power module inserter, two (2) screws evenly spaced on a 10 wide header insertion module and at least three (3) screws evenly spaced on a 25 wide header insertion module. Figure 2-4 shows a typical completed assembly.

**CAUTION:** Do not over tighten the setscrews; this could damage the insertion tool.

**NOTE:** See Section 4 for details on selecting modules and mounting blocks.

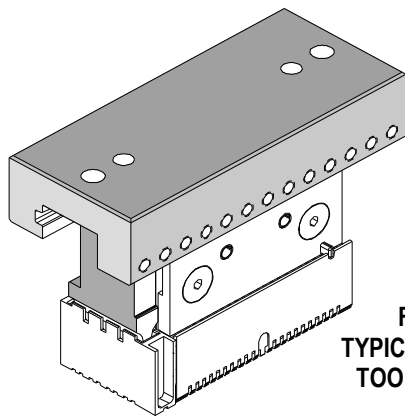


Figure 2-4  
TYPICAL INSERTION TOOL ASSEMBLY

## 2.4 Operation

### Header insertion Tooling

- Carefully locate the connector(s) on the printed circuit board and start in by hand. Make sure terminal pin 1 is in the correct position on all connectors. See Figure 2-5.

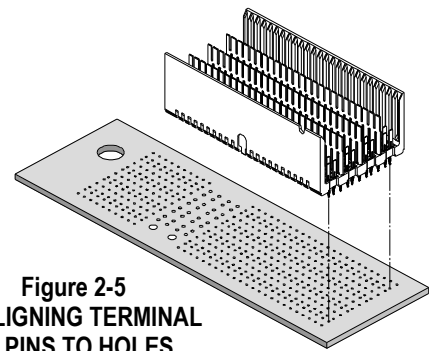


Figure 2-5  
ALIGNING TERMINAL PINS TO HOLES

- Locate the pre-loaded board into the support pallet. See Figure 2-6.

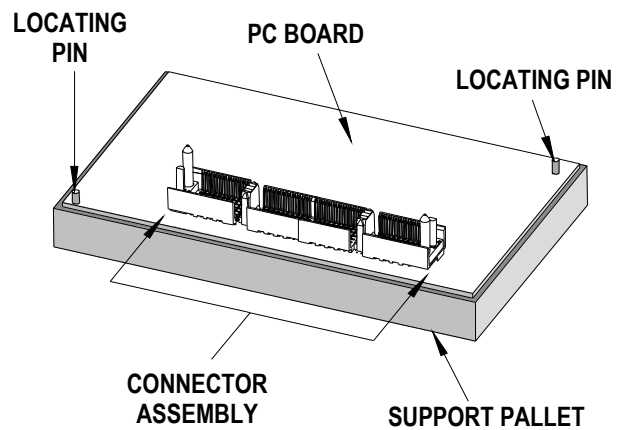


Figure 2-6  
CONNECTOR ASSEMBLY ON PC BOARD SUPPORT PALLET

- Locate the tooling assembly in the connector assembly, carefully checking alignment. The orientation feature on the tool must engage with the notch on the connector body. See Figure 2-7.

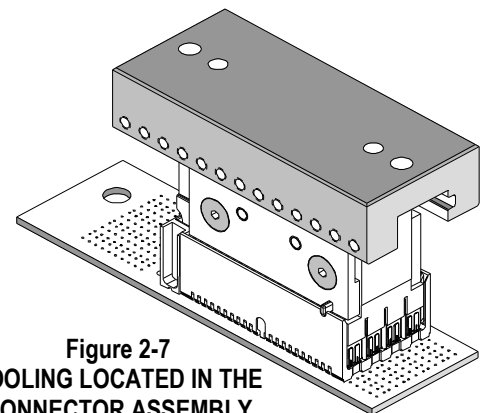


Figure 2-7  
TOOLING LOCATED IN THE CONNECTOR ASSEMBLY



4. Position the pre loaded support pallet under the press platen.
5. Cycle the press. See Section 2.1 (Press Stroke Adjustment).
6. Remove the loaded support pallet.
7. Carefully remove the insertion tool assembly.  
Remove the printed circuit board.

### Daughtercard Tooling

Operation for inserting Daughtercard assemblies is different because Daughtercard connectors are available only in complete assemblies that are held together with a stiffener rail, so therefore, insertion tooling is only determined by the total assembly length. The insertion module is 100mm long and can be used alone or stacked in a tool holder for larger connector assemblies.

1. Locate the Daughtercard connector assembly on the printed circuit board.
2. Start the assembly into the board by hand. Check for proper seating and bent pins under the assembly after pre loading on to the P.C. board. See Figure 2-8.

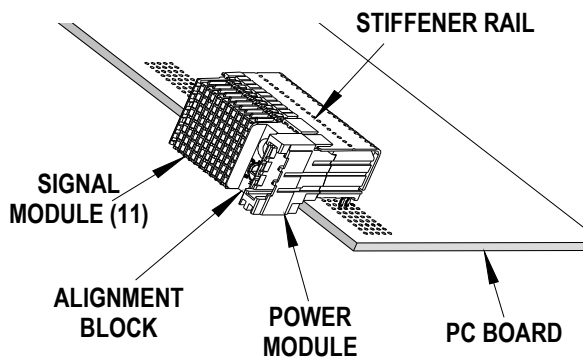


Figure 2-8  
TYPICAL DAUGHTERCARD ASSEMBLY  
ON THE PC BOARD

3. Locate the P.C. board with the connector assembly on the user supplied support pallet.
4. Position the insertion tooling on the connector assembly.  
See Figure 2-9.

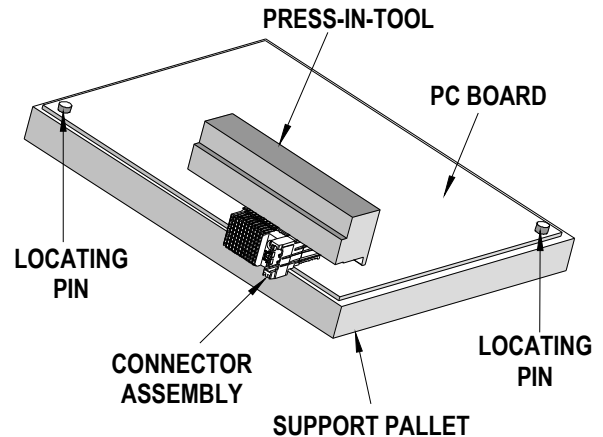


Figure 2-9  
PC BOARD, CONNECTOR, AND TOOLING ON  
SUPPORT PALLET READY FOR PRESS

5. Position the P.C. board and support fixture under the press platen.
6. Cycle the press.
7. Remove the loaded support pallet from the press.
8. Remove the insertion tool.
9. Carefully remove the assembled printed circuit board from the support pallet.

