

**DUV A1000X**

## **Dalton Pro ATV Clutch Kit**

**Model:** 2013+ Arctic Cat Wildcat 1000 X model (Team clutches)  
Stock or oversized tires, adjustable kit

**Kit #:** DUV A1000X

**Components:** 1 Dalton Lime/White primary spring (DPPS-L/W)  
1 Dalton Purple/white secondary spring (DPSS-PL/W)  
1 set of Dalton Quick Adjust flyweights/hardware (QAW-62 )  
3 packs 1/4" UNC "Quick Adjust" set screws (QACA-SH)  
6 pcs step washer/spacers for flyweights

**Tools:** *Primary clutch puller bolt* is recommended . A primary clutch puller makes for easier drive clutch service if you intend to do more clutch work in future(maintenance), or remove the drive clutch for easier work and inspection. Arctic Cat dealers have them or can order Dalton part # DCP-N.

Also required will be a secondary compression tool. (This model/kit is dealer installation recommended) and a torque wrench.



### **Description :**

Optimum CVT clutch calibration for the Wildcat X

One clutch kit that can be set up for different terrain and tires sizes/elevation means accurate clutch tuning for your situation. Improved acceleration and performance in bottom and midrange, better clutch reaction to load conditions.

This kit includes Dalton's patented "Quick Adjust" flyweight system that allows you to add or subtract weight from the flyweights without even removing the flyweights from the drive clutch. Instead of using generic flyweights or designs from OEM snowmobiles or regular ATV models, extensive testing lead to development of a new custom base flyweight specific to this model. The new "Quick Adjust" flyweight in this kit has a different ,specific base weight, and location of mass which allows superior belt grip and RPM control .**Having a custom base flyweight and location of mass on the flyweight means that the total GRAMS you use may be irrelevant to other flyweights** , there is a common misconception in the market as to comparing flyweights by only "grams".

- Stock tires or oversized
- Altitude adjustable
- New custom Wildcat X specific flyweight profile
- Set up manual includes set up instructions for different applications.

**PLEASE READ ALL INSTRUCTIONS CAREFULLY FIRST !**

**This model is a Dealer installation and has reference to the service manual.**

Dealer -Please take the time to thoroughly read and understand these pages before continuing.

**WARNING**

Clutch components should only be installed by factory trained mechanics and personnel with a complete knowledge of variable rate belt transmission systems or CVT's. There are references to parts diagrams and service manuals. Dalton Pro clutch components are made from high quality materials in a controlled procedure. Do not modify components.

CVT clutches are assembled under spring pressure. **DO NOT** attempt to disassemble clutches if not experienced or qualified. This is a performance kit and is intended for the use of experienced adult riders ,who are trying to obtain a higher level of performance for racing, etc.This kit should not be installed on any vehicle that will be used by any person of MINOR AGE. Dalton Industries has no control over the use ,misuse, or installation of these components and assumes no responsibility for any injury or damage.

**IMPORTANT !**

*Take the time to read the associated documents and set up instructions for the components in this kit before continuing with installation. This kit contains various set up options and recommended settings for different applications.*

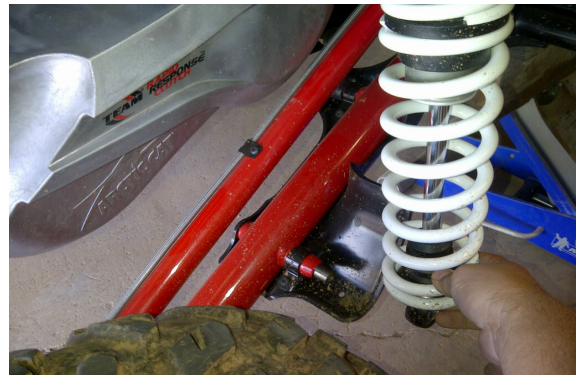
**INSTALLATION: (dealer)**

**Important:** Always remove the KEY from the ignition before working on clutches.

- 1) Park the vehicle on level surface. Elevate rear of vehicle and support in safe manner. On this model, clean the vehicle's clutch area first, and remove the right rear wheel for installing the kit . It helps to jack up the vehicle at the front of the trailing arm. This will lower the arm more out of the way of the clutch cover. Remove lower shock bolt and swing shock over for easier access.



