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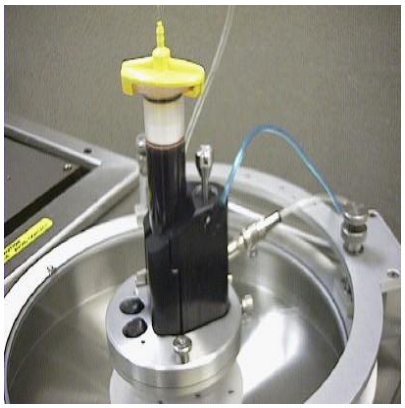
# *OPERATIONS GUIDE*

## Cee® Disposable Syringe Dispense System Model DSD/1



Cost Effective Equipment

## Contents

## 1. Description of the DSD/1 System

The DSD/1 (Disposable Syringe Dispense: Model 1) is a stainless steel/anodized aluminum assembly, pneumatically operated flow controlling mechanism with integral suck-back, which dispenses fluid from a disposable syringe barrel.
The DSD/1 consists of four systems:

1. Housing/Door Assembly: Support structure for internal mechanisms and syringe assembly.
2. Piston Assembly: Pneumatically operated cylinder used to actuate the flow control mechanism.
3. Flow Control Assembly: The mechanism controls the fluid flow and suck-back.
4. Syringe Assembly: Consisting of the pressurized syringe barrel, piston, cap and tip.

The syringe assembly, as mentioned above, is comprised of a syringe barrel, piston, cap and tip. The syringe barrel is made of HDPE (high density polyethylene). The piston and cap are made from polypropylene. The tip is comprised of two materials: the luer fitting, made of HDPE, and the tip, made of Teflon.

The control box is a small Stainless Steel box, which contains all the valves, gauges and regulators. Its function is to pressurize the syringe barrel and supply air to operate the DSD/1.

The dispense hub (located in the center of the spinner lid) is used to locate and lock the DSD/1 to the spinner lid.

The DSD/1 is equipped with a manually operated pressure relief valve. This valve relieves pressure in the syringe barrel during loading and unloading.

If the manually operated relief valve is not closed before opening the door, a by-pass port integrated into the Housing/Door Assembly relieves pressure in the syringe barrel and prevents material from being dispensed accidentally.

## 2. Utility Requirements

All utilities are supplied from the tool (Model 100, 100CB, etc.). The control box routes a fixed 70psi $N_2$/CDA line from the tool to the DSD/1 to operate the piston assembly. The $N_2$ pressure supplied to the syringe barrel is adjusted with a regulator on the front of the control box. The standard range is 0-30psi (0-100psi optional).

## 3. Cleaning the DSD/1

Acceptable cleaning solvents:

1. Isopropyl alcohol
2. N-Methyl Pyrrolidinone (NMP)
3. Acetone

The recommended cleaning method is with a wetted clean room wipe or swab. If large amounts of material are present on the flow control assembly, disassembly may be required for thorough cleaning.

**DO NOT** immerse the DSD/1 in cleaning solvent, this will damage internal components. **DO NOT** squirt solvent directly on the flow control assembly.

Clean the exterior of the DSD/1 with a wetted clean room wipe. **DO NOT** hose down with solvent.

Clean the interior with a wetted swab. **DO NOT** squirt solvent into the mechanism.

Care should be taken not to allow cleaning solvents or materials being dispensed to come into contact with the pneumatic hoses or fittings. Excessive exposure could weaken components.

## 4. Safety Considerations

**DO** fully seat the dispense tips into the syringe barrel.

**DO** wear safety goggles when operating the DSD/1.

**DO** securely fasten the syringe cap to the syringe barrel.

**DO** completely insert pneumatic hoses into quick connect fittings.

**DO** push pneumatic hose until fully seated on syringe cap.

**DO NOT** over pressure the syringe barrel. The acceptable range is 0-100psi.

**DO NOT** open the door when the syringe barrel is pressurized.

**DO** securely fasten the DSD/1 to the dispense hub.

**DO NOT** dispense while the lid is in the open position.

The following describes the operation of the Cee® Disposable Syringe Dispense System. The intent of this manual is to introduce the Operator to the fundamentals of its use, but as with any mechanical device, maximum efficiency in its use will result only from actual practice with the device.

