

MUELLER

MAINTENANCE and OPERATING INSTRUCTIONS

FOR THE

MUELLER / 107[®] FIRE HYDRANT

MAIN OFFICE and PLANT
500 West Eldorado Street
Decatur, Illinois 62522



1. Read and follow instructions carefully. Proper training and periodic review regarding the use of this equipment is essential to prevent possible serious injury and/or property damage.
2. Do not exceed the pressure ratings of any components or equipment. Exceeding the rated pressure may result in serious injury and/or property damage.
3. Safety goggles and other appropriate protective gear should be used. Failure to do so could result in serious injury.

MUELLER[®] Drilling Machines and Equipment have been carefully designed and engineered to work together as a unit. The use of equipment manufactured by someone other than Mueller Co. may cause excessive wear or a malfunction of the MUELLER machines.

All warranties, express and implied, for Mueller Drilling Machines are rendered null and void if the machines are used with shell cutters or equipment manufactured by someone other than Mueller Co.

Mueller Co.

MUELLER / 107 FIRE HYDRANT

GENERAL INFORMATION AND BONNET REMOVAL

To insure their readiness for instantaneous use, all fire hydrants should be inspected and tested at six-month intervals.

Inspect visually for damaged or missing parts.

Unscrew one nozzle cap slightly and tighten the others. Open the main valve. Tighten the one loose nozzle cap when water starts flowing. Check bonnet* and all gaskets for leaks. Close the main valve.

Remove one nozzle cap and open main valve and flush the barrel and the hydrant lateral. Close the main valve.

Remove all nozzle caps. Clean and lubricate the threads.

*We recommend the stocking of bonnet assemblies. If a bonnet should show signs of damage or if you wish to inspect it for any other reason the bonnet can then be quickly and easily replaced in the field and inspected or reconditioned in your shop where it is convenient to do so.

To replace the bonnet assembly in the field, follow the instructions below:

Examine the inside of the barrel to be certain that the drain valves allow the water to drain from the barrel. If the water fails to drain from the barrel it may be caused by one or more of the following conditions:

1. Water table in ground higher than drains.
2. When hydrant was installed no coarse gravel was put around the drains and the ground is of such a nature that it will not readily absorb water.
3. Drains stopped up by some foreign substance.
4. Failure to leave the cap off the hydrant to allow air to enter so barrel will drain.

Replace nozzle caps.



1. Remove bonnet bolts and nuts. Rotate operating nut in opening direction to fully opened position. This lifts bonnet off the upper barrel. Rotate complete bonnet assembly counterclockwise to detach from upper stem threads. Lift off.



2. Check to see that stem threads are lubricated and that upper stem seal ("O" Ring) is not damaged. Also check bonnet gasket and replace if damaged. To assemble inspected bonnet assembly, rotate the operating nut in opening direction to fully open position. This extends stem nut. Assemble bonnet assembly to upper stem by rotating clockwise as far as possible, then back up only enough to align bolt holes, if needed.



