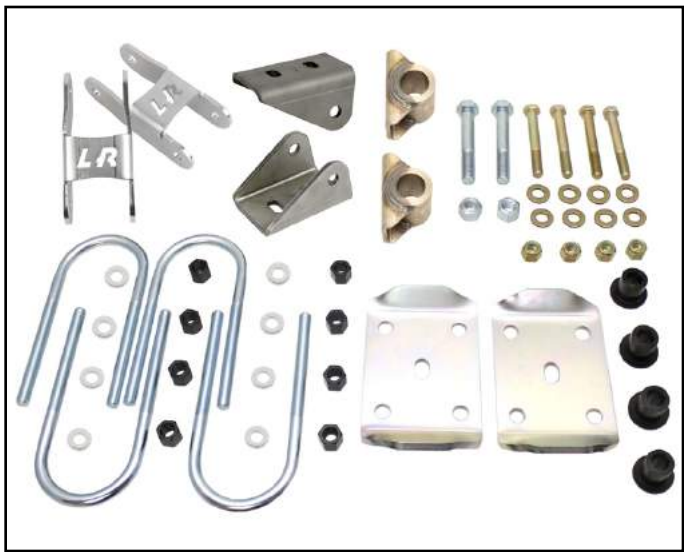
Instructions Created by an:

Automotive Service Excellence
MASTER AUTO TECHNICIAN

Low Range Off Road Ultimate Chevy Spring Swap Kit (SKU# TSP-CSK)

Revised 7-14-14

Installation Instructions



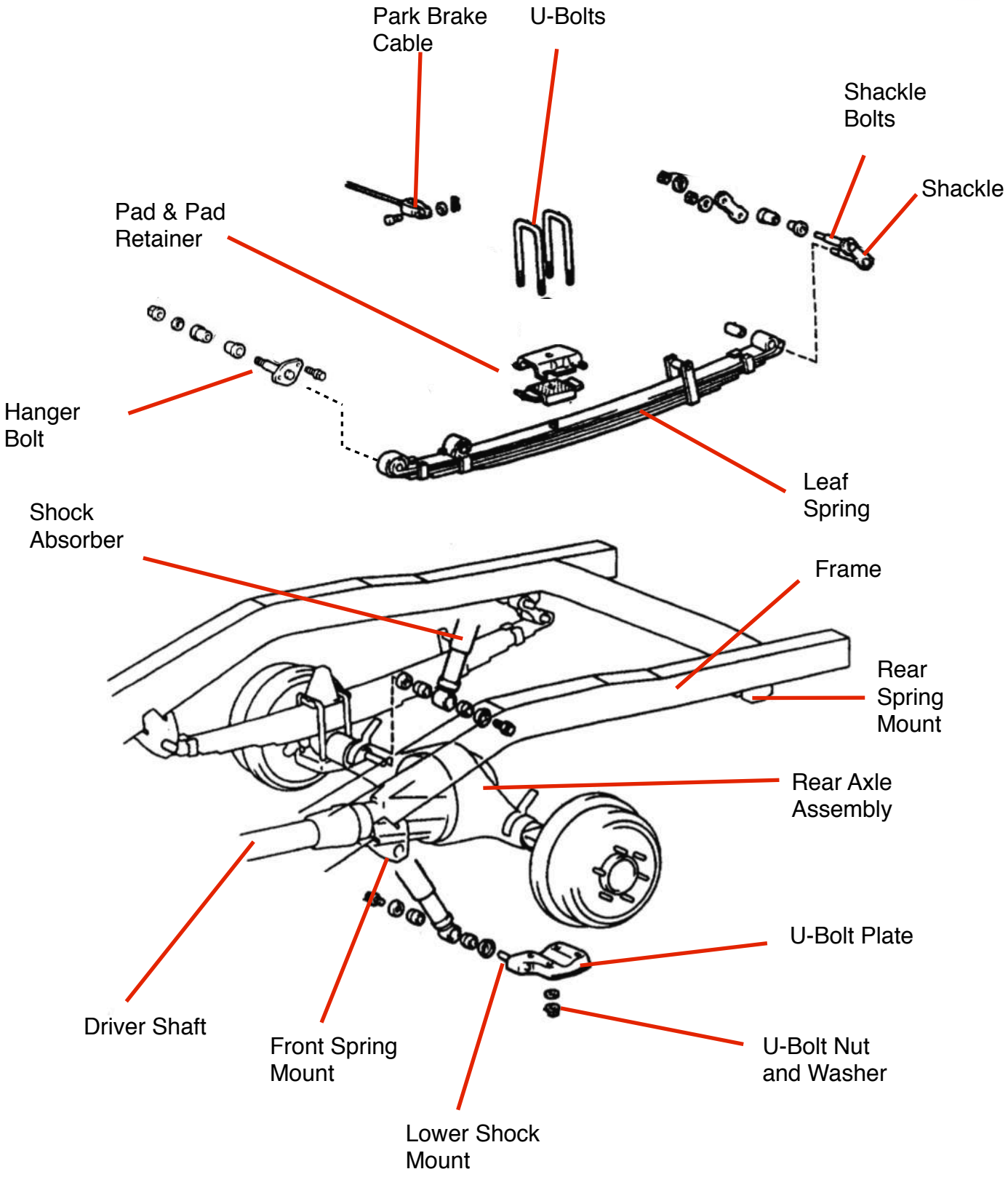
CAUTION: Safety glasses should be worn at all times when working with vehicles and related tools and equipment.

