2002

TECHNICAL MANUAL
MTB COMPONENTS

ENGLISH






SRAM

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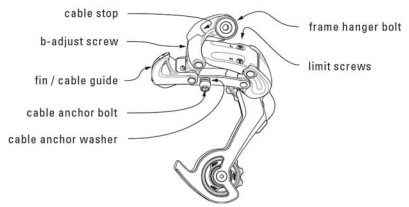
X.0 / 9.0SL / 9.0 / 7.0 / 5.0 · REAR DERAILLEURS · ESP™ TECHNICAL DATA / ASSEMBLY REQUIREMENTS

1:1

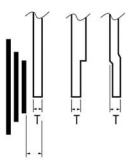
X.0 9.0SL 9.0 7.0 5.0

		X.0 NEW		9.0SL		9.0	7.0	5.0
	Part No.	—	—	—	—	—	—	—
	Speeds	9/8		9/8		9/8	9/8	8
	Shifter Compatibility	SRAM X.0/9.0SL/9.0/7.0/5.0				←	←	←
Chain Capacity	Total	37T	45T	37T	45T	45T	45T	45T
	Cage Length	Short	Long	Short	Long	Long	Long	Long
	Max Sprocket	34T		34T		34T	34T	34T
	Min Sprocket	11T		11T		11T	11T	11T
	Front Difference	22T		22T		22T	22T	22T
Design	Parallelogram Spring	Titanium		Steel, reinforced		Steel	Steel	Steel
	Pulleys	Cartr. bearing, stainless		Cartridge bearing		Bushing, hardened	Bushing, hardened	Bushing, hardened
	Cogsets & Chains	SRAM/IG & HG 9/8spd		SRAM/IG & HG 9/8spd		SRAM/IG & HG 9/8spd	SRAM/IG & HG 9/8spd	SRAM/IG & HG 8spd
	Direct Mount	Yes		Yes		Yes	Yes	Yes
	Weight	200 g		242 g		252 g	254 g	310 g
	Upper Knuckle	Forged Aluminum / Anod.		Grilon Composite		Grilon Composite	Grilon Composite	Grilon Composite
	Outer Link	Forged Magnesium		Forged Aluminum		Forged AL / Anodized	Alu die-cast / Painted	Grilon Composite
	Inner Link	Aluminum / Anodized		Forged Aluminum		Steel / E-coat	Steel / E-coat	Steel / E-coat
	Outer Cage	Aluminum / Anodized		Forged Aluminum		Stamped AL / Anodized	Stamped AL / Anodized	Steel / E-coat
	Inner Cage	Aluminum / Anodized		Forged Aluminum		Grilon Composite	Grilon Composite	Grilon Composite
	Hanger Bolt	Aluminum / Anodized		Aluminum / Anodized		Aluminum / Anodized	Aluminum / Anodized	Steel

DERAILLEUR ANATOMY

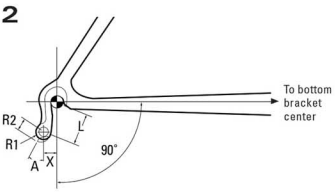


1



12.7 mm ± 1

2



COMPATIBILITY

Shifters	SRAM® X.0, 9.0SL, 9.0, 7.0, 5.0, 3.0IBS shifters ONLY
Cogsets	11-30, 11-32, 12-32, 11-34, 12-34
Chains	SRAM Power Chain and Shimano® HG & IG
Chainrings	22-32-42/44, 24-34-46, 26-36-46/48
Cable	1.1 or 1.2 mm high quality cables
Housing	4 or 5 mm compressionless cable housing with end cap maximum diameter of 5.8 mm.

FRAME DIMENSIONS

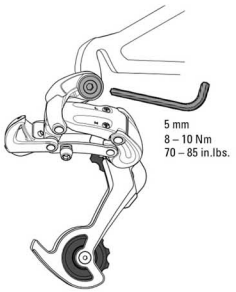
(see figure 1 and 2)

- For optimal ESP rear derailleur performance, the recommended rear derailleur hanger length (L) should be 28 – 30 mm.
- For a given L, use the chart below to determine other ESP rear derailleur hanger specifications.

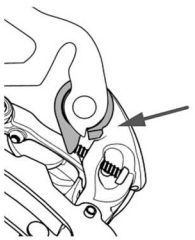
L	X	A	R1	R2	T
28	6 – 10	25° – 30°	8.5 max	11.5 – 13.5	7 – 8
30	7.5 – 10	25° – 30°	8.5 max	11.5 – 13.5	7 – 8

X.0 / 9.0SL / 9.0 / 7.0 / 5.0 · REAR DERAILLEURS · ESP™ ASSEMBLY

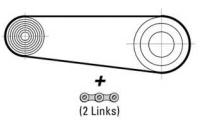
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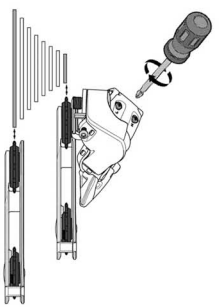
2



3



4



ASSEMBLY

Advice:

Check the rear derailleur hanger alignment. A bent rear derailleur hanger will result in inaccurate index shifting. Outboard side impacts are the most common causes of this type of damage.

- Attach the rear derailleur to the frame's rear derailleur hanger using a 5 mm hex head wrench ***(Fig. 1).***
- Check that the b-adjust washer tab is clear of the rear derailleur dropout tab ***(Fig. 2).***
- Tighten the 5 mm hex hanger bolt to 8 – 10 Nm (70–85 in.lbs.).

CHAIN LENGTH

A properly measured chain will prevent accidentally shifting to the largest chain ring and cog combination. This type of accidental shifting may cause harmful binding or seizure of the chain and potentially cause severe damage.

- Bypassing the rear derailleur, run the chain around the largest cog/large chainring combination ***(Fig. 3)***.
  – For rear suspension frames, position the rear suspension for the greatest chain length required.
- Add 2 LINKS or 1 link + Power Link to this length for proper chain length.

LIMIT SCREWS ADJUSTMENT

- View the rear derailleur and pulleys from behind the rear of the bicycle ***(Fig. 4)***.
- Turn the limit screw marked 'H' on the outer link of the derailleur to align the upper guide pulley center with the outboard edge of the smallest cog – clockwise moves the guide pulley inboard towards the wheel.
- While turning the crank, push the rear derailleur towards the larger cogs by hand.
- Align the upper guide pulley under the largest cog, center to center, by turning the limit screw marked 'L' on the outer link – clockwise moves the guide pulley outboard away from the spokes.

CHAIN GAP ADJUSTMENT

Chain gap is the distance between the upper guide pulley and the cog the chain is riding on. Optimal chain gap is small enough to allow quick, efficient shifts to and from any cog, but large enough to allow smooth shifts to and from the largest cog.

- Shift chain to the small chain ring.
- While turning the crank, push the rear derailleur inboard by hand to the largest cog.
- Hold the derailleur in this position while making the following adjustment.
- Use a 2,5/3 mm hex wrench, turn the b-adjust screw until the chain gap equals approximately 6 mm ($^1/_4$") from tip of the cog to tip of upper guide pulley ***(Fig. 5)***.

– Turn the b-adjust screw clockwise to increase the chain gap.
– Turn the b-adjust screw counterclockwise to decrease the chain gap.

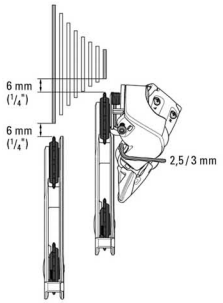
Advice:

- ***Bicycles equipped with an 11-28 cassette may require you to set the chain gap at the smallest cog. This is due to the shallow angle of the cassette in relation to the steeper movement of the 9spd rear derailleur.***
- ***It is best to measure the rear piece of cable housing between the frame and derailleur after the chain gap is determined. See figure and chart for recommended lengths.***
- ***Do not use the b-adjust screw to adjust the rear derailleur to act as a chain-tensioning device or to prevent chain suck. This increases the chain gap causing poor shifting performance.***

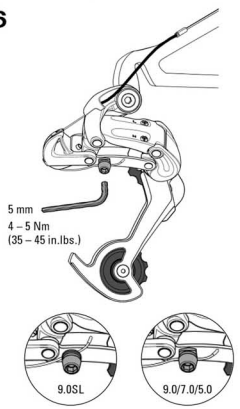
INDEX SHIFTING ADJUSTMENT

- Check that the chain and the rear derailleur are in the smallest cog position.
- Measure and cut the rear piece of cable housing. Make sure that it is not too short or long ***(see figure and chart).***
- Rotate the rear shifter until the largest number and gear indication tab/dash line up.
- Turn the rear shifter barrel adjust clockwise fully into the shifter, then turn counterclockwise 1 full turn.
- Feed the rear shifter cable through the rear derailleur cable housing, stops and cable guides.
- Feed the rear derailleur cable through the rear derailleur-housing stop and through the cable guide on the fin.
- Pull the cable tight and position it under the cable anchor washer ***(Fig. 6)***.
- Tighten the 5 mm hex cable anchor bolt to 4 – 5 Nm (35–45 in.lbs.).
  – Be careful not to crush or deform the cable.
- Rapidly shift the chain and derailleur up and down the cassette several times. If the cable slips repeat the two former steps.
- Shift the chain to the smallest cog.
- While pedaling, move the shifter up one detent.
  – If the chain hesitates or does not shift to the second cog, increase the cable tension by turning the shifter barrel adjuster counterclockwise.
  – If the chain shifts beyond the second cog, decrease the cable tension by turning the shifter barrel adjuster clockwise.

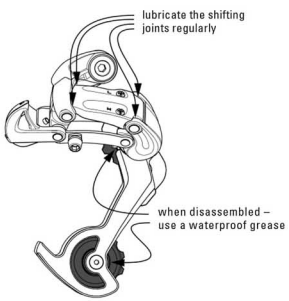
5



6



7



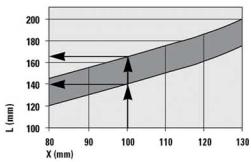
- Repeat the two former steps until shifting and cable tension is accurate.
- While turning the crank, shift the chain up and down the cassette and chain rings several times to ensure that your derailleur is indexing smoothly.

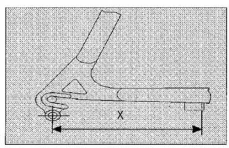
MAINTENANCE

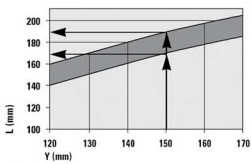
- Do not use solvants or corrosive materials to clean the components.
- Lubricate the shifting joints regularly ***(Fig. 7)***.
- Grease any cable guides (e.g. beneath the bottom bracket).

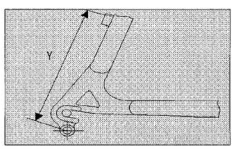
CHART / LENGTH OF CABLE HOUSINGS

Example: Distance X = 100 mm → cable housing length L = 140 – 165 mm.









Caution:
It is imperative to respect the values for the correct length of cable housing.

TROUBLESHOOTING

Problem	Cause	Remedy
Chain jumps from smallest sprocket to frame dropout.	High gear limit screw is not adjusted properly.	Turn in screw H until the guide pulley is aligned with the smallest sprocket.
Difficult or impossible to shift chain onto smallest sprocket.	High gear limit screw is not adjusted properly.	Unscrew screw H until the guide pulley is aligned with the smallest sprocket.
Chain jumps over largest sprocket and falls between the spokes and largest sprocket or inner cage plate scrapes on spokes.	Low gear limit screw is not adjusted properly.	Turn in screw L until the guide pulley is aligned with the largest sprocket.
	Rear derailleur or derailleur hanger is bent.	Straighten or replace.
Delayed shifting.	Clearance between guide pulley / sprocket is too large.	Adjust b-adjust screw by rotating counterclockwise.
Rough shifting behavior.	Clearance between guide pulley / sprocket is too small.	Adjust b-adjust screw by rotating clockwise.
Chain jumps two gears on small sprocket	Shift cable insufficiently tensioned.	Turn barrel adjuster on the shifter counterclockwise.
Delayed shifting onto larger sprocket	Shift cable insufficiently tensioned.	Turn barrel adjuster on the shifter counterclockwise.
Delayed shifting onto smaller sprocket	Shift cable is too tight.	Turn barrel adjuster on the shifter clockwise.
	Excessive cable friction, pinched or poorly routed cable.	Lubricate or replace cable and housing. Check for excessive bending of cable housing.

4.0 / 3.0 · REAR DERAILLEURS · ESP™
TECHNICAL DATA / ASSEMBLY REQUIREMENTS

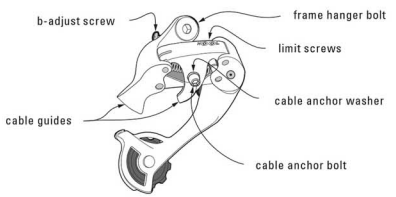
1:1

- 1:1 Actuation Ratio
- Larger Pivots, Links And Cages
- Expanded Gear Range
- New Appearance
- Slant Parallelogram Design
- Outward Facing Limit Screws

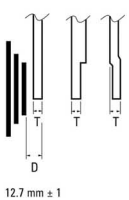
		4.0	3.0
	Part No.	—	—
	Speeds	8/7	8/7
	Shifter Compatibility	SRAM9.0SL/9.0/7.0/5.0/4.0/3.0IBS	
Chain Capacity	Total	45T	45T
	Cage Length	Long	Long
	Max Sprocket	34T	34T
	Min Sprocket	11T	11T
	Front Difference	22T	22T
Design	Spring Enhancement	Yes	Yes
	Pulleys	Bushing (replaceable)	Bushing
	Cogsets & Chains	SRAM / IG & HG 8/7spd	SRAM / IG & HG 8/7spd
	Direct Mount	Yes	Yes
	Weight	242 g	239 g
	Knuckles	Grilon Composite	Grilon Composite
	Outer Link	Grilon Composite	Grilon Composite
	Inner Link	Steel / Zinc Coat	Steel / Zinc Coat
	Outer Cage	Grilon Composite	Grilon Composite
	Inner Cage	Grilon Composite	Grilon Composite
	Hanger Bolt	Steel	Steel

4.0 3.0

DERAILLEUR ANATOMY

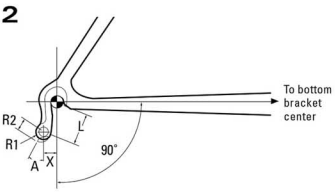


1



12.7 mm ± 1

2



COMPATIBILITY

Shifters	SRAM 7 & 8spd ESP cable pull shifters only
Cogsets	Min. 11T, Max. 34T
Chains	SRAM Power Chain and Shimano® HG & IG
Chainrings	22-32-42/44, 24-34-46, 26-36-46/48
Cable	1.1 or 1.2 mm high quality cables
Housing	4 or 5 mm compressionless cable housing with end cap maximum diameter of 5.8 mm.

FRAME DIMENSIONS

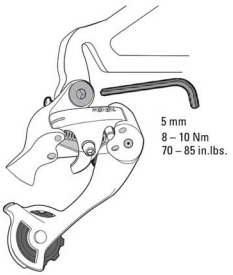
(see figure 1 and 2)

- For optimal ESP rear derailleur performance, the recommended rear derailleur hanger length (L) should be 28 – 30 mm.
- For a given L, use the chart below to determine other ESP rear derailleur hanger specifications.

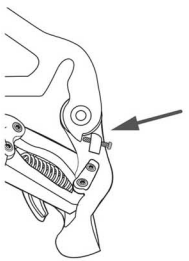
L	X	A	R1	R2	T
28	6 – 10	25° – 30°	8.5 max	11.5 – 13.5	7 – 8
30	7.5 – 10	25° – 30°	8.5 max	11.5 – 13.5	7 – 8

4.0 / 3.0 · REAR DERAILLEURS · ESP™ ASSEMBLY

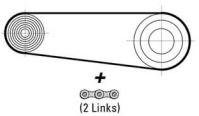
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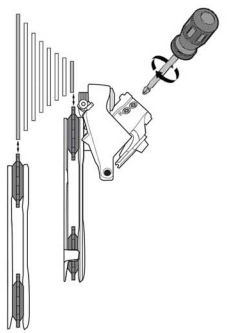
2



3



4



ASSEMBLY

Advice:

Check the rear derailleur hanger alignment. A bent rear derailleur hanger will result in inaccurate index shifting. Outboard side impacts are the most common causes of this type of damage.

- Attach the rear derailleur to the frame's rear derailleur hanger using a 5 mm hex head wrench ***(Fig. 1)***.
- Check that the b-adjust screw is clear of the rear derailleur dropout tab ***(Fig. 2)***.
- Tighten the 5 mm hex hanger bolt to 8 – 10 Nm (70–85 in.lbs.).

CHAIN LENGTH

A properly measured chain will prevent accidentally shifting to the largest chain ring and cog combination. This type of accidental shifting may cause harmful binding or seizure of the chain and potentially cause severe damage.

- Bypassing the rear derailleur, run the chain around the largest cog/large chainring combination ***(Fig. 3)***.
  – For rear suspension frames, position the rear suspension for the greatest chain length required.
- Add 2 LINKS or 1 link + Power Link to this length for proper chain length.

LIMIT SCREWS ADJUSTMENT

- View the rear derailleur and pulleys from behind the rear of the bicycle ***(Fig. 4)***.
- Using a small screwdriver, turn the limit screw marked 'H' on the outer link of the derailleur to align the upper guide pulley center with the outboard edge of the smallest cog – clockwise moves the guide pulley inboard towards the wheel.
- While turning the crank, push the rear derailleur towards the larger cogs by hand.
- Align the upper guide pulley under the largest cog, center to center, by turning the limit screw marked 'L' on the outer link – clockwise moves the guide pulley outboard away from the spokes.

CHAIN GAP ADJUSTMENT

Chain gap is the distance between the upper guide pulley and the cog the chain is riding on. Optimal chain gap is small enough to allow quick, efficient shifts to and from any cog, but large enough to allow smooth shifts to and from the largest cog.

- Shift chain to the small chain ring.
- While turning the crank, push the rear derailleur inboard by hand to the largest cog.
- Hold the derailleur in this position while making the following adjustment:
- Use a 3 mm hex wrench, turn the b-adjust screw until the chain gap equals approximately 6 mm (1/4") from tip of the cog to tip of upper guide pulley ***(Fig. 5)***.

– Turn the b-adjust screw clockwise to increase the chain gap.
– Turn the b-adjust screw counterclockwise to decrease the chain gap.

