Revising the Meter Body / Process Head Parts

ST 700 and ST 800 Pressure Transmitters and SMV800 Multivariable Transmitter - Instruction sheet

Document Number: 34-ST-33-70  
Effective Date: 5/27/2016 (Process Heads)  
Supersedes: 11/1/2015

Overview
This kit instruction provides general (disassembly/assembly) procedures for replacing meter body and process head parts.

NOTE: Process head replacement and instruction references Does Not apply to In-Line transmitter models.

Purpose / Scope of this Kit Instruction
All of the parts included in the kits are components of the Meter Body and associated Process Head assemblies. None of the kits include components of the Electronic Housing assembly. However, the procedures include disassembly/assembly instructions for the Electronics Housing as required for replacement of parts included in the kits.

Applicability
These instructions apply to the models listed in the title above.

Parts Replacement Kits

⚠️ CAUTION
Improper selection or application of replacement parts could cause damage to property and equipment.

⚠️ WARNING
Improper selection or application of replacement parts could cause serious injury or death to personnel.

The materials and manufacturing methods of parts vary with transmitter applications. When performing any of the procedures in this kit Instruction, ensure that the proper parts are selected for each application.
Figure 1 - Typical transmitter configurations

STD700, STD800 and SMV800 models

STA700, STA800, STG700 and STG800 models

ST700 and ST800 In-Line models

(Process connection will vary)
ST700, ST800 and SMV800 Replacement parts

NOTE: O-ring (K7) replacement may be done with process head attached as shown in Figure 4 or with process heads removed as shown in Figure 5.
Figure 4 – O-ring (K7), process heads attached

Figure 5 - O-ring (K7), process heads removed
Table 1 Kit parts common to Figure 2 and Figure 3 (Generic Listing*)

<table>
<thead>
<tr>
<th>Key Number</th>
<th>Description*</th>
<th>Quantity Per kit</th>
</tr>
</thead>
<tbody>
<tr>
<td>51452864*</td>
<td>Process Head kit (includes the following items)</td>
<td></td>
</tr>
<tr>
<td>K1</td>
<td>Pipe Plug</td>
<td>2</td>
</tr>
<tr>
<td>K2</td>
<td>Vent Plug</td>
<td>1</td>
</tr>
<tr>
<td>K3</td>
<td>Vent Bushing</td>
<td>1</td>
</tr>
<tr>
<td>K5</td>
<td>Process Head</td>
<td>1</td>
</tr>
<tr>
<td>K6</td>
<td>Gasket, Process Head</td>
<td>1</td>
</tr>
<tr>
<td>Ka</td>
<td>Gasket, Adapter</td>
<td>1</td>
</tr>
<tr>
<td>50019274*</td>
<td>Reference Head kit (includes the following items)</td>
<td></td>
</tr>
<tr>
<td>K9</td>
<td>Carbon Steel Reference Head</td>
<td>1</td>
</tr>
<tr>
<td>K9</td>
<td>316 SS Reference Head</td>
<td>1</td>
</tr>
<tr>
<td>51452865*</td>
<td>Meterbody Gasket kit (includes the following items)</td>
<td></td>
</tr>
<tr>
<td>K6</td>
<td>Gasket, Process Head</td>
<td>6</td>
</tr>
<tr>
<td>Ka</td>
<td>Gasket, Flange Adapter</td>
<td>6</td>
</tr>
<tr>
<td>K7</td>
<td>O-ring, meterbody to Electronics Housing</td>
<td>3</td>
</tr>
<tr>
<td>51452866*</td>
<td>Bolts &amp; Nuts kit (includes the following items)</td>
<td></td>
</tr>
<tr>
<td>Kc</td>
<td>Bolt, Hex head, 7/16-20 UNF x 1.50&quot; Ig (Flange Adapter)</td>
<td>4</td>
</tr>
<tr>
<td>K4</td>
<td>Nut, Hex, 7/16-14UNC (Process Head)</td>
<td>4</td>
</tr>
<tr>
<td>K8</td>
<td>Bolt, Hex, 7/16-14UNC x 3.25&quot; Ig (Process Head)</td>
<td>4</td>
</tr>
<tr>
<td>51452867*</td>
<td>Flange Adapter kit (includes the following items)</td>
<td></td>
</tr>
<tr>
<td>Ka</td>
<td>Gasket, Flange Adapter</td>
<td>2 or 1</td>
</tr>
<tr>
<td>Kb</td>
<td>Flange Adapter</td>
<td>2 or 1</td>
</tr>
<tr>
<td>Kc</td>
<td>Bolt, Hex, 7/16-20 UNF x 1.5&quot; Ig (Flange Adapter)</td>
<td>4 or 2</td>
</tr>
<tr>
<td>51452868*</td>
<td>Gasket kit (includes the following items)</td>
<td></td>
</tr>
<tr>
<td>K6</td>
<td>Gasket, Process Head, PTFE</td>
<td>12 (pack)</td>
</tr>
<tr>
<td>K6</td>
<td>Gasket, Process Head, Viton</td>
<td>6 (pack)</td>
</tr>
<tr>
<td>K6</td>
<td>Gasket, Process Head, Graphite (use only as replacement of existing graphite gasket)</td>
<td>6 (pack)</td>
</tr>
<tr>
<td>Ka</td>
<td>Gasket, Flange Adapter, PTFE</td>
<td>6 (pack)</td>
</tr>
<tr>
<td>Ka</td>
<td>Gasket, Flange Adapter, Viton</td>
<td>6 (pack)</td>
</tr>
<tr>
<td>Ka</td>
<td>Gasket, Flange Adapter, Graphite (use only as replacement of existing graphite gasket)</td>
<td>6 (pack)</td>
</tr>
</tbody>
</table>
REPLACEMENT OF METER BODY AND / OR METER BODY O-RING
(All models)

