

Operating Guide

For the Shift-E Four-Speed Transmission



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INTRODUCTION TO E-BIKE AUTOMATIC SHIFTING

Riding a bicycle equipped with the Shift-E automatic transmission is a truly enjoyable experience.

Until you get used to the way Shift-E works and feels with an electric assist motor, we recommend that you ride in areas where there is little or no traffic or other distracting obstacles. The Rodriquez Shift-E has a wide range four-speed rear transmission. The difference between one gear and the next is designed to provide a gear range that works in conjunction with the motor.

With Shift-E, it is not necessary to ease up on the pedaling pressure to shift gears. For example, Shift-E will downshift while you are pushing up a hill as hard as you can. However, before you get off the saddle and stand up to pump the pedals, we highly recommend shifting to Manual mode (see Buttons and Auto/Manual Operation, page 5). because an unexpected automatic shift may cause you to lose your footing on the pedals.

A WARNING: Riding out of the saddle with your weight on the pedals while in Auto mode could cause you to lose control and fall.

The Rodriquez Shift-E Transmission was designed "to get on and ride". It is not complicated. In manual mode, you control the shifting. In automatic mode, you can forget about shifting because the Electronic Control Unit (ECU) does it for you.

This Guide provides comments and tips concerning operation and maintenance of your Rodriquez Shift-E. It is important that you read and understand it. If you have any questions about the operation or maintenance of the Shift-E, please contact us at R+E Cycles.

COMPONENT MODULES

The Rodriquez Shift-E Transmission has individually replaceable components for ease of repair.



INSTALLING THE BATTERIES

The Rodriquez Transmission operates on four (4) AAA batteries located in the **ECU** as shown below.



The ECU is located on the non-drive side of the down tube. There is no need to remove the ECU from the bike.

There is a compartment door at the bottom of the ECU. To open the compartment door to access the batteries use the edge of a coin like a nickel and perform $\frac{1}{4}$ turn.

Align new batteries (polarity) according to diagram on battery compartment door and reverse the $\frac{1}{4}$ turn to close. It is recommended to use only Lithium batteries in the ECU.

After new batteries are installed, push Up or Down Control Button and listen for "click" of Selector. If no "click" is heard, verify batteries are installed correctly.

Changing the batteries every 500 miles or at least once per season is recommended.

AUTO/MANUAL OPERATION

Manual Mode

- o Rotate Auto/Manual toggle switch (located on Junction Box housing) so knurled portion of toggle switch is turned to 'M'.



- o Push top button once for next higher gear.



- o Push bottom button once for next lower gear.



- o More than one button push in either or both directions does no harm, however the mechanism responds only to the first button push after the last shift is completed. All excess button pushes are forgotten.

Automatic Mode

- o Rotate Auto/Manual toggle switch (located on Junction Box housing) so knurled portion of toggle switch is turned to 'A'.



- o In Automatic mode, the transmission shifts up or down one gear automatically, depending on wheel speed.

Button functions in automatic

- The wheel speed at which the transmission shifts can be adjusted in either direction at any time. The shift point is adjusted while pedaling forward. Repeat the button push adjustment until your pedal cadence feels comfortable. The Computer will remember the setting.
- Pushing "up" button once will shift to next higher gear AND change the automatic operation to maintain a slower cadence.
- Pushing "down" button once will shift to next lower gear AND change the automatic operation to maintain a faster cadence.
- Occasionally, you may notice that the computer does not know what gear it is in. This can occur after a tire is changed or when the batteries are low. To correct the computer:
 - If batteries are low: ride in Manual mode
 - If gear is too low: slow down and let the bike correct itself.
 - If gear is too high: switch to Manual; shift 1 past the High limit; then switch back to Automatic
- If the system is shifting erratically and you cannot get the shift points you want, you need to reset the ECU. Locate the small black button at the front of the ECU, press it firmly and hold for 2 seconds. The shift points will return to the default settings and can then be adjusted to your liking with the button push Adjustment described above. You can also reset to the default shift points by stopping the bike and moving the Auto/Manual toggle switch back and forth.

MAINTENANCE AND A FEW SIMPLE TESTS

In normal operation, the Rodriquez Shift-E Transmission should not require adjustments during its lifetime. However, the transmission does require some care and maintenance. In addition, you can perform a few simple tests to determine the health of your transmission.