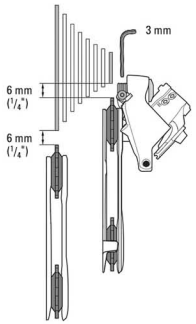
Advice:

- ***Bicycles equipped with an 11–28 or 14–28 cassette may require you to set the chain gap at the smallest cog. This is due to the shallow angle of the cassette in relation to the steeper movement of the rear derailleur.***
- ***Precision index shifting may require small changes of the b-adjustment while setting the proper cable tension.***
- ***Do not use the b-adjust screw to adjust the rear derailleur to act as a chain-tensioning device or to prevent chain suck. This increases the chain gap causing poor shifting performance.***

INDEX SHIFTING ADJUSTMENT

- Check that the chain and the rear derailleur are in the smallest cog position.
- Measure and cut the rear piece of cable housing. Make sure that it is not too short or long.
- Rotate the rear shifter until the largest number and gear indication tab/dash line up.
- Turn the rear shifter barrel adjust clockwise fully into the shifter, then turn counterclockwise 1 full turn.
- Feed the rear shifter cable through the rear derailleur cable housing, stops and cable guides.
- Thread the rear derailleur cable through the rear derailleur-housing stop and through the cable guide on the fin ***(Fig. 6)***.
- Pull the cable tight and position it under the cable anchor washer ***(Fig. 6)***.
- Tighten the 5 mm hex cable anchor bolt to 4 – 5 Nm (35–45 in.lbs.)
  – Be careful not to crush or deform the cable.
- Rapidly shift the chain and derailleur up and down the cassette several times. If the cable slips repeat the two former steps.
- Shift the chain to the smallest cog.
- While pedaling, move the shifter up one detent.
  – If the chain hesitates or does not shift to the second cog, increase the cable tension by turning the shifter barrel adjuster counterclockwise.
  – If the chain shifts beyond the second cog, decrease the cable tension by turning the shifter barrel adjuster clockwise.

5

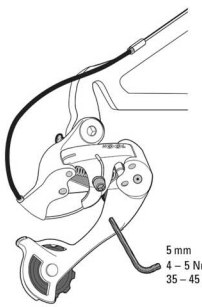


- Repeat the two former steps until shifting and cable tension is accurate.
- While turning the crank, shift the chain up and down the cassette and chain rings several times to ensure that your derailleur is indexing smoothly.

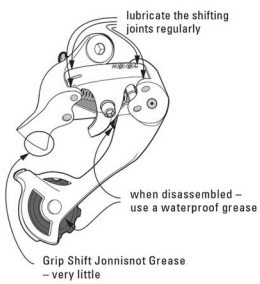
MAINTENANCE

- Do not use solvants or corrosive materials to clean the components.
- Lubricate the shifting joints regularly ***(Fig. 7)***.
- Grease any cable guides (e.g. beneath the bottom bracket).

6



7



TROUBLESHOOTING

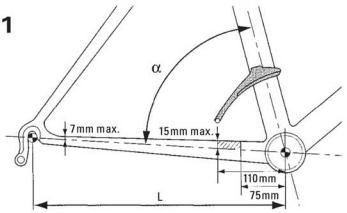
Problem	Cause	Remedy
Chain jumps from smallest sprocket to frame dropout.	High gear limit screw is not adjusted properly.	Turn in screw H until the guide pulley is aligned with the smallest sprocket.
Difficult or impossible to shift chain onto smallest sprocket.	High gear limit screw is not adjusted properly.	Unscrew screw H until the guide pulley is aligned with the smallest sprocket.
Chain jumps over largest sprocket and falls between the spokes and largest sprocket or inner cage plate scrapes on spokes.	Low gear limit screw is not adjusted properly.	Turn in screw L until the guide pulley is aligned with the largest sprocket.
	Rear derailleur or derailleur hanger is bent.	Straighten or replace.
Delayed shifting.	Clearance between guide pulley / sprocket is too large.	Adjust b-adjust screw by rotating counterclockwise.
Rough shifting behavior.	Clearance between guide pulley / sprocket is too small.	Adjust b-adjust screw by rotating clockwise.
Chain jumps two gears on small sprocket	Shift cable insufficiently tensioned.	Turn barrel adjuster on the shifter counterclockwise.
Delayed shifting onto larger sprocket	Shift cable insufficiently tensioned.	Turn barrel adjuster on the shifter counterclockwise.
Delayed shifting onto smaller sprocket	Shift cable is too tight.	Turn barrel adjuster on the shifter clockwise.
	Excessive cable friction, pinched or poorly routed cable.	Lubricate or replace cable and housing. Check for excessive bending of cable housing.

3.0 · FRONT DERAILLEURS
TECHNICAL DATA / ASSEMBLY REQUIREMENTS

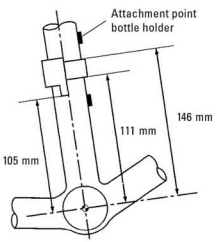
3.0

		3.0	
Part No. Clamp Size	28.6 mm	—	—
	31.8 mm	—	—
	Cable Routing	Top Pull	Bottom Pull
	Cage Size	Compact	Compact
	Top Gear	44/42T	44/42T
	Large - Small Capacity	22T	22T
	Large - Middle Capacity	min. 10T	min. 10T
	Chainstay Angle	66-69°	66-69°
Shifter	SRAM Micro adj.	●	●
	SRAM Indexing	●	●
	Shim. Rapidf. Plus	●	●
	Cable Housing	4 or 5 mm, compressionl.,	5.8 mm end caps diam.
	Weight	123 g	123 g
Design	Outer Link	Steel / Grilon Composite	Steel / Grilon Composite
	Inner Link	Steel	Steel
	Chain Cage	Steel / Chrome Plated	Steel / Chrome Plated
	Clamp	Steel	Steel
	Band Clamp	●	●

1



2



FRAME DIMENSIONS
(see Fig. 1)
- The seat tube should be positioned in the center of the bottom bracket shell.

Length of chainsty:
- MTB/Trekking L > 420 mm.
- Rear frame alignment must be symmetrical.

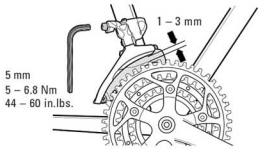
Chainstay angle:
α = 66° – 69°.

Chainline:
47.5 – 50 mm.
(Measurement from the center of the bracket to the center of middle chainring.)

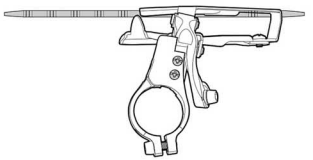
Necessary clearance:
(see Fig. 2)
- Attachment point bottle holder.
- Be sure to leave enough clearance between bottle cage holes and clamp location.

3.0 · FRONT DERAILLEURS ASSEMBLY / MAINTENANCE

1



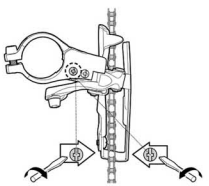
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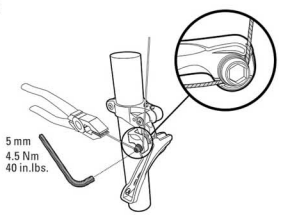
3



4



5



ASSEMBLY

SRAM 3.0 front derailleurs are designed to work with both compact chainwheels and full size chainwheels. Please note your chainwheel specific adjustment instructions below.

- Attach the front derailleur to the seat tube.
- Adjust the position along the seat tube so that clearance between the front derailleur cage and the large chainring is 1 – 3 mm ***(Fig. 1)***.
  At the same time, align the front derailleur cage outerplate to be parallel with the chainrings ***(Fig. 2)***.
- Tighten the 5 mm hex clamp bolt to 5 – 6.8 Nm (44 – 60 in.lbs.).
- If a set plug is present, remove it at this time ***(Fig. 3)***.

LOW LIMIT ADJUSTMENT

(see Fig. 4)

- Set the chain to the largest rear cog and the smallest front chainring.
- Adjust the low limit screw so that clearance between the front derailleur cage inner plate and the chain is:
  Compact 0 – 0.5 mm
  Full size 0 – 0.5 mm (46T Largest Chainr.)
  1 – 1.5 mm (48T Largest Chainr.)

CONNECTING CABLE

- Check that the chain and the front derailleur are in the smallest chainring position.
- Rotate the front shifter so the indicator mark is aligned with the '1' mark.
- Turn the front shifter barrel adjuster clockwise fully into the shifter, then turn counterclockwise 1 full turn.
- Feed the front shifter cable through the cable housing and stops.
- Run the cable under the cable anchor washer and hold taut.
  – Top pull ***(Fig. 5)***.
  – Bottom pull ***(Fig. 6)***.
- Tighten the 5 mm hex cable anchor bolt to 4.5 Nm (40 in.lbs.). Be careful not to crush or deform the cable.
- Shift the chain up and down the chainrings several times.

HIGH LIMIT ADJUSTMENT

(see Fig. 8)

- Set the chain to the smallest rear cog and the largest front chainring.
- Adjust the high limit screw so that clearance between the front derailleur cage outer plate and the chain is 0 – 0.5 mm.

INDEX SHIFTING ADJUSTMENT

(see Fig. 7)

For SRAM indexing shifter models only (not micro adjust shifter):

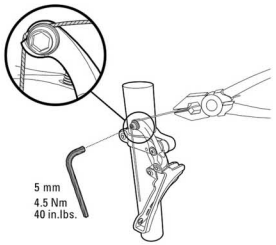
- Set the chain to the largest rear cog and the middle front chainring.
- Adjust the front shifter barrel adjuster so that clearance between the front derailleur cage inner plate and the chain is 0 – 0.5 mm.

MAINTENANCE

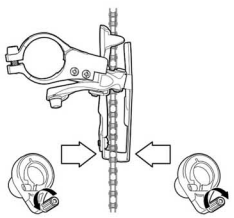
- Do not use solvants or corrosive materials to clean the components.
- Lubricate the shifting joints regularly ***(Fig. 9)***.
- Grease any cable guides (e.g. beneath the bottom bracket).

3.0 · FRONT DERAILLEURS ASSEMBLY / MAINTENANCE

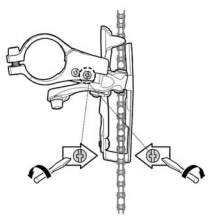
6



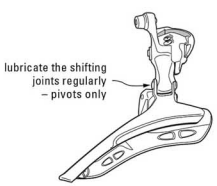
7



8



9



TROUBLESHOOTING

Problem	Cause	Remedy
Shifter actuated, chain fails to change chainring.	Shift cable incorrectly clamped.	Check shift cable and correct as necessary (cable clamp; cable housing stops; cable recess in shifter; cable tension).
	High / low limit screw poorly adjusted.	Correct limit screws.
	Clearance between cage and large chainring is too big / small.	Correct position (1– 3 mm).
Chain falls over large / small chainring.	High / low limit screw poorly adjusted.	Correct limit screws.
Chain is on middle chainring and scrapes against the cage when the largest or smallest sprocket is selected.	Precise adjustment of cable tension is incorrect.	Readjust shifter barrel adjuster.
Force required to actuate gears is too high.	Excessive cable friction, pinched or poorly routed cable.	Lubricate or replace cable and housing. Check for excessive bending of cable housing.
Crank collides with front derailleur.	High gear limit screw incorrectly adjusted.	Correct high limit screw.
	Cage not parallel with chainring.	Correct the front derailleur position.

X.0 / 9.0SL / 9.0 / 7.0 / ROCKET / ATTACK · TWIST SHIFTERS
TECHNICAL DATA / ASSEMBLY REQUIREMENTS



X.0 / 9.0SL

		X.0 NEW			9.0SL			
	Version	—	—	—	Half Pipe	Shorty	Half Pipe	Shorty
	Shifter Type	Front / Micro adjust	Front / Index	Rear 1:1 / ESP	Front / Micro adjust		Front / Index	
	Speeds		3	9			3	
Compatibility	Derailleur	SRAM & Shimano	SRAM & Shimano	SRAM X.0/9.0SL/9.0/7.0/5.0	SRAM & Shimano		SRAM & Shimano	
Compatibility	Crankset	Shimano	Shimano		Shimano		Shimano	
	Cable Pull Release	SRS	SRS	SRS	SRS		SRS	
	Cable	Teflon Coated	←	←	Teflon Coated		←	
	Gear Indication	Window	Window	Window	Window		Window	
	Barrel Adjuster	Indexing	Indexing	Indexing	Indexing		Indexing	
	Clamping Diameter	22.3 mm	22.3 mm	22.3 mm	22.3 mm		22.3 mm	
	Shifter Length	70 mm	←	←	98 mm	70 mm	←	

9.0SL / 9.0 / 7.0

		9.0SL		9.0				7.0	
	Version	Half Pipe	Shorty	Half Pipe	Shorty	Half Pipe	Shorty	Half Pipe	Shorty
	Shifter Type	Rear 1:1 / ESP		Front / Micro adjust		Front / Index		Front / Micro adjust	
	Speeds	9				3		9	
Compatibility	Derailleur	SRAM X.0/9.0SL/9.0/7.0/5.0		SRAM & Shimano		SRAM & Shimano		SRAM X.0/9.0SL/9.0/7.0/5.0	
Compatibility	Crankset			Shimano		Shimano		Shimano	
	Cable Pull Release	SRS		SRS		SRS		SRS	
	Cable	Teflon Coated		Teflon Coated		←		Teflon Coated	
	Gear Indication	Window		Window		Window		Window	
	Barrel Adjuster	Indexing		Indexing		Indexing		Indexing	
	Clamping Diameter	22.3 mm		22.3 mm		22.3 mm		22.3 mm	
	Shifter Length	98 mm	70 mm	98 mm	70 mm	←		98 mm	70 mm

7.0 / ROCKET

		7.0				Rocket					
	Version	Half Pipe	Shorty	Half P.	Sho.	Half P.	Sho.	Half Pipe	Shorty	Half Pipe	Shorty	Half Pipe	Shorty
	Shifter Type	Front / Index		Rear 1:1 / ESP				Front / Micro adjust		Front / Index		Rear 2:1	
	Speeds	3		9		8				3		9	
Compatibility	Derailleur	SRAM & Shimano		SRAM X.0/9.0SL/9.0/7.0/5.0				SRAM & Shimano		SRAM & Shimano		SRAM 2:1 & Shimano	
Compatibility	Crankset	Shimano						Shimano		Shimano			
	Cable Pull Release	SRS		SRS				SRS		SRS		SRS	
	Cable	Teflon Coated		←				Teflon Coated		←		←	
	Gear Indication	Window		Window				Window		Window		Window	
	Barrel Adjuster	Indexing		Indexing				Indexing		Indexing		Indexing	
	Clamping Diameter	22.3 mm		22.3 mm				22.3mm		22.3mm		22.3mm	
	Shifter Length	98 mm	70 mm	←				98 mm	70 mm	←		←	

ATTACK

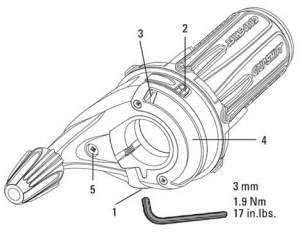
		Attack					
	Version	Half Pipe	Shorty	Half Pipe	Shorty	Half P. Sho.	Half P. Sho.
	Shifter Type	Front / Micro adjust		Front / Index		Rear 2:1	
	Speeds			3		9	8
Compatibility	Derailleur	SRAM & Shimano		SRAM & Shimano		SRAM 2:1 & Shimano	
Compatibility	Crankset	Shimano		Shimano			
	Cable Pull Release	SRS		SRS		SRS	
	Cable	Teflon Coated		←		←	
	Gear Indication	Window		Window		Window	
	Barrel Adjuster	Indexing		Indexing		Indexing	
	Clamping Diameter	22.3 mm		22.3 mm		22.3 mm	
	Shifter Length	98 mm	70 mm	←		←	

CABLE HOUSING

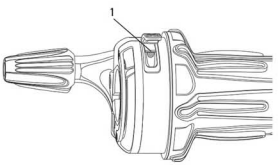
- Use only new high quality cable and compressionless cable housing with end caps.
- When choosing cable housing lengths, be sure to allow enough housing for an extreme turn of the handlebars in both directions.
- Note also, that different stem lengths and cable stop positions effects cable housing length.

X.0 / 9.0SL / 9.0 / 7.0 / ROCKET / ATTACK · TWIST SHIFTERS ASSEMBLY / MAINTENANCE

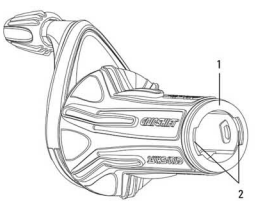
1



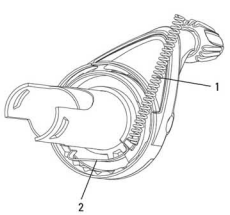
2



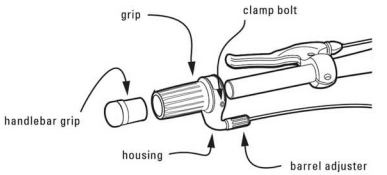
3



4



SHIFTER ANATOMY



ASSEMBLY

Front and Rear:

- Slide the shifter onto the handlebar.
  - If necessary, move the brake lever to allow for shifter and handlebar grip.
  - Bar end users – don't forget to leave room for the bar end.
- Rotate the shifter until the barrel adjuster is beneath (but out of the way of) the brake lever.
- Tighten the 3 mm hex clamp bolt (1, ***Fig. 1)*** to 1.9 Nm (17 in.lbs.).
- Slide the handlebar grip onto the handlebar.
  - **Solvents, lubricants or hair spray may damage handlebar grip!**
  - Use of a spray adhesive (e.g. 3M SUPER 77) or grip glue may help installation and may minimize grip rotation caused by wear or moisture.
- Feed the cable through the cable housing and stops.
- Attach cable to the derailleur.
- Adjust indexing per derailleur instruction.

Caution:

- ***Always check the front and rear brake levers for proper operation.***
- ***If there is interference between shifters and brake levers, re-adjust lever and shifter placement.***
- ***Check again for proper operation!***

CABLE CHANGE

Advice:

- ***Leave the shifter on the handlebar.***
- ***No need to move other components. The shifter does not need to be opened.***
- ***Use only new high quality cable and compressionless cable housing with end caps.***

Front and Rear:

- Detach the cable from the derailleur.
- Cut cable off 15 cm (6") from shifter barrel adjuster. Discard old cable and cable housing.
- From the edge (2, ***Fig. 1)***, pull open the cable change hatch. The hinge of the hatch should remain attached to the shifter.
- Rotate the shifter fully in the cable release direction (3). (Gear "1" on the front shifter, gear "9" on the rear shifter.)
- Look for cable head entry ***(Fig. 2)***.
- Using a small flat head screw driver, push back the tab (1, ***Fig. 2)*** covering the cable head.
- Push cable up/out of the shifter and discard.
- Feed the new cable through the cable entry and out the barrel adjuster.
- Pull cable snug to seat cable head under tab.
- Replace cable change hatch.
- Feed the cable through the new cable housing and frame stops.
- Attach cable to the derailleur.
- Adjust indexing per derailleur instruction.

