

2005

NEW TECH. SPECIFICATONS
GEAR HUB SYSTEMS
MTB COMPONENTS

ENGLISH



SRAM



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GEAR HUB SYSTEMS

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MTB COMPONENTS

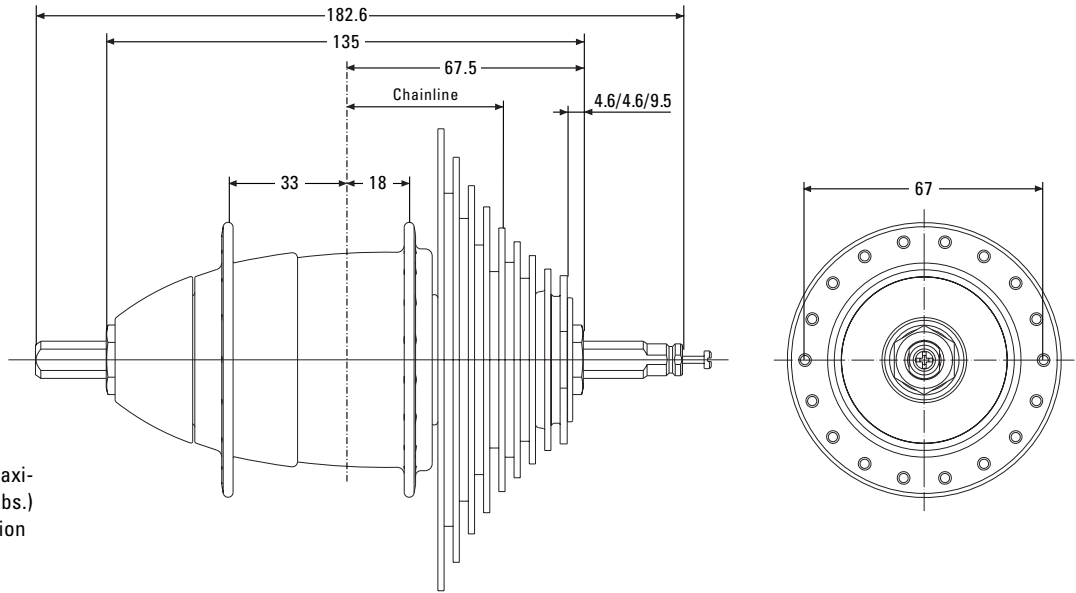
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DUALDRIVE TECHNICAL DATA / ASSEMBLY REQUIREMENTS



Caution:
Not suitable for tandems, trademen's delivery bicycles and similar.

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



		DualDrive 27	DualDrive 24	DualDrive 21		
	Total Speeds	27	24	21		
	Brake Versions	Without brake / for i-Brake / for Disc brake*			Without brake / for i-Brake / for Disc brake*	
	Over Locknut Dim.	135 mm	135 mm	135 mm		
	Length	182.6 mm	182.6 mm	182.6 mm		
Axle	Ends Diameter	FG 10.5	FG 10.5	FG 10.5		
	Holes	36 or 32	36 or 32	36	32	28**
Spoke	Hole Diameter	2.6 mm	2.6 mm	2.6 mm		
	Hole Ref. ø	67 mm	67 mm	67 mm		
	Flange Dist. to 1/2 OLD	33 mm / 18 mm	33 mm / 18 mm	33 mm / 18 mm		
	Totally	575 % (27spd)	541 % (24spd)	496 % (21spd)		
Ratio	Totally hub	186 %	←	←		
	Speed 1	73 %	←	←		
	Speed 2	100 %	←	←		
	Speed 3	136 %	←	←		
	Chainline	45 mm	45 mm	42 mm		
	Crankset	33 / 38 Teeth	←	←		
	Cogset	11-34 Teeth	11-32 Teeth	12-32 Teeth		
	Cogset Compatib.	DualDrive 27	DualDrive 24	DualDrive 21		
	Shifter Compatib.	DualDrive 27	DualDrive 24	DualDrive 21		
	Sealing	Extra sealed	←	←		
	Tandem compatib.	—	—	—		
	Weight	970 g (hub without brake) / 985 g (hub for i-Brake) / 985 g (hub for disc brake)				
Finish	Hub Shell	Aluminum, silver anodized	Aluminum, silver anodized	Aluminum, silver anodized		
	Shifting device	Composite	Composite	Composite		

* Compatible with Magura / Hayes / Shimano disc brakes. ** 28 Spoke Holes available in version without brake only.

DUALDRIVE TECHNICAL DATA / ASSEMBLY REQUIREMENTS

DERAILLEURS

	DualDrive 27 <i>NEW</i>	DualDrive 24	DualDrive 21
Speeds	9 / 8	9 / 8	8 / 7
Shifter Compatibility	DualDrive 27	DualDrive 24	DualDrive 21
Cage Length	Short, 75 mm	Short, 75 mm	Short, 75 mm
Sprocket, max.	34 Teeth	32 Teeth	32 Teeth
Sprocket, min.	11 Teeth	11 Teeth	11 Teeth
Pulleys	Exchangeable / Bushing	Exchangeable / Bushing	Exchangeable / Bushing
Direct Mount	●	●	●
Weight	258 g	265 g	265 g
Upper Knuckle	Aluminum, forged	Aluminum, forged	Grilon Composite black
Lower Knuckle	Grilon Composite silver	Grilon Composite silver	Grilon Composite black
Outer Link	Aluminum	Grilon Composite silver	Grilon Composite black
Inner Link	Steel / Zinc coat	Steel / Zinc coat	Steel / Zinc coat
Outer Cage	Forged Aluminum	Grilon Composite black	Steel black
Inner Cage	Grilon Composite black	Grilon Composite black	Grilon Composite black
Hanger Bolt	Aluminum	Steel	Steel

CASSETTES

	DualDrive 27	DualDrive 24	DualDrive 21
Part No.	—	—	—
Largest Cog	34 Teeth <i>NEW</i>	32 Teeth	32 Teeth
Speeds	9	8	7
Cogs	11/13/15/17/20/23/26/30/34	11/12/14/16/18/21/26/32	12/14/16/18/21/26/32
Spacers	Dark Gray	Black	Grey
Chain compatib.	9spd, HG/IG/PC comp.	8spd, HG/IG/PC comp.	7spd, HG/IG/PC comp.
Weight	410 g	280 g	310 g
Cogs	SAPH 440 steel	←	SAPH 440 steel / 1008 steel
Screws	Steel / Zinc Coat	←	←
Finish	Chrome Plated, Satin	Chrome	Chrome

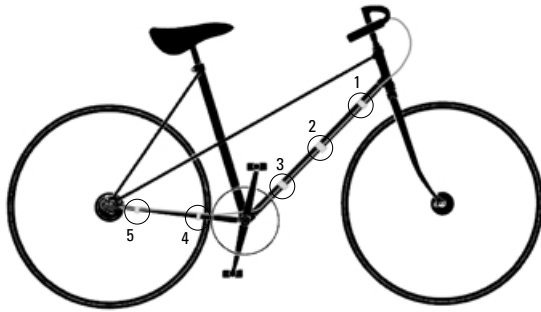
SHIFTERS

	DualDrive single sided shifter			Trigger shifter	Twist shifter		
Version	DualDrive 27	DualDrive 24	DualDrive 21	DualDrive 27	DualDrive 27	DualDrive 24	
Clickbox Cable	1400 mm / 1500 mm / 1600 mm / 1700 mm / 2100 mm			see Price list	see Price list	←	
Shifter Type	SRS Twisting-Thumbshifter-Combo (2in1)			Trigger shifter	Twist shifter	←	
Arrangement	Handlebar, right	←	←	left and right	left and right	←	
Com- pat.	Gear Hub	DualDrive 27	DualDrive 24	DualDrive 21	DualDrive 27	DualDrive 27	DualDrive 24
	Derailleur	DualDrive 27	DualDrive 24	DualDrive 21	DualDrive 27	DualDrive 27	DualDrive 24
	Gear Indication Der.	Window	Printed	Printed	Window	Printed	Printed
	Riding Mode Indic.	Printed	Printed	Printed	Window	Printed	Printed
	Barrel Adj. Gear Hub	None	←	←	Indexing	Indexing	←
	Barrel Adj. Derailleur	Indexing	←	←	Indexing	Indexing	←
	Clamping Diameter	22.3 mm	←	←	22.3 mm	22.3 mm	←
	Handlebar, Straight Area	Minimum length = 150 mm		←	N/A	N/A	←
	Cable Routing, Gear Hub	Continuous housing (preassembled)		←	Open or continuous	Continuous housing (preassembled)	←
	Cable Routing, Der.	Open or continuous	←	←	Open or continuous	Open or continuous	←
	Weight	N/A	←	←	N/A	N/A	←
	Cables	Stainless steel		←	Stainless steel	Stainless steel	←
	Housing	Glass filled PA – Silver painted		Black/Silver painted	Aluminum	Glass filled PA	←
	Grip Cover	Thermoplastic elastomer, Overmolded		←	—	Thermoplastic elastomer, Overmolded	←
	Clamping Collar	Aluminum	←	←	Aluminum	Aluminum	←
	Clickbox	Composite	←	←	Composite	Composite	←

DUALDRIVE TECHNICAL DATA / ASSEMBLY REQUIREMENTS



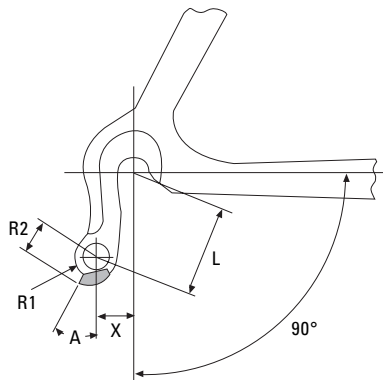
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Cable routing	DualDrive 27 / DualDrive 24 / DualDrive 21
Hub cable	Along chainstay only
Derailleur cable	Along chainstay only

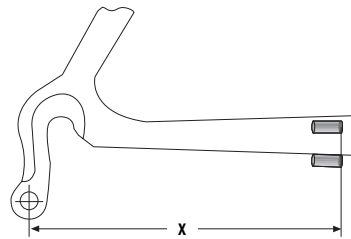
Cable attachment see Fig. 1	Cable housing	Attachement points	Cable stops
Hub	Continuous	1/2/3/4 (see Fig. 1)	—
Derailleur	Continuous	1/2/3/4/5 (see Fig. 1)	—
	Open	—	1/5 (Fig. 1)

2



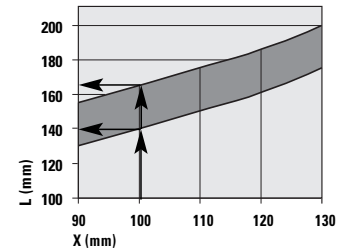
CABLE HOUSING FOR DERAILLEUR

Rear cable stop position



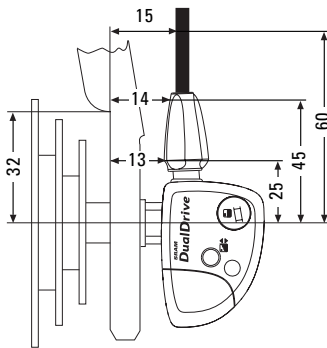
Length X min. 90 mm.
Cable stop below or beside chainstay.

