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SENTRYX™ SOFTWARE ENABLED SUPER CENTURION® INSTALLATION INSTRUCTIONS

PRIOR-TO FIELD WORK

- Access to the Sentryx website is required to complete this installation. If you do not have a user account or cannot log in, please contact your site administrator. [Alerts from the Sentryx platform will be provided for (a) coverage strength feedback in the "Field Work" section and (b) "success" in Section 36. In order to receive alerts, you need to create a Sentryx account (with current email address and cell number provided), select email and/or text alerts, and bring an electronic device to receive these alerts into the field.]

FIELD WORK

For Retrofit Kit

- Signal Strength:
 - Prior to disassembly of installed hydrant, confirm cell coverage at site of installation.
 - Hold the new bonnet near the same height and location of installation.
 - Place the commissioning tool close to the bonnet, approximately 1/4" away, above "M" on the seal plate flange, while keeping away from iron parts. (Reference to the right).
 - Move the commissioning tool up along the curve of the bonnet keeping it approximately 1/4" away from the surface. This action will cause the bonnet to awaken and search for a connection.
 - o If the bonnet does not establish a connection (i.e. no Sentryx alert is provided within 5 minutes), select a different location.
 - Once a connection is established, the Sentryx platform will send out an email and/or text message (Depending on initial configuration) displaying the signal strength. See Appendix A.
 - o If message indicates a weak signal, select a different location.
 - o If message indicates a strong signal, proceed through instructions below.

⚠ CAUTION

COMPLY WITH ALL REQUIRED INDUSTRY, SITE, STATE, AND FEDERAL SAFETY REQUIREMENTS

DO NOT DROP NEW HYDRANT LOWER STEM OR NEW BONNET ASSEMBLY. DAMAGE MAY OCCUR.

THE ANTENNA ON THE STEM CAN BE DAMAGED BY A FORCEFUL IMPACT FROM A SEAT WRENCH – UTILIZE CARE.

SENTRYX SOFTWARE ENABLED SUPER CENTURION IS DESIGNED TO WORK WITH MUELLER OEM PARTS ONLY.

AVOID BACKFILLING OVER EXPOSED BONNET AS DAMAGE TO PAINT MAY OCCUR



Note: Caution: Changes or modifications not expressly approved by Mueller Systems, LLC could void the user's authority to operate the equipment. This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

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For complete Sentryx software enabled Super Centurion
It is just as important to confirm the location's signal strength prior to installing a complete Sentryx software enabled Super Centurion. However, the bonnet will already be installed on the hydrant. Please reference the Mueller Cellular Signal Strength guide (F14334) for suggestions on how this can be accomplished.

HYDRANT FLUSHING

- Depending on the location of the hydrant, conditions of piping, hydrant lateral, etc. prior to de-pressurization it is recommended to flush the hydrant until water is clear prior to the insertion of Sentryx software enabled Super Centurion parts.

DE-PRESSURIZATION OF HYDRANT



WARNING

DO NOT REMOVE ANY BOLT(S) HOLDING THE HYDRANT TOGETHER BEFORE THE HYDRANT IS DE-PRESSURIZED.

DISASSEMBLY OF HYDRANT WITH PRESSURIZED WATER ACTING AGAINST THE MAIN VALVE COULD RESULT IN EJECTION OF HYDRANT PARTS AND DEBRIS, HIGH-PRESSURE WATER STREAM, OR OTHER DANGEROUS CONDITIONS THAT COULD CAUSE SERIOUS BODILY INJURY OR DEATH.

FOLLOW ALL COMPANY POLICIES AND OSHA REQUIREMENTS FOR LOCK-OUT/TAG OUT TO ENSURE THE HYDRANT IS DE-PRESSURIZED BEFORE DISASSEMBLY AND DOES NOT INADVERTENTLY GET RE-PRESSURIZED.

1. Before removing any bolt(s) holding hydrant together, shut off the appropriate gate or isolation valve(s) to isolate hydrant from main water source.
2. Loosen – BUT DO NOT REMOVE – one nozzle cap two turns and check for water under pressure inside the hydrant – bleed off any pressure, then remove the nozzle cap completely.
3. Open hydrant main valve completely.
4. A continuous flow of water, no matter how slight, indicates hydrant is not properly isolated from the main water supply. This issue must be corrected before any hydrant disassembly can proceed, i.e. the water to the hydrant MUST be stopped.

