STANDARD FIELD SERVICE BULLETIN

FSB Number	CHRAEFSB2018-3
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Date	01/12/2018
Subject	Moto X4 - Front Camera Focus Performance
Model Affected	XT1900-1-7 (All Models)
Level Of Repairs	Level 2

Problem:

Motorola is aware of a potential customer experience issue on the Moto X4 product related to the Front Facing Camera. Some users reported experiencing an issue where images captured with the Front Camera, at certain distances, appeared to be out-of-focus.

From a product design perspective, the Front Camera focus is tuned at a range of 40cm-60cm with an optimal focus performance set around a distance of 60cm. This distance is chosen to provide the best experience to users taking "Selfies" both with and without the aid of "Selfie Stick" accessories. Thus, at shorter distances, the focus performance is expected to degrade but still maintain a minimum performance level.

Upon reviewing customer devices, two main concerns were raised:
1. Devices exhibiting poor focus performance when taking pictures at normal distance range (40cm-60cm).
2. Devices exhibiting severely out-of-focus images when taking pictures at shorter distances (20cm-40cm).

Any device confirmed to exhibit one of these two issues, using the provided Focus Test Procedure below, can be considered as problematic. Evaluation of problematic devices determined that although all individual components in the system were with-in specifications, the z-axis stack-up of the system as a whole may position the camera too close to the lens, resulting in a shift in focus range.

Solution:

Short-Term:

- A revision was made to the Rear Housing Assembly (P/N: 5S58C09xxx & SS58C19xxx) to add additional space for the Front Camera. Rear Housings Assemblies with this change can be identified with markings Rev B and later. See image below.
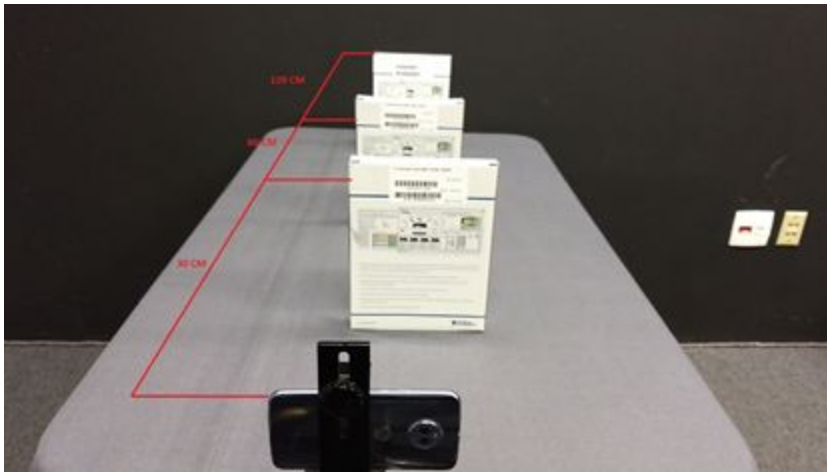

Figure 1.0 – Rear Housing Assembly Rev Marking

- Global Service/Repair Team can use the detailed **Focus Test Procedure** below to confirm suspected problematic devices.

Focus Test Procedure

1. Setup a scene as follows:

The objects used on the scene could be different as long as they provide the following elements on it:
·   Text
·   Barcode
·   Images with borders

On the following link it is possible to find an image with those elements. This one

could be printed to be used on this setup.

The device shall be framed in order to have the objects on its Field-Of-View as shown on the image below:

To help on achieving such framing, please activate **Assistive grid** functionality on the camera´s menu and place the content of the scene on the center grid as seen above.