For additional copies of these and other instructions go to: www.lowrangeoffroad and click on the "Tech and Instructions" tab.

Suggested Tools:

- Twin Post Lift (or Floor Jack and 2 Safety Stands)
- Safety Stands (3)
- Under Hoist Jack Stand (if using a twin post lift)
- Standard Sockets: 12,14,17,19 & 21 mm
- Ratchet
- Shallow Impact Sockets, 1/2" Drive: 12,14,17,19 & 21 mm
- Deep Impact Sockets: 19 & 21 mm
- Impact Wrench, 1/2" Driver
- Combination Wrenches: 12,14,17,19 & 21 mm
- Tubing Wrenches: 10,14 & 17mm
- MIG Welder (and related safety equipment)
- Permanent Marker
- Angle Grinder
- Cut-Off Wheel Grinder
- C-Clamp, 6" or larger
- Ladies Foot Pry Bar
- Torque Wrench
- Measuring Tape
- Carpenters Square
- Plumb Bob (with a string)
- Ball Peen Hammer
- 8-2X4X12" Boards (or equivalent wooden blocks totaling 6" thick)
- Spray Paint (color optional)

Rear Suspension Parts Identification



LOW RANGE OFF-ROAD
WWW.LOWRANGEOFFROAD.COM Phone: 801-805-6644
1195 S 1680 W
Orem, UT 84058 USA

Step 1

Raise and support the vehicle on a twin post lift.

Note: We did this installation on a twin post lift, but it could be done with 5 safety stands and a floor jack.

Step 2

Remove both rear wheels using a 19 mm socket.

Measuring and Marking

Step 3

Hold the plumb bob string against the frame as shown. Then lower the plumb bob by sliding the string through your fingers until it touches the rear axle assembly. Move the string forward or backward until the plumb bob is centered on the rear axle assembly as shown in the next picture.

Step 3 Continued

This shows the plumb bob centered on the rear axle assembly.

Step 3 Continued

Then mark the frame indicating the exact location of the rear axle housing using a permanent marker.

Note: A white maker works well here.

Step 4

Mark the location of the spring mount using the plumb bob in the same method as shown in the previous steps.

Note: The best way to do this is to use the hanger bolt hole as a reference.

Step 5

Repeat the previous step locating the position of the rear shackle mount.

Note: Use the center of the shackle bolt as a reference.

Step 6

Repeat all 3 measurements (axle housing, front mount, and rear mount) on the passenger side.

Removing the drive shaft

Step 7

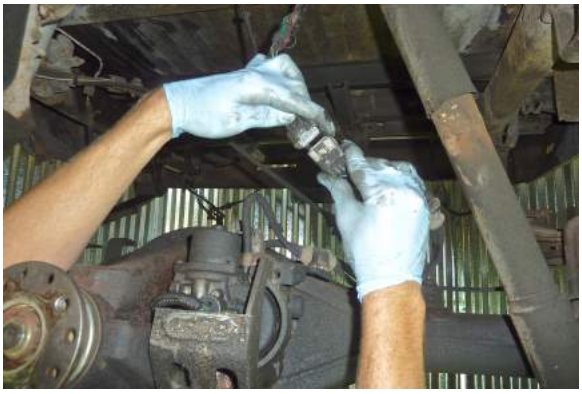
Disconnect the front of the rear drive shaft using two 14 mm box end wrenches.

Step 8

Disconnect the rear of the rear drive shaft using two 14 mm box end wrenches.

Step 9

Remove the rear drive shaft and set it aside.



Step 10

If the vehicle you are working with has an E-Locker (or air locking) rear differential, unplug the electrical (or air line) connector.

Disconnecting the Park Brake

Step 11

Disconnect the cable from the park brake lever by removing the cotter pin at both drum brakes.

Step 12

Disconnect the park brake cable bracket by removing the bolt indicated by the arrow, using a 14 mm socket.

Step 13

Disconnect the park brake cable using a 14 mm box end wrench or socket. Tie the park brake cable back out of the way.

Disconnecting the Brake Lines, Hoses and Proportioning Valve Lever

Step 14

Hold the flexible brake hose using a 17 mm tubing wrench and loosen the solid brake hose using a 10 mm tubing wrench.

Note: Do NOT disconnect the hose completely yet. Just brake it loose and then snug it backup for now.

Step 15

Remove the retainer clip using a lady's foot pry bar.