Rear housing length



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

3



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.

CRANKSET

Bicycle without chain case:
Use a chain guard disc (at the outer surface of chainring, material no resin)
Use only standard chainring version (non-shifting teeth).

Chainline = 45 mm.

Ask for recommended DualDrive-cranksets at:

- Truvativ
<http://www.truvativ.com>
- Tien Hsin Industries
<http://www.thindustries.com>

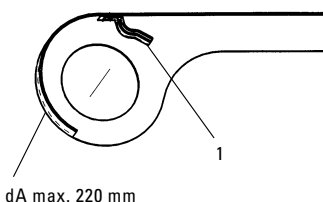
DROPOUT

Only flat and no off-set versions.
Dropout thickness: 7 – 8 mm.
Vertical or horizontal dropout slot.
Dropouts must be parallel.

Dropout dimensions: see Fig. 2 with chart below and Fig. 3.

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

4



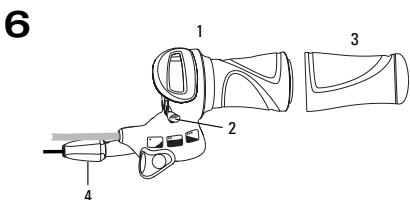
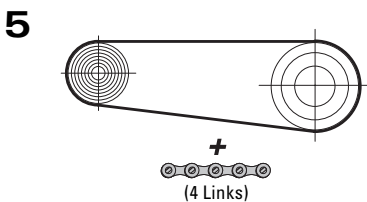
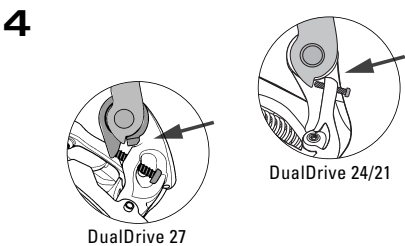
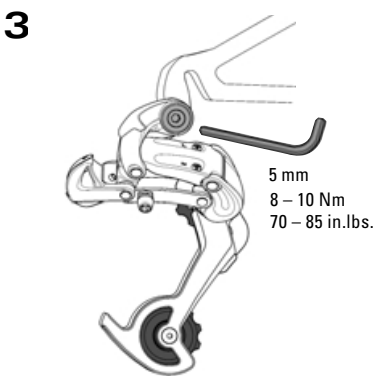
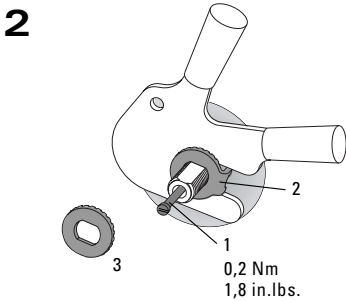
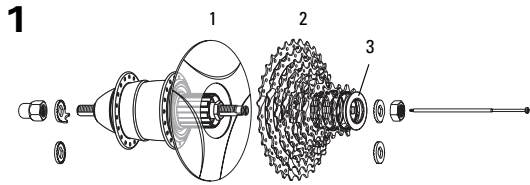
CHAIN GUIDE FORK

It prevents chain from jumping off front chainring, is bolted inside the chain case (1, Fig. 4).

HANDLEBAR

Diameter: 22.3 mm.
Minimum length of straight area for shifter: 150 mm.
Check the compatibility of intended handlebars and brake levers.

DUALDRIVE ASSEMBLY



ASSEMBLY HUB

- Lace the wheel as normal.
- Place spoke protector disc (1, **Fig. 1**) on shoulder of hub, fit cassette (2) onto driver profile. Screw lock nut (3) with cassette tool (Park Tool FR-5 or SRAM Part No. 4624 411 010), tightening torque: 40 Nm (350 in.lbs.).
- Screw shifting rod (1, **Fig. 2**) into the hub axle and tighten it with 0.2 Nm (1.8 in.lbs.).
- Fit wheel in dropouts.
- Place retaining washers (**Fig. 2**) on both sides of the axle – the serrations must bear against the dropout.
 - Version for horizontal dropouts (2): the lug must engage in the dropout slot.
 - Version for vertical dropouts (3): without lug.
- Tighten up axle nuts. Tightening torque 30 – 40 Nm (266 – 350 in.lbs.).

ASSEMBLY DERAILLEUR

Advice:

Check the rear derailleur hanger alignment. A bent rear derailleur hanger will result in inaccurate index shifting.

- Attach the rear derailleur to the frame's rear derailleur hanger using a 5 mm hex head wrench (**Fig. 3**).
- Check that the b-adjust washer tab (b-adjust screw at DualDrive 24/21) is clear of the rear derailleur dropout tab (**Fig. 4**).
- Tighten the 5 mm hex hanger bolt to 8 – 10 Nm (70–85 in.lbs.).

CHAIN LENGTH

- Bypassing the rear derailleur, run the chain around the largest cog/large chainring combination (**Fig. 5**).
 - For rear suspension frames, position the rear suspension for the greatest chain length required.
- Add 4 LINKS or 3 links + Connecting Link to this length for proper chain length.

ASSEMBLY SHIFTER

Caution:

- **Never use lubricants or solvents to install handlebar grips. Handlebar grips provide safety function. For this reason, they should be mounted in such a way as to make sure they do not slip off handlebar!**
- **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!**

DualDrive single sided shifter:

- Slide the shifter (1, **Fig. 6**) onto the handlebar.
- Rotate the shifter until the barrel adjuster (4) is beneath (but out of the way of) the brake lever.
- Tighten the 3 mm hex clamp bolt (2) to 1.9 – 2.5 Nm (17 – 22 in.lbs.).
- Slide the handlebar grip (3) onto the handlebar.

Trigger shifter (without picture):

- Slide first shifter then brake lever onto handlebar.
- Bar end users – don't forget to leave room for the bar end.
- Slide the handlebar grip onto the handlebar.
- Tighten the 5 mm hex clamp bolt to 44 in.lbs. (5 Nm).

Twist shifter (without picture):

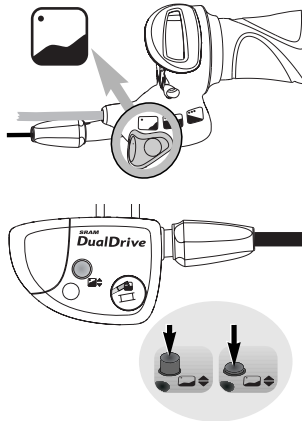
- Slide the shifter onto the handlebar.
 - If necessary, move the brake lever to allow for shifter and stationary grip.
 - Bar end users – don't forget to leave room for the bar end.
- Rotate the shifter until the barrel adjuster is beneath (but out of the way of) the brake lever.
- Tighten the 3 mm hex clamp bolt to 1.9 Nm (17 in.lbs.).
- Slide the plastic washer onto the handlebar.
- Slide the stationary grip onto the handlebar.

INSTALLING CLICKBOX

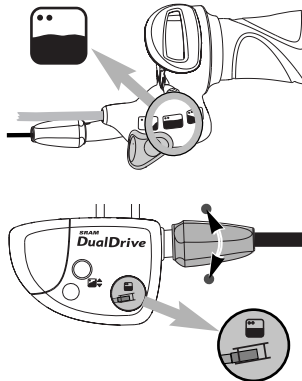
- Fit the cable and avoid small radius.
- Cable attachment points **see Page 5 / Fig. 1**. **Cable housing must be movable inside attachment.**
- Place hub shifter in uphill riding mode / gear position „1“ (**Fig. 7**).
- Push Clickbox button down (**Fig. 7**).
- Push on Clickbox to the stop on the hub axle.
- Press button up.
- Place hub shifter in standard riding mode / gear position „2“ (**Fig. 8**).
- Match up the marks in the Clickbox viewing window by twisting the barrel adjuster (**Fig. 8**).



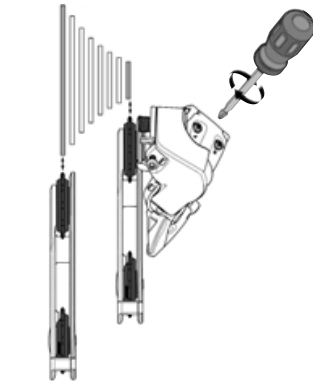
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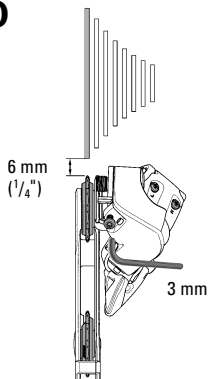
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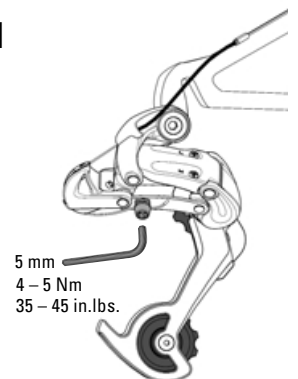
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10



11



DERAILLEUR ADJUSTMENT

Limit screw adjustment:

- View the rear derailleur and pulleys from behind the rear of the bicycle (**Fig. 9**).
- 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 ($\frac{1}{4}$ ") from tip of the cog to tip of upper guide pulley (**Fig. 10**).
- Turn the b-adjust screw clockwise to increase the chain gap.
 - Turn the b-adjust screw counterclockwise to decrease the chain gap.

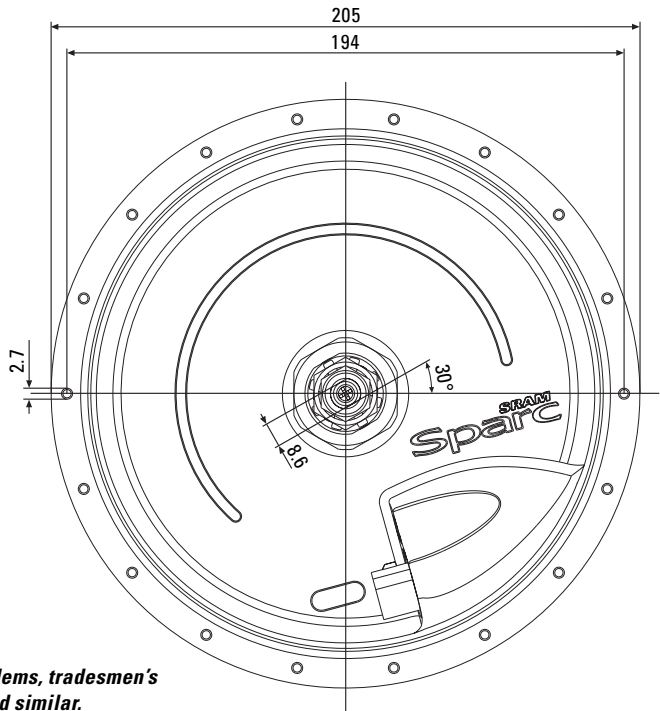
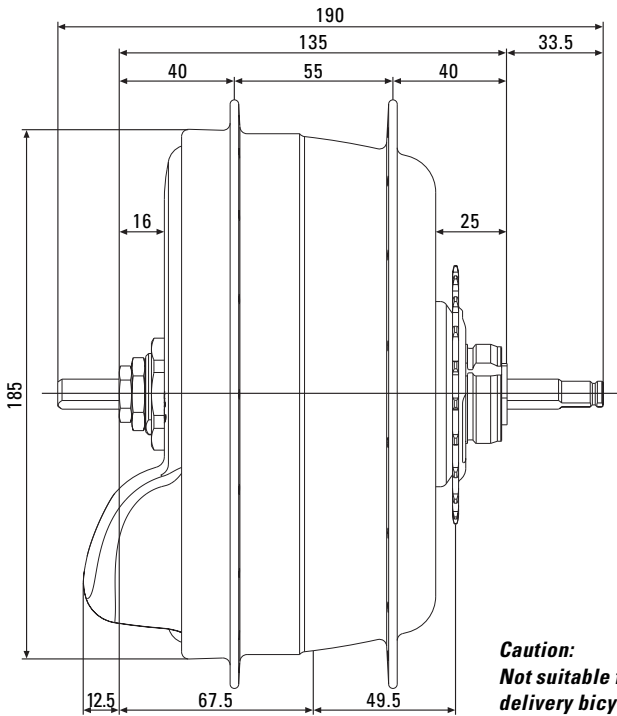
Advice:

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 page 5 for figure and chart**).
- Rotate the derailleur shifter until the largest number and gear indication tab/dash line up.
- Turn the shifter barrel adjuster (**4, Fig. 6**) clockwise fully into the shifter, then turn counterclockwise 1 full turn.
- Feed the 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. 11**).
- Tighten the 5 mm hex cable anchor bolt to 4 – 5 Nm (35–45 in.lbs.).
- 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.
- 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.