GRIP REPLACEMENT

Advice:

Do not remove the triangular housing cover to make the change.

Removal:

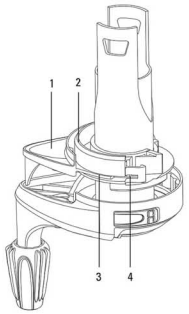
- Rotate the shifter fully in the cable release direction (3, ***Fig. 1)***. (Gear "1" on the front shifter, gear "9" on the rear shifter.)
- Using a 3 mm hex wrench (1, ***Fig. 1)***, remove shifter from the handlebar.
- While holding shifter housing and grip together in one hand, remove axial fixture ring (1, ***Fig. 3)*** by squeezing together housing tabs (2).
- While pushing/rotating the grip lightly forward (release direction), slowly move the grip outward away from housing.
  - Pulling the grip quickly may cause the coil spring (1, ***Fig. 4)*** to move out of position.

Replacement:

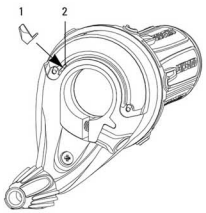
- Replace front end of coil spring (1, ***Fig. 4)*** on to tab in groove if necessary.
- While sliding grip up towards the housing, align spring tab so that it catches the open end of the coil spring.
- Rotate grip forward slightly compressing the coil spring and engage grip and tab into the housing.
- Replace axial fixture ring (1, ***Fig. 3)*** over housing tabs (2).

1:1
2:1

5



6



INTERNAL CLEANING

Advice:
When shifting performance is compromised, try replacing the cable and housing before you disassemble the shifter for cleaning.

Disassembly:
- Follow "GRIP REPLACEMENT/Removal".
- Remove lens cover (4, ***Fig. 1)***.
- Remove gear indicator needle (3) by pulling straight out.
- Remove the spool's coil spring (1, ***Fig. 4)***.
- Using small pliers, pull leaf spring (2) straight out. Take note of the shape of the spring so that you can replace it in the correct direction.
- Remove housing cover screw (5, ***Fig. 1)***. Slide housing cover (1, ***Fig. 5)*** and spool (2) out at the same time being careful not to break the tab (3) on the cover.
- Clean all parts with soapy water only.
- Using only Gip Shift Jonnisnot, grease housing tube, detentes and cable track at housing bend.

Reassembly:
- Slip tab (3, ***Fig. 5)*** on housing cover into groove (4) on spool.
- Slide spool and cover into housing and install cover screw (5, ***Fig. 1)***.
- Place leaf spring (2, ***Fig. 4)*** into spool. Push down slightly on opposite end of spring, then seat spring completely into spool and housing.
- Follow "GRIP REPLACEMENT/Replacement".
- Rotate shifter to full release position.
- Install gear indication needle (1, ***Fig. 6)*** in slot (2).
- Replace gear indicator lens (4, ***Fig. 1)*** and screws.
- Install shifter on to bars and check for proper function.

5.0 ROYALE / 5.0 / VERIO / CENTERA · TWIST SHIFTERS
TECHNICAL DATA / ASSEMBLY REQUIREMENTS



5.0 ROYALE

		5.0 Royale NEW			
	Part No.	—	—	—	—
	Shifter Type	Front / Micro adjust	Front / Index	Rear 1:1 / ESP	Rear 1:1 / ESP
	Speeds		3	9	8
Compatibility	Derailleur	SRAM & Shimano	SRAM & Shimano	SRAM 9.0SL / 9.0 / 7.0	SRAM 9.0SL / 9.0 / 7.0 / 4.0 / 5.0
Compatibility	Crankset	Shimano	Shimano		
Compatibility	Brake Lever Clamp	Thickness max. 5 mm	Thickness max. 5 mm	Thickness max. 5 mm	Thickness max. 5 mm
	Cable Pull Release	SRS	SRS	SRS	SRS
	Cable	DieDrawn	←	←	←
	Gear Indication	Window	Window	Window	Window
	Barrel Adjuster	IIndexing	Indexing	Indexing	Indexing
	Clamping Diameter	22.3 mm	22.3 mm	22.3 mm	22.3 mm
	Shifter Length	65 mm	←	←	←
	Weight	N/A	N/A	N/A	N/A

5.0

		5.0 Half Pipe			
	Part No.	—	—	—	—
	Shifter Type	Front / Micro adjust	Front / Index	Rear 1:1 / ESP	Rear 1:1 / ESP
	Speeds		3	9	8
Compatibility	Derailleur	SRAM & Shimano	SRAM & Shimano	SRAM 9.0SL/9.0/7.0	SRAM 9.0SL / 9.0 / 7.0 / 4.0 / 5.0
Compatibility	Crankset	Shimano	Shimano		
	Cable Pull Release	FFS	FFS	Standard	Standard
	Cable	Stainless Steel	←	←	←
	Gear Indication	Printed	Printed	Printed	Printed
	Barrel Adjuster	Indexing	Indexing	Indexing	Indexing
	Clamping Diameter	22.3 mm	22.3 mm	22.3 mm	22.3 mm
	Shifter Length	100 mm	←	←	←
	Weight	N/A	N/A	N/A	N/A

5.0

		5.0 Shorty			
	Part No.	—	—	—	—
	Shifter Type	Front / Micro adjust	Front / Index	Rear 1:1 / ESP	Rear 1:1 / ESP
	Speeds		3	9	8
Compatibility	Derailleur	SRAM & Shimano	SRAM & Shimano	SRAM 9.0SL / 9.0 / 7.0	SRAM 9.0SL / 9.0 / 7.0 / 5.0
Compatibility	Crankset	Shimano	Shimano		
	Cable Pull Release	FFS	FFS	Standard	Standard
	Cable	Stainless Steel	←	←	←
	Gear Indication	Printed	Printed	Printed	Printed
	Barrel Adjuster	IIndexing	Indexing	Indexing	Indexing
	Clamping Diameter	22.3 mm	22.3 mm	22.3 mm	22.3 mm
	Shifter Length	57 mm	←	←	←
	Weight	95 g	95 g	95 g	95 g

5.0 ROYALE / 5.0 / VERIO / CENTERA · TWIST SHIFTERS TECHNICAL DATA / ASSEMBLY REQUIREMENTS

VERIO

		Verio NEW			
	Part No.	—	—	—	—
	Shifter Type	Front / Micro adjust	Front / Index	Rear 2:1	Rear 2:1
	Speeds		3	9	8
Compatibility	Derailleur	SRAM & Shimano	SRAM & Shimano	SRAM 2:1 & Shimano	SRAM 2:1 & Shimano
Compatibility	Crankset	Shimano	Shimano		
Compatibility	Brake Lever Clamp	Thickness max. 5 mm	Thickness max. 5 mm	Thickness max. 5 mm	Thickness max. 5 mm
	Cable Pull Release	SRS	SRS	SRS	SRS
	Cable	DieDrawn	←	←	←
	Gear Indication	Window	Window	Window	Window
	Barrel Adjuster	Indexing	Indexing	Indexing	Indexing
	Clamping Diameter	22.3 mm	22.3 mm	22.3 mm	22.3 mm
	Shifter Length	65 mm	←	←	←
	Weight	N/A	N/A	N/A	N/A

CENTERA

		Centera Half Pipe			
	Part No.	—	—	—	—
	Shifter Type	Front / Micro adjust	Front / Index	Rear 2:1	Rear 2:1
	Speeds		3	9	8
Compatibility	Derailleur	SRAM & Shimano	SRAM & Shimano	SRAM 2:1 & Shimano	SRAM 2:1 & Shimano
Compatibility	Crankset	Shimano	Shimano		
	Cable Pull Release	FFS	FFS	Standard	Standard
	Cable	Stainless Steel	←	←	←
	Gear Indication	Printed	Printed	Printed	Printed
	Barrel Adjuster	Indexing	Indexing	Indexing	Indexing
	Clamping Diameter	22.3 mm	22.3 mm	22.3 mm	22.3 mm
	Shifter Length	100 mm	←	←	←
	Weight	N/A	N/A	N/A	N/A

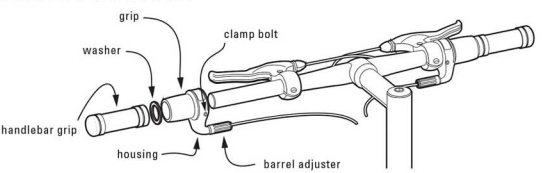
CENTERA

		Centera Shorty			
	Part No.	—	—	—	—
	Shifter Type	Front / Micro adjust	Front / Index	Rear 2:1	Rear 2:1
	Speeds		3	9	8
Compatibility	Derailleur	SRAM & Shimano	SRAM & Shimano	SRAM 2:1 & Shimano	SRAM 2:1 & Shimano
Compatibility	Crankset	Shimano	Shimano		
	Cable Pull Release	FFS	FFS	Standard	Standard
	Cable	Stainless Steel	←	←	←
	Gear Indication	Printed	Printed	Printed	Printed
	Barrel Adjuster	Indexing	Indexing	Indexing	Indexing
	Clamping Diameter	22.3 mm	22.3 mm	22.3 mm	22.3 mm
	Shifter Length	57 mm	←	←	←
	Weight	90 g	90 g	90 g	90 g

CABLE HOUSING

- Use only new high quality cable and compressionless cable housing with end caps.
- When choosing cable housing lengths, be sure to allow enough housing for an extreme turn of the handlebars in both directions.
- Note also, that different stem lengths and cable stop positions effects cable housing length.

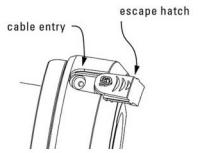
SHIFTER ANATOMY



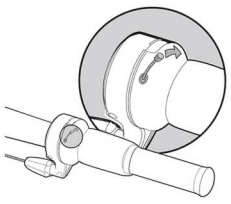
5.0 ROYALE / 5.0 / VERIO / CENTERA · TWIST SHIFTERS ASSEMBLY / MAINTENANCE

1:1
2:1

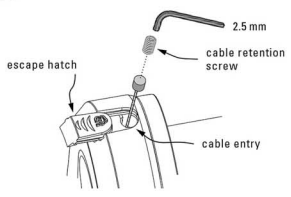
1



2

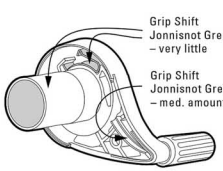


3



4





ASSEMBLY

Front and Rear:

- Slide the shifter onto the handlebar.
  – If necessary, move the brake lever to allow for shifter and handlebar grip.
  – Bar end users – don't forget to leave room for the bar end.
- Rotate the shifter until the barrel adjuster is beneath (but out of the way of) the brake lever.
- Tighten the 3 mm hex clamp bolt to 1.9 Nm (17 in.lbs.).
- Slide the plastic washer onto the handlebar.
- Slide the handlebar grip onto the handlebar.
  – **Solvents, lubricants or hair spray may damage the handlebar grips!**
  – Use **only** compressed air or water to aid installation.
- Feed the cable through the cable housing and stops.
- Attach the shifter cable to the derailleur.
- Adjust indexing per derailleur instructions.

Caution:

- ***Always check the front and rear brake levers for proper operation.***
- ***If there is interference between shifters and brake levers, re-adjust lever and shifter placement.***
- ***Check again for proper operation!***

CABLE CHANGE

Front and Rear:

Advice:

- ***Leave the shifter on the handlebar.***
- ***No need to move other components. The shifter does not need to be opened.***
- ***Use only new high quality cable and compressionless cable housing with end caps.***

- Detach the cable from the derailleur.
- Cut the cable off 15 cm (6") from shifter barrel adjuster. Discard old cable and cable housing.
- Remove the escape hatch ***(Fig. 1 / 5.0 and Centera)***. 5.0 Royale and Verio see ***Fig. 2***.
- Rotate the shifter until the cable entry is visible.
- **Only Rear shifter:** remove the 2.5 mm hex cable retention screw ***(Fig. 3 / 5.0 und Centera)***.
- Remove and discard the rest of the old cable.
- Feed the new cable through the cable entry and out the barrel adjuster. Pull the cable snug ***(5.0 and Centera)***.
- **Only Rear shifter:** replace the cable retention screw – be sure to turn until the screw contacts the cable head.
- Replace the escape hatch.
- Feed the cable through the new cable housing and stops.
- Attach the cable to the derailleur and adjust indexing per derailleur instruction.

MAINTENANCE

- ***Clean all shifter parts using only water and mild soap.***
- ***Use only Grip Shift Jonnisnot Grease for any shifter lubrication.***
- ***After proper cleaning relubricate the areas shown in Fig. 4.***

4.0 / 3.0 / MRX PLUS / MRX · TWIST SHIFTERS TECHNICAL DATA / ASSEMBLY REQUIREMENTS

4.0 3.0

		4.0 Half Pipe				3.0 Shorty	
	Part No.	—	—	—	—	—	—
	Shifter Type	Front / Micro adjust	Front / Index	Rear 1:1 / ESP		Front / Micro adjust	Front / Index
	Speeds		3	8	7		3
Compatibility	Derailleur	SRAM & Shimano	SRAM & Shimano	SRAM 7.0 / 5.0 / 4.0 / 3.0		SRAM & Shimano	SRAM & Shimano
Compatibility	Crankset	Shimano	Shimano			Shimano	Shimano
	Cable Pull Release	FFS direct	FFS direct	Standard		FFS	FFS
	Cable	Die Drawn Steel	←	←		Die Drawn Steel	←
	Gear Indication	Printed	Printed	Printed		Printed	Printed
	Barrel Adjuster	Indexing	Indexing	Indexing		Indexing	Indexing
	Clamping Diameter	22.3 mm	22.3 mm	22.3 mm		22.3 mm	22.3 mm
	Shifter Length	96 mm	←	←		64 mm	←
	Weight	N/A	N/A	N/A		58 g	58 g

3.0 MRX PLUS

		3.0 Shorty		MRX Plus Half Pipe					
	Part No.	—	—	—	—	—	—	—	—
	Shifter Type	Rear 1:1 / ESP		Front / Micro adjust	Front / Index	Rear 2:1		Rear Shimano Rapid Rise	
	Speeds	8	7		3	8	7	8	7
Compatibility	Derailleur	SRAM 7.0 / 5.0 / 4.0 / 3.0		SRAM & Shimano	SRAM & Shimano	SRAM 2:1 & Shimano		Shimano Rapid Rise	
Compatibility	Crankset			Shimano	Shimano				
	Cable Pull Release	Standard		FFS direct	FFS direct	Standard		Standard	
	Cable	Die Drawn Steel		Die Drawn Steel	←	←		←	
	Gear Indication	Printed		Printed	Printed	Printed		Printed	
	Barrel Adjuster	Indexing		Indexing	Indexing	Indexing		Indexing	
	Clamping Diameter	22.3 mm		22.3 mm	22.3 mm	22.3 mm		22.3 mm	
	Shifter Length	64 mm		96 mm	←	←		←	
	Weight	58 g		N/A	N/A	N/A		N/A	

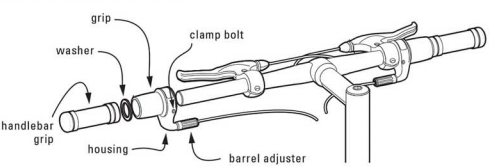
MRX

		MRX Shorty					
	Part No.	—	—	—	—	—	—
	Shifter Type	Front / Micro adjust	Front / Index	Rear 2:1			Rear Shimano Rapid Rise
	Speeds		3	8	7	6	7
Compatibility	Derailleur	SRAM & Shimano	SRAM & Shimano	SRAM 2:1 & Shimano			Shimano Rapid Rise
Compatibility	Crankset	Shimano	Shimano				
	Cable Pull Release	FFS	FFS	Standard			Standard
	Cable	Standard Steel	←	←			←
	Gear Indication	Printed	Printed	Printed			Printed
	Barrel Adjuster	Indexing	Indexing	Indexing			Indexing
	Clamping Diameter	22.3 mm	22.3 mm	22.3 mm			22.3 mm
	Shifter Length	64 mm	←	←			←
	Weight	58 g	58 g	58 g			58 g

CABLE HOUSING

- Use only new high quality cable and compressionless cable housing with end caps.
- When choosing cable housing lengths, be sure to allow enough housing for an extreme turn of the handlebars in both directions.
- Note also, that different stem lengths and cable stop positions effects cable housing length.

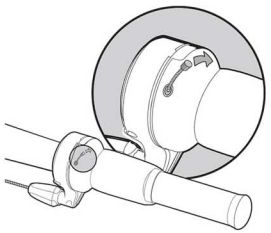
SHIFTER ANATOMY



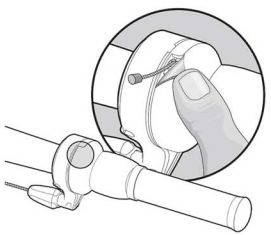
4.0 / 3.0 / MRX PLUS / MRX · TWIST SHIFTERS ASSEMBLY / MAINTENANCE

1:1
2:1

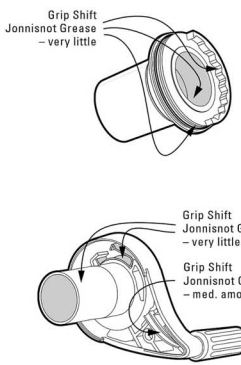
1



2



3



ASSEMBLY

Front and Rear:

- Slide the shifter onto the handlebar.
  - If necessary, move the brake lever to allow for shifter and handlebar grip.
  - Bar end users – don't forget to leave room for the bar end.
- Rotate the shifter until the barrel adjuster is beneath (but out of the way of) the brake lever.
- Tighten the 2.5 mm hex clamp bolt to 1.7 Nm (15 in.lbs.).
- Slide the plastic washer onto the handlebar.
- Slide the handlebar grip onto bar.
  - **Solvents, lubricants or hair spray may damage handlebar grips!**
  - Use **only** compressed air or water to aid installation.
- Feed the cable through the cable housing and frame stops.
- Attach cable to the derailleur.
- Adjust indexing per derailleur instructions.

Not recommended for use on thin walled alluminum handlebars such as Hyperlite® type handlebars.

