Service Information

Madone 2010

The Trek Madone is the lightest, strongest frameset we have ever made. To accomplish this, we have used shaped tubes, an integral seatmast with seatmast cap, internal rear brake inner-wire, and very thin-walled carbon tubes. Because of these unique features, the Trek Madone requires different or additional assembly techniques, provided here:

- Putting the bike in a workstand
- Attaching and adjusting the saddle
- Inner-wire routing for front derailleur and rear brake

Note: Instructions for Shimano's electronic Di2 are in a separate document. See your dealer.

We have also provided general maintenance information:

- Carbon fiber care
- Headset bearing installation
- Bottom bracket bearing installation for a variety of bottom bracket types

These instructions are written for an experienced mechanic. If you need further information, refer to your bicycle owner's manual, the instructions in a bicycle mechanic's handbook, or consult your dealer.

Please save these instructions for future reference. Also check www.trekbikes.com for updates.

Note about performing mechanical work on bicycles:

Many people think of bicycles as simple machines, almost toys. However, modern bicycles use high-tech materials and designs that rely on correct maintenance and precision workmanship. If any part on the bicycle is worn, corroded, rusted, loose, or damaged in any other way, replace the part. If you do not have the correct tools or experience, do not perform the tasks in this manual; take your bicycle to your dealer for service.
In some cases we provide several methods of checking the tightness or connection of parts. The most preferable of these is always the one with the most precision. In other words, correct mechanical work requires that all bolts be tightened with a torque wrench.
Incorrect mechanical work on your bicycle could lead to damage or premature breakage of a part, which could cause you to fall and lead to serious injury or death.

Table of Contents

Working with Carbon Fiber Parts 1

Preparing the Seatmast Cap for the Saddle 2

Adjusting the Saddle 3

Adjusting the Height of the Saddle 3

Putting the Frame in a Repair Stand 4

Adjusting the Angle of the Saddle (up-and-down and side-to-side) 5

Changing the Adjustment of the Saddle 5

Cutting a Carbon Fiber Steerer 6

Front Derailleur Inner-wire Installation 8

'08, '09, and '10 Madone 5 Series 8

'10 Madone 6 Series 9

Rear Derailleur Inner-wire Installation 11

'10 Madone 6 Series 11

Derailleur Inner-wire Replacement 13

'10 Madone 6 Series 13

Rear Brake Inner-wire Installation 14

'08 and '09 Madone, '10 Madone 5 Series 14

'10 Madone 6 Series 16

Headset Installation 18

Warning! 18

Special Care Information 18

Inspecting the Headset 20

DuoTrap Computer Sensor 21

Crankset Installation 22

Pressing bearings that are tighter than "slip fit" 23

'10 Madone Series 6 23

SRAM GXP 24

Shimano HollowTech 27

Campagnolo UltraTorque 31

Inspecting the bottom bracket 33

FSA MegaExo AL 34

Crankset Troubleshooting 37

Torque Specifications 39

Working with Carbon Fiber Parts

Carbon fiber parts are different from metal parts, so they require different treatment.

Avoid sharp edges or excessive pressure

Carbon fiber composite can be damaged by sharp edges or clamping mechanisms which cause a point load, or a high pressure area. Before installing any carbon fiber part, or attaching any component to an existing carbon fiber part, follow these procedures to make sure the parts or components are carbon-compatible.

As carbon frames have gotten lighter and lighter, you can now feel movement in the tubes when you squeeze them. This is normal and no reflection of the strength of the frame. However, repeated compression of the sides of the tubes is not good for them, and could eventually lead to frame damage. Do not squeeze the frame tubing with your fingers, and especially never clamp the tubing in any mechanical device, including car racks.

Clean carbon parts before installation

With some interfaces of metal parts, grease is used on the clamping surfaces to prevent corrosion. When making adjustments, always grease the threads and shoulders of bolts. Grease reduces corrosion and allows you to achieve the correct tightness without damaging tools.

However, with most carbon parts you should avoid grease. If grease is applied to a carbon part that is clamped, the part may slip in the clamp, even at the recommended torque specification. The carbon part can be assembled in a clean, dry state. As an alternative, we recommend the following special carbon prep products:

· Tacx carbon assembly compound

· Fiber Grip™ carbon fiber assembly gel from Finish Line

On the other hand, the bearing seats of the Madone frameset do require grease, as explained in these instructions.

Never modify the fork, frame, or components

The parts of the Madone frameset have been carefully designed to meet the strength and function requirements of safe riding. Modifying these parts in any way may make the bike unsafe. As an example, the seatmast on the Madone frame is a “No Cut” System. The closed end of the seatmast provides strength required for the system. Do not cut the seatmast on this frame. . Removing the redundant wheel retention tabs on fork tips or peg-and- eyelet style redundant retention devices is another example of how modifying a bicycle could make it less functional.

Suspension forks can add stress to a bike frame. Never add a suspension fork to a road bike, or change style and/or length of forks. If you are unsure if a fork is compatible with a frame, call Trek customer service. Any modification of a frame, fork, or components means that the bike no longer meets our specifications and will therefore void the bike’s warranty.

Preparing the Seatmast Cap for the Saddle

The seatmast cap must be prepared for use. This service will make the saddle adjustment easier and also more secure. The preparation for the '08, '09, and '10 Madone 5 Series is different from the preparation for the '10 Madone 6 Series.

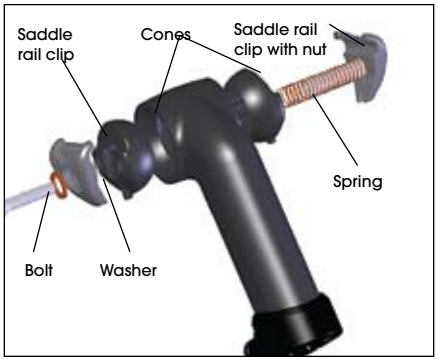

Figure 1. Parts of the saddle rail clamp mechanism



Figure 2. Applying grease to the socket of the seatmast cap (NOT '10 Madone 6 Series)

Tools and materials required

- 5 mm allen wrench
- Park Polylube 1000 grease

To prepare the seatmast cap ('08, '09, and '10 Series 5)

1. Remove the bolt that holds the clamp (Figure 1).
2. Remove the cones.
3. Apply a light coat of grease to the sockets, the surfaces of the seatmast cap where the cones contact it (Figure 2).
4. Apply a light coat of grease to the threads of the bolt.
5. Assemble the clamp parts.
6. Wipe excess grease from the clamp.

To prepare the seatmast cap ('10 Series 6)

1. Remove the bolt that holds the clamp (Figure 1).
2. Apply a light coat of grease to the threads of the bolt.
3. Re-install the bolt.
4. Wipe excess grease from the clamp.

Adjusting the Saddle

The seatmast on the Madone frame uses a "No Cut" system. The closed end of the seatmast provides strength required for the system. Do not cut the seatmast on this frame. Note: Do not use grease between the seatmast and the seatmast cap. For the best performance, the seatmast should be clean before installation of the cap, as explained on page 1.

Tools and materials required

- 4 mm allen wrench
- 5 mm allen wrench
- Torque wrench with 4 mm and 5 mm allen fittings

Adjusting the Height of the Saddle

1. Loosen the clamp bolts on the seatmast cap.
2. Slide the cap up or down as necessary.
3. Make sure the seatmast cap covers the minimum insertion line (Figure 3).
4. Tighten the clamp bolts gradually in an alternating pattern to the torque specification (see page 38):

If the seatmast cap does not provide enough adjustment, optional caps with different lengths and setbacks are available (see Table 1).

Table 1. Seatmast caps

Seatmast cap			PN
Shape/ Color	Cap height (mm)	Setback (mm)	
Aero	120	5	402770
	120	20	402738
	120	-10 (forward)	402773
	160	5	402772
	160	20	402771
	160	-10 (forward)	402774
Round/ Carbon	135	5	413481
	135	20	413479
	175	5	413480
	175	20	413478
Round/ white	135	5	413533
	135	20	413531
	175	5	413532
	175	20	413530
Seatpost ears for oversize saddle rails			406923

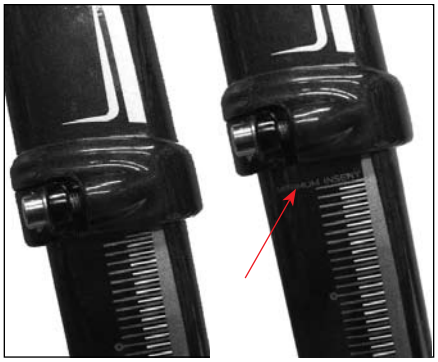

Figure 3. Proper seatmast cap insertion (left) and improper (right)

Putting the Frame in a Repair Stand

Use special care when putting the new Madone frame in a workstand. The only accepted or recommended method is to use the special workstand clamp adapter designed specifically for this frameset. The adapter clamps to the seatmast cap (only), which must be installed first.

Tools and materials required

- 4 mm allen wrench
- Torque wrench with 4mm allen fitting
- Workstand
- Workstand clamp adapter (Figure 1), PN 403494 (includes adapters for all Madone seatmast caps)

To install the seatmast cap

1. Clean the seatmast.
2. Grease the clamp bolts of the seatmast cap.
3. Slide the seatmast cap over the seatmast.
4. Make sure the seatmast cap has the minimum insertion.
   The Minimum Insertion line should be completely covered (Figure 4).
5. Tighten the clamp bolts gradually in an alternating pattern to the torque specification (see page 38).

