2011

SRAM

new technical specifications

(english) gear hub systems

SRAM® LLC WARRANTY

EXTENT OF LIMITED WARRANTY

SRAM warrants its products to be free from defects in materials or workmanship for a period of two years after original purchase. This warranty only applies to the original owner and is not transferable. Claims under this warranty must be made through the retailer where the bicycle or the SRAM component was purchased. Original proof of purchase is required.

LOCAL LAW

This warranty statement gives the customer specific legal rights. The customer may also have other rights which vary from state to state (USA), from province to province (Canada), and from country to country elsewhere in the world.

To the extent that this warranty statement is inconsistent with the local law, this warranty shall be deemed modified to be consistent with such law, under such local law, certain disclaimers and limitations of this warranty statement may apply to the customer. For example, some states in the United States of America, as well as some governments outside of the United States (including provinces in Canada) may:

a. Preclude the disclaimers and limitations of this warranty statement from limiting the statutory rights of the consumer (e.g. United Kingdom).

b. Otherwise restrict the ability of a manufacturer to enforce such disclaimers or limitations.

LIMITATIONS OF LIABILITY

To the extent allowed by local law, except for the obligations specifically set forth in this warranty statement, in no event shall SRAM or its third party supplies be liable for direct, indirect, special, incidental, or consequential damages.

LIMITATIONS OF WARRANTY

This warranty does not apply to products that have been incorrectly installed and/or adjusted according to the respective SRAM technical installation manual. The SRAM installation manuals can be found online at www.sram.com, www.RockShox.com, or www.avidbike.com.

This warranty does not apply to damage to the product caused by a crash, impact, abuse of the product, non-compliance with manufacturers specifications of usage or any other circumstances in which the product has been subjected to forces or loads beyond its design.

This warranty does not apply when the product has been modified.

This warranty does not apply when the serial number or production code has been deliberately altered, defaced or removed.

This warranty does not apply to normal wear and tear. Wear and tear parts are subject to damage as a result of normal use, failure to service according to SRAM recommendations and/or riding or installation in conditions or applications other than recommended.

Wear and tear parts are identified as:

- Dust seals
- Bushings
- Air sealing o-rings
- Glide rings
- Rubber moving parts
- Foam rings
- Rear shock mounting hardware and main seals
- Upper tubes (stanchions)
- Stripped threads/bolts (aluminium, titanium, magnesium or steel)
- Brake sleeves
- Brake pads
- Chains
- Sprockets
- Cassettes
- Shifter and brake cables (inner and outer)
- Handlebar grips
- Shifter grips
- Jockey wheels
- Disc brake rotors
- Wheel braking surfaces
- Bottomout pads
- Bearings
- Bearing races
- Pawls
- Transmission gears
- Tools

This warranty shall not cover damages caused by the use of parts of different manufacturers.

This warranty shall not cover damages caused by the use of parts that are not compatible, suitable and/or authorised by SRAM for use with SRAM components.

This warranty shall not cover damages resulting from commercial (rental) use.

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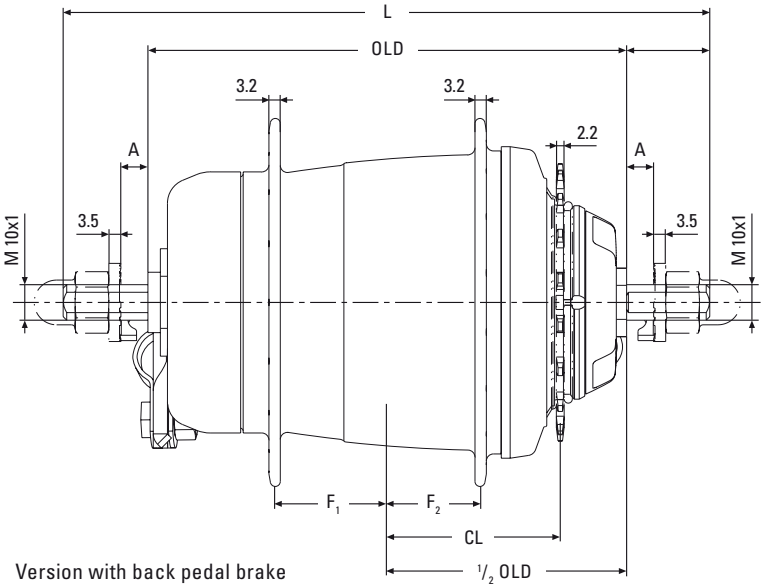
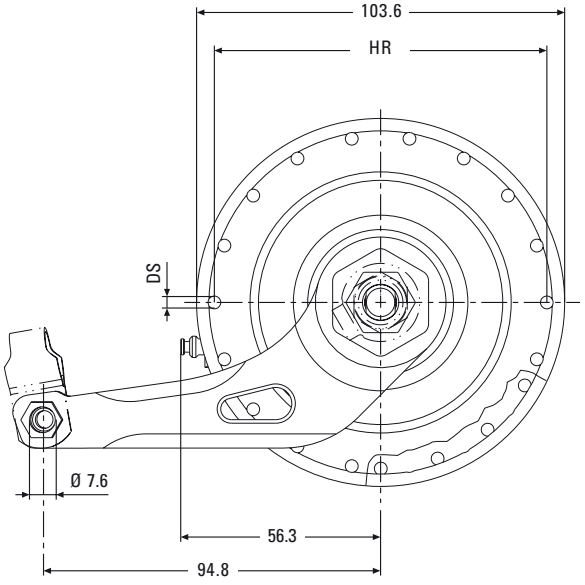


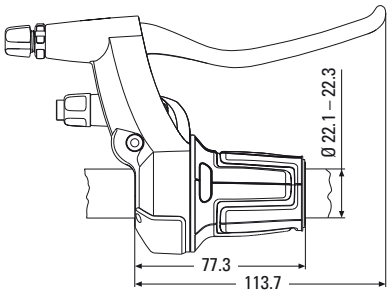
Version with back pedal brake



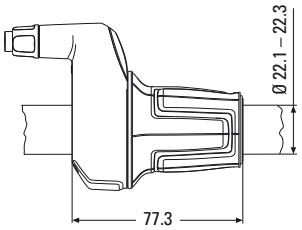
GEAR HUBS

		i-MOTION 9 with back pedal brake		i-MOTION 9 disc brake compatib.	i-MOTION 9 without brake
	Speeds	9		9	9
	Brake	With back pedal brake		Adaptor for disc brake	without
Over Locknut Dim., OLD		135 mm		135 mm	135 mm
Axle	**Length, L**	186 mm		186 mm	186 mm
Axle	**Ends Diameter**	M 10x1		M 10x1	M 10x1
Dropout Width Dim., A		min. 4 mm / max. 10 mm		min. 4 mm / max. 10 mm	min. 4 mm / max. 10 mm
Spoke	**Holes**	36 or 32		36 or 32	36 or 32
Spoke	**Hole Diameter, DS**	2.8 mm		2.8 mm	2.8 mm
Spoke	**Hole Ref. ø, HR**	93.6 mm		93.6 mm	93.6 mm
Flange Dist. to 1/2 OLD		F_1 = 26.5 mm / F_2 = 31.5 mm		F_1 = 26.5 mm / F_2 = 31.5 mm	F_1 = 26.5 mm / F_2 = 31.5 mm
Ratio	**Overall**	340 %	Gear steps	←	←
Ratio	**1st gear**	0,542	↧	←	←
Ratio	**2nd gear**	0,621	14 %	←	←
Ratio	**3rd gear**	0,727	17 %	←	←
Ratio	**4th gear**	0,853	17 %	←	←
Ratio	**5th gear**	1,000	17 %	←	←
Ratio	**6th gear**	1,172	17 %	←	←
Ratio	**7th gear**	1,375	17 %	←	←
Ratio	**8th gear**	1,611	17 %	←	←
Ratio	**9th gear**	1,844	14 %	←	←
Chain	**Chainline, CL**	48.8 mm		48.8 mm	48.8 mm
Chain	**Ratio**	1.73 – 1.90		min. 1.73	min. 1.73
Chain	**Dimensions**	1/2" x 1/8" and 1/2" x 3/32"		1/2" x 1/8" and 1/2" x 3/32"	1/2" x 1/8" and 1/2" x 3/32"
Compatibility	**Sprocket**	18 / 19 / 20 / 21 / 22 teeth		18 / 19 / 20 / 21 / 22 teeth	18 / 19 / 20 / 21 / 22 teeth
Compatibility	**Shifter**	i-MOTION 9 IBS SL and i-MOTION 9 SL		←	←
Compatibility	**Disc Brake**	—		6 holes	—
Compatibility	**Hand brake lever**	—		Disc brake compatible	—
Compatibility	**Tandem**	Not suitable for tandems, transport bicycles or similar			←
	Weight	2,400 g		1,960 g	1,960 g
Finish	**Mat. Hub shell**	Aluminum		Aluminum	Aluminum
Finish	**Surface**	Satin matt "Lux" anodized		Satin matt "Lux" anodized	Satin matt "Lux" anodized

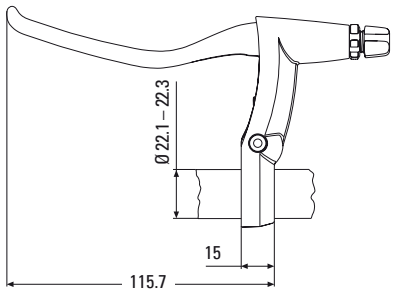
i-MOTION® 9
TECHNICAL DATA / ASSEMBLY REQUIREMENTS



Shifter i-MOTION 9 IBS SL



Shifter i-MOTION 9 SL



Brake lever SRAM BL 60

SHIFTERS

		i-MOTION 9 IBS SL	i-MOTION 9 SL
	Version	i-MOTION 9 IBS (integrated hand brake lever)	i-MOTION 9 (single shifter)
	Shift cable lengths	1400 mm / 1500 mm / 1600 mm / 1700 mm	1400 mm / 1500 mm / 1600 mm / 1700 mm
	Shifter type	SRS Twist shifter with integrated brake lever	SRS Twist shifter
	Mounting location	right side of handlebar	right side of handlebar
	Compat. Gear hub	i-MOTION 9	i-MOTION 9
	Gear indicator	Window	Window
	Barrel adjuster	Indexed	Indexed
	Clamping diameter	22.1 – 22.3 mm	22.1 – 22.3 mm
	Straight handlebar ends	Minimum necessary length for shifter and handlebar grip = 150 mm	
	Cable routing	Continuous cable housing (pre-assembled)	Continuous cable housing (pre-assembled)
	Compatibility	Linear-Pull, Avid BB Disc	—
	Ratio	2.32	—
	Cable path	24 mm	—
	Reach Adjust	Yes	—
	Adjusting screw	Yes	—
	Lever size	4-finger	—
	Material	Aluminum, forged	—
	Weight	272 g	195 g
Material	Shift cable	Stainless steel	Stainless steel
Material	Housing	Cast aluminum	Cast aluminum
Material	Grip cover	Thermoplastic elastomer	Thermoplastic elastomer
Material	Frame clamp	Aluminum	Aluminum
Material	Finish	Mercury silver painted	Mercury silver painted

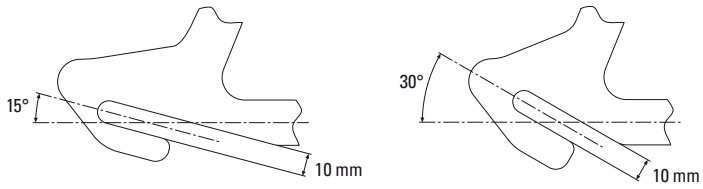
BRAKE LEVER

	SRAM BL 60	
Version	SRAM BL 60, left	SRAM BL 60, right
Mounting location	left side of handlebar	right side of handlebar
Clamping diameter	22.1 – 22.3 mm	→
Compatibility	Linear-Pull, Avid BB Disc	→
Ratio	2.32	→
Cable path	24 mm	→
Reach Adjust	Yes	→
Adjusting screw	Yes	→
Lever size	4-finger	4-finger
Weight	95 g	95 g
Housing	Cast aluminum	→
Lever	Aluminum, forged	→
Frame clamp	Aluminum	→
Finish	Mercury silver painted	→

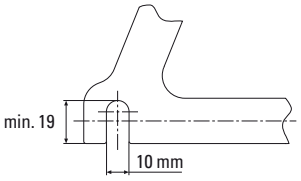
Frame strength must be such that, the rear part of the frame does not undergo any permanent deformation when a max. braking torque of 250 Nm (2200 in.lbs.) is applied to the rear wheel.
Only flat and not off-set versions.
Dropout thickness: 4 – 10 mm.
The dropouts must be parallel.

Dropout dimensions: ***see figures on right.***

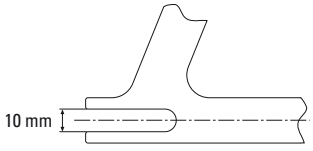
Standard dropouts



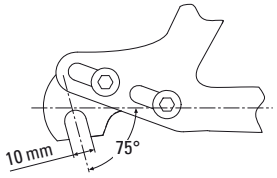
Vertical dropout



Dropout open towards rear

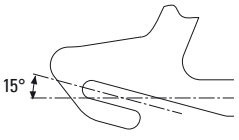
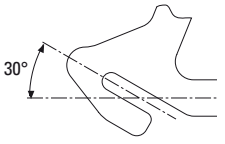
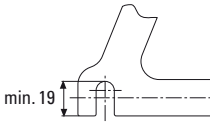
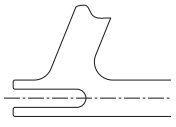
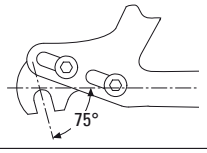
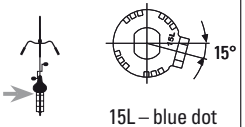
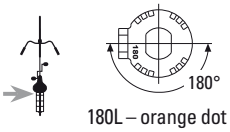
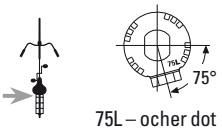
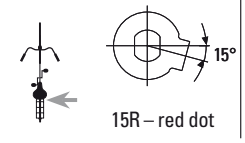
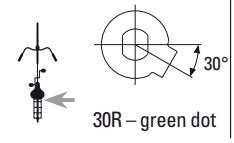
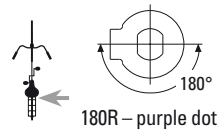
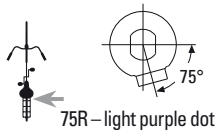


Rohloff dropout



RETAINING WASHERS

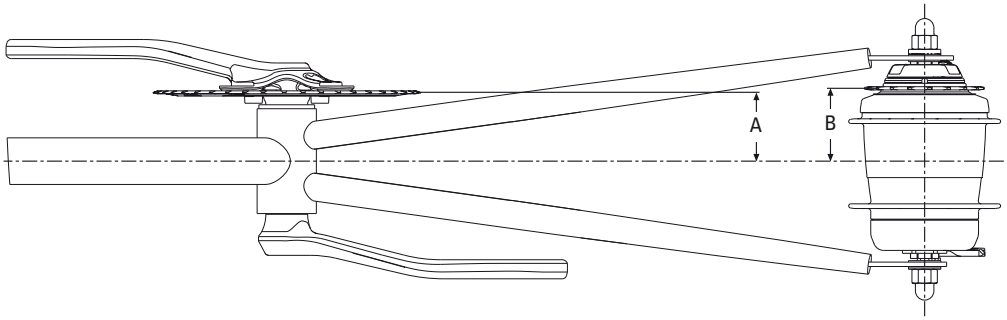
The following table shows the permissible combinations of dropout and retaining washer.

Type of dropout					
Necessary Retaining washer on the left axle end (non drive side)	 15L – blue dot	 30L – yellow dot	 67L – dark brown	 180L – orange dot	 75L – ocher dot
Necessary Retaining washer on the right axle end (drive side)	 15R – red dot	 30R – green dot	 67R – pastel blue	 180R – purple dot	 75R – light purple dot

The crankset and bottom bracket specifications must conform to the following details.

A = 48.8 mm ± 5 mm

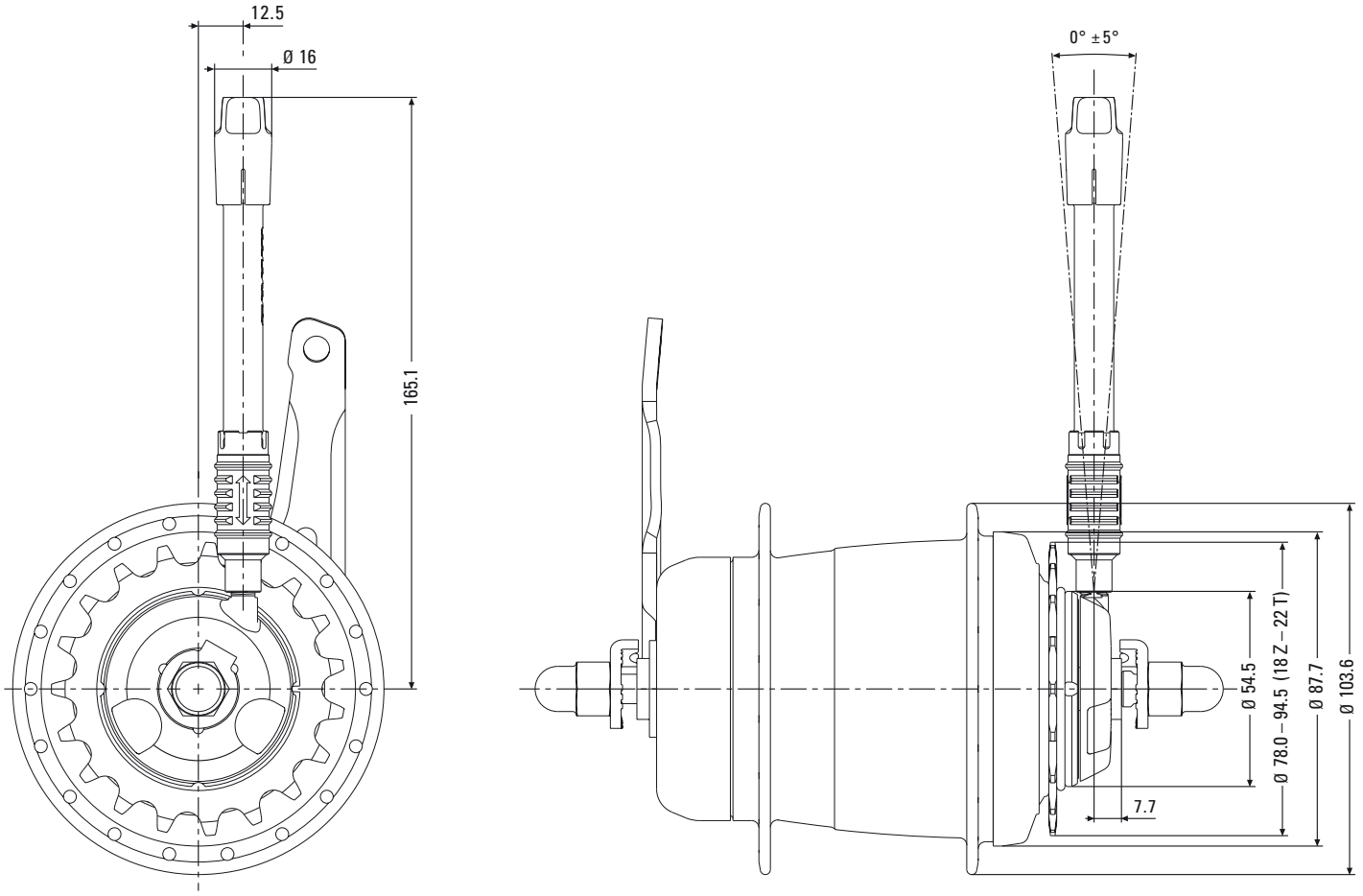
B = 48.8 mm (rear chainline)



i-MOTION® 9
TECHNICAL DATA / ASSEMBLY REQUIREMENTS

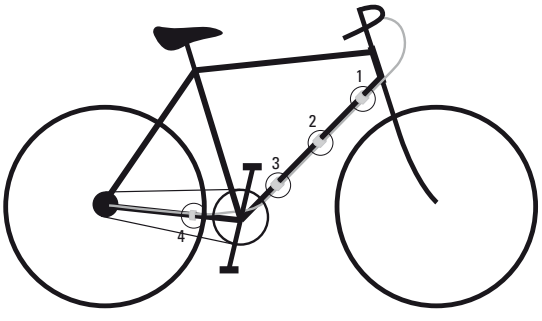
FRAME AND CHAIN GUARD

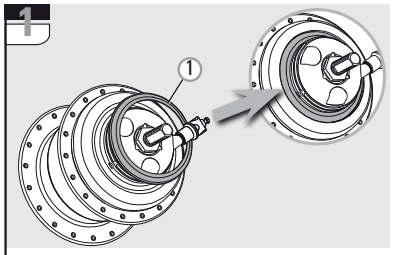
For the frame and chain guard layout, the dimensions listed below have to be considered.