⚠️ ESD HAZARD. Use a ground strap or ionizer when handling the PWA.
Electrostatic discharge can damage circuit components.

1. Save or record device configuration data.
2. Turn OFF transmitter power.
3. It is recommended to remove the Transmitter from service, and move it to a clean area before disassembling.
4. Refer to Figure 6. Loosen the End Cap Locking Screw, and unscrew the End Cap from the electronics side of the Transmitter housing.

Figure 6 – Disassembly for Meter Body Replacement

⚠️ ELECTROSTATIC DISCHARGE HAZARD! Use a ground strap or ionizer when handling the PWA, because ESD can damage circuit components.
5. If a display is present, press the two snaps along the side, and remove it from the communication module assembly. 
   **Note:** Do not discard or misplace the Display/Communication connector, it will be required to reassemble the Display Module.

6. Loosen the two retaining screws on the Communication Module assembly, and remove the Communication Module assembly from the electronics housing.

7. Disconnect the Sensor Ribbon Cable from the Communications Board.

8. Refer to Figure 7. Use a 2 mm hex wrench to completely loosen the set screw on the outside of the housing to permit rotation of the meter body.

![Figure 7 – Hardware Location to Remove the Meter Assembly](image)

**NOTE:**
Process Heads present on STA700/800, STD700/800, STG700/800 and SMV800 models only
**Note:** Steps 10 through 14 and 16 to 17 are not required for ST700 and ST800 In-Line models.

9. Carefully turn the complete meter body counterclockwise to unscrew it from the electronics housing.
10. Remove the nuts from bolts that hold the process head(s) to the Meter Body.
11. Remove process heads and bolts.
12. Remove the gaskets or O-rings from the process heads.
13. Clean the interior of the process head(s) with a soft bristle brush and suitable solvent.

**CAUTION**
To prevent damage to the diaphragm in the Meter Body, use extreme care when handling or placing the Meter Body on any surface. Carefully assemble gaskets or O-rings to the process head.

14. Coat threads on process head bolts with LOCTITE® Silver Anti-Seize Lubricant or equivalent.
15. Refer to Figure 8. Apply Parker Super O-ring silicone grease to the meter body adapter O-ring and carefully assemble the O-ring to the meter body.
16. Assemble the process head(s) and bolts to the new meter body. For now, make the bolts only finger-tight.