## 5. Syringe Barrel Tip Assembly

As shown in figures 1 and 2, attach the luer tip, which threads into the syringe barrel. Hand tighten the tip until it is fully seated, otherwise it may leak.

Figure 1

Figure 2

## 6. Opening the Syringe Door

To open the door of the syringe housing, as shown in figure 3, hold the syringe housing firmly in one hand and grasp the knurled thumbscrew with the other hand.

Figure 3

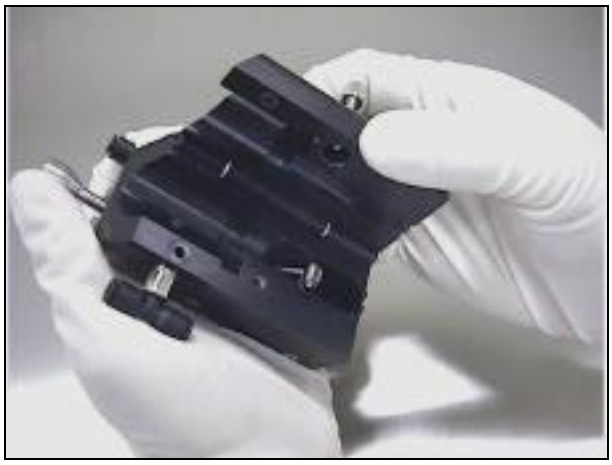


Figure 3a

Hold the door closed while turning the knurled thumbscrew counter clockwise until it is free from the threads. Release your grasp on the door thus allowing it to be opened, as shown in figure 3a above.

## 7. Loading Syringe Barrel

Place the syringe barrel / tip assembly into the housing as shown in figure 5. Be sure to rotate the entire assembly until the curvature of the tip is concave towards the housing.

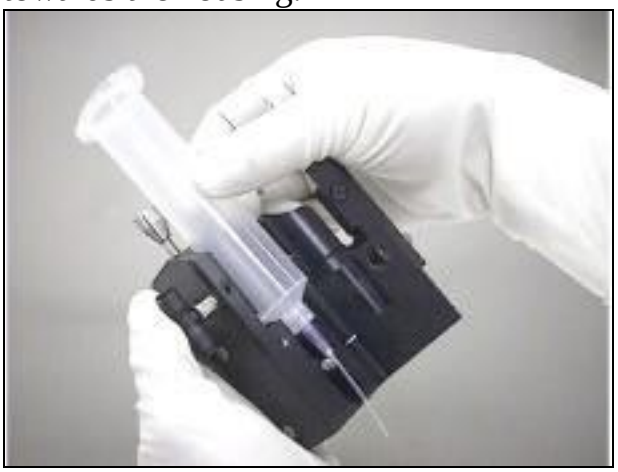


**Figure 5**

Be sure that the tip is centered in the "V" shaped guide at the bottom edge of the housing as shown in figure 6.

**Figure 6**

The housing door is now ready to be closed. As shown in figure 7, close the door until the surfaces of the housing and door meet. Prior to making contact with the housing, you will feel some resistance as the door contacts the shut off mechanism inside the housing.

**Figure 7**

Make sure to press the door firmly against the face of the housing as shown in figure 8 below before turning the thumb screw. Turn clockwise until tight.

**Figure 8**

## 8. Pre-forming The Tip

You must pre-form all the luer tips to obtain an improved uniformity for consecutive dispenses.

**Figure 9**

Press the spring- loaded knob on the top of the housing until it stops, then release it as shown in figures 9 above and figure 10 below.

**Figure 10**

This "press & release" procedure must be repeated approximately 30 to 40 times to obtain the desired tip shape.

## 9. Installing DSD/1 Onto Tool

The syringe system is now ready to be installed into the dispense hub on the spinner lid of the tool. This simple procedure is shown in figures 11 and 12 below.

