

Aerospace Operations 40-60 Delaware St. Sidney, NY 13838-1395		<b>CONTACTS</b>	Part No. PR-301 CONTACTS
Quality Approval: NEUBERGER Revision: 03/04/2015	Quality Standards CONTACT MACHINING & ASSEMBLY		Issue No. 003  PAGE 1 of 9

This Quality Standard applies to all contacts with regard to machining of the contact (Section 1) and assembly of contacts (Section 2.)

Contacts should be free of all machine and tool marks that violate dimensions and/or surface finish as per the machining and/or plated level drawing.

Parts shall be inspected under **3x** magnification. Use of 10x magnification may only be used to confirm a suspected defect previously viewed at 3x.

### **SECTION 1: Contact Machining**

Setup and scrap pieces:

- Must be segregated from good parts.
- Must be placed into the red scrap bins at each workstation.
- The scrap bins must be emptied into the red scrap barrels at the end of each shift.
- Bad setup pieces should be well marked with red Dykem to indicate they need to be separate from good parts.
- Setup pieces are sometimes shared between processes within a department (first turn to second turn, for example), but they must be removed from the order before it leaves the department.

#### **Surface Finish**

Unless otherwise specified, unplated machined contact surfaces shall have a maximum surface finish of 63 microinches.

#### **Machine Finish Defects**

Machine finish defects that do not violate surface finish requirements and/or print dimensions will be acceptable.

#### **Burrs**

Burrs are acceptable provided that they are firmly attached and do not impair the proper function of the end product.

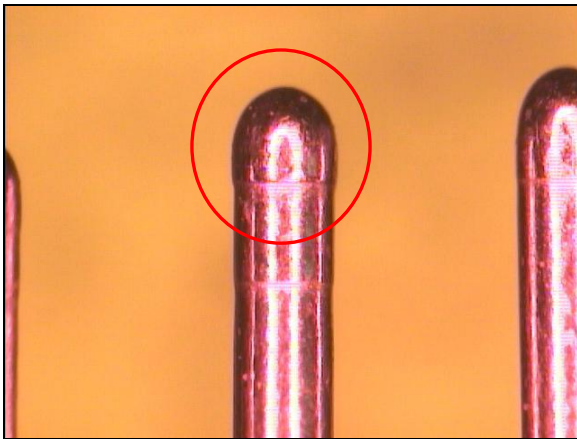
Burrs are not acceptable:

- If not firmly attached and can be removed with light pressure from a finger or a pick
- If they cause a feature to violate print dimensions
- If they will impair or prevent the proper function of the part at subsequent levels of manufacture

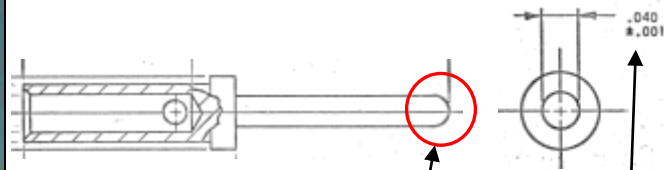
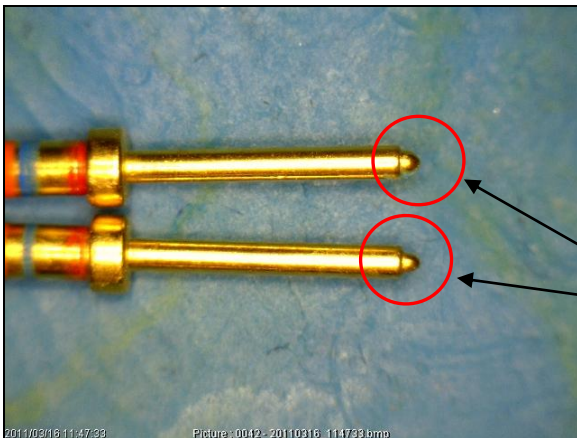
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## Machine Finish Defects

Examples of machine finish defects and acceptability/rejectability are shown on the following pages. Some examples show plated and/or assembled contacts.