To attach the workstand clamp adapter

1. Open the workstand clamp adapter (Figure 5).
2. Wrap the adapter around the seatmast cap (Figure 6).
   Do not attach the clamp adapter directly to the seatmast, which is part of the frame. Clamp to the cap only.
3. Insert the base of the seatmast clamp in the workstand.

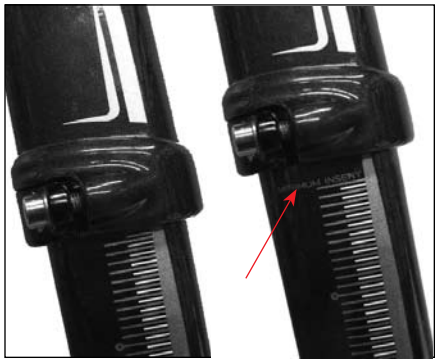

Figure 4. Proper seatmast cap insertion (left) and improper (right)



Figure 5. Seatmast clamp.



Figure 6. Seatmast clamp in workstand, holding bicycle

Adjusting the Angle of the Saddle (up-and-down and side-to-side)

As with a "normal" seatpost, the saddle rail clamp on the seatmast cap of the Madone provides a wide adjustment of saddle tilt. The adjustment system uses a "ball and socket" system (Figure 1) to provide precise angular adjustment.
The '08 and '09 Madone saddle rail clamp also provides several degrees of lateral angle adjustment so you can align the saddle (Figure 7). The saddle rail clamp is a mating ball and socket system that is easy to use.

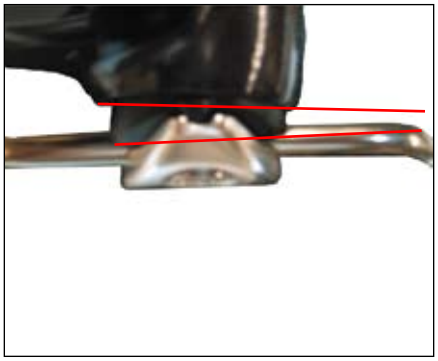

Figure 7. Angular (side-to-side) adjustment of the saddle, '08 and '09 Madone only

To adjust the saddle angle

1. Tighten the saddle rail clamp bolt just enough to keep the assembly from rattling.
2. Tap the front or the back of the saddle to adjust the fore-aft position.
3. Tap the nose of the saddle to align, either horizontally or vertically.
4. When the saddle is in the desired position, hold the saddle and tighten the saddle rail clamp bolt to the torque specification (see page 38).

Changing the Adjustment of the Saddle

After the saddle rail clamp bolt has been tightened, the clamp mechanism will lock into place. When you loosen the clamp bolt, the mechanism might not unlock.



Figure 8. Prying the locking cones loose with a 4 mm allen wrench

To unlock the saddle clamp mechanism

1. Loosen the saddle rail clamp bolt until the outer clamp plate allows you to insert a 4 mm hex wrench in one of the holes in the adjusting ball (Figure 8).
2. Push lightly on the allen wrench until the cup releases from (moves within) the carbon cap.
3. Follow same procedure for the other side of the clamp.
4. Follow the procedure "To Adjust the Saddle Angle."

Cutting a Carbon Fiber Steerer

These instructions explain the best practices for cutting a carbon fiber steerer tube.

Warning! A steerer that is damaged by incorrect cutting, installation or maintenance is unsafe and could break, causing loss of control and injury. Follow the instructions carefully.

About cutting carbon fiber

High quality carbon fiber composite behaves like a solid; if the layers of carbon are correctly bonded together, there will be no layers or loose fibers apparent. Your job when cutting the steerer is to avoid damage to the steerer that might separate layers or leave loose fibers. Done correctly, there is no need to dress the steerer with tape before cutting, or to dress it with epoxy after cutting.

Measure twice, cut once

- Before cutting the steerer, make sure the steerer length is correct. Remember these requirements:
- Place at least two spacers under the stem (two 5mm spacers are acceptable).
- Do not stack more than 40mm of spacers.
- Use a stem with circumferential clamps; never a wedge-type stem.

Use the correct tools in the correct manner.

- Do not scratch or score the steerer below the cut line; any damage to the tube surface (scratches, cracks, or torn or loose fibers) can compromise the strength of the steerer.
- Allow the saw to do the work; instead of cutting cleanly, excessive pressure tends to pull on or tear the carbon.
- Always cut toward the center of the steerer, which helps prevent splintering of the carbon. This requires turning the steerer in the saw guide. Keep the cut aligned correctly so that the finished cut is even and perpendicular to the centerline of the steerer.
- Avoid inhaling the carbon fiber dust that occurs during the cutting process.

Materials and tools needed

- Bench vise
- Saw guide to create a perpendicular cut (e.g. Park Tool Threadless Saw Guide #SG-6)
- Hacksaw with Carbide Grit hacksaw blade
- Fine grit sandpaper (220 - 400 grit)
- File: smooth tooth or mill bastard

To cut the steerer

1. Clamp the saw guide securely in the bench vise.
2. Clamp the steerer in the saw guide.
   Be careful not to crush the steerer; do not overtighten.
3. Using only light pressure on the saw blade, cut about halfway through the steerer (Figure 9).
   Be careful not to create loose fibers—on the inside or the outside the steerer.
4. While keeping the cut aligned with the cutting guide, rotate the steerer 180 degrees (Figure 10).
5. Finish cutting the steerer.
6. Loosen the saw guide slightly and push the steerer through. Retighten.
7. Working away from the crown, file the outside corner off the cut end of the steerer. (Figure 11).
   You can also use sand paper for this step. Sandpaper is less aggressive and a bit more forgiving.
8. With the sandpaper, smooth the cut end of the steer tube and the inside corner (Figure 12).
   This can be done with a "shoeshine" movement or by rotating and reciprocation with the sandpaper.
9. Remove the fork from the saw guide.
10. Inspect for frayed, loose, or broken fibers; and repair.
    • If, despite your care, some individual fibers break free, treat the fibers with care because if one is pulled or moved, it could "zipper" down the length or the steerer.
    • If a loose fiber area is small and short, you can repair it. To repair, glue the fiber in place with two-part epoxy. Finish by lightly sanding with 220 or 400 grit sandpaper.
    • If you see loose fibers extending more than one-half the length of the steerer, have the fork evaluated by Trek before repairing or installing.

The fork is now ready for you to complete the fork installation.



Figure 9. Use light pressure when cutting.

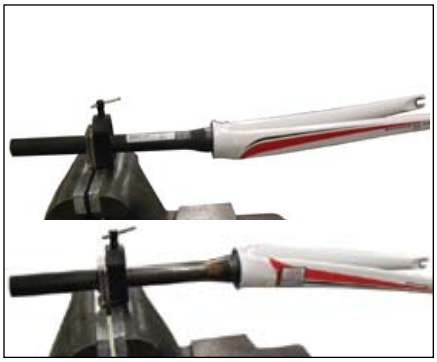

Figure 10. Turn the fork over so that cutting is always toward the center; this prevents loose fibers



Figure 11. File away from the crown (NOT toward it)

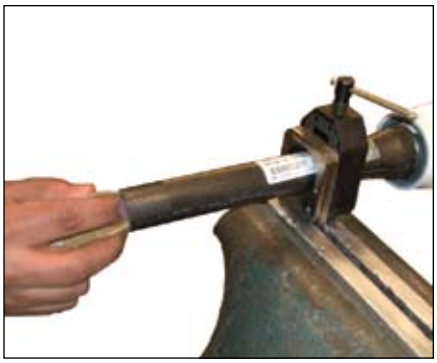

Figure 12. Smooth the inside of the steerer with fine-grit sandpaper

Front Derailleur Inner-wire Installation

The preparation for the '08, '09, and '10 Madone 5 Series is different from the preparation for the '10 Madone 6 Series.

`08, `09, and `10 Madone 5 Series

The front derailleur inner-wire on the '08, '09, and '10 Madone 5 Series starts out following a normal path (Figure 13 and Figure 14). However, the inner-wire passes through a special guide tube in the bottom bracket (Figure 15).

Tools and materials required

- Madone '08, '09, and '10 Madone 5 Series bottom bracket inner-wire guide PN 292700
- Derailleur inner-wire and housing
- Inner-wire lubricant
- Inner-wire cutters
- Housing cutters
- 5 mm allen wrench
- Torque wrench with 5 mm allen fitting

To install the front derailleur inner-wire guide

1. Grease the end of the guide tube.
2. Reach through the top of the hole in the frame with a 3mm allen wrench and slide the wrench into the top of the guide.
3. Slide the guide into the frame, using the allen wrench to center the guide as you press it home.

To install the front derailleur inner-wire

1. Install front shifter housing into the housing stop on the non-drive side of the down tube (Figure 13).
2. Insert the inner-wire through the housing, the housing stop, and the bottom bracket inner-wire guide (non-drive side, Figure 14).
3. Route the inner-wire from the bottom bracket guide and into the tunnel in the bottom of the bottom bracket shell (Figure 15).
4. Pull the inner-wire out the top of the tunnel.
5. Attach the inner-wire to the front derailleur and adjust in the normal manner.