Advice:

- ***Always check the front and rear brake levers for proper operation.***
- ***If there is interference between shifters and brake levers, re-adjust lever and shifter placement.***
- ***Check again for proper operation!***

CABLE CHANGE

Front and Rear:

Caution:

- ***Leave the shifter on the handlebar.***
- ***No need to move other components. The shifter does not need to be opened.***
- ***Use only new high quality cable and compressionless cable housing with endcaps.***

See Figure 1 (4.0 / MRX Plus) or 2 (3.0 / MRX)

- Detach the cable from the derailleur.
- Cut the cable off 15 cm (6") from shifter barrel adjuster. Discard old cable and cable housing.
- Rotate the shifter until the cable entry is visible.
- 3.0 / MRX only: Carefully peel back the corner of the grip cover shown in ***Fig. 2***. Use your fingernail or a small screw-driver.
- Remove and discard the rest of the old cable.
- Feed the new cable through the cable entry in the grip and out through the barrel adjuster.
- Feed the cable through the new cable housing and stops.
- Attach the cable to the derailleur and adjust indexing per derailleur instruction.

MAINTENANCE

- ***Clean all shifter parts using only water and mild soap.***
- ***Use only Grip Shift Jonnisnot Grease for any shifter lubrication.***
- ***After proper cleaning relubricate the areas shown in Fig. 3.***

9.0 / GEMINI PRO · TRIGGER SHIFTERS
TECHNICAL DATA / ASSEMBLY REQUIREMENTS

9.0

		9.0		
	Part No.	—	—	—
	Shifter Type	Front / Index	Rear 1:1 / ESP	
	Speeds	3	9	8
Compatibility	Derailleur	SRAM & Shimano	SRAM 9.0SL / 9.0 / 7.0	
Compatibility	Crankset	Shimano		
	Cable Pull Release	IT	IT	
	Cable	Stainless Steel	←	
	Gear Indication	Window	Window	
	Barrel Adjuster	Indexing	Indexing	
	Clamping Diameter	22.3 mm	22.3 mm	
	Shifter Length	26 mm	←	
	Weight	N/A	N/A	

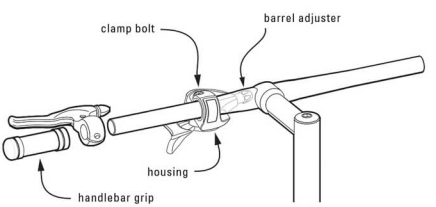
GEMINI PRO

		Gemini Pro		
	Part No.	—	—	—
	Shifter Type	Front / Index	Rear 2:1	
	Speeds	3	9	8
Compatibility	Derailleur	SRAM & Shimano	SRAM 2:1 & Shimano	
Compatibility	Crankset	Shimano		
	Cable Pull Release	IT	IT	
	Cable	Stainless Steel	←	
	Gear Indication	Window	Window	
	Barrel Adjuster	Indexing	Indexing	
	Clamping Diameter	22.3 mm	22.3 mm	
	Shifter Length	26 mm	←	
	Weight	N/A	N/A	

CABLE HOUSING

- Use only new high quality cable and compressionless cable housing with end caps.
- When choosing cable housing lengths, be sure to allow enough housing for an extreme turn of the handlebars in both directions.
- Note also, that different stem lengths and cable stop positions effects cable housing length.

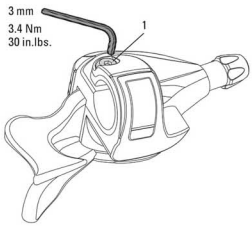
SHIFTER ANATOMY



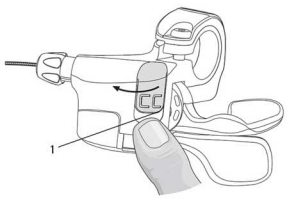
9.0 / GEMINI PRO · TRIGGER SHIFTERS
ASSEMBLY / MAINTENANCE

1:1
2:1

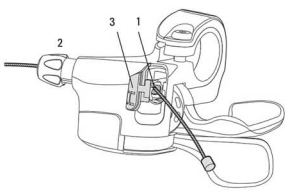
1



2



3



ASSEMBLY

Front and Rear:

- Slide the shifter onto the handlebar.
- Tighten the 3 mm hex clamp bolt (1, ***Fig. 1)*** to 1.9 Nm (17 in.lbs.).
- Slide the handlebar grip onto the handlebar (external diameter must not exceed 32 mm in the area of the shifter).
  – **Solvents, lubricants or hair spray may damage the handlebar grips!**
  – Use **only** compressed air or water to aid installation.
- Feed the cable through the cable housing and stops.
- Attach the shifter cable to the derailleur.
- Adjust indexing per derailleur instructions.

Caution:

- ***Always check the front and rear brake levers for proper operation.***
- ***If there is interference between shifters and brake levers, re-adjust lever and shifter placement.***
- ***Check again for proper operation!***

CABLE CHANGE

Front and Rear:

Advice:

- ***Leave the shifter on the handlebar.***
- ***The shifter does not need to be opened.***
- ***Use only new high quality cable and compressionless cable housing with endcaps.***

- Detach the cable from the derailleur.
- Cut the cable off 15 cm (6") from shifter barrel adjuster. Discard old cable and cable housing.
- Line up the "1" (front) or HIGHEST gear number (rear) mark with the indicator mark.
- From the edge (1, ***Fig. 2)***, pull open the cable change hatch. The hinge of the hatch should remain attached to the shifter.
- Look for cable head entry (1, ***Fig. 3)***.
- Push cable up/out of the shifter and discard.
- Feed the new cable through the cable entry and out the barrel adjuster (2).
- Replace cable change hatch (3).
- Feed the cable through the new cable housing and frame stops.
- Attach cable to the derailleur.
- Adjust indexing per derailleur instruction.

MAINTENANCE

- ***Do not disassemble the shifter.***

3.0 IBS / MRX IBS · INTEGRATED BRAKE SHIFTERS TECHNICAL DATA / ASSEMBLY REQUIREMENTS

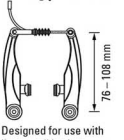
3.0 IBS

		3.0 IBS Shorty			
	Part No.	—	—	—	—
	Shifter Type	Front / Micro adjust	Front / Index	Rear 1:1 / ESP	Rear 1:1 / ESP
	Speeds		3	8	7
Compatibility	Derailleur	SRAM or Shimano	SRAM or Shimano	SRAM9.0SL/9.0/7.0/5.0/3.0	SRAM9.0SL/9.0/7.0/5.0/3.0
Compatibility	Crankset	Shimano	Shimano		
Compatibility	Brake Compatib.	Linear Pull	←	←	←
	Cable Pull Release	FFS	FFS	Standard	Standard
	Cable	Die Drawn Steel	←	←	←
	Gear Indication	Printed	Printed	Printed	Printed
	Barrel Adjuster	Indexing	Indexing	Indexing	Indexing
	Clamping Diameter	22.3mm	22.3mm	22.3mm	22.3mm
	Shifter Length	75mm	←	←	←
Brake	Lever Size	3 Finger	←	←	←
Brake	Cable Pull	24 mm	←	←	←
Brake	Leverage Adjust	Single Position	←	←	←
Brake	Reach Adjust	Yes	Yes	Yes	Yes
Brake	Barrel Adjuster	Lock Ring	Lock Ring	Lock Ring	Lock Ring
	Weight	N/A	N/A	N/A	N/A

MRX IBS

		MRX IBS Shorty		
	Part No.	—	—	—
	Shifter Type	Front / Micro adjust	Front / Index	Rear 2:1
	Speeds		3	7
Compatibility	Derailleur	SRAM or Shimano	SRAM or Shimano	SRAM 2:1 or Shimano
Compatibility	Crankset	Shimano	Shimano	
Compatibility	Brake Compatib.	Linear Pull	←	←
	Cable Pull Release	FFS	FFS	Standard
	Cable	Standard Steel	←	←
	Gear Indication	Printed	Printed	Printed
	Barrel Adjuster	Indexing	Indexing	Indexing
	Clamping Diameter	22.3mm	22.3mm	22.3mm
	Shifter Length	75mm	←	←
Brake	Lever Size	3 Finger	←	←
Brake	Cable Pull	24 mm	←	←
Brake	Leverage Adjust	Single Position	←	←
Brake	Reach Adjust	Yes	Yes	Yes
Brake	Barrel Adjuster	Lock Ring	Lock Ring	Lock Ring
	Weight	N/A	N/A	N/A

Caution:
SRAM Integrated Brake Shifters are designed for use with linear-pull brakes. Do not use SRAM Integrated Brake Shifters with conventional cantilever brakes (those with arms measuring less than 76 mm and utilizing a non-linear straddle cable). Use of SRAM Integrated Brake Shifters with conventional cantilever brakesets will result in faulty braking performance.



Designed for use with linear-pull brakes.


Do not use conventional cantilever brakes.

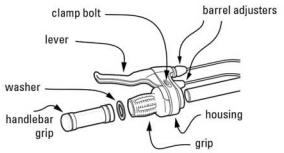
CABLE HOUSING

- Use only new high quality cable and compressionless cable housing with end caps.
- When choosing cable housing lengths, be sure to allow enough housing for an extreme turn of the handlebars in both directions.
- Note also, that different stem lengths and cable stop positions effects cable housing length.

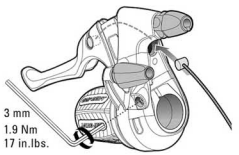
3.0 IBS / MRX IBS · INTEGRATED BRAKE SHIFTERS ASSEMBLY / MAINTENANCE

1:1
2:1

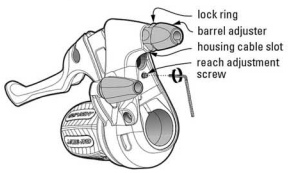
SHIFTER ANATOMY



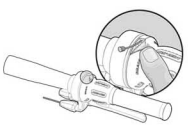
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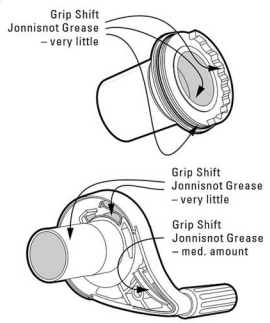
2



3



4



ASSEMBLY

Front and Rear:

- Slide the shifter onto the handlebar.
  - Leave room for the handlebar grip.
  - Bar end users – don't forget to leave room for the bar end.
- Tighten the 3 mm hex clamp bolt to 1.9 Nm (17 in.lbs.) ***(Fig. 1)***.
- Slide the plastic washer onto the handlebar.
- Slide the handlebar grip onto the handlebar.
  - **Solvents, lubricants or hair spray may damage handlebar grips!**
  - Use **only** compressed air or water to aid installation.

Shifter:

- Feed the shifter cable through the shifter cable housing and stops.
- Attach the cable to the derailleur.
- Adjust indexing per derailleur instructions.

Brake lever:

- Line up the brake lever barrel adjuster, lock ring and housing cable slots ***(Fig. 2)***.
- Pull on the lever and push the brake cable head through the opening in the brake lever housing ***(Fig. 1)***.
- Install the cable head into the cable socket in the lever.
- Set up the brakes and brake pads per brake instructions.
- Actuate each brake lever 5–10 times.
  - **Check that all brake system components are functioning properly.**

Reach adjustment:

- Using a 2 mm hex wrench ***(Fig. 2)***.
- Turn the reach adjustment screw clockwise to bring the lever closer to the handlebars.
- Turn the screw counterclockwise to move the lever further away.

Caution:

- ***Do not turn reach adjust screw past flush with the housing!***
- ***After any ajustment to the reach, always check the brake cable tension to ensure proper braker system performance. Re-adjust the cable tension if necessary.***
- ***Always check the front and rear brake levers for proper operation.***

CABLE CHANGE

Front and Rear:

Advice:

- ***Leave the shifter on the handlebar.***
- ***No need to move other components. The shifter does not need to be opened.***
- ***Use only new high quality cable and compressionless cable housing with end caps.***
- Detach the cable from the derailleur.
- Cut the cable off 15 cm (6") from shifter barrel adjuster. Discard old cable and cable housing.
- Line up the "1" (front) or HIGHEST gear number (rear) mark with the indicator mark.
- Carefully peel back the corner of the grip cover shown in ***Fig. 3***. Use your fingernail or a small screwdriver.
- Remove and discard the rest of the old cable.
- Feed the new cable through the cable entry in the grip and out through the barrel adjuster.
- Feed the cable through the new cable housing and stops.
- Attach the cable to the derailleur and adjust indexing per derailleur instruction.

MAINTENANCE

- ***Clean all shifter parts using only water and mild soap.***
- ***Use only Grip Shift Jonnisnot Grease for any shifter lubrication.***
- ***After proper cleaning relubricate the areas shown in Fig. 4.***

CASSETTES
TECHNICAL DATA / ASSEMBLY REQUIREMENTS

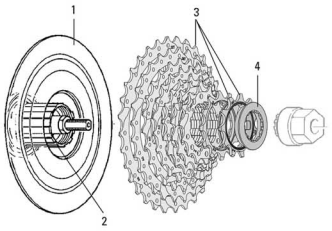
9.0 7.0

		9.0 Spider		7.0	
	Part No.	—	—	—	—
	Largest Cog	34 T	32 T	34 T	32 T
Compatibility	Speeds	9	9	9	9
Compatibility	Chains	SRAM / Shimano	SRAM / Shimano	SRAM / Shimano	SRAM / Shimano
Compatibility	Hubs	SRAM / Shimano	SRAM / Shimano	SRAM / Shimano	SRAM / Shimano
Compatibility	Cogs	11/12/14/16/18/21/24/28/34	11/12/14/16/18/21/24/28/32	11/12/14/16/18/21/24/28/34	11/12/14/16/18/21/24/28/32
	Lockring torque	40 Nm	40 Nm	40 Nm	40 Nm
	Weight	300 g	290 g	340 g	330 g
Design	Cogs	SAPH 440 steel	SAPH 440 steel	SAPH 440 steel	SAPH 440 steel
Design	Spider	Grilon Composite	Grilon Composite		
Design	Rivets	Stainless Steel	Stainless Steel		
Design	Screws			Steel / Zinc Coat	Steel / Zinc Coat
Design	Finish	Matte Ni-Chrome Plated	Matte Ni-Chrome Plated	Matte Ni-Chrome Plated	Matte Ni-Chrome Plated

5.0 XF-8

		5.0		XF-8
	Part No.	—	—	—
	Largest Cog	32 T	28 T	32 T
Compatibility	Speeds	8	8	8
Compatibility	Chains	SRAM / Shimano	SRAM / Shimano	SRAM / Shimano
Compatibility	Hubs	SRAM / Shimano	SRAM / Shimano	SRAM / Shimano
Compatibility	Cogs	11/12/14/16/18/21/26/32	11/12/14/16/18/21/24/28	11/12/14/16/18/21/26/32
	Lockring torque	40 Nm	40 Nm	40 Nm
	Weight	280 g	250 g	400 g
Design	Cogs	SAPH 440 steel	SAPH 440 steel	SAPH P&O steel
Design	Spider			
Design	Rivets			Steel / Zinc Coat
Design	Screws	Steel / Zinc Coat	Steel / Zinc Coat	
Design	Finish	Nickel-Chrome Plated	Nickel-Chrome Plated	Nickel-Chrome Plated

1



ASSEMBLY

- Snap spoke protector disc (1, ***Fig. 1)*** onto the hub flange.
- Fit cassette (3) onto driver profile (2).
- Screw lock nut (4) with cassette tool (Park Tool FR-5 or SRAM Part No. 4624 411 010), tightening torque: 40 Nm (350 in.lbs.).

Advice:
Due to the optimized stability of the rear wheel, there is less space between the right spoke flange and the sprocket cassette. This means that not all spoke protector discs available on the market will fit. Please carry out a trial assembly run before specifying spoke protector discs (spoke protector discs must not rub against the sprocket cassette).

