



# BR1200

## Beam Driven Chemical Injection Pump

### MAINTENANCE

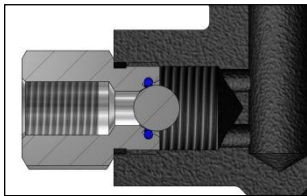


**Disconnect power source and ensure pressure is removed from pump head prior to performing any maintenance. Hazardous pressures can result in serious injury or property damage.**

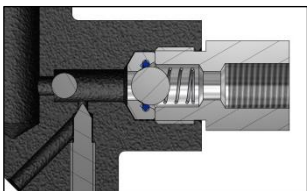
### Pump Head Maintenance

#### Pump Head Assembly (3/16" to 1/2" Plunger Size)

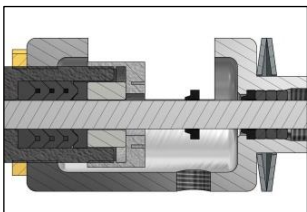
**Step 1:** Ensure all parts are clean and free from damage (see Inspection section). Lubricate all O-rings with petroleum based lubricant; lubricate packing and plunger with suitable packing lubricant grease (Teflon or Graphite based packing lubricant is recommended, but an equivalent suitable lubricant like a Molybdenum disulfide based lubricant can be substituted).



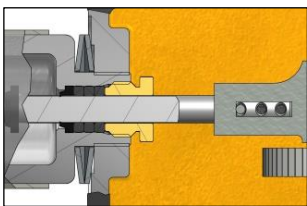
**Step 2:** Install O-ring into bottom seat. Place 3/8" ball into bottom seat (install metal gasket on seat for 3/16" plunger size) and thread seat into suction end of body utilizing a thread sealant. Tighten bottom seat.



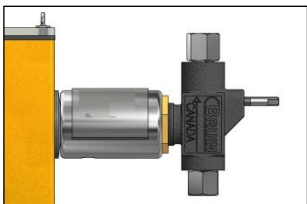
**Step 3:** Place the 1/4" ball into the discharge end of the body, for plunger sizes 1/4" to 1/2". Install O-ring into top seat, and insert top seat into body. Place the 3/8" ball and ball check spring into the top bushing. Thread top bushing into body, utilizing a thread sealant. Tighten top bushing.



**Step 4:** Install packing in body, ensuring it is installed in the correct order and orientation. *Note: The "V-Ring" point should be pointing outward.* Place plunger packing gland on the packing. Thread yoke lock nut and yoke onto the body. Loosely thread plunger packing gland nut onto body. Install plunger wiper ring and yoke packing set into yoke. Insert plunger into yoke and body, ensuring plunger drip ring is installed onto plunger.



**Step 5:** Thread yoke packing nut into yoke finger tight. Install yoke into housing with Belleville washers in place. Slide plunger into the crosshead and insert plunger pin.



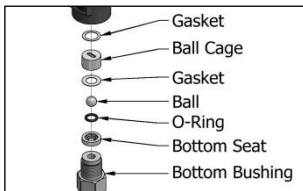
**Step 6:** Orientate head assembly in upright position with suction port down. Snugly tighten the plunger packing gland nut, do **not** over tighten. Install gasket and cover with wing screws. Install and tighten priming valve into body. *Note: 3/16" plunger size head needs a 1/4" ball inserted into priming valve hole before installing priming valve.*

## Pump Head Disassembly (3/16" to 1/2" Plunger Size)

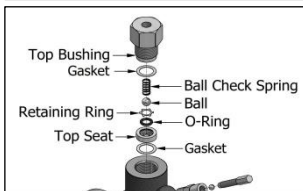
- Step 1:** Disconnect power source, ensure all pressure is removed from pump head assembly and isolate fluid discharge and suction lines. Open and remove priming valve. Disconnect fluid discharge and suction lines.
- Step 2:** Remove cover and gasket by loosening and removing wing screw.
- Step 3:** Remove plunger pin from plunger.
- Step 4:** Unscrew yoke from housing and remove pump head assembly from housing.
- Step 5:** Remove Belleville washers from yoke.
- Step 6:** Loosen and remove top bushing, ball check spring, ball(s), and top seat. Remove O-ring from top seat.
- Step 7:** Loosen and remove bottom seat, (gasket) and ball. Remove O-ring from bottom seat.
- Step 8:** Unthread plunger packing gland nut, yoke packing nut and unthread yoke from body. Remove plunger, plunger packing gland, plunger packing yoke packing set and plunger drip ring and wiper ring.