- 2) Remove the cvt cover bolts to remove the aluminum cover shroud.



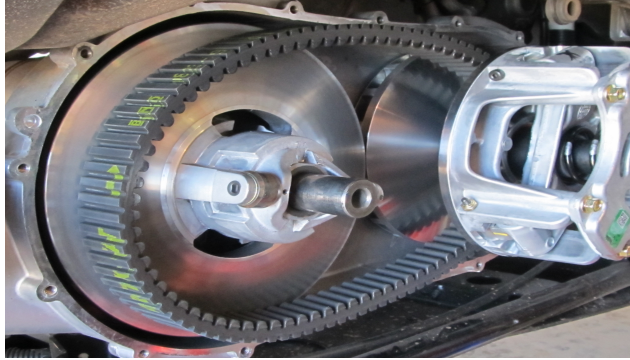
**\*Take note of direction of belt before removal.**

- 3)Remove belt. **INSPECT BELT** carefully for hour glass shape or spot wear. Worn belts should be replaced.



There are different ways to remove the belt on the Wildcat.X. On this model you can remove the belt by carefully inserting a smooth, flat object (small prybar) into the clutch as shown and spread the secondary sheaves to allow some belt slack. (use only the slot shown, be careful of rollers).



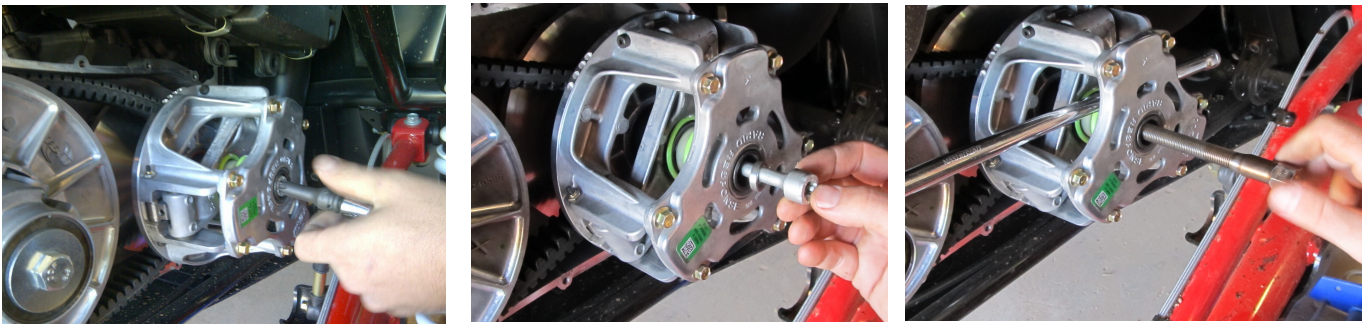


Also, you have the option that you could now remove the center bolt of the secondary clutch and remove the outer half of the secondary. This will also make it easy to remove the belt. It will need to be removed anyway to install the secondary spring.

4) You will next be removing primary center bolt. Using a **T 60** Torx bit, remove center bolt and keep track of spacer washer, etc.

Use puller to remove primary clutch. **Dalton puller part# DCP-N** or Arctic part # 0744-062.

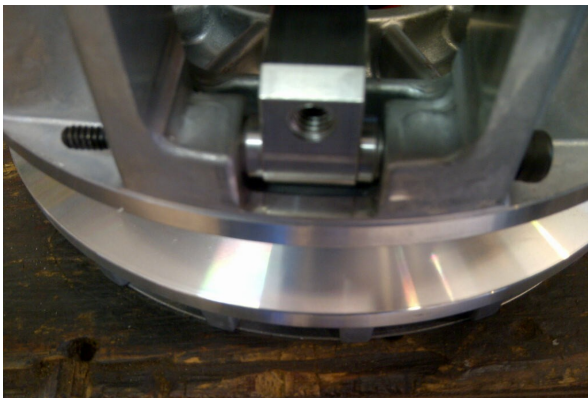
Keep the spacers/washers on the bolt and set the primary bolt aside.



