DaltonPro Clutch kit DBM 1000 updated 16*

Model: **2013-2016** Can-Am Maverick 1000 4X4 UTV.
Kit #: DBM 1000 Adjustable Clutch Kit . Stock and Oversized tires
Components:

1) Dalton Yellow/Black **secondary** clutch spring (DPSS-Y/B)
3) Dalton adj. flyweights (c/w thrust washers) (Part# DB355MV, a specific shape/version)
1) pkg Hollow aluminum mass rivets (DFRA – Y .85g)
1) pkg Hollow steel weight mass rivets (DFRH– Y 2.4g)
1) pkg solid mass rivets (DFR-Y 3.1g)
1) includes **Instruction manual and "CVT clutching overview"**

Tool required: Can Am Clutch holder part#529 036 238

Description: **Better belt grip and improved performance .** This one clutch tuning package can optimize CVT calibration for different tire sizes and applications. This kit includes adjustable mass flyweights for more flexible tuning options. **A new case specific flyweight** was built for this application, and to work with the other parts provided in the kit. This kit provides for better acceleration, and improved back shifting to hold rpm better under load conditions. Adjustments can be made to help compensate for oversized tires, or terrain conditions, as well as power loss from operating at higher elevations. Includes "set-up manual" as well as clutching overview for this model.

WARNING

Read this before installing

Clutch components should only be installed by factory trained mechanics and service personnel with a complete knowledge of CVT (Variable Rate Belt Transmissions), and have the required proper tools and holding fixtures to do so. For example, if your shop does not have the proper equipment to hold a clutch and torque to the proper specification and procedure, there is good probability of damage/part failure and possible injury. Make sure to consult your dealer service manual, and also that clutches have been properly inspected for fatigue, cracks, wear. ATV clutches are assembled under spring pressure. DO NOT attempt to disassemble clutches if you are not qualified, as serious personal injury could result.
This is a performance kit and is intended for the use of Experienced Adult Riders, who are trying to obtain a higher level for racing, etc. This kit should NOT be installed on any ATV that will be used by any person of MINOR age. Dalton Industries has no control over the use or misuse of these components and assumes no responsibility for any injury or damage.

Installation Instructions (Dealer installation)

IMPORTANT: Always remove the key from the ignition when working around clutches.
This is a dealer recommended installation. There are a couple of optional procedures listed in the Can am service manuals for drive clutch service. There are BRP holding tools for clutches as well. The following is only a basic guideline, always consult your dealer service manual for more detailed description.

READ AND UNDERSTAND THIS ENTIRE DOCUMENT BEFORE INSTALLING !!

1) Remove drivers side seat ,and console panels as necessary to gain access to clutch cover shroud. Remove cover bolts and plastic cover to expose CVT clutch system.
2) Loosen the center bolt on the primary (motor) clutch, do not completely remove the bolt. **There are clutch holding tools and procedures in your Can Am service manual.**
3) Only the OUTER half (moveable) of the primary clutch will be removed. Hold inward on the outer half of the primary clutch while center bolt is being removed. Hold pressure against it, or it may spring off. If stuck, hold it inward with one hand and with a rubber hammer, lightly tap on the side. This will jar the moveable sheave assembly from its taper fit, if it is stuck.
4) Remove center bolt* (or nut if updated July 2013, bulletin #2014-3*) and the primary moveable sheave assembly. **NOTE: Keep moveable sheave assembly together as a unit** at this time and place it on the workbench for later work. Note: the primary spring and the spring retainer cup on the shaft. Remove the spring and set it away. Leave the SPRING RETAINER CUP on the shaft.

Using the Clutch spreader bolt from BRP (A fully threaded M8 X 1.25 bolt can be used) spread the secondary make slack to remove the belt.