POWER CHAINS
TECHNICAL DATA / ASSEMBLY REQUIREMENTS

POWER CHAINS

		PC 99	PC 89R	PC 69	PC 59	PC 49 NEW
	Part No.	—	—	—	—	—
	Application	MTB	Road	MTB	MTB	MTB
	Compatibility Front	HG / EXA-Drive	HG / EXA-Drive	HG / EXA-Drive	HG / EXA-Drive	HG / EXA-Drive
	Compatibility Rear	HG / EXA-Drive	HG / EXA-Drive	HG / EXA-Drive	HG / EXA-Drive	HG / EXA-Drive
	Max. No. of sprockets	9 only	9 only	9 only	9 only	9 only
	Dimension	1/2" x 11/128"	1/2" x 11/128"	1/2" x 11/128"	1/2" x 11/128"	1/2" x 11/128"
Pin	Length	6.7 mm	6.7 mm	6.7 mm	6.7 mm	6.7 mm
Pin	Riveting	Cross Step	Step	Step	Step	Step
Pin	Chrome Hardened	Yes	Yes	Yes	Yes	Yes
Pin	Push Power	2000 N / 450 in.lbs.	1500 N / 340 in.lbs.	1500 N / 340 in.lbs.	1500 N / 340 in.lbs.	1500 N / 340 in.lbs.
Pin	Tensile Strength	9800 N / 2200 in.lbs.	9800 N / 2200 in.lbs.	9800 N / 2200 in.lbs.	9800 N / 2200 in.lbs.	9800 N / 2200 in.lbs.
Pin	Weight (116 links)	300 g	295 g	300 g	300 g	300 g
Design	External Pin Plate	Silver / Nickel Plated	Silver / Nickel Plated	Silver / Nickel Plated	Silver / Nickel Plated	Grey / Polished
Design	Internal Pin Plate	Silver / Nickel Plated	Silver / Nickel Plated	Silver / Nickel Plated	Grey / Polished	Grey / Polished
Design	Weight Reduced		Yes			
	Connecting Method	Power Link 9SPD	Power Link 9SPD or Pin	Power Link 9SPD or Pin	Power Link 9SPD or Pin	Power Link 9SPD or Pin

POWER CHAINS

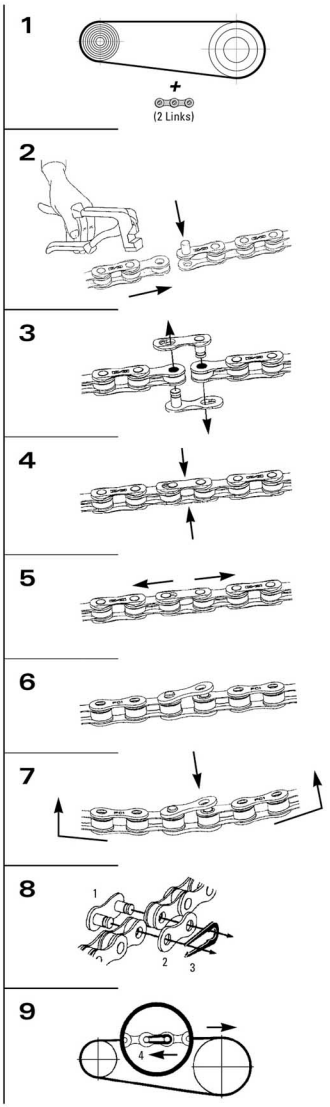
		PC 68	PC 58	PC 48	PC 38 Saltshaker	PC 38
	Part No.	—	—	—	—	—
	Application	MTB	MTB	MTB	MTB	MTB
	Compatibility Front	HG / IG / PG / EXA-Drive	HG / IG / PG / EXA-Drive	HG / IG / PG / EXA-Drive	HG / IG / EXA-Drive	HG / IG / EXA-Drive
	Compatibility Rear	HG/HG-I/IG/PG/EXA-Drive	HG/HG-I/IG/PG/EXA-Drive	HG/HG-I/IG/PG/EXA-Drive	HG/HG-I/IG/PG/EXA-Drive	HG/HG-I/IG/PG/EXA-Drive
	Max. No. of sprockets	max. 8	max. 8	max. 8	max. 8	max. 8
	Dimension	1/2" x 3/32"	1/2" x 3/32"	1/2" x 3/32"	1/2" x 3/32"	1/2" x 3/32"
Pin	Length	7.1 mm	7.1 mm	6.8 mm	6.9 mm	6.9 mm
Pin	Riveting	Cross Step	Step	Step	Step	Step
Pin	Chrome Hardened	Yes	Yes	Yes		
Pin	Push Power	2000 N / 450 in.lbs.	1500 N / 340 in.lbs.	1500 N / 340 in.lbs.	1100 N / 350 in.lbs.	1100 N / 350 in.lbs.
Pin	Tensile Strength	9800 N / 2200 in.lbs.	9800 N / 2200 in.lbs.	9800 N / 2200 in.lbs.	9800 N / 2200 in.lbs.	9800 N / 2200 in.lbs.
Pin	Weight (116 links)	315 g	315 g	305 g	305 g	305 g
Design	External Pin Plate	Silver / Nickel Plated	Silver / Nickel Plated	Grey / Polished	Grey / Dacromet	Grey / Polished
Design	Internal Pin Plate	Silver / Nickel Plated	Grey / Polished	Black / Burnished	Grey / Dacromet	Brown / Annealed
	Connecting Method	Power Link S or Pin	Power Link S or Pin	Power Link S or Pin	Power Link G or Pin	Power Link G or Pin

POWER CHAINS

		PC 10 Saltshaker	PC 10	PC 7X[1]	PC 1 Saltshaker	PC 1 Ni	PC 1
	Part No.	—	—	—	—	—	—
	Application	MTB	MTB	BMX / Track	Gear Hubs	Gear Hubs	
	Compatibility Front	HG	HG	Single	Single	Single	
	Compatibility Rear	HG	HG	Single	Single	Single	
	Max. No. of sprockets	max. 7	max. 7	1	1	1	
	Dimension	1/2" x 3/32"	1/2" x 3/32"	1/2" x 1/8"	1/2" x 1/8"	1/2" x 1/8"	
Pin	Length	6.9 mm	6.9 mm	8.2 mm	7.8 mm	7.8 mm	
Pin	Riveting	Step	Step	Step	Step	Step	
Pin	Push Power	1000 N / 225 in.lbs.	1000 N / 225 in.lbs.	1500 N / 340 in.lbs.	800 N / 180 in.lbs.	800 N / 180 in.lbs.	
Pin	Tensile Strength	9800 N / 2200 in.lbs.	9800 N / 2200 in.lbs.	11000 N / 2500 in.lbs.	8000 N / 1800 in.lbs.	8000 N / 1800 in.lbs.	
Pin	Weight (116 links)	305 g	305 g	345 g (114 links)	350 g	350 g	
Design	External Pin Plate	Grey / Dacromet	Brown / Annealed	Gold / Gold Plated	Grey / Dacromet	Silver / Nickel Plated	Brown / Annealed
Design	Internal Pin Plate	Grey / Dacromet	Brown / Annealed	Black / Burnished	Grey / Dacromet		
	Connecting Method	Power Link G or Pin	Power Link G or Pin	3 pcs. Connecting Link	Snap Lock or Pin	Snap Lock or Pin	

[1] PC 7X 114 links only

POWER CHAINS
ASSEMBLY / MAINTENANCE



1/2" x 3/32" AND 1/2" x 11/128" (DERAILLEURS / SINGLE AND MULTI-SPEED HUBS)

Chain length:
- Shorten chain to the length specified by the derailleur manufacturer.

SRAM derailleurs:
- Place chain over largest front chainwheel and largest rear sprocket and add 2 links or 1 link + Power Link ***(Fig. 1)***.
- For rear suspension frame, position the rear suspension for the greatest chain length required.

Closing standard version with clamping pin:
- Fit chain, bring the two ends together and press pin ***(Fig. 2)*** through with assembly tool. **The pin must extend by the same amount at both outer plates. It must be possible to move the connecting link slightly.**
- The use of the SRAM assembly plier (Part No. 00 2799 980 001) is recommended for PC 68, PC 58 and PC 48.

Power Link connecting links:
Caution:
Use only as specified, to avoid material damage or the rider to fall off his bicycle resulting in injury.

Power Link G	grey coloured
	for PC 38, PC 10
Power Link S	silver coloured
	for PC 68, PC 58, PC 48
Power Link 9SPD	gold coloured
	for PC 99, PC 89R, PC 69, PC 59, PC 49

Closing:
- Fit chain, bring the ends together and insert both halves of the Power Link into the chain ends. ***(Fig. 3)***
- Press both halves of the Power Link together ***(Fig. 4)*** and lock in place by pulling the chain apart. ***(Fig. 5)***

Opening:
- Press both plates of the Power Link together ***(Fig. 4)*** while sliding the chain ends together (unlock). Remove the two halves of the link from the chain ends.

Caution:
Always use a new Power Link when fitting a new chain. Failure to shorten the chain properly or to lock it exactly into place may cause damage to the chain and eventually total chain failure, material damage or the rider to fall off his bicycle resulting in injury.

PC 1 1/2" x 1/128" (SINGLE AND MULTI-SPEED HUBS)

Closing chain with Snap Lock:
- Fit the shortened chain, bring the ends together and connect with the Snap Lock. Place the outer plate on one pin ***(Fig. 6)***.
- Gently flex the chain until the outside connector plate snaps into position over the second pin ***(Fig. 7)***.

Caution:
- ***Make sure plate is fully seated in the pin channel and plates are parallel to each other.***
- ***If movement of the connector plate is noticed a new Snap Lock must be used.***
- ***Always use a new Snap Lock when fitting a new chain. Failure to shorten the chain properly or to lock it exactly into place may cause damage to the chain and eventually total chain failure, material damage or the rider to fall off his bicycle resulting in injury.***

PC 7X 1/2" x 1/8" (BMX / TRACK)

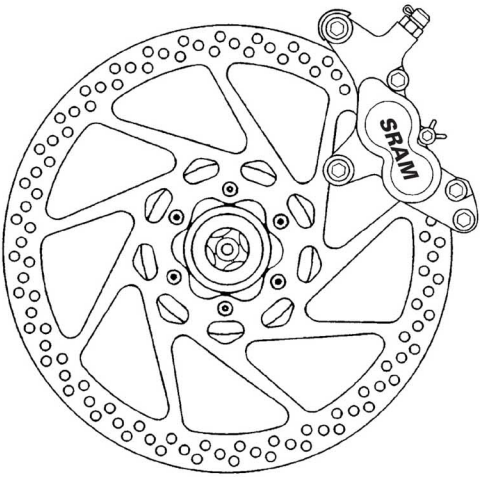
Closing chain:
- Fit the shortened chain, bring the two ends together and connect with the chain lock. The chain lock consists of an outer plate with pins (1, ***Fig. 8***), an outer plate (2) and a retaining spring (3).
- Insert outer plate with pins (1) into the chain ends, attach outer plate (2) and press chain lock together (1+2).
- Attach retaining spring (3) with the closed end of the retaining ring pointing in the direction of chain travel ***(Fig. 9)***.
- Slide retaining spring in the direction of arrow (4, ***Fig. 9)*** to engage it in the grooves in the pins.

MAINTENANCE
- Regular lubrication will extend the chain's service life.
- Apply oil to the chain rollers and allow to work in.
- Clean dirty chains before oiling. Do not use any grease-dissolving or acidic agents. Cleaning agent must be rinsed off after a few minutes with water. Apply oil after chain is completely dried.

9.0 DISC BRAKES
TECHNICAL DATA / ASSEMBLY REQUIREMENTS

Caution:

- ***There is a risk of accident if unsuitable forks or frames are used!***
- ***The combined mass of the bicycle, the rider, and the load shall be max. 125 kg.***
- ***Designed for Cross-Country riding. Not suitable for tandems, tradesmen's delivery bicycles and similar.***
- ***The 9.0 Disc Brakes must go on the left side viewed from behind the rear of the bicycle.***
- ***Exclusively use SRAM 9.0 Disc Brake components, spare parts respectively.***



CALIPER

NEW		Brake Caliper	
	Part No.	—	—
Compatibility	Brake Lever	9.0 Disc Brake	
	Mount Type	International Standard	
	Brake Fluid	DOT 3, DOT 4	
	Pistons	Opposed 4-Pistons, different ø	
Brake line	Material	Stainless, resin coated	
	Length, front	750 mm	
	Length, rear	1400 mm	
	Weight	N/A	
	Material	Aluminum	

LEVER

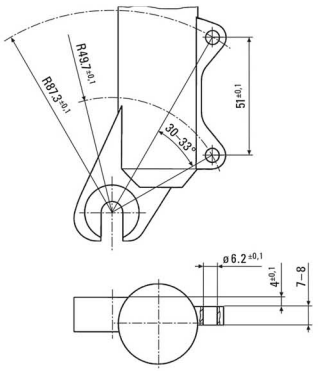
NEW	Brake Lever
Part No.	—
Brake Caliper Compatib.	9.0 Disc Brake
Lever Size	1.5 Finger
Reach Adjust	Yes
Clamping Diameter	22.3mm
Brake Fluid	DOT 3, DOT 4
Piston Diameter	Front Lever: ø 9 mm / Rear Lever: ø 10 mm
Brake Line — Material	Stainless, resin coated
Brake Line — Length, front	750 mm
Brake Line — Length, rear	1400 mm
Brake Line — Weight	N/A
Finish — Brake Lever	Aluminum
Finish — Housing	Aluminum

DISC

NEW	Brake Disc
Part No.	—
Compatibility — Brake Caliper	9.0 Disc Brake
Compatibility — Hub	see next page, figure 3
Outer Diameter, front	160 mm, 180 mm, 185 mm for Post Mount (Manitou) Fork
Outer Diameter, rear	160 mm
Weight	N/A

9.0 DISC BRAKES
TECHNICAL DATA / ASSEMBLY REQUIREMENTS

1

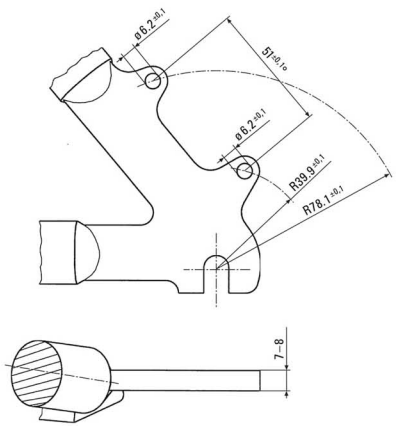


FRONT FORK REQUIREMENTS

Strength:
The strength must be such that with a maximum torque of 300 Nm (2700 in.lbs.) on the wheel no residual deformation can occur on the front fork.

Dimensions:
Important dimensions for front forks are shown in ***Fig. 1***.
Fork dropouts must be parallel.

2



REAR FRAME REQUIREMENTS

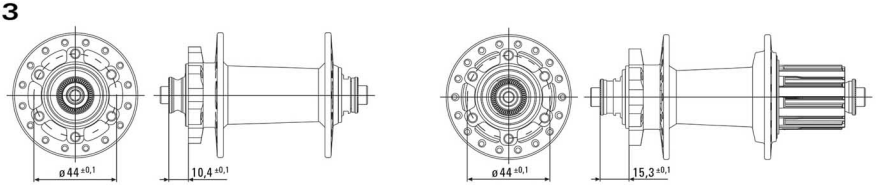
Strength:
The strength must be such that with a maximum torque of 250 Nm (2200 in.lbs.) on the rear wheel no residual deformation can occur on the rear structure.

Dimensions:
Important dimensions for rear frames are shown in ***Fig. 2***.
Rear fork dropouts must be parallel.

HUB DIMENSIONS

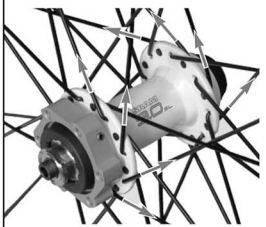
see Figure 3

3



9.0 DISC BRAKES ASSEMBLY

1



2



3



LACING THE WHEEL

While braking with Disc Brakes, high energies are applied to the spokes. Therefore the spokes must be aligned according to the pictures.

Caution:
At least 3 spoke crossings (no radial alignment of the spokes!)

Front Wheel *(Fig. 1):*
The heads of the spokes, which are under pulling tension while in braking mode, should be located inwards of the spoke flanges.

Rear wheel:
Drive side ***(Fig. 2):***
The heads of the spokes, which are under pulling tension while in drive mode, should be located inwards of the spoke flange.

Brake side ***(Fig. 3):***
The heads of the spokes, which are under pulling tension while in braking mode, should be located inwards of the spoke flange.

ASSEMBLY DISC

- Put the brake disc onto the hub of the wheel. Pay attention to the direction of rotation of the disc ***(Fig. 4)***.
- Mount the brake disc with the pertaining screws crosswise and at a torque of 5 – 7 Nm (44 – 62 in.lbs).
- Mount the wheel to the frame or fork and tighten it.

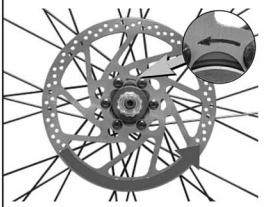
ASSEMBLY BRAKE LEVER

- Mount the brake lever at the handlebar and tighten both screws (1, ***Fig. 5)*** equably with a torque of 7 – 11 Nm (62 – 97 in.lbs.).

Advice:
- ***Ensure that the compensation tank is aligned preferably horizontally.***
- ***If the brake lever and the gear shifter interfere with each other, then this must be corrected.***

Caution:
- ***The brake levers are designed for use with front or rear wheel brake.***
- ***Only use the brake levers according to the marking on the bottom side of the housings.***
  "9" = for front wheel brake
  "10" = for rear wheel brake

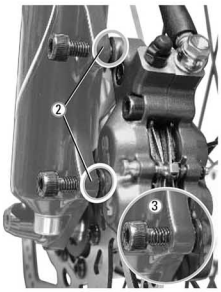
4



5



6



7



ASSEMBLY BRAKE CALIPER

- Insert the wheel.

Caution:
The front wheel quick-release lever must be mounted, so that the lever is not on the brake side.

- Remove the red brake pad spacer and insert the brake caliper onto the brake disc of the wheel.
- Hold the brake caliper to the receptacle (2, ***Fig. 6)***. By hand, turn the fastening screws (3) only 2 – 3 threads.
- Pull the brake lever and hold it at high tension. The brake caliper will be centered. Check the distances between brake caliper and receptacle ***(Fig. 7)***. You can choose the necessary spacing washers.
- Insert the spacing washers ***(Fig. 8)*** and tighten the screws. Torque of the screws: 10 – 12 Nm (90 – 106 in.lbs.).
- Pull the brake lever once and check if the wheel turns freely.
- If necessary, repeat the centering.

Advice:
If the end of the screw is too close to the brake disc, insert a 2 mm washer directly under the screw head (Fig. 9).

- Mount the brake line starting from the brake caliper towards the frame or fork.

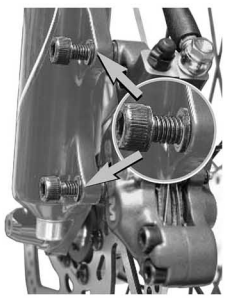
Caution:
The line may not be bent nor squeezed.
- ***Ensure that the line will not be touched by the pedals or by the wheels.***
- ***The bends of the brake line in front of the handlebars must be large enough to allow a complete turn of the handlebar.***

Caution:
Before each journey, ensure that all parts of the brake system are functioning correctly.

8



9

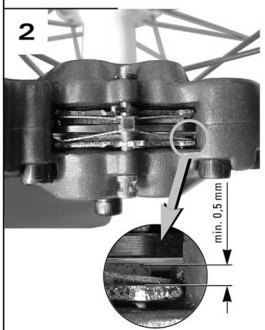


9.0 DISC BRAKES MAINTENANCE

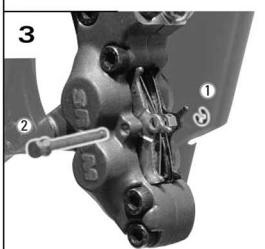
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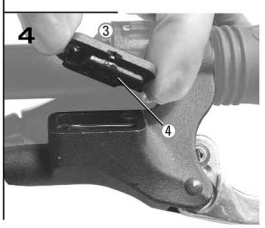
2



3



4



BRAKE LEVER REACH ADJUSTMENT

Use a 2 mm inner hexagon wrench (Allen Wrench) ***(Fig. 1)*** to adjust the brake lever by:

- Turning the gear limit screw clockwise to increase lever reach.
- Turning the gear limit screw counter-clockwise to reduce lever reach.

CHECKING THE BRAKE LINING

Advice:
With the 9.0 Disc Brake System, the brake pads are automatically adjusted with increasing wear.