Figure 13. Inner-wire routing around the head tube



Figure 14. Front derailleur inner-wire on the rider's left of the bottom bracket inner-wire guide

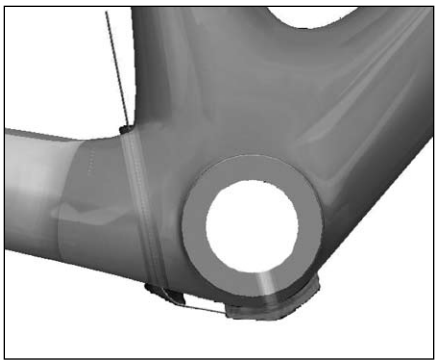

Figure 15. Front derailleur inner-wire passing through bottom bracket inner-wire guide tube

`10 Madone 6 Series

The front derailleur inner-wire on the Madone 6 Series runs inside the frame. The inner-wire enters the frame at the drive-side down-tube housing stop, crosses sides inside the frame, exits briefly at the bottom bracket inner-wire guide, and then runs back through the guide to the exit below the front derailleur.

There are several steps to complete this procedure:

- Prepare and install the frame fittings and housing
- Install the inner-wire

Tools and materials required

- Madone 6 Series frame hardware kit (Table 2)
- Derailleur inner-wire and housing
- Inner-wire lubricant
- Inner-wire cutters
- Housing cutters
- 3 mm allen wrench
- Torque wrench with 3 mm allen fitting
- Housing ferrules: Use the correct ferrules at the shifters.

For Shimano Ultegra or Dura-Ace shifters, only use Shimano or Jagwire 464 alloy ferrules. Non-sealed ferrules create less friction, so they will increase shifting speed and precision.

To prepare and install the frame fittings and housings

1. Slide the bottom bracket inner-wire guide tube into the hole in the bottom bracket shell (Figure 16).
2. Place the bottom bracket inner-wire guide in the frame (Figure 17), lubricate the screw and insert it, and tighten to the torque specifications (see page 38).
3. Snap the right (drive-side) down tube housing stop into the frame.
   There is only one fitting, which works on either side of the frame.
4. Measure and cut the housing.
   - Cut the length with allowance for ferrules and if desired, an in-line barrel adjuster.
   - The path of the front shifter housing goes in front of the head tube and into the right-hand (drive-side) housing stop (Figure 18).

To install the front derailleur inner-wire

1. Place the bike so that it stands upright with the down tube at a 60 degree angle to the floor.
2. While avoiding placing any bends or kinks in the inner-wire, slide the inner-wire through the shifter and housing.
3. Slide the inner-wire through the down tube housing stop, through the downtube, and out the bottom bracket inner-wire guide.
   - The end of the inner-wire makes noise in the frame; you can estimate its location by listening carefully.
   - To get the inner-wire end to exit the guide, slide the inner-wire up and down, or try



Figure 16. Bottom bracket inner-wire guide tube



Figure 17. Bottom bracket inner-wire guide



Figure 18. Down tube housing stop, several inches below the head tube

Table 2. Contents of Series 6 frame hardware kit, PN 419093

Part	Qty
Brake housing stop, head tube	1 set
Brake housing stop, top tube; attachment screw; liner	1 set
Brake housing stop, rear dropout	1
Bottom bracket guide; attachment screw; guide tube	1 set
Shift housing stop, down tube	1 pr

rolling the cable between your fingers to make it rotate.

• If the inner-wire does not exit, you can 'fish' it out by grasping the inner-wire with the head of a J-bend spoke through the exit hole of the cable guide (Figure 19).

4. Pull the remainder of the inner-wire from the frame until the housing is seated in the down tube housing stop.
5. Slide the inner-wire through the non-drive-side hole at the other end of the bottom bracket guide (Figure 20).
6. With the inner-wire lying in the slot of the guide (Figure 21), attach the inner-wire to the front derailleur inner-wire clamp.



Figure 19. A J-bend spoke can grasp the inner-wire, and then you can pull the inner-wire through the guide



Figure 20. The inner-wire for the front derailleur runs in the non-drive-side hole



Figure 21. The inner-wire should lay in the groove of the guide

Rear Derailleur Inner-wire Installation

`10 Madone 6 Series

The rear derailleur inner-wire on the Madone 6 Series runs inside the frame. The inner-wire enters the frame at the non-drive-side down-tube housing stop, crosses sides inside the frame, exits briefly at the bottom bracket inner-wire guide, then runs inside the chainstay to the exit near the rear dropout.

There are several steps to complete this procedure: The front derailleur inner-wire should be installed before the rear.

- Prepare and install the frame fittings and housing
- Install the inner-wire

Tools and materials required

- Madone 6 Series frame hardware kit PN 419093
- Derailleur inner-wire and housing
- Inner-wire lubricant
- Inner-wire cutters
- Housing cutters
- Housing ferrules: Use the correct ferrules at the shifters.

For Shimano Ultegra or Dura-Ace shifters, only use Shimano or Jagwire 464 alloy ferrules. Non-sealed ferrules create less friction, so they will increase shifting speed and precision.



Figure 22. Down tube housing stop, several inches below the head tube

To prepare and install the frame fitting and housing

1. Snap the left (non-drive-side) down tube housing stop into the frame (Figure 22). There is only one fitting, which works on either side of the frame.
2. Measure and cut the housing.
   - Cut the length with allowance for ferrules and if desired, an in-line barrel adjuster.
   - The path of the rear shifter housing goes in front of the head tube and into the left-hand (non-drive-side) housing stop.

To install the rear derailleur inner-wire

1. Place the bike so that it stands upright with the down tube at a 60 degree angle to the floor.
2. While avoiding placing any bends or kinks in the inner-wire, slide the inner-wire through the shifter and housing.
3. Slide the inner-wire through the down tube housing stop, through the downtube, and out the bottom bracket inner-wire guide.
   - The end of the inner-wire makes noise in the frame; you can estimate its location by listening carefully.
   - To get the inner-wire end to exit the guide, slide the inner-wire up and down, or try

rolling the cable between your fingers to make it rotate.

• If the inner-wire does not exit, you can 'fish' it out by grasping the inner-wire with the head of a J-bend spoke through the exit hole of the cable guide (Figure 23).

4. Pull the remainder of the inner-wire from the frame until the housing is seated in the down tube housing stop.
5. Slide the inner-wire through the drive-side hole at the other end of the bottom bracket guide (Figure 24), lay the inner-wire in its groove (Figure 25), and then slide the inner-wire out the end of the chainstay (Figure 26).
6. Slide the chainstay housing stop onto the inner-wire with the cup facing out and press the stop into the frame.
7. Measure and cut the housing.
8. Slide the housing onto the inner-wire.
9. Attach the inner-wire to the rear derailleur inner-wire clamp.



Figure 23. A J-bend spoke can grasp the inner-wire, and then you can pull the inner-wire through the guide



Figure 24. The inner-wire for the rear derailleur runs in the drive-side hole



Figure 25. The inner-wire should lay in the groove of the guide



Figure 26. Housing stop and housing in the chainstay

Derailleur Inner-wire Replacement

`10 Madone 6 Series

The derailleur inner-wires on the Madone 6 Series runs inside the frame. This procedure is one way to replace an inner-wire.

Tools and materials required

- High-pressure tubing
- New inner-wire
- Masking tape
- 5 mm allen wrench
- Torque wrench with 5 mm allen fitting

To install a replacement derailleur inner-wire

1. Loosen the inner-wire clamp bolt for the inner-wire you are replacing.
2. Cut the end of the inner-wire so that is has a clean, square, and round end. If the inner-wire has been flattened, frayed, or misshapen, cut off that portion of the inner-wire.
3. Loosen the end of the inner-wire.
   - For the rear derailleur, remove the housing that extends out of the chainstay.
   - For the front derailleur, pull the inner-wire out of the bottom bracket guide tube so that the inner-wire hangs from the bottom bracket inner-wire guide.
4. Slide the selected piece of tubing up the inner-wire (Fig. 27).
   - Use a piece of tubing that is long enough to go completely through the frame and protrude about 2" (5 cm) out both ends.
5. Slide the tubing over the inner-wire, all the way through the frame until it exits the other end.
   - The down tube housing stop must be removed to allow the tubing to exit the frame. Pry gently, or try grasping the inner-wire behind the tubing (closer to where the derailleur was attached), then pulling on the inner-wire from in front of the housing stop.
7. After the tubing protrudes the down tube about 2" (5 cm), tape the tubing to the frame to prevent it from sliding out.
8. Pull the inner-wire out of the tubing, front housing, and shifter.
   - DO NOT remove the tubing.
9. Install a new inner-wire in the lever and install the front housing.
10. Slide the inner-wire through the down tube housing stop and the tubing.
11. Pull the tubing from the end of the inner-wire (Fig. 28).
12. Finish the inner-wire installation (if needed, refer to the Installation instructions on preceding pages).



Figure 27. The inner-wire for the front derailleur runs in the drive-side hole

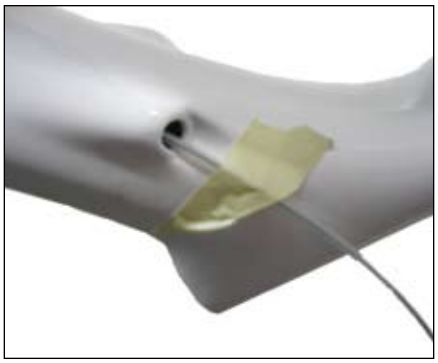

Figure 28. The inner-wire for the front derailleur runs in the drive-side hole

Rear Brake Inner-wire Installation

The '08-09 Madone and '10 Madone 5 Series share the same brake inner-wire routing. The '10 Madone 6 Series uses a different method, shown on the following pages.