SPARC TECHNICAL DATA / ASSEMBLY REQUIREMENTS



Caution:
Not suitable for tandems, tradesmen's delivery bicycles and similar.

BCI

		Sparc hub NEW			
Electric Drive	V max.	Part No.	—		
		Wheelsize	28"	26"	20"
	Range	Econ Mode	20 km/h	20 km/h	15 km/h
		Speed Mode	25 km/h	25 km/h	21 km/h
		at 15 km/h Ø	12 km (in Speed mode)		
		at 20 km/h Ø	26 km (in Speed mode)		
	Engine Type	at 24 km/h Ø	40 km (in Speed mode)		
		Power	2 x 16.8V DC engines		
	Assist Type	Power	2 x 100 W max.		
		Support Modes	Econ / Speed		
Over Locknut Dim.	Brake	None			
	Length /	135 mm			
Ends Diameter	Length /	190 mm			
	Ends Diameter	FG 10.5			
Holes	Holes	36			
	Hole Diameter	2.9 mm			
Hole Reference Ø	Hole Reference Ø	194 mm			
	Total hub ratio	251 %			
Speed 1/2/3/4/5	Speed 1/2/3/4/5	63 % / 78 % / 100 % / 128 % / 158 %			
	Usable Dimension	1/2" x 1/8" or 1/2" x 3/32"			
Line	Line	49.5 mm (only off-set sprockets)			
	Ratio	1.7–2.6	1.8–2.6	2.3–2.6	
Shifter Compatib.	Shifter Compatib.	Sparc Shifter			
	Frame Compatib.	Dropouts max. 7 mm / OLD 135 mm			
Weight		2450 g			

SHIFTER

		Sparc Shifter	
Part No.	—		
Shifter Type	Twist Shifter		
Cable Length	see SRAM P5		
Gear Indication	Window		
Clamping Diameter	22.3 mm		
Handlebar, Straight Area	Minimum length = 150 mm		
Weight	89 g		

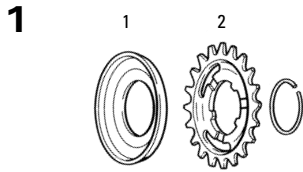
REM·CON·

		Sparc Remote Control Unit					
Part No.	—						
Cable Length (mm)	1500	1600	1700	1800	2000	2200	
Mode Selector	Off / Econ / Speed						
Mode Indication	Printed						
Clamping Diameter	22.3 mm						
Cable Connection	3.5 mm stereo jack						
Weight	45 g						

B·A·B·O·X

		Sparc Battery Box NEW					
Part No.	—						
Cable Length (mm)	650	750	850	1400	1650	1950	
Battery	16.8V / 8Ah NiMH battery						
Charger	16,8V / 2.2A						
Charging time	3 hours 40 minutes						
Luggage carrier comp.	Struts: Ø 8 mm / dist. 68 mm center to center / parallel						
Weight	2400 g						

SPARC ASSEMBLY



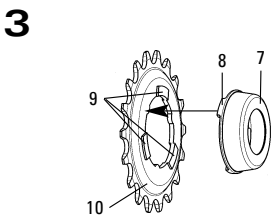
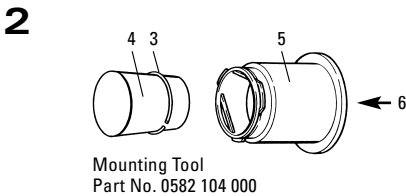
LACING THE WHEEL

Version Europe 28" / USA 26":

1-cross only.
All spoke heads must be positioned at the outside of the spoke flange.
Spoke tension about 1000 N recommended.

Version Europe 20":

- 1-cross:
Use only rim „Rigida 20x406 59 (L 01 12 E)“ (or contact SRAM).
All spoke heads must be positioned at the outside of the spoke flange.
Spoke tension about 1000 N recommended.
- Radial lacing:
No restrictions.
Spoke tension about 1000 N recommended.



ASSEMBLY HUB

- Place the dust cap (1, Fig. 1) and sprocket (2) on the driver. Toothing close to the hub (only sprocket version off-set).
- Push sprocket circlip (3, Fig. 2) onto the cone of tool sleeve (4). Place tool sleeve with large diameter on the driver.
- Push the spring end of sliding sleeve (5) of the tool over the tool sleeve. Thrust sliding sleeve in direction (6), this forces circlip into the recess of the driver.
- Remove tool and check that the circlip is seated correctly.
- Turn dust cap (7, Fig. 3) until the three lugs (8) are between the three beads (9) on the sprocket (10).
- Position dust cap and push towards sprocket until it is felt to lock into place.
- Placing the wheel in the rear frame.

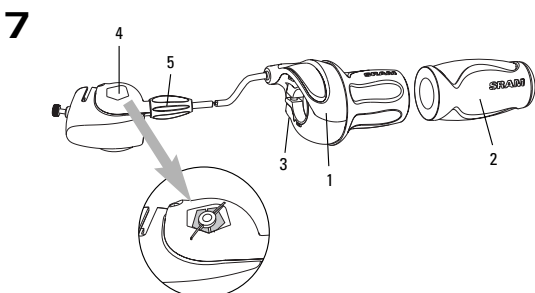
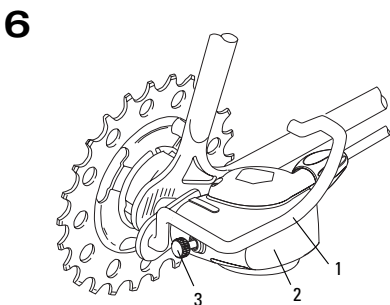
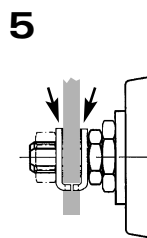
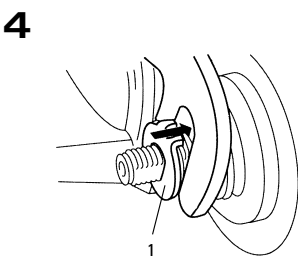
Advice:

Dropouts must be parallel.

- Mount the chain.
- Fit retaining washers (1, Fig. 4) on both axle ends. The serrations must bear against the dropout and the lug must engage in the dropout slot.
In case of little space e.g. by thick dropouts, both retaining washers should be assembled on the left axle end (Fig. 5).
- On the sprocket side fit the protective bracket (1, Fig. 6) directly below the axle nut. Tightening torque on acorn or axle nuts 30 – 40 Nm (266 – 350 in.lbs.).

Advice:

- If a different protective bracket is used the thickness of the attachment plate must be max. 3 mm.
- Do not use additional washers.
- At least the beginning of the axle thread must be visible in front of the axle nut.



ASSEMBLY SHIFTER

Advice:

- Contrary to the old shifter version the shifter cable of the new version runs above the brake lever. Maybe you need 50 mm more cable length.
- 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 handlebar positions effects cable housing length.
- Slide shifter (1, Fig. 7) onto handlebar.
- Mount fixed grip (2) onto end of handlebar.
- Slide shifter against fixed grip, adjust shifter on handlebar and tighten with bolt (3) with a torque of 1.5 Nm (13 in.lbs.).

Caution:

- Never use lubricants or solvents to install fixed grips.
Fixed grips provide an axial safety function. For this reason, they should be mounted in such a way as to make sure they do not slip off handlebar.
- Check that the shifter and brake lever function properly and are unobstructed (realign if necessary).

- When fitting the cable (1, Fig. 8) avoid small radius.
- Last attachment point is on the lower rear wheel fork (2, Fig. 8) immediately behind the chain wheel.
Cable housing must be movable inside attachment.

INSTALLING CLICK BOX

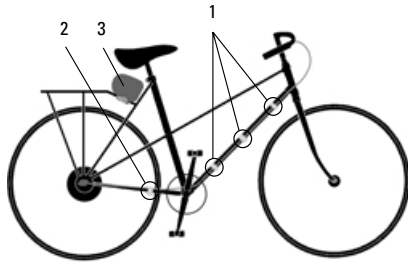
- Insert shift rod (1, Fig. 9) in shift tube (2) (oil parts lightly) and then push into axle bore as far as the stop. Turn slot (6) in shift tube to a position where it is easily visible.
- Push locating sleeve (3) with guiding rib (4) to the front onto the hub axle – making sure that the internal lug (5) is guided in the slot (6) of the shift tube until it can be felt – and heard – to engage.
- Turn locating sleeve on the axle (7) until the guiding rib (4) is facing roughly upwards.
- Place shifter in gear position “2”.
- Push on clickbox (2, Fig. 6) to the stop on the axle. The guiding rib (4, Fig. 9) of the locating sleeve thereby engages in the slot on the housing. In the end position tighten up the knurled bolt (3, Fig. 6) by hand (0,3 Nm / 2,7 in.lbs.).

ADJUSTMENT HUB

- Be sure to reset rotational shifter from 4th. to 3rd gear.
- Match up the arrow marks in the Clickbox viewing window (4, Fig. 7) by turning the adjusting screw (5).



8



ASSEMBLY BATTERY BOX

- Pull both quick releases outward and turn them to the „open“ position (*Fig. 10*).
- Position battery box onto luggage carrier struts (3, *Fig. 8*).
- Push quick releases inward and turn them to the „closed“ position.
- Slide plug of battery cable in the slot of the battery box until it snaps in.
- Attach cable along the frame or luggage carrier strut.

Advice:

Last attachment point of the cable at the rear fork: approx. 8 cm away from the axle end.

Do not jam the cable between frame and rear hub and keep it away from the rotating hub shell.

Make a cable loop between plug and cable attachment point to avoid tensile load.

- Slide plug in the slot on the hub until it snaps in.

