

Instructions Created by an:



**Automotive
Service
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MASTER AUTO TECHNICIAN



Suzuki Samurai, Sidekick, X90 Geo Tracker Off Road Universal Joint (SKU# SAX-UJOR)

Instructions also apply to: SKU# SAX-UJOE, SDT-FY-9095, SAX-SY, STM-SL

Revised 6-30-14

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.com and click on the "INSTRUCTIONS" tab.

Suggested Tools:

- Twin Post Lift (or Floor Jack and 4 Jack Stands)
- Standard Socket: 24 mm, 12 point, 1/2" Drive
- Deep Socket: 17 mm, 3/8 Drive
- Combination Wrench: 8mm
- Snap-ring pliers
- Dead Blow Hammer
- Brass Hammer (optional)
- Small Sledge Hammer
- Flat Nose Cold Chisel
- 1/8" Tapered Punch
- Channel Lock Pliers
- Bench Vice with an Anvil
- Needle Nose Pliers

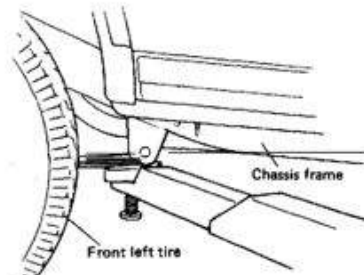
Lifting and Supporting the Vehicle



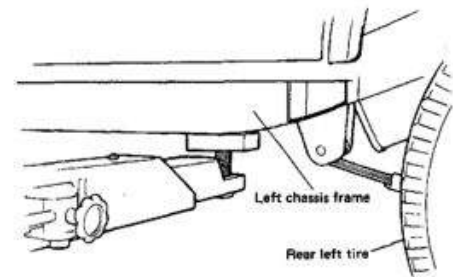
Lifting Option 1

Lift and support the vehicle on a twin post lift.

CAUTION: Always follow the safety guidelines associated with the lift you are using.



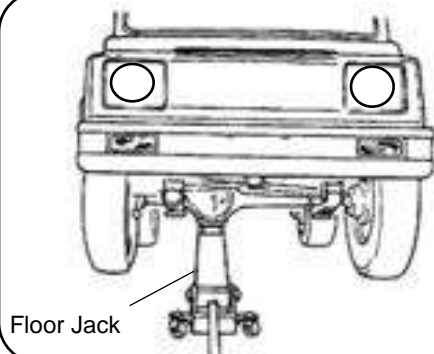
Front Support Location



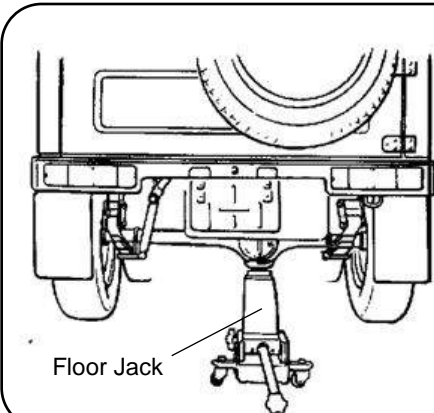
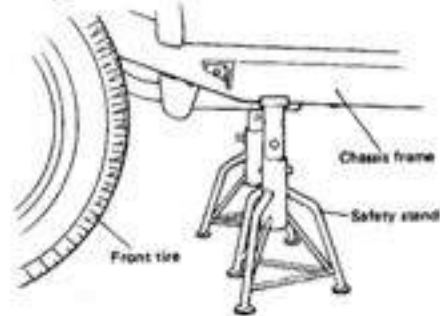
Rear Support Location

Lifting Option 2

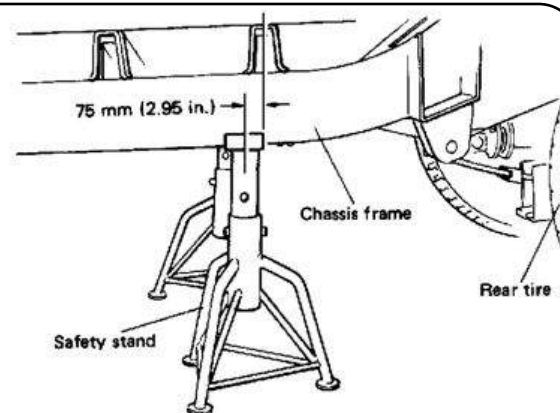
We used a twin post lift for these instructions, but this job could also be done with a floor jack and (4) safety stands.