Caution:
- ***The thickness of the brake lining should be checked regularly.***
- ***The brake pad must be replaced, if the thickness is below 0.5 mm or if the brake pad spring touches the brake disc (Fig. 2).***
- To exchange the brake pads, the wheel must be removed.
- Take off the snap ring (1, ***Fig. 3)*** and remove the bolt (2).
- Remove the old brake pads and the brake pad spring from the brake caliper.
  Advice:
  Never activate the brake lever with the wheel removed or with the brake pads removed.
- Clean the pistons and the surrounding surfaces.
  Caution:
  Do not turn the pistons while doing so! To clean, only use soap water or a dry cloth. Do not use brake cleaning fluids or mediums to avoid braking noises.
- Remove the lid (3, ***Fig. 4)*** with the membrane (4) of the compensation tank at the brake lever.
- Carefully push the pistons back without turning or damaging them.
  Caution:
  While doing so, brake fluid can flow out of the compensation tank.
  Handling of brake fluid:
  - ***Spilled brake fluid must be removed immediately to avoid damages.***
  - ***Wear safety glasses. Use safety gloves. Contact with brake fluid can lead to severe damages.***
  - ***In the case of brake fluid getting into your eyes, rinse thoroughly with water and consult a doctor immediately.***
  - ***In the case of brake fluid getting onto your skin, the pertaining skin must be cleaned with soap and water.***
- Insert the new brake pads and the brake pad spring. The friction surfaces must face the brake disc.
- Install the bolt (2, ***Fig. 3)*** and secure it with the snap ring (1).
- Install the red plastic brake pad spacer ***(Fig. 5)*** (if no longer available, install the wheel).
- Operate the brake lever slowly several times to check, if the brake functions correctly and if it shows a hard pressure point. If the response is still poor, the brake system must be bled. Refer to MAINTENANCE AND CARE – BLEEDING THE BRAKE SYSTEM.
- Remove the red brake pad spacer and install the wheel.
- Check the brake fluid level and, if necessary, fill the container to the point that no brake fluid will flow over the container while installing the lid.
  Caution:
  Only use new type DOT3 or DOT4 brake fluid from a hermetically sealed container.
- At the brake lever, install the lid with the membrane onto the compensation tank ***(Fig. 4)***.
  Torque of the screws: 0.3 – 0.8 Nm (2.7 – 7 in.lbs.).

5



9.0 DISC BRAKES MAINTENANCE

6



7



8



9



BLEEDING THE BRAKE SYSTEM

Caution:

- ***Only use new type DOT3 or DOT4 brake fluid from a hermetically sealed container.***
- ***While bleeding, refill new brake fluid adequately into the compensation tank in such a way that no air bubbles can reach the system.***

- Ensure that the compensation tank at the brake lever is aligned horizontally.
- At the brake lever, remove the lid (1, ***Fig. 6)*** with the membrane (2) from the compensation tank.
- At the brake caliper, insert the transparent flexible tubing onto the bleeding screw and place the other end into a suitable container ***(Fig. 6)***.
- Slowly pull the brake lever several times and hold it close to the handlebar.
- In this position, slightly open the bleeding screw (3, ***Fig. 8)***. Brake fluid and air bubbles flow through the flexible tubing.
- Tighten the bleeding screw again and release the brake lever.
- Repeat this process until the brake fluid flows without bubbles.
- Tighten the bleeding screw (3, ***Fig. 8)*** and remove the flexible tubing. Mount the covering cap (4) onto the bleeding screw.
- Fill the compensation tank to the point that no brake fluid will flow over the container while installing the lid.
- At the brake lever, install the lid with the membrane onto the compensation tank. Torque of the screws: 0.3 – 0.8 Nm (2.7 – 7 in.lbs.).

CLEANING

Advice:

- ***The Disc Brake components are well protected against external environmental factors. High-pressure water for cleaning (e.g. high pressure cleaner or water jet) should not be used to avoid malfunctions due to penetrating water (Fig. 9).***
- ***During the winter season, the bicycle should be cleaned more frequently to avoid any damages caused by de-icing salt.***
- ***Do not use aggressive detergents.***
- ***Do not use brake cleaning solutions or mediums to avoid braking noises.***

TROUBLESHOOTING

Problem	Cause	Remedy
The lever produces no effect when moved towards the handlebar	Incorrect bleeding	Repeat bleeding
	Leak in the system	Check for leaks
The disk rubs against the pads	The caliper is not properly centred on the disk.	Centre caliper once again
	Incorrect span (protruding piston)	Push the piston into the right position
	Bent disc	Replace disc
Limited braking power	Dirty disc	Clean disc with alcohol
	Worn pads	Replace pads
Fluid leaks	Leak in the fitting	Tighten the brake line nut or replace the sealing
	Leak in the brake line	Replace brake line
	Caliper bleed screw loose	Tighten the caliper bleed screw

9.0 / 7.0 / 5.0 LINEAR PULL BRAKES
TECHNICAL DATA / ASSEMBLY REQUIREMENTS

- Low Flex Truss Arm Design
- Forged Alloy Arms
- Brakecrawler Seal Quick Release
- Easy Adjust Spring Tension
- Single Bolt Pad Adjustment

9.0

		9.0			
	Part No.	—	—	—	—
	Brake	Front	Rear	Front	Rear
	Brake Type	Linear Pull			
	Washer Setup	Inside Thick		Inside Thin	
	Brake Shoe	Cartridge		Cartridge	
	Pad Post Type	Threaded		Threaded	
	Brake Boss Bolt Length	16 mm	25 mm	16 mm	25 mm
	Weight	N/A			
Design	Arm	Forged AL / Anodized		←	
Design	Pad Holder	Forged AL / Anodized		←	

7.0

		7.0			
	Part No.	—	—	—	—
	Brake	Front	Rear	Front	Rear
	Brake Type	Linear Pull			
	Washer Setup	Inside Thick		Inside Thin	
	Brake Shoe	Low Profile – 70 mm		Low Profile – 70 mm	
	Pad Post Type	Threaded		Threaded	
	Brake Boss Bolt Length	16 mm	25 mm	16 mm	25 mm
	Weight	N/A			
Design	Arm	Forged AL / Anodized		←	
Design	Pad Holder	Steel		←	

5.0

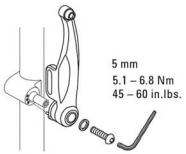
		5.0			
	Part No.	—	—	—	—
	Brake	Front	Rear	Front	Rear
	Brake Type	Linear Pull			
	Washer Setup	Inside Thick		Inside Thin	
	Brake Shoe	Low Profile – 60 mm		Low Profile – 60 mm	
	Pad Post Type	Threaded		Threaded	
	Brake Boss Bolt Length	16 mm	25 mm	16 mm	25 mm
	Weight	198 g			
Design	Arm	Forged AL / Anodized		←	
Design	Pad Holder	Steel		←	

CABLE HOUSING

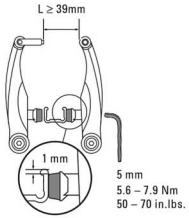
- Use only new brake cable and cable housing.
- When choosing cable housing lengths, be sure to allow enough housing for an extreme turn of the handlebars in both directions.
- Note also, that different stem lengths and cable stop positions effects cable housing length.

9.0 / 7.0 / 5.0 LINEAR PULL BRAKES ASSEMBLY

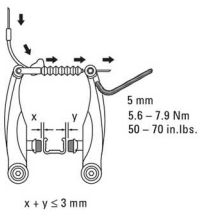
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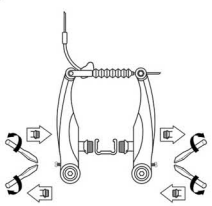
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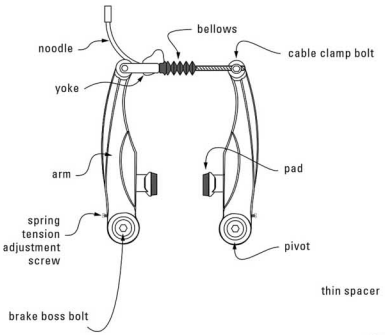
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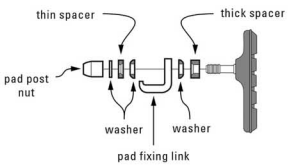


4



LINEAR PULL BRAKE ANATOMY





INSTALLATION

(5.0 Linear-Pull Brakes only:
Do not remove the plastic 'plug' in the pivot. The plug will pop free when the arm is installed onto the brake boss. You may discard the plug!)

- Slide the right linear-pull brake arm ***(Fig. 1)*** onto the right brake boss.
- Align the stopper pin with the center-spring hole.
- Using a 5 mm hex wrench, tighten the brake boss bolt to 5.1–6.8 Nm (45–60 in.lbs.).
- Repeat the former 3 steps for the left arm.
- Arrange the thick and thin spacers – for each pad – so when the pads are pushed against the rim, **L** is at least 39 mm ***(Fig. 2)***.

Caution:
Too small dimension L will not allow the brake pads to come into full contact with the rims. The brakes will not work.

- Hold one pad against the rim using the arm ***(Fig. 2)***.
- Using a 5 mm hex wrench, tighten the pad post nut to 5.6 – 7.9 Nm (50 – 70 in.lbs.).
- Repeat the former 2 steps for the other pad.

Be sure to leave about 1 mm between the top of the brake pad and the top of the rim! (Fig. 2)
Use only new brake cable and cable housing.

- Run the brake cable through the noodle and the bellows ***(Fig. 3)***.
- Using a 5 mm hex wrench, tighten the cable clamp bolt to 5.6 – 7.9 Nm (50 – 70 in.lbs.).
  Leave a total clearance of 3mm (maximum) between the brake pads and the rim!
- Using a small screw driver, turn the spring tension adjustment screws to balance the arms and equalize the pad offsets ***(Fig. 4)***.
  – turn the spring tension adjustment screw clockwise to pull the pad away from the rim.
  – turn the spring tension adjustment screw counterclockwise to push the pad closer to the rim.
- Pull each brake lever – hard – at least 5 – 10 times.

Caution:
Check that all the brake system components are functioning properly!

9.0 / 7.0 / 5.0 BRAKE LEVERS
TECHNICAL DATA / ASSEMBLY REQUIREMENTS

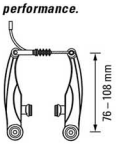
		9.0		7.0	
	Part No.	—	—	—	
	Brake Lever	Left	Right	Left	Right
	Lever Size	2.5 Finger	←	2.5 Finger	
	Brake Compatibility	i-Brake/Linear Pull/Cable Actuated Disc		i-Brake/Linear Pull/Cable Actuated Disc	
	Leverage Adjust	Infinite Adjust	←	3 Position	
	Cable Pull	N/A	←	26.0/24.3/22.4	
	Pivot Bushing	I-Glide	←	Acetal	
	Reach Adjust	Yes	Yes	Yes	Yes
	Barrel Adjuster	Indexing	Indexing	Lock Ring	Lock Ring
	Clamping Diameter	22.3 mm	22.3 mm	22.3 mm	22.3 mm
	Weight	77 g	77 g	70 g	70 g
Design	Housing	Grilon Composite	←	Grilon Composite	←
Design	Lever	Grilon Composite	←	Grilon Composite	←

9.0 / 7.0

		5.0	
	Part No.	—	—
	Brake Lever	Left	Right
	Lever Size	2.5 Finger	←
	Brake Compatibility	i-Brake/Linear Pull	←
	Leverage Adjust	Single Position	←
	Cable Pull	N/A	←
	Pivot Bushing	Acetal	←
	Reach Adjust	Yes	Yes
	Barrel Adjuster	Lock Ring	Lock Ring
	Clamping Diameter	22.3 mm	22.3 mm
	Weight	80 g	80 g
Design	Housing	Grilon Composite	←
Design	Lever	Grilon Composite	←

5.0

Caution:
SRAM Brake Levers are designed for use with i-Brakes and linear-pull brakes. Do not use SRAM Brake Levers with conventional cantilever brakes (those with arms measuring less than 76 mm and utilizing a non-linear straddle cable). Use of SRAM Brake Levers with conventional cantilever brakesets, drum brakes or roller brakes will result in faulty braking performance.



Designed for use with linear-pull brakes.

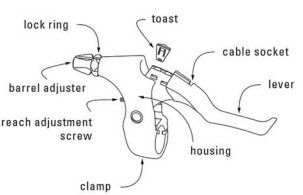


Do not use conventional cantilever brakes.

CABLE HOUSING

- Use only new brake cable and cable housing.
- When choosing cable housing lengths, be sure to allow enough housing for an extreme turn of the handlebars in both directions.
- Note also, that different stem lengths and cable stop positions effects cable housing length.

7.0 BRAKE LEVER ANATOMY

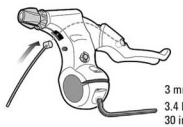


9.0 / 7.0 / 5.0 BRAKE LEVERS ASSEMBLY / MAINTENANCE

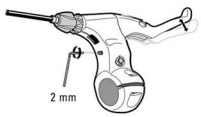
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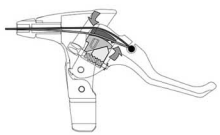
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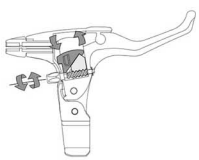
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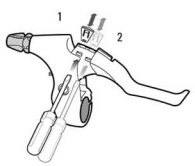
4



5



6



INSTALLATION

- When sliding the brake lever onto the handlebar, allow enough room for the shifter, the handlebar grip, and the bar end.
- Using a 3 mm hex wrench, tighten the clamp bolt to 3.4 Nm (30 in.lbs.) ***(Fig. 1/2)***. ***Be careful not to over tighten!***
- Line up the barrel adjuster, the lock ring, and the brake lever housing cable slots.
- Pull on the lever and push the brake cable head through the opening in the brake lever housing ***(Fig. 2)***. ***Use only new cable and cable housing.***
- Install the brake cable head into the cable socket in the lever.
- Set up the brakes and brake pads per brake instructions.
- Actuate each brake lever 5 – 10 times.

Caution:
Check that all the brake system components are functioning properly!

REACH ADJUSTMENT

Using a 2 mm hex wrench ***(Fig. 3)***:

- Turn the reach adjustment screw clockwise to bring the lever closer to the handlebars.
- Turn the screw counterclockwise to move the lever further away.

Caution:
Do NOT turn the screw past flush with the housing!
After any adjustment to the reach always check the brake cable tension to ensure proper brake system performance. Readjust the cable tension if necessary.

LEVERAGE ADJUSTMENT

9.0 Brake Levers only:
To view the leverage setting ***(Fig. 4)***: Pull the brake lever toward the handlebar to expose the leverage indication window from under the housing. The position of the red indicator shows the brake leverage settings.

- The **+** sign indicates the highest leverage. Moving the adjuster toward this position increases system leverage. This position has the greatest stopping power for a given amount effort.
- The **-** sign indicates the lowest leverage. Moving the adjuster toward this position decreases system leverage. This position is the standard configuration for most braking conditions.

To adjust the leverage setting ***(Fig. 5)***: Use the Control Cam adjuster knob to fine-tune the feel of your levers. The adjuster knob may be positioned at **+**, **-** or anywhere in between ...

- Turn the adjuster knob **counter clockwise** to **increase** leverage. This adjustment moves the red indicator toward the **+** sign and gives increased leverage and increased stopping power.
- Turn the adjuster knob **clockwise** to **decrease** leverage. This adjusment moves the red indicator toward the **-** sign and returns the lever to standard leverage and standard stopping power.

There is positive stop at both ends of the leverage adjustment. Use only hand force to adjust the knob. Do not force the adjustment knob past these stops!

7.0 Brake Levers only *(Fig. 6)*:

- STANDARD LEVERAGE OPTION – The brake lever is packaged with the toast installed in position 1. This option is the standard configuration for most braking conditions.
- MID LEVERAGE OPTION – Moving the toast to position 2 gives you greater brake system leverage. This option increases your stopping power for a given amount of effort.
- HIGH LEVERAGE OPTION – Removing the toast results in the highest brake system leverage. This option has the greatest stopping power for a given amount of effort.

Removing the toast:
1. Remove the brake cable.
2. Insert a small screw driver into the adjuster window.
3. Depress the tab and push the toast out.

Installing the toast:

- Remove the brake cable.
- Determine which option fits your riding needs.
- Align the runner on the toast with the curved track in the lever.
- Press the toast into the slot until it clicks.

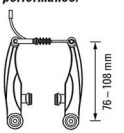
Caution:
After any adjustment to the reach or leverage, always check the brake cable tension to insure proper brake system performance. Readjust the cable tension if necessary.

TWO-AXIS BRAKE LEVER
TECHNICAL DATA / ASSEMBLY REQUIREMENTS

TWO-AXIS

		Two-Axis	
	Part No.	—	—
	Brake Lever	Left	Right
	Lever Size	4 Finger	←
	Brake Compatibility	i-Brake / Linear Pull	←
	Leverage Adjust	Single Position	←
	Cable Pull	28 mm	←
	Pivot Bushing	I-Glide	←
	Reach Adjust	Yes	Yes
	Barrel Adjuster	Ergonomic Indexing	Ergonomic Indexing
	Clamping Diameter	22.3 mm	22.3 mm
	Weight	155 g	155 g
Design	Housing	Grilon Composite	←
	Lever	Forged Aluminum	←

Caution:
SRAM Brake Levers are designed for use with i-Brakes and linear-pull brakes. Do not use SRAM Brake Levers with conventional cantilever brakes (those with arms measuring less than 76 mm and utilizing a non-linear straddle cable). Use of SRAM Brake Levers with conventional cantilever brakesets, drum brakes or roller brakes will result in faulty braking performance.



Designed for use with linear-pull brakes.

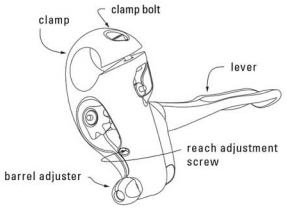

Do not use conventional cantilever brakes.

CABLE HOUSING

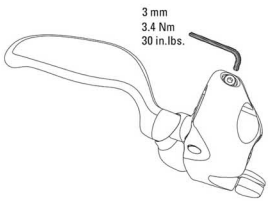
- Use only new brake cable and cable housing.
- When choosing cable housing lengths, be sure to allow enough housing for an extreme turn of the handlebars in both directions.
- Note also, that different stem lengths and cable stop positions effects cable housing length.

TWO-AXIS BRAKE LEVER ASSEMBLY / MAINTENANCE

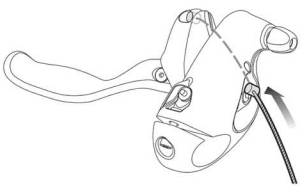
BRAKE LEVER ANATOMY



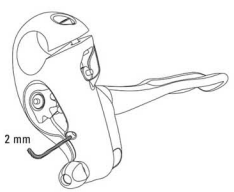
1



2



3



INSTALLATION

- When sliding the brake lever onto the handlebar, allow enough room for the shifter, the handlebar grip, and the bar end.
- Using a 3 mm hex wrench, tighten the clamp bolt to 3.4 Nm (30 in.lbs.) ***(Fig. 1)***. ***Be careful not to over tighten!***
- Line up the barrel adjuster and the brake lever housing cable slots.
- Pull on the lever and push the brake cable head through the opening in the brake lever housing ***(Fig. 2)***.
- Install the brake cable head into the cable socket in the lever.
- Set up the brakes and brake pads per brake instructions.
- Actuate each brake lever 5 – 10 times.

