

2100



(english) **technical manual**
part # GEN.00000000001722 Rev. A

SRAM LLC WARRANTY

EXTENT OF LIMITED WARRANTY

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

LOCAL LAW

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

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

- a. Preclude the disclaimers and limitations of this warranty statement from limiting the statutory rights of the consumer (e.g. United Kingdom).
- b. Otherwise restrict the ability of a manufacturer to enforce such disclaimers or limitations.

LIMITATIONS OF LIABILITY

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

LIMITATIONS OF WARRANTY

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

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

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

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

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

Wear and tear parts are identified as:

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

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

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

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

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For exploded diagram and part number information, please refer to the Spare Parts Catalog available on our website at www.sram.com.

For order information, please contact your local SRAM distributor or dealer.

Information contained in this publication is subject to change at any time without prior notice. For the latest technical information, please visit our website at www.sram.com.

Your product's appearance may differ from the pictures/diagrams contained in this catalog.

Product names used in this document may be trademarks or registered trademarks of others.

2010



Technical Manual

TABLE OF CONTENTS

ROAD CHAINRING COMPATIBILITY CHART.....	6
MTB HANDLEBARS AND STEMS.....	7
PRESSFIT GXP BOTTOM BRACKET AND CRANKSET	10
GIGA X PIPE BOTTOM BRACKETS AND CRANKSETS.....	12
GIGA PIPE / ISIS DRIVE / ISIS OVERDRIVE BOTTOM BRACKETS.....	15
SQUARE XR / SQUARE LE / POWER SPLINE BOTTOM BRACKETS.....	17
BOXGUIDE / SHIFTGUIDE / CHAIN TENSIONER	19
HAMMERSCHMIDT.....	21
ANATOMY	21
FRAME PREPARATION	23
INSTALLATION	25
USE / MAINTENANCE.....	30
TECHNICAL SERVICE / ANATOMY	31
SERVICE SCHEDULE / TORQUE VALUES	32
TROUBLESHOOTING	33
TECHNICAL SERVICE	35



SAFETY FIRST

At SRAM Corporation, we care about you. Please, always wear your safety glasses and gloves when servicing your Truvativ products.
Protect your eyes! Wear your safety glasses!

ROAD CHAINRING COMPATIBILITY CHART

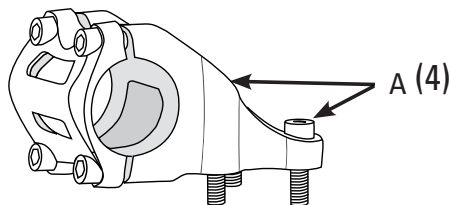
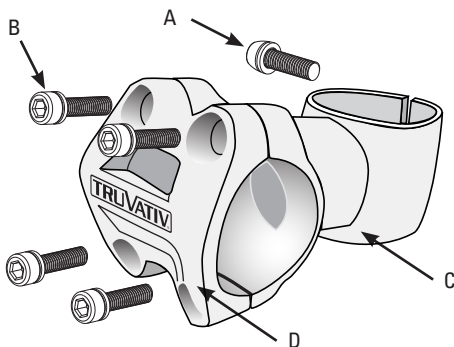
Combination	Rings	Material	Marking	8-speed	9-speed	10-speed	SRAM Only
39-53	39	Steel	39-53	●	●		
	53	Steel	53-V2				
39-53 *	39	Steel	39-53		●		
	53	AL-7075-4mm	53-V4 (w/ date code)				
39-53	39	AL-7075-3mm	39-53-V2			●	
	53	AL-7075-4mm	53-V4 (w/ date code)				
39-53	39	AL-7075-3mm	39-53-V2			●	●
	53	AL-7075-4mm	53T-S1 USE W/39T ONLY SRAM CHAIN ONLY (w/ date code)				
39-53	39	AL-7075-3mm	39-53-V2			●	●
	53-TT	AL-7075-4mm	53T-S1 USE W/39T ONLY SRAM CHAIN ONLY (w/ date code)				
42-54	42	AL-7075-3mm	42T-V4-130			●	●
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42-55	42	AL-7075-3mm	42T-V4-130			●	●
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39-48	39	Steel	39-53		●		
	48	AL-7075-3mm	48-V1				
39-48	39	Steel	39-53		●	●	
	48	AL-7075-4mm	48-39				
34-48	34-110BCD	AL-7075-3mm	34-110 V1 10 SPEED ONLY		●		
	48-110BCD	AL-7075-3mm	48T V1 USE W/34T ONLY (w/ date code)				
34-48	34-110BCD	AL-7075-3mm	34-110 V1 10 SPEED ONLY			●	
	48-110BCD	AL-7075-4mm	48T V2 USE W/34T ONLY (w/ date code)				
36-50	36-110BCD	Steel	36-V1-110	●			
	50-110BCD	Steel	50T-V3-110 36T ONLY				
36-50	36-110BCD	Steel	36-V1-110		●		
	50-110BCD	AL-7075-4mm	50T-A-V4 (for 36-50) (w/ date code)				
36-50	36-110BCD	AL-7075-3mm	36-110-V3 10 SPEED ONLY			●	
	50-110BCD	AL-7075-4mm	50T-A-V4 (for 36-50) (w/ date code)				
34-50	34-110BCD	Steel	34-110 V1		●		
	50-110BCD	AL-7075-4mm	50T-B-V2 (for 34-50) (w/ date code)				
34-50	34-110BCD	AL-7075-3mm	34-110 V1 10 SPEED ONLY			●	
	50-110BCD	AL-7075-4mm	50T-B-V2 (for 34-50) (w/ date code)				
34-50	34-110BCD	AL-7075-3mm	34-110 V1 10 SPEED ONLY			●	●
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	52-110BCD	AL-7075-4mm	52TC-S1 USE W/36/38T ONLY SRAM CHAIN ONLY (w/ date code)				
38-46	38	AL-7075-3mm	TRUVATIV 38		●	●	
	46	AL-7075-4mm	46-38				
30-39-50	30	AL-7075-3mm	30-V4			●	
	39	AL-7075-3mm	39-V4 (w/ date code)				
	50	AL-7075-4mm	USE W/ 39T ONLY				
30-39-52	30	AL-7075-3mm	30-V4			●	
	39	AL-7075-3mm	39-V4 (w/ date code)				
	52B	AL-7075-4mm	52B-V2 USE W/ 39T ONLY (w/ date code)				
30-42-52	30	Steel	30-V4	●	●		
	42	Steel	42-52 V3				
	52	Steel	52-V2				
30-42-52	30	Steel	30-V4		●		
	42	Steel	42-52 V3				
	52	AL7075-3mm	52-V2				
30-42-52	30	AL-7075-3mm	30-V4		●		
	42	AL-7075-3mm	42-52 V3				
	52	AL7075-4mm	52-V2				

* 39 STEEL RING MUST HAVE .20mm SPACERS BETWEEN SPIDER TABS AND RING FOR THIS RING COMBINATION TO BE 9 SPEED COMPATIBLE.

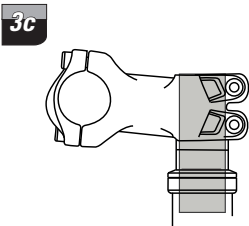
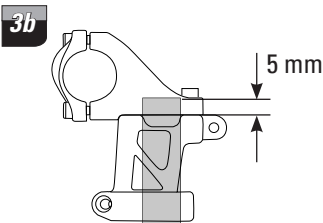
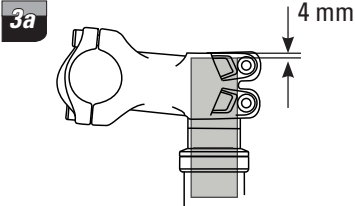
Last Update 16-Jun-09 JC

MTB HANDLEBARS AND STEMS

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IDENTIFY PARTS AND TOOLS

STEM PARTS*

- | | |
|---|----------------|
| A - Steerer Clamp or direct mount bolt(s) | C - Stem |
| B - Face Clamp bolts | D - Face Clamp |

TOOLS NEEDED

- | | |
|-----------------------------|--|
| Safety Glasses | Grease or titanium anti-seize for titanium bolts |
| 4, 5, and 6 mm hex wrenches | Isopropyl alcohol |
| Torque wrench | 400 grit sandpaper |
| Friction paste | 28-tooth blade saw |

*Your Truvativ stem may differ from the model shown

PREPARE PARTS

- 1 Use isopropyl alcohol to clean the fork steerer tube, stem steerer clamp surface as well as the handlebar and stem contact surfaces.

Important: do not lubricate any of the surfaces.

- 2 Remove stem bolts and apply grease on standard bolt threads or titanium anti-seize on titanium bolt threads.

IMPORTANT: while the bolts are removed, remove any burrs from the stem steerer clamp and face clamp surfaces and smooth with 400 grit sandpaper.

Re-install the steerer clamp bolt(s) until finger tight and the bolt head contacts the stem surface. Set aside the face clamp bolts.

- 3 Install the fork onto the bike according your fork manufacturer's instructions. If the fork's steerer tube needs to be cut, adhere to the following instructions to ensure proper stem clamp engagement with the steerer tube:

IMPORTANT: be sure to account for the overall stack height of the stem, headset, and spacers prior to cutting.

Standard steerer tube (3a): measure and cut the steerer tube 4 mm below the top of the stem.

Dual crown-steerer (3b): mark the steerer tube making sure 5 mm of steerer tube is exposed above the upper crown and cut to the proper length.

Carbon steerer tube (3c): the steerer tube must be cut flush with the top of the stem. Apply masking tape at the cut location to help prevent the carbon from fraying. Use a 28-tooth (minimum) blade saw and cut to the proper length.

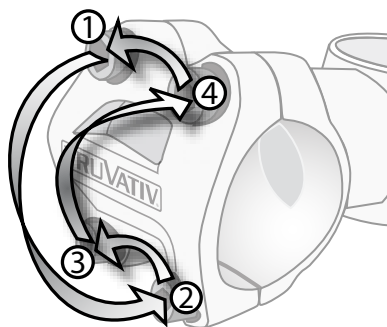
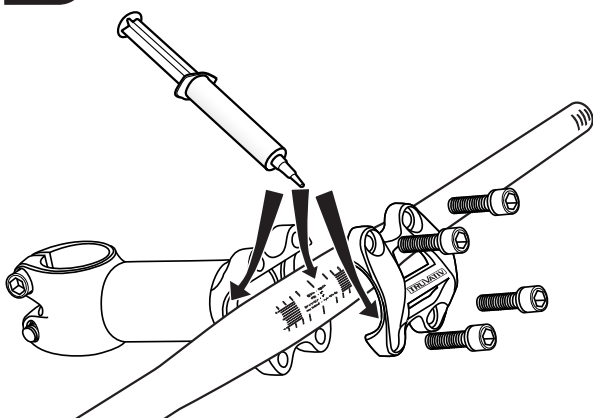
Smooth the entire cut area with 400 grit sandpaper.

MTB HANDLEBARS AND STEMS

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4

Size your handlebar. If necessary, your handlebar width can be cut narrower to suit your personal preference.

IMPORTANT: remove handlebar bar plugs prior to cutting. Do not cut narrower than the cut down lines specified on the handlebar.

Standard handlebar: use the cut down lines to determine your final handlebar width then cut at the same mark on each side of the handlebar.

Carbon handlebar (except Noir World Cup riser bar): use the cut down lines to determine your final handlebar width. Apply masking tape at the same cut down line on each side of the handlebar to help prevent the carbon from fraying. Use a 28-tooth (minimum) blade saw and cut to the proper width.



WARNING - NOIR WORLD CUP RISER BAR

Do **not** cut Noir World Cup riser bars.

Smooth the entire cut area with 400 grit sandpaper and re-install handlebar bar plugs.

INSTALLATION

5

Install the stem and top cap on the fork steerer tube.

IMPORTANT: follow your headset manufacturer's instructions for proper installation of the headset compression device, star nut, or expansion plug.

Align the stem to the bike, then preload the headset by installing the top cap bolt to the torque specified by your headset manufacturer's instructions.

6

Tighten the steerer clamp or direct mount bolt(s), in increments of one full turn, in an alternating fashion, to 7.9 - 9.0 N·m (70 - 80 in-lb).



WARNING

Do not over tighten the steerer clamp bolt(s). Over tightening the steerer clamp bolt(s) could damage the fork's steerer tube and cause it to fail, which could lead to serious injury and/or death.

7

Install handlebar onto stem.



WARNING - CARBON HANDLEBARS AND STEMS

If your handlebar and/or stem is carbon, you **must** apply friction paste to the contact surfaces. Friction paste is designed to create friction between the contact surfaces to prevent the handlebar from slipping without over-torquing the face clamp bolts. Coat each contact surface of the handlebar and stem with a moderate amount of friction paste prior to installing. Failure to use friction paste could cause your handlebar to slip while riding which could lead to serious injury and/or death.

Center the handlebar in the stem face clamp and angle it to suit your personal preference.

Finger tighten the face clamp bolts such that there is an equal gap on the top and bottom of the stem face clamp and each bolt head touches the stem surface.

Tighten each bolt one full turn, in a continuous sequence, while maintaining an equal gap on the top and bottom of the stem face clamp. Torque to 5.6 - 6.8 N·m (50 - 60 in-lb).



Install handlebar controls according to manufacturer's instructions.



ADVICE

Avoid scratching or gouging the handlebar when installing controls. Remove any burrs from the control clamp surfaces and smooth with 400 grit sandpaper.

We highly recommend the use of friction paste when installing controls on a carbon handlebar. Coat each contact surface of the handlebar and controls with a moderate amount of friction paste prior to installing.

Do **not** install controls on the bend of riser handlebars.



WARNING - SRAM X.0 and X.9 SHIFTERS WITH TRUVATIV CARBON HANDLEBARS

Because of the unique design of the clamp for SRAM X.0 and X.9 shifters, do **not** exceed 3 N-m torque when mounting to Truvativ carbon handlebars. You **must** apply a moderate amount of friction paste to the contact surfaces of the handlebar and controls prior to installation. Failure to follow these instructions could cause damage to the handlebar which can lead to premature fatigue and/or failure of the handlebar, resulting in serious injury and/or death.



WARNING - BAR ENDS

Any damage to the handlebar when installing bar ends voids your warranty and can lead to premature fatigue and/or failure of the handlebar, resulting in serious injury and/or death.

Standard handlebar: be sure to install non-compressible bar plugs prior to installing bar ends. Make certain the end of the handlebar is not crimped nor damaged when bar ends are tightened.

Carbon handlebar - flat bars only: you **must** install Truvativ alloy bar plugs prior to installing bar ends. Use of non-Truvativ alloy bar plugs will void your warranty. Make certain the end of the handlebar is neither crimped nor damaged when bar ends are tightened.

Carbon handlebar - riser bars: **never** use bar ends on carbon riser bars.

SAFETY CHECK

Check that the handlebar does not slip in the stem. Check that the handlebar controls do not slip on the handlebar.

Check handlebar control cables for binding. The front wheel must be free to turn at least 90 degrees to either side of the bicycle frame.

Pinch the front wheel between your knees and twist handlebar. The stem should not twist separately from the front wheel.



WARNING

Please inspect the torque for all stem bolts after your first ride, and periodically afterwards. You should never ride with a loose stem and/or handlebar.

MAINTENANCE

Clean the stem and handlebar using only water and mild soap.

Regularly inspect components for signs of damage or fatigue.

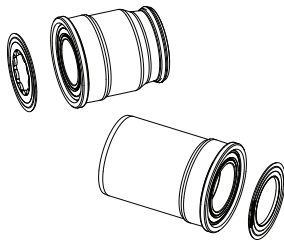
Always inspect components for damage after any crash.

Signs of damage or fatigue include, but are not limited to cracks, dents, deformation, discoloration, deep scratches, or audible creaking. **Discontinue use and replace any parts that show signs of damage or fatigue.** Do not attempt to repair parts. If you are unsure of the integrity of your handlebar or stem, have them inspected by your Truvativ dealer.

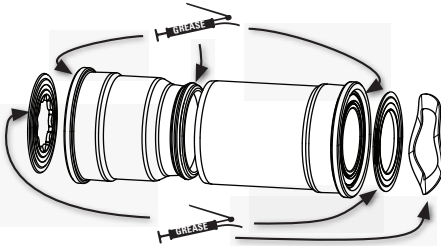
Periodically replace your handlebar and stem with new ones. Frequency and type of riding along with rider weight will impact the overall life of the handlebar and stem. Consult a Truvativ dealer for help determining a replacement schedule appropriate for you.

PRESSFIT GXP BOTTOM BRACKET AND CRANKSET

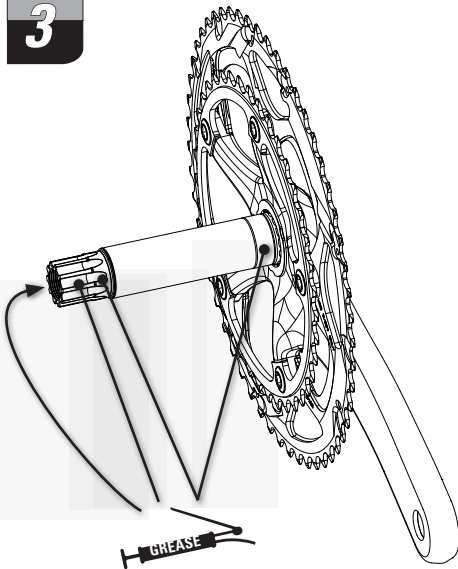
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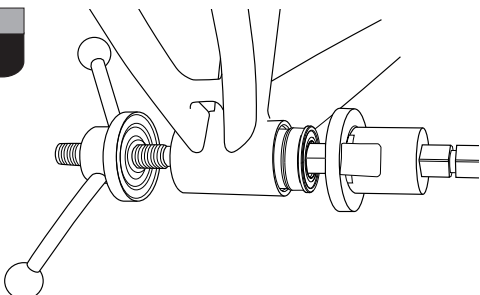
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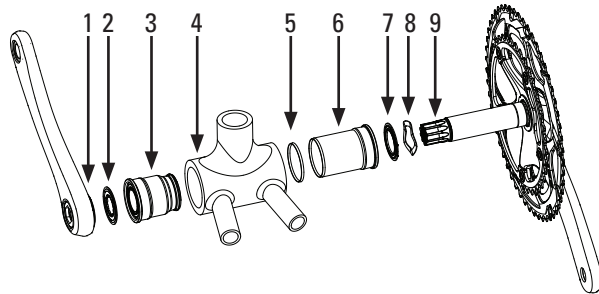


4



ANATOMY

1. Non-Drive Side Crank Arm
2. Non-Drive Side Bearing Shield
3. Non-Drive Side Bottom Bracket Cup
4. Bottom Bracket Shell
5. Drive Side Spacer - MTB only
6. Drive Side Bearing Shield
7. Drive Side Bottom Bracket Cup
8. Wave Washer
9. Drive Side Crank Arm and Spindle



IMPORTANT

To ensure that your PressFit GXP ROAD or MTB Bottom Bracket performs properly and to help make your riding experience more enjoyable and trouble-free, we highly recommend that you have it installed by a qualified bicycle mechanic. Installation of the adapter does not have to be permanent. However, removal of the adapter can damage the cups and bearings. Do not re-use the adapter after removal from the frame shell. The adapter will only work in undamaged frames in good condition. The adapter must NOT be used as a way to repair frames with damaged press fit bottom bracket shells. Improper use, installation or removal of the adapter will void your warranty and can void the warranty for your frame.