Step 16

Disconnect the solid brake line from the flexible brake hose.

Note: Place a cloth under this connection to catch any fluid that escapes.

Step 17

Disconnect the flexible brake hose from the fitting on the differential by holding the fitting with 17 mm open end wrench and turning the hose with a 17 mm tubing wrench.

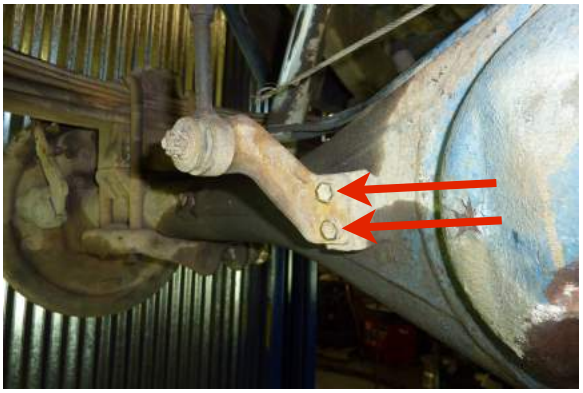
Step 18

RECONNECT the hose at the upper end . . . .

Step 19

. . . . and clamp it to keep excessive amounts of fluid from escaping.

Caution: If you plan to use this hose again be careful not to damage it. Only use clamps designed for this purpose.



Step 20

Disconnect the portioning valve linkage by removing these two bolts using a 14 mm socket.

Step 21

Beginning with the passenger side, slightly raise the rear axle assembly using an under hoist jack stand (or floor jack).

Note: The reason for raising and supporting the rear axle is to relieve the tension on the shock absorber making it easier to remove.

Step 22

Disconnect the lower shock mount using a 14 mm socket.

Step 23

Disconnect the upper shock mount using a 14 mm socket.

Step 24

Remove the upper end of the shock using a large screwdriver or pry bar.

Step 25

Remove the lower end of the shock using a large screwdriver or pry bar and set the shock aside.

Note: The chevy leaf springs provide approximately 3” of additional lift. Therefore, these shocks will likely be too short for this application.

Step 26

Lower the under hoist jack stand (or floor jack) and remove it from supporting the rear axle.

Step 27

Remove the driver side shock using the same method as the passenger side.

Disconnecting the Rear Axle Assembly

Step 28

If you are working on a twin post lift, lower the vehicle near the floor and support the rear axle assembly using two jack stands.

Step 29

Remove the driver side U-Bolt nuts using a 19 mm socket.

Step 30

Remove the U-Bolts, and pad and pad retainer.

Step 31

Remove the U-Bolt Plate.

Note: This vehicle had lift blocks between the rear axle assembly and the springs. Of course you would remove them if they were used on your vehicle.

Step 32

Repeat the above steps on the passenger side U-bolts, pad, pad retainer and U-bolt plate.

Step 33

Carefully and slowly raise the vehicle using the twin post lift (or floor jack), separating the rear axle assembly from the leaf springs.

Caution: Be sure and double check to see that everything has been disconnected. Also, be aware that the rear axle assembly will rotate to the position shown in the picture as you raise the vehicle. Insure that the rear axle assembly stays securely supported on the jack stands as the vehicle is raised.

Tech Tip

We recommend moving the rear axle assembly out of the way before proceeding to the next steps. Things work out better with a clear area to work in.

Removing the Leaf Springs and Mounts

If not already done raise the vehicle to a comfortable working height.

Step 34

Remove these two bolts using a 12 mm socket.

Step 35

Remove the nut from the front leaf spring bolt using a 19 mm socket.

Step 36

If possible pound the front hanger bolt out. If the bolt comes out, skip to Step 40 . If not continue to next step.

Step 37

Mark a guide line like the one shown.

Step 38

Using a cut-off wheel cut the spring mount as shown.

Step 39

Pull the spring outward disconnecting it from the mount and let spring hang from the rear shackle.

Step 40

Mark and cut the inside half of the front spring mount.

Step 41

Remove the upper rear shackle bolt nut using a 19 mm socket.

Step 42

Remove the lower rear shackle bolt nut using a 19 mm socket.

Step 43

Pound the upper shackle bolt out using a ball peen hammer and set the spring aside.

Step 44

Repeat the previous steps on the passenger side leaf spring. The only difference being, use a box end wrench instead of socket on the front mount nut, because the fuel tank does not allow enough room for a socket.

Step 45

Beginning on the driver side, mark the outside of the rear shackle mount and cut it off with the cut-off wheel.

Step 46

Mark and cut the inside half of the driver side rear shackle mount.

Step 47

Repeat the previous two steps on the passenger side rear shack mount.

