

Mods & Improvement

QRS Maintenance videos at Youtube

QRS Secondary Video # 1

QRS Secondary Video # 2

QRS Belt Deflection Video

When you observe fluctuating rpms; 1) high rpms on road and low rpms in the snow, or 2) Correct rpms for moments at full throttle but watch the rpms diminish, then (and i know it is not pleasant to measure) you must check all bushings to see if they are near or at the wear limit. If the bushings are heading towards the wear limit then the clutch fitness itself can be causing the rpm fluctuation when all the engine management is fine and working well.



1. Pivot screw
2. Sliding sheave
3. Fixed sheave

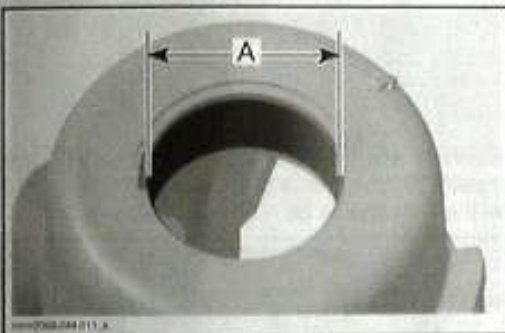
Remove rollers.
Discard E-clips.

Driven Pulley Inspection

Cam and Spring

Verify contact surfaces of cam for visible damages. Replace cam if necessary.

Using a dial bore gauge, measure the inner diameter of cam bushing. Measuring point must be at least 5 mm (1/4 in) from bushing edge.



A. Inner diameter of cam bushing

BUSHING	SERVICE LIMIT
Cam bushing	41.5 mm (1.634 in)

Replace the cam if the inner diameter of bushing is out of specification.

Sliding Sheave

Inspect pulley sheave for marks or scratches.

Using a dial bore gauge, measure the inner diameter of sliding sheave bushing. Measuring point must be at least 5 mm (1/4 in) from bushing edge.



A. Inner diameter of sliding sheave bushing

BUSHING	SERVICE LIMIT
Sliding sheave bushing	41.5 mm (1.634 in)

Replace the sliding sheave if the inner diameter of bushing is out of specification.

Fixed Sheave

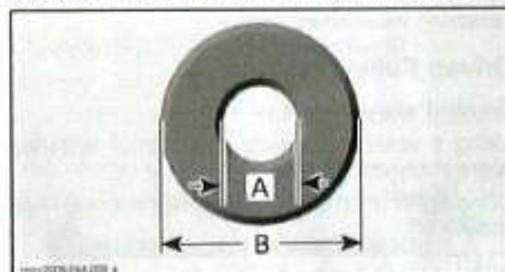
Replace fixed sheave and countershaft if one of the following problem is detected:

- Marks or scratches on pulley sheave
- Bent, twisted or otherwise damaged countershaft
- Defective splines and threads at the end of countershaft.

Driven Pulley Rollers

Check the rollers for flat spots, cracks or other visible damages. Replace if necessary.

Measure inner and outer diameter of rollers.



A. Inner diameter
B. Outer diameter

ROLLER DIAMETER	SERVICE LIMIT
Inner diameter	8.5 mm (.335 in)
Outer diameter	21.5 mm (.846 in)

Measure the roller thickness.

Helix bushing - Product specs



**This bushing fits the
QRS sliding sheave
and helix. \$18**

Secondary Rollers

No need to buy a shiny flavour of the week aftermarket secondary - the addition of these phenolic resin make for...

Clutch roller service life dramatically increased.

Longer belt life.

Rollers are made from hi-tech extremely durable material

Highly resistant to heat and distortion.