`08 and `09 Madone, `10 Madone 5 Series

The Madone uses an internal inner-wire route for the rear brake. The inner-wire housing does not run continuously through the frame, but instead uses special housing stops. This design is lighter and provides a firmer feel to the lever when applying the rear brake.

Tools and materials required

- Madone top tube housing stops (2) and fixing screws (2) (contact customer service for part number)
- Brake inner-wire and housing
- Inner-wire lubricant
- J-bend spoke
- 5 mm allen wrench
- Inner-wire cutters
- Housing cutters

To install the inner-wire

1. Loosen the fixing screw on the rear housing stop (Figure 29).
2. Remove the rear housing stop from the exit window in the frame.
3. Insert the inner-wire through the front housing stop (Figure 30).
4. Feed the inner-wire through the top tube while you watch the rear exit window of the top tube. When you see the inner-wire, use a spoke to fish it out (Figure 31).
5. Slide the housing stop onto the inner-wire (Figure 32).
6. Insert the housing stop into the exit window.



Figure 29. Removing the fixing screw for the rear housing stop



Figure 30. Run the inner-wire through the end of the housing stop

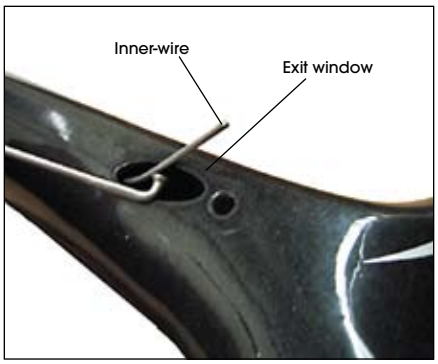

Figure 31. Fishing the rear brake inner-wire with a spoke



Figure 32. Sliding the frame ferrule up the brake inner-wire

7. Install the fixing screw (Figure 33) and tighten the screw to the torque specifications (see page 38).

To install the rear brake housing

1. Cut the housing to the desired length.
2. Lubricate the inner-wire and slide the housing into place.
3. Press the housing firmly into the housing stop so that it seats correctly.
4. Attach the inner-wire to the brake and adjust the brake.
5. Squeeze the brake lever firmly toward the handlebar to make sure the housing is in place and that the lever applies adequate force to the rim.



Figure 33. Attaching the housing stop with the fixing screw

`10 Madone 6 Series

The Madone uses an internal inner-wire route for the rear brake. The housing does not run continuously through the frame, but instead uses special housing stops. This design is lighter and provides a firmer feel to the lever when applying the rear brake.

Tools and materials required

- Madone 6 Series head tube housing stop: "Nut" and "bolt" (Figure 34)
- Madone 6 Series frame hardware kit PN 419093
- Brake inner-wire and housing
- Inner-wire lubricant
- J-bend spoke
- 5 mm allen wrench
- Torque wrench with 5 mm allen fitting
- Inner-wire cutters
- Housing cutters

To install the head tube housing stop

If this installation was done at the factory, go to the next section.

1. Position the frame so the head tube is parallel to the ground (the frame can be on its side or vertical).
2. From the inside of the head tube, insert the "nut" portion of the housing stop (Figure 35). The little tab, or keyway, should extend out of the hole in the frame.
3. Press the threaded portion of the "bolt" out and thread it into the "nut."
4. With the base of the housing stop aligned with the outer surface of the head tube, tighten the "bolt" to the torque specification (see page 38).

To install the inner-wire

1. Position the frame in the workstand in the "normal" position.
2. Slide the inner-wire through the brake lever, housing, and end caps.
   If you use 5mm housing, the head tube housing stop does not need an end cap.
3. Slide the inner-wire through the head tube housing stop until the inner-wire is visible at the port, or window, at the rear of the top tube.



Figure 34. "Nut" (left) and "bolt" of head tube housing stop



Figure 35. Inserting the "nut" portion of the housing stop



Figure 36. Engaging the threads of the "bolt" part of the housing stop with the "nut" inside the head tube

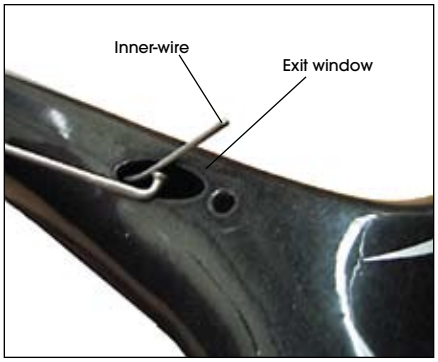

Figure 37. Fishing the rear brake inner-wire with a spoke

4. With the spoke, fish the inner-wire out of the frame (Figure 37)
5. Slide the rear housing stop onto the inner-wire (Figure 38).
6. With the flange nearest the rear brake, slide the liner onto the inner-wire.
7. With your fingers, firmly press the housing stop into the frame.
8. Install the rear section of housing and attach the cable to the brake.
   The housing does not need a ferrule or end cap in the housing stop.
9. Install the housing stop screw and tighten to the torque specifications (see page 38).



Figure 38. Attaching the housing stop with the fixing screw

Headset Installation

The headset of the Madone uses a 1.5″ lower bearing and 1$^{1/8}$″ upper bearing (Figure 13). The bearings are slip-fit into the frame. There are many benefits to this design, and one is that the Madone headset is a tool-less installation. The bearings are slip fit, so a headset press or fork race setting tool are not needed.

Warning!

Incorrect spacers above or below the stem can create stress that could damage the steerer, resulting in a serious accident. Follow the instructions carefully.

Special Care Information

Follow these requirements to avoid frame or fork damage:

- Do not attempt to remove the dust cap on the shoulder of the fork; it is bonded on.
- With the carbon steerer, do not use a star-fangled nut; use only the compression nut assembly supplied with the fork.
- Do not cut or machine the fork crown or head tube; never use facing tools.
- Do not use a hammer to install the bearings.
- Make sure the stem clamp is designed correctly and is free of burrs.
- In addition to the bearing cover, on all direct-connect systems, place at least one 5 mm spacer below the stem. On carbon steerers, place at least one 5 mm spacer above the stem (Figure 39).
- If you choose to cut the steerer, follow all normal procedures and cautions regarding carbon fiber composite parts. If you are not familiar with these procedures, consult your dealer.

Tools and materials required

- Top cap assembly

Steerer	PN	Adjuster type
Aluminum		Star-fangled set
Carbon, ‘08 and ‘09 Series 6	283396	Compression set
Carbon, ‘10 Series 6	408118	Compression set

- Bearing cover, conical

Model	PN	Color	Size
‘08-‘09	404691	Aluminum	5 mm
	404689		15 mm
	404690	Carbon	5 mm
	404687		15 mm
‘10 Series 6	416709	Nude	5 mm
	416890		20 mm
	416891	White	5 mm
	416892		20 mm

- Shims and optional headset spacers (maximum of 40 mm including bearing cover, Figure 40)
- Stem



Figure 39. Direct-connect stem and required spacers:
One below on all steerers
One above on carbon steerers

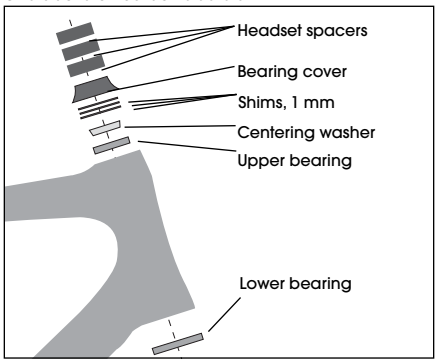

Figure 40. Madone headset parts and spacers

- Centering washer
- Bearings

Model	PN	Size	Material
'08-'09	271111	11/8" (upper)	Steel
	271112		Stainless
'08, '09, and '10 Series 5	404698	1.5" (lower)	5 mm
'10 Series 6	417578		15 mm

- Rock "N" Roll Super Coat grease
- 4 and 5 mm allen wrenches
- Torque wrench with 4 mm and 5 mm allen fittings

To install the bearings

1. Apply a light coat of grease to the inner race of the lower bearing.
2. Install the bearing on the steerer (Figure 41).

The bearing is symmetrical, so either side is "right-side up."

3. Apply a liberal coat of grease to the bearing seats of the head tube, both top and bottom (Figure 42).
4. Slide the steerer (with the bearing installed) through the head tube (Figure 43).
5. Slide the upper bearing down the steerer and into the frame.
6. Slide the compression ring onto the steerer (Figure 44).

To install the shims, bearing cap, and spacers

Trek installs three 1mm shims between the centering washer and the bearing cover to ensure an adequate space between the bearing cover and the top of the head tube. There should be at least 0.5 millimeter space.



Figure 41. Lower bearing on fork crown



Figure 42. Greasing upper bearing saddle



Figure 43. Inserting the fork through the head tube



Figure 44. Slide the compression washer onto the steerer

1. Slide the three shims onto the steerer.
2. Slide the bearing cover onto the steerer (Figure 45).
3. Measure the gap between the head tube and the bearing cover.
- In some cases, all three shims may provide more clearance than necessary. In this case, remove shims until there is only one millimeter of space between the head tube and the bearing cover (Figure 46).

