



MODEL **351GF-15**
Hydrant Coupler

351GF-15 Hydrant Coupler

This installation/operation/maintenance guide is designed to provide instructions for the installation operation & maintenance/service for the Poppet Actuating Section of the Model 351GF-15 Fueling .

The hose end of the elbow is fitted with a QUICK DISCONNECT which swivels about its centerline and can be removed from the elbow while connected to the hose.

The lower element of the coupler assembly FIG.1 is a DRY DISCONNECT hand operated unit with an interlock (A), which is activated by placement on an API hydrant.

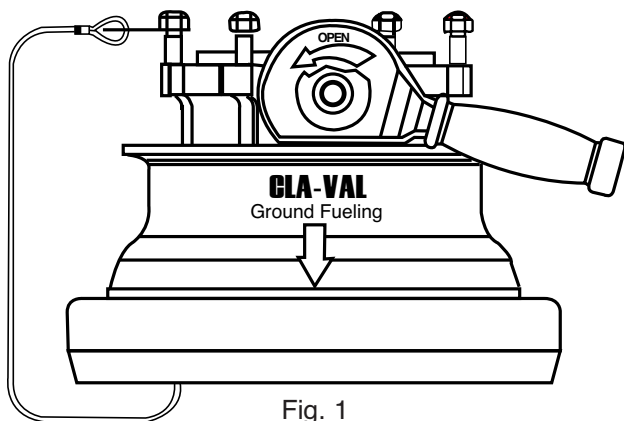
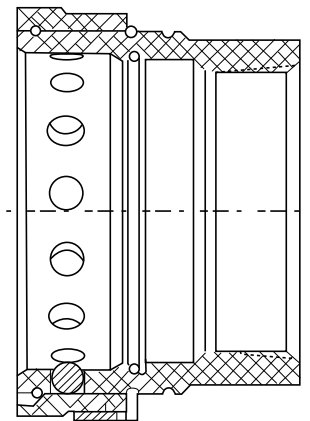
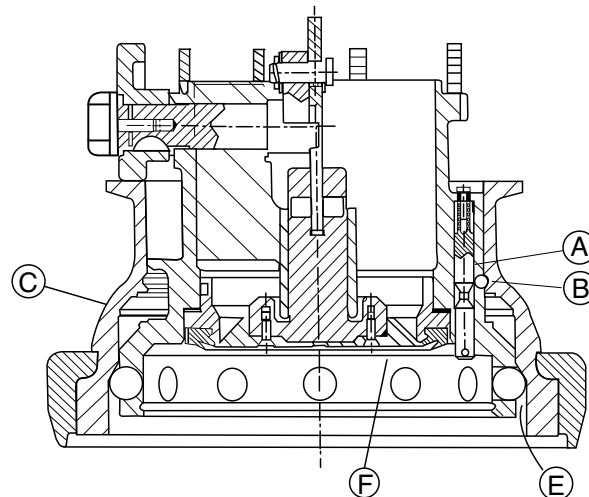
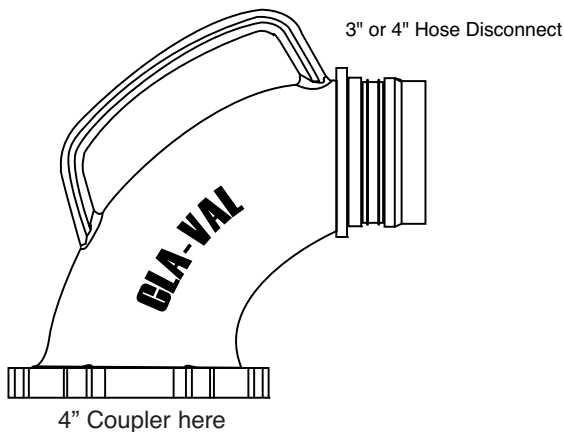


Fig. 1



DESCRIPTION:



The Model 351GF-15 Hydrant coupler is a 4" size designed to mate with hydrants manufactured in accordance with A.P.I. Bulletin 1584. There are three basic assemblies to make a complete connection from hydrant to hose. These are the coupler shown above the ELBOW with nuts and bearing race in 4" hydrant to 3" hose size or 4"x 4" hose.

