# DEALER TECHNICAL MANUAL 1999

derailleurs system components

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WHO WE ARE & WHAT WE MAKE

SRAM?

SRAM is the second largest bicycle component supplier in the world. Founded in 1988, SRAM’s World Headquarters is located in Chicago, Illinois USA. Currently, SRAM has manufacturing facilities in Ireland, Mexico, Taiwan, and with the purchase of Sachs Bicycle Component, also now has manufacturing in Germany, France, and Portugal.

Twist shifters, designed to operate ESP and traditional actuation ratio derailleurs.

Rear derailleurs designed only to operate with ESP compatible GRIP SHIFT shifters.

Cassettes and cranksets for a majority of applications.

Front and rear derailleurs designed to operate with Grip Shift twist shifters and other traditional actuation ratio shifters.

Internal gear hub systems and leisure biking systems.

Chains for all applications.

Hubs for a majority of applications.

Brakes & levers for a majority of applications.
NEW IN 1999 / NAMING MATRIX

WHAT’S NEW FOR 1999?

• 9-speed shifters/rear derailleurs: 9.0SL, 9.0, 7.0 Plasma, Quarz, Neos
• 9-speed chains: PC59 and PC89R
• DI.R.T. Quarz/Neos front derailleur
• DI.R.T. Quarz/Neos rear derailleur
• MRX shifters: completely redesigned
• MRX IBS integrated brake shifter
• SRAM 9.0, 7.0 & 5.0 linear pull brakes
• Spectro internal hub systems

WHAT’S IMPROVED FOR 1999?

• New grip cover on the Grip Shift ESP 7.0 & 5.0 shifters and Grip Shift Centera shifter
• New gear indication on the Grip Shift ESP 5.0 shifter and Grip Shift Centera shifter
• New features for the SRAM 9.0 brake lever
  – Shorter reach
  – Smoother blade
  – Satin anodized hardware
• New features for the SRAM 7.0 brake lever
  – 2 position leverage adjust
  – Shorter reach
  – Smoother blade
  – Grey/black finish

EVOLUTION OF SRAM GRIP SHIFT SHIFTERS

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<td>600 (7 &amp; 8 speed)</td>
<td>600 (7 &amp; 8 speed)</td>
<td>Quarz (1998 SACHS Extreme Shifter)</td>
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<td>400 (7 &amp; 8 speed)</td>
<td>400 (7 &amp; 8 speed)</td>
<td>Neos (1998 SACHS Wavey Shifter)</td>
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<td>MRX 170</td>
<td>MRX 170</td>
<td>Centera (7 &amp; 8 speed)</td>
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<td>MRX 170</td>
<td>MRX 170</td>
<td>MRX (New shifter design)</td>
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WHAT IS ESP?

ESP is SRAM’s mountain specific rear derailleur technology.

• **1:1 ACTUATION RATIO**

Other derailleurs have 1:2 actuation ratio – one inch of cable pull at the shifter, two inches of movement at the derailleur. This multiplies any problems or poor adjustments at the shifter or with the cable system into twice the problem at the derailleur.

A 1:2 system also requires higher cable tension. With an ESP rear derailleur, when your shifter pulls an inch of cable, the rear derailleur only moves an inch. This is achieved by a ‘fin’ on the derailleur outer link, which efficiently spools cable as you shift gears. With our 1:1 actuation ratio, you effectively have twice as long a lever arm as a 1:2 system giving you half the cable tension with spring. This means less cable friction between the shifter and the derailleur which translates to lower shifting effort and faster shifts.

• **CONSTANT CHAIN GAP**

Other rear derailleurs utilize a road bike design with an added longer cage. This design utilizes a b-spring where the derailleur mounts to the bike. The force in this b-spring must be balanced against the force in the idler cage spring along with the offset jockey wheel to achieve constant chain gap. It is impossible to increase the stiffness of the idler cage spring without affecting chain gap because this overpowers the b-spring. Because the ESP Rear Derailleur is mountain bike specific, we got rid of the b-spring and fixed the angle of the slant parallelogram to mirror the profile of an MTB cassette. With this constant chain gap feature and no b-spring bounce in rough terrain, the ESP derailleur remains perfectly located for fast and precise shifts with less effort. It also makes possible the use of a much stronger idler cage spring for better control of chain slap and chain suck.

• **NO FLOATING GUIDE PULLEY**

The combined effects of constant chain gap and a 1:1 actuation ratio give the ESP rear derailleurs an inherent precision. This makes it unnecessary for the derailleur to have a floating guide pulley – once again resulting in faster and more positive shifts.

• **POWER SPRING**

There are two kinds of parallelogram actuating springs commonly found in rear derailleurs: extension springs and torsion springs. Both have advantages and disadvantages. The power spring concept combines the best characteristics of both while eliminating the disadvantages. The result is nearly equal effective spring tension across the entire operating range of the rear derailleur. (Only ESP has it.)

WHAT IS GRIP SHIFT?

Grip Shift is the original twist shifter. (It allows you to shift a full range of gears in a single twist). Nothing is faster or easier to use. Now that SRAM has bought Sachs, all twist shifters in SRAM’s arsenal are “Grip Shift”. Remember – only SRAM twisters are “Grip Shift”!
SRAM TECHNOLOGY

WHAT IS DI.R.T.?

DI.R.T. stands for Direct Response Technology. Its front cable pull routing provides lower shifting effort, more direct cable routing, and high performance. DI.R.T. derailleurs use a traditional actuation ratio and are compatible with Grip Shift & Shimano® shifters.

WHAT IS SACHS SPECTRO BY SRAM?

Spectro is the new name for Sachs famous internal geared hub products. The design focus for Spectro is maximum shifting comfort with minimum maintenance for recreational and city bikes. Spectro models includes:

- Spectro 3x7
- Spectro E12
- Spectro S7
- Spectro P5
- Spectro T3
- NEW! Spectro Combi
- NEW! Spectro Plus shifters
- NEW! Spectro Lux V6 Dynamo

WHAT IS SRAM COMPOSITE?

We’ve searched the globe and evaluated materials in order to find the right balance of strength, toughness, stiffness, and weight. Materials from companies like Dupont, the makers of super tough Zytel® and EMS of Switzerland, who produce specialty performance polymers like Grilon®. The result of our effort is the best possible materials for each application.

POWER LINK SECTION

Every chain is only as strong as its weakest link – traditionally this is the connecting link. In contrast, the Power Link connection is just as strong and durable as every other link in the chain. And it can be opened and closed as many times as you want without using tools.
SUPPORT
# WORLDWIDE DISTRIBUTORS

## UNITED STATES

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<thead>
<tr>
<th>Name</th>
<th>Address</th>
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<tbody>
<tr>
<td>Action Bicycle USA</td>
<td>217 Washington Avenue -A</td>
<td>Carlstadt, NJ, 07072</td>
<td>800.284.2453</td>
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</tr>
<tr>
<td>Brunswick Bicycles</td>
<td>2275 Half Day Road</td>
<td>Bannockburn, IL, 60015</td>
<td>847.940.8777</td>
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<tr>
<td>Bicycle Tech International</td>
<td>3201 B Richards Lane</td>
<td>Santa Fe, NM, 87505</td>
<td>800.558.8234</td>
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<tr>
<td>Diamondback</td>
<td>4030 Via Pescador</td>
<td>Camarillo, CA, 93012</td>
<td>800.776.7641</td>
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<tr>
<td>Downeast Bicycle Specialists</td>
<td>Porter Road, P.O. Box 226</td>
<td>Fryeburg, ME, 04037</td>
<td>800.242.1043</td>
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<tr>
<td>Euro-Asia Imports</td>
<td>3935 FootHill</td>
<td>La Crescenta, CA, 91214</td>
<td>818.248.1814</td>
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<tr>
<td>Giant Bicycle, Inc.</td>
<td>737 Artesia Boulevard</td>
<td>Rancho Dominguez, CA, 90220</td>
<td>800.874.4266</td>
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<tr>
<td>Great Northwest</td>
<td>2325 North West Xavier</td>
<td>Portland, OR, 97210</td>
<td>800.527.9242</td>
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<tr>
<td>Hans Joehnensen Company</td>
<td>8901 Chancellor Row</td>
<td>Dallas, TX, 75247</td>
<td>800.879.1515</td>
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<tr>
<td>The Hawley Company</td>
<td>One Hawley Drive</td>
<td>Lexington, SC, 29073</td>
<td>800.822.1985</td>
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<tr>
<td>Island Cycle Supply</td>
<td>425 Washington Avenue North</td>
<td>Minneapolis, MN, 55401</td>
<td>800.627.2453</td>
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<tr>
<td>J&amp;B Importers, Inc.</td>
<td>P.O. Box 168156</td>
<td>Miami, FL, 33118</td>
<td>800.866.5000</td>
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<tr>
<td>J&amp;B Importers West, Inc.</td>
<td>P.O. Box 1246</td>
<td>Englewood, CO, 80150</td>
<td>800.999.9228</td>
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<tr>
<td>J&amp;B Importers Pacific, Inc.</td>
<td>P.O. Box 88808</td>
<td>Seattle, WA, 98138</td>
<td>800.827.2453</td>
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<tr>
<td>KHS Inc., Distributor</td>
<td>1264 East Walnut Street</td>
<td>Carson, CA, 90746</td>
<td>800.347.7854</td>
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<tr>
<td>The Merry Sales Company</td>
<td>1415 San Mateo Avenue</td>
<td>San Francisco, CA, 94080</td>
<td>800.245.9593</td>
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<tr>
<td>Performance Cycle Products</td>
<td>22 South 6th Avenue</td>
<td>Mount Vernon, NY, 10550</td>
<td>888.285.1876</td>
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<tr>
<td>Olympic Cycle Supply</td>
<td>5711 West Douglass Avenue</td>
<td>Milwaukee, WI, 53218</td>
<td>800.236.8380</td>
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<tr>
<td>Quality Bicycle Products</td>
<td>6400 West 105th Street</td>
<td>Bloomington, MN, 55438</td>
<td>800.346.0004</td>
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<tr>
<td>Quantum Bicycle &amp; Fitness</td>
<td>400 Venture Court, Suite 101</td>
<td>Verona, WI, 53503</td>
<td>800.545.1229</td>
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<tr>
<td>Quentin Distributors</td>
<td>845 Carol Court</td>
<td>Carol Stream, IL, 60188</td>
<td>800.323.1741</td>
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<tr>
<td>Raleigh Bicycle Co., USA</td>
<td>22710 72nd Avenue South</td>
<td>Kent, WA, 90302</td>
<td>800.222.5527</td>
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<tr>
<td>Riteway Products</td>
<td>2001 East Dyer</td>
<td>Santa Ana, CA, 92705</td>
<td>800.880.9886</td>
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<tr>
<td>Schwinn Cycling and Fitness</td>
<td>1890 38th Street</td>
<td>Boulder, CO, 80301</td>
<td>800.245.1849</td>
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<tr>
<td>Seattle Bike Supply</td>
<td>7820 South 192nd</td>
<td>Kent, WA, 98032</td>
<td>800.282.2455</td>
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<tr>
<td>Security Bicycle</td>
<td>32 Intersection Street</td>
<td>Hamptonstead, NY, 11551</td>
<td>800.645.2090</td>
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<tr>
<td>Sinclair Imports</td>
<td>2705 Highway 40</td>
<td>Verdi, NV, 89439</td>
<td>800.654.8052</td>
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<tr>
<td>Trek Bicycle Corporation</td>
<td>801 West Madison</td>
<td>Waterloo, WI, 53594</td>
<td>800.879.8735</td>
<td></td>
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<tr>
<td>United Bicycle Parts</td>
<td>691 Washington Street</td>
<td>Ashland, OR, 97520</td>
<td>800.482.1984</td>
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<tr>
<td>Wilson Bicycle Sales</td>
<td>31157 Wiegmans Road</td>
<td>Hayward, CA, 94544</td>
<td>800.877.0077</td>
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<tr>
<td>World Wide Cycle Supply</td>
<td>100 D Executive Drive</td>
<td>Edgewood, NY, 11717</td>
<td>800.330.2550</td>
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## EUROPE

### AUSTRIA

- **KTM Fahrrad GmbH**
  - Harlochnerstrasse 13
  - 5230 Mattighofen
  - Phone: +43 7742 409 132
  - Fax: +43 7742 409 126

