

# Modifications to my KLR

*Last update: July 7, 2024*

This article discusses modifications from stock that I have made to my 2004 KLR... to either make it last longer, safer to ride, or easier to live with. In riding the bike over the years, I've modified or changed these items away from stock. The KLR is a great canvas which can be tweaked towards the type of riding you most want to do, thanks to a large supply of aftermarket parts.

There's a bit of overlap with a separate article titled "How many miles do you have on that KLR?" which addresses the longevity of my bike and how long certain components lasted before they were replaced. It is also here at [watt-man.com](http://watt-man.com) under the "KLR articles" tab.

But in this article, let's address the modifications to my KLR, as customers bring the question up frequently. Keep in mind that these are my opinions... don't misread this to think that every KLR needs every one of these. This is just a listing of what I found important, and the reasons for the change.

The table below provides a quick summary of the 31 modifications that will be discussed. They fall into some general categories in the table's left column. For more detail, I have comments of varying length about each of them.

## Watt-man's Modification List - KLR A-Model

	Item	Source
Longevity	1 Eagle Dooickey and Torsion Spring	eaglemike.com
	2 Thermo-Bob and Coolant Temperature Face Overlay	watt-man.com
	3 Magnetic oil drain plug	eaglemike.com
	4 Disable safety switches	<a href="http://www.klr650.marknet.us/safetyswitch.html">www.klr650.marknet.us/safetyswitch.html</a>
	5 T-mod for carb vent line	<a href="http://www.klr650.marknet.us/tmod.html">www.klr650.marknet.us/tmod.html</a>
	6 Zerk fittings to lube rear suspension	watt-man.com
	7 Updated seat	
	8 Horns from 2010 Honda CrossTour (Part #'s in this article)	Honda car dealership
	9 Manual fuel petcock	<a href="http://www.bigcee.com/Engineering/">http://www.bigcee.com/Engineering/</a>
	10 MOSFET Voltage Regulator	
Safety	11 Flashing LED taillight	
	12 320mm front brake rotor	eaglemike.com
	13 LED Headlight	watt-man.com
	14 Running lights in rear turn signals	<a href="http://www.bigcee.com/Engineering/1157/1157mod.html">http://www.bigcee.com/Engineering/1157/1157mod.html</a>
Convenience	15 Throttle Lock (Vista Cruise)	
	16 Tank Bag (Wolfman Rainier)	
	17 17 tooth front sprocket (Sunstar!)	eaglemike.com
	18 Prevailing torque countershaft nut	eaglemike.com
	19 Centerstand	do some research
	20 Heated grips	Symtec heaters, Progrip 714's
	21 Calibrate speedometer	watt-man.com
	22 Twelve Volt accessory port	
	23 Handlebar risers	eaglemike.com
Robust Hardware	24 15 Amp headlight fuse	auto parts store
	25 Moose skid plate	
	26 Eagle rear brake bracket	eaglemike.com
	27 Choke lever relocation	eaglemike.com
	28 7/16 inch, Grade 8 Footpeg bolts	good hardware store
	29 Master cylinder lid screws	eaglemike.com
	30 Subframe bolt upgrade	eaglemike.com
	31 Rear shock cover	

# LONGEVITY

## 1) Eagle Doohickey and Torsion Spring



Oh man, this could be an entire article in itself. There is so much to say here but I'll try to keep this on the short side. **On ALL model years of the KLR, I believe these parts should replace your stock components.** The function of this lever and spring is to properly tension your counterbalancer chain, which is being driven by your crankshaft. If you think about it, the crankshaft is decelerating a little on the exhaust and intake strokes, decelerating a lot on the compression stroke, and accelerating a LOT on the power stroke. This is actually a significant torsional input to the system with every revolution of the engine, which means that the counterbalancers and water pump are also accelerating and decelerating with every engine revolution. Now put a loose chain or sloppy system between these two into the equation and you can see why things get beat up if they are not properly tensioned.

Gen 1 levers broke or cracked, Gen 2 and Gen 3 levers are much stronger but have a spring which runs out of tension in a short distance (around 5,000 miles is common), and ALL factory levers have a sloppy torsional fit onto the idler shafting. Thus, even when bolted down from the factory, the stock balancer system is rattling torsionally within the lever with every engine revolution, which over time, beats up the torsional fit in the lever (especially the Gen 1 bikes) and in all cases, beats up the rubber on the balancer sprockets. After running out of tension from the factory spring (most prevalent on the Gen 2 bikes), this wear accelerates.

The factory extension spring stinks, period. It's job is to *rotate* the doohickey to keep the balancer system tensioned. Of course, Kawasaki should use a torsion spring to rotate something... but they don't. They pull on the side of a **separate** lever, which has two problems: one, this could never turn the separate lever very far because the load application angle never changes, and two, it preloads the factory doohickey against the *loose side of the flats* on the idler shaft, guaranteeing the maximum torsional rattle discussed above.

The Eagle Doohickey fits the flats on the idler shaft with much less slop, PLUS the torsion spring actually applies torque directly **to** the doohickey, NOT a sub-lever. Thus the doohickey is *always preloaded to the "tight" side of the flats* on the idler shaft. Win-win.

Of course, when it comes to installing the torsion spring, having the right technique is important. You'll see people bemoan the torsion spring installation, as it took them a number of tries to successfully install it. Technique, people! Here's a video of Eagle Mike installing a torsion spring. It takes him 5 seconds.