Front



Rear



Important Notices

Note 1

There are many methods to change universal joints. The one shown here is one of several used by our Low Range Technicians. You may follow these instructions exactly as shown or adapt according to your individual needs, tools and skills.

Note 2

We will be replacing a Suzuki Transmission Slip Yoke which includes the replacing of a universal joint. Though these instructions are written for the Suzuki Samurai they can easily be adapted to the Sidekick, Geo Tracker, Vitara, Grand Vitara, Jimny, SJ410 and X90. The universal joints are exactly the same.

Removing the Drive Shaft



Step 1

Remove the input driveline by removing the (4) bolts using (2) 12 mm box end wrenches.



Step 2

Once the driveline is disconnected from the transfer case, let it drop down and pull it out of the transmission. The transmission end of the drive shaft has a slip yoke (**See Figure A**) that allows it to be remove with little effort.

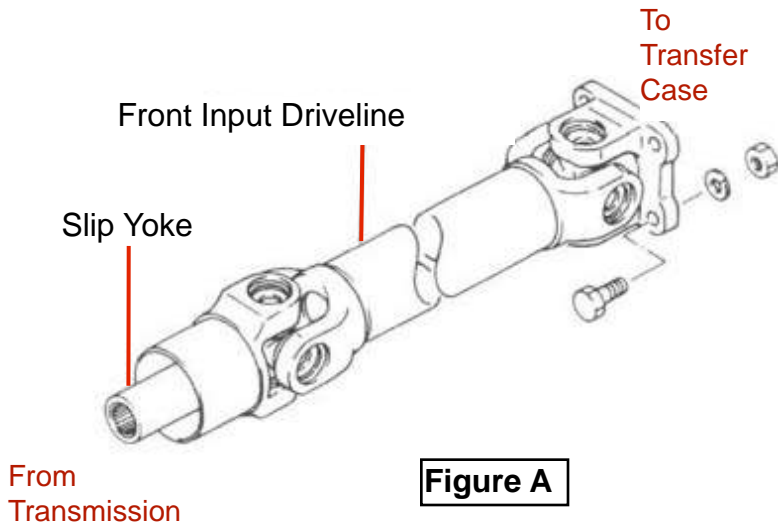
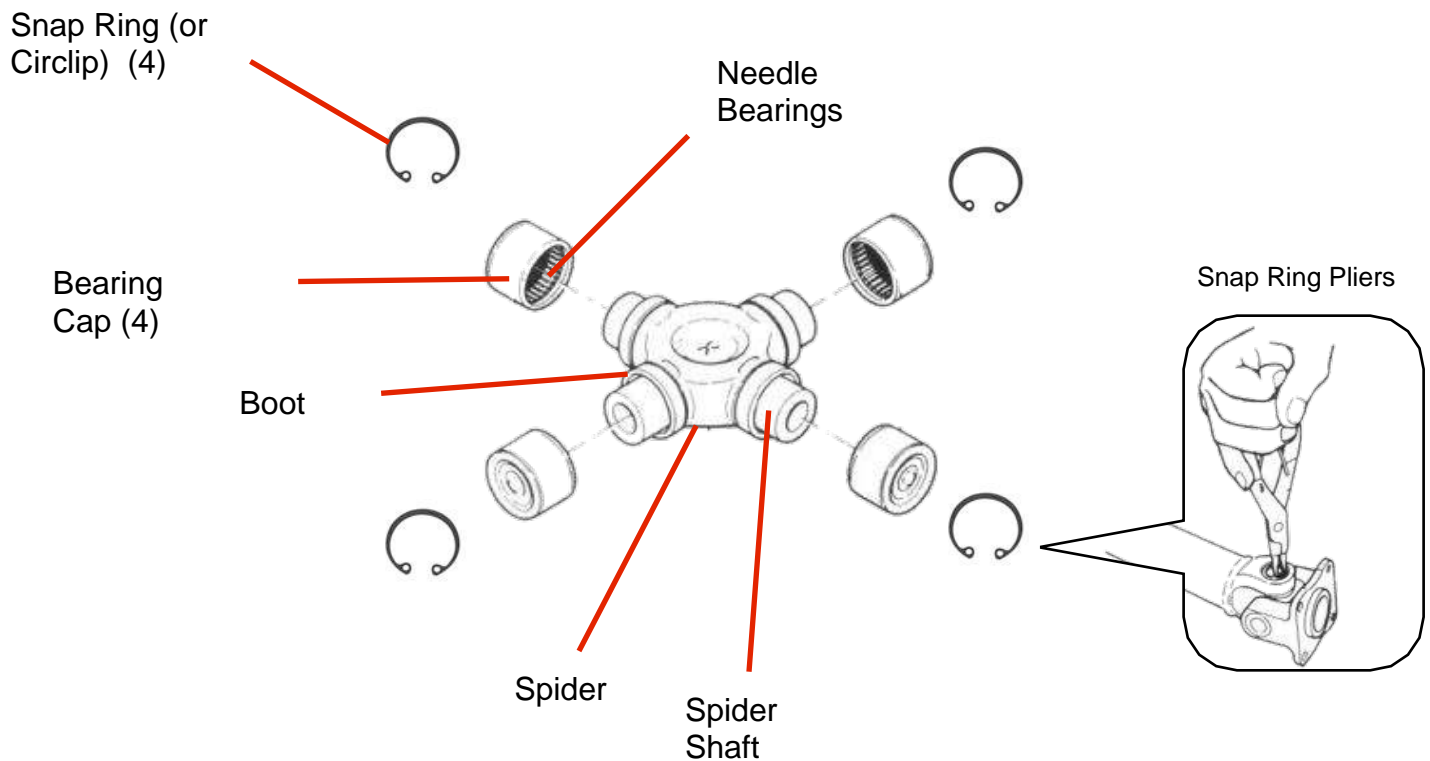