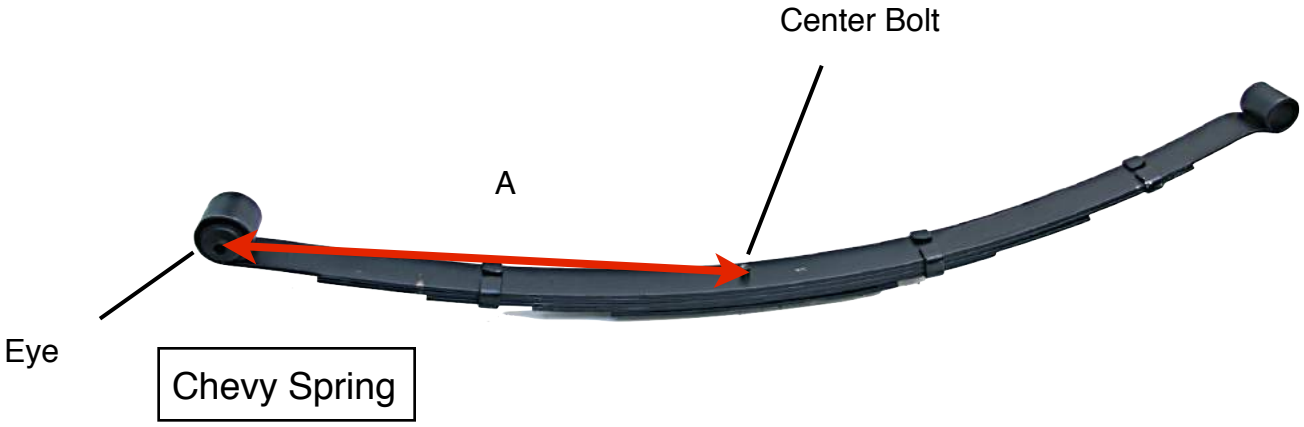
Step 48

Smooth all (4) areas where the mounts were removed using an angle grinder.

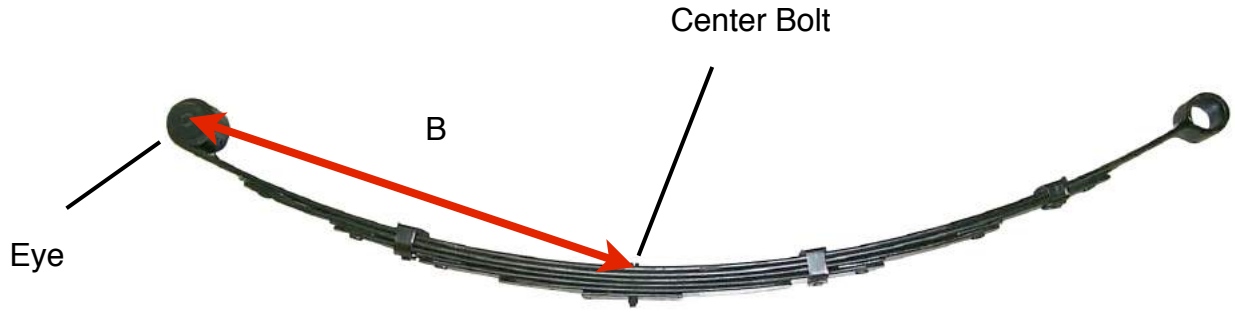
Measuring the Leaf Springs

Note 1: These measurements are made with NO LOAD on the springs.

Note 2: We are measuring from the center of the front leaf spring eye to the center of the leaf spring center bolt.



Chevy Spring



Toyota Spring

Step 49

Measure dimension A on the Chevy spring.

Measure dimension B on the Toyota spring.

Subtract dimension B from dimension A.

Use this figure to determine where to place the front spring mount.

In our installation we measured:

Dimension A =	31.50”
Dimension B =	-20.75”
Difference =	10.75”
*Add for spring load	+ .25”
Total	11.00”

*We added .25” to 10.75” = 11” because the spring will lengthen under a load

Step 50

Beginning with the driver side, measure 11” ahead of the front mount mark made earlier and make a mark.

Step 51

Using a square, make a mark the full height of the outside of the frame.