Advice:

Closed elements such as brazed-on eye bolts are not suitable because plug will not pass through.

ASSEMBLY REMOTE CONTROL UNIT

- Slide remote control unit (1, *Fig. 11*) onto handlebar.
- Mount brake lever (2) and fixed grip (3).
- Adjust remote control unit on handlebar and tighten the bolt (4) with a torque of 1.5 Nm (13 in.lbs.).
- Slide plug of remote control cable in the slot (5) of the remote control unit until it snaps in.
- Attach cable along the frame.

Advice:

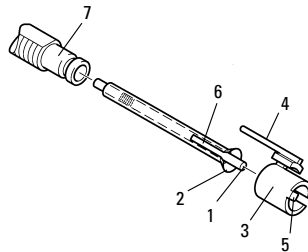
Last attachment point of the cable at the rear fork: approx. 8 cm away from the axle end.

Do not jam the cable between frame and rear hub.

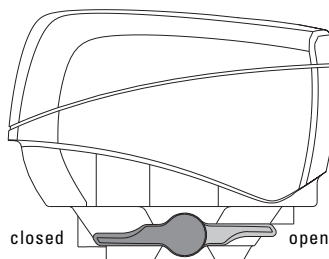
Make a cable loop between plug and cable attachment point to avoid tensile load.

- Slide the plug straightly in the slot on the hub until it snaps in. Angular installation may damage the slot.

9



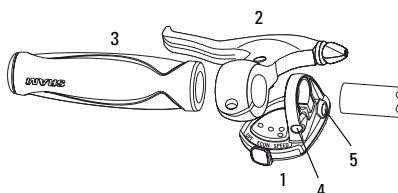
10



STORING THE BATTERY

The battery box should be stored fully charged in a dry and cool place. All batteries are shipped with an additional documentation about the last charging date within our SRAM facility. This documentation of battery charging also allows you to fill in the dates of additional charge actions that you would need to perform if the batteries stay in your warehouse over a longer period of time. You can identify the next necessary charge date at a glance (at least 6 months after last charge).

11



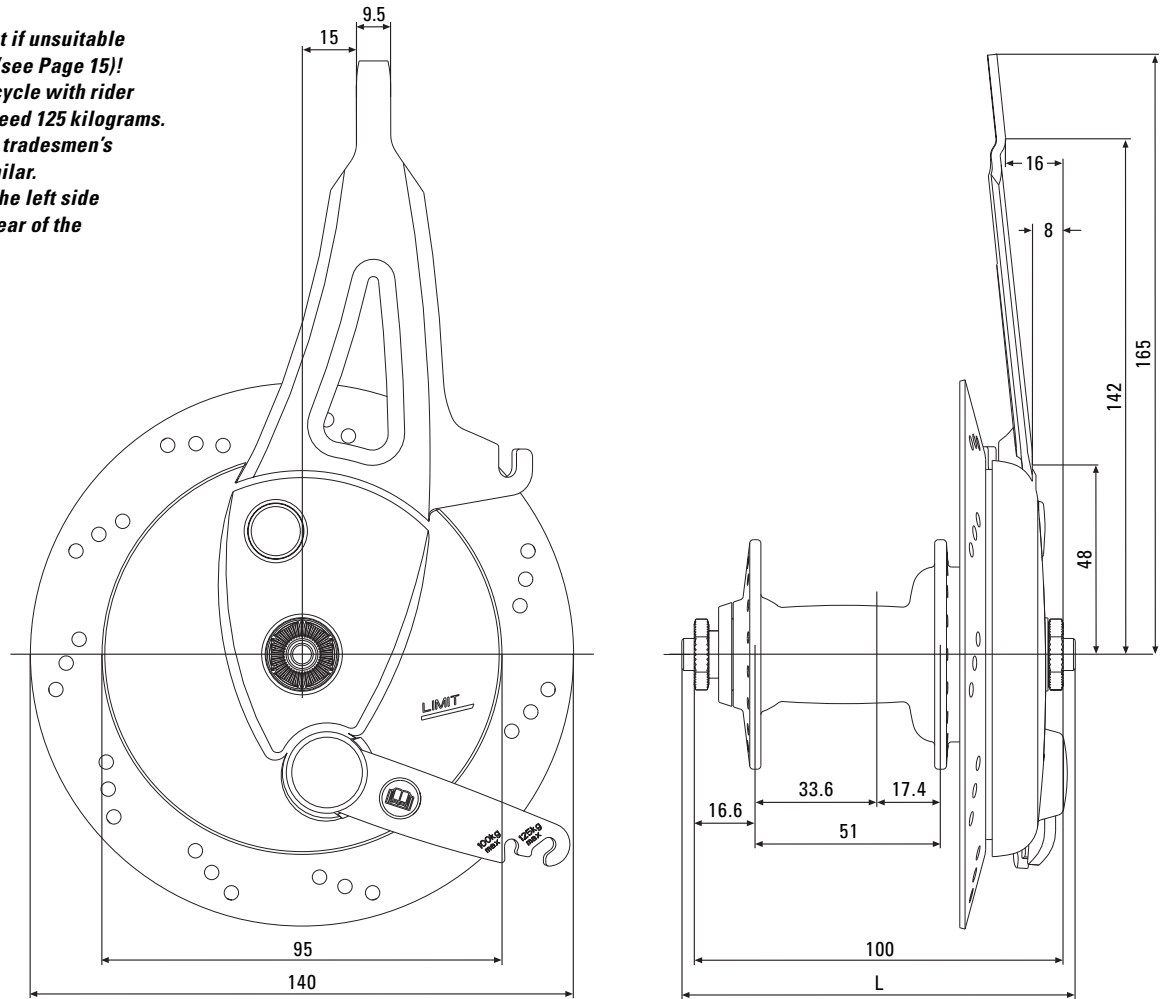
i-BRAKE AND COMPATIBLE HUBS

TECHNICAL DATA / ASSEMBLY REQUIREMENTS



Caution:

- There is a risk of accident if unsuitable forks or frames are used (see Page 15)!
- The total weight of the bicycle with rider and baggage may not exceed 125 kilograms.
- Not suitable for tandems, tradesmen's delivery bicycles and similar.
- The i-brakes must go on the left side viewed from behind the rear of the bicycle.

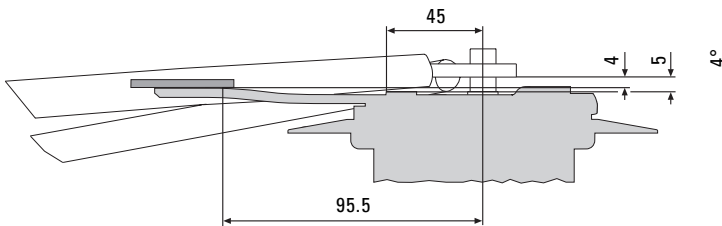
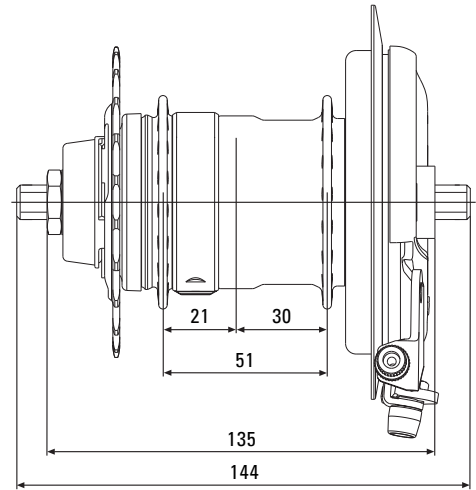
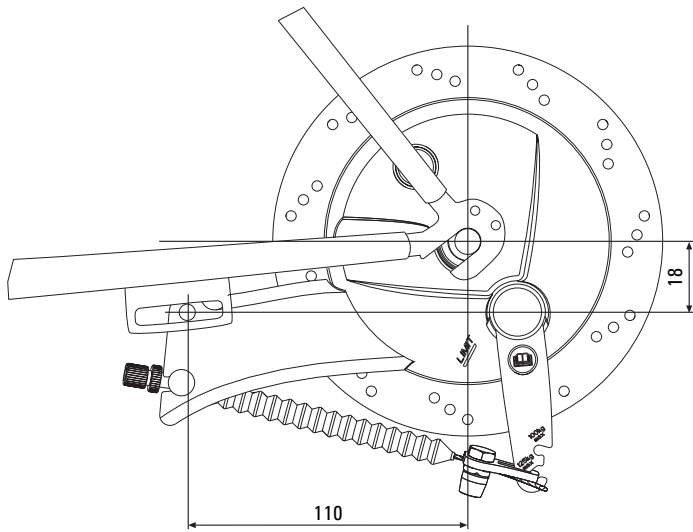


FRONT HUBS

NEW		i-brake System for Front Hubs			
Brake Model	i-brake		i-brake dynamo		
	Performance Level		Comfort / City / Commuter / Trekking		
Hub		Front Hub i-brake compatible		Front Hub i-brake compatible	
Axle	Over Locknut Dim.	100 mm	←	100 mm	←
	Length, L	110 mm	140 mm	110 mm	140 mm
	Type	Hollow	Solid	Hollow	Solid
	Material	Steel	←	Steel	←
	Ends Diameter	9 mm	←	9 mm	←
Spoke	Holes	36	←	36	←
	Spoke Diameter	2 mm	←	2 mm	←
	Hole Reference ø	39 mm	←	80 mm	←
	Bearing	Cartridge	←	Cartridge	←
Sealing		Lip Seal / Labyrinth / Dust Cap		Lip Seal / Labyrinth / Dust Cap	
Tandem Compatib.		—	—	—	—
Compat. brake lever		Linear Pull compatible, Two-Axis		Linear Pull compatible, Two-Axis	
Brake anchor plate		Version D	←	Version D	←
Total Weight		790 g	←	950 g	←
Finish	Hub Shell	Aluminum, anodized	←	Aluminum	←
	Brake Drum	Stainless steel	←	Stainless steel	←

i-BRAKE AND COMPATIBLE HUBS

TECHNICAL DATA / ASSEMBLY REQUIREMENTS



Caution:

- There is a risk of accident if unsuitable forks or frames are used (see Page 15)!
- The total weight of the bicycle with rider and baggage may not exceed 125 kilograms.
- Not suitable for tandems, tradesmen's delivery bicycles and similar.
- The i-brakes must go on the left side viewed from behind the rear of the bicycle.