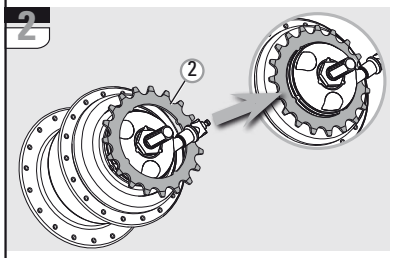


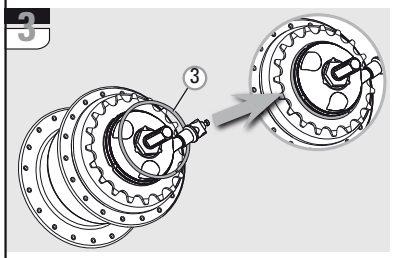
SHIFT CABLE ROUTING

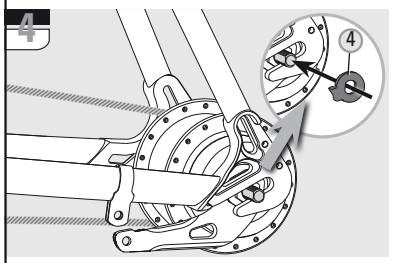
Shift cable routing only along the chainstay
Only continuous cable housing (no open cable routing).
See the adjoining figure for attachment points.

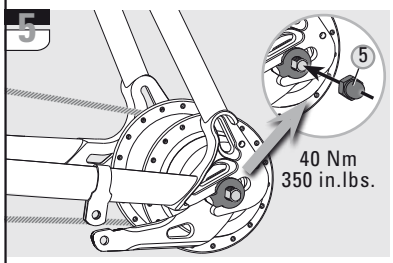


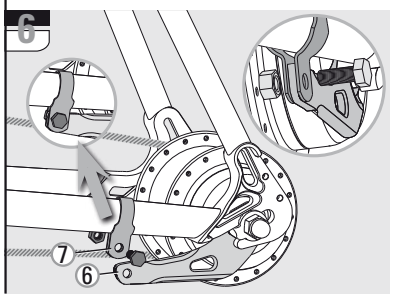












ASSEMBLY THE HUB

» Spoke the hub as normal.

1 Set the dust cap (1) onto the driver. The curvature must point to the outside.

2 Set the sprocket (2) onto the driver.

3 Mount the sprocket circlip (3) onto the driver. Check for proper seating of the circlip.

» Hub version for Disc Brake:

Advice:
Read and observe the corresponding technical documentation for assembling the disc of the disc brake.

Caution:
Plane faces of the hub and disc and the threaded holes of the hub must be clean and free from oily and greasy substances.

» Place the rear wheel into the rear frame.

4 Slide one retaining washer each (4) onto each axle end. The correct version is shown in the table on page 5. The serrated face of the retaining washer must lie against the frame dropout. Where retaining washers have locating lugs, these must engage in the frame dropouts.

5 First fit the axle nut on the drive side and tighten to a torque of 40 Nm (350 in.lbs.).
Then fit the axle nut (5) on the non-drive side and tighten to a torque of 40 Nm (350 in.lbs.).

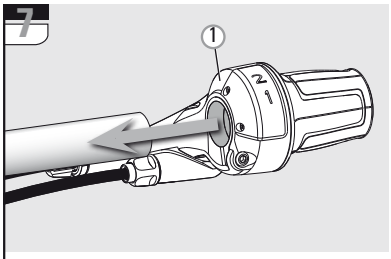
6 If applicable, mount the brake lever (6) between the two straps of the frame clamp (7).

Caution:
The frame clamp must be fitted tightly on the frame without any play.
Use a self-locking nut (M6)!
Tightening torque: 2 – 3 Nm (18 – 27 in.lbs.).

Caution:
Before setting out on any ride, always check the correct and trouble-free operation of the shift system and brakes.

i-MOTION® 9 ASSEMBLY

7



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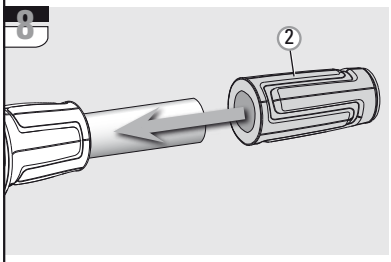

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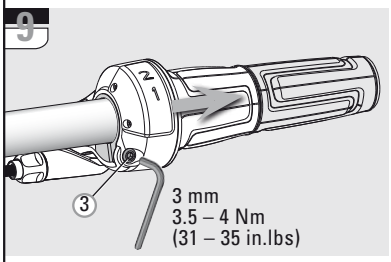

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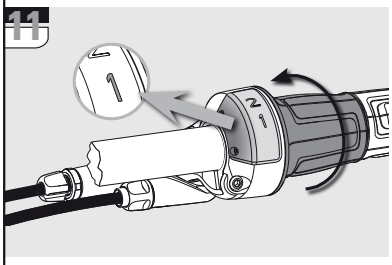

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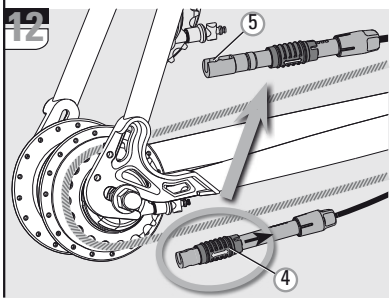

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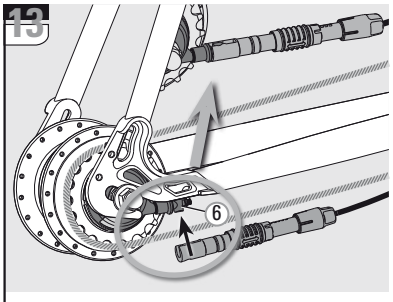

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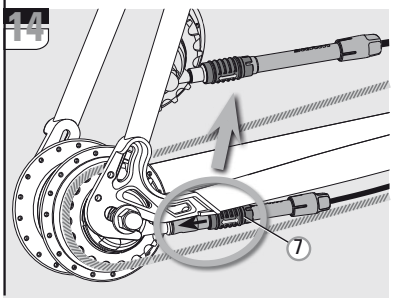


FITTING THE SHIFTER

7 Slide the shifter (1) onto the handlebar.

8 Slide the handlebar grip (2) onto the handlebar.

Caution:
Never use lubricants or solvents when fitting handlebar grips. They have a safety function and must not come free from the handlebar.

9 Place the shifter on the handlebar grip and position so that you can use it comfortably. Tighten the clamping bolt (3). 3 mm Allen key, torque 3.5 – 4 Nm (31 – 35 in.lbs.).

Caution:
Check that shifter and brake lever can be easily operated (if necessary, realign).

» Never ride without handlebar grips. The turning grip of the twist shifter could become loose. This can result in severe injuries.

Caution:
Before setting out on any ride, always check the correct and trouble-free operation of the shift system and brakes.

FITTING THE SHIFT CABLE

Advice:
Make sure that the cable housing length is sufficient to permit turning of the handlebar over its full range.

» Also bear in mind the effect of adjustable handlebars and stems on the cable housing length.

» Always use new, high-quality cables and compressionless cable housings with end caps.

10 Secure the cable housing to the frame.

Advice:
The cable housing must be free to move at the securing points.

» Avoid tight bends when routing the shift cable.

11 Make sure that the shifter is set to 1st gear.

12 Slide the quick release fastener (4) on the connecting tube to the right. The opening (5) should now be visible.

13 Make the connection by sliding the opening of the connecting tube onto the catch (6) on the hub.

14 Slide the quick release fastener (7) on the connecting tube to the left until it snaps into place. The connection is now locked.

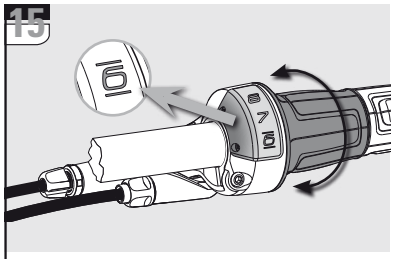
Caution:
Before setting out on any ride, always check the correct and trouble-free operation of the shift system and brakes.

FITTING THE BRAKE LEVER SRAM BL 60

» Slide the brake lever onto the handlebar.

» Tighten the clamping bolt. 3 mm Allen key, torque 2 – 2.5 Nm (18 – 22 in.lbs.).

15



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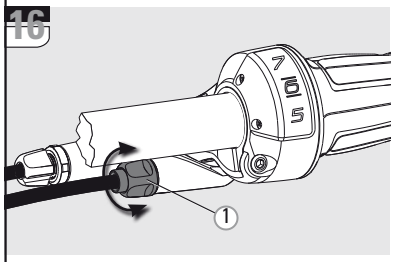

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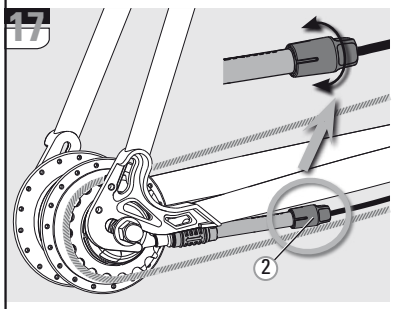

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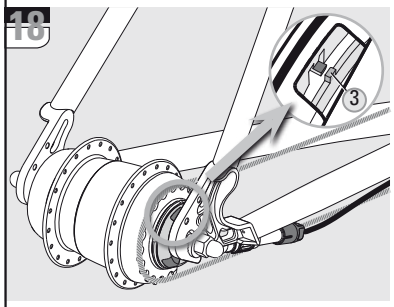


GEAR ADJUSTMENT

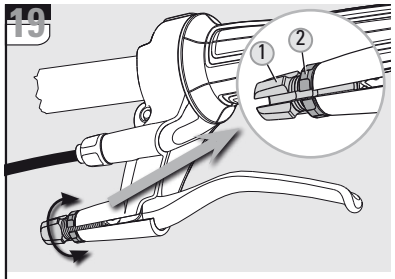
» Before adjusting the gears, shift several times between 1st and 9th gears and then back again, so that the shift cable seats itself correctly.

15 Turn the twist shifter from 7th to 6th gear.

16 To make adjustments, use the barrel adjuster (1) on the shifter
17 or the barrel adjuster (2) on the connecting tube.

18 Turn the barrel adjuster until the yellow / red marks (3) in the window of the gear hub are aligned.

19



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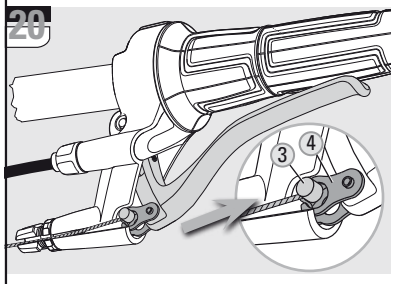

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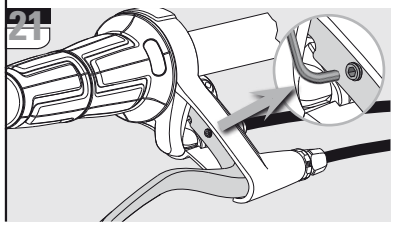


FITTING THE BRAKE CABLE

Caution:
The brake lever on the i-MOTION IBS shifter and the brake lever i-BRAKE 60 BL is only compatible with the following brakes: Avid BB Disc and Linear-Pull compatible brakes.

Advice:
Make sure that the cable housing length is sufficient to permit turning of the handlebar over its full range.
» Also bear in mind the effect of adjustable handlebars and stems on the cable housing length.
» Always use new, high-quality cables and compressionless cable housings with end caps.

19 Turn the cable adjustment screw (1) and the counter nut (2) so that the cable slot is aligned with the slot on the bottom of the brake lever housing.

20 Pull the brake lever to the handlebar and guide the inner cable into the housing.
Hook the nipple (3) of the inner cable into the recess (4) in the brake lever.

» Follow the brake manufacturer's instructions when fitting the brake cable and adjusting the brakes.

Caution:
Check that the brake is operating in a correct and trouble-free manner.

Reach adjust of the hand brake lever:
so that you can operate the brake lever on the shifter comfortably, set the reach to match your hand size.

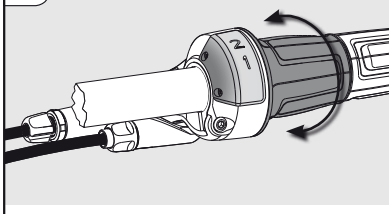
21 Use a 2 mm Allen key to set the distance between the brake lever and the handlebar.

Caution:
Every time you adjust the reach, check and correct the brake cable tension to ensure good brake performance.

Advice:
Read and observe the operating manual and technical documentation of the brake manufacturer.

i-MOTION® 9
OPERATION

1



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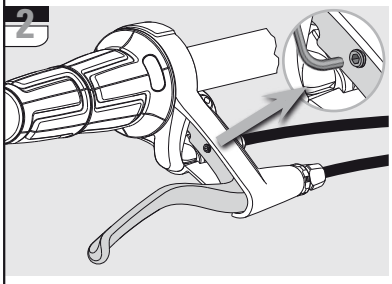


SHIFTING

1 Shift gears by turning the twist shifter on the right side of the handlebar.

» You can shift gear while stationary or when riding.
» Ensure you shift to a lower gear in plenty of time before hills.
» The quickest and smoothest gear shifts are achieved by shifting while pedaling using only a low force.

BRAKING

When descending long and steep hills, always use the second (front) brake as well, to prevent overheating of the brakes.

Caution:
Before setting out on any ride, always check the correct and trouble-free operation of the shift system and brakes.

Caution:
Excessive heating of the hub caused by back pedal braking may result in loss of lubricant and cause sharper braking. Relubricating of the brake sleeve with special grease is then necessary. See “Technical Manual Gear Hub Systems” on www.sram.com.

Reach adjust of the hand brake lever:
so that you can operate the brake lever on the shifter comfortably, set the reach to match your hand size.

2 Use a 2 mm Allen key to set the distance between the brake lever and the handlebar.

Caution:
Every time you adjust the reach, check and correct the brake cable tension to ensure good brake performance.

Advice:
Read and observe the operating manual and technical documentation of the brake manufacturer.

TROUBLESHOOTING

Problem	Cause	Remedy
Shifting difficulties:	Incorrect gear adjustment.	Adjust the gears. See page 11.
	The shift cable for the cable housing is damaged.	Renew the shift cable and cable housing. See “Technical Manual Gear Hub Systems” on www.sram.com.
	The connecting tube is touching the bike frame or is twisted.	The connecting tube must be freely connected to the hub without being twisted. Remove the cause of twisting (e.g. by correctly aligning the rear wheel).
	The connecting tube is twisted: – Left and right retaining washers have been interchanged. – Incorrect retaining washers fitted.	The connecting tube must be freely connected to the hub without being twisted. Fit the correct retaining washers. See page 7.
The pedals go forwards when freewheeling:	The chain tension is too tight.	Slacken the chain tension.

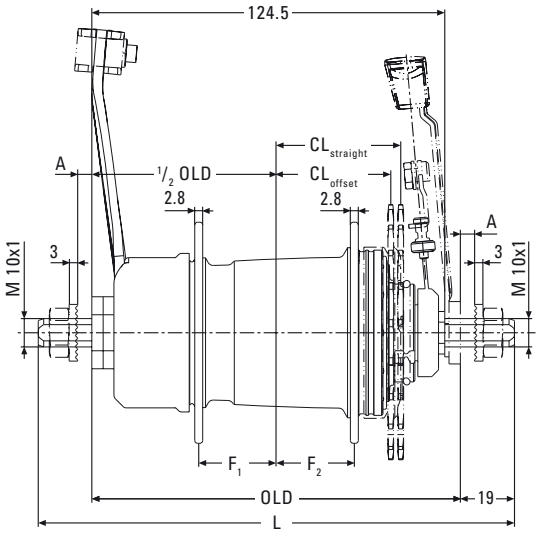
i-MOTION® 3
TECHNICAL DATA / ASSEMBLY REQUIREMENTS

CYCLE FRAME

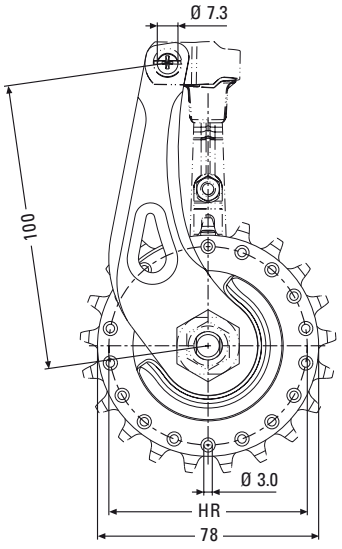
Frame strength must be such that, the rear part of the frame does not undergo any permanent deformation when a max. braking torque of 250 Nm (2200 in.lbs.) is applied to the rear wheel.

DROPOUTS

- Only flat and no off-set versions.
- Dropout thickness: 4 – 8 mm.
- Dropouts must be parallel.
- Slot width at rear dropout: max. $10^{+0.5}$ mm.



Version with back pedal brake

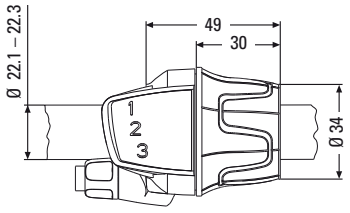


GEAR HUBS

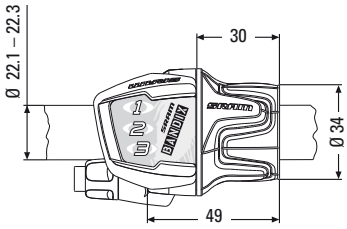
		i-MOTION 3 w. back pedal brake		i-MOTION 3 disc brake compatib.	i-MOTION 3 without brake
	Speeds	3		3	3
	Brake	With back pedal brake		Adaptor for disc brake	Without brake
	Over Locknut Dim., OLD	130 mm		135 mm	130 mm
Axle	Length, L	178 mm (and 168 mm)		178 mm	178 mm (and 168 mm)
Axle	Ends diameter	M 10x1		M 10x1	M 10x1 M 10x1
Axle	Dropout Width Dim, A	min. 4 mm / max. 8 mm		min. 4 mm / max. 8 mm	min. 4 mm / max. 8 mm
Spoke	Holes	28 / 32 / 36		32 / 36	32 / 36
Spoke	Hole diameter	3.0 mm		3.0 mm	3.0 mm
Spoke	Hole ref. ø, HR	70 mm		70 mm	70 mm
	Flange Dist. to 1/2 OLD	F_1 = 27.3 mm / F_2 = 27.6 mm		F_1 = 27.3 mm / F_2 = 27.6 mm	F_1 = 27.3 mm / F_2 = 27.6 mm
Ratio	Overall	186 %	Gear steps	←	←
Ratio	1st gear	0,734	↧	←	←
Ratio	2nd gear	1,000	36 %	←	←
Ratio	3rd gear	1,362	36 %	←	←
Chain	Chainline, CL	44.0 mm (straight sprocket) / 40.5 mm (offset sprocket)			←
Chain	Ratio	24", 26", 28" = 2,0 – 2,4 / 20" = 2,0 – 2,5		min. 2.0	min. 2.0
Chain	Dimensions	1/2" x 1/8" and 1/2" x 3/32"		1/2" x 1/8" and 1/2" x 3/32"	1/2" x 1/8" and 1/2" x 3/32"
Compatibility	Sprocket	16 / 17 / 18 teeth (straight) / 19 / 20 / 21 teeth (offset)			←
Compatibility	Shifter	SRAM i-MOTION 3		SRAM i-MOTION 3	SRAM i-MOTION 3
Compatibility	Disc Brake	—		6 holes	—
Compatibility	Hand brake lever	—		Disc brake compatible	—
Compatibility	Tandem	Not suitable for tandems, transport bicycles or similar			←
	Weight	1,390 g		1,210 g	1,120 g
Finish	Mat. Hub shell	Steel		Steel	Steel
Finish	Finish	Pearl Nickel / Chrome		Pearl Nickel / Chrome	Pearl Nickel / Chrome

i-MOTION® 3
TECHNICAL DATA / ASSEMBLY REQUIREMENTS

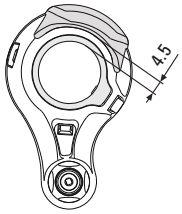
SHIFTERS



Shifter i-MOTION 3



Shifter i-MOTION 3 BANDIX

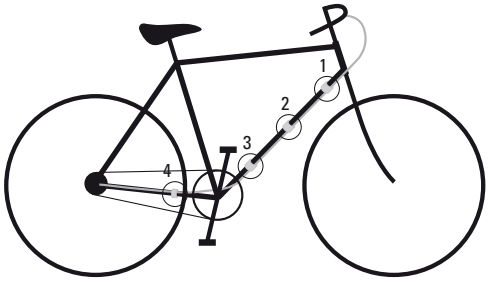


SHIFTERS

		i-MOTION 3 shifter	
	Version	i-MOTION 3	i-MOTION 3 BANDIX (for kids)
	Shift cable lengths	1400 mm / 1500 mm / 1600 mm / 1700 mm / 2200 mm	1400 mm / 1500 mm / 1600 mm / 2200 mm
	Shifter type	SRS twist shifter	SRS twist shifter
	Assembly location	Right side of handlebar	Right side of handlebar
	Compat. gear hub	i-MOTION 3	i-MOTION 3
	Gear indicator	Window	Window
	Barrel adjuster	Indexed	Indexed
	Clamping diameter	22.1 – 22.3 mm	22.1 – 22.3 mm
	Straight handlebar ends	Minimum necessary length for shifter and handlebar grip = 150 mm	
	Cable routing	Continuous cable housing (pre-assembled)	Continuous cable housing (pre-assembled)
	Weight	58 g	58 g
Material	**Shift cable**	Stainless or galvanized steel	Stainless or galvanized steel
Material	**Housing**	Plastic injection molding	Plastic injection molding
Material	**Grip cover**	Thermoplastic elastomer	Thermoplastic elastomer
Material	**Frame clamp**	Aluminum	Aluminum
Material	**Finish**	Silver painted	Silver painted

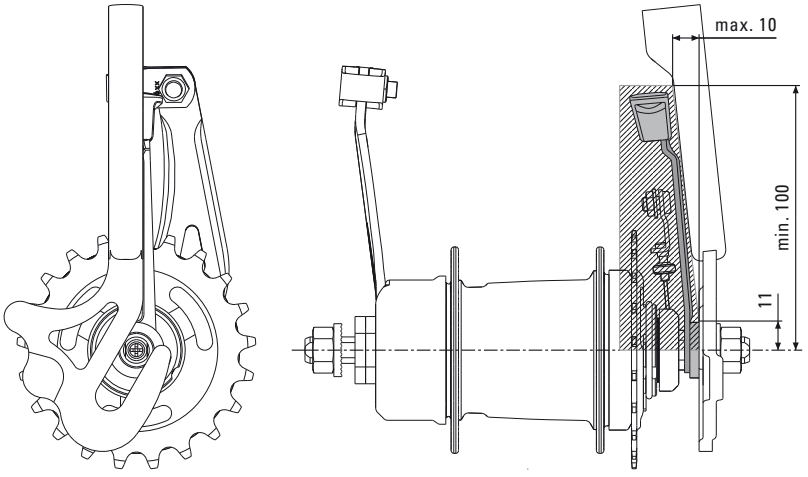
SHIFT CABLE ROUTING

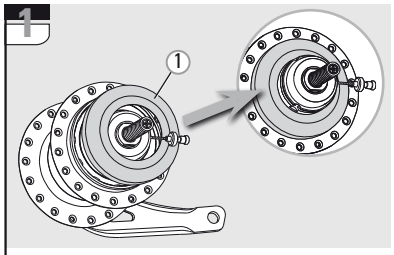
- Shift cable routing only along the chain stay.
- Only continuous cable housing (no open cable routing).
- See the adjoining figure for attachment points.

