# Dealer's Manual

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<td>City Touring/</td>
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</table>

## HYDRAULIC DISC BRAKE

### XTR
- BR-M9100
- BR-M9120
- BL-M9100
- BL-M9120

### Non-Series
- RT-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, consult a place of purchase or a distributor for their assistance.
• Make sure to read all instruction manuals included with the product.
• Do not disassemble or modify the product other than as stated in the information contained in this dealer's manual.
• All dealer's manuals and instruction manuals can be viewed on-line on our website (http://si.shimano.com).
• 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>
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<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 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:**

- The 203 mm and 180 mm disc brake rotors provide a higher braking force than the 160 mm disc brake rotors. Make sure that you completely understand the braking characteristics before using the brakes.

- Each bicycle may handle slightly differently depending on the model. Therefore, be sure to learn the proper braking technique (including brake lever pressure and bicycle control characteristics) and operation of your bicycle. Improper use of your bicycle's brake system may result in a loss of control or a fall, which could lead to severe injury. For proper operation, consult a professional bicycle dealer or the bicycle's owner's manual. It is also important to practice riding and braking, etc.

- Please make sure to keep your fingers away from the rotating disc brake rotor. The disc brake rotor is sharp enough to inflict severe injury to your fingers if caught in the openings of the disc brake rotor while it is moving.

- The calipers and disc brake rotor will become hot when the brakes are operated; do not touch them while riding or immediately after dismounting from the bicycle. Otherwise you may get burned.

- Be careful not to allow any oil or grease to get onto the disc brake rotor and brake pads. Otherwise the brakes may not work correctly.
• If any oil or grease does get on the brake pads, you should consult a place of purchase or a distributor. Otherwise the brakes may not work correctly.

• If noise occurs during brake operation, the brake pads may have been worn down to the usable limit. Check that brake system temperature has cooled down sufficiently, check the thickness of the brake pad. If the thickness is 0.5 mm or less, the brake pad needs to be replaced with a new one. Consult a place of purchase or a distributor.

• If the disc brake rotor is cracked or deformed, immediately stop using the brakes and consult a place of purchase or a distributor.

• If the disc brake rotor becomes worn down to a thickness of 1.5 mm or less, or if the aluminum surface appears, immediately stop using the brakes and consult a place of purchase or a distributor. The disc brake rotor may break, and you may fall off the bicycle.

• Vapor lock may occur if the brakes are applied continuously. To solve this problem, momentarily release the lever.

Vapor lock occurs when the oil inside the brake system becomes heated, which causes the water or air bubbles inside the brake system to expand. This can then result in a sudden increase in the brake lever stroke.

• The disc brake is not designed to work when the bicycle is upside down. If the bicycle is turned upside down or on its side, the brake may not work correctly, and a serious accident could occur. Before riding the bicycle, be sure to depress the brake lever a few times to check that the brakes operate normally. If the brakes do not operate normally, stop using the brakes and consult a place of purchase or a distributor.

• If you feel no resistance when depressing the brake lever, immediately stop using the brakes and consult a place of purchase or a distributor.

• If fluid leaks occur, immediately stop using the brakes and consult a place of purchase or a distributor.

• If the front brake is applied too strongly, the wheel may lock and the bicycle may fall forward, and serious injury may result.

• Always make sure that the front and rear brakes are working correctly before riding the bicycle.

• The required braking distance will be longer during wet weather. Reduce your speed and apply the brakes early and gently.
TO ENSURE SAFETY

• If the road surface is wet, the tires will skid more easily. If the tires skid, you may fall off the bicycle. Reduce your speed and apply the brakes early and gently.

• Because of the characteristics of the carbon fiber material, the lever should never be altered. Otherwise, the lever may break preventing braking operation.

• Check before riding that there is no damage such as carbon peeling or cracking. If there is any damage, stop using the bicycle and consult a place of purchase or a distributor. Otherwise, the lever may break preventing braking operation.

For installation to the bicycle, and maintenance:

• Please make sure to keep your fingers away from the rotating disc brake rotor during installation or maintenance of the wheel. The disc brake rotor is sharp enough to inflict severe injury to your fingers if caught in the openings of the disc brake rotor while it is moving.

