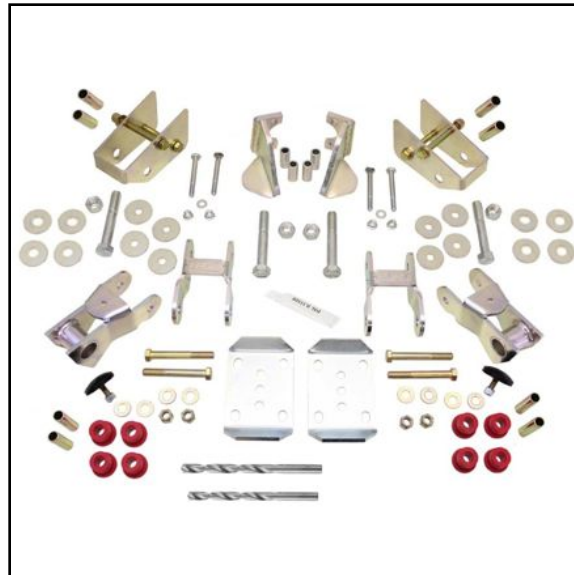


Suzuki Samurai to Toyota Front Spring Swap Kit, with Missing Link Shackles (SKU#SSP-TSFM)

Installation Instructions



CAUTION: Safety glasses should be worn at all times when working with vehicles and related tools and equipment.



FOR ADDITIONAL COPIES OF THESE AND OTHER INSTRUCTIONS GO TO:
www.lowrangeoffroad.com and click on the "INSTRUCTIONS" tab.

Suggested Tools:

- Twin Post Lift (or Floor Jack and 2 Stands)
- Sockets: 10,12,14,17,19 & 27
- Ratchet
- Combination Wrenches: 12,14,17,19 & 27mm
- Impact Sockets: 17 & 19mm
- Impact Wrench, 1/2" Drive
- Drill Press (or Electric Hand Drill)
- Ball Peen Hammer
- 3/16 Pin Punch
- Center Punch
- Channel Lock Pliers
- Large standard Screwdriver (or Pry Bar)
- Ladies Foot Pry Bar
- Die Grinder w/ a Cut-off Wheel

Things to consider when installing **Toyota Leaf Springs on the Front**



Spring Over Axles: The vehicle we used for these instructions has been converted to a SPOA (Spring Over Axle) suspension. In most cases the vehicle this kit will be installed on is of this same configuration. If the vehicle you are working with is not of the SPOA configuration, these instructions may not be as helpful.

Sway Bar: The sway bar on a Suzuki Samurai is connected to the U-bolt plates. The OEM (Original Equipment Manufacturer) U-bolt plates will not work with the wider Toyota leaf springs being installed with this kit and the supplied U-bolt plates have no provision for connecting the sway bar. Therefore, most people remove the sway bar altogether.

Shock Absorbers: The OEM (Original Equipment Manufacturer) shock absorbers will not be the correct length which could cause shock absorber damage and limited axle travel. We recommend measuring for new shocks and using the ones best suited for your application. Click [HERE](#) for instructions on how to measure for correct shock size.

Shock Mounts: The OEM (Original Equipment Manufacturer) upper and lower shock mounts will not work out very well after this installation. We recommend installing new shock mounts on top and bottom. Click [HERE](#) for more information on the lower shock mounts and [HERE](#) for upper shock mounts. We have also created full color step-by-step instructions are listed with these products

Brake Lines(s): The OEM brake lines will be too short. We recommend installing extended length flexible brake lines. Click [HERE](#) to see what Low Range has to offer. We have full color, step-by-step instructions on how to install these brake lines as well as instructions on how to bleed the system. Additionally, we have a How-To Video on how to bleed Toyota Tacoma brakes, but the procedure is basically the same for a Samurai. Click [HERE](#) to see this video.

Drive Shafts: After installing this kit, the drive shaft will over-extended and have excessive angle at both universal joints. We strongly recommend installing an aftermarket extended drive shaft with off-road U-Joints. Click [HERE](#) to see what Low Range has to offer. Drive shaft spacers may also be needed as well. Click [HERE](#) to see our drive shafts spacers.

OEM Front Bumper: The front bumper will need to be removed in order to install this kit and it will not be reusable as-is. You will need to modify it or buy/build a custom bumper. Click [HERE](#) to see what Low Range has to offer.

U-Bolts: U-Bolts are not supplied with this kit because size and length will vary according to spring size and axle assembly type; i.e. Toyota, Suzuki, ect. However, U-bolts are a one-time-use item and it is recommended that they be replaced whenever they are removed. Click [HERE](#) to see what Low Range Has to offer for Suzuki axles and [HERE](#) for Toyota Axles.