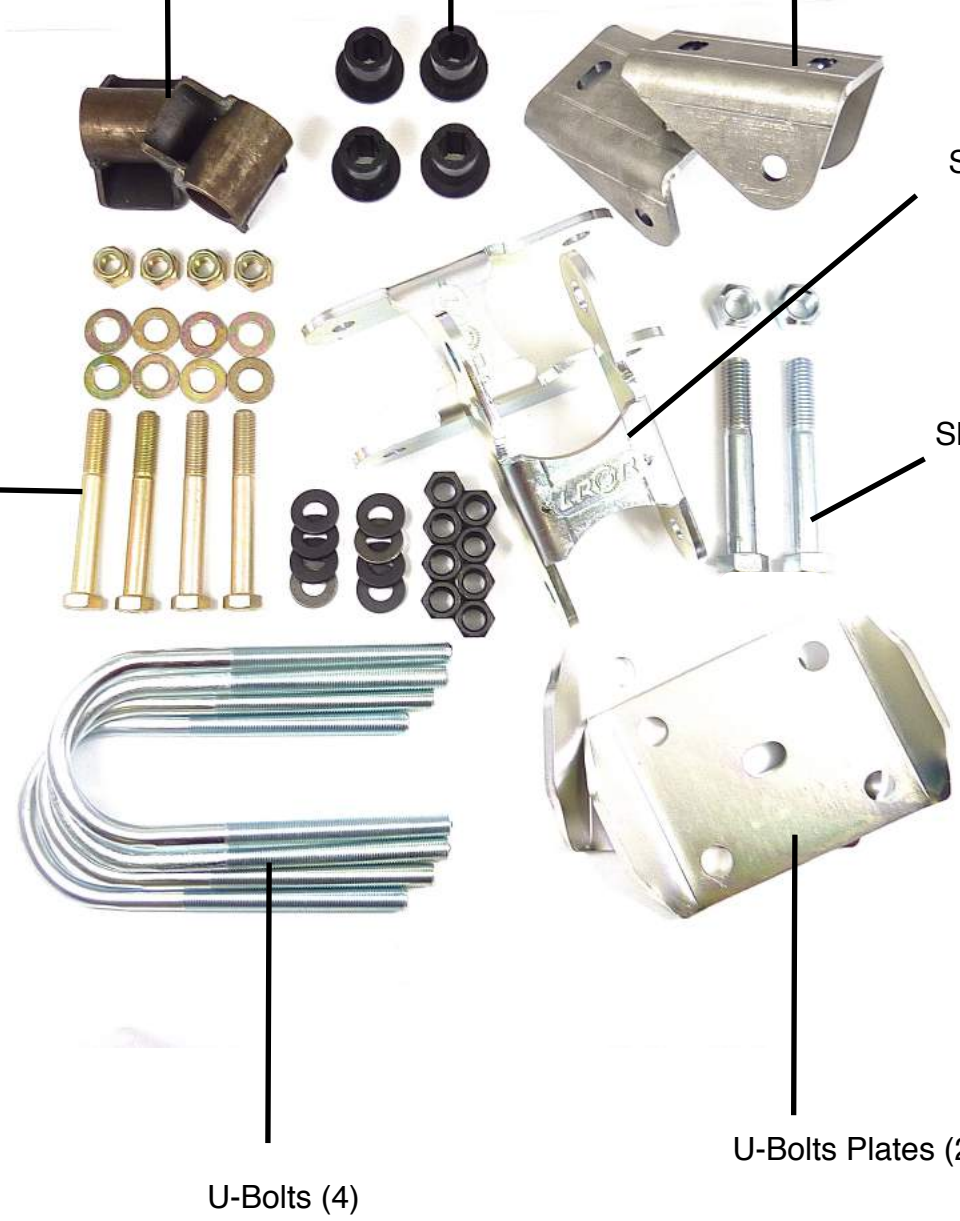
Step 52

Using a grinder, remove any rust or undercoating where the front mount is to be positioned to provide a good clean surface for welding.

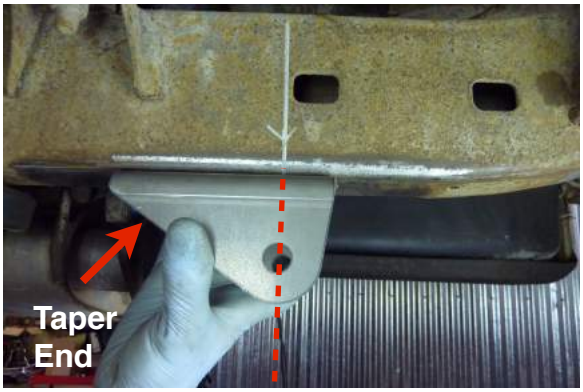
Step 53

Mark the location of the passenger side front spring mount in the same way as you did the driver side, using the exact same measurement. In our case it is 11". Also, be sure to clean the area with a grinder for welding.

Chevy Leaf Spring Kit Parts



Welding on the Front Spring Mounts



Step 54

Position the front spring mount with the bolt hole aligned with the mark on the frame.

Note: Be sure the tapered end of the mount goes forward.

Step 55

Position the front spring mount, centered, on the frame as shown.

Step 56

After the mount is perfectly positioned, use a C-Clamp to hold it in place.

Step 57

Tack weld the front mount in at least 4 places using a MIG (or stick) welder.

Tech Tip

These the tack welds need to be Strong enough to hold the spring in place during fitment testing and making more measurements, but not so strong that the mount could not be broken loose if repositioning becomes necessary.

Step 58

Repeat the previous steps on the passenger side mount.

CAUTION: The welding of this mount is near the fuel tank. Be sure there are no gas leaks present before welding and do not let the welder tip touch the fuel tank.

Installing the Chevy Springs

Step 59

Position the eye of the chevy spring in the front spring mount and install the supplied 9/16-18X4.5” bolt and washer.

Step 60

Install the supplied washer and top nut. Snug the nut but do not tighten all the way at this point.

