

OVERVIEW

This service alert is intended to allow field personnel to test the XEM gap sub for basic operating integrity using the XEM gap sub tester and a multi-meter. The steps outlined below are the same as those done by R&M to determine the functionality of the XEM gap sub. This service alert does not cover other aspects of gap sub maintenance procedures, such as examining the threads, checking for wash, examining the LCP, etc.

Any excessive damage to the interior of the walls of the XEM gap sub will result in the requirement to replace the XEM gap sub, as the walls can't be repaired. Very small pitting is allowed, however it must be monitored by Extreme's Repair and Maintenance team. The Landing Key can't appear to be excessively eroded. Regarding 8" and 10" XEM gap subs, these should have O-rings installed prior to deployment, and the O-ring glands should be inspected for damage. The 4.75" and 6.5" XEM gap subs should also be inspected in the same area where the O-rings on the DPG would line-up.

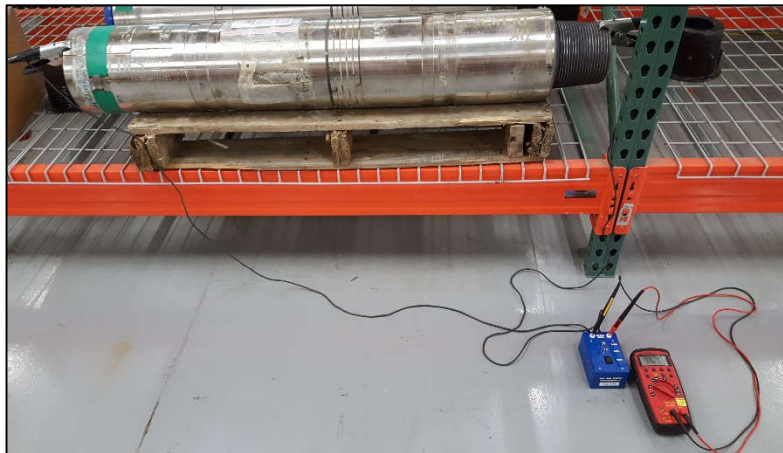
NECESSARY ACTIONS

Field Operator

- Follow the steps outlined below to determine the operating integrity of the XEM gap sub at any point above surface.
- Ensure the test is conducted on a dry, clean XEM gap sub. **Never use a power washer to clean the XEM gap sub.**

NOTES

Using the Gap Sub Tester, ensure that the top and the bottom ends of the Gap Sub are electrically isolated via the LCP material injected between them. This requires a Ω and VAC test.



The overall setup for the test should look something like the setup to the left. Make sure the XEM gap sub is dry and isolated from itself (e.g. not on metal)

When testing ohms (Ω). Make sure your multi-meter is set properly.



When testing Voltage Alternating Current (VAC). Make sure your multi-meter is set properly.



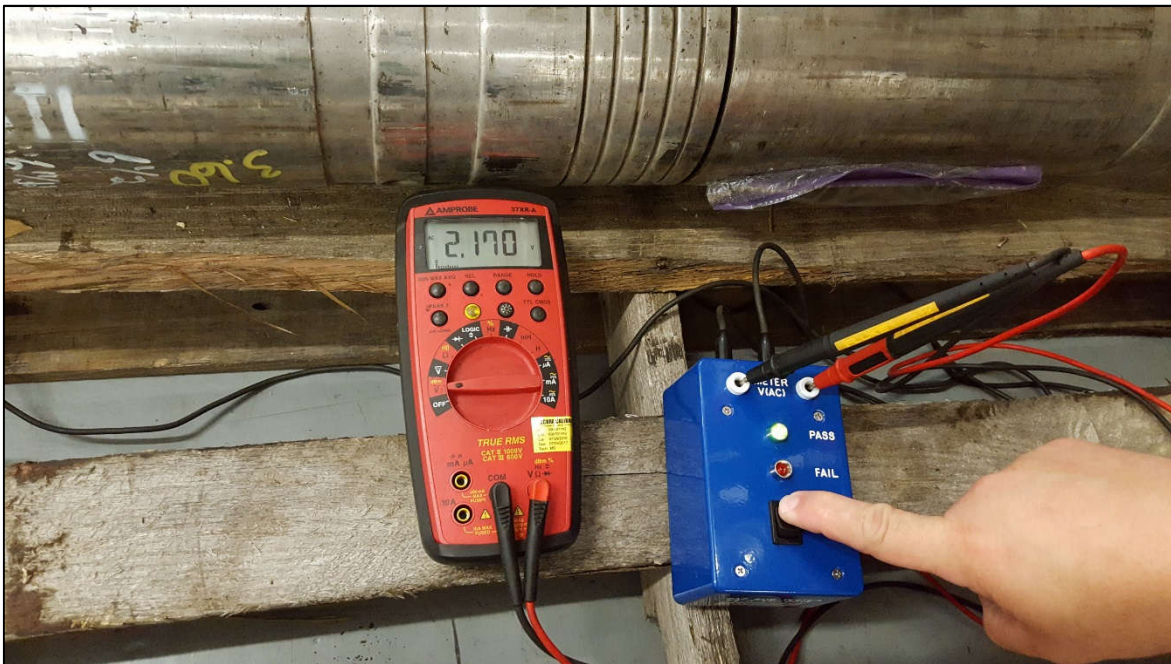
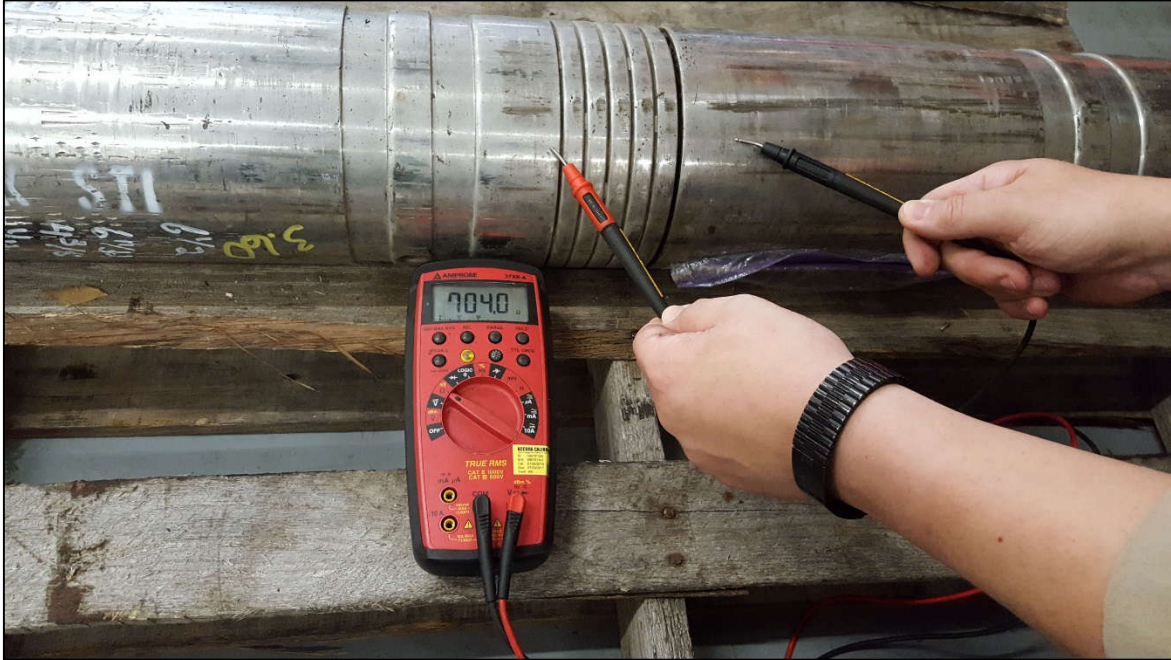
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1. If more than 3 k Ω , and 4.0 VAC, approved for all jobs, but ideal for Oil Based Mud.