**Figure 11**

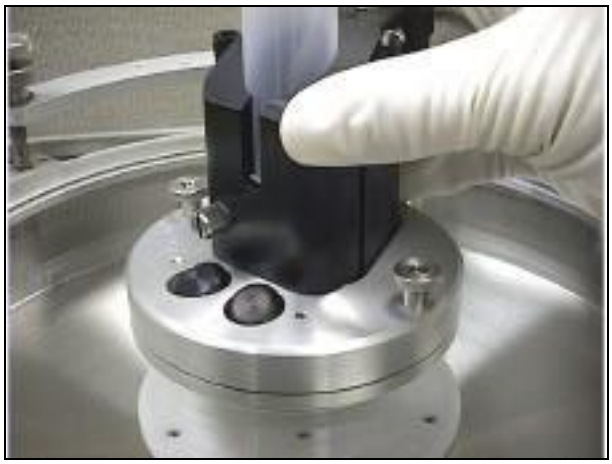


**Figure 12**

You will find that no tools will be required to fit the Syringe housing into the lid dispense hub and that because of its' shape, it will only fit into the hub in the correct orientation. When installed as described, the luer tip will always be directly over the center of the substrate.

Make sure that the tip extends through the hole in the dispense hub, as shown in figure 13 below and has not become inadvertently folded under, thus becoming trapped between the Syringe housing and the dispense hub.

**Figure 13**

The Syringe housing must also rest solidly on the bottom surface of the dispense hub pocket.

To secure the Syringe housing to the dispense hub, tighten the thumbscrew, located at the rear of the hub, as shown in figure 14.

*Check the tightness of the thumb screw before opening the spinner lid, to assure the DSD/1 is securely attached.*

**Figure 14**

## 10.Pneumatic Tubing Connections

Connect the pneumatic control tubing to the Syringe system as shown in figures 15 and 16.
The tubes must be pushed into the quick connect fittings firmly until they are seated completely, to eliminate leaks and inadvertent disconnection's.

**Figure 15**

**Figure 16**


**Figure 17**

The small diameter clear tubing from the Dispense Control box hose barb will attach to the 90° quick connect elbow fitting on the housing. *(The photos for this document, of this tubing, were taken using blue tubing for clarity.)*

The larger diameter clear tubing from the Dispense Control box quick connect fitting will attach to the "T" quick connect fitting on the Syringe housing. This line will also have an in-line sleeve valve.

The red tubing on the Dispense Control box is the incoming pressurized nitrogen gas or pressurized clean dry air. (CDA)

## 11. Filling Syringe Barrel

The Syringe system is now ready to be filled with the desired material that is to be dispensed. Carefully pour the material into the top of the open Syringe barrel as shown in figure 18.

**Figure 18**

*Refer to Section 03 for cleaning methods and/or precautions.*

Install the piston into the barrel, pushing it firmly down until it reaches the top meniscus of the fluid and the majority of the air has been removed between the piston and the fluid. This is shown in figures 19 below and figure 20 on the following page.

**Figure 19**

**Figure 20**

Next, install the yellow syringe cap onto the Syringe barrel as shown in figures 21 through 24.

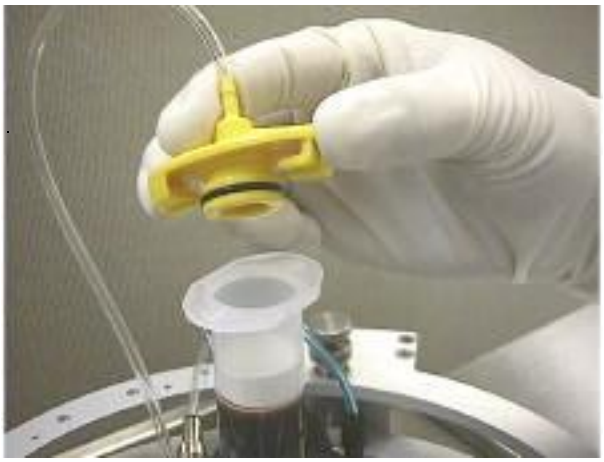


**Figure 21**

**Figure 22**

**Figure 23**

**Figure 24**

As shown in the two photos above, hold the barrel firmly in place while twisting the yellow Syringe cap clockwise until it stops.

## ***CAUTION!***

You must ensure that you do not twist the barrel in the Syringe housing / door assembly or damage will occur to the dispense tip.

## 12. Sleeve Valve Operation

Figure 25 shows the sleeve valve in the closed position. Figure 26 shows the valve in the open position. To move from one position to the other, simply slide the collar in the desired direction.

**Figure 25**

**Figure 26**

For overall general safety and to prevent accidental partial dispenses and /or spillage, this valve should normally be in the closed position.

Open this sleeve valve for actual dispense operations only.

## 13. Setting Barrel Pressure

The final setup step prior to dispense operations is to adjust the gas pressure that is being fed to the Syringe barrel from the Dispense Control box.