COMPATIBILITY

PressFit GXP ROAD Bottom Bracket: enables the use of SRAM and Truvativ GXP road double cranksets in frames designed with sleeveless (PressFit) bottom bracket shells of 86.5 mm width, and 41 mm diameter.

PressFit GXP MTB Bottom Bracket: enables the use of SRAM and Truvativ GXP MTB triple cranksets in frames designed with sleeveless (PressFit) bottom bracket shells of 89.5 mm or 92 mm width, and 41 mm diameter.

TOOLS

Installation

- Safety glasses
- 8 mm, 16 mm (5/8") hex
- Torque wrench
- Headset Press (Park Tool™ HHP-2 or equivalent)
- Grease
- Pick

PREPARE PARTS

1 Carefully remove the bearing shields from the bottom bracket cups. You may need to use a pick to free the shields from the bottom bracket cups.

2 Apply grease to the bottom bracket surfaces as indicated.

3 Generously apply grease to the the crank spindle as indicated.

INSTALLATION



ATTENTION

Bearing shields must be removed from the bottom bracket cups prior to installation (**step 1**).

ATTENTION

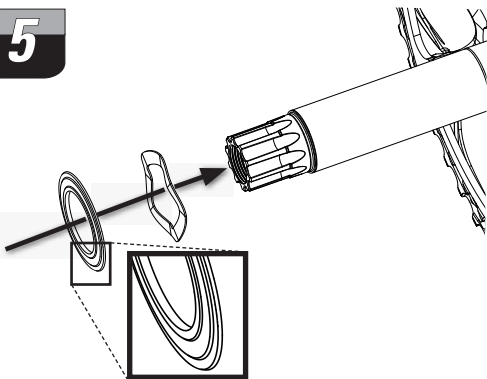
For PressFit GXP MTB bottom brackets only: If the bottom bracket shell width is 89.5 mm wide, install the 2.5 mm spacer between the drive side cup and frame. No spacer is required for a bottom bracket shell width of 92 mm.

4 Using a headset press, press the drive side bottom bracket cup into bottom bracket shell until bottom bracket cup flange is fully seated against bottom bracket shell. Repeat process for non-drive side bottom bracket cup. Consult your headset press manufacturer's instructions for proper operation of the headset press.

Identification of non-drive side bottom bracket cup:	
PressFit GXP ROAD:	 O-Ring
PressFit GXP MTB:	

PRESSFIT GXP BOTTOM BRACKET AND CRANKSET

5



- 5** Install the wave washer and then the drive side bearing shield onto the spindle, making sure the bearing shield is oriented correctly. The stepped lip on the bearing shield should face the bottom bracket shell.



ADVICE

The drive side bearing shield inner diameter has a circular design. The non-drive side bearing shield inner diameter has a "flower" like design.

- 6** Gently and completely insert the drive side crank assembly spindle through the bottom bracket cups until the non-drive side splines come through the non-drive side bottom bracket cup, and the spindle stops.

- 7** Install the non-drive side bearing shield onto the spindle, making sure the bearing shield is oriented correctly. The stepped lip on the bearing shield should face the bottom bracket shell (not pictured).

- 8** Apply grease to the threads of non-drive side crank bolt. Place the non-drive side crank arm on the spindle and use a 8 mm hex to torque the crank bolt to 48-54 N-m (425-478 in-lb).

Check the assembly for play by rocking the crank arms back and forth away from frame. If the crank moves, tighten crank arm bolt until no play is detected. If maximum torque of 54 N-m (478 in-lb) has been achieved, remove the crank arm from the spindle, apply additional grease and repeat installation procedures until play is eliminated.

PEDAL INSTALLATION

- 9** Grease the pedal threads and install the included pedal washers (a, Figure 9). Thread the pedals into the crankarms, and torque to 47-54 N-m (416-478 in-lb).



ADVICE

The drive side is right hand pedal-thread. Non-drive side is left hand pedal-thread.

MAINTENANCE

Important: use only water and a mild soap to clean crankset and bottom bracket. Do NOT use a pressure washer.



ADVICE

If creaking of the assembly occurs, check that all parts are torqued to specification, and grease is liberally applied on all surfaces noted. Verify that chainring bolts are torqued to 8-9 N-m (80-90 in-lb). If creaking continues, consult your local Truvativ dealer for assistance.



ATTENTION

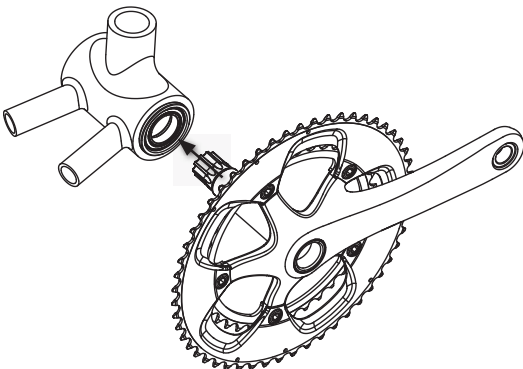
Bearings require regular maintenance. Re-grease bearings after 100 hours of use in dry conditions or immediately following any significant exposure to water; such as riding in heavy rain or through water crossings.

REMOVAL

- 10** Use the self-extracting crank bolt assembly or crank puller (if applicable) to remove the non-drive side crank arm. Use a rubber mallet to gently tap the end of the crank spindle towards the frame, and slide it out of the bottom bracket. Remove the bearing shields from the bottom bracket cups (not pictured).

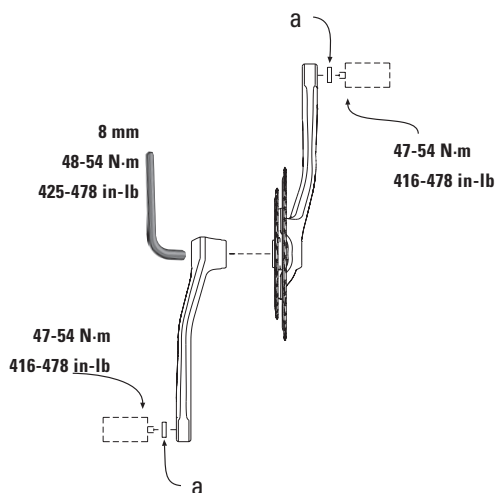
The bottom bracket should be removed by applying force on the internal adapter cup wall (not the bearing) (not pictured).

6



8

9

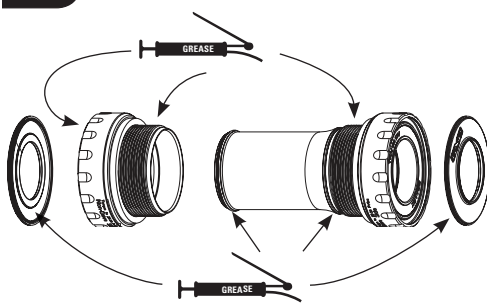


GIGA X PIPE BOTTOM BRACKETS AND CRANKSETS

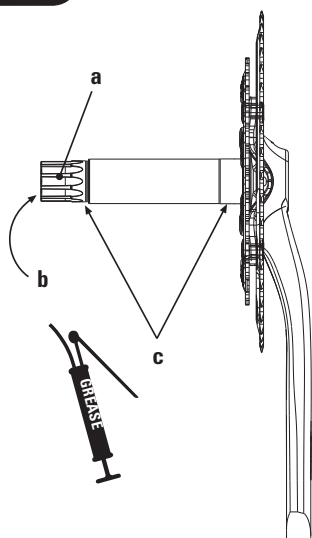
COMPATIBILITY

Crankset Model		Chainline	Frame Shell Width	Spacer Configuration	Chain Compatibility
Omnium	Track / Single Speed	41.0 mm	68 mm	-	1/2" X 1/8"
		41.2 mm	70 mm (Italian)	-	
Elita*, Rouleur, Rouleur OCT, Rouleur Carbon, Noir Road	Double	44.5 mm	68 mm	-	10 Speed * 9 Speed Elita configuration available
		44.7 mm	70 mm (Italian)	-	
	Triple	46.5 mm	68 mm	-	
		46.7 mm	70 mm (Italian)	-	
Firex, Stylo, Stylo OCT, Noir XC	Triple / Double with Rockguard / Single Speed	51.0 mm	68 mm	2 Spacers (one per side)	9 Speed
			68-E	1 Spacer (non-drive side)	
			73 mm / 73-E	-	

2



3



IMPORTANT

To ensure that your crankset and bottom bracket perform properly, we highly recommend that you have them installed by a qualified bicycle mechanic. We also urge you to follow our recommendations to help make your riding experience more enjoyable and trouble-free. Truvativ cranksets and bottom brackets are designed to function optimally as a system. For optimal performance use with Truvativ and SRAM components. e instructions provided by the other manufacturer in order to ensure proper installation.

TOOLS AND SUPPLIES

TOOLS

- Safety Glasses
- Torque wrench
- 8 mm, 10 mm, 16 mm (5/8") hex wrench
- Bottom Bracket installation tool (Truvativ GXP tool, Park™ BBT9 or equivalent)
- Grease

1 Assure the frame's bottom bracket shell threads are clean and undamaged; there should be no paint or dirt present. Have your bottom bracket shell chased and faced by a professional bicycle mechanic for best results. Make sure the threads of your GXP bottom bracket match the threads in the bottom bracket shell of your frame, IT for Italian threading (etched on the bottom bracket cup), BSA for standard threading, or TD for tandem captain.

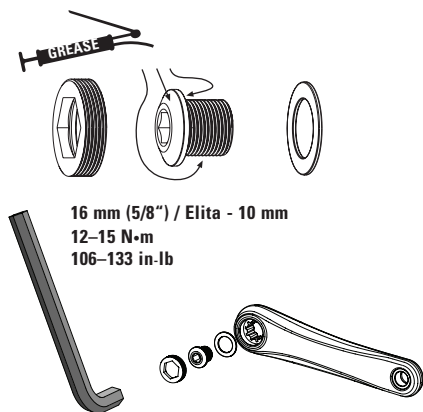
2 Apply grease to the bottom bracket as illustrated. Refer to the Compatibility chart for spacer configuration. The bearing seals should be pressed into the bottom bracket cups so that the outer lip seats firmly into the bottom bracket cup groove.

IMPORTANT: drive side bearing seal has larger inner diameter than non-drive side seal. Tandem captain GXP bottom brackets have identical seals

3 Apply grease to the crank spindle surfaces indicated.

GIGA X PIPE BOTTOM BRACKETS AND CRANKSETS

4



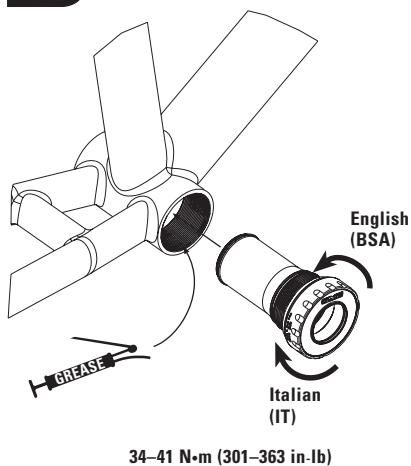
- 4** If it is not already assembled, prepare the self-extracting crank bolt as illustrated. Apply grease to the surfaces indicated. Use a 16 mm hex (5/8") (10 mm hex for Elita cranksets) to install self-extracting crank bolt and torque to 12–15 N•m (106–133 in-lb).

INSTALLATION

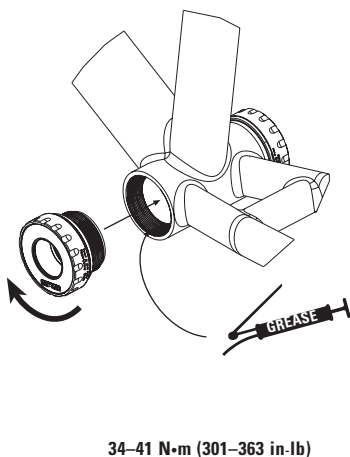
- 5** Thread the drive side bottom bracket cup into the frame until the flange (or spacer) contacts the bottom bracket shell face. Torque to 34–41 N•m (301–363 in-lb).
- 6** Thread the non-drive side bottom bracket cup into the frame until the flange (or spacer) contacts the bottom bracket shell face. Torque to 34–41 N•m (301–363 in-lb).
- 7** Apply grease to the inner bearing races as illustrated. Slide the right crankarm assembly spindle through the drive side bottom bracket cup until the splines come through the non-drive side bottom bracket cup and the spindle stops.
- 8** Assemble the left crank arm onto the bottom bracket spindle using an 8 mm hex and torque to 48–54 N•m (425–478 in-lb).

Check the assembly for play by rocking the crank arms back and forth away from frame. If the crank moves, tighten crank arm bolt until no play is detected. If maximum torque of 54 N•m (478 in-lb) has been achieved, remove the crank arm from the spindle, apply additional grease and repeat installation procedures until play is eliminated.

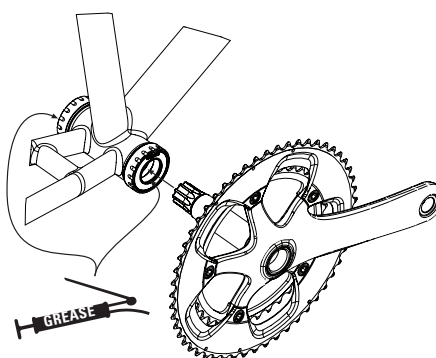
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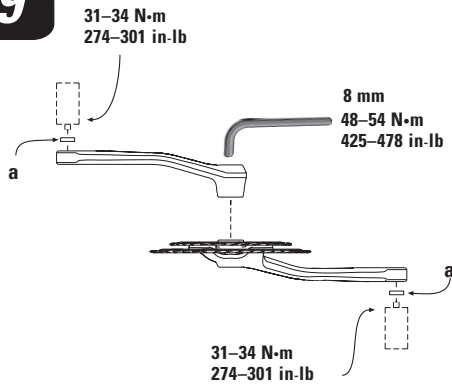
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GIGA X PIPE BOTTOM BRACKETS AND CRANKSETS

8

9



PEDAL INSTALLATION

9 Grease the pedal threads and install pedals to the crankarms. Torque to 31–34 N•m (274–301 in-lb). Use the included pedal washers (**a**, **Figure 9**) if the pedal contact surface is not flat and smooth.

IMPORTANT: drive side is right hand pedal-thread. Non-drive side is left hand pedal-thread.

MAINTENANCE

IMPORTANT: use only water and a mild soap to clean crankset and bottom bracket. Do NOT use a pressure washer.



NOTE

If creaking of the assembly occurs, check that all parts are torqued to specification, and grease is liberally applied on all surfaces noted. Verify that chainring bolts are torqued to 8–9 N•m (80–90 in-lb). If creaking continues, consult your local Truvativ dealer for assistance.



NOTE

GXP seals are designed to prevent contamination and therefore must rub against their sealing surfaces. New GXP seals will feel stiff upon initial installation. This is normal. With use the seals will wear-in and loosen up.



NOTE

Ceramic bottom bracket bearings require regular maintenance. Re-grease bearings using SKF LGHP2 grease after 100 hours of use in dry conditions or immediately following any significant exposure to water (riding in heavy rain, water crossings).

- Remove crankarms according to manufacturer's instructions.
- Using a pick, carefully remove external seals from the face of bottom bracket, and rubber bearing seal from the face of bearing.
- Load SKF LGHP 2 grease into syringe. Apply grease, ensuring that bearings are completely covered, including between bearings.
- Press the rubber bearing seal back into place.
- Apply light coating of grease to the inside surface of the external seal. Press external seals into place so that the outer lip seats firmly in bottom bracket cup groove.
- Wipe away any excess grease with a clean cloth.
- Re-install crankarms according to manufacturer's instructions.

GIGA PIPE / ISIS DRIVE / ISIS OVERDRIVE BOTTOM BRACKETS

Application Chart				
Part	Road	XC	AM	DH
BB-##-(GPSL/GPTI/MXTI/ODSL/ODTI/SPL-SLLT)-###				
BB-##-(BMX/GPDH/ODDH/SPL-DHLT)-###				

Key: XC = Crosscountry AM = All-Mountain DH = Downhill

Compatibility					
Spindle/BB Shell	Frame Shell Width	Chainline	E-type Der. Chainguide	Spacer Config.	O-Ring
Part #: BB-##-(GPSL/GPTI/SPL-SLLT)-108/68					
108/68	68mm	46 1-spd/44.5 rd. double/42.5 track	No	NO Spacer	No
Part #: BB-##-GPSL-108/70 (Italian Thread)					
108/70*	70mm	46 1-spd/44.5 rd. double/42.5 track	No	NO Spacer	No
Part #: BB-##-(GPDH/GPSL/GPTI/MXTI/SPL-DHLT/SPL-SLLT)-113/(68/68E/73)					
113/68	68mm	48.5 mtb/47 rd. TT	No	ONE Spacer	Yes
113/68E	68mm	48.5 mtb/47 rd. TT	Yes	NO Spacer	Yes
113/73	73mm	48.5 mtb	No	NO Spacer	No
Part #: BB-##-BMX-113/68					
113/68	68mm**	42.5 bmx	No	NO Spacer	No
Part #: BB-##-(GPDH/GPSL/GPTI/MXTI/SPL-SLLT/SPL-DHLT)-118/(68/68E/73)					
118/68	68mm	51mtb/46.5 road trp.	No	ONE Spacer	Yes
118/68E	68mm	51 mtb	Yes	NO Spacer	Yes
118/73	73mm	51 mtb	No	NO Spacer	No
Part #: BB-##-(GPDH/GPSL/GPTI/MXTI/SPL-DHLT/SPL-SLLT)-118/73E					
118/73E	73mm	51 mtb	Yes	NO Spacer	No
Part #: BB-##-GPSL-118/70 (Italian Thread)					
118/70*	70mm	46.5 road triple	No	NO Spacer	No
Part #: BB-##-(GPDH/GPSL)-128/(68/68E/73)					
128/68	68mm	56 mtb	No	ONE Spacer	Yes
128/68E	68mm	56 mtb	Yes	NO Spacer	Yes
128/73	73mm	56 mtb	No	NO Spacer	No
Part #: BB-##-GPDH-128/73E					
128/73E	73mm	56 mtb	Yes	NO Spacer	No
Part #: BB-##-GPDH-128/(83/83E)					
128/83	83mm	56 mtb	No	ONE Spacer	No
128/83E	83mm	56 mtb	Yes	NO Spacer	No
Part #: BB-##-GPDH-148/(100/100E)					
148/100	100mm	66 mtb	No	ONE Spacer	No
148/100E	100(E)mm	66 mtb	Yes	NO Spacer	No
Part #: BB-##-(ODSL/ODTI)-108/68 (ISIS Overdrive™ Shell)					
108/68	68mm	46 1-spd/44.5 rd. double/42.5 track	N/A	N/A	N/A
Part #: BB-##-(ODDH/ODSL/ODTI)-113/68 (ISIS Overdrive™ Shell)					
113/68	68mm	48.5 mtb/42.5 bmx/47 rd. TT	N/A	N/A	N/A
Part #: BB-##-(ODDH/ODSL/ODTI)-118/68 (ISIS Overdrive™ Shell)					
118/68	68mm	51mtb/46.5 road trp.	N/A	N/A	N/A
Part #: BB-##-ODDH-128/68 (ISIS Overdrive™ Shell)					
128/68	68mm	56 mtb	N/A	N/A	N/A
Part #: BB-04-ODDH-148/100 (ISIS Overdrive™ Shell)					
148/68	100mm	66 mtb	N/A	N/A	N/A

*= Italian threaded bottom bracket shells only

**=68mm BSA (Euro) shell OR BMX shell with Truvativ BMX to BSA shell adapter.

Parts and Tools

Parts:

- Bottom bracket
- Left Bottom Bracket Adapter
- Spacer (not used in all applications)
- O-Ring (not used in all applications)

Tools:

- Bottom bracket installation tool (Truvativ BB-02-SPL-TOOL, Park™ BBT8, or equivalent)
- Torque wrench

Supplies:

- Grease
- Titanium anti-seize compound (ODTI, GPTI, and MXTI BB only)

Parts Preparation

Step 1

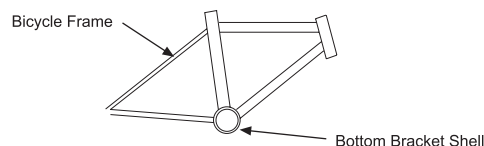


Figure 1

Assure the frame's bottom bracket shell threads are clean and undamaged, there should be no paint or dirt present. Have your bottom bracket shell chased and faced by your bike shop for best results. Check to make sure the threads of your Truvativ bottom bracket match the threads in the bottom bracket shell of your frame, i.e. Italian or English threads.