Caution:
Check that all the brake system components are functioning properly!

REACH ADJUSTMENT

Using a 2 mm hex wrench ***(Fig. 3)***:

- Turn the reach adjustment screw clockwise to bring the lever closer to the handlebars.
- Turn the screw counterclockwise to move the lever further away.

Caution:
After any adjustment to the reach always check the brake cable tension to ensure proper brake system performance. Readjust the cable tension if necessary.

SMARTBAR
TECHNICAL DATA / ASSEMBLY REQUIREMENTS

- New Style
- ErgoFit – allows for height, reach, and rise adjustment
- ErgoFunction – improved control, enhanced ergonomics and safety
- Upgradeable – full suite of integrated accessories



QUILL

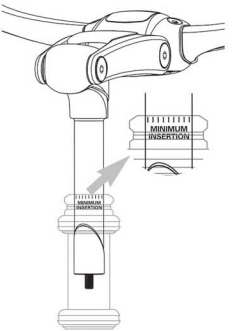
		SmartBar Quill Stem							
	Part No.	—	—	—	—	—	—	—	—
	Stem diameter 1"	●	●	●	●				
	Stem diameter 1 1/8"					●	●	●	●
Shifter	Rear, 9spd	●	●			●	●		
Shifter	Rear, 8spd			●	●			●	●
Shifter	Front, Micro Adjust	●		●		●		●	
Shifter	Front, Index		●		●		●		●

CLAMP

		SmartBar Clamp-On Stem							
	Part No.	—	—	—	—	—	—	—	—
	Stem diameter 1"	●	●	●	●				
	Stem diameter 1 1/8"					●	●	●	●
Shifter	Rear, 9spd	●	●			●	●		
Shifter	Rear, 8spd			●	●			●	●
Shifter	Front, Micro Adjust	●		●		●		●	
Shifter	Front, Index		●		●		●		●

SMARTBAR
ASSEMBLY ERGOFIT STEM (QUILL STEM)

1

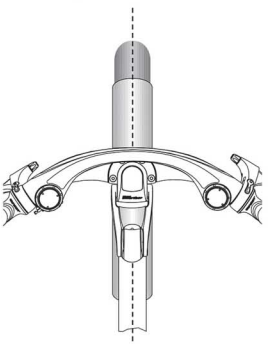


Caution:
The SmartBar requires a knowledgeable and trained bicycle mechanic for proper installation and adjustment.
To ensure rider safety, all stem adjustments should be made by a trained mechanic using a calibrated torque wrench to verify required tightening torque.

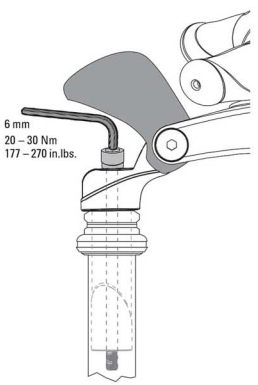
- Lightly grease the outside of the stem quill tube below the MINIMUM INSERTION mark before assembly.
- Slide the stem into the steerer tube of the front fork making sure that it is inserted past the "MINIMUM INSERTION" mark on the stem quill ***(Fig. 1)***.
- Align the SmartBar assembly so that the stem centerline is in line with the centerline of the front wheel ***(Fig. 2)***.
- Rotate the elastomer quill cover upward to allow access to the 6 mm hex wedge bolt ***(Fig. 3)***.
- Tighten the 6 mm hex wedge bolt to 20 – 30 Nm (177 – 270 in.lbs).

Caution:
- ***Always check that the stem cannot slip up/down or rotate in/on the steerer tube when the handlebars are turned.***
- ***If the handlebars can be turned so that the stem does not line up with the front wheel, check and re-tighten the hex wedge bolt.***
- ***Re-tighten and check again for proper attachment and operation!***

2

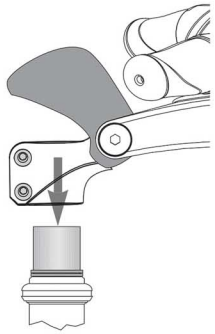


3

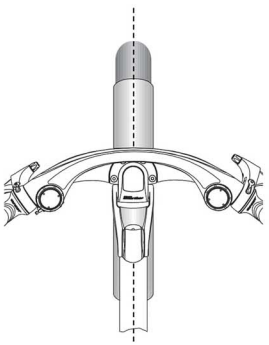


SMARTBAR
ASSEMBLY ERGOFIT STEM (CLAMP-ON STEM)

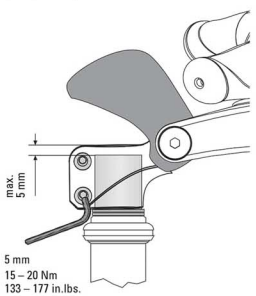
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6



Caution:
The SmartBar requires a knowledgeable and trained bicycle mechanic for proper installation and adjustment.
To ensure rider safety, all stem adjustments should be made by a trained mechanic using a calibrated torque wrench to verify required tightening torque.

- Make sure that there is at least 37 mm of threadless steerer tube above the headset (and spacers) for clamping the stem.

Advice:
Use several headset spacers between the headset and stem to allow for more height adjustment.

- Slide the stem over the steerer tube of the front fork ***(Fig. 4)***.

- Make sure that the top of the stem clamp is no more than 5 mm above the top of the steerer tube ***(Fig. 6)***.

- Align the SmartBar assembly so that the stem centerline is in line with the centerline of the front wheel ***(Fig. 5)***.

- Rotate the elastomer quill cover upward to allow installation of the headset top cap and access to the two 5 mm hex clamp bolts ***(Fig. 6)***.

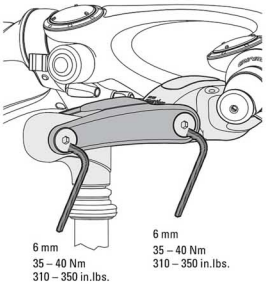
Advice:
Adjust the headset bearings and top cap tension following the headset manufacturers' recommendations.

- Tighten the two 5 mm hex clamp bolts to 15 – 20 Nm (133 – 177 in.lbs) ***(Fig. 6)***.

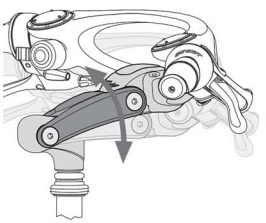
Caution:
- ***Always check that the stem cannot slip up/down or rotate in/on the steerer tube when the handlebars are turned.***
- ***If the handlebars can be turned so that the stem does not line up with the front wheel, check and re-tighten the hex clamp bolts.***
- ***Re-tighten and check again for proper attachment and operation!***

SMARTBAR
ADJUSTMENT ERGOFIT STEM (REACH ADJUSTMENT)

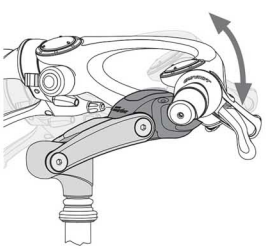
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8



9



The ErgoFit stem has two rotating adjustment bolts and a "Flip-Flop" design that allow for a very wide range of adjustments.

FORE-AFT POSITION

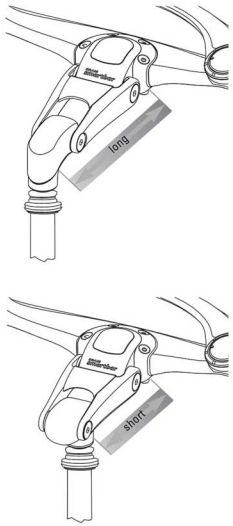
- To fine-tune the fore-aft position of the handgrips adjust the Ergo-Fit rotation adjustments ***(Fig. 7)***.
- Loosen the two 6 mm hex adjustment bolts just enough that the links can be rotated freely.
- Rotate the main structure and links forward and down or backward and up until the desired fore-aft position is achieved. Choose any one of the locking positions that are evenly spaced in 15-degree increments ***(Fig. 8)***.
- Tighten the 6 mm hex **rear** adjustment bolt just enough to hold the desired position.
- Rotate the main structure and grips so that lower flat section of the main structure is nearly level with the ground and the gear indicators are clearly visible from the riding position. Locking positions are evenly spaced in 15-degree increments ***(Fig. 9)***.
- Tighten the 6 mm hex **front** adjustment bolt to 35 – 40 Nm (310 – 350 in.lbs) ***(Fig. 7)***.
- Tighten the 6 mm hex **rear** adjustment bolt to 35 – 40 Nm (310 – 350 in.lbs).

Caution:

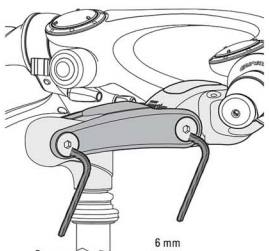
- ***Always check that the stem rotation adjustments cannot be rotated up or down after tightening.***
- ***If the handlebars can be moved up or down or rotated forward or backward after tightening the adjustment bolts, check and re-tighten both the adjustment bolts making sure that they are in one of the locking positions.***
- ***Re-tighten and check again for proper attachment and operation!***

SMARTBAR
ADJUSTMENT ERGOFIT STEM (REACH ADJUSTMENT)

10



11



FLIP-FLOP POSITION

- To make a large change to the fore-aft position adjust the "Flip-Flop" position to **long** or **short** adjustment ***(Fig. 10)***:
- Loosen the 6 mm hex wedge bolt or the two 5 mm hex clamp bolts to allow the stem to rotate freely on the steerer tube ***(Fig. 3 / Fig. 6)***.
- Loosen the two 6 mm hex adjustment bolts just enough that the links can be rotated freely ***(Fig. 11)***.
- Loosen the 6 mm hex **rear** adjustment bolt and **remove** the bolt completely.

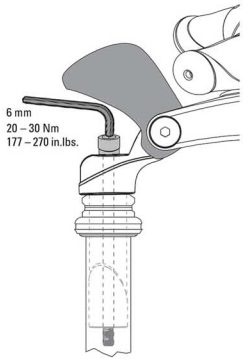
Advice:
You will have to support the main structure while you make this change.

- Change the Flip-Flop stem quill or stem clamp 180 degrees to the desired short or long position.
- Re-insert the 6 mm hex **rear** adjustment bolt and tighten just enough to hold the desired position.
- Follow the prior instructions to fine-tune the fore-aft position.
- Tighten the 6 mm hex **front** adjustment bolt to 35 – 40 Nm (310 – 350 in.lbs).
- Tighten the 6 mm hex **rear** adjustment bolt to 35 – 40 Nm (310 – 350 in.lbs).
- Align the SmartBar assembly so that the stem centerline is in line with the centerline of the front wheel ***(Fig. 2 / Fig. 5)***.
- Quill stem: Tighten the 6 mm hex wedge bolt to 20 – 30 Nm (177 – 270 in.lbs) ***(Fig. 3)***.
- Clamp-On stem: Tighten the two 5 mm hex clamp bolts to 15 – 20 Nm (133 – 177 in.lbs) ***(Fig. 6)***.

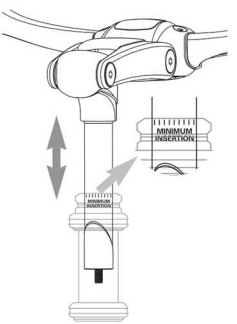
Caution:
- ***Always check that the stem rotation adjustments cannot be rotated up or down after tightening.***
- ***If the handlebars can be moved up or down or rotated forward or backward after tightening the adjustment bolts, check and re-tighten both the adjustment bolts making sure that they are in one of the locking positions.***
- ***Re-tighten and check again for proper attachment and operation!***

SMARTBAR
ADJUSTMENT ERGOFIT STEM (HEIGHT ADJUSTMENT)

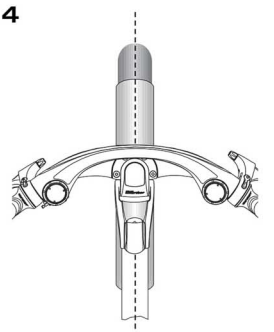
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13



14



To fine tune the up-down position of the handgrips of a quillstem SmartBar adjust the stem up or down on the steerer tube.

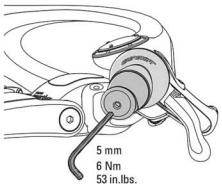
- Loosen the 6 mm hex wedge bolt ***(Fig. 12)***.
- Move the stem to the desired position up or down making sure that it is inserted past the "MINIMUM INSERTION" mark on the stem quill ***(Fig. 13)***.
- Align the SmartBar assembly so that the stem centerline is in line with the centerline of the front wheel ***(Fig. 14)***.
- Tighten the 6 mm hex wedge bolt to 20 – 30 Nm (177 – 270 in.lbs) ***(Fig. 12)***.

Caution:

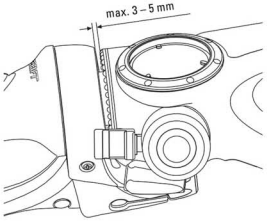
- ***Always check that the stem cannot slip up/ down or rotate in/on the steerer tube when the handlebars are turned.***
- ***If the handlebars can be turned so that the stem does not line up with the front wheel, check and re-tighten the hex wedge bolt or hex clamp bolts.***
- ***Re-tighten and check again for proper attachment and operation!***

SMARTBAR
ADJUSTMENT CONTROL POD

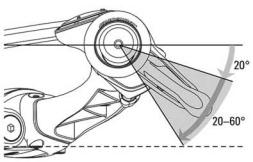
15



16



17



Verify that the rotational position of the brake levers is desired as assembled.

If no position change is required:

- Insert a 5 mm hex wrench into the hole in the end of the handgrip. Tighten the 5 mm hex bolt to 6 Nm (53 in.lbs) ***(Fig. 15)***.

If a different position is desired:

- Insert a 5 mm hex wrench into the hole in the end of the handgrip ***(Fig. 15)***. Loosen the bolt five complete turns. This is enough to allow the control pod to be pulled a few millimeters away from the main structure without disassembly of the control pod unit.

Caution:
Do NOT disassemble the control pod!
The gear indication cables are set at the factory, and improper disassembly will damage the gear indication cables and function.

- Pull the control pod slightly away (3 – 5 mm) from the main structure and rotate to the desired position ***(Fig. 16)***.

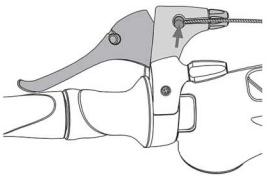
Caution:

- ***Do NOT rotate the control pod assembly outside of the allowed adjustment range of 20 – 60 degrees down from horizontal (Fig. 17)!***
- ***Rotating the pods beyond their allowed adjustment range will damage the gear indication cables and function.***

- The pods can be adjusted in increments of 10 degrees within the range of 20 – 60 degrees down from horizontal.
- Once desired position is determined tighten the 5 mm hex bolt to 6 Nm (53 in.lbs) ***(Fig. 15)***.

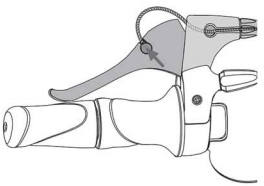
SMARTBAR
ASSEMBLY BRAKE CABLE

18



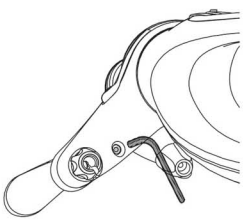
- Line up the barrel adjuster with the slot in the underside of the control pod housing.
- Pull on the brake lever and push the cable head through the opening in the brake lever housing ***(Fig. 18)***.
  Use only new cable and housing.
- Install the cable head into the cable socket in the brake lever ***(Fig. 19)***.
- Set up the brakes and brake pads per brake instructions.
- Actuate each brake lever 5 – 10 times and ensure proper operation.

19



SMARTBAR
BRAKE LEVER REACH ADJUSTMENT

20



Using a 2 mm hex wrench.

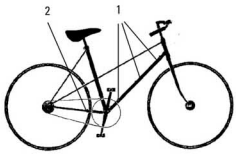
- Turn the reach adjustment screw clockwise to bring the lever closer to the handgrip ***(Fig. 20)***.
- Turn the screw counterclockwise to move the lever further away.
- Actuate each brake lever 5 – 10 times and ensure proper operation.

Caution:

- ***Do NOT force the screw past its normal stop!***
- ***After any adjustment to the reach always check the brake cable tension to ensure proper brake system performance.***
- ***Readjust the cable tension if necessary.***

SMARTBAR
ASSEMBLY SHIFTER CABLE INSTALLATION

21



24spd and 27spd ESP systems

- Feed the cable through the cable housing and stops.
- Attach the cable to the derailleur. Use only new cable and housing.
- Adjust indexing per derailleur instructions.

7 Speed Spectro Gearhubsystems

- The cable, housing and Clickbox are pre-assembled at the factory.

Advice:
When fitting the cable avoid small radius.

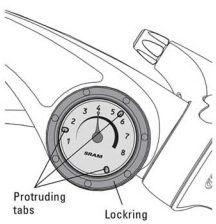
- See figure for cable attachment points (1, ***Fig. 21)***.
- Last attachment point is on the lower rear wheel fork (2, ***Fig. 21)*** immediately behind the chain wheel.

Advice:
Cable housing must be movable inside attachment.

- CLICKBOX INSTALLATION AND ADJUSTMENT per Technical Manual / Spectro S7.

SMARTBAR
ADJUSTMENT GEAR INDICATION

22



Caution:
Do NOT disassemble the gear indication display!

The gear indicators and cables are set at the factory and improper disassembly will damage the gear indication and its function. In the event of external damage or adjustment problems not solved by the following procedures, please call technical service for detailed repair instructions.

- Check all gears are shifting well, shift the derailleur or internal gear hub into the middle gear:

  Gear 4 = middle gear for 7spd internal hub

  Gear 4 = 4th largest sprocket on 8spd cassette

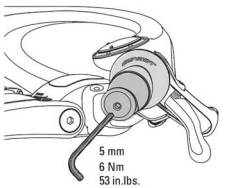
  Gear 5 = 5th largest sprocket on 9spd cassette

  Gear 2 = middle chainring for front derailleurs with triple chainrings (left side gear indication).