EQUIPMENT & TOOLS NEEDED:

PPE:

- Hard hat
- Safety shoes
- Safety vest
- Safety glasses
- Work gloves

Tool:

- A-367 brass sleeve
- A-311 operating wrench
- A-359 seat wrench*
- 1/4" hex-key wrench
- 5/16" hex-key wrench
- Commissioning tools
- Dianna 2100 Grease
- Mueller hydrant lubricating oil
- Thred Gard® Anti-Seize

***Review the Seat Wrench Operating Manual (F14285) for more seat ring removal information.**

INSTRUCTIONS FOR SENTRYX SOFTWARE ENABLED SUPER CENTURION:

The following instructions apply to the installation of the Sentryx software enabled Retrofit Kit. For the complete hydrant, install the same way as a Super Centurion Fire Hydrant (Reference AWWA M17). Once installation is complete, follow steps 37-40 below.

CAUTION

MUELLER CO. RECOMMENDS FOLLOWING AWWA M-17 MANUAL FOR INSTALLATION, FIELD TESTING AND MAINTENANCE OF FIRE HYDRANTS.

1. Confirm the hydrant is de-pressurized as described above.
2. Place the hydrant in the closed position.
3. Remove hold-down nut (Turn opposite of the opening direction), anti-friction washer and operating nut from bonnet.



4. Lubricate outside of brass sleeve and slide over threaded stem end to prevent o-ring damage.
5. Remove bolts (8) from bonnet and remove bonnet. remove brass sleeve.



6. Remove o-ring from upper barrel. Slide slotted end of A-359 over top of stem and engage the pin in upper stem. Turn "T" head tightening wrench against stem*.



7. Pull up on seat wrench to be sure the main valve is completely closed. [The main valve must be closed or the upper valve plate will be damaged]. Lower support arm onto top flange of the upper barrel and tighten thumb screw to hold the main valve in the closed position.
8. Unfasten main valve assembly by turning seat wrench counter-clockwise.
9. Disengage seat wrench from upper stem.
10. Pull up and remove upper & lower stem, main valve assembly and seat ring from hydrant barrel as a unit.



***Review the Seat Wrench Operating Manual (F14285) for more seat ring removal information.**

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11. Unscrew lower valve nut and remove.



12. Remove lock washer, stem seal, lower valve plate, main valve, seat ring and upper valve plate.
13. Remove lower stem from upper stem.



14. Straighten stainless steel lock washer.
15. Clean, inspect and replace any damaged parts (Super Centurion main valve can be reversed to provide a new seal). Replace drain valve facings if damaged.



16. Reassemble main valve assembly to new lower stem (Reverse steps) with newly provided brass lower valve nut and tighten to 90-115 ft-lbs.



17. Assemble the new lower stem via the stem coupling to the upper stem.



18. Bend edges of lock washer over one flat on the lower valve plate and one flat on the brass lower valve nut.



19. Inspect and lubricate with grease top and bottom seat ring o-rings (replace if necessary). Mueller Co. recommends the use of Thred Gard® Anti-Seize on threads.



20. Lower main valve into the barrel. Carefully align main valve assembly with seat ring then thread clockwise into the base of the hydrant. Hand tighten at first to avoid cross threading.



21. Reassemble wrench to upper stem. Pull up on seat wrench to ensure main valve is completely closed, lower support arm, and tighten thumb screw, while maintaining main valve in the closed position. Turn main valve assembly clockwise to 100-190 ft-lbs.
22. Remove the seat wrench.
23. Attach brass sleeve to upper stem and lubricate outside to protect o-ring seals from thread damage.
24. Check the condition of the upper barrel o-ring (Flat gasket for pre-1997 Centurion hydrants). Replace if necessary.
25. Remove the plastic plug from top of the new bonnet assembly taking care of the hold down washer and bonnet o-ring.



26. Place the new bonnet assembly on top of the upper stem, slide it down to top of upper barrel, and hand tighten bolts (8). Remove brass sleeve.



27. Check condition of wiper ring and o-ring seals (on the outer diameter and inner diameter of the hold down nut) and bonnet o-ring.
28. Take red plastic spacer and slide over bottom of hold down nut past the o-ring and up against the hold down nut shoulder.



29. Reassemble operating nut, anti-friction washer (on top thrust collar of operating nut), bonnet o-ring, hold down washer, and hold down nut (hand-tighten to secure in place).



30. Torque bonnet bolts (8) to 40-80 ft-lbs.
31. Torque hold-down nut to 200-300 ft-lbs with A-311 hydrant wrench.



⚠ CAUTION

ALWAYS FILL THE OIL RESERVOIR WITH THE BONNET INSTALLED, THE HYDRANT IN ITS NORMAL UPRIGHT POSITION, AND THE MAIN VALVE FULLY CLOSED.

FILLING THE HYDRANT WITH OIL UNDER ANY OTHER CIRCUMSTANCES CAN RESULT IN OVERFILLING AND CREATE A PRESSURE LOCK. THIS COULD DAMAGE THE SEALS OR BONNET OR PREVENT PROPER HYDRANT OPERATION.