Step 2

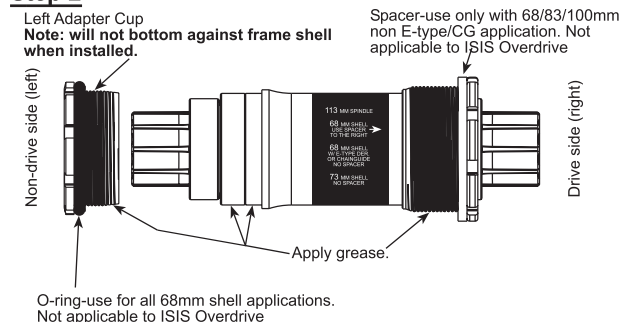


Figure 2

Pre-assemble the bottom bracket as shown, omitting the spacer and/or O-ring if not used in your application, refer to the Compatibility Chart. Apply grease to the surfaces shown in Figure 2.

GIGA PIPE / ISIS DRIVE / ISIS OVERDRIVE BOTTOM BRACKETS

Assembly

Step 1

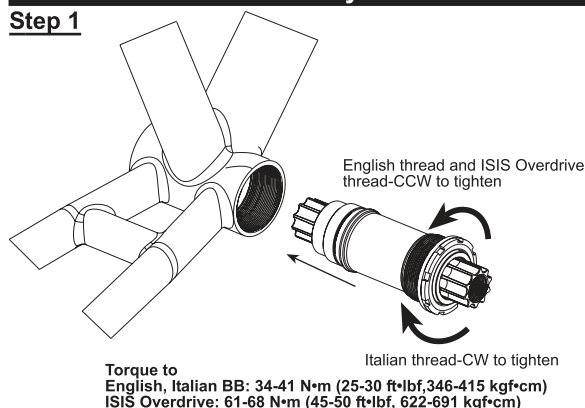


Figure 3
Thread the prepared bottom bracket into the drive side (right side) of the frame until the flange, or spacer if applicable, bottoms against the frame shell face. Torque to 34-41 N•m (25-30 ft•lbf, 346-415 kgf•cm) or 61-68 N•m (45-50 ft•lbf, 622-691 kgf•cm) for ISIS Overdrive BBs using a torque wrench. Note the tightening direction for Italian and English or ISIS Overdrive threaded bottom brackets shown in Figure 3.

Step 2

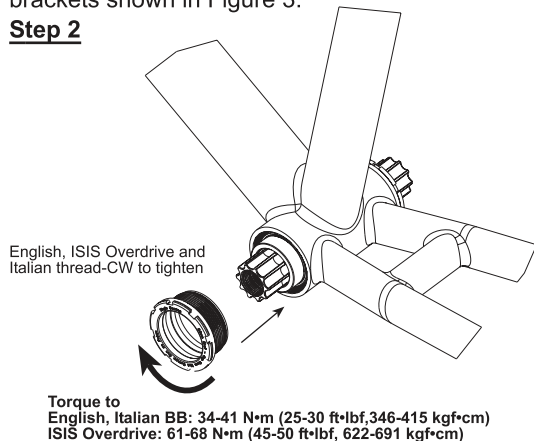
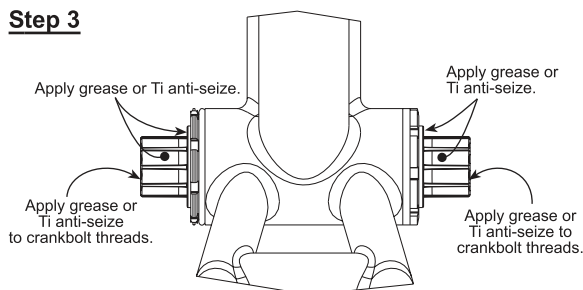


Figure 4
Thread the prepared left adapter cup into the non-driveside (left side) of the frame. The tightening direction for both English, ISIS Overdrive, and Italian is the same for the left adapter cup, refer to Figure 4. The cup flange will NOT bottom against the left face of the frame shell. The O-ring should be installed on the left adapter cup in 68mm shell applications, refer to the compatibility

Step 2 (cont'd)

chart. Torque the left adapter cup to 34-41 N•m (25-30 ft•lbf, 346-415 kgf•cm) or 61-68 N•m (45-50 ft•lbf, 622-691 kgf•cm) for ISIS Overdrive BBs using a torque wrench.

Step 3



Note: Do not exceed 47 N•m (35 ft•lbf, 484 kgf•cm) torque when tightening the crankarm bolts.

Figure 5

Apply grease, or titanium anti-seize if you have a titanium spindle, liberally as shown in Figure 5, to the spline surfaces of the spindle, the faces of the crank stops, and also to the crankbolt threads in order to prepare the bottom bracket for crankarm installation. When installing the crankarms do not exceed 47 N•m (35 ft•lbf, 484 kgf•cm) torque when tightening. Consult your crankarm instruction manual for exact torque specifications.

SQUARE XR / SQUARE LE / POWER SPLINE BOTTOM BRACKETS

Application Chart				
Part	Road	XC	AM	DH
BB-##-(SQ-LE/XR)/PSPL-###/###				
Key: XC = Crosscountry AM = All-Mountain DH = Downhill				
Compatibility				
Spindle/ BB Shell	Frame Shell Width	Chainline	E-type Der. Chainguide	Spacer Configuration
Part #: BB-##-SQ-LE-108/68(A)				
108/68	68mm	46 Dual Drive/46.5 mt. double/43.5 track	No	NO spacer
Part #: BB-##-SQ-XR/LE-113/(68/68(E)/73)(A)				
113/68	68mm	48.5 mtb/46.5 road triple	No	NO spacer
113/68(E)/73	68mm	48.5 mtb	No	ONE Spacer
113/68(E)/73	68mm	48.5 mtb	Yes	NO Spacer
113/68(E)/73	73mm	48.5 mtb	No	NO Spacer
113/73	73mm	48.5 mtb	No	NO Spacer
Part #: BB-##-PSPL-108/68(A)				
108/68	68mm	46 Dual Drive/44.5 mt. double/42.5 track	No	NO spacer
Part #: BB-##-PSPL-113/(68/68(E)/73)(A)				
113/68	68mm	48.5 mtb/47 rd TT	No	NO spacer
113/68(E)/73	68mm	48.5 mtb/47 rd TT	No	ONE spacer
113/68(E)/73	68mm	48.5 mtb	Yes	NO spacer
113/68(E)/73	73mm	48.5 mtb	No	NO spacer
113/73	73mm	48.5 mtb	No	NO spacer
Part #: BB-##-PSPL-118/(68/68(E)/73)				
118/68	68mm	46.5 road triple	No	NO spacer
118/68(E)/73	68mm	51 mtb/46.5 road triple	No	ONE spacer
118/68(E)/73	68mm	51 mtb	Yes	NO spacer
118/68(E)/73	73mm	51 mtb	No	NO spacer
Parts and Tools				

Parts:

- Bottom bracket
- Left Bottom Bracket Adapter
- Spacer (not used or included in all applications)

Tools:

- Bottom bracket installation tool (Park™ BBT2, or equivalent)
- Torque wrench

Supplies:

- Grease

Parts Preparation

Step 1

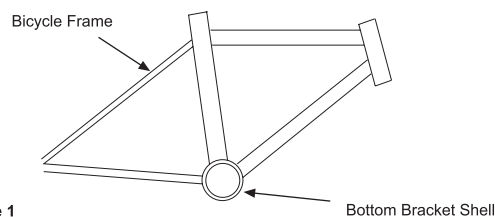


Figure 1

Assure the frame's bottom bracket shell threads are clean and undamaged, there should be no paint or dirt present. Have your bottom bracket shell chased and faced by your bike shop for best results. Check to make sure the threads of your Truvativ bottom bracket match the threads in the bottom bracket shell of your frame.

Step 2

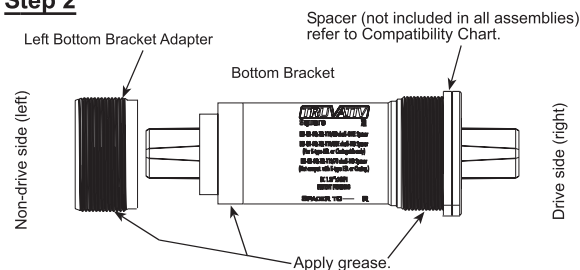
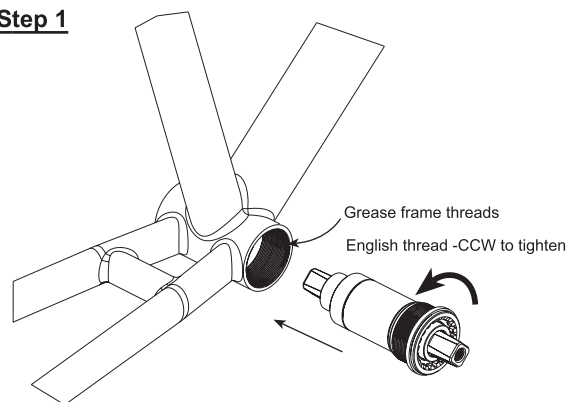


Figure 2

Prepare the bottom bracket as shown, use the spacer if it is included and required for your application, refer to the Compatibility Chart. Apply grease to the surfaces shown in Figure 2.

Assembly

Step 1



Torque to 34-41 N•m (25-30 ft•lbf, 346-415 kgf•cm)

Figure 3

SQUARE XR / SQUARE LE / POWER SPLINE BOTTOM BRACKETS

Step 1 (cont'd)

Thread the prepared bottom bracket into the drive side (right side) of the frame until the flange, or spacer if applicable, bottoms against the frame shell face. Torque to 34-41 N•m (25-30 ft•lbf, 346-415 kgf•cm) using a torque wrench. Refer to Figure 3.

Step 2

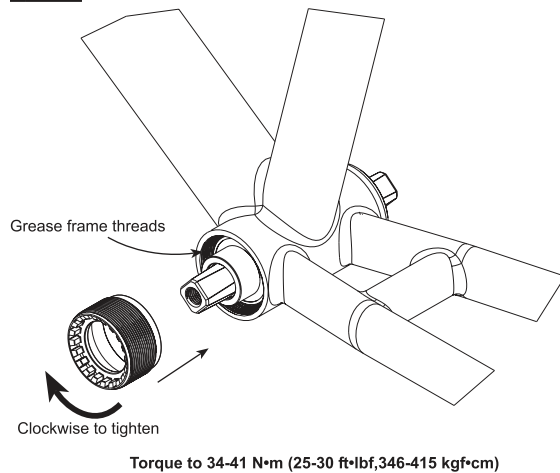


Figure 4

Thread the prepared left adapter cup into the non-drive side (left side) of the frame. The tightening direction is clockwise, refer to Figure 4. Torque the left adapter cup to 34-41 N•m (25-30 ft•lbf, 346-415 kgf•cm) using a torque wrench.

Step 3 (for square taper only)

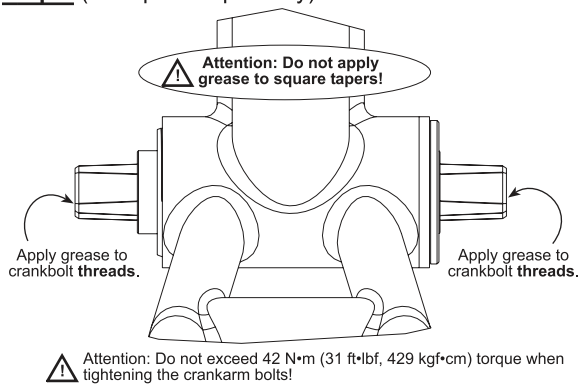
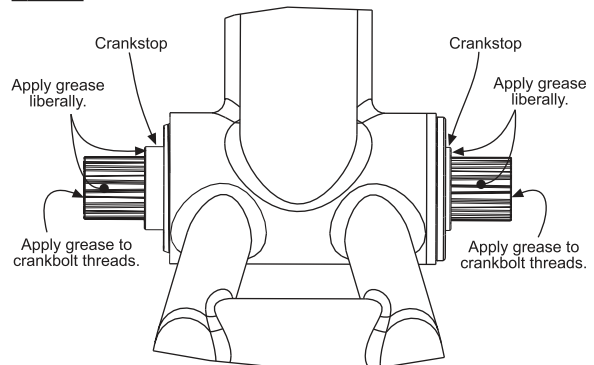


Figure 5

Apply grease **to the crankbolt threads only** in order to prepare the bottom bracket for crankarm installation. When installing the crankarms do not exceed 42 N•m (31 ft•lbf, 429 kgf•cm) torque when tightening. Consult your crankarm instruction manual for exact torque specifications.

Step 3 (for Power Spline only)



Attention: Do not exceed 42 N•m (31 ft•lbf, 429 kgf•cm) torque when tightening the crankarm bolts! Crankarms should contact crankstops before maximum specified torque is achieved!

Figure 6

Apply grease liberally as shown in Figure 6, to the spline surfaces of the spindle, the faces of the crank stops, and also to the crankbolt threads in order to prepare the bottom bracket for crankarm installation. When installing the crankarms do not exceed 42 N•m (31 ft•lbf, 429 kgf•cm) torque when tightening. Consult your crankarm instruction manual for exact torque specifications. Crankarm should contact crankstop after installation. Should they not, remove the crankarm(s) and re-install until crankarms contact crankstop before maximum torque of 42 N•m (31 ft•lbf, 429 kgf•cm).

BOXGUIDE / SHIFTGUIDE / CHAIN TENSIONER

Congratulations!

Thank you for purchasing a Truvativ chainguide. The following instructions should be read thoroughly before installation. Improper installation of your Truvativ Boxguide or Shiftguide may cause an unexpected failure of the parts that could cause you to lose control of your bicycle resulting in serious injury or death. We recommend having your parts installed by a qualified bicycle technician. Truvativ assumes no responsibility for malfunction or injury due to faulty installation.

Compatibility

Chainguide Model #:	Chaining Capacity* (min-max)	BB Shell Width and compatible chainline				ISCG/ISCM
		68mm	73mm	83mm	100mm	
00-6300-002(-090,-130)	34-46					NO
00-6300-002(-110,-150,-190)	34-46					YES
00-6300-002(-080,-120)	34-38	48.5-51	50-51	56	66	NO
00-6300-002(-100,-140)	34-38					YES
00-6300-001(-030,-020)	22x32					NO
00-6300(-007,-006)-000	or 24x36					

Notes:

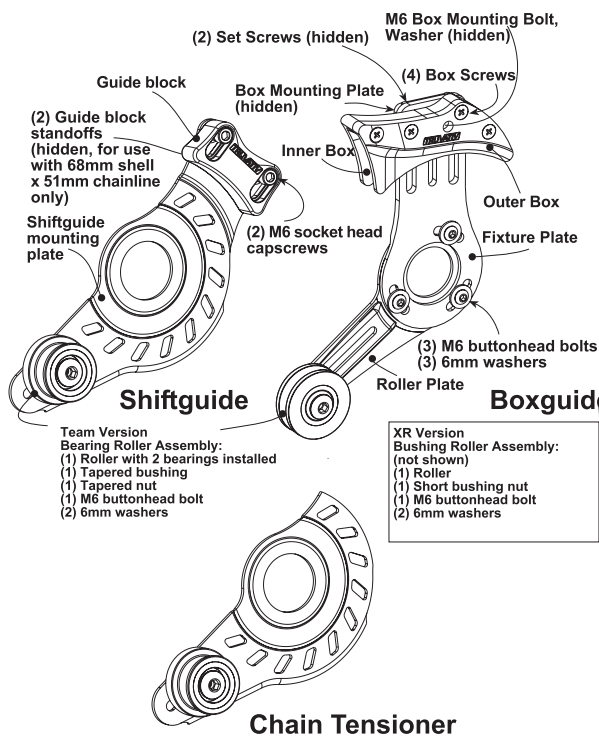
*Represents ring capacity for Boxguide, however frame design may limit maximum ring size.

Your Truvativ bottom bracket will specify which shell width it can accommodate, i.e. 68, 68E, 73, etc.

The Boxguide is compatible with Truvativ Bashguards (but not Rockguards). Use the correct size Bashguard for the chaining you are using. Bashguards are available in 34-36, 38-40, 42-44, 46 sizes. Refer to Step 3 and Figure 5 for chainguide setup with the Bashguard.

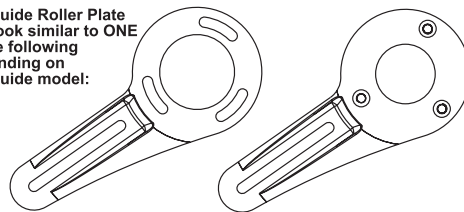
The Shiftguide must be used with a Truvativ Rockguard. Choose the proper size Rockguard for the middle chaining you are using. Rockguards are available for 32T and 36T sizes.

