

Pad Series 2mm
High Performance Contactors



Maintenance and Inspection

Guide

The Right Contacts®

Johnstech®

Johnstech Mission Statement

To Provide

The worldwide market with superior micro-contact interfacing solutions by providing customers with high value results through the development, introduction, and enhancement of advanced technologies.

To Be

An employer of choice by providing a challenging and fulfilling work experience to our employees, while recognizing and rewarding excellence.

To Continue

To develop an organization that ensures sustainable, consistent results and optimum growth.



About Johnstech

Johnstech International is a leading provider of interconnect solutions for semiconductor manufacturers. Our unique approach to semiconductor test and test interfaces has proven to be an important asset to semiconductor manufacturers requiring higher first pass yields and lower cost of test in this rapidly changing industry.

Johnstech's high performance test contactors are based on our patented technology and provide superior electrical and mechanical performance. Solutions are available for DIMM, BGA/CSP, QFP/SO/QFN/DFN, and other packages. Johnstech also partners with handler, tester, and load board manufacturers to ensure appropriate interfaces. Johnstech provides service and support worldwide.

Founded in 1990, the company's patented technology was introduced to the market in 1992.

Johnstech is headquartered in Minneapolis, Minnesota. It has sales and support offices in the U.S., Europe, Japan, Korea, Taiwan, and Southeast Asia (Singapore, Malaysia, Thailand, Philippines).

Table of Contents

Pad Series 2mm

- Contactors Layout4**
- Contactors Identification5**
- Contactors Inspection6**
 - Recommended Tools6
 - Contactors Verification7
 - Alignment Plate Verification7
 - Contactors Registration Verification7
 - Periodic Maintenance8
 - Contact Inspection9
 - Center Body Contact Inspection9
- Elastomer Installation10**
 - Elastomer Inspection10
 - Elastomer Installation at a Symmetrical Corner11
 - Elastomer Installation at a Non-Symmetrical Corner11
 - Elastomer Installation in a Single Row11
- Elastomer Replacement12**
 - Device Side Elastomer Replacement12
 - Load Board Side Elastomer Replacement13
- Contact Replacement14**
 - Contact Removal14
 - Contact Replacement15
- Insert Replacement16**
 - Insert Removal16
 - Insert Replacement17
- Center Body Contact Replacement18**
 - Center Body Contact Removal18
 - Center Body Contact Replacement19
- Load Board Inspection21**
- Light Cleaning Procedures22**
 - Cleaning Schedule22
 - Automated Handler Cleaning22
 - Solder Oxide Buildup22
 - Light Cleaning22
- Thorough Cleaning Procedures23**

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Pad Series 2mm

Most Johnstech Pad Series 2mm contactors have four standard parts that comprise the contactor housing assembly:

- Contactor housing
- Peripheral contacts and elastomers
- Center grounding contacts and elastomers
- Alignment plate*

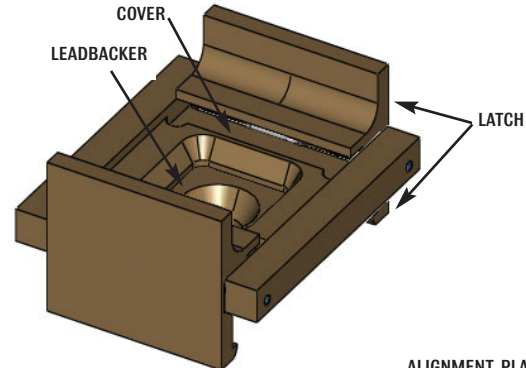
For short run testing and characterization, the manual actuator assembly includes:

- Cover with latch
- Leadbacker with elastomer retainer
- Alignment plate*

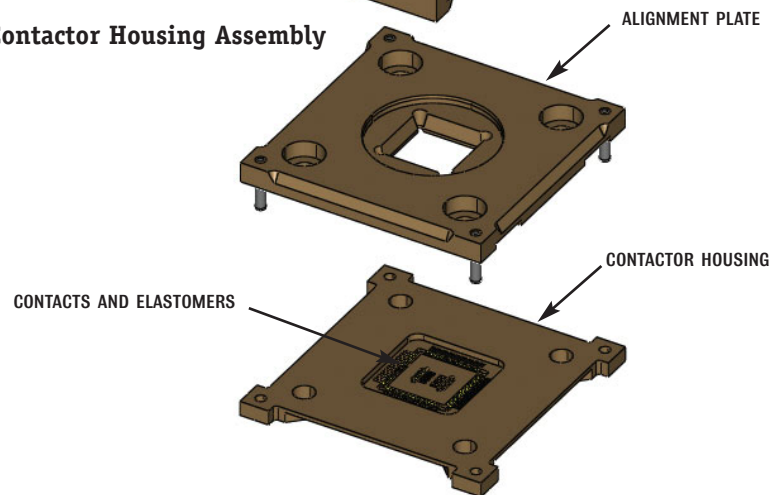
*An alignment plate is included with the contactor assembly for all designs using an alignment plate during automated test operation. All other designs include the alignment plate as part of the manual actuator assembly. Leadbackers and alignment plates are designed as a matched set. A change in either of these may necessitate a change to both pieces.

Contactors Layout

Manual Actuator Assembly



Contactors Housing Assembly

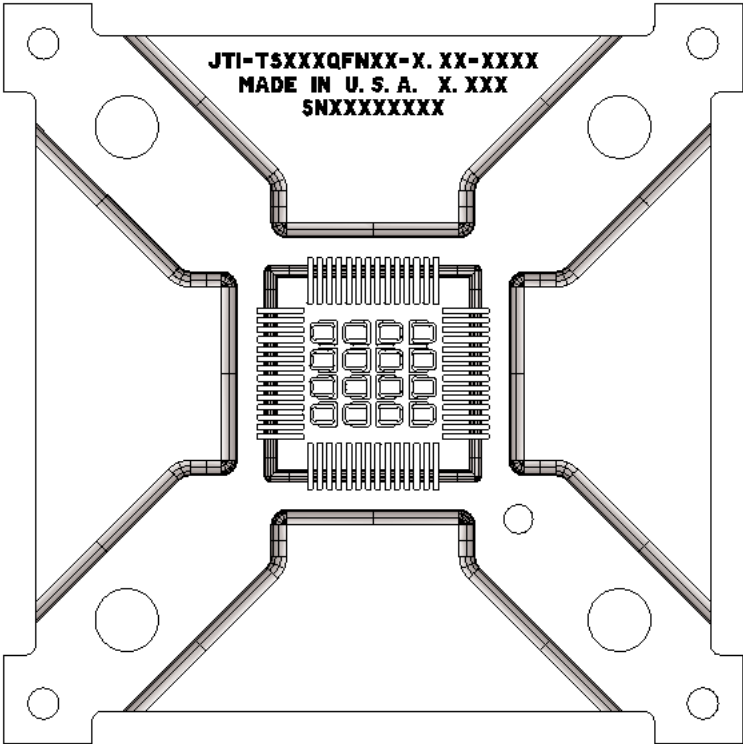


Contactors Identification

JTI - TS XXX QFN XX - X.XX - XXX
 1. 2. 3. 4. 5. 6. 7.

MADE IN USA X.XXX
 8.

SN:XXXXXXXX
 9.



Pad Series 2mm

Johnstech engraves three identification numbers - part number, serial number, and contact thickness onto each contactor, when possible. The identification system is designed to provide you with the technical information you need to identify the contactor, its attributes, and its design-specific data sheet.

Here is how to identify your contactor:

1. JTI - identifies the contactor as a Johnstech International contactor
2. Assembly Type
 TS: Test Socket
 MA: Manual Actuator
 DL: Double Latch Manual Actuator
3. Device Pad Count
4. Device Package Type (QFN in this example)
5. Device Package Body Size (in mm)
6. Device Pad Pitch (in mm)
7. Johnstech's Design Number
8. MADE IN THE USA X.XXX - (contact width in inches)
9. Serial Number with Date Code

Pad Series 2mm

Recommended Tools

Depending on what inspection, maintenance, or cleaning your contactors need, Johnstech recommends the tools listed here.

CAUTION: Any tools used directly on the contacts must be non-metallic. Metal tools may scratch the contacts, causing signal degradation. Johnstech recommends that you do not touch the contacts with your bare hands; use finger cots to prevent contaminating the contacts.