### BELGIUM

- **Transmission S.A.**
  - Boulevard du Centenaire 4
  - 1325 Dion-Valmont
  - Phone: +32 10 24 47 14
  - Fax: +32 10 24 47 77

### CZECH REPUBLIC

- **vokolek import rezlerova 308**
  - 10900 praha-petrovice
  - Phone: +420 2692 3399
  - Fax: +420 2692 3399

### DENMARK

- **Dan Agentur**
  - Stationsvej 77
  - 5792 Arslev
  - Phone: +45 65 99 24 11
  - Fax: +45 65 88 24 18

### FINLAND

- **J. Syväranta Oy**
  - Nervanderinkatu 5E 47 / PL 64
  - F-00101 Helsinki
  - Phone: +358 9 490 137
  - Fax: +358 9 493 890

### FRANCE

- **SRAM France**
  - Rue de la Bruquierie
  - 80210 Chepy
  - Phone: +33 3 22 26 01 00
  - Fax: +33 3 22 26 01 03

- **M.I.C.M.O. Eurostar**
  - 16, Rue de Marcel Brunliere
  - 44270 Machecoul
  - Phone: +33 2 40 78 24 00
  - Fax: +33 2 40 02 33 86

### GERMANY

- **Hartje**
  - Deichstr. 120-122
  - 27318 Hoyerswerda
  - Phone: +49 4251 8110
  - Fax: +49 4251 811249

- **Epple**
  - Mittereschweg 1
  - 87700 Memmingen
  - Phone: +49 8331 7510
  - Fax: +49 8331 75197

- **Bico**
  - E. Wiener Bike parts
  - GZB
  - Rabeneick/Schloste
  - Trisport
  - Veloring
  - ZE6
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### EUROPE (CONTINUED)

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<td>GREECE</td>
<td>Gatsoulis Imports&lt;br&gt;8, Thesalonikis Street&lt;br&gt;14342 New Filadelfia-athens&lt;br&gt;Ph: +30 1 25 12 779&lt;br&gt;Fx: +30 1 25 33 960</td>
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<tr>
<td>HUNGARY</td>
<td>Biker Kft.&lt;br&gt;Gyepos u. 1&lt;br&gt;1211 Budapest&lt;br&gt;Ph: +38 1278 1021&lt;br&gt;Fx: +38 1278 1023</td>
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<td>ICELAND</td>
<td>Dermam Hjol Ltd., P.O. Box 9036, Skeifan 11&lt;br&gt;Reykjavik&lt;br&gt;Ph: +354 1 88 98 92&lt;br&gt;Fx: +354 5 88 98 96</td>
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<td>ITALY</td>
<td>A.M.G. S.r.l.&lt;br&gt;Via Pieve 10&lt;br&gt;23871 Lonamagna (LC)&lt;br&gt;Ph: +39 039 5 30 11 67&lt;br&gt;Fx: +39 039 9 22 02 70</td>
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<td>NETHERLANDS</td>
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<td>NETHERLANDS</td>
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<td>NORWAY</td>
<td>Stians Sport A.S.&lt;br&gt;Vollveien 13, Bygg D, P.O. Box 107&lt;br&gt;1324 Lysaker&lt;br&gt;Ph: +47 67 11 00 20&lt;br&gt;Fx: +47 67 11 00 42</td>
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<td>POLAND</td>
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<td>SWEDEN</td>
<td>Vartex&lt;br&gt;Batterivägen 14&lt;br&gt;43232 Varberg&lt;br&gt;Ph: +46 340 850 80&lt;br&gt;Fx: +46 340 61 11 90</td>
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<td>SWITZERLAND</td>
<td>Intercycle&lt;br&gt;Industriegebiet, Haldemattstr. 3&lt;br&gt;6210 Sursee&lt;br&gt;Ph: +41 41 92 66 55 11&lt;br&gt;Fx: +41 41 92 66 352</td>
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<td>U.K.</td>
<td>Raleigh P&amp;A&lt;br&gt;Triumph Road&lt;br&gt;NQ 72 DD Nottingham&lt;br&gt;Ph: +44 115 9420202&lt;br&gt;Fx: +44 115 9282044</td>
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<td>Fishers&lt;br&gt;Unit 2, Haslemore Business Centre&lt;br&gt;Lincoln Way off&lt;br&gt;Lincoln Road&lt;br&gt;EN 1 1TE Enfield, Middx&lt;br&gt;Ph: +44 181 8053088&lt;br&gt;Fx: +44 181 8058821</td>
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<td>Chickens &amp; Sons&lt;br&gt;Bisley Works/Landpark Lane&lt;br&gt;LUG 2PP Kewstowe, Beds&lt;br&gt;Ph: +44 1582 873583&lt;br&gt;Fx: +44 1582 873583</td>
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<td>PORTUGAL</td>
<td>Ciclo coimbroes&lt;br&gt;paiica manuel da silva reis 122&lt;br&gt;4400 vila nova de gaia&lt;br&gt;Ph: +351 23 79 4461&lt;br&gt;Fx: +351 23 06 163</td>
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<td>REP. OF IRELAND</td>
<td>Raleigh Ireland Limited&lt;br&gt;Raleigh House,&lt;br&gt;Kylemore Road&lt;br&gt;Dublin 10&lt;br&gt;Ph: +353 1 626 1333&lt;br&gt;Fx: +353 1 626 1770</td>
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<td></td>
<td>Groupe Sportif Pty. Ltd.&lt;br&gt;20 Harker Street&lt;br&gt;Burwood, Victoria 3125&lt;br&gt;Ph: +613.9888.9882</td>
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<td></td>
<td>Velo-Vita Pty. Ltd.&lt;br&gt;Unit A, 602-612 Botany Road&lt;br:NSW 2015 Alexandria&lt;br&gt;Ph: +61.2.9700.8177</td>
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<td></td>
<td>Bell Sports Canada&lt;br&gt;700 Chemin Bernard&lt;br&gt;Granby, PQ, J2G 9G7&lt;br&gt;Ph: 800.861.1662</td>
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<td>Kempter Marketing&lt;br&gt;1271 St Louis&lt;br&gt;St Lazare, PQ, J7T 1Z9&lt;br&gt;Ph: 514.424.4000</td>
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<td>Norco Products Limited&lt;br&gt;1465 Kebed Way&lt;br&gt;Port Coquitlam, BC, V3C 6L3&lt;br&gt;Ph: 800.863.8916</td>
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<td>Hobbys ltd.&lt;br&gt;3 dsv. fridman street&lt;br&gt;52504 ramat gan&lt;br&gt;Ph: +972 5 2429 905&lt;br&gt;Fx: +972 3 7223 543</td>
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### JAPAN

<table>
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<tr>
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<th>Phone</th>
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</thead>
<tbody>
<tr>
<td></td>
<td>Kawashima Cycle Supply&lt;br&gt;No. 2-4-2 Kushiva-Chi Igishiba&lt;br&gt;Osaka 590&lt;br&gt;Ph: 0722.36.1057</td>
<td></td>
<td></td>
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<tr>
<td></td>
<td>Nichinao Shokai&lt;br&gt;6-16-8 Sotokanda Chiyodako&lt;br&gt;Tokyo 101&lt;br&gt;Ph: 0338.32.6251</td>
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### NEW ZEALAND

<table>
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<tbody>
<tr>
<td></td>
<td>Cycle Supplies&lt;br&gt;P.O Box 3051&lt;br&gt;Christchurch&lt;br&gt;Ph: +64.3.338.6803</td>
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<td>H.S. White &amp; Sons&lt;br&gt;7C Anwen Place, East Tamacki&lt;br&gt;P.O Box 59331 Greenvouni&lt;br&gt;Auckland&lt;br&gt;Ph: +64.9273.7690</td>
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### SOUTH AFRICA

<table>
<thead>
<tr>
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</thead>
<tbody>
<tr>
<td></td>
<td>Adventure Sports Trading&lt;br&gt;27 Elizabeth Lane, North End&lt;br&gt;6001 Port Elizabeth&lt;br&gt;Ph: +27.41.547101</td>
<td></td>
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</tbody>
</table>

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Technical information may be enhanced without prior notice. Released 08/98.
**SRAM 2 YEAR WARRANTY**

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

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

**WHO TO CALL**

For fast SRAM dealer warranty and technical support help, please contact us at the appropriate locations listed hereafter. (Other Countries: please contact your local distributor.)

**EUROPE**

Dealer Helpdesk Number for the following countries:
- Austria
- Belgium
- Denmark
- France
- Germany
- Italy
- The Netherlands
- Norway
- Sweden
- Switzerland
- United Kingdom

**NORTH AMERICA**

Dealer Helpdesk Number:
(800)-346-2928

+ 800 / 77 26 43 57

SRAM HELP

Technical information may be enhanced without prior notice. Released 08/98.
TECHNICAL TIPS & GUIDELINES
INDEX SHIFTING OVERVIEW

AN EFFECTIVE SHIFTING SYSTEM

Index shifting has a single objective – one click of the shifter gets you one gear change. Accurate indexing depends on many things, but two are critical. One is the smooth interaction between the chain and cogset and the chain and chainrings. The other is getting the shifter ‘signal’ accurately to the derailleur. The signal tolerance is getting smaller as technologies advance (7 to 8 to 9 speeds) and styles change (various component manufacturers). Add to this the harsh effects of the riding environment – rain, mud, grit. An efficient shifting system achieves consistent, smooth, accurate shifts with minimal effort.

Component compatibility, proper setup and system cleanliness are essential to achieve a precision indexing system.

LINKAGE

CABLE & CABLE HOUSING

Getting a good signal from the shifter to the derailleur is enhanced by a precise cable connection between the two. The signal quality degrades with use and abuse. When shifting, pulling cable stretches the cable and compresses the cable housing; releasing cable decompresses the cable housing. This small change in the cable system can scramble the message from the shifter to the derailleur.

• Use only index compatible cable – flexible, smooth surface and corrosion resistant.

• Use 4.0 mm or 5.0 mm lined and capped compressionless cable housing – stiff, yet bends uniformly.

• Always route cables and cable housing as smoothly as possible.

• Use compressionless cable housing ferrules.

When riding in mountain biking conditions, water, mud and grit contaminate the cable housing sections. The most vulnerable section is the housing at the rear derailleur.

• Replace cable housing and clean or replace cable when dirty or when shifting effort becomes high.

• Use a frictionless seal.

SEALS

To help minimize and slow down the contamination it is advantageous to seal the rear derailleur cable housing section. Sealed ferrules are, unfortunately, points of resistance. A frictionless seal is optimal.
INDEX SHIFTING OVERVIEW

FRONT SHIFTING

Keys to accurate front shifting:

• clean, low friction index compatible cables and cable housing
• chain line between 47.5 and 50 mm
• matching front derailleur cage to chainwheel – compact with compact; full size with full size
• front derailleur gear teeth capacity (See Front Derailleur Installation section.)
• compatible chain for chainrings
• cable tension
• limit screw settings
• accurate front derailleur cage positioning and angle

REAR SHIFTING

Keys to accurate rear shifting:

• clean, low friction index compatible cables and cable housing
• rear derailleur hanger alignment and geometry
• rear derailleur total capacity (See Rear Derailleur Installation section.)
• compatible chain for cogset
• correct chain gap (See Rear Derailleur Installation section.)
• cable tension
• limit screw settings
• freely moving rear derailleur pivots and strong springs

CHAIN LINE

47.5 – 50.0 mm

CHAIN LENGTH

Chain length will also affect indexing quality and shifting effort. See the Rear or Front Derailleur Installation section for proper chain length sizing.
TROUBLESHOOTING TIPS

A WORD ABOUT CONTAMINATION...
Contamination of shifter cable housing from water, mud and grit is by far your worst enemy.

- replace cable housing when dirty – do not try to clean it –
- clean and save (if possible) the cable when dirty; otherwise replace it
- never put a fresh cable into used cable housing

I CAN’T SHIFT TO SMALLEST COG...

- cable housing is contaminated; replace cable housing and clean or replace cable
- rear derailleur hanger misaligned; check with a derailleur hanger gauge.
- worn or contaminated rear derailleur pivots or spring
- incorrect limit screw adjustment (See derailleur instructions.)
- incorrect cable tension (See derailleur instructions.)
- incorrect chain gap (See derailleur instructions.)
- chain is incompatible with cogs
- worn chain, cogs, or pulleys
- D dimension is off

MY FRONT SHIFTING IS OFF...

