2023 Can Am Outlander 700 models 0-4500' elevation -29.5-30" Extreme mud tires, and all 32" tires. (adjustable flyweights allow for some adjustment for mid-elevations – avg 4500).

This kit is designed for those extreme mud competition type tires of 29.5" and larger, and all tires 30" and larger if often used in soft terrain, etc.
Offers improved belt grip, as well as superior performance and "back shifting of the belt when the vehicle senses load". Better response in those tough conditions and best suited to hard use and extra large tires. The kit includes a new vehicle specific set of adjustable flyweight lever arms that were designed exactly for this application, as well as new springs for both primary and secondary clutches. This kit is designed to work all together and has specific instruction for the different application included.

Components: 1) **Set 3 of custom adjustable flyweights** and hardware (CA7 815)
Hardware incl: 3) ¼" set screw, 3) 1/2"set screw,3) Gold button head 2.4g, 3) 3/8" Button head 3.1g
1) **Dalton Tan/Orange primary spring** (DPPS-TN/O)
1) **Primary spring engagement spacer** (PD SPC 700)
1) Dalton **Yellow/Black** secondary spring (DPSS-Y/B)
1) Includes **instructions** and "CVT clutching overview"

Tools required*: Dealer installation.

WARNING !

There are many required tools to assemble and disassemble the new clutches on this model. Some BRP dealers may have other similar tools from other models, but attempts should not be made without proper tools. A particular example would be the proper pulley spring circlip removal tools, etc. That are specific to Pdrive.

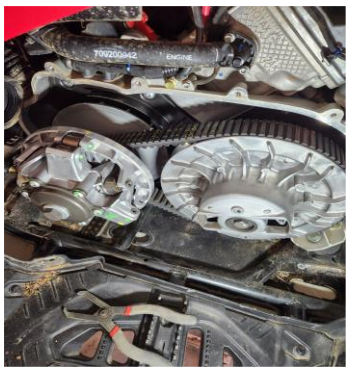
- **Secondary clutch spreader** tool or fully threaded M8 bolt (BRP#529036098) to open the secondary and remove belt
- **Clutch holding tool** to keep primary drive clutch from turning (BRP#52906559) while removing and torquing properly
- **Primary puller** to remove primary clutch from the engine (Dalton part # **DCP-R**, BRP#529000064)
- **Governor cup removal tool** (BRP#529036546) This is used to separate the primary clutch to access the flyweights and spring. This governor tool is different for the Pdrive than older BRP clutch units.
- **Pulley spring/circlip removal and install tools- primary** (BRP# 529036545,529036542) to compress the spring and governor cup to remove the circlip that holds down the spring retainer.
- **Flyweight axle removal tool** (BRP#529036372)
- **Secondary pulley dissemble kit** (BRP#529036548) this is pulley spring circlip tools for secondary.
- **Torque wrench**

The tools listed are the tools directly from BRP for dealer reference.

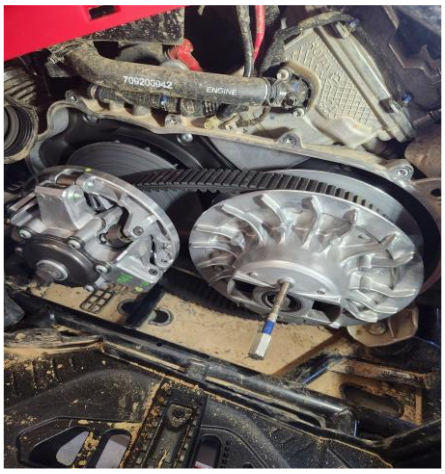
Also note: BRP require a **new bolt** to be used when re-installing the secondary clutch. This bolt is only available through BRP. The secondary clutch bolt is a stretch to yield type

This is a dealer installation and requires special tools and knowledge of the PDrive CVT system. The following is a basic guideline, please refer to the BRP service manual as procedures and part numbers of BRP tools and procedures are updated and can sometimes change.

Primary clutch – 1) Remove the cover shroud to expose the clutch system. Note-Watch for the cover gasket to not be misaligned later when re-installing the cover.