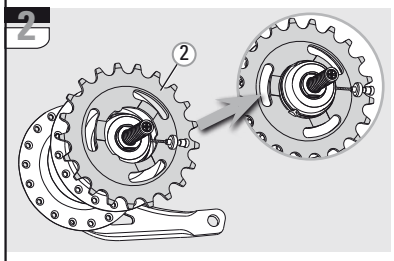


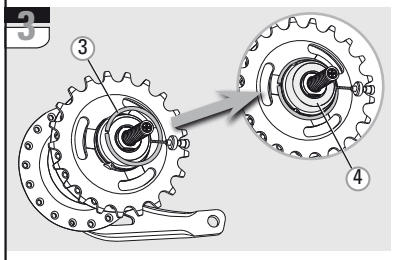
FRAME AND CHAIN GUARD

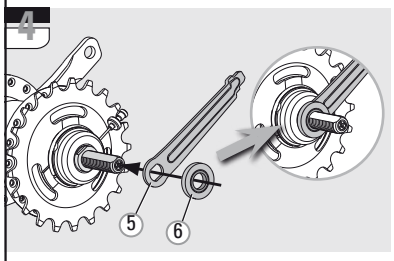
For the frame and chain guard layout, the dimensions listed below have to be considered.

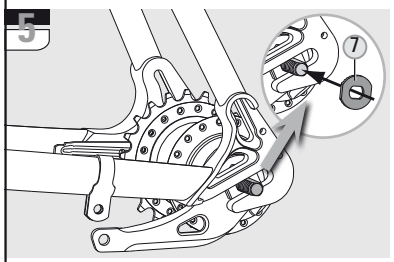


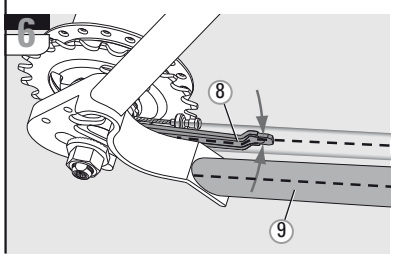


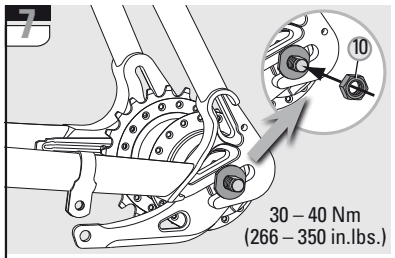


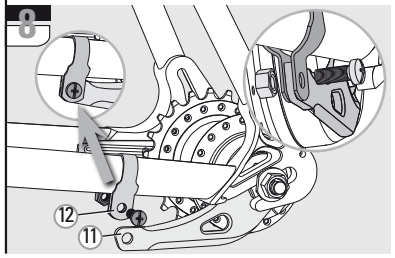












ASSEMBLING THE HUB

» Lacing the hub:
- Lacing by hand: Place the cable stop bracket (5, figure 4) and the locking bush with the rubber insert (6) on the axle, to permit an axial spoke arrangement.
- Automatic lacing machine: Ensure an offset of 5.5 mm.
  Alternatively, a spacer sleeve (part no. 0399.110.000) is mountable on the drive side of the alxe.

1 Set the dust cap (1) onto the driver.
The curvature must point to the outside.

2 Place the sprocket (2) on the driver.
For offset, i.e. transversely displaced sprockets, the sprocket should be mounted with the toothing to the inside (the curvature must point outwards).

3 Mount the sprocket circlip (3) onto the driver.
Advice:
Ensure that the plastic dust cap (4) is not damaged.
Check for proper seating of the circlip.

» Hub version for Disc Brake:
Advice:
Read and observe the corresponding technical documentation for assembling the disc of the disc brake.
Caution:
Plane faces of the hub and the disc and the threaded holes of the hub must be clean and free from oily and greasy substances.

4 Push the cable stop bracket (5) and then the locking bush with the rubber insert (6) onto the axle end on the sprocket side.

» Place the rear wheel into the rear frame.

5 Place one retaining washer (7) on each axle end.
The serrated face of the retaining washer must lie against the frame dropout.

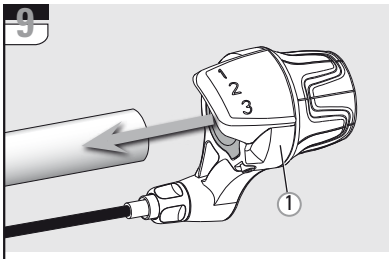
6 Align the cable stop bracket (8) parallel to the frame strut (9).

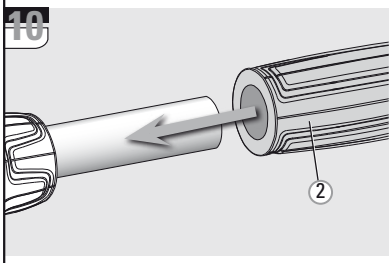
7 Fit the axle nuts (10) and tighten these while alternating between sides. Tightening torque 30 – 40 Nm (266 – 350 in.lbs.).

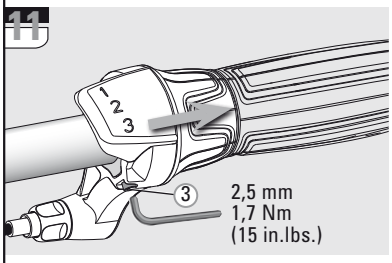
8 If applicable, mount the brake lever (11) between the two straps of the frame clamp (12).
Caution:
The frame clamp must be fitted tightly on the frame without any play.
Use a self-locking nut (M6)!
Tightening torque: 2 – 3 Nm (18 – 27 in.lbs.).

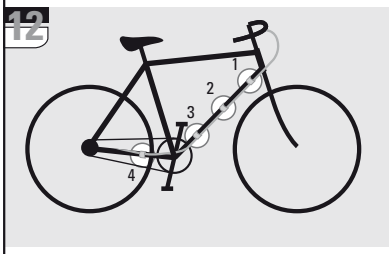
Caution:
Before setting out on any ride, always check the correct and trouble-free operation of the shift system and brakes.

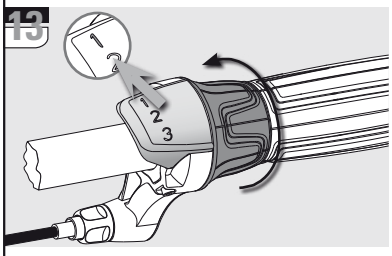
i-MOTION® 3 ASSEMBLY

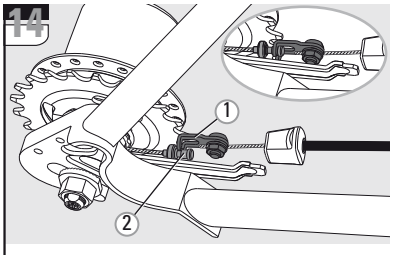


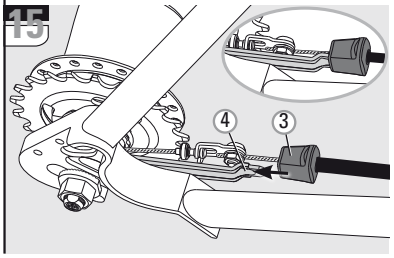












FITTING THE SHIFTER

Caution:
Because of a risk of fracturing, following types of handlebars are not suited:
– thin walled aluminum handlebars, e.g. Hyperlite© handlebars
– carbon handlebars

9 Slide the shifter (1) onto the handlebar.

10 Slide the handlebar grip (2) onto the handlebar.

Caution:
Never use lubricants or solvents when fitting handlebar grips. They have a safety function and must not come free from the handlebar.

11 Place the shifter on the handlebar grip and position so that you can use it comfortably. Tighten the clamping bolt (3). 2.5 mm Allen wrench, torque 2 Nm (15 in.lbs.).

Caution:
Check that shifter and brake lever can be easily operated (if necessary, realign).
» Never ride without handlebar grips. The turning grip of the twist shifter could become loose. This can result in severe injuries.

Caution:
Before setting out on any ride, always check the correct and trouble-free operation of the shift system and brakes.

FITTING THE SHIFT CABLE

Advice:
Make sure that the cable housing length is sufficient to permit turning of the handlebar over its full range.
» Also consider the influence of adjustable handlebars and stems on the cable housing length.

12 Fasten the cable housing on the frame.

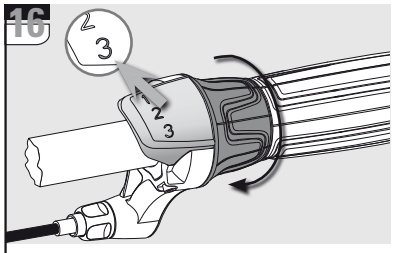
Advice:
The cable housing must be free to move at the securing points.
» Avoid tight bends when routing the shift cable.

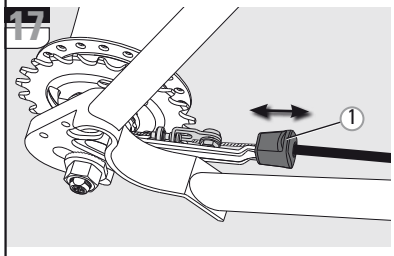
13 Make sure that the shifter is set to 1st gear.

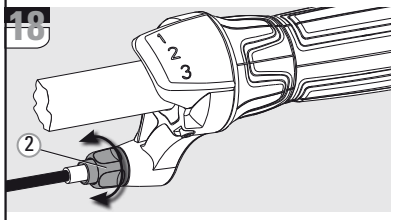
14 Make the connection between shifter and rear wheel hub by hooking the connection lug (1) onto the shift cable nipple (2).

15 Plug the plastic retainer (3) onto the cable stop bracket (4).

Caution:
Before setting out on any ride, always check the correct and trouble-free operation of the shift system and brakes.







GEAR ADJUSTMENT

» Before adjusting the gears, shift several times between 1st and 3rd gears and then back again, so that the shift cable seats itself correctly.

16 Turn the twist shifter to 3rd gear.

Advice:
The shift cable should be adjusted so that it is free from play when 3rd gear is selected, i.e. it must be pulled out as far as it will go.

17 It should not be possible to pull the shift cable further out of the gear hub by pulling on the plastic retainer (1).

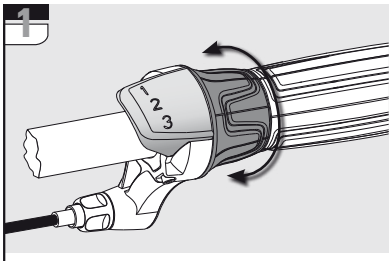
– Shift cable has too much play:
Turn the twist shifter to 1st gear.
18 Reduce the shift cable play by turning the barrel adjuster (2) on the shifter.

– Shift cable is too tight/taut:
Either the shifter cannot select 3rd gear or the gear hub does not shift to 1st gear or shifts constantly between 1st and 2nd gears.
Turn the twist shifter to 1st gear.
18 Reduce the shift cable tension with the aid of the barrel adjuster (2) on the shifter.

» Turn the twist shifter to 3rd gear and check once again that there is no play in the shift cable.

i-MOTION® 3
OPERATING

1



SHIFTING

1 Shift gears by turning the twist shifter on the right side of the handlebar.

» You can shift gear while stationary or when riding.
» Ensure you shift to a lower gear in plenty of time before hills.
» The quickest and smoothest gear shifts are achieved by shifting while pedaling using only a low force.

BRAKING

When descending long and steep hills, always use the second (front) brake as well, to prevent overheating of the brakes.

Caution:
Before setting out on any ride, always check the correct and trouble-free operation of the shift system and brakes.

Caution:
Excessive heating of the hub caused by back pedal braking may result in loss of lubricant and cause sharper braking. Relubricating of the brake sleeve with special grease is then necessary. See “Technical Manual Gear Hub Systems” on www.sram.com.

Advice:
Read and observe the operating manual and technical documentation of the brake manufacturer.

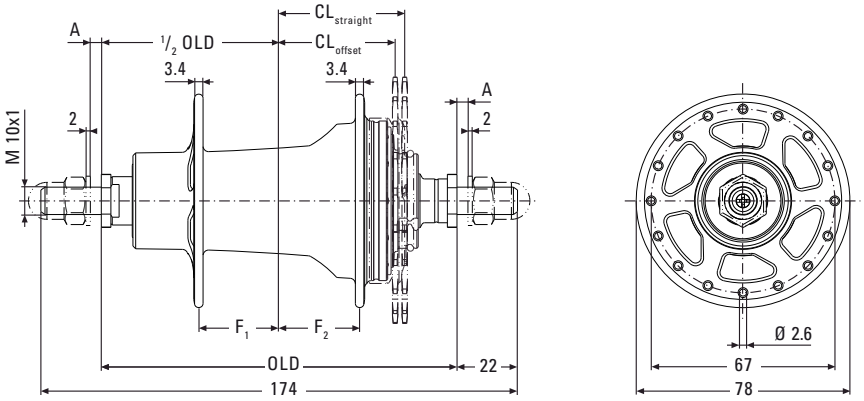
TROUBLESHOOTING

Problem	Cause	Remedy
Shifting difficulties:	Incorrect gear adjustment.	Adjust the gears. Page 19.
	The shift cable or the cable housing is damaged.	Renew the shift cable and cable housing. See “Technical Manual Gear Hub Systems” on www.sram.com.
The pedals go forwards when freewheeling:	The chain tension is too tight.	Slacken the chain tension.

SRAM® TORPEDO® SINGLESPEED
TECHNICAL DATA / ASSEMBLY REQUIREMENTS

DROPOUTS

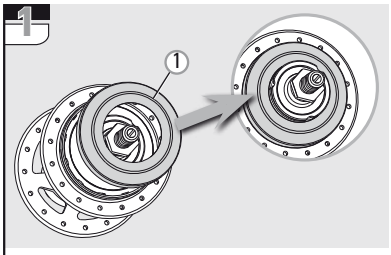
- Dropout thickness:
  130 mm Over Locknut Dimension: 5 – 12 mm.
  120 mm Over Locknut Dimension: 8 – 12 mm.
- Dropouts must be parallel.
- Slot width at rear dropout: max. $10^{+0.5}$ mm.

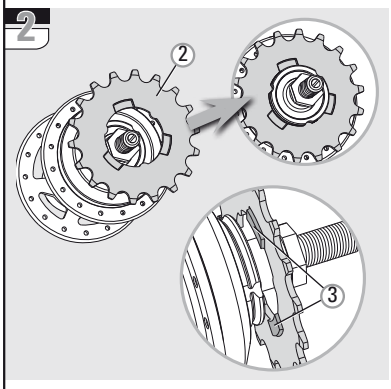


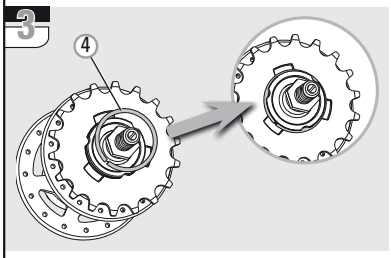
TORPEDO

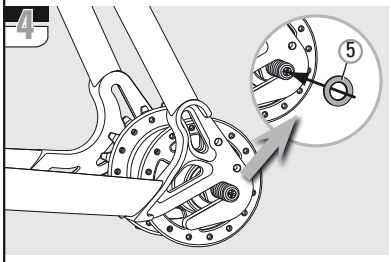
		Torpedo Singlespeed NEW	
	Speeds	Singlespeed, fixed gear / Singlespeed, freewheel	←
	Brake	Without brake	←
	Over Locknut Dim., OLD	130 mm	120 mm
Axle	Length	174 mm	←
Axle	Ends Diameter	M 10x1	←
Axle	Dropout Width Dim, A	min. 5 mm / max. 12 mm	min. 8 mm / max. 12 mm
Spoke	Holes	32	←
Spoke	Hole Diameter	2.6 mm	←
Spoke	Hole Reference ø	67 mm	←
Spoke	Flange Dist. to 1/2 OLD	F_1 = 29.5 mm / F_2 = 29.5 mm	←
Chain	Chainline, CL	46 mm (straight sprocket) / 42.5 mm (offset sprocket)	←
Chain	Dimensions	1/2" x 1/8" and 1/2" x 3/32"	←
Compat.	Sprocket	16 / 17 / 18 teeth (straight) / 19 / 20 / 21 teeth (offset)	←
Compat.	Tandem	Not suitable for tandems, transport bicycles or similar	
	Weight	480 g	←
Finish	Material Hub Shell	Forged Alloy	←
Finish	Finish	Anodised silver / Anodised black	←

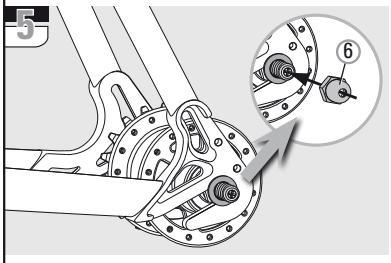
SRAM® TORPEDO® SINGLESPEED ASSEMBLY











ASSEMBLY HUB

» Spoke the hub as normal.

5 Set the dust cover (1) onto the driver.

6 Set the sprocket (2) onto the driver.

Advice:
When fitting a straight sprocket (not an offset version), the beadings (3) of the sprocket must lie against the dust cover.

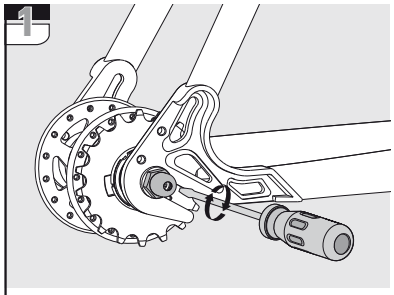
7 Mount the sprocket retaining ring (4) onto the driver. Check proper seat of the retaining ring.

» Place the chain on the sprocket. Place the rear wheel into the rear frame and align it.

8 Slide one retaining washer (5) onto each axle end.

9 Mount the axle nuts (6) and tighten them with a torque of 30 – 40 Nm (266 – 350 in.lbs.).

SRAM® TORPEDO® SINGLESPEED OPERATION



OPERATION

The SRAM Torpedo Singlespeed hub can be used in freewheel mode or alternatively in a fixed gear mode.
The Singlespeed hub comes factory set for freewheel mode.

Caution:
We recommend that you familiarize yourself with the ride characteristics of the Singlespeed hub before using it in traffic. Practice using the hub in a low traffic area, in order to become accustomed to the handling of your bike. Failure to do so may result in a crash which can lead to serious injury.

CHOOSING THE RIDING MODE

The riding mode can be changed with the adjustment screw on the sprocket side.

» The adjustment screw is located within the axle on the sprocket side (drive side).

Advice:
It is not necessary to remove the axle nut as the adjustment screw is accessible through a hole in the axle nut.

