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

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 and click on the "INSTRUCTIONS" tab.

Suggested Tools:

- Twin Post Lift (or Floor Jack and 2 Stands)
- Sockets: 10,12,14,17,19 & 27mm
- Ratchet
- Combination Wrenches: 12,14,17,19 & 27mm
- Impact Sockets: 17 & 19mm
- Impact Wrench, 1/2" Drive
- Drill Press (Optional)
- Ball Peen Hammer
- 3/16 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.

Shock Absorbers: After installing this kit it is not likely that the OEM (Original Equipment Manufacturer) shock absorbers will be of 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 vehicle. Click HERE for instructions on how to measure for correct shock size.

Shock Mounts: The (OEM) 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 showing how to install these mounts for your convenience.

Brake Lines(s): The OEM brake lines will likely 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 Shaft: 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.

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

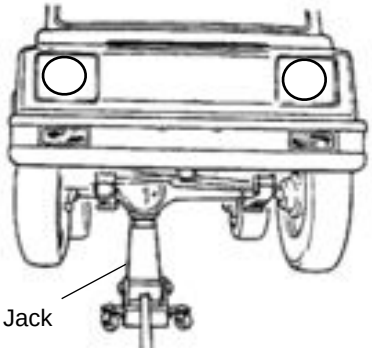
When working on suspension, brakes or drive train parts it is a good idea to spray all fasteners with penetrating oil a day ahead. If not done a day ahead, an hour or even minutes before is helpful.

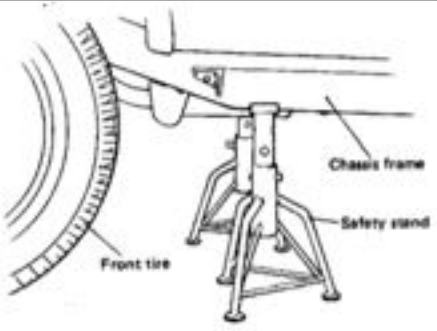
Step 1

Lift and support the vehicle on a twin post lift.

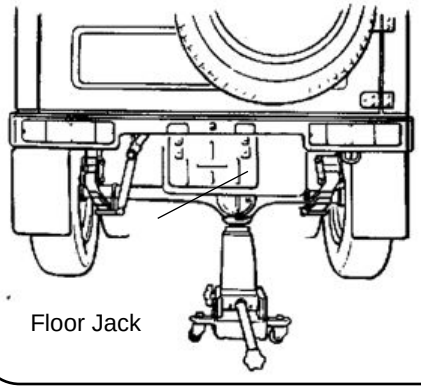
Note: We used a twin post lift, but this job could also be done with a floor jack and (2) safety stands.