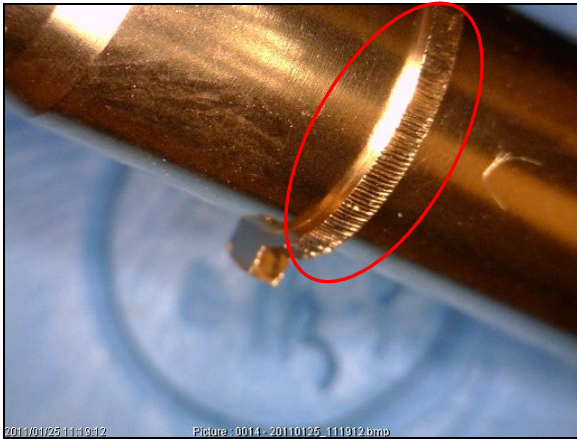
**Figure 1: Rejectable** *Bulb at tip of contact violates print dimension for the feature diameter.*



Note the reduction in diameter at the tip of the pin in Fig. 2 relative to profile and dimension of the pin from the engineering drawing clips shown above.

**Figure 2: Rejectable** *Malformed tip of contact mating pin violates print dimensions for the feature diameter*

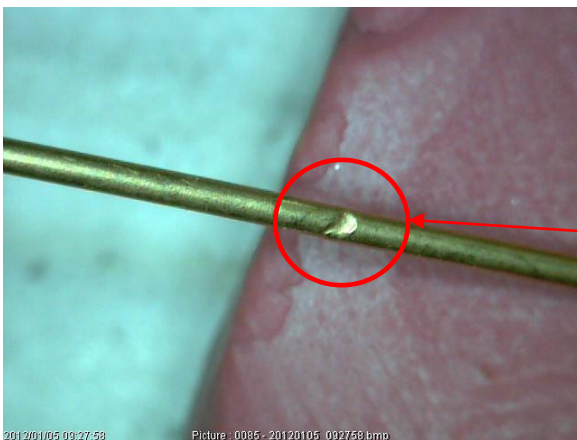
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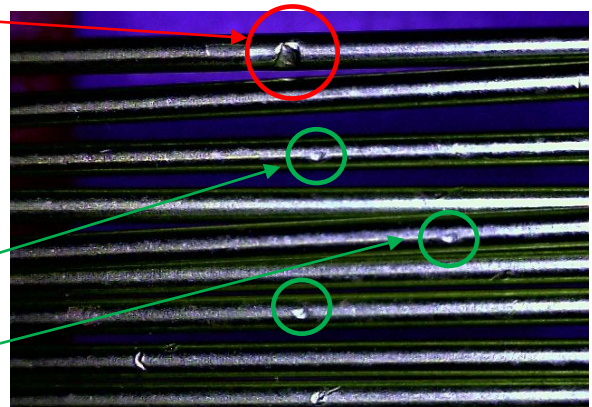
**Figure 3: Rejectable** Rough machining on the contact retention shoulder violates print dimensions for the feature as well as the surface finish.



**Figure 4: Rejectable** Crimp well diameter violates print dimensions for the feature in the reduced diameter area.

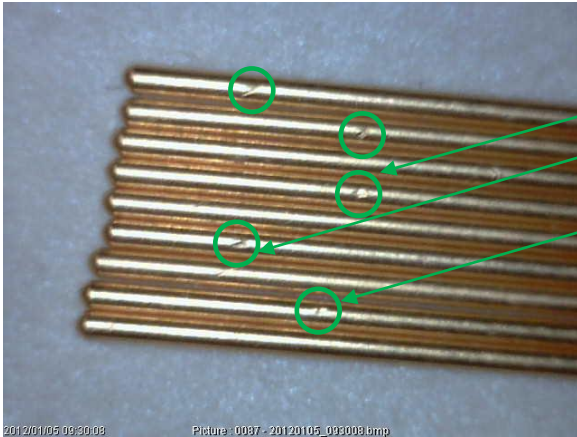


Note the much larger size of the defect below in red versus those in the green in the picture below.