Lifting and Supporting the Vehicle



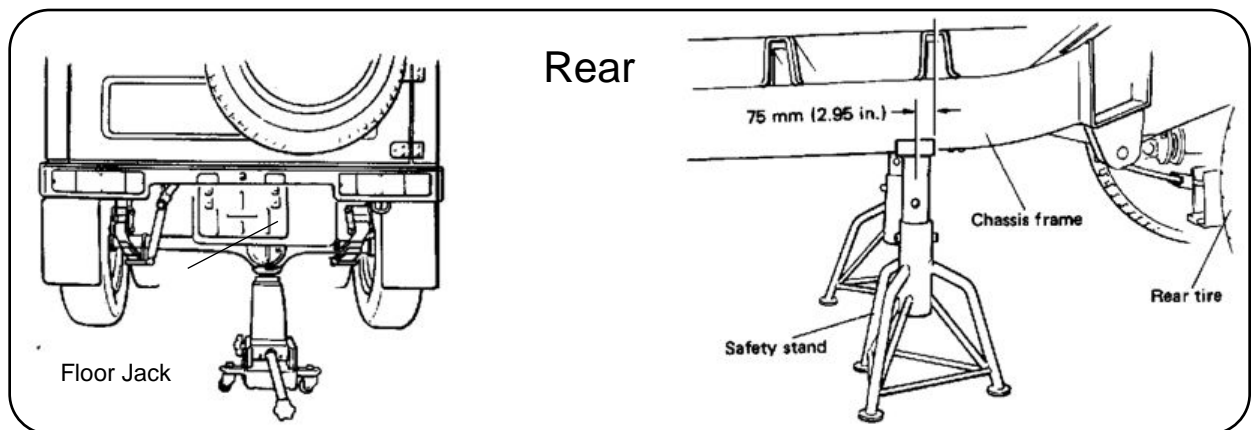
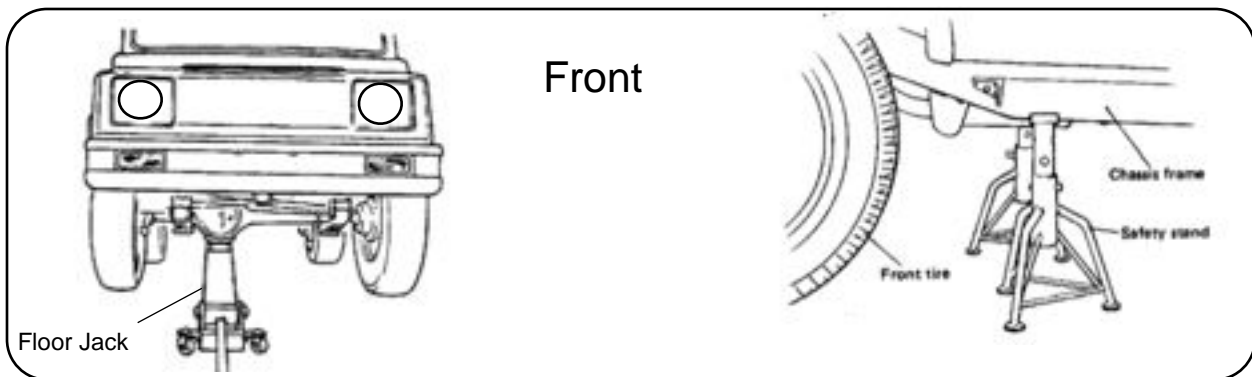
Tech Tip

When working on suspension, brakes or drive train parts it is a good idea to spray all fasteners with penetrating oil a day ahead. If not done a day ahead, an hour or even minutes before is helpful.

Step 1

Lift and support the vehicle on a twin post lift.

Note: We used a twin post lift, but this job could also be done with a floor jack and (2) safety stands.