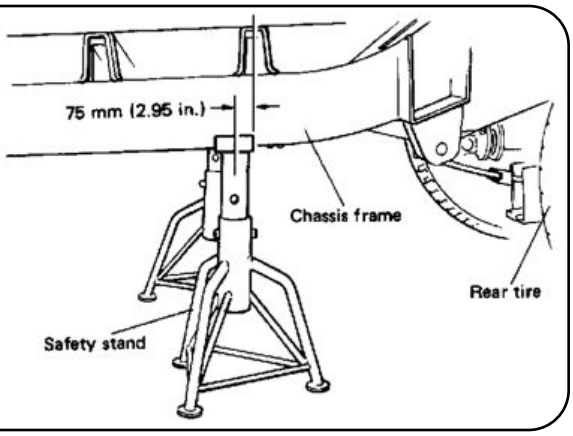
Front





Rear

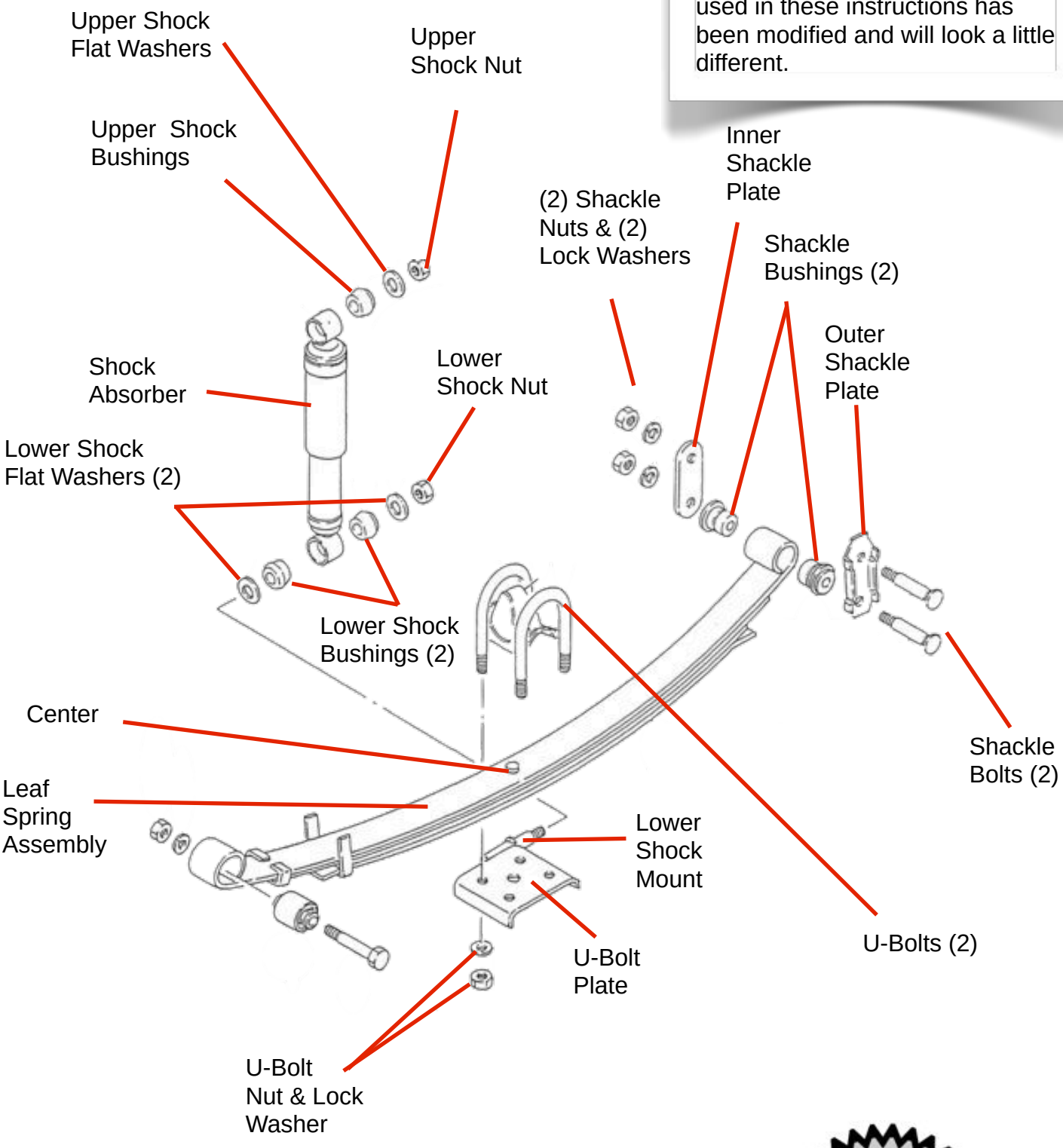




Rear Spring Over Axle Pads

Rear Suspension Parts Identification

This Illustration shows OEM parts of a Suzuki Samurai. The vehicle used in these instructions has been modified and will look a little different.



LOW RANGE OFF-ROAD
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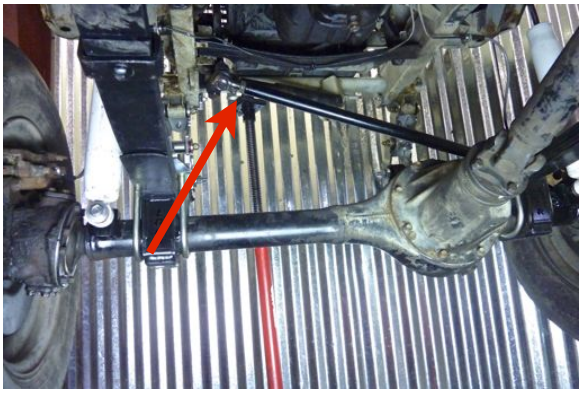
1195 S 1680 W
Orem, UT 84058 USA

Step 2

If you are using a twin post lift we recommend using a high lift safety stand (or “Pogo Stick”) under the front of the vehicle to make things a bit safer.



Tech Tip 2

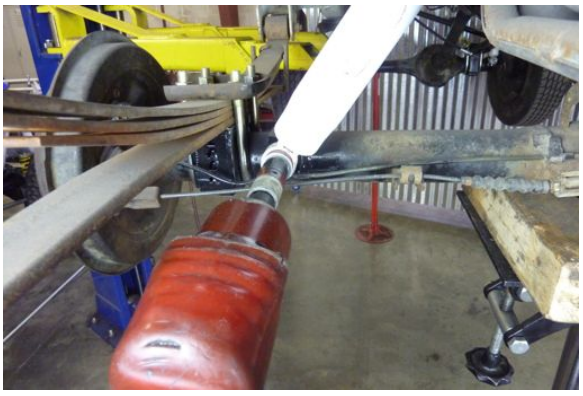
Place the safety stand under the front frame cross member or something similar that is strong.

Step 3

Remove the driver side wheel using a 19 mm socket.

Step 4

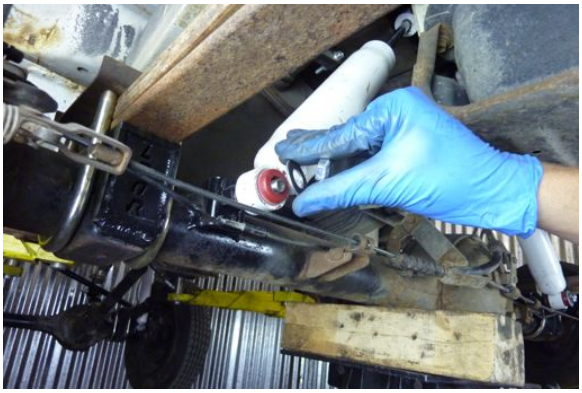
Support the rear axle assembly with a high lift transmission jack or floor jack if working from jack stands. Lift the front axle assembly slightly; about 1/2” is usually enough. This is done to relieve tension on the shock absorbers so they are more easily disconnected.



Step 5

Disconnect the lower shock mount using a 14 mm socket.

