

Techcon Systems  
TS5520  
Spray Valve

User Guide



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## 12. LIMITED WARRANTY

Manufacturer warrants this product to the original purchaser for a period of one (1) year from date of purchase to be free from defects in material and workmanship, but not against damages by misuse, negligence, accident, faulty installations and instructions. Manufacturer will repair or replace (at factory's option), free of charge, any component of the equipment thus found to be defective, on return of the component, "PREPAID" to the factory during the warranty period. In no event shall any liability or obligation of the Manufacturer arising from this warranty exceed the purchase price of the equipment. This warranty is only valid if the defective product is returned as a complete assembly without physical damage. The Manufacturer's liability, as stated herein, cannot be altered or enlarged except by a written statement signed by an officer of the company. In no event shall the Manufacturer be liable for consequential or incidental damages. A return authorization is required from Techcon Systems prior to shipping a defective unit to the factory.

Manufacturer reserves the right to make engineering product modifications without notice.

All returns must be issued with a Returns Authorization number, prior to return. Send warranty returns to:

### Americas and Asia

OK International  
Garden Grove Division  
12151 Monarch Street  
Garden Grove, Ca 92841

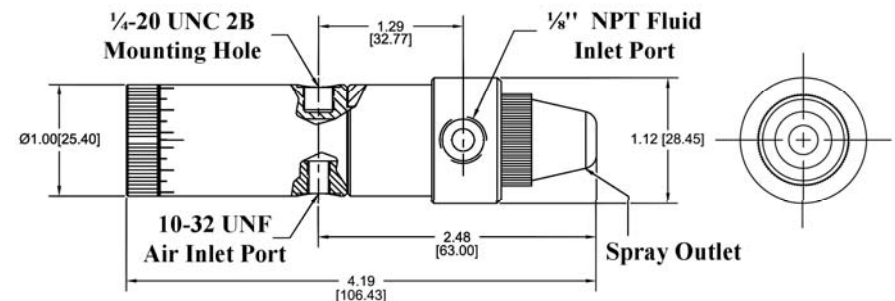
### Europe

OK International  
Eagle Close  
Chandler's Ford Ind Est  
Eastleigh  
Hampshire  
SO53 4NF  
United Kingdom

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## 1. SPECIFICATIONS

|                          | <b>TS5520</b>                              |
|--------------------------|--|
| Size                     | 4.2" Length X 1.12"<br>(107mm X 28.5mm)    |
| Weight                   | 0.3 lb (136g)                              |
| Fluid Inlet Port         | 1/8" NPT female                            |
| Fluid Outlet Port        | Nozzle and Spray Cap                       |
| Air Inlet Port           | 10-32 UNF                                  |
| Auxiliary Air Inlet Port | 10-32 UNF                                  |
| Minimum Air Pressure     | 70 psi (4.8bar)                            |
| Maximum Fluid Pressure   | 100psi (6.9bar)                            |
| Operating Frequency      | Exceeds 400 cycles/min.                    |
| Mounting Port            | 1/4-20 UNC-2B                              |
| Wetted Parts             | Type 303 SS, Al., Teflon®, Delrin®,<br>EPR |



Dimensions are in inches [mm]

**Figure 1.0**

TSI-0223\_B

## 2. UNPACKING AND INSPECTION

Carefully unpack the valve and examine the items contained in the carton. These will include:

- Valve Assembly
- Valve bracket
- User guide
- Valve Air Hose

## 3. DESCRIPTION

The TS5520 Series Spray Valve is designed to spray low viscosity fluid with very precise deposits. An external stroke control makes it easy for the operator to fine-tune fluid flow. Total control of the spray cycle is provided by adjustable fluid flow and precise control of pre-spray, atomizing air and post-spray with the TS500R spray valve controller. Maintenance is made simple by the elimination of troublesome spring loaded needle packings. The valve's compact design and easy mounting hole allow for easy integration into automated applications.

## 4. THEORY OF OPERATION

The TS5520 Series Spray Valve is a normally closed, adjustable opening, needle and seat valve. Inlet air pressure through port (2) retracts the needle assembly (7) from the seat (4) allowing fluid to flow from the valve fluid inlet (6) to the outlet nozzle (5). Air pressure through port (3) passes around the dispense "orifice" providing the atomized spray pattern. Relieving the input air pressure allows the spring (1) to return the needle back to its position to close the material path.