Johnstech's Maintenance & Inspection Kit contains the tools needed for maintenance and inspection. The tools are designed for Johnstech high performance contactors. Contact your Johnstech representative for more information. The Kit includes:

Hex Drivers - small allen wrenches for removing the contactor from the load board

Elastomer Tool - used to remove and replace worn contacts and elastomers correctly; non-metallic tool prevents damage to elastomers and contact slots (Johnstech #500365-0002)

Zirconia Tipped Tweezers - non-metallic tweezers for handling contacts

Pen Light - aids in elastomer and contact inspection

Nylon Brush and Replacement Tip - for cleaning contacts; allows removal of solder oxide contamination on the contacts without damaging elastomers or contacts

10x Machinist Scope - for elastomer and contact inspection

Vampire Tool With Attachments - an anti-static tool for picking up devices, eliminating damage and contamination to the leads

A Micro Tweezers/Scissors - for cutting elastomers to length

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Contactors Inspection

Due to the wide range of variables, each user needs to determine the optimal solution for maintenance intervals through an effective use of Statistical Process Control. By carefully monitoring and recording yield rates and following good test floor troubleshooting procedures, you will be able to clearly differentiate between alignment problems and maintenance problems. An effective maintenance cleaning cycle can be established to match your test floor's needs.

Handler Design and Setup

Handlers vary by test plane configurations, device transportation methods, plunge mechanisms, and accessories. Each has its own unique attributes. Handler setups that are not optimized can increase the required maintenance frequency by contributing to problems like premature contactor and elastomer wear, as well as solder buildup on the contacts. Working with Johnstech and your handler supplier, you can identify those attributes of the handler that can best be used to maximize maintenance intervals.

Correct Plunge Depth and Device Placement

Incorrect plunge depth reduces the effectiveness of the solder shedding contact profile and may cause, or increase the amount of, solder buildup on the contacts. Incorrect plunge depth may adversely affect the elastomer life by creating tears, cuts, or permanent deformation (compression set) in the elastomer. (Plunge depth is specified on the Johnstech data sheet.)

Package Variations

Variations in packages can affect your maintenance schedule. Different package vendors or even different lots of devices may require different leadbacker or alignment plates. Variations in package body size and thickness may affect contactor performance.

Pad Plating Variations

The method used for plating of the pads can affect your maintenance schedule. Pads that have been solder dipped rather than solder plated generally tend to possess a more uneven surface. There also may be variations in the tolerances and/or the tin-lead content. All of this can vary the rate of solder buildup and debris, and consequently vary the required interval between each cleaning.

Device Pitch

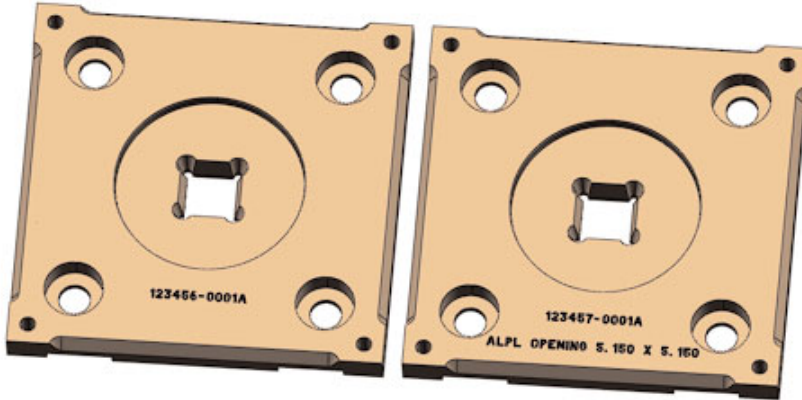
The smaller the pitch, the greater the probability that accumulation of contaminants (such as solder flake, solder oxide, and mold flash) will contribute to continuity failures during the test process.

General Test Floor Maintenance Activities

Frequency of handler maintenance also affects contactor cleaning. For example, how often the handler and handler test areas are blown free of debris has an impact on the effectiveness of the contactor. Contactors exposed to increased levels of foreign debris from other sources are likely to require more frequent maintenance and cleaning.

Contactors Inspection

Verify the Alignment Plate



THIS ALIGNMENT PLATE OPENING IS 5.100MM. CHECK THE ALIGNMENT PLATE PART NUMBER ON THE DESIGN DATA SHEET AGAINST THE PART NUMBER ENGRAVED ON THE ALIGNMENT PLATE TO ENSURE THAT THE ALIGNMENT PLATE IN USE IS CORRECT.

THIS ALIGNMENT PLATE OPENING IS 5.150MM. CHECK THE ALIGNMENT PLATE PART NUMBER ON THE DESIGN DATA SHEET AGAINST THE PART NUMBER ENGRAVED ON THE ALIGNMENT PLATE TO ENSURE THAT THE ALIGNMENT PLATE IN USE IS CORRECT.

Pad Series 2mm

Contactors Verification

Each contactor's design data sheet contains information and dimensions for load board layout, handler plunge depth, alignment plate opening, and other necessary information for setup and trouble shooting. Refer to the design data sheet to verify:

- The correct alignment plate for manual or automated test
- The correct contact profile and thickness
- The correct elastomer configuration
- The correct manual actuator or nest
- The correct load board layout

Alignment Plate Verification

The use of different package vendors or a change in handlers may require a change in alignment plates. If the same design uses different alignment plates for various testing situation, the design data sheet denotes which alignment plate is appropriate for which application. If applicable, it also denotes any special engraving that may appear on the alignment plate.

Contactors Registration Verification

Inspect the contactor for fit and alignment with the device being tested. Inspect for registration between the device pads and the contacts. It is very important that every device pad touch the assigned contact. There should not be any likelihood that a device pad can miss an assigned contact or touch an adjacent contact. Skewing of the device may indicate a change in device size, a misapplication of a contactor and/or alignment plate, or a worn alignment plate.

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Pad Series 2mm

Contactors Inspection

Periodic Maintenance

During periodic maintenance of the contactor, perform this inspection:

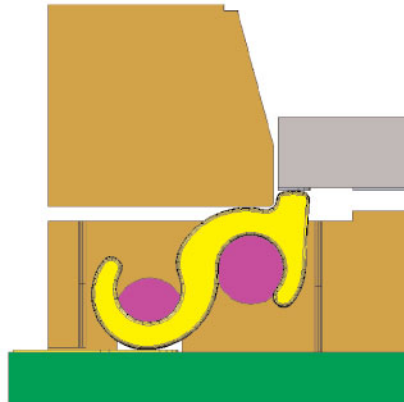
1. Before you remove the contactor from the load board, use a minimum of 10x magnification to inspect the contactor, contacts, and elastomers for signs of the following:
 - Damaged, missing, or excessively worn contacts
 - Solder and mold flash trapped between contacts
 - Fatigue, i.e., cracks or chipping, on the contactor housing or the alignment plate
 - Worn alignment plate, usually due to the device rubbing on alignment plate walls
 - Worn handler alignment pin holes (contact Johnstech for bushings to reduce wear on the contactor)

CAUTION: Please use special care while inspecting. The elastomer and contact slots are fragile and excessive force can fracture the slot walls.

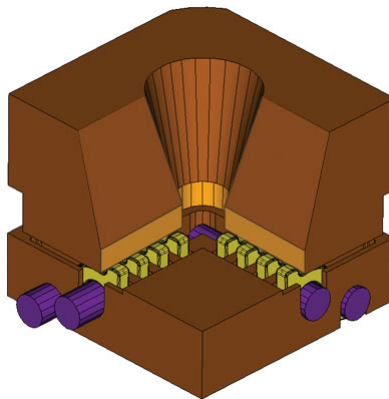
2. If you notice significant wear or cracking in the contactor housing, please contact Johnstech's Applications Engineering Department.

NOTE: Refer to page 6 for a description of recommended tools. Johnstech offers a complete Maintenance & Inspection Kit that provides you with all recommended tools.

