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Nordic_Kat
Top Down Driver
Location: Texas

Keeping Your 3 Series Origami Top in Tip Top Shape

A special thanks to **fun2drive** for his huge contribution  

Okay folks, you asked for it, here it is. In response to everyone who has asked for a Sticky on how to maintain the seals and keep the moving parts of the convertible hardtop lubricated, **fun2drive** and I have put our heads together and assembled a DIY. Much of this is based on experience, but we have also tried to get as much input as possible from dealership service techs and the photo documentation included is the direct result of my E93 having just been in for a full dealership hardtop lubrication and adjustment.

We welcome contributions of tips and tricks picked up along the way. As always, comments and questions are great. The intent is to have a one-stop resource for people looking for information on keeping the folding hardtop well maintained and problem free.

Probably one of the greatest concerns of any E93 owner is how to keep their folding hardtop free of creaks, squeaks, wind noise and heaven forbid water leaks. If you own one, you are at least marginally aware that there are literally hundreds of parts in the form of seals, hinges, locks, hydraulics, and microswitches that must all work in perfect harmony to deliver the 22 seconds to nirvana top down experience. So, how to keep things running smoothly:

- Keep the rubber seals lubricated and moisturized.
- Secondly, but equally important is to keep the moving joints well lubricated and dust free.
- Listen to your top. For those who acquired their E93s new, think back to what the top sounded like when the car was brand new. If you acquired your car second hand, go to your local dealership and ask them if you can observe **(that is listen)** to the top of a brand new E93. It should be silky smooth with no squeaks, no jolts and no stickiness.

So, here are some tips and tricks to keeping your top in great shape.

Seal Lubrication:

There are two products routinely discussed when this topic comes up.

Gummi Pflege (which in German, literally translates to "Rubber Care"***8221  made by Einzett.

<http://www.amazon.com/einszett-91480.../dp/B004B8GTQG>

Krytox - specifically the GPL205 Grease made by Dupont. This is expensive stuff, but well worth every penny.

http://www.amazon.com/s/ref=nb_sb_no...=Krytox+gpl205



A couple of words about products to use on rubber seals: Silicon is a natural enemy of rubber. It makes rubber swell and fracture. Whether your tires or your door seals – do your car a favor, spend the few extra dollars to get good products.

Rubber Seal Lubrication:

The rubber seals on your top are very similar to your skin. They need moisture and protection or they will dry out and eventually crack. At the very least they will shrink with dehydration, or prematurely break down due to UV damage.

Gummi Pflege: The applicator is a little bulky. I found the on board applicator to be overkill for the narrow strips of rubber that make up the E93 lateral top seals (those rubber seals running from driver to passenger side).

As an alternative, I use "foam lollipops" available from either Autogeek or Detailed Image. I moisten the lollipop with the Gummi Pflege then run it along the length of the seal including the grooved area. I follow with a microfiber wrapped sponge to help spread the Gummi evenly and mop up any puddles.

Krytox:

This is best applied using your fingers and a little really does go along way. The best description I can use here is watch your wife or girlfriend the next time she applies lip balm or lip gloss. She will take a little tiny bit on the tip of her finger and smooth it all the way over her lips. Same thing applies here. It takes just a little bit to be smoothed the length of the seal.

You need to keep going over the area until you have a uniform thin coating over the entire seal area. If you live in a cold area of the country and are trying to do this at temperatures below 60F, take a terry face cloth and get it wet with hot water. Wring it out then wrap it around the syringe applicator and let it sit for a few minutes. This will gently warm the Krytox and make it easier to apply.

Alternatively, if it is in the tube, let it sit in a coffee mug of hot water for a few minutes to SOFTEN it. **DON'T stick it in the microwave.** If you liquefy it, you may alter its properties.

So now that you know what to use and how to apply it, where does it go? For the seals that is pretty easy. **If it's black and rubbery (soft and slightly squishy) and it's on either the front or rear edge of one of the top panels or it is between the front and rear passenger windows it is fair game.** Pictures do a far better job of explaining it so here they are. Don't forget to use a little Krytox along the area where the side view mirrors mate with the A pillar.

You need to "stack your top" to get to these seals



Top seals that need to be treated with either Gummi Pflege or Krytox



Seal area close up



Roof Panel 2 Back Seal

Don't forget this seal!



This smooth rubber area is a good place to use something like 303 Aerospace Protectant

More about these areas in the Joint Lubrication section



Krytox - "A little dab will do ya"

This is all it takes to do the rubber seal between the front and back side windows



With your finger, evenly work this dab of Krytox the length of the entire seal

Start of Krytox application on side window seal



Don't forget these areas where the mirrors mate with the A-Pillars



The little bit of residual Krytox left on my finger from doing the side glass helps keep this drip susceptible area in good shape.

