BIG CEE
ENGINEERING

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KLR650 Ultimate Blue Subframe Hardware Upgrade Kit

Preparation:

1) If you can put the bike on a centerstand or work stand to hold it vertical, it will be easier to keep the holes straight when you drill. A helper may be useful to keep the bike from tipping over as you apply pressure on the drill.
2) Remove the side panels and seat.
3) Remove the gas tank shrouds and gas tank.
4) Disconnect the battery cables from the battery and cut the wire tie holding them to the subframe.
5) Remove the retaining clip from the wire bundles running along the subframe tube; this is the clip secured by one M6 hex bolt. If you need more slack, unplug the connectors.
6) Remove the exhaust system from the end of the headpipe back (i.e. the muffler and S-pipe, if there is one).
7) Loosen the clamp on the carburetor inlet boot.
8) Remove the rear screw from the rear brake master cylinder cover/bracket.
9) Remove the crankcase vent tube from the airbox, and plug the tube with a paper towel or clean rag.
10) Remove the two upper subframe screws (socket head type)
11) Rotate the subframe back until the threaded sockets are clear. You may have to loosen the lower subframe bolts to permit rotation. You may also have to work the carb boot off of the carb. Be careful that the subframe doesn't just drop; support it if necessary by placing a strut between the tire and inside fender, tying the grab handles to the handlebars, etc. Tightening the lower bolts again may also hold the subframe out of the way.
12) **Important:** Cover the carb inlet and airbox tube. Do not allow any metal chips or other debris to get into the intake.
13) Make sure that the wire bundles, coolant overflow tube, battery cables and any other wires stay out of the way during drilling.

NOTE: If your stock bolts are intact, you may be able to leave the subframe connected if you drill one side at a time and leave the other bolt in place to keep the parts aligned. I have not tried this. (Removing both stock bolts usually lets the subframe sag, so it does not maintain alignment. In that case, it is best to move the subframe clear out of the way to get a straight shot at drilling.) Others have been able to keep the subframe aligned by connecting tie-down straps between the handlebars and grab handles.

Removal of broken bolts:

If you are doing this modification because your original upper bolts snapped, you will need to extract at least one of the remaining stubs. The recommended screw extractors for M8 bolts are the #2 and #3; #3 is larger, hence stronger and probably a better choice. The matching drill bit for the #3 extractor is 5/32". You may want to start with a smaller one so you get a grip with the extractor before drilling through the bottom of the bolt. If available, use a center punch to dimple the bolt as close to the center as possible. The factory threadlock is very strong, so use of a penetrating oil and/or a propane torch or other heat on the surrounding metal will help. Finally, using left-handed drill bits for the extractors may help loosen the bolts.

You will get the best results if you can remove the broken bolts from both sides of the frame. If you can only remove one bolt, drill all the way through from that side. Again, use heat and/or oil on the remaining bolt stub while you are drilling, as the force from the drill may be enough to dislodge it.

Modification:

1) Using the 5/16" drill bit (the size is stamped on the shank), drill out the 8mm threads in the main frame crossbar. The new bit is sharp, and will grab the threads. If you have one, use an older 5/16" bit to drill out the threads on either side, and use the new bit for boring through the frame. As these are relatively large drill bits, do not use excessive speed. Use a 0-1200 rpm drill if available. If the bit is getting caught on the threads, increase speed and drill with a smooth "pecking" motion by moving the bit in and out of the hole. Once the threads are drilled out, continue drilling until you go all of the way through the crossbar. Go slowly, use firm pressure on the bit, and put a few drops of oil on the tip every 30-60 seconds for lubrication. If possible, drill halfway through from one side, and then finish drilling from the other side. Keep the drill as straight as possible, and take your time. Ideally, you should be able to drill through the frame in about 5 minutes.
2) Once you have gotten through the crossbar, enlarge the hole with the 13/32 bit. Drill halfway through from one side, and finish drilling from the other side. Again, do not use excessive drill speed, and do use some oil on the bit. Also enlarge the holes in the subframe posts. Drill as straight as possible.
3) To protect the exposed metal in the hole, pump or spread some grease inside, or spray in some oil or chain lube. (Chain wax makes an excellent rust-inhibiting coating.)
4) Align the holes in the upper subframe mount, and insert the large cap screw. The 13/32 bit gives a close fit, and you may need to tap the screw through. On the other side, install the large spacer first, followed by the washer and the lock nut. Tighten to approximately 30 ft-lb.
5) Replace the lower subframe bolts (one at a time) with the new ones in the kit. Use *two washers on the left side*, and one washer on the right. Use loctite if available, and tighten to 18 ft-lb.
6) Reinstall all of the parts removed in the preparation phase. Use the wire tie to secure the battery cables to the frame as they were before.