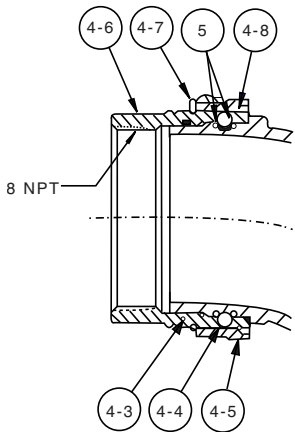
The 28291-01B LOCKPIN (A) has an annular notch into which the steel ball (B) can withdraw.

The steel ball (B) locks the 28278-01J sleeve (C) in the up or "Poppet Closed" position which, in turn, prevents the operating handle (D) from rotation which would open the coupler poppet (F). As previously stated, when the "Lockpin" (A) is depressed, the ball (B) can disengage the sleeve (C) permitting it to be pushed down. The downward travel of the sleeve (C) drives the 12 steel balls (E) under the lip of the API hydrant locking the device on the hydrant.

INSTALLATION & OPERATION

The 4" hydrant to 3" hose or 4" hydrant to 4" hose quick disconnect is available on its appropriate elbow as an option with 3" NPT or 4" NPT thread sizes for hose connection.

The assembled unit is shipped with the quick disconnect & elbow as specified for connection to the hose and placement on the hydrant.



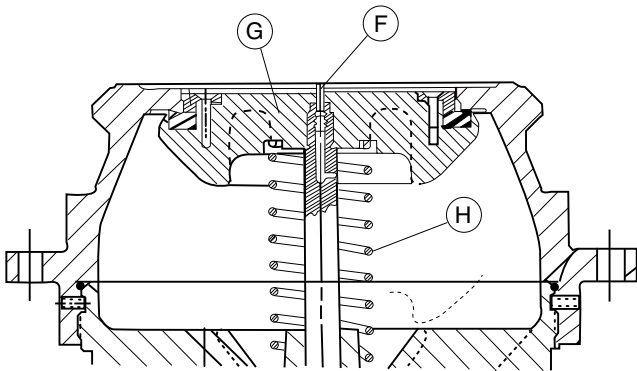
The disconnect can be attached to the hose while assembled because it swivels but the O-Ring seal causes a lot of drag.

If the disconnect assembly is to be removed from the elbow coupler assembly for easy attachment to a hose, a 5/32" (4 mm) Allen wrench is required to remove the two 10-32 Socket Head screws retaining the 28296-01B Lock (4") or 200073-01H Lock (3") allowing the Spring retaining 4-7 ring to be expanded out of its groove and moved back to the groove at the threaded end of the assembly.

Having moved the Spring Retaining Ring, the Sleeve Adapter can be moved back which allows the steel balls to disengage the elbow and be removed. To reinstall the assembly on its elbow reverse procedure.

With the hose connected to the disconnect assembly and reinstalled on the elbow, the coupling assembly can be placed on a 4" API Hydrant conforming to Bulletin API 1584 (2nd Edition 12-1994).

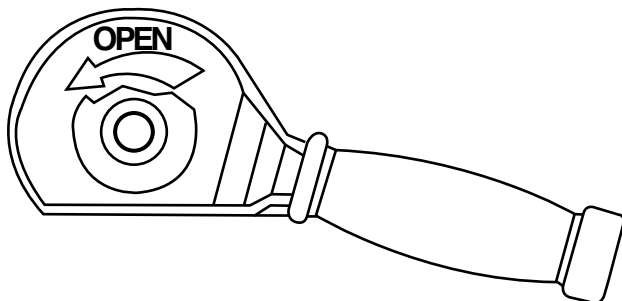
CROSS SECTION OF HYDRANT:



Placement of the hose, disconnect, elbow and coupler on the hydrant displaces the lockpin (A) (Fig 1, page 1) permitting the ball (B) to release the sleeve (C) locking the assembly on the hydrant.

SPECIFICS OF OPERATION.

Rotation of the coupler handle counter clockwise (away from the hose) approximately 15° will bring the cam portion of the handle into contact with the sleeve (C) locking it in the down position for the remainder of any travel of the operating handle in the



counter clockwise direction. Forces involved when the operation handle is moved are several starting with the first 15° of travel because the 200277-01B Wave Spring (find no. 1-7 dwg. 29725) is compressed until the 28289-01F crank (find no. 1-19 dwg. 29725) passes top dead center, then the spring expands driving the 28276-01C Seat assembly down, keeping it in contact with the coupler poppet assembly 28281. Next in sequence, the coupler poppet con-tacts the "Pressure Equalizing Valve" (F) or poppet on center of the API 1584 hydrant and as travel progresses, the P.E.V. is depressed equalizing pressure between hydrant and coupler.