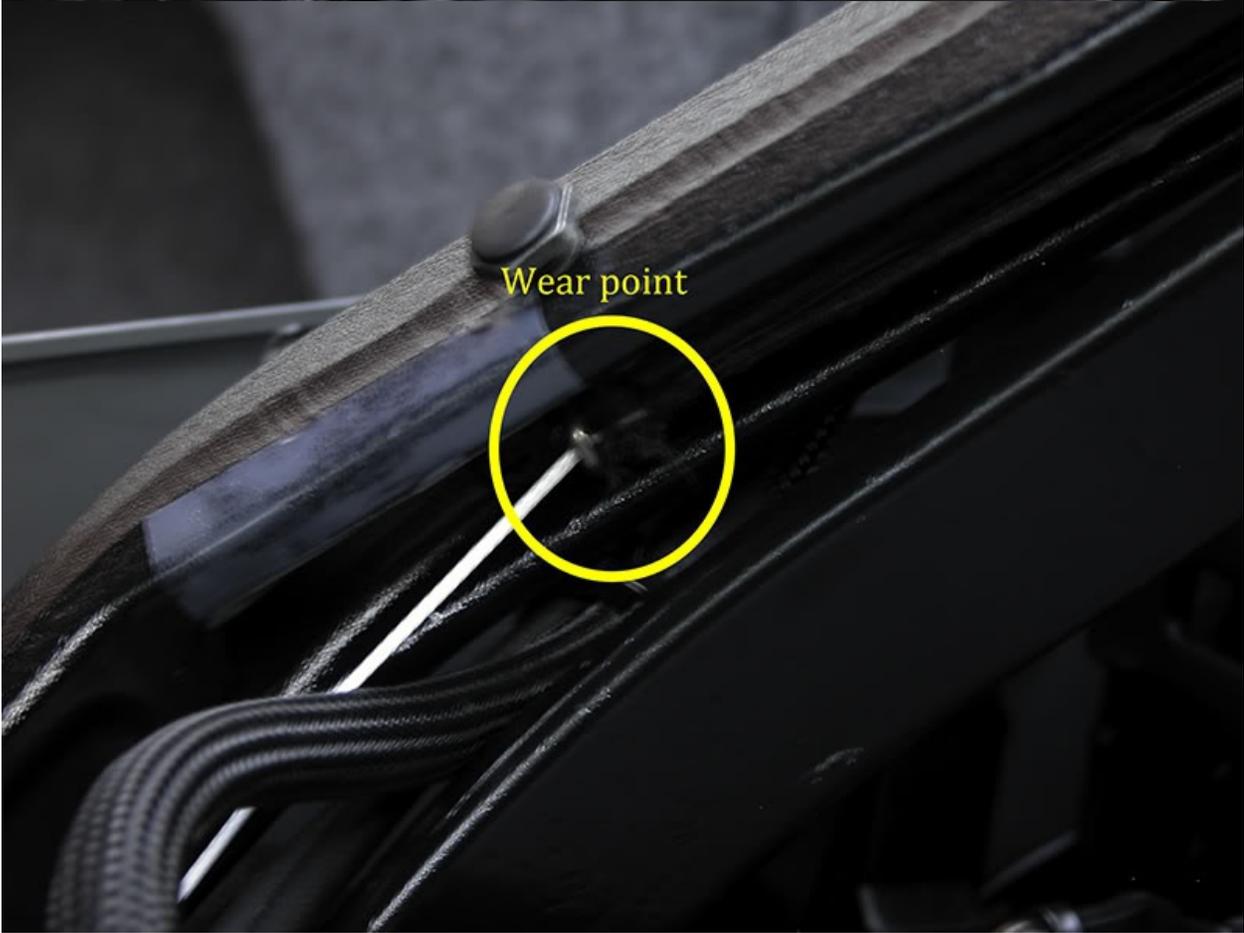
A quick word about the tensioning cords. While these are not something that can be lubricated or treated per se, it is of value to inspect them for wear. It seems that around MY 2011, the cords were upgraded to a more robust version as earlier cars exhibited fraying of these cords. My 2009 had the cords replaced under warranty in August 2011. This is what the frayed cords look like and the points where they are the most visible.



Fray point - white is bare cord underneath
Black is covering that is fraying off.



Cord covering starting to fray



Wear point



The replaced cords are not as silky looking and are holding up much better.



Now for the hinges, locks, pins and slides: **fun2drive** is going to explain about lubricants and application techniques. We had a fortuitous photo –op in that my E93's top had developed a nasty little squeak and a bit of a catch or sticky spot when being returned to closed from the stowed (top open) position. It went to the dealership for a full lubrication. The photos were taken the day after the service visit, so we have a pretty clear understanding of the lube points as specified by BMW.



If your sport doesn't put blood, dirt or grease under your fingernails, then it's just a game.
Euro Modded|Split Armrest|Rear Foglight Mod|Front Reflector Delete|LUX H8 Angel Eyes|No Bells|Few Whistles|Das Fahren im Freien

Last edited by Nordic_Kat; Today at 05:05 AM.



fun2drive
Officially Welcomed to the 'Fest
Location: florida

E93 Part 2 Top Lubrication

Lubricants for Our E93 BMW

The collection of hinges, bushings and bearing that allow our tops to operate will operate a long time without doing much to them. However just like giving your car an oil change your linkages for this complex top require attention too. You can use almost anything that provides lubrication such as WD-40, Kroil, 3-in-1 oil, and Lithium grease. The question is what is best? WD-40, 3-in-1 Oil and Kroil are all fine lubricants but are light and will wear off whereas Lithium grease will adhere to anything it touches and not wear off as fast. It may not be as easy to apply as lubricating oils but them it will not drip out after application.

WD-40 is actually a water displacement product and not intended for use for our application. If you apply this product frequently it will work but it was not designed to be durable for bearings and bushing but designed to displace water thus the reason it is used so much in the marine industry. I use this all the time on my sailboat and jetski after use in salt water. This inexpensive product can be sourced virtually at any grocery store or hardware store.

3 in 1 Oil has been around since initial formulation in 1894. It has been reformulated for modern applications and is also owned by the same company that owns WD-40. It is a general purpose lubricant which is excellent for our top moving parts like bearings and bushings. It is light in weight around SAE 20 but suitable for application. Because of the light weight using a rag to catch the excess dripping is desired. While considered an older lubricant it serves the purpose well and I use this product. It does not penetrate as do other lubricants so you need to apply in a couple locations to get the bushing or bearing coated. If you can turn the bushing or bearing you can apply in one location and get sufficient coverage by rotating it. This inexpensive product can be sourced in virtually any hardware store, Walmart, some grocery stores as well.

Lithium grease is a grease that is sprayed out of a compressed can like WD-40 and exits like a heavy liquid and then flashes off when exposed to air and becomes sticky. Lithium grease is actually a combination of oil and soap. It is suitable for all of our top applications meaning bushings, bearing and linkages that slide. However it is not easy to apply unless you are careful and use a straw inserted into the discharge nozzle and is messy requiring clean up with a solvent that can remove a grease. I use this product for areas that slide on our top and also on the door striker, hood latch areas anyplace where a lot of exposure to the elements will occur and you want something to stick. Again application is key for this product and getting this grease into the bushings and bearings while harder to do because it is messy results in a lubricant which lasts a long time and does not drip out. The areas where you apply it to sliders should be lightly applied where the sliders meet each other or if a slider is capturing a bushing coating the inside of the slider and outside of the bushing is ideal. Wipe off the excess as quickly as you can before it changes state from a heavy liquid to a grease. It is inexpensive and can be located at most any hardware or auto parts store.