- cable housing is contaminated; replace cable housing and clean or replace cable
- chain line is off check that crank bolts are tight
- incorrect limit screw adjustment (See derailleur instructions.)
- incorrect cable tension (See derailleur instructions.)
- front derailleur position and/or angle are off (See derailleur instructions.)
- chain incompatible with chainrings
- front derailleur cage and chainrings do not match; compact with compact, full size with full size

IT IS HARD TO TWIST SHIFTER...

- cable housing is contaminated; replace cable housing and clean or replace cable
- cable housing ferrules improperly seated or missing
- inner wire rubs against cable housing stop; try alternate routing
- cable housing not compressionless type
- cable routing has small, drastic bends or kinks – particularly the rear derailleur section try alternate routing or use zip ties to realign cable housing
- shifter cable clamped to wrong side of the derailleur cable anchor bolt (See derailleur instructions.)
- wrong grease/lubricant or cleaner used in shifter; use only SRAM factory approved Jonnisnot grease
- shifter spring installed in the wrong direction (See shifter installation section.)
- no washer(s) between the shifter and the stationary grip
- shifter contaminated; properly clean and lube
LUBRICATION GUIDELINES

After proper cleaning of a component, relubricate the following key areas with Jonnisnot lube:

**SHIFTER**

- Grip Shift® Jonnisnot Grease – very little
- Grip Shift® Jonnisnot Grease – very little
- Grip Shift® Jonnisnot Grease – very little
- Grip Shift® Jonnisnot Grease – very little
- Grip Shift® Jonnisnot Grease – MED. AMOUNT

**REAR DERAILLEUR**

- a spray lube with Teflon®
- a spray lube with Teflon®
- Grip Shift® Jonnisnot Grease – very little
- when disassembled – use a waterproof grease

**FRONT DERAILLEUR**

- a spray lube with Teflon® – pivots only
- (use Finish Line® Professional Grease)
MAKE IT SHINE!

KEEPING YOUR BIKE CLEAN

Keeping your bike and components clean and correctly lubricated will keep performance high and usually slow down the wear and tear on parts.

HOW THE PROS DO IT

Wanna know how the pros do it? Use mild soap and water and a large sponge or soft brush to gently work off the mud and crud. Then rinse with a clean water sponge bath.

CLEANING OF ESP AND GRIP SHIFT

We recommend that the internal cleaning and lubrication of Grip Shift shifters should only be done when shifting performance has deteriorated due to excessive contamination. We have found that, generally, the deterioration of shifting efficiency starts with the contamination of the cable and housing system. This causes high friction buildup in a shifting system and should be examined first.

THINK OF RE-LUBRICATING

After the cleaning of any component, always properly re-lubricate if required.

Caution:
Be careful how you use degreasers, citrus or otherwise, on your bike components. Degreasers can bloat, soften, or otherwise damage parts.

KEEP THE BIKE ON BOTH WHEELS

Always keep the bike on both wheels when cleaning with water. Hanging the bike vertically or upside down to hose it clean can lead to water drainage into now vulnerable components. Pay and spray? Avoid it.

Quick rinses at the car wash or even spraying with a garden hose can drive contaminants past the sealed mechanisms of your components. This could compromise their performance and shorten their lifespan.
INSTRUCTIONS
ESP REAR DERAILLEUR INSTALLATION

REAR DERAILLEUR ANATOMY

COMPATIBILITY

<table>
<thead>
<tr>
<th>Component</th>
<th>Compatibility</th>
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<tr>
<td>Shifters</td>
<td>SRAM® 5.0, 7.0, 9.0, 9.0SL shifters ONLY</td>
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<tr>
<td>Cogsets</td>
<td>7.0, 9.0, 9.0SL use 11-28, 11-30, 12-28, 12-32, 11-32</td>
</tr>
<tr>
<td></td>
<td>5.0 use 11-28, 11-30, 14-28</td>
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<tr>
<td>Chains</td>
<td>SRAM Power Chain and Shimano® HG &amp; HG</td>
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<td>Chainrings</td>
<td>22-32-42-44, 24-34-46, 26-36-46/48</td>
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<tr>
<td>Cable</td>
<td>1.1 or 1.2 mm high quality cable</td>
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<tr>
<td>Housing</td>
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FRAME DIMENSIONS

DIMENSIONS (mm, except A)

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<tr>
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<td>8.5max</td>
<td>11.5–13.5</td>
<td>7–8</td>
</tr>
</tbody>
</table>

INSTALLATION

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

1. Attach the rear derailleur to the frame rear derailleur hanger. (Fig. 1)
2. Check that the b-adjust screw is clear of the rear derailleur dropout tab. (Fig. 2 or 3)
   • For 9.0, 9.0SL models, check that the b-adjust washer is properly oriented. The b-adjust washer allows for a more accurate chain gap adjustment. (Fig. 3)
3. Tighten the 5 mm hex hanger bolt to 70–85 in-lb. (7.9–9.6 Nm).
ESP REAR DERAILLEUR INSTALLATION

**CHAIN LENGTH**

When the chain is in the largest chainring/largest cog combination, a very tight chain or chain seizure can occur. Therefore, it is important to have a properly sized chain length.

1. Bypassing the rear derailleur, run the chain around the largest chainring/largest cog combination. (Fig. 4)
   - For a rear suspension frame, position the rear suspension for the greatest chain length required.
2. Add 2 LINKS of chain to this length for proper chain length.

**LIMIT SCREWS ADJUSTMENT**

1. View the rear derailleur and pulleys from behind the rear wheel.
2. Align the guide pulley center with the outboard edge of the smallest cog, using a small screwdriver to turn the 'H' (BOTTOM) limit screw. (Fig. 5)
3. While turning the crankset, push the rear derailleur inboard by hand.
4. Align the guide pulley with the largest cog, center to center, using a small screwdriver to turn the 'L' (TOP) limit screw. (Fig. 5)
   - For the 'H' limit screw – clockwise moves the guide pulley inboard.
   - For the 'L' limit screw – clockwise moves the guide pulley outboard.

**CHAIN GAP ADJUSTMENT**

Chain gap is the distance, along the chain, between the chain contact with a cog and the chain contact with the guide pulley. Optimal chain gap is small enough to allow quick, efficient shifts to and from any cog; large enough to allow smooth shifts to and from the largest cog.

1. While turning the crankset, push the rear derailleur inboard by hand to the largest cog.
2. Hold the rear derailleur in this position while making the following adjustment.
3. Use a 3 mm hex wrench to turn the b-adjust screw until the chain gap equals 1 1/2 LINKS. (Fig. 6)
   - Turn the b-adjust screw clockwise to increase chain gap.
   - Turn the b-adjust screw counterclockwise to decrease chain gap.

**INDEX SHIFTING ADJUSTMENT**

1. Check that the chain and the rear derailleur are in the smallest cog position.
2. Rotate the rear shifter so the highest gear indication mark lines up with the dash mark.
3. Turn the rear shifter barrel adjuster clockwise fully into the shifter, then back off one full turn.
4. Feed the rear shifter cable through the rear derailleur cable housing, stops, and rear derailleur cable guides.
5. Pull the cable taut around the curved cable guide and position it under the cable anchor washer. (Fig. 7)
6. Tighten the 5 mm hex cable anchor bolt to 35–45 in-lb. (3.9–5.0 N-m).
   - Be careful not to crush or deform the cable.

**TIP:**

A unique feature of ESP rear derailleurs is the low cable tension necessary for proper indexing. Be sure not to over tension the cable when attaching it to the rear derailleur.

7. Rapidly shift the chain up and down the cogset several times.
   - If the cable slips, see steps 5–6.
8. Shift the chain to the smallest cog.
9. Shift one detent to the second cog.
   - 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.
10. Repeat steps 8–9 until the cable tension is accurate.

**TIP:**

Cable and housing components will settle under compression. It may be necessary to readjust the rear derailleur cable tension using the shifter barrel adjuster after an initial “break-in” period.
DI. R.T. REAR DERAILLEUR INSTALLATION

TECHNICAL SPECIFICATIONS

<table>
<thead>
<tr>
<th>Index/Friction</th>
<th>Plasma</th>
<th>Quarz</th>
<th>Neos</th>
<th>Centera</th>
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<tr>
<td>Direct mount</td>
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</table>

ASSEMBLY REQUIREMENTS, FRAME DIMENSIONS

Mounting with rear derailleur bracket:
- The angle (α) between the dropout and the centerline of the chainstay must be in the range of min. 20° and max. 30° (Fig. 1).
- If the maximum dimension of 18" is exceeded between the smallest sprocket and the outer side of dropout, a rear derailleur with an offset bracket must be used (Reference No. 1120 441 020) (Fig. 2).

Direct mount:
- Important dimensions for rear dropout with integrated derailleur hangers are shown in figure 3 and in the following table.

<table>
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<th>A</th>
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<tr>
<td>25°–30°</td>
<td>26–30</td>
<td>6–10</td>
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</table>

- The distance between the smallest sprocket and the derailleur contacting surface must not exceed 9 to 13 mm. (Fig. 4)
- On the dropout, the hanger to which the rear derailleur is attached may have a max. chamfer of 0.5 x 45°. The contacting surface for the rear derailleur must be completely level. (Fig. 5)
- Dropouts which are opened towards the bottom are more reliable.

Direction of dropout:
- The differential between point A and point B must not exceed 10 mm. (Fig. 6)

Geometry of rear dropout:
- The geometry of the seat stay and rear fork depends on the smallest sprocket used. (Fig. 7)

Outer stops for cable housings:
- The inner diameter of the outer stop must be a minimum of 6.05 mm. (Fig. 8)

System components / Accessories
- Direct mount: When the thickness of the frame dropout is ≤ 5.5 mm: use washer with reference number 1118 401 071 (Fig. 9).
- Mounting with bracket: If the maximum dimension of “10” is exceeded between the smallest sprocket and the outer side of the dropout, a derailleur with an offset bracket (with reference number 1120 441 020 must be used. (Fig. 10)

COMPATIBLE ROTATIONAL SHIFTERS

Grip Shift
- Plasma ................. 8, 9 speeds
- Quarz .................... 8, 9 speeds
- Neos ..................... 7, 8 speeds
- Centera .................. 7, 8 speeds
- MRX ..................... 6, 7 speeds
- Bandix ................... 5, 6, 7 speeds

Di.R.T. rear and front derailleurs are Shimano® compatible

To mount the SRAM shifters, please refer to the Fitting Instructions and User's Manual No. 1188 107 001

Technical information may be enhanced without prior notice. Released 08/98.
DI.R.T. REAR DERAILLEUR
INSTALLATION

LENGTH OF CABLE HOUSINGS / DI.R.T. REAR DERAILLEURS

Caution:
With this system, it is imperative to respect the following values for the correct length of cable housing. (See corresponding tables across)

a) Example:
Distance X = 100 mm – here, cable housings measuring between 150 mm and 175 mm may be used.

b) Example:
Distance Y = 150 mm – here, cable housings measuring between 200 mm and 210 mm may be used.

Caution:
When replacing cable housings, make sure to only use shifter cable housings measuring the same lengths.

INSTALLATION / ADJUSTMENT / REMOVAL & ASSEMBLY OF DI.R.T. REAR DERAILLEURS

Installation:
• Fasten rear derailleur to frame dropout – with direct mount, use a 5 mm or 6 mm allen key, and a tightening torque of 8–10 Nm. When fitting with a bracket, use an 8 mm wrench and a tightening torque of 4–5 Nm.

Connecting the shift cable (also applies when replacing shift cable; Fig. 11):
• Put the righthand shifter in highest gear position.
• Guide the shift cable through slot 1, thread through cable recess 2 of the cable cam (cable must run inside the “finger” 2a). Place the cable in the groove of the clamping plate 3, tighten and clamp in place with the cable clamp nut 4. Use an 8 mm hex key or a 5 mm allen key-tightening torque 5–6 Nm (53–60 in.lbs.). Make sure cable housing is well positioned in cable stop 5 of derailleur. (Fig. 11)

Mounting chain:
• Determining chain length: place chain on largest front chainwheel and on largest rear sprocket then add two chain links. Close chain.