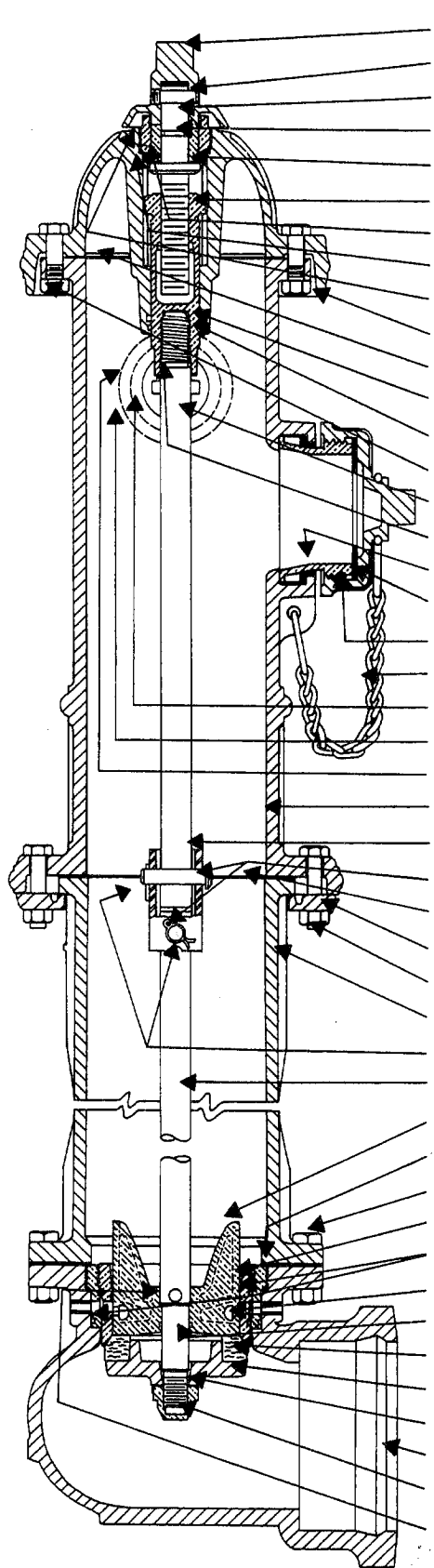
3. Rotate operating nut in closing direction which lowers bonnet assembly onto upper barrel and allows bolts to be replaced. With all bolts in bonnet, rotate operating nut using the same torque as normally used to close the hydrant. Tighten all bonnet bolts and nuts. Loosen one hose nozzle cap, to bleed air, while hydrant is opened to check gasket tightness. When barrel is filled with water, tighten nozzle cap and check gaskets. Turn operating nut and weather cap to fully closed position, loosen one nozzle cap to allow barrel to drain.

IMPORTANT—Initial installation of the hydrant **must be made properly** so the safety flange will function in the ground properly. It should be backed up by concrete or some similar substance to prevent the ground from giving away when the hydrant is struck.

For additional information on hydrant anchorage, blocking, and drainage see AWWA Specification C-600.

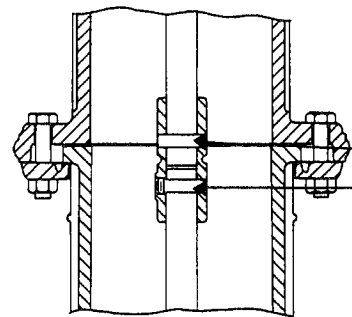
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PARTS



- H-110 OPERATING NUT AND WEATHER CAP
- H-111 SCREW PIN
- H-112 OPERATING SCREW
- H-113 OPERATING SCREW SEAL
- H-114 ANTI-FRICTION WASHER
- H-115 STEM NUT
- H-116 OPERATING SCREW BEARING
- H-117 BEARING SEAL
- H-118 HOLDDOWN NUT
- H-119 BONNET
- H-59 BONNET GASKET
- H-120 STEM NUT SEAL
- H-121 WIPER RING
- H-122 BONNET BOLT
- H-123 UPPER STEM
- H-124 UPPER STEM SEAL
- H-66 PUMPER NOZZLE
- H-67 PUMPER NOZZLE CAP
- H-68 PUMPER NOZZLE GASKET
- H-69 CAP CHAIN
- H-70 HOSE NOZZLE
- H-71 HOSE NOZZLE CAP
- H-72 HOSE NOZZLE GASKET
- H-73 UPPER BARREL
- H-125 SAFETY STEM COUPLING
- H-136 CLEVIS PIN
- H-76 SAFETY FLANGE GASKET
- H-77 SAFETY FLANGE
- H-78 SAFETY FLANGE BOLT
- H-80 LOWER BARREL
- H-137 COTTER PIN
- H-127 LOWER STEM
- H-128 UPPER VALVE PLATE
- H-84 SHOE GASKET
- H-85 SHOE BOLT
- H-132 SEAT RING
- H-133 SEAT RING SEAL
- H-134 DRAIN VALVE SEAL
- H-135 LOWER STEM SEAL
- H-129 MAIN VALVE
- H-130 LOWER VALVE PLATE
- H-131 LOCK WASHER
- H-138 SHOE
- H-91 CAP NUT
- H-126 STEM PIN
- H-96 HYDRANT LUBRICATING OIL

H-139 BONNET ASSEMBLY COMPLETE
(Includes necessary oil.)



