FRONT CHAINWHEEL

**XTR**
FC-M9100
FC-M9120

**DEORE XT**
FC-M8100
FC-M8120
FC-M8130

**SLX**
FC-M7100
FC-M7120
FC-M7130
FC-MT610

**Bottom Bracket**
SM-BB93
BB-MT800
SM-BB94-41A
BB-MT800-PA

**Non-Series**
FC-MT900
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IMPORTANT NOTICE

• This dealer's manual is intended primarily for use by professional bicycle mechanics. Users who are not professionally trained for bicycle assembly should not attempt to install the components themselves using the dealer's manuals. If any part of the information on the manual is unclear to you, do not proceed with the installation. Instead, contact your place of purchase or a bicycle dealer for their assistance.

• Make sure to read all owner's manuals included with the products.

• Do not disassemble or modify the product other than as stated in the information contained in this dealer's manual.

• All owner's manuals and dealer's manuals can be viewed on-line on our website (http://si.shimano.com).

• For consumers who do not have easy access to the internet, please contact a SHIMANO distributor or any of the SHIMANO offices to obtain a hardcopy of the user's manual.

• Please observe the appropriate rules and regulations of the country, state or region in which you conduct your business as a dealer.

For safety, be sure to read this dealer’s manual thoroughly before use, and follow it for correct use.

The following instructions must be observed at all times in order to prevent personal injury and physical damage to equipment and surroundings. The instructions are classified according to the degree of danger or damage which may occur if the product is used incorrectly.

<table>
<thead>
<tr>
<th>DANGER</th>
<th>Failure to follow the instructions will result in death or serious injury.</th>
</tr>
</thead>
<tbody>
<tr>
<td>WARNING</td>
<td>Failure to follow the instructions could result in death or serious injury.</td>
</tr>
<tr>
<td>CAUTION</td>
<td>Failure to follow the instructions could cause personal injury or physical damage to equipment and surroundings.</td>
</tr>
</tbody>
</table>
TO ENSURE SAFETY

WARNING

• Be sure to follow the instructions provided in the owner's manuals when installing the product.

It is recommended to use SHIMANO genuine parts only. If parts such as bolts and nuts become loose or damaged, the bicycle may suddenly fall over, which may cause serious injury.

In addition, if adjustments are not carried out correctly, problems may occur, and the bicycle may suddenly fall over, which may cause serious injury.

• Be sure to wear safety glasses or goggles to protect your eyes while performing maintenance tasks such as replacing parts.

• After reading the dealer's manual thoroughly, keep it in a safe place for later reference.

Be sure to also inform users of the following:

• Intervals between maintenance depend on the use and riding circumstances. Clean the chain with an appropriate chain cleaner regularly. Never use alkali based or acid based solvents such as rust cleaners. If those solvents are used the chain might break and cause serious injury.

• Check that there are no cracks in the crank arms before riding the bicycle. If there are any cracks, the crank arm may break and you may fall off the bicycle.

• Check the chain for any damage (deformation or crack), skipping, or other abnormalities such as unintended gear shifting. If any problems are found, consult your place of purchase or a distributor. The chain may break, and you may fall.

• Be careful not to let the hemming of your clothes get caught in the chain while riding. Otherwise, you may fall off the bicycle.

For installation to the bicycle, and maintenance:

• If the inner cover is not installed correctly, the axle may rust and become damaged, and the bicycle may fall over and serious injury may occur as a result.

• Be sure to use a torque wrench when tightening the crank mounting bolts (45 - 55 N·m). Furthermore, after riding approximately 100 km (60 miles), use a torque wrench to re-check the tightening force. Re-checking the tightening torque of the crank is especially necessary when the crank is subjected to strong blows from a fall. If the crank is used when the tightening torque is weak, the crank could detach and you may fall off the bicycle.
Be sure to also inform users of the following:

• Be careful to keep body parts away from the sharp teeth of chainrings.