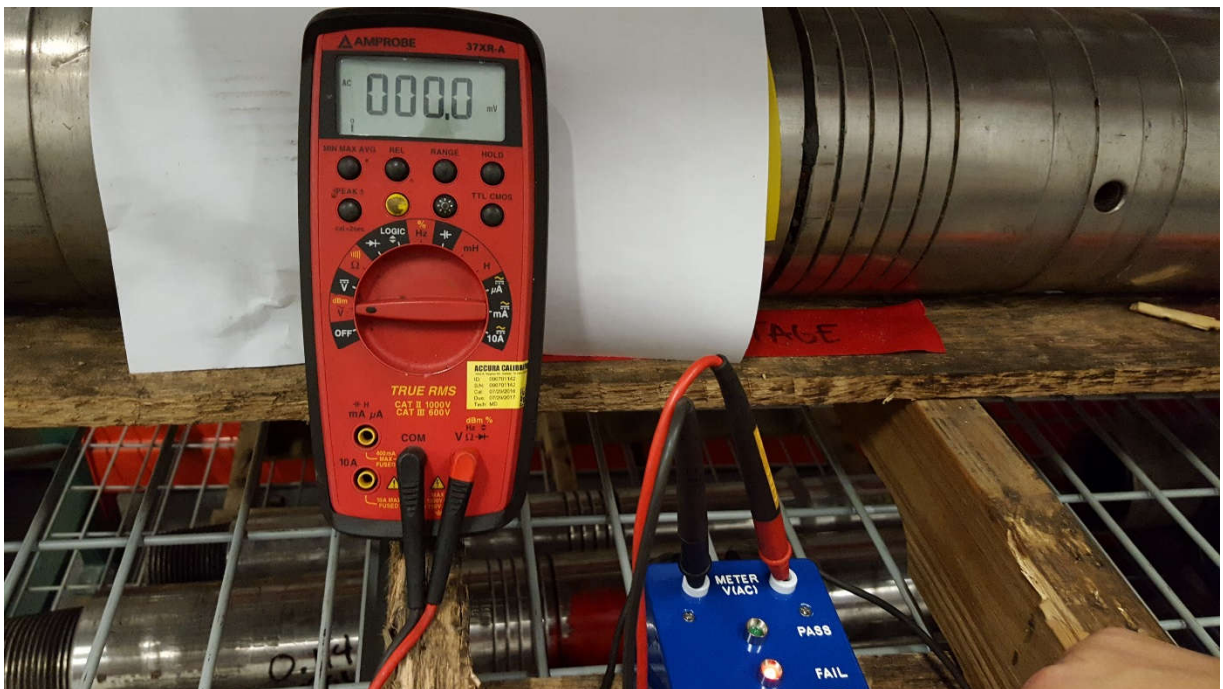
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2. If more than 60 Ω , and 0.5 VAC, approved for Water Based Mud Only.



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3. If less than $60\ \Omega$, and less than 0.5 VAC, further analysis by Extreme Repair and Maintenance team required.



4. If the results of the Electrical Resistance Test don't fall within aforementioned range, contact the Command Center at 1-888-693-0247 or ExtremeCommandCenter@Extremeeng.com