[https://www.youtube.com/watch?v=4MYytmcHQ\\_c](https://www.youtube.com/watch?v=4MYytmcHQ_c)

Bottom Line: I installed an Eagle Doohickey and Torsion Spring back when my bike was new. I've got 200,000 miles as of this writing and everything is tight and quiet. More details are provided at my "How Many Miles" article, but the bottom line is it's doing great at 200,000 and has a lot of life left in it.

Pardon the pun, but just DOO it. Be done with it for the entire life of the bike in one afternoon.

## 2) Thermo-Bob and Coolant Temperature Face Overlay



Paper Overlay for 1987-2007



Lexan Overlay for 2008-2018

You're probably aware that the Thermo-Bob is my contribution to the aftermarket for the KLR. The factory cooling system relies on cold coolant being let into the bottom of the engine to cool it, and the temperature gradient it creates makes the bottom of the cylinder go slightly oval. Rather than spelling it all out on this page, I have a FAQ at [watt-man.com](http://watt-man.com) and a technical write-up with recorded temperature data there as well. Bottom line: my oil burn rate is documented at [watt-man.com](http://watt-man.com) and even with 200,000 miles, it's still not rebuild time yet. To me, that's enough documentation to make my case!

## 3) Magnetic oil drain plug

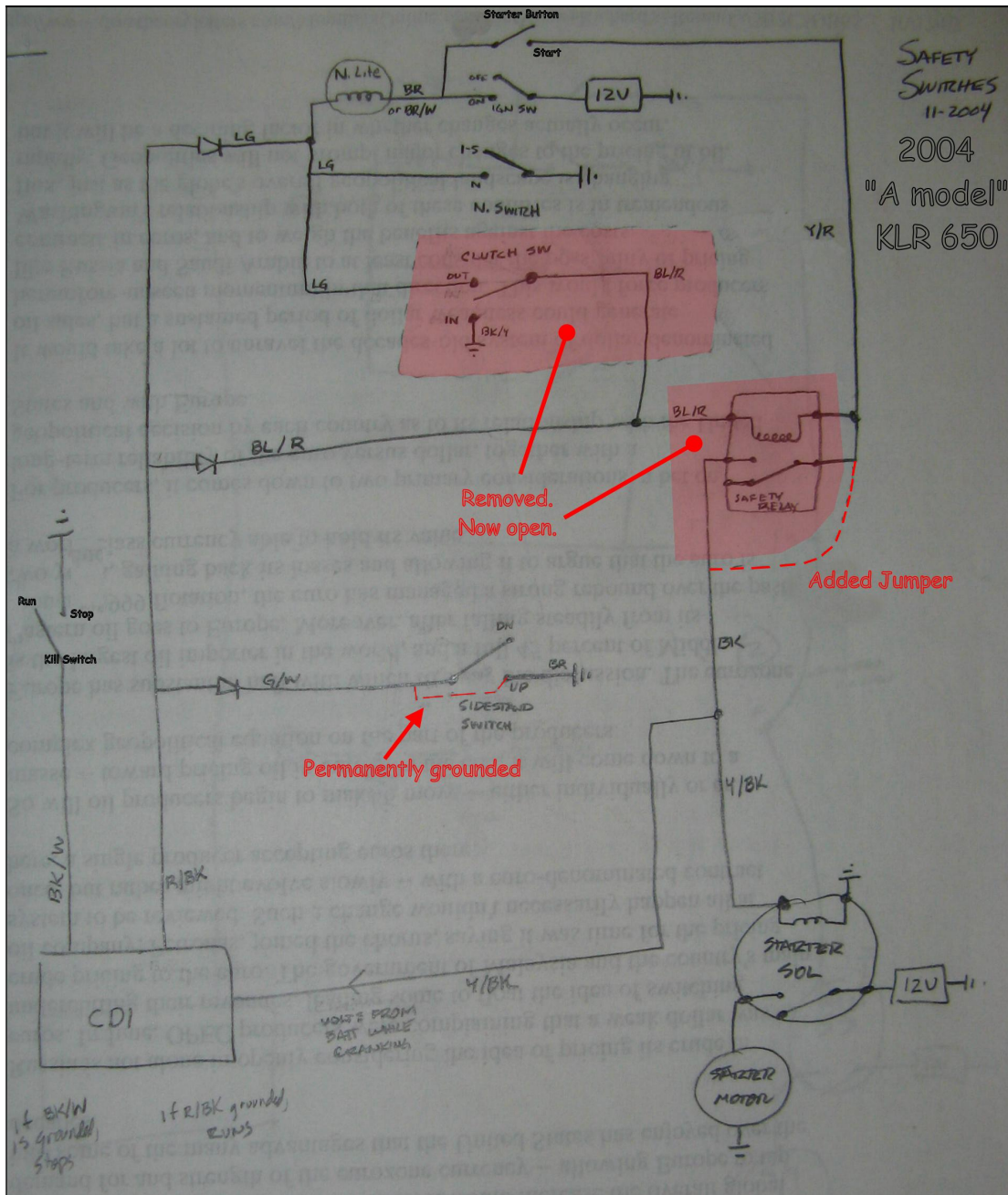
This is a simple item, and probably self-explanatory on why it's a good idea.