NOTICE

Be sure to also inform users of the following:

• Before riding the bicycle, check that there is no gap or looseness between the fastening section. Also, be sure to retighten the crank arm and pedals at periodic intervals.

• Be sure to keep turning the crank arm during the lever operation.

• When the chain is in any of the positions shown in the figures, the chain may come into contact with the chainring or front derailleur and generate noise. If noise is a problem, shift the chain onto the next largest sprocket or the one after it.

<table>
<thead>
<tr>
<th>Chainring</th>
<th>XTR M9100 series/FC-MT900</th>
<th>DEORE XT M8100 series/SLX M7100 series (including FC-MT610)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sprocket</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

• Use a neutral detergent to clean the crank arm and the bottom bracket. Using alkaline or acidic detergents may cause discoloration.

• If pedaling performance does not feel normal, check the bicycle once more.

• Do not wash the surrounding area of the bottom bracket with a high-pressure washer. Water may enter the bearing section and cause noise or adhesion.

• The gears should be periodically washed with a neutral detergent. In addition, cleaning the chain with neutral detergent and lubricating it can be an effective way of extending the life of the gears and the chain.

• The cuffs of your clothing may get dirty from the chain while riding.

• Products are not guaranteed against natural wear and deterioration from normal use and aging.
• For maximum performance we highly recommend SHIMANO lubricants and maintenance products.

**For installation to the bicycle, and maintenance:**

• When installing the pedals, apply a small amount of grease to the threads to prevent the pedals from sticking. Use a torque wrench to securely tighten the pedals (tightening torque: 35 - 55 N·m). The right crank has a clockwise thread, and the left crank has a counterclockwise thread.

• If the bottom bracket shell is not parallel, gear shifting performance will drop.

• If the chain keeps skipping during use, replace the gears and the chain.

• When installing the left and right adapters, apply grease and be sure to install the inner cover. Otherwise, the waterproofing performance will worsen.

• To ensure the best performance, be sure to use only the specified type of chain.

• If a squeaking noise is heard coming from the axle of the right crank arm unit and the fastening section of the left crank arm, apply grease to the fastening section and then tighten it firmly with the specified torque.

• If you feel any looseness in the bearing section, the bottom bracket should be replaced.

• Be sure to use the specified gear tooth combination. If an unspecified gear is used, the dimension between the gears changes, and the chain may fall in between the gears.

• Use FC-M9120-B2 with a specially designed frame.

The actual product may differ from the illustration because this manual is intended mainly to explain the procedures for using the product.
LIST OF TOOLS TO BE USED

The following tools are needed for installation/removal, adjustment, and maintenance purposes.

<table>
<thead>
<tr>
<th>Tool</th>
<th>Description</th>
<th>Code</th>
</tr>
</thead>
<tbody>
<tr>
<td><img src="image" alt="5 mm hexagon wrench" /></td>
<td>5 mm hexagon wrench</td>
<td>TL-FC32</td>
</tr>
<tr>
<td><img src="image" alt="8 mm hexagon wrench" /></td>
<td>8 mm hexagon wrench</td>
<td>TL-FC33</td>
</tr>
<tr>
<td><img src="image" alt="17 mm spanner" /></td>
<td>17 mm spanner</td>
<td>TL-FC34</td>
</tr>
<tr>
<td><img src="image" alt="32 mm spanner" /></td>
<td>32 mm spanner</td>
<td>TL-FC36</td>
</tr>
<tr>
<td><img src="image" alt="Plastic mallet" /></td>
<td>Plastic mallet</td>
<td>TL-FC37</td>
</tr>
<tr>
<td><img src="image" alt="TL-FC16" /></td>
<td>TL-FC16</td>
<td>TL-FC41</td>
</tr>
<tr>
<td><img src="image" alt="TL-FC18" /></td>
<td>TL-FC18</td>
<td>TL-BB12</td>
</tr>
<tr>
<td><img src="image" alt="TL-FC24" /></td>
<td>TL-FC24</td>
<td>TL-BB13</td>
</tr>
<tr>
<td><img src="image" alt="TL-FC25" /></td>
<td>TL-FC25</td>
<td>Hexalobular [#30]</td>
</tr>
</tbody>
</table>
INSTALLED/REMOVAL
Installing/removing the bottom bracket

Tool combination chart

Use the tool combinations specified in the table.