Figure A



Step 2 Continued

This picture shows the driveline being removed.



Removing the Universal Joint



Step 3

Place the drive shaft on a work bench.



Step 4

Break the first snap ring loose by striking it with a flat nosed cold chisel and hammer. First, one end



Step 5

. . . . and then the other.



Tech Tip 5

This shows the positioning of the cold chisel against the snap ring when breaking it loose.



Step 6

To make the snap rings easier to remove, strike the bearing cap (NOT the snap ring) with a flat nose cold chisel and a hammer.



Step 7

Position the snap ring pliers in the two holes and squeeze them together.

Note: If the OEM universal joint has been replaced, there may be a different style snap ring. If you have this type snap ring, simply use needle nose pliers to squeeze the two ends together.



Step 8

Remove the snap ring.



Step 9

Repeat Steps 4 through 7 on the other 3 bearing caps.



Step 10

Open the vice just wide enough to allow the slip yoke to fit loosely between the jaws. Then strike the yoke with a dead blow hammer as shown. It may take several licks. Continue until the bearing cap has been moved up, flush with the yoke housing.



Tech Tip 10

This shows the bearing cap flush (or level) with the yoke.



Step 11

Using a brass hammer, strike the slip yoke exposing more of the bearing cap.

Caution: Do NOT strike the bearing cap.



Step 12

Continue striking the yoke until the bearing cap is about 1/4" above the yoke.



Tech Tip 12 A

Place a 24mm 12point socket over the bearing cap and . . .

Caution: Be sure the socket fits over the bearing cap.



Tech Tip 12 B

. . . strike the socket with the dead blow hammer until the bearing cap is as high as it will come.



Step 13

Rotate the drive shaft 180° and place it back between the vice jaws.



Step 14

Strike the yoke with a dead blow hammer until the bearing cap is flush with the yoke, just as before.



Step 15

Strike the yoke with a brass hammer exposing more of the bearing cap.



Step 16

Place the 24mm 12 point socket over the bearing cap and hit it with the dead blow hammer until the bearing cap is as high as it will come.



Step 17

Remove one bearing cap using channel lock pliers.



Step 18

Remove the transmission slip yoke.



Step 19

Place the yoke in the vice as shown and drive the second bearing cap out using a hammer and tapered punch.

Caution: Clamping the yoke with too much force could alter the shape of the hole and not allow the new bearing cap to fit properly.



Step 20

Place the U-joint spider in the vice with the spider shafts resting on the vice jaws as shown.



Step 21

Strike the yoke with a dead blow (or brass) hammer, causing more of the bearing cap to be exposed.



Step 22

Continue hitting the yoke until the bearing cap is as high as it will go.