Step 61

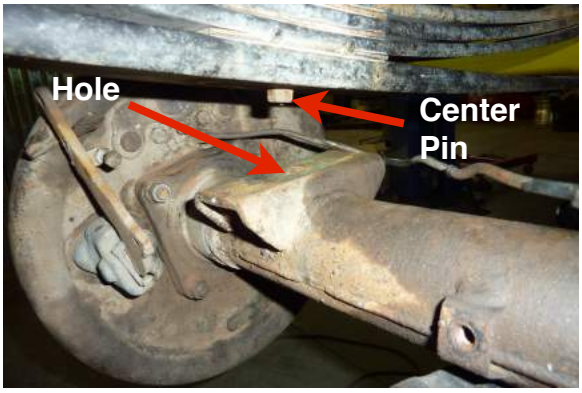
Install the passenger side spring the same way as the driver side.

Step 62

If not already done, move the rear axle assembly back into position. While lowering the vehicle, guide the springs over the rear axle as shown.

Step 63

Rotate the rear axle assembly so that the pinion flange is positioned properly and supported by a third jack stand. Then continue lowering the vehicle.



Step 64

Position the rear axle assembly such that the spring center bolts align with the holes in the rear axle perches.

Step 65

Raise or lower the vehicle so that the rear eyes of the leaf springs are about 6 inches away from the frame.

Step 66

Double check to see that the spring center pins are correctly positioned in the rear axle perches on both sides.

Step 67

Position the supplied driver side U-Bolt plate on top of the leaf spring.

Note: Be sure to align the center bolt with the center hole in the plate.

Step 68

Install the supplied U-Bolts, washers and U-Bolt nuts.

Step 69

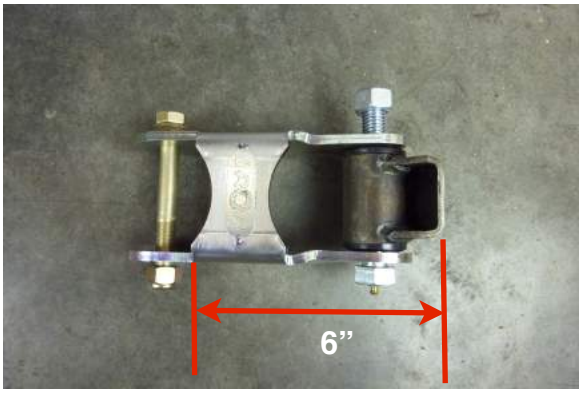
Snug the nuts just enough to keep things in place, but do not tighten them all the way at this point.

Step 70

Install the U-Bolt plate on the passenger side in the same way you did the driver side.

Step 71

Temporarily assemble the rear shackle assembly using the supplied bushings and hardware as shown.



Tech Tip

This the way the shackle assembly should look when done. Now measure the dimension shown by the arrows. We measured about 6”.

Step 72

Stack 6” worth of wood between the frame and the rear of the leaf springs. Four 2X4‘s worked just right. (2X4‘s are actually 1.5” thick) It may be necessary to raise the vehicle a bit to accomplish this step. Once the wood is in place on both sides, lower the vehicle until the full weight of the rear of the vehicle is resting on the rear axle assembly and leaf springs.

Step 73

With the full weight of the rear of the vehicle resting on the rear axle assembly and leaf springs, position the plumb bob as shown. Be sure the string is aligned with the line on the frame and the plumb bob is hanging freely. The plumb bob should align with the center bolt on the springs. Check both sides. They should be within an 1/8” of each other. If the rear axle assembly is too far back or forward you will need to reposition the front mounts. This is done by disconnecting the springs from the front mount, breaking the tack welds loose and tacking them back in the correct position.

Installing the Rear Shackles

Step 74

Position the previously assembled shackle assembly as shown.

Magnetic angle finder attached to the shackle

The lower 9/16” spring bolt aligned with leaf spring eye.

The shackle mount aligned with the bottom of the frame.

Move the top of the shackle forward or backward as needed to obtain the desired shackle angle. The owner of this vehicle asked for 25° shackle angel.

Tech Tip

Acceptable shackle angle ranges between 20° to 40° forward at the top from true vertical.

20° Gives more lift, more load carrying, and less flex.

40° Gives less lift, less load carrying and more flex.

Step 75

Once the correct angle is obtained, mark the location of shackle mount bolt, on the frame. This will indicate where the shackle mount is to be welded.

Step 76

Repeat Steps 74 & 75 on the passenger side shackle mount.

Step 77

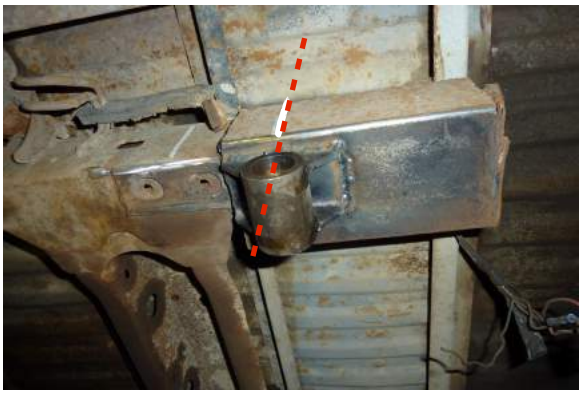
Disconnect the leaf spring from the front spring mount on both sides.