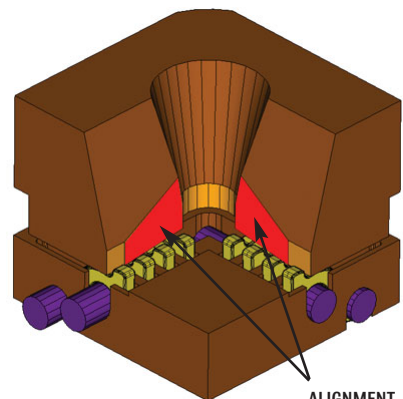
Pad Series 2mm Methodology Model



Correct Alignment Plate



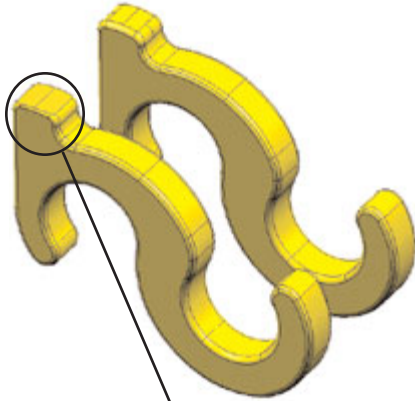
Worn Alignment Plate



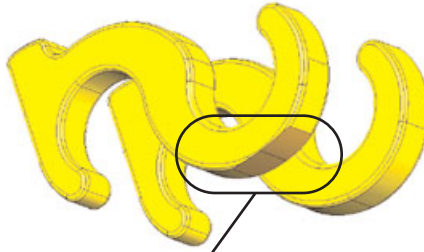
THE ALIGNMENT PLATE IS WORN FROM THE DEVICE RUBBING ON THE ALIGNMENT PLATE WALL. THIS WEAR CAUSES MISALIGNMENT OF THE DEVICE PADS AND CONTACTS AND CAN LEAD TO OPENS.

Contactors Inspection

Worn Peripheral Contacts

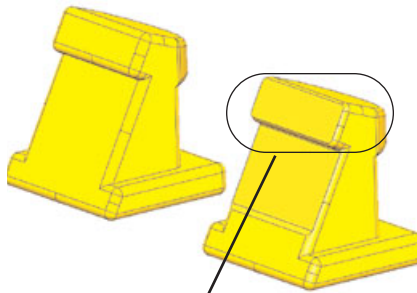


THE DEVICE SIDE OF THIS CONTACT IS WORN AND SHOULD BE REPLACED

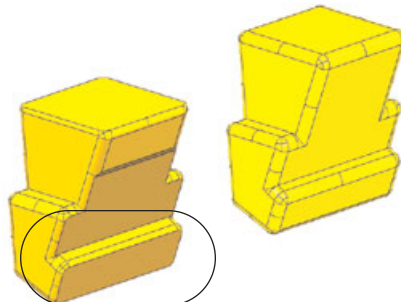


THE LOAD BOARD SIDE OF THIS CONTACT IS WORN AND SHOULD BE REPLACED

Worn Center Body Contacts



THE INSIDE OF THE CENTER BODY CONTACT ASSEMBLY IS WORN AND SHOULD BE REPLACED



THE INSIDE OF THE CENTER BODY CONTACT ASSEMBLY IS WORN AND SHOULD BE REPLACED

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Contact Inspection

Check for wear on the device side of the contact. Gouging of the device pads or misalignment of the scrub marks on the device pad indicate worn contacts that should be replaced.

Check for wear on the load board side of the contacts. Strong witness marks on the load board pads indicate worn contacts that should be replaced.

Center Body Contact Inspection

The Center Body Contact (CBC) will wear over time. Replace the CBC if it appears loose within the housing, if the electrical signal from the ground is weak, or if performance varies significantly.

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Correct Elastomer Installation

Ensure that the elastomers are not bunching in the elastomer slot. Bunching indicates that the elastomer is too long for the slot. Bunching keeps the contacts from sitting properly in the contactor; this affects contact motion, the alignment of the device, and accuracy of the test.

To avoid elastomer bunching, ensure that the elastomer is the correct size and run the Elastomer Tool gently across the elastomer so that it is smooth in the slot.

Signs of Visible Compression

When a compression set on the elastomer is visible, measure the interface components to ensure that compression set does not exceed the application's maximum allowable value based upon the specified deflection values. This value may vary depending upon the specific design and application requirements. In general, compression set on elastomers should not exceed 0.05mm (0.002in).

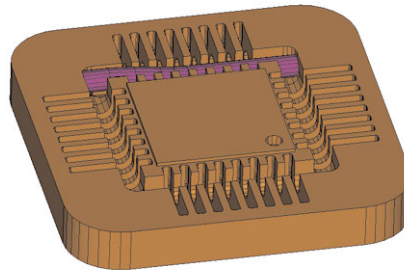
Cuts or Tears

Check for cuts or tears in the elastomer. If you see cuts or tears, replace the elastomer immediately.

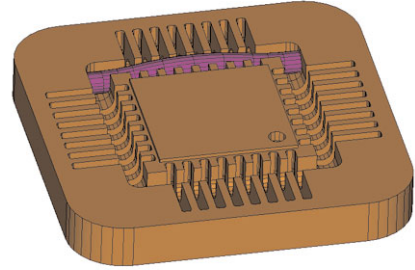
If elastomers are cut or have an excessive compression set, they must be replaced. Frequent elastomer replacement (<50,000 - 100,000 insertions) may be an indication of excessive overtravel. If this is occurring, please contact Johnstech's Applications Engineering Department for assistance.

Elastomer Installation

Elastomer Bunching at One End



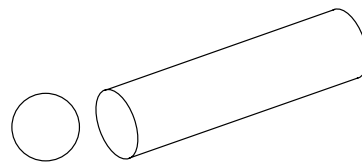
Elastomer Bunching in the Middle



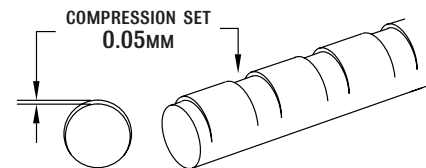
IN BOTH PICTURES, THE ELASTOMER IS TOO LONG. ELASTOMER BUNCHING CAUSES THE CONTACT TO SIT INCORRECTLY IN THE SLOT; THIS AFFECTS CONTACT MOTION, DEVICE ALIGNMENT, AND TEST ACCURACY.

Signs of Visible Compression

ACCEPTABLE:
NO COMPRESSION VISIBLE IN THE ELASTOMER



REPLACE:
EXCESSIVE COMPRESSION SET IN THE ELASTOMER



Cuts or Tears

ACCEPTABLE:
NO CUTS OR TEARS IN THE ELASTOMER



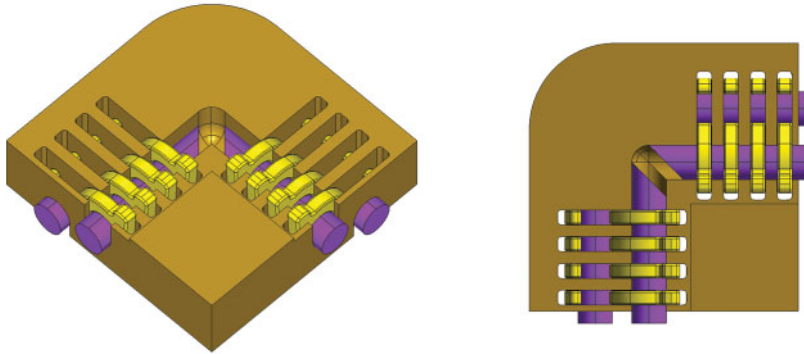
REPLACE:
CUTS OR TEARS VISIBLE IN THE ELASTOMER



Elastomer Installation

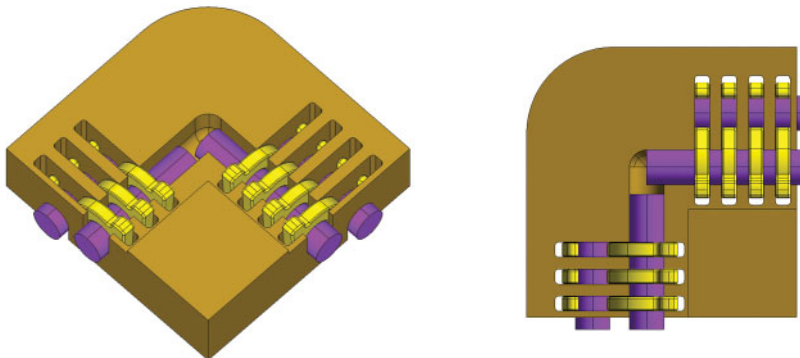
Pad Series 2mm

Elastomer Installation at a Symmetrical Corner



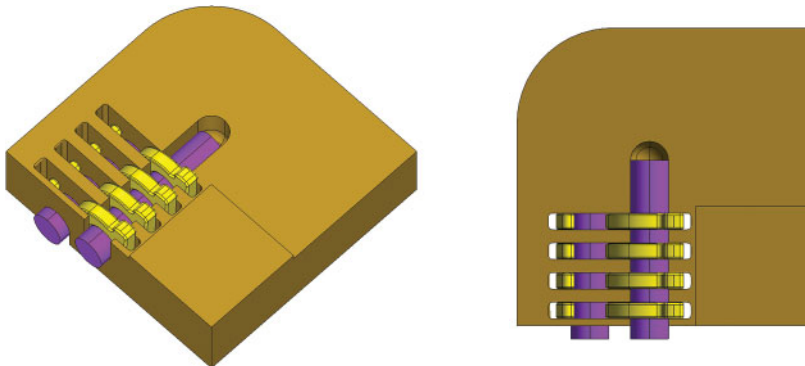
TO INSTALL AN ELASTOMER AT AN ANGLE WHERE THE END CONTACTS ARE THE SAME DISTANCE FROM THE CORNER, CUT THE ELASTOMER AT A 45° ANGLE. THE ENDS OF THE ELASTOMERS SHOULD NOT TOUCH. THIS GIVES THE ELASTOMER ROOM TO EXPAND WHEN COMPRESSED.