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 6

Remove the nut and flat washer.

Step 7

Disconnect the lower end of the shock absorber.

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

Step 8

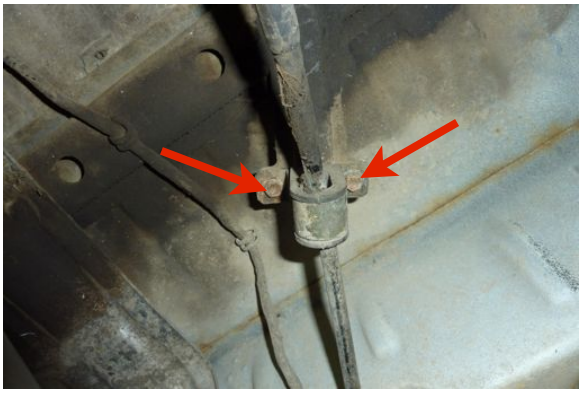
Repeat Steps 3 through 7 on the passenger side rear wheel.

Disconnecting the Drive Shaft and Brake Components

Step 9

If you plan to reuse the existing drive shaft, 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 to make these marks. But any permanent marker would do.



Step 11

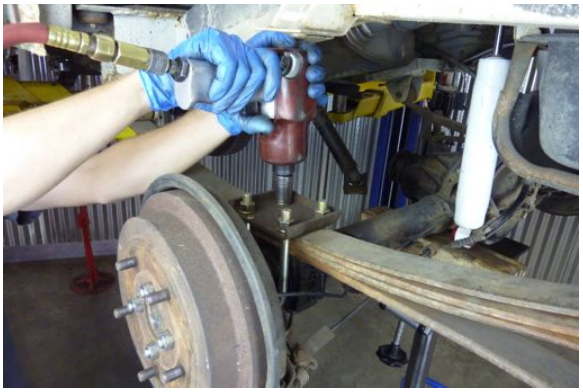
Disconnect the park brake cable bracket by removing these two bolts using a 12 mm socket.

Note: It is likely that this bracket will not be connectable once this kit is installed. Most just leave it loose. Another option would be making a custom bracket.

Step 10

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

Disconnecting the Rear Axle From the Leaf Springs



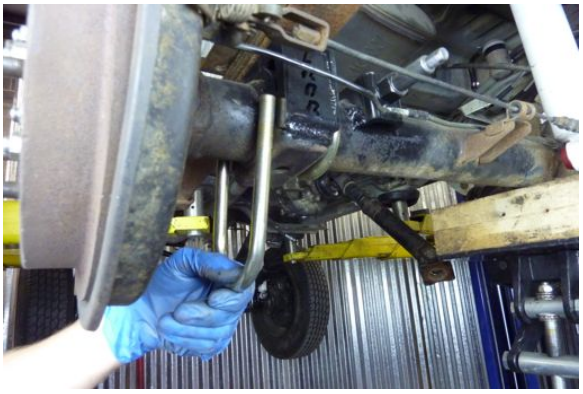
Step 12

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

Step 13

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 14

Remove the U-Bolts and set them aside.

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

Step 15

Repeat Steps 12 through 14 on the passenger side.

Removing the Spring Shackles

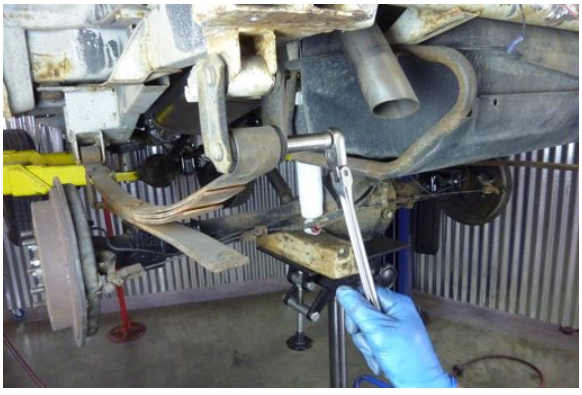
Step 16 Important Notice

Before moving on to the next steps. Be sure there is plenty of slack in the flexible brake line (or 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 rear flexible brake lines click HERE. Also, be aware that you will need to bleed the Brake System before putting this vehicle back into service if the brake lines are replaced. Click HERE for instructions on Brake System Bleeding. Or HERE to see a video on bleeding brakes on a similar vehicle.

Step 16

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

Caution: Be sure the axle assembly is secured well to the transmission jack if used.



Step 17

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

Step 18

Remove the inner shackle plate.