**SM-BB93**

<table>
<thead>
<tr>
<th>TL-FC24 &amp; TL-FC32</th>
<th>TL-FC24 &amp; TL-FC33</th>
</tr>
</thead>
<tbody>
<tr>
<td><img src="image1.png" alt="Tool Combination 1" /></td>
<td><img src="image2.png" alt="Tool Combination 2" /></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>TL-FC24 &amp; TL-FC36</th>
<th>TL-FC34</th>
</tr>
</thead>
<tbody>
<tr>
<td><img src="image3.png" alt="Tool Combination 3" /></td>
<td><img src="image4.png" alt="Tool Combination 4" /></td>
</tr>
</tbody>
</table>
### INSTALLATION/REMOVAL

#### Installing/removing the bottom bracket

**BB-MT800**

<table>
<thead>
<tr>
<th>TL-FC25 &amp; TL-FC32</th>
<th>TL-FC25 &amp; TL-FC33</th>
</tr>
</thead>
<tbody>
<tr>
<td><img src="image1.png" alt="Image of TL-FC25 &amp; TL-FC32 combination" /></td>
<td><img src="image2.png" alt="Image of TL-FC25 &amp; TL-FC33 combination" /></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>TL-FC25 &amp; TL-FC36</th>
<th>TL-FC37</th>
</tr>
</thead>
<tbody>
<tr>
<td><img src="image3.png" alt="Image of TL-FC25 &amp; TL-FC36 combination" /></td>
<td><img src="image4.png" alt="Image of TL-FC37" /></td>
</tr>
</tbody>
</table>

**NOTICE**

- When using an impact wrench on SM-BB93, use it in combination with TL-FC34. Using any other combinations will damage the tool.
- When using an impact wrench on BB-MT800, use it in combination with TL-FC37. Using any other combinations will damage the tool.
- TL-FC24 may become damaged and unusable after repeated use.
- Check the possible installation positions when setting TL-FC24 or TL-FC25 in TL-FC32.

- Any installation position is possible for TL-FC33/FC36.
Installation

 Threadsed bottom bracket

1. Place the spacers.

(1) Check the width of the bottom bracket shell.

(2) Prepare a spacer (2.5 mm) for the position indicated in the table.

<table>
<thead>
<tr>
<th>Bottom bracket shell width</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
</tr>
<tr>
<td>68 mm</td>
</tr>
<tr>
<td>Left</td>
</tr>
<tr>
<td>[Diagram of left side]</td>
</tr>
<tr>
<td>Right</td>
</tr>
<tr>
<td>[Diagram of right side]</td>
</tr>
<tr>
<td>73 mm</td>
</tr>
<tr>
<td>Left</td>
</tr>
<tr>
<td>[Diagram of left side]</td>
</tr>
<tr>
<td>Right</td>
</tr>
<tr>
<td>[Diagram of right side]</td>
</tr>
</tbody>
</table>

Note: The diagrams represent the bottom bracket shell width and the positioning of spacers on both sides.
2. Install the inner cover, adapter, and spacer.

   (1) Apply grease to the left and right adapters.

   (2) Use the SHIMANO original tools (refer to "Tool combination chart" in "Installing/removing the bottom bracket") to tighten the left and right adapters.

   ![Diagram of installing the inner cover, adapter, and spacer]

   **Left hand adapter (right hand thread)**

   **Right hand adapter (left hand thread)**

   ![Premium grease (Y-04110000)]

   ![35 - 50 N·m (Example)]

   ![Press-fit bottom bracket]

1. Set the bottom bracket in the bottom bracket shell.

   (1) Check the width of the bottom bracket shell.
(2) Prepare a spacer (2.5 mm) for the position indicated in the table.