GEAR HUBS

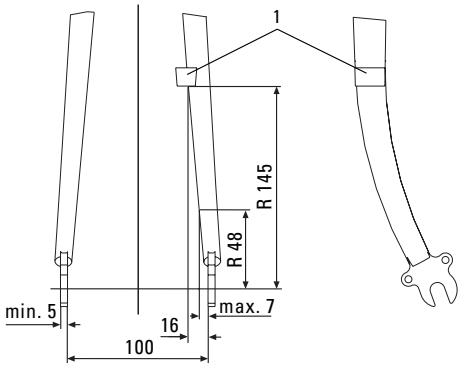
NEW		DualDrive	SRAM S7	SRAM P5	SRAM T3
Brake Model		i-brake for DualDrive	i-brake for SRAM S7	i-brake for SRAM P5	i-brake for SRAM T3
Performance Level		Comfort / City / Commuter / Trekking		←	←
Hub		DD 27 / 24 / 21 i-Brake comp.	SRAM S7 i-Brake comp.	SRAM P5 i-Brake comp.	SRAM T3 i-Brake compatible
Over Locknut Dim.		135 mm	135 mm	126 mm	118 mm
Length		177 mm	188.5 mm	179 mm	164 mm
Ends Diameter		FG 10.5	FG 10.5	FG 10.5	FG 10.5
Holes		36	36	36	36
Hole Diameter		2.6 mm	2.9 mm	2.9 mm	2.8 mm
Hole Reference ø		75 mm	75 mm	89 mm	89 mm
Tandem Compatib.		—	—	—	—
Compat. brake lever		Linear Pull compatible, Two-Axis		←	←
Brake anchor plate		Version D	Version D	Version D	Version D
Total Weight		1095 g	1695 g	1465 g	1046 g
Hub Shell		Aluminum, anodized	Steel, matt chrome plated	Steel, matt chrome plated	Steel, matt chrome plated
Brake Drum		Stainless steel	Stainless steel	Stainless steel	Stainless steel

i-BRAKE AND COMPATIBLE HUBS

TECHNICAL DATA / ASSEMBLY REQUIREMENTS



1



FRONT FORK REQUIREMENTS

Strength:

The strength must be such that with a maximum braking 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.

Brake arm anchor boss (1, **Fig. 1**):

Brazed-on or screwed (suspension forks)

Warning:

Don't use brake arm clamps (Fig. 2).

Mudguard and luggage carrier attachment:
Mounting screws should not collide with i-Brake (**Fig. 3**).

HAND BRAKE LEVER COMPATIBILITY

- Use only Linear Pull compatible hand brake levers.
- Leverage must be 1.9 – 2.1.
- Cable pull of at least 25 mm.
- Hand brake lever with adjustable leverage:
Adjust the leverage to get above described values of leverage and cable pull. (SRAM 9.0 / 7.0 – adjust to smallest leverage, that means max. cable pull.)

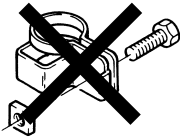
Warning:

There is a risk of accident if unsuitable brake levers are used.

BRAKE CABLES

- Use only new high quality 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 effect cable housing length.

2



REAR FRAME REQUIREMENTS

Strength:

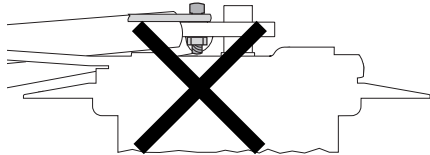
The strength must be such that with a maximum braking torque of 250 Nm (2200 in.lbs.) on the rear wheel no residual deformation can occur on the rear structure.

Dimensions:

Important dimensions for rear frames see **previous page**.
Rear fork dropouts must be parallel.

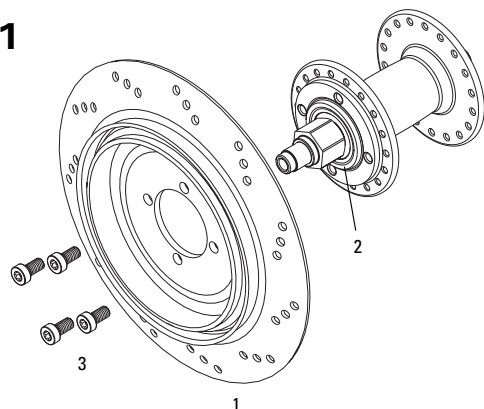
Mudguard and luggage carrier attachment:
Mounting screws should not collide with i-Brake (**Fig. 3**).

3

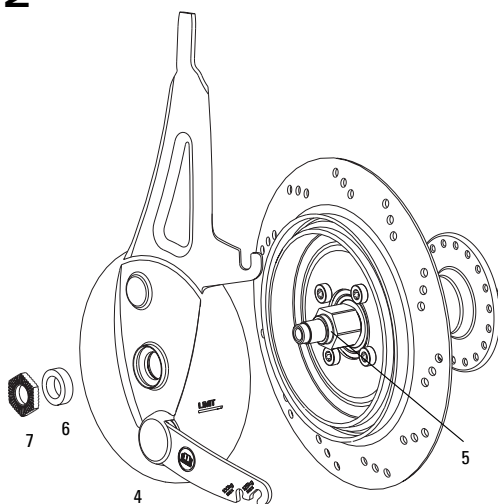


i-BRAKE AND COMPATIBLE HUBS ASSEMBLY

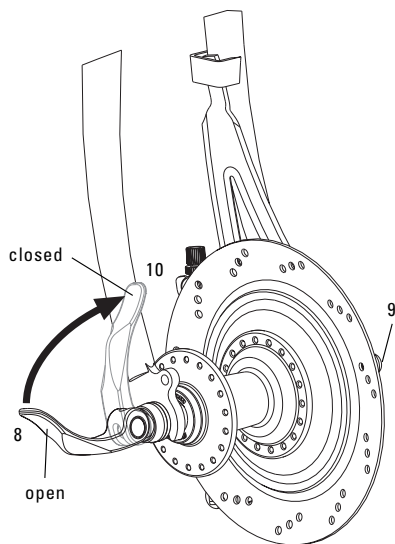
1



2



3



ASSEMBLY

- Lace the wheel as normal. 3-cross only.

Caution:

- **Plane faces of brake drum and hub must be clean and free from oily and greasy substances.**

- **Internal area of the brake drum and brake lining material must be free of dirt and oil or other substances containing grease.**

Danger of accident!

- Slide brake drum (1, Fig. 1) onto centering seat (2) and fasten crosswise with appropriate four cylinder head screws (3), (or countersunk screws for version DualDrive). Torx T25, tightening torque 5,5 – 6 Nm (49 – 53 in.lbs.).

- Slide brake anchor plate (4, Fig. 2) onto centering seat (5) without tilting it.

Front hubs:

- Apply steel washer (6) and lock nut (7), milled side outwards. Wrench 15 mm, tightening torque 15 – 20 Nm (133 – 177 in.lbs.).

Gear Hubs:

- Apply steel/resin washer (6). Lock nut (7) must not be used.

Advice:

The wheel must turn freely.

- Placing the wheel in fork ends. Guide the top end of brake anchor plate into the brazing part of the front fork resp. fit frame clamp to fasten the brake anchor plate at rear fork.

Caution:

Mount the brake anchor plate between the two straps of the frame clamp.

The clamp must be seated on the rear fork with no play.

Use a self-locking nut! Hex screw, property class 8.8.

Tightening torque: 7 – 8 Nm (62 – 70 in.lbs.).

Fastening wheel / solid axle:

- Fit washers resp. retaining washers to the axle ends.
- Tighten up axle nuts, torque 30 – 40 Nm (270 – 350 in.lbs.).

Fastening wheel / quick release (Fig. 3):

- Only use quick release devices with the correct length.
- Position quick release opposite to the brake.
- Turn release lever (8) outwards until it is at least at a right angle to the bike (position "open").
- Tighten adjusting nut (9) as much as possible by hand.

- Turn release lever (8) to the "closed" position (10) (the word "close" is visible from the outside).

After closure, the release lever should be parallel to the fork. If the release lever can be closed relatively easily, the tension force is inadequate.

In this case, open release lever again, tighten adjusting nut (9) slightly and close release lever again.

If considerable force is required to close the lever, open the lever again, undo the adjusting nut slightly and close lever again.

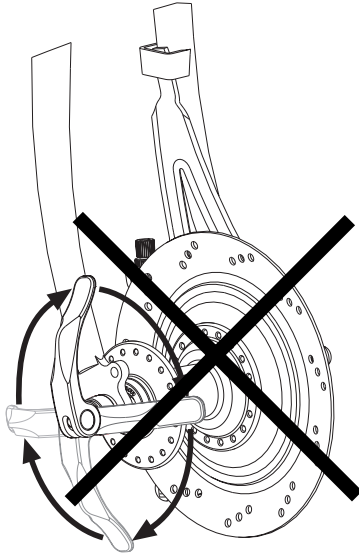
Warning:

- **Do not tighten wheel by turning the quick release lever clockwise (Fig. 4)!**
- **Only use hand force.**
- **By incorrectly mounting the skewer or the wheel in the dropout, or by wrongly adjusting the closing force, the wheel may come loose and fall off during the ride. This may lead to severe rider injury or death.**

i-BRAKE AND COMPATIBLE HUBS ASSEMBLY



4



CONNECTING i - BRAKE

- Fit cable stop (1, **Fig. 5**) with adjusting bolt (2) and nut (3) and insert into the slot on the brake anchor plate.
- Turn adjusting bolt down completely.
- Route the brake cable.
- Push brake cable end through adjusting screw.
- Insert cable housing end into adjusting screw.
- Thread brake cable end (5, **Fig. 5**) into link (6) and tighten nut (7) slightly (hex wrench 5 mm).

Caution:

Ensure that the brake cable lies in the notch of the link. Curved side of the link should be outside and hex nut should point away from brake.

- Attach link to brake lever (4). Use outer standard position "125 kg" (overall weight).
- Pull brake cable end tight with pliers so that link can still be attached and removed (important for changing wheel).
- Tighten nut (7), torque 7 – 8 Nm (62 – 70 in.lbs.). Counter the screw with a 10 mm wrench.
- Put the link in the position first that is closest to your total weight with bike (and equipment).
- Positioning of link can be changed to personal preferences, but we advise to use according to weight.
- Make sure you use the same position after changing the wheel.

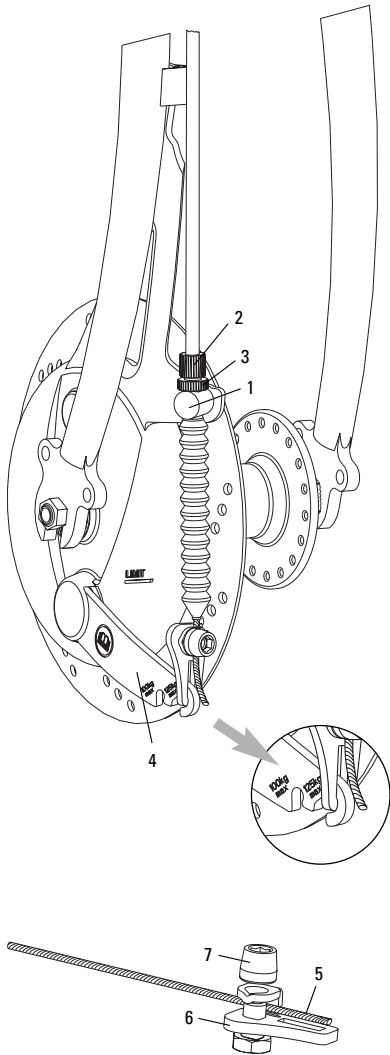
ADJUSTMENT i - BRAKE

- Unscrew adjusting screw (2, **Fig. 5**) until the brake pads drag lightly.
- Actuate the hand brake lever forcefully several times and then, if necessary, turn the adjusting screw further in just until the wheel starts spinning freely.
- Lock with nut (3).

