OPERATOR’S MANUAL
65178X-XXX-B
INCLUDING: SERVICE KITS, TROUBLESHOOTING, PARTS LIST, DISASSEMBLY & REASSEMBLY.

HIGH PRESSURE MATERIAL REGULATOR

READ THIS MANUAL CAREFULLY BEFORE INSTALLING, OPERATING OR SERVICING THIS EQUIPMENT.
It is the responsibility of the employer to place this information in the hands of the operator. Keep for future reference.

SERVICE KITS

- Use only genuine ARO® replacement parts to assure compatible pressure rating and longest service life.
- Order 637219-XXX-B rebuild kit (see chart below) for general repair of the regulator. This includes a diaphragm kit and a valve kit.
- Fluid diaphragm kit 61962-1 can be ordered separately (see page 4).
- Valve kit can be ordered separately (see page 4).

REBUILD KIT DESCRIPTION CHART

<table>
<thead>
<tr>
<th>Type</th>
<th>637219 - XXXX - B</th>
</tr>
</thead>
<tbody>
<tr>
<td>0 - Downstream</td>
<td>651780-XXX-B</td>
</tr>
<tr>
<td>1 - Back Pressure</td>
<td>651781-XXX-B</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Ball Size</th>
<th>A - 0.1875&quot;</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>B - 0.2500&quot;</td>
</tr>
<tr>
<td></td>
<td>C - 0.5000&quot;</td>
</tr>
</tbody>
</table>

| Ball & Seat Material | 1 - Tungsten Carbide |

Rebuild Kit Selection
Example: Model # 651780-A3B-B
Rebuild Kit # 637219-0A1-B

SPECIFICATIONS

Model Series .................. 65178X-XXX-B
Type .................. 651780-XXX-B, 651781-XXX-B
Material Inlet ................. see model chart
Material Outlet .............. see model chart
Dimensional Data ............. see figure 10

PERFORMANCE DATA

Regulated Pressure Range ........ see model chart
Maximum Regulated Pressure .... see model chart
Maximum Inlet Pressure
- 651780-XXA-B ................ 3000 p.s.i. (206.9 bar)
- 651780-XXB-B, -XXC-B, -XXR-B ... 6000 p.s.i. (413.8 bar)
- 651781-XXX-B ................ 3000 p.s.i. (206.9 bar)
Maximum Temperature Limits ..... 0° to 200° F (-18° to 93° C)

MODEL DESCRIPTION CHART

Type
- 0 - Downstream
- 1 - Back Pressure

Port Size, (Ball Size)
- A - 3/8 - 18 N.P.T.F. (0.1875"
- B - 3/8 - 18 N.P.T.F. (0.2500"
- C - 3/4 - 14 N.P.T.F. (0.500"

Body Material, (Seat Material)
- 1 - Carbon Steel (Tungsten Carbide)
- 3 - 316 Stainless Steel (Tungsten Carbide)

Regulated / Maximum Pressure Range
- A - 400 - 1250 p.s.i. (27.6 - 86.2 bar)
- B - 100 - 3000 p.s.i. (6.9 - 206.9 bar) Back Pressure models
- 1000 - 3000 p.s.i. (69 - 206.9 bar) -XXB models
- 2000 - 5000 p.s.i. (137.9 - 344.8 bar) -BXR models
- 750 - 2500 p.s.i. (51.7 - 172.4 bar) -CXB Downstream models
- 750 - 5000 p.s.i. (51.7 - 344.8 bar) -CXR models
**OPERATING AND SAFETY PRECAUTIONS**

- Read and heed all warnings, cautions and safety precautions before operation of this unit.
- Be certain anyone operating this equipment or fluid system has been trained to use it safely.

**WARNING** HIGH PRESSURE DEVICE. Improper usage of this equipment could result in serious injury. The possibility of injection into the flesh is a potential hazard. Wear approved safety glasses or face shield and other equipment as needed to prevent injury. Never allow any part of the human body to come in contact with the material outlet, the tip, or the material outlet of the dispensing device. An injection injury can be serious. If an injection accident should occur, it is very important that you contact a qualified physician for immediate treatment.