5) **Do Not** just pull the belt off. **BE CAREFUL when removing the belt to not disrupt the primary, and to leave the <u>center hub</u> sprage and <u>spring retainer cup</u> all the way <u>IN</u> on the shaft ! <u>NOTE DIRECTION OF BELT</u>** (arrow) when you remove it. *Make sure belt remains clean & free of any oils / grease, a non-residue cleaner like brake cleaner maybe used to clean clutch surfaces, etc.*

6) Remove the secondary pulley (rear clutch) by removing the center bolt (or nut from stud assembly on 2014+ updated). Be careful as you release the clutch, as the spring in the rear clutch will push outwards when the bolt is off the threads. Have a helper hold the clutch inward toward the vehicle while the bolt is removed.
7) When releasing the rear clutch to for removal, **TAKE NOTE of the position of the Helix Cam** as the clutch comes off. **IMPORTANT** that is goes in the correct position during re-assembly or the clutch could lock up at partial belt travel and injury or damage may occur.

***Note (2013) Can Am/BRP states that this bolt is a stretch bolt and should be replaced any time removed !*

***NOTE:** If your vehicle is a **2014 and newer**, or has had the **"BRP bulletin 2014-6"** completed, there will be a stud and nut assembly instead of the bolt in the secondary. **The main inner nut is torqued to 15 ft/lbs + 180 degrees of rotation of the nut** while <u>holding with proper tools</u>, and then the locking nut is torqued while holding the inner nut. (outer locking nut 26 ft/lbs.)*

8) **Install the supplied secondary spring** and carefully re-install the rear pulley assembly taking note of the position of the helix cam as you re-install the secondary clutch. **(see notes regarding bolt or stud assy above). Make sure the threads of the new secondary bolt are clean and dry. Apply BLUE LOCTITE #243 to the threads.

Torque the secondary ONLY by the BRP recommended procedure !

<u>This clutch must always be torqued only as specified. (15 Ft./Lbs + 180 degrees of rotation of the bolt)</u> many engine mechanics are familiar with this type of torque procedure and some have a degree wheel for their torque wrench.

In the Set-up guide, you will see that this clutch kit has also an "optional secondary spring" part # DPSS-B/V, which is used ONLY for specific applications. If your application calls for this optional spring install it and use the installation procedure for that spring. The DPSS-B/V has instructions with the spring specific to installing that torsional style spring. The instructions for the DPSS-B/V are also on the "Downloads" page of daltonindustries.com

9) **Install belt. Examine belt for inspection or replacement: (flat spots on edge from burning on take off, or holding brake etc). We recommend the factory Can Am belt for this application !

- CAREFULLY install the belt around the rear clutch and center hub of the front clutch. There is a threaded hole in the secondary clutch that can be used to spread the sheaves of the secondary. Can Am technicians have a special bolt *"driven pulley expander*".This will assist in letting the belt down into the secondary and make re-installing the belt easy. This hole is a M8 x 1.25 . A FULLY threaded bolt of aproximately 75mm length can be used.
- *Make sure belt and clutch surfaces are CLEAN! (non residue cleaner like brake cleaner if necessary for sheaves)*
- *Note direction arrow on the belt.*
- *New belts should be first washed with hot soapy water to remove mould release residue,then rinsed thoroughly .*

***** The Factory Can Am belt** is the **best belt for this vehicle**. As much as we would like to recommend a cheaper priced alternative, the factory belt is superior and recommended for this application. In fact the components in this kit and the " set up guide" are calibrated to this belt compound.* ***The drive belt is a CRITICAL component in tuning this vehicle.*** *Even though you may have ruined a factory belt at one time, it is well proven that the factory belt is superior in this application.*

CHANGING PRIMARY COMPONENTS:

A) With the primary assembly still together, use a marker to show orientation of spider for re-assembly

B) With the primary moveable assembly on the workbench (spring side down) carefully lift spider assembly out of the moveable sheave. *ATTENTION: Be careful not to lose the plastic sliding buttons that will be exposed on the sides of each finger of the spider, as you lift it out. Keep the spider flat and horizontal (as not to lose the plastic buttons) and sit it aside gently. If any of these plastic slide buttons are damaged, replace them.*