The dimensional relationship between coupler components and hydrant provides coupler seat assembly driven by wave spring to make hydrant contact at the time the coupler poppet has opened to provide a fluid path for the hydrant pressure equalizing Valve (F) opening, then as the coupler poppet contacts the hydrant poppet (G), the force required to compress the hydrant poppet drive spring (H) is evident.

Full stroke of the coupler operating handle positions is approximately 15° below the horizontal top line of the 28278-01J sleeve (C) (Handle travel from closed to full open is 210°). At the full stroke position, both coupler poppet and hydrant pop-pet are full open (2" of travel) for max. flow.

Stop flow and removing coupler from hydrant. Move the coupler operating handle from the open position in clockwise direction.

WARNING

Because of stored energy in the hydrant poppet drive, spring (H) and fluid pressure under the hydrant poppet, the coupler operating handle can "FLIP" with considerable force when the 28289-01F CRANK (find no. 1-19 dwg. 29725) moves from its 15° past vertical locked position to the 6 o'clock position (straight down) and the poppet link and crank are free to be driven by a force under the hydrant poppet.

Operator should provide a restraining force followed by a push of 28286-01B handle clockwise to close the coupler poppet and lock it in its closed position.

With the coupler poppet closed and locked (by 15° past top dead center of crank), the Sleeve (C) can be lifted releasing the 12 steel balls from the hydrant allowing the coupler to be removed. Replace the 29762-01A Cover Assembly (find no.3 dwg. 29725).

MAINTENANCE

Replacement of the 28277-01A Guard (find no. 1-4 dwg. 29725). The coupler with elbow can be removed from the hose by following the procedure outlined on page 1.

Inspection or replacement of the 28276 Seat Assembly, its 00833E O-Ring or the 200277-01B Wave Spring can be accomplished as follows:

WARNING

Assure that the hose is not pressurized and is drained before separating the quick disconnect from the elbow. With the disconnect and hose removed, the replacement guard can be passed over the elbow - and down to the 28278-01F Sleeve. If the 28286-01B Handle is an interference, depressing the 28291-01B lockpin and letting the 28278-01F Sleeve drop allows the handle to rotate to the half travel position for easy pass on the Nitrile guard. Stretching the guard over the retaining lip of the sleeve can be difficult and a thick mix of soap in water will help.

Inspection or replacement of the 28276 Seat Assembly, its 00833E O-Ring or the 200277-01B Wave Spring can be accomplished as follows:

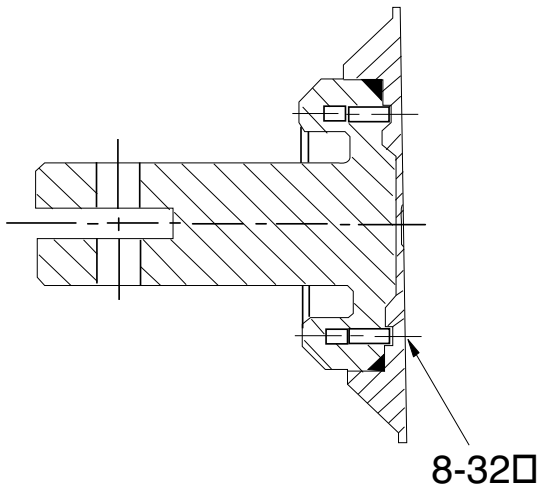
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WARNING

Assure that the hose is not pressurized and is drained

Open the poppet by depressing the 28291-01B lockpin, which allows the 28278-01F sleeve to be moved providing clearance for rotation of the 28286-01B Handle.

Tool required - 0.094 (2.39 mm) Hex (Allen) Wrench. Opening the poppet by rotating the operating handle releases the energy of the 200277-01B Wave Spring reducing the torque required to remove the 6 each 8-32 Socket head. Screws which retain the 28280-01E Poppet. Removing the poppet exposes the 00779K O-Ring and allows the 28276 Seat Assembly to be removed. Removing the 28276 seat assembly from the coupler body can be difficult because the O-Ring (01140A) must be tight to seal and the "low swell" compound only means it does not swell as



much in fuel. In addition, the poppet stem restricts the space available for entrance of fingers or tools.