**WARNING** MISAPPLICATION HAZARD. Do not use the regulator when the fluid inlet pressure is too high for the designed operating range. Excessive inlet pressure can cause a lock-out situation. Lock-out occurs when the inlet pressure is beyond the regulator's spring capacity. The valve will not open. Attempts to disassemble components while in a lock-out condition may result in injury.

**WARNING** COMPONENT RUPTURE. Do not operate regulator at an inlet pressure greater than specified. To avoid possible damage or personal injury do not operate this unit at pressure higher than the stated operating range as it appears on the model plate.

**WARNING** DISASSEMBLY HAZARD. Do not disassemble this regulator when it is under pressure. Relieve pressure in the pumping system before attempting service or disassembly procedures. Disconnect air lines and carefully bleed pressure off the system. Be certain the system is not maintaining pressure due to a material restriction in the hose, line, dispensing device, or the spray or extrusion tip. Failure to relieve pressure both upstream and downstream may result in an injury upon disassembly.

**WARNING** BONNET REMOVAL HAZARD. Do not attempt to remove the four bonnet retaining bolts without first relieving the tension on the main spring. Failure to relieve tension could result in an accident upon disassembly.

**WARNING** PREVENT FIRES. Keep solvents away from heat, sparks or open flame. Keep containers closed when not in use. When pumping, flushing or recirculating volatile solvents, be certain the area is adequately ventilated.

**CAUTION** FLUSH SUPPLY LINE. Before installing fluid regulator blow the supply lines clear and flush to remove contaminates.

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**INSTALLATION**

- Refer to the typical installation view which best applies.
- Locate the regulator as close as possible to the spray gun or dispensing device for best pressure control.
- Identify the regulator INLET / OUTLET (flow direction). The regulator is marked with an arrow on the body base (refer to figure 10).
- When flexible fluid lines are used, mount the regulator securely using the (2) 1/4" - 20 threaded holes in the base (see figure 10).
- Flush supply line before installing regulator.
- Remote models require maximum 100 p.s.i. (6.9 bar) signal pressure. Start with a signal pressure as low as possible and adjust upward until proper flow is reached.

**TYPICAL RECIRCULATING SYSTEM**

**TYPICAL DEAD END SYSTEM**

**TYPICAL REMOTE SYSTEM**

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Figure 2

- ARO® is a registered trademark of Ingersoll Rand Company • Loctite® and 242® are registered trademarks of Henkel Loctite Corporation • 271™ and 680™ are trademarks of Henkel Loctite Corporation • Hytrel® is a registered trademark of the DuPont Company • Perma-lock® is a registered trademark of National Starch and Chemical Corporation •
OPERATING INSTRUCTIONS

Refer to pages 4 and 5 for parts reference.

- To **INCREASE** outlet pressure, turn the (6) adjusting screw **CLOCKWISE** (see figure 3).
- To **DECREASE** outlet pressure, turn the (6) adjusting screw **COUNTERCLOCKWISE** (see figure 3).

**NOTE:** Part Y106-109 Allen wrench is included to make necessary pressure adjustments.

**FLUSH-OUT FEATURE FOR DOWNSTREAM MODELS ONLY.**

See figure 4.

- Flush the regulator periodically. The interval may vary depending on the amount and type of material used.
- By using a wrench and “flush-out” plug (provided), the operator is able to move the entire spindle downward and force the ball off the seat which should purge the regulator of particle build-up.

**NOTE:** The flush-out procedure temporarily overrides the adjusted pressure. It will not, however, affect the regulator setting when flushing operation is completed.

**FLUSH-OUT PROCEDURE**

1. Remove spray gun or dispensing device, this will allow any particles to clear from the system.
2. Insert (21) flush-out plug and turn clockwise until it touches the (4) washer (see view on page 5).
3. Turn up to two turns maximum. This will allow the ball to unseat and pass material at free flow (unregulated). **DO NOT** attempt to turn further to avoid damage.
4. Turn the plug back to its original position.

**SEAT PLUG FEATURE**

The (47) plug, located at the base of the regulator, can be removed for access to the ball and seat assembly for cleaning and inspection for wear. With this feature, the regulator does not have to be unthreaded from the pumping system. Be certain to relieve system pressure (See “WARNING: DISASSEMBLY HAZARD”).