C) **VERY IMPORTANT:** CAN-AM ATV drive clutch has places for 6 flyweights. On this 1000cc Maverick model all 6 positions are filled, and as many of you know (CAN AM service techs) there are other Can Am models with only 3 or 4 of the positions filled and some are not used at all. Example: Outlander 400 has only 4 flyweights…. With 2 of the 6 positions empty (180 degrees opposite each other). Some models only use 3 positions. In this case, we will be removing and replacing only 3 of the flyweights with adjustables, and leaving 3 of the stock ones intact. In the next picture you can see that 3 of the stock weights are still in the assembly.

The 3 stock and 3 adjustable weights are alternating. The 3 stock are 120 degrees apart, as are the 3 new ones. – Every second one is replaced. THIS IS THE ONLY CONFIGURATION THAT 3 WEIGHTS CAN BE REPLACED.

It is known in the racing world with CVT clutches with 4 and 6 weight drive clutches, that weights are often mixed, but it must be: a) evenly spaced (every second one or 120' apart) or b) Directly opposite each other (180' apart) with the same weights.

D) After setting up the provided flyweights **properly for your application (* See attached "flyweight set – up" for recommended application),** install the new flyweights into the clutch and secure the pins / nuts the same way as they were removed. **Be certain to put THE PROPER THRUST WASHERS supplied with the Dalton flyweights** in this kit (they ARE different from the stock ones) in place on each side of flyweight before putting the pin through the weight.

E) Carefully slide the spider assembly back down onto the moveable sheave assembly, making sure the plastic buttons are still in place properly and the *spider is in the **CORRECT POSITION with ROLLERS over each flyweight*** and the marks you made in the correct position.

F) **See pic to make sure you have located the Maverick stock hex slider to the correct position and make sure it stays that way until completely installed.**

With the moveable sheave / spider assembly back together, keep it together and re-install as a unit, along with the stock primary spring. Install the primary spring into the clutch first, then install the whole unit and ***torque to spec.**

CAUTION: For this application the clutch bolt (or inner clutch nut if *updated) should be set to a torque spec (89-95 ft/lbs). We suggest that you install cover shroud and do a couple engagements of the clutch and then re-torque the assembly. This will ensure a good lock up of the matching tapers. Do not "assume"or guess at this torque spec, it is a critical element of this installation. Be certain the **tapers are clean and dry** (only use quick drying, non-residue cleaner like **brake cleaner**, never lube or oil.

***UPDATE ! CAN AM Bulletin# 2014-3 , July 2013. This primary center bolt should be replaced with new factory updated parts and procedure (BRP kit#703500842). This kit/updated screw/nut/set screw assembly for the primary clutch fastening should be done at your dealer first if not already done. If you have a 2013/2014 Maverick you should confirm with your dealer.**

10) Re-install plastic cover shroud, **Note:** Be certain that the cover gasket is properly in place and use caution not to cross thread the cover bolts.
Carefully inspect all wires, cvt vent tube clamps, etc during re-assembly.

FLYWEIGHT SET-UP (DBM 1000 clutch kit)

The following set ups are for use with the spring/springs and components supplied in this kit.
In this 1000 configuration.The total "grams" are only relative to components supplied.

26-27" typical trail/mud tires (including stock 27"Bighorn 2.0), For 0-4000' elevation *
Use the supplied flyweights along with:
- .85g hollow aluminum rivet ** installed in each
- DPSS-Y/B (Yellow/Black) secondary spring
- Stock primary spring
- This set up also used for trail applications of **a few of the very light 28" tires** that are smaller than stated, an example like the 28"Zilla would be often used this way for primarily trail, but if heavy sand / mud was common usage, the same tire would use the set up below (empty flyweight)

***if primarily used in Sand Terrain, or these tires at highe (4000-5000')elevation** use the flyweight empty.

28" tires (All aftermarket trail/mud) 0-4000'. (for 28" tires at high elev. See below- "using optional sec. spring")
Use the provided flyweights empty. *This set up can be used for some light 29" like OEM type Bighorn, or some 30" like "zilla", that measure only approx 28.5-29" and are light tires more for trail use.*
- No rivet installed
- Yellow/Black secondary spring
- Stock primary spring

For **Extreme Mud Tires** and **Extra Large Sizes**, the optional **Black/Violet** secondary spring must be ordered separately.