ACF-50 is used in the marine and aircraft industry to prevent corrosion of metal parts and protection of electronic components like switches. It is a light weight lubricant that is not totally suitable for our bushings and bearing yet alone the sliding components. However it is presented here for those that live in a climate where you can get corrosion on the top assembly or very high humidity areas that can cause corrosion. In those areas this would be the product to apply for protection from corrosion followed by a more suitable longer duration lubricant as cited above. It will provide 12-18 months of protection and does not attract dust, dirt as will other lubricants. Only a very small percentage of our members will have need for this product but it is provided here so they are aware it exists. Compared to the above products it is a more expensive and has great application for owners that have marine or aircraft too. Typically you have to order ACF-50 online.

Kroil oil is a penetrating oil which will penetrate into the bushings and bearings. It is suitable for getting a light lubricant into these locations when you have not kept up on maintenance for a while meaning you may have a dried out lubricant in the bearings or bushing. I cite Kroil here because we do have members that may never touch their top moving assemblies for many years and when they stumble upon this DIY thread it might save them a lot of grief. This penetrating oil is the first step for the moving assemblies of a neglected top. Following application with a straw inserted into the nozzle of the spray can it should be allowed to sit (wipe the excess oil off) for a day. Once it has sat you can try to operate bushings or bearings that are frozen or stuck. Once free you can then retreat with a more suitable lubricant as listed above. Strongly recommend this product for neglected linkages that need to be freed up. Kroil is about as expensive as ACF-50 and typically has to be ordered online.

I visited the BMW dealership to inquire what they use for our top linkage. The BMW dealership technicians typically use two types of lubricants on our E93's; Wurth HHS-K and our friend Lithium grease. Wurth HHS-K is an excellent lubricant suitable for bearing, bushing and sliders as well. It is about as expensive as ACF-50 or Kroil is and can be sourced online or at those retail stores that sell quality lubricant product and mechanics tools. HHS-K penetrates well, lubricates even under high pressure, and has excellent adhering properties. In short as mentioned above this is suitable for the entire top. It is just not that common a lubricant you can source without some effort. A quick check of Amazon shows it is available online.

Some of the better quality lubricants out there are listed below. Your experience is valued so if you have a product that performs well for our top applications please list it below.

Versilube G322L This product is designed for use as a lubricant on aluminum and steel substrates. Versilube G322L contains additives for enhanced corrosion protection. An ideal product for lubricating and protecting linkages, bushings, bearings, lock hinges, engine components and other mechanisms. G322L is safe to use on a variety of plastics, metals, glass and painted surfaces. G322L provides outstanding viscosity-temperature characteristics, corrosion protection, good adherence while being non-corrosive.

You can find this at various sources like Amazon.

Teflon lubricants are also excellent lubricants if they can be coupled with other carriers that have good adhesion and don't collect dust and dirt.

Without a doubt dust and dirt will find its way on top of the lubricants you use. It is just a fact of life. If you never open your top it will never happen and in general will be a minor issue but be sure before applying any of the products you use wipe the area down with a clean dry cloth. Any lubricant applied to the areas shown below is better than nothing and there is certainly more lubricants that are suitable than listed above. However the ones listed above are typically easy to source and suitable for this application.