4. Slide the headset spacers and the stem onto steerer.
5. Install the headset top cap and adjusting bolt.
- For a carbon steerer, do not use a star-fangled nut. Use the special adjusting plug.

6. Adjust the headset.
- The Madone headset uses an angular contact bearing system, so the headset will rotate freely with a wide range of tension. Make sure there is no free play, but do not overtighten the bearings because they might wear prematurely.

7. Tighten the stem clamp bolts to the manufacturer's recommendation.
8. Follow the steps in "Inspecting the Headset."



Figure 45. Sliding the shims and bearing cover onto the steerer

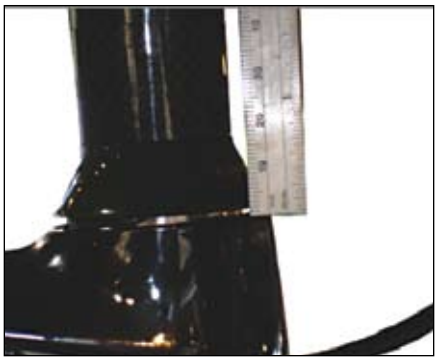

Figure 46. Measure the distance from the head tube to the bearing cover

Inspecting the Headset

Once a month inspect the headset of your bicycle to see that it is not loose, nor too tight. If your headset bearings are loose or too tight, do not ride the bicycle.
Readjust the bearings or take your bike to your Trek dealer for service.

To check is the headset is too loose

1. Stand over the top tube of your bicycle with both feet on the ground.
2. Apply the front brake firmly while you rock the bicycle forward and backward.
3. Look, listen, and feel for looseness of the headset bearings.

To check is the headset is too tight

1. With the front wheel off the ground, slowly rotate the fork and handlebar to the right and left.
2. Look, listen, and feel for any grinding noises, or stickiness or binding at any point in the rotation; the bearings may be too tight.

DuoTrap Computer Sensor

The 2010 Madone frame includes a special pocket on the left chainstay for installation of the Bontrager DuoTrap sensor that combines speed and cadence sensing in a single, wireless unit. This unit attaches through a hole in the chainstay (Figure 47).

To install a Duotrap sensor

1. Remove the attachment screw and the cover plate over the chainstay.
2. Slide the cylindrical part of the sensor through the chainstay (Figure 48) until the sensor sits flush (Figure 49).
3. Install the attachment screw and tighten to the torque specifications (see page 38).
4. Place the rubber plug over the attchment screw (Figure 49).



Figure 47. Hole through the chainstay for Duotrap sensor



Figure 48. Sliding the speed cylinder of a Duotrap sensor through the chainstay

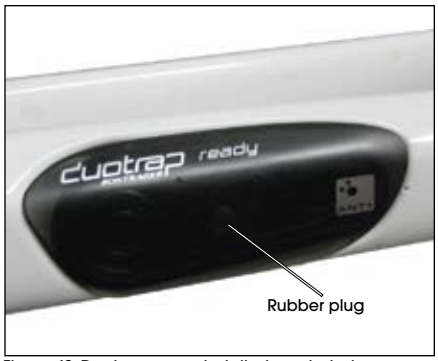

Figure 49. Duotrap sensor installed on chainstay

Crankset Installation

The Madone uses a special bearing system that has no parts that thread into the frame. Instead, the bearings are a slip-fit into the frame. However, the '10 Madone Series 6 uses a tighter fit of the bearings, which may require using a headset press (see page 22).
Bearings kits are available for all major brand of cranksets: SRAM/TruVativ/Bontrager GXP, Shimano HollowTech, Campagnolo UltraTorque, and FSA MegaExo.
Each kit includes a slightly different set of bearings, seals, and spacers. When installing other crankset systems, follow the manufacturer's instructions to achieve the correct assembly and adjustment.
Do not use a hammer or bearing press to install the bearings into the frame. If the bearing fit is too tight, make sure the bearing seats are clean and free of debris.

All bottom bracket systems share the same procedure to install the bottom bracket shields. Do these steps before installing the bearings.

To install the axle shields

Your frame may already have the axle shields installed in the frame.
1. Apply a light coat of grease to the male axle shield (smaller diameter, Figure 50).
2. Place the male axle shield into the bottom bracket shell from the drive side (Figure 51).
3. Place the female (larger diameter) axle shield into the bottom bracket shell from the non-drive side.
4. With the installation tool (Figure 52), push together the two halves of the axle shield. When they are inserted in the correct position, there will be an audible click.
5. Go to the instructions (on the following pages) for the bearing system you want to install.



Figure 50. Applying grease to the axle shield



Figure 51. Inserting one half of the axle shield into frame

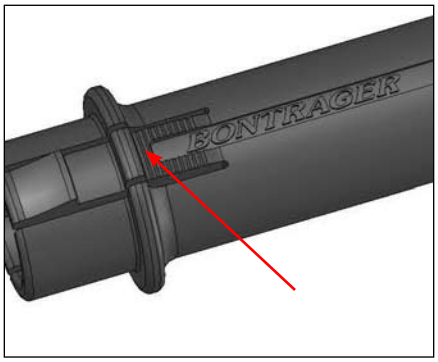

Figure 52. Release tab

Pressing bearings that are tighter than "slip fit"

`10 Madone Series 6

The bearing fit is tighter in the '10 Madone Series 6 than in previous Madone models. If the bearings do not slip in by hand, follow this procedure after you have installed the bearing shield (page 21).

Notes:

- Be very careful when using the press. Too much force can crack the bottom bracket shell.
- Press in one bearing at a time.



Figure 53. Using a headset press to install the bearings

Tools required

Installation
- Park headset press

Removal
- Brass punch
- Hammer

To press a bearing

1. Install the bearing shield.
2. Press the bearing into the frame by hand as far as possible.
3. With the cup guide on the bearing side (Figure 53), slide the bearing press through the bearing and frame.
4. Center the guide in the bearing.
5. Press the bearing into the bottom bracket shell until the bearing is flush with the shell.

To remove a bearing

If you cannot remove a bearing because it is stubborn, follow these directions.

1. Remove the crankset.
2. Slide the punch through one side of the bottom bracket shell to the back side of the bearing.
3. Position the punch on the inside ring of the bearing.
4. Gently tap the punch with the hammer, then move 90 degrees around the bearing and tap again.
5. Continue tapping and moving around the bearing. TAP GENTLY.
6. Go around the bearing and keep tapping.
   DO NOT HIT HARD. Excessive force can damage the bottom bracket shell.

SRAM GXP

These instructions explain how to install a SRAM/TruVativ/Bontrager GXP crankset (Figure 54) in a new Madone. To complete the installation, you will also need the SRAM instructions, available at: http://www.sram.com/_media/techdocs/2005_gxp-05-r5-e.pdf

Tools and materials required

- Crankset and bottom bracket
- 8 mm allen wrench
- Bearing installation tool PN 404694
- Rock "N" Roll Super Coat grease
- Bottom bracket parts
- TruVativ GXP installation instructions

Part description		SRAM
Kit		404700
Ceramic kit		411814
Drive side parts		
	Bearing	281824
	Ceramic Bearing	293617
	Seal	281820
	Axle shield	281823
	Wave washer	282866
Non-drive side parts		
	Bearing	282864
	Ceramic Bearing	293618
	Seal	282865
	Axle shield	281822

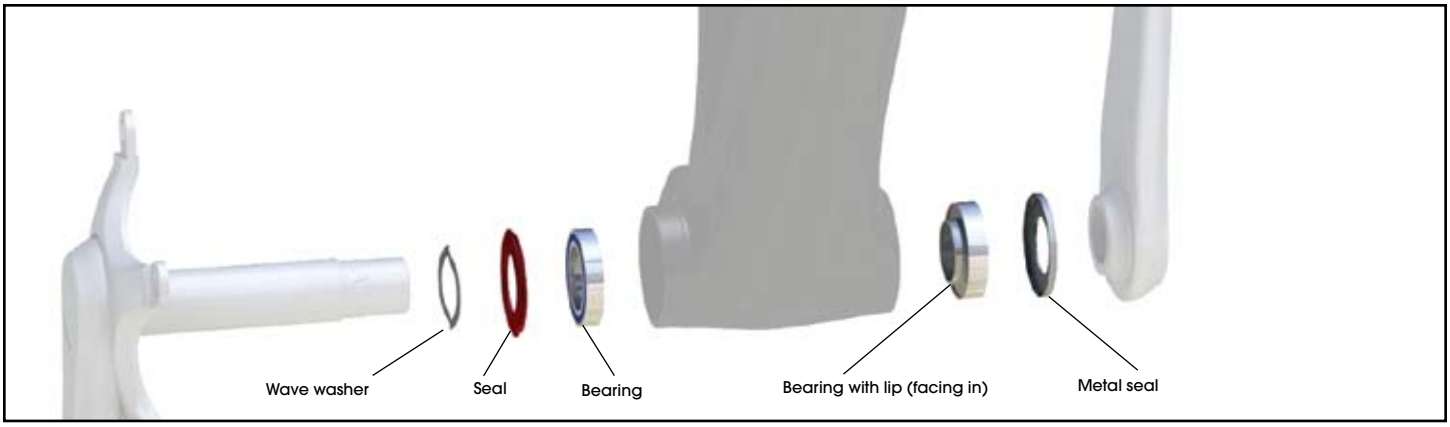

Figure 54. SRAM bearing set

To install the bearings

1. Apply a liberal coat of grease to the contact surfaces of one bearing and the drive side of the bottom bracket shell (Figure 55).
2. Slide a bearing onto the installation tool.