• If the disc brake rotor is cracked or warped, it should be replaced.

• If the disc brake rotor becomes worn down to a thickness of 1.5 mm or if the aluminum surface becomes visible on one side, be sure to replace the disc brake rotor with a new one.

• Check that the brake components have cooled down sufficiently before attempting to adjust the brakes.

• Use only SHIMANO genuine mineral oil. If other types of oil are used, it may cause problems with brake operation, and cause vapor lock or the system to be unusable.

• Be sure to use only oil from a freshly-opened container, and do not re-use oil which has been drained from the bleed nipple. Old or reused oil may contain water, which could cause vapor lock in the brake system.

• Be careful not to let water or air bubbles to get into the brake system. Otherwise, vapor lock may occur. Be particularly careful when removing the cover of the reservoir tank.

• If cutting the brake hose in order to adjust the length of the brake hose, or when changing over the brake hose from left to right or vice versa, be sure to bleed the air from the hose according to steps given in “Adding SHIMANO genuine mineral oil and bleeding air.”
• When turning the bicycle upside down or on its side, the brake system may have some air bubbles inside the reservoir tank which are still there when the bleed screw is closed, or which accumulate in various parts of the brake system when it is used for long periods. This disc brake system is not designed to work with the bicycle upside down. If the bicycle is turned upside down or on its side, the air bubbles inside the reservoir tank may move in the direction of the calipers. If the bicycle is ridden in this condition, there is danger that the brakes may not operate and a serious accident may occur. If the bicycle has been turned upside down or on its side, be sure to depress the brake lever a few times to check that the brakes operate normally before riding the bicycle. If the brakes do not operate normally, adjust them according to the following procedure.

If brake does not seem to work (feels sluggish) when the lever is depressed
Set the brake lever so that it is parallel to the ground, and then gently depress the brake lever several times and wait for the bubbles to return to the reservoir tank. It is recommended that you then remove the reservoir tank cover and fill the reservoir tank with mineral oil until no bubbles remain. If the brakes are still sluggish, bleed the air from the brake system. (Refer to "Adding SHIMANO genuine mineral oil and bleeding air."

• If the quick release lever on the hub is on the same side as the disc brake rotor, they may interfere with each other, which is dangerous, so check that they do not.

• SHIMANO disc brake systems are not compatible with tandem bicycles. Because tandem bicycles are heavier, the stress on the brake system increases during brake operation. If hydraulic disc brakes are used with tandem bicycles, the oil temperature will become too high and vapor locks or ruptures in the brake hoses may occur, causing the brakes to fail.

**Brake hose**

• After installing the brake hose to the brake unit, adding SHIMANO genuine mineral oil and bleeding air bubbles, depress the brake lever again several times to check that the brakes are operating normally and there are no fluid leaks from the hose or the system.

• The connector insert is for this brake hose only. Use an appropriate connector insert according to the following table. Use of a connector insert incompatible with the brake hose may cause fluid leaks.

<table>
<thead>
<tr>
<th>Model No.</th>
<th>Length</th>
<th>Color</th>
</tr>
</thead>
<tbody>
<tr>
<td>SM-BH90</td>
<td>11.2 mm</td>
<td>Silver</td>
</tr>
<tr>
<td>SM-BH59/80</td>
<td>13.2 mm</td>
<td>Gold</td>
</tr>
<tr>
<td>YM-BH81</td>
<td>13.2 mm</td>
<td>Silver</td>
</tr>
</tbody>
</table>
• Do not reuse the olive piece or the connector insert when reinstalling. A damaged or reused olive, or connector insert, may not provide a secure brake hose connection, possibly causing the brake hose to disconnect from the calipers or brake lever. If the brake hose becomes disconnected, there is danger that the brakes may suddenly stop working.

![Diagram of brake hose components]

• Cut the brake hose so that the cut end is perpendicular to the length of the hose. If the brake hose is cut at an angle, fluid leaks may result.

- **CAUTION**

Be sure to also inform users of the following:

#### Cautions on SHIMANO genuine mineral oil

• Contact with eyes may result in irritation. In the event of contact with eye, wash with water and seek medical attention immediately.

• Contact with skin may cause a rash and discomfort. In the event of contact with skin, wash well with soap and water.

