

AVALANCHE
SUSPENSION

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PROGRAM
MAKING SUSPENSION BETTER FOR EVERYONE.

Hybrid Coil/Air Open Bath Cartridge System
Install and Set-up



Typical assembly (Fox 36)

Hybrid coil/air cartridge damper system

Here is a more detailed explanation of the hybrid coil cartridge system. We use PayPal as our secure payment system, your invoice will direct you through the payment path.

We have install instructions and videos that will provide the details or you can send us your fork and we can do this for \$129 if you wish.

How our customer describes this system, "Motocross forks utilize a combo of coil and air (they use oil volume to adjust air pressure progression) because allows for increasing the progression or keeping it more linear and adds to the overall spring rate. This makes a fork that isn't initially too soft/ divvy and a well supported mid stroke due to the coil/air and then you get the progression needed at the end to prevent harsh bottom outs. No doubt a hydraulic bottom out works as well but then you might lose some other benefits of a hybrid setup, mainly spreading the spring force between both legs to reduce side to side deflection and friction, so that they work in better harmony. Supporting the rider weight on just fork one leg have reported notably different amounts of travel being used by each fork leg due to the flex."

Another customer:

"Just thought I'd give an update on the 38 cartridge/hybrid coil setup. I ended up after a day of riding at the bike park increasing the air pressure to 52 psi. I kind of like things on the firmer side. The compression is at 8 clicks from closed. And the rebound I left at 11. This thing is awesome. The fork had the Grip 2 in it and your stuff blows it away. I can go faster/harder and the fork just eats it all up, Its awesome. It even eats up roots/rocks far better. Its really the best of both worlds (just like you claim). No arm pump or any hand pain. Just figured I'd update you on the settings and say thanks for an awesome product. "

Did you get a chance to read why a Hybrid Coil Cartridge System as compared to a coil only replacement system?

This is the key to a plusher more coil like feel because the spring rate is not over sized compared to coil only MTB coil forks.

The reason you have to play with spring rates to get the best compromise is the reason you need ramp up through the entire stroke, ramp up allows you to run much softer spring creating a plusher feel and increased bottoming protection. In other words the lack of ramp up forces you to an over sprung system.

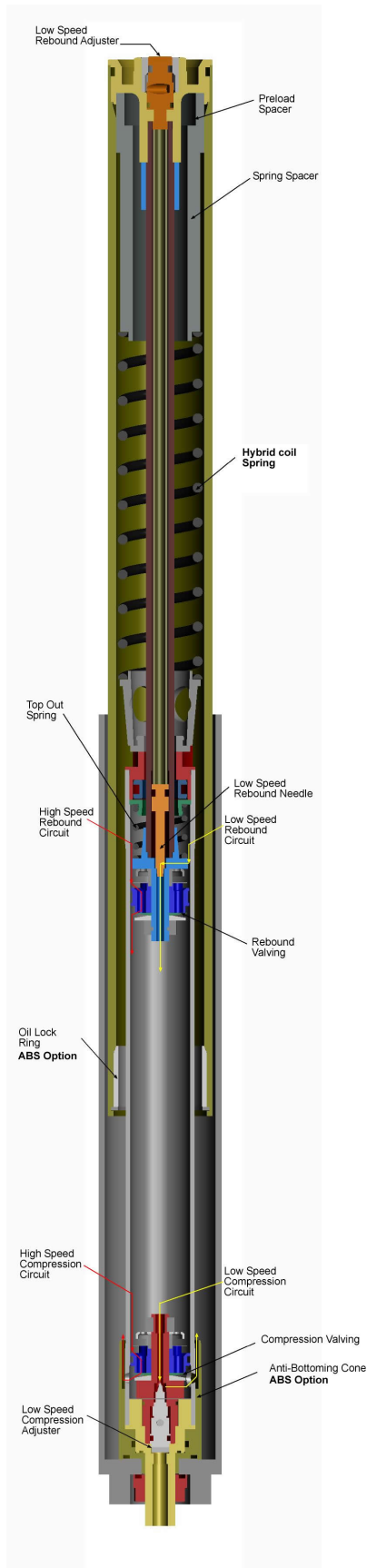
Think of the fork as creating 3 almost equal separate forces to create a properly uncompromised suspension.