Parts and Tools



Rev 8 JUL-2007

Boxguide Roller Plate will look similar to ONE of the following depending on Boxguide model:



ISCG/CMS Roller Plate

BB Flange mount roller plate

Tools:

- 2.5mm, 4mm, 5mm, 6mm hex wrenches
- Truvativ X-Tool or Truvativ GXP/Howitzer tool, PARK™ BBT9, or equivalent (optional, only for installing Truvativ BB)
- Phillips head screw driver
- Torque wrench

Supplies:

- Medium strength threadlock compound (Loctite™ 242 or equivalent)

Assembly

Step 1

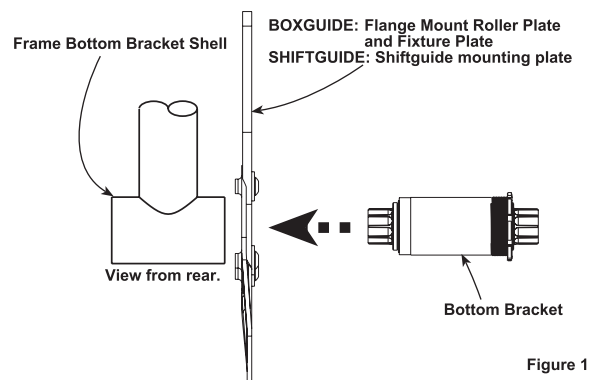


Figure 1

Mounting orientation:

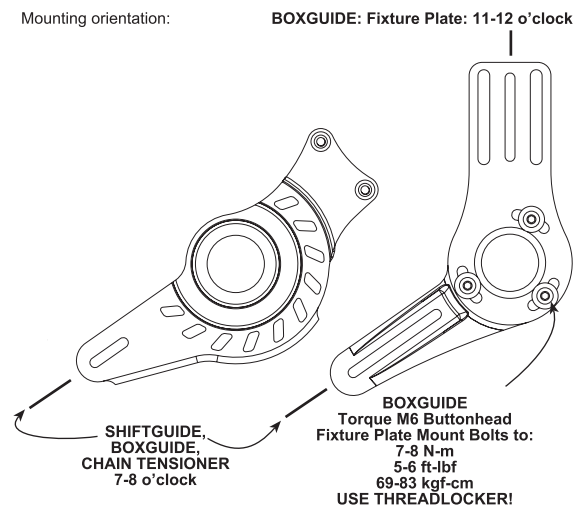


Figure 2

BOXGUIDE / SHIFTGUIDE / CHAIN TENSIONER

Step 2

Boxguide shown, Shiftguide and Chain Tensioner assembly are similar

TEAM version Bearing Roller:
 Tapered bushing
 Cartridge bearing roller
 Tapered bushing nut
 M6 Buttonhead
 Apply threadlocker
 Apply grease
 M6 Buttonhead

XR version Bushing Roller:
 Bushing roller
 Apply threadlocker
 M6 Buttonhead
 Bushing roller

Figure 3

Assemble loosely to allow final adjustment.

Step 3

SHIFTGUIDE:

Guide block standoffs
 Use with 68mm shell x 51mm chainline only
 Omit for all others

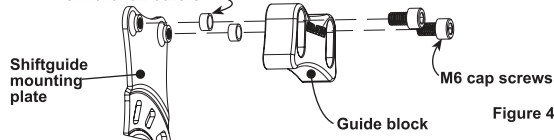


Figure 4

BOXGUIDE:

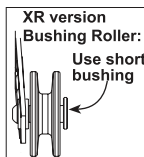
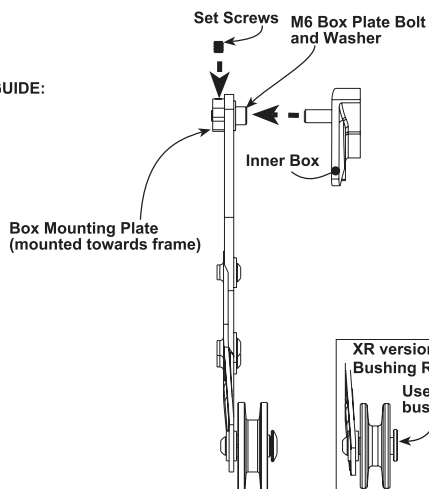


Figure 5

Assemble as shown above. Single chainring mounts in the middle position when used with Boxguide.

Step 4

BOXGUIDE ONLY:

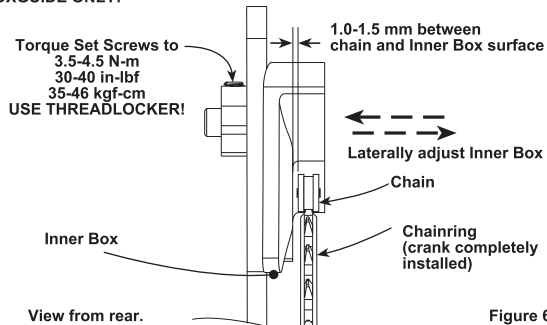


Figure 6

Step 5

BOXGUIDE:

Clearance between Inner Box and chainring tooth: 3.5-4.5mm, OR 1.0-2.0mm between chain and Inner Box

Torque M6 bolt to:
 8-9.5 N-m
 6-7 ft-lbf
 81.5-97 kg-cm
 USE THREADLOCKER!

Torque M6 Box Mounting Bolt to:
 10-11 N-m
 7-8 ft-lbf
 97-111 kgf-cm
 USE THREADLOCKER!

Adjust Inner Box to achieve gap as noted at left.

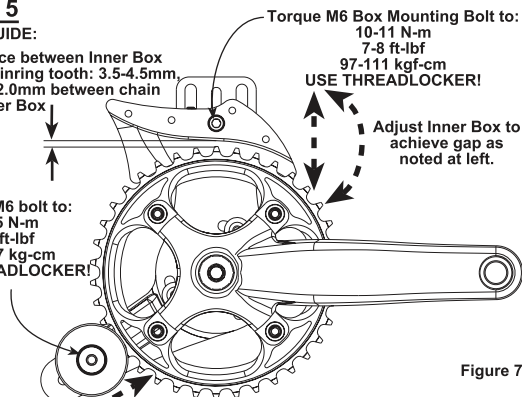


Figure 7

SHIFTGUIDE:

Torque M6 bolt to:
 8-9.5 N-m
 6-7 ft-lbf
 81.5-97 kg-cm
 USE THREADLOCKER!

Torque M6 Guide Block Mounting Bolts to:
 10-11 N-m
 7-8 ft-lbf
 97-111 kgf-cm
 USE THREADLOCKER!

It is normal for the guide block to contact the chain during shifting.

Adjust Roller to hold chain against chainring, then back off 1-2mm and tighten.

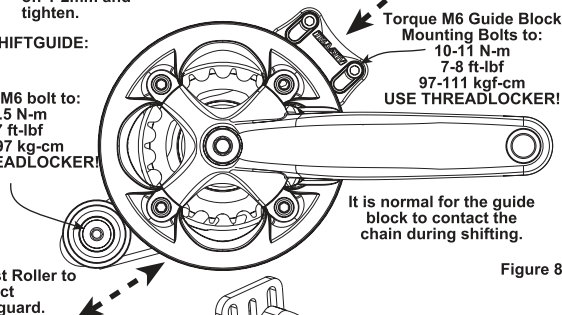


Figure 8

Step 6

BOXGUIDE ONLY:

Torque Box screws to:
 3.4-4.5 N-m
 30-40 in-lbf
 35-46 kgf-cm

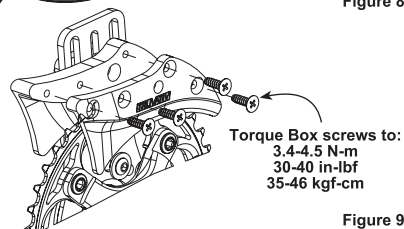


Figure 9

HAMMERSCHMIDT ANATOMY

NOTE:

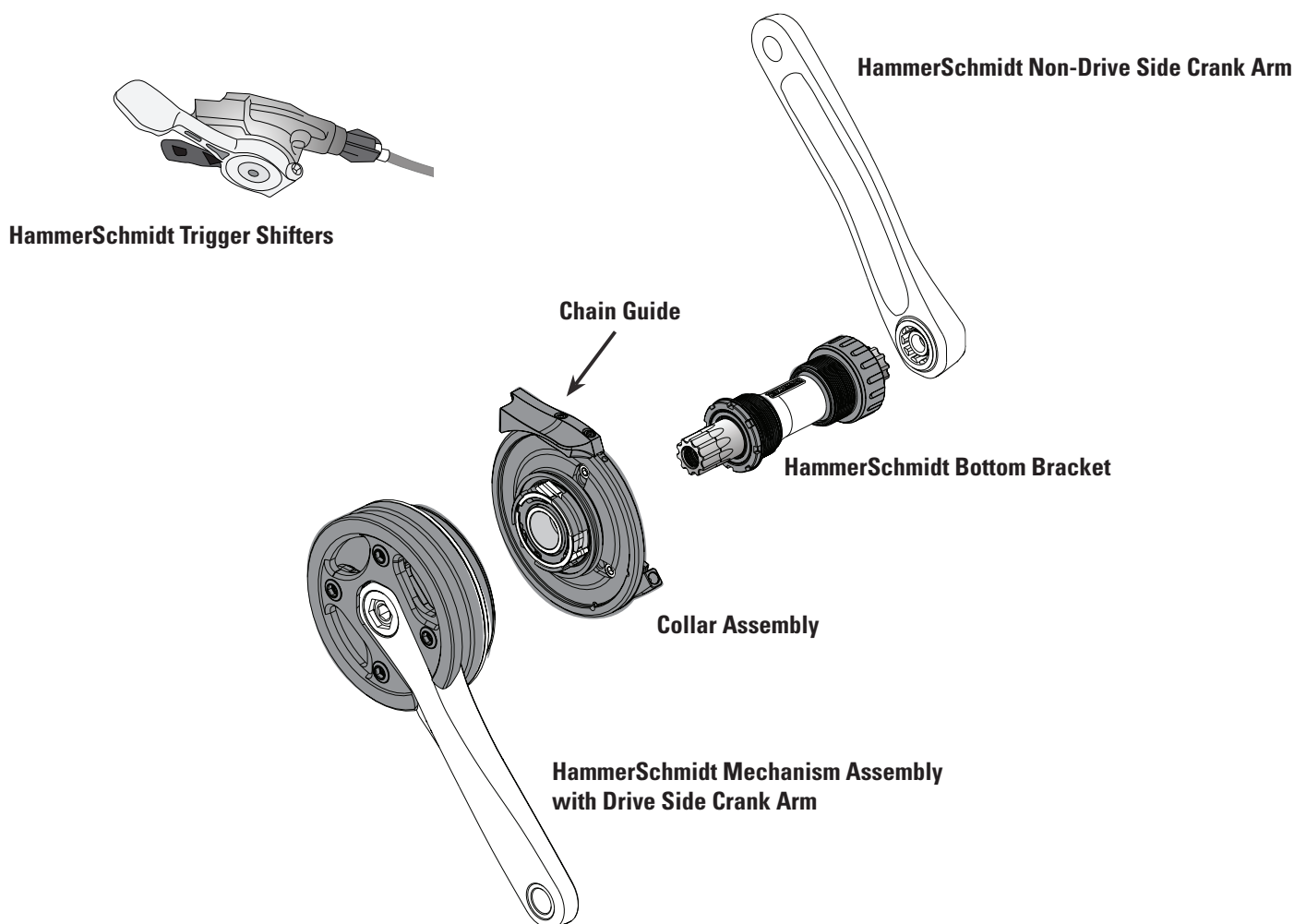
The information at the beginning of this document is pulled from the user manual. Some of the user manual information will be referenced in the technical service section.

INTRODUCTION

Your days of front shifting as you know it are over. Welcome to instant front transmission. Welcome to HammerSchmidt!

HammerSchmidt is a front transmission so fast and so seamless it's magical. It gives you the security of a single chainring, with the gear range of a double. HammerSchmidt provides better ground clearance and flawless shifting: shifting under load, while coasting, or even standing still. This revolutionary instant shift is accomplished with the proprietary HammerSchmidt X.0 and X.9 trigger shifters. HammerSchmidt's front transmission design is comprised of five main components: HammerSchmidt bottom bracket, crank arm, collar assembly, mechanism assembly and trigger shifters, each working in perfect concert, allowing you to react to terrain in ways you've never imagined before. Take a peek below at the anatomy of HammerSchmidt.

ANATOMY



HAMMERSCHMIDT

PARTS AND TOOLS NEEDED

- Safety glasses
- HammerSchmidt frame compatibility checker
- 2, 2.5, 4, 5, and 8 mm hex wrenches
- Flathead screwdriver
- Cable cutters
- Adjustable torque wrench up to 54 N·m (478 in·lb)
- Digital calipers
- Bottom bracket facing tool and cutter (Park Tool BFS-1 or similar)
- HammerSchmidt ISCG tab facing cutter
- Cutting Oil
- Truvativ ISIS and GXP bottom bracket installation tools
- Grease

FRAME COMPATIBILITY CHECK

HammerSchmidt is engineered to mount to frames with ISCG 03 or ISCG 05 chain guide mounting tabs and 68, 73, or 83 mm bottom bracket shell widths. However, not all frames are made to the precision standards HammerSchmidt requires. Therefore, before installing you will need to perform a simple frame compatibility check to determine if you can use HammerSchmidt on your frame.

IMPORTANT:

It is critical to perform this check, otherwise you will experience complications with installation and/or function.

To check compatibility, use the enclosed HammerSchmidt frame compatibility checker tool. First, remove your old crank arms and bottom bracket from your frame (if applicable). Next, thread the cup checker into the drive-side bottom bracket shell. Finally, slide the pin checker over the cup checker and insert the pins into the ISCG tabs. The pin checker is double sided; one side has ISCG 03 pins, the other ISCG 05 pins. Be sure to insert the appropriate pins into the ISCG holes. For compatibility, the pins must go into the ISCG holes, the cup checker must be centered in the pin checker and the arrow on the pin checker should point toward the rear wheel axle. If the tool is difficult to insert, won't fit at all, or the arrow doesn't point toward the rear wheel axle, you cannot use HammerSchmidt on your frame.

If you need additional help to determine the compatibility of HammerSchmidt you can visit www.magicmechanics.com or head over to your local Truvativ dealer for assistance.

COMPONENT COMPATIBILITY CHECK

- Bottom Bracket - HammerSchmidt BB only
- Front Shifter - HammerSchmidt X.0 and X.9 trigger shifters only
- Chainrings - HammerSchmidt 22 or 24 tooth
- Chains - 1 x 1, 7, 8, and 9-speed SRAM® or Shimano® chains

NON-COMPATIBILITY

Do not mount HammerSchmidt to an ISCG adapter device. ISCG adapters do not provide enough structural integrity to handle the weight and loads applied by HammerSchmidt. ISCG adapters are only intended as a means to mount chain guide devices to non-ISCG frames; make sure you keep it that way.

FRAME PREPARATION

FRAME PREPARATION

IMPORTANT:

The following sections on Frame Preparation call for making permanent and non-reversible modifications to your frame, requiring advanced mechanical knowledge, skills, and tools. We recommend these procedures only be performed by a qualified bicycle mechanic. If you choose to perform these procedures yourself you should read and understand these instructions and have a working knowledge of tools required prior to starting work on your frame. In addition, you should wear your safety glasses until you have completed all the steps in this manual.

FRAME PREPARATION - PART 1

Now that you have determined that the ISCG tabs on your frame are compatible with HammerSchmidt, it is time to make sure the face of the bottom bracket shell and ISCG mounting surfaces are parallel and uniform. This is a critical process because one part of the HammerSchmidt mechanism is located off the bottom bracket shell while the other part is located off the ISCG tabs. When they are mated together, the HammerSchmidt internals need to be aligned so they can engage and function properly. Let's get started:

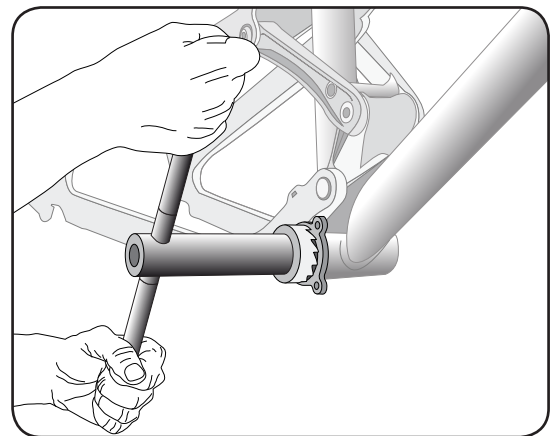
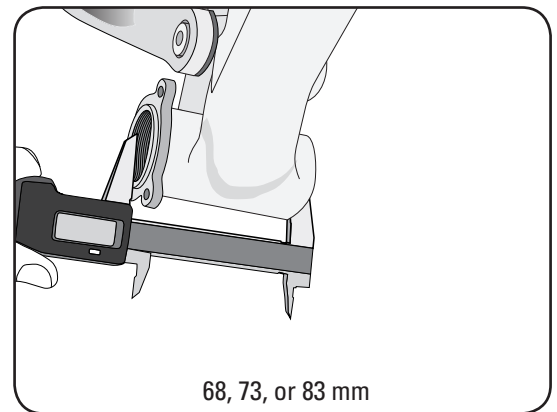
Make sure your frame's bottom bracket shell threads are clean and undamaged; there should be no paint or dirt in there. For best results, have your bottom bracket shell tapped by a professional bicycle mechanic.

Step 1:

Measure your bottom bracket shell width with a pair of digital calipers. The shell width should be either 68, 73 or 83 mm (+0.3 / -0.2 mm).

Step 2:

Face the bottom bracket shell. This will create a flat surface for ISCG cutter to bottom out on in the next step. Keep in mind the tolerances as you face the bottom bracket shell. If the shell width exceeds the maximum tolerance value (+0.3 mm), you will need to face it within specification. However, do not face shorter than the minimum tolerance value allows (-0.2 mm). Follow the instructions provided by the manufacturer of your bottom bracket facing tool for proper operation of the tool.



FRAME PREPARATION

FRAME PREPARATION - PART 2

Ok, are you ready for the final and most critical step in frame preparation?

Step 3:

Replace the bottom bracket facing cutter on your tool with the Truvativ ISCG tab facing cutter that is appropriate for your size ISCG tabs and remove all spacers from the cutter.

- If your ISCG tabs are flush with the face of the bottom bracket shell (zero offset), you will only be facing the tabs to ensure they are parallel to the bottom bracket shell face. Face the ISCG tabs using the same method provided by the manufacturer of your bottom bracket facing tool. If the cutter does not completely face the surface of each tab, add a 0.5 mm spacer to the cutter tool and face again. When you are finished facing, be sure the ISCG tab surface is smooth and free from burrs and debris.

NOTE:

If you added a 0.5 mm spacer to the cutter, you now have a 0.5 mm offset to your tabs. Write this number down, you will need it later.

- If your ISCG tabs are offset inboard of the face of the bottom bracket shell, you will need to determine that offset prior to facing so you can space the cutter tool to match. Use the depth stick on the caliper and measure the depth at all three tabs. Select the largest of the three numbers and write it down, this is your offset.

Locate your offset in the chart below and select the spacer or combination of spacers from those supplied with the Truvativ ISCG cutter. The cutter comes with 0.5 mm, 1 mm, and 2 mm width spacers, each marked with its width. For 68 mm width bottom brackets, do **not** exceed 0.5 mm of cutter tool spacing. For 73 mm and 83 mm width bottom brackets, do not exceed 3.0 mm of cutter tool spacing.