• Inhalation of SHIMANO genuine mineral oil mist or vapors may cause nausea. Cover nose and mouth with a respirator type mask and use in a well ventilated area. If SHIMANO genuine mineral oil mist or vapor is inhaled, cover up with a blanket and go immediately to an area with fresh air. Stay warm and calm, and seek professional medical advice.

#### Burn-in period

• Disc brakes have a burn-in period, and the braking force will gradually increase as the burn-in period progresses. Make sure that you are aware of any such increases in braking force when using the brakes during the burn-in period. The same thing will happen when the brake pads or disc brake rotor are replaced.
For installation to the bicycle, and maintenance:

• When using the SHIMANO original tool (TL-FC36) to remove and install the disc brake rotor fixing ring, be careful not to touch the outside of the disc brake rotor with your hands. Wear gloves to protect your hands from getting cut.

■ Handling SHIMANO genuine mineral oil

• Contact with eyes may result in irritation. Use safety glasses when handling, and avoid contact with eyes. In the event of contact with eye, wash with water and seek medical attention immediately.

• Contact with skin may cause a rash and discomfort. Use gloves when handling. In the event of contact with skin, wash well with soap and water.

• Do not drink. May cause vomiting or diarrhea.

• Keep out of reach of children.

• Do not cut, let near heat, weld or pressurize the oil container, as this may cause explosion or fire.

• Disposal of Used Oil: Follow local county and/or state codes for disposal. Use caution when preparing the oil for disposal.

• Directions: Keep the container sealed to prevent foreign objects and moisture from getting inside, and store it in a cool, dark area away from direct sunlight or heat. Keep from heat or flame, Petroleum Class III, Danger level III

■ When cleaning with a compressor

• If disassembling the caliper body to clean the internal parts using a compressor, note that moisture from the compressed air may remain on the caliper components. Let the caliper components dry sufficiently before reassembling the calipers.

■ Brake hose

• When cutting the brake hose, handle the knife carefully so as not to cause injury.

• Be careful to avoid injury from the olive.

NOTICE

Be sure to also inform users of the following:

• When the bicycle wheel has been removed, it is recommended that pad spacers are installed. Do not depress the brake lever while the wheel is removed. If the brake lever is depressed without the pad spacers installed, the pistons will protrude further than normal. If that happens, consult a place of purchase.
• Use soapy water and a dry cloth when cleaning and carrying out maintenance of the brake system. Do not use commercially available brake cleansers or silencing agents. Such substances can cause damage to parts such as seals.

• In the case of carbon levers, wash them with a soft cloth using a neutral detergent. Otherwise, the material may break down and be damaged.

• Avoid leaving the carbon levers in areas of high temperature. Also keep them well away from fire.

• 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:**

• The 203 mm and 180 mm disc brake rotors have a larger diameter than the 160 mm disc brake rotor for cross-country bicycles, and so the warping of these disc brake rotors is greater. As a result, they may interfere with the performance of the brake pads.

• If the brake caliper mounting boss and the dropout are not parallel, the disc brake rotor and caliper may touch.

• When the bicycle wheel has been removed, it is recommended that pad spacers are installed. The pad spacers will prevent the piston from coming out if the brake lever is depressed while the wheel is removed.

• If the brake lever is depressed without the pad spacers installed, the pistons will protrude further than is normal. Use a flat-shaped tool to push back the brake pads, while being careful not to damage the surfaces of the brake pads. (If the brake pads are not installed, use a flat-shaped tool to push the pistons straight back in, while being careful not to damage them.) If it is difficult to push the brake pads or pistons back, remove the bleed screws and then try again. (Note that some oil may overflow from the reservoir tank at this time.)

• Use isopropyl alcohol, soapy water or a dry cloth when cleaning and carrying out maintenance of the brake system. Do not use commercially available brake cleansers or silencing agents. Such substances can cause damage to parts such as seals.

• Do not remove the pistons when disassembling the calipers.