» **Fixed gear riding mode:**

1 Using a small screw driver, turn the adjustment screw clockwise until it stops.

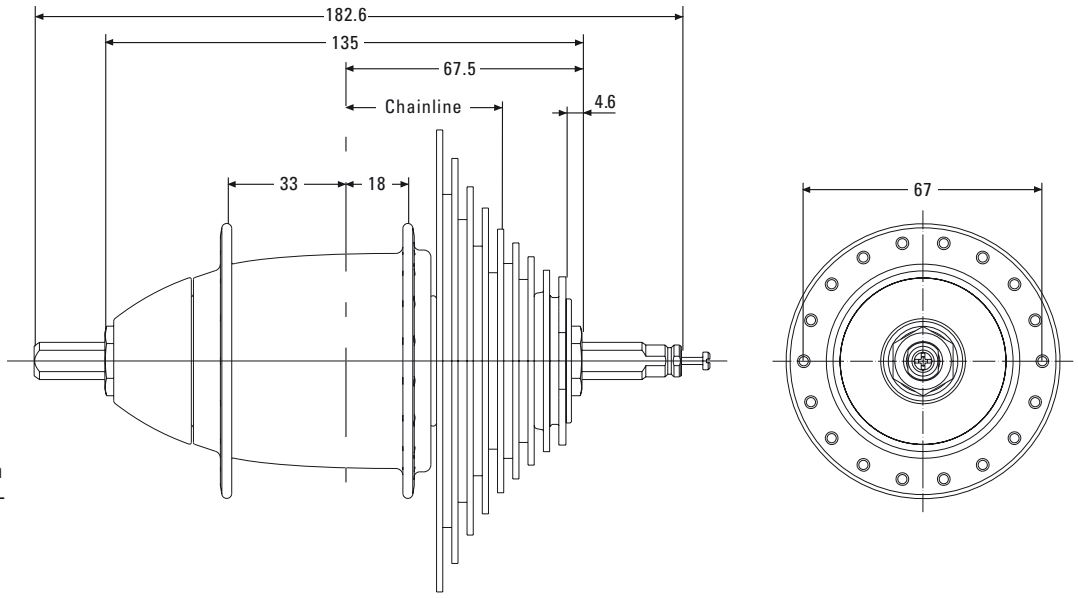
Caution:
In fixed gear mode, the pedals are always turning in the same direction as the back wheel. We recommend that you familiarize yourself with the ride characteristics before using this mode in traffic.

» **Freewheel riding mode:**

1 Using a small screwdriver, turn the adjustment screw clockwise until it stops, then turn it back 5 full turns counter-clockwise.

DUALDRIVE™
TECHNICAL DATA / ASSEMBLY REQUIREMENTS

GEAR HUBS



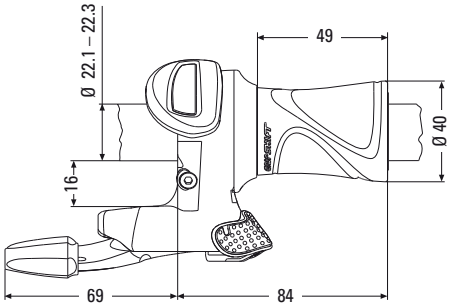
Caution:
Not suitable for tandems, transport bicycles and similar.

Cycle frame:
- Slot width at rear dropout $10^{+0.5}$ mm.
- 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.

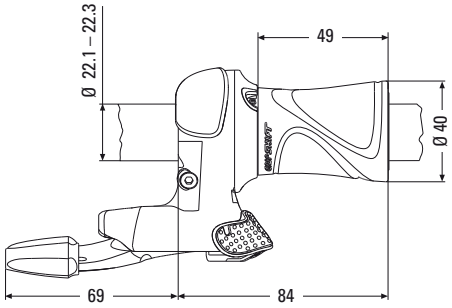
GEAR HUBS

		DualDrive II · Without brake		DualDrive II · Disc brake compatible	
	Version (Speeds)	DualDrive II 27	DualDrive II 24	DualDrive II 27	DualDrive II 24
	Brake	Without brake		Adaptor for Disc brake	
	Over Locknut Dim.	135 mm		135 mm	
Axle	**Length**	182.6 mm		182.6 mm	
	Ends Diameter	FG 10,5		FG 10,5	
Spoke	**Holes**	36 or 28		36 or 32	
	Hole Diameter	2.6 mm (28 holes also available in 2,8 mm)		2.6 mm	
	Hole Ref. ø	67 mm		67 mm	
	Flange Dist. to $^1/_2$ OLD	33 mm / 18 mm		33 mm / 18 mm	
Ratio	**Totally**	573 % (27spd)	539 % (24spd)	573 % (27spd)	539 % (24spd)
	Totally hub	186 %	Gear steps	←	
	Speed 1	0,734	↧	←	
	Speed 2	1,000	36 %	←	
	Speed 3	1,362	36 %	←	
Chain	**Chainline**	45 mm		42 mm	
	Usable Dimensions	$^1/_2$" x $^{11}/_{128}$"	$^1/_2$" x $^3/_{32}$"	$^1/_2$" x $^{11}/_{128}$"	$^1/_2$" x $^3/_{32}$"
Compatibility	**Crankset**	33 / 38 Teeth		←	
	Cogset	11-34 Teeth	11-32 Teeth	11-34 Teeth	12-32 Teeth
	Cogset	DualDrive 27	DualDrive 24	DualDrive 27	DualDrive 24
	Shifter	DualDrive 27	DualDrive 24	DualDrive 27	DualDrive 24
	Disc brake	—		6 holes	
	Hand Brake Lever	—		Disc brake compatible	
	Tandem	Not suitable for tandems, transport bicycles or similar			
	Sealing	Extra sealed		←	
	Weight	970 g		985 g	
Finish	**Hub Shell**	Aluminum, silver anodized		Aluminum, silver anodized	
	Shifting device	Composite		Composite	

SHIFTERS



Shifter DualDrive 27



Shifter DualDrive 24

SHIFTERS

		DualDrive single sided shifter	
	Version	DualDrive 27	DualDrive 24
	Clickbox Cable	1400 mm / 1500 mm / 1600 mm / 1700 mm / 2100 mm	
	Shifter Type	SRS Twistring-Thumbshifter-Combo (2in1)	
	Arrangement	Right side of handlebar	←
Compat.	Gear Hub	DualDrive 27	DualDrive 24
Compat.	Derailleur	DualDrive 27	DualDrive 24
	Gear Indication Der.	Window	Printed
	Riding Mode Indic.	Printed	Printed
	Barrel Adj. Gear Hub	None	←
	Barrel Adj. Derailleur	Indexing	←
	Clamping Diameter	22.1 – 22.3 mm	←
	Straight handlebar ends	Minimum necessary length for shifter and handlebar grip = 150 mm	
	Cable Routing, Gear Hub	Continuous housing (preassembled)	←
	Cable Routing, Der.	Open or continuous	←
	Weight	N/A	←
Design	Cables	Stainless steel	←
Design	Housing	Glass filled PA – Silver painted	←
Design	Grip Cover	Thermoplastic elastomer	←
Design	Clamping Collar	Aluminum	←
Design	Clickbox	Composite	←

DUALDRIVE™
TECHNICAL DATA / ASSEMBLY REQUIREMENTS

DERAILLEURS

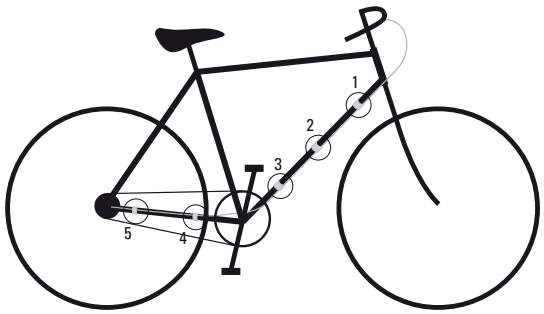
		DualDrive 27	DualDrive 24
	Speeds	9 / 8	9 / 8
	Shifter Compatibility	DualDrive 27	DualDrive 24
	Cage Length	Short, 75 mm	Short, 75 mm
	Sprocket, max.	34 Teeth	32 Teeth
	Sprocket, min.	11 Teeth	11 Teeth
	Pulleys	Exchangeable / Bushing	Exchangeable / Bushing
	Direct Mount	Yes	Yes
	Weight	258 g	265 g
Design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

CASSETTES

		DualDrive 27	DualDrive 24
	Largest Cog	34 Teeth	32 Teeth
	Speeds	9	8
	Cogs	11/13/15/17/20/23/26/30/34	11/12/14/16/18/21/26/32
	Spacers	Dark Gray	Black
	Chain compatib.	9spd, HG® / IG® / PC comp.	8spd, HG® / IG® / PC comp.
	Weight	410 g	280 g
Design	Cogs	SAPH 440 Stahl	←
Design	Screws	Steel / Zinc Coat	←
Design	Finish	Chrome, matt	Chrome

DUALDRIVE™
TECHNICAL DATA / ASSEMBLY REQUIREMENTS

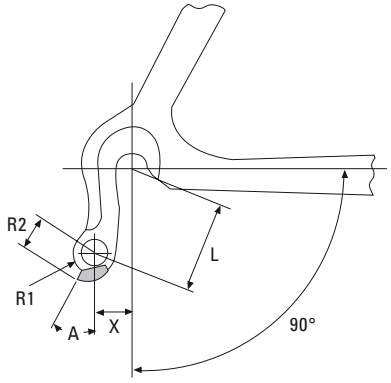
1



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

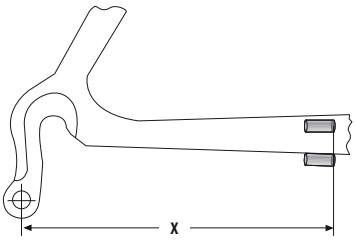
Cable attachement siehe Bild 1	Cable housing	Attachement points	Cable stops
Hub	Continuous	1/2/3/4 ***(see Fig. 1)***	—
Derailleur	Continuous	1/2/3/4/5 ***(see Fig. 1)***	—
	Open	—	1/5 ***(Fig. 1)***

2



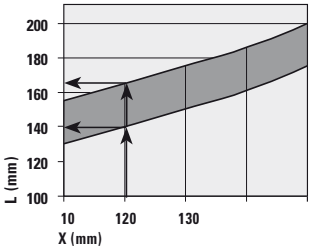
CABLE HOUSING FOR DERAILLEUR

Rear cable stop position



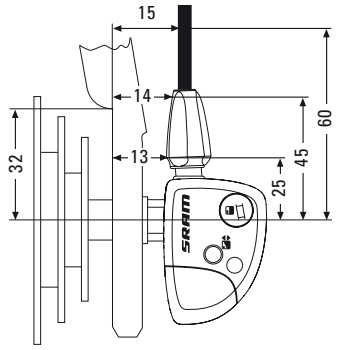
Length X min. 90 mm.
Cable stop below or beside chainstay.

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 com-pressionless 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 effect cable housing length.

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 and 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

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).

Number of teeth: 33 / 38

Chainline: 45 mm

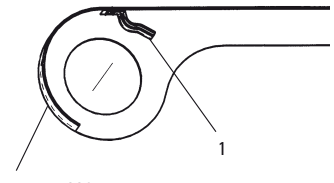
CHAIN GUIDE FORK

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.

4



ø max. 220 mm

DUALDRIVE™ ASSEMBLY

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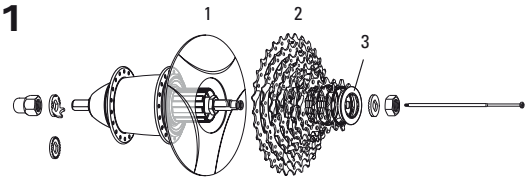

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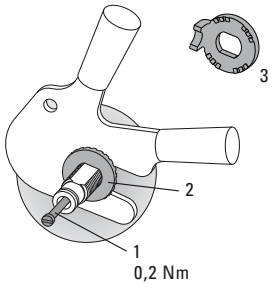

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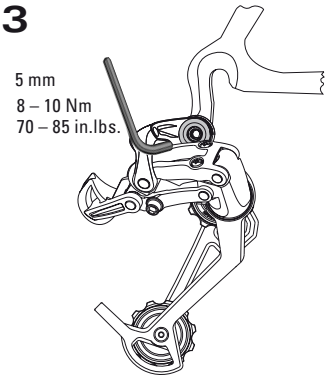

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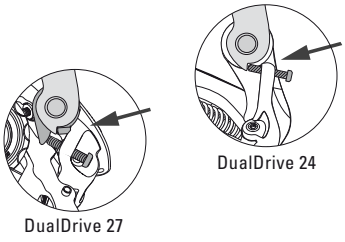

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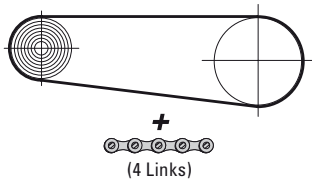

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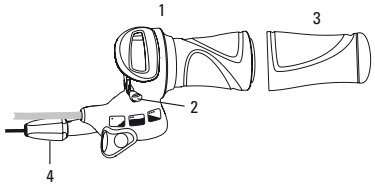


ASSEMBLY HUB

- 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.
- Hub versions for Disc Brake:
  Advice:
  Read and observe the corresponding technical documentation for assembling the disc of the disc brake.
  Caution:
  Plane faces of the hub and the disc and the threaded holes of the hub must be clean and free from oily and greasy substances.
- Place one retaining washer without lug (2, ***Fig. 2)*** on right axle end (drive side). The serrations must bear against the dropout.
- Place one retaining washer with lug (3, ***Fig. 2)*** (new version, 3,5 mm thick) on left axle end (non-drive side). The lug must engage in the dropout slot.
  On vertical dropouts, fit one retaining washer without lug on each axle end. The serrations must bear against the dropout.
- 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) 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 link + Connecting Link to this length for proper chain length.

ASSEMBLY SHIFTER

Caution:

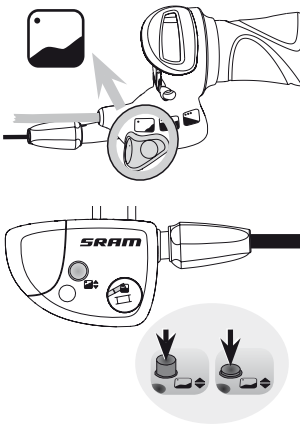
- ***Never use lubricants or solvents to install handlebar grips. Handlebar grips provide safety function.***
  For this reason, they should be mounted in such a way as to make sure they do not slip off handlebar!
- ***Always check the front and rear brake levers for proper operation.***
  If there is interference between shifters and brake levers, re-adjust lever and shifter placement.

- 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.

INSTALLING CLICKBOX

- Fit the cable and avoid small radius.
- Cable attachment points ***see Page 49 / Fig. 1***.
  Cable housing must be movable inside attachment.
- Place shift lever 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 thumb shift lever 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)***.

7



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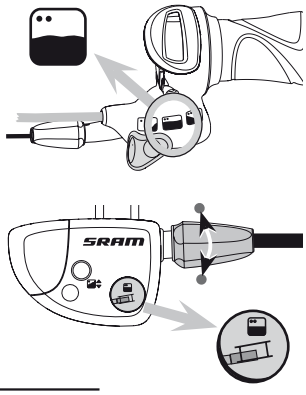

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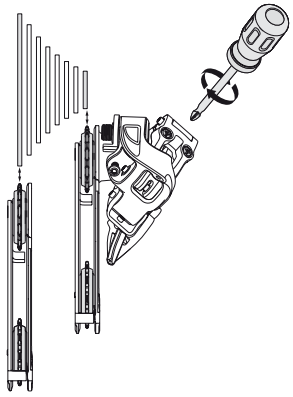

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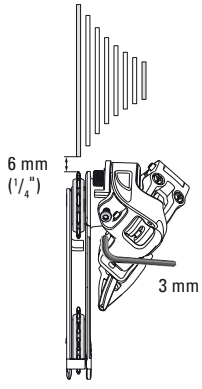


DERAILLEUR ADJUSTMENT

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 (1/4") from tip of the cog to tip of upper guide pulley ***(Fig. 10)***.

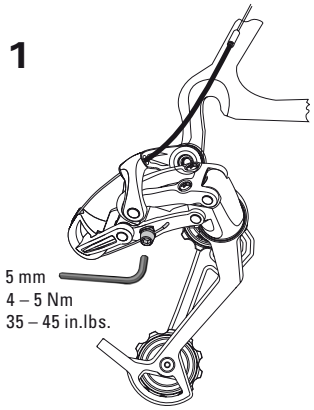
– Turn the b-adjust screw clockwise to increase the chain gap.
– Turn the b-adjust screw counterclockwise to decrease the chain gap.

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 29 for figure and chart).***
- Rotate the twist shifter until the largest number and gear indication tab/dash line up.
- Turn the twist 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.

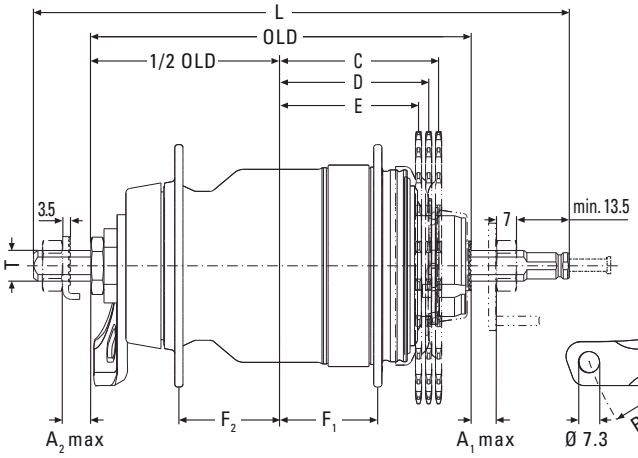
11



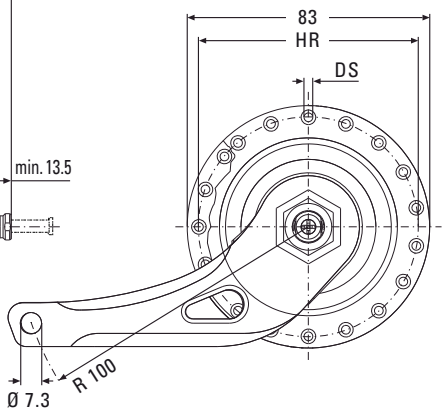
SRAM® S7
TECHNICAL DATA / ASSEMBLY REQUIREMENTS

Caution:
Not suitable for tandems, transport bicycles and similar.

Cycle frame:
- Dropouts must be parallel.
- Slot width at rear dropout $10^{+0.5}$ mm.
- 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.



Version with Coaster Brake

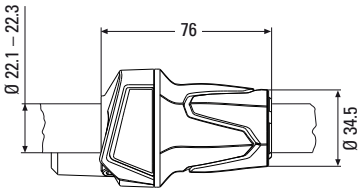


GEAR HUBS

		SRAM S7 with coaster brake		SRAM S7 without brake
	Type	MH 7215		MH 7205
	Brake	With coaster brake		Without brake
	Over Locknut Dim., OLD	130 mm		130 mm
Axle	Length, L	183.4 mm		183.4 mm
Axle	Ends Diameter, T	FG 10.5		FG 10.5
Axle	Dropout Width Dim.	A_1 max. = 12.5 mm / A_2 max. = 12 mm		A_1 max. = 12.5 mm / A_2 max. = 10 mm
Spoke	Holes	36		36
Spoke	Hole Diameter, DS	3.0 mm		3.0 mm
Spoke	Hole Ref. ø, HR	75 mm		75 mm
Spoke	Flange Dist. to $^1/_2$ OLD	F_1 = 33 mm / F_2 = 34 mm		F_1 = 33 mm / F_2 = 34 mm
Gear Hub Ratio	Totally	303 %	Gear steps	←
Gear Hub Ratio	Speed 1	0,574	↓	←
Gear Hub Ratio	Speed 2	0,677	18 %	←
Gear Hub Ratio	Speed 3	0,809	19 %	←
Gear Hub Ratio	Speed 4	1,000	24 %	←
Gear Hub Ratio	Speed 5	1,236	24 %	←
Gear Hub Ratio	Speed 6	1,476	19 %	←
Gear Hub Ratio	Speed 7	1,742	18 %	←
Chain	Usable Dimensions	$^1/_2$" x $^1/_8$" or $^1/_2$" x $^3/_{32}$"		$^1/_2$" x $^1/_8$" or $^1/_2$" x $^3/_{32}$"
Chain	Line, C/D/E	C = 54 mm / D = 51 mm / E = 48 mm		C = 54 mm / D = 51 mm / E = 48 mm
Chain	Ratio	24", 26", 28"= 1.83 – 1.90 / 20"= 1.83 – 2.00		min. 1.83
Compatibility	Sprocket	16 – 24 Teeth (outward offset - Chain Line C) / 18 Teeth (straight - CL D) / 19 – 24 Teeth (inward offset - CL E)		
Compatibility	Shifter	SRAM Grip 7		←
Compatibility	Clickbox	Clickbox S7		←
Compatibility	Tandem	Not suitable for tandems, transport bicycles or similar		
	Weight	1714 g		1556 g
Finish	Hub Shell Material	Steel		Steel
Finish	Finish	Matt Chrome Plated or Black		Matt Chrome Plated or Black

SRAM® S7
TECHNICAL DATA / ASSEMBLY REQUIREMENTS

SHIFTER

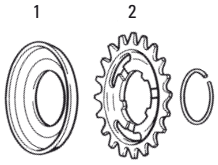


SHIFTER

		SRAM Grip 7							
	Shifter Type	Twist Shifter mit Clickbox							
	Cable Length	Black housing: 1400 mm	1500 mm	1600 mm	1700 mm	1800 mm	1900 mm	Grey housing: 1650 mm	1750 mm
	Gear Indication	Window							
	Clamping Diameter	22.1 – 22.3 mm							
	Straight handlebar ends	Minimum necessary length for shifter and handlebar grip = 150 mm							
	Length of shifter	76 mm							
	Weight	N/A							
Design	**Housing**	Glass filled PA, black or grey							
	Grip	PP							
	Grip Cover	Thermoplastic elastomer, Overmolded							
	Clamping Collar	Aluminum							

SRAM S7
ASSEMBLY

1



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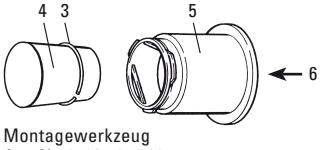
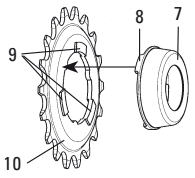


Montagewerkzeug
Art.-Nr. 0582 104 000

3



ASSEMBLY HUB

- Lace the wheel as normal. See spoke length table.
- Place the dust cap (1, ***Fig. 1)*** and sprocket (2) on the driver.
  Advice:
  When fitting a straight sprocket (not an offset version), the beadings of the sprocket must lie against the dust cap.
- 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.