2) Use the secondary clutch spreader bolt to open the secondary and allow slack in the belt. Wind this spreader bolt into the threaded hole (close to the center bolt) in the secondary pulley, this will spread the sheaves. (you can use a M8 fully threaded bolt to spread the sheaves here).

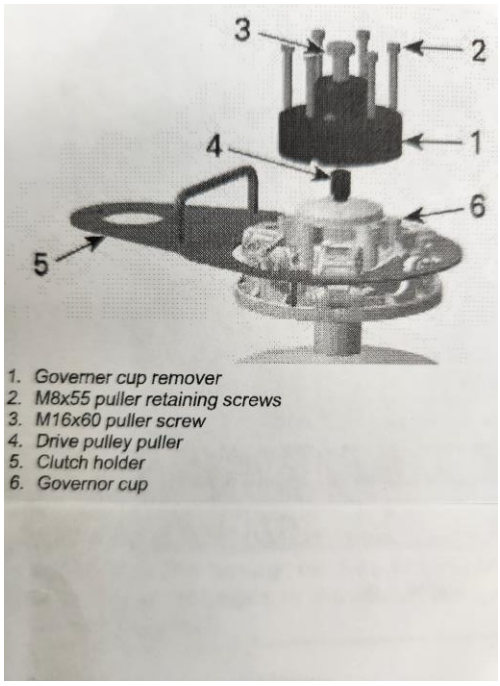


3) Remove the belt (note direction arrows on belt).

4) Remove the center bolt from the primary clutch. Keep the center bolt and conical washer together the correct way on the bolt (BRP recommend replacing the washer each time).

5) Insert the proper clutch puller and remove the primary clutch from the crankshaft while using the clutch holding tool to keep the primary from rotating.

6) With the primary removed from the vehicle and on the bench, leave the clutch puller in the clutch and leave the head of the puller extended up for use with the Governor cup removal tool. This tool gets bolted to the primary and the center portion presses against the puller to separate the two halves of the primary.



1. Governer cup remover
2. M8x55 puller retaining screws
3. M16x60 puller screw
4. Drive pulley puller
5. Clutch holder
6. Governor cup

The primary must be separated to install weights and spring. Before using the Governor cup tool, make sure the head of the puller is protruding up about 1 ¼". Also make sure that the head of the puller fits properly into the Governor cup removal tool.

The Governor tool will separate the two halves of the primary clutch. **Note:** on some other previous BRP clutches, the halves could be separated by supporting the upper sheave by hand and hitting blows to the puller to separate, however on this model the Pdrive primary rollers could be damaged, the proper tool should always be used to separate the primary.

7) Once the primary is separated, you need to **remove the primary cover** (torque flange) and remove the primary spring using the **Primary spring circlip removal tools**.

Use the tool to slightly compress the retainer cap, then using circlip pliers, remove the circlip.

Once the circlip is removed, slowly release the retainer cap using the tool to let off the spring pressure.

Once the pressure is off, you can remove the primary spring.

8) You need to open the primary to change flyweights.

Mark the halves of the two upper sections of the primary for later re-alignment before lifting it apart.

Open the primary to expose the flyweights

9) Change flyweights

The flyweights are mounted on a tapered fit axle that can only go through from one side, and held with a retaining screw. Once the screw is loosened, the axle must be pushed back through the opposite way to remove. There is a proper tool (**flyweight axle removal tool**) to thread in where the screw was to tap out the axle.

Set up the adjustable flyweights as described for your tires in the **"Set-Up Guide" page 7, install flyweights.**

After installing the axle in the flyweights, use a drop of Blue threadlocker and tighten the retaining screw to proper inch torque.(44 lbf-in).

Important! – When sliding the Governor cup portion back down over the moving sheave and flyweight assembly, it is important to lift each flyweight at the tip and make certain that they enter into the **slots (holes) in the center** of the Governor cup. Holes are shown to the left.

Then slide it all together, **making sure the flyweights each have entered those holes** in the center part of the Governor cup.