OFFSET (mm)	ISCG CUTTER SPACER(S) REQUIRED*
0.0	None
0.1 - 0.5	0.5 mm
0.6 - 1.0	1.0 mm
1.1 - 1.5	1.5 mm
1.6 - 2.0	2.0 mm
2.1 - 2.5	2.5 mm
2.6 - 3.0	3.0 mm†

*write this number down you will need it again later on

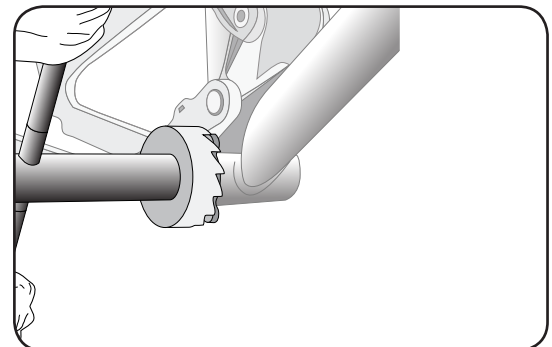
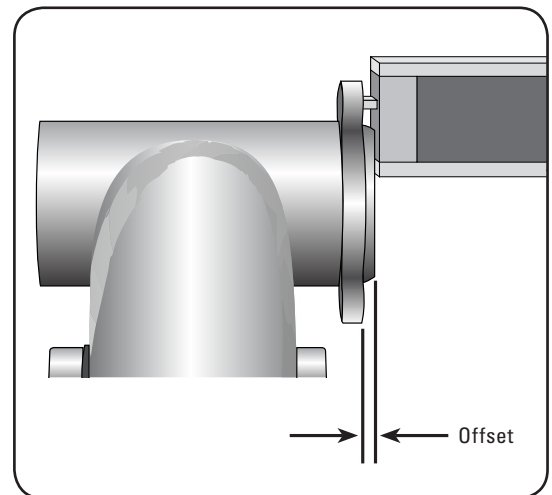
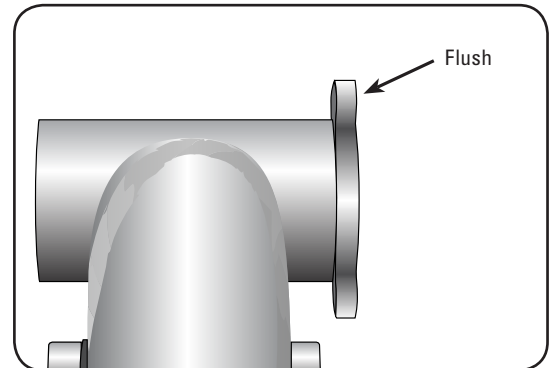
† maximum spacer value for 73 and 83 mm bottom brackets

Step 4:

Face the ISCG tabs using the same method provided by the manufacturer of your bottom bracket facing tool. If the cutter does not completely face the surface of each tab, add a 0.5 mm spacer to the cutter tool and face again. Remember, do not exceed 3.0 mm of spacers. When you are finished facing, be sure the ISCG tab surface is smooth and free from burrs and debris.

IMPORTANT:

For 73 and 83 mm bottom brackets do not exceed 3.0 mm of spacers during facing. If you exceed 3.0 mm of spacers the resulting offset will be too large and the custom HammerSchmidt mounting bolts will not have enough thread engagement with ISCG tabs to safely mount HammerSchmidt.

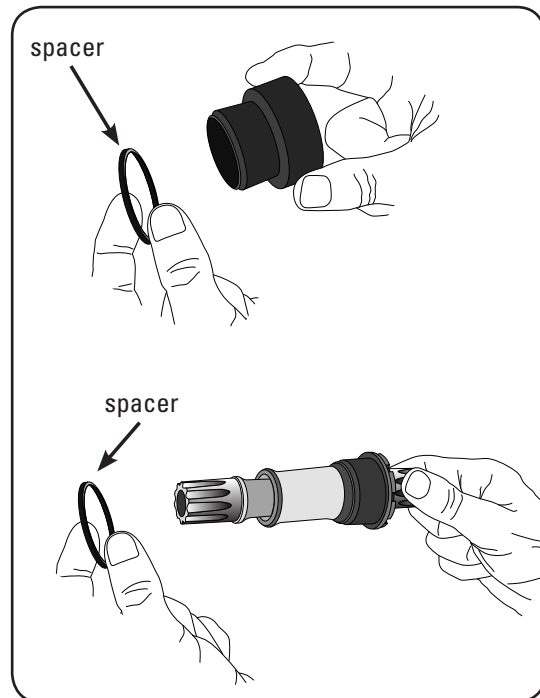


INSTALLATION

INSTALL HAMMERSCHMIDT BOTTOM BRACKET

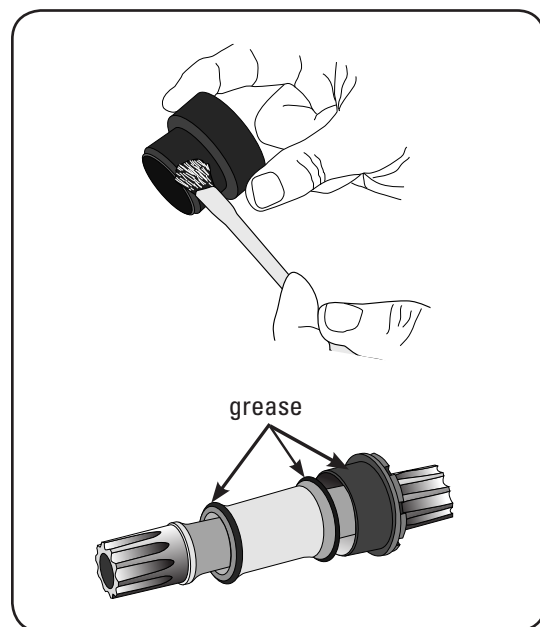
1 If you have a 68 mm bottom bracket shell, separate the two parts of the bottom bracket and install the included bottom bracket spacers, one over the drive side bottom bracket cup, the other over the non-drive side bottom bracket cup. This will set the bottom bracket spacing to accommodate HammerSchmidt.

1



2 Apply a liberal amount of grease to the bottom bracket shell threads in the frame. If you haven't already, pull the non-drive side cup off the bottom bracket and apply a small amount of grease to the cup threads. Carefully separate the center shell from the drive side cup and apply a small amount of grease to the o-rings on each side of the cup. Insert the center shell back into the drive side cup. Finally, apply a small amount of grease to the drive side cup threads.

2



INSTALLATION

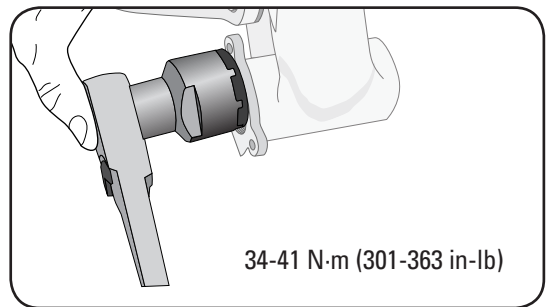
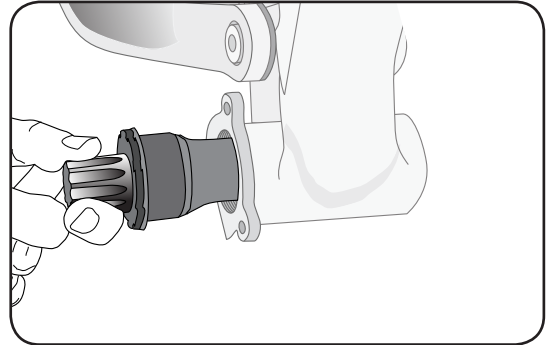
The HammerSchmidt bottom bracket needs to be installed in a specific order:

- 3** A. Thread the drive side bottom bracket assembly into your frame using the Truvativ ISIS (or equivalent) bottom bracket installation tool. The drive side assembly is left-hand threaded, so turn it counter-clockwise to install and torque to 34-41 N·m (301-363 in-lb).

B. (not pictured)

Install the non-drive side bottom bracket assembly using the Truvativ GXP (or equivalent) bottom bracket installation tool. The non-drive side assembly is right-hand threaded, so turn it clockwise to install and torque to 34-41 N·m (301-363 in-lb).

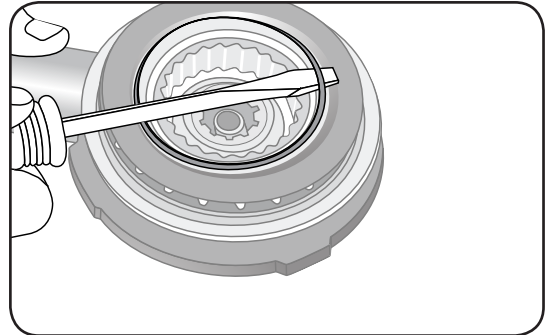
3



CHAINRING REPLACEMENT – OPTIONAL

- 5** If you want to change your chainring size, now is a convenient time to do it. Locate the retaining ring on the HammerSchmidt mechanism crank arm and use a flathead screwdriver to gently pry the retaining ring off the ring guide. Remove the ring guide and chainring. Install your other chainring. Re-install the ring guide and carefully press on the retaining ring using the flathead screwdriver. Make sure the retaining ring is fully seated in the groove of the ring guide by rotating it a couple of revolutions.

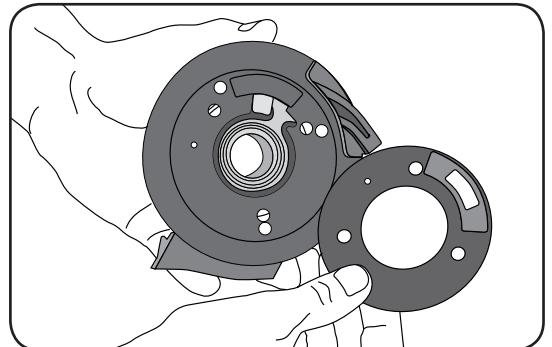
5



COLLAR PLATE ASSEMBLY INSTALLATION

- 6** Check that the seal disk for your frame's ISCG standard (ISCG 03 or ISCG 05) is installed. If you need to change out the seal disk, use a 4 mm hex to remove the cable anchor bolt and a 2 mm hex to remove the seal disk retaining bolt then switch seal disks. Make sure the recess on the seal disk anchor bolt window faces down. Re-install the cable anchor bolt until it is hand tight. Re-install the seal disk retaining bolt and torque to 0.5 N·m (4 in-lb).

6



INSTALLATION

- 7** The collar assembly **must** sit flush with the bottom bracket shell face (or spacer for 68 mm bottom brackets). So now you need to determine if you need to add ISCG tab spacers.

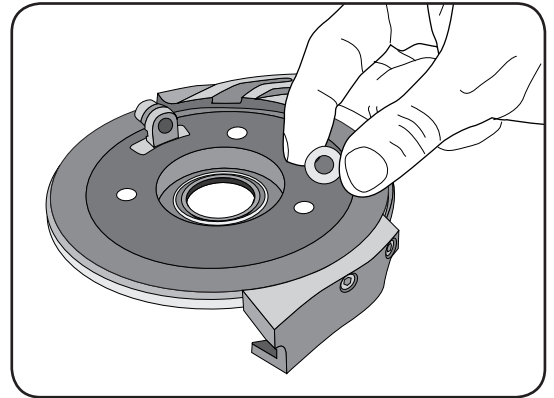
If your frame's ISCG tabs are flush with the bottom bracket shell face, you do not need to add any spacers. If your frame's ISCG tabs are offset inboard of the bottom bracket shell face, you will need to add the same amount of spacers you used when facing the ISCG tabs in the Frame Preparation section in order to make the surface flush (you wrote this down remember?). Locate the ISCG specific spacer(s) you need.

NOTE:

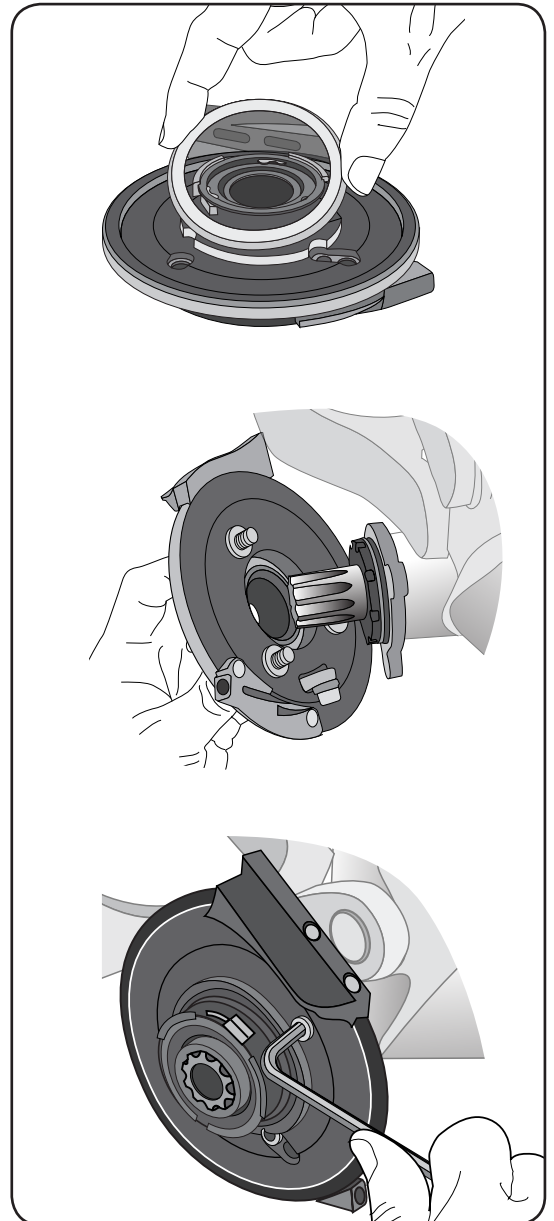
68 mm bottom bracket users! You must add an **additional** 2.5 mm of spacer thickness to the ISCG spacers you needed above. This will complete the spacing requirements necessary for HammerSchmidt.

- 8** Remove the rubber seal from the front of the collar assembly, if necessary, to fully access the mounting holes. Place the ISCG spacer(s) onto the back of the collar assembly and align all of the mounting holes. Insert the three mounting bolts through the collar assembly and ISCG spacer(s) to hold everything together. Carefully slide the complete assembly over the drive side spindle. Align the mounting bolts to the mating ISCG tabs and hand start each bolt. Gently push the assembly on so it sits flat against the ISCG tabs. Use a 4 mm hex to tighten all three mounting bolts in an alternating fashion. Torque each bolt to 4.5 N·m (40 in-lb).

7



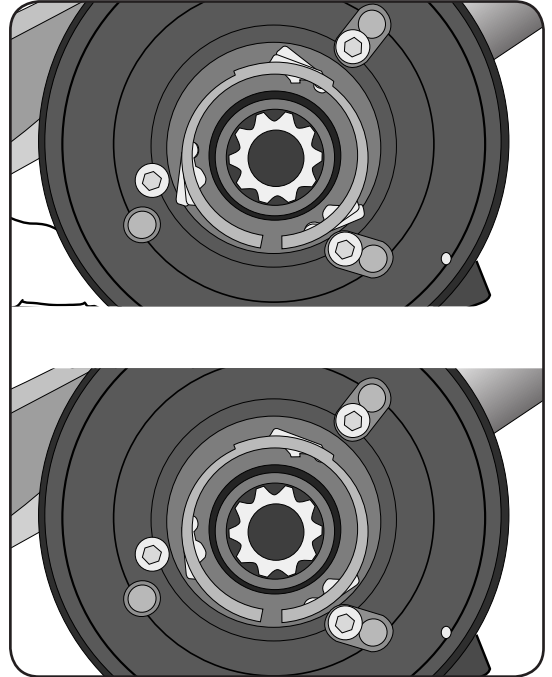
8



INSTALLATION

9 You can check for proper collar assembly installation by sliding the anchor bolt on the collar assembly back and forth in the seal disk window. You should see the pawls in the collar assembly extend to 'catch' and retract to 'release'; there should be no binding of the actuator. If you removed the rubber seal from the front of the collar assembly, slide the anchor bolt so the pawls are retracted, and re-install the rubber seal, lip side down. Make sure it is fully seated and check again that the pawls can extend and retract without interference.

9



HAMMERSCHMIDT SHIFTER INSTALLATION

10

Install your HammerSchmidt shifter onto your handlebar in a position that is right for you. Use a 5 mm hex to tighten the shifter clamp bolt and torque to 2.5-4 N·m (22-35 in-lb).

Turn the shifter adjuster barrel clockwise until it stops, then turn the adjuster barrel counter-clockwise one full turn.

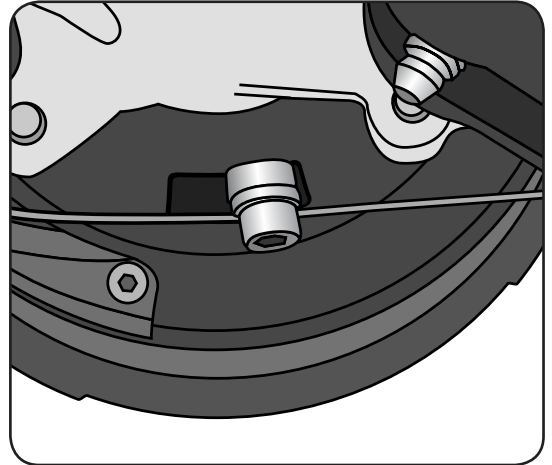
Measure the amount of cable housing you will need to route the housing from the shifter into the cable stop on the collar assembly. Cut the housing with the cable cutters. Remember, measure twice, cut once!

Feed the cable through the cable housing and route the housing from the shifter into the cable stop. Make sure the housing has a slight bend as it reaches the collar assembly and fits easily into the cable stop.

Press the small shifter paddle to ensure the cable is fully released. Loosen the cable anchor bolt, pull the shifter cable taut and attach it to the actuator making sure the cable is sitting in the groove of the anchor bolt. Keeping the shifter cable pulled taut, use a 4 mm hex to tighten the anchor bolt to 2.2 N·m (20 in-lb). Cut the cable a couple centimeters past the anchor bolt and install a cable tip.

Slowly turn the HammerSchmidt shifter barrel adjuster counter-clockwise until you see the anchor bolt move slightly to take up any cable slack. There should be a small gap between the anchor bolt and the edge of the seal disk window.

10

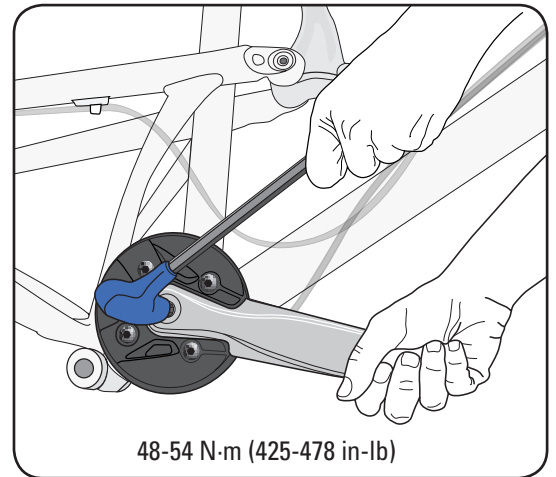


INSTALLATION

DRIVE MECHANISM AND CRANK ARM INSTALLATION

- 11** Press the large shifter paddle to pull the actuator and retract the pawls on the collar assembly. Apply grease to the drive side bottom bracket splines and crank bolt threads. Use an 8 mm hex to install the drive side crank arm assembly, making sure the spindle splines engage with the bottom bracket. Tighten the crank bolt until it stops, and torque to 48-54 N·m (425-478 in-lb).

