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Dear Fitmaster Customer:

Thank you for choosing Fitmaster to help you offer the ultimate in rider service. The Fitmaster is designed to provide precise measurements and years of daily use.

This manual is designed to make it easy to assemble and use this instrument. While we provide guidance on the set-up, merchandising and use of the Fitmaster, there is no substitute for proper training, experience and commitment to serving the rider. With these tools and skills, you can significantly enhance the ability of your business to deliver quality fits to the riding community.

Thanks again and may you create many satisfied customers through this tool.

Sincerely,

The Waterford Team.



Item	Qty	Description
Α.	1	Fitmaster Base
В.	4	Levelers
C.	1	Resistance unit parts bag
D.	1	Resistance Unit
E.	1	Rear wheel mount assembly
F.	1	Rear angle plate assembly
G.	1	Bottom bracket kit
H.	1	Crank Arms and bolts.
Ι.	1	Chainring
J.	1	Chainring bolt kit
K/L.	1	Wheel and Tire
М.	1	Tube
Ν.	1	Rim strip
О.	1	Cog
Ρ.	1	Chain
Q.	1	Front angle plate assembly
R.	1	Seatmast slider
S.	1	Head tube slider
T.	1	Seat clamp
U.	1	Seatpost

Assembly Instructions

A. Establish a roomy assembly area, close to the area to be used for fitting.

B. Prior to assembly, you will want to acquire the appropriate tools and non-supplied parts:

C. Proper and safe assembly requires average bicycle mechanic

skills, including the ability to:

- Install a crank and chainrings.
- Install a bicycle chain
- Install a rear cog
- Install a nutted rear wheel

Tools for Assembly / Operation

Item	Qty	Description	
1	1	Allen wrench - 4mm	
2	1	Allen wrench - 5mm	
3	1	Allen wrench - 6mm	
4	1	Allen wrench - 8mm	
5	1	Allen wrench - 10mm	
6	1	15mm axle wrench	
7	1	Container grease (red lithium)	
8	1	Set BB mounting tools	
9	1	Adjustable wrench	
10	1	Chain tool	
11	1	Tire pump and mounting tools.	
12	1	Level / angle finder	
13	1	Metric tape measure	
14	1	Plumb bob	
15	1	Straightedge	

Be sure to lubricate all threads before securing parts.

Step 2. Unpack the Fitmaster.

Check off the parts against the parts list.

Step 3. Install the base levelers.

Remove the levelers from their packaging. Screw in the height adjustment nut to the maximum depth (but do not tighten). Then screw the levelers into the holes in each of the four feet.



Assembly (cont'd)

Step 4. Install the resistance unit.

Bolt the resistance unit to the base. Be sure to insert the bolt through the square hole. Then tighten. Insert the positioning bolt in its hole and line up with the leveling bolt integrated into the resistance unit. Once the threaded section is inserted into the head, tighten the knob to bring the unit as far down as possible. Then, after mounting the wheel, turn the knob counter-clockwise raise the roller until it fully engages the tire.









Step 5. Install the rear wheel support.

Use the 4mm allen screws from the bolts bag #4 to connect the support (#5) to the base (#1).



Step 6. Install the rear angle plate assembly.

- A. Use the bolts from the bolt kit to attach the plat to the base..
- B. Install the bottom bracket.
- C. Make sure the non-drive side bottom bracket clamp is as tight as possible while allowing the BB shell to turn as you change the angles.



Step 7. Install the crank.

- A. Install chainring to drive side crank using chainring bolts.
- B. Install the crank on the BB spindle according the the manufacturer's specification.



Assembly (cont'd)



Step 8. Install the wheel and chain.

Mount the tire and pump up to midpoint of inflation range noted on the tire. Install the cog. Hand tightening is sufficient since pedalling will naturally tighten the cog. The rear wheel plate is designed to fit up to a 130mm spacing wheel. Spacers are included with the wheel to allow the 120mm hub to mount properly. Using the chain tool, install the chain according to the manufacturer's specifications. Tension the chain as you would with a fixed gear or single speed bike.

Step 9. Install the front angle plate.