OEM Front Suspension Parts - Passenger Side

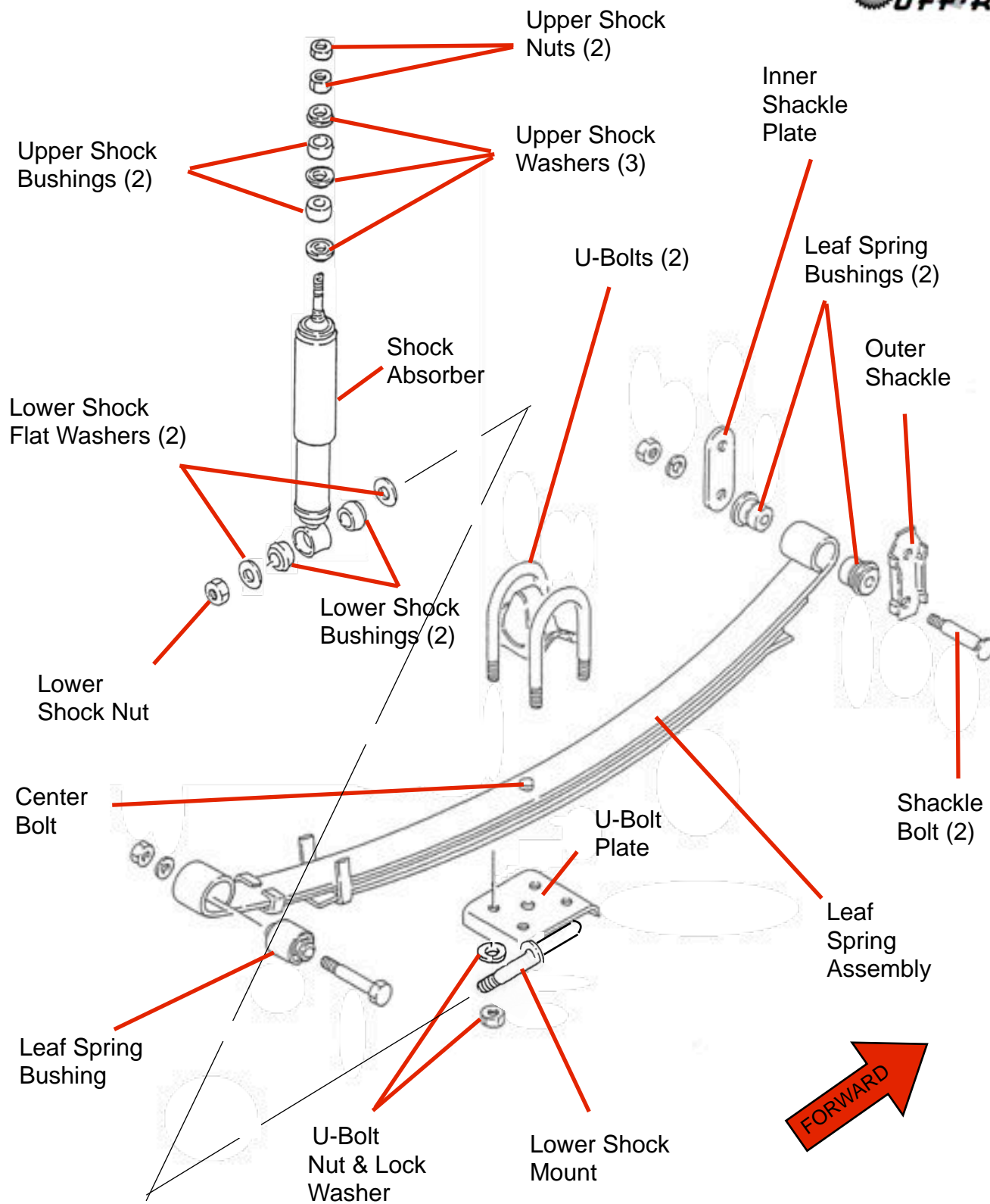
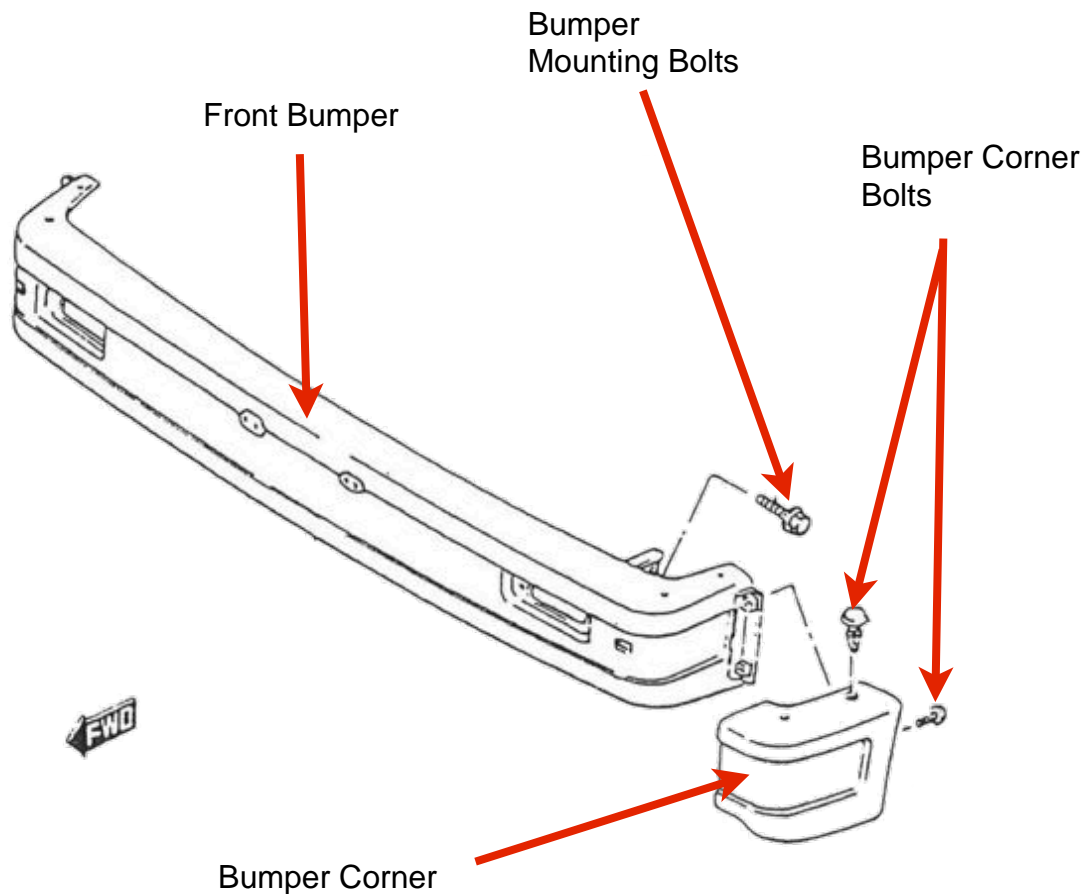