Elastomer Installation at a Non-Symmetrical Corner



WHEN ONE ROW OF CONTACTS IS CLOSER TO THE CORNER THAN THE OTHER ROW OF CONTACTS, EXTEND THE ELASTOMER ALMOST TO THE CORNER OF THE ROW CLOSEST TO THE CORNER. THE ENDS OF THE ELASTOMERS SHOULD NOT TOUCH. THIS GIVES THE ELASTOMER ROOM TO EXPAND WHEN COMPRESSED.

Elastomer Installation in a Single Row



IN A STRAIGHT ROW OF CONTACTS, ENSURE THAT THE ELASTOMER REACHES TO THE END OF THE SLOT.

Elastomer Installation at a Symmetrical Corner

1. To install an elastomer at an angle where the end contacts are the same distance from the corner, cut the elastomer at a 45° angle.
2. The ends of the elastomers should not touch in the elastomer slot; this gives the elastomer room to expand when compressed.

Elastomer Installation at a Non-Symmetrical Corner

1. To install an elastomer at an angle when one row of contacts is closer to the corner than the other, cut the elastomer straight across the elastomer.
2. First install the elastomer in the row where the contacts are closest to the corner, then install the other row.
3. Ensure that there is room in the elastomer slot so that the elastomer can expand when compressed.

Elastomer Installation in a Single Row

1. To install an elastomer in a single row of contacts, cut the elastomer straight across the elastomer.
2. Ensure that there is room in the elastomer slot so that the elastomer can expand when compressed.

CAUTION: Avoid stretching the elastomer, as this could lead to fatigue and a shortened life cycle for the elastomer.

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Elastomer Replacement

Device Side Elastomer Replacement

1. Leave the contactor mounted to the load board and remove the alignment plate.

NOTE: Refer to your Johnstech data sheet to ensure proper elastomer combination and location.

2. Use Johnstech's Elastomer Tool #500365-002, or a non-metallic tweezers to gently unhook and move the contacts away from the device side elastomer, FIGURE 1.
3. With all the contacts in the row rolled back, carefully remove the existing elastomer, FIGURE 2.

CAUTION: Avoid stretching the elastomer, as this could lead to fatigue and a shortened life cycle for the elastomer.

4. Use dry, clean compressed air to blow away debris.
5. Beginning at one end of the slot, tuck the elastomer into the slot. Work down the slot, tucking in the elastomer with the Johnstech Elastomer Tool, FIGURE 3.
6. When the elastomer is almost completely in the elastomer slot, cut the elastomer as close to the end of the slot as possible. Do not cut the elastomer so it is too long and hangs out of the slot, see page 13.
7. Use the elastomer tool or a similar nonmetallic tool to move the contact gently over the device side elastomer, FIGURE 4.

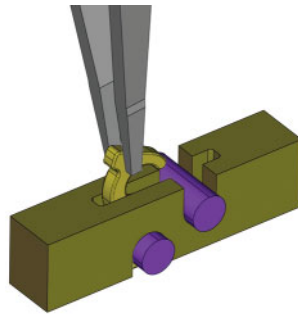


FIGURE 1 USING A NON-METALLIC TWEEZERS, UNHOOK AND MOVE THE CONTACTS AWAY FROM THE DEVICE SIDE ELASTOMER.

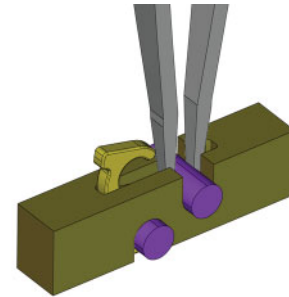


FIGURE 2 CAREFULLY REMOVE THE EXISTING ELASTOMER.

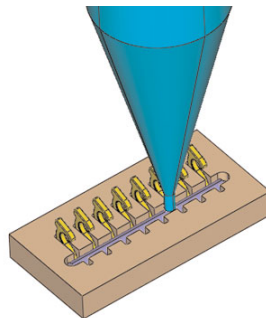


FIGURE 3 TUCK THE NEW ELASTOMER INTO THE SLOT WITH THE ELASTOMER TOOL.

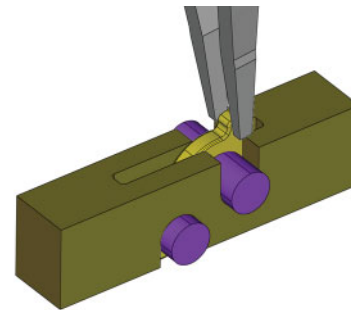


FIGURE 4 MOVE THE CONTACT GENTLY OVER THE DEVICE SIDE ELASTOMER.

Elastomer Replacement

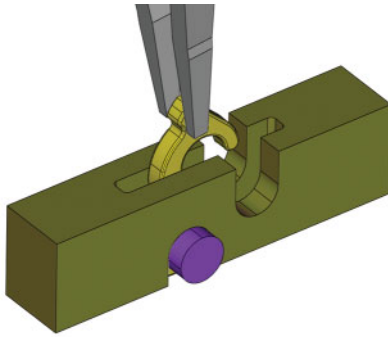


FIGURE 1 REMOVE THE CONTACTS USING A NON-METALLIC TWEEZERS.

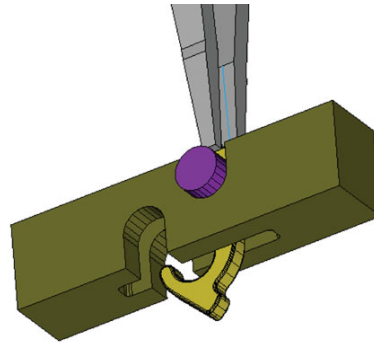


FIGURE 2

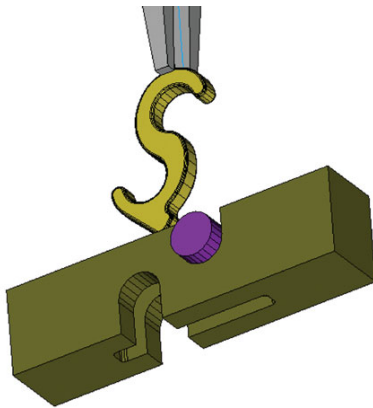


FIGURE 3

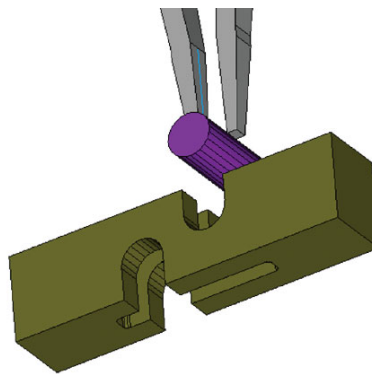


FIGURE 4 REMOVE THE LOAD BOARD SIDE ELASTOMER USING A NON-METALLIC TWEEZERS.

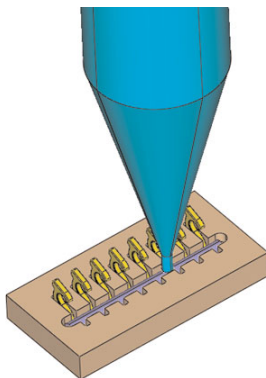


FIGURE 5 TUCK THE ELASTOMER INTO THE SLOT. CUT THE ELASTOMER TO FIT INTO THE SLOT.