Adjustment (for preadjustment)
• Screws 1 and 2 are used for presetting (symbols 3 engraved in the outer link designate the corresponding bolt for the smallest and the largest sprocket). Screw 1 refers to the high gear limit screw and screw 2 refers to the low gear limit screw. (Fig. 12)
• Move the guide pulley beneath the smallest sprocket (hold in place) and adjust the high gear limit screw (1) until the pulley is aligned directly below the smallest sprocket (Fig. 13).
• Move the guide pulley beneath the largest sprocket (hold in place) and adjust the gear limit screw (2) until the pulley is aligned directly below the largest sprocket (Fig. 14).

Caution:
Di.R.T. rear derailleur incorporate a two spring design. The omission of the upper pivot spring has several functional advantages but does require precise adjustment of the angle adjustment screw (4, Fig. 15).
DI.R.T. REAR DERAILLEUR
INSTALLATION

Adjustment requirements:
- For a cassette with a low gear (largest) sprocket of 30 or 32 teeth, the clearance between the tooth tip of the guide pulley and the tooth tip of the low gear (largest) sprocket must equal 5–10 mm (Fig. 16).
- For a cassette with a low gear sprocket of 28 teeth or less, the clearance between the tooth tip of the guide pulley and the tooth tip of the 11 T or 12 T sprocket must be 5–10 mm (Fig. 17).

Final adjustment (cable tension adjustment with shifter adjusting barrel):
- Place the right shifter in the highest gear. This corresponds to the chain being on the smallest sprocket.
- Rotate the crank. If the chain already scrapes against the second sprocket or changes onto it, turn the setting screw (5, Fig. 18) clockwise until the scraping noise stops and/or the chain changes back to the smallest sprocket.
- Change into the next gear using the shifter, rotating the crank in the drive direction.
- If the chain does not move to the next sprocket turn adjusting barrel (5) counterclockwise (Fig. 18), to tension the control cable until the chain changes smoothly onto the second sprocket.
- Shift through gears several times and make any necessary adjustments.

DISASSEMBLY & REASSEMBLY

(Complete disassembly is only possible with the Plasma rear derailleur)

Completely dismounting cage:
- Dismount cage 1, to do so turn cage counterclockwise against spring until bolt 2 becomes accessible. Unscrew stop screw (Fig. 22) and turn cage clockwise into a vertical position. This is the only position in which one can remove cage 1 with 0-Ring 3 (seated relatively snug around cage) and spring 4 from the lower body. (Fig. 20)

Disassembling and reassembling cage:
- After loosening the two bolts 5 in Fig. 21, disassemble cage entirely into individual parts. Clean and eventually replace defective or worn parts. Before reassembling, lightly grease all bearing areas and spring 4. The position and assembly direction of the individual parts should correspond to the following illustration (Fig. 21).
- Tighten fastening bolts 5 with a torque of 2.5–3.5 Nm. (We recommend the use of a safety device such as Loctite).

Disassembling parallelogram:
- Remove washer 6 from axle IV, slide axle out and remove spring 8. (Fig. 25)

Caution:
Before reassembly, clean all parts and lightly grease bearing areas and axles. Replace all defective or worn out parts.

Reassembling parallelogram:
- Slide axle IV halfway through inner parallelogram arm 9 and lower body 10. Place guide spring 8 in the slot and slide axle through completely. Mount washer 6. (Fig. 26)
- Slide axle I halfway through outer parallelogram arm 7 and upper body 11. Place spring in the slot and slide axle through completely. Tighten with a 2.5 mm allen key, a maximum of 1 Nm. (Fig. 27)
- Link outer parallelogram arm 7 and lower body with axle III. Mount washer 6. (Fig. 28)
- Mount axle II and add safety washer. (Fig. 29)

Fitting pre-mounted cage:
- Place spring 4 in body and keep turning until you feel spring end snap into bore which has been specifically designed for it.
- Insert cage 1 with O-ring 3 in such a way as to make sure that spring end is seated in bore 4a. (Fig. 30)
- Push cage against body and turn counterclockwise to the “12 O’clock position”. This is the only position in which the cage’s axle will completely slide in. (Fig. 31)
- Keep tightening cage counterclockwise until you are able to place stop screw 2. Torque: 1 Nm. (Fig. 32)

MAINTENANCE / CARE
- Do not use solvents or corrosive materials to clean the components.
- Oil the shifting joints regularly.
- Grease any cable guides (e.g. beneath the bottom bracket).
ESP & DI.R.T. FRONT DERAILLEUR
INSTALLATION

TECHNICAL SPECIFICATIONS

<table>
<thead>
<tr>
<th>Clamp model</th>
<th>QuaRz ESP 9.0</th>
<th>NEOs ESP 7.0</th>
<th>CEntERA ESP 5.0</th>
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<td>X</td>
</tr>
<tr>
<td>34.8</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Guide deflection</td>
<td>Functions as Top + Bottom = Twin pull</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Compact drive</td>
<td>Total capacity</td>
<td>22 T</td>
<td>22 T</td>
</tr>
<tr>
<td>Max. No. of teeth</td>
<td>46 T</td>
<td>44 T</td>
<td>44 T</td>
</tr>
<tr>
<td>Min. No. of teeth</td>
<td>20 T</td>
<td>20 T</td>
<td>20 T</td>
</tr>
<tr>
<td>Min. diff. between large and middle chaining</td>
<td>10 T</td>
<td>8 T</td>
<td>8 T</td>
</tr>
</tbody>
</table>

ASSEMBLY REQUIREMENTS, FRAME DIMENSIONS

On traditional (non elevated) lower chain-stays, the measurement Z should generally not exceed the value indicated in the following illustration. This will guarantee proper functioning of chain with dynamic chain angles. The seat tube should be positioned in the center of the bottom bracket shell (Fig. 2).

Length of chainstay:
- MTB/Trekking L > 420 mm (Fig. 3)
- Rear frame alignment must be symmetrical.

Chainstay angle (Fig. 4)

Version 1
a = 63°...66°

Version 2
a = 66°...69°

Chainline: (Fig. 5)
Chainline = measurement from the center of the middle bracket to the center of middle chaining 47.5...50 mm

Necessary clearance for the DI.R.T. front derailleur
- Attachment of bottle holder (Fig. 6)
- Clearance between seat tube and mudguard or tire. (Striped area, Fig. 7)

COMPATIBLE ROTATIONAL SHIFTERS

Grip Shift
- Plasma
- Quarz
- Neos
- Centera
- MRX
- Bandix

Di.R.T. front derailleurs are Shimano® compatible.

To mount the SRAM shifters, please refer to the Fitting instructions and User’s manual No. 1168 107 001.

FITTING / ASSEMBLING

Fitting:
Open the clamp gently and applying a slight pressure, clip it onto the frame tubing. (Fig. 8)

Caution!
When fitting, do not open the clamp too far – as it may break. (Fig. 9)

Maximum width of opening “X” (Fig. 10).

<table>
<thead>
<tr>
<th>Tube Ø (mm)</th>
<th>max. X (mm)</th>
</tr>
</thead>
<tbody>
<tr>
<td>28.6 + 5</td>
<td>34.0</td>
</tr>
<tr>
<td>31.8 + 5</td>
<td>37.0</td>
</tr>
<tr>
<td>34.8 + 5</td>
<td>40.0</td>
</tr>
</tbody>
</table>

- Align the front derailleur on the seat tube and tighten lightly.

Important:
For optimum gear change, there must be a clearance of 1–3 mm between the head of the teeth on the large chainring and the lower edge of the outer cage plate (4). The outer cage plate (4) must be parallel to the chainrings (Fig. 11).

- Tighten clamping bolt (3, Fig. 12) to a torque of 4.5 Nm (40 in.lbs) (Allen key 5 mm).

Setting low gear limits: (Fig. 12)
- Place the chain on the largest sprocket and the smallest chainring.
- Adjust the high gear limit screw (1) so that the chain is positioned close to the inner cage plate (5) without actually touching it.

Note:
The symbols (6) between the high and low limit screws (1, 2) show which limit screw belongs to which chainring.

Connecting the shift cable
(for example after changing the cable)

a) Top Pull (Fig. 13)
- Place the shifter in the corresponding end position.
- Guide shift cable (1), coming from above, behind guide lug X between the clamping washers (2).
ESP & DI.R.T. FRONT DERAILLEUR
INSTALLATION

• Tension cable (3) in the direction of the arrow and tighten clamping bolt (4). Allen key 5 mm – tightening torque 4–5 Nm (45–53 in.lbs) (Fig. 13).

b) Bottom Pull (Fig. 14)
• Place the cable (1), coming from below, in guide groove (5) on the Twin Pull cable cam and route through the clamping washers (2).
• Tension cable (3) in the direction of the arrow and tighten clamping bolt (4). Allen key 5 mm – tightening torque 4–5 Nm (45–53 in.lbs).

Setting high gear limits: (Fig. 15)
• Shift the chain onto the smallest sprocket and the largest chainring.
• If the chain fails to shift onto the largest chainring, adjust the limit screw (2) accordingly. The chain must not scrape against the outer cage plate (4) and must not be thrown off the chainring.

Final adjustment (tensioning the cable)
Shift the chain onto the smallest sprocket and middle chainring – if the chain scrapes against the outer cage plate (4, Fig. 15), turn the adjusting barrel (7, Fig. 16) on the shifter counter-clockwise until the chain shifts smoothly and free of obstruction.
• Shift the chain onto the largest chainring – if the chain scrapes against the inner cage plate, turn the adjusting barrel on the shifter clockwise until the chain shifts smoothly and free of obstruction (Fig. 16).

Function test
• Shift through gears several times and adjust as necessary.

MAINTENANCE/CARE/SAFETY
Front Derailleur:
• Do not use solvents or corrosive materials to clean the components.
• Oil the shifting joints regularly.
• Grease any cable guides (e.g. beneath the bottom bracket).

Sachs rotational shifters:
• All shifters are equipped with an adequate supply of grease and are practically maintenance-free.

CAUTION! Warning:
• Fixed grips (left and right) take on an axial securing function and must be assembled so that they cannot slip off the handlebar.
• Never fit fixed grips using greasy or soapy solutions.
• Never ride without fixed grips, the turning part can work its way out of the housing and slip from the handlebar – this could lead to the rider falling and being injured.
# Troubleshooting Guide

## Rear & Front Derailleur

### Rear Derailleur

<table>
<thead>
<tr>
<th>No.</th>
<th>Fault</th>
<th>Cause</th>
<th>Remedy</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Chain jumps from smallest sprocket to frame dropout</td>
<td>• High gear limit screw (1) is not adjusted properly</td>
<td>• Turn in screw (1, Fig. 12) until the guide pulley is aligned with the smallest sprocket</td>
</tr>
<tr>
<td>2</td>
<td>Difficult or impossible to shift chain onto smallest sprocket</td>
<td>• High gear limit screw (1) is not adjusted properly</td>
<td>• Unscrew screw (1, Fig. 12) until the guide pulley is aligned with the smallest sprocket</td>
</tr>
<tr>
<td>3</td>
<td>Chain jumps over largest sprocket and falls between the spokes and largest sprocket or inner cage plate scrapes on spokes</td>
<td>• Low gear limit screw (2) is not adjusted properly</td>
<td>• Turn in screw (2, Fig. 12) until the guide pulley is aligned with the largest sprocket</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Rear derailleur or derailleur hanger is bent</td>
<td>• Straighten or replace.</td>
</tr>
<tr>
<td>4</td>
<td>Delayed shifting</td>
<td>• Clearance between guide pulley/ sprocket is too large</td>
<td>• Adjust angle adjusting screw by rotating counterclockwise (4, Fig. 15)</td>
</tr>
<tr>
<td>5</td>
<td>Rough shifting behavior</td>
<td>• Clearance between guide pulley/ sprocket is too small</td>
<td>• Adjust angle adjusting screw by rotating clockwise (4, Fig. 15)</td>
</tr>
<tr>
<td>6</td>
<td>Chain jumps two gears on small sprocket</td>
<td>• Shift cable insufficiently tensioned</td>
<td>• Turn barrel adjuster (5, Fig. 18) on the shifter counterclockwise</td>
</tr>
<tr>
<td>7</td>
<td>Delayed shifting onto larger sprocket</td>
<td>• Shift cable insufficiently tensioned</td>
<td>• Turn barrel adjuster (5, Fig. 18) on the shifter counterclockwise</td>
</tr>
<tr>
<td>8</td>
<td>Delayed shifting onto smaller sprocket</td>
<td>• Shift cable is too tense</td>
<td>• Turn barrel adjuster (5, Fig. 18) on the shifter clockwise</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Excessive cable/housing friction</td>
<td>• Lubricate or replace cable and housing</td>
</tr>
</tbody>
</table>