**MAINTENANCE**

- Disassembly should be done on a clean work bench and use clean cloths.
- If replacement parts are necessary, refer to the parts list and drawings on pages 4 and 5.
- Upon reassembly, lubricate parts and use Loctite where indicated. Follow the torque specifications as shown.
- Service kits are available, which include parts typically needed for an overhaul.
- Keep good records of service activity and include the regulator in a preventive maintenance program.
- Certain “Smart Parts” are indicated with a “*” in the parts list, these parts should be available for fast repair and reduction of down time.

**TROUBLE SHOOTING**

No fluid pressure.
- Check for damaged or worn diaphragms.
- Look for possible obstruction by hardened material or foreign matter, periodically use the regulator “Flush-out” feature (Downstream models only). Use a fluid filter upstream from the regulator.

Pressure creeps above the setting when system is dead ended and in a static (no flow) mode.
- Check for dirty seat and clean as appropriate.
- Check for worn or damaged seat and replace if necessary.

Outlet pressure drops below setting.
- Check pump for proper operation and check for possible leakage problems.
- Look for a clogged supply line problem, flush the supply line.

Fluid leakage from spring housing.
- Check the bonnet hold-down screws and the plate hold down screws and re-torque as needed.
- Check for damaged diaphragm, replace as needed.

Regulator will not function, even when dispensing device is opened.
- Check for possible obstruction in the fluid line.
- Inlet pressure is too high, causing a “Lock-Out” situation. Read “WARNING: MISAPPLICATION HAZARD” found on page 2.

![Typical Downstream Regulator Cross Section View Showing Major Components.](image)

**Figure 3**

**Figure 4**

**Figure 5**
<table>
<thead>
<tr>
<th>Item</th>
<th>Description (size)</th>
<th>Qty</th>
<th>Part No.</th>
<th>[Mtl]</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Housing - 65178X-XXX-B (downstream)</td>
<td>(1)</td>
<td>651781-XXX-B (back pressure)</td>
<td>93534-1</td>
</tr>
<tr>
<td>2</td>
<td>Bolt (7/16&quot; - 20 x 5-1/2&quot;)</td>
<td>(4)</td>
<td>93487-1</td>
<td>93488-1</td>
</tr>
<tr>
<td>3</td>
<td>Washer (7/16&quot; i.d.)</td>
<td>(4)</td>
<td>Y79-716</td>
<td>93534-2</td>
</tr>
<tr>
<td>4</td>
<td>Washer (1.162&quot; o.d. x 0.125&quot; thick)</td>
<td>(1)</td>
<td>93485-1</td>
<td>93486-1</td>
</tr>
<tr>
<td>5</td>
<td>Thrust Bearing (1.173&quot; o.d.)</td>
<td>(1)</td>
<td>93484-1</td>
<td>93485-1</td>
</tr>
<tr>
<td>6</td>
<td>Adjusting Screw (5/8&quot; - 24, left hand)</td>
<td>(1)</td>
<td>93486-1</td>
<td>93487-1</td>
</tr>
<tr>
<td>7</td>
<td>Plate</td>
<td>(1)</td>
<td>93818</td>
<td>93819</td>
</tr>
<tr>
<td>8</td>
<td>Adjusting Nut</td>
<td>(1)</td>
<td>93481-1</td>
<td>93482-1</td>
</tr>
<tr>
<td>9</td>
<td>Spring - 65178X-XXX-B (green, 100 - 1250 in. lbs)</td>
<td>(1)</td>
<td>65178X-XXA-B (red, 1000 - 3000 in. lbs)</td>
<td>65178X-XXB-B (yellow, 2000 - 5000 in. lbs)</td>
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<tr>
<td>10</td>
<td>Screw (#10 - 32 x 7/8&quot;)</td>
<td>(1)</td>
<td>Y191-107</td>
<td>65178X-XXC-B</td>
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<tr>
<td>11</td>
<td>Lockwasher (0.196&quot; i.d.)</td>
<td>(1)</td>
<td>Y14-10</td>
<td>93479-1</td>
</tr>
<tr>
<td>12</td>
<td>Small Plate</td>
<td>(1)</td>
<td>93820</td>
<td>93821</td>
</tr>
<tr>
<td>13</td>
<td>Piston</td>
<td>(1)</td>
<td>93821</td>
<td>93822</td>
</tr>
</tbody>
</table>

**MATERIAL CODE**

- [A] = Aluminum
- [SS] = Stainless Steel
- [C] = Carbon Steel
- [T] = PTFE
- [H] = Hytrel®

**NOTE:**
- 637219-XXX-B rebuild kits include both 61962-1 diaphragm service kit and valve kit shown in the chart.
- "Smart parts", keep these items on hand in addition to the service kits for fast repair and reduction of down time.
- Includes item 46.
- See note on page 7.