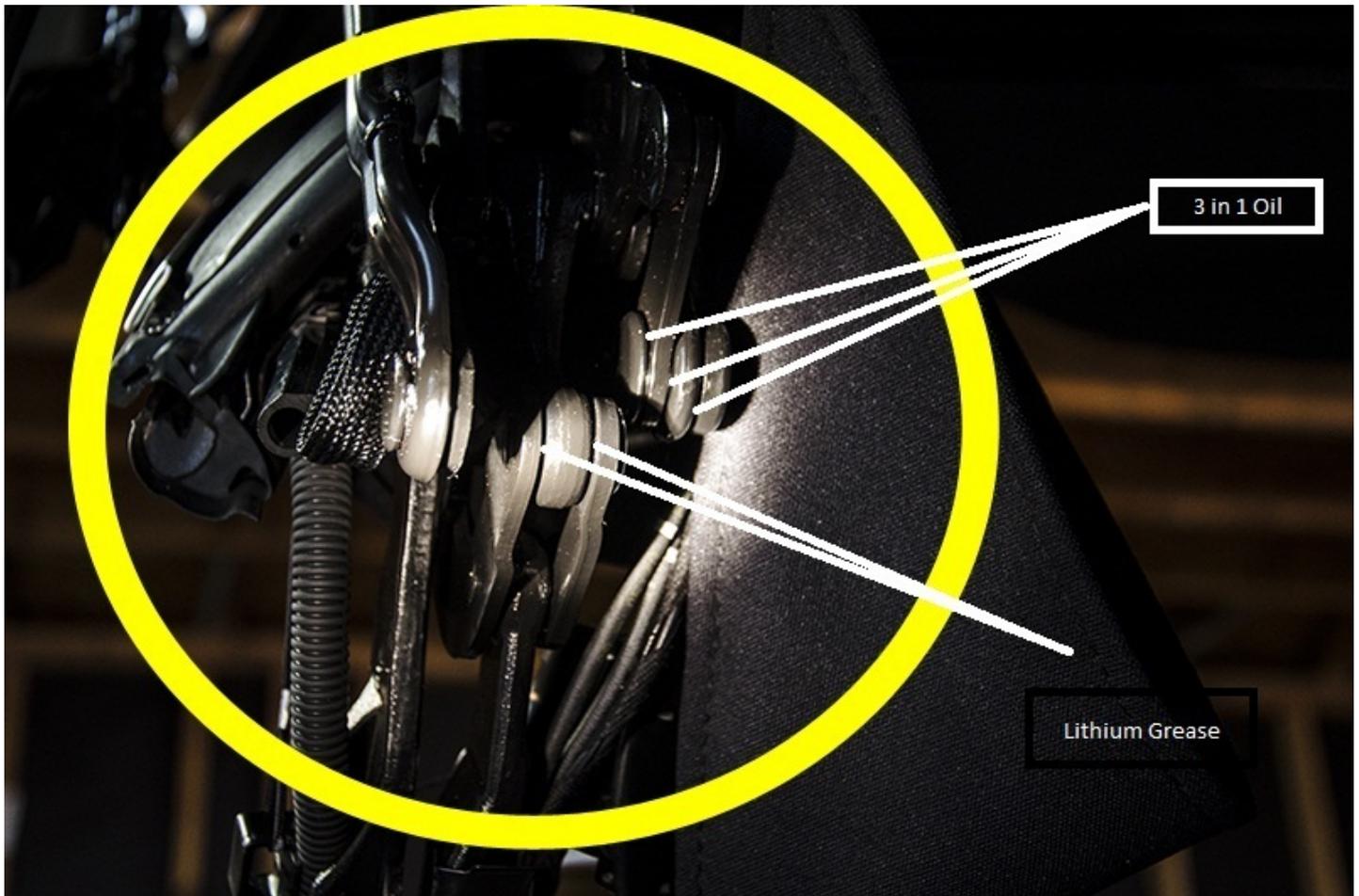
Procedure

Kat has provided a lot of quality pictures that show your top in various stages of operation. Suffice to say that to perform this work you do need the top in these configurations. Required is the lubricant you choose to use (see above), a rag to keep the over spray and drips off your vehicle, latex or vinyl gloves if you are sensitive to these lubricants. You can go the extreme and use Stoddard solvent to wipe any excess off the lubricated area. Most of these products are applied in a spray manner using a straw attached to the nozzle to help direct the lubricant to the intended area. Small squirts are much better than long ones because you want to allow some time for the lubricant to penetrate. If possible move the linkage, bushing or bearings, it will help to distribute the material over the intended area. If possible once the entire top is lubricated operate the top a couple of times to allow the lubricant to disperse. It doesn't typically matter if it is a bushing or bearing since they both require lubrication to keep from seizing up. BMW over the years has used both.

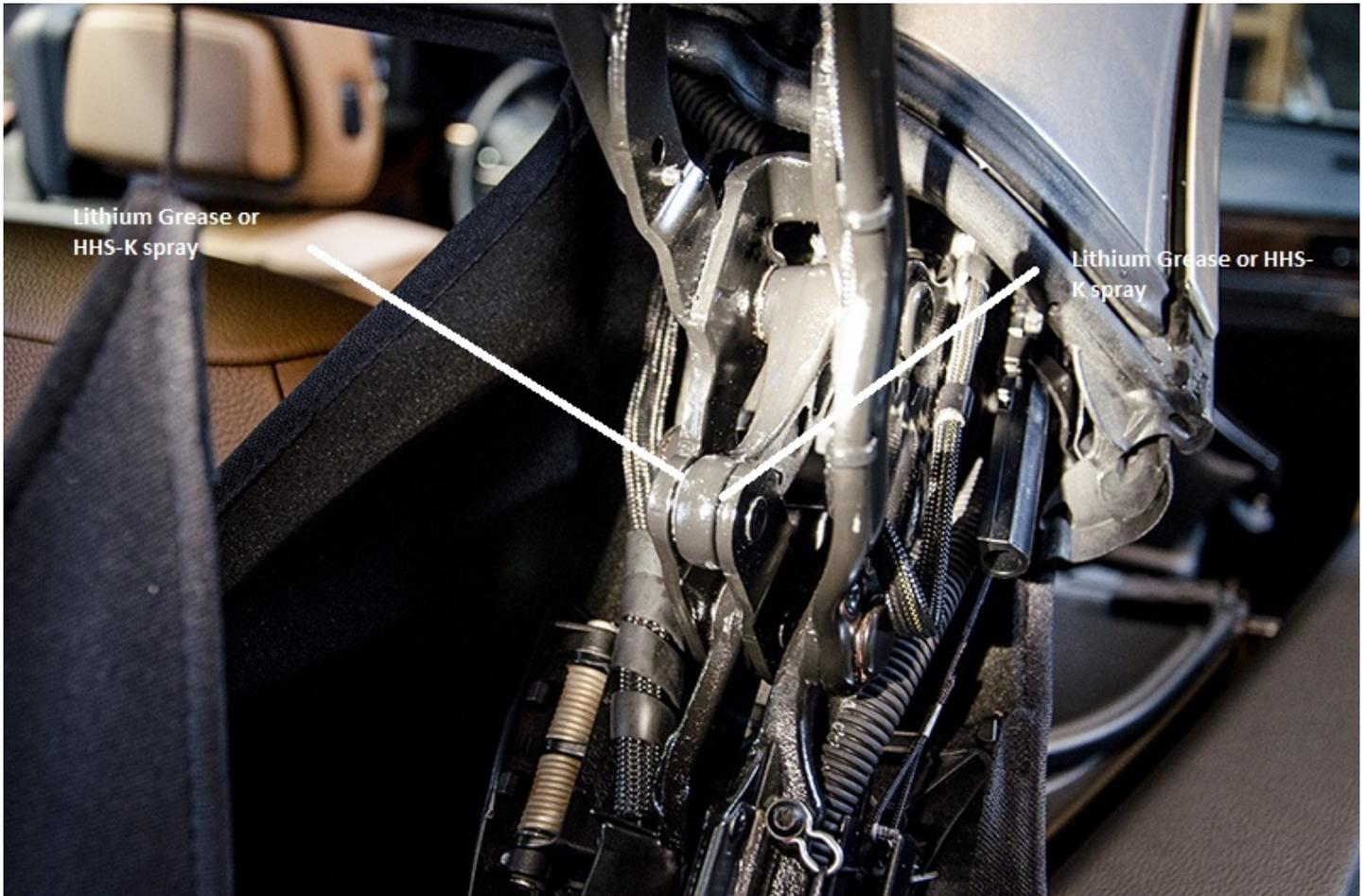
How often should you lubricate your top? It depends upon how often you operate your top. BMW typically used the term Condition Based Service (CBS). It does apply here as well for the owner. There is no right or wrong answer but consider you are moving 400 pounds around on these linkages. I would guess 30-40 operation cycles wouldn't be too soon. This should assure long life out of the moving parts of the top that require lubrication. When the top is in the configurations to lubricate the bearings, sliders and bushings it should not take a great deal of time to do this task. Wiping the areas before applying the product is key. It makes no sense to apply product to an area that has collected dust and dirt and has old dried lubricant. There are simply too many variations of how to apply this product to cover them all but just as you lubricate a hinge on your front door you would do the similar operation for the bushings and bearings. The areas that have a sliding mechanism require a different technique. Once the area is wiped down and clean I would recommend using an applicator like a Q-tip lightly coated in lithium grease and apply to the inside of the sliding mechanism that is in contact with the bushing and also lightly coat the bushing as well. Wipe excess off and it is common to get grease outside of the intended are.