## Section 3

### MAINTENANCE

- 3.1      Cleaning
- 3.2      Lubrication
- 3.3      Preventive Maintenance
- 3.4      Troubleshooting

### 3.1. Cleaning

Once a day, the support fixture should be cleaned of dust and plating particles and other debris. Compressed air may be necessary to remove debris from the pin clearance holes.

**CAUTION:** Use extreme caution when using compressed air for cleaning as it can cause debris to get lodged in the tooling, and fly out at the operator. **USE** of proper safety glasses by the operator and onlookers is required.

### 3.2 Lubrication

There is no lubrication required on any of the GbX® tooling. However, the presses each have their own requirements for lubrication and maintenance. The instruction manual for the specific press being used should be referred to. Molex provides a sheet for logging routine preventive maintenance in this section.

### 3.3 Preventive Maintenance

**DAILY:** Clean, See Section 3.1

**MONTHLY:** Lubricate, See Section 3.2

**CHECK SHEET** MONTH \_\_\_\_\_ YEAR \_\_\_\_\_

Week	Daily Use	Days of the Week							Solution
		MON	TUE	WED	THU	FRI	SAT	SUN	
1									
2									
3									
4									
Cleaning	Daily								
Lubricate	Monthly								

Schedule should be adjusted up or down depending on usage. Molex recommends that a log of preventive maintenance be kept with the tool.

### 3.4 Troubleshooting

Symptom	Cause	Solution
Connector Being Damaged	▪ Press stroke set too low.	Refer to the appropriate press manual and adjust the stroke. See Section 2.2.
	▪ Something not properly aligned.	Check fixture and repair as required.
		Check alignment of fixture in press.
	▪ "Blades" on tooling bent or damaged.	Check to be sure the press platen is pressing squarely on the tooling block.
		Replace tool.

## Section 4

### AVAILABLE TOOLS

#### 4.1 Standard Press-In-Tools

Table 4-1 Assembly Tooling for GbX® Signal Headers

Table 4-2 Assembly Tooling for GbX® Daughtercard Receptacles

Table 4-3 Standard Tool Holder for Back Plane Header Assembly

Table 4-4 Field Repair Tooling for GbX® Backplane and Daughtercard Assemblies

#### 4.2 Standard Tool Ordering Procedure

## 4.1 Standard Press-In-Tools

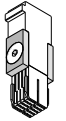
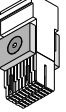
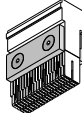
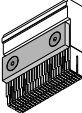
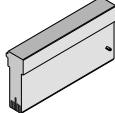
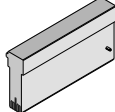
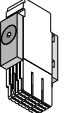
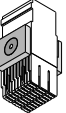
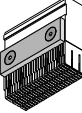
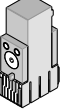
### Standard Insertion Tools

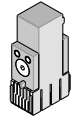
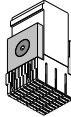
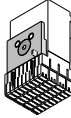
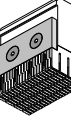
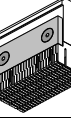
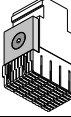
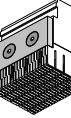


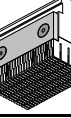
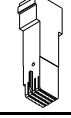
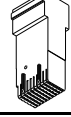

All the applicable GbX® connectors and the standard tooling required for each connector are located in these tables.


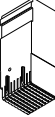
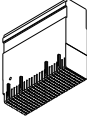
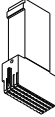
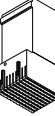
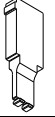
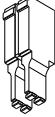

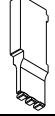
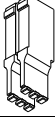

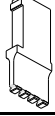

**Table 4-1**

**Assembly Tooling for GbX® Signal Headers** (For use in standard tool holders)

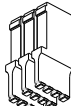
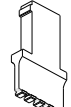
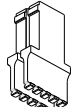
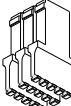
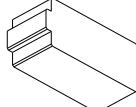
Refer to the individual instruction sheets for more information on Individual tools.

Product Number	Tool Description	Tool Size (Long)	Illustration
GbX® Signal Header (2 pair by 5 wide) (75827 series)	Insertion Tool 62202-2810	9.25mm (.364")	
GbX® Signal Header (2 pair by 10 wide) (75647, 75827, 75828, 75832, and, 75833 series)	Insertion Tool 62202-2410	18.50mm (.728")	
GbX® Signal Header (2 pair by 20 wide) (75647, and 75834 series)	Insertion Tool 62202-2420	37.00mm (1.457")	
GbX® Signal Header (2 pair by 25 wide) (75647, 75827, and 75832 series)	Insertion Tool 62202-2430	46.25mm (1.82")	
GbX-U™ Signal Header (2 pair by 45 wide) (76922 series)	Insertion Tool 62202-3025	85.09mm (3.35")	
GbX-U™ Signal Header (2 pair by 45 wide) (76922 and 76923 series)	Insertion Tool 62202-3026	85.09mm (3.35")	
GbX® Signal Header (3 pair by 5 wide) (75433 and 75836 series)	Insertion Tool 62202-2500	9.25mm (.364")	
GbX® Signal Header (3 pair by 10 wide) (75433, 75434, 75836, 75837, and 75844 series)	Insertion Tool 62202-2510	18.50mm (.728")	
GbX® Signal Header (3 pair by 25 wide) (75433, 75434, 75836, 75837, and 75844 series)	Insertion Tool 62202-2530	46.25mm (1.821")	
GbX® Signal Header (4 pair by 5 wide) (2.5mm) (75235 series)	Wide Differential Insertion Tool 62202-2110	9.53mm (0.38")	