1. damping force, 2. spring to support your weight at proper sag and preload, and 3. ramping to increase the spring rate as it gets deeper in the travel.

If the damping is missing (compression open or all the way out) then it needs to be over sprung or more ramp up is needed to come up with a compromised solution.

If the ramp up is missing then the damping or spring needs to be over done for a compromised solution

The 3 part solution is what all forks have been using for 50 years, only MTB suspension tries to eliminate 1 of the 3 or 2 of the 3 parts for lighter weight and reduced cost.



So what makes this a hybrid coil/air system: The open bath cartridge damper side now contains a coil spring and open bath oil. The air side of the fork continues to function as before but at a much lower pressure because the coil spring and air over oil pressure build up no support about half the riders weight.

Why keep the air spring system: The air spring system can still help support the rider weight, its just not as good as a coil in the initial stroke (small bump compliance) and more linear feel through the stroke. It also controls the travel and the overall progression of the fork. The forces are also distributed about equally between the left and right side, Equal Force System(EFS).

How does the Hybrid spring and open bath cartridge system damper add more function to the fork: The open bath cartridge is self bleeding and requires almost no maintenance. The air space above the oil creates pressure on the oil to prevent cavitation and adds ramp pressure depending on the oil height setting. The stock damper is sealed and adds no additional spring rate and requires regular service to bleed the damper oil.

How is the sag set with two different springs involved: The initial starting preload on the hybrid coil is based on the rider weight and the selected coil for the Hybrid system. One can add preload spacers on top of the coil to decrease the sag or add air pressure to the air spring to create a more progressive spring system. If increased spring rate is needed deeper in the stroke to prevent bottoming or simply create a more poppy lively feel then tokens can be added as desired.

How can we better make a coil fork even better!

A little history as to how this happened

:

The original or traditional coil forks were designed for MX and the early MTB forks with a damper and spring in each side, filled about 2/3's with oil. This allowed the fork to create a coil spring like feel for the first half of the travel. The air space above the oil is compressed which produces an additional spring force in the last half of the travel. This additional air spring effect does two things, it allows the selected coil spring rate to be much softer because the air supplements and increases the spring rate and the ramp up or progression can still be controlled by the air volume compression by changing the oil height.

MTB forks eliminated one damper to save weight and reduce the cost to produce over the past 20 years and used a single long over rated spring with no oil in the coil leg. This led to an air spring version that emulates a coil to further reduce the weight.

This is essentially is where we are now with your typical air spring system single damper front fork.

Our hybrid coil conversion brings back the ideal coil/air spring system without the added weight of traditional spring/oil filled fork. The air side is still used to create the additional spring rate and ramp rate at a much lower pressure. We use our open bath damper with a lighter and shorter coil spring on top of it. The air spring side remains unchanged and creates the additional spring rate. The air side now uses about 1/3-1/2 of the pressure that you currently used to create the additional spring rate which can be adjusted to support your weight and ramp up desired.

This hybrid system works in conjunction with our open bath custom valved damper with our exclusive midvalve and high speed blow off system (FvAT/HSB). Our damper creates a very supportive compression system that prevents fork dive and still feels plush on small bumps. This midvalve system and base valve will still blow off to prevent deep square edged harshness without bottoming.

Available For:

Rockshox Boxxer, Fox 40, Fox 49, Bomber 58, BomberZ1 (160/150/140), Fox

38 (170/160) Fox 36 (160/150/140), some Fox 34 and Z2 (150), Pike 29er (2014-17) 150, Zeb (180/170/160/150), Yari/Lyrik, 160/150/140 (riders under 200 lbs). MRP (160,150), Bartlett 200.