Maintenance

A new Shift-E system should have a routine maintenance check at R&E Cycles or by an authorized Shift-E service shop at the end of the first season or after the first 1,000 miles, whichever comes first.

Load the battery compartment with new AAA Lithium batteries, following the instructions in "Installing the Batteries". Keep the battery terminals clean. Corrosion on the battery terminals will stop the operation of the transmission.

- The Rodriquez Shift-E Transmission will operate in rain and muddy conditions and does not have to be pampered, it is good practice to periodically wash the whole bicycle with a garden hose. Do not use a high-pressure sprayer.

*Every time the "up" button or the "down" button is pushed, the Gear Selector responds with a "clicking" sound. This is an indication the mechanism is working as it should. You can check the Shifter/Gear Selector/ECU function by pressing the "up" or "down" button and listening for the click. If no clicking is heard, check for loose connections in the cables; then check the batteries.

Periodically check the position and condition of the magnets on the rear wheel. Loose, missing or out of position magnets will cause the transmission to malfunction. The magnets should sweep within 1/8" of the Witness Mark on the Selector. Make sure the magnets are tight enough on the spokes to prevent them from moving or turning and hitting Gear Selector.

Gear Selector

The Gear Selector contains the mechanism that activates the gear changes. There is "Witness Mark" on the Gear Selector that the (2) wheel magnets engage with during automatic shifting. Below is the **Gear Selector** with the noted embossed Witness Mark line.

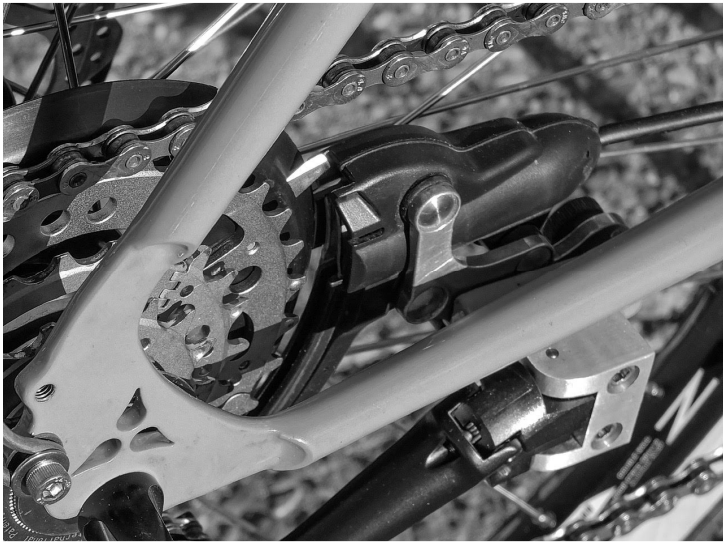


Sprocket Cluster and Pawl

Below is the rear **Gear Cluster** with swing-gate technology, you can see the Sprocket Cluster Pawl as it extends from the outside protective plate.



The pawl on the Sprocket Cluster should track through the slot on the Gear Selector without touching.



If a regular "ticking" noise is heard while pedaling the bicycle, examine the bicycle immediately. The most likely causes are:

1. The rear wheel may be loose or not properly installed. If this is the case, this dangerous condition must be corrected before continuing the ride. (See the section "Changing a Tire," page 11, in this manual.)
2. The Sprocket Cluster Lock Nut may be loose. This requires a special tool. Do not ride the bicycle until you have had the Lock Nut correctly tightened by an authorized Shift-E service center.
3. The Selector may be loose. Tighten the two thumbscrews on the Selector mount.
4. The hinge of the Sprocket Cluster is sticking. Lubricate with a lightweight lubricant

If the "ticking" is mild, the bike is rideable however, it should be taken to R+E Cycles or an authorized Shift-E service center as soon as possible.

The Chain Tensioner



The chain tensioner resides under the rear cogset and provides light return spring tension that assists with guiding the chain during the swing-gate shifting action.

The chain tensioner must move freely for proper operation. Periodically check for 'return' spring action by applying light pressure down on the pulley wheel cage.



Lubrication can be performed with a lightweight lubricant on the various pivot points of the chain tensioner. If spring action appears stunted and lubrication does not help, a visit to an authorized Shift-E service center is in order.

CHANGING A TIRE

Removing the Rear Wheel

- 1) Release the rear brakes.
- 2) Shift the chain on to the smallest rear sprocket.
- 3) Remove the chain from the front chainring.
- 4) Release the quick release lever on the hub.
- 5) Pull the chain to the rear, forming a loop. Free the chain from engagement with the cluster and remove the wheel.