## 4) Disable safety switches

The KLR 'safety switches' on the clutch lever and sidestand have a spotty reliability history. On two annual trips, I've been affected by co-rider's bikes being inoperable until we bypassed these.

Obviously, removing them is a personal choice because they were added thanks to people riding away with their sidestand down, or starting their bike in gear with the clutch out and then suing the company for something that the rider was actually responsible for.

Oops, did I say that out loud?



## 5) T-mod for carb vent line

I had read about this modification on the forums and thought "I'm old enough now that I don't cross deep rivers on a motorcycle anymore", and left the bike stock... until we were on an annual trip and got caught in a downpour. And what do you know, on an asphalt road at 60 mph, my bike promptly acted like it ran out of gas... just like the forum members had said. **Wow.** After adding the tee and second vent line to the carburetor, it has never had this problem again. E model owners should do this mod as well - they also have only one vent line, it's just routed differently.

## 6) Zerk fittings to lube rear suspension



Every Honda and Yamaha I've owned in the past had zerks to lubricate the various pivots in the swingarm. I was surprised to see that the KLR did not have zerks. Instead, the KLR forums discuss disassembling the rear of the motorcycle every 6,000 miles to lubricate things... **really?** And many who waited too long found they couldn't even get their swingarm pivot bolt out in the first place. That seemed silly to me. Why didn't Kawasaki install zerk fittings from the factory?

If you're only going to keep your KLR for 10,000 miles, this is not the task for you. But since I was in this for the long haul, it seemed logical to take advantage of my first disassembly and spend an afternoon to add zerk fittings to the rear suspension. This has been written up with photos and the link can be found in a separate article at [watt-man.com](http://watt-man.com). It has worked great since, now only requiring a whopping 3 minutes every 6,000 miles with a grease gun and it's done. Since I tend to replace my endless drive chain with another endless drive chain about every 20,000 to 30,000 miles, I do have to pull the swingarm bolt out at those intervals and it slides out like a greased pig each time.

## 7) Updated Seat

This isn't for bike longevity, it's for rider longevity.

In the past, I would see expensive seats advertized and thought they really couldn't be that different from stock. I got used to riding about 30 miles before finding that I need to stand on the pegs for a minute and get re-settled. I accepted this as a requirement of motorcycling. Then, one year right before the annual trip, a friend loaned me a Corbin Flat seat so I gave it a try. Suddenly, I was riding about *90 miles* before finding that I need to stand on the pegs for a minute and get re-settled. Sold! It stayed on the bike for 139,000 miles until the cover started wearing thin. I tried to contact Corbin a number of times with no luck, then Eagle Mike mentioned that I might like the factory seat off of a 2014 "New Edition" or newer KLR650. I chased one down and had to modify the mounting method with  $\frac{1}{4}$ " spacers at the bolt holes, and it has been on the bike for 14,000 miles without issue. I like it!

-continued on next page-

## 8) Horns from 2010 Honda CrossTour

This might be along the 'rider longevity' angle again.

The puny factory KLR horn doesn't need to get used much at all, but when it does, no one knows you hit the button unless you're going 20 mph and the offender is standing at the curb. At speed on the road, the odds of a person in a car actually hearing the stock KLR horn and reacting to their mistake are somewhat laughable.

I've seen different horn installations and really didn't want to have something 'sticking out' of the bike somewhere. Sometimes I've heard that certain models of air horns take a second to generate enough airflow to start making appreciable noise. Not wanting to play that game either, I simply tried to find some electric car horns that would fit under the factory radiator shrouds. After seeing lots of car horns that were \$40 each, the \$12-each horns from a 2010 Honda CrossTour were the final choice as they were loud, inexpensive, and with a little effort, fit under the right factory radiator shroud.



Because of the larger current draw when activated, you'll need to add a relay to the system - but after removing the stock horn, you'll find you can simply plug in the factory horn wires onto the relay for activation. Then run a large switched 12 volt wire over to the relay, and the output of the relay to the two horns.



Right Shroud Removed  
to show placement



Final wiring and relay

I should have done this mod years ago. They are great!