<table>
<thead>
<tr>
<th>Bottom bracket shell width</th>
</tr>
</thead>
<tbody>
<tr>
<td>89.5 mm</td>
</tr>
<tr>
<td>Left</td>
</tr>
<tr>
<td>Inner cover</td>
</tr>
<tr>
<td>Spacer</td>
</tr>
<tr>
<td></td>
</tr>
</tbody>
</table>

(3) Set the inner cover and adapters.

**NOTICE**

- If the frame has openings for the bottom bracket shell, attach an inner cover to prevent foreign objects from getting inside. If there are no openings, it can be installed without an inner cover.
2. Insert the SHIMANO original tool into the bottom bracket.

3. Press-fit the bottom bracket.

Make sure that the contact surface of the bottom bracket is parallel with the contact surface of the bottom bracket shell.

* Press-fit until there is no more gap between the bottom bracket and the bottom bracket shell.
Removal

 brasile bottom bracket

1. Perform the removal in the reverse order from "Installation" in "Installing/removing the bottom bracket."

Press-fit bottom bracket

1. Insert the SHIMANO original tool into the bottom bracket.
   
   (1) Extend the flaps to taper the tip of the SHIMANO original tool.
   
   (2) Insert the SHIMANO original tool from the opposite side of the adapter you wish to remove.
   
   (3) As shown in the figure, press down on the protruding portion of the tip with your hand to expand the flaps.
   
   (4) Push the tool in further while continuing to press down on the tip, until the flanges on the flaps engage with the adapter.
2. Tap the SHIMANO original tool with a plastic mallet to push out the adapter.

3. Remove the adapter on the opposite side in a similar manner.

**NOTICE**

- Do not reuse adapters as they can be damaged during removal.
Installing/removing the cranks

Installation

› FC-M9100/FC-M9120

1. Insert the right crank arm unit into the bottom bracket.

2. Completely tighten the adjustment nut of the left crank arm.
   Turn in the direction shown in the figure to tighten it.
3. Set the left crank arm onto the axle of the right crank arm.
   As shown in the figure, be sure to set the left and right crank arms so that they are aligned.
   For FC-M9120, be sure to place a spacer between the left crank arm and bottom bracket.

   ![Diagram showing how to set the left crank arm onto the axle of the right crank arm.]

   **NOTICE**
   - When using FC-M9120, if the right crank arm and frame interfere, set the spacer between the right crank arm and bottom bracket instead of between the left crank arm and bottom bracket.

4. Tighten the mounting bolt of the left crank arm.

   ![Diagram showing the tightening of the mounting bolt of the left crank arm.]

   Mounting bolt
   \[8 \, 45 - 55 \, \text{N-m}\]
5. Turn the adjustment nut of the left crank arm to remove any looseness between the crank and bottom bracket.

* Turn the adjustment nut directly by hand or by inserting a tool such as a thin hexagon wrench into one of the holes.
1. Insert the right crank arm unit into the bottom bracket.

For the following models, be sure to place a spacer between the bottom bracket and the left and right crank arms.

<table>
<thead>
<tr>
<th>Models that need a spacer</th>
<th>3 mm spacer</th>
<th>4.5 mm spacer</th>
</tr>
</thead>
<tbody>
<tr>
<td>FC-M8120/FC-M7120</td>
<td>3 mm spacer</td>
<td></td>
</tr>
<tr>
<td>FC-M8130/FC-M7130</td>
<td>4.5 mm spacer</td>
<td></td>
</tr>
</tbody>
</table>
2. **Set the left crank arm onto the axle of the right crank arm.**

   (1) Apply grease to the axle of the right crank arm unit.
   (2) Align the wide part of the left crank arm and the wide part of the axle of the right crank arm unit.