**Figure 27**

Turn the adjustment knob on the Dispense Control box counterclockwise to decrease the pressure as shown in figure 27.

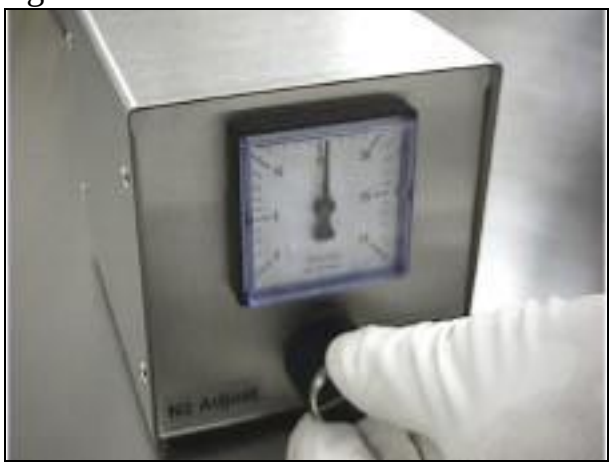


**Figure 28**

As demonstrated above, turn the pressure adjustment knob on the Dispense Control box clockwise to increase the pressure as shown in figure 28.

## 14. Purging the System

To empty the system manually, apply pressure to the Syringe by moving the Sleeve Valve to the on position, and hold the knob on the top of the housing down until the Syringe is empty.

**Figure 29**

Release the knob and turn off the gas via the Sleeve Valve.

## 15. Locking Mechanism

A unique feature of the Syringe system allows the operator to lock the mechanism in the open position to facilitate a continuous dispense of material until the barrel is empty. This method may also be used to purge the system.

**Figure 30**

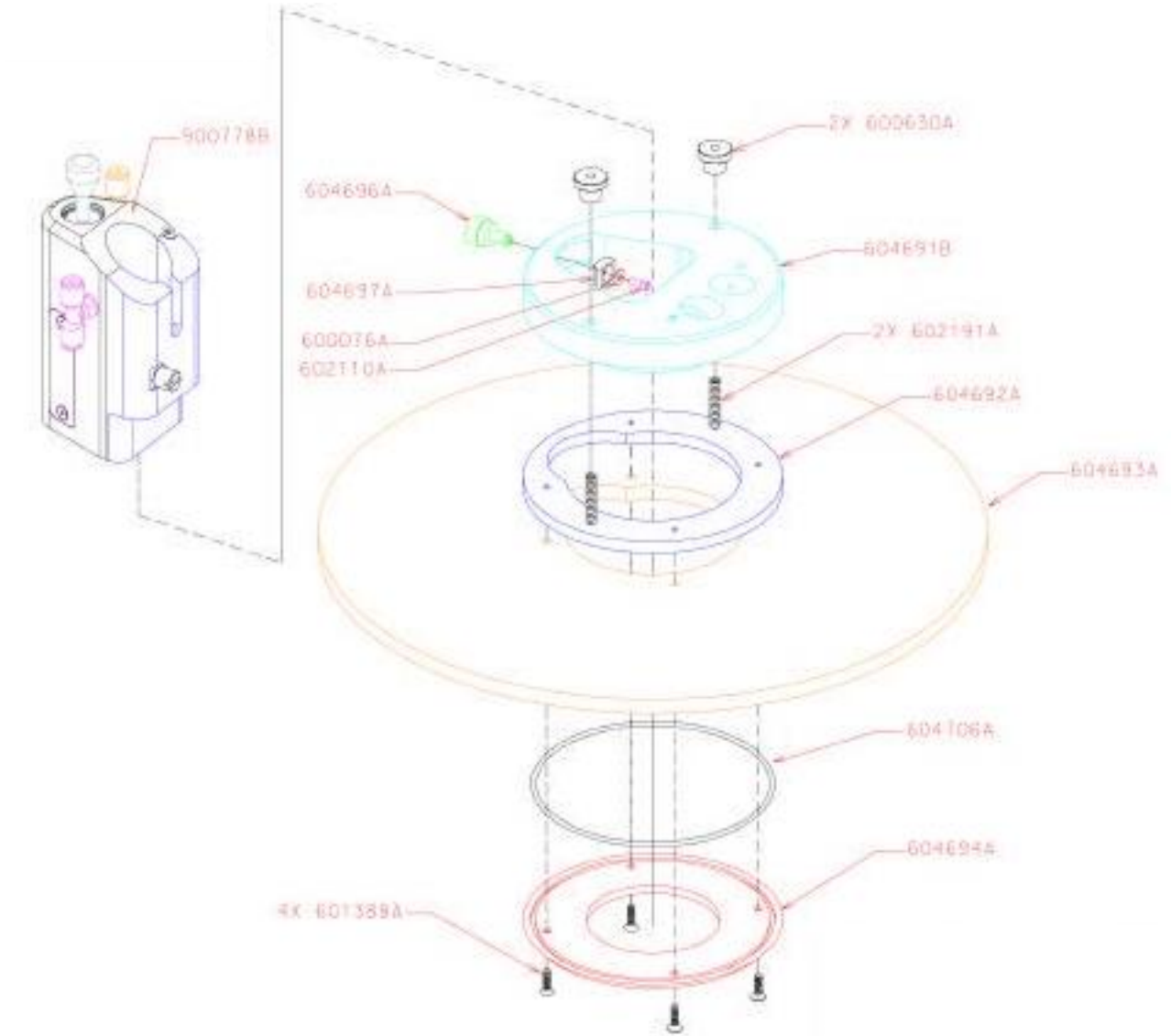
Push the knob on the top of the Syringe housing down until it stops. See figure 30.

