

86-95 Suzuki Samurai Align-Correct HD Crossover High-Low Steering Kit–Stage 1 (SKU# SST-ACCS-1)

Installation Instructions



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

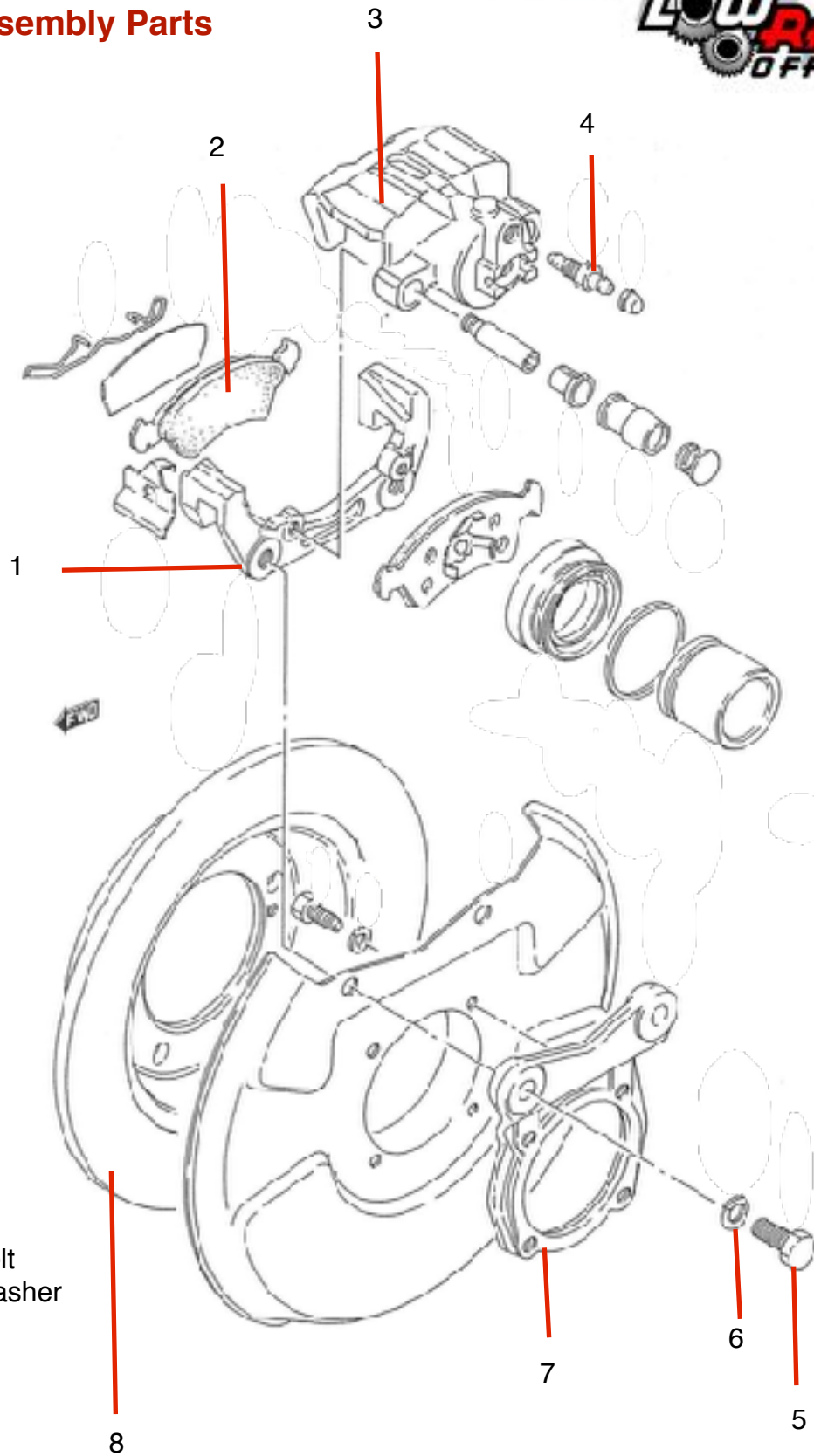


For additional copies of these and other instructions go to:
www.lowrangeoffroad and click on the
“Tech and Instructions” tab.