Keep in mind that air forks are trying to emulate the way actual coil springs do it naturally and because of this emulation, air springs don't do a very good job in the beginning and end of the stroke.

The main reason for our Hybrid coil system is to provide the support needed for proper ride height/sag without having to over pressurize the air spring resulting in too much spring rate which restricts the travel and makes the fork feel too stiff.

With the stock Fox 38, if you try to run 22-25% sag you can't get full travel and the overall feel is too stiff. So you are forced to use 30-35 sag. The Grip damper also contributes to the fork riding low in the stroke because it feels too harsh so you have to run the compression mostly all the way out. This reduces the effective travel and makes you feel like you need increase the travel to make up for this.

Installing the cartridge, oil and hybrid coil spring

Thank you for purchasing an Avalanche Advantage Cartridge Kit. The following instructions are intended for those experienced with the mechanics of suspension service. Please follow the instructions carefully and thoroughly. If there are any questions please contact Avalanche DownHill Racing for further assistance.

Do not dispose of waste oil inappropriately! Contact your local recycling center for information on proper disposal.

Disclaimer:

Avalanche Suspension Inc. is not responsible for any damages to you or others from riding, transporting or other use of your Avalanche Advantage Cartridge or mountain bike. User

fully

understands that mountain bike riding and/or racing is dangerous and hard on equipment.

In the event

your Avalanche Advantage cartridge kit fork breaks or malfunctions, Avalanche Suspension Inc. will

assume no liability or obligation beyond the repair or replacement of your fork.

Before getting started you will need to locate the following tools and consumables

**Tools, fluid and lubricants required to install
Avalanche Advantage Cartridge upgrade kit**

Tools:

6 point sockets: 36, 34, 32/30mm depending on fork cap hex size, cassette for later rockshock products, 15mm

Open end wrench : 1/2 in

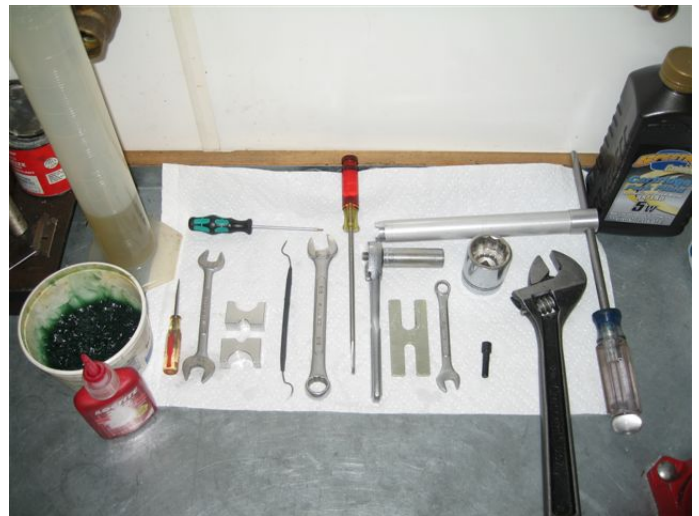
Hex Keys : 2mm , 2.5mm, 5mm

Small Flat blade Screw driver

Soft face hammer

In-Lbs Torque wrench

Graduated Cylinder (Optional) Small tape measure or ruler(suction fork oil level gage)



Consumables:

Rubber Gloves

Spectro oil 85/150

Shop rags

Isopropyl alcohol or

Contact Cleaner)

Assembly Lube or light

**Preparing your fork for the Avalanche
Advantage Cartridge upgrade kit and Hybrid coil option.**

Remove the stock damper
Tap the loosened bolt to relieve
the lower press fit.



Depending on the model remove
the bottom out ring so the
cartridge will slide into the
lowers with no interference



Install the cartridge into the
lowers, secure using hardware
provided, 15 mm hex for Fox
forks



Install the cartridge into the
lowers, secure using hardware
provided, 6 x 1.0 Allen bolt for
Rockshox forks.