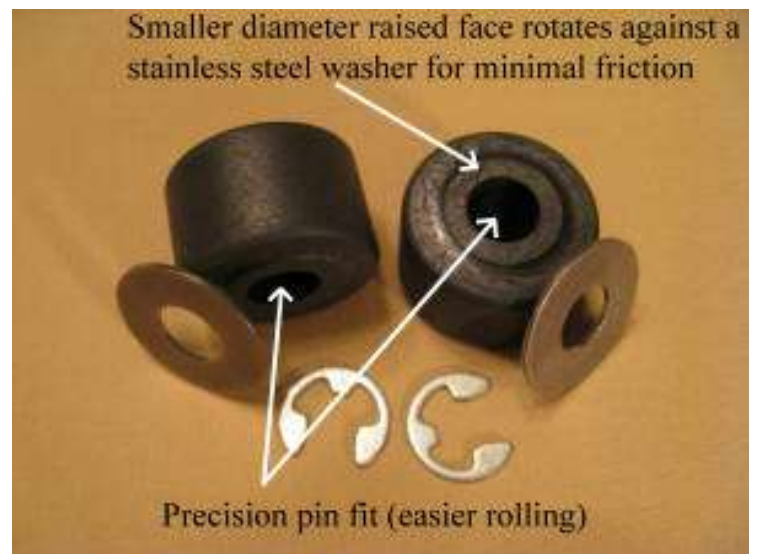
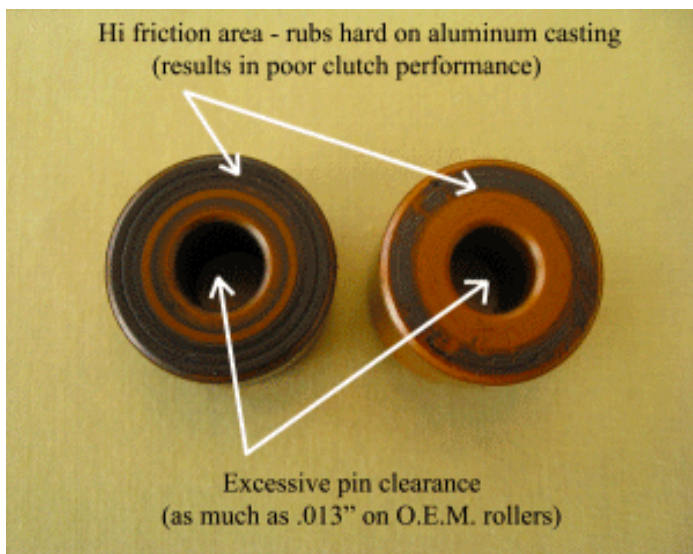
No more flat spots or skidding.

Clutching and tuning made easier due to consistent action.

Quicker backshift gives better throttle response.

I recommend these secondary rollers especially in any 2008~2010 trail or mountain model XP sled.

[HiTorque Rollers out of British Columbia](#)



Pivot stud fastener device

2008, 09, 10, 11 have the D-Clip which holds in the pivot stud.

2012 has a threaded screw to hold in the pivot stud.

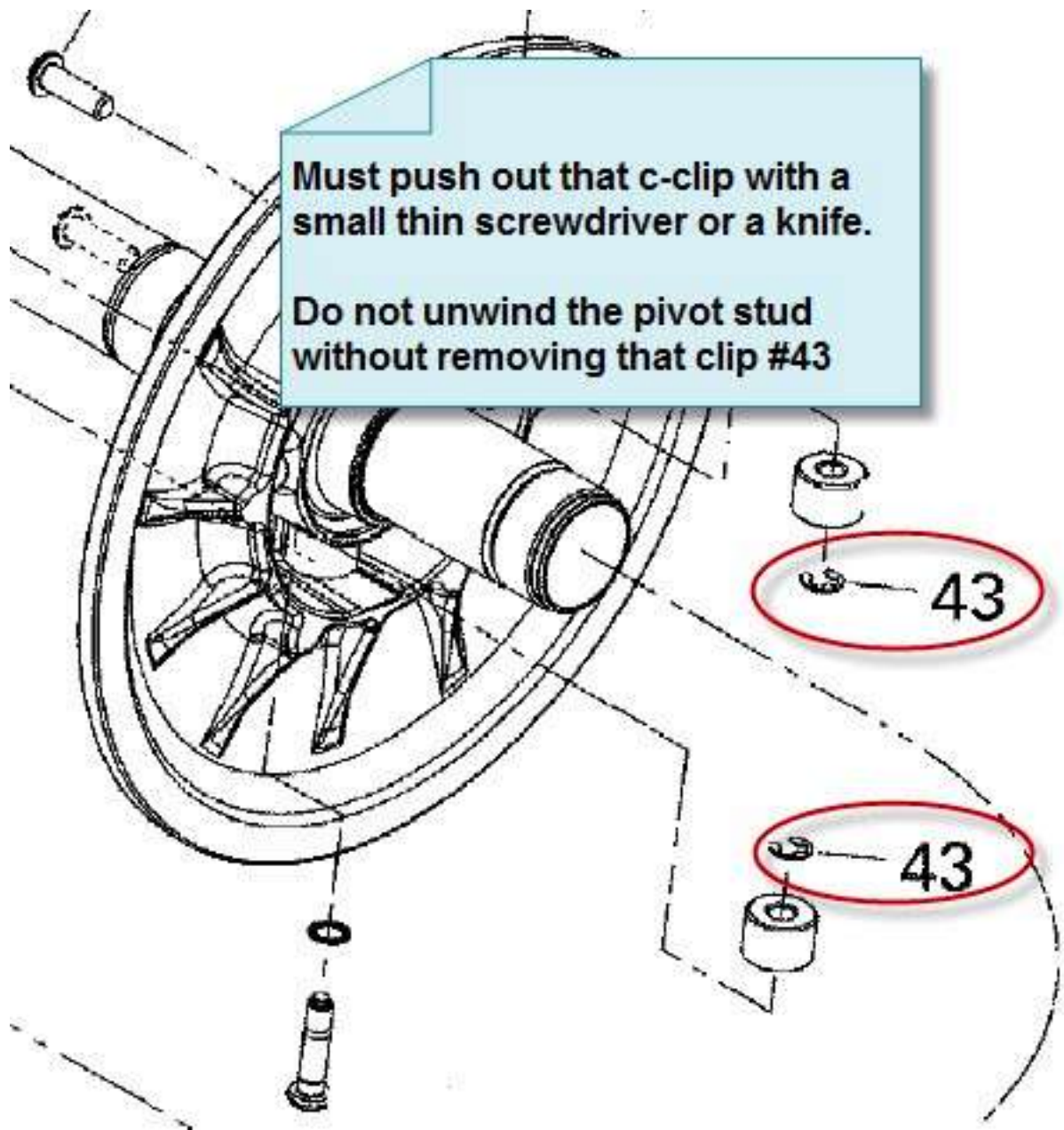
2013~16 has a steel compression roll pin pressed into the casting to hold the pivot stud.