### Front Derailleur

<table>
<thead>
<tr>
<th>No.</th>
<th>Fault</th>
<th>Cause</th>
<th>Remedy</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Shifter actuated, chain fails to change chainring</td>
<td>• Shift cable incorrectly clamped</td>
<td>• Check shift cable and correct as necessary (cable clamp; cable housing stops; cable recess in shifter; cable tension)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• High/low limit screw poorly adjusted</td>
<td>• Correct as described under fitting, Fig. 12/15</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Clearance between cage and large chainring is too big/small (spec. 1 - 3 mm, compare Fig. 11)</td>
<td>• Correct as described under fitting</td>
</tr>
<tr>
<td>2</td>
<td>Chain falls over large/small chainring</td>
<td>• High / low limit screw poorly adjusted</td>
<td>• Correct as described under fitting, Fig. 12/15</td>
</tr>
<tr>
<td>3</td>
<td>Chain is on middle chainring and scrapes against the cage when the largest or smallest sprocket is selected</td>
<td>• Precise adjustment of cable tension is incorrect</td>
<td>• Readjust as described under fitting, &quot;Final adjustment&quot;, Fig. 15/16</td>
</tr>
<tr>
<td>4</td>
<td>Force required to actuate gears is too high</td>
<td>• Excessive cable friction</td>
<td>• Lubricate or replace cable and housing</td>
</tr>
<tr>
<td>5</td>
<td>Front derailleur collides with crank</td>
<td>• High gear limit screw (2) incorrectly adjusted</td>
<td>• Correct as described under fitting, &quot;Setting high gear limits&quot;, Fig. 12/15</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Use of a crankset which is incompatible with SRAM front derailleurs</td>
<td>• Use compatible crankset</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Cage not parallel with chainring</td>
<td>• Correct the front derailleur position as described under fitting, Fig. 11</td>
</tr>
</tbody>
</table>
SHIFTER INSTRUCTIONS
ESP 9.0SL, 9.0, 7.0, PLASMA™

SHIFTER ANATOMY

INSTALLATION
FRONT and REAR:
1. Slide the front (rear) shifter onto the left (right) side of the handlebar.
   • If necessary, move the brake lever to allow for the shifter and the handlebar grip.
   • Bar end users – don’t forget to leave room for the bar end.
2. Rotate the shifter until the barrel adjuster is beneath (but out of the way of) the brake lever.
3. Tighten the 3 mm hex clamp bolt to 17 in-lb. (1.9 Nm).
4. Slide the plastic washer onto the handlebar.
   • The washer prevents the handlebar grip from interfering with the shifter rotation.
5. Slide the handlebar grip onto the handlebar.
6. Feed the cable through the cable housing and stops.
7. Attach the front (rear) shifter cable to the front (rear) derailleur.
8. Adjust indexing per the derailleur instructions.

Attention!
• Always check the front and rear brake levers for proper operation.
• If there is interference between a shifter and a brake lever, rotate one out of the way. Check for proper brake lever operation again!

CABLE CHANGE
Check this out:
• Leave the shifter on the handlebar.
• No need to move other components – THE SHIFTER DOES NOT NEED TO BE OPENED.
• Use only new, high quality cable and compressionless cable housing.

FRONT (Fig. 1)
1. Detach the cable from the front derailleur.
2. Cut the cable off 6" from the shifter barrel adjuster. Discard the old cable and cable housing.
3. Remove the escape hatch.
4. Rotate the shifter so the indicator mark is aligned with the highlighted number.
   • Look for the cable entry.
5. Remove and discard the rest of the old cable.
6. Feed the new cable through the cable entry and out the barrel adjuster.
7. Pull the cable snug.
8. Replace the escape hatch.
9. Feed the cable through the new cable housing and stops.
10. Attach the cable to the front derailleur and adjust indexing per the derailleur instructions.

REAR (Fig. 2)
1. Detach the cable from the rear derailleur.
2. Cut the cable off 6" from the shifter barrel adjuster. Discard the old cable and cable housing.
3. Remove the escape hatch.
4. Rotate the shifter so the indicator mark is aligned with the highlighted number.
   • Look for the cable entry.
5. Remove the 2.5 mm hex cable retention screw.
6. Remove and discard the rest of the old cable.
7. Feed the new cable through the cable entry and out the barrel adjuster. Pull the cable snug.
8. Replace the cable retention screw – be sure to turn until the screw contacts the cable head.
9. Replace the escape hatch.
10. Feed the cable through the new cable housing and stops.
11. Attach the cable to the rear derailleur and adjust indexing per the derailleur instructions.

Hey again!
• Clean all shifter parts using ONLY water and mild soap.
• Use ONLY Grip Shift Jonnisnot Grease for any shifter lubrication.
SHIFTER INSTRUCTIONS
5.0 CENTERA™

SHIFTER ANATOMY
See picture on the left page.

INSTALLATION
FRONT and REAR:
1. Slide the front (rear) shifter onto the left (right) side of the handlebar.
   • If necessary, move the brake lever to allow for the shifter and the handlebar grip.
   • Bar end users – don’t forget to leave room for the bar end.
2. Rotate the shifter until the barrel adjuster is beneath (but out of the way of) the brake lever.
3. Tighten the 3 mm hex clamp bolt to 17 in-lb. (1.9 Nm).
4. Slide the plastic washer onto the handlebar.
   • The washer prevents the handlebar grip from interfering with the shifter rotation.
5. Slide the handlebar grip onto the handlebar.
   • Solvents, lubricants or hair spray may damage the handlebar grips!
6. Feed the cable through the cable housing and stops.
7. Attach the front (rear) shifter cable to the front (rear) derailleur.
8. Adjust indexing per the derailleur instructions.

Attention!
• Always check the front and rear brake levers for proper operation.
• If there is interference between a shifter and a brake lever, rotate one out of the way. Check for proper brake lever operation again!

CABLE CHANGE
Hey! For the best results:
• Leave the shifter on the handlebar.
• Allow for 0.5–1” of working space around the shifter.
• Use only new, high quality cable and compressionless housing.

FRONT
1. Detach the cable from the front derailleur.
2. Cut the cable off 6” from the shifter barrel adjuster. Discard the old cable and cable housing.
3. Use a small screwdriver to pop off the cover. (Fig. 1)
4. Carefully pull the grip and the housing apart only until the cable head is exposed.
   • Be careful not to lose the spring.
5. Remove and discard the rest of the old cable.
6. Feed the new cable 0.25” straight into the cable entry. (Fig. 4)
7. Bending the cable away from the cable track, continue to push the cable completely through the shifter.
   • This causes a slight bowing of the cable which aids in the installation. (Fig. 5)
8. Feed the cable through the barrel adjuster and pull the cable snug.
9. Check that the cable is lying in the cable track. Snap the cover back into place.
10. Check for proper assembly by rotating the grip and listening for the clicks.
11. Feed the cable through the new cable housing and stops.
12. Attach the cable to the front derailleur and adjust indexing per the derailleur instructions.

Hey! Now this is going to be easy:
• Leave the shifter on the handlebar.
• No need to move other components. – THE SHIFTER DOES NOT NEED TO BE OPENED.
• Use only new, high quality cable and compressionless housing.

REAR
1. Detach the cable from the rear derailleur.
2. Cut the cable off 6” from the shifter barrel adjuster. Discard the old cable and cable housing.
3. Line up the ‘CC’ mark with the indicator mark.
4. Use a small screwdriver to pop off the cover. Do not pull apart the shifter. (Fig. 1)
5. Push the old cable into the shifter to expose the cable head. (Fig. 3)
6. Remove and discard the rest of the old cable.
7. Feed the new cable 0.25” straight into the cable entry. (Fig. 4)
8. Bending the cable away from the cable track, continue to push the cable completely through the shifter.
9. Feed the cable through the barrel adjuster and pull the cable snug.
10. Check that the cable is lying in the cable track. Snap the cover back into place.
11. Check for proper assembly by rotating the grip and listening for the clicks.
12. Feed the cable through the new cable housing and stops.
13. Attach the cable to the rear derailleur and adjust indexing per the derailleur instructions.

Hey again!
• Clean all shifter parts using ONLY water and mild soap.
• Use ONLY Grip Shift Jonnisnot Grease for any shifter lubrication.
SHIFTER INSTRUCTIONS
MRX™

SHIFTER ANATOMY

INSTALLATION
FRONT and REAR:
(For use with NON-ALUMINUM handlebars ONLY)
1. Slide the front (rear) shifter onto the left (right) side of the handlebar.
   • If necessary, move the brake lever to allow for the shifter and the handlebar grip.
   • Bar end users – don’t forget to leave room for the bar end.
2. Rotate the shifter until the barrel adjuster is beneath (but out of the way of) the brake lever.
3. Tighten the 2.5 mm hex clamp bolt to 15 in-lb. (1.7 Nm).
4. Slide the plastic washer onto the handlebar.
   • The washer prevents the handlebar grip from interfering with the shifter rotation.
5. Slide the handlebar grip onto the handlebar.
   • Solvents, lubricants or hair spray may damage the handlebar grips!
   • Use only compressed air or water to aid installation.
6. Thread the cable through the cable housings and stops.
7. Attach the front (rear) shifter cable to the front (rear) derailleur.
8. Adjust indexing per the derailleur instructions.
   Not recommended for use on thin walled aluminium handlebars such as Hyperlite® type handlebars.

Attention!
• Always check the front and rear brake levers for proper operation.
• If there is interference between a shifter and a brake lever, rotate one out of the way. Check for proper brake lever operation again!

CABLE CHANGE

Check this out:
• Leave the shifter on the handlebar.
• No need to move other components – THE SHIFTER DOES NOT NEED TO BE OPENED.
• Use only new, high quality cable and compressionless cable housing.

FRONT – Models 201-10, -30
REAR – Models 201-60, -70
See Figure 1 (front) or 2 (rear).
1. Detach the cable from the appropriate derailleur.
2. Cut the cable off 6” from the shifter barrel adjuster. Discard the old cable and cable housing.
3. Line up the ‘1’ (front) or HIGHEST gear number (rear) mark with the indicator mark.
4. Carefully peel back the corner of the grip cover shown in Figure 1 (front) or Figure 2 (rear).
   • Use your fingernail or a small screwdriver.
5. Remove and discard the rest of the old cable.
6. Feed the new cable through the cable entry in the grip and out through the barrel adjuster.
7. Feed the cable through the new cable housing and stops.
8. Attach the cable to the appropriate derailleur and adjust indexing per the derailleur instructions.

Hey! Make it easy on yourself:
• Leave the shifter on the handlebar.
• Allow for 0.5–1” of working space around the shifter.
• Use only new, high quality cable and compressionless housing.
SHIFTER INSTRUCTIONS
MRX™

FRONT – Models 201-12, -32

1. Detach the cable from the front derailleur.
2. Cut the cable off 6" from the shifter barrel adjuster. Discard the old cable and cable housing.
3. Use a small screwdriver in the rear slot of the housing to pop off the cover. (Fig. 3)
4. Rotate the shifter so the indicator mark is beyond the ‘3’ mark and carefully pull the grip and the housing apart.
   • Be careful not to lose the spring.
5. Remove and discard the rest of the old cable.
6. Feed the new cable through the cable entry in the housing and loop it once around the handlebar.
7. Feed the cable out through the barrel adjuster. (Fig. 4)
8. Line up the ‘1’ mark with the indicator mark.
   • This will also align the small retention tab on the housing with the grip.
9. Lay the cable over the ‘shovel’ on the grip.
10. While pulling the cable snug, snap the grip and the housing back together. (Fig. 5)
   • Make sure the cable is lying in the cable track before snapping the shifter closed.
11. Snap the cover back into place.
12. Check for proper assembly by rotating the shifter and listening for the clicks.
13. Feed the cable through the new cable housing and stops.
14. Attach the cable to the appropriate derailleur and adjust indexing per the derailleur instructions.

Hey again!
• Clean all shifter parts using ONLY water and mild soap.
• Use ONLY Grip Shift Jonnisnot Grease for any shifter lubrication.
TECHNICAL SPECIFICATIONS

- Grip Shift Quarz: Two-part grip, 3 speeds left, 8 or 9 speeds right, gear indicator in window, Tune-to-Terrain adjustable shifting force, easy cable replacement with the Cable Quick Release feature.

