Dock-It™ Decaleur
Core/Builder's Kit Application Notes
Update: October 2017

Overview

The Dock-It™ decaleur is a new entry into the field of fixtures used to prevent sway in tall bags carried on a bicycle's front rack. It is a radical new design, purpose-built from the ground up to eliminate the complaints commonly associated with traditional decaleur designs which have changed little since the middle of the last century. The heart of the Dock-It™ technology is a short-throw rotary latching mechanism, designed with a secure capture state and a strong tactile feedback to the rider. This builder's kit brings you the compact proprietary core of this design (docking barrel, docking button, tubular spindle), allowing you to design/build the single supporting strut that can be attached **wherever** (bar, stem, steerer tube) works best in your particular bike-to-bag spatial arrangement. Refer to the photos on the Dock-It™ website.

The unique rotary latching mechanism allows the Dock-It™ decaleur to offer a pair of opportunities in securing the compact proprietary core to the bike and to the bag. If you are sure about where you want to locate the pieces, the most elegant solution is to use a high strength adhesive (Super Glue, Loctite 271) to bond the core into a single tubular strut, which attaches to the bike and positions the core at the point in space where the docking barrel meets the docking button. Think of a NASA docking maneuver. If you think that you want to experiment with the location, you can fabricate the strut with a pinch-bolt feature which allows you to slide the barrel's spindle into the strut and clamp it securely in place. The bonding option is discussed below. If you decide to use the pinch-bolt option, you know what to do.

The Dock-It™ system was designed to allow it to be mounted off-center from the bike's central plane, and a similarly off-center strut allows this decaleur to avoid interfering with bag flap closures and brake cables. The decaleur may be offset to either side of center to accommodate the right/left handedness of the rider.

The second new opportunity comes with the bag-side hardware. The only thing attached to the outside of the bag is the little docking button. That is bolted through the bag to an internal stiffening structure, the design of which can vary quite a bit from one bag maker to the next. Some bags will require that you add some extra material (aluminum strap, or plastic panels for instance) to moderate the 3-axis movements at the top of the bag. Continuing the flight analogy, the latched docking button is able to resist roll, pitch and yaw in the greater bag by working with a smartly designed internal stiffener using only a small amount of material.

Getting Started

This Dock-It™ builder's kit includes the following items;

Docking Button, with internal drop strap and hardware
Docking Barrel, mounted on spindle tube
Torque Key, for installing button
Spindle collar, nylon, ½" OD

Additional material needed;

Loctite 271 (red) high strength bonding compound, or
Gorilla Glue brand Super Glue "Impact-Tough formula"

The rotary action of the docking barrel has been pre-tuned to produce the feel and response which the designer specified. Your first task is to mount the barrel's spindle in a bench vise to exercise the latching functions by hand and get familiar with how to orient the pieces to be installed. Make note of the set screw visible on the perimeter of the barrel, and use that as your rotary travel reference. Built-in travel limits will keep the barrel within the quarter-turn operating range. As viewed by a rider seated on the bike, this quarter-turn runs with the set screw moving from 12:00 (open) to 3:00 (locked). The kit ships with the barrel in the locked position.

Note that the barrel's rotary action can feel unexpectedly stiff if you attempt to operate it while holding it only with your hands. This is an illusion. Secure the barrel spindle in a vise to simulate it being tied to the bike on a rigid mounting strut, and notice how it appears to rotate with less effort. Still, the barrel must receive a stout force to perform its latching function. It is all in the wrist, as they say, so practice with it while you have it in the vise. In a few minutes, you will learn how to quickly "snap" the barrel into the latch positions at both ends of the quarter-turn.

Docking Button Installation

Determining where to mount the docking button on the side of the bag comes first. On a rear entry bag, the button/barrel should be clear of the bag flap and closure cord/strap. With any bag, the button/barrel/strut should stand clear of a front brake cable/hanger. Beyond this, it is up to you to tie the docking button into a bag's internal stiffener.

With a Dock-It™ Ready Bag (DRB), the bag's maker will have installed an appropriate structural element inside of the bag, and also may have designed a mounting spot on the outside of the bag. In this case, the bag maker should specify the where and how to mount the docking button. For more information about the DRB concept, contact Dave Cain at the Waxwing Bag Company.

On all other bags, you will have to see what type of existing stiffener (if any) is available, and what needs to be added. The minimum requirement is a rigid aluminum strap which runs across the rear perimeter at a height where it can be bolted to the leather band that is stitched to the outside of the bag. If the strap can be bent into a shallow "U" shape and the arms secured to the ends of the bag, that would be the best. This kit includes a short piece of "drop" strap that may be used to position the button below the bag flap.

You will use an M5 bolt to anchor the docking button. This kit comes with an M5 x 12mm SHCS used to attach the button to the strap. The kit also includes M5 SHCS in 16mm and 20mm lengths. Which bolt length is right for you will be a function of how much stuff the bolt has to pass through before it gets to the button. Note that the threads inside the button do not extend all of the way to the button face. This prevents the situation where a bolt protrudes beyond the face of the docking button, as that would prevent this mechanism from working. Use the longest one of these three bolts which does not reach the end of the internal threads.

When you are ready to tighten the bolt holding the button, use the special torque key that is included in this kit. This key's two teeth slip into the two notches in the face of the button. The key lets you hold the button alignment while you tighten the bolt. Using any other tool may scar the button, and render it unusable. Use Loctite 242 (blue) thread lock in the final installation. The docking button is intended to be installed with the two notches oriented at 12:00 and 6:00 to align with the pins in a correctly installed docking barrel. If, after installing it on the strut, you find that the barrel in not aligned on the same axis, you can reorient the button to make the docking action work as intended.