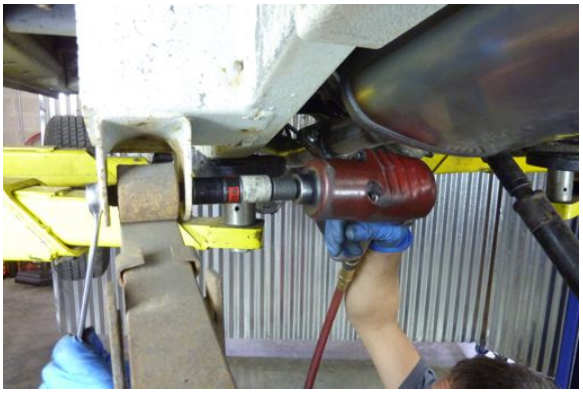
Step 19

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

Step 20

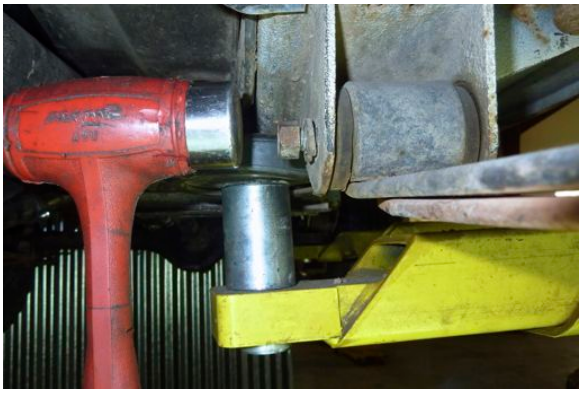
Repeat Steps 17 through 19 on the passenger side shackle.

Disconnecting the Spring Mounts



Step 21

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



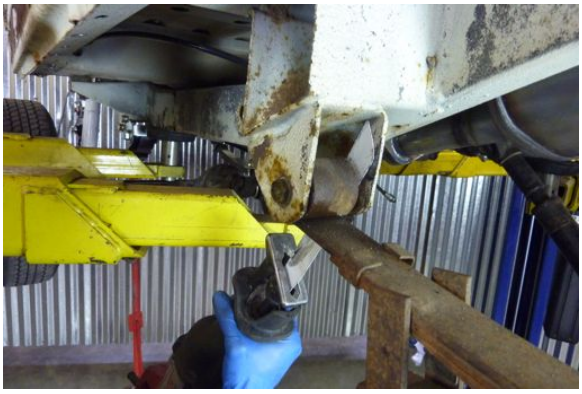
Tech Tip 21-1

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 22.

Note: These bolts and nuts are often quite rusted. Therefore, it may be necessary to use a sawzall as an alternative. (See Next 2 Tech Tips)

Tech Tip 21-2

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.

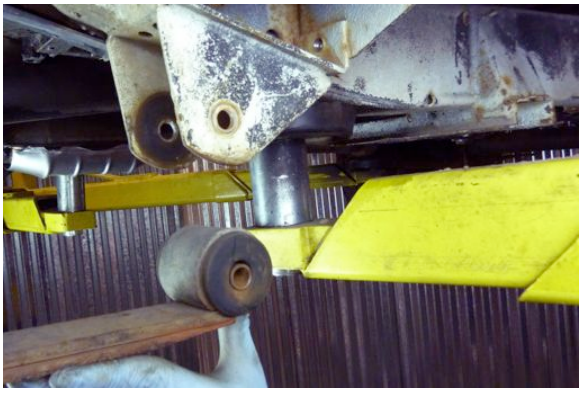


Tech Tip 21-3

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

Step 22

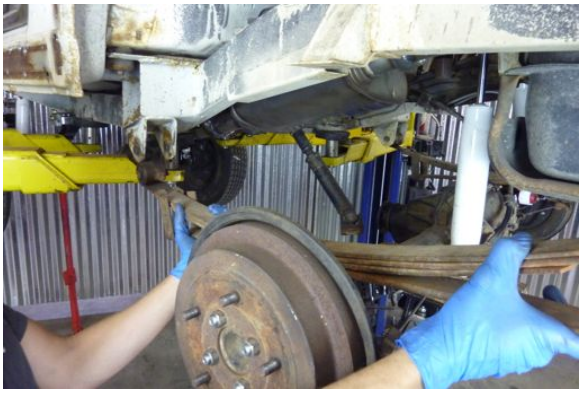
Drive the bolt out using an 3/16” pin punch (or something similar) and a ball peen hammer.



Step 23

Remove the leaf spring from the mount.

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



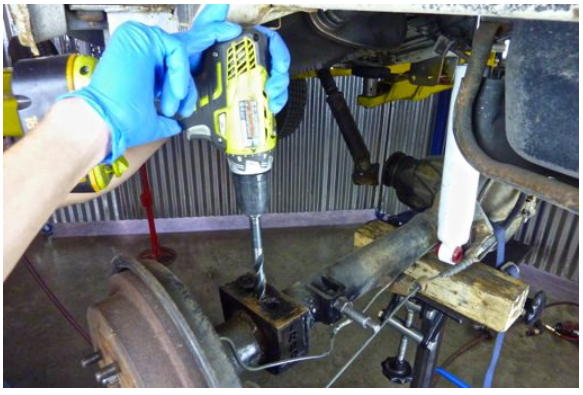
Step 24

Remove the leaf spring and set it aside.

Step 25

Repeat Steps 21 through 24 on the passenger side of the vehicle.