Figure B

Step 1 - Remove the Front Bumper (If still in place)

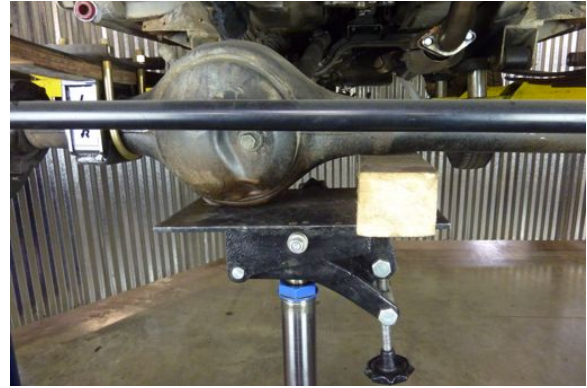
1. Remove the bumper corners by removing the bumper corner bolts.
2. Unplug the park/signal light wires
3. Remove the bumper mounting bolts
4. Remove the bumper.





Step 2

Remove the driver side wheel using a 19 mm socket.



Step 3

Support the front axle assembly with a high lift transmission jack or floor jack if working from jack stands. Lift the front axle assembly slightly; about 1/2" is usually enough. This is done to relieve tension on the shock absorbers so they are more easily disconnected.



Step 4

Disconnect the lower shock mount using a 14 mm socket for OEM shock mounts.

Note: This Samurai has Doetsch Tech 3000 series shocks with our Low Range weld-on lower shock mounts, so we used a 19 mm socket.



Step 5

Remove the nut and flat washer.



Step 6

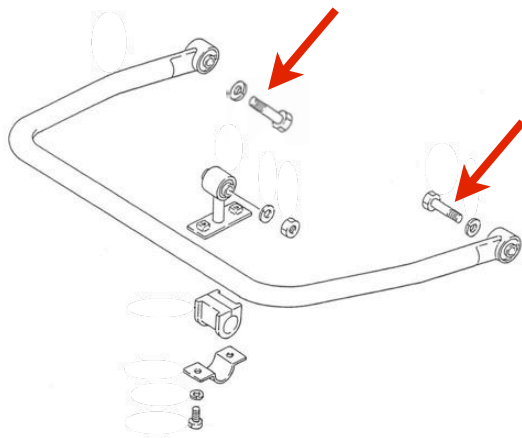
Disconnect the lower end of the shock absorber.

Note: Keep track of the hardware if you plan to reuse the existing shock absorbers.



Step 7

Repeat Steps 2 through 6 on the passenger side front wheel.



Step 8

This vehicle did not have a sway bar on it. If the vehicle you are working with has a sway bar, simply remove the bolts indicated by arrows and let it drop down out of the way.

Note: You may want to completely remove the sway bar. For more information see "Sway Bar" on page 2 of this document.





Step 9

Remove the (4) U-Bolt nuts and lock washers using a 19 mm socket.



Step 10

Remove the U-Bolt plate and set it aside.

Note: It may be necessary to tap the U-Bolt plate using a ball peen hammer.



Step 11

Remove the U-Bolts and set them aside.

Note: U-bolts are a one time use item. See Page 2 for more information.



Step 12

Repeat Steps 9 through 11 on the passenger side.

Removing the Spring Shackles



Step 13 Important Notice

Before moving on to the next steps. Be sure there is plenty of slack in the flexible brake lines. If there is not sufficient slack, it will be necessary to replace these brake lines with longer brake lines. Click [HERE](#) to see the 15" and 21" flexible lines offered by Low Range. For instructions on replacing the front flexible brake lines click [HERE](#). Also, be aware that you will need to bleed the Brake System before putting this vehicle back into service. Click [HERE](#) for instructions on Brake System Bleeding. Or [HERE](#) to see a video on bleeding brakes on a similar vehicle.



Step 14

Lower the front axle assembly enough to separate it from the leaf springs.

Caution: Be sure the axle assembly is supported well.



Step 15

Beginning on the driver side, remove the (2) Shackle nuts and (2) lock washers using a 14 mm socket.



Step 16

Remove the inner shackle plate.





Step 17

Lift up on the leaf spring and remove the outer shackle plate and bolts.



Step 17 Tech Tip

It may be necessary to tap the bolts with a ball peen hammer to remove them.



Step 18

Repeat Steps 15 through 17 on the passenger side shackle.



Disconnecting the Spring Mounts



Step 19

Beginning on the driver side, remove the spring mount bolt using a 17 mm socket and 17 mm combination wrench.