Suggested Tools:

- Diagonal Cutting Pliers
- Lug Wrench: 19 mm
- Twin Post Lift (or Floor Jack and (2) Jack Stands)
- Combination Wrench: 17mm
- Sockets: 17 & 19 mm
- Ratchet to fit the above sockets
- 7/16 Socket: 1/2 in. Drive, 12 point
- Ratchet, 1/2 in. Drive
- Extension, 1/2 in. Drive, 12 inches long.
- 2 Ball Peen Hammers (24 oz.)
- Penetration Oil
- 10 inch C-Clamp
- Torque Wrench, 100 ft. lb. minimum.
- Anti-Seize Compound
- 18 inch Crescent Wrench
- Rubber Mallet

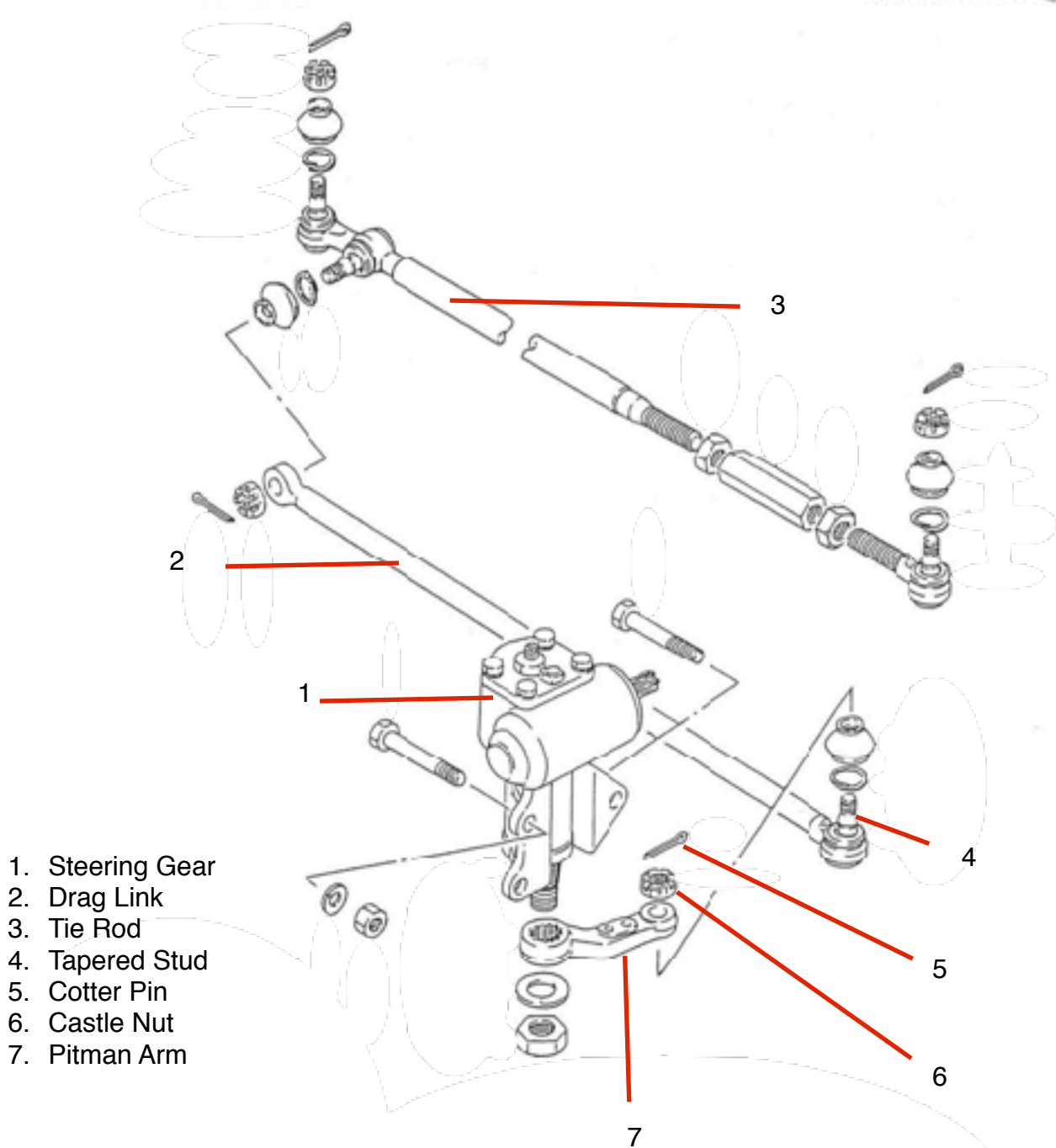
Disc Brake Assembly Parts



- 1. Caliper Adapter
- 2. Outboard Pad
- 3. Caliper
- 4. Bleeder Valve
- 5. Caliper Adapter Bolt
- 6. Caliper Adapter Washer
- 7. Caliper Holder
- 8. Disc

Figure A

Steering System Parts



1. Steering Gear
2. Drag Link
3. Tie Rod
4. Tapered Stud
5. Cotter Pin
6. Castle Nut
7. Pitman Arm

Figure B