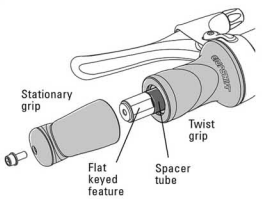
- While holding the lockring stationary turn the clear gear indication dome until the middle gear number is exactly lined up with the gear indicator needle.
- Use the three protruding tabs on the clear gear indication dome to turn the dome and the gear display beneath it while holding the lockring stationary ***(Fig. 22)***.

SMARTBAR
GRIP REPLACEMENT

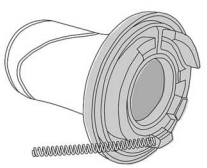
23



24



25



STATIONARY GRIP:

Removal

- Rotate the shifter fully in the cable release direction. (Gear "1" on the front shifter, gear "1" on the Spectro 7spd shifter, gear "8" on the 8spd shifter, and gear "9" on the 9spd shifter).

Caution:
Do NOT disassemble the control pod!

- The gear indication cables are set at the factory, and improper disassembly will damage the gear indication cables and function.

- Insert a 5 mm hex wrench into the hole in the end of the handgrip ***(Fig. 23)***.

- While pressing the twist grip toward the center of the handlebar, unscrew the bolt completely until the stationary grip can be pulled straight off ***(Fig. 24)***.

Replacement

- Align the flat keyed feature on the new stationary grip assembly with the flat keyed feature on the end of the Smart-Bar and push the grip assembly onto the SmartBar until it makes contact with the spacer tube ***(Fig. 24)***.

- Tighten the 5 mm hex bolt to 6 Nm (53 in.lbs) ***(Fig. 23)***.

TWIST GRIP:

Removal

- Remove stationary grip, see left.

- Pull the spacer tube straight off the SmartBar ***(Fig. 24)***.

- Next, while pressing the control pod housing toward the center of the handlebar, slowly pull the twist grip straight off, taking care to keep the coil spring from falling out.

Replacement

- Slide new twist grip over SmartBar.

- Slide the spacer tube back onto the SmartBar and part way through the new grip, making sure that the flange is on the outboard side toward the stationary grip ***(Fig. 24)***.

- Replace rear end of coil spring onto spring tab of new grip ***(Fig. 25)***.

- While sliding the grip towards the housing, align the free end of the spring into the spring cavity in the spool (already in the housing).

- Push the spacer tube all the way into the grip assembly.

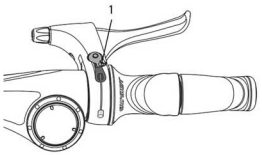
- Rotate grip forward slightly compressing the coil spring and push the grip towards the housing until there is no gap between the housing and grip.

- Align the flat keyed feature on the stationary grip assembly with the flat keyed feature on the end of the Smart-Bar and push the grip assembly onto the SmartBar until it makes contact with the spacer tube ***(Fig. 24)***.

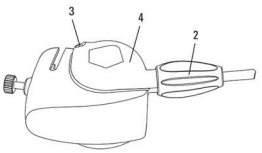
- Tighten the 5 mm hex bolt to 6 Nm (53 in.lbs) ***(Fig. 23)***.

SMARTBAR
CABLE CHANGE / CLEANING

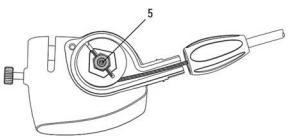
26



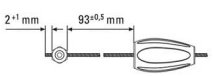
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28



29



24SPD & 27SPD ESP SYSTEMS

Removal

- Detach the cable from the derailleur.
- Cut cable off 15 cm (6") from shifter arrel adjuster. Discard old cable and housing.
- From the top edge pull open the cable change hatch (1, ***Fig. 26)***.
- Rotate the shifter fully in the cable release direction. (Gear "1" on the front shifter, gear "8" on the 8spd shifter, and gear "9" on the 9spd shifter.)
- Look for cable head and push cable up / out of the shifter and discard ***(Fig. 26)***.

Replacement

- Feed the new cable through the cable entry and out the barrel adjuster. Be sure to thread the cable through the small hole in the spool.
- Pull the cable snug to seat the cable head in the shifter.
- Replace the cable change hatch.
- Feed the cable through the new cable housing and frame stops.
- Attach the cable to the derailleur.
- Adjust indexing per derailleur instructions.

7 SPEED SPECTRO GEARHUBSYSTEMS

Removal

- Rotate the shifter fully in the cable release direction. Gear position "1".
- Do not remove the Clickbox from the axle end.
- Unscrew the barrel adjuster (2, ***Fig. 27)*** completely.
- Unscrew bolt (3, ***Fig. 27)***, remove cap (4).
- Withdraw shifter cable and clamping bolt (5, ***Fig. 28)*** upwards, loosen clamp and pull clamping piece from the cable.
- From the top edge pull open the cable change hatch (1, ***Fig. 26)***
- Look for cable head and push cable up / out of the shifter and discard.

Replacement

- Feed the new cable through the cable entry and out the barrel adjuster.
- Pull the cable snug to seat cable head in the shifter.
- Replace the cable change hatch.
- Feed the cable through the new cable housing and adjusting barrel.
- Position clamping bolt at a distance of 93 mm, tighten to 1.5 Nm (13 in.lbs.) and cut off cable end to 2 – 3 mm ***(Fig. 29)***.
- Locate clamping bolt (5, ***Fig. 28)*** (screw head not visible) and place shifter cable around carrier cylinder (counter-clock-wise winding).
- Position cap (4, ***Fig. 27)*** and tighten with bolt (3), torque 0.35 – 0.45 Nm (3.1– 4.0 in.lbs.).
- Screw the barrel adjuster (2) completely onto the clickbox.
- CLICKBOX INSTALLATION AND ADJUSTMENT per Technical Manual Gear Hub Systems / Spectro S7.

CLEANING

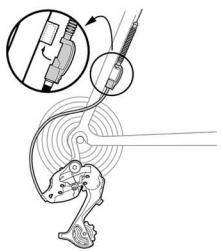
- Clean all parts with soapy water only.
- It is recommended that you clean the bike in a upright position, this allows the water to drain out correctly.
- After cleaning, if moisture does impair the clarity of the gear indication lens cap it is not recommended to remove the lens, instead leave your bike in a warm dry room, until the moisture disappears from the lens.

NIGHTCRAWLER / BRAKECRAWLER TECHNICAL DATA / ASSEMBLY REQUIREMENTS

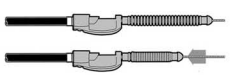
		Nightcrawler	Brakecrawler			
SEALS	Part No.	—	—	—	—	—
	Type	Cable Seal	Sealing Quick Release	←	←	←
	Cable Type	Derailleur Cables Only	Brake Cables Only	←	←	←
	Cable Size	1.1mm/1.2mm	1.6mm	←	←	←
	Housing	Compressionless	Compressionless or Standard Brake Housing		←	←
	Housing Ferrule/Max.	5.8mm	5.8mm	←	←	←
	Cable Stop/Slit Minim.	2.1mm	2.2mm	←	←	←
	Guide Pipe		Chrome Plated	←	Stainless Steel	←
	Bend		90°	130°	90°	130°
	Weight	6g	N/A		N/A	
Design	Rigger	Acetal	Acetal	Acetal	Acetal	Acetal
	Bellows	Silicon	Silicon	Silicon	Silicon	Silicon

NIGHTCRAWLER

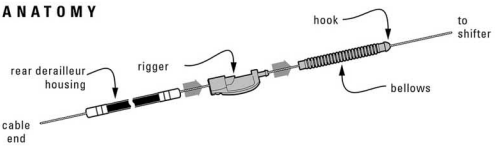
1



2



ANATOMY



COMPATIBILITY
- Fits most frames
- Use with derailleur cables ONLY

SETUP
- No tools needed
- Cable detached from the rear derailleur
- Rigger separate from the bellows

INSTALLATION
(see figure 1)
- Feed the cable through the bellows – hook end first.
- Feed the cable through the rigger – bellows end first.
- Join the rigger to the bellows.
- Feed the cable through the rear derailleur housing.
- Seat the rear derailleur housing into the rigger.
- Slide the rigger into the rear derailleur cable stop.
- Re-attach the cable to the rear derailleur.
- Check that the chain is on the smallest cog.
- Using your fingers, slide the hook end of the bellows towards the rigger until fully compressed ***(fig. 2)***.

BRAKECRAWLER

1



Features and Benefits:
- Complete cable sealing.
- Maintains smooth braking performance in all conditions.
- Easy to grab quick release finger tab: allows for easy wheel removal.
- Integrated bellows design: bellows stays attached even during wheel removal and replacement.

Detailed specifications:
- Fits SRAM, Shimano and most other linear pull brakes.
- Replaces existing noodle guide tube and bellows.
- Stainless steel or Chrome plated.
- 90 degree or 130 degree bend.

NOTICES

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SUPPORT
DISTRIBUTORS

UNITED STATES

Action Bicycle USA
217 Washington Avenue -A
Carlstadt, NJ, 07072
Ph: +1 800.284.2453

Bicycle Tech International
3201 B Richards Lane
Sante Fe, NM, 87505
Ph: +1 800.558.8324

DiamondBack, Distributor
300 Camarillo Ranch Rd.
Camarillo, CA, 93012
Ph: +1 800.776.7641

Downeast Bicycle Specialists
Porter Road, P.O. Box 226
Fryeburg, ME, 04037
Ph: +1 800.242.1043

Euro-Asia Imports
3935 FootHill
La Crescenta, CA, 91214
Ph: +1 818.248.1814

Giant Bicycle, Inc.
737 W. Artesia Boulevard
Rancho Dominguez, CA, 90220
Ph: +1 800.874.4268

Great Northwest
2335 North West Savier
Portland, OR, 97210
Ph: +1 800.927.9242

Hans Johnsen Company
8901 Chancellor Row
Dallas, TX, 75248-5326
Ph: +1 800.879.1515

The Hawley Company
One Hawley Drive
Lexington, SC, 29074-7812
Ph: +1 800.822.1980

Island Cycle Supply
425 Washington Avenue North
Minneapolis, MN, 55401
Ph: +1 800.627.2453

J&B Importers, Inc.
P.O. Box 161859
Miami, FL, 33116-1859
Ph: +1 800.666.5000

J&B Importers West, Inc.
P.O. Box 1248
Englewood, CO, 80150
Ph: +1 800.999.9228

J&B Importers Pacific, Inc.
P.O. Box 88808
Seattle, WA, 98138-2808
Ph: +1 800.627.2453

KHS Inc., Distributor
1264 East Walnut Street
Carson, CA, 90746
Ph: +1 800.347.7854

The Merry Sales Company
1415 San Mateo Avenue
San Francisco, CA, 94080
Ph: +1 800.245.9959

Olympic Cycle Supply
5711 West Douglass Avenue
Milwaukee, WI, 53218
Ph: +1 800.236.8380

Performance Cycle Products
22 South 6th Avenue
Mount Vernon, NY, 10550
Ph: +1 888.269.1846

Quality Bicycle Products
6400 West 105th Street
Bloomington, MN, 55438
Ph: +1 800.346.0004

Quantum
400 Venture Court, Suite 101
Verona, WI, 53593-1821
Ph: +1 800.545.1229

Quentin
454 Scott Drive
Bloomingdale, IL, 60108
Ph: +1 800.323.1741

Raleigh Bicycle Co., USA
22710 72nd Avenue South
Kent, WA, 98032
Ph: +1 800.222.5527

Riteway Products
2001 East Dyer
Santa Ana, CA, 92705-5709
Ph: +1 800.869.9866

Schwinn Cycling and Fitness
1690 38th Street
Boulder, CO, 80301
Ph: +1 800.SCHWINN

Seattle Bike Supply
7620 South 192nd
Kent, WA, 98032
Ph: +1 800.955.2453

Security Bicycle
32 Intersection Street
Hempstead, NY, 11550-1332
Ph: +1 800.645.2990

Sinclair Imports
2755 Highway 40
Verdi, NV, 89439
Ph: +1 800.654.8052

Trek Bicycle Corporation
801 West Madison St.
Waterloo, WI, 53594-0183
Ph: +1 800.369.8735

United Bicycle Parts
691 Washington Street
Ashland, OR, 97520
Ph: +1 800.482.1984

Wilson Bicycle Sales
31157 Wiegman Road
Hayward, CA, 94544
Ph: +1 800.877.0077

World Wide Cycle Supply
100 D Executive Drive
Edgewood, NY, 11717
Ph: +1 800.330.2550

EUROPE

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Harlochnerstrasse 13
5230 Mattighofen
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Boulevard du Centenaire 4
1325 Dion-Valmont
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CZECH REPUBLIC

Vokolek Import
Rezlerova 308
10900 Praha-Petrovice
Ph: +420 2692 3399
Fx: +420 2692 3399

Zitny
Ceskobratske Nam. 133
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1470 Serrières de briord
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Lapierre Cycles S.A.
Eurostar
SUNN

GERMANY

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Fx: +49 42 51 81 12 49

Epple Zweirad GmbH
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Bico
E. Wiener Bike parts
GZR
Rabeneick/Schlote
Veloring
ZEG

GREECE

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8, Thessalonikis Street
14342 New Filadelfia-Athens
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Biker Kft.
Gyepsor u. 1
1211 Budapest
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ICELAND

Oerninn Hjol LTD.
P.O. Box 8036, Skeifan 11
Reykjavik
Ph: +354 1 88 98 92
Fx: +354 5 88 98 96

ITALY

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Via Piave 10
23871 Lomagna (Como)
Ph: +39 039 5 30 11 67
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NETHERLANDS

Koch Kleeberg B.V.
Postbus 1069, Dukdalfweg 25
1300 BB Almere
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Fx: +31 36 532 25 48

Vertex Cycle Systems

SUPPORT DISTRIBUTORS

NORWAY

Stians Sport A.S.
Vollveien 13, Bygg D, POB 107
1324 Lysaker
Ph: +47 67 11 00 20
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POLAND

Harfa-Harryson
Ul. Ks. Witolda 48
50203 wroclaw
Ph: +48 7 13 72 15 70
Fx: +48 7 13 27 80 92

PORTUGAL

Ciclo Coimbrões
Praça Manuel da Silva Reis, 122
4400-211 Vila Nova de Gaia
Ph: +351 22 379 44 61
Fx: +351 22 375 61 63

RUSSIA

Sportclub Triatlon

SLOVAKIA

Excelia s.r.o.

SLOVENIA & CROATIA

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Partizanska 4
64000 Kranj
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San Julian, S/N Apdo Correos 89
E-08400 Granollers
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Fx: +34 9 38 46 53 56

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Vartex
Batterivägen 14
43232 Varberg
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SWITZERLAND

Intercycle
Industriegebiet, Haldemattstr. 3
6210 Sursee
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Amsler & CO AG
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Raleigh P&A
Triumph Road
NG 72 DD Nottingham
Ph: +44 115 9420202
Fx: +44 115 9282044

Fisher Outdoor Leisure PLC
Unit 2, Haslemore Business Centre
Lincolnway off Lincoln Road
EN 11 TE Enfield, Middx
Ph: +44 181 8053088
Fx: +44 181 8058821

Chickens & Sons
Bisley Works/Landpark Lane
LU 62 PP Kensworth, Beds
Ph: +44 1582 873329
Fx: +44 1582 873583

AUSTRALIA

Groupe Sportif Pty. Ltd.
20 Harker Street
Burwood, Victoria 3125
Ph: +61.3.9888.9882

Velo-Vita Pty. Ltd.
Unit A, 602-612 Botany Road
NSW 2015 Alexandria
Ph: +61.2.9700.8177

CANADA

Bell Sports Canada
700 Chemin Bernard
Granby, PQ, J2G 9H7
Ph: +1 800.661.1662

Kempter Marketing
1271 St Louis
St Lazare, PQ, J7T 1Z9
Ph: +1 514.424.4600

Norco Products Limited
1465 Kebet Way
Port Coquitlam, BC, V3C 6L3
Ph: +1 800.663.8916

ISRAEL

Hobby's LTD.
POB 1231
53111 Givataim
Ph: +972 5 24 299 05
Fx: +972 35 75 45 29

JAPAN

Kawashima Cycle Supply Corp.
No. 4-2-4 Kushiya-Cho Higashi
Sakai, Osaka 590
Ph: +81-722 381 557

Nichinao Shokai Co., Ltd.
6-16-8 Sotokanda Chiyoda-ku
Tokyo 101
Ph: +81-3 3382 6251

NEW ZEALAND

Cycle Supplies
PO Box 33051
Christchurch
Ph: +64.3.338.6803

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7C Anwen Place, East Tamacki
PO Box 58331 Greemouni
Auckland
Ph: +64.9273.7690

SOUTH AFRICA

Cape Cycle Systems (PTY) LTD.
10/12 Argo Road, Wetton
7780 Cape Town
Ph: +27.21.761.3528

SUPPORT
WHO TO CALL / SRAM WARRANTY / SPARE PARTS

WHO TO CALL

For fast SRAM dealer warranty and technical support help, please contact us at the appropriate locations.

NORTH AMERICA

Dealer Helpdesk Number:

(800)-346-2928

EUROPE

Please contact your local distributor.

SRAM 2 YEAR WARRANTY

In addition to standard legal warranty entitlements, SRAM components include a two year full warranty beginning on the date of purchase. This warranty is subject to the following conditions:

1. During the warranty period, SRAM components with material or production defects which as a result adversely affect the proper functioning of such components, shall either be repaired or replaced with a functioning SRAM component free of charge, whereby we are free to determine whether repair or replacement should take place. If a component cannot be replaced or repaired, the purchaser shall receive, free of charge, a component of higher value from the current SRAM product line. Defective components which have been replaced become the sole property of SRAM.
2. Any other warranty claims not included in this statement are void. This especially includes any disassembly or assembly costs (for instance by the dealer), which shall not be covered by SRAM.
3. Warranty claims are only valid upon presentation of a proper proof of purchase.
4. Parts subject to normal wear and tear (for example brake sleeves, brake pads, chains etc.) and damage which is caused by improper use, specifically caused by disregard for our assembly and operating instructions, shall not be covered by this warranty. Furthermore, this warranty shall not cover damages caused by the use of parts of different manufacturers or otherwise which are not compatible or suitable for use with SRAM components.
5. The servicing of a valid warranty claim shall neither extend this warranty nor establish a warranty period.
6. If a defect is discovered, please contact the dealer where the bicycle or the SRAM component in question was purchased.

SPARE PARTS

You can find an extensive spare parts program in SRAM's Spare Parts List Model Year 2002 · Publ. Number 8502.

SRAM ORIGINAL PARTS

Installation of parts and accessories not originally intended could result in less than optimal performance and/or injury.

www.sram.com

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