Tech Tip 19-1

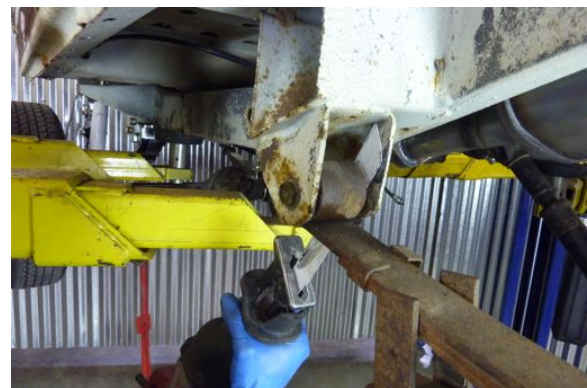
If the bolt will not turn, it may be necessary to loosen the nut to where the nut is flush with the end of the bolt (to protect the threads) and pound on the nut to loosen the bolt. If the bolt breaks loose, skip the next two Tech Tips and go ahead to Step 20.

Note: These bolts and nuts are often quite rusted. Therefore, it may be necessary to use a sawzall as an



Tech Tip 19-2

The first cut is between the spring mount and the leaf spring. Try to cut the bolt only. The bushing sleeve is very hard steel.



Tech Tip 19-3

Make the second cut as shown. Drop the spring out the bottom and remove the remaining pieces of the bolt.





Step 20

Drive the bolt out using an 3/16" pin punch (or something similar) and a ball peen hammer.



Step 21

Remove the leaf spring from the mount.

Note: You may need to use a large pry bar to get the spring out of the the mount.



Step 22

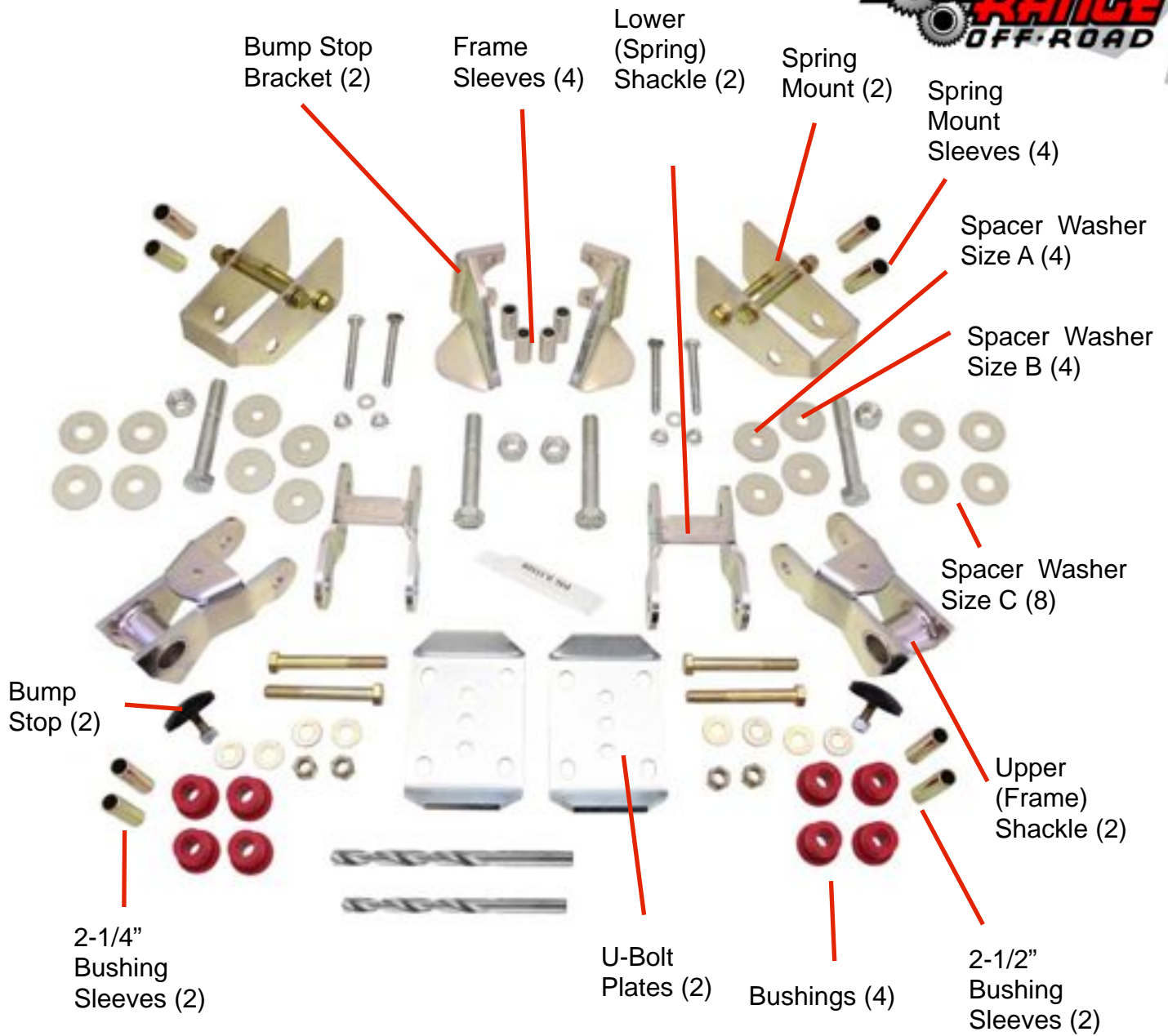
Remove the leaf spring and set it aside.