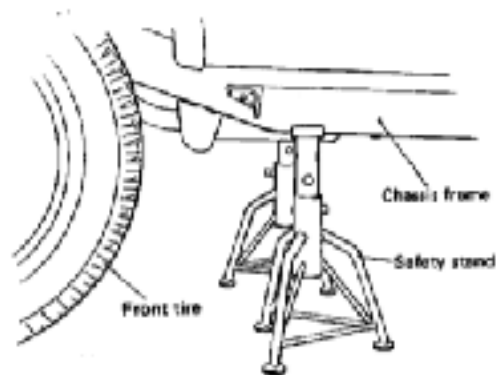
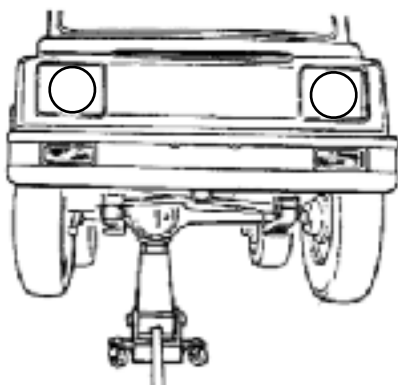
Tech Tip

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 easily be done with a floor jack and (2) safety stands.



Tech Tip

Proper positioning of floor jack.

Tech Tip

Proper positioning of safety stands.





Step 2

Remove the passenger side front wheel assembly by removing the (5) lug nuts using a 19 mm socket.



Step 3

Remove the driver side wheel assembly.

Disconnecting the Drag Link from the Pitman Arm



Step 4

Straighten the legs of the cotter pin using diagonal cutting pliers.



Step 5

Remove the cotter pin using diagonal cutting pliers.



Step 6

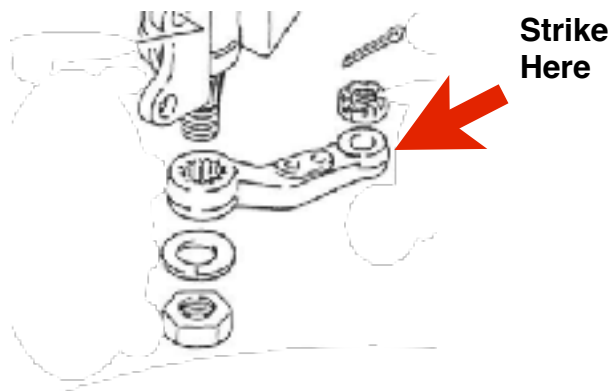
Remove the castle nut using a 17 mm box end wrench.



Step 7

Separate the drag link from the pitman arm by striking the pitman arm sharply with a ball peen hammer.