Using the Optional Secondary Spring (Black/Violet) - First and foremost, DO NOT use the optional secondary spring OR the instructions below unless you require it and have the optional Black /violet secondary spring.....More parts is not always better, applications that require its use are well laid out below and on our website.
The flyweight/rivet settings below are related to the use of the torsional Black violet spring only.

28" Extreme Mud Tires for Competittion (Outlaws,Silverbacks and primary mud use) 0-4000' elev.
- Dalton flyweights (part# DB355MV) provided, with 3.1g rivet installed**
- use OPTIONAL Dalton Black/ Violet secondary spring (Dalton Part# DPSS-B/V)
- Stock primary spring (or for higher engagement, use optional yellow/red DPPS-Y/R)

29.5"+ LARGER TIRES – Using Optional Sec. Spring for extreme large tires / mud. (0-4000')
- Dalton flyweights (part# DB355MV) provided, with 2.4g rivet installed**
- use OPTIONAL Dalton Black/ Violet secondary spring (Dalton Part# DPSS-B/V)
- Stock primary spring (or if you prefer higher engagement rpm , use optional yellow/red part# DPPS-Y/R)

28" + larger tires at High Elevation (above 4000') and Sand Dune applications with 29-30" tires.
- Dalton flyweights (part# DB355MV) provided, with .85g aluminum rivet installed for first test.
- use OPTIONAL Dalton Black/ Violet secondary spring (Dalton Part# DPSS-B/V)

High elevation and mud tires are speculative,...the elevation ,terrain, and chosen tire can vary widely. Start with .85 gram aluminum rivet and test rpm in "clutch phase" - see clutching overview on following pages **If you are above 6000' do first test with flyweight empty**, check rpm.

** **For Installation and removal of Mass Rivets see following page**

INSTALLING AND REMOVING MASS RIVETS

1) Push and hold the rivet ALL the way through the hole in the flyweight. (**remember to keep all rivets same direction**)
2) Using a LARGE shop vise, hold the rivet in a manner that keeps the rivet all the way through the hole so that you will be expanding the part that protrudes from the other side.
3) Squeeze/expand the rivet using strong pressure on the vise. Once the rivet "expands" so it is tight in the hole it will flare on the end and not move.

For later removal of rivets if desired,use the following procedure:

1) Mark lightly the center of the flush side of the rivet with a center punch.
2) Using a 3/16" drill bit, drill approximately **half way** into the rivet.
3) Make certain that the flyweight is SUPPORTED all around the rivet before trying to drive out the old rivet. A hole in a steel surface or a large vise that is slightly open (close to the rivet) is good support for the flyweight.
4) Insert a flat ended punch with a smaller diameter straight shaft than the drilled hole(1/8" straight shaft punch) , and tap the rivet right through the hole.

Read the following pages before operation.

It is a huge benefit to the vehicle operator to understand the CVT system on this vehicle. If you want the best results that you can have, take the time to read and understand the following.

MAVERICK 1000 - General Overview and CVT (Continuously Variable Transmission)

Clutching, belts, and potential problems.

The new Can am 1000 Maverick has excellent hp in stock form.This vehicles has plenty of power, along with very tall final drive gearing making it capable of reaching very high top speeds. Because of this combination, the potential is here to aggressively overheat belts, particularly when operating at LOW SPEEDS in HIGH RANGE. Any time this vehicle is operated at low speeds it should be in LOW range.