### 651780-XXX-B DOWNSTREAM REGULATORS

<table>
<thead>
<tr>
<th>Flow / Size</th>
<th>Port Size N.P.T.F.</th>
<th>Ball Size</th>
<th>Rebuild Kit</th>
<th>Valve Kit (41, 42, 43, 44) (see below)</th>
<th>Flow Tube (45)</th>
<th>&quot;O&quot; Ring (46)</th>
<th>Base (48)</th>
<th>Pipe Plug (52) (2 req'd)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Standard</td>
<td>-A1X 3/8 0.1875&quot;</td>
<td>637219-0A1-B</td>
<td>92985</td>
<td>62169</td>
<td>93489-1</td>
<td>93492-1</td>
<td>93540-1</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td>-A3X 3/8 0.1875&quot;</td>
<td>637219-0A1-B</td>
<td>92985</td>
<td>62169</td>
<td>93489-1</td>
<td>93492-1</td>
<td>93541-1</td>
<td>-</td>
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</tbody>
</table>

Hi-Flow

<table>
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<tr>
<th>Flow / Size</th>
<th>Port Size N.P.T.F.</th>
<th>Ball Size</th>
<th>Rebuild Kit</th>
<th>Valve Kit (41, 42) (see below)</th>
<th>Flow Tube (45)</th>
<th>&quot;O&quot; Ring (46)</th>
<th>Base (48)</th>
<th>Pipe Plug (52) (2 req'd)</th>
</tr>
</thead>
<tbody>
<tr>
<td>-B1X 3/8 0.250&quot;</td>
<td>637219-0B1-B</td>
<td>92985</td>
<td>62237</td>
<td>93489-1</td>
<td>93492-1</td>
<td>93540-1</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>-B3X 3/8 0.250&quot;</td>
<td>637219-0B1-B</td>
<td>92985</td>
<td>62237</td>
<td>93489-1</td>
<td>93492-1</td>
<td>93541-1</td>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>

Mastic

<table>
<thead>
<tr>
<th>Flow / Size</th>
<th>Port Size N.P.T.F.</th>
<th>Ball Size</th>
<th>Rebuild Kit</th>
<th>Valve Kit (41, 42, 43)</th>
<th>Flow Tube (45)</th>
<th>&quot;O&quot; Ring (46)</th>
<th>Base (48)</th>
<th>Pipe Plug (52) (2 req'd)</th>
</tr>
</thead>
<tbody>
<tr>
<td>-C1X 3/4 0.500&quot;</td>
<td>637219-0C1-B</td>
<td>93778</td>
<td>61963-1</td>
<td>93490-1</td>
<td>93491-1</td>
<td>93536-1</td>
<td>Y17-51-N</td>
<td>-</td>
</tr>
<tr>
<td>-C3X 3/4 0.500&quot;</td>
<td>637219-0C1-B</td>
<td>93778</td>
<td>61963-1</td>
<td>93490-1</td>
<td>93491-1</td>
<td>93537-1</td>
<td>Y17-51-S</td>
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</table>

### 651781-XXX-B BACK PRESSURE REGULATORS

<table>
<thead>
<tr>
<th>Flow / Size</th>
<th>Port Size N.P.T.F.</th>
<th>Ball Size</th>
<th>Rebuild Kit</th>
<th>Valve Kit (41, 42)</th>
<th>Flow Tube (45)</th>
<th>&quot;O&quot; Ring (46)</th>
<th>Base (48)</th>
<th>Pipe Plug (52) (2 req'd)</th>
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<tbody>
<tr>
<td>Hi-Flow</td>
<td>-B1X 3/8 0.250&quot;</td>
<td>637219-0B1-B</td>
<td>93565-1</td>
<td>61985-1</td>
<td>93489-1</td>
<td>93492-1</td>
<td>93540-1</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td>-B3X 3/8 0.250&quot;</td>
<td>637219-0B1-B</td>
<td>93565-1</td>
<td>61985-1</td>
<td>93489-1</td>
<td>93492-1</td>
<td>93541-1</td>
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Mastic