Note: This usually requires several blows with the hammer. Don't be shy. You have to hit it hard.



Step 7 Continued

Strike the pitman arm in the direction of the arrow.

Step 7 Continued

Drag link disconnected.

Disconnecting the Drag Link from the Tie Rod



Step 8

Straighten the legs of the cotter pin using diagonal cutting pliers.



Step 9

Remove the cotter pin using diagonal cutting pliers as shown.



Step 10

Remove the castle nut using a 17 mm box end wrench.



Step 11

Separate the drag link from the tapered stud by placing one ball peen hammer against the bottom of the drag link and striking the top shapely with a second ball peen hammer.

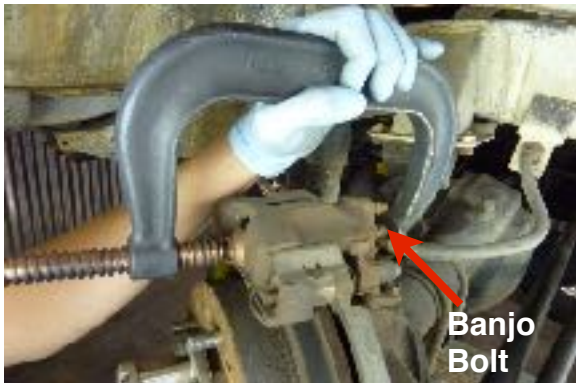
Note: This may take several blows. Again, do not be shy about this. Hit it hard. However, be careful; when the drag link does come loose it will drop to the floor—or your toe, whichever comes first.



Step 12

Set the drag link aside. You will not need this part again in this installation.

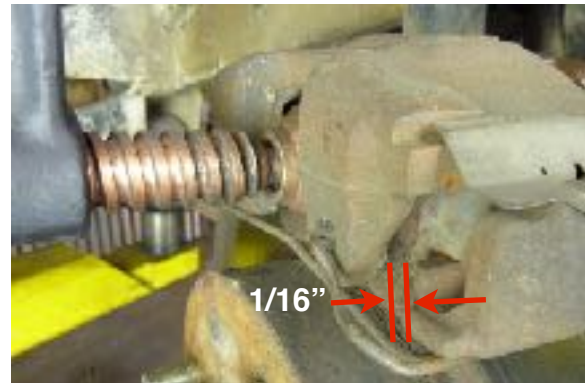
Disconnecting the Brake Caliper



Step 13

Position a C-clamp on the outboard brake pad (See **Figure A**) and the brake line banjo bolt (where the brake line connects to the caliper) as shown.

Note: Be sure to avoid clamping against the bleeder screw.



Step 14

Tighten the C-clamp, by turning the handle clockwise, until it is snug against the outboard pad. Then tighten the handle an additional 1/2 turn more.

Note: The inboard pad should move away from the caliper about 1/16 of an inch. Performing this step will make the caliper and pads easier to remove from the rotor.



Step 15

Then loosen the handle and remove the C-Clamp.



Step 16

Grasp the rotor with both hands and rotate the brake assembly outward. This will allow easier access to the caliper adapter bolts.



Step 17

Remove the front caliper adapter bolt using a 17 mm socket.



Step 18

Remove the rear caliper adapter bolt using a 17 mm socket.



Step 19

Lift up on the caliper and caliper adapter an inch or so.



Step 20

Position the LROR steering arm under the caliper as shown.



Step 21

Then set the caliper back in its original position.



Step 22

Align the holes in the steering arm, the caliper adapter and the caliper.



Step 23

Start and snug the supplied Front (12X1.25X65mm) caliper adapter bolt and lock washer. But do not tighten it all the way yet.

Note: This bolt is the longer of the two caliper adapter bolts.



Step 24

Start the supplied rear (12X1.25X55mm) caliper adapter bolt and lock washer. Then snug it down with a 19 mm socket.



Step 25

Torque the front caliper adapter bolt to 51-72 ft. lbs.



Step 26

Torque the rear caliper adapter bolts to 51 - 72 Ft. Lbs.