   ![Diagram](https://via.placeholder.com/150)

3. **Install the cap.**

   (1) Apply grease to the crank arm mounting bolt specified in the figure.
   (2) Tighten using the SHIMANO original tool.

   ![Diagram](https://via.placeholder.com/150)
4. **Tighten and secure it using a bolt.**

   (1) Set the stopper plate in the direction shown in the figure and push it in.
   
   (2) Check that the plate pin is securely inserted.
   
   (3) Tighten the left crank arm bolts alternately.

---

![Diagram of crank arm installation](image)

1. Cross-section
2. Plate pin
3. Left crank arm
4. Stopper plate
5. 12 - 14 N·m
Removal

**FC-M9100/FC-M9120**

1. Loosen the mounting bolt of the left crank arm.
   As the mounting bolt is loosened, the left crank arm naturally detaches from the axle area of the right crank arm. For FC-M9120, remove the spacer.

2. Remove the right crank arm unit from the bottom bracket.

**FC-M8100/FC-M8120/FC-M8130/FC-M7100/FC-M7120/FC-M7130/FC-MT610/FC-MT900**

1. Perform the removal in the reverse order from "Installation" in "Installing/removing the cranks."
MAINTENANCE

Replacing the chainring

Perform the steps of the removal procedure for chainring replacement in the reverse order from the installation procedure.

Single gear types


1. Remove the chainring from the crank arm.

   ![Diagram of chainring removal]

   (Example) TL-FC41

   Tool combinations

   | TL-FC41 + TL-FC41 | TL-FC41 + TL-FC41 | TL-FC41 + 32 |
2. Apply grease to the inset portion of the crank arm.

3. Set the chainring on the crank arm.

Set it so that the wide indentation on the inset portion of the chainring is aligned with the wide convex section of the crank arm.

* When using FC-MT900, install a spacer between the crank arm and chainring.

* When using FC-M8100/FC-M8120/FC-M8130/FC-M7100/FC-M7120/FC-M7130, this spacer is attached to the chainring.
**NOTICE**

- The lock ring included with the DEORE XT M8100 series, SLX M7100 series, and FC-MT900 cannot be used with the XTR M9100 series. The lock ring included with the XTR M9100 series can be used with the DEORE XT M8100 series, SLX M7100 series, and FC-MT900. Use a compatible lock ring when replacing the chainring.

<table>
<thead>
<tr>
<th>Included with the XTR M9100 series (no series name mark)</th>
<th>Included with the DEORE XT M8100 series/SLX M7100 series</th>
<th>Included with FC-MT900</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Lock ring</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td><img src="image1" alt="Lock ring" /></td>
<td><img src="image2" alt="Lock ring" /></td>
<td><img src="image3" alt="Lock ring" /></td>
</tr>
<tr>
<td><strong>Compatibility</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>The lock ring can be used with the DEORE XT M8100 series/SLX M7100 series/FC-MT900 too.</td>
<td>The lock ring cannot be used with the XTR M9100 series.</td>
<td></td>
</tr>
</tbody>
</table>
4. Secure the chainring.

Tighten using the tool combinations specified in the following table.

(Example) TL-FC41 + TL-FC41

<table>
<thead>
<tr>
<th>Tool combinations</th>
</tr>
</thead>
<tbody>
<tr>
<td>TL-FC41 + TL-FC41</td>
</tr>
<tr>
<td>TL-FC41 + TL-FC41</td>
</tr>
<tr>
<td>TL-FC41 + 32</td>
</tr>
</tbody>
</table>
MAINTENANCE
Replacing the chainring

FC-MT610

1. Remove the chainring from the crank arm.

2. Set the chainring on the crank arm.
   With the marked side facing outward, set the chainring.

3. Secure the chainring.
   Tighten the fixing bolts.
Double gear types

**NOTICE**

- Be sure to use the gear combination with the specified number of teeth. If other gears are used, the chain may fall between the gears and damage the gears.