Either side of the drive-side bearing is the "right side." The non-drive bearing on GXP systems has a lip (Figure 56). Install the bearing so that the lip faces in.

3. Press one bearing into the drive side of the bottom bracket shell (Figure 57).

To remove the installation tool, press the release tab.

4. Repeat steps 1-3 for the other bearing on the non-drive side.



Figure 55. Greasing the bearing and the frame saddle

To install the drive-side crankarm

When handling the seals, avoid bending them. A bent seal will rub on the bearing, creating drag.

1. Apply a light coat of grease to the bearings on the face and the axle contact surface.
2. Apply a light coat of grease to the metal inside of one bearing seal (Figure 58).
3. Install the wave washer and with the grease facing up, slide the bearing seal onto the axle (Figure 59).
4. Apply a light coat of grease to the bearing contact area of the axle (Figure 60).

The grease areas should be about 1 inch (25 mm) wide. On the drive side, start at the bearing seal. On the non-drive side, start at the splines and apply toward the drive side of the axle

5. Insert the axle through the drive-side bearing in the bottom bracket (Figure 61).



Figure 56. Grease on the frame and the non-drive side bearing (with the lip facing in)



Figure 57. Pressing the bearing into the frame



Figure 58. Greasing the bearing covers

To install the non-drive side crankarm

1. Apply a light coat of grease to the inside of the metal bearing seal.
2. With the grease side toward the bearing, slide the bearing seal onto the axle (Figure 62).
3. Follow the TruVativ GXP installation instructions to complete to install the non-drive crank arm.
4. Tighten the crank bolt to the torque specifications (see page 38).
5. Follow the steps in "Inspecting the bottom bracket."



Figure 59. Sliding the wave washer and bearing cover onto the axle

To remove the bottom bracket bearings

The Madone bottom bracket bearing system is designed to be a slip fit. However, after the first installation some bearings might be tight. If the bearings do not easily come out by hand, you may use the following method to remove them.

1. Slide the crank axle into the bearing so that the bearing is over the non-drive side of the axle, about 1 inch (25 mm) from the non-drive end.
2. Gently rock the axle while you pull the axle out.



Figure 60. Greasing the axle

Inspecting the bottom bracket

Every 3 months check the bottom bracket adjustment.

To check the bottom bracket bearing adjustment

1. Lift the chain from the chainrings.
2. Rotate the crank so that one of the arms is parallel to the seat tube.
3. Put one hand on the crank arm and one hand on the seat tube, and attempt to move the crank arm laterally toward and away from the seat tube.
4. Spin the cranks.

If the crank feels or sounds loose, or if the motion stops abruptly or you hear a grinding noise coming from the bearings, readjust the bearings or take the bike to your Trek dealer.



Figure 61. Sliding the axle through the bearings

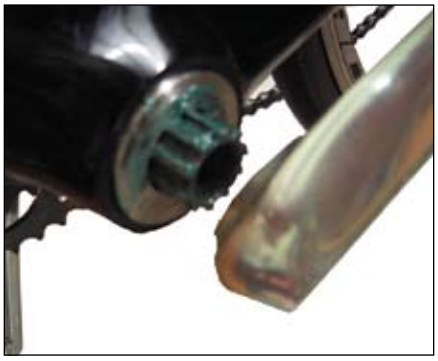

Figure 62. Metal bearing cover in place over the bearing

Shimano HollowTech

These instructions explain how to install a Shimano HollowTech (Figure 63) in a new Madone. To complete the installation, you will also need the Shimano instructions, available at: http://techdocs.shimano.com/media/techdocs/content/cycle/SI/Dura-Ace/FC-7800-7803/SI_1F30H_En_v1_m56577569830605111.pdf.

Tools and materials required

- Crankset and bottom bracket
- Shimano FC16 crank arm installation tool
- 5 mm Allen Wrench
- Bearing installation tool PN 404694
- Rock "N" Roll Super Coat grease
- Bottom bracket parts

Part description		Shimano
Kit		404699
Ceramic kit		411813
Drive side parts		
	Bearing	281824
	Ceramic bearing	295213
	Seal	281820
	Axle shield	281823
	Wave washer	-
Non-drive side parts		
	Bearing	281824
	Ceramic bearing	295213
	Seal	281820
	Axle shield	281822

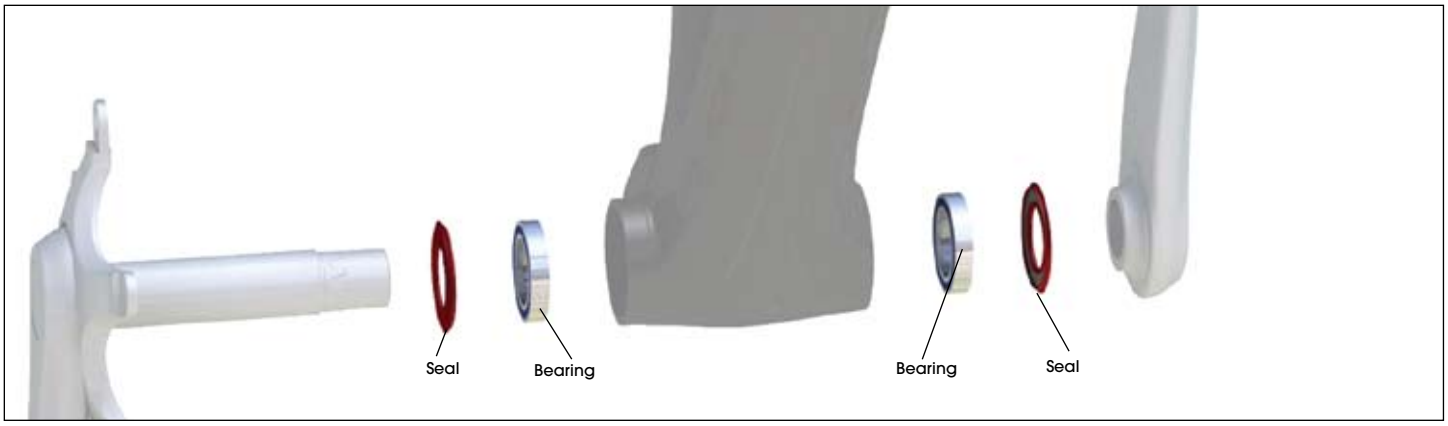

Figure 63. Shimano bearing set

To install the bearings

1. Apply a liberal coat of grease to the contact surfaces of one bearing and the drive side of the bottom bracket shell (Figure 64).
2. Slide a bearing onto the installation tool.

Either side of the bearing is the “right side.”

3. Press one bearing into the drive side of the bottom bracket shell (Figure 65).

To remove the installation tool, press the release tab (Figure 52).

4. Repeat steps 1-3 for the other bearing on the non-drive side.



Figure 64. Greasing the bearing and the frame seat



Figure 65. Pressing the bearing into the frame

To install the drive-side crankarm

When handling the seals, avoid bending them. A bent seal will rub on the bearing, creating drag.

1. Apply a light coat of grease to the bearings on the face and the axle contact surface.
2. Apply a light coat of grease to the metal inside of one bearing seal (Figure 66).
3. With the grease facing up, slide the bearing seal onto the axle (Figure 67).
4. Apply a light coat of grease to the bearing contact area of the axle (Figure 68).

The grease areas should be about 1 inch (25 mm) wide. On the drive side, start at the bearing seal. On the non-drive side, start at the splines and apply toward the drive side of the axle

5. Insert the axle through the drive-side bearing in the bottom bracket (Figure 69).



Figure 66. Greasing the bearing covers



Figure 67. Sliding the bearing cover onto the axle



Figure 68. Greasing the axle



Figure 69. Sliding the axle through the bearings

To install the non-drive side crankarm

1. Apply a light coat of grease to the inside of the other bearing seal.
2. With the grease side toward the bearing, slide the bearing seal onto the axle (Figure 70).
3. Align the non-drive crank arm with the groove on the axle and slide the crank onto the axle.

The non-drive crank arm should point 180 degrees opposite of the drive-side crank arm.

4. With the plastic installation tool, press the crank onto the axle (Figure 71) as far as it will go.
5. Release the installation tool and spin the cranks 10 to 20 revolutions.
6. Follow the Shimano instructions to complete the installation.
7. Follow the steps in "Inspecting the bottom bracket."



Figure 70. Pressing in the second bearing cover



Figure 71. Pressing the crank arm onto the axle

To remove the bottom bracket bearings

The Madone bottom bracket bearing system is designed to be a slip fit. However, after the first installation some bearings might be tight. If the bearings do not easily come out by hand, you may use the following method to remove them.

1. Slide the crank axle into the bearing so that the bearing is over the non-drive side of the axle, about 1 inch (25 mm) from the non-drive end.
2. Gently rock the axle while you pull the axle out.

Inspecting the bottom bracket

Every 3 months check the bottom bracket adjustment.