H-126 STEM PIN
H-111 SCREW PIN

HYDRANT WITH CAST IRON SAFETY STEM COUPLING
(All other parts same as drawing at left)

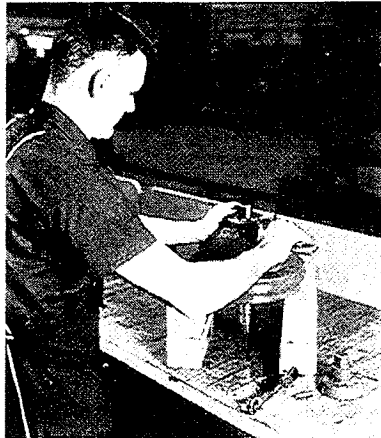
HYDRANT WITH STEEL SAFETY STEM COUPLING

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SHOP INSPECTION AND MAINTENANCE OF BONNET ASSEMBLY



1. Remove socket head screw pin from combined operating nut and weather cap.



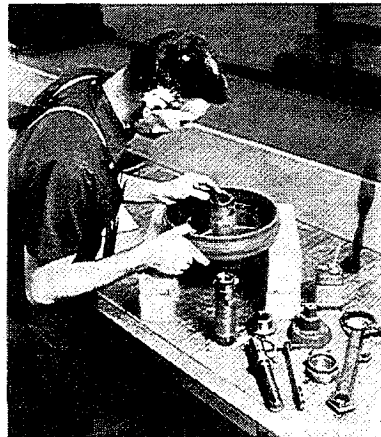
2. Lift operating nut and weather cap off of the operating screw. Remove hold down nut by rotating counterclockwise.



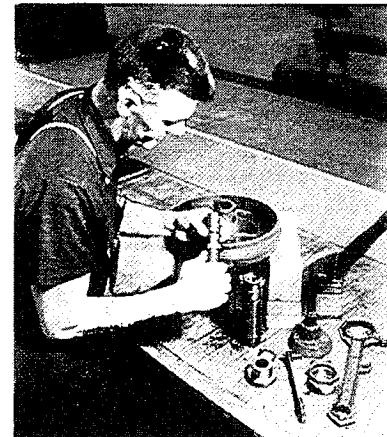
3. Lift operating screw, operating screw bearing, anti-friction washer, and stem nut cut through top of bonnet as one unit. Remove operating screw bearing and anti-friction washer from operating screw and operating screw from stem nut.



4. Remove and replace oil in stem nut. Fill stem nut with Mueller hydrant lubricant (approximately 2 oz. required) while part is setting level on bench. Oil level is to be even with oval slots in sides of the stem nut.



5. Check or replace stem nut seal (Quad Ring) and wiper ring ("O" Ring) in lower end of bonnet part.



6. Check or replace operating screw seal ("O" Ring) on operating screw, and bearing seal ("O" Ring) on operating screw bearing. Examine anti-friction washer and replace if bearing surfaces are rough or gouged.



7. With stem nut properly filled with oil and stem nut seal (Quad Ring) and wiper ring ("O" Ring) in place in bonnet, insert operating screw into stem nut. Engage several threads, then insert stem nut into bonnet with lugs engaging mating grooves in bonnet. (Stem nut should be in its fully extended position.)

Thrust collar on operating screw is to be positioned slightly lower than shoulder in bonnet which positions operating screw bearing.

Assemble anti-friction washer, operating screw bearing with bearing seal ("O" Ring) assembled, and hold down nut onto operating screw. Position operating screw bearing with lugs in engagement with bonnet grooves. Tighten hold down nut securely in a clockwise direction.

SHOP INSPECTION AND MAINTENANCE OF BONNET ASSEMBLY

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8. Rotate operating screw in an opening direction, until anti-friction washer on operating screw thrust collar contacts operating screw bearing. Position operating nut and weather cap on operating screw, retaining it with socket head screw pin.



9. Check to see that stem nut is fully extended by rotating operating nut in opening direction.



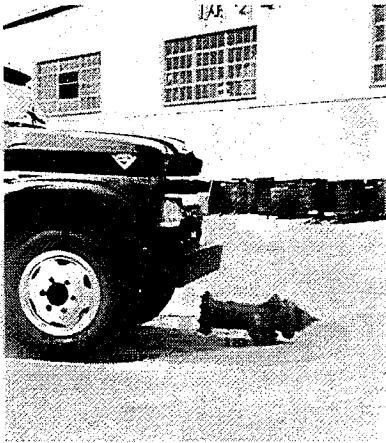
10. Retract stem nut to fully retracted position by rotating operating nut in a closing direction. Bonnet assembly is ready for use.