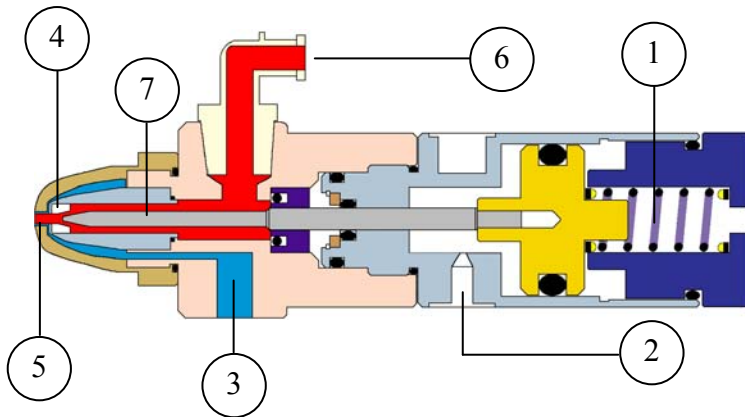


Figure 2.0

## 11. TROUBLE SHOOTING

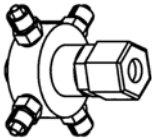
| PROBLEM  | POSSIBLE CAUSE                          | CORRECTION   |
|--|---|--|
| No Fluid Flow  | Fluid pressure too low                  | Increase fluid pressure  |
|  | Operating pressure too low              | Increase air pressure to 70 psi (4.8bar)                                 |
|  | Valve is not actuating                  | Check Valve controller   |
|  | Fluid cured in valve chamber            | Clean valve thoroughly   |
|  | The stroke adjustment closed            | Open stroke adjustment counterclockwise                                  |
| Inconsistent Fluid Flow                                      | Fluid pressure fluctuating              | Make sure fluid pressure is constant                                     |
|  | Valve operating pressure is too low     | Increase valve pressure to 70 psi (4.8bar)                               |
|  | Valve open time is not consistent       | Check to make sure the valve controller is providing a consistent output |
|  | Air trapped in fluid housing            | Purge valve  |
| Fluid drools after the valve closes, eventually stopping     | Air trapped in fluid housing            | Purge valve  |
| Fluid flows through nozzle but will not spray<br>Steady drip | Atomize pressure is too low             | Increase atomize pressure  |
|  | Dirty needle and seat                   | Perform thorough cleaning  |
|  | Worn needle and seat                    | Replace worn or damaged part   |
|  | Fluid pressure exceeds 100 psi (6.9bar) | Lower fluid pressure   |

## 10. STANDARD ACCESSORIES

| PART NUMBER   | DESCRIPTION                            |
|---------------|--|
| 5520F-000-001 | Collar for Fan Cap                     |
| 5520F-000-002 | Fan Cap for "Elliptical" Spray Pattern |

### 10.1 OPTIONAL ACCESSORIES

| PART NUMBER | DESCRIPTION          |
|-------------|----------------------|
| TS918-46    | 4-Way Fluid Manifold |
| 5420-SIT    | Seal Insertion Tool  |



### 10.2 FLUID FITTINGS AND TUBING

| PART NUMBER   | DESCRIPTION                                     |
|---------------|---|
| TSD1003-16    | 1/8" NPT to 1/4" O.D. Tube, 90° Elbow           |
| TSD1002-17    | 1/8" NPT to 3/8" O.D. Tube                      |
| TSD1002-18    | 1/8" NPT to 1/4" O.D. Tube                      |
| TSD1002-38    | 1/4" NPT to 1/4" O.D. Tube                      |
| TSD1099-22    | 3/8" O.D. X 1/4" I.D. Tube, Black, Polyethylene |
| TSD1099-23    | 3/8" O.D. X 1/4" I.D. Tube, Clear, Polyethylene |
| TSD1099-24    | 1/4" O.D. X 1/8" I.D. Tube, Clear, Polyethylene |
| TSD1099-25    | 1/4" O.D. X 1/8" I.D. Tube, Black, Polyethylene |
| TSD1099-45    | 6mm O.D. X 4mm I.D, Clear, Polyethylene         |
| TSD1099-46    | 6mm O.D. X 4mm I.D, Black, Polyethylene         |
| TSD126-360BPK | Luer Lock Tubing, 60" (1524mm) , Black          |

### 10.3 BRACKETS

| PART NUMBER  | DESCRIPTION                               |
|--------------|---|
| 918-033-000  | Productions Master Stand (Base & Support) |
| 918-000-012  | Rod Clamp Assembly                        |
| 1212-000-008 | 6" (152.4mm) Threaded Mounting Rod        |

## 5. SETUP INSTRUCTIONS

Refer to Figure 3.0

Note: This installation uses Luer lock adapters shipped with the valve. Any approved material line with 1/8" NPT connections will work.