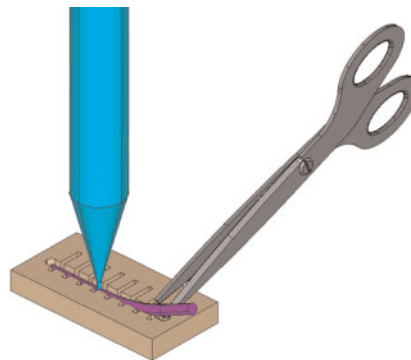


FIGURE 6 CUT THE ELASTOMER TO FIT INTO THE SLOT.

Pad Series 2mm

Load Board Side Elastomer Replacement

1. Remove the contactor from the load board and remove the alignment plate.
2. Use dry, clean compressed air to blow away debris.
3. Remove all contacts, following the procedure on page 14, FIGURES 1-3.
4. Use the Johnstech Elastomer Tool or a non-metallic tweezers to carefully remove the existing elastomer, FIGURE 4.

CAUTION: Avoid stretching the elastomer, as this could lead to fatigue and a shortened life cycle for the elastomer.

5. Use dry, clean compressed air to blow away debris.
6. Beginning at one end of the slot, tuck the elastomer into the slot. Work down the slot, tucking in the elastomer with the Johnstech Elastomer Tool, FIGURE 5.
7. When the elastomer is almost completely in the elastomer slot, cut the elastomer as close to the end of the slot as possible. Do not cut the elastomer so it is too long and hangs out of the slot, FIGURE 6.
8. Replace the contacts, following the instructions on page 15.

NOTE: Refer to page 6 for a description of recommended tools. Johnstech offers a complete Maintenance & Inspection Kit that provides you with all recommended tools.

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Contact Replacement

Contact Removal

1. Remove the contactor from the load board.
2. Remove the alignment plate from the contactor.
3. Using the Johnstech Elastomer Tool #500365-0002 or a nonmetallic tweezers, gently unhook and move the contacts away from the device side elastomer, FIGURE 1.
4. Remove the device side elastomer, FIGURE 2.
5. Remove the contact from the slot with non-metallic tipped tweezers, FIGURE 3.
6. Remove the remaining contacts.

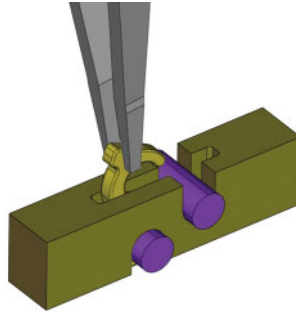


FIGURE 1 USING A NON-METALLIC TWEEZERS, UNHOOK AND PULL THE CONTACT BACK FROM THE ELASTOMER.

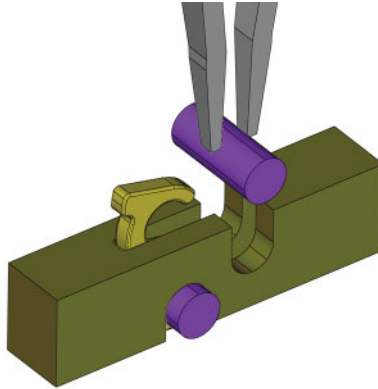


FIGURE 2 REMOVE THE DEVICE SIDE ELASTOMER.

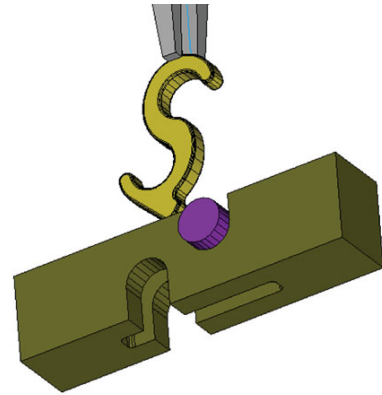


FIGURE 3 PULL THE CONTACT OUT OF THE CONTACTOR USING A NON-METALLIC TWEEZERS.

Contact Replacement

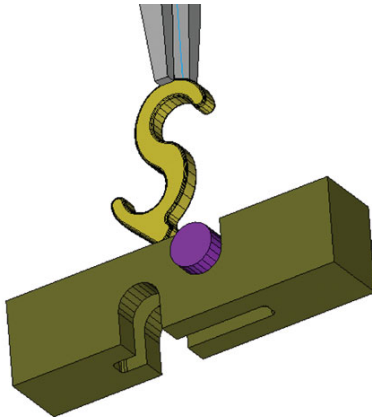


FIGURE 1 INSERT THE CONTACT INTO THE SLOT USING A NON-METALLIC TWEEZERS.

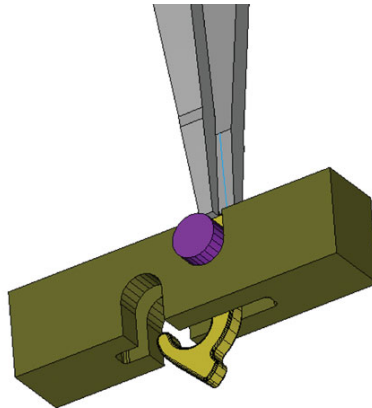


FIGURE 2 SLIDE THE LOAD BOARD SIDE OF THE CONTACT OVER THE LOAD BOARD SIDE ELASTOMER USING A NON-METALLIC TWEEZERS.

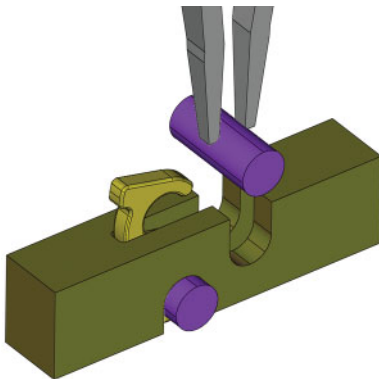


FIGURE 3 INSTALL THE DEVICE SIDE ELASTOMER.

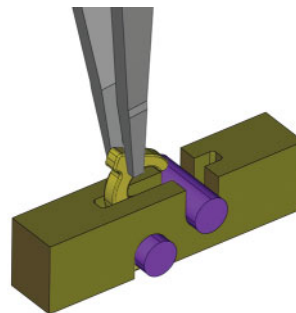


FIGURE 4 MOVE THE CONTACT OVER THE DEVICE SIDE ELASTOMER USING A NON-METALLIC TWEEZERS; PRESS UP ON THE LOAD BOARD SIDE OF THE CONTACT TO AVOID DAMAGING THE ELASTOMER.

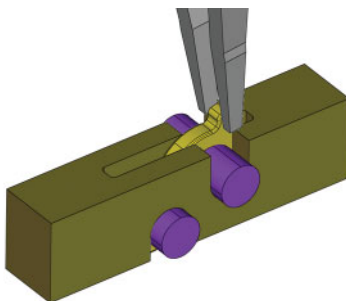


FIGURE 5

Pad Series 2mm

Contact Replacement

1. To replace the contacts, reverse the process; begin by replacing the load board side elastomer, see page 13.
2. Using non-metallic tipped tweezers, place the contact in the slot, FIGURE 1.
3. Slide the load board side of the contact over the load board side elastomer, FIGURE 2.
4. Install the device side elastomer, FIGURE 3. Reference page 11 for the elastomer installation section in this document.
5. Use the Johnstech Elastomer Tool #500365-0002 or a nonmetallic tweezers, move the contact gently over the device side elastomer, FIGURE 4-5.

CAUTION: Press up on the load board side of the contact to avoid damaging the elastomer.

6. Install the remaining contacts.

NOTE: Refer to page 6 for a description of recommended tools. Johnstech offers a complete Maintenance & Inspection Kit that provides you with all recommended tools.

Pad Series 2mm

Insert Replacement

Insert Removal

When handling the inserts, cover fingers with finger cots to avoid contaminating the inserts.

1. With a covered finger or the elastomer tool, push down on one of the two sides of the insert that has the extra tab on the DUT side of the contactor to remove it from the housing,

FIGURE 1.

Tip: To find the extra tab in the housing, look at the housing under a microscope, FIGURE 2.