If a pressure test is desirable on a reconditioned bonnet assembly, the unit can be bolted to a test fixture so that water pressure can be applied to see that the stem nut seal (Quad Ring) is holding. This requires some minor assembly changes from those listed above. The bearing seal ("O" Ring) on the operating screw bearing is to be left off as part of Operation No. 7. The weather cap is also not assembled as part of Operation No. 8. These changes will allow any leakage past the stem nut seal (Quad Ring) to show up as an oil leak past the hold down nut threads. Water will displace oil if leakage is occurring.

After the pressure test has been made, it will be necessary to remove hold down nut and operating screw bearing, and replace the bearing seal ("O" Ring) on the operating screw bearing. Assembly operations, No. 7, 8, 9 and 10 can then be followed.

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REPLACING SAFETY FLANGE AND SAFETY STEM COUPLING



1. View of truck knocking over upper barrel of hydrant. Note: No water is lost.



2. Unbolt and remove broken safety flange from upper barrel.



3. Unbolt and remove bonnet and upper stem from upper barrel.



4. Remove upper stem from stem nut by holding bonnet and turning stem counter-clockwise.



5. Remove stainless steel cotter pin from stainless steel clevis pin. Remove stainless steel clevis pin and remove safety stem coupling from upper stem.



6. Assemble new safety stem coupling to upper stem with new stainless steel clevis pin and new stainless steel cotter pin.



7. SAFETY STEM COUPLING SHOULD BE INSTALLED WITH NOTCHES TOWARDS THE LOWER STEM. WORDS "THIS END UP" TOWARDS THE UPPER STEM.



8. Remove stainless steel cotter pin from stainless steel clevis pin in lower stem (throw away the old clevis pin and cotter pin).



9. Assemble upper stem and new safety stem coupling on to lower stem and retain it with new stainless steel clevis pin and new stainless steel cotter pin furnished with safety stem coupling.

REPLACING SAFETY FLANGE AND SAFETY STEM COUPLING

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10. Check safety flange gasket on lower barrel and if damaged, replace. Reassemble upper barrel being sure gasket is centered as nozzles are located in desired position. Bolt into place the two halves of safety flange with circular groove facing upward, and with safety flange fitting snugly around lower barrel.



11. Check bonnet gasket on top of upper barrel, replace if damaged. Check to see that upper stem threads are lubricated and upper stem seal ("O" Ring) is not damaged. Rotate the operating nut in opening direction to fully open position. This extends stem nut. Reassemble bonnet assembly to upper stem by rotating clockwise as far as possible, then back up only enough to align bolt holes, if needed.



12. Rotate operating nut in closing direction which lowers bonnet assembly onto upper barrel and allows bolts to be replaced. With all bolts in bonnet, rotate operating nut using the same torque as normally used to close the hydrant. Tighten all bonnet bolts and nuts.

Loosen one hose nozzle cap, to bleed air, while hydrant is opened to check gasket tightness. When barrel is filled with water, tighten nozzle cap and check gaskets. Turn operating nut and weather cap to fully closed position, loosen one nozzle cap to allow barrel to drain.

NOTE: If cast iron safety stem coupling was originally installed — it may be removed from upper stem by punching out the stainless steel stem pin and removing the upper half of the broken safety stem coupling. Remove the lower half of the broken safety stem coupling from the lower stem by removing the socket head screw pin. If either half of the coupling or screw pin is stuck a Mueller Stem Coupling Tool A-24144 may be used to remove them.