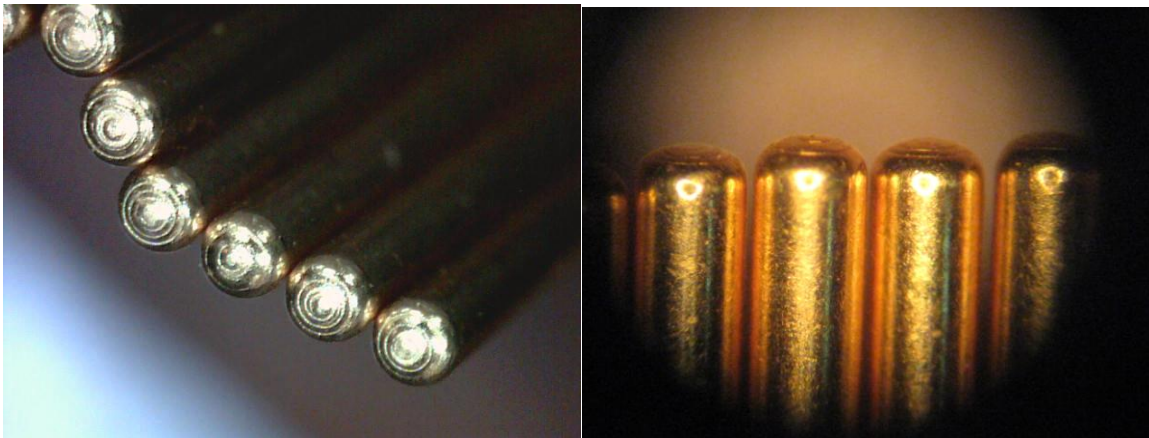


**Figure 5: Rejectable** Damage to contact violates print dimensions

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**Figure 6: Acceptable** Nicks in contact are minor and do not violate print dimensions or compromise functionality.



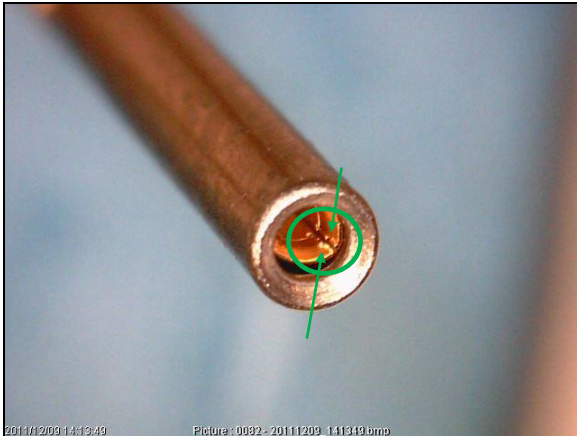
**Figure 7a & 7b: Acceptable** Swirl tool marks shown in Fig7a (profile view in 7b) do not violate print dimensions or compromise functionality of the part. Magnification of Fig7b is approximately 60X to actual size.

### Burrs/Chips

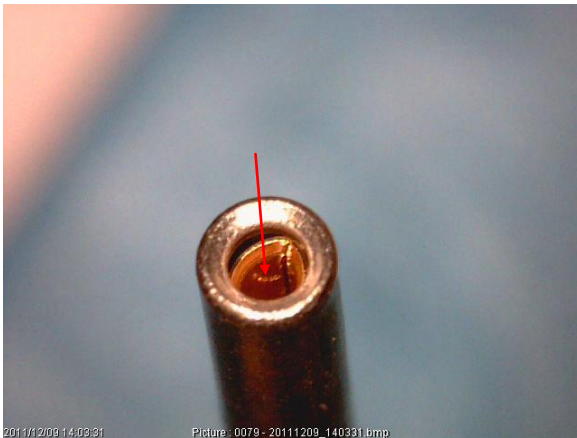
Examples of burrs/chips and acceptability/rejectability. Some examples below show plated and/or assembled contacts.