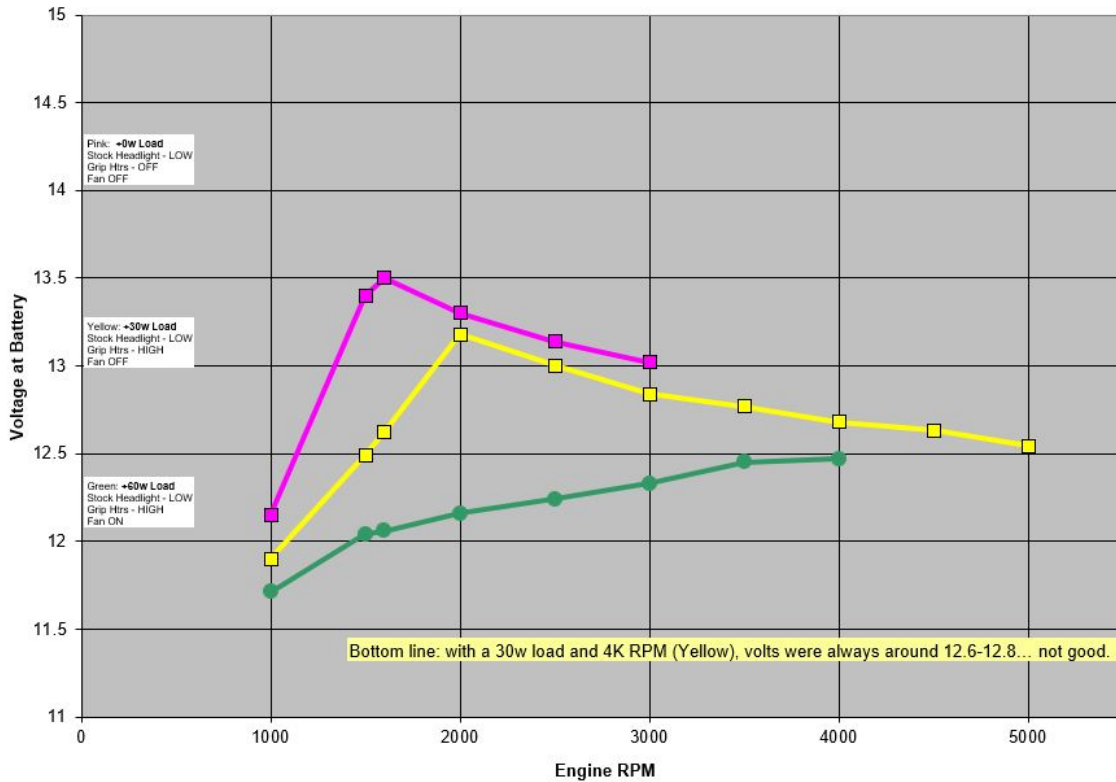
### 9) Manual fuel petcock

This might go along with my opinion about the rider being responsible for having the sidestand up before riding... but I'm used to being the one who turns the fuel on and off, and like knowing that a failed factory fuel petcock diaphragm won't mess up my vacation. There are more reasons like how this flushes the float needle clean but I'll stop there. You can read about the parts at this link: <http://www.klr650.net/forums/showthread.php?t=89987> ... Jeff Saline doesn't make them anymore but he shows the dimensions and materials required.

### 10) MOSFET Voltage Regulator

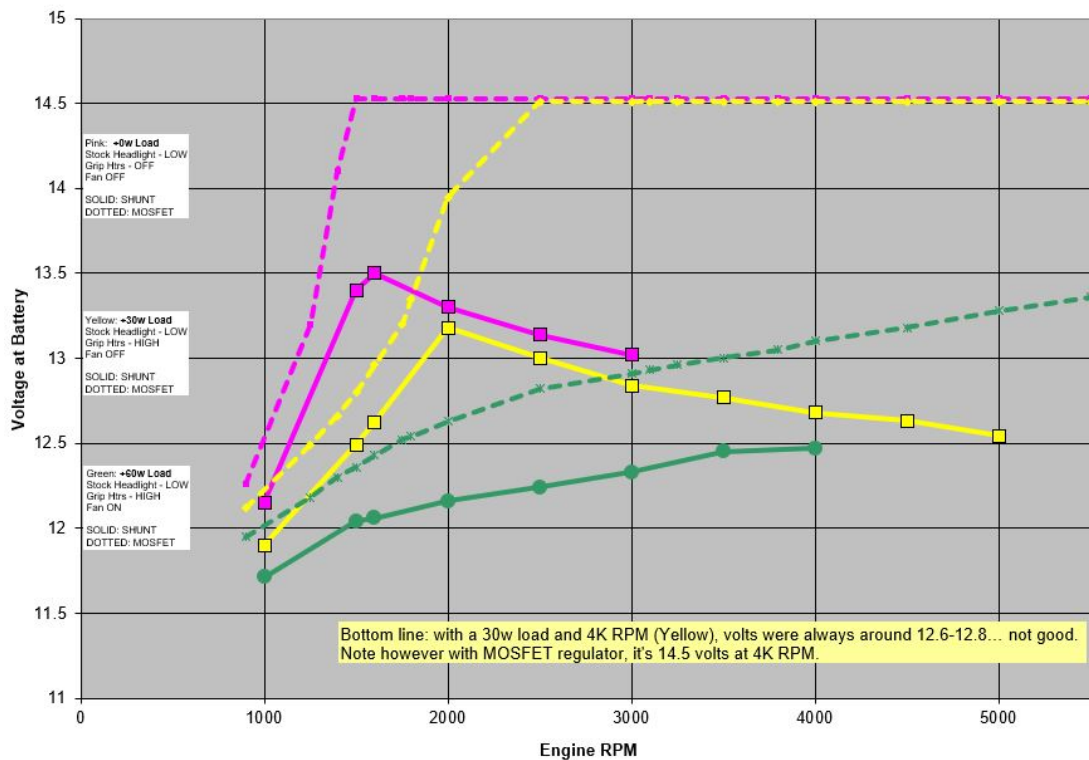
I lived with the stock voltage regulator for years and noted how the battery voltage varied with RPM. I lived with the quirkiness of voltage dropping with increased rpm (how non-intuitive!), but by 160,000 miles I was noticing that the cranking speed was slower even with a good battery. This led to investigation of battery voltage, and the stock 'Shunt' regulator still had the 'decreasing volts with RPM' just like it always had, but all charging voltages were lower than testing I had measured years before. The usual rule is that you'd like to see battery voltage in the 13.5 – 14.5 volt range when riding, and as you can see on the next page, it wasn't up in that range – EVER. With only one accessory on (see the yellow line) battery charging voltage was only 12.5 to 12.8 volts at any normal road speed. No wonder my battery was never fully charged!

