

# 86-95 Suzuki Samurai Align-Correct HD Crossover High-Low Steering Kit–Stage 2 (SKU# SST-ACCS-2)



## Installation Instructions



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



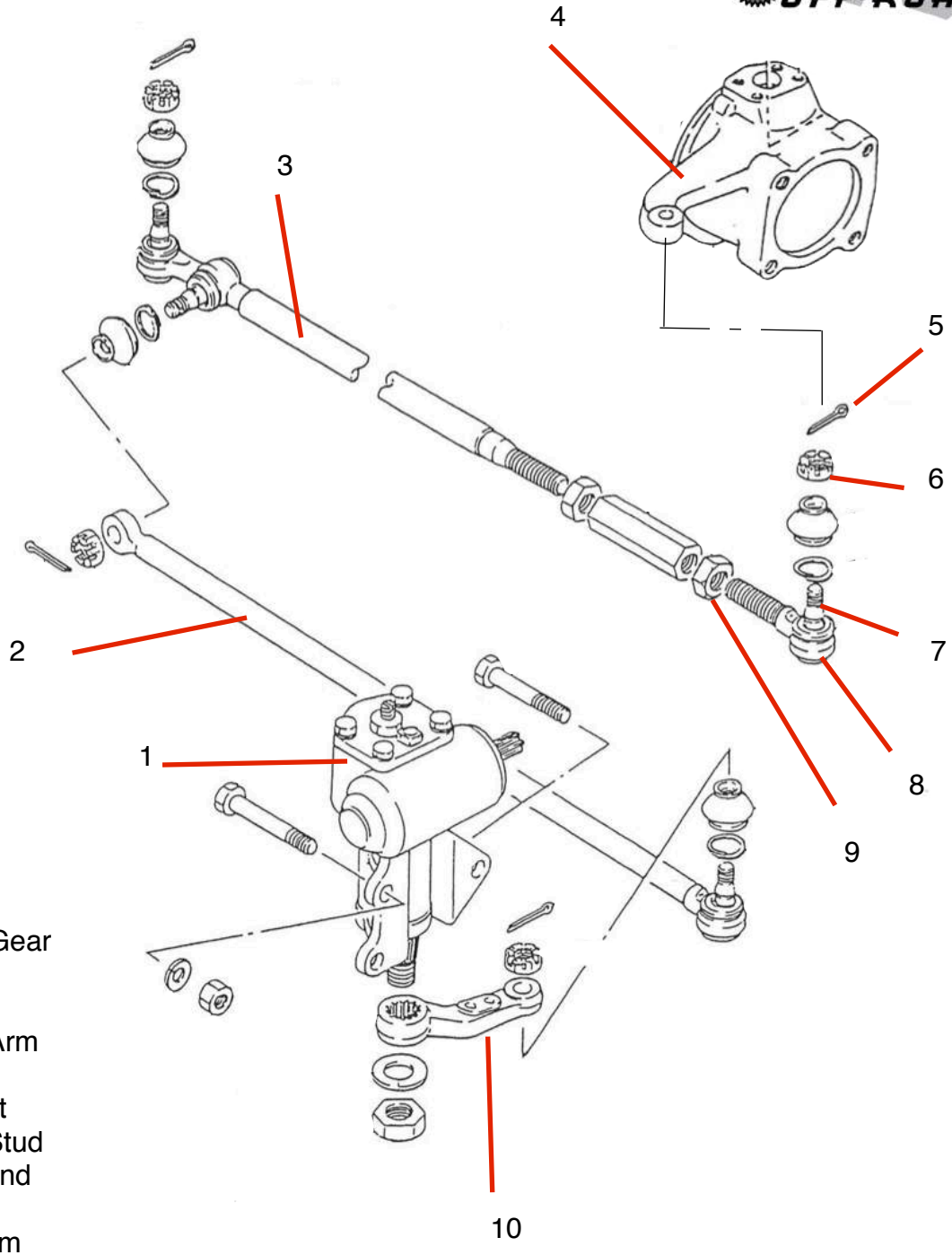
For additional copies of these and other instructions go to:

[www.lowrangeoffroad.com](http://www.lowrangeoffroad.com) 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
- Socket: 17mm
- Ratchet to fit the above socket
- 7/16 Socket: 1/2 in. Drive, 12 point
- Ratchet, 1/2 in. Drive
- Extension, 1/2 in. Drive, 12 inches long.
- 1 Ball Peen Hammer (24 oz.)
- Penetration Oil
- Torque Wrench, 100 ft. lb. minimum.
- Anti-Seize Compound
- 2-18 inch Crescent Wrenches