To check the bottom bracket bearing adjustment

1. Lift the chain from the chainrings.
2. Rotate the crank so that one of the arms is parallel to the seat tube.
3. Put one hand on the crank arm and one hand on the seat tube, and attempt to move the crank arm laterally toward and away from the seat tube.
4. Spin the cranks.

If the crank feels or sounds loose, or if the motion stops abruptly or you hear a grinding noise coming from the bearings, readjust the bearings or take the bike to your Trek dealer.

Campagnolo UltraTorque

The Madone uses a special bearing system that has no parts that thread into the frame. Instead, the bearings are a slip-fit into the frame. However, the Campagnolo UltraTorque system requires you to attach bearing supports (seal seats) to the Madone bottom bracket shell (Figure 72). This section explains how to do that.

The seal seats might fit into the frame tightly. In this case, you might need to tap the cups with a soft-faced mallet. However, do not use a hammer or bearing press to install the bearings into the frame. If the bearing fit is too tight, make sure the seal seats are clean and free of debris.

Part description		Campagnolo
Kit		407383
Drive side parts		
	Bearing	Campy part
	Seal seat	281825
	Axle shield	281823
	Washer	281826
Non-drive side parts		
	Bearing	Campy part
	Seal seat	281825
	Wave washer	281827
	Axle shield	281823
	Washer	281826

Tools and materials required

To complete the installation, you will also need the Campagnolo instructions, available at: http://www.campagnolo.com/pdf/7225306_Ultra_torque_05_07.pdf.

Also read the warning: http://www.campagnolo.com/pdf/7225365_warning_Ultra_Torque_0607.pdf

- Crankset and bottom bracket (bearings come pressed onto the axle halves)
- Plastic crank arm installation tool
- LocTite® 638 retaining compound, TCG 408082
- LocTite® primer 7649, TCG 408083
- 5 mm Allen Wrench
- Rock "N" Roll Super Coat grease
- Bottom bracket parts

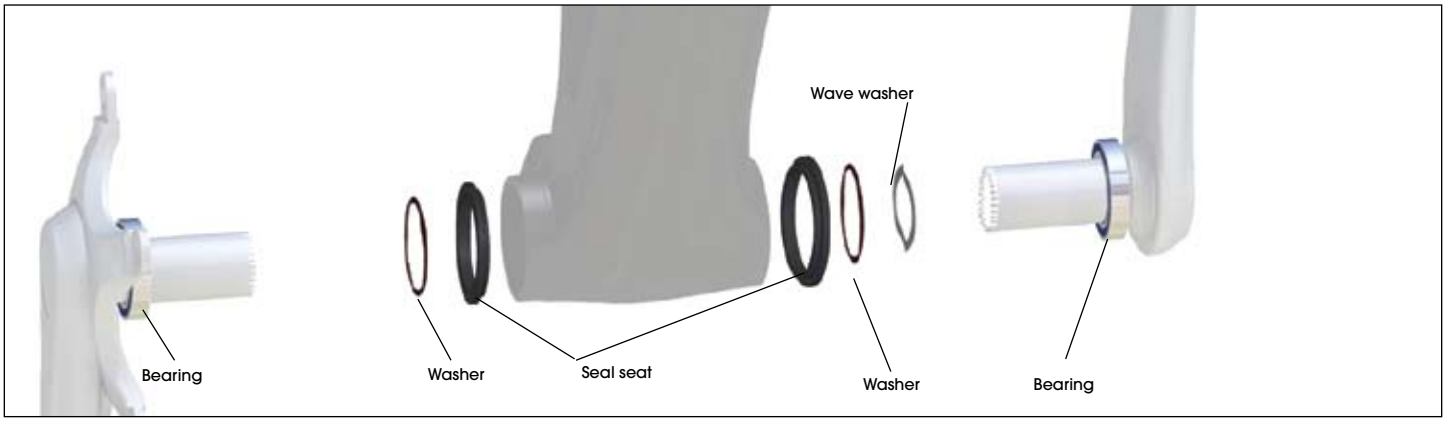

Figure 72. Campagnolo bearing set

To install the seal seats

1. Clean all surfaces to be bonded (bottom bracket shell, seal seats) with alcohol wipes or similar (Figure 73).
2. Apply a thin film of LocTite Primer to the outer step of the bearings cups and the outer shoulder of the bottom bracket shell (Figure 74). Allow the primer to evaporate completely.
3. Apply LocTite 638 to the faced of the seal seat that contacts the bottom bracket shell.
4. Press the seal seat into the frame (Figure 75). If needed, tap lightly with a soft-faced mallet.

Let the LocTite cure for at least 24 hours before inserting the bearings.



Figure 73. Cleaning bonding surfaces with an alcohol wipe

To install the non-drive side bearings

1. Insert a washer into the non-drive side seal seat.
2. Apply a liberal coat of grease to the contact surfaces of the bearing (Figure 76) and the non-drive side seal seat (Figure 77).
3. Insert the Wave washer into the non-drive side seal seat (Figure 78).
4. Slide the non-drive side axle through the seal seat and bottom bracket shell (Figure 79).



Figure 74. Applying LocTite primer to the outer step of the bearing cups



Figure 75. Inserting the bearing cups into the bottom bracket shell

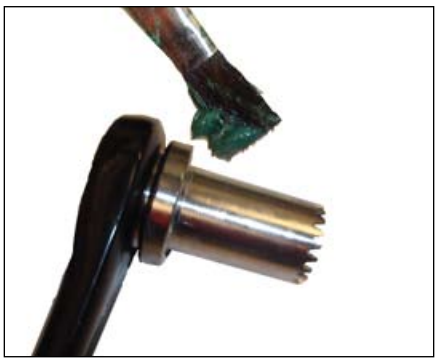

Figure 76. Greasing the bearings

To install the drive side bearings

1. Insert a washer into the drive side seal seat.
2. Apply a liberal coat of grease to the contact surfaces of the bearing (Figure 76) and the drive side seal seat (Figure 77).
3. Slide the drive side axle through the seal seat and bottom bracket shell (Figure 79).
4. Line up the splines of the bottom bracket axle and press the axle together. If necessary, tap the ends together with the heel of your palms.
5. Insert the crank bolt from the drive side (Figure 80) and tighten to the torque specifications (see page 38).
6. Follow the steps in "Inspecting the bottom bracket."



Figure 77. Greasing the bearing cups

To remove the bottom bracket bearings

With the Campagnolo system, each of the two bearings are pressed onto one of the halves of the bottom bracket axle. To remove the bearings, follow the Campagnolo service instructions.



Figure 78. Inserting the Wave washer (after the washer) on the non-drive side

Inspecting the bottom bracket

Every 3 months check the bottom bracket adjustment.

To check the bottom bracket bearing adjustment

1. Lift the chain from the chainrings.
2. Rotate the crank so that one of the arms is parallel to the seat tube.
3. Put one hand on the crank arm and one hand on the seat tube, and attempt to move the crank arm laterally toward and away from the seat tube.
4. Spin the cranks.

If the crank feels or sounds loose, or if the motion stops abruptly or you hear a grinding noise coming from the bearings, readjust the bearings or take the bike to your Trek dealer.



Figure 79. Inserting the non-drive side axle

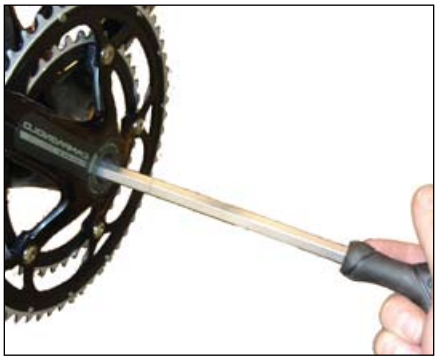

Figure 80. Tightening the axle bolt

FSA MegaExo AL

These instructions and parts are for the aluminum FSA cranks only. The current "B" kit will not work for FSA carbon cranks.

The Madone uses a special bearing system that has no parts that thread into the frame. Instead, the bearings are a slip-fit into the frame (Figure 81). This section explains how to install the bearings and crankset.

The bearings might fit into the frame tightly. In this case, you might need to tap them with a soft-faced mallet. However, do not use a hammer or bearing press to install the bearings into the frame. If the bearing fit is too tight, make sure the bearings are clean and free of debris.

Part description		FSA
BB90 bearing kit "B"		293227
Drive side parts		
	Axle shield	281823
	Bearing	300162
	Seal	294668
Non-drive side parts		
	Axle shield	281822
	Bearing	300162
	Seal	294668

Tools and materials required

To complete the installation, you will also need the FSA instructions, available at: http://www.road.fullspeedahead.com/downloadfly.aspx?download=downloads/Install_MegaExoAlloy.pdf.