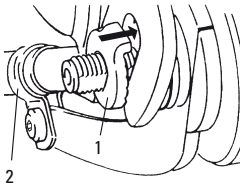
Spoke length table

Tire Size		Cross	Length
47–406	20" x 1.75 x 2	3 x	181 mm
37–490	22" x 1 3/8	3 x	225 mm
47–507	24" x 1.75 x 2	3 x	232 mm
37–540	24" x 1 3/8	3 x	251 mm
47–559	26" x 1.75 x 2	3 x	259 mm
37–590	26" x 1 3/8	3 x	275 mm
47–622	28" x 1.75	3 x	289 mm
37–622	28" x 1 3/8 x 1 5/8	3 x	289 mm
28–622	28" x 1 1/8	3 x	289 mm
32–622	28" x 1 5/8 x 1 1/4	3 x	289 mm
28–630	27" x 1 1/4 fifty	3 x	294 mm
32–630	27" x 1 1/4	3 x	294 mm

Spoke lengths are approximate values. They must be checked through lacing attempts and adjusted accordingly.

SRAM® S7 ASSEMBLY

4



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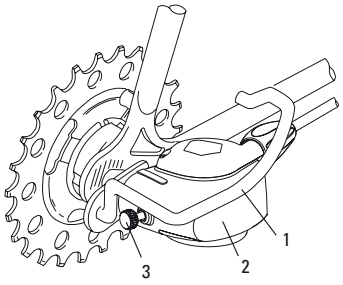

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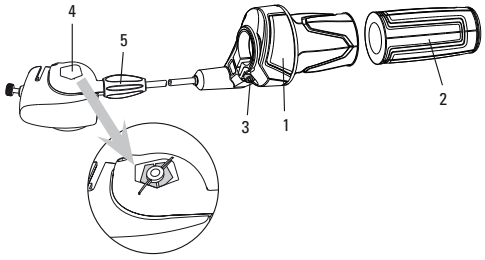

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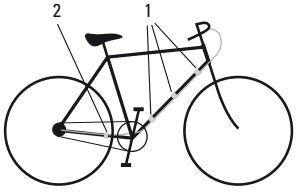

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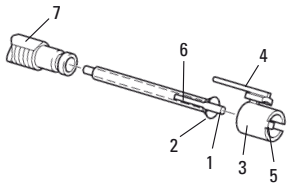


- Turn dust cap (7, ***Fig. 3)*** until the three lugs (8) are between the three beads (9) on the sprocket (10).
- Position dust cap and push towards sprocket until it is felt to lock into place.
- Placing the wheel in the rear frame.
- Fit new retaining washer (3,5 mm thick) on left axle end (1, ***Fig. 4)***.
  The serrations must bear against the dropout and the lug must engage in the dropout slot.
- Fit the hoop guard (1, ***Fig. 5)*** on the right axle side (drive side).
  No additional washers or any accessories are permitted.
  Advice:
  If a different protective bracket is used the thickness of the attachment plate must be max. 3 mm.
  At least the beginning of the axle thread must be visible in front of the axle nut.
- Mount the axle nuts. Tightening torque on axle nuts 30 – 40 Nm (266 – 350 in.lbs.)
- Version with coaster brake:
  Mount the brake lever using a suitable frame clamp (2, ***Fig. 4)***.
  Caution:
  Mount the brake lever between the two straps of the frame clamp.
  The clamp must be seated on the frame without play.
  Use a self-locking nut! Tightening torque: 2 – 3 Nm (18 – 27 in.lbs.).

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

ASSEMBLY SHIFTER

Advice:

- ***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 the shifter (1, ***Fig. 6)*** onto the handlebar.
- Slide the handlebar grip (2) onto the handlebar.
  Caution:
  Never use lubricants or solvents when fitting handlebar grips. They have a safety function and must not come free from the handlebar.
- Place the shifter on the handlebar grip and position so that you can use it comfortably. Tighten the clamping bolt (3). 3 mm Allen key, torque 3.5 – 4 Nm (31 – 35 in.lbs.).

Caution:

- ***Check that shifter and brake lever can be easily operated (if necessary, realign).***
- ***Never ride without handlebar grips. The turning grip of the twist shifter could become loose. This can result in severe injuries.***

- When fitting the cable avoid small radius. Attach the cable 3 times to the down tube (1, ***Fig. 7).***
- Last attachment point is on the lower rear wheel fork (2, ***Fig. 7)*** immediately behind the chain wheel.
  Cable housing must be movable inside attachment.

INSTALLING CLICKBOX

- Insert shift rod (1, ***Fig. 8)*** 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 until the guiding rib (4) is facing roughly upwards.
- Place shifter in gear position "1".
- Push on Clickbox (2, ***Fig. 5)*** to the stop on the hub axle. The guiding rib (4, ***Fig. 8)*** of the locating sleeve thereby engages in the slot on the housing. In the end position tighten up the knurled bolt (3, ***Fig. 5)*** by hand (0.3 Nm / 2.7 in.lbs.).

ADJUSTMENT

- Be sure to reset rotational shifter from 5th to 4th gear.
- Match up the marks in the Clickbox viewing window (4, ***Fig. 6)*** by turning the barrel adjuster (5).

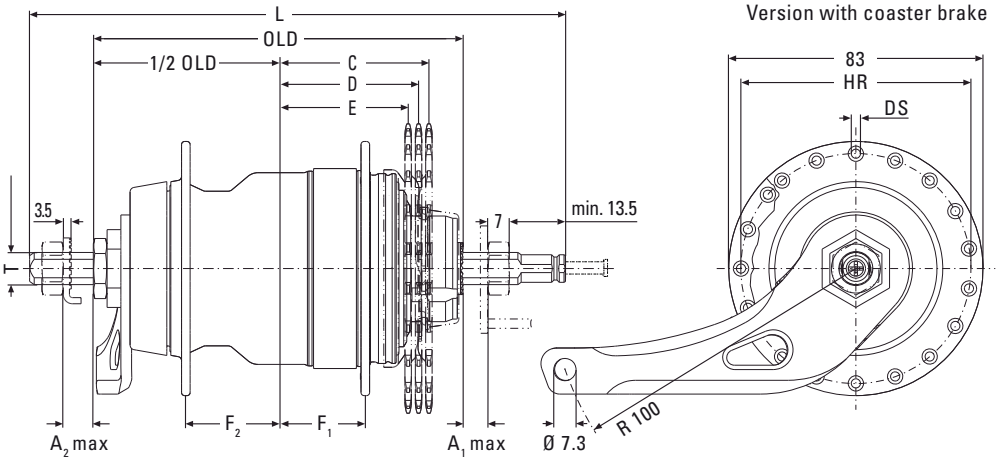
Caution:
Check that all the brake system components are functioning properly!

SRAM® P5
TECHNICAL DATA / ASSEMBLY REQUIREMENTS

Version SRAM P5 Cargo:
see page 41.

Caution:
Not suitable for tandems, transport bicycles and similar.

Cycle frame:
- Dropouts must be parallel.
- Slot width at rear dropout $10^{+0.5}$ mm.
- 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.

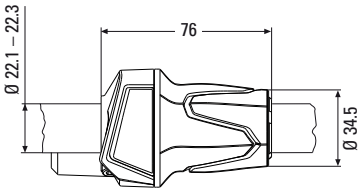


GEAR HUBS

		SRAM P5 with coaster brake		SRAM P5 without brake
	Type	MH 5215		MH 5205
	Brake	With coaster brake		Without brake
Over Locknut Dim., OLD		122 mm		122 mm
Axle	**Length, L**	175 mm		175 mm
	Ends Diameter, T	FG 10.5	FG 10.5 toothed cone	FG 10.5
	Dropout Width Dim.	A_1 max. = 12.5 mm / A_2 max. = 11.5 mm		A_1 max. = 12.5 mm / A_2 max. = 10.5 mm
Spoke	**Holes**	36		36
	Hole Diameter, DS	3,0 mm		3,0 mm
	Hole Ref. ø, HR	75 mm		75 mm
	Flange Dist. to $^1/_2$ OLD	F_1 = 28.5 mm / F_2 = 29.5 mm		F_1 = 29 mm / F_2 = 29 mm
Gear Hub Ratio	**Totally**	251 %	Gear steps	←
	Speed 1	0,633	↧	←
	Speed 2	0,781	23 %	←
	Speed 3	1,000	28 %	←
	Speed 4	1,281	28 %	←
	Speed 5	1,579	23 %	←
Chain	**Usable Dimensions**	$^1/_2$" x $^1/_8$" or $^1/_2$" x $^3/_{32}$"		$^1/_2$" x $^1/_8$" or $^1/_2$" x $^3/_{32}$"
	Line, C/D/E	C = 49 mm / D = 45.5 / E = 43 mm		C = 49 mm / D = 45.5 mm / E = 43 mm
	Ratio	24", 26", 28"= 1.8 – 1.9 / 20"= 1.8 – 2.0		min. 1.8
Compatibility	**Sprocket**	16 – 24 Teeth (outward offset - Chain Line C) / 16 – 18 Teeth (straight - Chain Line D) / 18 – 24 Teeth (inward offset - Chain Line E)		
	Shifter	SRAM Grip 5		←
	Clickbox	Clickbox P5		←
	Tandem	Not suitable for tandems, transport bicycles or similar		
	Weight	1495 g		1330 g
Finish	**Hub Shell Material**	Steel		Steel
	Finish	Matt Chrome Plated		Matt Chrome Plated

SRAM® P5
TECHNICAL DATA / ASSEMBLY REQUIREMENTS

SHIFTER

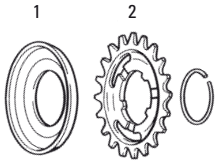


SHIFTER

		SRAM Grip 5				
	Shifter Type	Twist Shifter mit Clickbox				
	Cable Length	1500 mm	1600 mm	1700 mm	1800 mm	1900 mm
	Gear Indication	Window				
	Clamping Diameter	22.1 – 22.3 mm				
	Straight handlebar ends	Minimum necessary length for shifter and handlebar grip = 150 mm				
	Length of shifter	76 mm				
	Weight	N/A				
Design	**Housing**	Glass filled PA				
	Grip	PP				
	Grip Cover	Thermoplastic elastomer, Overmolded				
	Clamping Collar	Aluminum				

SRAM P5
ASSEMBLY

1



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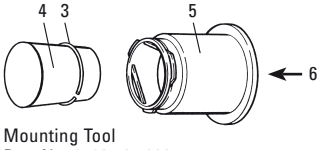
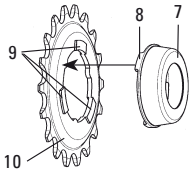


Mounting Tool
Part No. 0582 104 000

3



ASSEMBLY HUB

- Lace the wheel as normal. See spoke length table.
- Place the dust cap (1, ***Fig. 1)*** and sprocket (2) on the driver.
  Advice:
  When fitting a straight sprocket (not an offset version), the beadings of the sprocket must lie against the dust cap.
- Push sprocket circlip (3, ***Fig. 2)*** onto the cone of tool sleeve (4). Pvlace 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.

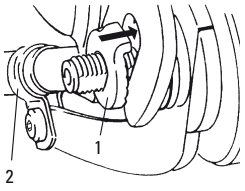
Spoke length table:

Tire Size		Cross	Length
47–406	20" x 1.75 x 2	3 x	181 mm
37–490	22" x 1 3/8	3 x	225 mm
47–507	24" x 1.75 x 2	3 x	232 mm
37–540	24" x 1 3/8	3 x	251 mm
47–559	26" x 1.75 x 2	3 x	259 mm
37–590	26" x 1 3/8	3 x	275 mm
47–622	28" x 1.75	3 x	289 mm
37–622	28" x 1 3/8 x 1 5/8	3 x	289 mm
28–622	28" x 1 1/8	3 x	289 mm
32–622	28" x 1 5/8 x 1 1/4	3 x	289 mm
28–630	27" x 1 1/4 fifty	3 x	294 mm
32–630	27" x 1 1/4	3 x	294 mm

Spoke lengths are approximate values. They must be checked through lacing attempts and adjusted accordingly.

SRAM® P5 ASSEMBLY

4



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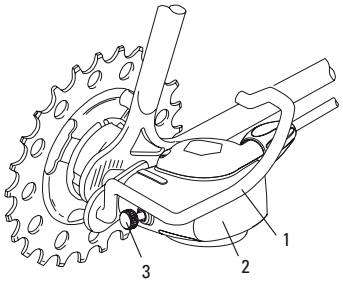

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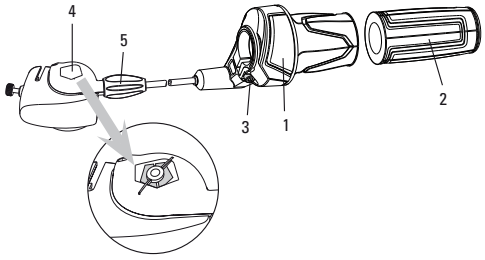

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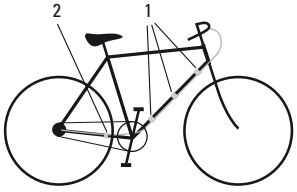

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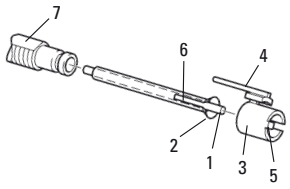


- Turn dust cap (7, ***Fig. 3)*** until the three lugs (8) are between the three beads (9) on the sprocket (10).
- Position dust cap and push towards sprocket until it is felt to lock into place.
- Placing the wheel in the rear frame.
- Fit new retaining washer (3,5 mm thick) on left axle end (1, ***Fig. 4)***. The serrations must bear against the dropout and the lug must engage in the dropout slot.
- On the sprocket side fit the protective bracket (1, ***Fig. 5)*** directly below the axle nut. Tightening torque on axle nuts 30 – 40 Nm (266 – 350 in.lbs.).
- Mount the brake lever using a suitable frame clamp (2, ***Fig. 4)***.
  Caution:
  Mount the brake lever between the two straps of the frame clamp.
  The clamp must be seated on the frame without play.
  Use a self-locking nut! Tightening torque: 2 – 3 Nm (18 – 27 in.lbs.).

Advice:
- ***If a different protective bracket*** (1, ***Fig. 5)*** ***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.***

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

ASSEMBLY SHIFTER

Advice:
- ***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 the shifter (1, ***Fig. 6)*** onto the handlebar.
- Slide the handlebar grip (2) onto the handlebar.
  Caution:
  Never use lubricants or solvents when fitting handlebar grips. They have a safety function and must not come free from the handlebar.
- Place the shifter on the handlebar grip and position so that you can use it comfortably. Tighten the clamping bolt (3). 3 mm Allen key, torque 3.5 – 4 Nm (31 – 35 in.lbs.).

Caution:
- ***Check that shifter and brake lever can be easily operated (if necessary, realign).***
- ***Never ride without handlebar grips. The turning grip of the twist shifter could become loose. This can result in severe injuries.***

- When fitting the cable avoid small radius. Attach the cable 3 times to the down tube (1, ***Fig. 7).***
- Last attachment point is on the lower rear wheel fork (2, ***Fig. 7)*** immediately behind the chain wheel.
  Cable housing must be movable inside attachment.

INSTALLING CLICKBOX

- Insert shift rod (1, ***Fig. 8)*** 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 until the guiding rib (4) is facing roughly upwards.
- Place shifter in gear position “2“.
- Push on Clickbox (2, ***Fig. 5)*** to the stop on the hub axle. The guiding rib (4, ***Fig. 8)*** of the locating sleeve thereby engages in the slot on the housing. In the end position tighten up the knurled bolt (3, ***Fig. 5)*** by hand (0.3 Nm / 2.7 in.lbs.).

ADJUSTMENT

- Be sure to reset rotational shifter from 4th to 3th gear.
- Match up the marks in the Clickbox viewing window (4, ***Fig. 6)*** by turning the barrel adjuster (5).

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

SRAM® P5 CARGO
TECHNICAL DATA / ASSEMBLY REQUIREMENTS

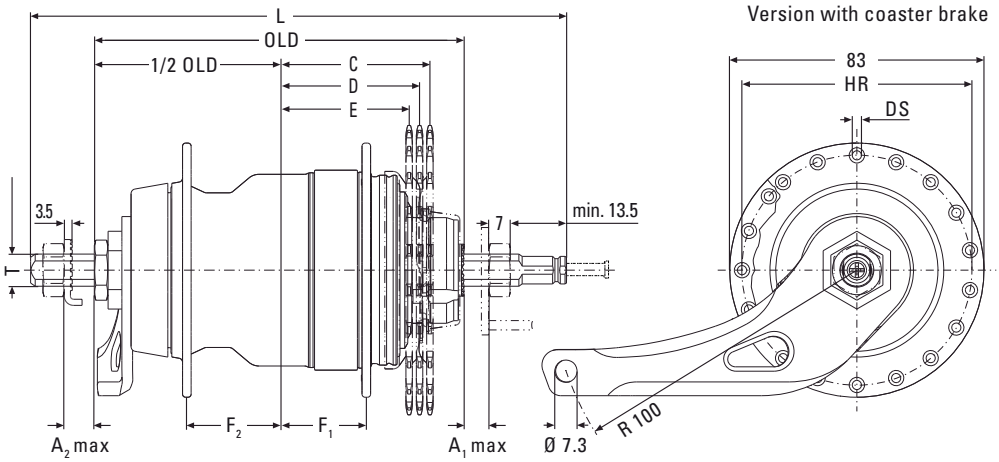
P5 CARGO

Caution:
The SRAM P5 Cargo is suitable for tandems, transport bicycles and similar. An additional external rear brake is necessary due to the high load.

Tolerable stress:
Axle load: max. 120 kilograms
Torque/driver body: max. 85 Nm (750 in.lbs.), no continuous stress.

Identification SRAM P5 Cargo:
Yellow grub screw inside the axle end.

Version SRAM P5 for normal bikes:
see page 37.



Cycle frame:
- Dropouts must be parallel.
- Slot width at rear dropout $10^{+0.5}$ mm.
- 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.

GEAR HUBS

		SRAM P5 Cargo with coaster brake		SRAM P5 Cargo with drum brake	SRAM P5 Cargo disc brake compatible
	Typ	MH 5215 Cargo		MH 5225 Cargo	–
	Brake	With coaster brake		With drum brake – Version „D“	Adaptor for disc brake
	Over Locknut Dim., OLD	122 mm		126 mm	125 mm
Axle	**Length, L**	175 mm		179 mm	179 mm
Axle	**Ends Diameter, T**	FG 10.5 toothed cone		FG 10.5	FG 10.5
Axle	**Dropout Width Dim.**	A_1 max. = 12.5 mm / A_2 max. = 11.5 mm		A_1 max. = 12.5 mm / A_2 max. = 12.5 mm	A_1 max. = 12.5 mm / A_2 max. = 11.5 mm
Spoke	**Holes**	36		36	36
Spoke	**Hole Diameter, DS**	3.0 mm		2.9 mm	3,0 mm
Spoke	**Hole Ref. ø, HR**	75 mm		89 mm	75 mm
Spoke	**Flange Dist. to $^1/_2$ OLD**	F_1 = 28.5 mm / F_2 = 29.5 mm		F_1 = 30.5 mm / F_2 = 29.5 mm	F_1 = 28.5 mm / F_2 = 29.5 mm
Gear Hub Ratio	**Totally**	224 %	Gear steps	←	←
Gear Hub Ratio	**Speed 1**	0,667	↓	←	←
Gear Hub Ratio	**Speed 2**	0,778	17 %	←	←
Gear Hub Ratio	**Speed 3**	1,000	29 %	←	←
Gear Hub Ratio	**Speed 4**	1,286	29 %	←	←
Gear Hub Ratio	**Speed 5**	1,500	17 %	←	←
Chain	**Usable Dimensions**	$^1/_2$" x $^1/_8$" or $^1/_2$" x $^3/_{32}$"		$^1/_2$" x $^1/_8$" or $^1/_2$" x $^3/_{32}$"	$^1/_2$" x $^1/_8$" or $^1/_2$" x $^3/_{32}$"
Chain	**Line, C/D/E**	C = 49 mm / D = 45.5 mm / E = 43 mm		C = 51.5 mm / D = 48.5 mm / E = 45.5 mm	C = 50 mm / D = 47 mm / E = 44 mm
Chain	**Ratio**	24", 26", 28"= 1.8 – 1.9 / 20"= 1.8 – 2.0		min. 1.8	min. 1.8
Compatibility	**Sprocket**	16 – 24 Teeth (outward offset - Chain Line C) / 16 – 18 Teeth (straight - Chain Line D) / 18 – 24 Teeth (inward offset - Chain Line E)			
Compatibility	**Shifter**	SRAM Grip 5		←	←
Compatibility	**Clickbox**	Clickbox P5		←	←
Compatibility	**Scheibenbremse**	—		—	6 holes
Compatibility	**Hand Brake Lever**	—		see page 87	Disc brake compatible
Compatibility	**Tandem**	Suitable for tandems, transport bicycles or similar			←
	Weight	1495 g		1536 g	1390 g
Finish	**Hub Shell Material**	Steel		Aluminum	Steel
Finish	**Finish**	Matt Chrome Plated		Clear Coat	Matt Chrome Plated

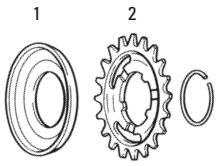
SRAM® P5 CARGO
TECHNICAL DATA / ASSEMBLY REQUIREMENTS

SHIFTER

	SRAM Grip 5 (Drawing see Page 38)					
	Shifter Type	Twist Shifter mit Clickbox				
	Cable Length	1500 mm	1600 mm	1700 mm	1800 mm	1900 mm
	Gear Indication	Window				
	Clamping Diameter	22.1 – 22.3 mm				
	Handlebar, Straight Area	Minimum necessary length for shifter and handlebar grip = 150 mm				
	Length of shifter	76 mm				
	Weight	N/A				
Design	**Housing**	Glass filled PA				
	Grip	PP				
	Grip Cover	Thermoplastic elastomer, Overmolded				
	Clamping Collar	Aluminum				

SRAM P5 CARGO
MONTAGE

1



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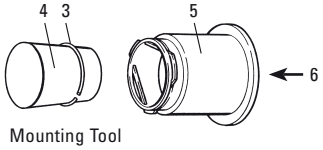

Mounting Tool
Part No. 0582 104 000

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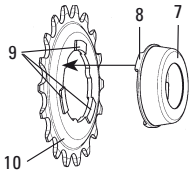

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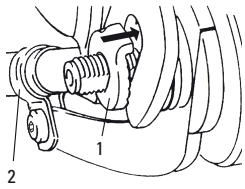


ASSEMBLY HUB

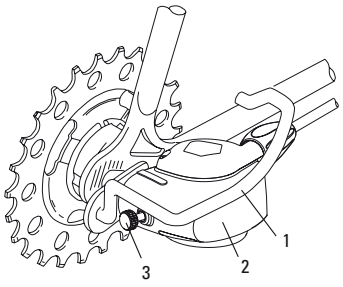
- Lace the wheel as normal. See spoke length table.
- Place the dust cap (1, ***Fig. 1)*** and sprocket (2) on the driver.
  Advice:
  When fitting a straight sprocket (not an offset version), the beadings of the sprocket must lie against the dust cap.
- Push sprocket circlip (3, ***Fig. 2)*** onto the 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.
- Hub versions for Disc Brake:
  Advice:
  Read and observe the corresponding technical documentation for assembling the disc of the disc brake.
  Caution:
  Plane faces of the hub and the disc and the threaded holes of the hub must be clean and free from oily and greasy substances.
- Placing the wheel in the rear frame.
- Fit new retaining washer (3,5 mm thick) on left axle end (1, ***Fig. 4)***. The serrations must bear against the dropout and the lug must engage in the dropout slot.