## Pump Head Assembly (3/4" to 1" Plunger Size)

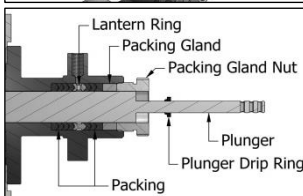
**Step 1:** Ensure all parts are clean and free from damage (see Inspection section). Lubricate all O-rings with petroleum based lubricant; lubricate packing and plunger with suitable packing lubricant grease (Teflon or Graphite based packing lubricant is recommended, but an equivalent suitable lubricant like a Molybdenum disulfide based lubricant can be substituted).



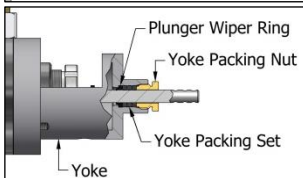
**Step 2:** Install O-ring into bottom seat. Place 1/2" ball and gasket onto seat and cover ball with ball cage. Place gasket onto ball cage and insert into suction end of body. Thread bottom bushing into suction end of body utilizing a thread sealant. Tighten bottom bushing.



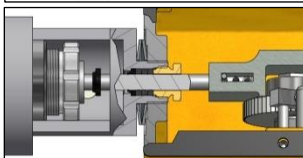
**Step 3:** Install O-ring and retaining ring into top seat. Install top seat into discharge end of body with a gasket on both sides of seat. Place 3/8" ball and ball check spring into top bushing. Thread top bushing into body utilizing a thread sealant. Tighten top bushing.



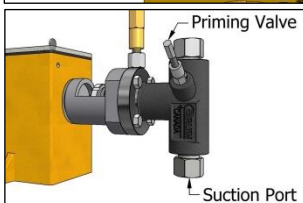
**Step 4:** Install packing and lantern ring in body, ensuring it is installed in the correct order and orientation. *Note: The "V-Ring" point should be pointing outward and the lantern ring in line with the grease jack.* Place plunger packing gland on packing. Loosely thread plunger packing gland nut into body. Insert plunger into packing and slide plunger drip ring onto plunger.



**Step 5:** Install plunger wiper ring and yoke packing set into yoke. Insert body assembly into yoke, ensuring plunger fits through yoke. Thread yoke packing nut into yoke finger tight. Attach body and yoke with hex bolts.



**Step 6:** Install yoke into housing with Belleville washers in place. Slide plunger into the crosshead and insert plunger pin.



**Step 7:** Orientate head assembly in upright position with suction port down. Snugly tighten plunger packing gland nut, do **not** over tighten. Install gasket and cover with wing screw. Install and tighten priming valve into body.

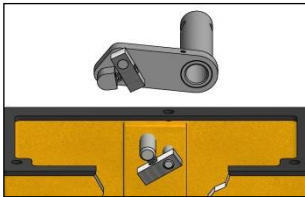
## Pump Head Disassembly (3/4" and 1" Plunger Size)

- Step 1:** Disconnect power source, ensure all pressure is removed from pump head assembly and isolate fluid discharge and suction lines. Open and remove priming valve. Disconnect fluid discharge and suction lines.
- Step 2:** Remove cover and gasket by loosening and removing wing screw.
- Step 3:** Remove plunger pin from plunger.
- Step 4:** Unscrew yoke from housing and remove pump head assembly from housing.
- Step 5:** Remove Belleville washers from yoke.
- Step 6:** Loosen and remove top bushing, ball check spring, ball, gaskets and top seat. Remove retainer ring and O-ring from top seat.
- Step 7:** Loosen and remove bottom bushing, bottom seat, ball, ball cage and gaskets. Remove O-ring from bottom seat.
- Step 8:** Unthread yoke packing nut. Remove hex bolts and remove yoke from body. Unthread plunger packing gland nut. Remove plunger, plunger packing gland, plunger packing, lantern ring, yoke packing set and plunger drip ring and wiper ring.

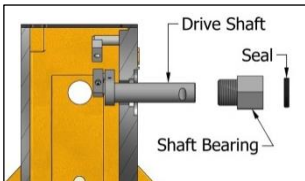
## Housing Maintenance

### Housing Assembly

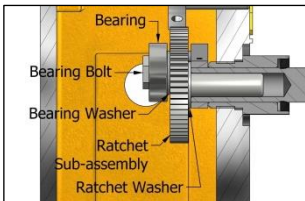
- Step 1:** Ensure all parts are clean and free from damage (see Inspection section).