- Crankset and bearings (bearing shields come pressed onto the bearings)
- 5 mm Allen Wrench
- Rock "N" Roll Super Coat grease
- Bottom bracket parts

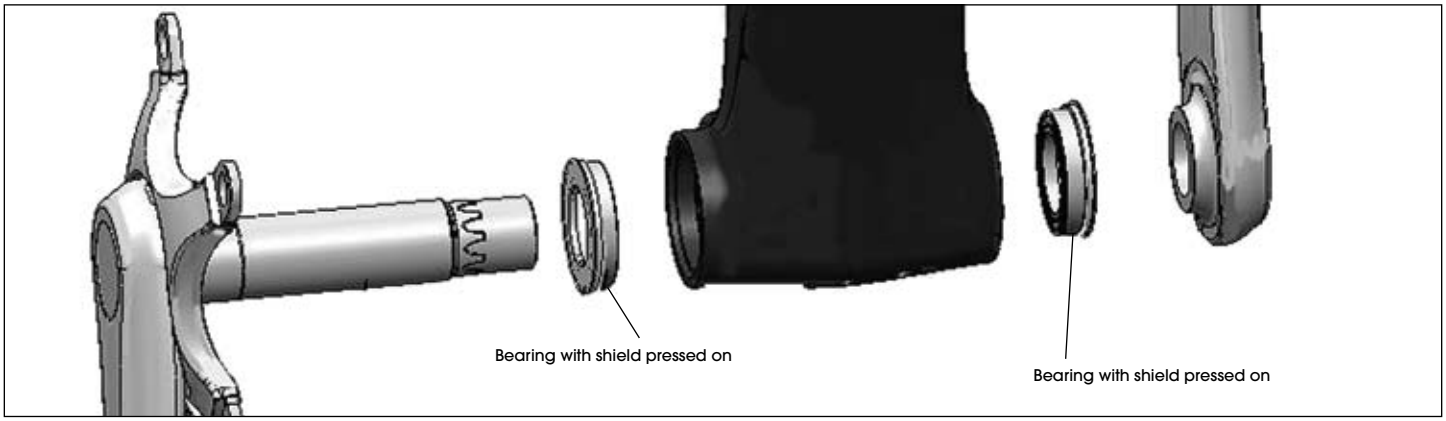

Figure 81. FSA bearing set

To install the bearings

1. Apply a liberal coat of grease to the contact surfaces of one bearing and the drive side of the bottom bracket shell (Figure 82).
2. With the plastic bearing shield facing out, press one bearing into the drive side of the bottom bracket shell (Figure 83).
3. Repeat Steps 1-2 for the other bearing on the non-drive side.

To install the drive-side crankarm

1. Apply a light coat of grease to the axle surface where the bearings will be in contact (Figure 84).

The grease areas should be about 1 inch (25 mm) wide. On the drive side, start at the bearing seal. On the non-drive side, start at the splines and apply toward the drive side of the axle

2. Insert the axle through the drive-side bearing in the bottom bracket (Figure 85).



Figure 82. Greasing the bearing and the frame saddle

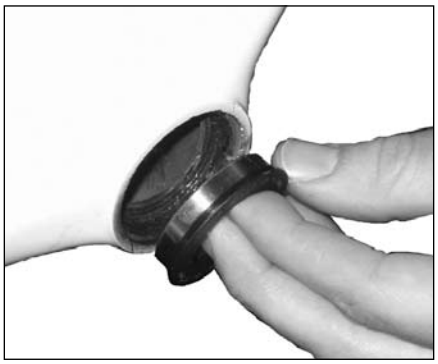

Figure 83. Pressing the bearing into the frame with the shield on the outside



Figure 84. Greasing the axle



Figure 85. Sliding the axle through the bearings

To install the non-drive side crankarm

1. Align the non-drive crank arm with the groove on the axle and slide the crank onto the axle.

The non-drive crank arm should point 180 degrees opposite of the drive-side crank arm.

2. Install the FSA crank bolt and tighten to their torque specifications (Figure 86).
3. Follow the FSA instructions to complete the installation.
4. Follow the steps in "Inspecting the bottom bracket."



Figure 86. Pressing the crank arm onto the axle

To remove the bottom bracket bearings

The Madone bottom bracket bearing system is designed to be a slip fit. However, after the first installation some bearings might be tight. If the bearings do not easily come out by hand, you may use the following method to remove them.

1. Slide the crank axle into the bearing so that the bearing is over the non-drive side of the axle, about 1 inch (25 mm) from the non-drive end.
2. Gently rock the axle while you pull the axle out.

Inspecting the bottom bracket

Every 3 months check the bottom bracket adjustment.

To check the bottom bracket bearing adjustment

1. Lift the chain from the chainrings.
2. Rotate the crank so that one of the arms is parallel to the seat tube.
3. Put one hand on the crank arm and one hand on the seat tube, and attempt to move the crank arm laterally toward and away from the seat tube.
4. Spin the cranks.

If the crank feels or sounds loose, or if the motion stops abruptly or you hear a grinding noise coming from the bearings, readjust the bearings or take the bike to your Trek dealer.

Crankset Troubleshooting

This section describes problems that occasionally occur, and possible solutions. If these solutions do not solve a problem, contact Customer Service.

Bearing play in a GXP crank or bottom bracket assembly

The crank feels loose when grasped at the pedal end and rocked side-to-side.

Cause	Solution
Wave washer not compressed fully This is usually caused by insufficient torque on the non-drive crank arm. In rare instances a tolerance stack can be created by the five critical parts: non-drive bearing, drive bearing, drive-side seal, bottom bracket shell, and axle length.	First, verify that the crank has been tightened to the torque specifications (see page 38). Most issues with play in GXP crankarms are resolved when the arms are properly tightened. If this does not solve the issue, add a 0.5mm washer/spacer (PN 294162) between the wave washer and seal (Figure 87) to increase the bearing preload.
Spline of GXP crankarm is undersized • We have seen some variation in the tolerance of GXP crankarms. • If the installation torque is not sufficient, the crank arm will not completely compress the shield and bearing race.	Remove the crankarm and re-install with plenty of grease. Verify that the crank has been tightened to the torque specifications (see page 38). Re-check the bearings after installation. The GXP axle spline is tapered, so it requires that the crank be completely tightened to seat on the axle.

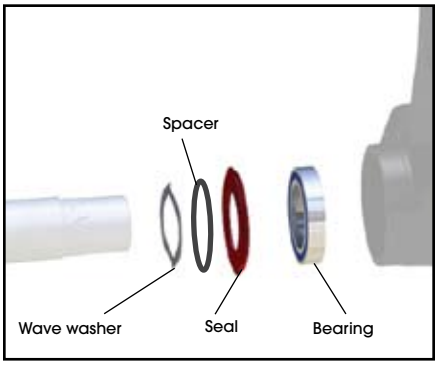

Figure 87. SRAM bearing set

Crank is rubbing or there is excessive drag

If you notice that the crank arms rotate poorly, there are several possible issues.

Cause	Solution
Out of spec or bent non-drive metal seal • The inside chamfer of the metal seal (Figure 88) rubs on the outer race of the bearing. • The metal seal deforms under the compressive load of the non-drive arm and rubs on the outer race of the bearing.	Install a new metal seal (same Part Number: 282865). We have revised the metal seal by adding a ring of material, 0.3mm thick, to the seal around the inner diameter. This will move the outer edge of the seal away from the bearing.
Bearing not seated properly • The axle shield might not be seated completely in the frame (Figure 89) causing the flange of the shield to foul the bearing. • A tight bore can cause the installer to think the bearing is seated when it is not.	Make sure the halves of the axle shield are snapped together, and then remove and reinstall the bearing. When properly installed the bearing will not sit even with bottom bracket shell. •Enduro bearing: 0.75mm inside the shell. •GXP non-drive bearing: 0.25mm outside the shell

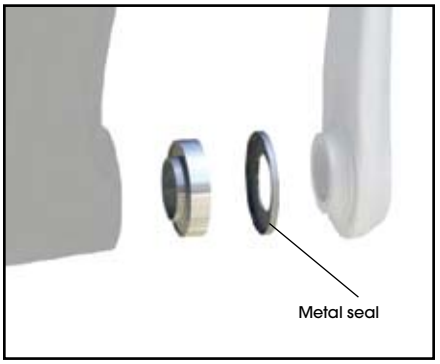

Figure 88. SRAM bearing set


Figure 89. Inserting one half of the axle shield into frame

GXP triple crankset can't be properly preloaded

Although some cranksets change the arm configuration to add clearance for a third chainring, the GXP crankset uses a longer axle. Without additional spacers, a longer axle will not compress the bearing..

Cause	Solution
Different axle lengths require different spacers Triple GXP crank axles are 5mm longer than doubles.	Install a 5mm thick spacer (Part Number 291276) between the wave washer and the red bearing seal (Figure 90).

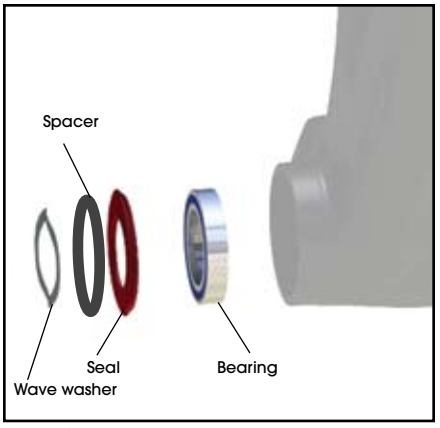

Figure 90. SRAM bearing set

Torque Specifications

Part	Lb•in	Nm
Seatmast cap clamp bolts	62	7
Saddle clamp bolt	125-140	14-16
Cable stop fixing screw	8-10	1
SRAM GXP crank bolt	420-780	48-54
Campagnolo UltraTorque crank bolt	380	43
Head tube housing stop “bolt”, Series 6	22	2.5
Rear housing stop fixing screw, Series 6	22-30	2.5-3.5
DuoTrap sensor attachment screw	11	1
Bottom bracket inner-wire guide	22-30	2.5-3.5