- Grip Shift Neos: Two-part grip, 3 speeds left, 7 or 8 speeds right, gear indication printed on shifter housing.

- Grip Shift Spectro: Two-part grip, 3 speeds left, 6, 7 or 8 speeds right, gear indication printed on shifter housing.

- Grip Shift Bandix: Two-part grip, 2 or 3 speeds left or right, 5, 6 or 7 speeds right, gear indication printed on shifter housing.

- Grip Shift Traxx: Two-part grip, 3 speeds left, 6 or 7 speeds right, gear indication printed on shifter housing.

ASSEMBLY REQUIREMENTS / MOUNTING PROCEDURE

- Handlebar diameter “Y”: 22.0 – 22.4 mm
- Length of straight handlebar end “X”: Quarz/Neos 160 mm, Spectro/Traxx 150 mm, Bandix 135 mm.
  Note: These measurements do not take into account the brake lever clamp dimension (Fig. 2).

Assembly (Fig. 3):
Slide housing (1) with turning grip (2) onto the handlebar. Follow with two thrust washers (3).

- Mount fixed grip (4) as far as it will go. Warning: Do not use grease for mounting the fixed grips (4)!
- Place the housing (1) with the turning grip (2) against the fixed grip in such a way as to give the thrust washers (3) some free room. Adjust housing and tighten bolt to a torque of 1.5 – 2.5 Nm.

Note:
In order to mount the rotational shifter onto handlebars with very narrow bending radiiuses (integral handlebars), the housing (1) and turning grip (2) may be separated. In this case:

- Fig. 4: Hold the housing (1) with one hand and the rotational grip (2) with the other, then apply the necessary force to separate them.
- Slide the housing (1) followed by the grip (2) onto the handlebar.

REPLACING CONTROL CABLE

- Fig. 5: Remove cable cap (5) from shifter body with a sharp tool and turn shifter forward as far as it will go. Cable head will appear in window. Slide cable head from cable guide and pull out cable.
- Route new cable through opening, adjust onto frame as desired and pull into cable guide up to the stop.
- Connect the cable to the front or rear derailleur or hub and close opening with cable cap (5).
- When necessary, shifting adjustment can be corrected by turning the adjusting barrel (6).

ADJUSTING THE REQUIRED HAND FORCE / MAINTENANCE

Fig. 6 – (only the Grip Shift Quarz) In order to increase or decrease the required hand force, move the bar (7) in the plus (+) or minus (–) direction. This grey bar is found on the inner part of the shifter body.

All shifters are permanently lubricated at manufacturing site and are normally maintenance free.
NIGHTCRAWLER™ INSTRUCTIONS

NIGHTCRAWLER™ ANATOMY

Steps 1 – 5

Steps 6 – 7

COMPATIBILITY
- Fits most frames
- Use with derailleur cables ONLY

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

INSTALLATION
1. Feed the cable through the bellows – hook end first.
2. Feed the cable through the rigger – bellows end first.
3. Join the rigger to the bellows.
4. Feed the cable through the rear derailleur housing.
5. Seat the rear derailleur housing into the rigger.
6. Slide the rigger into the rear derailleur cable stop.
7. Re-attach the cable to the rear derailleur.
8. Check that the chain is on the smallest cog.
9. Using your fingers, slide the hook end of the bellows towards the rigger until fully compressed.

Steps 8 – 9
## Hubs Instructions

### Assembly Drawing Plasma Powerdisc

![Assembly Drawing Plasma Powerdisc](image_url)

### Rear Hubs MTB, Trekking

<table>
<thead>
<tr>
<th>Over locknut dimension</th>
<th>Plasma/Powerdisc</th>
<th>Quartz/Powerdisc</th>
<th>NEDS</th>
<th>Centera</th>
<th>TRAXX</th>
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<tbody>
<tr>
<td>126 mm</td>
<td>X</td>
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<td>X</td>
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<tr>
<td>135 mm</td>
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</table>

<table>
<thead>
<tr>
<th>Axle length (hollow axle)</th>
<th>Plasma/Powerdisc</th>
<th>Quartz/Powerdisc</th>
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<th>Centera</th>
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<td>134 mm</td>
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<thead>
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<th>Number of spoke holes</th>
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<th>Quartz/Powerdisc</th>
<th>NEDS</th>
<th>Centera</th>
<th>TRAXX</th>
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<tr>
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<td>36</td>
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<table>
<thead>
<tr>
<th>Spoke hole “O”</th>
<th>Plasma/Powerdisc</th>
<th>Quartz/Powerdisc</th>
<th>NEDS</th>
<th>Centera</th>
<th>TRAXX</th>
</tr>
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<tbody>
<tr>
<td>2.5 mm + 0.15</td>
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<td>X</td>
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<table>
<thead>
<tr>
<th>Spoke hole reference “O”</th>
<th>Plasma/Powerdisc</th>
<th>Quartz/Powerdisc</th>
<th>NEDS</th>
<th>Centera</th>
<th>TRAXX</th>
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<td>62.5 mm</td>
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<table>
<thead>
<tr>
<th>Distance middle flange to middle fork width</th>
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<tbody>
<tr>
<td>• 8-speed / OLD 135</td>
</tr>
<tr>
<td>right (drive side)</td>
</tr>
<tr>
<td>left</td>
</tr>
<tr>
<td>20.8 mm</td>
</tr>
<tr>
<td>30.4 mm</td>
</tr>
<tr>
<td>• 8-speed / OLD 130</td>
</tr>
<tr>
<td>right (drive side)</td>
</tr>
<tr>
<td>left</td>
</tr>
<tr>
<td>18.3 mm</td>
</tr>
<tr>
<td>32.9 mm</td>
</tr>
<tr>
<td>• 7-speed / OLD 135</td>
</tr>
<tr>
<td>right (drive side)</td>
</tr>
<tr>
<td>left</td>
</tr>
<tr>
<td>23.8 mm</td>
</tr>
<tr>
<td>27.4 mm</td>
</tr>
<tr>
<td>• 7-speed / OLD 130</td>
</tr>
<tr>
<td>right (drive side)</td>
</tr>
<tr>
<td>left</td>
</tr>
<tr>
<td>21.3 mm</td>
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<td>29.9 mm</td>
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<thead>
<tr>
<th>Mounting</th>
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<tr>
<td>Quick release</td>
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<tr>
<td>Solid axle</td>
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<table>
<thead>
<tr>
<th>Axle ends Ø</th>
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<td>10 mm</td>
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<table>
<thead>
<tr>
<th>Bearings and sealing</th>
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<tbody>
<tr>
<td>Cartridge bearing</td>
</tr>
<tr>
<td>Cone/lip seal</td>
</tr>
<tr>
<td>Cone/labyrinth</td>
</tr>
<tr>
<td>Cone/dust cap</td>
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</table>

<table>
<thead>
<tr>
<th>Cassette body</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bearings</td>
</tr>
</tbody>
</table>
Dismantling – Fig. 1:
(Neos, Centera, 5000)
- Unscrew axle nut (1) on the non-drive side and remove, using a 17 mm wrench, while holding the adjusting cone (3) in place with a 15 mm wrench.
- Unscrew adjusting cone (3) and pull out axle (5).
(Only remove dust cap (8) and cone with plastic cover (9) if damaged.) When replacing the cone (9) measure the distance to the axle end so that the new part is fitted in the same position. Tighten axle nut (1) 15–20 Nm (11–14.75 ft.lbs.) while holding the cone (9) in place with a 15 mm wrench.
- Remove 9 balls (4) from the hub shell.
- Remove body bolt in the hub shell using a 12 mm hex and remove body (7).

Note: In the case of versions with cone bearing, the body bolt remains in the hub shell – the non-drive side bearing shell would have to be disassembled before the bolt can be removed.
- Use a suitable tool to drive the worn bearing shell out of the hub shell (6). Press new bearing shell in completely.
- The body (7) cannot be dismantled and must, if necessary, be replaced completely.
- Clean all parts if necessary – replace damaged/worn parts.

Differences specific to type:
- On the Centera 8-speed version, a labyrinth cover pressed onto the cone (3 + 9) seals the hub on drive and non-drive side – the Centera 7-speed and 5000 version has no dust cap (8).
- On the Neos, the rubber lip seal (3a) is fitted on both sides. It is fitted completely onto the labyrinth cover; the sealing lip must point towards the labyrinth cover to function.

Assembly:
- Grease ball running surfaces on both sides and insert 9 balls on each side.
- Insert preassembled axle with cone (9) and axle nut (1).
- On the non-drive side, tighten adjusting cone (3) on the balls so that it is free from play but without exerting pressure. Fit spacer (2). Hold adjusting cone in place with a 15 mm wrench and tighten axle nut (1) to a torque of 15–20 Nm (11–14.75 ft.lbs.).
- To fit dust cap (8), see version with cartridge bearing, assembly (next page).
HUBS INSTRUCTIONS

**Version with Cartridge Bearing**

Dismantling – Fig. 2:
(Plasma, Quarz, New Success, 7000, plus Plasma and Quarz for Powerdisc)

- Unscrew and remove axle nut (1) using a 17 mm wrench on the driver side, while holding the opposite side in place with a 17 mm wrench.
- Remove dust cap (10) and rubber lip seal (9).
- Remove axle (4) using a plastic or rubber hammer.

**Important:** Take care of the adjusting washers under the outer bearing ring (see body bearing assembly instruction).

- Clean all parts if necessary – replace damaged/worn parts.
- After unscrewing the nut (1), the bearing (3) on the axle (4) can be removed with the spacer and the dust cap.
- Use a 12 mm hex key to unscrew the body bolt (5) in the hub shell (6) and remove body (7).
- Use a suitable tool on the opposite side to drive ball bearing (3) out of the body – to do so, place the body on a board or in a vise. The cover (8) is driven out at the same time.

**Differences specific to type:**
- The cassette hubs Plasma and New Success (Fig. 2) have an aluminum spacer (2) and an aluminum cover (2a) between the left bearing (3) and the axle nut (1). The axle nuts (1) have a turned groove which points towards the dropout when installed.
- Quarz and 7000 (Fig. 3) have a longer steel spacer (x) with a pressed-on plastic labyrinth cover between the left bearing (3) and the axle nut (1). Both axle nuts (y) are grooved on both sides.

**Assembly:**
- Press bearing (3) as far as it will go into body (7).
- Press in dust cap (8) with the larger diameter first – the locking for the Power Glide cassette (11) and assembly tool (12) (Fig. 4) will be required – tighten lockring completely and the dust cap will be in exactly the right position.
- Push the bearing (3) completely onto the longer end of the axle. Fit aluminum cover and aluminum spacer (Plasma) and tighten axle nut (1) to a torque of 15 – 20 Nm (11–14.75 ft.lbs.).
- Before fitting the left bearing, the adjusting washers provided must be inserted into the hub shell. These washers prevent undesirable bearing play.
- Insert preassembled axle with bearing into the hub shell and press in bearing completely.

**Important – the following applies to both bearings:** When pressing in the bearing, only exert force via the outer bearing ring.

- Push rubber lip seal (9) completely onto the spacer with pressed-on labyrinth cover (10) – the sealing lip should point towards the labyrinth cover.
- Fit spacer (10) to axle.
- Tighten axle nut (1) – hold the opposite side in position with a 17 mm wrench and tighten nut to a torque of 15 – 20 Nm (11–14.75 ft.lbs.).

**Conditions for Lacing Spokes / Power Glide Assembly / Chains**

**Conditions for lacing spokes:**
- In the case of MY ‘99 cassette hubs, the distance from the flange center to the 1st (largest) sprocket is reduced from 7.0 mm to 5.5 mm. (compatible with Shimano®). This results in different spiking variants

- **When the rear derailleur (largest sprocket) is in the limit position,** it is important to make sure that there is always sufficient space (X) between spokes and cage and that they do not come into contact (see Fig. 5).