1. If desired, mount the valve to the mounting bracket included.
2. Connect fluid feed line to fluid inlet port (2).
3. Install the valve actuating air hose to the valve air inlet (1).
4. Install the atomize air hose to the valve atomize air inlet (3).
5. Connect the valve actuating air hose (1) to Port A of the TS500R controller.
6. Connect the atomize air hose (3) to Port B of the TS500R controller.
7. Make sure all connections are tight.
8. Set fluid pressure. Do not exceed 100 psi (6.9bar).
9. Place container under the valve outlet and activate the valve until the fluid flows steady.

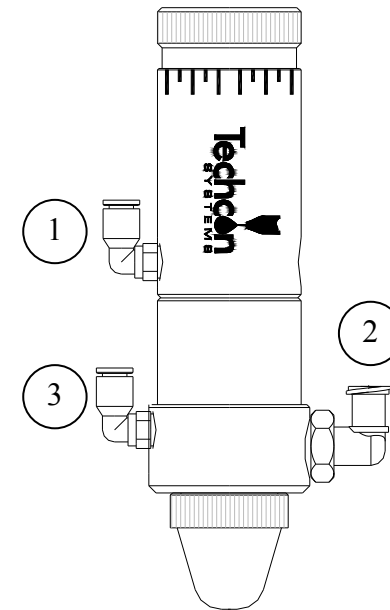


Figure 3.0

## 6. TYPICAL SYSTEM SET-UP

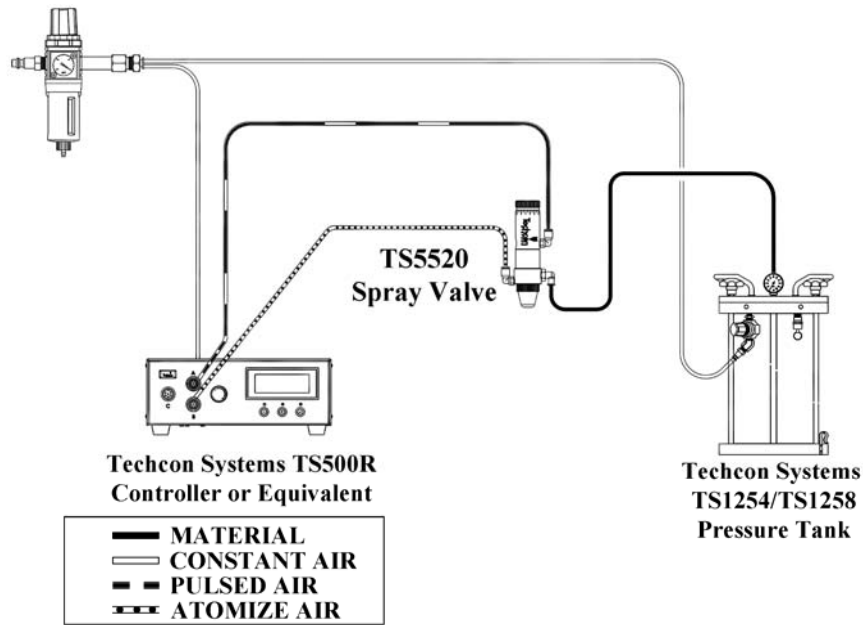


Figure 4.0

### SPRAY AREA COVERAGE BY ROUND NOZZLE:

| Distance from Nozzle      | 1"<br>(25.40mm)    | 2"<br>(50.80mm)     | 3"<br>(76.20mm)     | 6"<br>(152.40mm)    |
|---------------------------|--------------------|---------------------|---------------------|---------------------|
| Diameter of spray pattern | 0.250"<br>(6.35mm) | 0.500"<br>(12.70mm) | 0.750"<br>(19.05mm) | 1.500"<br>(38.10mm) |