Thread the primary clutch puller into the primary (motor) clutch and remove primary clutch now.

6) Mark the cover for location during re-assembly. **Be sure to look for alignment marks on cover plate or mark the clutch with a magic marker for orientation during re-installation.** *Be careful when removing cover plate bolts, the primary spring is under pressure.*

With the primary clutch cover plate off (primary clutch pressure spring removed) or with the primary on the bench, move the sheave inward and remove stock flyweights.



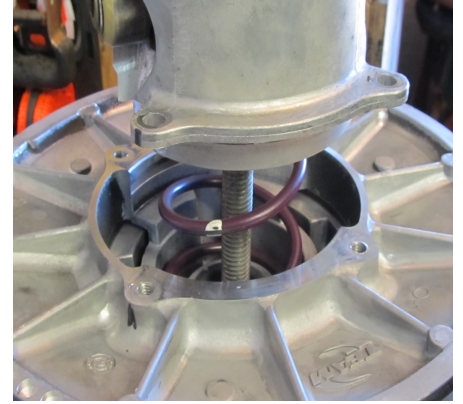
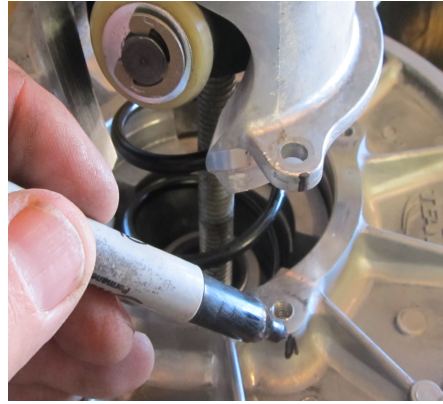
7) \* **Set up the flyweights as described** in this instruction manual for your desired application **See “Set-Up Guide”** Take note of “**your set up**”, and set up the flyweights, **then install the flyweights into the drive clutch.** The guide is within this instruction set. You should go by tire size first, then read details of each set up.  
**Step Washer : SMAL STEP goes OUTWARD from the flyweight on each side of weight (see picture).** Step washer replaces the flat washer that is used with stock weights.

**Caution:** Always assemble clutches as per factory service manual. Be certain all components are re-installed properly.

8)\*\* **Install the provided primary spring** into the primary clutch and re-install the cover plate onto the drive clutch (primary clutch).

9) Remove the secondary.

10) Using the manufacturers procedure, you will need a **clutch compression tool or shop press** to contain the secondary while the spring is being released. Mark the helix and the clutch for orientation when re-assembling. Once the fixture is holding the clutch together, remove the screws that hold the helix and slowly release the spring.



Release the spring and replace with the provided secondary spring.

Install the helix screws with a drop of blue removeable loctite.

11) Install both clutches and belt onto the vehicle and torque to manufacturers specs. **(60 ft/ lbs for both clutches)**

**\*Note: Install belt** noting direction .

12) **Install cover shroud.** It is important to inspect the cover seal to make sure it is in good condition and replace if necessary. Be careful to ensure all wires are tucked neatly out of harms way and zip tied, etc as necessary. Carefully inspect cvt air duct and clamps.

13) Install Rear wheel assembly and test. If you have installed a new belt be sure to break in the belt with an easy short ride without extended wide open throttle or load situations and let the belt cool before hard use.





## **OVERVIEW - and general CVT tuning**

There are books written on CVT clutch tuning and some in depth principles of controlling the rate of shift of the belt on belt drive systems. The following is a very general guide to help those unfamiliar with understanding some basic principals of the system.