<table>
<thead>
<tr>
<th>Flow / Size</th>
<th>Port Size N.P.T.F.</th>
<th>Ball Size</th>
<th>Rebuild Kit</th>
<th>Valve Kit (41, 42)</th>
<th>Flow Tube (45)</th>
<th>&quot;O&quot; Ring (46)</th>
<th>Base (48)</th>
<th>Pipe Plug (52) (2 req'd)</th>
</tr>
</thead>
<tbody>
<tr>
<td>-C1X 3/4 0.500&quot;</td>
<td>637219-0C1-B</td>
<td>93518-1</td>
<td>61967-1</td>
<td>93490-1</td>
<td>93491-1</td>
<td>93536-1</td>
<td>Y17-51-N</td>
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<tr>
<td>-C3X 3/4 0.500&quot;</td>
<td>637219-0C1-B</td>
<td>93518-1</td>
<td>61967-1</td>
<td>93490-1</td>
<td>93491-1</td>
<td>93537-1</td>
<td>Y17-51-S</td>
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### DOWNSTREAM VALVE KITS

<table>
<thead>
<tr>
<th>Valve Kit</th>
<th>&quot;O&quot; Ring</th>
<th>Seat</th>
<th>Ball</th>
<th>Spring</th>
</tr>
</thead>
<tbody>
<tr>
<td>61963-1</td>
<td>Y328-19</td>
<td>93522-1</td>
<td>93510-1</td>
<td>93480-1</td>
</tr>
<tr>
<td>62169</td>
<td>Y328-14</td>
<td>93885</td>
<td>93508-1</td>
<td>93881</td>
</tr>
<tr>
<td>62237</td>
<td>Y328-14</td>
<td>93558-1</td>
<td>93561-1</td>
<td>93881</td>
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</table>

### BACK PRESSURE VALVE KITS

<table>
<thead>
<tr>
<th>Valve Kit</th>
<th>&quot;O&quot; Ring</th>
<th>Seat</th>
</tr>
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<tbody>
<tr>
<td>61967-1</td>
<td>Y328-19</td>
<td>93522-1</td>
</tr>
<tr>
<td>61985-1</td>
<td>Y328-14</td>
<td>93558-1</td>
</tr>
</tbody>
</table>
ASSEMBLY TORQUE REQUIREMENTS

NOTE: DO NOT OVERTIGHTEN FASTENERS.

(2) Torque alternately.
1.) Snug.
2.) 20 - 25 ft lbs. (27.1 - 33.9 Nm).
10.) 65 - 75 in. lbs. (7.3 - 8.5 Nm).
14.) Torque alternately.
1.) Snug.
2.) 20 - 25 ft lbs. (27.1 - 33.9 Nm).
3.) 50 - 55 ft lbs. (67.8 - 74.6 Nm).

LUBRICATION / SEALANTS

① Apply "DRI-SLIDE" upon assembly.
② Apply Loctite® nickel anti-seize to threads.
③ Apply 40036 grease to threads.
④ Apply Loctite 271™ to threads.
⑤ Apply Perma-Lok® LH150 anaerobic pipe sealant to threads.
⑥ Apply Loctite nickel anti-seize to threads (except on models 65178X-X1X-B).

Figure 6

651780-XXX-B Downstream Style

651781-XXX-B Back Pressure Style
FOR "WARNINGS", REFER TO "OPERATING AND SAFETY PRECAUTIONS" ON PAGE 2 FOR DETAILS.
BEFORE SERVICING, READ "WARNING: DISASSEMBLY HAZARD" FOUND ON PAGE 2.
TOOLS REQUIRED:
- Small bench vise
- 3/8" Allen wrench (Y106-109 is included)
- 5/32" Allen wrench
- A 9/16" Allen wrench for -CXX-B models
- Torque wrench and Loctite 242.

NOTE: It is not always necessary to remove the regulator from the fluid line to service or inspect only the valve section.
BEFORE DOING ANY IN-LINE SERVICE, ALL FLUID PRESSURE MUST BE RELIEVED. HEED ALL WARNINGS FOUND ON PAGE 2.