## Steering System Parts



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

**Figure A**



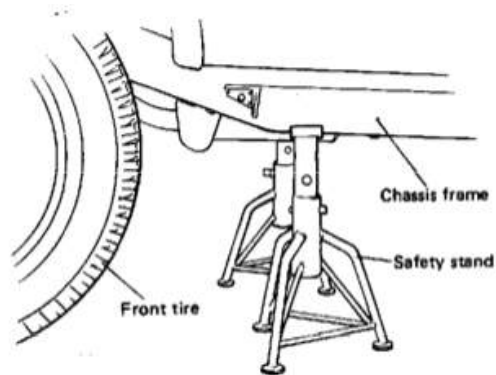
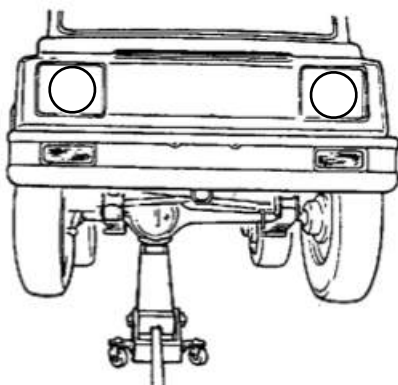
### Tech Tip

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 in the same way.

## Disconnecting the Tie Rod from the Steering Arms

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### Step 4

Beginning on the passenger side tie rod end, straighten the legs of the cotter pin using diagonal cutting pliers.



### Step 5

Remove the cotter pin using diagonal cutting pliers.



### Step 6

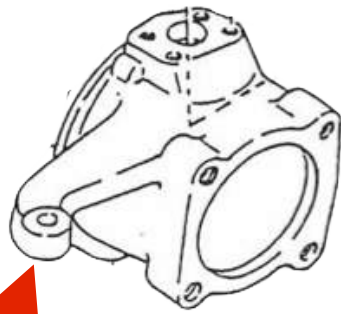
Loosen the castle nut using a 17 mm socket or a box end wrench.



### Step 7

Separate the tie rod end from the steering arm by striking the steering 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.



Strike Here



### Step 7 Continued

Strike the steering arm in the location indicated by the arrow.

### Step 7 Continued

Tie rod end disconnected.





### Step 8

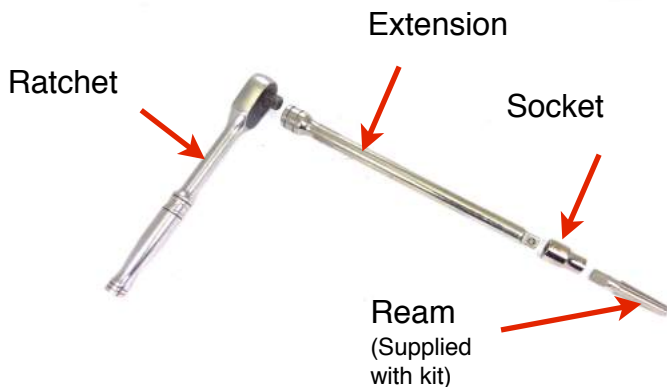
Repeat **Steps 4 to 7** on the driver side tie rod end.



### Step 9

Remove the tie rod from the vehicle and set it aside.

## Reaming (or Enlarging) The Steering Arm Holes



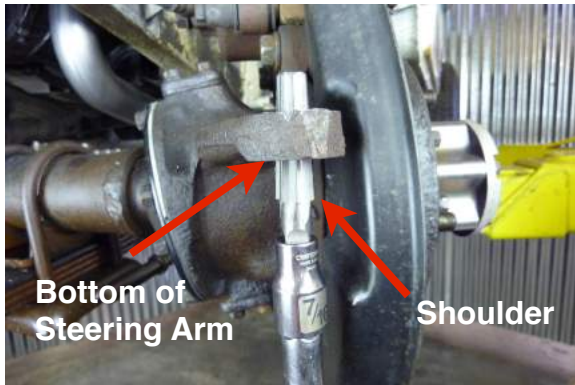
### Step 10

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 11

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





## Step 12

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



## Step 12 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 13

Repeat **Steps 11 & 12** on the passenger side steering arm.

## Installing the Tie Rod



### Step 14

Ready the first tie rod end by threading the jam nut all the way on the tie rod end, as shown.



### Step 15

Apply anti-seize compound to the threads of the tie rod end.



### Step 16

Thread the tie rod end into the supplied tie rod about 3 threads short of where the jam nut is. See photograph in the next step.