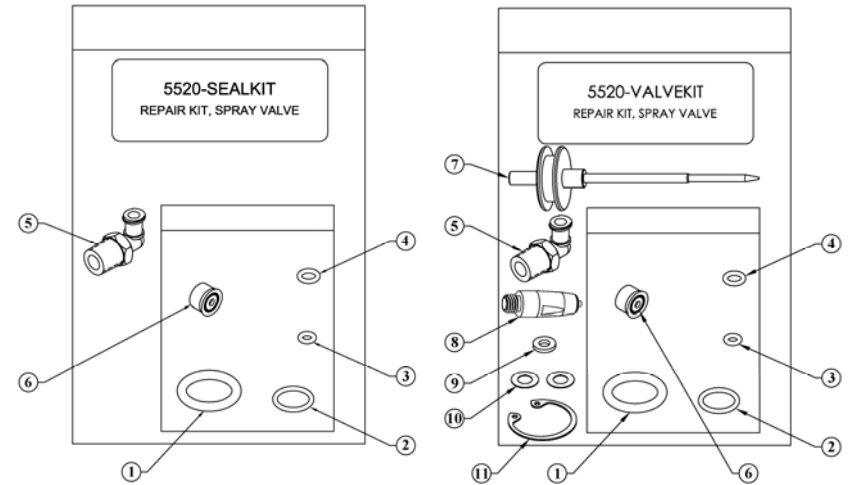
### SPRAY AREA COVERAGE BY FAN NOZZLE:

| Distance from Nozzle      | 1"<br>(25.40mm)     | 2"<br>(50.80mm)     | 3"<br>(76.20mm)     | 6"<br>(152.40mm)    |
|---------------------------|---------------------|---------------------|---------------------|---------------------|
| Diameter of spray pattern | 1.000"<br>(25.40mm) | 1.500"<br>(38.10mm) | 2.000"<br>(50.80mm) | 3.250"<br>(82.60mm) |

Spray coverage is determined by:

- Flow adjustment - turn end cap counterclockwise to increase material flow rate.
- Length of actuation, set at controller (valve open time).
- Fluid reservoir pressure
- Fluid viscosity

## 9. REPAIR KITS



| ITEM | PART NUMBER  | DESCRIPTION              | QTY |
|------|--------------|--------------------------|-----|
| 1    | TSD1400-208A | Piston O-Ring, Buna      | 1   |
| 2    | TSD1400-013A | O-Ring, Buna             | 1   |
| 3    | TSD1400-006A | O-Ring, Buna             | 1   |
| 4    | TSD1400-008A | O-Ring, Buna             | 1   |
| 5    | TSD931-75    | Luer Lock Adaptor, Elbow | 1   |
| 6    | TSD400-70    | U-Cup Seal               | 1   |
| 7    | 5520-000-010 | Needle/Piston Assembly   | 1   |
| 8    | 5520-000-020 | Nozzle, Inc. Seat        | 1   |
| 9    | TSD1109-45   | Nylon Washer             | 1   |
| 10   | TSD1109-43   | Mylar Washer             | 2   |
| 11   | TSD1120-15   | Retaining Ring, Large    | 1   |

## SPARE PARTS, CONT.

### Valve Front Section

#### Recommended lubricant:

All O-Rings & seals must be lubricated with Bimba HT-99, or equivalent, with the exception of TSD400-70, which must remain dry.