Caution:

- **Check that all the brake system components are functioning properly.**
- **Practise using the brake on safe ground without traffic. Learn to make emergency stops.**
- **Always use both brakes.**
- **Avoid constant braking on long down-hills. Rather brake harder before getting too fast and allow to cool off again.**
- **Always wear a helmet.**
- **The i-Brake requires a braking-in period to achieve maximum braking power.**
- **Before riding, always check the brakes for proper operation especially after cleaning or car transport in rain or not using the bike for a longer time or after a crash.**

5

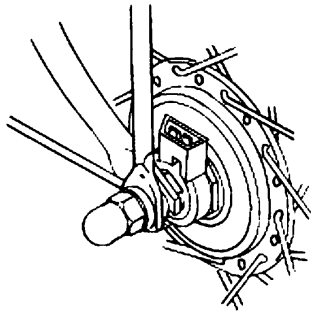


I-LIGHT FRONT HUB DYNAMO

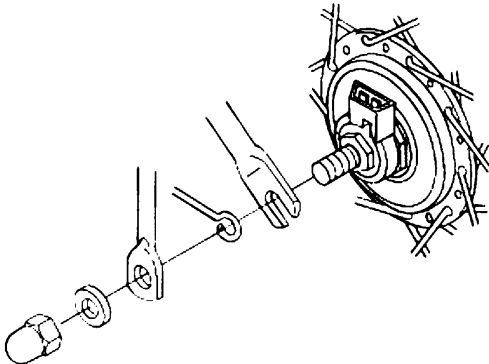
TECHNICAL DATA / ASSEMBLY REQUIREMENTS

		NEW i-light Hub Dynamo									
		D324s		D330s		D330b		D730s		D730s-ib	
I - L I G H T F R O N T H U B S	Model	Standard		←		←		←		i-brake compatible	
		Version	Standard		←		←		←		i-brake compatible
	Output	2.4 W		3.0 W		3.0 W		3.0 W		3.0 W	
	Voltage	6 V		6 V		6 V		6 V		6 V	
	Over Locknut Dim.	100 mm		←		←		←		100 mm	
		Length, L	140 mm		←		←		140 mm		108 mm
	Type	Solid		←		←		Solid		Hollow	
		Material	Steel		←		←		←		Steel
	Ends Diameter	N/A		←		←		←		N/A	
	Holes	36		←		←		←		36	
Spoke Diameter	2 mm		←		←		←		2 mm		
Hole Reference ø	80 mm		←		←		←		80 mm		
Flange Distance	60 mm		←		←		←		N/A		
Offset	0 mm		←		←		←		N/A		
Bearing	Cartridge		←		←		←		Cartridge		
Sealing	Double Sealed		←		←		←		Double Sealed		
Tandem Compatib.	—		—		—		—		—		
Weight	N/A		N/A		N/A		N/A		N/A		
Finish Hub Shell	Aluminum, clear coated		←		Aluminum, black coated		Aluminum, silver coated		Aluminum, silver coated		

1



2



ASSEMBLY

Putting together the front wheel mounting assembly:

- Align the front wheel (hub dynamo) in its mounting position (**Fig. 1**). The connection terminal of the hub dynamo should be on the right side (when the bicycle is facing forward). The connection terminal should be positioned between the front fork and the basket stay.
- Assemble the fender stays and basket stays (**Fig. 2**). Make sure that the hub washer and hub nut have been put on in the correct order (**Fig. 2**).
- Tighten the hub nut.
 - Tighten the left and right hub nuts alternately, little by little, to course that the hub dynamo connection terminal do not turn away from the correct orientation.
 - The recommended hub nut tightening torque is 20 Nm (177 in.lbs.).

Connecting of the cables:

- Recommended wire specifications: Inner wire size (AWG) 22 / Diameter approx. 0.8 mm. Insulation 1.8 2mm.
- Twist the cable wires before connecting them so that they stay together.
- Connect the cables as shown in **Fig. 3**.
- Bend the cable wires and run them along the grooves (**Fig. 4**).

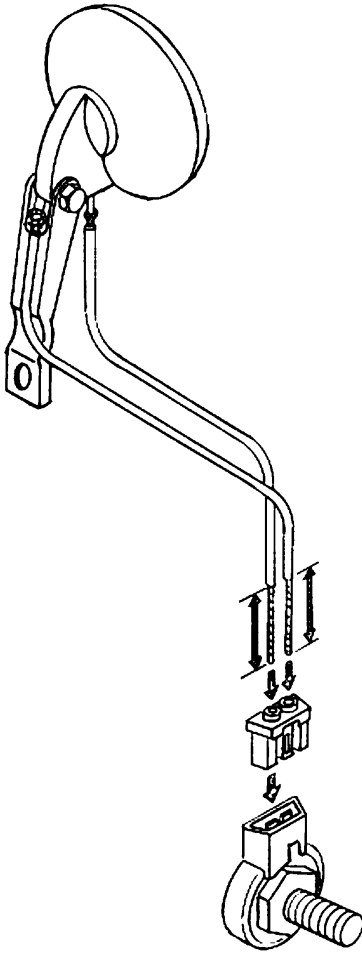
Checking the lamp illuminations:

Rotate the front wheel and check that the lamp illuminations (**Fig. 5**).

I-LIGHT HUB DYNAMO ASSEMBLY / MAINTENANCE



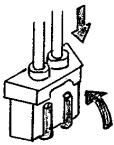
3



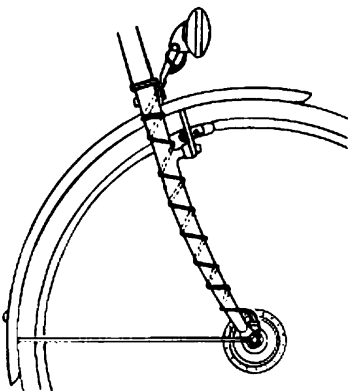
MAINTENANCE

- Do not disassemble the internal hub mechanism.
- Do not apply any lubricant to the inside of the hub, otherwise the grease will come out and it may cause problems with conductivity.
- If the hub nuts are screwed on too tight, or if one or the other is screwed tighter or looser than the other, the hub axle may be forced to turn. Making the hub nuts looser or too tight, this could permanently damage the hub axle.
- Contact your dealer for repairs if the tire needs replacement or the hub nuts are loose.
- Compatible bulbs:
Frontlamp 6 V, 2.4 W or 6 V, 3 W
Taillamp 6 V, 0.6 W

4



5



X-GEN / 3.0 • FRONT DERAILLEURS

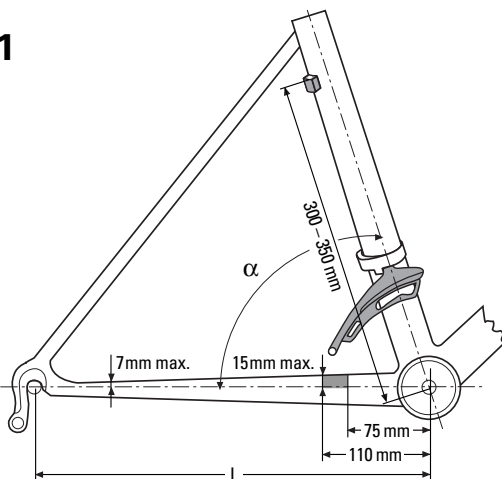
TECHNICAL DATA / ASSEMBLY REQUIREMENTS



X-GEN 3.0

	X-Gen	3.0
Clamp Size	28.6 mm with band adaptor ←	Not available ←
	31.8 mm with band adaptor ←	with band adaptor ←
	34.9 mm original ←	original ←
	Rear Compatibility 9spd ←	8spd / 7spd ←
Index Compatible Yes ←	Yes ←	
Total Capacity 22T ←	20T ←	
Top-Middle Min. Capacity min. 12T ←	min. 10T ←	
Top Gear Teeth 44T ←	42T 48T	
Cable Routing Twin Pull Type (Top and Bottom Pull)	Twin Pull Type (Top and Bottom Pull)	
Chainstay Angle 66 – 69° ←	66 – 69° ←	
Mount Type Down Swing ←	Down Swing ←	
Chain Line 47,5 – 50 mm ←	47,5 – 50 mm ←	
Weight N/A ←	N/A ←	
Band Material Aluminum ←	Steel ←	
Outer Link Aluminum ←	Steel ←	
Inner Link Aluminum ←	Steel ←	
Link Bushing Outer Sealed ←	Bushing ←	
Chain Cage Steel Chrome Plated ←	Steel Chrome Plated ←	
Color Silver Black	Black ←	

1



FRAME DIMENSIONS (see Fig. 1)

- For Top Pull version: upper cable stop should be positioned 300 – 350 mm above bottom bracket center.
- The seat tube should be positioned in the center of the bottom bracket shell.

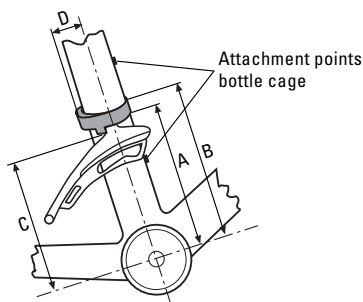
Chainstay angle:
α = 66° – 69°.

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

Length of chainstay:

- MTB/Trekking L > 420 mm.
- Rear frame alignment must be symmetrical.

2



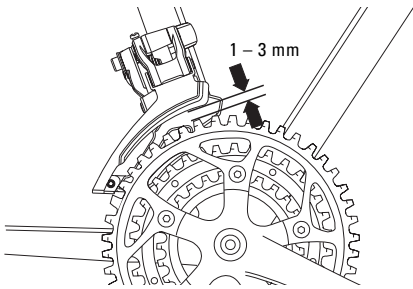
NECESSARY CLEARANCE (see Fig. 2)

- Be sure to leave enough clearance between bottle cage holes and clamp location.
- Lower bottle cage hole is usually placed between 90 – 110 mm over bottom bracket center.

Necessary clearance see Fig. 2	X-Gen	3.0 42T	3.0 48T	
Clamp band position	A	130 mm	114 mm	119 mm
	B	152 mm	128 mm	133 mm
	C	100 mm	107 mm	112 mm
Tire clearance	D	38 mm	43 mm	43 mm

X-GEN / 3.0 · FRONT DERAILLEURS ASSEMBLY

1



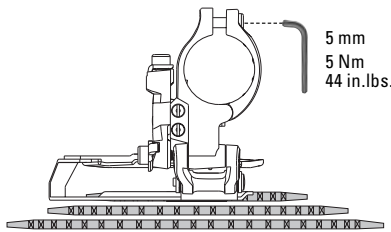
ASSEMBLY

- 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 – 7 Nm (44 – 62 in.lbs.).

INDEX SHIFTING ADJUSTMENT

(*see Fig. 7*)
Shift the chain onto the largest rear sprocket and middle chainring – if the chain scrapes against the inner cage plate, turn the adjusting barrel on the shifter clockwise until the chain shifts smoothly and free of obstruction.

2



LOW LIMIT ADJUSTMENT

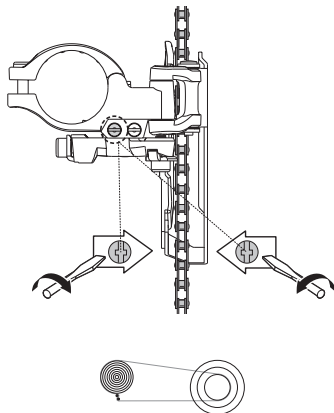
(*see Fig. 3*)

- Place the chain on the largest rear cog and the smallest front chainring.
- Adjust the low limit screw (*Fig. 3*) so that the chain is positioned close to the inner cage plate without actually touching it.