Please note that these suggestions for maintaining your top are of course not the official BMW sanctioned way to do it. Taking it to the dealer and allowing them to maintain the top for you is. I am certain there are other lubricants that are also excellent and please feel free to add to our thread those that you have had success with so that we all may learn. Please use this thread at your own risk. May your top life a long and well lubricated life.

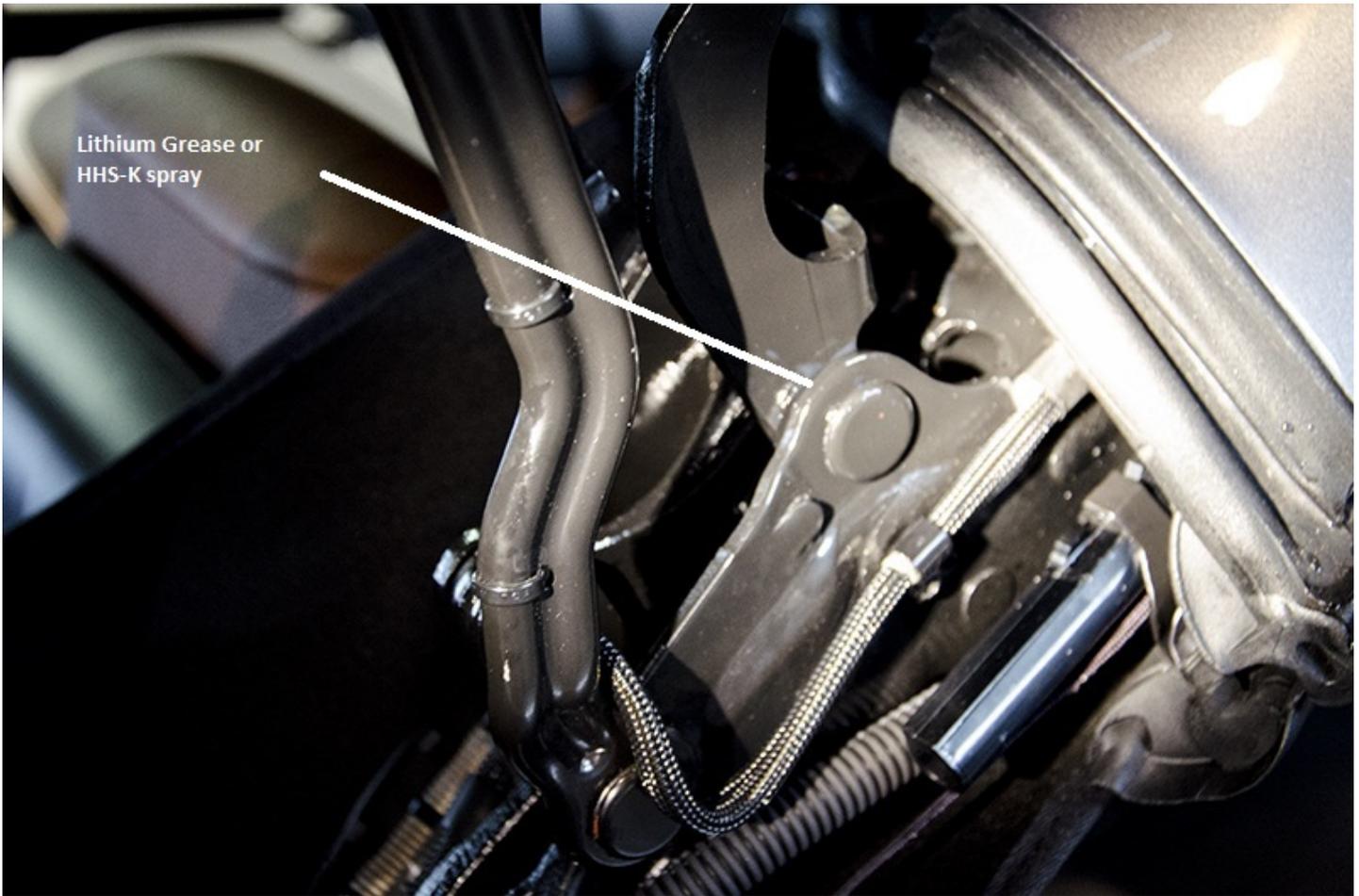
I will now attempt to put some verbiage to the annotated pictures that Kat has taken of our top. The first picture shown below shows the top with one smaller linkage suitable for light weight lube and a more significant linkage that is best lubricated with Lithium grease or HHS-K spray. A couple small shots around the linkages on both sides should do it, be sure to have your rag ready too to capture anything that drips off.



The second picture shown below shows a main linkage for our E93. This linkage requires either Lithium G grease or HHS-K spray again applied around both sides of the linkage. Wipe excess off and it helps to use the rag to catch over spray as well so it doesn't stain any fabric or material that the over spray might reach.