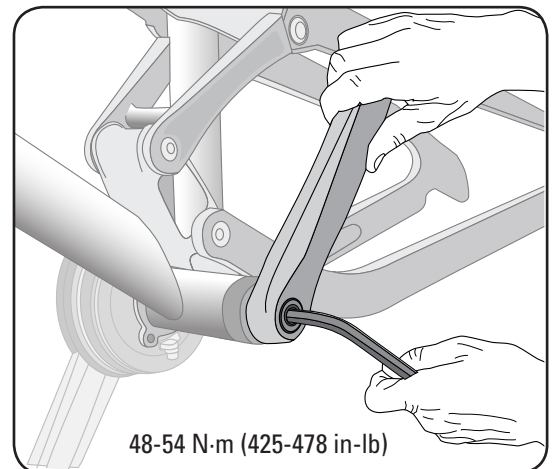
11



NON-DRIVE SIDE CRANK ARM INSTALLATION

- 12** Apply grease to the non-drive side bottom bracket splines and crank bolt threads. Align the non-drive side crank arm to be 180° opposite the drive side crank arm. Use an 8 mm hex to install the non-drive side crank arm, making sure the spindle splines engage with the bottom bracket. Tighten the crank bolt until it stops and torque to 48-54 N·m (425-478 in-lb). Check that the crank arm contacts non-drive side crank stop (no gap). If it doesn't, you will need to remove the crank arm, apply additional grease and re-install.

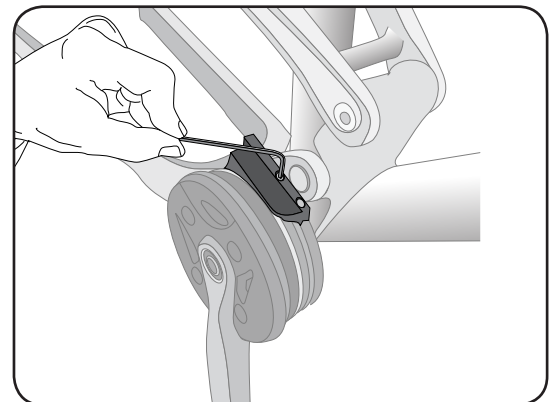
12



INSTALL CHAIN AND ADJUST CHAIN GUIDE

- 13** Size and install a new SRAM chain according to the installation instructions. Use a 2,5 mm hex to adjust the location of the chain guide if necessary. Make sure the chain guide does not interfere with the chain when the rear suspension is fully compressed.

13



USE / MAINTENANCE

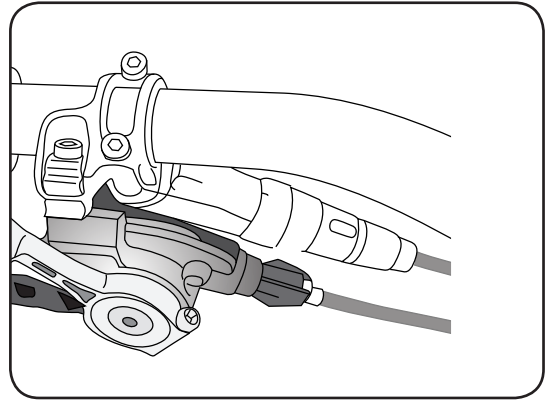
HAMMERSCHMIDT USE

14 HammerSchmidt has two front transmission gears: 1:1 and Overdrive. In 1:1, everything in the mechanism is locked and spinning together; one turn of the pedals equals one revolution of the chainring. This is great for tackling steep climbs! In Overdrive, one turn of the pedals equals approximately 1.6 revolutions of the chainring. This is great for hammering big descents!

The shift from 1:1 to Overdrive can be made smoothly and instantly using the proprietary HammerSchmidt X.0 or X.9 trigger shifters. Press the large shifter paddle to pull cable and you're in 1:1. Instantly! Press the small shifter paddle to release cable and you're in Overdrive. Instantly! With only two shifting directions, you'll never make a bad shift.

Remember, you can shift in any circumstance, no matter what your chain tension is without having to plan ahead. HammerSchmidt does not depend on pedaling; shift while regrouping with your crew before the next climb, shift mid-manual, even shift while coasting or pedaling backward. Shift smoothly and instantly anytime, every time. Your days of front shifting as you know it are over. HammerSchmidt!

14



HAMMERSCHMIDT MAINTENANCE

Use only water and a mild soap to clean the HammerSchmidt unit.

Do NOT use a pressure washer. This will damage the seals and allow dirt/debris to contaminate and potentially damage the internals of the HammerSchmidt unit.

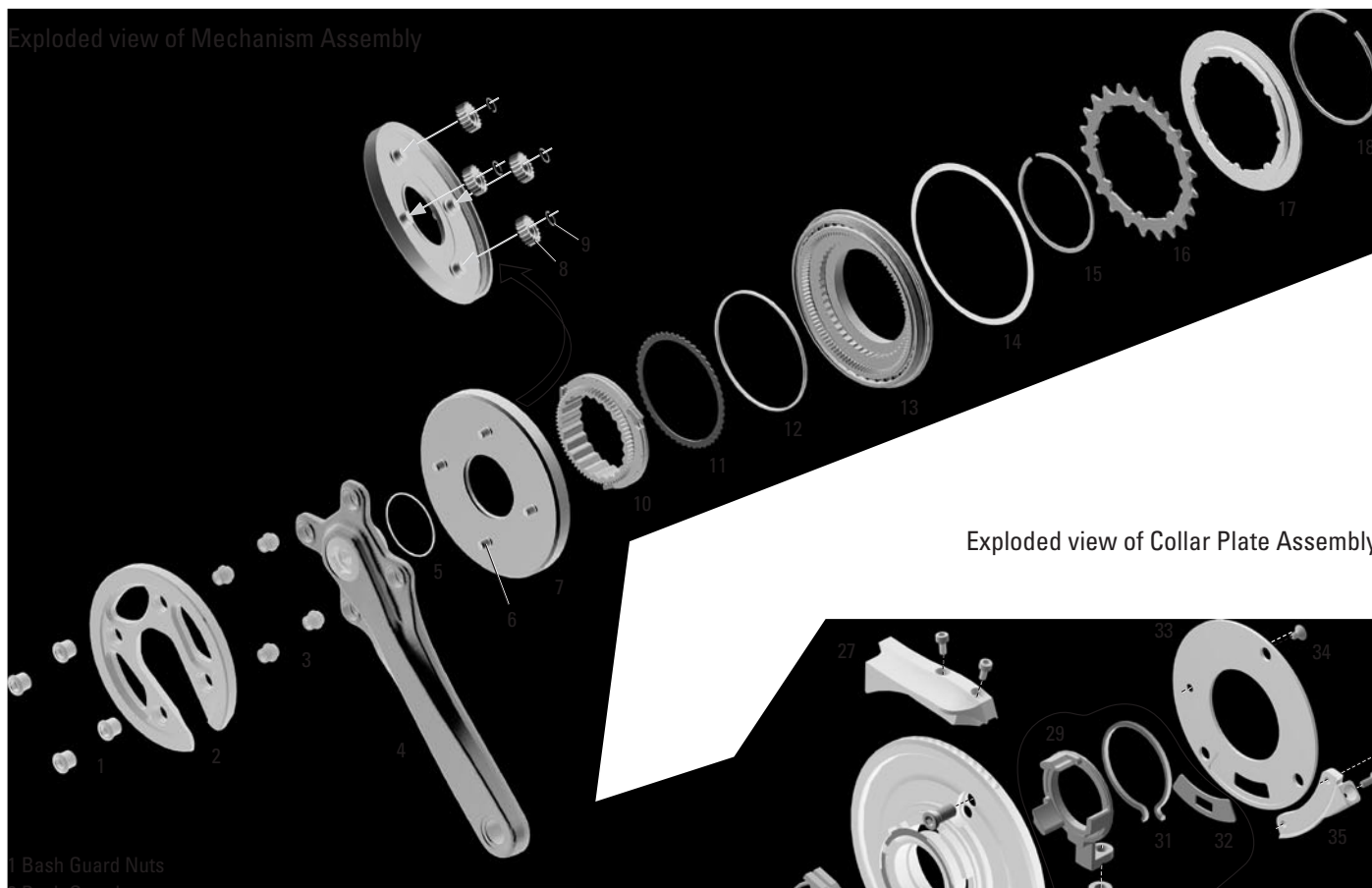
Periodically inspect all of the bolts of the HammerSchmidt unit and crank arms for proper torque. See the service interval schedule at Technical Service.

You should have a professional bicycle mechanic periodically disassemble your HammerSchmidt unit to inspect the internals for signs of wear or damage and to re-lubricate the mechanism.

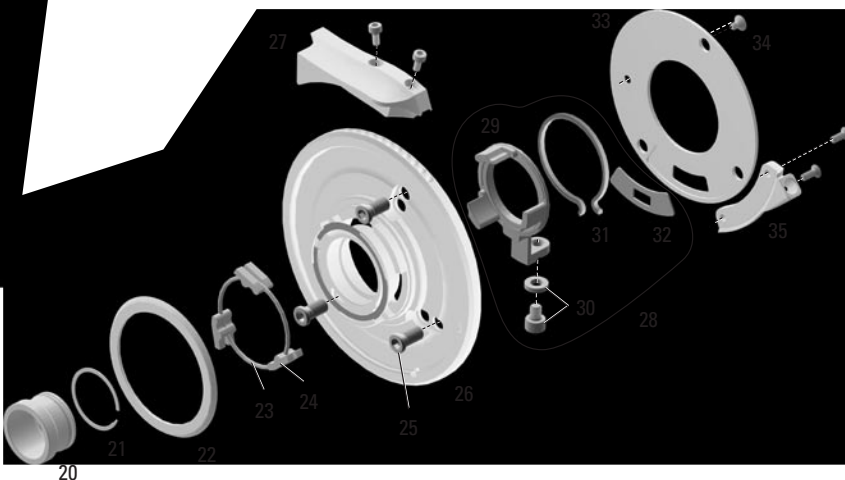
Always inspect components for damage after any crash.

EXPLODED VIEW OF HAMMERSCHMIDT MECHANISM

Exploded view of Mechanism Assembly



Exploded view of Collar Plate Assembly

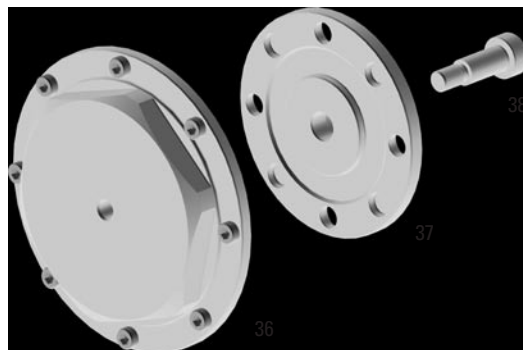


- 1 Bash Guard Nuts
- 2 Bash Guard
- 3 Planet Nuts
- 4 Crank Arm
- 5 Carrier Seal
- 6 Planet posts
- 7 Carrier Assembly
- 8 Planets
- 9 Planet Retaining Rings
- 10 Sun Gear
- 11 Ring Spacer
- 12 Damper
- 13 Bearing Assembly
- 14 Bearing Seal
- 15 Sun Retainer
- 16 Chainring
- 17 Guide Ring
- 18 Retaining Ring for Guide Ring

- 20 Crank Stop
- 21 Crank Stop Retainer
- 22 Collar Seal
- 23 Overdrive Spring
- 24 Overdrive Pawls
- 25 Collar Plate Mounting Bolts
- 26 Collar Plate
- 27 Chain Guide
- 28 Actuator Assembly
- 29 Actuator
- 30 Cable Anchor Bolt and Washer
- 31 Actuator Spring
- 32 Wiper Seal
- 33 Seal Disk
- 34 Disk Bolt
- 35 Cable Stop

HAMMERSCHMIDT BEARING REMOVAL TOOL

- 36 Vice Tool
- 37 Tool Clamp
- 38 Shoulder Screw



SERVICE SCHEDULE / TORQUE VALUES

SERVICE INTERVAL SCHEDULE

To maintain optimal performance and durability of the HammerSchmidt, periodic maintenance is required. If you ride in extreme conditions, maintenance should be performed more frequently.

IMPORTANT:

We recommend that you have your Truvativ HammerSchmidt serviced by a qualified bicycle mechanic. Servicing the HammerSchmidt requires advanced mechanical skill, knowledge of planetary gear systems, as well as access to and knowledge of use of the special tools required for service.

Component	Service	Interval (hours)
Bottom Bracket	Re-lubricate BB splines	25
Collar Plate	Check collar plate bolt torque	25
	Clean dirt and debris from collar plate assembly and re-lubricate	25
Mechanism and Crank Arms	Check planet nut torque. Damage can result from over-tightening	25
	Check crank bolt torque	25
	Inspect chainring for wear	25
	Inspect mechanism assembly function for wear or contamination	25
	Clean dirt and debris from inside of mechanism and re-lubricate	100

HAMMERSCHMIDT SYSTEM TORQUE VALUES

Recommended torque values for the HammerSchmidt are provided below.

IMPORTANT:

Do not exceed the recommended torque values. Over-tightening can result in damage to the unit.

Component	Part	Torque Value		Needed Tool
		N·m	in-lb	
Bottom Bracket	Bottom Bracket Cups	34-41	301-363	Truvativ ISIS and GXP tools (or equivalent)
Collar Plate	Cable Anchor Bolt	2.2	20	4 mm hex
	Cable Housing Stop Bolts	0.6	5	2 mm hex
	Chain Guide Bolts	0.7	6	2.5 mm hex
	Collar Plate Bolts	4.5	40	4 mm hex
	Disk Bolt	0.6	5	2 mm hex
Mechanism and Crank Arms	Chainring Nut	4.5	40	6 mm hex
	Crank Bolts	48-54	425-478	8 mm hex
	Planet Nuts	5.6	50	5 mm hex
Shifter	Shifter Clamp Bolt	2.5-4.0	22-35	5 mm hex

GREASE

IMPORTANT:

Use only the HammerSchmidt grease kit for re-lubrication. Poor performance and accelerated wear can be expected from use of other lubricants.

TROUBLESHOOTING

TROUBLESHOOTING

If performance issues arise, please consult the following table for possible solutions. For more information, please contact your local dealer or SRAM Dealer Service.

Issue	Possible Cause	Cure
Stuck in Overdrive/Loss of 1:1 Gear	Too little tension in shift cable	Adjust the shifter by turning barrel adjuster on the shifter counter-clockwise. If barrel adjuster will not provide sufficient adjustment, reattach cable at the cable anchor bolt per "Shifter Installation Instructions".
	Malfunctioning or damaged shifter	Cycle the shift lever several times to confirm proper function. Replace shifter, if necessary.
	Contaminated or improperly routed shift cable housing	Check that housings are properly routed and that cable moves freely within the housing. Properly routed cables will take a smooth path to the cable stop and provide enough slack for handlebar and suspension linkage movement. Clean and lubricate or replace housings if necessary.
	Cable end pinched between collar plate and frame or ISCG spacers	Check to confirm that the excess cable beyond the cable anchor bolt is trimmed to the correct length and allowed to move freely. If not remove cable from pinch point.
	Contamination on overdrive pawls	Clean and lubricate overdrive pawls.
	Contamination inside actuator assembly	Clean and lubricate actuator assembly internals.
	Broken overdrive spring	Replace overdrive spring.
	Incorrect ISCG spacers installed on offset ISCG tabs	Confirm offset and spacer configuration.
Stuck in 1:1/ Loss of Over-Drive Gear	Too much tension in shift cable	Adjust the shifter by turning barrel adjuster on the shifter clockwise. If barrel adjuster will not provide sufficient adjustment, reattach cable at the cable anchor bolt per "Shifter Installation Instructions".
	Malfunctioning or damaged shifter	Cycle the shift lever several times to confirm proper function. Replace shifter, if necessary.
	Contaminated or improperly routed shift cable housing	Check that housings are properly routed and that cables move freely within the housing. Properly routed cables will take a smooth path to the cable stop and provide enough slack for handlebar and any suspension linkage movement. Clean and lubricate or replace housings if necessary.
	Contamination inside actuator assembly	Clean and lubricate actuator assembly internals.
	Contamination in mechanism assembly	Disassemble, inspect, clean, and lubricate mechanism assembly.
	Broken overdrive spring	Replace overdrive spring.
	Incorrect ISCG spacers installed on offset ISCG tabs	Confirm offset and spacer configuration.
Increased Drag	Contamination in mechanism assembly	Disassemble, inspect, clean, and lubricate mechanism assembly.
	Wear or damage in mechanism assembly	Disassemble mechanism assembly and examine gear teeth and pawls for wear or damage.
	Incorrect ISCG spacers installed on offset ISCG tabs	Confirm offset and spacer configuration.
	ISCG tabs out of spec	Use SRAM ISCG cutting tool and face ISCG tabs perpendicular to BB axis.

TROUBLESHOOTING

Issue	Possible Cause	Cure
Erratic Shifting	Too little tension in shift cable	Adjust the shifter by turning barrel adjuster on the shifter counter-clockwise. If barrel adjuster will not provide sufficient adjustment, reattach cable at the cable anchor bolt per "Shifter Installation Instructions".
	Too much tension in shift cable	Adjust the shifter by turning barrel adjuster on the shifter clockwise. If barrel adjuster will not provide sufficient adjustment, reattach cable at the cable anchor bolt per "Shifter Installation Instructions".
	Malfunctioning or damaged shifter	Cycle the shift lever several times to confirm proper function. Replace shifter, if necessary.
	Contaminated or improperly routed shift cable housing	Check that housings are properly routed and that cables move freely within the housing. Properly routed cables will take a smooth path to the cable stop and provide enough slack for handlebar and any suspension linkage movement. Clean and lubricate or replace housings if necessary.
	Cable end pinched between collar plate and frame or ISCG spacers	Check to confirm that the excess cable beyond the cable anchor bolt is trimmed to the correct length and allowed to move freely. If not remove cable from pinch point.
	ISCG tabs are not perpendicular to the BB axis	Use SRAM ISCG cutting tool and face ISCG tabs perpendicular to BB axis.
	ISCG tabs do not meet HammerSchmidt dimensional guidelines	Confirm frame compatibility with the HammerSchmidt ISCG tab gages. Frames with ISCG tabs that do not meet the gage criteria are not recommended for use with HammerSchmidt.
	Loose collar plate	Tighten collar plate bolts to proper torque value.
	Broken overdrive spring	Replace overdrive spring.
	Contamination on OverDrive pawls	Clean and lubricate overdrive pawls.
	Contamination inside actuator assembly	Clean and lubricate actuator assembly internals.
	Contamination in mechanism assembly	Disassemble, inspect, clean, and lubricate mechanism assembly.
	Wear or damage in mechanism assembly	Disassemble mechanism assembly and examine gear teeth and pawls for wear or damage.
Unusual Noises (Creaking, Ticking, Grumbling, Buzzing, Chain rub)	Loose collar plate	Tighten collar plate bolts to proper torque value.
	Loose crank bolts	Tighten crank bolts to proper torque value.
	Loose bash guard nuts	Tighten bash guard nuts to proper torque value.
	Loose planet nuts	Remove bash guard nuts and bash guard. Tighten planet nuts to proper torque value. Replace bash guard and tighten bash guard nuts to proper torque value.
	Worn or loose chainring	Inspect chainring and chainring retainer. Replace if necessary.
	Worn damper or ring spacer	Disassemble mechanism assembly, inspect and replace as appropriate.
	Contamination in mechanism assembly	Disassemble, inspect, clean, and lubricate mechanism assembly.
	Incorrect chain guide position	Adjust chain guide as necessary.
	Wear or damage in mechanism assembly	Disassemble mechanism assembly and examine gear teeth and pawls for wear or damage.