• If the disc brake rotor is worn, cracked or warped, it should be replaced.
The BL-M9100 is made of magnesium. Corrosion starts when these components come into contact with parts made of other types of metals, such as iron bolts. In the contact area, water residue, sweat, rain and other moisture particles may create a potential reaction. This forms an electrochemical cell, resulting in an electrochemical reaction. To prevent this problem, each part is treated with a special-purpose surface treatment. Use appropriate parts to prevent the progression of rusting. For more details, refer to "Designated parts for magnesium products" in "MAINTENANCE."

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>
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<tbody>
<tr>
<td>![2 mm hexagon wrench](2 mm hexagon wrench)</td>
<td>2 mm hexagon wrench</td>
</tr>
<tr>
<td>![2.5 mm hexagon wrench](2.5 mm hexagon wrench)</td>
<td>2.5 mm hexagon wrench</td>
</tr>
<tr>
<td>![4 mm hexagon wrench](4 mm hexagon wrench)</td>
<td>4 mm hexagon wrench</td>
</tr>
<tr>
<td>![8 mm spanner](8 mm spanner)</td>
<td>8 mm spanner</td>
</tr>
<tr>
<td>![7 mm socket wrench](7 mm socket wrench)</td>
<td>7 mm socket wrench</td>
</tr>
<tr>
<td>![Adjustable wrench](Adjustable wrench)</td>
<td>Adjustable wrench</td>
</tr>
<tr>
<td>![Slotted screwdriver](Slotted screwdriver)</td>
<td>Slotted screwdriver</td>
</tr>
<tr>
<td>![Screwdriver [#2]](Screwdriver [#2])</td>
<td>Screwdriver [#2]</td>
</tr>
<tr>
<td><img src="TL-BH62" alt="TL-BH62" /></td>
<td>TL-BH62</td>
</tr>
<tr>
<td><img src="TL-FC36" alt="TL-FC36" /></td>
<td>TL-FC36</td>
</tr>
<tr>
<td><img src="TL-LR15" alt="TL-LR15" /></td>
<td>TL-LR15</td>
</tr>
</tbody>
</table>
Installing the brake lever

For the installation method when installing with an I-SPEC EV type shifting lever, refer to the dealer's manual of the shifting lever being used.

1. **Open the clamp band of the brake lever.**
   
   (1) Loosen the mounting bolt.
   
   (2) Press the recessed area of the clamp band with a tool such as a 2 mm hexagon wrench.

2. **Install the brake lever on the handlebar.**
   
   Tighten with the mounting bolt.

   ![Diagram showing mounting bolt and tightening process]
**NOTICE**

- When installing parts on a carbon frame/handlebars, confirm the recommended tightening torque with the carbon frame or part manufacturer in order to prevent damage to the carbon material due to overtightening or inadequate securing of the components due to insufficient tightening torque.

- Perform the installation onto the handlebar after adding an O-ring to the clamp band side as shown in the figure.

- When installing it in combination with a standard type shifting lever, install the brake lever so that the position of the shifting lever band is within the range shown in the figure. After the shifting lever is installed, install the brake lever while checking its position.
Installing the disc brake rotor

Perform the removal of the disc brake rotor in the reverse order from the installation procedure.

1. Check that the spokes are laced as shown in the figure.
   Radial lacing cannot be used.

   ![Spoke lacing diagram]

2. Set the disc brake rotor on the hub, and then secure it with the disc brake rotor fixing lock ring.
   Secure with TL-LR15 and an adjustable wrench or TL-FC36.

   ![Disc brake rotor and lock ring diagram]

<table>
<thead>
<tr>
<th></th>
<th>Inner serration type</th>
<th>Outer serration type</th>
</tr>
</thead>
<tbody>
<tr>
<td>Disc brake rotor fixing lock ring</td>
<td><img src="image" alt="Inner serration type" /></td>
<td><img src="image" alt="Outer serration type" /></td>
</tr>
<tr>
<td>Lock ring tightening tool</td>
<td>TL-LR15 and adjustable wrench</td>
<td>TL-FC36</td>
</tr>
</tbody>
</table>
Installing the brake caliper

Post mount type

1. Install the wheel with an attached disc brake rotor onto the frame.

2. Remove the bleed spacer (yellow).
   (1) Remove the snap ring.
   (2) Remove the bolt.
   (3) Remove the bleed spacer (yellow).