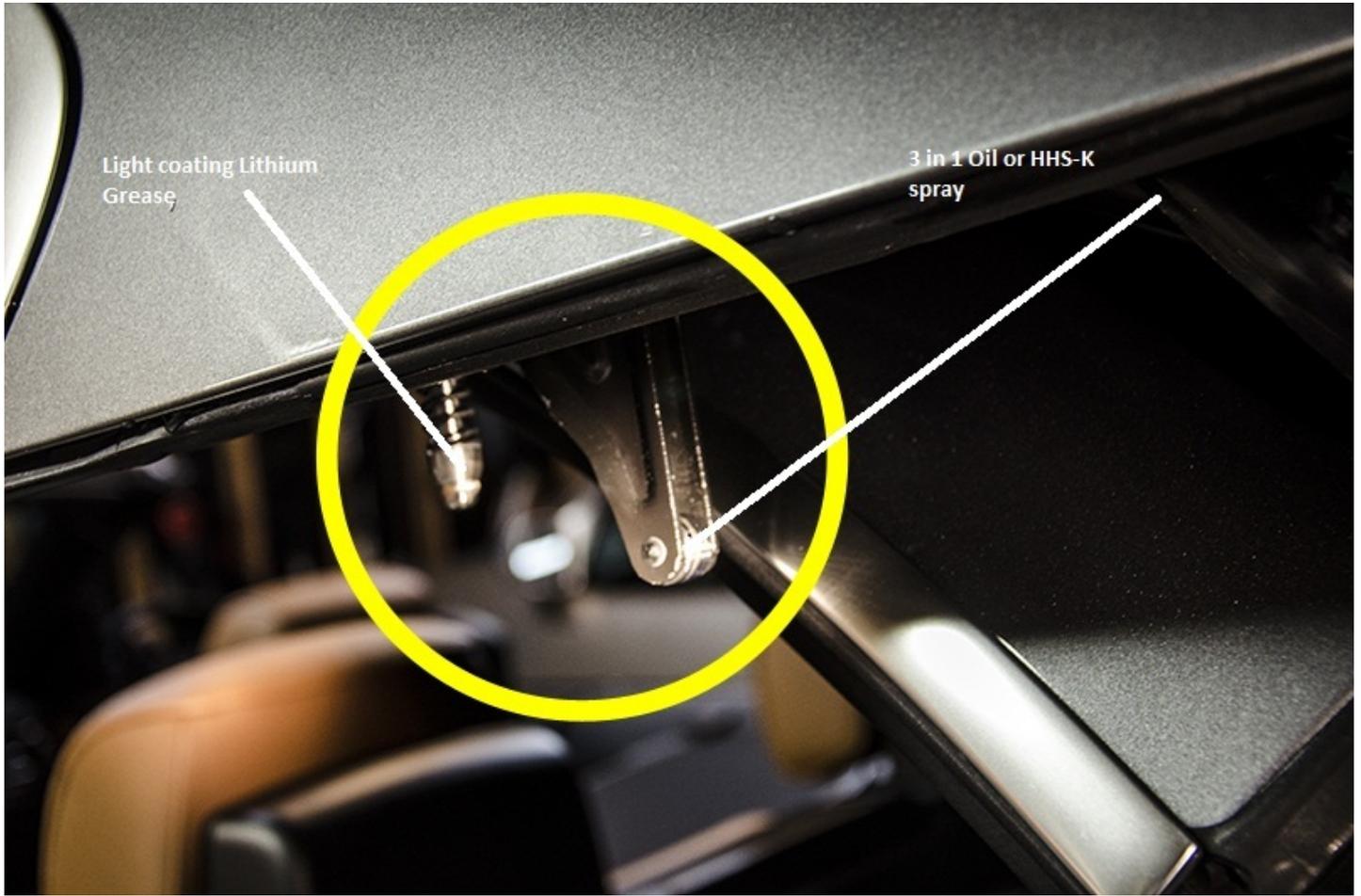
The third picture also shows a substantial linkage which should be lubricated on both sides. Again small short shots around the linkage areas where the linkage articulates around a bushing is where you want the lubricant to be sprayed.



The fourth picture shows a receiver cup and small bushings. Both can be lubricated with Lithium grease or HHS-K spray. Here is where a Q-tip with some grease or HHS-K applied can be applied around the cup and the bushing.



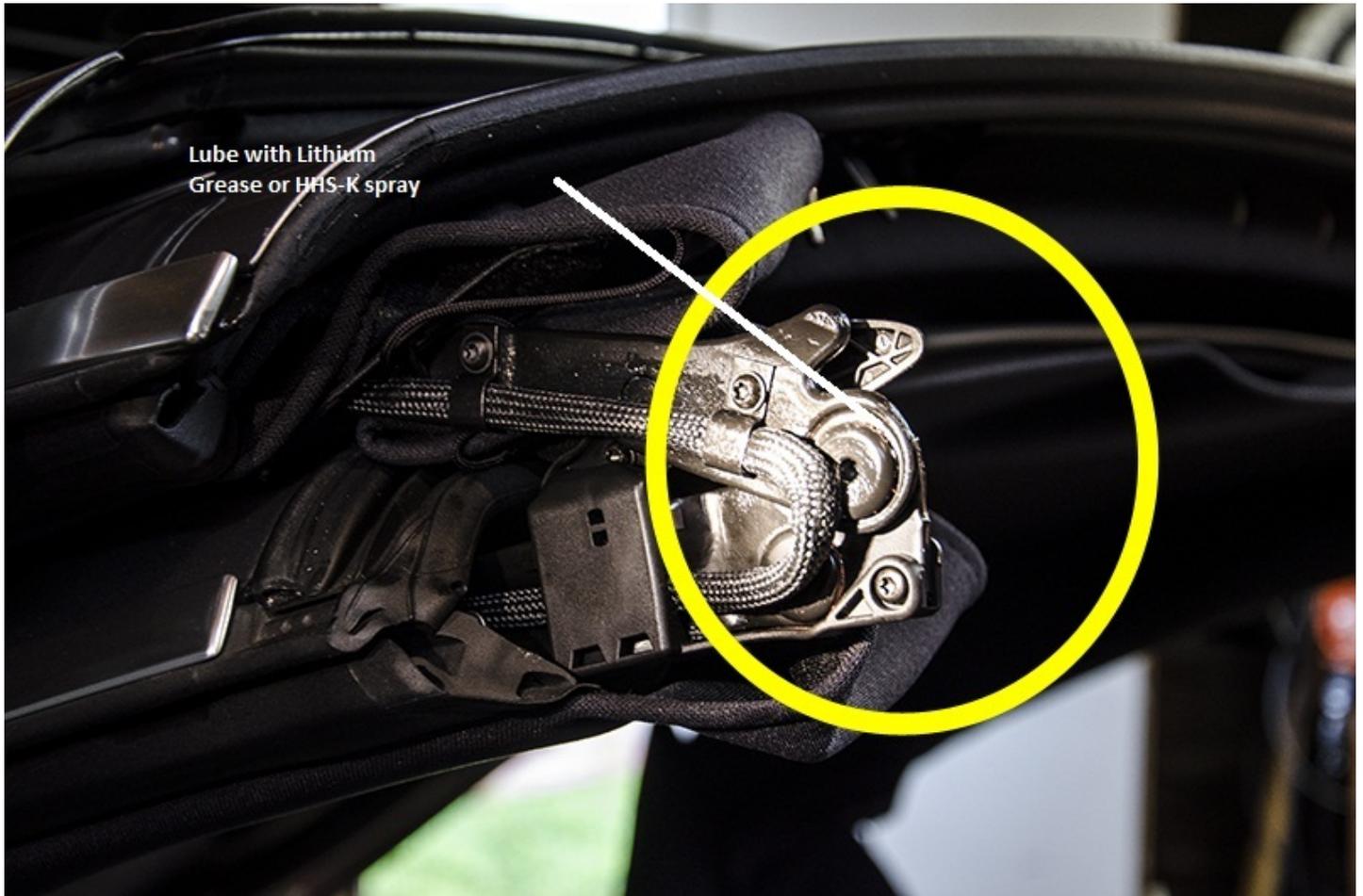
The fifth picture show a pin and light duty bushing. The bushing can be lubricated with HHS-K or 3 in 1 Oil and the pin is best lubricated with a light coating using a Q-tip or rubber gloved finger.