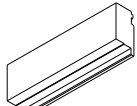
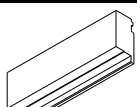
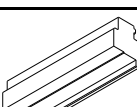
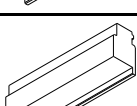
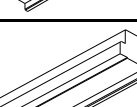
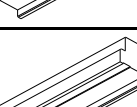
Product Number	Tool Description	Tool Size (Long)	Illustration
GbX® Signal Header (4 pair by 7 wide) (2.5mm) (75235 series)	Wide Differential Insertion Tool 62202-2120	12.7mm (0.50")	
GbX® Signal Header (4 pair by 10 wide) (75831-All 4 pair series) (75235, 75838, and 75839 series)	Insertion Tool 62202-2000	18.50mm (.728")	
GbX® Signal Header "RE" Series (4 pair by 10 wide) 2.5mm (75644, 75870, 75871, and 75872 series)	2.5mm Pitch Insertion Tool 62202-2630	25.00mm (.984")	
GbX® Signal Header (Double 4 pair by 10 wide) (75830-All 4 pair series) (75235, 75831, and 75839 series)	Insertion Tool 62202-2010	37.00mm (1.457")	
*For two stacked 10's only. Not for 20 wide discrete.			
GbX® Signal Header (4 pair by 25 wide) (75235, 75466, and 75831 series)	Insertion Tool 62202-2020	46.25mm (1.821")	
GbX® Signal Header (5 pair by 10 wide) (75237, and 75848 series)	Insertion Tool 62202-2030	18.50mm (.728")	
GbX® Signal Header (Double 5 pair by 10 wide) (75237, and 75848 series)	Insertion Tool 62202-2040	37.00mm (1.457")	
*For two stacked 10's only. Not for 20 wide discrete.			
GbX-U™ Signal Header (5 pair by 10 wide) (76922 series)	Insertion Tool 62202-3030	20.32mm (0.80")	
GbX-U™ Signal Header (5 pair by 10 wide) (76932 series)	Insertion Tool 62202-3031	20.32mm (0.80")	
GbX® Signal Header (5 pair by 25 wide) (75237, and 75848 series)	Insertion Tool 62202-2050	46.25mm (1.821")	
2 pair by 5 wide L Series (75861, 75862, 75863 and 75864 series)	Insertion Module 62202-2440	9.25mm (.364")	
2 pair 10 wide L Series (75861, 75862, and 75863 series)	Insertion Module 62202-2450	18.50mm (.728")	
2 pair 25 wide L Series (75861 and 75863 series)	Insertion Module 62202-2470	46.25mm (1.821")	

Product Number	Tool Description	Tool Size (Long)	Illustration
3 pair by 5 wide L Series (75649, and 75858 series)	Insertion Module 62202-2540	9.25mm (.364")	
3 pair 10 wide L Series (75467, 75649 and 75858 series)	Insertion Module 62202-2550	18.50mm (.728")	
3 pair 25 wide L Series (75649 and 75858 series)	Insertion Module 62202-2570	46.25mm (1.821)	
4 pair by 5 wide L Series (75465, 75466, 75854, and 75856 series)	Insertion Module 62202-2015	9.25mm (.364")	
4 pair 10 wide L Series (75465, 75466, 75854, 75855, 75856, and 75857 series)	Insertion Module 62202-2025	18.50mm (.728")	
2 pair 1 up Power module (75492 series)	Insertion Module 62202-2480	5.55mm (.219")	
2 pair 2 up Power module (75492 series)	Insertion Module 62202-2485	12.95mm (.509")	
2 pair 3 up Power module (75492 series)	Insertion Module 62202-2490	20.35mm (.801")	
3 pair 1 up Power module (75331 series)	Insertion Module 62202-2580	5.55mm (.219")	
3 pair 2 up Power module (75332 series)	Insertion Module 62202-2585	12.95mm (.509")	
3 pair 3 up Power module (75333 series)	Insertion Module 62202-2590	20.35mm (.801")	
4 pair 1 up Power module (75341 series)	Insertion Module 62202-2005	5.55mm (.219")	
4 pair 2 up Power module (75342 series)	Insertion Module 62202-2060	12.95mm (.510")	

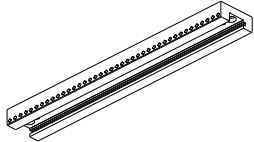


Product Number	Tool Description	Tool Size (Long)	Illustration
4 pair 3 up Power module (75343 series)	Insertion Module 62202-2061	20.35mm (.801")	
5 pair 1 up Power module (75510,75512, 75513, 75514, 75515, 75516, 75517 75518,and 75519 series)	Insertion Module 62202-2007	5.55mm (.219")	
5 pair 2 up Power module (75520,75524, 75526, 75527 and 75529 series)	Insertion Module 62202-2062	12.95mm (.510")	
5 pair 3 up Power module (75530,75534, 75536, 75537 and 75539 series)	Insertion Module 62202-2063	20.35mm (.801")	
GbX® Signal Headers, 2,3,4, and 5 pair-closed end (All Headers with Guide/ Polarizer)	Spacer Block 62202-2009	6.35mm (.250")	

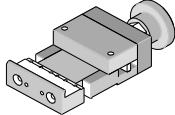
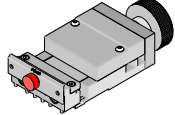
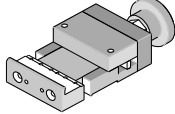
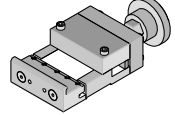
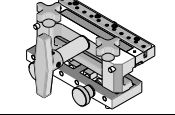
**Table 4-2**  
**Assembly Tooling for GbX® (Daughtercard Receptacles)**

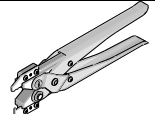
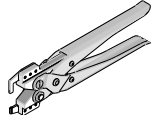
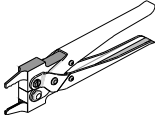
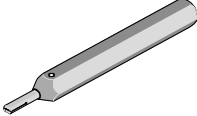
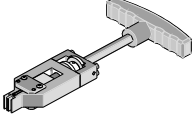
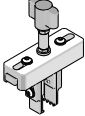