Note: The tie rod ends are side specific. If one will not thread into the tie rod, try the other end of the tie rod.



### Step 17

Tie rod end properly positioned with about 3 threads showing.





## Step 18

Repeat **Steps 14 to 17** on the other end of the tie rod.



## Step 19

Remove the castle nuts from both tie rod ends.



## Step 20

Position the tie rod on the leaf springs as shown.

Note: There is a groove cut in one end of the tie rod, near the jam nut. This grooved end should be oriented toward the driver side of the vehicle.



## Step 21

Install the passenger side tie rod end in the steering arm and install the castle nut.





## Step 22

Torque the castle nut to 50 ft. lbs.



## Step 23

If the castle nut slots align with the hole in the stud (as shown here) skip ahead to **Step 25**. If not, continue to the next step, **Step 24**.



## Step 24

Continue tightening the castle nut until the cotter pin can be installed.

Caution: **NEVER** loosen the castle nut to align the castle nut with the hole in the stud. **ALWAYS** tighten.



## Step 25

Install the supplied new cotter pin.

Note: NEW cotter pins should always be used on these applications. It is not considered safe to use the old cotter pins.



### Step 26

Bend one leg of the cotter pin as shown.



### Step 27

Cotter pin properly installed and bent.



### Step 28

Repeat **Steps 21 to 27** on the driver side tie rod.



### Step 29

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

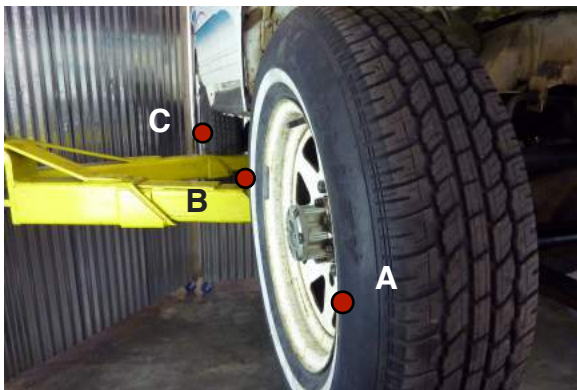




## Step 30

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

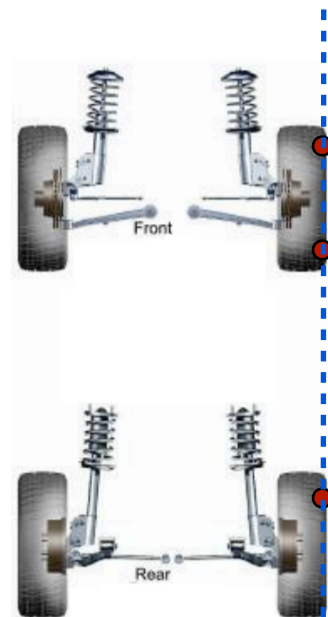
### Front Toe-In – Rough Adjustment



## Step 31

Position the passenger side front tire in the straight ahead position by sighting down the outside edge of the tire using the outside edge of the rear tire as a reference. See **Figure B**

**Figure B**



Straight Ahead Position (or 0 Toe) of the front wheel is when Point A and Point B align with Point C.



### Step 32

Sight down the outside edges of the driver side front tire using the outside edge of the rear tire as a reference. If either front tire is not in the straight ahead position continue to the next step. If both front tires are straight ahead, skip the next step.



### Step 33

While monitoring both front tires, rotate the tie rod until both front tires are as near as possible to being straight ahead.