- A. Apply a light coating of grease to the bottom of the angle plate to make it easy for the plate to move back and forth on the base.
- B. Use the supplied bolts (taped to the plate) to mount the angle plate.





Step 10. Install the head tube and seat tube sliders.

- A. Install head tube and seat tube sliders (#23 and #21, respectively) to the tubes in the associated mounting plates.
- B. Install the seat clamp (#22) on the seat tube slider (#23).

Step 11. Install the seat clamp and seatpost.

- A. Slide the seatpost clamp over the top of the seat tube.
- B. Assemble the saddle seatpost, insert into the seat tube an secure the clamp.



Non-Supplied Parts List

You must supply general parts to be able to use the Fitmaster. These parts are readily available in every bike shop.

Item	Qty	Description	
A	1	Seat	
В	1	Pedals	
С	1	Handlebars	
D	1	Stem	
E.	1	Brake Levers	
F	1	Handlebar Tape	

While Waterford supplies an initial crank and seatpost, you may want to equip yourself with extras to increase your level of service:

- Saddles: The Fitmaster requires a 25.4mm seatpost. You may want to purchase additional seatposts and install a range of saddles to allow comparison and quickly prepare for different riders.
- Handlebars: Consider setting up a selection of popular bar widths (40cm, 42cm and 44cm outside to outside, for example), with brake levers and bar tape, ready to match to the rider's recommended fit. Don't forget to include a flat bar set up for hybrid or off-road fitting.
- Stem: A Fit Kit FitStem lets you adjust your stem dimensions almost on the fly. This is especially useful when fitting a rider to a stock geometry. When fitting for custom geometry, having a selection of standard stems on hand lets you adjust the frame dimensions to based on a normal stem, giving the rider more opportunities to adjust the stem length at a later time without affecting the bike's handling.
- Cranks: The Fitmaster is supplied with a single crank . Consider purchasing an adjustable crank or a selection of crank lengths .

The proper merchandising of fitting services with a well equipped fitting area and a well-established protocol serves both you and the rider in several ways.

- 1. You are better able to efficiently conduct a proper fitting. You won't have to waste time looking for parts and tools. Records management is also easier.
- 2. The rider is more willing to place his or her confidence in you.
- 3. Quality control is improved since you will have more accurate information and the rider will be more willing to share honest feedback with you.
- 4. You can earn higher revenue with an organized and complete presentation.



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Planning and Fit Area Preparation

The Fitmaster is part of a collection of tools to assist you in providing the best in professional bicycle fitting services. Merchandising can significantly improve your shop's overall success. Plan carefully to insure that you get the most precise fitting results, efficient service delivery and the highest possible customer satisfaction.

- Level Surface: The Fitmaster should be mounted on a level surface with preferably less than 5mm of slope between the front and the rear of the machine. This facilitates accurate measurements especially those that require a level.
- Platform: Many shops find it easier to adjust the machine and observe the rider when the Fitmaster is mounted on a platform, typically not higher than 18 inches from the surrounding floor (45cm).
- Other Fitting Equipment: The fit area should include space for related fitting tools such as the Fit Kit and a trainer for measuring the rider's existing bike.
- Tool storage: Storage for fitting and Fitmaster-related tools such as tape measures, plumb bobs, wrenches and stems.
- Related Products: Custom bike-related products, such as stems, saddles, shoes and so on, should be located within easy reach.
- Computer: A desk with computer, printer and internet access is helpful for getting manufacturer and other information for setting up the Fitmaster.
- Furniture: Provide chairs for observing riders and for guests to be comfortable during the fitting session.
- Dressing area for riders getting fitting services. You'll get better results when the rider is wearing their riding clothes.
- The fitting area should be far enough out of the way to facilitate a comfortable and focused environment, but visible enough to reinforce to your customers that you are capable of professional fits.
- Forms or Systems: Good forms facilitate a disciplined approach to fitting. They allow you another way to analyse the rider's issues and to replicate a past fit.
- Fitting prcedures: If your store has or will have two or more fitting professionals, consider setting up a protocol manual to insure consistency from fit to fit.