The cvt system on your atv is a variable rate system. It is a two pulley system that gives different belt ratio as it shifts. As the belt goes up on the primary motor clutch, it also goes down into the driven (or secondary clutch) giving a higher clutch ratio and more speed.. Conversely , as the machine comes under load or slows down its speed , it back shifts to a lower ratio so that it will be able to pull away again after slowing or stopping. A system that is properly calibrated for its intended application will UP SHIFT as quick as possible *while still maintaining the proper rpm for the engines power curve*. If a system is up shifted TOO quickly it lowers the engine rpm to a level below peak hp....if it up shifts too slowly it will rev higher during the shift phase than that rpm where the engine makes best power . This same system should also BACK SHIFT properly. Back shifting properly means maintaining that optimum rpm as best possible, as the vehicle comes under load. The best key to good belt life is having the belt in the correct ratio for the load present, so that slippage is minimized. A very important part of cvt calibration is making sure the backshifting is happening exactly when it should.

**It is very important** to realize that on most ATV/UTV situations, that the “**clutch phase** “(the time that the belt goes from low ratio to high ratio) is only for a distance of approximately 500 feet at wide open throttle,(typical hard packed run) or around 45 mph. **After** which ...the clutch components are open all the way, and have little effect on rpm, as the belt is already up on the top of the primary clutch . Once the belt is to the top, it is to the top... and the engine starts to build rpm as the belt is out of ratio. Clutch components cannot control rpm after full shift out is achieved. ***Clutch components change the rate of shift of the belt...once the belt is shifted out ,clutch kits can not offer top speed increases.***

Different tuning components can control the rate of up shift and back shift of the belt to maintain a desired rpm range. The goal of a cvt system is to keep the belt in the proper ratio at any given speed and load situation. The factory has set up your system to be what they consider a decent “all around” calibration. Sometimes the factory calibration is better for one situation than another . Many users of ATV’s, for various reasons, like to change the desired effects and purpose of their machine to a more case specific application, whether it be oversized tires for mud, drag racing, sand applications, pulling competition, high altitude operation where less power is available, different engine(rpm) characteristics from engine modification etc. In different situations like this , performance can be optimized by re- calibrating the shift pattern of the cvt.

An example of a need to change the shift pattern would be adding larger mud tires. When installing larger tires there are a couple of factors that effect the clutching. The larger tires result in taller gearing. With a taller gearing situation, the last thing you would want to do is up shift too fast, as you are already starting off in a higher gear from the tires. The other factor is rotating mass. Heavier, large diameter rotating mass is a real negative for acceleration. Although most experienced tuners know that a atv with even slightly oversized tires will never be quite as quick as one with stock lightweight tires, clutch tuning can help compensate for some of the losses and help restore performance to acceptable level.

There are some vehicles that simply respond well to clutch calibration and make the vehicle much more sport oriented, even with stock tire sizes.

Whether it is a vacation week at a high elevation place, or a user with multiple sets of tires, the adjustability this kit makes it very flexible.

## **Weights, Springs, and Components** : A quick reference guide to the tuning components

**Flyweights** (weights) are the principal control of operating rpm during the clutch phase.

**Heavier Weights**- Quicker up shift and lower rpm during the “**clutch phase**”.

Depending on the situation, sometimes you can get away with a quicker up shift. It is important to remember that the primary spring is the opposing force to the clutch weights, and that changing the rating of the primary spring can effect the amount of force required from the flyweights.

**Lighter weights**- Slower up shift during the clutching phase. Slower up shift increases rpm.

*Note:* Remember, sometimes different curvature and profile can make total GRAMS irrelevant to each other. **You can only compare flyweights by grams if the curve and distribution of mass of two flyweights are the same**. Curvature and distribution of mass are also tuning methods.

**Springs** (general)- Stiffer springs slow the up shift. Softer springs up shift faster. The initial load (first part of the compression) of a primary spring controls engagement. Sometimes a stronger compressed load rating spring (second part of spring compression) can allow the use of more flyweight and the combination is effective for a situation ,but not all situations are the same. A spring is another type of tuning component. A spring is always chosen relative to the flyweight and the rest of the system. There are primary (motor clutch) springs, and secondary (driven clutch) springs.