Step 23

Repeat Steps 19 through 22 on the Passenger side.

Kit Parts Identification



Spacer Washers

Quantity	Inside Diameter	Outside Diameter	Thickness	Size
4	1/2"	2"	1/16"	A
4	1/2"	2"	1/8"	B
8	18mm	2"	1/8"	C



Installing the Leaf Spring Mounts



Step 24

Enlarge the existing spring mount hole using the supplied 1/2" drill bit.



Step 25

Position the supplied spring mount as shown.



Step 26

Position the spring mount sleeve and install the supplied 1/2X20X4.5" bolt.

Note 1: Be sure to include a washer on this bolt. There is no need for a nut at this point.

Note 2: These sleeves have been upgraded from a silver to a yellow zinc color.



Step 27

Drill a 1/2" hole in the existing spring mount using the supplied spring mount as a guide as shown.

Note: Only drill the outside hole. The inside hole will be drilled in the next step.





Step 28

Drill a 1/2" hole on the inside the same as in the previous step.

Note: It may be necessary to disconnect the exhaust system (as shown here) if it is in the way.



Step 29

Install the second 1/2X20X4.5" bolt and sleeve in the holes you just drilled.

Note: Be sure to include a washer here as well.

Note: These sleeves have been upgraded from a silver to yellow zinc color.



Step 30

Install (2) washers and (2) nuts on the bolts installed previously.



Step 31

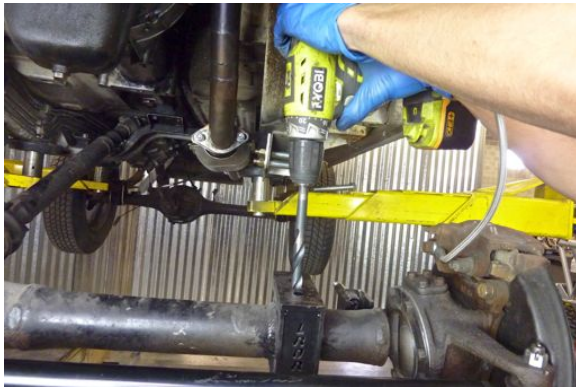
Tighten and torque both nuts to 75 ft. lbs.



Step 32

Repeat Steps 24 through 31 on the passenger side spring mount.

Drilling the Spring Perches



Step 33

Enlarge the center hole of the spring perch using the supplied 9/16" drill bit on the driver side of the front axle assembly.

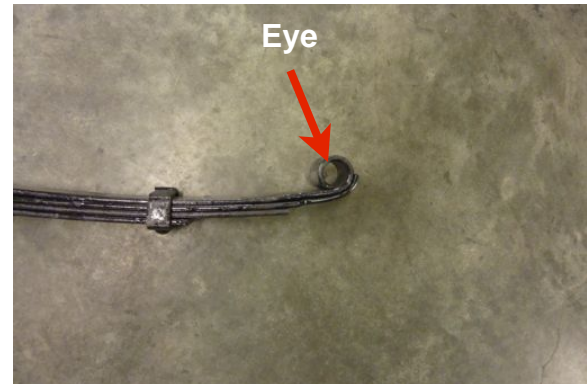
Caution: Do not drill through the axle housing.



Step 34

Enlarge the center hole in the spring perch on the passenger side as well.

Installing Toyota Leaf Springs



Tech Tip 34-1

This shows the “Military Wrap” end of the leaf spring. This end should always be oriented toward the spring mount, which in this case is toward the rear of the vehicle.

Tech Tip 34-2

This is the “eye” of the spring and should always be oriented toward the shackle, which in this case is toward the front of the vehicle.



Step 35

Install the front spring bushings if they are not already in place.

Note: These bushings come preinstalled with some springs.



Step 36

Install the rear bushings if not already in place.



Step 37

Position the Toyota leaf spring with the military wrap toward the spring mount or rear of the vehicle.



Step 38

Position the leaf spring in the spring mount. Position the supplied spacer washer Size C (See "Kit Parts Identification" Pg. 13) in the rear spring mount as shown. Insert the supplied (M18X2.5X120) bolt half way in, at this point.



Step 39

Install the second spacer washer Size C as shown and continue installing the bolt.

Note: This washer will likely be hard to install. It may be necessary to pry the leaf spring toward the driver side with a pry bar to make room for this washer. It may also be necessary to drive the washer in place with a hammer.



Step 40

Install the M18X2.5 locking nut on the bolt and tighten it until the bushing is compressed and secure.



Step 41

Repeat Steps 37 through 40 on the passenger side spring mount.

Replacing the Shackle Mount Bushings.



Step 42

Beginning on the driver side, remove the first shackle mount bushing using channel lock pliers.



Step 42 Continued

Remove the second shackle mount bushing in the same way.



Step 43

Apply some suspension lube to the outside of a supplied shackle mount bushing as shown.



Step 44

Install the shackle mount bushing on the outside of the mount.