Installing the LROR Drag Link



Step 27

Apply anti-seize compound to the threads of the supplied drag link end.

Note: Be sure the jam nut is threaded on as far as it will go as shown.

Step 28

Thread the drag link end into the supplied drag link a few threads short of where the jam nut is. See photograph in the next step.



Step 29

Drag link end properly positioned.



Step 30

Repeat **Steps 27 to 29** on the other end of the drag link.





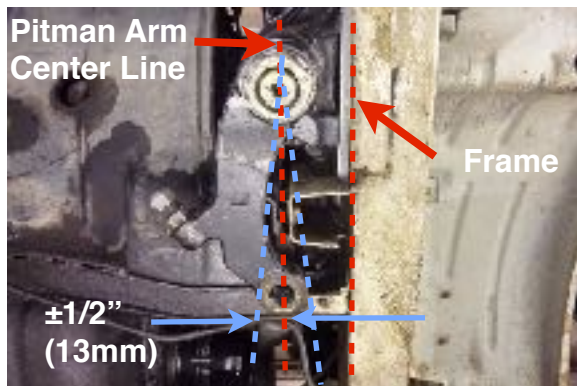
Tech Tip

Notice that one end of the drag link has a groove in it and the other end does not. The groove end should be installed toward the steering gear. Once the new drag link is ready, set it aside for now.



Step 31

Place the steering GEAR in the center position by turning the steering wheel all the way to the right. Then turn the steering wheel all the way left, counting the turns. Then turn the steering wheel back right exactly 1/2 the total number of turns. For example if it took 4 full turns to go from all the way right to all the way left then the steering gear would be centered at 2 full turns from either direction. If the steering wheel is not level at this time. Don't worry about it. We will address that later.



Step 32

Check the pitman arm for proper positioning. If the center line of the holes in the pitman arm are parallel with the frame ($\pm 1/2''$ or ± 13 mm), skip to **Step 34**. If the center line of the pitman arm holes are NOT parallel with the frame, continue to the next step.

Note: This is a Sidekick steering gear and pitman arm, but the principle is the same for a Samurai pitman arm. Simply align the the holes in the pitman arm with the frame.



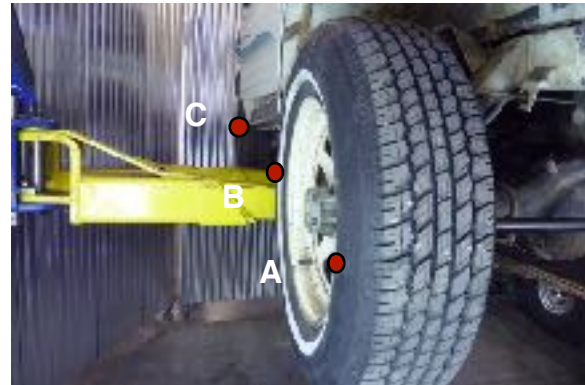
Step 33

Remove the pitman arm from the steering gear and reinstall it such that it is parallel with the frame.



Step 34

Install the passenger side wheel assembly and torque the lug nuts 36.5 to 57 ft. lbs.



Step 35

Position the passenger side wheel in the "Straight Ahead" position. A close estimate of the "Straight Ahead" position can be determined by sighting down the side of the front wheel using the rear wheel as a reference. Or in other words Point A and Point B should align with Point C. (See **Figure C**)