**Allowed:**
- Radial with spoke heads on drive side.
- Crossed at least 2x.y.

**Not allowed:**
- Radial spoking with spoke heads inside or crossed 1x on drive side.

**Note:**
*With Traxx rear derailleur, special attention must be paid to the low gear limit screw since, due to the width of the rear derailleur, there is little space between rear derailleur and spokes.*

**Assembling Power Glide cassettes**
- Push preassembled cassette section (2) onto the driver (1) (teeth only allow in one position).
- Type “A” 14 - 32 Z with 7 sprockets is assembled with a spacer (3) under the 14 T sprocket (4) (Fig. 6).
- Type “D” 12 - 28 Z with 7 sprockets does not require spacer (3, Fig. 6).
- Type “B” 11 - 28 Z with 8 sprockets, sprocket 12 Z (7) and sprocket 11 Z (8) are not pre-assembled (Fig. 7).
- Type “C” 12 - 32 Z B-sprocket, only sprocket 12 Z (7, Fig. 7) is not pre-assembled, 7 sprockets with 6 spacers are pre-assembled.
- All sprockets are fitted with the flange first and the corresponding tooth profile, the lock ring (5) is screwed in using the assembly tool (6) and tightened to a torque of 40 Nm (30 ft.lbs.).

**Important:**
- Do not use tool without its spacer or the hub seal could be damaged.
- Do not fit MY ’97 8-speed cassette to MY ’98 cassette hubs since the thread of the locking will not grip sufficiently.
Chains:
- Only retrofit the following chain:
  Power Chain, all chain models except PC 1 and PC10.

Important – the use of other chains will impair shifting functions considerably.

Compatibility
Power Glide cassettes are Shimano® compatible if used with Power Chain chains.
Power Glide cassettes can be replaced by Shimano® cassettes.

FITTING THE WHEEL
- Insert wheel into dropouts of frame or front fork and align. Only use correct length quick-release skewers (see table below).
- Turn clamping lever 1 to the outside until it is at least at right angles to the cycle open (Fig. 8).
- Tighten adjusting nut 2 as much as possible by hand.
- Turn clamping lever 1 to closed position "a" (the word "close" is visible from the outside). When closed, clamping lever should be parallel to the fork or frame. If the clamping lever closes relatively easily, the clamping force is insufficient. In this case, open clamping lever again, tighten adjusting nut 2 slightly more and close clamping lever again.
If considerable force is required to close the clamping lever, open the lever again, slacken off the adjusting nut slightly and close lever again.

Important:
Do not fix wheel in place by turning the quick-release lever (Fig. 9).
It is essential that the operating instructions for quick-release device No. 4668 001 001 be passed on to the end user.

MAINTENANCE / CARE
- When cleaning your bike, do not expose hub to compressed water (i.e. high pressure hose, etc). If water gets into system, malfunction may occur.
- The hubs have been factory lubricated and are nearly maintenance-free.

QUICK RELEASE (FIG. 10)

<table>
<thead>
<tr>
<th>Ref. Number</th>
<th>Overlocknut dimension</th>
<th>L</th>
<th>Dropout</th>
<th>Usable for suspension</th>
</tr>
</thead>
<tbody>
<tr>
<td>88 4689 518 001</td>
<td>front</td>
<td>100</td>
<td>131 mm</td>
<td>7.0–10.0 mm</td>
</tr>
<tr>
<td>88 4689 518 002</td>
<td>front</td>
<td>100</td>
<td>125 mm</td>
<td>4.0–7.0 mm</td>
</tr>
<tr>
<td>88 4689 519 002</td>
<td>rear</td>
<td>135</td>
<td>160 mm</td>
<td>4.0–7.0 mm</td>
</tr>
<tr>
<td>88 4689 520 002</td>
<td>rear</td>
<td>130</td>
<td>155 mm</td>
<td>4.0–7.0 mm</td>
</tr>
<tr>
<td>88 4689 519 001</td>
<td>rear</td>
<td>135</td>
<td>166 mm</td>
<td>7.0–10.0 mm</td>
</tr>
<tr>
<td>88 4689 521 001</td>
<td>front</td>
<td>100</td>
<td>131 mm</td>
<td>7.0–10.0 mm</td>
</tr>
<tr>
<td>88 4689 521 002</td>
<td>front</td>
<td>100</td>
<td>125 mm</td>
<td>4.0–7.0 mm</td>
</tr>
<tr>
<td>88 4689 522 002</td>
<td>rear</td>
<td>135</td>
<td>160 mm</td>
<td>4.0–7.0 mm</td>
</tr>
<tr>
<td>88 4689 523 002</td>
<td>rear</td>
<td>130</td>
<td>155 mm</td>
<td>4.0–7.0 mm</td>
</tr>
<tr>
<td>88 4689 522 001</td>
<td>rear</td>
<td>135</td>
<td>166 mm</td>
<td>7.0–10.0 mm</td>
</tr>
<tr>
<td>88 4689 513 001</td>
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<td>100</td>
<td>128 mm</td>
<td>5.0–8.0 mm</td>
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<tr>
<td>88 4689 513 002</td>
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</tr>
<tr>
<td>88 4689 514 001</td>
<td>rear</td>
<td>135</td>
<td>160 mm</td>
<td>4.0–7.0 mm</td>
</tr>
<tr>
<td>88 4689 515 001</td>
<td>rear</td>
<td>135</td>
<td>165 mm</td>
<td>7.0–10.0 mm</td>
</tr>
<tr>
<td>88 4689 516 001</td>
<td>rear</td>
<td>130</td>
<td>154 mm</td>
<td>4.0–7.0 mm</td>
</tr>
<tr>
<td>88 4689 517 001</td>
<td>rear</td>
<td>126</td>
<td>151 mm</td>
<td>4.0–7.0 mm</td>
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CASSETTES INSTRUCTIONS
POWER GLIDE

TECHNICAL SPECIFICATIONS

Power Glide cassette types

<table>
<thead>
<tr>
<th>Type</th>
<th>Connecting rings</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Number</td>
</tr>
<tr>
<td>Type “A” / 14 – 32 teeth, 7-speed (14 - 16 - 18 - 21 - 24 - 28 - 32)</td>
<td>5</td>
</tr>
<tr>
<td>Type “B” / 11 – 28 teeth, 8-speed (11 - 12 - 14 - 16 - 18 - 21 - 24 - 28)</td>
<td>5</td>
</tr>
<tr>
<td>Type “C” / 12 – 32 teeth, 8-speed (12 - 14 - 16 - 18 - 21 - 24 - 28 - 32)</td>
<td>6</td>
</tr>
<tr>
<td>Type “D” / 12 – 28 teeth, 7-speed (12 - 14 - 16 - 18 - 21 - 24 - 28)</td>
<td>5</td>
</tr>
</tbody>
</table>

Warning: Black connecting rings for 7-speed cassettes, grey connecting rings for 8-speed cassettes. Do not fit grey connecting rings with sprockets which have ≥ 16 teeth and a circular marking on the inner diameter. Sprockets with ≥ 16 teeth and production date 09/97 or later are marked with a triangle above the wide tooth. Sprockets produced prior to this date are marked with a circle. (Other sprockets are still marked with a circle.) Do not mix sprockets with different markings. (See also Fig. 3)

Power Chain chains:
- All types apart from PC 1 and PC 10.
  Warning: The use of other chains will impair shifting considerably.

Compatibility:
- Power Glide cassettes are Shimano® compatible if used with Power Chain chains.
- Power Glide cassettes can be replaced by Shimano® cassettes.

FITTING THE POWER GLIDE CASSETTES

- Fit pre-assembled cassette (2, Fig. 1) onto the splines of the cassette body (1) – toothed only allows it to be fitted in one position. Further assembly:
  - Type “A” / 14 – 32 T, 7-speed: fit intermediate ring (3, Type A only) and 14 tooth sprocket (4) collar first in accordance with tooth profile.
  - Type “B” / 11 – 28 T, 8-speed: fit 12 + 11 tooth sprockets (7 + 8, Fig. 2) collar first.
  - Type “C” / 12 – 32 T, 8-speed: fit 12 tooth sprocket collar first.
  - Type “D” / 12 – 28 T, 7-speed: fit 12 tooth sprocket collar first (ring 3 not needed).
  - Turn screw (5) with assembly tool (6) and tighten to a torque of 40 Nm.

Warning: Do not use tool without spacer as this could damage the hub seal. (Art. No. 4624 411 010)

Replacing individual sprockets:
The individual sprockets are connected by a clip system and can be fitted without tools. The connecting rings are plastic and have three lugs on each side which lock into the corresponding recesses in the sprockets. Certain markings (Fig. 3) on the sprockets and connecting rings help to make assembly easier:
- The sprockets are embossed with:
  a) a marking indicating use, e.g. 28 A – D (28 teeth, suitable for all cassette types A, B, C and D)
  b) a triangular marking (≥ 16 teeth) above the wide tooth on the inner diameter.
- The connecting rings have a circular marking above the wide tooth on the inner diameter.

To assemble, align the markings and press the sprockets and the connecting rings together gently so that they interlock.

Warning: Always use the same number of teeth and sprocket type; any change in stepping will cause shifting problems.
CRANK SET INSTRUCTIONS

1

CRANK SET INSTRUCTIONS

TECHNICAL SPECIFICATIONS AND ASSEMBLY REQUIREMENTS

<table>
<thead>
<tr>
<th></th>
<th>Quartz</th>
<th>Neos</th>
<th>Centera</th>
</tr>
</thead>
<tbody>
<tr>
<td>Power Glide Chainrings</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Number of teeth</td>
<td></td>
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</tr>
<tr>
<td>Top</td>
<td>44 T</td>
<td>44 T</td>
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<tr>
<td>Middle</td>
<td>34 T</td>
<td>34 T</td>
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<tr>
<td>Small</td>
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<td>24 T</td>
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<td>Crank length</td>
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<td>X</td>
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<td>175 mm</td>
<td>X</td>
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<td>Low profile</td>
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<tr>
<td>Chain guard</td>
<td>Option</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Chain type</td>
<td>PC/IG *</td>
<td>PC/IG *</td>
<td>PC/IG *</td>
</tr>
<tr>
<td>For derailleur “compact drive”</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Taper of bottom bracket cassette</td>
<td>JIS</td>
<td>JIS</td>
<td>JIS</td>
</tr>
<tr>
<td>square nut/screw</td>
<td>included in the program</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Chain line C. L.</td>
<td>47.5 +2.5</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Axle length of bottom bracket cassette</td>
<td>110 mm</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Q-Factor</td>
<td>161 mm</td>
<td>161 mm</td>
<td>161 mm</td>
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</table>

2

Assembly Requirements – Fig. 2
Combination crank set/Bottom bracket cassette (not a SRAM part)

<table>
<thead>
<tr>
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<th>Chain line C. L.</th>
<th>L</th>
<th>B</th>
<th>Taper A</th>
<th>L_g max</th>
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</thead>
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<td>Quartz triple</td>
<td>47.5 +2.5</td>
<td>110</td>
<td>55</td>
<td>X</td>
<td>77</td>
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<tr>
<td>Neos triple</td>
<td>47.5 +2.5</td>
<td>110</td>
<td>55</td>
<td>X</td>
<td>77</td>
</tr>
<tr>
<td>3000 triple</td>
<td>47.5 +2.5</td>
<td>110</td>
<td>55</td>
<td>X</td>
<td>77</td>
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</table>

ASSEMBLY

<table>
<thead>
<tr>
<th>Task</th>
<th>Procedure</th>
<th>Data, tools</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mounting crank</td>
<td>• Slide crank onto taper of bottom bracket axle</td>
<td>Allen key 8 mm</td>
</tr>
<tr>
<td></td>
<td>• Do not oil taper or use any fatty solutions!</td>
<td>Torque 40 Nm</td>
</tr>
<tr>
<td></td>
<td>• Tighten bolt of the crank/Bottom</td>
<td></td>
</tr>
<tr>
<td></td>
<td>bracket connection</td>
<td></td>
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</table>
TECHNICAL SPECIFICATIONS AND APPLICATION

<table>
<thead>
<tr>
<th>Type</th>
<th>PC 1</th>
<th>PC 41</th>
<th>PC 51</th>
<th>PC 80R</th>
<th>PC 61</th>
<th>PC 91</th>
<th>PC 59</th>
<th>PC 89R</th>
</tr>
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<tbody>
<tr>
<td>Use</td>
<td>Single / multi-speed hubs</td>
<td>MTB</td>
<td>MTB/ ROAD</td>
<td>ROAD</td>
<td>MTB</td>
<td>MTB</td>
<td>ROAD / MTB</td>
<td>ROAD</td>
</tr>
<tr>
<td>Dimensions</td>
<td>1/2&quot; x 1/8&quot;</td>
<td>1/2&quot; x 3/32&quot;</td>
<td></td>
<td></td>
<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>For derailleur</td>
<td>-</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
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<td>-</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>IG* compatible</td>
<td>-</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Exa-Drive* compatible</td>
<td>-</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
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</tr>
<tr>
<td>Max. no. of sprockets</td>
<td>1</td>
<td>8</td>
<td>8</td>
<td>8</td>
<td>8</td>
<td>9</td>
<td>9</td>
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</tbody>
</table>

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FEATURES

- Chamfered outer and inner plates
- Narrow width
- Pins chromized and heat-tret
- Power Link
- High load capacity
- Stamped outer plate (on PC 80R and PC 91)
- NEW: 9-speed chains, PC 59 and PC 89R

BENEFITS

- Easy and precise shifting
- Compatible with all indexed shifting systems
- Minimum chain wear
- High load capacity
- Reduced weight

ASSEMBLY (DERAILLEUR/CHAINS)

1/2" X 3/32"

Chain length:
(An assembly tool will be required to shorten the chain, see also point “Closing chain”, e.g. SRAM assembly pliers.)
- Replacing a worn chain: measure the worn chain and shorten the new chain to the same length (number of links).
- Initial assembly:
  - Shorten chain to the length specified by the derailleur manufacturer.
  - SRAM derailiers: place chain over largest front chainwheel and largest rear sprocket and add 2 links or 1 link + Power Link (Fig. 1). For frame versions with suspension, please read bicycle producer’s instruction.