3. Set the brake pad presser spring in the brake pads.
   Since there are fins on the front and rear of the finned pads, set the pads as shown in the figure.
4. Install the brake pads.
   (1) Set the brake pads in the caliper.
   (2) Insert the bolt.
   (3) Install the snap ring.

5. Temporarily install the caliper on the frame so that the caliper can still move horizontally.
   If it is necessary to install a mount adapter, temporarily install the adapter after setting it on the caliper. Set the adapter so that the mark is facing up.
   Without mount adapter
With mount adapter

6. Depress the brake lever so that the disc brake rotor is held between the pads, and then tighten the caliper fixing bolts.

If the brake hose is not already installed in the caliper, install the brake hose and then perform the step.

Caliper fixing bolts

4 6 - 8 N·m
7. Secure the caliper fixing bolt.
   In order to prevent the bolt from loosening, pass a wire through the hole in the head of the caliper fixing bolt and secure it by twisting the wire around the frame.

International-standard mount type

**NOTICE**
- For international-standard mounts, attach an adapter to the post-type mount caliper. (Separate front and rear adapters are available.)

1. Install the wheel with an attached disc brake rotor onto the frame.

2. Remove the bleed spacer (yellow).
   (1) Remove the snap ring.
   (2) Remove the bolt.
   (3) Remove the bleed spacer (yellow).
3. Set the brake pad presser spring in the brake pads.
   Since there are fins on the front and rear of the finned pads, set the pads as shown in the figure.

![Brake pad presser spring and Finned pads](image)

4. Install the brake pads.
   (1) Set the brake pads in the caliper.
   (2) Insert the bolt.
   (3) Install the snap ring.

![Brake pads, bolt, and snap ring](image)

2 - 4 N·m
5. Temporarily install the caliper on the adapter, and then install it onto the frame.

Tighten with the adapter fixing bolts.

* Leave enough slack so that the caliper can still move horizontally.

6. Depress the brake lever so that the disc brake rotor is held between the pads, and then tighten the caliper fixing bolts.

If the brake hose is not already installed in the caliper, install the brake hose and then perform the step.
7. Secure the caliper fixing bolt.

In order to prevent the bolts from loosening, secure the caliper fixing bolt and adapter fixing bolts with wire.

* Pass the wire through the holes in the heads of the fixing bolts and twist as shown in the figure.

**TECH TIPS**

- If bolt [1] loosens (turns counterclockwise), force is applied via the wire to turn bolt [2] in the tightening direction (clockwise). However, bolt [2] cannot turn any further in the tightening direction. Accordingly, this prevents bolt [1] from turning in the loosening direction because it is also connected via the wire. If either bolt begins to loosen, force will be applied to the other bolt, thereby turning the loosened bolt in the tightening direction. In other words, this system prevents the bolts from loosening.
Installing the brake hose

Overview of the easy hose joint system

Checking the length of the hose

1. Route the brake hose into the final installation position.
2. Check the appropriate length of the brake hose.

Secure the brake lever in the position used when riding.

(Since BL-M9100 cannot be secured on the handlebars unless the lever stopper is removed, place the lever in the position assumed to be used when riding.)

Check the mark added beforehand on the brake hose with the edge of the brake lever connecting bolt.

* If the hose is at the appropriate length, it is not necessary to cut the hose. Proceed to "Connecting the hose" in "Installing the brake hose."

* If the hose needs to be shortened, proceed to "Cutting the hose" in "Installing the brake hose."

* If the hose length is insufficient, replace with a hose that has an appropriate length.
Cutting the hose

Use care when cutting the hose, as oil may leak when the hose is cut.

1. **Determine the appropriate length and add a check mark on the brake hose.**

   Add the mark so it is aligned with the edge of the connecting bolt.

   ![Diagram](image)

   - Check mark
   - Connecting bolt

2. **Add a cut mark.**

   Mark the hose at a position 18 mm from the check mark towards the end of the hose.

   *When not connecting with an easy hose joint system, mark the hose at a position 11 mm from the check mark.*

   ![Diagram](image)

   - 18 mm
   - Cut mark
   - Check mark
3. Prepare SHIMANO original tool TL-BH62 for cutting the brake hose.
   Disassemble the tool as shown in the figure.