**KLR Battery Voltage: 163,500 miles**  
 Stock Headlight on low, LED taillight on (5w), rear running lights on (10w)



After hearing so many positive things about using a MOSFET regulator on a KLR, I then converted my bike over and was thrilled with the results. See the dashed lines in the chart below... for any normal riding condition, battery voltage sits at a nice constant 14.5 volts.

**KLR Battery Voltage: 163,500 miles**  
 Stock Headlight on low, LED taillight on (5w), rear running lights on (10w)  
**Solid lines: Stock SHUNT regulator**  
**Dotted lines: MOSFET regulator**



Most people recommend finding a Shindengen FH010 or FH012 regulator, both which work fine on a KLR. I've placed mine in the stock regulator's location under the seat and wiring was significantly simplified by purchasing a Triumph wiring harness (part number T2500676). Triumph had issues with their charging systems and also converted to this same regulator family, so this inexpensive harness from Triumph gives you a big head start to the conversion. Poke around on the internet to determine how to tell an original FH010 and FH012 from the 'fake' new ones out there. Stick only with original equipment regulators. My first buy was a FH012 from a BMW but it regulated right at 14.9 volts and that just seemed a little sporty to me. I then found a FH010 from a 2006 Kawasaki ZX10R. That one regulates at 14.5V and is the one I use on my KLR.

## SAFETY

### 11) Flashing LED Taillight

Simply put, motorcycles are harder to see than cars. Making them more visible seems like a good idea. I've installed a flashing LED taillight... I bought one from DualStar many years ago and it still works great... but DualStar's ability to communicate with customers and provide products has been spotty since then. You'll have to do some research to find the right one for you.

### 12) 320mm Front Brake Rotor

Well, this is a 1987-2007 issue for the most part but even the newer E-models will benefit. I've been riding for 50 years and found the KLR brakes to not be very 'balanced'. It was easy, in a short panic, to lock up the rear brake but yank like no one's business on the front and wish there was more. There are multiple ways to deal with this, but simply buying a 320mm front rotor was enough to make me happy. On an A-model, the larger rotor and bracket reposition the stock brake caliper out to a 25% larger radius from the axle, making your front brakes 25% stronger for a given load at your fingers. That really helped the 'front-to-back brake ratio' for me. Some people like to install braided steel brake lines because they improve linearity, but they only change the amount you *move the brake lever*. They won't change the force required to generate a given deceleration.

Here is a tip if you go with the big rotor / stock brake caliper like I did. There are small 'spools' connecting the brake rotor to its hub as shown in the right photo below. These spools transmit braking torque from the rotor to the hub, at the same time thermally *insulating* the rotor from the hub. The issue is that the spools stand proud of the assembly by just a little, and as your brake pads wear, you'll finally get to a point where one of your brake pad's backing plate will contact these spool sections before your brake pad is worn out all the way. The trick when installing new pads is to spend 5 minutes with a hand file to modify the one brake pad backing plate as shown below, so that you'll never have metal-to-metal contact between the backing plate and the spools.



### 13) LED Headlight

The dismal headlight on A-model KLRs (1987-2007) is something that people have tried to improve over the years. Instead of putting an LED Bulb in your 1970's designed reflector, you'll get much better results by removing your factory headlight entirely and installing a JNS DOT LED light in its place (also known as the "G4"). It's a direct plug-and-play installation (took me about 5 minutes) and puts out significantly more light. An added bonus is that it uses less power than the stock light!

Check out the attached photos - the light output is much 'whiter' (6000K) than the yellowish factory light and there's significantly more light spread out over a wider area in front of the bike. Note how the stock light was so weak that my shadow shows up from the streetlight that was *behind me*! The factory headlight uses 55 watts on low beam and 60 on high - this LED uses only 20 watts ! .

LOTS more light while using less power... win-win. It was such a great modification that I now sell these in my store at [watt-man.com](http://watt-man.com). It's like riding a different motorcycle now at night.

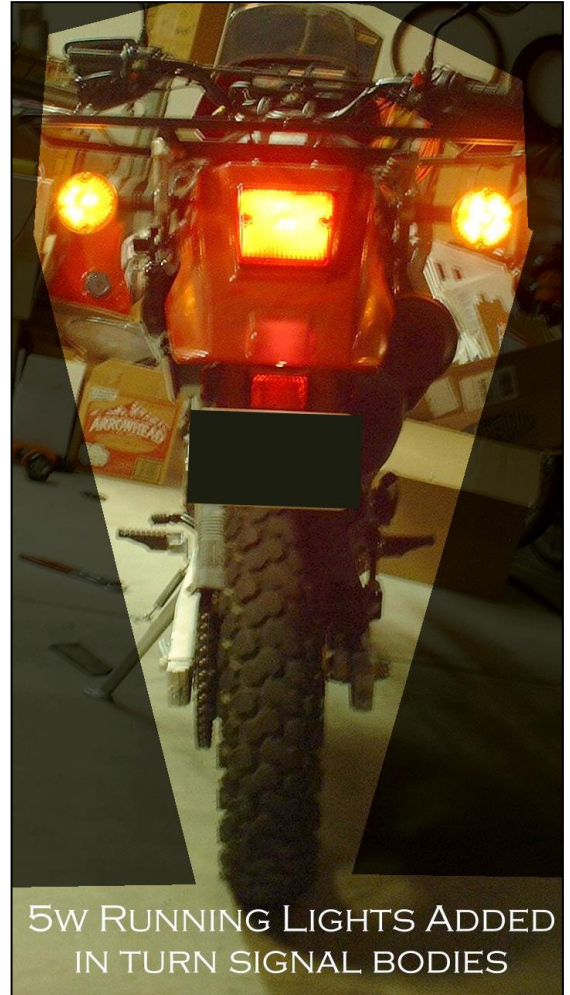


#### 14) Running lights in rear turn signals

Here is another way to generate more visibility. I added 5 watt running lights to the rear turn signals by installing 2-contact sockets in place of the single-contact sockets in the stock rear turn signals per