The Dock-It™ system is designed to give the installer a lot of freedom in how and where the button is attached to the bag. There is, however, a three-part protocol **which is essential** for a reliable and trouble-free installation, as follows;

1) Minimize compressible materials under the button. Compressible materials include leather, Coroplast, fiberboard and other non-metals present in this location. If such material is present, it is highly important that you verify that the button's bolt remains tight to the specified torque after these materials have a chance to break down. Depending on the specifics of your installation, it might be prudent to check on a daily basis, or following each ride, until you see no difference since the previous check.

2) Prevent relative rotation between the button and the bag. Anchoring the button to the bag's outer surface will help to prevent any rotation of the button relative to the bag. The kit includes a serrated tooth lock washer, which is to be positioned between the button's base and the material on the outside of the bag. Whether canvas, Cordura or leather, allowing this lock washer to bite a little bit shouldn't damage the bag material, since the backing structure carries the load.

3) Apply sufficient torque to the M5 bolt holding the button. Having set things up as described above, this is key to creating a reliable installation. Using the M5 socket head bolt from the kit, the specified torque is 5Nm (44 in-lb). After attaching the button finger tight, mount the special Dock-It™ installation key in a bench vise, engage the key and button and rotate the bag to set up a visual reference that will help you hold the bag at 90 degrees from the key. Hold that reference while you torque the bolt.

The button “stack” using the hardware from the Dock-It™ core kit is shown in a photo at the end of these instructions.

Attaching Barrel to Strut

The Dock-It™ decaleur's docking barrel is built around a 4130 CrMo tubular spindle, the end of which may be bonded into the mounting strut that you are going to fabricate. The barrel in this kit has about 3cm of spindle length for bonding use. Do not cut the spindle any shorter.

Warning: **Do not apply heat to the barrel spindle**. There are internal parts which will be damaged if you attempt to braze or solder the spindle into the strut tube.

The spindle is 5/16” diameter, which slip-fits into the 3/8” x 0.028, 4130 CrMo tube that is specified for the mounting strut. Tubing in this size is readily available from industrial metals vendors. If you are not used to working with this type of tube, consider using our B2B kit which includes pre-formed stainless steel strut tube and our unique multi-position mounting clamp.

The spindle-to-strut joint is bonded using either Loctite 271 (red) compound or Gorilla Glue brand super glue. The Loctite product is formulated for high-strength bonding of metal slip-fit assemblies. If the fit between spindle and strut is close fitting, the Loctite 271 should do the job. If that fit is loose enough that there is a bit of wiggle in the overlap zone, then the Gorilla super glue will be better for filling the gap. If you haven't used the selected compound before, please experiment on some scrap tube to get a feel for its flow/spread characteristics before trying it on the real parts. After putting coated parts together, you have about a minute to get everything lined up before the bonding starts to take hold. You've been warned!

Clean the spindle and the inside of the strut tube down to bright metal. The barrel internals have been lubricated during assembly, and you may notice a tiny ring of grease where the spindle exits the barrel. You need to degrease the spindle prior to bonding, but try to leave that ring of grease intact as a seal to prevent stray adhesive from bonding the barrel to the spindle. This kit includes a nylon spindle collar. Slip this collar onto the spindle and up against the barrel. Put a dab of grease on the spindle next to the barrel, and let the collar squish this into a protective position as it slides the final few millimeters into place.

When you are ready to bond for good, arrange your pieces so that they can easily be held in place on the first try. Spread the selected adhesive inside the first centimeter of the strut tube. Hold the strut tube with that end pointing up, and slide the spindle into place, letting this action carry the compound into the overlap zone. Done right, this should keep the compound inside the strut tube, and not burping out to where you don't want it to go. While making this slip-fit, watch the orientation of the barrel and adjust as necessary to make sure that the “open” position matches the alignment of the docking button.

Maintaining the Dock-It™ Core

The internal mechanism of the barrel was lubricated during assembly using Phil Waterproof Grease**.** That charge should last a long time, but it is not immune to fine dust that may find a way into the works. If the rotary quarter-turn action starts to feel rough, you can introduce a little Phil Tenacious Oil between the nylon bushing and back of the barrel, letting it find its way inside.

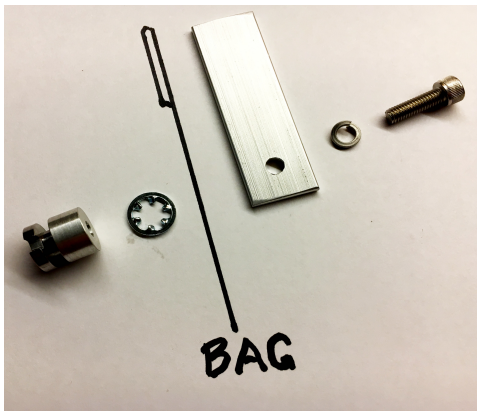
Other lubricants may not be compatible with unseen internals, and we can't test the market, so we're staying with good old Phil.

During assembly, we also put a tiny bit of grease on the button surface where the pins make contact. Mostly, this aids our break-in protocol, but you may add another dab of grease if you feel that the quarter-turn friction is increasing.

If you live/ride in a wet region, and leave the bag on the bike, you may put a thin coat of anti-seize on the face of the button to prevent it from seizing up with the barrel's mating load face. Nothing fancy, even a bit of chapstick will do.

Water won't necessarily hurt the Dock-It™ mechanism, but why not let it out? If you are fabricating a strut, with a shape which will trap water, consider adding a low-point drain. The barrel is self draining, and there is a small port leading to the strut. If water retention is a issue, tipping or hanging the bike nose-down should help.

Dock-It™ Decaleur Core/Builder's Kit, showing the button (left) and barrel mounted on the spindle (right).



Dock-It™ Decaleur button “stack” using attachment hardware as included in the core/builder's kit.