The Fitting Process

Though not a comprehensive guide to fitting, the following overview shows how to integrate the Fitmaster into your fitting process. Fit Kit Systems provides a wide range of tools for measuring riders and creating a developmental fit. In addition, we recommend recording information on the rider's existing bike as reference point and cross check on the proposed fit. Set the fit up on the Fitmaster and then refine the fit until the rider looks a feels good.

We offer a form you can use for fitting, followed up with recommended procedures for fitting custom as well as stock bikes.



Rider Name:		Date
Prepared By:		
•	Fit Kit Measu	urements
Inseam	Shoulders	Height
Thigh	Arm	Age
Foot	Hand	Weight:
Torso	Gender	Flexibility
Riding Style	Condon	
Brief History		
Bike Objectives		
Special Options		
	Eit Kit Dovolor	amontal Fit
Saddle-Pedal	Seat Angle	
Seat Tube C to C	Crank Arm Length	
Saddle-Bar Drop	Bar Width C-to-C	Spacers
Top Tube Theo	Top tube adjustments	Stem Clamp Height
Stem Length	Handlebar Drop	Handlebar Reach
Comments:		Tanaiobai Neuon
	Existing Bike M	easurements
Saddle-Pedal	Stem Length	l ever width
Saddle-Top of Bars	Seat Angle	
Saddle-Bar Drop	Crank Arm Length	H-Bar drop
Seat Tube C to C	Bar Width C-to-C	H-Bar reach
Issues/Complaints		
· ·	Dynamic Bike Fit	Observations
Leg extension	Bynamie Bike Fit	
Knees/Ankles/Feet		
Hips		
Back: Upper/Lower		
Shoulders / Arms		
Neck / Head		
Hands/Grip		
Other Observations		
	Fitmaster Measurements /	Fit Recommendations
BB to Top of Saddle	Head Angle	Stem Length
Saddle Top to Bars	Seat Tube C to C	Stem Angle
Saddle to Bar Drop	Seat Tube C to Top	Front Center
Seat Angle	Top Tube C to C	
Max Avg Standover	Top Tube Slope	
Recommendations:		
	New Frame/B	ike Specs
Brand/Model		Size
Eyelets	Rear Rack Mounts	Pump Peg
Chain Hanger	Frt. Derailleur Clamp	
Styling		

Fitting For a Custom Frame

Step 1: Complete the basic rider assessment.

- A. Starting crank length.
- B. Starting handlebar width and type.
- C. Establishing the proper starting stem dimensions.
- D. Select an appropriate saddle.
- E. Compute the starting seat angle, saddle height and top tube/stem combination.

Step 2: Prepare the Fitmaster based on the starting fit:

- A. Mount the appropriate crank length and re-tighten the rear wheel. Be sure to have the proper chain tension (advanced).
- B. Mount the starting stem and handlebars based on the fit. Consider using the Fit Kit Fit StemTM, which you would configure for the fit.
- C. Mount the rider's choice of saddle or (if no saddle specified), a suitable saddle.
- D. Install either the rider's pedals or pedals compatible with the rider's cycling shoes.
- E. Loosen the front angle plate bolts on the Fitmaster. This allows the front plate to float on the base as you make the other adjustments.
- F. If you know the expected head angle, if necessary, change the head angle by removing the angle bolt, rotating the head tube to the new angle and then securing the bolt in the hole corresponding to the revised angle.
- G. Loosen the top tube slider.
- H. Set the seat angle based on the starting design. This means removing the bolt from the seat angle plate and placing it in the hole corresponding to the desired seat angle. Securely tighten the seat angle bolt.
- I. Set the seat tube length to the starting value.
- J. Adjust the saddle height to the starting value estimated by your initial calculations.
- K. Level the top tube by loosening the head tube and top tube sliders, letting the top tube length float. Then secure the head tube.
- L. Set the theoretical top tube length by loosening the front angle plate and moving it in or out until you get the corrent length.
- M. Secure all sliders.

The rider is tready to get on the Fitmaster.

Step 3: Establish the riders leg position and pedal stroke.

A. Determine the most appropriate saddle height. As shown in the illustrations at right, the rider's knee should be slightly bent when at the bottom of the pedal stroke. Alternatively, when the leg is fully straightened, the heel should extend about 3/4" below the pedal.