![Figure 8 – Meter Body Reassembly](image-url)
17. Use a torque wrench to gradually tighten nuts to torque rating in sequence shown in Figure 9. Tighten head bolts in stages of 1/3 full torque, 2/3 full torque, and then full torque, per Table 2.

![Figure 9 – Head Bolt Tightening Sequence](image)

18. Feed the ribbon cable on the new meter body through the neck of the housing.

**CAUTION**
To prevent damage to the ribbon cable, use care when assembling the Meter Body to the electronics housing.

19. Screw the new meter body into the housing until the bottom of the Meter Body adapter is flush with the neck of the electronics housing.

20. Tighten the outside set screw to be sure it is fully seated in the slot in the header.

21. Loosen the set screw 1/2-turn.

22. Rotate the housing to the desired position (Max. 180° in either direction), and tighten the set screw.

23. Carefully align and connect the Sensor Ribbon Cable to connector “J4” at the bottom of the Communication module board. When installing the Communication module in the next step, be careful not to pinch the Sensor Ribbon Cable.

24. Carefully, insert the Communication module into the Electronics compartment. Ensure that the Sensor Ribbon Cable is not pinched.

25. Tighten the two Communication module retaining screws.
### Table 2 – Torque Table, Process Head Bolt/Nuts

<table>
<thead>
<tr>
<th>Bolting Type</th>
<th>Bolt Part Number</th>
<th>Nut Part Number</th>
<th>All Transmitters Except Draft Range</th>
<th>Draft Range Transmitters Only</th>
</tr>
</thead>
<tbody>
<tr>
<td>B7M</td>
<td>51452557-004</td>
<td>51452559-003</td>
<td>48.8 Nm +/- 2.4 Nm</td>
<td></td>
</tr>
<tr>
<td>MONEL K500</td>
<td>51452557-005</td>
<td>51452559-005</td>
<td>36.0 Lb Ft +/- 1.8 L Ft</td>
<td></td>
</tr>
<tr>
<td>SUPER DUPLEX</td>
<td>51452557-006</td>
<td>51452559-006</td>
<td>20.3 Nm +/- 1.0 Nm</td>
<td>15.0 Lb Ft +/- 0.8 L Ft</td>
</tr>
<tr>
<td>316 STAINLESS STEEL</td>
<td>51452557-003</td>
<td>51452559-004</td>
<td>56.9 Nm +/- 2.8 Nm</td>
<td></td>
</tr>
<tr>
<td>Grade 660 (NACE A286) with NACE 304 SS Nuts</td>
<td>51452557-002</td>
<td>51452559-002</td>
<td>42.0 Lb Ft +/- 2.1 L Ft</td>
<td>20.0 Lb Ft +/- 1.0 Lb Ft</td>
</tr>
<tr>
<td>Grade 660 (NACE A286) Bolts &amp; Nuts</td>
<td>51452557-002</td>
<td>51452559-008</td>
<td>67.8 Nm +/- 3.4 Nm</td>
<td></td>
</tr>
<tr>
<td>Grade 660 (NACE A286) Bolts &amp; Nuts 6000 PSI (415 BAR) OPTION ONLY</td>
<td>51452557-202</td>
<td>51452559-008</td>
<td>50.0 Lb Ft +/- 2.5 L Ft</td>
<td></td>
</tr>
<tr>
<td>CARBON STEEL</td>
<td>51452557-001</td>
<td>51452559-001</td>
<td>56.9 Nm +/- 2.8 Nm</td>
<td></td>
</tr>
</tbody>
</table>

26. If applicable, re-install the Display module as follows:
   a) Orient the display as desired.
   b) Install the Interface Connector in the Display module such that it will mate with the socket for the display in the Communication module.
   c) Carefully line up the display, and snap it into place. Verify that the two tabs on the sides of the display latch.

**Orient the Display for proper viewing through the end cap window.**

You can rotate the meter mounting orientation in 90° increments.