<http://www.bigcee.com/Engineering/1157/1157mod.html>.

Some might ask why I didn't do this to the front turn signals as well, but in my opinion the back of the bike is relatively dark so the addition of two lights stands out. In the front however, the headlight is so dominating that it's almost undetectable from a distance if you add the two running lights.



## CONVENIENCE

#### 15) Throttle Lock (Vista-Cruise)



This is at the top of my 'convenience' list because mine gets used every day, multiple times. I like the simple Vista-Cruise shown... it takes some inventing to install on the KLR, but once you've accomplished that, you're good to go forever.

#### 16) Tank Bag (Wolfman Rainier)



I've been riding for over 60 years but didn't buy my first tank bag until I bought the KLR, purchasing a Wolfman Rainier for an annual ride... and loved its usefulness so much that it's on the bike 100% of

the time. Pockets on the front, back and sides give access to things I want frequently (voice recorder, phone, earplugs), there's a lot of room inside, and it has a clear map window on the top. This is a quality bag.

### **17) Choose the best front sprocket for how you ride**

The quickest and least expensive way to change gearing is to change the front sprocket size. Kawasaki played the middle ground by selecting a 15 tooth front sprocket, but you can install a 14, 15, 16, or 17 tooth front and still use the stock chain. I own all four sprockets, and use a 17 most of the time. You'll have to find out what works best for you, as they're not too expensive and make a noticeable difference. At 4000 rpm in 5th gear, a 14 tooth will propel you at 53 mph or so, a 15 tooth gets you 56 mph, a 16 tooth gets you 60 mph and a 17 tooth gets you 64 mph. I've run different brands over the years, and I recommend Sunstar sprockets as they wear like iron! They're worth the extra money. A cheap front sprocket will just accelerate the wear of your expensive drive chain and rear sprocket.

### **18) Prevailing torque countershaft nut**

Once you spring for that Sunstar front sprocket at [eaglemike.com](http://eaglemike.com), add one of his prevailing torque countershaft nuts to the order. This will eliminate the stock 'bend-tab' washer (shown on the left by the red arrow) and makes sprocket changes easier.

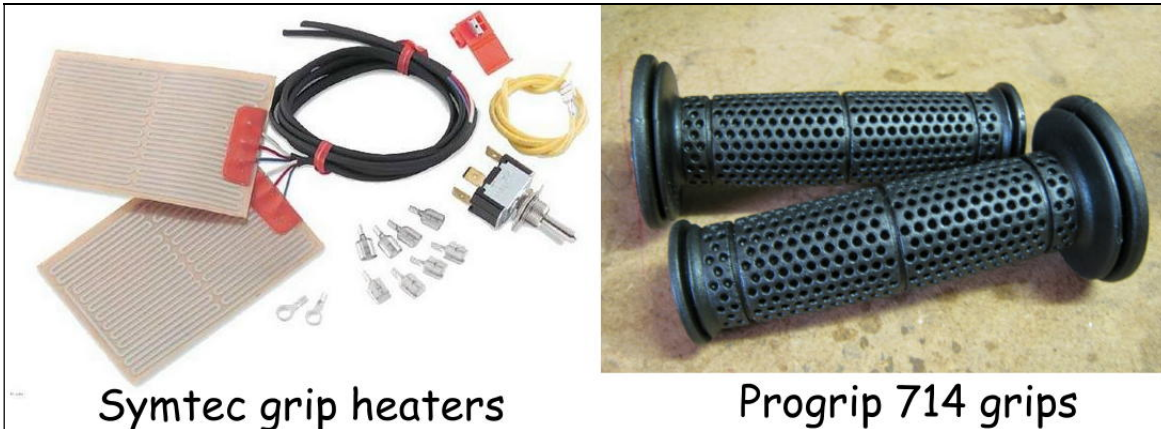


### **19) Centerstand**

This is a love-it or hate-it thing. The more serious off-road riders out there are not going to like a centerstand, as it decreases ground clearance and adds about 5 pounds to the bike (although at a very low height). The street riders love it, as it makes tire changes a breeze, chain lubing a breeze, even general maintenance is more stable and direct. I'm not going to recommend a brand... I bought an SW-Motech centerstand right after they were released to the public and had to modify the 'ground pads' to make them large enough not to sink into anything but the stiffest ground surface. A secondary reason to add the pads was to increase the centerstand length because the stock configuration wouldn't even lift a stock rear tire completely off the ground. They've probably fixed this since then, but I can't speak to the accuracy of that. My modified version has been great.