Step 78

Raise the vehicle and remove the blocks of wood from the rear. If possible, continue raising the vehicle until it is at a comfortable working height for welding.

Step 79

Remove the shackle mount bolt from the shackle and remove the rubber bushings from the shackle mount. This is important so the bushings do not get damaged (melted) during the welding process.



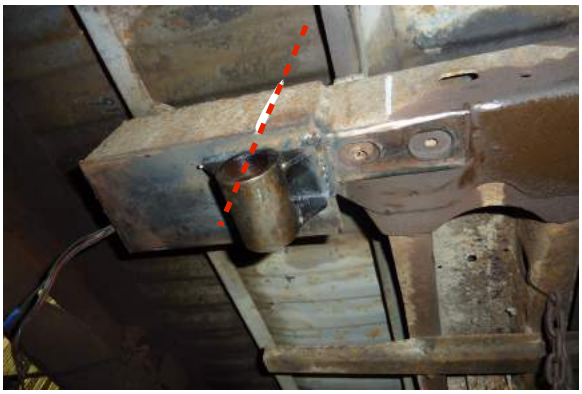
Step 80

Position, tack and weld the driver side rear shackle mounts. Be sure to align the hole of the mount with the mark on the frame. The mount should end up around 5 inches rearward from the original shackle mount location. It should also be centered, side-to-side, on the frame.

Note: The shackle mount on this vehicle does not look centered (side-to-side) because this vehicle had a piece of angle steel welded to the frame as a bumper mount. Just make sure the shackle mount is centered on the frame.

Step 82

Weld the driver side front spring mount on all 4 sides as well as the holes on the under side.



Step 81

Repeat the previous step on the passenger side shackle mount.

Step 83

Weld the passenger side front spring mount on 3 sides. You will not be able to weld the 4th side because of the location of the fuel tank. Be sure to weld the holes on the underside as well.

Step 84

After things cool. Paint all the exposed metal around all 4 mounts to improve appearance and reduce rust.

Step 85

Install a shackle on the rear of the driver side leaf spring using the supplied 9/16-18-4.5” bolt, (2) washers and top lock nut. Snug the nut but do not tighten all the way yet.

Step 86

Repeat the previous step on the passenger side of the vehicle.

Step 87

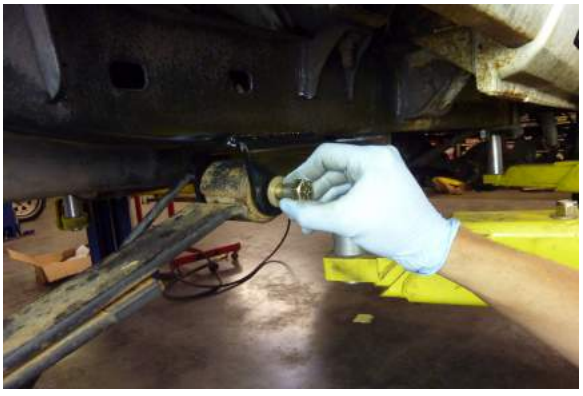
Lower the vehicle onto the rear axle assembly and leaf springs.

Step 88

While lowering the vehicle guide the front of the leaf springs into front mounts.

Step 89

Once aligned, install the 9/16-18X4.5” bolt, 2 washers and top lock nut. It is okay to snug the nut but do not tighten all the way yet.



Step 90

Align the passenger side leaf spring with the mount and install the 9/16-18X4.5” bolt, 2 washers and top lock nut. It is okay to snug the nut but do not tighten all the way yet.

Step 91

Install the bushings in the shackle mounts on both the driver and passenger side.

Step 92

Install the shackle mount bolt and nut on the passenger side. It is okay to snug this nut but do not tighten all the way yet.

Step 93

Repeat previous step on the driver side shackle bolt.

Final Tightening of Leaf Spring Components

Step 94

Lower the vehicle so that the weight of the vehicle is resting on the rear axle assemble and leaf springs. Two jack stands work well for this.

Step 95

Tighten the (2) shackle bolts to 67 ft. lbs.

Step 96

Tighten the (2) 9/16-18X4.5” shackle bolts to 67 ft. lbs.

Step 97

Tighten the (2) 9/16-18X4.5” front mount bolts to 90 ft. lbs.

Tech Tip

It may be necessary to shorten the U-bolts with a cut-off wheel so that a socket fits all the way down on the nut.

Step 98

Tighten the (8) U-Bolt nuts to 100 ft. lbs.

Note: The U-bolts should be progressively tighter in a criss-cross pattern until the specified torque is reached.