**Figure 31**

Push the small button on the side and release the knob. The mechanism is now "locked". See figure 31.

## 16. DSD/1 Parts List

| ITEM NO. | PART NO. | DESCRIPT ION | QUANTITY |
|---|---|---|---|
| 1 | 601185A | # 6 -3 2 S ET S CREW (1 / 8 LONG) | 1 |
| 2 | 604600A | SYRINGE PUSH KNOB | 1 |
| 3 | 601550A | INTERNAL RETAINING RING (5 / 8 BORE) | 1 |
| 4 | 604627A | BUNA -N O-RING # 0 1 4 | 1 |
| 5 | 604599B | SYRINGE SEAL CAP | 1 |
| 6 | 604626A | BUNA -N O-RING # 0 0 8 | 1 |
| 7 | 604598B | SYRINGE PISTON/ SHAFT | 1 |
| 8 | 604628A | Buna-N o-ring #109 | 1 |
| 9 | 604633A | SS Spring 1.5 lg x 0.48 OD x 0.038 wire dia. | 1 |
| 10 | 604632A | Rulon-J Bushing 3/16 ID x 5/16 ODx 1/4 lg | 1 |
| 11 | 604704A | MALE BRANCH T EE 5 / 3 2 OD T O 1 0 -3 2 | 1 |
| 12 | 601184A | # 4 -4 0 FHCS, 3 / 8 L ONG | 2 |
| 13 | 604591B | S YRINGE COV ER | 1 |
| 14 | 604695A | S YRINGE L OCK PIN | 1 |
| 15 | 604703A | Compression Spring 0.5 lg x 0.18 OD | 1 |
| 16 | 602013A | 3 / 3 2 E-RING | 7 |