Must use a thin screwdriver to spin the clip around to get the opening pointing towards you so you can push the clip off the pivot stud.

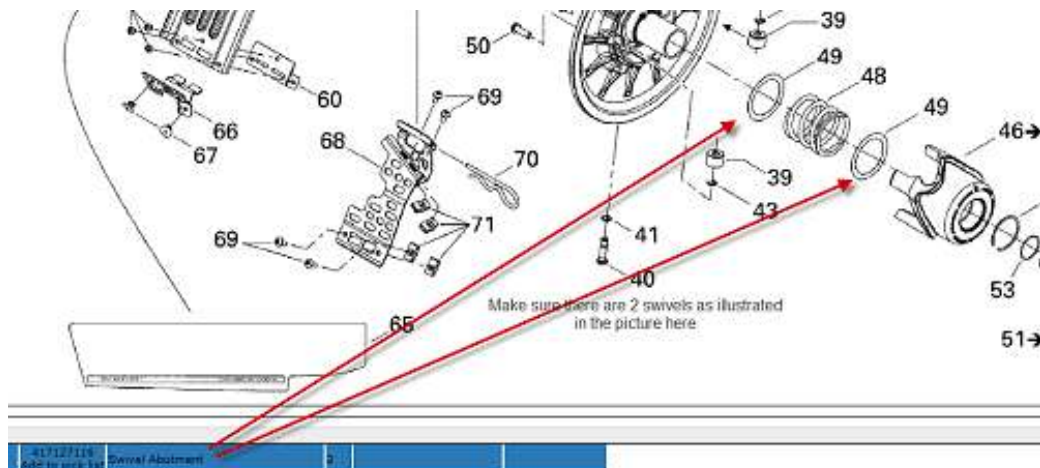
If you do not remove this clip, then as you unwind the stud out, the clip will score the smooth ground roller surface, the scoring will be in a spiral shape according to the thread pitch you see on the stud itself.





Swivel Washers

Dont forget to double check on the swivel washers that go on either end of the secondary spring. One has the secondary out and a swivel will fall on the floor or just disappear. Confirm there are two washers on either end of the spring, have no metal on metal.



The Floating secondary QRS

One of the best modifications i've ever used for alignment issues that cause torn out chords on belts.

<http://www.floatingqrs.com/>

[Doodoctor at Youtube](#) - click



Pulley alignment

REV XP chassis types please note the following specifications.