A seat extractor tool is available which can be placed into the space between the poppet stem and seat seal ring, then expands outward to engage the ring making it possible to remove the seat seal assembly with the operating handle. To remove the seat seal without the extractor tool, the elbow must be removed which involves removing six nuts that join the com-

ponents.

When the elbow is removed, a 5 1/2 or 6" length of hardwood dowel can be placed on the top edge of the seat seal assembly, then with hammer or mallet the ring is driven out of the coupler body. Moving the dowel from side to side cocking or jamming of



the ring can be prevented. After inspection and/or replacement of Seat Assembly, Wave spring and O-Ring the items can be reinstalled by placement in position-reinstalling the 28280-01E poppet. Then rotating the operating handle to the coupler "closed" position.

NOTE:

The 00833E O-Ring on the seat assembly is a "low swell" compound Parker No. N497-70 or equal for longer service life in Fuel.

Additional inspection and maintenance or disassembly and reassembly should be confined to a shop environment.

Access to interior components of the "Hydrant Coupler" requires removing the elbow with or without its disconnect assembly.

Tool required to remove elbow from coupler assembly 1/2 inch box or open end wrench.

Remove 6 each 80638-02G (5/16-18) self-lock nuts.

Remove the 29640-01J elbow - exercise care in removing the 00794J O-Ring as it is captured in a protected location and maybe used in reassembly.

When the elbow assembly is removed with or without the pop-pet seat assembly, and wave spring, a complete visual inspection can be made of the interior from the down stream (elbow end) of the coupler assembly including the path of components while operating handle is in motion.

Additional disassembly of the coupler assembly (Fig.1 Pg.1) is discouraged unless necessary.

If complete disassembly is required, remove poppet, seat assembly and wave spring as outlined on Pg. 3

Tools required:

- 3/8" open end, box end or socket wrench (for removing operating handle)
- 1/4" open end, box end or socket wrench (for 8-32 Hex washer head - find no. 1-24 dwg. 29725)
- 1/8" or smaller pin or drift punch (to prevent rotation 28291-01B lockpin find no. 1-26 dwg. 29725)

If the 28278-01F Sleeve (See page 2) is to be removed from the 28282-01A Body (find no. 1-28 dwg. 29725), it is recommended that a cut down 14"x14" corrugated box or tray with sides two to three inches high be used to prevent loss of 1/4 dia. ball (find no. 1-27 dwg. 29725) and the 12 steel balls, which are retained by the sleeve.

Having removed the poppet and seat assembly, the poppet stem is placed in the closed position to provide best access to the Cotter ring, which is removed with pliers so the stepped pin can be removed.

At this stage of disassembly it is suggested the relationship of parts be observed as an aid in reassembly. Position the assembly with operating handle on the right hand side lifting the poppet stem by the 28283-01J link high enough to rotate the link to the 9-o'clock position the 28290-01D Pin (find no. 1-23 dwg. 29725) can be pushed out. Removing the Pin-Poppet Stem is aided by a support under the poppet stem and use of a push rod with 90° short leg, similar to an Allen wrench.

Note:

The poppet stem support method is helpful, almost essential for reassembly when the poppet stem link attachment pin hole elevation and orientation must be exact when holding the link with one hand and reinstalling the 28290-01D Pin.

To remove the crank - required if the 28278-01F sleeve is to be disassembled.

Remove the 1/4 - 20 Machine Screw holding the 28284-01A retainer and handle in place on the end of the 28289-01F Crank

The crank need not be completely removed if the disassembly purpose is removal of the 28278-01F Sleeve. The crank can be moved inboard enough to clear the sleeve protecting the 00718H O-Ring and 200293C Backup Ring.