TECHNICAL SERVICE

MECHANISM ASSEMBLY AND DRIVE SIDE CRANK ARM SERVICE

WARNING:

Always wear your safety glasses and gloves when servicing the HammerSchmidt. Some parts of the HammerSchmidt are spring loaded and can pop out suddenly which could lead to injury if your eyes are not properly protected.

Make sure you have a clean work area, clean rags, and the necessary parts and tools to service your HammerSchmidt.

IMPORTANT:

When performing service on your HammerSchmidt, the following parts are not re-usable and must be replaced during service: Planet Retaining Rings and Carrier Seal.

Parts and tools needed for service:

- Safety glasses
- Gloves
- HammerSchmidt Bearing Removal Tool
- 5, 6, 8 mm hex wrenches
- 24 mm wrench
- Small flathead screwdriver
- Pick
- Clean rags
- Adjustable torque wrench up to 25 N-m (217 in-lb)
- HammerSchmidt grease kit*
- Small grease brush (optional)

* You must use the grease supplied in the HammerSchmidt grease kit unless otherwise specified. Using any other grease will void your warranty.

MECHANISM ASSEMBLY AND DRIVE SIDE CRANK ARM REMOVAL

Shift the HammerSchmidt into 1:1 by pressing the large shifter paddle. Remove the chain according to the chain manufacturer's instructions.

- 1** Using an 8 mm hex wrench, turn the self-extracting crank bolt counter-clockwise to remove the HammerSchmidt mechanism assembly and drive side crank arm.

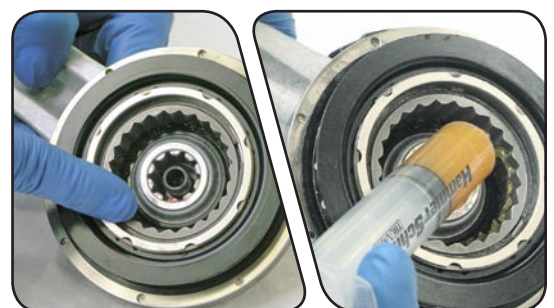
1



FUNCTIONAL INSPECTION OF THE HAMMERSCHMIDT MECHANISM ASSEMBLY

- 2** With the mechanism assembly separated from the collar plate inspect the HammerSchmidt visually and by feel for wear and contamination. Look inside the sun gear for dirt and debris. It may be appropriate to wipe this area with a clean, dry rag and re-grease periodically. Spin the ring gear counter-clockwise and feel for increased or unusual drag or play in the assembly as this may indicate the need for service.

2



TECHNICAL SERVICE

CHAINRING REMOVAL

- 3** Using a flathead screwdriver gently pry the retaining ring off the ring guide. Remove the guide ring and chainring.

3



BASH GUARD REMOVAL

- 4** Using a 6 mm hex wrench, loosen and remove the four bash guard nuts. Remove the bash guard.

4



TECHNICAL SERVICE

CRANK ARM REMOVAL

- 5** Using a 5 mm hex wrench, loosen and remove the four planet nuts. Lift and remove the crank arm.

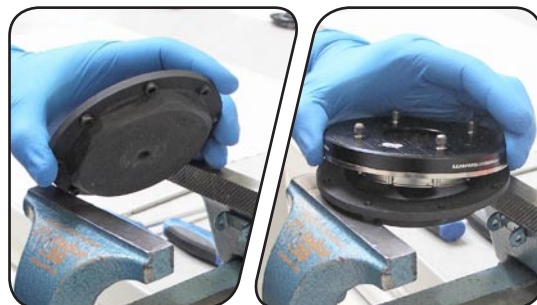
5



HAMMERSCHMIDT MECHANISM DISASSEMBLY

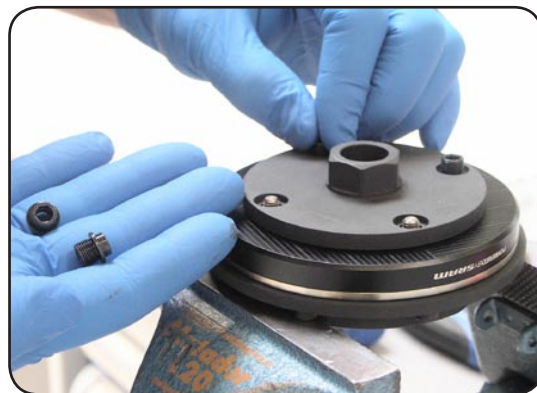
- 6** Clamp the bearing removal tool base into a vice. Place the HammerSchmidt mechanism assembly on the tool base so the tool pins engage the recesses on the HammerSchmidt mechanism.

6



- 7** Place the tool clamp over the planet posts. Using 5 mm hex wrench secure the clamp to the HammerSchmidt with the planet nuts. Torque to 5.6 N·m (50 in-lb).

7



- 8** Using a 5 mm hex wrench, install the shoulder screw. Torque hand-tight.

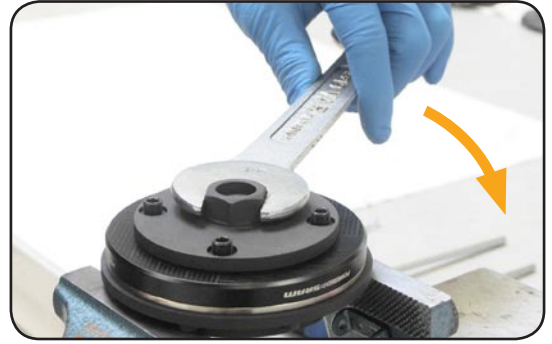
8



TECHNICAL SERVICE

- 9** The HammerSchmidt mechanism assembly is left hand threaded. Use a 24 mm wrench and turn the clamp **clockwise** until the mechanism breaks free. It could take significant force to open the system.

9



- 10** Using a 5 mm hex wrench, remove the shoulder screw and the planet nuts. Remove the clamp tool.

10



Planet Removal

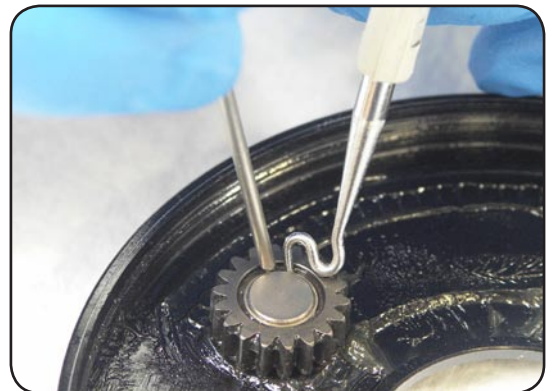
NOTE:

HammerSchmidt planet retaining rings are not reusable. Do not continue disassembly without new rings to reassemble the HammerSchmidt.

- 11** On the carrier assembly find the planet retaining rings. You may need to wipe away some grease to reveal the rings.

11

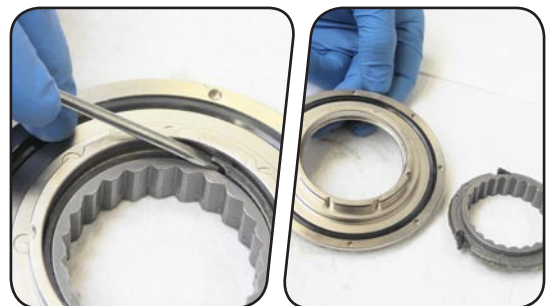
Use a small flathead screwdriver and a pick or tweezers, remove the ring by prying the two exposed ends of the ring outward. Repeat until all four rings have been removed. Discard the used rings. Lift and remove the planets.



Sun Gear Removal

- 12** Using a small flathead screwdriver, gently pry the retainer ring off the sun. Separate the sun and bearing assembly.

12



TECHNICAL SERVICE

Bearing Seal Removal

13 Use a small flathead screwdriver to remove the bearing seal by gently prying upward from the inner edge of the seal. Perform this step carefully to avoid bending or damaging the seal. If the seal is damaged during removal, it should be replaced to avoid creating increased drag and poor sealing performance.

13



Ring Spacer and Damper Removal

NOTE:

It is not necessary to remove the ring spacer and damper to service the HammerSchmidt mechanism assembly. These parts should only be removed for damper replacement to avoid damage from removal.

14 Use a pick and pry upward to lift out the ring spacer.

14



15 Use a pick to carefully pry the damper from the ring gear. The damper is tightly fitted into a groove on the ring gear and may require firm pressure to position the pick for prying.

15



TECHNICAL SERVICE

CLEAN MECHANISM ASSEMBLY

Thoroughly clean any contamination and grease from the components of the mechanism assembly. Ensure that any grease residue is removed from the pawls, pawl seats, gear teeth, and the outer bearing and ensure these components are dry prior to applying fresh grease.

GREASE AND REASSEMBLE MECHANISM ASSEMBLY

IMPORTANT:

Use only the grease provided in the HammerSchmidt grease kit inside the mechanism assembly. Poor performance and accelerated wear may be expected from use of other lubricants.

Reassemble Carrier Assembly

- 16** Apply a generous amount of grease to the planet carrier surface and planet posts.
- 17** Install the planet gears onto the planet posts. Grease should ooze from underneath the planets as they are pressed against the carrier.
- 18** Install **new** planet retaining rings. **Be sure that these rings are completely seated in their grooves** by pressing the ends in with a small screwdriver.
- 19** Apply grease to the teeth and exposed face of the planets.

16



17



18



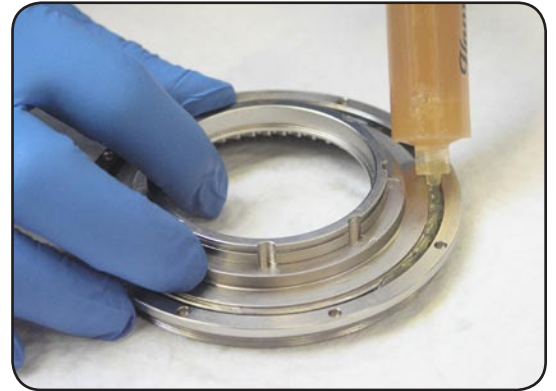
19



REASSEMBLE BEARING ASSEMBLY

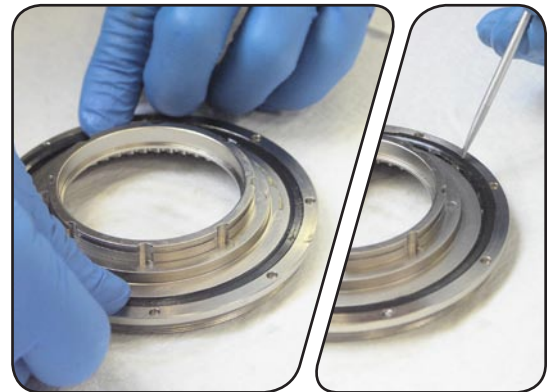
- 20** Apply a thin bead of grease in the space between the bearing and the outer race.

20



- 21** Replace the bearing seal by placing it over the bearing and pressing it firmly into the groove on the outer race. A screwdriver may be required to push the last portion of the bearing seal into the groove.

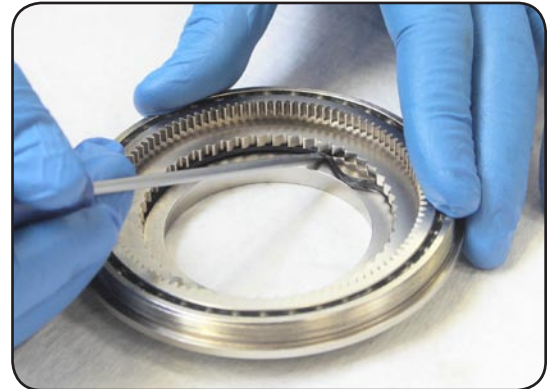
21



Ring Spacer and Damper Assembly

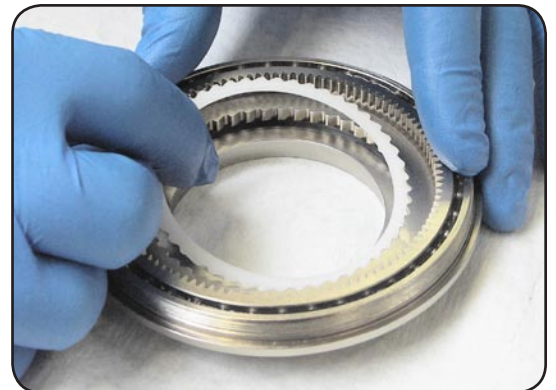
- 22** If the ring spacer and damper were removed in disassembly, they should be reassembled now. Using a new damper, press the wide portion of the damper into the back of the groove. To seat the damper properly, work around the circle pushing both into the groove and slightly back towards the section already in the groove. Once the damper is in, apply light pressure to the damper to smooth the damper and seat it evenly. Verify that there are no twists in the damper.

22



- 23** Press a new ring spacer inside the damper. The ring spacer will fit in tightly inside the damper and its outline should match the profile of the 1:1 pawl teeth.

23



TECHNICAL SERVICE

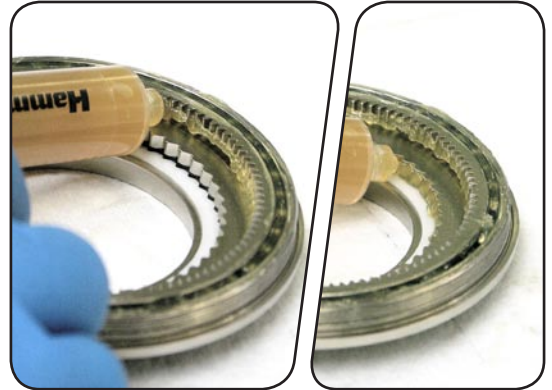
- 24** Apply grease to the inside of the bearing. Make sure you fill all of the gaps with grease. Spin the bearing to evenly distribute the grease.

24



- 25** Thoroughly grease ring gear teeth and 1:1 pawl teeth.

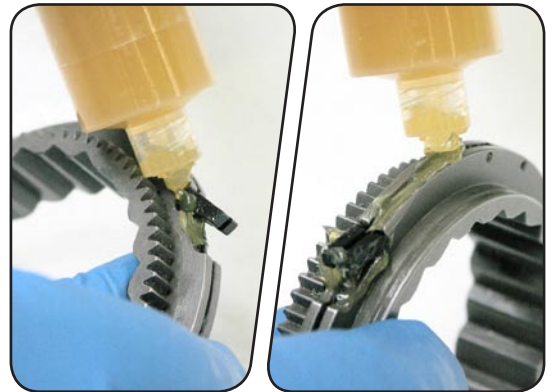
25



LUBRICATE SUN GEAR ASSEMBLY

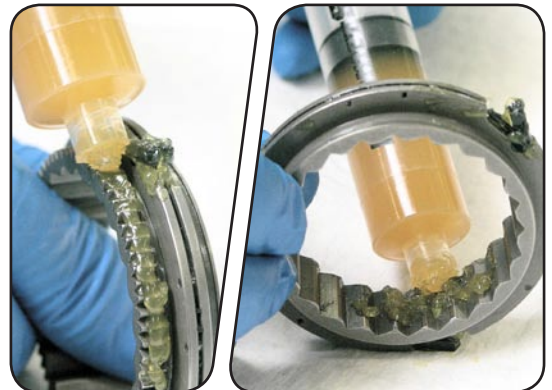
- 26** Apply grease to pawls, pawl seats, and spring groove of the sun gear.

26



- 27** Apply grease to the gear teeth and pawl teeth on the inside of the sun gear.

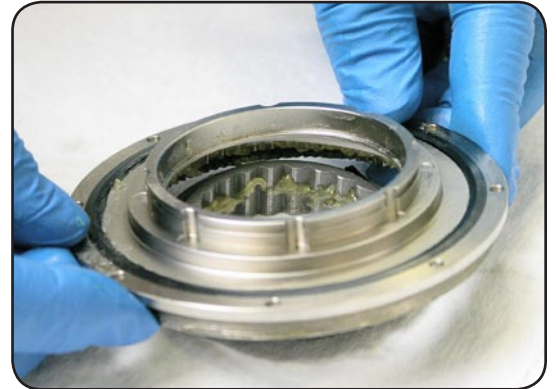
27



REASSEMBLE MECHANISM ASSEMBLY

28 Place the sun gear assembly inside the ring gear. Rotate the sun assembly counter-clockwise inside the ring to allow the 1:1 pawls to mesh with the corresponding pawl teeth.

28



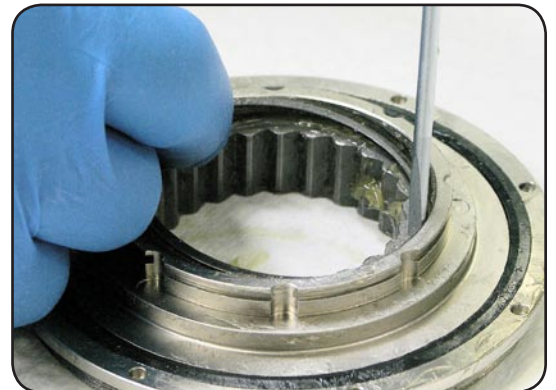
29 Apply grease to the sun retainer groove.

29



30 Hold the sun firmly against the ring and flip the assembly over. Using a flathead screwdriver, reinstall the sun retaining ring by pushing it into the groove on the sun assembly. Ensure the retaining ring is fully seated into the groove.

30



31 Apply a small dab of grease to the outside of the bearing and the inside of the carrier assembly. Using a grease brush or your finger, spread the grease all the way around the edge of each.

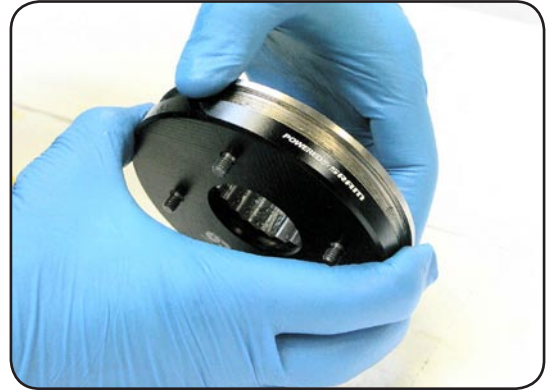
31



TECHNICAL SERVICE

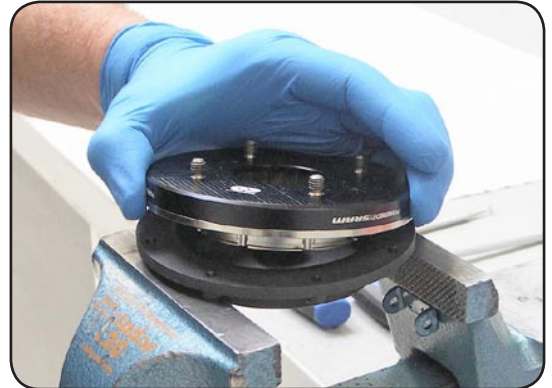
- 32** Place the bearing assembly on top of the carrier assembly. Wiggle them together until the bearing assembly slides slightly into the carrier assembly. Turn the ring gear counter-clockwise to ensure the gears mesh properly. Continue to turn the bearing assembly counter-clockwise until it is fully hand threaded into the carrier assembly.