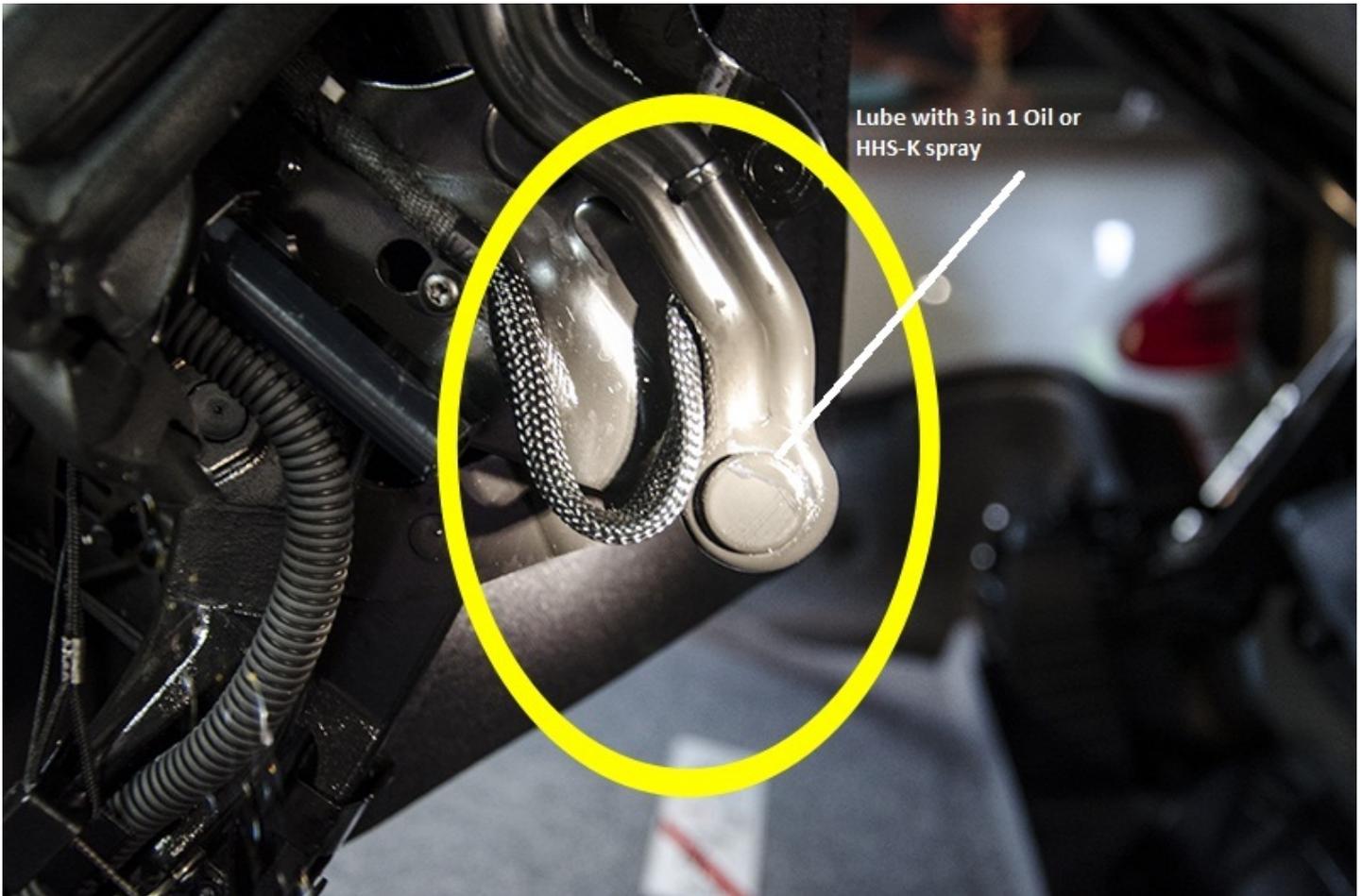
The sixth picture shows three substantial bushing or bearing (I don't have my E93 and can't tell from the picture) that require Lithium grease or HHS-K spray. You need to use small shots of spray around both sides of the bushing/bearing being careful of over spray. Wipe the excess off once it has set up and before it drips on to the car.