Removing Chain from Front Chainring



Form a Loop With The Chain



INSTALLING THE REAR WHEEL

- 1) Make a loop of the chain above the upper pulley to receive the Sprocket Cluster.
- 2) Place the wheel axle into the rear facing dropouts until the axle is all the way in the dropout. Replace the chain on to the smallest sprocket.

IMPORTANT: The dropout slot must be clean, and the axle must rest firmly against its bottom on both sides before the quick release is tightened. This preserves the alignment of the pawl to the cam as well as the alignment of the wheel to the brakes.

- 3) Tighten the quick release appropriately
- 4) Reset and test the rear brakes.

TROUBLESHOOTING

Transmission not shifting at all, in manual or automatic mode	
Verify	Corrective Procedure
Batteries are good.	If there is doubt concerning condition of the batteries, replace batteries.
Batteries are making proper contact and that polarity is correct.	Remove batteries from battery compartment. Check for corrosion or non-conducting interference on battery terminals. Reinstall batteries, making sure polarity of batteries is correct according to instructions "Installing Batteries" on page 4.
Selector mechanism is free of visible obstructions.	Brush away visible obstructions from Selector. Rinse with garden hose at very low pressure. Do not poke anything into the Selector, as it could cause damage.
Selector makes a "clicking sound" when button is pushed (Up or Down, Manual or Automatic Mode) and Cam is in turned position after pushing.	<p>If Selector makes "clicking sound" and Cam is in turned position (either Up or Down is OK) after pushing:</p> <ul style="list-style-type: none"> • Check proper assembly of Hub and Wheel to frame (page 11). • Check that Pawl on the Sprocket Cluster engages Cam in Selector. • If Selector does not make "clicking sound" • Check connectors and condition of electric cable between Selector, Computer, Junction Box and Shifter. • Replace the Selector. • Replace the Computer. • Replace the Junction Box. • Replace the Shifter.

Selector makes a "clicking sound" (Up or Down, Manual or Automatic Mode) and Cam is NOT in turned position after pushing.	Remove Selector from Chain Stay mount but leave Connected to Computer. Push button Up or Down and determine if Cam is being obstructed from turning. If Cam is unobstructed, replace Selector. Do not open the Selector, as you will break the moisture seal and void the warranty.
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Transmission not shifting in manual mode but shifts in automatic mode	
Verify	Corrective Procedure
Position of Mode Switch	Turn Mode Switch to Manual mode for manual operation.
Selector does NOT make a "clicking sound" when button is pushed (Up or Down, Manual or Automatic Mode).	<ul style="list-style-type: none"> • Tighten Connector fitting between Junction Box and Computer. • Replace batteries • Replace electrical cable between Junction Box and Computer. • Replace Shifter assembly.
Transmission not shifting in automatic mode but shifts in manual mode	
Verify	Corrective Procedure
Position of Mode Switch	Turn Mode Switch to Automatic mode for automatic operation.
Spoke magnets (2), attached to spokes of rear wheel, are in proper position.	Attach spoke magnets in correct position as shown in "Maintenance And a Few Simple Tests", page 7,
Transmission shifting is unreliable and must frequently be corrected with the buttons	
Verify	Corrective Procedure

Compensator has free vertical movement.	<ul style="list-style-type: none"> • Lubricate Compensator Arm pivots. • Have adjustment checked by a Certified Rodriquez Technician.
Spoke magnets (2), attached to spokes of rear wheel, are in proper position	Attach spoke magnets in correct position according to "Maintenance And a Few Simple Tests", page 7.
Batteries are good.	Install new batteries.

SPECIFICATIONS

BATTERY

Battery Type	(4) AAA Lithium
Typical Service Life	500 Miles / 200 days asleep.

COMPUTER

Clock Cycle Rate	11.059 MHz
Current Use	16mA/ 30nA on/sleep

PHYSICAL CHARACTERISTICS

Weight of complete system: 1 lb., 14 oz 1 850g

CHAIN REQUIREMENTS – KMC X8

GEARING (26 inch wheel - .6604 meters)

Gear	Teeth Front	Teeth Rear	Gear-inch Number	Metric Gear
1	42	32	34	2.72
2	42	23	47	3.79
3	42	17	64	5.13
4	42	12	91	7.26