2. The insert will easily snap out of the housing.

Removing the Insert

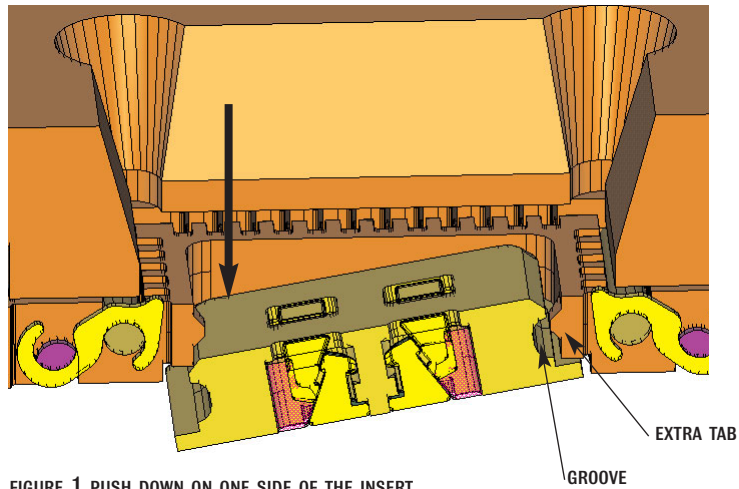


FIGURE 1 PUSH DOWN ON ONE SIDE OF THE INSERT THAT HAS AN EXTRA TAB IN THE HOUSING.

Insert Replacement

Orientation Markings

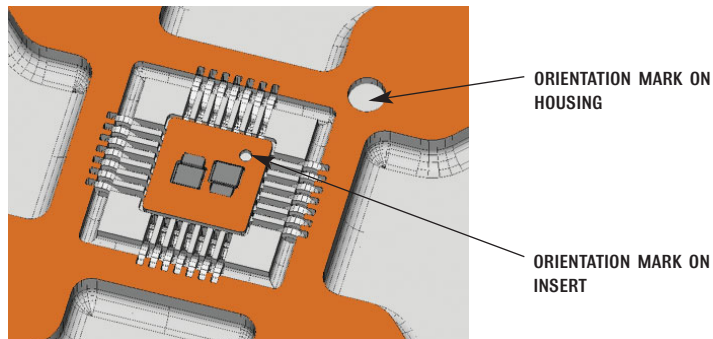


FIGURE 1 VIEW FROM THE LOAD BOARD SIDE OF THE CONTACTOR.

Contactor Components

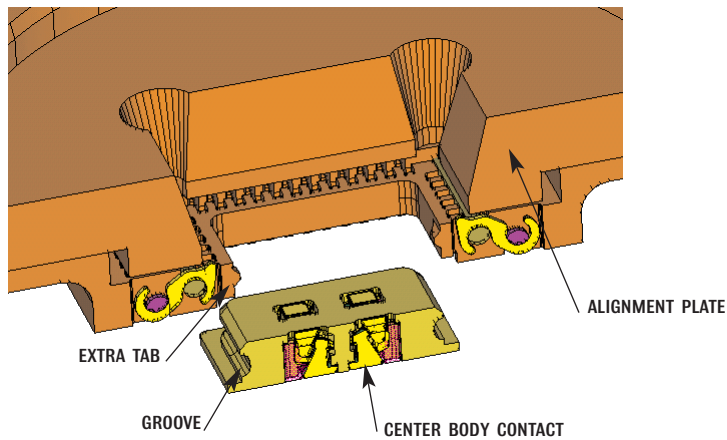


FIGURE 2

Replacing an Insert

FIRST, MATCH THE EXTRA TAB WITH THE GROOVE.

SECOND, PUSH THE INSERT INTO PLACE.

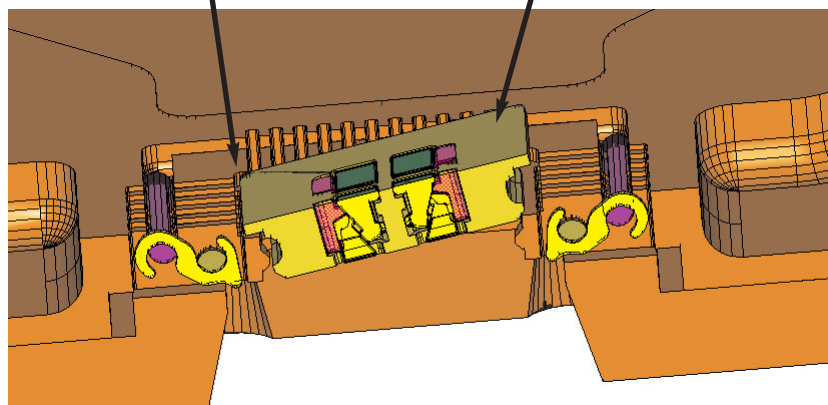


FIGURE 3

Pad Series 2mm

Insert Replacement

All inserts are designed to snap into the housing from the load board side of the contactor. When handling the inserts, cover fingers with finger cots to avoid contaminating the inserts.

1. Line up the white orientation marks on the load board side of the insert and on the load board side of the contactor housing; the marks must align for the insert to function correctly both mechanically and electrically, FIGURE 1.
2. Take note of the extra tab inside of the insert hole in the contactor housing, FIGURE 2.
3. Place one side of the insert against the extra tab in the housing.
4. The sides of the inserts have a groove in them to hold them in the housing; the groove in the insert matches the extra tab in the contactor housing.
5. With a covered finger, push the opposite side of the insert into place; you will hear a "snap" sound when the insert is completely in the housing, FIGURE 3.

CAUTION: If excessive pressure is required, the insert orientation is not correct; remove the insert and check the orientation.

CAUTION: The housing and/or the insert can break if all four sides of the insert are pushed into the housing at the same time.

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Center Body Contact Replacement

Center Body Contact (CBC) Removal

Lay the contactor with the load board side up on a flat surface. If removing CBCs from an insert, put the insert into the housing first. This makes disassembly much easier, as the housing is easier to hold and maneuver. Use a microscope, if at all possible, when doing this disassembly.

1. With the insert in the housing and looking through a microscope from the load board side of the housing, pull the elastomer straight out of the housing with tweezers, FIGURE 1.

Note: *Removing the elastomer damages it beyond use; if you remove the elastomer after the assembly is completed, discard the elastomer and re-assemble with a new one.*

2. Remove the contacts one at a time from the housing with non-metallic tweezers.

Removing the Elastomer

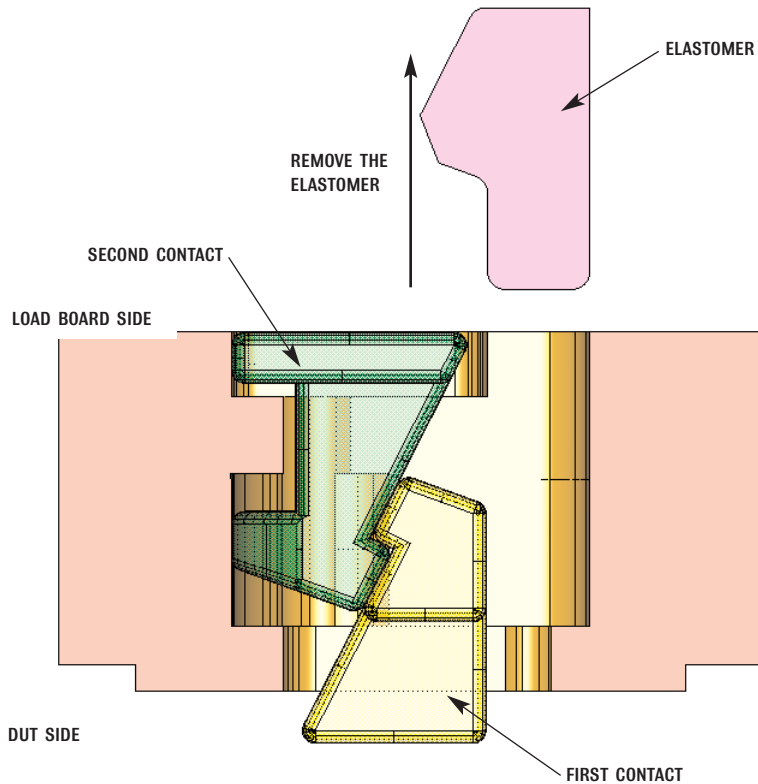


FIGURE 1

Center Body Contact Replacement

Pad Series 2mm

Center Body Contact Replacement

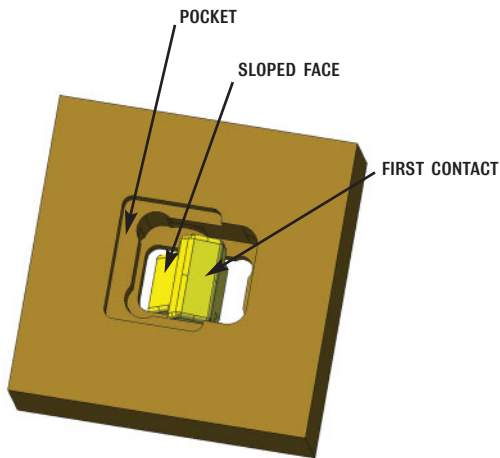


FIGURE 1 THE FIRST CONTACT PROPERLY SITS IN THE INSERT OR HOUSING.