Product Number	Tool Description	Tool Size (Long)	Illustration
2 pair Daughtercard Insert (75650, 75676 series)	Insertion Module 62202-2495	100mm	
2 pair Ram Insert (75966 series)	Insertion Module 62202-2496	100mm	
3 pair Daughtercard Insert (75370, 75660, 75666 75876 and 75877 series)	Insertion Module 62202-2595	100mm	
4 pair Ram Insert (75717 series)	Insertion Module 62202-2096	100mm	
4 pair Daughtercard Insert (75220, 75420, 75426, and 75878 series)	Insertion Module 62202-0214	100mm	
5 pair Daughtercard Insert (75360 series)	Insertion Module 62202-2008	100mm	

**Table 4-3**  
Standard Tool Holder for Back Plane Header Assembly

Tool Description	Tool Length	Illustration
Tool Holder for Backplane Assembly Tooling 62201-9501	24mm	
Tool Holder for Backplane Assembly Tooling 62201-9502	72mm	
Tool Holder for Backplane Assembly Tooling 62201-9503	156mm	
Tool Holder for Backplane Assembly Tooling 62201-9504	216mm	
Tool Holder for Backplane Assembly Tooling 62201-9509	254mm	
Tool Holder for Backplane Assembly Tooling 62201-9511	304.8mm	
Tool Holder for Backplane Assembly Tooling 62201-9512	406.4mm	

**Table 4-4**  
Field Repair Tooling for GbX® Backplane and Daughtercard Assemblies

Product Number	Tool Description	Illustration
Daughtercard Receptacles GbX® 2 and 3 pair Assembly (75370, 75650, 75660, 75666, 75676, and 75877 series)	Stiffener Removal Tool 62202-2300	
Daughtercard Receptacles/Ram GbX® 2 (75650, 75966) and 3 pair Assembly (75370, 75660, 75666, 75676, and 75877 series)	Stiffener Removal Tool and Insertion Tool 62202-2900	
Daughtercard Receptacles GbX® 4 and 5 pair Assembly (75360, 75420, 75426, 75878 series)	Stiffener Removal Tool 62202-2070	
Daughtercard Receptacles GbX® 4 pair (2.5mm) Assembly (75809 series)	Stiffener Removal Tool 62202-2620	
GbX® 4 pair Ram Assembly (75717 series)	Stiffener Removal Tool 62202-2600	

Product Number	Tool Description	Illustration
Daughtercard Receptacles GbX® 2 pair Assembly (75650, 75676, and 75874 series)	Wafer Removal Tool 62202-2083	
Daughtercard Receptacles GbX® 2 pair Right Angle Male (RAM) Assembly (75966 series)	Wafer Removal Tool 62202-2086	
Daughtercard Receptacles GbX® 3, 4 and 5 pair Assembly (75220, 75360, 75370, 75420, 75426, 75660, 75666, 75876, 75877, 75878 series)	Wafer Removal Tool 62202-2080	
Backplane Headers Signal pins (All sizes)	Signal Pair Inserter Repair Tool 62202-2090	
Backplane Headers Shields (All sizes)	Shield Removal Tool 62202-2100	
Backplane Headers GbX-U™ (76922, 76923, 76932, and 76933 series)	Removal Tool Backplane Headers 62100-9610	
Backplane GbX-U™ (76922, 76923, 76932, and 76933 series)	Signal Contact Insertion Tool 62100-5110	

## 4.2 Standard Tool Ordering Procedure

### Stacking Tooling

All the insertion tooling listed in Table 4-1 and 4-2 can be stacked in any combination so as to be able to simultaneously press in any arrangement of stacked connectors. Tooling holders are available in various lengths. Figure 4-1 shows a typical setup for a 4 pair by 25 wide signal module and a one up power module in a standard tool holder.

### Ordering Tooling for Backplane Connectors

In order to insert a typical row of backplane connectors, it is necessary to select the individual insertion tools and then pick the appropriate tooling holder (See example).

#### Basic Procedure

1. Determine the combination of signal modules and power modules to be inserted.
2. Select the proper insertion modules from Table 4-1 and Table 4-2.
3. Table 4-1 and Table 4-2 show the tool sizes. (L) Write down the length of each tool selected.

**NOTE:** Make sure that if you require four of a particular tool, write down its length 4 times.

**NOTE:** When using two 10 wide backplane insertion modules to press in a 20 wide header, only one module uses a side plate with a locating peg. On the second module, replace the pegged side plate with 62202-2003 un-pegged version.

4. Total up these lengths.
5. Using the length just calculated, select the next largest tooling holder from Table 4-3. The tooling holder can be shorter than the total tooling but not by more than 0.5 mm per side.
6. All of the tools selected above must be ordered separately.

#### Example

To be inserted: (1) 4 pair 25 wide Backplane Signal Module and (1) 4 pair 1 up Power Module.

1. Look at Table 4-1 and find the required tools. In this case it would be a 62202-2020 and a 62202-2005.
2. From Table 4-1 get the lengths of these tools. (Numbers may be rounded up)  $62202-2020 = 46.25\text{mm}$  and  $62202-2005 = 5.55\text{mm}$ .
3. Add these two values for a total of 51.80mm.
4. From the Tooling Holder list in Table 4-3, pick the 72mm long holder, P.N. 62201-9502.
5. Thus the order to Molex should include the following:

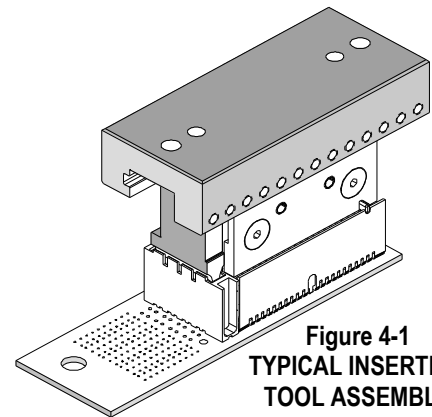


Figure 4-1  
TYPICAL INSERTION  
TOOL ASSEMBLY

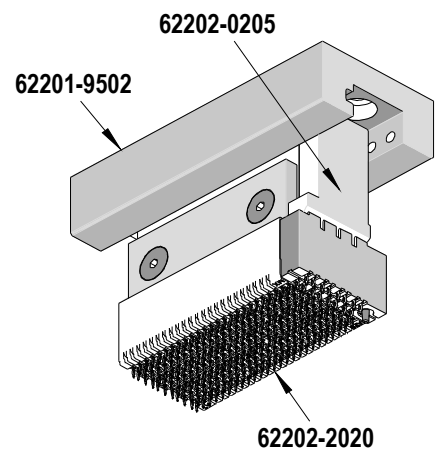


Figure 4-2  
EXAMPLE TOOL ASSEMBLY

Quantity	Order No.	Description
1	62202-2020	4 pair by 25 wide Header Insertion Tool
1	62202-2005	4 pair 1 up Power mod. Insertion Module
1	62201-9502	72mm Long Tooling Holder

(Figure 4-2 shows the assembled unit.)