Note Roller Alignment! – When sliding the Governor cup down make sure to watch carefully the alignment of the tapered rollers as it slides together. (shown to the right). Be careful not to force or hurt the tapered rollers.

10) <u>Install the primary spring</u> using the <u>primary spring install tools</u>.

Take note if your set up requires the use of the <u>stock plastic spring seat</u> inside the metal cup, **<u>OR</u>** the optional **Primary spring engagement spacer** provided. Check your set up guide page before continuing. (Never both!)

Make sure the circlip is properly in place inside the tool as you compress, and secure the circlip.

11) Re-install the Torque flange plate cover on the top of the primary spring area of the Governor cup. Use <u>Green Loctite 648</u> and torque properly.

(Torque flange retaining screws tighten in cris-cross pattern to **24 ft/lb**)

<u>Install primary clutch</u> back onto the crankshaft

Make sure the clutch and crankshaft tapers are <u>clean and dry</u> (no lubes of any type) so they lock together properly. Use the <u>clutch holding tool</u>, and a torque wrench and tighten the primary center bolt to **89 ft/lbs (+/-6 lbs)**

<u>Remove the Secondary pulley</u>

1)Remove the secondary pulley from the vehicle by removing the center bolt. Take note of the step washer and direction of the step for assembly. Take note of the spacer/o-ring

<u>Important</u> The shaft of the secondary has a <u>flat side</u> to keep the spring retainer aligned, it must be carefully installed so that the flat side on the retainer matches the shaft. <u>Mark the retainer</u> at the shaft flat.

You will be using the - **<u>Secondary pulley dissemble kit</u>** (BRP#529036548) to slightly push down the retainer so you can remove the round circlip from the groove and let off the pressure. Let pressure off slowly and remove the tool. **Take note of the alignment** of the <u>holes in the secondary steel spring retainer</u> and the plastic liner. <u>Keep them aligned like this</u> before installing the new spring into the secondary.

2) Install the new spring into the secondary.

Go very slow. Make sure the steel retainer cap gets properly aligned on the shaft as it starts to slide down onto the shaft. You may have to go very slow and carefully align it slightly as it compresses so that you do not bend or damage the steel retainer cap.

Again, watch that the alignment of the flat on the shaft and the spring retainer cap mark you made earlier.

Install the circlip and make sure it is seated properly before removing the compression tool.

3) Install the secondary back on the vehicle.

It is important to make sure that the secondary goes all the way onto the shaft and that the splines are aligned properly.

Make sure that the step side of the thrust washer is on the bolt and the step is facing the engine side. The bolt is a **stretch to yield** type fastener, BRP require a new bolt (Driven pulley screw) to be used each time. Make sure bolt is clean and dry (no lube or never seize).

Install the **Clutch holding tool** and tighten the driven pulley screw as specified below.

*The **secondary pulley bolt is torqued** at a very specific procedure:

*Torque wrench **Step one** is 15 ft/lbs, then after the 15 ft/lbs is reached, **Step 2** : the bolt is tightened a **further 180 degrees of rotation.***

*There have been many Can Am secondary pulleys come off previous models because of impacts, and persons who think this torque procedure is not important.

Use the clutch spreader bolt to open the secondary and allow room to install the belt (note direction of belt).

Close the cover shroud taking note of the cover gasket being in place properly.

Cover shroud bolts are torque inch pounds, **62 inch/lbs.**

Note: The flyweights used in this kit (CA7 815 flyweights) have more pivot area mass and a different distribution of mass, and thus the "total grams" of the flyweights are not relative to the stock or other flyweights. They have been designed to work along with the spring pressure provided in this kit.

***Note Optional part: - Primary "engagement spacer"**

The Primary clutch spring is main control of "engagement RPM among other things. We have a optional spacer to increase the preload on this spring. The spring we provide in this kit "engages" like stock with the stock plastic spacer, however, it does have more pressure than the stock spring when fully compressed. If you prefer a more aggressive type engagement when the vehicle first moves, we have this optional spacer.