Some operators,who may be simply uninformed, may state things like.... "It has all kinds of power and I should be able to leave it in high!" Although that may sound logical, it is simply not so. This is not a hydrostatic or oil pressure automatic, it is not even a wet clutch type of CVT. It is, like some other brands, a system that engages the belt each time the vehicle is required to move. With this type of system, it is important to understand the way the system functions, so you can maximize FUN and avoid belt problems.

The important thing to know here is that in LOW range the belt travels farther up the clutch at a given speed. For example, if you are riding at 10 mph in HIGH, the belt may still be very low in the primary clutch (close to the hub). If you switch to LOW range and travel the same mph...the belt rides up at a higher point on the primary clutch, offering MUCH more belt grip and substantially lower belt temperature. When going slow, use low. This simple fact, if not understood, can aggrevate the belt wear , and temperature dramatically.

Another mistake that is sometimes done is to hold the brake and rev up the engine past engagement . This will only burn a flat spot on the drive belt and make it unuseable,and should not be done on this type of system.

When straying from normal tire sizes and trail operation to other surfaces like mud and sand , it can become increasingly important to have proper clutch calibration to help compensate for the changes. Clutch calibration does one main thing...it changes the "rate of shift of the belt". The way to help eliminate unnecessary slippage and (thus heat) is to have the belt in the correct ratio on the pulleys for the loads present. We can manipulate that shift pattern with clutch tuning components.

You cannot make tires that are too big smaller, or the sand dunes flatter or more firm with less rolling resistance. However, by calibrating clutches we can help to compensate and make these situations easier on the drive belt and improve vehicle performance.

Clutch tuning

Before setting up and installing your clutch kit, take a moment to read a bit of basic clutch tuning theory. CVT tuning can get very involved and there are books written on theory of operation itself . There are various ways to change the way the system reacts from changing or altering the tuning components (spring rate, flyweights, etc). Flyweights alone can be a long discussed topic, as on a flyweight type system, the curvature, distribution of mass, etc can dramatically change shift characteristics. Many inexperienced tuners often make the mistake of comparing flyweights by "grams" alone. If the curvatures, profile, and location of mass are not the same,...then the "grams" are irrelevant. We have tested and developed various flyweights for this model during testing, and the chosen curvature and mass locations, as well as the adjustability were the result. Following is a basic overview to help you understand if you are unfamiliar with cvt function.

Changing CVT tuning components is done for many different reasons, but the thing that you are doing is ultimately **changing the rate of upshift and back shift of the belt** in the pulley system.The factory sends the machine with a calibration that they feel is a good "all around" set up. The factory set up not only has to be able to tow a trailer, do ok in a drag race, climb and backshift decently, but it also has to consider fuel economy and emissions during its testing. Many owners of ATV's and UTV's have a desire to re-calibrate the clutch system more specifically to their needs based on their own usage, and situation. Common reasons are racing, oversized tires, altitude, mud running, or towing. For instance , if you are a fan of mud and big tires, it is obvious that the taller final drive ratio from installing the tires changes things. With larger tires and more rotating weight, the last thing you would want would be to upshift too quickly and kill the rpm too rapidly, so you want that initial upshift to be slower. If you install tires much larger than the acceptable envelope that the manufacturer recommends, you can easily burn belts, the CVT tuning components can't change the actual gear ratio resulting, but by re-calibrating the cvt drive system ,you can often change the shift pattern to help get better results for your application. It will hold its correct rpm better by properly shifting on its own to the proper belt ratio as it comes under load (backshifting), based on what you set it up to do. If you were to install larger tires, and your machine was still upshifting quickly (like you can get away with with small stock tires) it would lower the rpm to a point **lower than the peak hp rpm** and performance would suffer.The belt would also not be in the proper ratio for the loads present with the bigger tires resulting in more slippage and heat....causing delamination and failure of the drive belt.