### Ordering Daughtercard Tooling

Daughtercard connectors only come in custom assemblies that are loaded in a stiffener rail. The daughtercard insertion modules are 100 mm long. Therefore, insertion tools can be used individually for connector assemblies that are shorter than 100mm. or stacked in a tool holder for connector assemblies that are longer.

### Basic Procedure

1. Determine the combination of signal wafers and power modules to be inserted.
2. Determine the total length of the stack of components. Using that length, select the DaughterCard insertion tools required to cover the whole connector assembly. If more than one 100mm module is used, a tool holder of appropriate length will be needed. This can be selected from Table 4-3.

## Section 5

### Repair and Replacement

- 5.1 Backplane Repair Procedure
- 5.2 GbX® Backplane Shield Repair Procedure
- 5.3 Daughtercard Repair Procedure
- 5.4 Glossary of Terms

## 5.1 GbX® Backplane Repair Procedure:

### For the removal and replacement of Signal Pair pins.

The following tools are required:

- ✓ Signal Pair Pin Replacement Tool 62202-2090
- ✓ Shield Removal Tool 62202-2100
- ✓ 5/16" T-handle wrench \*
- ✓ Needle nose pliers (miniature) \*
- ✓ Tweezers \*
- ✓ Plastic hammer \*

\* Not supplied by Molex

#### Removal

To remove damaged signal pins, grasp them with the needle nose pliers and pull straight up from the board. It is recommended that both pins in a pair be replaced. See Figure 5-1. In some cases it may be necessary to straighten a bent pin with the tweezers to allow access with the pliers.

**NOTE:** Never reuse a backplane signal pin once it has been removed. Also, no more than three pins should be pressed into any plated through hole.

#### Replacement

To replace pairs of pins, use insertion tool no. 62202-2090.

**Note:** The pins are left and right handed and must be loaded into the connector in their proper orientation. They should be positioned in the insertion tool so that the ribs on the center of the pins are located in the grooves in the tip of the tool, facing the round indentations. Due to the small size of the pins, a tweezers may help in this operation. There should be a slight friction fit when the pins are inserted all the way in to the tip. See Figure 5-2. Carefully load and push the pins down into the connector base until the tool stops against the board. See Figure 5-3. Then remove the inserter from the connector.

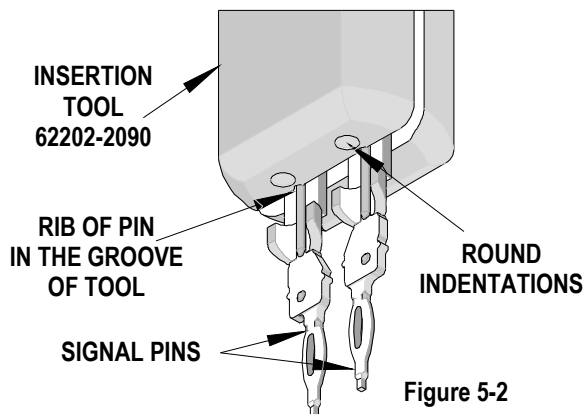


Figure 5-2

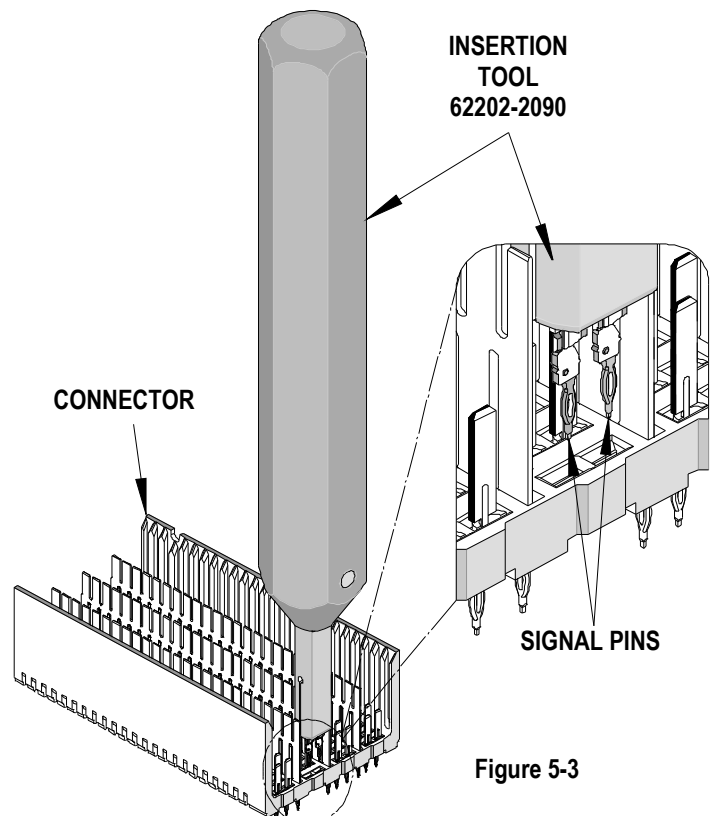


Figure 5-3

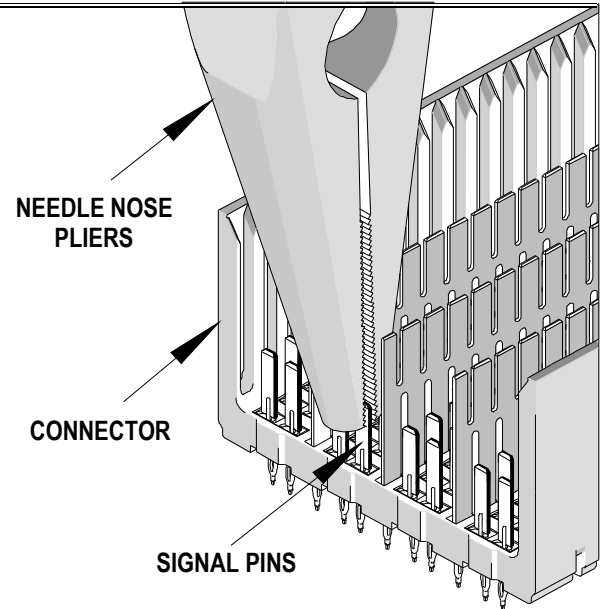


FIGURE 5-1

## 5.2 GbX® Backplane Shield Repair Procedure:

### For the removal and replacement of Backplane Shield.

The following tools are required:

- ✓ Shield Removal Tool 62202-2100
- ✓ 5/16" T-handle wrench \*
- ✓ Plastic hammer \*
- ✓ Appropriate signal insertion module  
(For shield replacement)

\* **Not supplied by Molex**

The backplane shield removal tool will remove 10 to 25 wide shields, from 2, 3, 4, and 5 pair assemblies.

**NOTE:** Never reuse a backplane shield once it has been removed.

### Removal

Preset the shield removal tool so the retention grippers are fully extended and there is no debris in the area shown in Figure 5-4. Insert the tip of the removal tool into the connector with the grippers over the shield to be removed. Be careful not to damage the metallic parts in the connector. Insert a 5/16" T-handle (not supplied with this tool) into the socket head screw on the top of the tool, (See Figure 5-5) and rotate clockwise until the tool grips the shield. Then continue to turn the T-handle one complete rotation. Remove the tool and shield by lifting vertically from the connector. Remove the shield from the tool by rotating the socket head screw counter-clockwise three complete turns.

### Replacement

To install a replacement shield, use the appropriate signal insertion module for the connector being repaired. The shields must be installed with the protruding stiffening ribs facing away from the backplane notch on the connector housing. See Figure 5-6. Preload the shield in its proper location and then load the insertion module. Gently tap the top of the insertion module with the plastic hammer until the shield is fully seated.

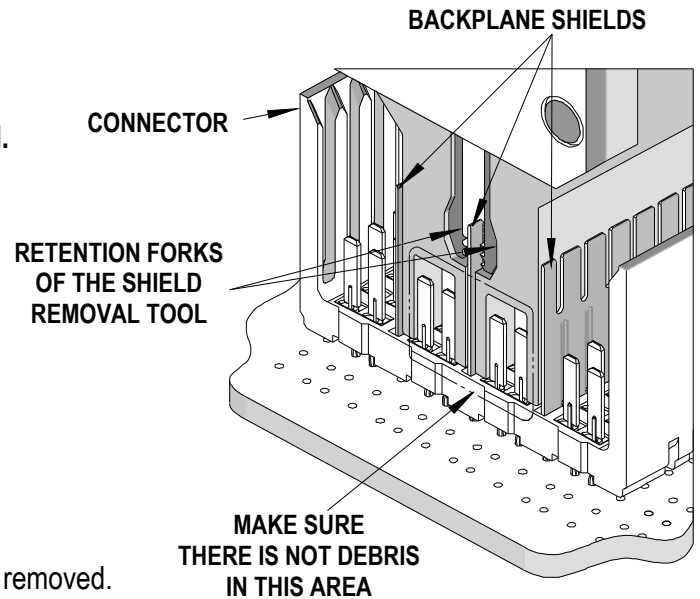


Figure 5-4

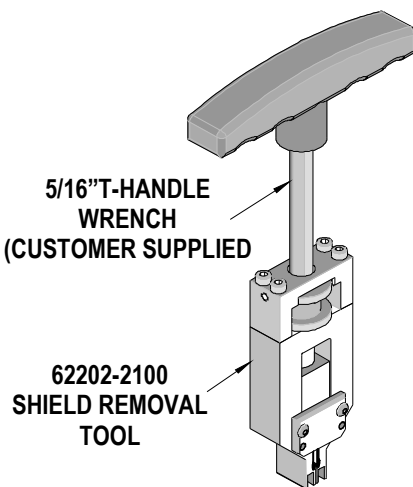


Figure 2

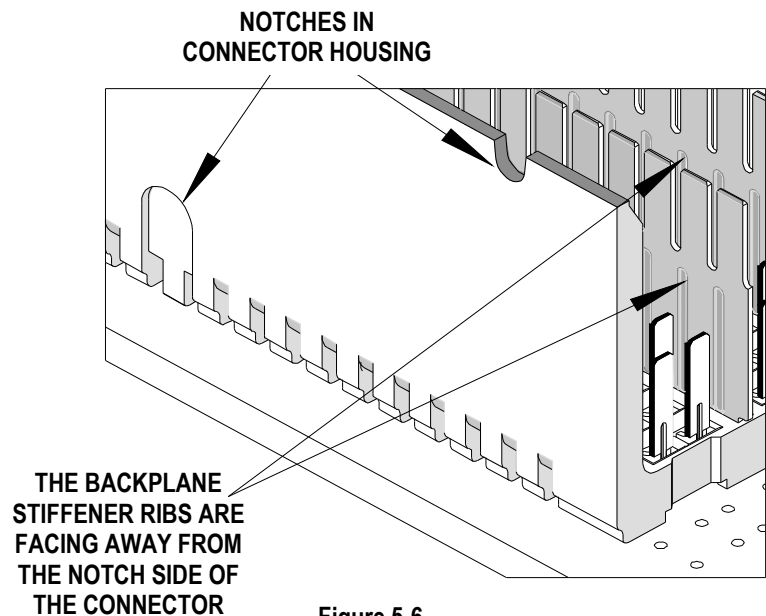


Figure 5-6



### 5.3 GbX® Daughtercard Repair Procedure:

#### For the removal and replacement of Signal and Power Wafer replacement.

The following tools are required:

- ✓ Stiffener press, 2,3,4, and 5 pair 62202-2070 or 62202-2620 for 75809 series only.
- ✓ Press Block 62201-6250
- ✓ Wafer Removal Tool 62202-2080
- ✓ Plastic hammer \* (Or Small arbor press) \*
- ✓ Pallet to support P.C. board \*
- ✓ Small arbor press (optional)\*

\* Not supplied by Molex

#### Stiffener Removal

Before using the Stiffener Press, make sure the orientation of the tool is in the right position and the pins of the tool are facing down towards the stiffener. To remove stiffener, place the small pins in the tool into the round holes of the stiffener while locating the rib on the tool against the wafer tabs that extend through the stiffener. Then rotate the knob clockwise (CW) to push the stiffener off of the wafers. See Figure 5-7 and 5-8.