Closing chain:
(Power Link and Power Link II connecting links)

...every chain is only as strong as its weakest link – traditionally this is the connecting link. In contrast, the POWER LINK connection is just as strong and durable as every other link in the chain. And it can be opened and closed as many times as you want without using tools.
- Fit chain, bring the two ends together and insert both halves of the Power Link into the chain ends. (Fig. 4)
- Press both halves of the connecting link together (Fig. 5) and lock in place by pulling the chain apart. (Fig. 6)
- To disassemble: Press both plates of the connecting link together ((Fig. 5) while sliding the chain ends together (unlock). Remove the two halves of the link from the chain ends.

IMPORTANT:
- "Power Link" (black) only for chains PC 41, PC 51, PC 80R, PC 61, PC 91.
- "Power Link II" (grey, “PL II” marked on the plate) only for chains PC 59, PC 89R.

Technical information may be enhanced without prior notice. Released 08/98.
ASSEMBLY
(SINGLE- AND MULTI-SPEED HUBS,
CHAIN PC1,
1/2" X 1/8")

Chain length:
• Measure the worn chain and shorten the new chain to the same length (number of links).
• For frame versions with suspension please read bicycle producer’s instruction.

Closing chain:
• Fit the shortened chain, bring the two ends together and connect with the chain lock. The chain lock consists of an outer plate with pins (1), an outer plate (2) and a retaining spring (3). (Fig. 7)
• Insert outer plate with pins (1) into the chain ends, attach outer plate (2) and press chain lock together (1+2). (Fig. 7)
• Attach retaining spring (3) with the closed end of the retaining ring pointing in the direction of chain travel. (Fig. 8)
• Slide retaining spring in the direction of arrow X (Fig. 8) to engage it in the grooves in the pins.

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

Warning:
• Make sure the retaining spring on the chain lock resp. Power Link is locked exactly into place.
• Always use a new chain lock resp. 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.
Because we care
• Before riding, always check the front and rear brake levers for proper operation.
• Be sure to practice riding and braking techniques under safe conditions before heading off road or out into traffic. Sudden operation of the brakes may cause the bicycle to pitch forward, possibly causing serious injury to the rider.

**INSTALLATION**

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

Fig. 1:
1. Slide the right linear-pull brake arm onto the right brake boss.
2. Align the stopper pin with the centerspring hole.
3. Using a 5mm hex wrench, tighten the brake boss bolt to 45–60 in-lb. (5.1–6.8 Nm).
4. Repeat 1-3 for the left arm. (Fig. 2)
5. Arrange the thick and thin spacers – for each pad – so when the pads are pushed against the rim, L is at least 39 mm. (Fig. 3)
6. Hold one pad against the rim using the arm.
7. Using a 5mm hex wrench, tighten the pad post nut to 50–70 in-lb. (5.6–7.9 Nm).
8. Repeat 6–7 for the other pad.

**Be sure to leave about 1 mm between the top of the brake pad and the top of the rim!** (Fig. 4)

*Use only NEW brake cable and cable housing!*

9. Run the new brake cable through the nozzle and the bellows.
10. Using a 5 mm hex wrench, tighten the cable clamp bolt to 50–70 in-lb. (5.6–7.9 Nm).

Leave a total clearance of 3mm (maximum) between the brake pads and the rim! (Fig. 5)

11. Using a small screw driver, turn the spring tension adjustment screws to balance the arms and equalize the pad offsets.
• turn the spring tension adjustment screw clockwise to pull the pad away from the rim.
• turn the spring tension adjustment screw counterclockwise to push the pad closer to the rim.

12. Pull each brake lever – hard – at least 5–10 times.

*Check that all the brake system components are functioning properly!*
BRAKE LEVER INSTRUCTIONS 7.0, 9.0

BRAKE LEVER ANATOMY

INSTALLATION

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

Check that all the brake system components are functioning properly!

Because we care
• Before riding, ALWAYS check the front and rear brake levers for proper operation.
   If there is interference between a shifter and a brake lever, rotate one out of the way.
   Check for proper brake lever operation again!
• Be sure to practice riding and braking techniques under safe conditions before heading off road or out into traffic. Sudden operation of the brakes may cause the bicycle to pitch forward, possibly causing serious injury to the rider. Riders who are not fully confident of their bike handling skills, SHOULD NOT remove the pie from the brake lever!

REACH ADJUSTMENT

Fig. 2:
Using a 2 mm hex wrench...
• Turn the reach adjustment screw clockwise to bring the lever closer to the handlebars.
• Turn the screw counterclockwise to move the lever further away.

Do NOT turn the screw past flush with the housing!

7.0 Brake Levers ONLY:
• STANDARD LEVERAGE OPTION – The brake lever is packaged with the pie installed. This option is the standard configuration for most braking conditions.
• MID LEVERAGE OPTION – Removing the pie results in the highest brake system leverage. This option has the greatest stopping power for a given amount of effort.

Fig. 3:
9.0 Brake Levers ONLY...
• STANDARD LEVERAGE OPTION – The brake lever is packaged with the pie installed in position 1. This option is the standard configuration for most braking conditions.
• MID LEVERAGE OPTION – Moving the pie to position 2 gives you greater brake system leverage. This option increases your stopping power for a given amount of effort.
• HIGH LEVERAGE OPTION – Removing the pie results in the highest brake system leverage. This option has the greatest stopping power for a given amount of effort.

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

Installing the pie:
1. Remove the brake cable.
2. Determine which option fits your riding needs.
3. Align the runner on the pie with the curved track in the lever.
4. Press the pie into the slot until it clicks.

After any adjustment to the reach or the leverage, always check the brake cable tension to ensure proper brake system performance and adjust the cable tension if necessary.

WARNING!
SRAM integrated brake shifters are designed for use with linear-pull brakes. Do not use SRAM integrated brake shifters with conventional cantilever brakes (those with arms measuring less than 76 mm and utilizing a non-linear straddle cable). Use of SRAM integrated brake shifters with conventional cantilever brake sets will result in faulty braking performance.
INTEGRATED BRAKE SHIFTER INSTRUCTIONS MRX™

INTEGRATED BRAKE SHIFTER ANATOMY

INSTALLATION

FRONT and REAR:
1. Slide the front (rear) integrated brake shifter onto the left (right) side of the handlebar. Leave room for the handlebar grip.
   • Bar end users – don’t forget to leave room for the bar end.
2. Tighten the 3 mm hex clamp bolt to 17 in-lb. (1.9 Nm). (Fig. 1)
3. Slide the plastic washer onto the handlebar.
   • The washer prevents the handlebar grip from interfering with the shifter rotation.
4. Slide the handlebar grip onto the handlebar.
   • Solvents, lubricants or hair spray may damage the handlebar grips!
   • Use only compressed air or water to aid installation.

SHIFTER:
1. Feed the shifter cable through the shifter cable housing and stops.
2. Attach the front (rear) shifter cable to the front (rear) derailleur.
3. Adjust indexing per the derailleur instructions.

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

Because we care
• Before riding, always check the front and rear brake levers for proper operation.
• Be sure to practice riding and braking techniques under safe conditions before heading off road or out into traffic. Sudden operation of the brakes may cause the bicycle to pitch forward, possibly causing serious injury to the rider.

SHIFTER CABLE CHANGE

Check this out:
• Leave the shifter on the handlebar
• No need to move other components
• THE SHIFTER DOES NOT NEED TO BE OPENED
• Use only new cable and compressionless cable housing

FRONT and REAR:
1. Detach the shifter cable from the appropriate derailleur.
2. Cut the cable off 6” from the shifter barrel adjuster. Discard the old cable and cable housing.
3. Line up the ‘1’ (front) or HIGHEST gear number (rear) mark with the indicator mark.
4. Carefully peel back the corner of the grip cover that is shown. (Fig. 2)
   • Use your fingernail or a small screwdriver.
5. Remove and discard the rest of the old cable.
6. Feed the new shifter cable through the cable entry in the grip and out through the shifter barrel adjuster.
7. Feed the cable through the new shifter cable housing and stops.
8. Attach the cable to the appropriate derailleur and adjust indexing per the derailleur instructions.

Hey!
• Clean all shifter parts using ONLY water and mild soap.
• Use ONLY Grip Shift Jonnisnot Grease for any shifter lubrication.

Warning!
SRAM integrated brake shifters are designed for use with linear-pull brakes. Do not use SRAM integrated brake shifters with conventional cantilever brakes (those with arms measuring less than 76 mm and utilizing a non-linear straddle cable). Use of SRAM integrated brake shifters with conventional cantilever brake sets will result in faulty braking performance.
APPENDIX

SPARE PARTS

You can find an extensive spare parts program in SRAM’s Spare Parts List Ref. Number 0368 201 060.

GLOSSARY

B-KNUCKLE
One of the two major rear derailleur body parts that anchors one side of the parallelogram links; houses the limit screws, b-adjust screw, and frame hanger bolt.

CABLE TRACK
A fixed or replaceable guide (depends on shifter) on a shifter housing that feeds the shifter cable smoothly into the shifter barrel adjuster.

COMPRESSIONLESS CABLE HOUSING
Index shifting specific cable housing; stiff, yet bends uniformly; characterized by many small wires arranged length wise; available in lined 3.8 mm, 4 mm, 5 mm outer diameters.

DI.R.T.™
SRAM mountain bike shifting technology; front and rear derailleurs designed to operate with Grip Shift twist shifters and traditional actuation ratio shifters.

ESP®
SRAM mountain bike shifting technology; rear derailleurs designed only to operate with ESP compatible Grip Shift shifters.

FRONT INDEX SHIFTER
SRAM front indexed shifters have 3 detents that are specific to traditional actuation ratios and chainring spacing. These shifter models should only be used with the following combination of front drive train components – SRAM or Shimano® front derailleur, Shimano® bottom bracket, SRAM or Shimano® crankset. The use of other front drive train components could cause poor shifting performance.

FRONT FRICTION SHIFTER
SRAM front friction shifters have 9 closely spaced detents that allow for greater trimming of front derailleurs. This detent design accommodates a wide variety of front drive train components.

FFS (FASTEST FRONT SHIFTING)
SRAM patented shifting technology; accomplishes 2 chainwheel shifts with one 70º twist; Shimano® compatible.

GRIFF SHIFT®
SRAM mountain bike shifting technology; twist shifters designed to operate ESP, DI.R.T. and Shimano® derailleurs.

LEVERAGE ADJUST
Three position power adjustment found on SRAM brake levers; allows for three distinct brake system power levels and customizing braking feel.

P-KNUCKLE
One of the two major rear derailleur body parts that anchors one side of the parallelogram links; mounting for the pulley cage assembly.

REACH ADJUST
Screw adjustment found on SRAM brake levers; allows changing the brake lever reach to fit different rider’s hand size.

SHOVEL CAM
SRAM patented cable pulling technology; currently in MRX and MRX 170 shifters; characterized by lower shifting effort and longer rotation; Shimano® compatible.

SRT
Size, Rotation, Transition. The design goals that drove the re-invention of the original, straight bar, Grip Shift twist shifters.