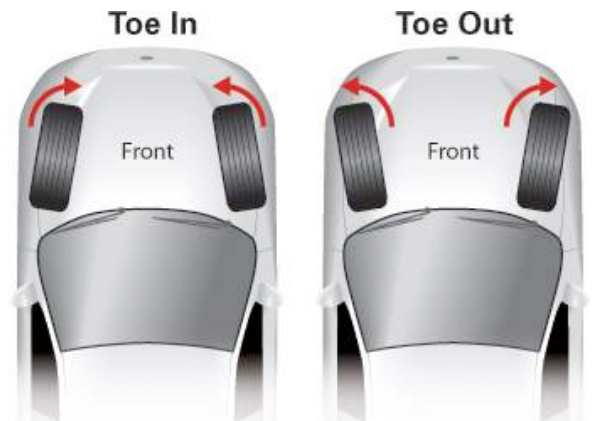
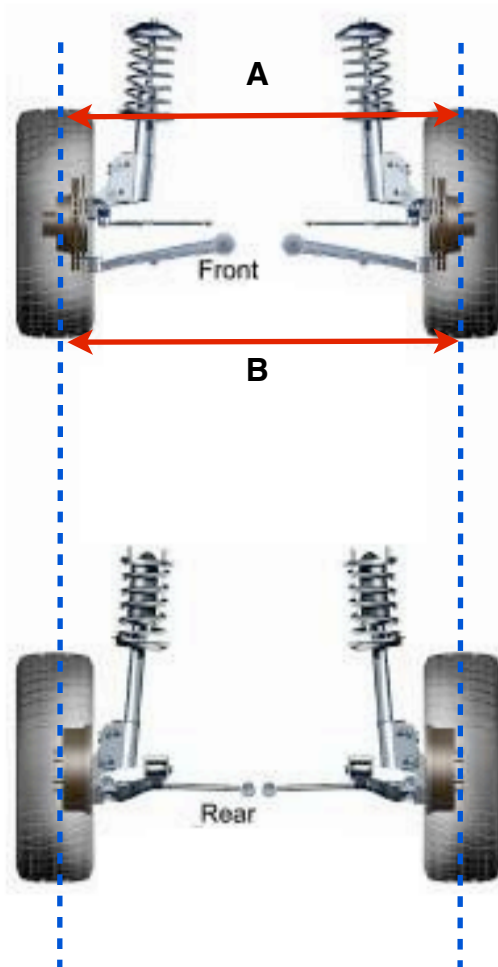


## Front Toe-In - Fine Adjustment

Toe is defined as: The difference in measurement between the forward most part of the tires and rear most part of the tires measured in inches or mm. The toe specification for a Samurai is 1/8" (or 4mm) IN.

Distance A subtracted from distance B equals toe.

- If distance A is less than distance B the wheels are Toed **IN**.
- If distance A is greater than distance B the wheels are Toed **OUT**.



**Front of the Passenger Side**



**Front of the Driver Side Tire**



### Step 34

Measure the distance between the two front tires at the front. The easiest way to accomplish this, is to measure from the same part of the tire tread on both tires. On the left front tire we chose the outside of the middle tread, shown by the arrow.

### Step 35

We then measured to the same place (the outside of the center tread) on the driver side tire. This measured approximately 51 5/8".

**Rear of the Driver Side Tire**



**Front of the Driver Side Tire**



### Step 36

Then we measured the back of the front tires. It measured 52 1/4". When you subtract the two measurements:

Rear 52 1/4" = 52 2/8" = 51 10/8

Front - 51 5/8" = 51 5/8" = 51 5/8

Total Toe **5/8" IN**

### Step 37

Rotate the tie rod such that the front of the tires move in or out as needed. In our example we needed to move the front of the tires out. The objective is to have the tires about 1/8" closer in the front than in the rear.



## Step 38

We ended up with 52 1/8" in the front and 52 1/4" in the rear, which is 1/8" Toe-In.

**Passenger Side**



**Driver Side**



## Step 39

Once the correct toe has been achieved, tighten the jam nuts using two 18" Crescent Wrenches.

Note: The jam nuts tighten by rotating them both in the same direction. In our application both nuts turned down in the front to tighten.



## Step 40

Double check all the hardware associated with the job to insure they are tight, secure and safe. Then lower the vehicle to the floor.





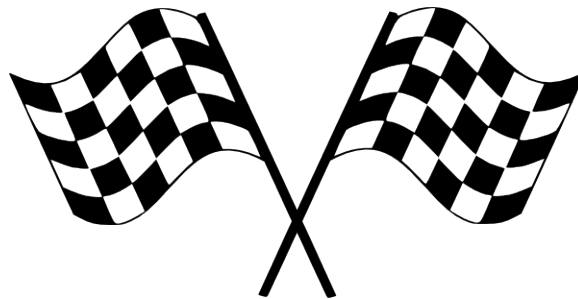
Steering gear box	Recirculating ball-and-nut type
Gear ratio	15.6 – 18.1
Steering angle, inside	29" ± 3"
Steering angle, outside	26" ± 3"
Steering wheel diameter	400 mm (15.74 in.)
Minimum turning radius	5.1 m (16.73 ft.)
Toe-in	2 – 6 mm (0.079 – 0.236 in.)
Camber	1 degree (1") ± 45'
Kingpin inclination	9 degree (9") ± 2"
Caster	3 degree 30 minutes (3" 30') ± 1"
Side slip	

*These Specifications are for an 87 Suzuki*

*Samurai. They may not apply to your*

## Step 41 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 Align Correct Crossover Generation II 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 improved.

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.

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