#### **Note:**

For longer connectors, it may be necessary to work the stiffener loose by moving the press tool from one end of the connector to the other until the stiffener can be easily removed.

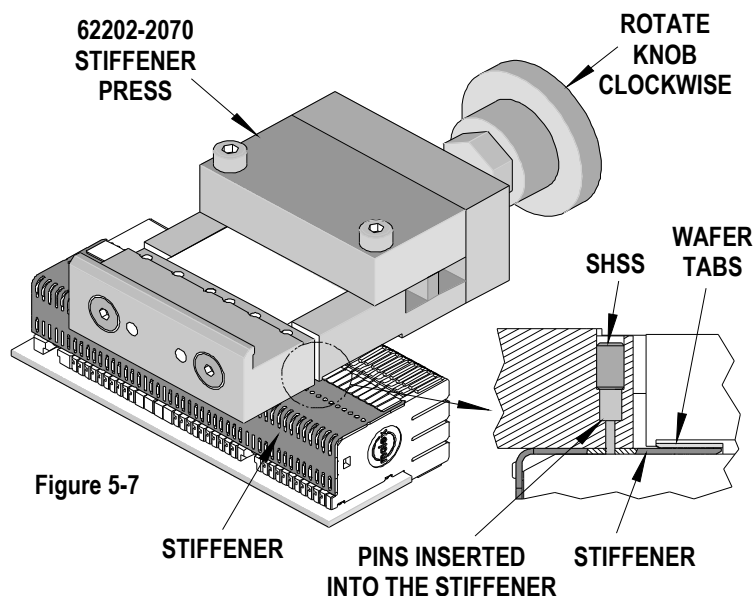


Figure 5-7

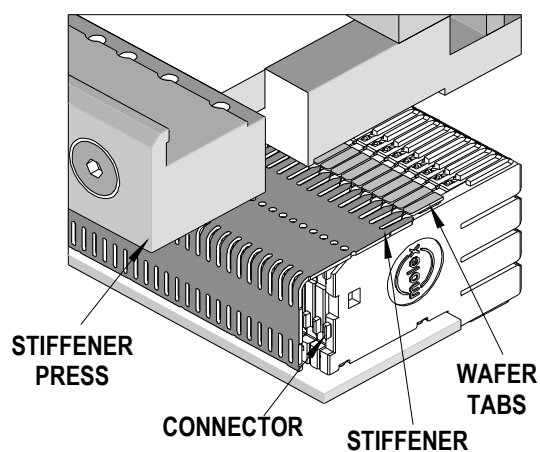


Figure 5-8

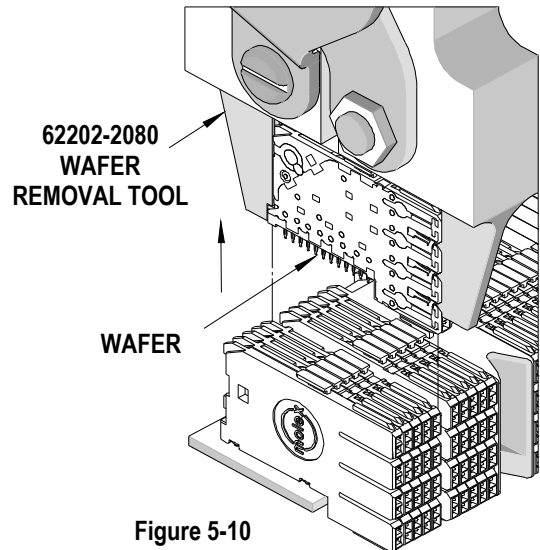
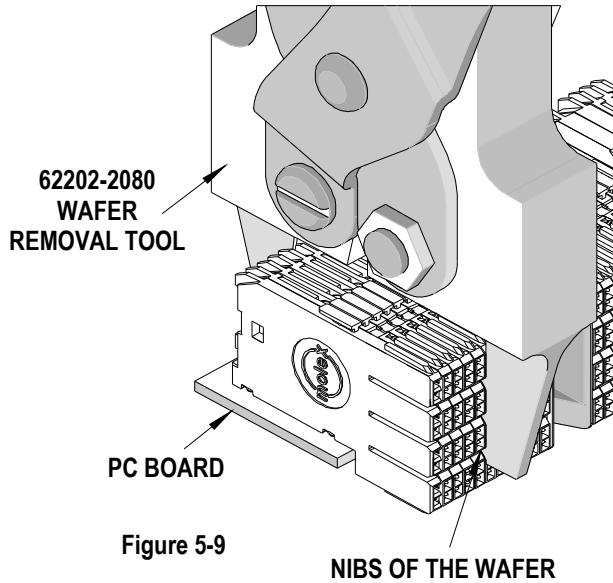
#### Wafer Removal

First identify the GbX® wafer that needs to be replaced.

#### **NOTE:**

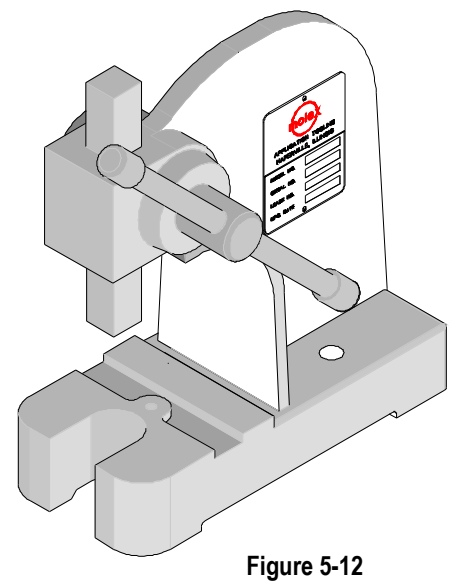
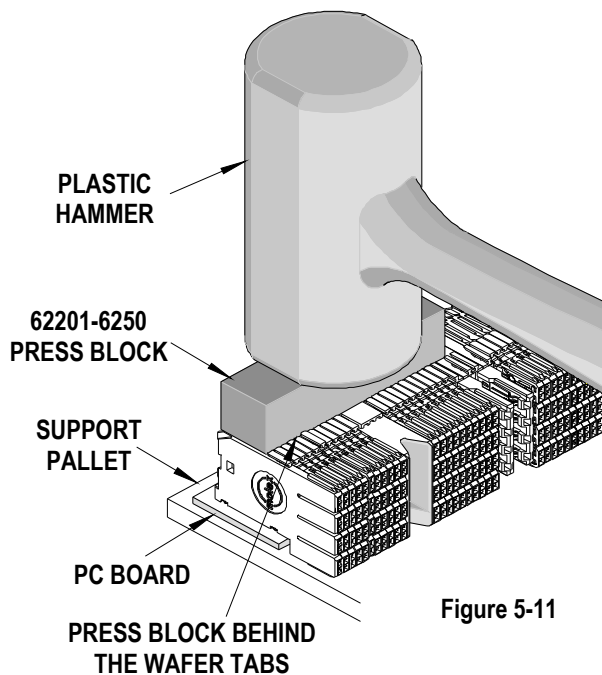
Marking the defective wafer with white correction fluid or other similar material will aid in the removal process.