32



- 33** Place mechanism assembly on the base of the bearing removal tool so the tool pins fit into the recesses on the outer race.

33



- 34** Place the tool clamp over the planet posts. Using a 5 mm hex wrench secure the clamp to the HammerSchmidt with the planet nuts. Torque to 5.6 N·m (50 in-lb).

34



- 35** Using a 24 mm wrench, tighten the mechanism assembly. Torque to 25 N·m (217 in-lb). Remember the HammerSchmidt mechanism assembly is left hand threaded.

35

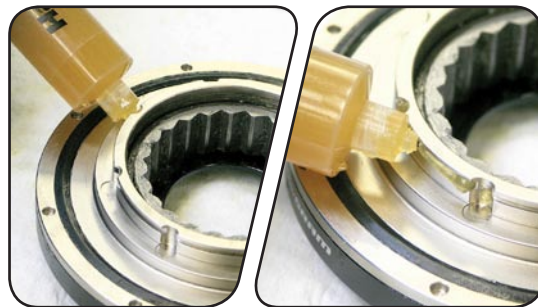


TECHNICAL SERVICE

CHAINRING INSTALLATION

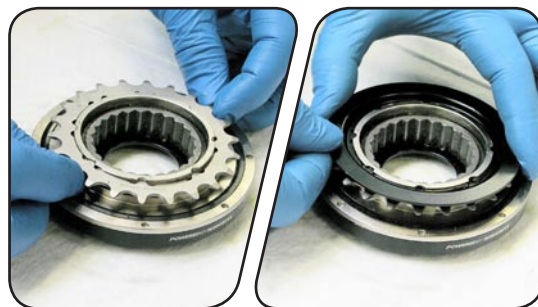
36 Apply a small dab of grease to the splines and retaining ring groove of the ring gear. Using a grease brush or your finger, spread the grease all the way around the edge.

36



37 Slide the chainring and guide ring into position.

37



38 Using a flathead screwdriver, install the chainring retaining ring. Make sure that it is fully seated in the groove of the ring gear by rotating it a couple of revolutions.

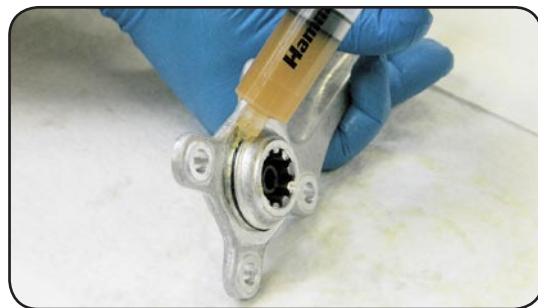
38



CRANK ARM INSTALLATION

39 Clean and lightly grease the carrier seal on the crank arm.

39



40 To reinstall the crank arm place arm over the planet posts. Insert the planet nuts and use 5 mm hex torque wrench to torque to 5.6 N-m (50 in-lb).

40



TECHNICAL SERVICE

BASH GUARD INSTALLATION

41 To replace the bash guard place it over the planet nuts. Using a 5 mm hex wrench, tighten the bash guard bolts. Torque to 4.5 N·m (40 in-lb).

41



REASSEMBLE THE MECHANISM ASSEMBLY AND DRIVE SIDE CRANK ARM

For reassembly of the mechanism assembly and drive side crank arm follow the instructions as shown under headings “Drive Mechanism and Crank Arm Installation” in the Installation section of this manual.

This concludes the Mechanism Assembly and Drive Side Crank Arm Service for your HammerSchmidt. You did a great job!

COLLAR PLATE ASSEMBLY SERVICE

Parts and tools needed for service:

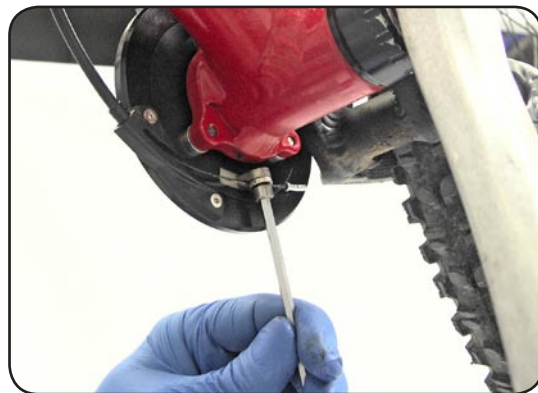
- Safety glasses
- Clean rags
- HammerSchmidt grease kit*
- Gloves
- Pick
- Small grease brush (optional)
- 2, 2.5, and 4 mm hex wrenches

* You must use the grease supplied in the HammerSchmidt grease kit unless otherwise specified. Using any other grease will void your warranty.

REMOVE THE COLLAR PLATE ASSEMBLY

1 Shift the HammerSchmidt into overdrive by pressing the small shifter paddle. Using a 4 mm hex wrench, loosen the cable anchor bolt and remove the cable. Remove the housing from the cable housing stop.

1



2 If you have ISCG 03 tabs, remove the collar seal to access the HammerSchmidt mounting bolts.

2



3 Using a 4 mm hex wrench to remove the 3 mounting bolts. Slide the collar plate off the bike.

3



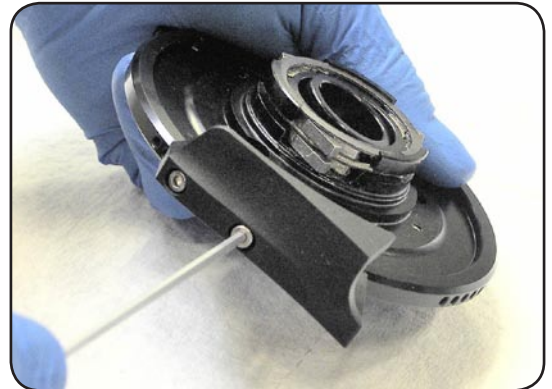
TECHNICAL SERVICE

COLLAR PLATE DISASSEMBLY

Chain Guide Removal

- 4** If your chain guide is damaged and needs to be replaced, locate the two screws that attach the chain guide to the collar plate and note their position. You will want to reinstall the chain guide in the same position later. Using a 2.5 mm hex wrench, remove the screws and chain guide.

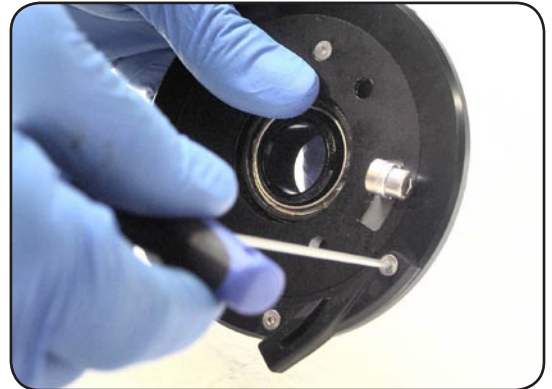
4



Cable Stop Removal

- 5** If your cable stop is damaged and needs to be replaced, use a 2 mm hex wrench to remove the screws and cable stop.

5



Overdrive Pawl Removal

- 6** Using a pick, carefully lift and pull back on the overdrive spring to remove it.

6



NOTE:

Be careful not to damage the spring upon removal by over stretching or kinking it. If the spring is damaged upon removal, replace it with a new one.

- 7** Remove the three pawls from their seats.

7

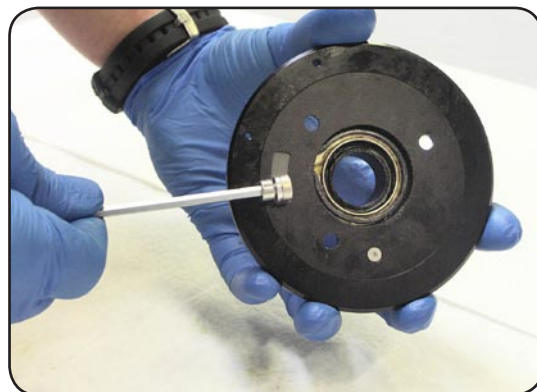


TECHNICAL SERVICE

Seal Disk Removal

8 Using a 4 mm hex wrench, remove the cable stop bolt and cable stop washer.

8



9 Using a 2 mm hex wrench, remove the disk bolt.

9



10 Lift and remove the seal disk.

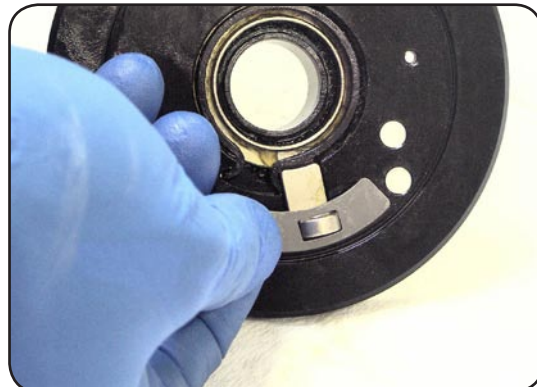
10



Wiper Seal Removal

11 With the seal disk removed the wiper seal can be removed.

11



TECHNICAL SERVICE

Actuator Removal

NOTE:

Be sure to wear your safety glasses for this step. The actuator spring is pre-loaded and may pop out suddenly.

- 12** Remove the actuator spring by pinching the curved tips together and lifting the spring out of the assembly. Remove the actuator.

12



Crank Stop Removal

- 13** Locate the beveled edge of the crank stop retainer. Using a pick, start at the beveled edge to lift the crank stop retainer from its groove.

13



TECHNICAL SERVICE

CLEAN COLLAR PLATE ASSEMBLY

Thoroughly clean any contamination and grease from the components of the collar plate assembly. Ensure that any grease residue is removed from the pawls, pawl seats, actuator, and the actuator recess in the collar plate and ensure these components are dry prior to applying fresh grease.

GREASE AND REASSEMBLE COLLAR PLATE

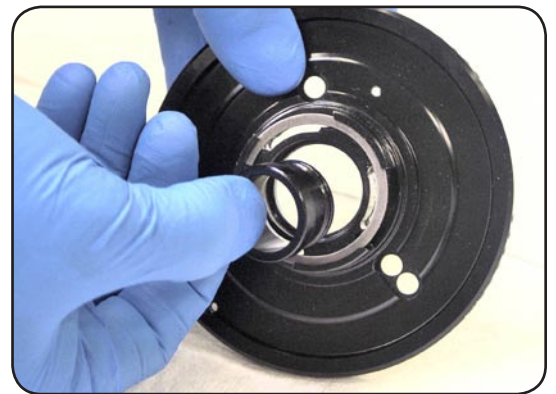
IMPORTANT:

Use only the grease provided in the HammerSchmidt grease kit inside the collar plate assembly. Poor performance and accelerated wear can be expected from use of other lubricants.

Crank Stop Reassembly

- 14** Insert the crank stop and secure it in place with the crank stop retainer. Make sure that the retaining ring is fully seated in the groove of the crank stop.

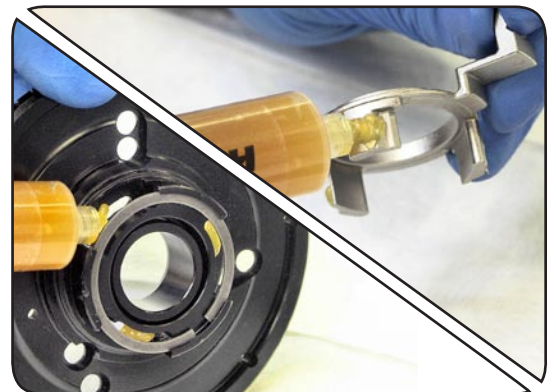
14



Actuator Reassembly

- 15** Apply a light coat of grease over the entire actuator, evenly distributing it with a small grease brush or your finger. Apply a light coat of grease to the corresponding recess in the collar plate.

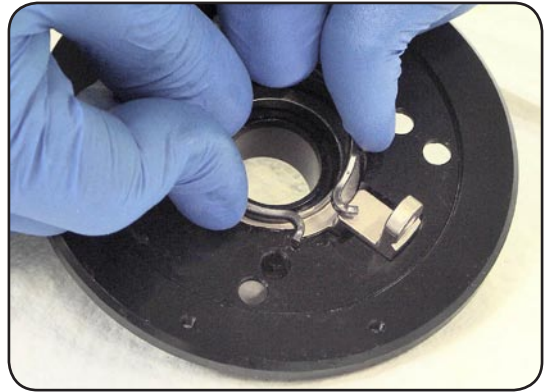
15



TECHNICAL SERVICE

- 16** Insert the actuator into the collar plate and install the actuator spring by squeezing the tips together and pressing it into the collar plate recess.

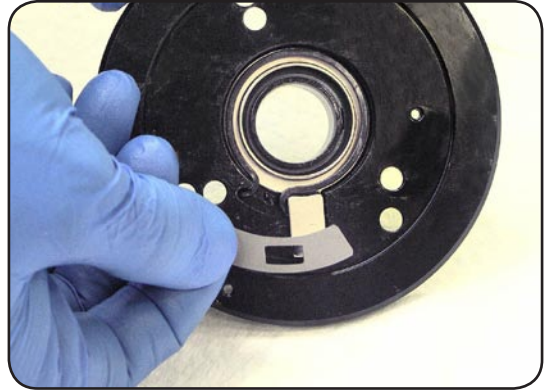
16



Wiper Seal Reassembly

- 17** Fit the wiper seal over the cable bolt tab on the actuator.

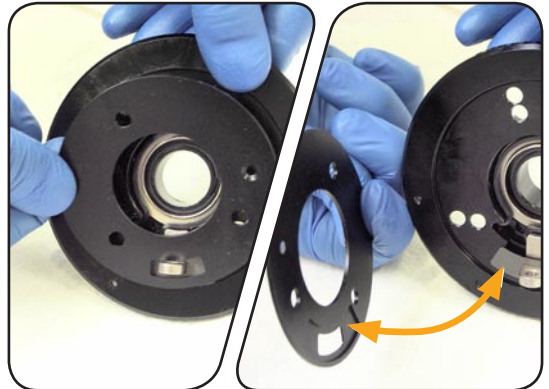
17



Seal Disk Reassembly

- 18** Replace the seal disk with the recessed side down.

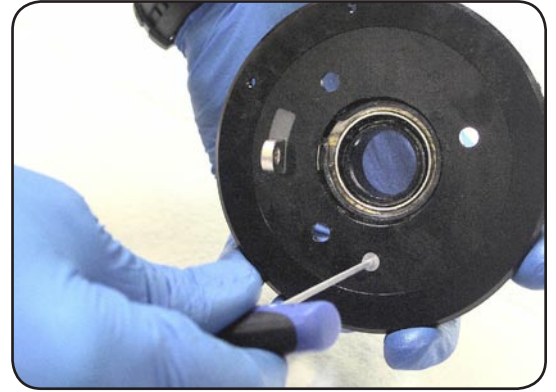
18



TECHNICAL SERVICE

- 19** Using a 2 mm hex wrench, install the seal disk bolt. Torque to 0.6 N·m (5.0 in-lb).

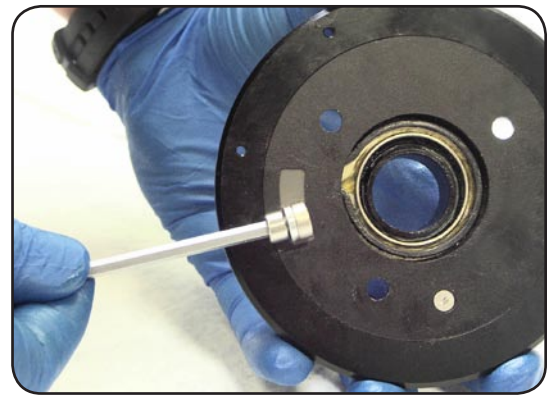
19



Cable Anchor Bolt Reassembly

- 20** Using a 4 mm hex wrench, install the cable anchor bolt and washer. Tighten to hand-tight.

20



Overdrive Pawls Reassembly

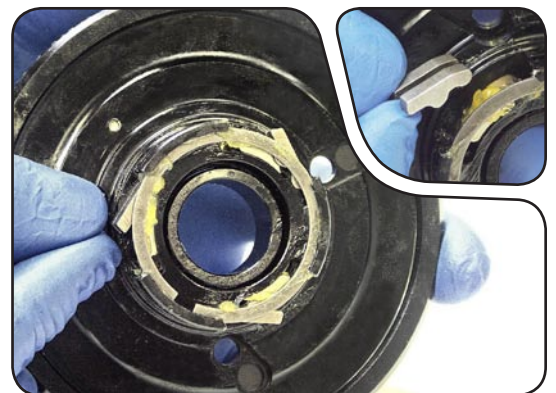
- 21** Apply a light coat of grease to pawl seats on the collar plate assembly.

21



- 22** Install the pawls in the collar plate assembly. Make sure the pawls are oriented correctly. The round end should be seated in the pocket and the square end should be exposed.

22



TECHNICAL SERVICE

- 23** Carefully stretch the overdrive spring around into the grooves of the collar plate and each of the pawls.

NOTE:

Be careful not to damage the spring upon removal by over stretching or kinking it. If the spring is damaged upon installation, replace it with a new one.

Make sure that the spring is fully seated in the groove of the collar plate and the pawls.

Collar Seal Reassembly

- 24** Pull the actuator arm so the pawls are retracted, and re-install the collar seal, lip side down. Make sure it is fully seated and check again that the pawls can extend and retract without interference.

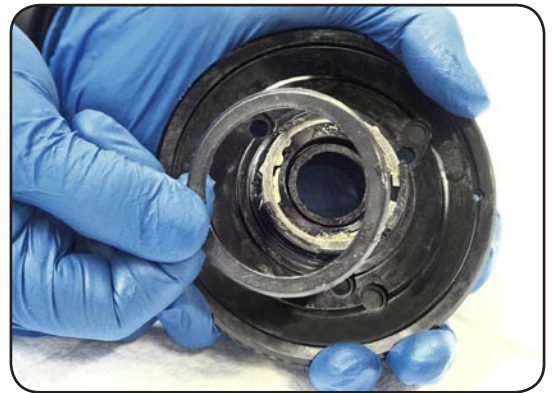
Chain Guide Reassembly

- 25** If the chain guide was removed due to damage, install a new chain guide onto the collar plate in the same location as before the service. Using a 2.5 mm hex wrench, install the two chain guide screws. Torque to 0.7 N·m (6 in-lb).

23



24



25



REASSEMBLE THE COLLAR PLATE ASSEMBLY

For reassembly of the collar plate assembly follow the instructions as shown under headings "Collar Plate Assembly Installation" in the Installation section of this manual.

For installation of the shifter cable and shifter adjustment follow the instructions as shown under headings "HammerSchmidt Shifter Installation" in the Installation section of this manual.

SAFETY CHECK



WARNING:

Before setting out on a ride, perform a parking lot test to ensure the HammerSchmidt shifts and functions properly.

This concludes the Collar Plate Assembly Service for your HammerSchmidt. You did a great job!

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