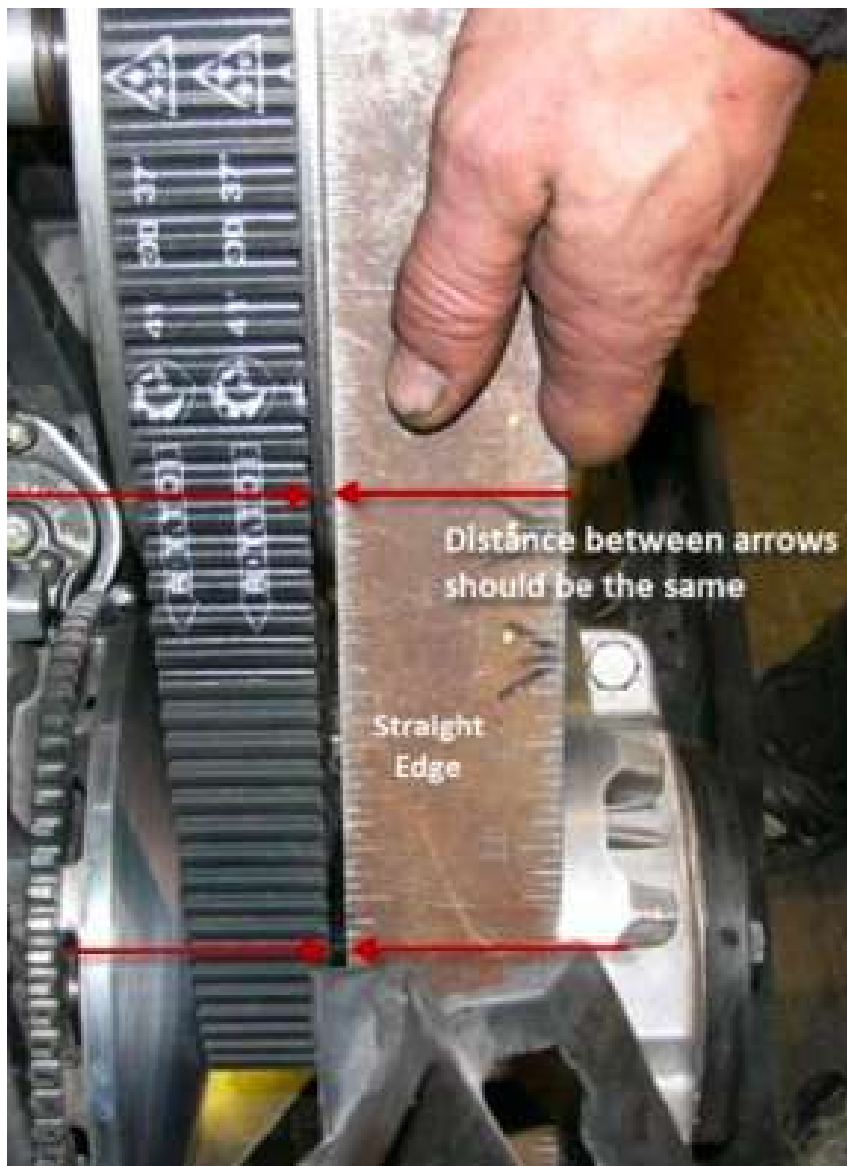
"Z" Distance 21.0mm .827 in.

"X" Offset 37.1 +/- 0.5mm 1.461 +/- .020 in

"X-Y" Difference 1.62mm 0.064 in.

Please note: Although these are the target specifications, pulley alignment is not adjustable. These dimensions are for reference only.

Doodoctor's Floating Secondary clutch is excellent to fix what ails your alignment



Alignment changes after Break-in

The primary clutch fixed sheave crankshaft taper may not be impressed far enough into the clutch and can give a further-away relationship to the engine, which will change the X dimension and alignment. (my personal 08 xp had this problem and solved with [doodoctor floating secondary](#) . My alignment was 1.2mm out even after a full shim kit behind the secondary shaft jackshaft bearing) If that measurement is in question then borrow or get another tra-7 primary clutch and put it on the engine to verify this measurement to eliminate the possibility of such an out of place event as I have experienced.

The engine back stop can move out over a 1/4 inch. The clutch alignment can be good at rest however under full load the torque would twist the engine out of parallel.

Renegade 137 x 1.75 blowing belts

Andrew) I am having belt bowing issues on my 2015 800 bcx it is stock please help its getting expensive what can I do

Joey) What is your percentage of on/off trail? Do you also get to run the sled at highest track speeds over 95mph? Do you run in deep snow all the time?

Andrew) 50 % off trail 50% on trail. I do like to run at high speed at times

Not always in deep snow to be honest 2 belts disintegrated running trails in the UP. Clutches get smoking hot. I do run some deep snow as we do to idaho a few times a year . Top gear is 23.

Joey) Going past 98mph will blow a belt with a 23 top gear

You could benefit from doing a different alignment – making the X of the secondary clutch shaft stick out more

Top Gear	<input type="text" value="23"/>
Bottom Gear	<input type="text" value="45"/>
Engine RPM	<input type="text" value="7950"/>
Gear Ratio	<input type="text" value="1.9565217391304"/>
Constant	<input type="text" value="46.1"/>

Belt Safe 1:1 ratio	Belt Caution 1/2 o.d.	Belt Danger Full o.d.
MPH 88.10	97.89	106.14
KMH 141.78	157.54	170.82

MODEL	DRIVE CLUTCH	DRIVEN CLUTCH	CENTER TO CENTER	X
MXZ, Renegade & Freeride (track 1.75") 800R E-TEC	TRA 7	QRS	258.7±2.3mm	36.4±1.8mm
Summit 800R Ptek Freeride (track 2.25") Summit & Freeride 146°-154° 800R E-TEC	TRA 7	QRS	258.7±2.3mm	39.4±1.8mm

You have 36.4 in the X on alignment and can probably use 39.4 on the X like a summit

Shim kit, <https://c-tpowersports.com/2013website/product/shim%20kit.html>

That will be a good start – do a new alignment spec. Stay below 98mph track speed.

Joey