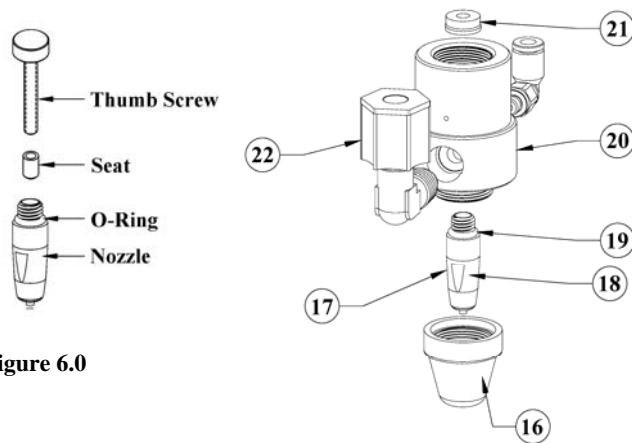


Figure 6.0

| ITEM  | PART NUMBER  | DESCRIPTION                 | QTY |
|-------|--------------|-----------------------------|-----|
| 16    | 5520-000-018 | Spray Cone Cap              | 1   |
| 17    | 5520-000-020 | Nozzle, Inc. Seat           | 1   |
| 18    | T1000598     | Nozzle Seat                 | 1   |
| 19    | TSD1400-008A | Nozzle Adaptor O-Ring, Buna | 1   |
| 20    | 5520-000-002 | Body                        | 1   |
| 21    | TSD400-70    | U-Cup Seal                  | 1   |
| 22    | TSD1003-16   | Compression Fitting         | 1   |
| Above | TSD1113-28   | Thumb Screw                 | 1   |

- Distance between spray nozzle to spray surface

## 7. MAINTENANCE AND CLEANING:

**Tool required:** 5/8" open-end wrench; Snap ring pliers, o-ring removal tool (P/N TSD1597-7).

Normally, purging the valve with appropriate flush material or solvent after use is sufficient for cleaning. However, some material may cause a buildup in the valve chamber, in this case periodic and thorough cleaning will be required.

#### NOTE:

- Make sure the fluid pressure is released before valve is disassembled
- To replace seals, please order seal kit part number: 5520-SEALKIT
- To repair valve, please order valve kit part number: 5520-VALVEKIT

### 7.1 Thorough Cleaning

Refer to figure 5.0

- Release fluid pressure.
- Disconnect fluid line and remove fluid inlet fitting (28).
- Disconnect valve air hoses.
- Turn the stroke control knob (16) two turns counterclockwise from closed position.
- Hold the fluid housing (8) and rotate the air cylinder (2) counterclockwise. When completely un-threaded, pull the two valve segments straight apart to separate.
- Inspect o-ring (6), replace o-ring if damaged found.
- Remove cup seal (7), replace seal if damaged found.
- Remove nozzle (10) and spray cone (9).
- Clean the fluid housing (8), needle/piston assembly (5), nozzle (10) and spray cone (9).

**NOTE:** Avoid using sharp probes for cleaning. Any nicks or scratches on the seal or the surfaces of the needle/piston assembly may cause leakage.

- Insert cup seal (7) into fluid housing (8) using 5420-SIT insertion tool. Make sure the o-ring side is facing down.
- Reinstall nozzle (10) and spray cone (9) to fluid housing (8).
- Lubricate o-ring (6) with Bimba HT-99, or equivalent.
- Thread the air cylinder/needle assembly into fluid housing.
- Make sure not to cross thread.

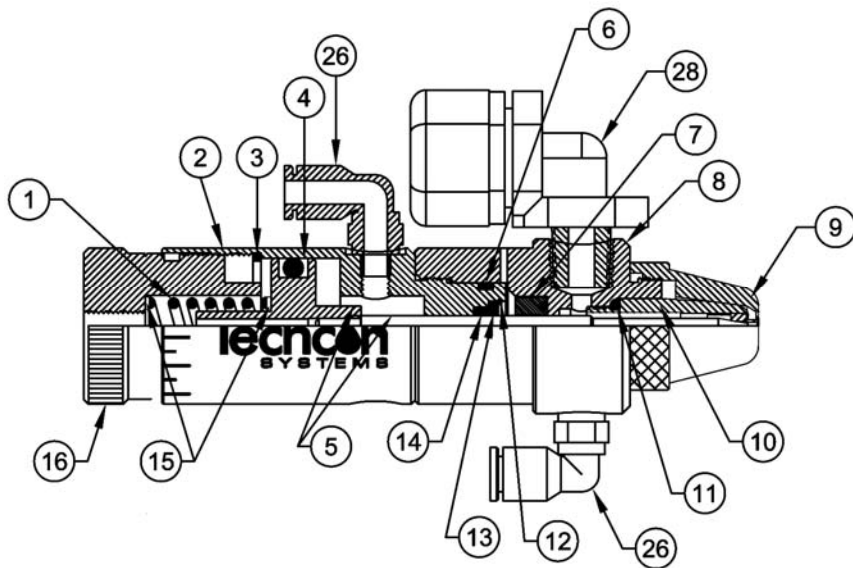
### 7.2 Nozzle Seat Replacement (refer to figure 6.0)

- Insert the thumb screw inside the nozzle (17) and rotate clockwise to attach to the seat (18).
- Secure the nozzle in a "soft jaw" vise and then pull the thumb screw, with the seat attached, straight out.