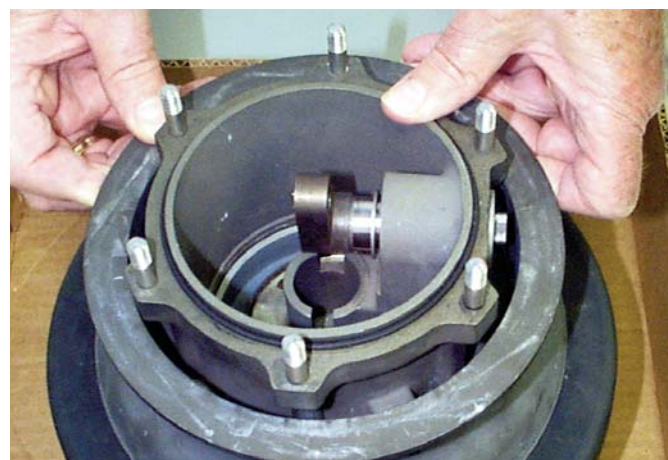
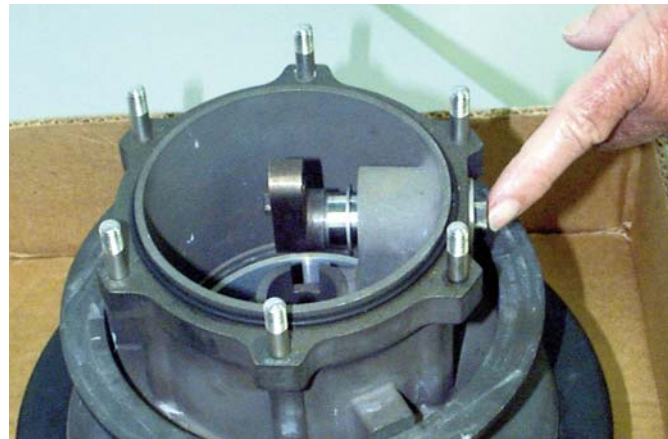
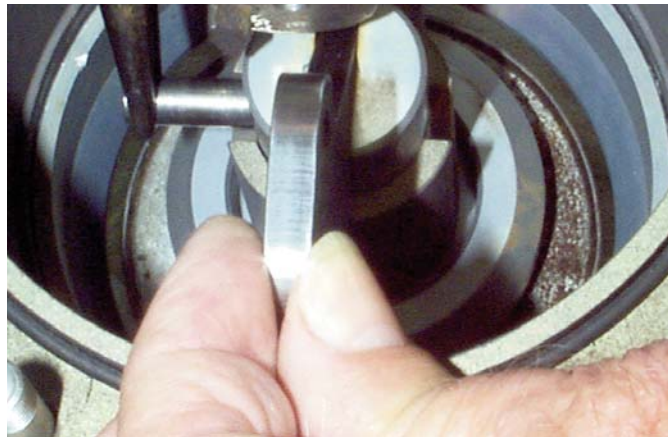
If the 28278-01F Sleeve is to be removed, the item should be placed in the recommended 14x14 box or tray to contain balls as they fall from the body.

In the event of complete disassembly, note the position of washers O-Ring, Backup Ring on the 28289-01F crank as they are removed.

The 28291-01B Lockpin has not been covered in this disassembly sequence as it can be removed at any time by preventing rotation with a 1/8" dia. or smaller drift punch and removing the hex washer head 8-32 screw at its other end.

CAUTION:

If the lockpin is removed with the 28278-01F Sleeve in place, the 200279-01K Spring will eject with the lockpin and the 90290-05K (0.250 dia.) Ball can fall into the pin gallery. Reassembly of the lockpin with the 28278-01F Sleeve in place



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will be difficult because the sleeve must be in position to permit the ball to recede by gravity out of the path of the reinserted lockpin with its spring this after getting the ball to enter its hole from the lockpin gallery.

Reassembly of Model 351GF-15

It is suggested that the following list of new unused O-Rings should be on hand for reassembly

- 2 each 00794J
- 1 only 00779K
- 1 only 00718H
- 1 only 200293C Back-up Ring

Materials and tools required

Loctite – Thread locker 222-Service Removable

Grease – To retain Steel balls in sockets and lube O-Rings to ease installation.

- 0.250 Hex (Allen) wrench
- 1/4" Box or open end wrench
- 3/8" Box or open end or socket wrench
- 1/4" Box or open end or socket wrench
- .045 thick blade screw driver
- .094" Hex (Allen) wrench
- 1/8" or smaller pin or drift punch
- Combination slip joint pliers (to hold 28290-01D Pin-link to poppet stem for installation)
- Pedestal (right circle cylinder) or 3"x 3" block both 3" or more high 14"x14" cut-down box.