2. With this approach, take 3 shots. One at 30 centimeters, one at 60 centimeters and one at 120 centimeters.
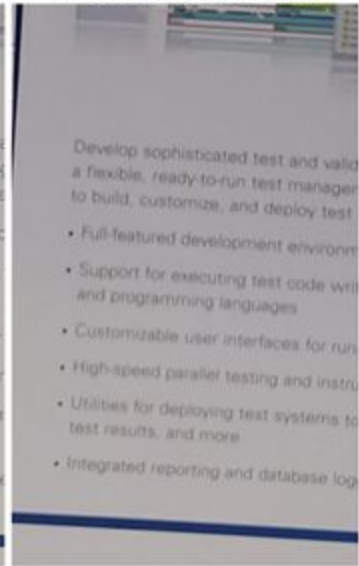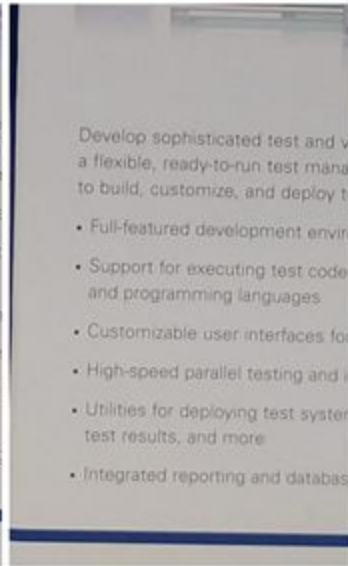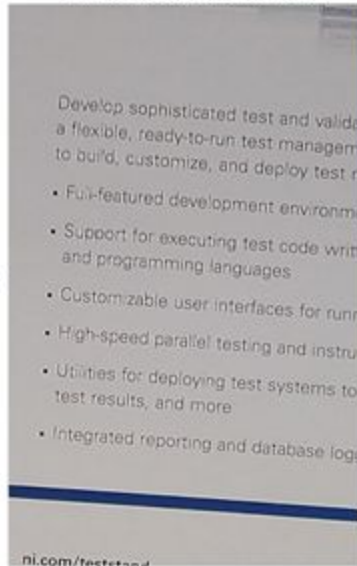
An example of the acquired images is shown below.

Consider each image and distance and use the table shown below to identify an undesired behavior.
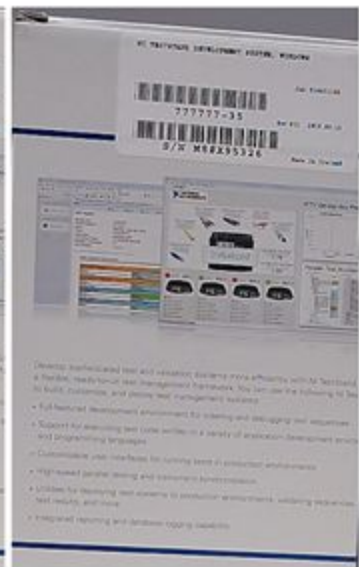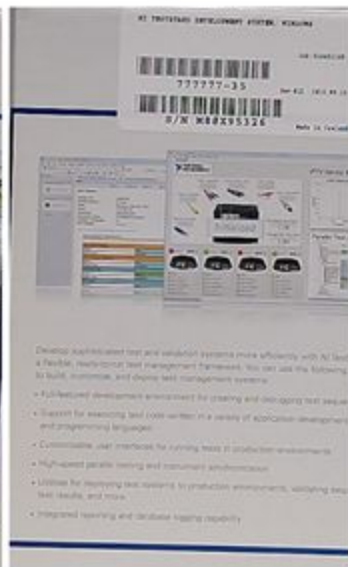
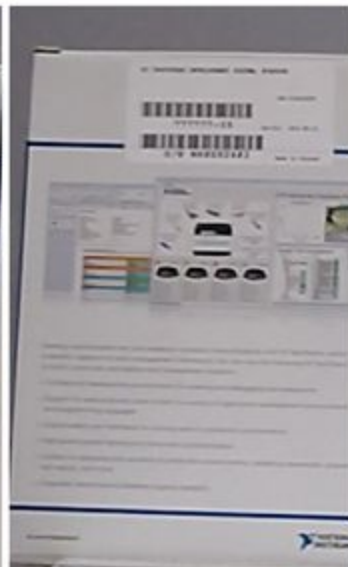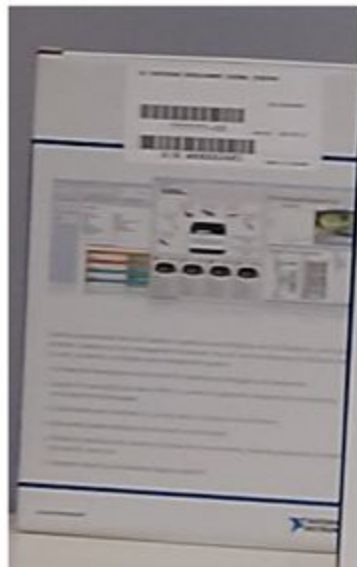| Undesired Behavior (Decreasing Sharpness Perception)	Expected Behavior	Undesired Behavior (Increasing Sharpness Perception)