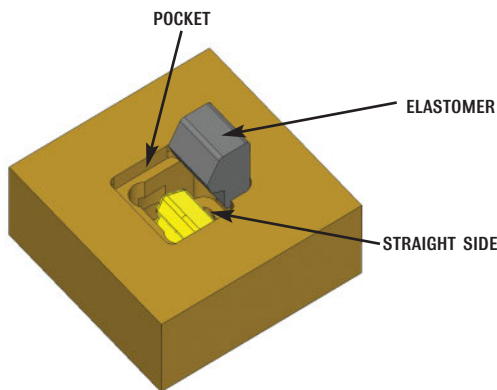


FIGURE 2 INSERT THE ELASTOMER WITH THE THIN END ON THE STRAIGHT SIDE OF THE CONTACT.

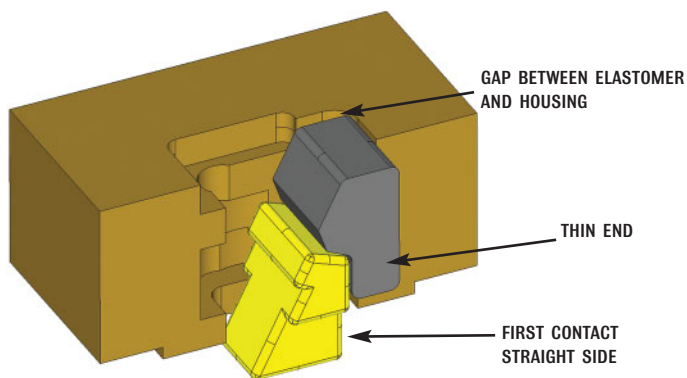


FIGURE 3 THE ELASTOMER IS BETWEEN THE CONTACT AND HOUSING, FLUSH WITH THE HOUSING.

Replacing the Center Body Contact

All components are installed from the load board side of either the contactor or insert (depending on the contactor configuration). The components must be installed in the correct order and orientation to achieve the desired functionality and get optimal life from the assembly.

1. With the insert in the contactor, lay the DUT side of the contactor on a flat surface.

NOTE: To avoid damaging the contacts and elastomers, only handle the components with non-metallic tweezers.

2. Install the first contact by positioning the contact so that the sloped side faces a pocket in the bottom of the insert, FIGURE 1.

Tip: To pick up the contact, position the contact sloped side down on a flat surface. Pick up the wide end of the contact with tweezers. Move the contact over the opening, allowing the contact to rotate 90° into position.

3. Install the elastomer on the straight side of the first contact; the thin end fits between the contact and the insert, or contactor housing wall, and the wider portion rests on the first contact, FIGURES 2 AND 3.

Tip: When properly installed, the elastomer sits flush with the load board side of the housing.

4. Make sure there are gaps between the elastomer and the wall of the insert or contactor housing; the gaps provide the necessary room for the elastomer to expand as the contact is compressed during testing.

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- Install the second contact by compressing the first contact into the elastomer with tweezers.

CAUTION: *The first contact must be seated against the elastomer to avoid pushing directly on the contact, which could break the insert or housing,* FIGURE 4.

- Put the second contact in position over the first contact.

Tip: Lay the contact sloped side down on a flat surface. Pick the wide end of the contact up with tweezers. Position the contact over the pocket and allow the contact to rotate 45° into position, FIGURES 5-8.

- Apply force to the second contact to slide the contact nose past the first contact with the flat edge of the tweezers; the force required to slide the second contact into position is less than 2 kg.

Tip: If excessive force is required and the second contact will not slide into position, remove the second contact and re-position the first contact against the elastomer and try again.

- With all of the components in place, flip the contactor over so the load board side is down, as it would be in the mounted state.

- Holding the contactor firmly down on a flat surface, exercise the CBC assembly with a Johnstech Elastomer Tool or other non-abrasive tool to ensure that the contact is fully compliant and returns to the expected free height position of 1.60 ± 0.05 mm from the mounting surface.

- Completely assemble each CBC assembly before assembling the next CBC to prevent losing components.

Center Body Contact Replacement

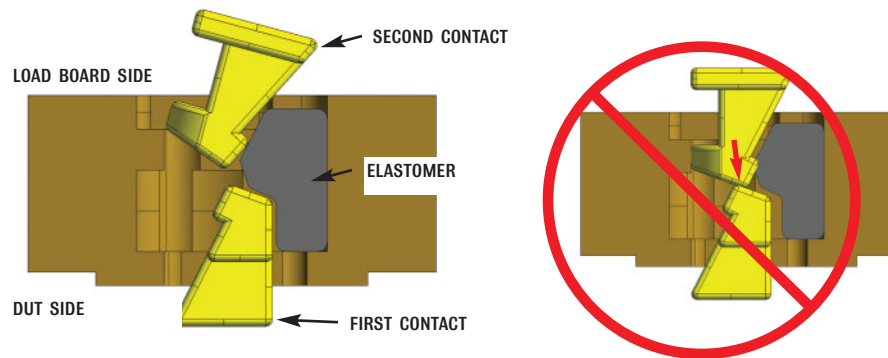


FIGURE 4 SLIDE THE SECOND CONTACT PAST THE FIRST; AVOID PUSHING THE SECOND CONTACT ON THE FIRST CONTACT.

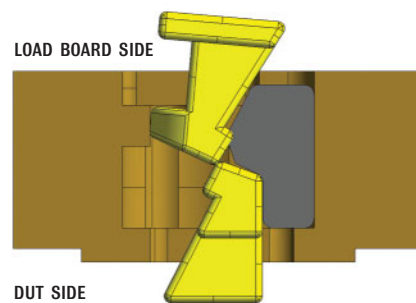


FIGURE 5 MOVE THE SECOND CONTACT PAST THE FIRST CONTACT.

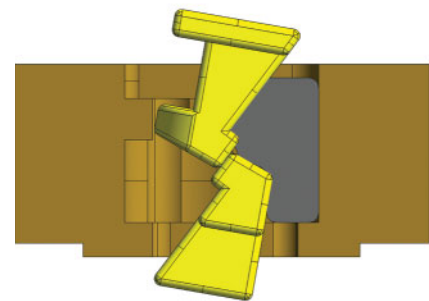


FIGURE 6 THE FIRST CONTACT PUSHES AGAINST THE ELASTOMER AS THE SECOND CONTACT SLIDES DOWN.

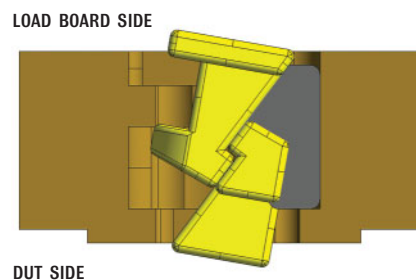


FIGURE 7 THE SECOND CONTACT SLIDES INTO PLACE.

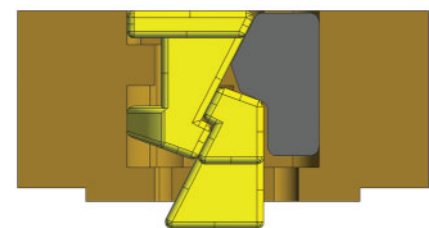
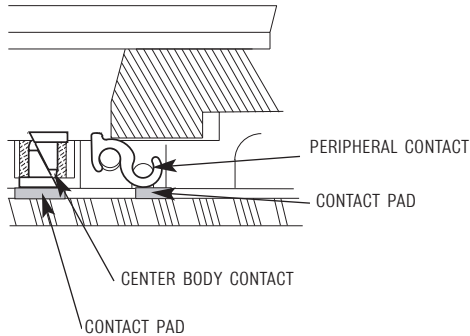


FIGURE 8 THE ASSEMBLED CENTER BODY CONTACT.