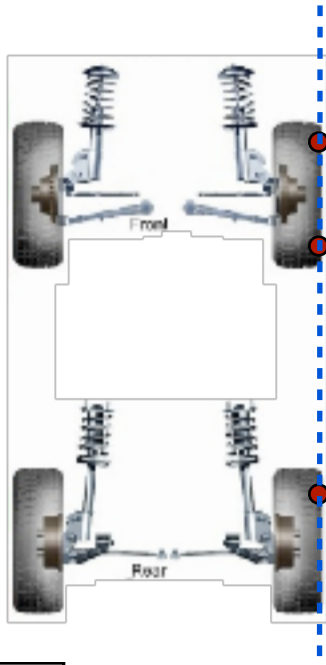


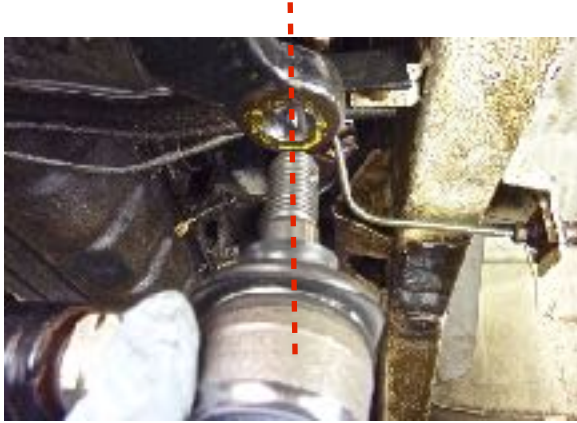
Figure C



Step 36

Place the drag link end in the LROR steering arm. Do not install the castle nut at this time.





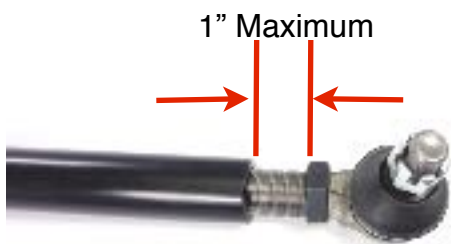
Step 37

Test fit the length of the drag link by holding it near the pitman arm as shown. If the drag link end aligns with the hole in the pitman arm, without moving the pitman arm, steering wheel or front wheels, skip to **Step 39**. If the drag link end does **NOT** align with the pitman arm hole, continue to the next step.



Step 38

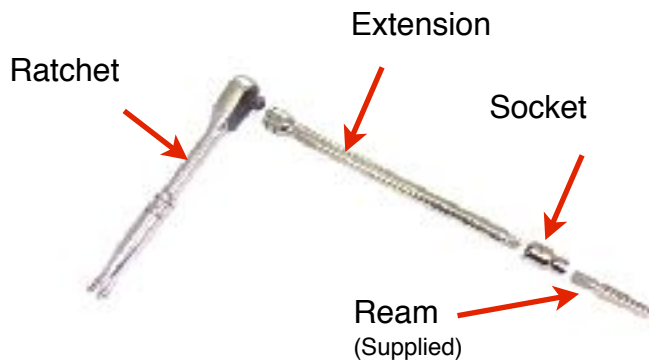
Rotate the drag link until the drag link is the right length and aligns properly with the pitman arm hole. Do **NOT** align the drag link ends by moving the tire, pitman arm or steering wheel.



Caution!

If adjusting the drag link causes the drag link ends to thread too far out of the drag link, the drag link will not be strong enough. There should be no more than one inch of thread exposed on the drag link ends. If there is more than one inch of thread exposed, this drag link is not considered safe for your application. If there is less than one inch of exposed threads, continue to the next step.

Reaming (or Enlarging) The Pitman Arm Hole



Step 39

Prepare for the next step by placing the supplied ream in a 7/16" 12 point socket. Place the socket in a 1/2" driver 12" long extension and connect the extension to a 1/2" driver ratchet as shown above.

Step 40

Ream the pitman arm using the supplied reaming tool. While pushing upward, turn the tool in a clockwise direction.



Step 41

Ream pitman arm gradually and test fit the tie rod regularly. Stop when the tie rod fits the new hole.

Step 41 Continued

Be careful to **NOT** ream too deeply. Over-reaming will make it impossible to tighten the tie rod nut correctly and may even make your pitman arm unusable.



Step 42

Install the supplied castle nut on the steering arm end of the drag link.



Step 43

Torque the nut to 50 ft. lbs. If the castle nut slots align with the hole in the tapered stud (as shown above) skip to **Step 45**. If the slots do NOT align, continue to the next step.



Step 44

Continue **TIGHTENING** the nut until it does align. **NEVER LOOSEN** this nut to obtain proper hole-to-slot alignment.