Pour in oil to fill the damper side to the top and start bleeding the air bubbles out by pulling up on the cartridge rod until the level drops, it maybe easier to temporarily attach the fork cap to create a better suction on the rod and make it easier to pull.



Pour in oil to fill the damper side to the top and start bleeding the air bubbles out by pulling up on the cartridge rod
Continue filling and pumping the rod and cycling the stanchions up and down until the level stops dropping.



Continue filling and pumping the rod and cycling the stanchions up and down until the level stops dropping.

Cup your hand over the top and use it to pressurize the leg as you compress the stanchions to help remove the air bubbles, if needed assemble the fork cap temporarily to help this process maybe easier.



Measure from top of stanchion down to oil with the fork fully compressed and the cartridge rod pressed all the way down. The height of oil needs to be 35 for extended fork cap and 55 mm for the new flush fork cap from the top. Over fill will cause fork seal damage, under filling will cause the cartridge to suck air and have erratic damping.



Use a 10 mm open end to slip over the cartridge rod and twirl the spring to get the rod to come to the top



Position the 10 mm wrench under the jam nut to attach the fork cap to the rod.



Using a ½ inch wrench and a 15mm, 6 point socket tighten the jam nut firmly hand tight (no torque requirement). **Be very careful these parts are delicate.**



Use a paper towel on the fork cap hex to avoid scratching the finish. Tighten the fork cap to the stanchion with a 15 mm socket to 25 ft-lbs.

Add or remove spring preload spacers as needed to set sag or adjust ride height. Max 2 spacers(6mm).



Same procedure without the hybrid spring, just thread the fork cap on the cartridge rod, being careful to completely thread the cap on and then bring the jam nut up to snitch it up.



Using a ½ inch wrench and a 15mm, 6 point socket tighten the jam nut. **Be very careful these parts are delicate. Use a paper towel on the fork cap hex to avoid scratching the finish.** Tighten the fork cap with a 15 mm socket to 25 ft-lbs.



The height of oil needed for your set is specified in the setup sheet provided with your order. Over fill will cause fork seal damage, under filling will cause the cartridge to suck air and have erratic damping.

Set-up and Adjustment Options

The fork cap adjuster is the low speed rebound and the standard setting is 11 clicks out (counterclockwise) from full hard. The bottom 10 mm adaptor bolt contains the low speed compression adjuster and the standard setting is 11 clicks out (counterclockwise) from full hard. It can be turned by inserting a small (3.4 mm wide max) flat blade screwdriver up into the lower leg gold adaptor bolt.

Set-up Options:

Oil Type:

Recommended oil:

Golden Spectro 85/150 Cartridge Fork Fluid 5wt

Pro Honda HP Fork Oil 5wt

Pro Circuit Fork Fluid PC-01

Yamalube 01 Suspension Oil / KYB 01

Bel-Ray Fork Fluid 5wt

Motul Very light 2.5 wt

There are many others that we have not tested but as long as they say for Cartridge Forks and or 85/150 rating they will work fine, all 5 wt fork oils are not the same so beware of lesser quality oils that may foam up easily

Compatibility with other air side upgrades

We do recommend the stock air shaft/spring system with a spring/rubber bumper top out to control the forks length for consistence preload on the hybrid coil.or using the best version of it.

The MRP Ramp system: Still will provide external ramp or progression.

The Runt system: Still will provide external ramp or progression.

Disclaimer

Avalanche Suspension Inc. is not responsible for any damages to you or others from riding, transporting or other use of your Avalanche Advantage Rockshox Pike or mountain bike. User fully understands that mountain bike riding and/or racing is dangerous and hard on equipment. In the event your Avalanche Advantage cartridge kit fork breaks or malfunctions, Avalanche Suspension Inc. will assume no liability or obligation beyond the repair or replacement or your fork.



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