32. Remove outer oil plug with a 5/16" hex-key wrench then remove inner oil plug with a 1/4" hex-key wrench.



33. Pour 1 bottle of Mueller hydrant lubricant into oil reservoir until the bottle is empty or the oil is level with inner oil plug hole. [Do not pour oil outside the oil reservoir].



34. Insert Inner oil plug (Smaller) inside the bonnet and tighten to 5-10 ft-lbs with a 1/4" hex-key wrench. [Take care to avoid damaging the bonnet paint with the wrench].



35. Insert outer oil plug (Larger) into bonnet and tighten to 5-10 ft-lbs with a 5/16" hex-key wrench. Do not overtighten outer plug as it could deform the bonnet (Outer oil plug should have two threads visible). [Take care to avoid damaging the bonnet paint with the wrench].
36. Rotate operating nut to ensure the main valve is closed. Turn ON water from gate valve.
37. With a minimum of 20 psi pressure, the sensor will come online. At this point the new stem is communicating to the new bonnet. Swipe the commissioning tool again at the location in the "Signal Strength" section to fully commission bonnet. The "success" / confirmation email and/or text may take up to 5 minutes to arrive (See Appendix A). If feedback does not come, swipe the commissioning tool again. If there is no response 5 minutes after the second attempt, reconfirm:
- a) Hydrant main valve is CLOSED
 - b) Gate valve is OPEN
 - c) **Water has been drained below the antenna near the top of the lower stem (Necessary for the stem to communicate with the bonnet)**



- d) System water pressure is 20 psi or greater.
 - e) Re-swipe the commissioning tool.
- If "success" feedback is not received within 5 minutes, contact Customer Service. (Once a Sentryx software enabled Super Centurion has been successfully installed, auto-locating of hydrant using GPS will automatically begin. Device location can take up to 72 hours to complete.)
38. Unscrew one hose nozzle cap slightly to bleed air. Open hydrant fully.
39. Tighten hose nozzle cap when water starts flowing and check all flange connections for leaks.
40. Turn operating nut in closing direction to make sure main valve is fully closed, then turn in opening direction approximately 1/4 turn to relieve tension on operating mechanism. Remove hose cap to aid in the draining of the hydrant. (Draining hydrants only). After hydrant is drained, replace and tighten hose cap.

⚠ CAUTION

DO NOT EXCEED 290PSIG ON PRESSURE SENSOR. IN THE EVENT THAT THE SYSTEM PRESSURE WERE TO EXCEED 290PSIG, ACCORDING TO THE MANUFACTURER'S SPECIFICATION, THE SENSOR MAY ENDURE OVERPRESSURES UP TO 420PSIG; HOWEVER, THE SENSOR WILL ONLY RECORD PRESSURES UP TO 290PSIG.

APPENDIX A

Figure 1: Signal Strength Feedback: Weak

Subject: Signal Strength: Weak | Device ID 267

Utility Name Site Name 04/12/2020 at 18:00

Signal Strength: Weak

An alert has been generated for your attention. See details below.


Device ID	267
Device ICCID	2048674393753478
Device Description	
Signal Strength	Weak
Alert Time	04/12/2020 at 18:00

Consider moving Smart Hydrant to an alternate location with better cellular coverage. Installation at this location may continue; however, poor transmission of cellular signal, possible loss of data, poor battery life, and potential challenges receiving over air updates maybe encountered with this location.

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**WARNING**

FOR WEAK SIGNAL STRENGTH CONSIDER MOVING SMART HYDRANT TO AN ALTERNATE LOCATION WITH BETTER CELLULAR COVERAGE. INSTALLATION AT CURRENT LOCATION MAY CONTINUE; HOWEVER, POOR TRANSMISSION OF CELLULAR SIGNAL, POSSIBLE LOSS OF DATA, POOR BATTERY LIFE, AND POTENTIAL CHALLENGES RECEIVING OVER AIR UPDATES MAYBE ENCOUNTERED WITH CURRENT LOCATION.

Figure 2: Signal Strength Feedback: Strong

Subject: Signal Strength: Strong | Device ID 267

Utility Name Site Name 04/12/2020 at 18:00

Signal Strength: Strong

An alert has been generated for your attention. See details below.

Device ID	267
Device ICCID	2048674393753478
Device Description	
Signal Strength	Strong
Alert Time	04/12/2020 at 18:00

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Figure 3: Success Feedback

Subject: Successful Installation | Device ID 267

Utility Name Site Name 04/12/2020 at 18:00

Successful Installation

An alert has been generated for your attention. See details below.

Device ID	267
Device ICCID	2048674393753478
Device Description	
Pressure	25psi
Alert Time	04/12/2020 at 18:00

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