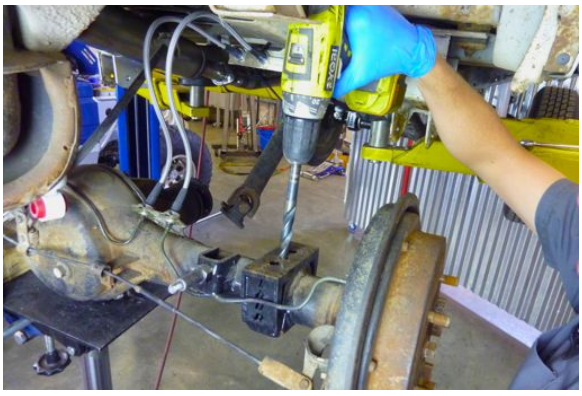
Drilling the Spring Perches



Step 26

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

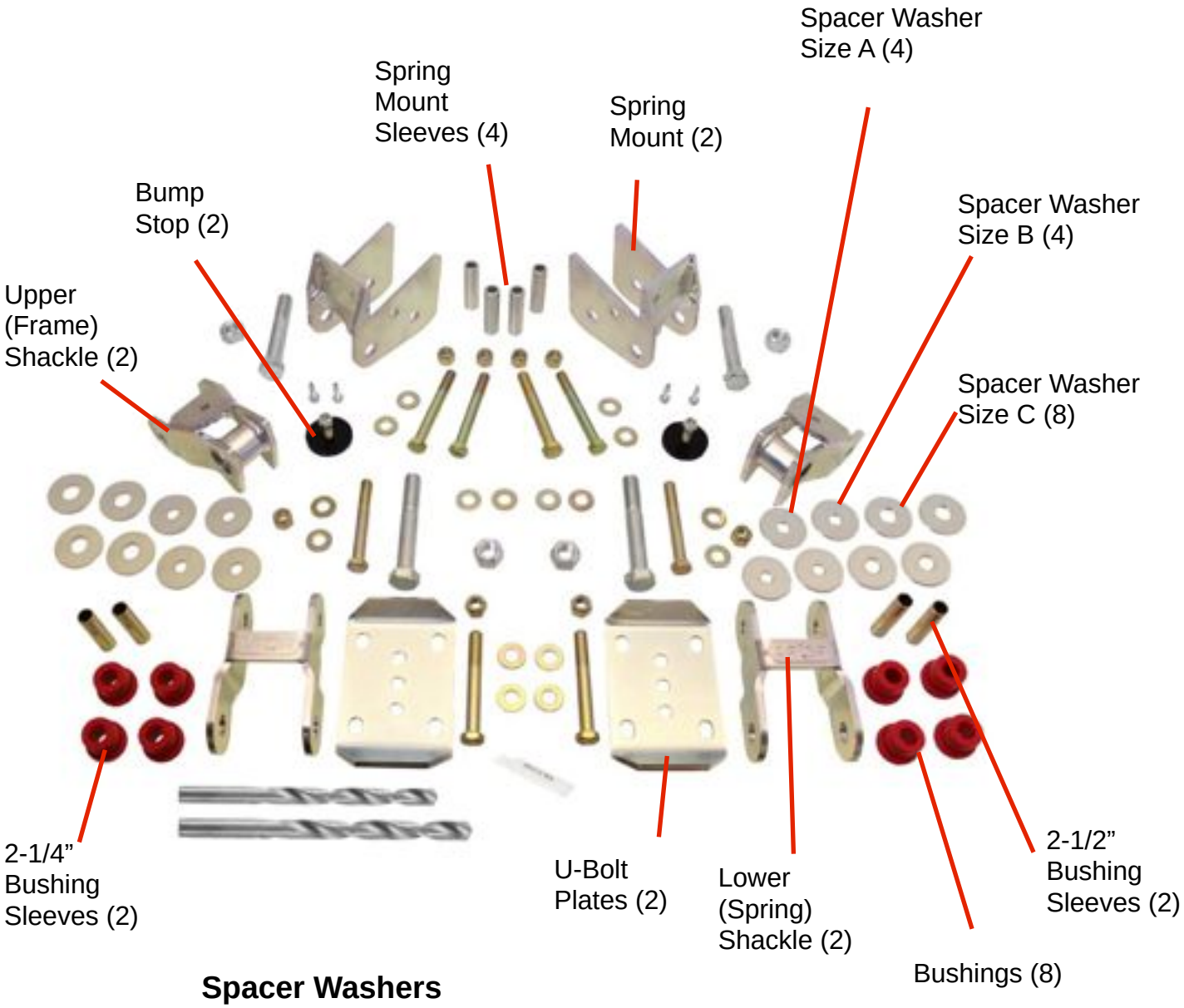
Caution: Do not drill through the axle housing.



Step 27

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

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

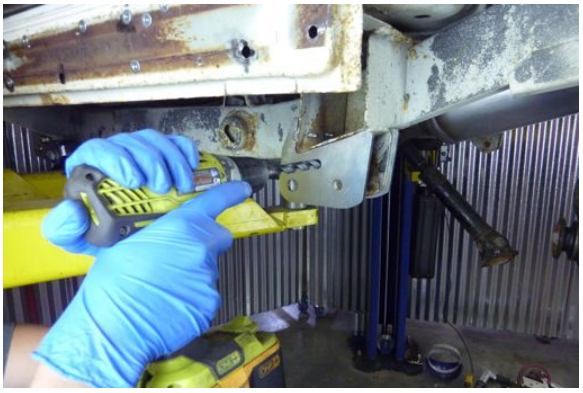
Installing the Leaf Spring Mounts

Step 28

Beginning on the driver side, position the supplied leaf spring mount as shown. Be sure it fits as snug as possible in the areas shown by the arrows.

Step 29

Install the (2) supplied self drilling screws using an electric hand drill with a 3/8 socket.



Step 30

Using the a electric hand drill and the supplied 1/2” drill bit drill the middle hole in the existing mount using the supplied spring mount as a guide.