<table>
<thead>
<tr>
<th>Crank arm</th>
<th>Top</th>
<th>Low</th>
</tr>
</thead>
<tbody>
<tr>
<td>FC-M9100</td>
<td>38T-BH</td>
<td>28T-BH</td>
</tr>
<tr>
<td>FC-M9120</td>
<td>38T-BH B</td>
<td></td>
</tr>
<tr>
<td>FC-M8100</td>
<td>36T-BJ</td>
<td>26T-BJ</td>
</tr>
<tr>
<td>FC-M8120</td>
<td></td>
<td></td>
</tr>
<tr>
<td>FC-M7100</td>
<td></td>
<td></td>
</tr>
<tr>
<td>FC-M7120</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

1. **Remove the chainring from the crank arm.**

After removing the smallest chainring, remove the largest chainring as shown in the figure.

![Diagram of chainring removal](image)

**Tool combinations**

| Tool combinations |
|-------------------|-----------------|-----------------|-----------------|
| TL-FC41 + TL-301  | TL-FC41 + TL-302 | TL-FC41 + TL-303 |
2. **Apply grease to the inset portion of the largest chainring.**

   ![Premium grease (Y-04110000)](image)

3. **Set the largest chainring on the crank arm.**
   
   Set it so that the wide indentation on the inset portion of the largest chainring is aligned with the wide convex section of the crank arm.
   
   * For FC-M8100/FC-M8120/FC-M7100/FC-M7120, the spacer is attached to the chainring.
**NOTICE**

- The lock ring included with the DEORE XT M8100 series, SLX M7100 series, and FC-MT900 cannot be used with the XTR M9100 series.

  The lock ring included with the XTR M9100 series can be used with the DEORE XT M8100 series, SLX M7100 series, and FC-MT900.

Use a compatible lock ring when replacing the chainring.

<table>
<thead>
<tr>
<th></th>
<th>Included with the XTR M9100 series (no series name mark)</th>
<th>Included with the DEORE XT M8100 series/SLX M7100 series</th>
<th>Included with FC-MT900</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Lock ring</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Compatibility</strong></td>
<td>The lock ring can be used with the DEORE XT M8100 series/SLX M7100 series/FC-MT900 too.</td>
<td></td>
<td>The lock ring cannot be used with the XTR M9100 series.</td>
</tr>
</tbody>
</table>
4. Secure the largest chainring.

Tighten using the tool combinations specified in the following table.

(Example) TL-FC41 + TL-RC5

35 - 50 N·m

<table>
<thead>
<tr>
<th>Tool combinations</th>
</tr>
</thead>
<tbody>
<tr>
<td>TL-FC41 + TL-FC41</td>
</tr>
<tr>
<td>TL-FC41 + TL-FC41</td>
</tr>
<tr>
<td>TL-FC41 + TL-FC41</td>
</tr>
<tr>
<td>TL-FC41 + TL-FC41</td>
</tr>
</tbody>
</table>

| TL-FC41 + TL-RC5 |
| TL-FC41 + TL-RC5 |
| TL-FC41 + TL-RC5 |
| TL-FC41 + TL-RC5 |
5. Set the smallest chainring.

With the marked side facing inward, set the smallest chainring so that the convex section is positioned under the crank arm.

FC-M9100/FC-M9120

FC-M8100/FC-M8120/FC-M7100/FC-M7120
**6. Secure the smallest chainring.**

Tighten using the SHIMANO original tool.

**FC-M9100/FC-M9120**

![Diagram of FC-M9100/FC-M9120]

**Chainring fixing bolt**

\[30\] 16 - 17 N·m

**FC-M8100/FC-M8120/FC-M7100/FC-M7120**

![Diagram of FC-M8100/FC-M8120/FC-M7100/FC-M7120]

**Chainring fixing bolt**

\[30\] 16 - 17 N·m