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**Figure 8:** Acceptable Slot burrs at the top of the socket tine; burrs less than .003” and in a non-functional area.



**Figure 9:** Rejectable Plated over FOD or chip from machining located in functional area of socket.



**Figure 10:** Rejectable Plated over chip from machining blocking functional inner diameter of the contact

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## SECTION 2: Contact Assembly

1. Orient and assemble a hood over the socket tine end of the contact and firmly seat it against the shoulder stop on the contact. Illustration 1 shows a properly assembled and seated hood with no gap prior to crimping.

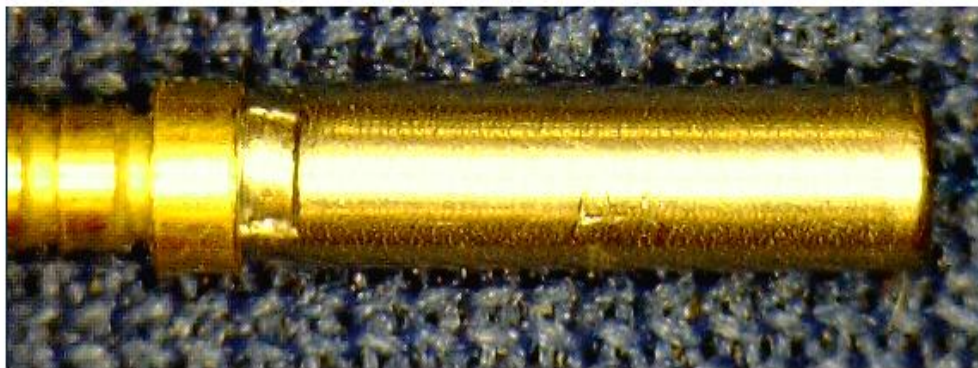


2. Place the assemble hood and contact, hood end first, into the crimping machine. Put a finger over the end of the contact to hold it downward against the stop rod at the bottom of the indenters, and cycle the crimper only once.
3. Remove the contact from the crimping machine. Refer to illustration 2 and perform a visual check to verify the following:
  - a. The crimp indents are properly positioned. The end of the hood must be securely formed into the recess at the shoulder of the contact
  - b. The plating on the shoulder of the contact must not be mutilated or disturbed.
  - c. The end of the hood butts against the shoulder of the contact.
  - d. The hood is not crooked.
  - e. The hood is tightly crimped and must not spin (rotate)
  - f. The hood must not “click” when pushed and pulled on the contact.

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### Illustration 2

The hood is tightly crimped, it will not "click" or spin, the crimp indents are properly placed, the end of the hood is formed into the recess above the shoulder stop on the contact, the plating on the contact shoulder is not mutilated or damaged, and the hood is straight.



4. Perform the required engagement and separation force check using specified gage pins and force test gages. Forces must meet requirements as specified. If forces meet requirements, proceed to assemble and crimp the hoods, and perform the required In Process Checks at intervals as specified. If forces do not meet requirements, check the forces of a contact prior to crimping the hood. If this contact meets the requirements, proceed to crimp a hood onto it and proceed to step 5.
5. Check the engagement and separation forces on this contact. If the forces meet requirements, proceed to assemble and crimp hoods, and perform the required In Process Checks as specified. If forces do not meet specified requirements, The crimp indenter stroke may be adjusted too tight. Adjust the stop screw as necessary to vary the indenter stroke until the hood is tightly crimped and the engagement/separation forces meet requirements.