Make sure the rider's hips aren't rocking and that their heel gets down near the pedal at the bottom of the pedal stroke. Also, the knee should be more than 90 degrees open at the power (1:30) position.



B. Determine the most appropriate saddle setback: A good starting point is to put the rider's foot in the 3:00 position (as shown at left). Then drop a plumb bob from the front of the knee. The plumb bob should point to the center of the pedal spindle.

If you should discover the need to make a significant change to the setback, you may want to adjust the seat angle. In an ideal world, the leg extension and knee-topedal spindle relationship should work with the saddle in the middle of the rails.

If you need to make significant (more than 2cm) setback adjustments, you may need to recheck the seatpost height.

The rider should pedal under light to moderate resistance to warm up. Waterford recommends that the rider warm up fully - 5-10 minutes - before providing feedback on the fit.



Custom Fitting (Cont'd).

Step 4: Get rider feedback and adjust the rider fit .

This is where the fitter's "bedside manner" is important. The goal is to get the most honest feedback possible from the rider and then to make adjustments accordingly. Be wary of riders who give you the answers they think you want to hear. Be especially sensitive to issues brought up during the rider inventory. **Ask, listen, observe and document.**

- A. Look for rocking of the hips from side to side or riding with the feet pointed downward. These symptoms indicates excessive leg extension.
- B. Look for excessive back movement ("hopping up and down"), this may indicate too low a saddle position.
- C. Look for comments about knee pain another indicator of improper saddle height..
- D. Listen for comments about being cramped or over-stretched. This indicates the need for a top tube adjustment.
- E. Listen for complaints about lower back and shoulder pain. These symptoms typically indicate a problem with handlebar height and reach as well as saddle angle.

The above comments just scratch the surface of possible conditions to address through the fitting process. Training and experience will provide you the skills to address a wide range of fit issues.

We recommend making only one adjustment at a time. For example, if appropriate, raise the handlebar, then review the results with the rider. Then, based on their comments, you might move the top tube. If you make too many moves at once, it becomes easy for both you and the rider to lose their place.

The key is to adjust the rider's position until he or she feels comfortable with their riding position and otherwise show reasonable form.

R Step 5: Record the measurements. Once you and the rider establish the ideal fit, it is essential to record all the pertinant statistics as a prelude to creating the custom bike. Your custom builder may have specific measurement requirements you will want to record at the end of the fitting. The following is a basic list: A. Bottom bracket to top of saddle. B. Top of saddle to top of bars HA C. Saddle over bars D. Seat tube length (center to center) E. Top tube length (center to center). HA. Head angle. SA.Seat Angle TTS. Top tube slope (in degrees). If you don't have an angle finder, measure TTS1 and TTS2. The difference is the amount TTS2. TTS1 of the top tube slope. Other information to collect is listed in the rider form on page 9.

Fitting to a Stock Design

Preparation is the key to using the Fitmaster to fit riders to a stock bike. In order to efficiently set up a Fitmaster for a stock bike, (as well as to use the Fit Kit fitting software), you must gather sufficient information from the manufacturer in order to complete the setup. This is particularly important with today's sloped top tube designs.

You can get all the stats you need to sell a Waterford and Gunnar from their web sites Waterfordbikes.com or Gunnarbikes.com. As another example, Bianchi provides the center-to-center seat tube measurement, the center-to-center top tube measurement and the top tube slope. Don't forget to get information on the upper head tube/headset/stem treatment. This may require adjustments from the standard Fitmaster setup.

Step 1: Complete the basic rider assessment.

- A. Starting crank length (advanced).
- B. Starting handlebar width and type.
- C. Establishing the proper starting stem dimensions.
- D. Select an appropriate saddle.
- E. Compute the starting seat angle and saddle height.

Then select the model you wish to simulate on the Fitmaster. Gather the information on that model before you set it up.