***It is NOT that quicker or slower up shift is BETTER....it is totally dependent on the situation. The goal is to achieve the best shift pattern for the application at hand, so that the engine stays in its best rpm zone, whether it be a stock or modified engine, or a different terrain tire or situation. Some people are wrongly informed that higher rpm is always better, which is not necessarily the case. Sometimes to over-rev is a worse hp drop than revving too low.***

***The key is shifting (upshift and back shift ) the belt at the correct rate to always keep the belt in the correct ratio on the pulley system for the situation. This keeps rpm in the correct zone as much as possible, while preventing belt slippage from being in the wrong belt ratio at the wrong time. Slippage is heat, and excessive heat is the enemy of the system.***

**\*\*Primary springs.** The spring in the primary (motor) clutch has many functions. These springs are often compared at two different load heights. The initial load comparison (commonly at 2.5” ) is a controlling force for “engagement RPM” . That is the rpm at which the clutch system engages the belt and moves the vehicle. Primary springs are also compared by “compressed load “ ( compared at 1.25” compression) which has effect on the flyweights as opposing force, and helps control shift rpm like flyweights do.

In order to change **engagement rpm only** on a given set up, for rider preference, one should use similar “compressed load” on a given spring, but could alter the “initial load” to suit engagement requirements. There is a load chart on the components page of [www.daltonindustries.com](http://www.daltonindustries.com) that compares springs.

**The Primary spring in this kit is identified as Lime/White, with part number DPPS-L/W**

**Secondary Springs** . Secondary spring is another tuning component. The secondary clutch is load sensing, and should be balanced with the primary clutch calibration. This kit is designed for and requires the use of the provided secondary spring .

**The Secondary spring provided in this kit is identified as Purple/White, with part number DPSS-PL/W**



## Dalton Pro Quick Adjust Cam Arms - Adjustable flyweights.

*Dalton's patented quick adjust method* means that you can add and subtract flyweight mass from the main body of the flyweight without removing the weights from the drive clutch.

With the **quick adjust threaded passage** that you can adjust **from outside the clutch** for weight adjustments.

The threaded passage can be used to adjust the weight of the flyweight by adding or subtracting the supplied threaded set screws. The grams can be *\* added or subtracted by simply turning the clutch so that the desired weight is up at the top, and using the supplied allen key to add or subtract set screws thus changing the total mass of the flyweight.*

If you were to, for example, switch from one size of tires to another, ..you could adjust your clutch to the recommended setting by simply removing the cover shroud, and make weight adjustments (according to instruction sheet), then re-install the cover. No puller or clutch disassembly required. You do not even need to remove the belt.

Set up and adjustment guidelines are on the "set up" page for different applications.

*Always be certain that you keep track of the weights you have adjusted...it helps to mark the clutch in number from 1-3 to keep track. Be certain to not cause an imbalance by double adding to one passage and not all of them the same. Keep track of screws remaining.*

*NEVER install screws so that they protrude out past the entry point of the threads!*

*Make sure all screws go in all the way and bottom for secure fastening (do not over tighten)\* It is best to not use the full length 1" set screw as the first one in the hole to bottom out. ..it has so much thread pitch contacting, that it may bind from internal distortion at the end of the tapped hole.*

*Adjusting the Dalton "Quick Adjust" flyweights can easily be done without removing the flyweights from the clutch. You can add or subtract grams for the situation without even removing the belt.*

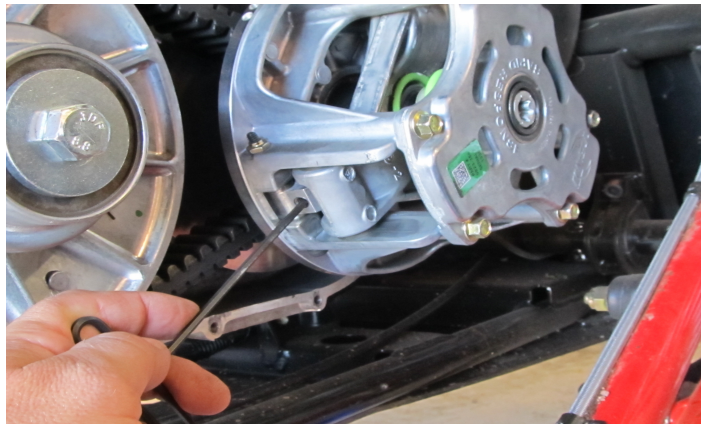
### Using the Quick Adjust set screws:

This can be done on the bench for initial set up, and as mentioned above, it can easily be adjusted later while the flyweight is still in the clutch.