ALLEN WRENCH NOTE: The Y106-109 (3/8") Allen wrench is included and can be used for several functions including: Regulator adjustment (spring type models), removal and assembly of the long bonnet bolts and the short plate bolts.

VALVE SEAT NOTE: Before deciding to order a general repair kit to service the whole regulator, check the easiest things first. Remove and inspect the valve seat for dirt, foreign matter, damage or wear (steps 1 - 3).

DOWNSTREAM STYLE MODELS
1. Remove the (46 / 47) base plug / "O" ring assembly, which will allow removal of the (44) spring, (43) ball, (45) flow tube, (42) seat and (41) "O" ring.

BACK PRESSURE STYLE MODELS
2. Remove the (46 / 47) base plug / "O" ring assembly, which will allow the removal of the (45) flow tube, (42) seat and (41) "O" ring.

REGULATOR DISASSEMBLY
3. Inspect the (42) seat for dirt, damage or wear.

READ "WARNING: BONNET REMOVAL HAZARD" FOUND ON PAGE 2.

4. Remove the four (2) long bolts to allow removal of the bonnet / adjusting screw assembly.

NOTE: The (6) adjusting screw, (5) thrust bearing and (4) washer are retained by (7) plate, which is pressed into place. It should not be necessary to disassemble these parts during normal service.

5. Remove the (9) regulator spring and (12) small plate.

6. Remove the (14) bolts.

7. Remove the (15) plate.

8. Remove the stem / diaphragm and piston assembly.

9. Place the stem in a vise, locate and secure on the stem flats provided.

10. Using a 5/32" hex Allen wrench, remove the (10) screw.

11. Remove the (11) lockwasher, (13) piston, two (16, 17) diaphragms and (18 and 19) "O" rings from the (40) valve stem.

REMOTE MODELS (Refer to figure 8)
1. Remove four (34) screws from (30) air cap and separate the diaphragm assembly from the (33) adapter.

2. Disassemble the diaphragm assembly by removing the ten (31) nuts.

3. Separate the two halves to allow inspection of the (27) diaphragm and replace, if necessary.

4. Reassemble in reverse order.

LUBRICATION / SEALANTS
- Apply Loctite 242 to threads.
- Secure (29) piston to (28) plate with Loctite 680 Retaining Compound. Apply "DRI-SLIDE" upon reassembly.

ASSEMBLY TORQUE REQUIREMENTS
- DO NOT OVERTIGHTEN FASTENERS.

NOTE: DO NOT OVERTIGHTEN FASTENERS.

(31) Torque in sequence.
1.) Snug.
2.) 20 ft lbs (27.1 Nm).

(32) Torque alternately.
1.) Snug.
2.) 20 - 25 ft lbs (27.1 - 33.9 Nm).

(34) Torque alternately.
1.) Snug.
2.) 10 ft lbs (13.6 Nm).

MATERIAL CODE
[A] = Aluminum
[C] = Carbon Steel
[N] = Neoprene

PARTS LIST

<table>
<thead>
<tr>
<th>Item</th>
<th>Description (size)</th>
<th>Qty</th>
<th>Part No.</th>
<th>Mtl</th>
</tr>
</thead>
<tbody>
<tr>
<td>25</td>
<td>Ribbed Bolt (3/8&quot; - 16 x 1-1/2&quot;)</td>
<td>(10)</td>
<td>93750-1</td>
<td>[C]</td>
</tr>
<tr>
<td>26</td>
<td>Air Cap</td>
<td>(1)</td>
<td>93753-1</td>
<td>[A]</td>
</tr>
<tr>
<td>27</td>
<td>Diaphragm</td>
<td>(1)</td>
<td>93754-1</td>
<td>[N]</td>
</tr>
<tr>
<td>28</td>
<td>Plate</td>
<td>(1)</td>
<td>94573</td>
<td>[C]</td>
</tr>
<tr>
<td>29</td>
<td>Piston</td>
<td>(1)</td>
<td>93751-1</td>
<td>[C]</td>
</tr>
<tr>
<td>30</td>
<td>Air Cap</td>
<td>(1)</td>
<td>93753-2</td>
<td>[A]</td>
</tr>
<tr>
<td>31</td>
<td>Nut (3/8&quot; - 16)</td>
<td>(10)</td>
<td>Y12-6-C</td>
<td>[C]</td>
</tr>
<tr>
<td>32</td>
<td>Cap Screw (7/16&quot; - 20 x 2&quot;)</td>
<td>(4)</td>
<td>Y157-76</td>
<td>[C]</td>
</tr>
<tr>
<td>33</td>
<td>Adapter</td>
<td>(1)</td>
<td>93752-1</td>
<td>[A]</td>
</tr>
<tr>
<td>34</td>
<td>Cap Screw (5/16&quot; - 18 x 1&quot;)</td>
<td>(4)</td>
<td>Y99-52</td>
<td>[C]</td>
</tr>
</tbody>
</table>