Step 2: Prepare the Fitmaster based on the starting fit:

- A. Mount the appropriate crank and re-tighten the rear wheel. Be sure to have the proper chain tension (advanced).
- B. Mount the starting stem and handlebars based on the fit. An adjustable stem is particularly helpful.
- C. Mount the rider's choice of saddle or (if no saddle specified), a suitable saddle.
- D. Install the rider's pedals or pedals compatible with the rider's cycling shoes.
- E. Loosen the front angle plate bolts on the Fitmaster. This allows the front plate to float on the base as you make the other ajustments.
- F. Loosen the top tube slider.
- G. Set the seat angle based on catalog specifications. This means removing the bolt from the seat angle plate and placing it in the hole corresponding to the desired seat angle. Securely tighten the seat angle bolt.
- H. Set the seat tube length to the value starting value. Then set the saddle height to the starting value estimated by your initial calculations.
- I. Set the head tube angle to the catalog specifications.
- J. Set the top tube length and rise to match the target frame dimensions.

Step 3: Establish the rider's leg position and pedal stroke.

A. Determine the most appropriate saddle height. As shown in the illustrations at right, the rider's knee should be slightly bent when at the bottom of the pedal stroke. Alternatively, when the leg is fully straightened, the heel should extend about 3/4" below the pedal.



E. Determine the most appropriate saddle setback: A good starting point is put the rider's foot in the 3:00 position. Then drop a plumb bob from the front of the knee. The plumb bob should point to the center of the pedal spindle.

If you need to make significant (more than 2cm) setback adjustments, you may need to re-check the seatpost height.

In extreme cases, the setback may indicate the need for a different size frame.



Fitting to a Stock Design (Cont'd).

Step 4: Get rider feedback and adjust the rider fit .

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The above comments just scratch the surface of possible conditions to address through the fitting process. Training and experience will provide you the skills to address a wide range of fit issues.

We recommend making only one adjustment at a time. For example, if appropriate, raise the handlebar, then review the results with the rider. Then, based on their comments, you might move the top tube. If you make too many moves at once, it becomes easy for both you and the rider to lose their place.

The key is to adjust the rider's position until he or she feels comfortable with their riding position and otherwise show reasonable form.

Step 5: Record the measurements.

Once you and the rider establish the ideal fit, record all the pertinant statistics as a prelude to ordering the bike. Keeping the frame statistics is a good backup cross-checking your work. The following is a basic list:

- A. Bottom bracket to top of saddle.
- B. Top of saddle to top of bars
- C. Saddle over bars

In addition, you'll want to record:

- 1. Bike brand, model, size and year.
- 2. Stem model, length and angle.
- 3. Seatpost and position within rails.
- 4. Saddle brand and model.

This information lets you replicate the fit sometime in the future.





Care and Maintenance

The Fitmaster is designed to give years of commercial use with a minimum of care. Below are measures that insure the proper functioning of your Fitmaster:

- 1. Lubricate all threads during assembly and re-assembly.
- 2. Keep all machanical parts chain, hubs, bottom bracket properly adjusted and lubricated.
- 3. Keep the seatpost and sliders lubricated with a light coating of lithium grease or equivalent.
- 4. Pivot points should be kept lubricated with a 3-in-1 oil or equivalent.
- 5. Periodically remove and re-grease the seatpost and any other moving parts as you would your bicycle.
- 6. Wipe down your Fitmaster with a damp cloth after every fit session.
- 7. Periodically remove the front plate and apply a light coating of grease to the underside to keep it sliding smoothly over the base.

Warranty

Waterford Precision Cycles, Inc. ("Waterford") warrants against all defects in material or workmanship for Waterfordproduced parts for a period of one year from the date of purchase.

- This warranty does not cover normal wear and tear, normal maintenance items or any damage, failure or loss caused by:
 - 1. Accident, misuse, neglect, abuse or improper maintenance.
 - 2. Structural modifications made by anyone other than Waterford Precision Cycles.
 - 3. Failure to follow instructions or warnings in the owner's manual.
 - This Warranty is applicable to the original purchaser only.
- This Warranty does not cover separately sold products including wheel, tires, chain, seatpost, crank and bottom bracket. Please address any warranty claims to the respective manufacturer.

• Waterford will, at its option, repair or replace a defective product. Dealer labor charges are not covered by this warranty.

• Waterford is not liable for incidental or consequential damages. Repair or replacement of defective products is the sole remedy under this warranty.

• If you elect to repair a damaged or defective Waterford product through a source other than Waterford then Waterford will not be liable for the defect(s) or damage caused by such repairs.