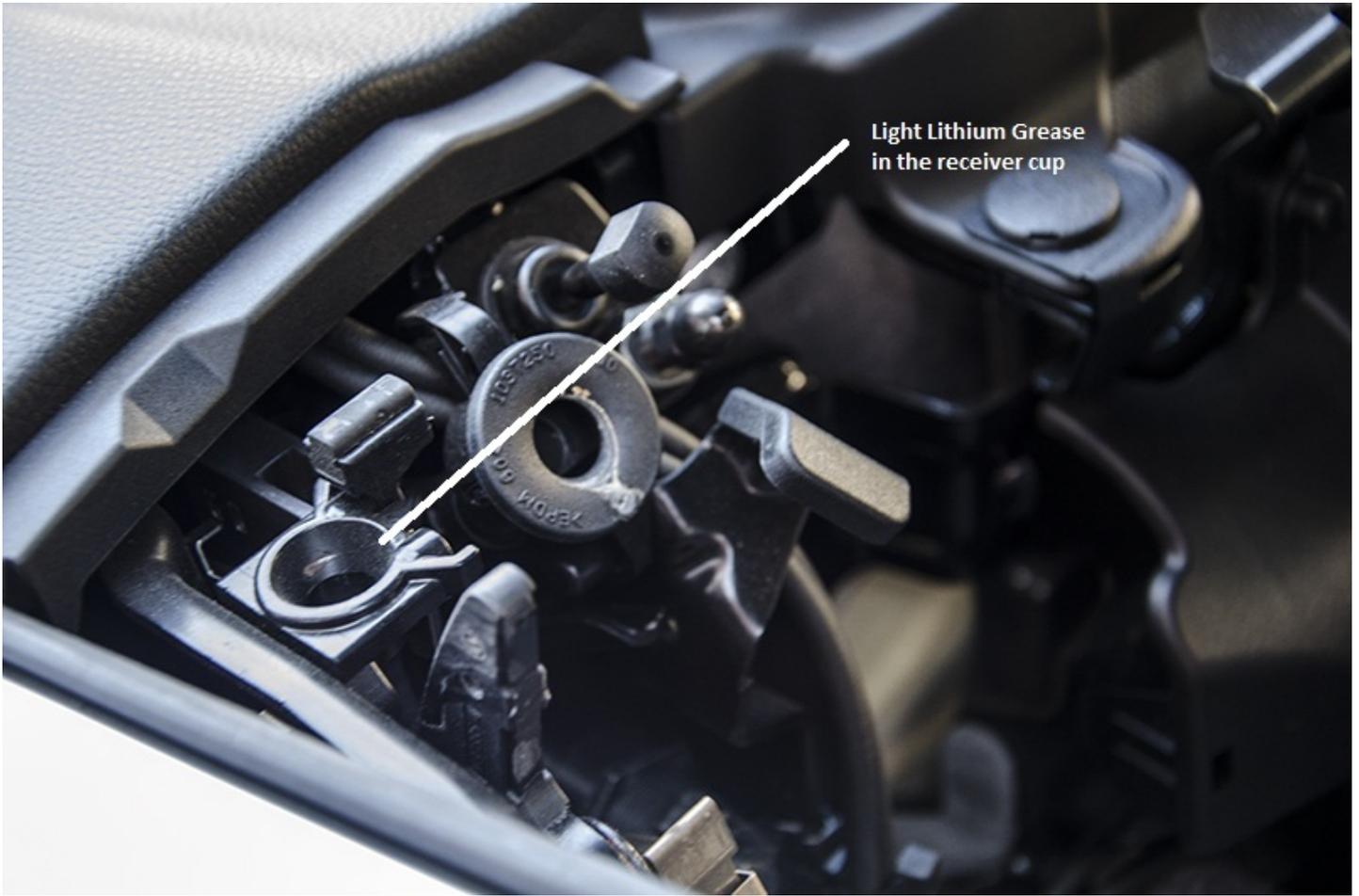
The seventh picture shows a substantial linkage that is best lubricated with Lithium grease or HHS-K spray. The bushing/ bearing (again can't tell since my car is not available) is serviced with a few shots around both sides being careful again to not let excess spray to drip or over spray to reach other areas of your car.



The eighth picture shows a medium duty bushing that should be lubricated with Lithium grease or HHS-K spray. This is a case that 3 in 1 Oil would also be suitable but grease and HHS-K sticks better. Again lubricate both sides of the bushing and wipe the excess off.



The ninth picture shows a receiver cup that can be lubed with Lithium grease or HHS-K spray. Using your gloved finger or a Q-tip works just fine.



The tenth picture shows a linkage arm that can be lubricated with Lithium grease or HHS-K spray. Note that you can see the lubricant around each side of the linkage arm. You can leave it this way or you can wipe any excess off.



Last edited by fun2drive; Today at 05:13 AM.

ADDENDA:

1. Regarding actual physical adjustments to the top - DO NOT attempt by yourself (JMHO). There are special tools that were built specifically for this purpose - which your dealer has. These tools include jigs which fit over and around the car and keep things aligned in 3 dimensions. The tolerances for the hardtop are only 0.7mm so any adjustment to it requires a great deal of precision.

According to the shop foreman at my home dealership, not all techs are certified to work on the tops. There is a special class they have to take and an entire manual devoted just to servicing the top. I have pictures of these tools which I will post later for reference.

2. Time of year directs some of my decision points on whether I use the Krytox or the Gummi Pflege. During the warmer months of the year when the car is religiously washed weekly, the Gummi works fine for the seals across the top. About once a quarter I'll substitute and do the whole shooting match with the Krytox. The side window seals which are very similar to the coupe windows do fine with just the Krytox on a quarterly basis. During the winter months, when my washing schedule is more erratic, and temperatures are cooler which means the rubber isn't as pliant, I tend to step up and use the Krytox every 4-6 weeks. With either product, a little goes a long way. In the 2.5 years of ownership, I just broke into my second bottle of Gummi Pflege last weekend. The one thing about the Krytox is you want to keep it very minimal at the area where the top of the window mates in the door frame. If you get too much it will smear down the glass and is a mega-PITA to clean up. (Yes, this is the voice of experience.)