Step 99

If possible, raise the vehicle up to a comfortable working height.

Step 100

If the flexable brake line is too short, as it was in our case, you will need to purchase a longer one. Connect the Flexible brake line at the lower end and tighten it.

Step 101

Remove the original brake hose if it is still installed.

Note: Place a cloth under to catch any fluid that escapes.

Step 102

Connect the flexible brake hose at the upper end and tighten. Install the retainer clip as well.

Step 103

Install the park brake mount bolt.

Step 104

Install the park brake cable bracket.

Note: Insure that the bracket tab is properly fit in the locating hole.

Step 105

Reattach the park brake cable at both rear drum brakes.

Step 106

Be sure to install new cotter pins at both wheel locations.

Important Note:

The purpose of the load sensing proportioning valve is to regulate the amount of braking done by the rear brakes based on the weight being carried by the rear wheels. Because of the added amount of lift associated with this installation the proportioning valve adjustment will be adversely affected and will need to be addressed.

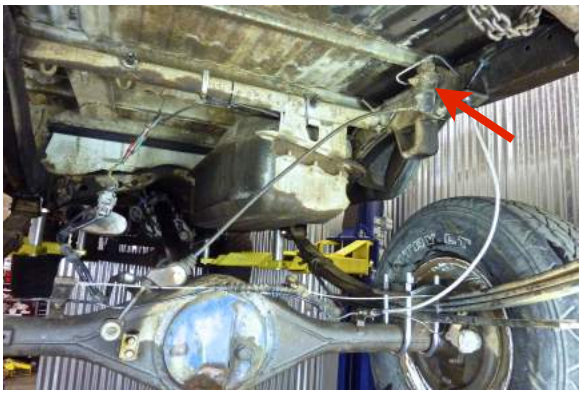
Option 1: Purchase and Install an adjustable aftermarket proportioning valve. Click HERE for more information. This product is for a Suzuki Samurai but will work for this application as well.

Option 2: Bypass the OEM proportioning valve by removing it and connecting the brake lines. **CAUTION:** This eliminates proportioning valve operation and may cause the rear wheels to lock up during heavy breaking.

Option 3: Cutting the lever about 2 inches away from the proportioning valve and adjust it manually according to your best judgement.

Option 4: Build a bracket that extends up from the rear axle assembly allowing the proportioning valve to be located at about the same operating position as it was originally.

Option 4: Connect the OEM proportioning valve lever and adjusting it as close as possible by adjusting the nut and/or bending the lever. This is the option we chose for this installation based on the owners wishes.



Proportioning Valve

Step 107

Loosen the lock nut using a 14 mm line wrench.

Step 108

Thread the linkage rod downward by turning it counterclockwise as far as it will go with out removing it.

Step 109

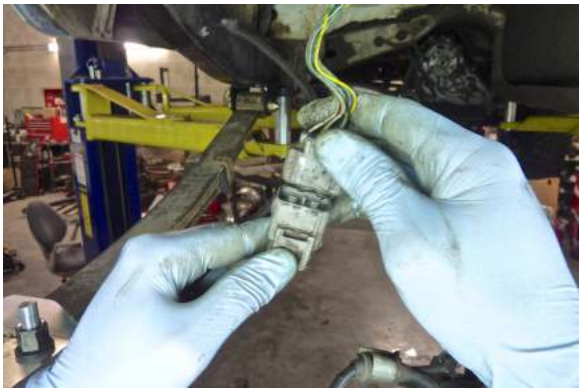
Tighten the lock nut.

Step 110

Connect the proportioning valve linkage by installing the two bolts.

Step 111

Bend the linkage in the location indicated by the arrow according to your best judgement.



Step 112

Plug in the E-Locker wires (or air hoses) if your vehicle has this feature.

Step 113

Connect the drive shaft at the transfer case by installing the (4) bolts, washers and nuts. Torque them to 54 ft. lbs.

Step 114

Connect the drive shaft at the rear axle by installing the (4) bolts, washers and nuts. Torque them to 54 ft. lbs.

Important Note:

The shock absorbers that were removed during this installation were too short to reuse. This will likely happen to you as well. You will need to measure for and purchase, replacement shock absorbers.

To see our instructions on how to accurately measure for the size of replacement shock absorbers click HERE

CAUTION:

Because you have disconnected and reconnected brake hoses and lines, air has been introduced into the hydraulic brake system and the the vehicle brakes will not work properly until the air has been removed or “Bleed” from the system. For instructions on how to “bleed” the braking system we invite you to access our instructions by clicking HERE. These instructions are for a Suzuki Samurai but will work just as well on the Toyota Pickup.

DO NOT OPERATE THIS VEHICLE UNTILL THE BRAKES HAVE BEEN PROPERLY BLEED.

Congratulations:

You have finished the installation of Chevy Leaf Springs on a Toyota Pickup. Enjoy the added lift, smoother ride and greater flex.

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 8am-5pm 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.