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

Step 31

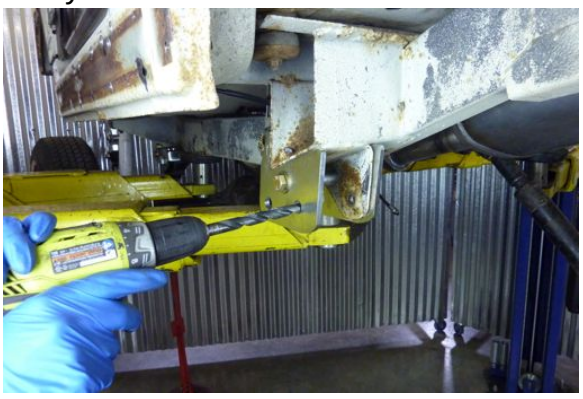
Drill a 1/2” hole on the inside, directly opposite the hole drilled in the previous step.

Step 32

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 (as shown here) to a yellow zinc color.



Step 33 Optional

This step may not be necessary. There are times when the rear hole will not align properly with the existing holes and will require drilling a little, using a 1/2” drill bit. There are other times when it will align, in which case, simply install the bolt.

Tech Tip 32

It may be necessary to drive the sleeve into place with a hammer.

Note: If the sleeve does not fit into place, you my need to grind the ends to make it fit properly.

Step 34 Optional

If the inside rear hole does not align properly, drill it out as well using a 1/2” drill bit.

Step 35

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

Note: Be sure to include a washer on the bolt as well.

Note: These sleeves have been upgraded from a silver (as shown here) to yellow zinc color.

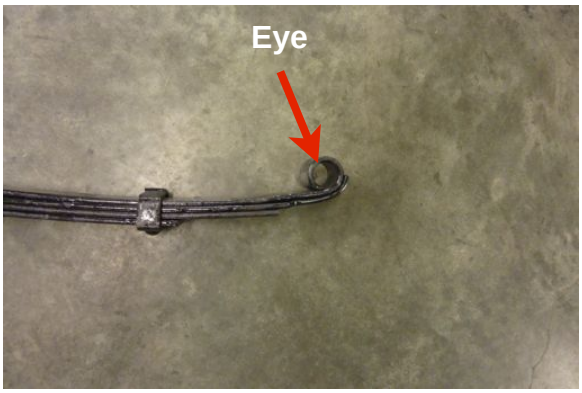
Step 36

Install (2) washers and (2) nuts on the bolts. Do not tighten them at this point. That will be done later.

Step 37

Repeat Steps 28 through 36 on the passenger side spring mount.

Installing Toyota Leaf Springs



Tech Tip 38-1

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 front of the vehicle.

Tech Tip 38-2

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

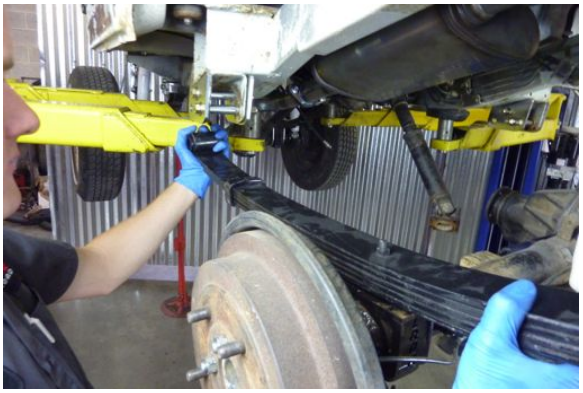
Step 38

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

Note: These bushings come preinstalled with some springs.

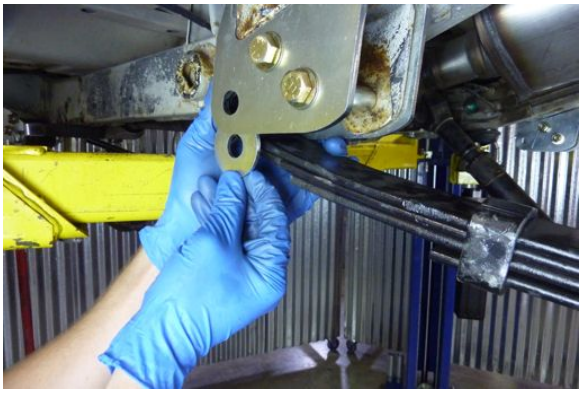
Step 39

Install the front spring bushings if not already in place, as well.



Step 40

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



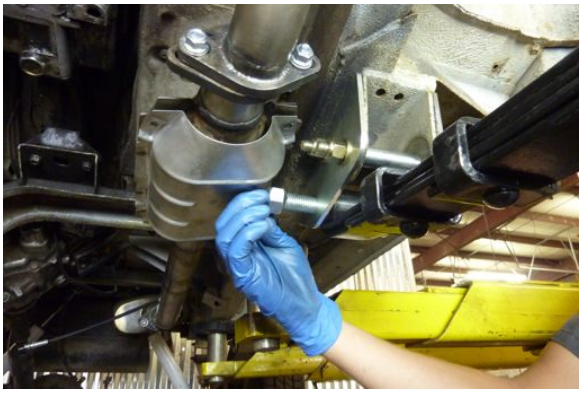
Step 41

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 42

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

Note: This washer will likely be hard to install. I 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 43

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

Step 44

Tighten the (2) 1/2X20 locking nuts to 75 ft. lbs.