Spoke length table:

Tire Size		Cross	Length MH 5215	Length MH 5225
47–406	20" x 1.75 x 2	3 x	181 mm	179 mm
37–490	22" x 1 3/8	3 x	225 mm	222 mm
47–507	24" x 1.75 x 2	3 x	232 mm	229 mm
37–540	24" x 1 3/8	3 x	251 mm	248 mm
47–559	26" x 1.75 x 2	3 x	259 mm	256 mm
37–590	26" x 1 3/8	3 x	275 mm	272 mm
47–622	28" x 1.75	3 x	289 mm	286 mm
37–622	28" x 1 3/8 x 1 5/8	3 x	289 mm	286 mm
28–622	28" x 1 1/8	3 x	289 mm	286 mm
32–622	28" x 1 5/8 x 1 1/4	3 x	289 mm	286 mm
28–630	27" x 1 1/4 fifty	3 x	294 mm	291 mm
32–630	27" x 1 1/4	3 x	294 mm	291 mm

Spoke lengths are approximate values. They must be checked through lacing attempts and adjusted accordingly.

5



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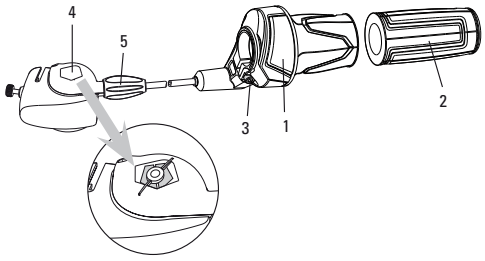

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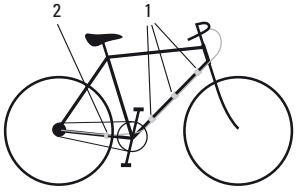

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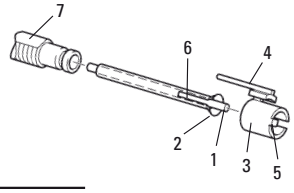

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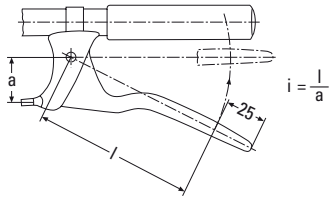

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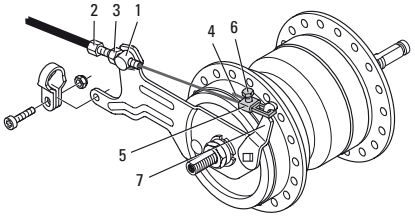


- On the sprocket side fit the protective bracket (1, ***Fig. 5)*** directly below the axle nut. Tightening torque on axle nuts 30 – 40 Nm (266 – 350 in.lbs.).
- Mount the brake lever using a suitable frame clamp (2, ***Fig. 4 resp. Fig. 10)***.
  Caution:
  Mount the brake lever between the two straps of the frame clamp.
  The clamp must be seated on the frame without play.
  Use a self-locking nut! Tightening torque: 2 – 3 Nm (18 – 27 in.lbs.).

Advice:
- ***If a different protective bracket*** (1, ***Fig. 5)*** ***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.***

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

ASSEMBLY SHIFTER

Advice:
- ***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 the shifter (1, ***Fig. 6)*** onto the handlebar.
- Slide the handlebar grip (2) onto the handlebar.
  Caution:
  Never use lubricants or solvents when fitting handlebar grips. They have a safety function and must not come free from the handlebar.

- Place the shifter on the handlebar grip and position so that you can use it comfortably. Tighten the clamping bolt (3). 3 mm Allen key, torque 3.5 – 4 Nm (31 – 35 in.lbs.).

Caution:
- ***Check that shifter and brake lever can be easily operated (if necessary, realign).***
- ***Never ride without handlebar grips. The turning grip of the twist shifter could become loose. This can result in severe injuries.***

- When fitting the cable avoid small radius. Attach the cable 3 times to the down tube (1, ***Fig. 7).***
- Last attachment point is on the lower rear wheel fork (2, ***Fig. 7)*** immediately behind the chain wheel.
  Cable housing must be movable inside attachment.

INSTALLING CLICKBOX

- Insert shift rod (1, ***Fig. 8)*** in shift tube (2) (oil parts lightly) and then push into axle bore as far as the stop. If the shifting rod is sticking up out of the axle end: apply slight pressure on the shift rod with its threaded section and screw inwards in a clockwise direction until it can again be moved axially (valid for older hub versions). 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 until the guiding rib (4) is facing roughly upwards.
- Place shifter in gear position "2".
- Push on Clickbox (2, ***Fig. 5)*** to the stop on the hub axle. The guiding rib (4, ***Fig. 8)*** of the locating sleeve thereby engages in the slot on the housing. In the end position tighten up the knurled bolt (3, ***Fig. 5)*** by hand (0.3 Nm / 2.7 in.lbs.).

ADJUSTMENT

- Be sure to reset rotational shifter from 4th to 3rd gear.
- Match up the marks in the Clickbox viewing window (4, ***Fig. 6)*** by turning the barrel adjuster (5).

CONNECTING DRUM BRAKE

Caution:
Only use brake levers with a cable moving distance of at least 15 mm and a leverage of "i" = 3.8 – 4.2 (Fig. 9).
- Fit cable stop (1, ***Fig. 10)*** with adjusting bolt (2) and nut (3) and insert into the slot on the brake anchor plate.
- Turn adjusting bolt down by approx. $^2/_3$ and route the brake cable from the brake handle.
- Push lower brake cable end through adjusting bolt (2) and insert lower cable housing end into adjusting bolt.
- Thread brake cable end (4) into fork unit (5).
- Tighten screw (6) slightly.
- Attach fork unit to brake lever (7).
- Pull brake cable end taut with pliers so that fork unit can still be attached and removed (important for changing wheel).
- Tighten screw (6).

ADJUSTMENT DRUM BRAKE

- Unscrew adjusting screw (2, ***Fig. 10)*** 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 hex nut (3).

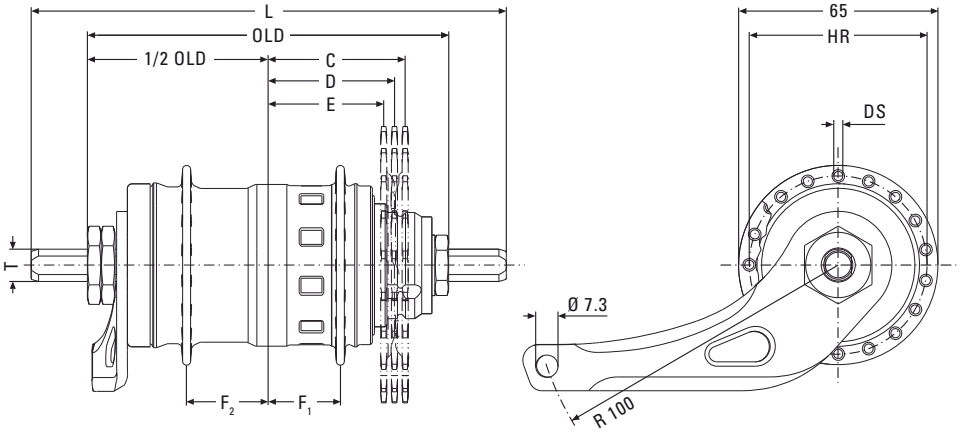
Caution:
Check that all the brake system components are functioning properly!

SRAM® T3
TECHNICAL DATA / ASSEMBLY REQUIREMENTS

GEAR HUBS

Caution:
Not suitable for tandems, transport bicycles and similar.

Cycle frame:
- Dropouts must be parallel.
- Slot width at rear dropout $10^{+0.5}$ mm.
- 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.



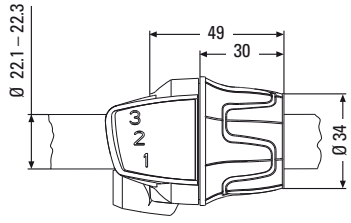
Version with Coaster Brake

GEAR HUBS

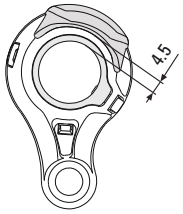
		SRAM T3 with coaster brake		SRAM T3 without brake
	Type	MH 3115		MH 3105
	Brake	Coaster		Without brake
Over Locknut Dim., OLD		118 mm	127 mm	117 mm
Axle	Length, L	155 or 166 mm	166 mm	155 mm or 166 mm
Axle	Ends Diameter, T	FG 10.5		FG 10.5
Spoke	Holes	36 or 28	36	36 or 28
Spoke	Hole Diameter, DS	3.0 mm		3.0 mm
Spoke	Hole Ref. ø, HR	58 mm		58 mm
Flange Dist. to 1/2 OLD		F_1 = 24.5 mm / F_2 = 25.5 mm		F_1 = 24.5 mm / F_2 = 25.5 mm
Gear Hub Ratio	Totally	186 %	Gear steps	←
Gear Hub Ratio	Speed 1	0,734	↧	←
Gear Hub Ratio	Speed 2	1,000	36 %	←
Gear Hub Ratio	Speed 3	1,362	36 %	←
Chain	Line, C/D/E	C = 44.5 mm / D = 41.5 mm / E = 38.5 mm		C = 44 mm / D = 41 mm / E = 38 mm
Chain	Ratio	24", 26", 28" = 2.0 – 2.4 / 20" = 2.0 – 2.5		min. 2.0
Chain	Dimensions	1/2" x 1/8" and 1/2" x 3/32"		1/2" x 1/8" and 1/2" x 3/32"
Compatibility	Sprocket	16 – 24 Teeth (outward offset - Chain Line C) / 16 – 18 Teeth (straight - Chain Line D) / 16 – 24 Teeth (inward offset - Chain Line E)		
Compatibility	Shifter	SRAM T3 / SRAM Bandix 3		←
Compatibility	Tandem	Not suitable for tandems, transport bicycles or similar		
	Weight	1182 g		911 g
Finish	Hub Shell Material	Steel		Steel
Finish	Finish	Matt Chrome Plated		Matt Chrome Plated

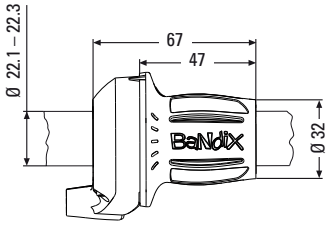
SRAM® T3
TECHNICAL DATA / ASSEMBLY REQUIREMENTS

SHIFTERS



Shifter SRAM T3





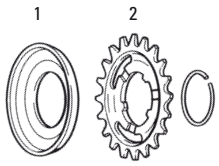
Shifter SRAM T3 BANDIX

SHIFTERS

		SRAM T3 shifter	
	Version	SRAM T3	SRAM T3 BANDIX (for kids)
	Shift cable lengths	2200 mm	2158 mm
	Comp. Cable Housing	Capped, Compressionless with Resin Liner inside	Capped, Compressionless with Resin Liner inside
	Shifter type	SRS twist shifter	SRS twist shifter
	Assembly location	Right side of handlebar	Right side of handlebar
	Compat. gear hub	SRAM T3	SRAM T3
	Gear indicator	Window	Printed
	Barrel adjuster	None	None
	Clamping diameter	22.1 – 22.3 mm	22.1 – 22.3 mm
	Straight handlebar ends	Minim. necessary length for shifter and handlebar grip = 150 mm	Minim. necessary length for shifter and handlebar grip = 155 mm
	Weight	58 g	65 g
Finish	**Shift cable**	Stainless or galvanized steel	Stainless or galvanized steel
Finish	**Housing**	Plastic injection molding	PA
Finish	**Grip cover**	Thermoplastic elastomer	Thermoplastic elastomer
Finish	**Frame clamp**	Aluminum	Aluminum
Finish	**Finish**	Black	Black

SRAM® T3 ASSEMBLY

1



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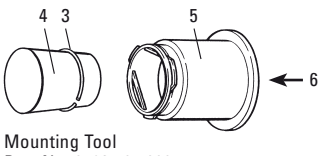

Mounting Tool
Part No. 0582 104 000

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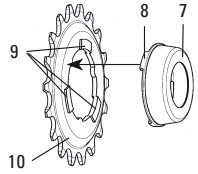

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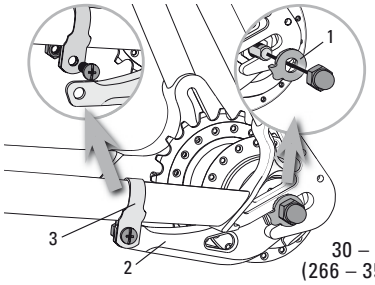
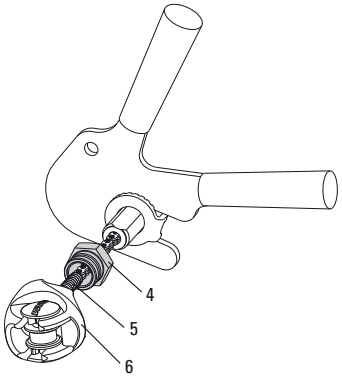


30 – 40 Nm
(266 – 350 in.lbs.)

5



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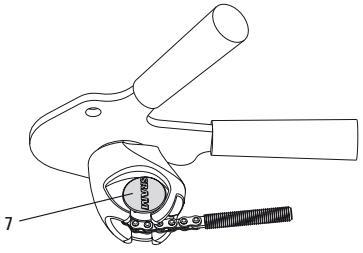


ASSEMBLY HUB

- Lace the wheel as normal. See spoke length table.
- Place the dust cap (1, ***Fig. 1)*** and sprocket (2) on the driver.
  Advice:
  When fitting a straight sprocket (not an offset version), the beadings of the sprocket must lie against the dust cap.
- 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.
- Screw tension chain (5, ***Fig. 5)*** into the axle end.
- Placing the wheel in the rear frame.
- Mount the chain.
- Slide one retaining washer (3,5 mm thick) (1, ***Fig. 4)*** each axle end.
  The serrations must bear against the dropout of the frame and the lug must engage in the dropout of the frame.
- Mount the special type axle nut ***(4, Fig. 5)*** on the right axle side (drive side) and the axle nut at the other axle end. Tightening torque 30 – 40 Nm (266 – 350 in.lbs.).
- Guide tension chain (5, ***Fig. 5)*** through return pulley (6).
- Position return pulley at axle nut (4, ***Fig. 5)*** and push until it is felt to lock into place.
  Turn return pulley until the circular area is at the top (7, ***Fig. 6)***.

Caution:
- ***Only install additional axle attachments (e.g. struts) between nut and retaining washer.***
- ***Cable stop bracket: dimensions see Fig. 9.***
- ***Axle end must protrude by min. 1 mm to max. 4 mm beyond the nut (4, Fig. 5).***

- Hub version with coaster brake:
  Mount the brake lever (3, ***Fig. 4)*** between the two straps of the frame clamp (4).
  Caution:
  Use a suitable frame clamp.
  The clamp must be seated on the frame without play.
  Use a self-locking nut! Tightening torque: 2 – 3 Nm (18 – 27 in.lbs.).

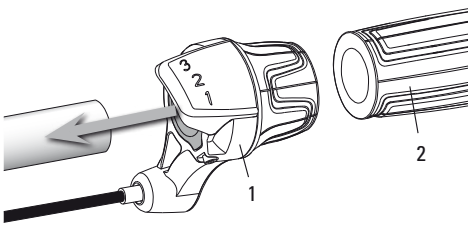
Caution:
Check that all the brake system components are functioning properly!

Spoke length table:

Tire Size		Cross	Length
		28 / 36 Holes	28 / 36 Holes
47–406	20" x 1.75 x 2	2 x / 3 x	182 mm / 184 mm
37–490	22" x 1 3/8	— / 3 x	— / 228 mm
47–507	24" x 1.75 x 2	2 x / 3 x	234 mm / 235 mm
37–540	24" x 1 3/8	— / 3 x	— / 254 mm
47–559	26" x 1.75 x 2	2 x / 3 x	258 mm / 262 mm
37–590	26" x 1 3/8	— / 3 x	— / 254 mm
47–622	28" x 1.75	2 x / 3 x	289 mm / 292 mm
28–622	28" x 1 1/8	— / 3 x	— / 292 mm
32–622	28" x 1 5/8 x 1 1/4	— / 3 x	— / 292 mm
37–622	28" x 1 3/8 x 1 5/8	— / 3 x	— / 292 mm
28–630	27" x 1 1/4 fifty	— / 3 x	— / 297 mm
32–630	27" x 1 1/4	— / 3 x	— / 297 mm

Spoke lengths are approximate values. They must be checked through lacing attempts and adjusted accordingly.

7



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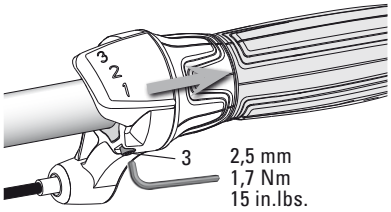

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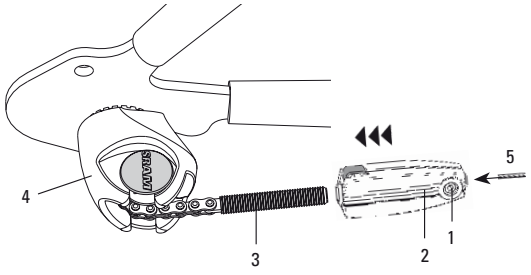

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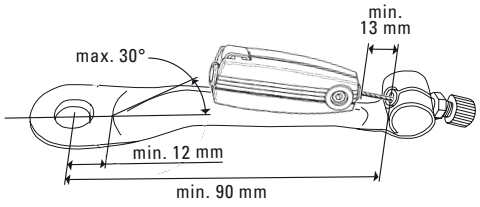


FITTING THE SHIFTER

Caution:
Because of a risk of fracturing, following types of handlebars are not suited:
– thin walled aluminum handlebars, e.g. Hyperlite© handlebars
– carbon handlebars

- Slide the shifter (1, ***Fig. 7)*** onto the handlebar.
- Slide the handlebar grip (2, ***Fig. 7)*** onto the handlebar.
  Caution:
  Never use lubricants or solvents when fitting handlebar grips. They have a safety function and must not come free from the handlebar.
- Place the shifter on the handlebar grip ***(Fig. 7)*** and position so that you can use it comfortably. Tighten the clamping bolt (3). 2.5 mm Allen wrench, torque 2 Nm (15 in.lbs.).

Caution:
- ***Check that shifter and brake lever can be easily operated (if necessary, realign).***
- ***Never ride without handlebar grips. The turning grip of the twist shifter could become loose. This can result in severe injuries.***

Caution:
Before setting out on any ride, always check the correct and trouble-free operation of the shift system and brakes.

FITTING THE SHIFT CABLE

Advice:
- ***Make sure that the cable housing length is sufficient to permit turning of the handlebar over its full range.***
- ***Also consider the influence of adjustable handlebars and stems on the cable housing length.***

- Fasten the cable housing on the frame.
  Advice:
  - ***In case of continuous cable housing the cable housing must be secured in equidistant intervals on the frame and must be free to move at the securing points.***
  - ***When fitting the cable avoid small radius.***
  - ***Use only compressionless cable housings with resin liner inside and capped.***

Advice:
To avoid malfunction the cable frictional force must not exceed 6 N (1.4 lbs.).