[1]  [2]
[3]  [4]

- Main body
- Hose cutter
- Press block
**NOTICE**

- Make sure to also refer to the instruction manual for SHIMANO original tool TL-BH62.
- Do not move the lever indicated in the figure before disassembling SHIMANO original tool TL-BH62.

4. Place the brake hose in SHIMANO original tool TL-BH62.
5. Check the cut location and secure the brake hose in place.

6. Check that the hose is secure, and then install the hose cutter.
7. Press the hose cutter as shown in the figure to cut the brake hose.

8. Remove the hose cutter and check that the cut end is even.

9. Install the connector insert in the press block, and then set the press block in SHIMANO original tool TL-BH62.

   Make sure that the tip of the connector insert is correctly positioned inside the opening of the brake hose.
• When connecting with an easy hose joint system, a specialized connector insert (SHIMANO CODE No.: Y8JA98020/color: silver) must be used. If the designated connector insert is not used, the part will become improperly assembled and malfunctions such as oil leakage may occur.

10. Depress the lever on SHIMANO original tool TL-BH62 to install the connector insert in the brake hose.

Check that the connector insert is installed correctly.

11. Remove the brake hose from SHIMANO original tool TL-BH62.
Connecting the hose

1. **Remove the hose cap.**
   
   If the brake hose was cut, it is not necessary to remove the hose cap.

2. **Secure the brake lever with a tool such as a vise.**
   
   Secure the hose connection port so that it is facing upward.

3. **Remove the seal plug.**
   
   Cover the seal plug with a waste cloth while conducting this procedure as oil that has adhered to the seal plug may leak.

4. **Pass the hose cover over the brake hose.**
5. **Insert the brake hose in the brake hose connection port.**

   The part comes with a built-in olive. Insert the hose so that it does not become snagged on the olive.
   Insert the hose up to the line marked on the hose surface.
   Cover with a waste cloth while conducting this procedure as some of the internal oil may leak.

   ![Inserting Brake Hose](image)

6. **Tighten the connecting bolt.**

   ![Connecting Bolt](image)

   - Tightening torque: 5 - 7 N·m

7. **Wipe off any oil and install the hose cover.**

   ![Wiping Oil and Installing Hose Cover](image)
8. Remove the lever stopper from the brake lever.

![Diagram of brake lever and lever stopper]

**NOTICE**

- After removing the lever stopper, check that the pad spacer is installed on the caliper side and that the caliper is installed on the bicycle with the disc brake rotor between both sides of the caliper before depressing the lever. After assembly on the bicycle is complete, make sure that the lever stopper is removed.

**TECH TIPS**

- Pull out the lever stopper by means of short back and forth movements while taking care not to depress the brake lever.

9. Check that the lever has become stiff.

If the lever does not become stiff, refer to "Adding SHIMANO genuine mineral oil and bleeding air" and bleed the air from the system.
ADJUSTMENT

Adjusting the reach

1. Turn the adjustment bolt to adjust the reach.

Tightening the adjustment bolt (clockwise) widens the distance between the initial position of the brake lever and the handlebar, while loosening bolt (counterclockwise) narrows it.
Adjusting the free stroke

Adjust the range of travel of the brake lever until the brake pad and disc brake rotor come into contact. Perform reach adjustment if the initial position of the brake lever changes when performing the free stroke adjustment.

1. Turn the free stroke adjustment screw to adjust the stroke.

   Tightening the free stroke adjustment screw (clockwise) narrows the range of travel of the brake lever, while loosening the screw (counterclockwise) widens it.

---

**NOTICE**

- Free stroke cannot be adjusted for BL-M9100.
MAINTENANCE

Replacing the brake pads

**NOTICE**

- This brake system is designed to automatically adjust the clearance between the disc brake rotor and the brake pads by the pistons gradually protruding in relation to the wear of the brake pads. As a result, when the brake pads are replaced, the pistons need to be pushed back into position.

**TECH TIPS**

Replace the brake pads in the following circumstances.

- When oil adheres to the brake pads
- When the brake pads are worn down to a thickness of 0.5 mm
- When the brake pad presser spring is interfering with the disc brake rotor

1. Remove the wheel from the frame.

2. Remove the brake pads.
   
   (1) Remove the snap ring.
   