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REMOVING THE MAIN VALVE

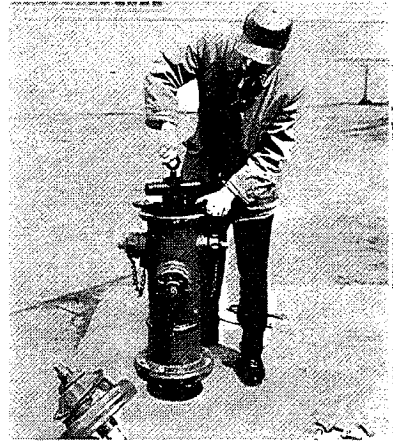


1. Close valve ahead of hydrant to shut off line pressure in hydrant being worked on. Open hydrant to full open position and drain.

Remove bonnet bolts and nuts which retain bonnet assembly.



2. Rotate bonnet assembly counterclockwise to detach from upper stem threads. Lift off. Remove bonnet gasket.



3. Check seat removal wrench to see that the guide plate is retracted to its uppermost position. (Top of sleeve section up against body.)

Attach seat wrench to upper stem by lowering it into upper barrel and engaging slots on lower end of wrench with stem pin at top of stem. Rotate eyebolt on top of seat wrench clockwise to engage stem threads with wrench.



4. Rotate guide plate clockwise until contact is made with hydrant barrel flange. Continue to rotate this guide plate clockwise to raise the center portion of the wrench approximately 2 1/2", which brings the main valve to the closed position.

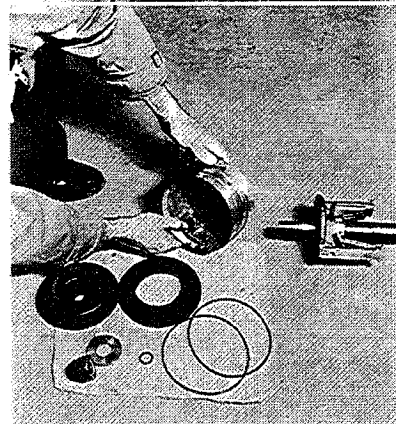


5. Align two of the bolt holes in the guide plate with corresponding holes in upper barrel and drop in two bonnet bolts to prevent rotation of the guide plate. (Three sets of holes in each side of guide plate align for the 4", 5" and 6" size hydrants.)

Attach handles to wrench and rotate wrench counterclockwise. Approx. 5 revolutions should remove seat ring and main valve assembly.



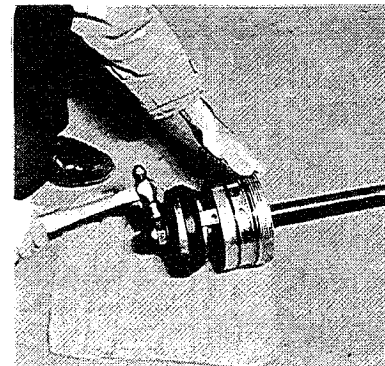
6. Lift the entire wrench, stem, main valve, and seat ring assembly from hydrant.



7. Bend over one edge of stainless steel lock washer and remove cap nut, lower valve plate, main valve, and seat ring.

Clean the grooves in the seat ring and the faces of the upper valve plate wings. Moderately lubricate upper valve plate wings. Push the O-ring into the seal ring and insert both parts into the seat ring groove with the seal ring face showing. Slide the seat ring onto the upper valve plate, taking care that the seal ring and O-ring remain in the grooves. Lubricate all seals and threads.

8. Reassemble seat ring, main valve, lower valve plate, lock washer, and cap nut. Bend over one edge of lock washer after cap nut is tightened.



REMOVING THE MAIN VALVE

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9. Retract guide plate on seat wrench to uppermost position by rotating counterclockwise.



10. Slowly lower entire wrench and stem assembly into hydrant barrel until seat ring threads engage shoe bushing. Rotate seat wrench clockwise approximately 2 revolutions to start seat ring into shoe bushing.



11. Rotate guide plate assembly clockwise until contact is made with upper barrel flange. Continue to rotate guide plate clockwise to raise center portion of wrench and stem assembly to close main valve of hydrant. CAUTION: Only rotate guide plate until main valve is moved to closed position since seat ring only has small contact with shoe bushing at this time.



12. Align bolt holes and drop in two bonnet bolts to retain guide plate from rotation. Continue to rotate seat wrench clockwise to finish inserting seat ring into shoe bushing and tighten securely.