| 17 | 604263A | MALE ELBOW 1 / 8 TUBE T O # 1 0 -3 2 | 1 |
| 18 | 604592A | SYRINGE HINGE PIN | 1 |
| 19 | 604612A | # 5 TEFLON WASHER | 4 |
| 20 | 604593B | SYRINGE PIN | 2 |
| 21 | 604589B | SYRINGE HOUSING | 1 |
| 22 | 604614A | 1/8" Shoulder Screw (5/16 shoulder) | 1 |
| 23 | 600503A | Viton O-Ring , 1 / 8 " X 1 / 4 "  -0 0 6 | 1 |
| 24 | 604631A | #8 Split Washer | 1 |
| 25 | 604590B | SYRINGE DOOR | 1 |
| 26 | 602069A | Nylon Washer .1 5 6 x.3 1 2 x.0 3 1 | 1 |
| 27 | 604634A | Knurled-head Panel Screw #8-32 x 1.0 lg. | 1 |
| 28 | 604596B | SYRINGE CYLINDER L INK | 1 |
| 29 | 604595B | SYRINGE PIVOT LINK | 1 |
| 30 | 604613A | 1/8" Dowel Pin (1/4" long) | 1 |
| 31 | 604616A | 1/4" Long x 1/8" Dia Spring | 1 |
| 32 | 604594A | SYRINGE ROLLER PIN | 1 |
| 33 | 604615A | 3/16 OD x 3/32 ID Bearing | 2 |
| 34 | 604597A | SYRINGE ROLLER | 1 |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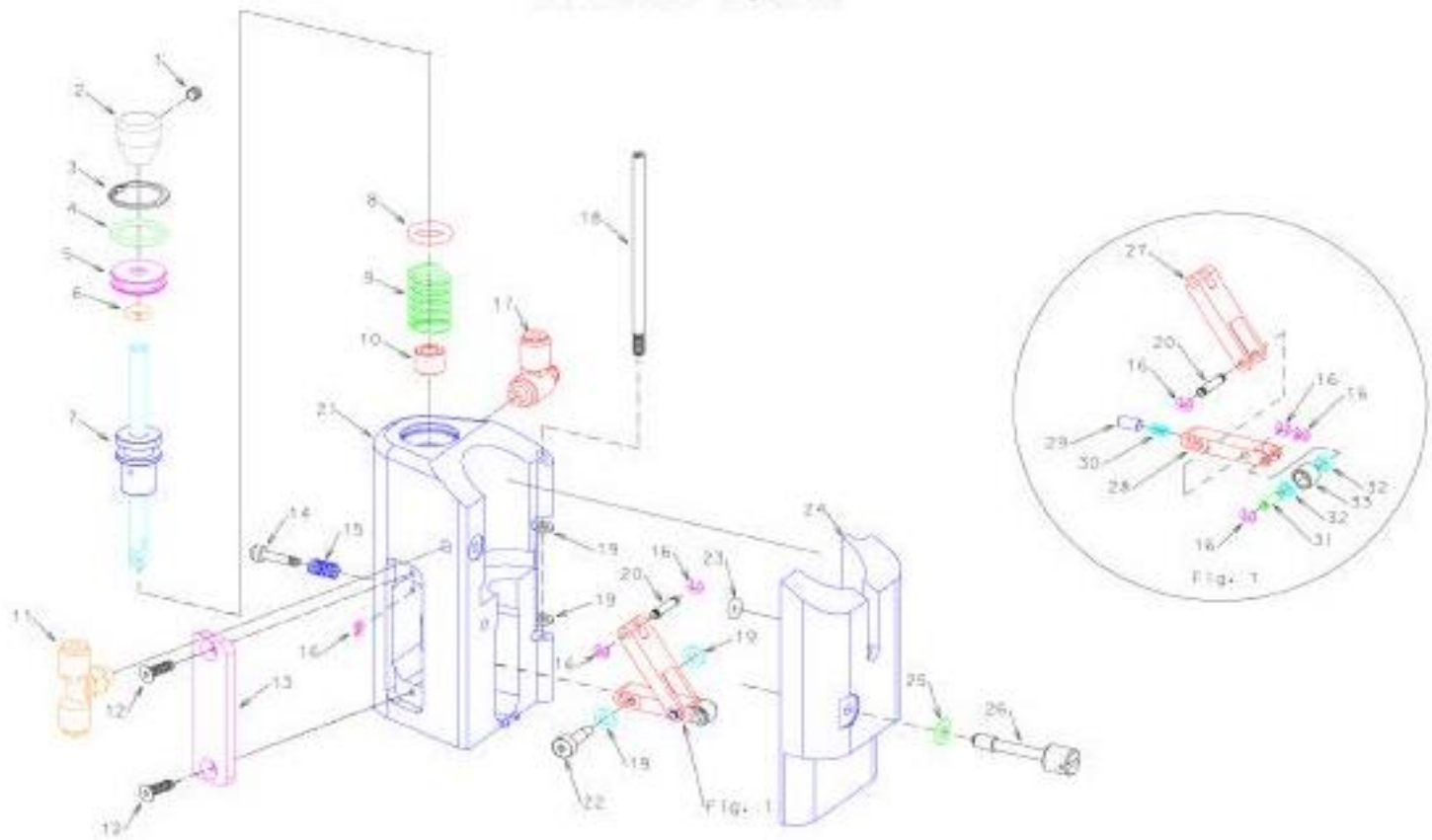
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Fig. 1