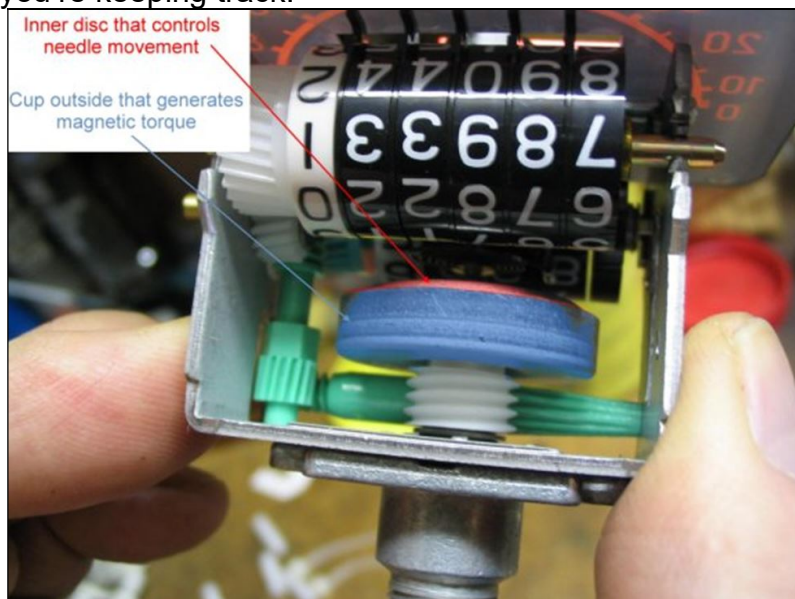
## 20) Heated Grips

Riding year-round, there are many days that it is on the cool side and heated grips are surprisingly useful. At first, I scoffed at the idea of heating the *palms* of my hands when the cold air was blowing on the *outside* of my hands, so it seemed smarter to buy heated gloves. **That was a mistake.** I quickly learned how much of a pain it was to run the wiring through my clothes each day and run a thermostatic control. Bah! Soon that was all sold and I installed heated grips instead. It does take some work to install them but having the wiring on the bike all year and a simple switch for on, low or high... is great. They are easy to use and get used a lot.



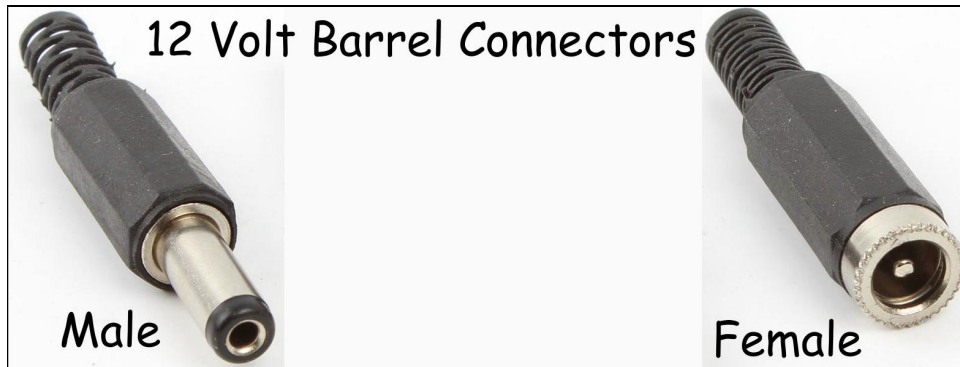
## 21) Calibrate speedometer

No matter if you have a Gen 1, Gen 2 or Gen 3 KLR, the factory *odometer* is pretty accurate, but the *speedometer* is usually off by about 7 to 10%. After some thinking about my Gen 1 bike, I decided that it was easiest to move the speedo needle on the shaft just a little to make the speedometer accurate in the speed range that I ride most. I've documented the procedure in an article that can be found at [watt-man.com](http://watt-man.com). This works for a Gen 1 and Gen 2 bike, but the Gen 3 bikes have an electronic dashboard that still suffers from the same inaccuracy. Since the Gen 3 bikes drive the speedometer off the countershaft sprocket, you can 'fix' the speedometer error by going to a 16 tooth front sprocket. But then, your odometer will read 7% low and you'll have to "add" 7% to each fuel mileage calculation, if you're keeping track.



## 22) Twelve Volt accessory port

A GPS unit is always part of our extended rides, and there's always the possible need to run a compressor after a flat tire repair. You can use a standard automotive power socket (known as a 'cigarette lighter socket' in my younger days), but I've found that they tend to slide out of connection throughout the day due to the spring-loaded nature of the design. I have had the best luck with the "barrel connector" plug shown below - with a female version on the bike at all times and installing the male versions on my accessories that I wish to power.



## 23) Handlebar risers

I'm tall (6 foot 4) and this helped my riding position - seated as well as standing on the pegs. I use the 0.7" risers from eaglemike.com and did not have to change any cabling.