One of the 0079J O-Rings can be saved for back-up replacement on the 28276 Seat Assembly providing the suggestion on pg 4. about exercising care when removing the 00794J O-Ring has been followed.

If the 28291-01B Lockpin has been removed it with the 200279-01K Spring should be reinstalled and retained with the 200275-01D Screw.

Loctite Thread locker 222 Service Removable or equal on the 200275-01D 8- 32 Screw is recommended.

Reinstallation of the Steel Ball 90290-05K for the lockpin and the 12 each 90290-06F Steel Balls is facilitated by the use of a dab of grease in the cavity for each ball to retain them when installing the 28278-01F Sleeve or length of duct tape.

To install the 28282-01A body with lockpin assembly and Steel balls into the 28278-01F Sleeve, the sleeve can be inverted on a smooth bench surface and inside the 14x14 box then the body carefully inverted and lowered into the sleeve. The 28278-01F Sleeve is carefully lifted and the 28291-01B Lockpin depressed to provide a indentation recess for the 90290-05K Ball allowing the sleeve to be pulled up capturing the 12 Steel balls in their sockets, then release the lockpin driving the 90290-05K Ball to engage the annular detent groove in the inside diameter of the sleeve. Return the body/sleeve assembly to the upright position. Install 28289-01F Crank with the 71988-40G washer into the body.

Note a light coat of grease on the shaft of the crank will aid the placement of the 00718H O-Ring and back-up ring.

The sequence of reassembly can vary at this point.

A - The crank installation can be completed by placing the O-Ring and back-up ring followed by the 28287-01K Delrin bearing, then the handle and its retainer with a drop of Loctite on the bolt.

B - The 28279-01G Stem Poppet (less the 28280-01E poppet) can be inserted in the body to a full-up position.

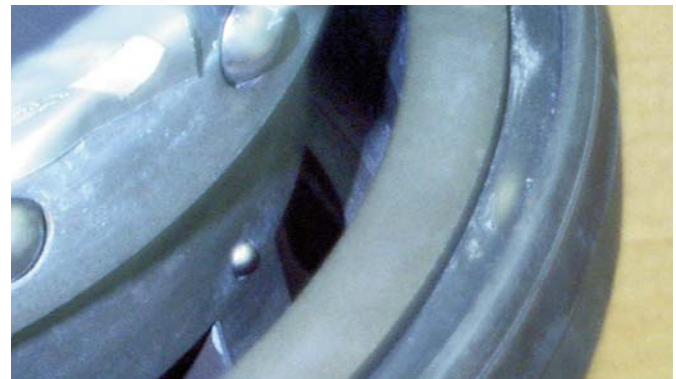
Assembly Aid:

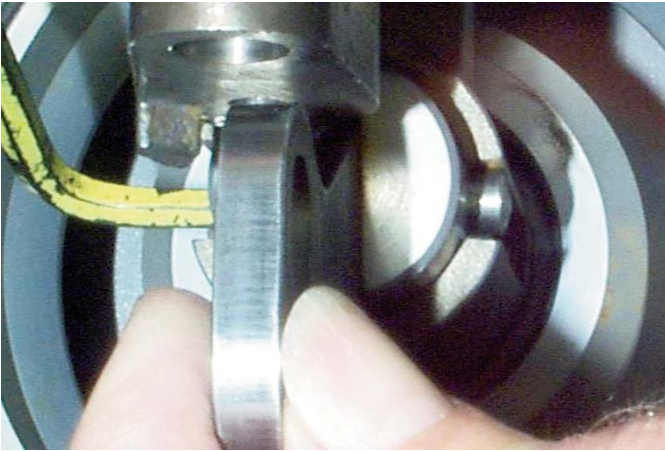
Resting the poppet stem on a cylindrical pedestal of 3 or more inches high and approximately 3" diameter (an inverted tin can) will facilitate the next steps of the assembly sequence.

With the assembly resting on the pedestal, rotate the body while restraining the poppet stem (use the 28283-01J link in the slot of the poppet stem) to a position such that the slots in the body are 90° relative to the slots in the poppet.