Step 45

Repeat Steps 38 through 44 on the passenger side spring mount.

Replacing the Shackle Mount Bushings.

Step 46

Beginning on the driver side, remove both shackle mount bushings using channel lock pliers.

Step 47

Apply some suspension lube to 2 of the bushings as shown.

Step 48

Install both bushings in the shackle mount.

Tech Tip 48

It may be necessary to seat the bushings with a hammer.

Step 49

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 50

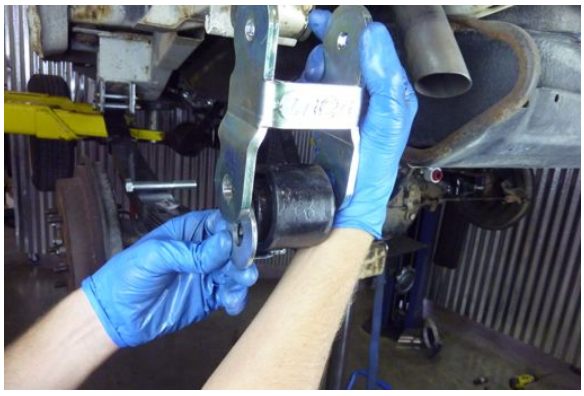
Insert the sleeve inside the bushing.

Step 51

Drive the sleeve in with a hammer.

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

Installing the Lower (Spring) Shackles



Step 52

Continuing 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 53

Insert the supplied M18X2.5X120 bolt half way.

Step 54

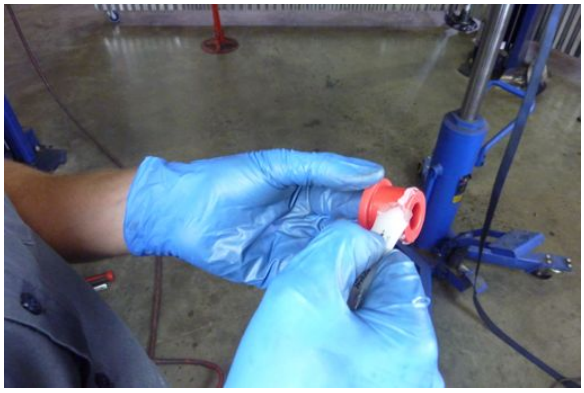
Insert the second supplied spacer washer Size C between the spring and the shackle as shown and insert the bolt the rest of the way through.

Note: This washer will likely be hard to install. I 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.

Step 55

Install the M18X2.5 self locking nut. Do not tighten it at this point.

Installing the Upper (Frame) Shackle



Step 56

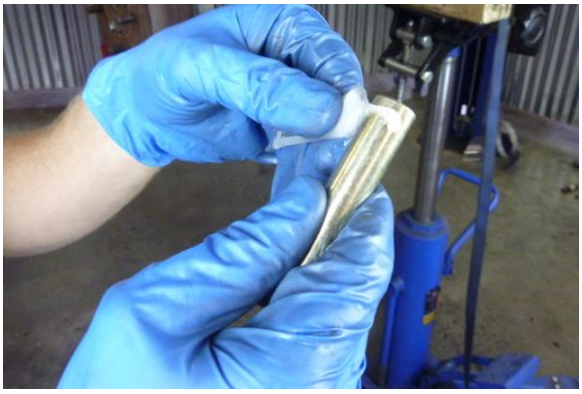
Prepare the supplied bushing sleeve for installation by applying some suspension lube to the outside surface.

Step 57

Install the bushing in the upper (frame) shackle.

Step 58

Repeat steps 56 and 57 on the second bushing.



Step 59

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

Step 60

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 61

Insert the supplied bump stop in the shackle.

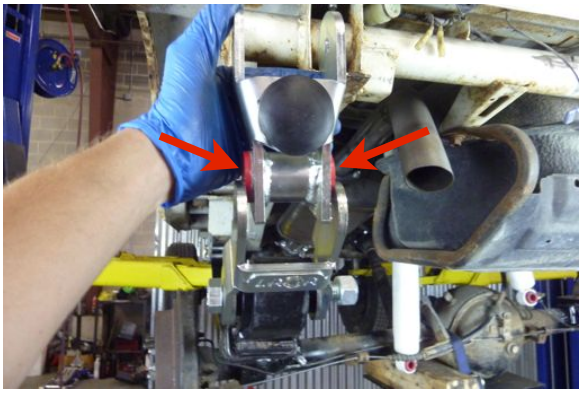
Step 62

Install the supplied nylock nut.

Step 63

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 nut.



Step 64

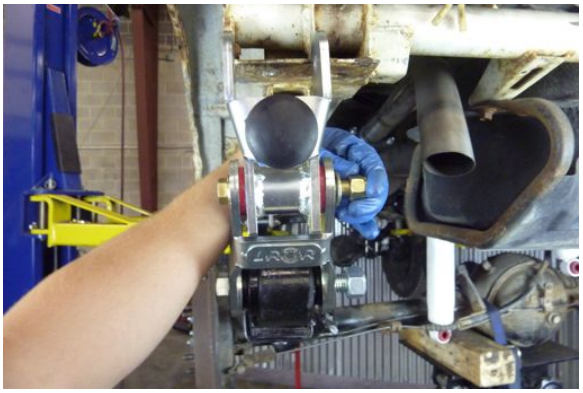
Insert the upper shackle into the lower shackle.