13. Remove bonnet bolts from guide plate holes and rotate clockwise to bring stem and main valve to fully closed position. Open control valve ahead of hydrant to reapply line pressure. Detach seat wrench from stem by turning eyebolt counterclockwise until threads disengage and then lift complete wrench off stem.



14. Replace bonnet gasket on top of upper barrel and see that upper stem threads and upper stem seal ("O" Ring) are thoroughly lubricated with a light cup grease. Check to be sure that the operating nut is in the fully open position which is with the stem nut fully extended. Reassemble bonnet assembly to upper stem by rotating clockwise as far as possible, then back up only enough to align bolt holes, if needed.



15. Rotate operating nut in closing direction which lowers bonnet assembly onto upper barrel and allows bolts to be replaced. With all bolts in bonnet, rotate operating nut using the same torque as normally used to close the hydrant. Tighten all bonnet bolts and nuts. Loosen one hose nozzle cap, to bleed air, while hydrant is opened to check gasket tightness. When barrel is filled with water, tighten nozzle cap and check gaskets. Turn operating nut and weather cap to fully closed position. Loosen one nozzle cap to allow barrel to drain.

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FACING OF HOSE NOZZLES



1. Loosen nuts on safety flange bolts.



2. Turn operating nut slightly in the opening direction to relieve compression between barrel sections.



3. Rotate upper barrel section as desired.



4. Tighten operating nut, turning in closing direction.



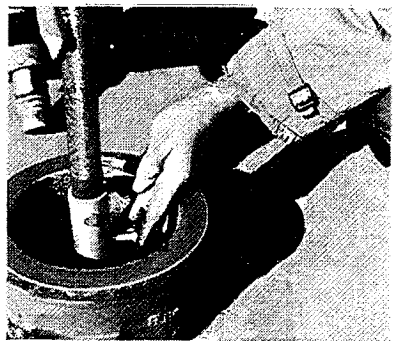
5. Tighten safety flange bolts.

INSERTING EXTENSION SECTION

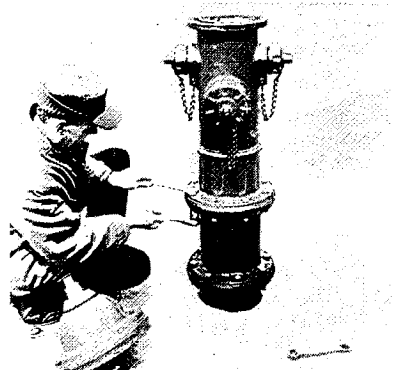
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1. Hydrant twelve inches too short because of a planned grade level change. Remove bonnet bolts and nuts. Rotate operating nut in opening direction to fully opened position. This lifts bonnet off the upper barrel. Rotate bonnet assembly counter-clockwise to detach bonnet from upper stem threads. Lift off bonnet, remove bonnet gasket.



4. Place extension stem and extension coupling on lower stem and retain it with stainless steel clevis pin and stainless steel cotter pin.



7. Attach upper barrel to extension barrel with safety flange halves (with groove) and bolts, being sure safety flange gasket is in place.



2. Unbolt safety flange and remove upper barrel.



5. Assemble upper stem and safety stem coupling on to extension stem and retain it with stainless steel clevis pin and stainless steel cotter pin. **MAKE SURE SAFETY STEM COUPLING IS INSTALLED WITH NOTCHES TOWARDS THE LOWER STEM. WORDS "THIS END UP" TOWARDS THE UPPER STEM.**



3. Remove upper stem and safety stem coupling by removing the lower stainless steel cotter pin and stainless steel clevis pin.



6. Attach extension barrel to lower barrel with solid flange halves (without groove) and bolts, being sure flange gasket is in place.

8. Check bonnet gasket on top of upper barrel, replace if damaged. Check to see that upper stem threads are lubricated and upper stem seal ("O" Ring) is not damaged. Check to be sure that the operating nut is in the fully open position which is with the stem nut fully extended. Reassemble bonnet assembly to upper stem by rotating clockwise as far as possible, then back up only enough to align bolt holes, if needed.

Rotate operating nut in closing direction which lowers bonnet assembly onto upper barrel and allows bolts to be replaced. With all bolts in bonnet, rotate operating nut using the same torque as normally used to close the hydrant. Tighten all bonnet bolts and nuts.