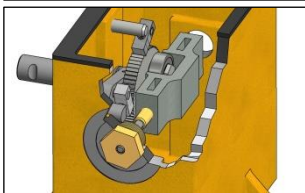
- Step 2:** Place plug into housing, utilizing thread sealant. Install pawl and pawl spring onto housing check pawl shaft and drive shaft.



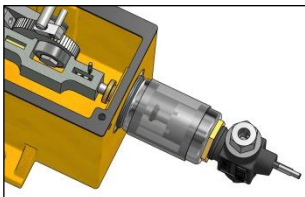
- Step 3:** Press seal into shaft bearing. Insert drive shaft into housing. Screw shaft bearing into housing ensuring drive shaft slips through the shaft seal.



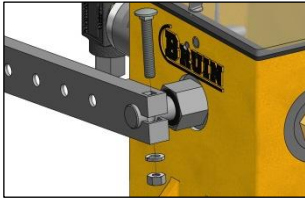
- Step 4:** Install washer onto ratchet sub-assembly. Install bearing and washer onto bearing bolt and thread bearing bolt into threaded hole in ratchet sub-assembly. Utilize a thread locking compound on threads. Insert ratchet assembly into drive shaft, engaging pawls.



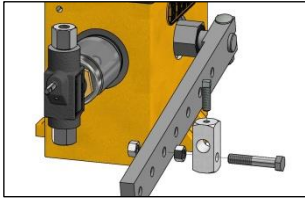
- Step 5:** For single head units, place crosshead over bearing and install guide plug assembly into body ensuring pin inserts into brass tubing on crosshead.  
*Note: Double head units do not have the brass tube or guide plug assembly, they can be removed from single head units to add a second pump head.*



- Step 6:** Install the pump head assembly into the housing and slide the plunger into the crosshead. Insert the plunger pin into the plunger.



**Step 7:** Slide the lever arm onto the drive shaft. Insert the lever bolt into the lever arm ensuring that the bolt fits into the notch in the end of the drive shaft assembly. Secure lever bolt with lock washer and nut.



**Step 8:** Mount knuckle onto lever arm. The knuckle should be able to rotate freely on the cap screw when nuts are tightened. Mount pump housing and fill with lubricating fluid. Secure gasket and cover with wing screws.

## Housing Disassembly

**Step 1:** Disconnect power source, ensure all pressure is removed from pump head assembly and isolate fluid discharge and suction lines. Open and remove priming valve. Disconnect fluid discharge and suction lines. Drain oil from gear box housing.

**Step 2:** Remove wing screws, cover and gasket.

### *To Remove Crosshead*

**Step 3:** Remove plunger pin. *Note: In a single headed unit, it is not necessary to remove the pump head in order to remove the crosshead.* See Pump Head Disassembly instructions for further disassembly of pump head assembly.

**Step 4:** Hand operate the lever arm until chemical injector plunger is free from crosshead.

**Step 5:** Remove guide plug assembly. *Note: In a double headed unit, it is necessary to remove one pump head from the gear box to remove the crosshead.* Lift out the crosshead.

### *To Remove Ratchet Sub-Assembly*

**Step 6:** Remove lever arm by removing lever bolt and sliding lever arm from drive shaft.

**Step 7:** Once crosshead is removed, the ratchet sub-assembly may be pulled towards the center of the housing and lifted out.

**Step 8:** To remove bearing and washer from ratchet, unscrew bearing bolt.

**Step 9:** Unscrew shaft bearing. Remove seal from shaft bearing and drive shaft assembly from housing.

**Step 10:** Remove ratchet pawls and pawl springs from drive shaft and housing shafts.

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## INSPECTION

**Inspect all components for damage. Replace or repair parts as necessary. The following is a guideline of what to inspect:**

- Inspect all threads, seals and packing for damage.
- Inspect body seal areas for corrosion, pitting, or damage. Seal areas on the body include the packing area and the area below the top seat and ball cage.
- Inspect balls, top seat, bottom seat and ball check spring for corrosion or damage.
- Inspect plunger for wear, scarring, or damage.
- Inspect ratchet and bearing for wear or damage.
- Inspect housing and all other components for damage.