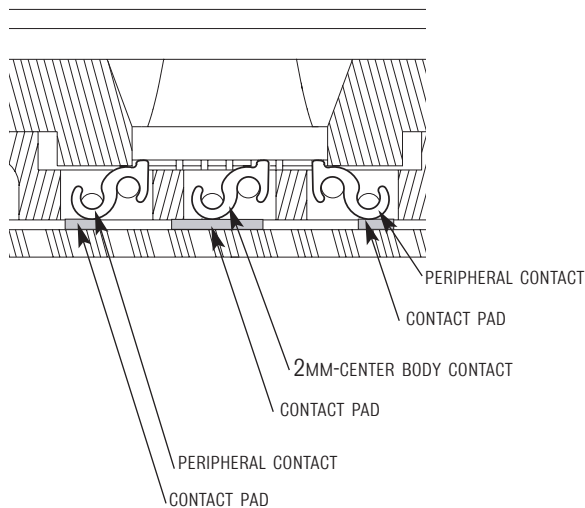
Load Board Inspection

Pad Series 2mm

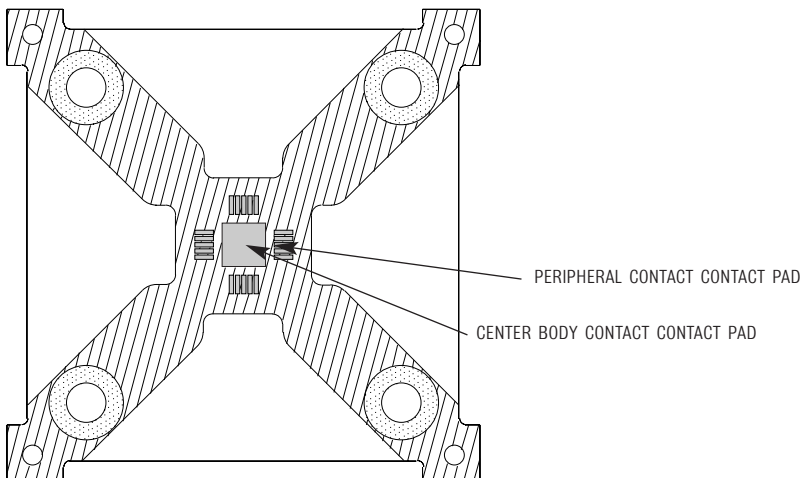
Center Body Contact for Device Body Sizes 3x3 and Larger



Center Body Contact for 4x4 through 10x10 mm Device Body Size



Load Board View (20 pin MLF shown)



Load Board Inspection

Inspect the load board and clean, per manufacturer's recommendations.

- Examine the contact land pad pattern for signs of premature wear on the gold.
- A board with visible signs of nickel showing on the contact land pad pattern should be thoroughly inspected before returning it to service. It is acceptable to utilize the nickel surface during testing; however, continued wear that extends deeper than the nickel surface can cause damage to the contacts and elastomers, as well as cause signal degradation.
- Load boards with wear that extends deeper than the nickel surface should be replaced.

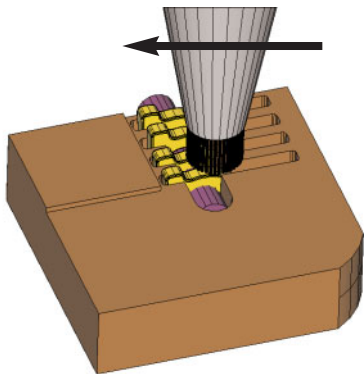
NOTE: Excessive load board wear can be caused by excessive nest overtravel.

- Ensure that no debris is present in the contactor-to-load board interface area. If necessary, use compressed air and a clean lint-free cloth to carefully wipe clean the bottom of the contactor and the surface of the load board before remounting the contactor to the load board.
- For more detailed information regarding load board interface requirements, please refer to Johnstech International Lit 1009, "Contactor Load Board Interface Application Note."

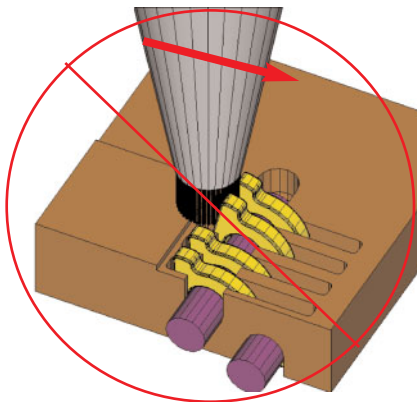
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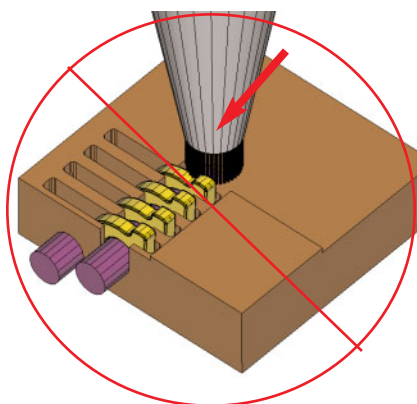
Correct Brushing Direction



INCORRECT Brushing Direction



INCORRECT Brushing Direction



Cleaning Schedule

To maintain proper operation and ensure long life, Johnstech contactors require regularly scheduled cleaning according to the maintenance and cleaning schedule you have established. Please refer to the Maintenance and Cleaning Frequency Section on pages 6-7 to determine the best schedule for your test floor.

Automated Handler Cleaning

The handler needs to be inspected and cleaned per manufacturer's recommendations.

Solder Oxide Buildup

The rotating wipe action of the contacts is designed to greatly reduce the amount of solder oxide buildup; however, some buildup may become visible on the device side contact tips over time. While some solder oxide buildup is normal, it is advisable to try to remove the oxidation that accompanies the solder. If the contact has a significant amount of solder buildup, please check all components of the testing process to be sure that everything is properly aligned and contact compression is within specification.

CAUTION: Johnstech does not endorse any method for full removal of solder buildup from the contacts. Attempts to fully remove the solder can cause damage to the contacts that can adversely affect operation of the contactor and/or possibly create degradation in signal quality.

Light Cleaning

Brush the contacts on the device side from the outside, or load board elastomer side, inward. Johnstech recommends using a telescopic nylon brush that will not scratch the contacts. With the contactor mounted to the load board and the alignment plate removed, extend the bristles of the brush approximately 3-6mm. Lightly brush over just the tips of the contacts. Only brush the contacts from the outside-in. After brushing, blow the contactor free of debris with clean, dry air.

CAUTION: Brushing in the wrong direction can cause the contacts to become unhooked from the elastomer or cause possible damage to elastomers and contact slots in the housing. Brushing the contacts too hard or with a brush that is too stiff can result in damage to the elastomers, contactor housing, and the gold plating on the contacts. If you suspect any of these occurrences, inspect and take the appropriate actions before proceeding any further with this cleaning procedure.

Cleaning with Compressed Air

Use dry, clean compressed air to blow free any loose debris that may be on the contactor. If any debris or foreign matter still remains, use an ultrasonic cleaner. If no loose debris remains on the contactor, the contactor may be remounted to the load board.

Thorough Cleaning

If necessary, clean the contactor assembly in an ultrasonic cleaner (500 W. max power).

1. Fully immerse the contactor and alignment plate into an ultrasonic cleaner bath of diluted isopropyl, or denatured alcohol (70/30 alcohol/water), or a heated (50° C max) mild acidic (7.0 > ph > 3.0) solution. The ultrasonic tank should have a catch basket to prevent the contactor from touching the tank bottom where it can contact settled debris.
2. Turn the ultrasonic cleaner on for a 10-minute cycle. Remove the contactor assembly from the bath after cleaning. Rinse the contactor in a deionized water bath after cleaning in either the alcohol or mild acidic bath.

NOTE: Freon or petroleum based solvents will leave a residue, which can cause resistance problems, and may swell the contactor elastomers. Water based cleaning may also swell the elastomers. To evaporate the solvent, place the contactor in a 100°C (212°F) controlled environment for approximately 1 hour for water based solvents, or 15 minutes for freon or petroleum based solvents.

3. To ensure dryness, carefully pat the parts with a lint-free cloth. Re-inspect the contactor and alignment plate for debris, damage, or excess moisture. Remove any moisture or debris with an air source free of moisture and oil, such as nitrogen. Do not exceed 40 psi. Oxidation may occur if any moisture is left remaining on the contacts.

NOTE: Always follow the manufacturer's recommendations and instructions regarding the proper operation of your ultrasonic cleaner.

WARNING:

- **Always use protective eye wear when using compressed air and cleaning solvents.**
- **All cleaning procedures should be performed in a well-ventilated area. The use of an exhaust hood during the cleaning process is required.**
- **Always wear lint free gloves when cleaning and handling.**

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