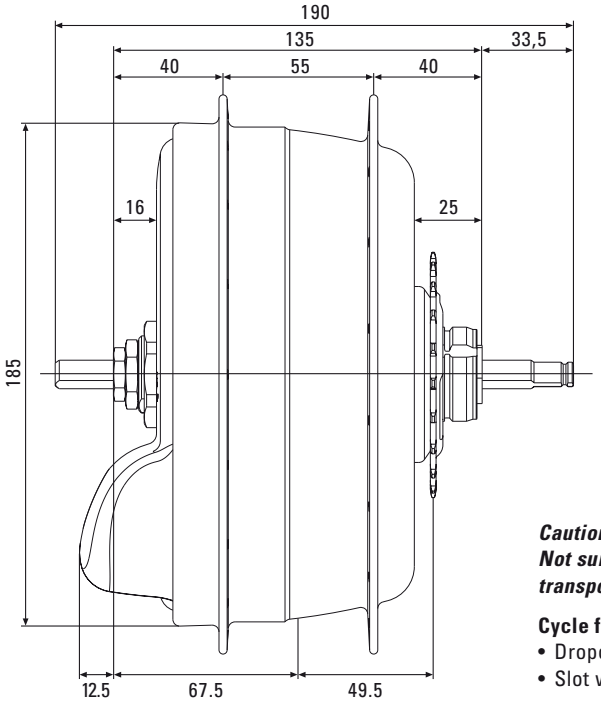
- Feed the shifter cable into the locating sleeve (5, ***Fig. 9)***, fix at the appropriate length (cable stop bracket: ***see Fig. 10)*** using the clamping bolt (1).
  Allen key 2.5 mm, tightening torque 1.5 Nm (13 in.lbs.). Shorten any cable which is sticking out.
- Connect to the hub: push locating sleeve (2, ***Fig. 9)*** loosely onto small pull rod (3).

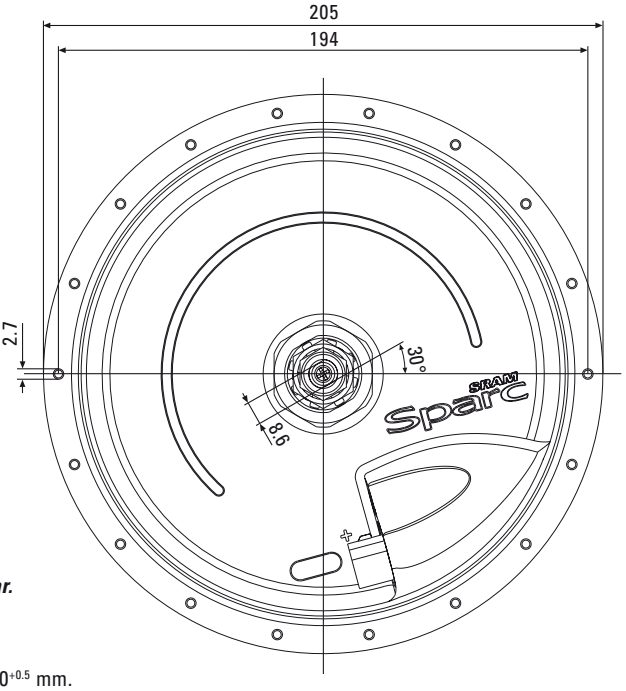
Adjustment
- Place the shifter in gear position "3". Move the crank to check that the gear is engaged.
- To make the adjustment, the cable must be taut in third gear to be able to transfer a shift movement directly to the hub.
- Push locating sleeve (2, ***Fig. 9)*** onto the small pull rod (3) until the control cable is taut. Make sure that you don't pull the indicator chain out of the return pulley (4).

Check:
- Place shifter in gear position "1" while moving the crank.
- Setting too loose: In gear position "1" the tension chain can be pulled out of the return pulley by hand.
- Setting too tight: It is difficult to place the shift lever in gear position "1".
- If required, readjust the shift mechanism (in third gear).

Caution:
Before setting out on any ride, always check the correct and trouble-free operation of the shift system and brakes

SPARC®
TECHNICAL DATA / ASSEMBLY REQUIREMENTS





Caution:
Not suitable for tandems, transport bicycles and similar.

Cycle frame:
- Dropouts must be parallel.
- Slot width at rear dropout $10^{+0.5}$ mm.

GEAR HUBS

		Sparc hub 16,8 V		
	Wheel ø	28" / 26"	20"	26" USA
V max.	**Econ Mode**	22 km/h	16 km/h	26 km/h
	Speed Mode	25 km/h	23 km/h	32 km/h
Range	**Econ Mode**	ca. 35 km*		
	Speed Mode	ca. 25 km*		
Electric Drive	**Engine Type**	2 x 16,8 V DC engines		
	Power	2 x 100 W max.		
	Assist Type	Pedal controlled		
	Assist Ratio	Econ / Speed		
	Brake	None		
	Over Locknut Dim.	135 mm		
Axle	**Length**	190 mm		
	Ends Diameter	FG 10.5		
Spoke	**Holes**	36		
	Hole Diameter	2.9 mm		
	Hole Reference ø	194 mm		
Ratio	**Totally**	251 %		
	Speed 1 / 2 / 3 / 4 / 5	63 % / 78 % / 100 % / 128 % / 158 %		
Chain	**Usable Dimension**	$^1/_2$" x $^1/_8$" or $^1/_2$" x $^3/_{32}$"		
	Line	49.5 mm (only off-set sprockets)		
	Ratio	1.7 – 2.6		
	Shifter Compatib.	Sparc Shifter		
	Frame Compatib.	Dropouts max. 7 mm		
		Over Locknut Dim. (OLD) 135 mm		
	Tandem	Not suitable for tandems, transport		
		bicycles or similar		
	Weight	2450 g		

SHIFTER

	Sparc Shifter (Drawing see Page 66)				
Shifter Type	Twist Shifter				
Cable Length	1450 mm	1550 mm	1650 mm	1750 mm	1850 mm
	1950 mm	2150 mm	2350 mm		
Gear Indication	Window				
Clamping Diameter	22.1 – 22.3 mm				
Straight handlebar ends	Min. necessary length for shifter a. handlebar grip = 150 mm				
Length of shifter	76 mm				
Weight	N/A				

REM. CON.

	Sparc Remote Control Unit					
Cable Length (mm)	1500	1600	1700	1800	2000	2200
Mode Selector	Off / Econ / Speed					
Mode Indication	Printed					
Clamping Diameter	22.1 – 22.3 mm					
Cable Connection	3.5 mm stereo jack					
Weight	45 g					

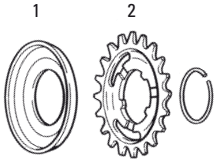
BA. BOX

	Sparc Battery Box 16,8 V					
Cable Length (mm)	650	750	850	1400	1650	1950
Battery	16,8 V / 8 Ah NiMH battery					
Charger	16,8 V / 2 A					
Charging time	4 hours 30 minutes					
Luggage carrier comp.	Struts: ø 8 mm / dist. 68 mm center to center / parallel					
Weight	2400 g					

***** Average speed 20 km/h in the plain using a 28-inch wheel and assuming 75-watt input by the rider. (US version: SPEED = 15 miles, ECON = 21 miles)
The range achieved by a single battery charge depends on various factors. These include drive mode, the condition of the battery, the road conditions and particularly the cyclist's own effort.

SPARC®
ASSEMBLY

1



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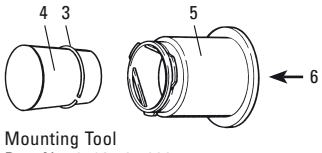
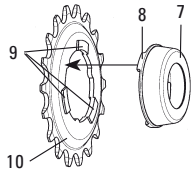


Mounting Tool
Part No. 0582 104 000

3



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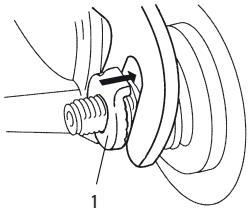

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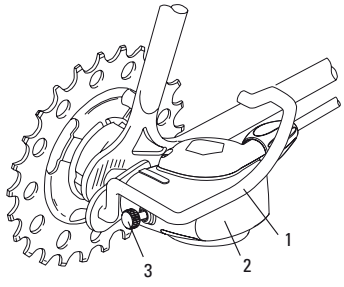

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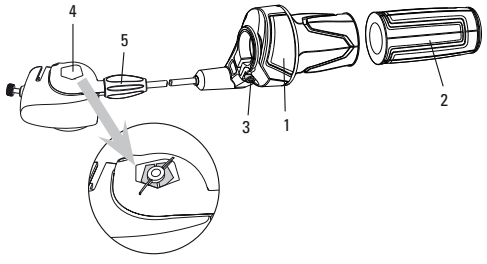


LACING THE WHEEL

Version 28" / 26":
1-cross only.
All spoke heads must be positioned either at the outside or the inside of the respective spoke flange.
Spoke tension about 1000 N recommended.

Version 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.
- Fit new retaining washer (3,5 mm thick) on left axle ends (1, ***Fig. 4)***. The serrations must bear against the dropout and the lug must engage in the dropout slot.
- On the sprocket side fit the protective bracket (1, ***Fig. 5)*** directly below the axle nut. Tightening torque on 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:
- ***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 the shifter (1, ***Fig. 6)*** onto the handlebar.
- Slide the handlebar grip (2) onto the handlebar.
  Caution:
  Never use lubricants or solvents when fitting handlebar grips. They have a safety function and must not come free from the handlebar.
- Place the shifter on the handlebar grip and position so that you can use it comfortably. Tighten the clamping bolt (3). 3 mm Allen key, torque 3.5 – 4 Nm (31 – 35 in.lbs.).

Caution:
- ***Check that shifter and brake lever can be easily operated (if necessary, realign).***
- ***Never ride without handlebar grips. The turning grip of the twist shifter could become loose. This can result in severe injuries.***
- When fitting the cable (1, ***Fig. 7)*** avoid small radius.
- Last attachment point is on the lower rear wheel fork (2, ***Fig. 7)*** immediately behind the chain wheel.
  Cable housing must be movable inside attachment.

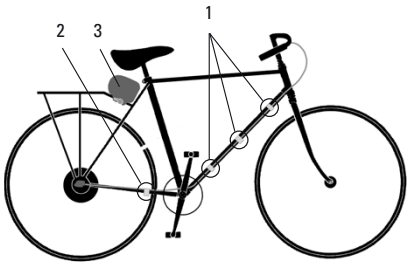
INSTALLING CLICK BOX

- Insert shift rod (1, ***Fig. 8)*** 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. 5)*** to the stop on the axle. The guiding rib (4, ***Fig. 8)*** of the locating sleeve thereby engages in the slot on the housing. In the end position tighten up the knurled bolt (3, ***Fig. 5)*** 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. 6)*** by turning the barrel adjuster (5).

7



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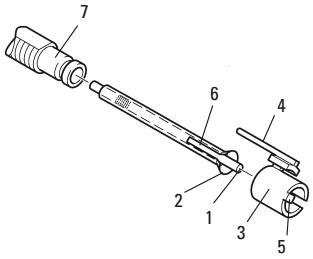

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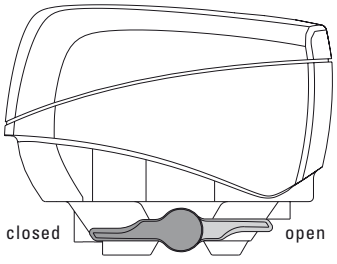

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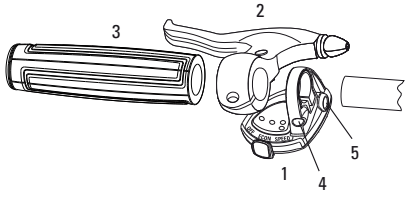


ASSEMBLY BATTERY BOX

- Pull both quick releases outward and turn them to the „open“ position ***(Fig. 9)***.
- Position battery box onto luggage carrier struts (3, ***Fig. 7)***.
- Push quick releases inwards and turn them to the „closed“ position ***(Fig. 9)***.
- 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.
- 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.

STORING BATTERY BOX

The battery box should be stored fully charged in a dry and cool place. Remove the plug of the battery cable from the box.

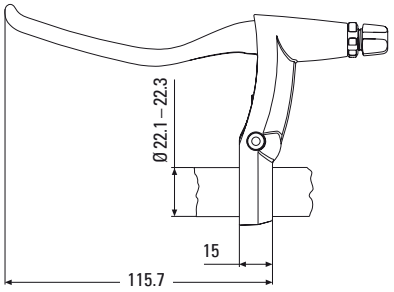
All batteries are shipped with an additional documentation about the last charging date within our SRAM facility. This documentation of battery charging also allows you to fill in the dates of additional charge actions that you would need to perform if the batteries stay in your warehouse over a longer period of time. You can identify the next necessary charge date at a glance (at least 3 months after last charge).

ASSEMBLY REMOTE CONTROL UNIT

- Slide remote control unit (1, ***Fig. 10)*** 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.

Check:
Switch remote control to „Speed“ position and rotate the rear wheel (Battery has to be fully charged).
At least 1 green and the red LED must gleam. If not, assemble plugs again completely / right.

BRAKE LEVER SRAM® BL 60
TECHNICAL DATA / ASSEMBLY REQUIREMENTS



BRAKE LEVER

		SRAM BL 60	
	Version	SRAM BL 60, left	SRAM BL 60, right
	Mounting location	left side of handlebar	right side of handlebar
	Clamping diameter	22.1 – 22.3 mm	←
	Compatibility	Linear-Pull, Avid BB Disc	←
	Ratio	2.32	←
	Cable path	24 mm	←
	Reach Adjust	Yes	←
	Adjusting screw	Yes	←
	Lever size	4-finger	4-finger
	Weight	95 g	95 g
Material	Housing	Cast aluminum	←
Material	Lever	Aluminum, forged	←
Material	Frame clamp	Aluminum	←
Material	Finish	Mercury silver painted	←

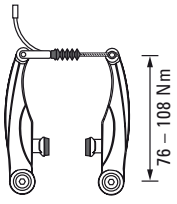
CABLE AND CABLE HOUSING

Advice:
Make sure that the cable housing length is sufficient to permit turning of the handlebar over its full range.

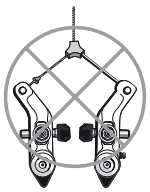
» Also bear in mind the effect of adjustable handlebars and stems on the cable housing length.

» Always use new, high-quality cables and compressionless cable housings with end caps.

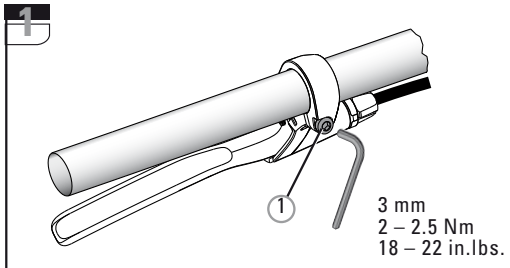
Caution:
SRAM BL 60 brake levers are designed for use with Avid BB Disc Brakes and Linear-Pull compatible brakes.
Do not use SRAM Brake Levers with conventionell cantilever brakes (those with arms measuring less than 76 mm and utilizing a non-linear straddle cable). Use of SRAM Brake Levers with conventional cantilever brakesets, drum brakes or roller brakes will result in faulty braking performance.

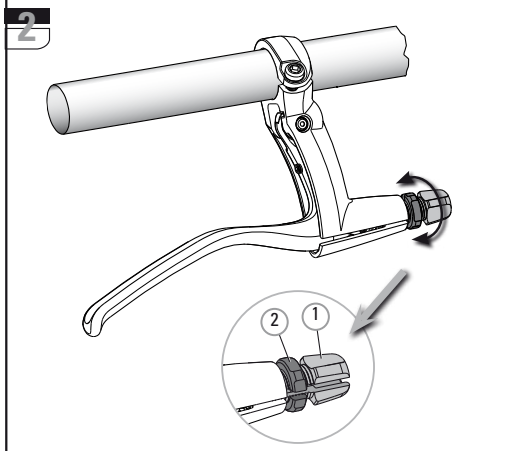


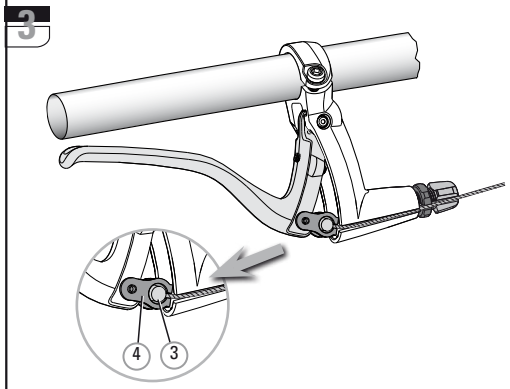
Designed for use with linear-pull brakes.

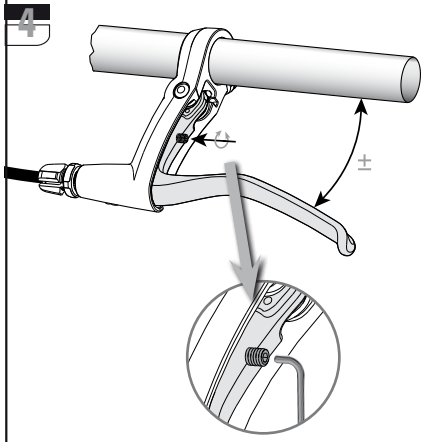

Do not use conventional cantilever brakes.

BRAKE LEVER SRAM® BL 60 ASSEMBLY









FITTING THE BRAKE LEVER

» Slide the brake lever onto the handlebar.

1 Tighten the clamping bolt.
3 mm Allen key, torque 2 – 2.5 Nm (18 – 22 in.lbs.).

FITTING THE BRAKE CABLE

Caution:
The SRAM BL 60 brake lever is only compatible with the following brakes: Avid BB Disc and Linear-Pull compatible brakes.

Advice:
Make sure that the cable housing length is sufficient to permit turning of the handlebar over its full range.
» Also bear in mind the effect of adjustable handlebars and stems on the cable housing length.
» Always use new, high-quality cables and compressionless cable housings with end caps.

2 Turn the cable adjustment screw (1) and the counter nut (2) so that the cable slot is aligned with the slot on the bottom of the brake lever housing.

3 Pull the brake lever to the handlebar and guide the inner cable into the housing.
Hook the nipple (3) of the inner cable into the recess (4) in the brake lever.

» Follow the brake manufacturer's instructions when fitting the brake cable and adjusting the brakes.

Caution:
Check that the brake is operating in a correct and trouble-free manner.

Reach adjust of the hand brake lever:
so that you can operate the brake lever on the shifter comfortably, set the reach to match your hand size.

4 Use a 2 mm Allen key to set the distance between the brake lever and the handlebar.

Caution:
Every time you adjust the reach, check and correct the brake cable tension to ensure good brake performance.

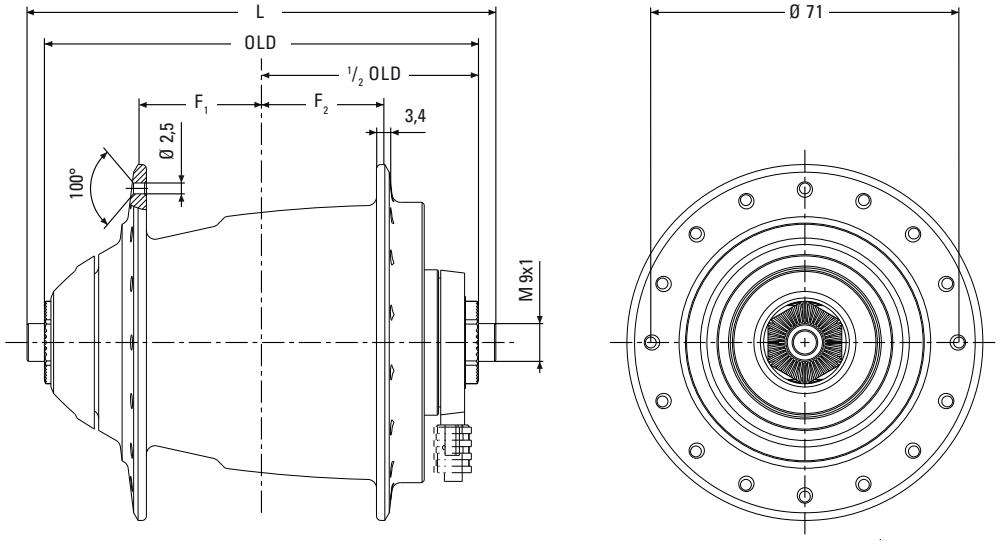
Advice:
Read and observe the operating manual and technical documentation of the brake manufacturer.

USE

Caution:
Before riding, always check that all brake system components are functioning properly.

Advice:
On your ride with your new bicycle, actuate the hand brake lever carefully to become familiar with the braking performance.

i-LIGHT™ – DYNAMO HUBS · D7-SERIES / D3-SERIES
TECHNICAL DATA / ASSEMBLY REQUIREMENTS



Caution:
The dynamo hub generates an extremely high voltage. Never touch the conntection terminal of the dynamo hub while riding or while the wheel is spinning. This may cause an electric shock.