Step 45

Apply some suspension lube to a second bushing.



Step 46

Install the shackle mount bushing on the inside of the mount.



Step 47

Apply some suspension lube to a 2-1/4" long bushing sleeve.

Note: Apply plenty of lube to the sleeve. It will install easier.



Step 48

Insert the sleeve inside the bushing.



Step 49

Drive the sleeve in with a hammer.

Note: Continue until the sleeve is centered side-to-side in the bushings.



Step 50

Repeat Steps 43 through 49 on the passenger side shackle mount

Installing the Lower (Spring) Shackles



Step 51

Beginning on the driver side, position the supplied lower (spring) shackle on the leaf spring as shown. Position a supplied spacer washer Size C between the spring and the shackle.



Step 52

Insert the supplied M18X2.5X120 bolt half way.



Step 53

Insert the second supplied spacer washer Size C between the spring and the shackle as shown and insert the bolt the rest of the way through.

Note: This washer will likely be hard to install. It may be necessary to pry the leaf spring toward the driver side of the vehicle with a pry bar to make room for this washer. It may also be necessary to drive the washer in with a hammer.

Installing the Upper (Frame) Shackle



Step 54

Prepare the supplied bushing sleeve for installation by applying some suspension lube to the outside surface.



Step 55

Install the bushing in the upper (frame) shackle.



Step 56

Repeat steps 54 and 55 on the second bushing.



Step 57

Ready a 2-1/2" bushing sleeve for installation by applying some suspension lube to the outside of sleeve.



Step 58

Insert the sleeve in the bushings. This may take some force. If you find it necessary to pound the sleeve into place, be sure not to “mushroom” or deform the sleeve in any way.



Step 59

Insert the supplied bump stop in the shackle.



Step 60

Install the supplied nylock nut.



Step 61

Tighten the locking nut using a 14 mm socket.

Note: It may be necessary to hold the rubber part of the bump stop with channel lock pliers while tightening the



Step 62

Insert the upper shackle into the lower shackle.



Step 63

Install the supplied 1/2X20X4" bolt and washer.

Note: Be sure to include the washer.



Step 64

Install the supplied washer and nylock nut, but do not tighten the nut all the way yet.



Step 65

Install the the supplied 18mm locking nut to the 18mm bolt but do not tighten it all the way yet.



Step 66

Position the upper shackle with the shackle mount, insert the supplied spacer washer Size B and install the 1/2X20X4" bolt and washer half way through.



Step 67

Insert the supplied spacer washer Size B between the shackle and the bushing as shown and push the bolt the rest of the way through.

Note: Because this joint needs to be tight, it is likely that this washer will be hard to install. It may be necessary to pry the shackle toward the passenger side of the vehicle with a pry bar to make room for this washer. It may also be necessary to drive the washer in with a hammer. If the Size B washer will not fit, install a Size A. If the Size B and A are too thick, use two size A washers, one on each side of the shackle mount.



Step 68

Install the supplied washer and nylock nut.



Step 69

Tighten the M18 locking nut using a 27 mm socket and 27mm box end wrench until the bushings are compressed and secure.



Step 70

Tighten the (2) 1/2" nylock nuts until the bushings are compressed and secure.



Step 71

Repeat Steps 51 through 70 on the passenger side shackles.

Disconnecting the Drive Shaft



Step 72

If you plan to reuse the existing drive line, mark the drive shaft and the differential yoke so the two parts can be reassembly in their original relationship.

Note: We used a ball peen hammer and a center punch for this. But any permanent marker would do.



Step 73

Disconnect the drive shaft using two 12 mm box end wrenches and tie the shaft back out of the way.

Attaching the Leaf Springs to the Front Axle Assembly.



Step 74

Position the front axle assembly such that the leaf spring center pin is positioned in the hole of the spring perch.

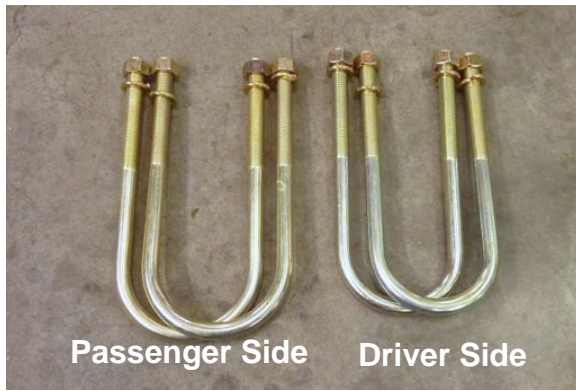


Step 75

Jack up the front axle assembly so that there is no gap between the leaf spring and the perch.

Note: If the perch and the leaf do not come together, you may need to drill the center hole in the spring perch a bit larger.





Tech Tip 75

Driver side U-Bolts are smaller than the U-Bolts designed for the passenger side.



Step 76

Position the supplied U-Bolt plate against the leaf spring and install one of the U-bolts.

Note 1: It is recommended that new U-bolts be installed here because U-bolts are a “one-time-use” part. The U-bolts get stretched each time they are tightened. When you buy new U-Bolts you will likely need the extended U-Bolts. There is more information on these U-Bolts on page 2 of these instructions.