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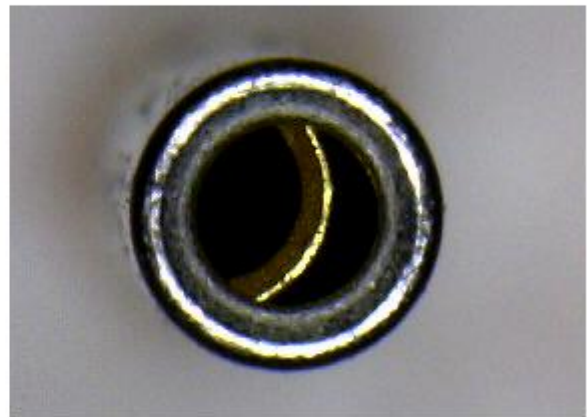
## Crooked Hoods

Refer to illustration 3. Crooked hoods are usually caused by the hood not being properly / fully seated against the shoulder of the contact, or the contact not being held against the stop rod in the crimping machine during the crimping cycle. If not seated against the shoulder of the contact, the hood opening will not be concentric with the socket tines. A visual check of the mating end (using magnification) will show socket tines are not centered in the hood opening (as shown in illustration 4).

**Illustration 3  
Crooked Hoods**



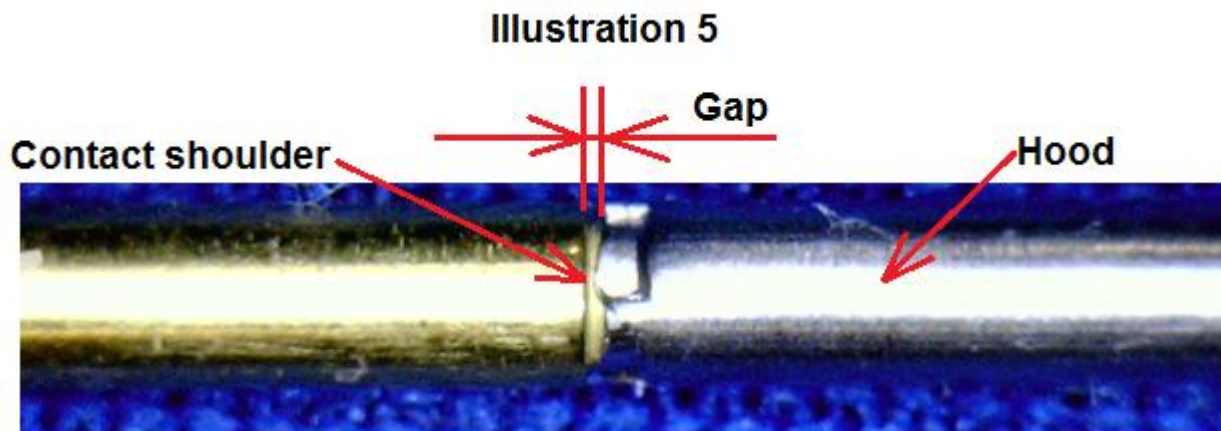
**Illustration 4  
Mating end view. Socket tines  
not centered in hood, caused by  
hood not seated/crooked hood.**





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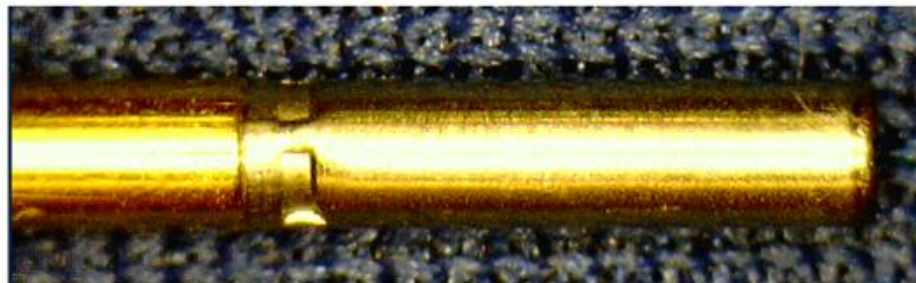
Illustration 5 shows an unacceptable gap between the hood and the shoulder of the contact.



The hood must seat against the shoulder.

Illustration 6 shows improperly placed crimp indents. This is usually caused by the stop rod being positioned too low in the crimping machine, or starting the crimp cycle before the contact is seated against the stop rod of the crimping machine.

**Illustration 6**  
**Crimp indents are too far from contact shoulder**



**Crimp indents properly positioned**