Position the 62202-2080 Wafer Removal Tool over the defective wafer with the slotted jaws over the nubs on the end of the wafer. See Figure 5-9. While holding the tool in position over the wafer, squeeze the handles until the jaws clamp the defective wafer. While applying pressure to the handles, pull straight up until the wafer slips out of the assembly. See Figure 5-10. It may be necessary to also remove and replace adjacent wafers as they are easily damaged in the process of removal.



**Wafer Replacement**

Set a support pallet beneath the PC board to allow the pins to protrude below the board when the wafers are pressed on the board. Preload the new wafers into the plated through holes. Place the Press Block on top of the wafers and behind the tabs that hold the stiffener in place. Then gently tap the block with the plastic hammer until the wafers are seated. See Figure 5-11. A small arbor press like the one shown in Figure 5-12 can be used with the press block in place of the plastic hammer.



### **Power Module Replacement**

Replacing a Power Module is similar to the one described for replacing a wafer. To install a new power connector, set a support pallet beneath the PC board. This allows the pins to protrude below the board when the connector is pressed on the board. Preload the new power module into the plated through holes. Place the press block on top of the power module behind the tabs that hold the stiffener in place. Then gently tap the block with the plastic hammer until the module is seated.

### **Stiffener Replacement**

Place the stiffener back on the connector and align the slots with the tabs on the wafers. See Figure 5-13. Rotate the Stiffener Press 180° so that the pins are on the top of the press and away from the stiffener. Use the jaws to push the stiffener securely in place. See Figure 5-14. Rotate the knob on the press counter clockwise (CCW). Check that the stiffener locating features are protruding through the slots in the back of the stiffener.

### **Note:**

For longer connectors, move the clamp from one end of the connector to the other until the stiffener is fully seated.

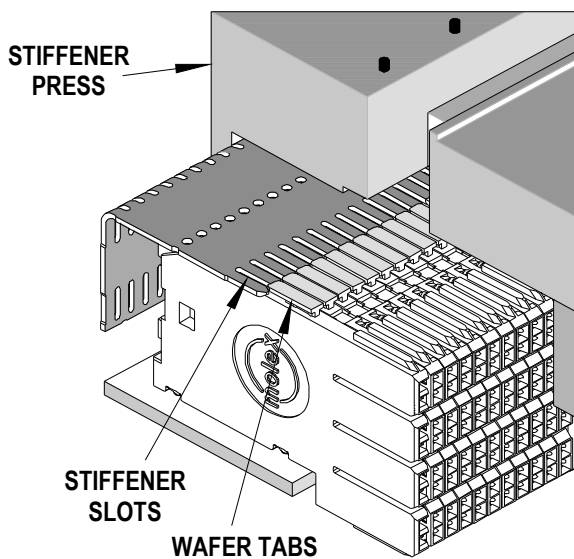


Figure 5-13

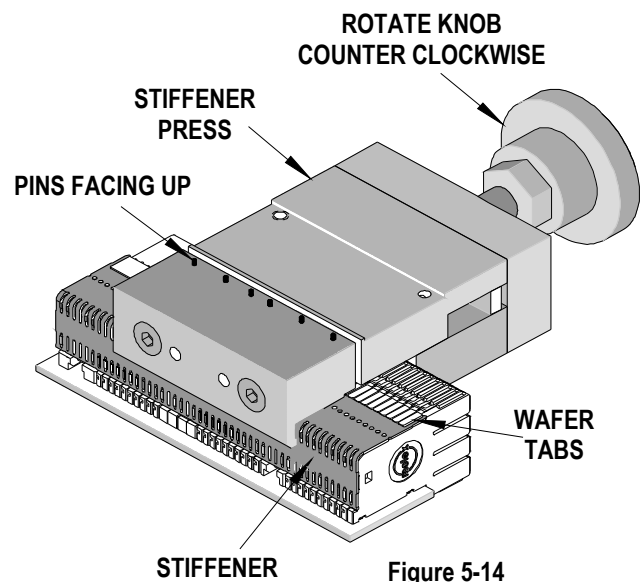


Figure 5-14

#### 5.4 Glossary of Terms:

Backup (or support) Pallet	A simple fixture used to locate and support a printed circuit while a compliant pin connector is being pressed into the pc board. Considerable force is required to press one of these connectors into a pc board, thus the pc board must be adequately supported to avoid being damaged. It must have adequate clearance for the terminals when they protrude through the pc board.
Compliant Pin Connector	A connector which has terminals that are designed to give slightly when pressed into a hole in a pc board so that the terminal (pin) makes solid electrical contact with the printed circuit board, alleviating the need for soldering.
Flat Platen Press	A press in which the upper tooling or die set is not attached to the press ram. The ram has a simple flat plate (or platen) attached to it. For this application, the upper tooling is positioned in the connector(s). The press ram comes down on top this tooling and presses on it. When the press ram goes back up, the upper tooling stays with the connector.
PC Board	Abbreviation for printed circuit board
Upper Tooling	The tooling that goes on top of the connector. It contains the mounting block and dies (or tools) necessary to properly apply pressure where required to push the connector terminals and locking posts into the holes in the printed circuit board.

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