In position as described above, the 5/16" hole in the poppet stem will be aligned with the slots in the body allowing the 28290-01D Pin to be inserted through the poppet stem and 28283-01J Link. (See Fig 8.) With the link retained in the stem, the two components can be rotated in the direction of 12 o'clock where the pin will be captured in stem guide area of the body. With the 200873 Stepped Pin in hand, the link and crank are aligned by turning and twisting to permit the pin to be inserted. When the 200873 Pin is in position, the 200874 Spacer is placed on the pin and retained with a Cotter pin.

If option "A" has not been chosen, the O-Ring backup ring





bag until reattachment to hose.

bearing, handle with key are installed now.

When the 200873 Pin is in position, the 200874 Spacer is placed on the pin and retained with a Cotter pin.

If option "A" has not been chosen, the O-Ring backup ring bearing, handle with key are installed now.

The 28276-01C Seat Assembly with O-Ring can now be inserted in place and the poppet stem actuated to the full open position. The 28280-01E Poppet with 0079K O-Ring is installed on the poppet stem with six 200276-01C (8-32 Skt. HEAD. C-Sink Screws). With the poppet installed, the seat assembly can be pulled into position by moving the 28286-01B Handle from its open to the closed position.

The coupler now reassembled is ready for reuse or replacement of the 00794 O-Ring and reinstallation of the 29640-01J 4" elbow or the 200076-01E 4" coupler to 3" hose elbow. The 29764-01B Clip is common with one of the six 5/16-18 nuts that attach the elbow to the coupler. This clip and its cable are the attachment means of the 29762 Dust Cover Assembly.

Flushing of the completely assembled device is at the discretion of service personnel. The grease used are locations outside of the fluid flow path, except that used to lube O-Ring on the seat seal.

Functional Test:

Place complete coupler assembly with elbow and disconnect on a dry hydrant assembly and cycle through

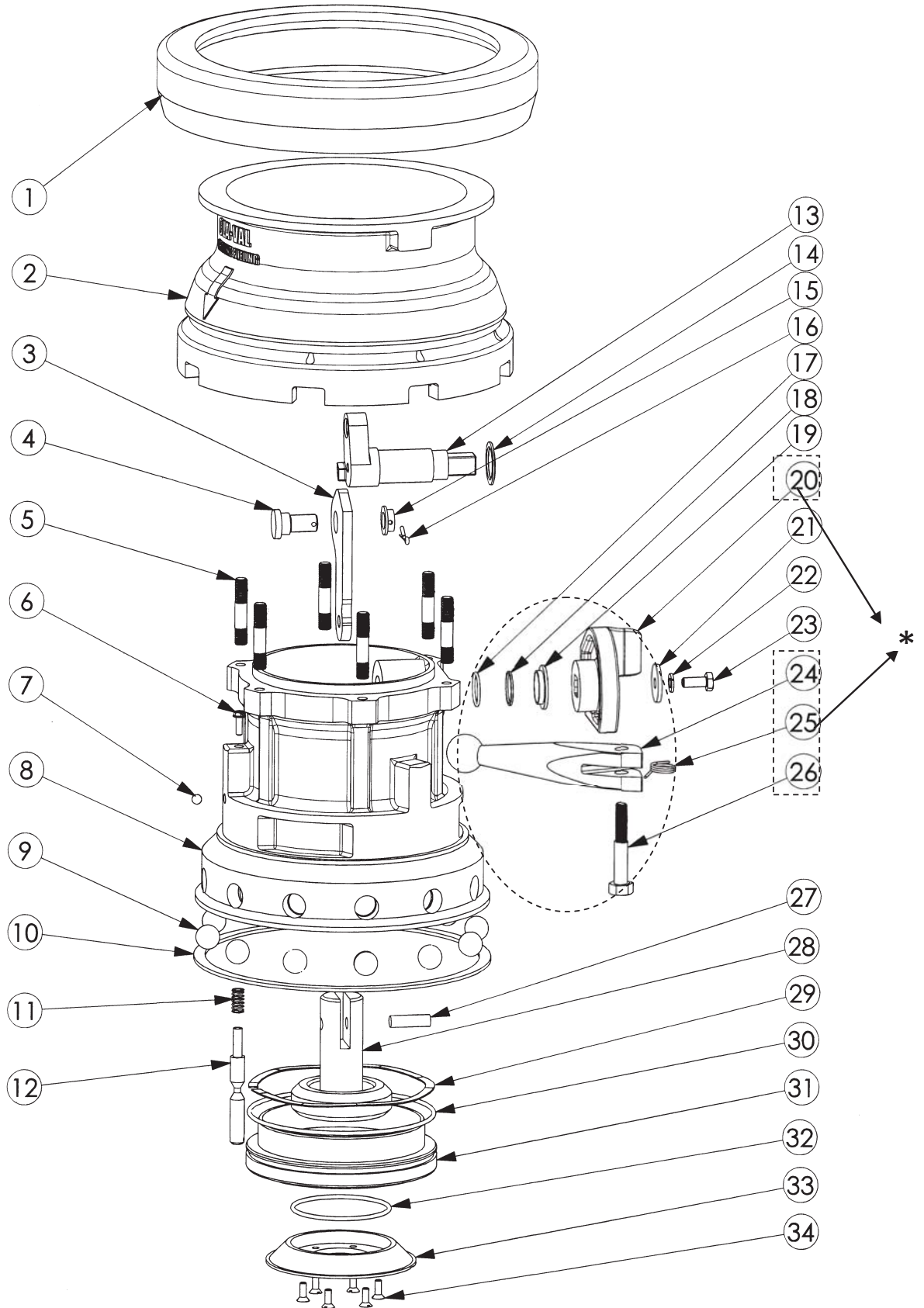
- 1-Placement,
- 2-Depressing of the "Lock Pin" which interlocks the Sleeve,
- 3-Press sleeve to full down and lock position.
- 4-Rotate handle through open/close cycle
- 5-Retract sleeve and remove coupling from hydrant.