D724 / D730

	Model	D724-N		D730-N		D724-D		D730-D	
	Version	Standard		→		Disc Brake compat. / 6 holes			
	Output	2.4 Watt		3.0 Watt		2.4 Watt		3.0 Watt	
	Voltage	6 V		←		6 V		←	
	Wheel ø	400 – 720 mm / 16" – 28"		←		400 – 720 mm / 16" – 28"		←	
	Over Locknut Dim., OLD	100 mm		←		100 mm		←	
Axle	**Length, L**	140 mm	108 mm	140 mm	108 mm	140 mm	108 mm	140 mm	108 mm
Axle	**Type**	Solid	Hollow[1]	Solid	Hollow[1]	Solid	Hollow[1]	Solid	Hollow[1]
Axle	**Material**	Steel		←		Steel		←	
Axle	**Ends Diameter**	M 9 x1	–	M 9 x1	–	M 9 x1	–	M 9 x1	–
Spoke	**Holes**	36 / 32		←		36 / 32		←	
Spoke	**Hole Diameter**	2.5 mm		←		2.5 mm		←	
Spoke	**Hole Reference ø**	71 mm		←		71 mm		←	
Spoke	**Flange Width**	3.4 mm		←		3.4 mm		←	
Spoke	**Flange Distance, F_1/F_2**	F_1 = 28 mm / F_2 = 28 mm		←		F_1 = 18 mm / F_2 = 31 mm		←	
Spoke	**Offset**	0 mm		←		6.5 mm		←	
	Bearing	Cartridge		←		Cartridge		←	
	Sealing	Double Sealed		←		Double Sealed		←	
	Homologation	KBA homologation for versions with 3.0 Watt (KBA = Kraftfahrtbundesamt Germany)							
	Efficiency	70% at 15 km/h		←		70% at 15 km/h		←	
	Weight	557 g	525 g	N/A	580 g	557 g	525 g	N/A	580 g
	Finish Hub Shell	Aluminum, silver or black anodized							

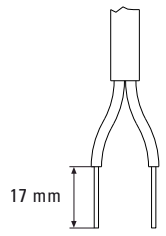
[1] Caution: Quick release braking load min. 10000 N (2250 lbs.)!

i-LIGHT™ – DYNAMO HUBS · D7-SERIES / D3-SERIES
TECHNICAL DATA / ASSEMBLY REQUIREMENTS

	Model	D324-N		D330-N		D324-N-74		D330-N-74	
	Version	Standard		←		Standard		←	
	Output	2.4 Watt		3.0 Watt		2.4 Watt		3.0 Watt	
	Voltage	6 V		←		6 V		←	
	Wheel ø	400 – 720 mm / 16" – 28"		←		300 – 720 mm / 12" – 28"		←	
	Over Locknut Dim., OLD	100 mm		←		74 mm		←	
D324	**Axle** **Length, L**	140 mm	108 mm	140 mm	108 mm	114 mm	82 mm	114 mm	82 mm
D324	**Axle** **Type**	Solid	Hollow[1]	Solid	Hollow[1]	Solid	Hollow[1]	Solid	Hollow[1]
D324	**Axle** **Material**	Steel		←		Steel		←	
D324	**Axle** **Ends Diameter**	M 9 x1	–	M 9 x1	–	M 9 x1	–	M 9 x1	–
D330	**Spoke** **Holes**	36		←		20		←	
D330	**Spoke** **Hole Diameter**	2.5 mm		←		2.5 mm		←	
D330	**Spoke** **Hole Reference ø**	71 mm		←		71 mm		←	
D330	**Spoke** **Flange Width**	3.4 mm		←		3.4 mm		←	
D330	**Flange Distance, F_1/F_2**	F_1 = 28 mm / F_2 = 28 mm		←		F_1 = 20.5 mm / F_2 = 20.5 mm			
D330	**Offset**	6.5 mm		←		0 mm		←	
	Bearing	Cartridge		←		Cartridge		←	
	Sealing	Double Sealed		←		Double Sealed		←	
	Homologation	KBA homologation for versions with 3.0 Watt (KBA = Kraftfahrtbundesamt Germany)							
	Efficiency	65% at 15 km/h		←		65% at 15 km/h		←	
	Weight	556 g	519 g	607 g	575 g	500 g	N/A	N/A	N/A
	Finish Hub Shell	Alum., silver or black painted				Aluminum, silver painted			

[1] Caution: Quick release braking load min. 10000 N (2250 lbs.)!

1



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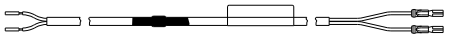


CABLE REQUIREMENTS

Recommended wire specifications:
Inner wire size AWG 22 / Diameter approx. 0.8 mm.
Wire insulation: 1.8 – 2 mm.
Remove insulation by 17 mm ***(Fig. 1).***

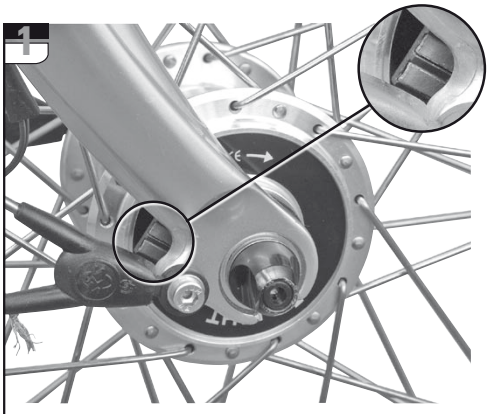
Advice:
Cables with a minimum cross-section of 0.4 mm² and a cable resistance of ≤ 0.045 Ω/m shall be used for the electrical connection of lighting equipment and for electrical supply systems.

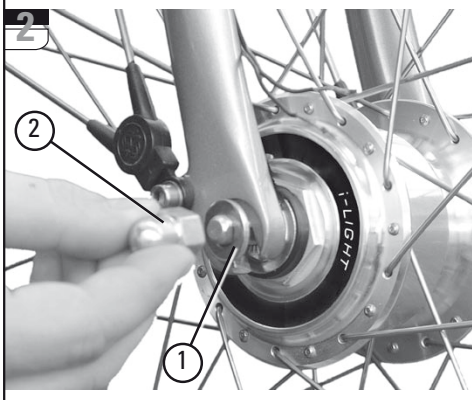
OVERVOLTAGE PROTECTION

Caution:
To protect the bulbs against overvoltage, e.g. if one lamp breaks down, the lighting system must be designed so that at a load of 60 Ω are not exceeded.

If your system doesn't have an overvoltage protection we recommend the SRAM overvoltage protection cable (Part # 92.2015.003.000) ***(Fig. 2).***

i-LIGHT™ – DYNAMO HUBS · D7-SERIES / D3-SERIES ASSEMBLY





ASSEMBLING THE HUB

Caution:
The dropouts of the fork must be parallel.

- Lacing the hub as normal.
- Hub version for Disc Brake:

Advice:
Read and observe the corresponding technical documentation for assembling the disc of the disc brake.

Caution:
Plane faces and threaded holes of the hub must be clean and free from oily and greasy substances.

- Place the front wheel into the front fork.

Advice:
The connection terminal of the dynamo hub (1) should be on the right side viewed from behind the rear of the bicycle. The connection terminal should tend upwards or backwards.

Fastening wheel / solid axle:

2 Place one retaining washer (1) on each axle end.

2 Fit the axle nuts (2).

– Tighten the axle nuts while alternating between sides, to course that the dynamo hub connection terminal do not turn away from the correct orientation.
– The recommended axle nut tightening torque is 20 Nm (177 in.lbs.).

Caution:
If the axle 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 axle nuts looser or too tight, this could permanently damage the dynamo hub.

Fastening wheel / quick release:

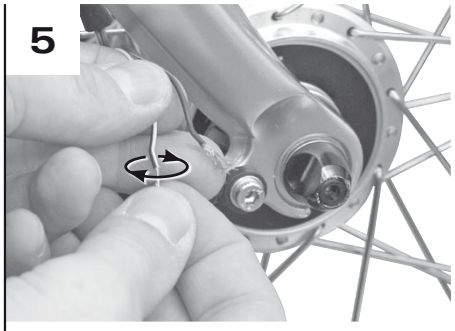
- Only use quick release devices with the correct length.
- Position quick release opposite to the brake (Disc Brake version).
- Turn release lever outwards until it is at least at a right angle to the bike (position "OPEN").
- Tighten adjusting nut on the end of the skewer as much as possible by hand.

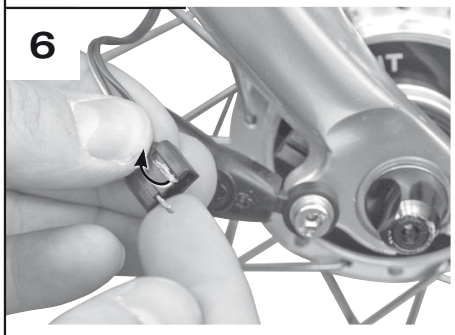
3 Turn release lever to the "closed" position (the word "CLOSE" is visible from the outside).

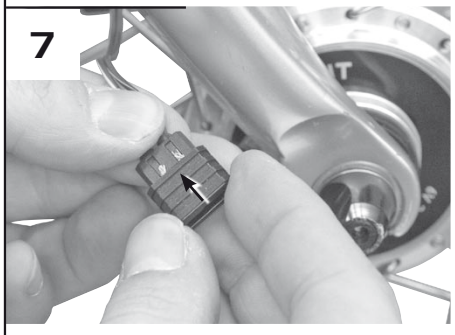
- After closure, the release lever should be parallel to the fork. If the release lever can be closed relatively easily, the tension force is inadequate.
  In this case, open release lever again, tighten adjusting nut slightly and close release lever again.
- If considerable force is required to close the lever, open the lever again, undo the adjusting nut slightly and close lever again.

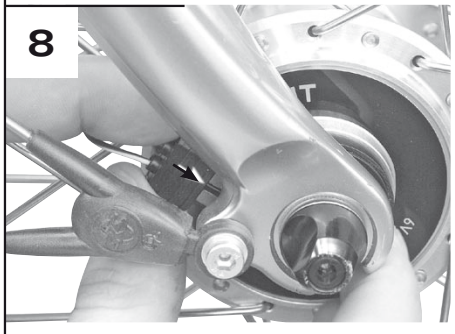
Caution:
4 Do not tighten the wheel by turning the release lever clockwise.

- 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.









CONNECTING THE CABLES

- Strip the insulation off of the wire aproximately 17 mm.

5 Twist the cable wires before connecting.

6 Stick the cables through the two holes of the inner connecting piece. Bend the cable wires and run them along the grooves.

7 Push the inner piece with cable wires into the outer piece.

Advice:
When doing this, ensure that the flattened corner of the inner peace matches the corresponding shape in the outer piece.

8 Connect the cable with the dynamo hub. Push the connecting piece onto the connection terminal of the dynamo hub.

Caution:
Make sure, that it is securely connected before using the dynamo hub.

Check:
Rotate the front wheel and check the lamp illumination.

Caution:
The dynamo hub generates an extremely high voltage. Never touch the conntection terminal of the dynamo hub while riding or while the wheel is spinning. This may cause an electric shock.

Caution:
Before setting out on any ride, always check the correct and trouble-free operation of the dynamo hub.

POWER CHAIN™
TECHNICAL DATA / ASSEMBLY REQUIREMENTS

POWER CHAIN

		PC 1 Saltshaker	PC 1 Ni	PC 1		
Application		Gear Hubs	Gear Hubs	Gear Hubs		
Max. No. of sprockets		1	1	1		
Compatibility Front		Single	Single	Single		
Compatibility Rear		Single	Single	Single		
Dimension		1/2" x 1/8"	1/2" x 1/8"	1/2" x 1/8"		
Pin	Length	7.8 mm	7.8 mm	8,98 mm		
	Riveting	Step	Step	V shape		
	Chrome Hardened	No	No	No		
	Push Power	800 N	800 N	800 N		
Min. Tensile Strength		8000 N	8000 N	8000 N		
Weight (114 links)		330 g	330 g	356 g		
Design	External Pin Plate	Light Grey	Silver / Nickel Plated	Brown		
	Internal Pin Plate	Light Grey	Silver / Nickel Plated	Brown		
Connecting Method		Snap Lock or Pin	Snap Lock, 3pcs Connection Link or Pin			

POWER CHAIN

		PC 10 Saltshaker	PC 10			
Application		Gear Hubs / MTB	Gear Hubs / MTB			
Max. No. of sprockets		max. 7	max. 7			
Compatibility Front		Single / HG®	Single / HG®			
Compatibility Rear		Single / HG®	Single / HG®			
Dimension		1/2" x 3/32"	1/2" x 3/32"			
Pin	Length	6.97 mm	6.97 mm			
	Riveting	Step	Step			
	Chrome Hardened	No	No			
	Push Power	1000 N	1000 N			
Min. Tensile Strength		9000 N	9000 N			
Weight (114 links)		300 g	300 g			
Design	External Pin Plate	Light Grey	Brown			
	Internal Pin Plate	Light Grey	Brown			
Connecting Method		Power Link SS1 or Pin	Power Link 7SPD or Pin			

POWER CHAIN™
TECHNICAL DATA / ASSEMBLY REQUIREMENTS

POWER CHAIN

		PC 991	PC 991 Hollow Pin	PC 991 Cross Step	PC 971	PC 951
Application		MTB / Road	MTB / Road	MTB / Road	MTB / Road	MTB / Road
Max. No. of sprockets		9 only	9 only	9 only	9 only	9 only
Compatibility Front		Truvativ® / HG® / EXA-Drive®	Truvativ® / HG® / EXA-Drive®	Truvativ® / HG® / EXA-Drive®	Truvativ® / HG® / EXA-Drive®	Truvativ® / HG® / EXA-Drive®
Compatibility Rear		HG® / PG / EXA-Drive®	HG® / PG / EXA-Drive®	HG® / PG / EXA-Drive®	HG® / PG / EXA-Drive®	HG® / PG / EXA-Drive®
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**	6.65 mm	6.35 mm	6.65 mm	6.65 mm	6.65 mm
	Riveting	Step	Cylindrical	Cross Step	Step	Step
	Chrome Hardened	Yes	Yes	Yes	Yes	Yes
	Push Power	2000 N	2000 N	2500 N	2000 N	2000 N
Min. Tensile Strength		9000 N	9000 N	9000 N	9000 N	9000 N
Weight (114 links)		297 g	276 g	297 g	297 g	297 g
Design	**External Pin Plate**	Silver / Nickel Plated	Silver / Nickel Plated	Silver / Nickel Plated	Silver / Nickel Plated	Grey / Polished
	Internal Pin Plate	Silver / Nickel Plated	Silver / Nickel Plated	Silver / Nickel Plated	Grey / Polished	Grey / Polished
	Connecting Method [1]	Power Link 9spd or Pin	Power Link 9spd only	Power Link 9spd only	Power Link 9spd or Pin	Power Link 9spd or Pin

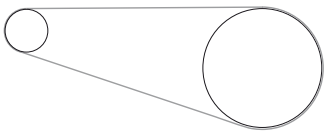
[1] ***Caution:*** Hollow Pin and Cross Step chains connecting method: with Power Link only (no pin)!

POWER CHAIN

		PC 890	PC 870	PC 850	PC 830 Saltshaker	PC 830
Application		MTB / Road	MTB / Road	MTB / Road	MTB / Road	MTB / Road
Max. No. of sprockets		max. 8	max. 8	max. 8	max. 8	max. 8
Compatibility Front		HG® / IG® / PG / EXA-Drive®	HG® / IG® / PG / EXA-Drive®	HG® / IG® / PG / EXA-Drive®	HG® / IG® / PG / EXA-Drive®	HG® / IG® / PG / EXA-Drive®
Compatibility Rear		HG® / IG® / PGII / EXA-Drive®	HG® / IG® / PGII / EXA-Drive®	HG® / IG® / PGII / EXA-Drive®	HG® / IG® / PGII / EXA-Drive®	HG® / IG® / PGII / EXA-Drive®
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**	6,92 mm	6,92 mm	6,92 mm	6,92 mm	6,92 mm
	Riveting	Step	Step	Step	Step	Step
	Chrome Hardened	Yes	Yes	Yes	No	No
	Push Power	2000 N	2000 N	2000 N	1300 N	1500 N
Min. Tensile Strength		9000 N	9000 N	9000 N	9000 N	9000 N
Weight (114 links)		313 g	313 g	313 g	313 g	313 g
Design	**External Pin Plate**	Silver / Nickel Plated	Silver / Nickel Plated	Grey / Polished	Light Grey	Grey / Polished
	Internal Pin Plate	Silver / Nickel Plated	Grey / Polished	Grey / Polished	Light Grey	Grey / Polished
	Connecting Method	Power Link 8SPD only	Power Link 8SPD or Pin	Power Link 8SPD or Pin	Power Link SS2 or Pin	Power Link 8SPD or Pin

POWER CHAIN™ ASSEMBLY

1



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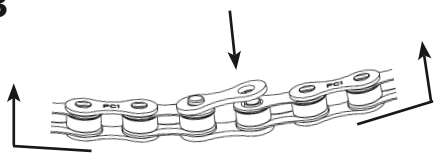

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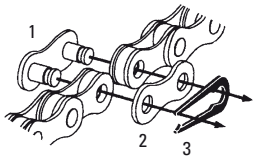

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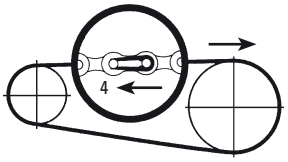

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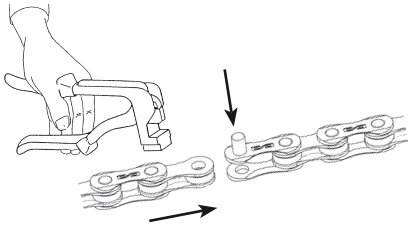


P C 1
(1/2" X 1/8")

Chain length:
(A chain tool will be required to shorten the chain.)

- Replacing a worn chain:
  Measure the worn chain and shorten the new to the same length.
- Initial assembly:
  Shorten the chain to the length specified by the drivetrain manufacturer.
  SRAM components:
  Place the chain over front chainwheel and rear sprocket ***(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. 2)***.
- Gently flex the chain until the outside connector plate snaps into position over the second pin ***(Fig. 3)***.

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.***
- ***Snap Lock is for one-time use only!***
- ***Always use a new Snap Lock when fitting a new chain.***
- ***Use Snap Lock only with SRAM chains!***
- ***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.***
- ***Worn sprockets should also be replaced when a new chain is fitted.***

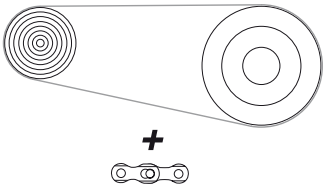
Closing chain with 3pcs Connection Link:

- 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. 4)***, 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. 4)***.
- Slide retaining spring in the direction of arrow (4, ***Fig. 5)*** to engage it in the grooves in the pins.

Closing standard version with clamping pin:
Fit chain, bring the two ends together and press pin ***(Fig. 6)*** 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 CHAIN™ ASSEMBLY

7



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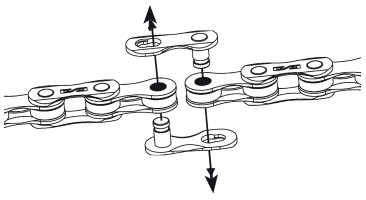

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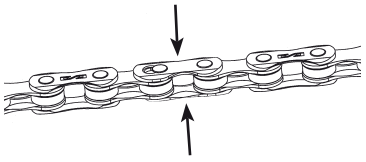

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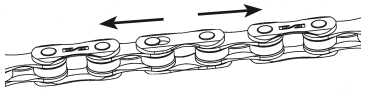

PC 991 / PC 971 / PC 951 / PC 890 / PC 870 / PC 850 / PC 830 / PC 10 (1/2" X 3/32" AND 1/2" X 11/128")

Chain length:
(A chain tool will be required to shorten the chain.)

- Replacing a worn chain:
  Measure the worn chain and shorten the new to the same length.
- Initial assembly:
  Shorten the chain to the length specified by the derailleur manufacturer.
  SRAM derailleurs:
  - Place the chain over largest front chainwheel and largest rear sprocket ***(Fig. 7)***. For rear suspension frame, position the rear suspension for the greatest chain length required.
  - Add 2 links or 1 link + Power Link ***(Fig. 7)***.
  - DualDrive II hub equipped bicycles: Add 4 links or 3 links + Power Link.

Closing chain with Power Link:
Caution:

- ***Use Power Link only with SRAM chains!***
- ***Use only Power Link to close Hollow Pin chains and Cross Step chains (no Pin)!***
- ***Use only as specified, to avoid material damage or the rider to fall off his bicycle resulting in injury:***

Power Link 9SPD (gold coloured):
for PC 991 Hollow Pin, PC 991 Cross Step, PC 991, PC 971, PC 951
Power Link 8SPD (silver coloured):
for PC 890, PC 870, PC 850, PC 830
Power Link SS2 (light grey coloured):
for PC 830 Saltshaker
Power Link SS1 (light grey coloured):
for PC 10 Saltshaker
Power Link 7SPD (grey coloured):
for PC 10

Closing:

- Fit chain, bring the ends together and insert both halves of the Power Link into the chain ends. ***(Fig. 8)***
- Press both halves of the Power Link together ***(Fig. 9)*** and lock in place by pulling the chain apart. ***(Fig. 10)***

Opening:
Press both plates of the Power Link together ***(Fig. 9)*** 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.***
- ***Worn sprockets should also be replaced when a new chain is fitted.***

Closing standard version with clamping pin:
Fit chain, bring the two ends together and press pin through with assembly tool ***(Fig. 6)***. **The pin must extend by the same amount at both outer plates. It must be possible to move the connecting link slightly.**

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