   (2) Remove the bolt.
   
   (3) Remove the brake pads from the caliper.
3. Clean the pistons and the surrounding area.

4. Push the pistons straight back as far as they will go.
   Use a flat-shaped tool to push the pistons back while being careful not to twist them.

   ![Piston]

   **NOTICE**
   - Do not push the pistons with a sharp tool. Doing so may damage the pistons.

5. Set a brake pad presser spring in the new brake pads.
   Since there are fins on the front and rear of the finned pads, set the pads as shown in the figure.

   ![Brake pad presser spring and finned pads]
6. **Install the brake pads.**

   (1) Set the brake pads in the caliper.
   
   (2) Insert the bolt.
   
   (3) Install the snap ring.
   
   (4) Install the pad spacer (red).

7. **Depress the brake lever a few times and make sure that the lever operation becomes stiff.**

8. **Remove the pad spacer and install the wheel.**

9. **Check that the disc brake rotor does not interfere with the brake pads.**

    If there is interference, check if the wheel is installed correctly. If there is no problem with the installation position of the wheel, refer to "Installing the brake caliper" and adjust the position of the caliper.
SHIMANO genuine mineral oil replacement

It is recommended to change your oil when the oil in the reservoir tank becomes noticeably discolored.

Draining the mineral oil

Follow local county and/or state codes for disposal of used oil.

1. **Position the bicycle as shown in the figure.**
   
   Install a bleed spacer (yellow) to the caliper and secure the bicycle with a stand, etc.

2. **Set the brake lever so that it is parallel to the ground.**
3. Remove the bleed screw and O-ring.

4. Install a bag and tube on the bleed nipple.
   (1) Place a 7 mm socket wrench in the position shown in the figure.
   (2) Connect the bag and attached tube to the bleed nipple.
5. Loosen the bleed nipple.

The oil will begin to drain. Operating the brake lever while the oil drains will allow the oil to drain more easily.

![Bleed nipple diagram]

Adding SHIMANO genuine mineral oil and bleeding air

When adding oil, use only SHIMANO genuine mineral oil.

1. Position the bicycle as shown in the figure.

   Install a bleed spacer (yellow) to the caliper and secure the bicycle with a stand, etc.

![Bicycle diagram]

**NOTICE**

- When bleeding the air out of the caliper, you will need the SM-DISC (oil funnel and oil stopper).
2. Set the brake lever so that it is parallel to the ground.

3. Remove the bleed screw and O-ring, and then insert the oil funnel.
   Do not insert the oil stopper.
4. Add the oil through the bleed nipple.

(1) Place a 7 mm socket wrench in the position shown in the figure.

(2) Fill a syringe with oil, and then connect the tube to the bleed nipple.

(3) Loosen the bleed nipple by 1/8 of a turn.

(4) Push the piston of the syringe to add the oil.

(5) Oil will start to come out from the oil funnel. Continue adding the oil until there are no more air bubbles in the oil that is coming out.

![Bleed nipple diagram]

**NOTICE**

- Secure the brake caliper main body in a vise to prevent the tube from being disconnected accidentally.

- Do not depress and release the lever repeatedly. Doing so will lengthen the amount of time needed to bleed the air as it will cause air bubbles to remain inside the brake caliper, even if no bubbles appear. (If the lever was depressed and released repeatedly, drain out all of the oil and then add the oil again.)
5. Once there are no more air bubbles mixed in with the oil, temporarily tighten the bleed nipple.

6. **Bleed the air.**

Most of the air bubbles remaining inside the brake system can be bled by performing the following operation.

(1) Place a 7 mm socket wrench in the position shown in the figure.

(2) Connect the bag and attached tube to the bleed nipple.

(3) Loosen the bleed nipple.

(4) After waiting a moment, the oil and air bubbles will flow naturally from the bleed nipple into the tube.
7. While bleeding the air, maintain the oil level by adding additional oil.
   Add additional oil so that more air is not sucked in (air does not get inside) when the oil level inside the funnel drops.

8. Once no more air bubbles come out from the bleed nipple, temporarily tighten the bleed nipple.
9. **With the brake lever depressed, loosen and tighten the bleed nipple in rapid succession.**

Loosen and tighten for approximately 0.5 seconds each time to release any air bubbles inside the caliper.