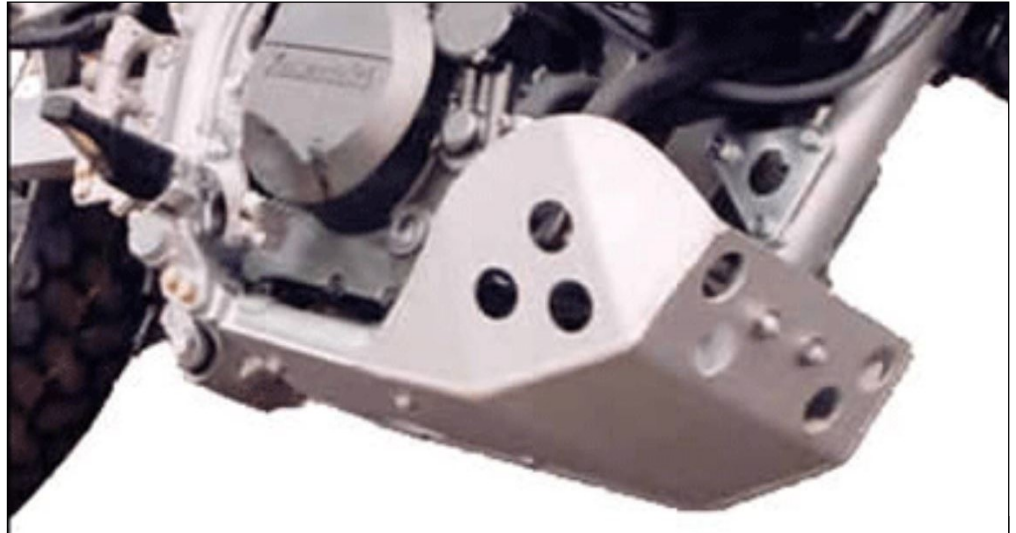
# ROBUST HARDWARE

## 24) 15 Amp headlight fuse

This tip came from the Chris Krok FAQ. It appears that some people have issues if the headlight switch isn't moved quickly enough from 'low' to 'high' beam and power both beams for a short period of time, long enough to blow the factory 10 Amp fuse. I put a 15 Amp in mine when the bike was new and it's still in there today without issue.

## 25) Moose skid plate

Most aftermarket skid plates are pretty similar in their function, but the Moose skid plate got the nod because the right 'ear' rises high enough to protect the water pump on the engine.



## 26) Eagle rear brake bracket

On 2010 and earlier bikes, the factory uses a brittle cast aluminum bracket for the pivot of the rear brake pedal. One good crash on the right usually breaks it. You then have NO REAR BRAKES for the rest of your ride home... exciting to say the least. Eagle sells a machined part to replace this which, to date, we've never seen one break. If you have a 2011 or newer bike, you will be happy to know that Kawasaki finally addressed this.



## 27) Enrichener Lever Relocation and Mirror Mount

This applies only to the 2007-and-older bikes, as the enrichener lever was down low under the handlebars and was at risk in a tip-over. Eagle Mike came up with a machining that replaces half of the factory clamp of the clutch lever mount, and it has a built-in mount for moving the lever up and out of harm's way... as well as a boss to move your factory rear view mirror to. This is doubly-good, as the factory mirror mount is part of an expensive turn signal / light control, which also tends to be at risk in a crash when the mirror gets hit. This way, the expensive switch housing is further protected.



## 28) 7/16 inch, Grade 8 Footpeg bolts

The footpeg bolts are a known issue with the KLR. This joint is quite weak from the factory and is loaded further when people like me put on a centerstand, which constantly loosens the bolts as the centerstand reacts all pitch torque over such a small bolt wheelbase. The factory bolts are 8mm and the actual weak link not the bolts themselves, but the tiny thread engagement in the nuts that react the bolt torque. If you look at picture 1 below, note that the design is a steel plate bent into a shape that is welded to the frame – and there are NO threads in that plate. On the back of the plate are two 8mm nuts welded in place – and you can see their threads – which only have about 4 threads of engagement. Ugh! These threads are the first thing to strip as shown in picture 1. Many people go to 10mm bolts of higher quality which increases the shear tearout area of the nuts by a little over 50%. Not bad... but I noticed that if you go to even larger 7/16-20 bolts, your tapping operation will also THREAD THE PLATE AND THE NUTS as shown in photos 2 and 3, doubling the length of the thread engagement. This increases the shear tearout area by 280% over the stock layout! If you use allen head bolts and select your washers carefully (photo 4), everything will fit without interference.



### 29) Master cylinder lid screws

A comment you'll occasionally hear on the forums is that some KLR fasteners are "made of compressed oatmeal". Naturally, you won't know that the two screws on the front brake's master cylinder lid fall into this category... until the day you want to take off the lid to add or flush brake fluid. Lots of people end out stripping the factory fasteners that have been untouched for years. Then it's the fun task of drilling them out very carefully to not screw up your expensive master cylinder. Bottom line: This is a wise place to invest a whopping \$2 to \$3 at eaglemike.com.



### 30) Subframe bolt upgrade

Another known weakness. I simply purchased the stronger bolts from eaglemike.com and installed them. The next step up for heavily loaded bikes is the "drill through" kit which also utilizes stronger bolts of a larger diameter. I didn't feel the need to go to that level, given how I ride.

However, from what we've seen on the forums, it is critical that you do the drill-through mod on your bike if you use SW-Motech or Tusk crash bars. We've seen too many owners take a spill and break their factory bolts in these applications.

### 31) Rear Shock Cover

The past bikes I've owned with a single shock always had factory plastics to protect the rear shock from debris coming off the rear wheel. The KLR does not. It just seemed prudent to put a \$15 cover over the entire shock and reinstall it. Maybe it was a waste of money, but for what it's worth, I'm still on the stock rear shock at 200,000 miles...

I hope this list has helped provide information in your search for KLR modification ideas.

Watt-man  
July 2024