Note: It may be helpful to apply suspension lube to these bushings (see arrows) to make installation easier.

Step 65

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

Note: Be sure to include the washer.



Step 66

Install the supplied washer and nylock nut, but do not tighten the nut at this point.

Step 67

Position the upper shackle with the shackle mount and insert the supplied spacer washer Size B.

Step 68

Insert the 1/2X20X4” bolt half way through.

Note: Don’t forget the washer.

Step 69

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 70

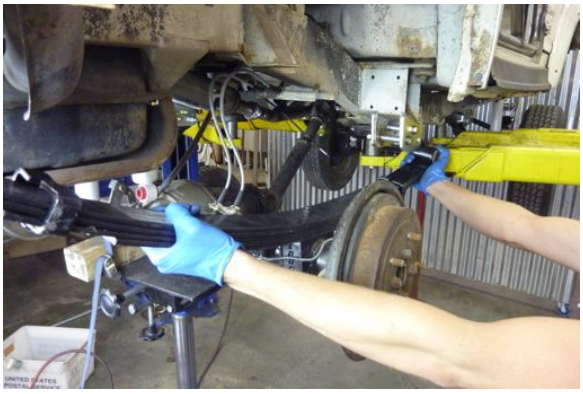
Install the supplied washer and nylock nut.

Step 71

Tighten the (2) 1/2X20 nylock nuts until the bushings are compressed and secure.

Step 72

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



Step 73

Repeat Steps 46 through 72 on the passenger side of the vehicle.

Attaching the Leaf Springs to the Rear Axle Assembly.

Step 74

Beginning on the driver side, position the rear axle assembly such that the leaf spring center pin is positioned in the hole of the spring perch. Then jack up the axle until there is no gap between the 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

This shows the center hole of the U-bolt plate being enlarged using a drill press and a drill press 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 75

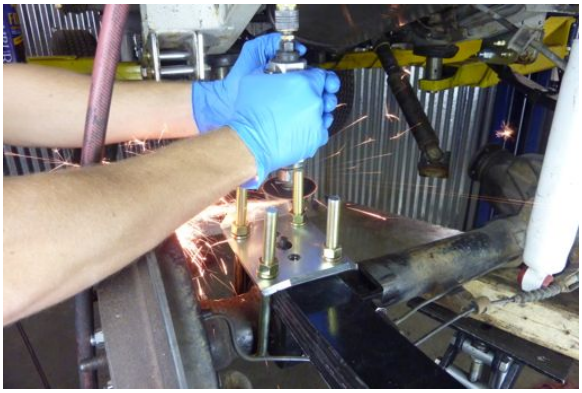
Position the supplied U-Bolt plate against the leaf spring and install one of the U-bolts including (2) lock washers and (2) nuts.

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 this document.

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 because U-Bolt nut sizes vary widely according to manufacturer and application.

Step 76

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



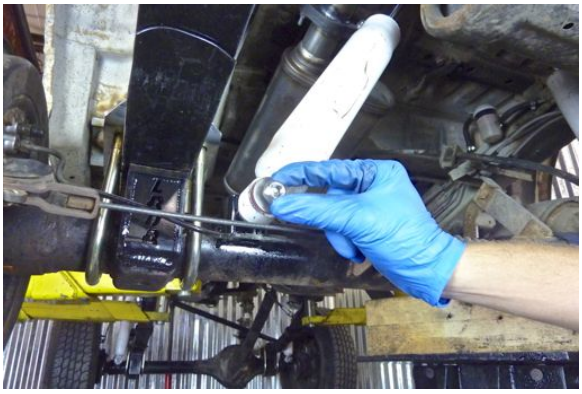
Step 77

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 78

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.

Note: This torque specification applies to Samurai OEM U-bolts. Always follow Manufacturer recommended specification.



Step 79

Raise the rear 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 installing new ones.

Step 80

Repeat Steps 74 to 79 on the passenger side.

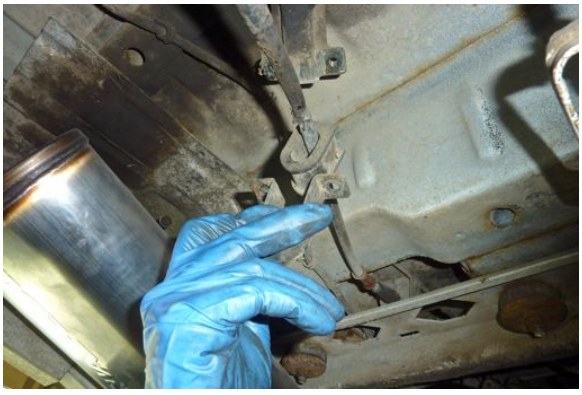
Step 81

As mentioned earlier, it is doubtful that the drive shaft will reach the differential flange without over extending the splines and causing excessive U-Joint angles. We refer you to page 2 of this document for suggested solutions. But, if the drive shaft will work without problems, connect the drive shaft in reverse order of disassembly.

Note: Be sure to align the marks if you are reconnecting the existing drive shaft.

Step 82

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



Step 83

If the park brake cable has enough slack at this point in the installation, connect it back up. If the cable will not reach, you could either leave it disconnected or build a custom bracket.

Step 84

Reinstall the rear 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 85

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

Congratulations!

You have successfully installed a Toyota Rear 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.