It is also very **important to remember** that cvt tuning parts only control the rpm during the **"clutching phase"** The clutch phase is when the **belt** is going from low ratio to high ratio on the clutch pulleys. ATV's and UTV's are not like snowmobiles,..on ATV's / UTV's the "**clutch phase**" is over in a distance of approximately 500 ft on a full throttle run . Once the belt is to the top of the primary clutch, it is to the top, and clutch components no longer control the rpm after that point. After that "fully shifted" point (with stock tires on hardpac) the engine will often start to overrev, but it is because the belt can shift no farther to control the rpm. It is important to remember that clutch components are not the controlling factor for rpm after that belt is fully shifted. For Clutch RPM testing it is good to use short distances(200 ft and 400 ft) to determine clutch rpm. **Dalton adjustable flyweights** help make it flexible.

Operating RPM - CVT tuning is often focused on operation rpm, but remember it is rpm during the "clutching phase" that is effected by clutch tuning components.
Stock Maverick 1000 – best peak operating rpm is **7600-7750 during the clutching phase.** Some modifications make the vehicle "happy" at higher or lower rpms, but on a STOCK engine this is the best tested rpm zone. Remember that when on a long road run the clutch phase is over in a short distance, and that your rpm may be higher after the belt is fully shifted but on long runs that rpm may not necessarily be a result of clutch components.

The Components

Flyweights- Flyweights are the principal item to control rpm during the clutch phase. ***Heavier*** *weights* upshift *faster* and *lower* the rpm. ***Lighter*** weights upshift ***slower*** and thus *increase* rpm during the clutch phase**. It is NOT that lower, or higher rpm is better.** Ideally, you want the clutch calibrated to shift the belt at the correct rate to hold the rpm at the rpm that the engine makes best HP. If an engine makes peak hp at 7650, then having it calibrated to run at 8100 is probably much worse than if set up to run at 7550, as many crankshaft engine dynos will easily prove.The proper amount of flyweight mass is determined by both the **other cvt tuning components being used,** the **given situation** or intended use of the vehicle, and ultimately the **field tested results for best efficiency for the situation** at hand. The Maverick has different design flyweights than previous BRP atv /side x side models.

Primary Springs- Primary springs have some overlapping uses. The springs are usually compared by using their pressure load rating at two intervals. The ***first load rating*** is often referred to for ***engagement***(stall rpm) first load number on a primary spring is the principal component to control engagement rpm.
The fully compressed or ***second load rating*** is used as the principal ***opposing force to the flyweight.*** Stronger fully compressed load ratings are a factor in how much flyweight mass you can run. You can often switch from one primary spring to another and leave flyweight mass the same if the second load rating on the springs are within the same zone and have minimal effect on top rpm. This is useful for those who like to experiment with engagement rpm. Engagement rpm is a personal preference . It is good to have options for this.There are OPTIONAL PRIMARY springs on our website. Some people prefer different "ENGAGEMENT" rpm than others, for various reasons. There are load rating charts available on www.daltonindustries.com under "components"

Many Maverick 1000 application work fine with the stock primary spring and accomplishes the desired shift pattern with the flyweight set ups provided in this kit. There are options if you prefer higher engagement,etc but in many typical ones the stock primary was excellent.For higher engagement some like the optional yellow/red (DPPS-Y/R)

It is also very important to realize that springs have different characteristics when used with other different components. The springs in this clutch kit may engage or operate at very different rpm when used with other flyweights,etc.

Secondary Springs- Secondary clutch springs are a component that has some overlapping features . Its principal function is torque feedback sensing, that is, that it initiates backshifting of the belt to proper ratio to maintain rpm. The secondary, however does have effect on upshift characteristics as well.
CVT's are about efficiency. Proper balance of components for efficiency is the way to good belt life. The key to preventing slippage is having the belt in the correct ratio at the right time. For the Maverick 1000 we have included a new secondary spring that the rest of this package is calibrated to. In fact, we also list a different optional version for certain specific applications. (see "Set-up Guide")

Thank you for choosing Dalton Industries !