

X.0 / X-9 / X-7 / SX5 / SX4 / 3.0 • REAR DERAILLEURS

TECHNICAL DATA / ASSEMBLY REQUIREMENTS

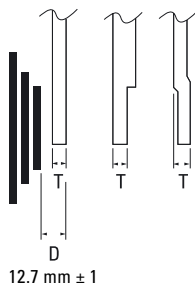


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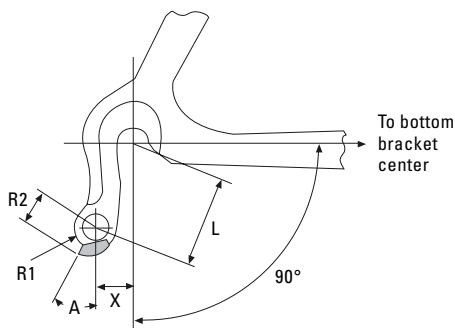
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	X.0		X-9		X-7		SX5		SX4		3.0
Compatih.	Speeds	9/8		9/8		9/8		9/8		8/7	
	Shifter Compatibility	SRAM 1:1 Actuation Ratio 9/8 speed shifters				←		←		SRAM 1:1 8/7spd shifters	
	Cogsets & Chains	SRAM/IG & HG 9/8spd		SRAM/IG & HG 9/8spd		SRAM/IG & HG 9/8spd		SRAM/IG & HG 9/8spd		SRAM/IG & HG 8/7spd	
	Chainrings	22-32-42/44, 24-34-46, 26-36-46/48				←		←		←	
Chain Capacity	Total	45 T	37 T	45 T	37 T	45 T	37 T	45 T	37 T	45 T	37 T
	Cage Length	Long	Medium	Long	Medium	Long	Medium	Long	Medium	Long	Med.
	Max Sprocket	34 T		34 T		34 T		34 T		34 T	
	Min Sprocket	11 T		11 T		11 T		11 T		11 T	
	Front Difference	22 T		22 T		22 T		22 T		22 T	
	Parallelogram Spring	Titanium		Steel		Steel		Steel		Steel	
Design	Pulleys	Cartr. bearing, stainless		Cartr.bear./Bush., hard.		Bushing, hardened		Bushing		Bushing	
	Direct Mount	Yes		Yes		Yes		Yes		Yes	
	Cable & Housing	1.1 or 1.2 mm high quality cables, 4 or 5 mm compressionless cable housing with end cap / maximum diameter of 5.8 mm									
	Weight	210 g	205 g	230 g	225 g	275 g	N/A	309 g	N/A	309 g	N/A
	B-Knuckle	Forged Aluminum / Anod.		Aluminum		Aluminum		Aluminum		Aluminum	
	Outer Link	Forged Aluminum		Alu die-cast / Painted		Alu die-cast / Painted		Aluminum		Zinc Alloy	
	Inner Link	Forged Aluminum		Aluminum / Anodized		Steel / E-coat		Steel / E-coat		Composite	
Design	Outer Cage	Aluminum	Carbon Comp.	Stamped AL / Anodized		Stamped AL / Anodized		Steel / E-coat		Steel / E-coat	
	Inner Cage	Aluminum	Carbon Comp.	Stamped AL / Anodized		Steel		Steel		Steel	
	Hanger Bolt	Aluminum / Anodized		Aluminum / Anodized		Aluminum / Anodized		Steel		Steel	

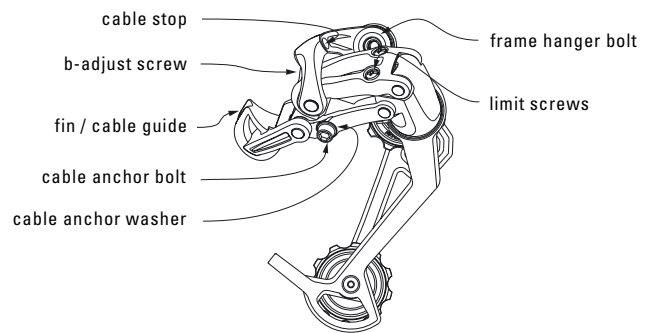
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DERAILLEUR ANATOMY



FRAME DIMENSIONS

(see figure 1 and 2)

- For optimal 1:1 Actuation Ratio rear derailleur performance, the recommended rear derailleur hanger length (L) should be 28 – 30 mm.

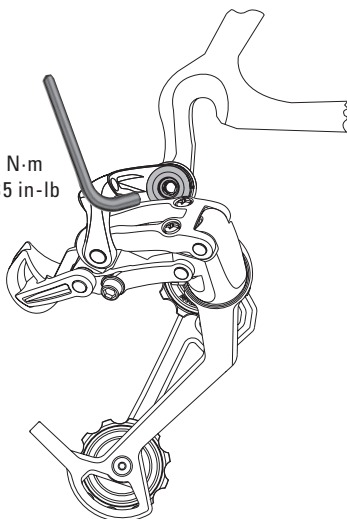
- For a given L, use the chart below to determine other 1:1 Actuation Ratio rear derailleur hanger specifications.