CONNECTING CABLE

- Check that the chain and the front derailleur are in the smallest chainring position.
- Place the front shifter in gear position '1'.
- 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. 4*).
 - Bottom pull (*Fig. 5*).
- Tighten the 5 mm hex cable anchor bolt to 5 Nm (44 in.lbs.). Be careful not to crush or deform the cable.
- Shift the chain up and down the chainrings several times to take out initial slack in the cable.
- If necessary re-tension the cable and tighten cable anchor bolt.

3

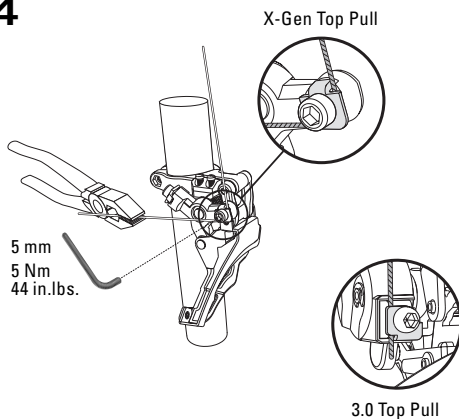


HIGH LIMIT ADJUSTMENT

(*see Fig. 6*)

- 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.

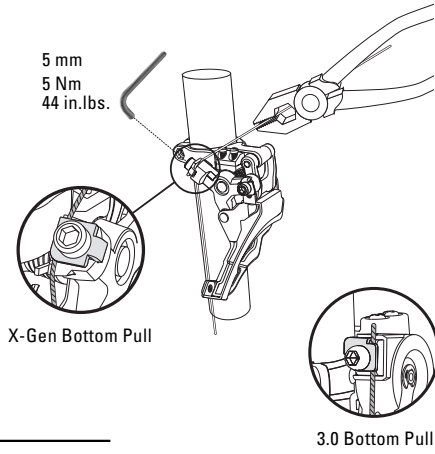
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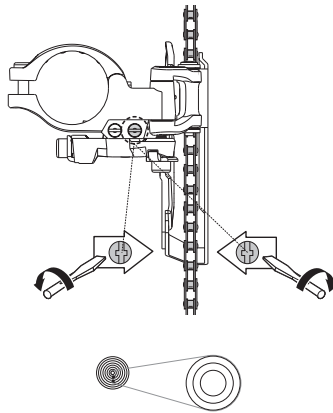
X-GEN / 3.0 · FRONT DERAILLEURS ASSEMBLY



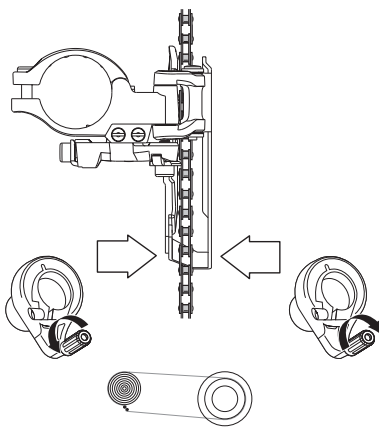
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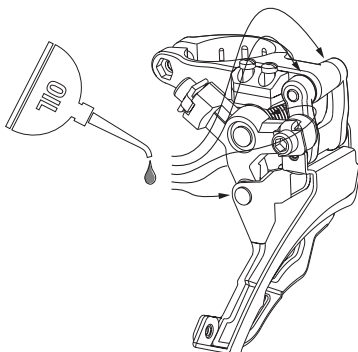
6



7



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.
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-9/X-7/4.0/ROCKET/ATTACK/TRX • TRIGGER SHIFTERS

TECHNICAL DATA / ASSEMBLY REQUIREMENTS

X-9 X-7		X-9		X-7	
	Shifter Type	Front / Index	Rear 1:1 / ESP	Front / Index	Rear 1:1 / ESP
	Speeds	3	9	3	9 8 NEW
	Derailleur	SRAM & Shimano	SRAM X-0 / X-9 / X-7 / 5.0	SRAM & Shimano	SRAM X-0 / X-9 / X-7 / 5.0
	Crankset	Triple Indexed		Triple Indexed	
	Cable Pull Release	Impulse Technology	Impulse Technology	Impulse Technology	Impulse Technology
	Cable	Stainless Steel / Teflon Coated		Stainless Steel	←
	Gear Indication	Window	Window	Window	Window
	Barrel Adjuster	Indexing, Aluminum	Indexing, Aluminum	Indexing, Composite	Indexing, Composite
	Clamping Diameter	22.3 mm	22.3 mm	22.3 mm	22.3 mm
	Shifter Length	26 mm	←	26 mm	←
Weight	262 g (pair)	262 g (pair)	260 g (pair)	260 g (pair)	

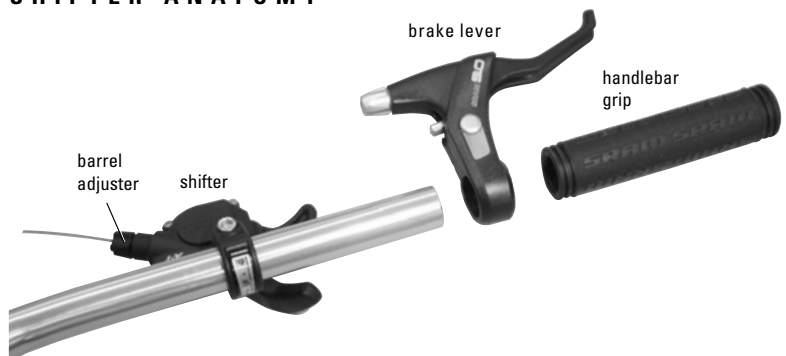
4.0 ROCKET		4.0 <i>NEW</i>		Rocket	
	Shifter Type	Front / Index	Rear 1:1 / ESP	Front / Index	Rear 2:1
	Speeds	3	8 7	3	9
	Derailleur	SRAM & Shimano	SRAM X-0 / X-9 / X-7 / 5.0	SRAM & Shimano	SRAM 2:1 & Shimano
	Crankset	Triple Indexed		Triple Indexed	
	Cable Pull Release	Uni-Lever Technology	Uni-Lever Technology	Impulse Technology	Impulse Technology
	Cable	Standard	←	Stainless Steel / Teflon Coated	
	Gear Indication	Window	Window	Window	Window
	Barrel Adjuster	Indexing, Composite	Indexing, Composite	Indexing, Aluminum	Indexing, Aluminum
	Clamping Diameter	22.3 mm	22.3 mm	22.3 mm	22.3 mm
	Shifter Length	N/A	←	26 mm	←
Weight	N/A	N/A	262 g (pair)	262 g (pair)	

ATTACK TRX		Attack		TRX <i>NEW</i>	
	Shifter Type	Front / Index	Rear 2:1	Front / Index	Rear 2:1
	Speeds	3	9 8 NEW	3	9 8
	Derailleur	SRAM & Shimano	SRAM 2:1 & Shimano	SRAM & Shimano	SRAM 2:1 & Shimano
	Crankset	Triple Indexed		Triple Indexed	
	Cable Pull Release	Impulse Technology	Impulse Technology	Uni-Lever Technology	Uni-Lever Technology
	Cable	Stainless Steel	←	Standard	←
	Gear Indication	Window	Window	Window	Window
	Barrel Adjuster	Indexing, Composite	Indexing, Composite	Indexing, Composite	Indexing, Composite
	Clamping Diameter	22.3 mm	22.3 mm	22.3 mm	22.3 mm
	Shifter Length	26 mm	←	N/A	←
Weight	260 g (pair)	260 g (pair)	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



X-9/X-7/4.0/ROCKET/ATTACK/TRX • TRIGGER SHIFTERS ASSEMBLY



1



ASSEMBLY

- Slide first shifter then brake lever onto handlebar.
Bar end users – don't forget to leave room for the bar end.

- Slide the handlebar grip onto the handlebar.

Caution:

Never use lubricants or solvents to install handlebar grips. Handlebar grips provide safety function.

For this reason, they should be mounted in such a way as to make sure they do not slip off handlebar!

- Tighten the 5 mm hex clamp bolt to 30 in.lbs. (3.4 Nm).

- Feed the cable through the cable housing and stops. Make sure the front shifter is in gear position "1" and the rear shifter is in HIGHEST gear position.
- 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 for proper brake lever operation again!**

2



CASSETTES

TECHNICAL DATA / ASSEMBLY REQUIREMENTS

PG990

		PG 990			
Compati- bility	Application	MTB	MTB		
	Technology	Power Glide II	Power Glide II		
	Largest Cog	34 T	32 T		
	Speeds	9	9		
	Chains	SRAM / Shimano	SRAM / Shimano		
	Hubs	Shimano	Shimano		
	Cogs	11/12/14/16/18/21/24/28/34	11/12/14/16/18/21/24/28/32		
	Lockring torque	40 Nm	40 Nm		
	Weight	300 g	290 g		
	Design	Cogs	SAPH 440 steel	SAPH 440 steel	
Spider		Composite	Composite		
Lockring		Forged Steel	Forged Steel		
Rivets		Stainless Steel	Stainless Steel		
Finish		Chrome Plated, Satin	Chrome Plated, Satin		

PG970

		PG 970				
Compati- bility	Application	MTB	MTB	Road	Road	Road
	Technology	Power Glide II	Power Glide II	Power Glide II	Power Glide II	Power Glide II
	Largest Cog	34 T NEW	32 T	26 T	23 T	23 T
	Speeds	9	9	9	9	9
	Chains	SRAM / Shimano	SRAM / Shimano	SRAM / Shimano	SRAM / Shimano	SRAM / Shimano
	Hubs	Shimano	Shimano	Shimano	Shimano	Shimano
	Cogs	11/13/15/17/20/23/26/30/34	11/12/14/16/18/21/24/28/32	12/13/14/15/17/19/21/23/26	12/13/14/15/16/17/19/21/23	11/12/13/14/15/17/19/21/23
	Lockring torque	40 Nm	40 Nm	40 Nm	40 Nm	40 Nm
	Weight	410 g	330 g	230 g	210 g	210 g
	Design	Cogs	SAPH 440 steel	SAPH 440 steel	SAPH 440 steel	SAPH 440 steel
Lockring		Forged Steel	Forged Steel	Aluminum, anodized	Aluminum, anodized	Aluminum, anodized
Screws		Steel / Zinc Coat	Steel / Zinc Coat	Steel / Zinc Coat	Steel / Zinc Coat	Steel / Zinc Coat
Finish		Chrome Plated, Satin	Chrome Plated, Satin	Chrome Plated	Chrome Plated	Chrome Plated