This is a **optional part !** This optional engagement spacer goes on top of the primary spring under the steel spring seat cup-**"instead" of the stock plastic spacer** seat. If you prefer more "stall" type higher engagement, you would choose this more aggressive engagement spacer. This is a decision you should make on your own. It is **NOT** that "with", or "without" is Better – this is a personal rider preference, you should listen to YOURSELF, not any other person or the internet or anything else. Some like the RPM to come up higher before engagement…some do not like this at all. Be true to yourself, would you rather engagement like stock (approx.1950)?..or higher more aggressive engagement (2150)? This is a choice that you should make on your own. The owner/rider should be making the decision!

- **We even have a different optional Tan/Green primary spring (DPPS-TN/G) that engages sooner for some who prefer that. It can always be ordered separately. Nice to have choices.

29.5-30" Extreme mud tires 0-3000' elevation – Use the following

- **Tan/Orange** (DPPS-TN/O) primary spring, (When used with the optional higher engagement spacer, take note of gram screws used below).

- **Yellow/black** (DPSS-Y/B) secondary spring,

- **CA7 815 flyweights**, -use **3.1g Silver Button head** in each when optional *engagement spacer added

  OR -use **2.4g Gold button head** when primary spring with stock plastic spacer used.

29-30" tires at 3000-4500 – use both springs and the flyweights with **¼" long set screw** in each.

32" tires 3000' elevation – Use the following

- **Tan/Orange** (DPPS-TN/O) primary spring, Spacer is optional.

- **Yellow/black** (DPSS-Y/B) secondary spring,

- **CA7 815 flyweights** - with **2.4g Gold button head** with **either** the stock spacer or the optional higher engagement spacer.

32" tires 3000-4500 elevation - use both springs and the flyweights empty with no screws.

You always **only use one or the other (ours or stock) for the primary spring seat spacer…**never both**.*

*** optional Dalton Tan/Green primary spring can be ordered separately 902 897-3333.*

Read the following pages before operation.

It is a huge benefit to the vehicle operator to understand the CVT system on this vehicle, both for the function of the belt and tuning components, and the limitations and proper use of the drive system.

General Overview and CVT basics

Clutching, belts, and potential problems.

This vehicle has excellent hp in stock form. This vehicle has plenty of power, along with tall final drive gearing making it capable of reaching high top speeds in high range. 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**.

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 firmer, however, by calibrating clutches we can help to compensate and make these situations easier on the drive belt and improve vehicle performance.

Clutch tuning

If you have the interest, take a moment to read a bit of basic clutch tuning theory. 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 and usually for stock tires only.. The factory set up 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. Clutch re-calibration can help to 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 (back shifting).

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. 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 the engine will often start to overrev, but it is because the belt can shift no farther to control the rpm.

Operating RPM - CVT tuning is often focused on operation rpm, but remember it is RPM during the "clutching phase" that is affected by clutch tuning components.
2023 700 Outlander– best peak HP operating RPM is **6850-7100 during the clutching phase.** There can be some variance and 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

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 7000, then having it calibrated to run at 7400 is probably worse than if set up to run at 6800, as many crankshaft engine dynos will easily prove. Some people get wrapped up in thinking "more RPM is always better". Proper peak HP rpm zone is the target.
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.

Primary Springs- Primary springs have pressure characteristics and uses. A primary spring is the principal component to control RPM at the point when "engagement" of the belt occurs on take off. It does also have effect on the shift RPM as it is also the opposing force to the Flyweights.

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 back shifting of the belt to proper ratio on the pulleys when the vehicle senses load. The secondary, however does have effect on upshift characteristics as well.

Flyweights – Consider the flyweights to be the **main control** of wide open **RPM** going down the track. (up to about 50 MPH in high range flyweights control RPM), where after that, the belt is fully shifted and the engine controls RPM. **Having adjustable flyweights can help make one kit more universal if you ever change tire size, go to mid elevation, etc.** For this kit we built case specific weights for the application with improved belt grip. Heavier weights upshift faster and lower RPM.
Lighter weights upshift the belt slower and raise the RPM.

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 this kit we have included a new secondary spring that the rest of this package is calibrated to, it all works together for this application.

Thank you for choosing Dalton Industries !