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

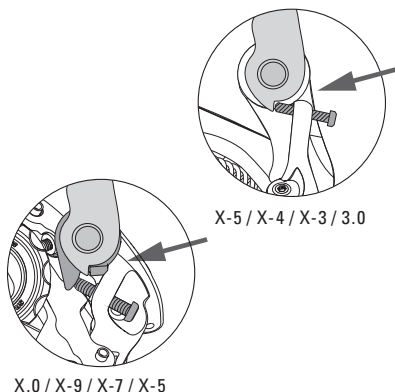
X.0 / X-9 / X-7 / X-5 / X-4 / X-3 / 3.0 · REAR DERAILLEURS ASSEMBLY

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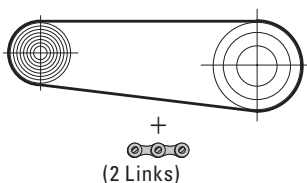
5 mm
8 – 10 N·m
70 – 85 in·lb



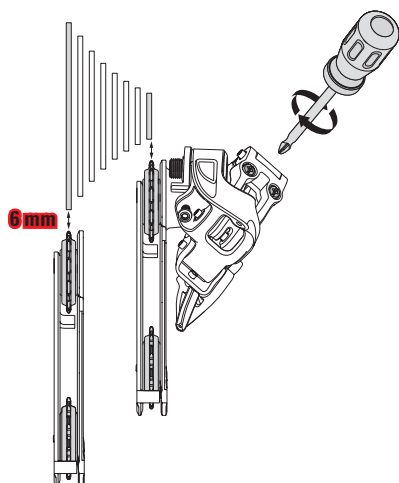
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ASSEMBLY



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 wrench (**Figure 1**).
- Check that the b-adjust washer tab (b-adjust screw) is clear of the rear derailleur dropout tab (**Figure 2**).
- Tighten the 5 mm hex hanger bolt to 8 – 10 N·m (70–85 in·lb) (**Figure 1**).

CHAIN LENGTH

A properly measured chain will prevent damage in case of 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 (**Figure 3**).
- For rear suspension frames, position the rear suspension for the greatest chain length required.
- Add 2 LINKS or 1 link + Connecting Link to this length for proper chain length.

LIMIT SCREWS ADJUSTMENT

- View the rear derailleur and pulleys from behind the rear of the bicycle (**Figure 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.

- Using a 2.5 or 3 mm hex (screw driver for X-5), turn the b-adjust screw until the chain gap equals approximately 6 mm ($\frac{1}{4}$ ") from tip of the cog to tip of upper guide pulley (**Figure 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 9 speed 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.

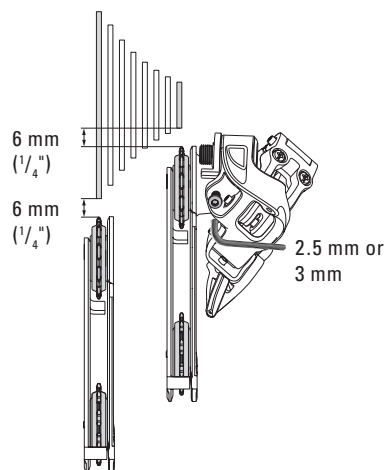
Do not use the b-adjust screw to adjust the rear derailleur to act as a chain-tensioning device or to prevent chain suck. This increases the chain gap causing poor shifting performance.

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 (**Figure 6**).
- Tighten the 5 mm hex cable anchor bolt to 4 – 5 N·m (35 – 45 in·lb).
- 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.

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· While pedaling, move the shifter up one detent.

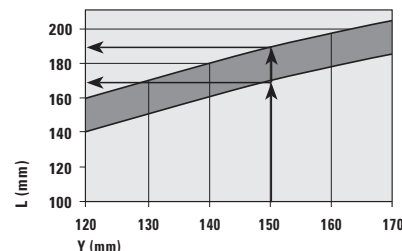
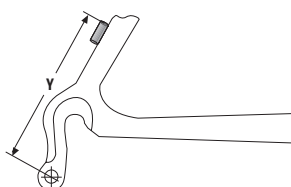
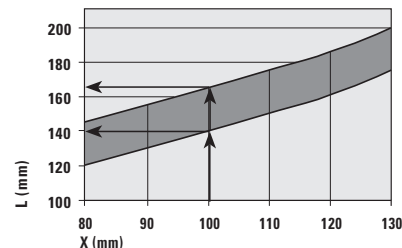
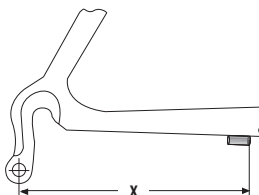
– If the chain hesitates or does not shift to the second cog, increase the cable tension by turning the shifter barrel adjuster counterclockwise.

– If the chain shifts beyond the second cog, decrease the cable tension by turning the shifter barrel adjuster clockwise.

· 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.

Chart / length of cable housings



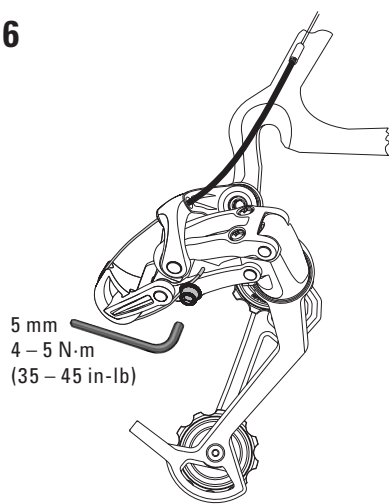
Example:

Distance Y = 150 mm → cable housing length L = 165 – 190 mm.

Caution:

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

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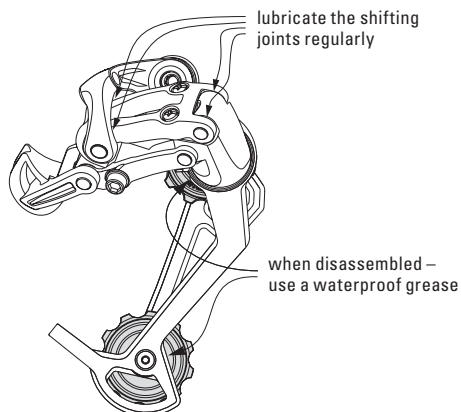


X.0 / X-9
X-5



X-7 / X-5
X-4 / X-3 / 3.0

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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.
Shifts more gears onto smaller sprockets than intended.	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.