- Install the new seat on the thumb screw and then insert the thumb screw straight into the nozzle. To ensure proper seat alignment, it is recommended that the seat installation is done on an Arbor Press.

### 7.3 To Replace Seal in Air Cylinder

- Hold the fluid housing (8) and rotate the air cylinder (2) counterclockwise. When completely un-threaded, pull the two valve segments straight apart to separate.
- Remove stroke control knob (16) by rotating it in counterclockwise direction.
- Remove compression spring (1).
- Using the snap ring pliers, remove the retaining ring (3).
- Remove Mylar washers (15).
- Pull the needle/piston assembly (5) straight out from the air cylinder (2).
- Using the snap ring pliers, remove the retaining ring (12).
- Remove the nylon washer (13) from the air cylinder.
- Using o-ring removal tool, remove o-ring (14).
- Replace all o-rings if necessary.
- Lubricate all o-rings with Bimba HT-99, or equivalent.
- Reinstall o-ring (14).
- Reinstall nylon washer (13) and secure with retaining ring (12).
- Thread the air cylinder (2) into fluid housing (8). Make sure not to cross thread.
- Reinstall needle/piston assembly (5) and secure with retaining ring (3).
- Reinstall first Mylar washer (15) on the needle/piston assembly (5).
- Reinstall compression spring (1) into air cylinder (2).
- Reinstall second Mylar washer (15) in the stroke control knob (16).
- Reinstall stroke control knob (16).

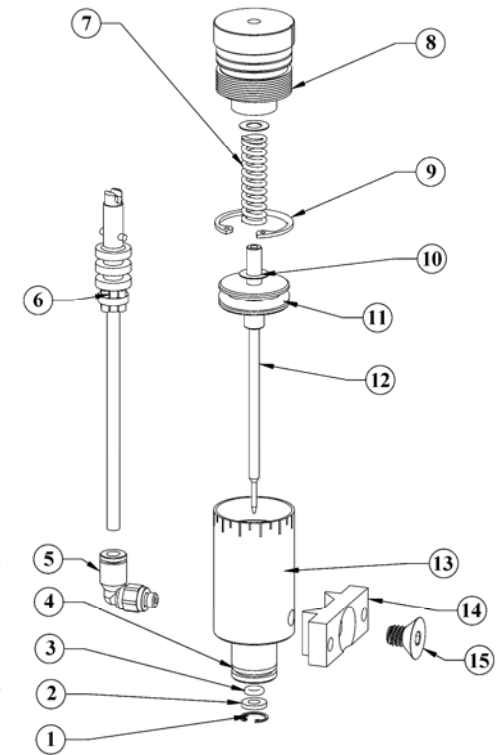


## 8. SPARE PARTS

### Valve Rear Section

#### Recommended lubricant:

All o-rings & seals must be lubricated with Bimba HT-99, or equivalent.



| ITEM | PART NUMBER  | DESCRIPTION                      | QTY |
|------|--------------|----------------------------------|-----|
| 1    | TSD1120-2    | Retaining Ring, Small            | 1   |
| 2    | TSD1109-45   | Nylon Washer                     | 1   |
| 3    | TD1400-006A  | O-Ring, Buna                     | 1   |
| 4    | TSD1400-013A | O-Ring, Buna                     | 1   |
| 5    | TSD1003-20   | Air Fitting, 4mm, Elbow          | 2   |
| 6    | A0100478     | Air Hose/Connector Assembly, 4mm | 2   |
| 7    | TSD1150-34   | Spring                           | 1   |
| 8    | 5520-000-007 | End Cap                          | 1   |
| 9    | TSD1120-15   | Retaining Ring, Large            | 1   |
| 10   | TSD1109-43   | Mylar Washer                     | 2   |
| 11   | TSD1400-208A | Piston O-Ring, Buna              | 1   |
| 12   | 5520-000-010 | Needle/Piston Assembly           | 1   |
| 13   | 5520-000-001 | Air Cylinder                     | 1   |
| 14   | 918-000-048  | Mounting Bracket                 | 1   |
| 15   | TSD1106-36   | Mounting Screw                   | 1   |