(”Smart parts”, keep these items on hand in addition to the service kits for fast repair and reduction of down time.)
Also refer to parts list and views on pages 4 and 5.

1. Place the (40) stem in a vise. Use the flats provided.
2. Position the (19) "O" ring in the groove.
3. Place the (17) white diaphragm onto the (40) stem center.
4. Place the (16) cream colored diaphragm onto the (40) stem.
5. Place the (13) piston on the assembly.
6. Install the (11) lockwasher and the (10) screw.
   NOTE: Make certain the diaphragm holes are in alignment before tightening the (10) screw. Torque to 65 - 75 in. lbs (7.3 - 8.5 Nm).
   SERVICE HINT: Use the (14) screw to help align the diaphragm holes.
7. Remove the diaphragm / piston / stem assembly from the vise.

UPPER REGULATOR BODY SECTION REASSEMBLY
☆ NOTE: (from page 4 parts list) If the (1) housing has been removed and disassembled, the (7) plate should be re-placed.
8. Place the (48) base in a vise, using the flats.
9. Place the (15) plate over the diaphragm / piston / stem assembly.
10. Apply Loctite 271 to the (14) screw.
11. Install the (14) screws.
   NOTE: Tighten the short bolts alternately and evenly.
   • Tighten snug.
   • Tighten to 20 - 25 ft lbs (27.1 - 33.9 Nm).
   • Tighten to 50 - 55 ft lbs (67.8 - 74.6 Nm).
12. Place the (12) plate (ball side down) into the hex of the (10) screw.

REGULATOR VALVE SECTION REASSEMBLY
DOWNSTREAM MODELS
• Install (41) "O" ring.
• Install (42) seat.
• Install the (45) flow tube.
• Install the (43) ball.
• Install the (44) spring with the narrow end against the ball.
• Install the (47) valve plug and "O" ring assembly.
• Tighten until snug.

BACK PRESSURE MODELS
• Install (41) "O" ring.
• Install (42) seat.
• Install the (45) flow tube.
• Install the (47) valve plug and "O" ring assembly.
• Tighten until snug.

PERFORMANCE DATA

<table>
<thead>
<tr>
<th>P.S.I. (bar)</th>
<th>3200 (221)</th>
<th>2800 (193)</th>
<th>2400 (166)</th>
<th>2000 (138)</th>
<th>1600 (110)</th>
<th>1200 (83)</th>
<th>800 (55)</th>
<th>400 (28)</th>
</tr>
</thead>
<tbody>
<tr>
<td>G.P.M. (l.p.m.)</td>
<td>1 (3.8)</td>
<td>2 (7.6)</td>
<td>3 (11.4)</td>
<td>4 (15.1)</td>
<td>5 (18.9)</td>
<td>6 (22.7)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

SERVICE NOTE: "DRI-SLIDE", FXR is a commercially available anti-rust lubricant (contains 9% Molybdenum Disulfide) or Molybdenum Disulfide powder with or without light oil carrier.
Rear Mount Gauge

93505-1  0 - 3000 p.s.i. (0 - 210 bar)  Brass
93506-1  0 - 3000 p.s.i. (0 - 210 bar)  Stainless Steel
93507-1  0 - 5000 p.s.i. (0 - 350 bar)  Brass

NOTE:
- 651780-XXX-B (downstream models): “C” is the INLET port, “D” is the OUTLET port.
- 651781-XXX-B (back pressure models): “D” is the INLET port, “C” is the OUTLET port.

OPTIONAL ACCESSORIES

Models 65178X-AXX-B and 65178X-BXX-B
Gauge and Auxiliary port

92968 Outlet Adapter
3/8 - 18 N.P.T.F. - 1