PG970
PG950

		PG 970	PG 950			
Compati- bility	Application	Road	MTB	MTB	Road	Road
	Technology	Power Glide II	Power Glide II	Power Glide II	Power Glide II	Power Glide II
	Largest Cog	21 T	34 T NEW	32 T	26 T	26 T
	Speeds	9	9	9	9	9
	Chains	SRAM / Shimano	SRAM / Shimano	SRAM / Shimano	SRAM / Shimano	SRAM / Shimano
	Hubs	Shimano	Shimano	Shimano	Shimano	Shimano
	Cogs	11/12/13/14/15/16/17/19/21	11/13/15/17/20/23/26/30/34	11/12/14/16/18/21/24/28/32	12/13/14/15/17/19/21/23/26	12/13/14/15/16/17/19/21/23
	Lockring torque	40 Nm	40 Nm	40 Nm	40 Nm	40 Nm
	Weight	200 g	470 g	380 g	240 g	220 g
	Design	Cogs	SAPH 440 steel	Steel	Steel	SAPH 440
Lockring		Aluminum, anodized	Forged Steel	Forged Steel	Forged Steel	Forged Steel
Screw		Steel / Zinc Coat	Steel / Zinc Coat	Steel / Zinc Coat	Steel / Zinc Coat	Steel / Zinc Coat
Finish		Chrome Plated	Chrome Plated	Chrome Plated	Chrome Plated	Chrome Plated

CASSETTES

TECHNICAL DATA / ASSEMBLY REQUIREMENTS

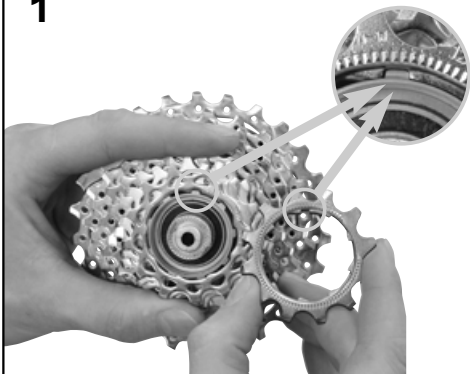


P G 8 5 0	Compati- bility	PG 850						
		Application	MTB	MTB	MTB	Road	Road	
		Technology	Power Glide II	Power Glide II	Power Glide II	Power Glide II	Power Glide II	
		Largest Cog	32 T	30 T <i>NEW</i>	28 T	26 T	23 T	
		Speeds	8	8	8	8	8	
		Chains	SRAM / Shimano	SRAM / Shimano	SRAM / Shimano	SRAM / Shimano	SRAM / Shimano	
		Hubs	Shimano	Shimano	Shimano	Shimano	Shimano	
		Cogs	11/12/14/16/18/21/26/32	11/13/15/17/20/23/26/30	11/12/14/16/18/21/24/28	12/13/15/17/19/21/23/26	12/13/14/15/17/19/21/23	
		Lockring torque	40 Nm	40 Nm	40 Nm	40 Nm	40 Nm	
		Weight	280 g	310 g	250 g	230 g	220 g	
		Design	Cogs	SAPH 440 steel	SAPH 440 steel	SAPH 440 steel	SAPH 440 steel	SAPH 440 steel
			Lockring	Forged Steel	Forged Steel	Forged Steel	Forged Steel	Forged Steel
			Screw	Steel / Zinc Coat	Steel / Zinc Coat	Steel / Zinc Coat	Steel / Zinc Coat	Steel / Zinc Coat
			Finish	Chrome Plated	Chrome Plated	Chrome Plated	Chrome Plated	Chrome Plated

P G 8 3 0	Compati- bility	PG 830			PG 730			
		Application	MTB	MTB	MTB	MTB		
		Technology	Power Glide II	Power Glide II	Power Glide II	Power Glide II		
		Largest Cog	32 T	30 T <i>NEW</i>	28T	32T		
		Speeds	8	8	8	7		
		Chains	SRAM / Shimano	SRAM / Shimano	SRAM / Shimano	SRAM / Shimano		
		Hubs	Shimano	Shimano	Shimano	Shimano		
		Cogs	11/12/14/16/18/21/26/32	11/13/15/17/20/23/26/30	11/12/14/16/18/21/24/28	12/14/16/18/21/26/32		
		Lockring torque	40 Nm	40 Nm	40 Nm	40 Nm		
		Weight	320 g	340 g	280 g	310 g		
		Design	Cogs	Steel	Steel	Steel	Steel	
			Lockring	Forged Steel	Forged Steel	Forged Steel	Forged Steel	
			Screw	Steel / Zinc Coat	Steel / Zinc Coat	Steel / Zinc Coat	Steel / Zinc Coat	
			Finish	Chrome Plated	Chrome Plated	Chrome Plated	Chrome Plated	

CASSETTES ASSEMBLY

1



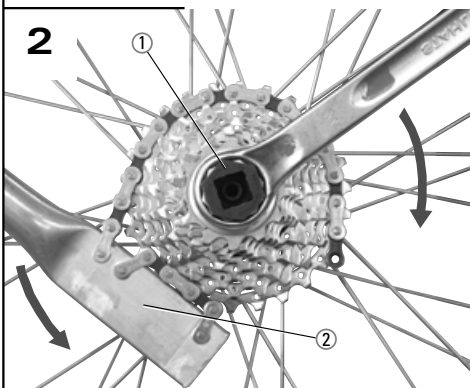
ASSEMBLY

- Position the cassette cluster and individual sprockets on the cassette body by aligning the spline pattern (**Fig. 1**).
- Screw the lockring in to the cassette body and tighten it to 40 Nm (350 in.lbs.) by using a cassette tool (1, **Fig. 2**) like the Park Tool® FR-5 or Shimano® and a chain wrench (2).
- Adjust the rear derailleur according to the installation advice from the derailleur manufacturer.

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).

2



POWER CHAINS

TECHNICAL DATA / ASSEMBLY REQUIREMENTS

POWER CHAINS

	PC990	PC970	PC950	PC38 Saltshaker	PC38
Application	MTB / Road	MTB / Road	MTB / Road	MTB / Road	MTB / Road
Max. No. of sprockets	9 only	9 only	9 only	max. 8	max. 8
Compatibility Front	HG / EXA-Drive	HG / EXA-Drive	HG / EXA-Drive	HG / IG / EXA-Drive	HG / IG / EXA-Drive
Compatibility Rear	HG / EXA-Drive	HG / EXA-Drive	HG / EXA-Drive	HG / HG-I / IG / PG / EXA-Drive	HG / HG-I / IG / PG / EXA-Drive
Dimension	1/2" x 11/128"	1/2" x 11/128"	1/2" x 11/128"	1/2" x 3/32"	1/2" x 3/32"
Length	6.8 mm	6.8 mm	6.8 mm	7.1 mm	7.1 mm
Riveting	Step	Step	Step	Step	Step
Chrome Hardened	Yes	Yes	Yes		
Push Power	2000 N / 450 lbs.	2000 N / 450 lbs.	2000 N / 450 lbs.	1300 N / 292 lbs.	1300 N / 292 lbs.
Min. Tensile Strength	9000 N / 2023 lbs.	9000 N / 2023 lbs.	9000 N / 2023 lbs.	9000 N / 2023 lbs.	9000 N / 2023 lbs.
Weight (114 links)	288 g	288 g	288 g	307 g	307 g
External Pin Plate	Nickel Plated	Nickel Plated	Gray	Light Gray	Gray / Polished
Internal Pin Plate	Nickel Plated	Grey	Gray	Light Gray	Gray / Polished
Connecting Method	Power Link Gold or Pin	Power Link Gold or Pin	Power Link Gold or Pin	Power Link SS2 or Pin	Power Link Silver or Pin

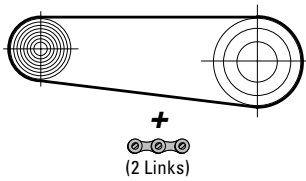
POWER CHAINS

	PC10 Saltshaker	PC10	PC1 Saltshaker	PC1
Application	MTB	MTB	Gear Hubs	Gear Hubs
Max. No. of sprockets	max. 7	max. 7	1	1
Compatibility Front	Single / HG	Single / HG	Single	Single
Compatibility Rear	Single / HG	Single / HG	Single	Single
Dimension	1/2" x 3/32"	1/2" x 3/32"	1/2" x 1/8"	1/2" x 1/8"
Length	6.9 mm	6.9 mm	7.8 mm	7.8 mm
Riveting	Step	Step	Step	Step
Push Power	1000 N / 225 lbs.	1000 N / 225 lbs.	800 N / 180 lbs.	800 N / 180 lbs.
Min. Tensile Strength	9000 N / 2023 lbs.	9000 N / 2023 lbs.	8000 N / 1800 lbs.	8000 N / 1800 lbs.
Weight (114 links)	300 g	300 g	330 g	330 g
External Pin Plate	Light Gray	Brown	Light Gray	Brown
Internal Pin Plate	Light Gray	Brown	Light Gray	Brown
Connecting Method	Power Link SS1	Power Link Gray	Snap Lock or Pin	Snap Lock or Pin

POWER CHAINS ASSEMBLY



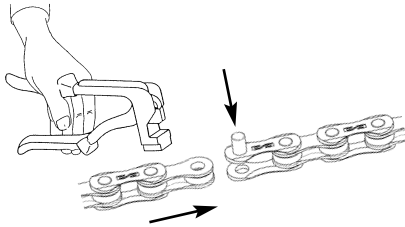
1



PC 990 / PC 970 / PC 950 / PC 38 / PC 10
 ($\frac{1}{2}$ " x $\frac{3}{32}$ " AND $\frac{1}{2}$ " x $\frac{11}{128}$ ")

PC 1
 ($\frac{1}{2}$ " x $\frac{1}{8}$ ")

2



Chain length:

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

SRAM derailleurs:

- Place chain over largest front chain-wheel 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.

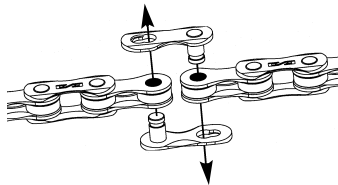
Closing chain with Snap Lock:

- 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.**

3



Closing standard version with clamping pin:

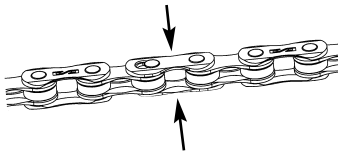
Fit chain, bring the two ends together and press pin (Fig. 2) through with assembly tool. The pin must extend by the same amount at both outer plates. It must be possible to move the connecting link slightly.

Power Link connecting links:

Caution:

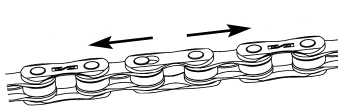
- **Use only as specified, to avoid material damage or the rider to fall off his bicycle resulting in injury.**
- **Use only Power Link Gold for closing Holow Pin chain versions (no pin).**

4



Power Link Gray	gray coloured for PC 10
Power Link SS1 (SaltShaker 1)	light gray coloured for PC 10 SaltShaker
Power Link Silver	gold coloured for PC 38
Power Link SS2 (SaltShaker 2)	light gray coloured for PC 38 SaltShaker
Power Link Gold	gold coloured for PC 990, PC 970, PC 950

5



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)

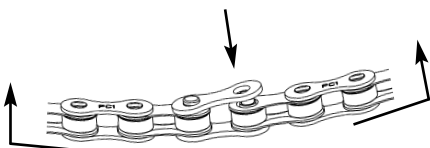
6



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.

7



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.

NOTICES

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