27. Connect the bracket to the Transmitter housing
28. Recalibrate the Transmitter per the Calibration section of the relevant Transmitter User manual (ST 800 #34-ST-25-35, ST 700 #34-ST-25-44, SMV 800 #34-SM-25-03)
29. Return the Transmitter to service, and turn ON power
30. Verify the Transmitter configuration data. Restore the saved database if necessary.
31. Lubricate the end-cap O-rings with Parker Super O-ring silicone lubricant or equivalent before replacing the end caps.
Perform steps 1, 2 & 3 on page 6 before performing the following procedure.

**NOTE:**
This procedure does not require that the Meter Body be removed from the Electronics Housing.
If the Flange Adapters are being replaced in conjunction with procedures for other kits parts (that is, Process heads, etc), follow those procedures and incorporate the following steps.

<table>
<thead>
<tr>
<th>Step</th>
<th>Action</th>
</tr>
</thead>
</table>
| 1    | **Note:** The threaded hole in each Flange Adapter is offset from center. To ensure correct orientation when it is reassembled, make a note of the orientation of the offset relative to each Process Head before removing any adapter. Remove and discard:  
- the two bolts (Kc) that attach the Adapter to the Process Head  
- Adapter (Kb)  
- Gasket (Ka) |
| 2    | Clean the mating surface(s) of the Process Heads. |
| 3    | Apply anti-seize lubricating compound to the new bolts, and carefully assemble the new Adapter(s) and Gasket(s) to the Process Head(s). |
| 4    | Evenly torque the bolts to 47.5 N·M +/- 2.4 N·M (35 Lb·Ft +/- 1.8 Lb·Ft). |
| 5    | Place the transmitter back into service. |
Perform steps 1, 2 & 3 on page 6 before performing the following procedure.

**NOTE:**
This procedure does not require that the Meter Body be removed from the Electronics Housing.

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**Step** | **Action**
---|---
1 | **Caution:**
To prevent damage to the diaphragm in the Meter Body, use extreme care when handling the Meter Body (center section) or when placing it on any surface.
Loosen and remove the four nuts (K4).
Carefully separate the Process Head(s) (K5) from the Meter Body (item 1).
Discard the old Gaskets(s) (K6) and Process Head(s).

2 | Apply sealant or PTFE Tape to the new bushings (K3) and pipe plugs (K1), and install into the new Process Head. Tighten Bushings and Pipe Plugs to a torque of 58 +/- 2,7 N-m (43 +/- 2 Lb-Ft). If Bushings (K3) require special orientation, then torque further up to an additional 180 degrees of rotation to desired orientation. Tighten Vent/Drain (K2) to 4.0 +/- 0.5 N-m (35 +/- 4 Lb-in).
**Note:**
If Flange Adapters (Kb) are to be attached, use the procedure given in Step 1 of Table 3.

3 | If the old nuts and bolts for the Process Heads will be used, clean and then lubricate them. If new nuts and bolts are to be installed, lubricate them.
<table>
<thead>
<tr>
<th>Step</th>
<th>Action</th>
</tr>
</thead>
<tbody>
<tr>
<td>4</td>
<td><strong>Note:</strong> The bolts for the Process Heads (K8) should be on the <strong>low-pressure side</strong> of the Meter Body, and the nuts (K4) should be on the <strong>high-pressure side</strong>. (High- and low-pressure sides are marked on the Meter Body.) Carefully assemble the new Gasket(s) and Process head(s) to the Meter Body as shown in the illustration above, and hand-tighten the nuts.</td>
</tr>
</tbody>
</table>
| 5    | **Note:** Refer to Table 2 for torque specifications for the Process Heads. Tighten the four nuts in three steps, using a torque wrench in the sequence shown in the illustration and as listed below.  
   a. Tighten all four nuts to approximately 1/3 full torque.  
   b. Tighten all four nuts to approximately 2/3 full torque.  
   c. Tighten all four nuts to full torque. |
| 7    | Place the transmitter back into service. |
Sales and Service
For application assistance, current specifications, pricing, or name of the nearest Authorized Distributor, contact one of the offices below.

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