- 1) Carefully install the set screw into the threaded passage . Be careful not to cross thread the set screws.
- 2) Wind the set screw all the way in until it is snug at bottom of threads. Do not over tighten
- 3) Add additional screws as required, always bottoming on the one inside.

### Set Screws in this application (1/4" UNC) weight :

1/4" long = .7g	1/2" = 1.9g	3/4" = 3.1g
3/8" long = 1.3g	5/8" = 2.5g	1" = 4.3g



## FLYWEIGHT SET UP GUIDE – 2013+ Arctic Cat Wildcat X 1000 (W/Team clutches)

**Springs.** The primary and secondary springs provided in this kit are to be **used in all of the flyweight set ups below.** Proper opposing spring pressures are a part of the calibration and without that the flyweight set up would be irrelevant.

**RPM :** The **Wildcat 1000 X** model performs best when operated in the zone of **7250-7600 rpm** (during the clutch phase) on a wide open test run. It may be normal to first shift at a slightly lower rpm and climb in the very early part of the run. It is not always that more rpm is better. Some of the best tested hardpack acceleration runs were shifting at a rpm of 7400-7450. Different terrain and situations require you to set up differently to find the sweet spot for your application. For instance, if you are often in sand and mud you may want to keep the rpm a bit on the high side for hardpack, so that it has closer to best rpm in those load situations. Set up clutching for the situation most important to you.

**Remember,** the clutch phase is over after the clutches are fully shifted and the belt is to the top of the primary. After a distance of approx 500 ft or around 50 mph the clutches are fully shifted on this vehicle. After the clutches are fully shifted it is not necessarily the clutch tuning components that control the rpm.

**The following set ups are for use WITH the use of the provided springs, and the supplied flyweight set.**

Read TIRE SIZE FIRST for your set up:

### **2013+ Wildcat 1000 X (QAW-62 base weight) 0-4000 ft elevation\***

**25-26" Tires - Stock machine** (and with aftermarket typical bolt ons:, filters, slip on pipes, etc. when used with stock camshafts and header pipes.) Typical hardpac trail riding and mixed use.

QAW 62 base weight with the following:

- (1) 3/4" long + (1) 1/2" long. set screws in threaded passage of each flyweight.

*\* Some of the very large/heavy 26" radial with heavy ply tires require the use of (1) 3/4" long set screw in each flyweight, but start with the 2 above set screws first and test.*

- for sand/elevation use only (1) 5/8" set screw, and in some cases of higher elevations/ or deeper sand use 1/4" long .

**27" Stock Bighorn 2.0 tires \* and lighter/smaller mixed use type tires. - Stock machine** (and with typical bolt ons)

QAW 62 base weight + use (1) 5/8" set screw, + (1) 1/2" set screw in the threaded passage of each flyweight.

*\* Some of heavier mud and trail radials 27" (EG: Mudlite XTR, Bighorn originals) should start with (1) 5/8" set screw in each flyweight and test for their own terrain/tire/application.*

- for sand /elevation use less flyweight mass. Sometimes only a 1/4" or 3/8" is used, or empty if higher than 4000' elevation or in deep/dry sandy conditions.

**28" tires typical trail/mud\*\*, mixed use applications**

- Use the QAW 62 flyweight set empty with only (1) 1/2" set screw installed.

\*\* For 28"+ size tires (Outlaws, etc), extreme mud use, or any 28" at high elevations use the flyweight empty.

*\* The above is a guideline. **There is no way we can test every size and brand/application of tires.** The sizing and weight of tires has large differences from different manufacturers. For example, some 27" radial tires from one brand are much heavier/larger than a 28" from another when actually measured. If in question go to the heavier clutch weight set up.*