10. **Repeat step 9 two to three times, and then tighten the bleed nipple.**
11. Operate the brake lever.

Air bubbles in the system will rise up through the port into the oil funnel. Continue operating the brake lever until no more bubbles appear.

12. Check that the lever has become stiff.

NOTICE

• If the lever does not become stiff, repeat the procedures from step 6.

13. Tilt the brake lever upwards 30° from the ground and conduct step 11.

Check that there are no remaining air bubbles.
14. Tilt the brake lever downwards 30° from the ground and conduct step 11.
   Check that there are no remaining air bubbles.

15. Plug the oil funnel with the oil stopper.
   Make sure that the side of the oil stopper with the O-ring attached is facing downward.

16. Remove the oil funnel.
   Remove the oil funnel while it is still plugged by the oil stopper.
17. **Tighten with a bleed screw to which an O-ring has been attached.**

   Tighten until oil flows out to make sure that no air bubbles remain inside the reservoir tank.

   ![Bleed screw diagram]

   **Bleed screw**

   $2.5 \; 0.5 - 1 \; N\cdot m$

   **NOTICE**

   • Do not operate the brake lever. If operated, there is a risk that air bubbles may enter the cylinder.

18. **Wipe away any oil that has overflowed.**
Replacing the brake hose

After replacing the brake hose, refer to "SHIMANO genuine mineral oil replacement" to replace the mineral oil and bleed the air from the system.

Checking and cutting the hose length

1. Route the brake hose into the final installation position.

2. After determining the appropriate length, add a check mark on the brake hose.
   Add marks to both the brake lever side and caliper side of the hose.

3. Cut the brake hose.
   Refer to "Cutting the hose" in "Installing the brake hose."
For the brake lever side

1. Pass the cover, connecting bolt, and olive over the brake hose.

2. Check that the olive is in the position shown in the figure, and then apply premium grease to the threads of the connecting bolt and outer surface of the olive.

3. Install the brake hose in the brake lever.
   Insert the hose until the check marks added beforehand on the surface of the hose are covered.
4. Tighten the connecting bolt while pushing on the brake hose. After tightening, install the cover.

5. Install the cover.

For the caliper side

Straight type

1. Pass the connecting bolt and olive over the brake hose.
2. Check that the olive is in the position shown in the figure, and then apply premium grease to the threads of the connecting bolt and outer surface of the olive.

3. Install the brake hose in the caliper.

   Insert the hose until the check marks added beforehand on the surface of the hose are covered.

**NOTICE**

- Do not let the brake hose become twisted when installing it. Check that the caliper and brake lever are in the positions shown in the figure.
4. Tighten the connecting bolt while pushing on the brake hose.

Banjo type

Install the brake hose on the caliper as shown in the figure.
Adjustment when the pistons are not operating correctly

The caliper includes two pistons. Adjust the pistons with the following procedure if these pistons do not operate properly, if they protrude unevenly, or if the brake pads remain in contact with the disc brake rotor.

1. Remove the wheel from the frame.

2. Remove the brake pads.
   (1) Remove the snap ring.
   (2) Remove the bolt.
   (3) Remove the brake pads from the caliper.

3. Clean the pistons and the surrounding area.

4. Push the pistons straight back as far as they will go.
   Use a flat-shaped tool to push the pistons back while being careful not to twist them.
**NOTICE**

- Do not push the pistons with a sharp tool. Doing so may damage the pistons.

5. Install the brake pads and pad spacer (red) in the caliper.

6. Operate the brake lever through its full range of travel and depress it several more times so that the two pistons move to their initial positions.

7. Remove the pad spacer and install the wheel.

8. Check that the disc brake rotor does not interfere with the brake pads.

   If there is interference, loosen the fixing bolt and adjust until there is no more interference.

**Designated parts for magnesium products**

BL-M9100 is a magnesium component. Use parts designated for use with magnesium components for the parts shown in the following figure.

![Designated parts for magnesium products diagram](image_url)

**NOTICE**

- If parts other than those designated for use with magnesium components are used, the rusting process will accelerate.