Note 2: Also, it may be necessary to drill out the center hole in the U-bolt plate. Some leaf spring center bolt nuts are larger than others. We had to drill our U-bolt plates center hole with an 11/16 drill bit. This bit is NOT included in this kit.



Tech Tip 76

This shows the center hole of the U-bolt plate being enlarged using a drill press and a vice.

This could also be done with an electric hand drill, a C-Clamp and a block of wood.



Caution: Be sure to secure the U-Bolt plate when drilling.



Step 77

Install the second U-bolt, (4) lock washers and (4) nuts as shown. Tighten these nuts to about 25 ft. lbs. which is 1/2 the specified torque using a 19 mm box end wrench.



Step 78

Cut off the excess length (if there is any) at about a nuts width above the nut. This is about 8 threads above the nut.



Step 79

Tighten the U-Bolt nuts in a progressively tighter criss-cross pattern until 43.5 to 57.5 ft. lbs. is reached. U-Bolts should be re-torqued after the first 100 miles.



Step 80

Repeat Steps 74 to 79 on the passenger side.



Installing the Bump Stop Brackets



Step 81

Beginning with the driver side, position a supplied (1-5/8" long) sleeve inside the frame as shown. Install one of the M10X1.25X80mm bolts through frame as shown.

Note: It is **NOT** necessary to install a washer on this bolt.



Step 82

Position the second (1-5/8" long) sleeve inside the frame and insert a M10X1.25X80mm bolt.

Note: A washer **IS** required on this bolt.



Step 83

Position the supplied bump stop bracket on the two bolts as shown.



Step 84

Install the supplied serrated M10X1.25MM flange nuts and tighten them to 35 ft. lbs.



Step 85

Repeat Steps 81 through 84 on the passenger side bump stop bracket.



Step 86

As mentioned earlier it is doubtful that the drive shaft will reach. Suggested solutions can be found on Pg 2 of these instructions.



Step 87

This shows the drive shaft extended in an attempt to connect it to the front differential flange after doing this "Toy-Swap" installation. If we were to connect this shaft, these splines would come completely out of the Yoke.

Connecting the Shock Absorbers & Installing the Tires



Step 88

Raise the front axle assembly and connect the shock absorber in reverse order of disassembly, if you are reusing the existing shock absorbers or according manufacture instruction if not.



Step 89

Repeat the previous step on the passenger side shock absorber.

Note: As mentioned earlier, it is very likely that the existing shock absorbers will be too short. See page 2 in these instructions for suggested solutions.



Step 90

Lower the front axle assembly and remove the high lift transmission (or floor) jack.



Step 91

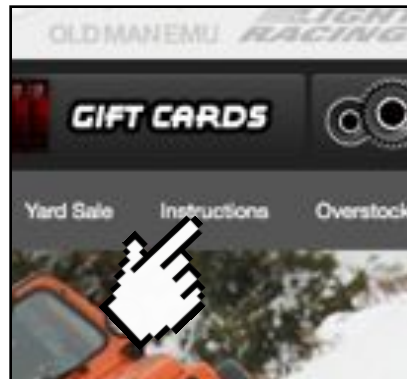
Reinstall the front wheels and tighten the lug nuts in a progressively tighter criss-cross pattern until 36.5 to 57.5 ft. lbs. is reached. Lower the vehicle to the floor.



Step 92

Do not forget. If you replaced the brake lines you will need to bleed the system before putting this vehicle back into service.

Also, it is likely that you will be installing a Toyota Leaf Spring Kit in the rear. For complete color instructions go to our Lowrangeoffroad.com home page and click on the "Instructions" tab.



Congratulations!

You have successfully installed a Toyota Front Leaf Spring Kit. We hope these instructions have been helpful. If you have suggestions on how we could improve our instructions or products please email us at sales@lowrangeoffroad.com

As always, If you experience any difficulty during the installation of this product please contact Low Range Off-Road Technical Support at 801-805-6644 M-F 7:30am-5:30pm MST. Thank you for purchasing from Low Range Off-Road.



These instructions are designed as a general installation guide. Installation of many Low Range Off-Road products require specialized skills such as metal fabrication, welding and mechanical trouble shooting. If you have any questions or are unsure about how to proceed, please contact our shop at 801-805-6644 or seek help from a competent fabricator. Using fabrication tools such as welders, torches and grinders can cause serious bodily harm and death. Please operate equipment carefully and observe proper safety procedures.

Rock crawling and off-road driving are inherently dangerous activities. Some modifications will adversely affect the on-road handling characteristics of your vehicle. All products sold by Low Range Off-Road are sold for off road use only. Any other use or application is the responsibility of the purchaser and/or user. Some modifications and installation of certain aftermarket parts may under certain circumstances void your original dealer warranty. Modification of your vehicle may create dangerous conditions, which could cause roll-overs resulting in serious bodily injury or death. Buyers and users of these products hereby expressly assume all risks associated with any such modifications and use.

Revised 01/15/14© Copyright 2014 Low Range Off-Road, LC All Rights Reserved