Repeat steps 1 through 5 a number of times to insure proper function of all features of the device.

Pressure test assembled device to insure all seals are in place and functioning.

After a final inspection install the 29762 Dust Cover Assembly in the hydrant end and seal the hose end with a plastic plug or

Exploded View:



*Folding Handle Option Pictured, Exclusively for 353GF. Rigid Styles Only Available on 351GF-15.

Parts List:

ITEM	QTY.	PART NO.	DESCRIPTION	MATERIAL
1	1	28277-01A	GUARD	RUBBER
2	1	28278-01F	SLEEVE	ALUMINUM
3	1	28283-01J	LINK	STAINLESS STEEL
4	1	200873-01G	PIN	STAINLESS STEEL
5	6	42878-02F	STUD	STAINLESS STEEL
6	1	200275-01D	SCREW	STAINLESS STEEL
7	1	90290-07D	BALL	STAINLESS STEEL
8	1	28282-01A	BODY	ALUMINUM
9	12	90290-06F	BALL	STAINLESS STEEL
10	1	84081-43K	RETAINING RING	STAINLESS STEEL
11	1	200279-01K	SPRING	STAINLESS STEEL
12	1	28291-01B	LOCK PIN	STAINLESS STEEL
13	1	28289-01F	CRANK	STAINLESS STEEL
14	1	71988-40G	WASHER	STAINLESS STEEL
15	1	200874-01J	SPACER	ALUMINUM
16	1	67992-12D	COTTER PIN	STAINLESS STEEL
17	1	00518B	O-RING	NITRILE
18	1	200293C	BACKUP RING	NITRILE
19	1	28287-01K	BEARING	TEFLON
*20	1	203750-01B	HANDLE	ALUMINUM
21	1	28284-01G	RETAINER	STAINLESS STEEL
22	1	67584-05C	LOCK WASHER	STAINLESS STEEL
23	1	67603-05A	HEX HEAD BOLT	STAINLESS STEEL
* 24	1	205595-01F	FOLDING HANDLE	STAINLESS STEEL
*25	1	90292-17J	TORSION SPRING	STAINLESS STEEL
*26	1	203749-01F	PIVOT SCREW	STAINLESS STEEL
27	1	28290-01D	POPPET STEM PIN	STAINLESS STEEL
28	1	28279-01G	STEM, POPPET	ALUMINUM
29	1	200277-01B	WAVE WASHER	STAINLESS STEEL
30	1	01140A	O-RING	NITRILE
31	1	28276-01C	NOSE SEAL	ALUM. & POLYURETHANE
32	1	00779K	O-RING	NITRILE
33	1	28280-01E	POPPET	ALUMINUM
34	6	200276-01C	FLAT HEAD SCREW	STAINLESS STEEL

*Parts are replaced by _____, _____ for rigid handle styles