Step 45

Install the supplied cotter pin and bend one leg of the cotter pin as shown.



Step 46

Connect the other end of the drag link to the pitman arm and repeat **Steps 42 through 45** performed earlier.



Step 47

Install the driver side wheel and torque the lug nuts to 36.5-57 ft. lbs.



Step 48

Lower the vehicle to the floor. Roll the vehicle rearward about 3 feet and then back to its original position. This will allow the wheels to "settle-in" to their normal ride position. Now check to see that the front wheels are still straight ahead and the pitman arm is still parallel with the frame. If they either (front wheels or pitman arm) is not in the correct position, move them such that they are.



Step 49

Now check the steering wheel. If it is level (as you see in the picture) skip to **Step 65**. If the steering wheel is slightly off (2" or less at the circumference), it could be leveled by lengthening or shortening the drag link, then skip to **Step 65**. If the steering wheel is not close to level (more than 2" at the circumference), continue to the next step.

Straightening the Steering Wheel

These instructions were made with a Grant GT aftermarket steering wheel. If your Samurai has an OEM steering wheel, follow manufacturers instructions for removal and installation.



Step 50

Disconnect the negative battery terminal.



Step 51

Remove the horn button by prying gently with a small standard screwdriver as shown.



Step 52

Remove the spring.



Step 53

Remove the steering shaft nut using a 17 mm socket.





Step 54

Reinstall the nut 2 or 3 turns only.

Note: This is to keep the steering wheel from flying off during the next step.



Step 55

Strike the spoke of the steering wheel with a rubber mallet.

Note: If a rubber mallet is not available, some have found success by striking the steering wheel upward with the heel of the hand in several locations around the steering wheel.



Step 56

Once the steering wheel is loose, remove the nut.



Step 57

Remove the washer.



Step 58

Lift the steering wheel off.



Step 59

Rotate the steering wheel to a level position and set it back on the steering shaft.



Step 60

Install the washer and nut.



Step 61

Torque the nut to 20 ft. lbs.





Step 62

Install the spring.



Step 63

Reposition the horn button and strike it gently with the heel of your hand. It should snap back into place as before.



Step 64

Reconnect the negative battery cable.





Step 65

Tighten the jam nuts on both drag link ends using an 18" crescent wrench.



Step 66

Because the front brake pad was moved inward with the C-Clamp, you will need to pump the brake pedal 2 or 3 times to insure you have the correct brake pedal feel. Correct brake pedal feel is defined by the pedal moving downward and getting hard to push about 1/2 way to the floor. If the brake pedal goes to or near the floor, do not drive the vehicle and seek professional help. Failure to perform this step could result in brake failure and serious injury or accident.



Step 67

If after driving the vehicle you find the steering wheel is not level, repeat **Steps 50 to 64** to correct the problem. If the out-of-level condition is minor, you could adjust the Drag Link to level the steering wheel.

Steering gear box	Recirculating ball-and-nut type	
Gear ratio	15.6 – 18.1	
Steering angle, inside	28° ± 3°	
Steering angle, outside	26° ± 3°	
Steering wheel diameter	400 mm (15.74 in.)	
Minimum turning radius	5.1 m (16.73 ft.)	
WHEEL ALIGNMENT	Tie-rod	2 – 6 mm (0.079 – 0.236 in.)
	Camber	1 degree (1") ± 45'
	Kingpin inclination	9 degree (9") ± 2"
	Caster	3 degree 30 minutes (3° 30') ± 1"
	Side slip	0.5 mm (0.0197 in.)

These Specifications are for an 87 Suzuki Samurai. They may not apply to your particular vehicle.

Step 68 Caution!

The installation of steering and suspension parts can negatively affect the handling, braking, and tire tread life. We recommend you have the wheels aligned by a qualified professional as soon as possible after this installation.



Congratulations!

You have successfully installed a LROR Drag Link Kit on a Suzuki Samurai. We hope it has been a good experience! Please let us know if you have suggestions on how our instructions or products could be better.



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.

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