30 CM

60 CM

120 CM

3. If the resulting photos show a behavior similar to example images labeled as **UNDESIRED** above, consider this device to be problematic and should be repaired.

4. If the resulting photos show a behavior matching examples labeled as **EXPECTED** above, then consider this device as good and educate consumer that device is working as intended.

Long-Term:
- Motorola is evaluating a software change to further improve the focus performance of the Front Camera when taking pictures at shorter distances (20cm-40cm). Once finalized, this change will be made available to consumer devices in later Software Releases via OTA Update.

Field Service Action:

When servicing Moto X4 consumer returns, regardless of complaint, then:
1. Execute the **Focus Test Procedure** specified in the **Short Term** solution section above to confirm if the device has a functional issue or not.
   a. If the captured photos show a behavior similar to example images labeled as **UNDESIRED BEHAVIOR** above, then consider this device to be problematic and should be repaired as directed below.
      i. Following Service Manual, carefully disassemble the device and remove PCBA from Rear Housing Assembly (P/N: 5S58C09xxx & SS58C19xxx).
      ii. Inspect the Rev Marking on the Rear Housing Assembly (P/N: 5S58C09xxx & SS58C19xxx). If marking is Rev A, then replace Rear Housing Assembly (P/N: 5S58C09xxx & SS58C19xxx) with Rev B or later. Reference **Figure 1.0** above.
      iii. Replace Front Camera Assembly (P/N: SC28C21776 & 9401405900x).
      iv. Following Service Manual, carefully reassemble the device and perform the **Focus Test Procedure** specified in the **Short Term** solution section above to ensure issue is resolved.
   b. If the resulting photos show a behavior matching examples labeled as **EXPECTED** above, then consider this device as good and educate consumer that device is working as intended.

Service Inventory:

Stock inventory of the following parts to support this bulletin:
- Rear Housing Assembly (P/N: 5S58C09xxx & SS58C19xxx) Rev B or later
- Front Camera Assembly (P/N: SC28C21776 & 9401405900x)

Call Center Action:

When responding to Moto X4 users reporting an issue with poor focus performance on the Front Camera, then:
1. Follow normal troubleshooting steps including removing any 3rd Party Cases/ Liners/Accessories and cleaning the camera lens surface.
2. If normal troubleshooting cannot resolve the issue, then assist the user with returning their Moto X4 device to a Service Center to be evaluated, per this bulletin.

Service Entry Code:

Global M-Claims Codes:

Customer Complaint Code: C0004 - Camera Problem

Problem Found Code: P0007 - Camera

REF Designator Code: RD014 - Imager/Camera

Repair Code: R0013 - REPL LVL 2 Part CSB

Note:
Only apply the designated Service Entry Codes, listed in this bulletin, if the unit fails a test or has a customer complaint that matches the issue described in the bulletin
If the unit fails a test or has a customer complaint that does not match the issue described in the bulletin, the Service Entry Codes used should accurately reflect the true problem found
If the unit passes all tests and inspections and does not have a related customer complaint, the Service Entry Code used should be NFF