Step 23

Turn the drive shaft over 180° and rest it back in the vice with the spider shafts resting on the vice jaws as shown.



Step 24

Strike the yoke until the bearing cap is as high as it will come.



Step 25

Remove the drive shaft from the vice.



Step 26

Remove the first bearing cap by clamping it in the vice and twisting and pulling up on the drive shaft.

Note: This could be done with channel lock pliers.



Step 27

Rotate the drive shaft 180° and repeat the previous step on the other bearing cap. Then remove the universal spider from the drive shaft.

Preparing the for Universal Joint Installation.



Step 28

Clean any grease and debris from the (4) bearing cap areas of both yokes.

Step 29

Clean any rust or burs from the (4) bearing cap areas using 400 grit emery cloth or equivalent.

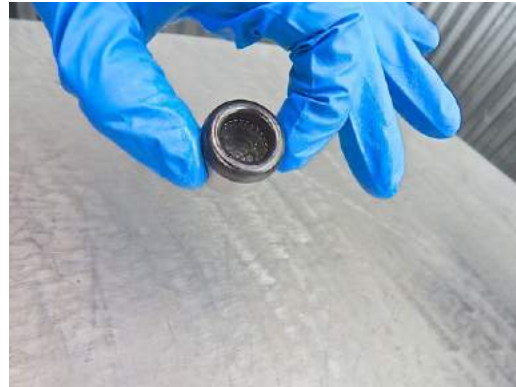


Step 30

Clean any rust, grease or debris from the (4) snap ring grooves using a small standard screwdriver or pick tool.



Universal Joint Installation



Step 31

Remove and inspect all 4 of the new bearing caps. Be sure all of the roller bearings are positioned properly and that they have some grease on them. Replace the caps.

Tech Tip 31 A

One of the most common mistakes in replacing universal joints is attempting to install a bearing cap with one or more of the roller bearings out of place. These bearings are typically held into place with bearing grease. ALWAYS check each bearing cap to insure that ALL the roller bearings are in place before installing a universal joint.



Tech Tip 31 B

If one or more roller bearings have fallen out of place, reposition it using a small standard screwdriver. If needed, you could also add a little wheel bearing grease to help keep the rollers in place during the universal joint installation process.

Tech Tip 31 C

Even new bearing caps, fresh out of the box, can have a roller bearing out of place. If this cap were to be installed with just one roller out of place you would not be able to install the snap rings and even if you could, the universal joint would not be centered, resulting in a serious drive shaft vibration.





Step 32

Remove 2 of the bearing caps and set them aside.

Caution: Keep the bearing area as clean as possible during installation. Allowing dirt and debris to enter the bearing area can greatly reduce the life of a universal joint.



Step 33

Press one of the bearing caps into the drive shaft yoke as shown. Push it in as far as you can by hand.

Caution: Do not pound on the bearing cap at this point. Pounding on the bearing cap will likely cause the rollers to fall out of place.



Step 24

Place the cap-less spider shaft in to the yoke as shown.



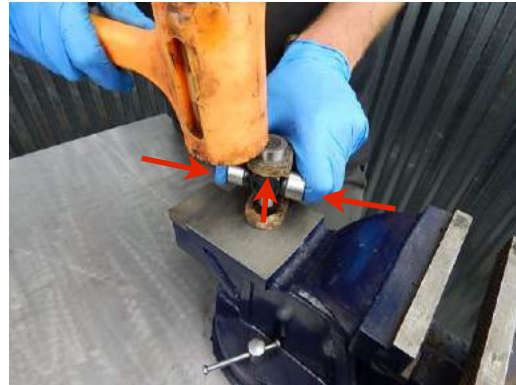
Step 35

Place the other cap-less spider shaft inside the bearing cap as shown.



Tech Tip 36

Be sure the spider shaft is engaged in the cap enough to keep the rollers from falling out of the cap. Also, be sure to hold the other two (top and bottom shown here) caps secure on the spider.



Step 37

Now rotate the drive shaft such that the bearing cap is up and set it on the vice anvil or solid work bench.

Caution: Be sure to keep the universal joint secure (upward) in the bearing cap so as not to allow any roller bearings to fall out of place. Also, hold the other two bearing caps in place as well.



Step 38

While doing everything described in the previous step, pound the bearing cap into place with a dead blow hammer. It should be flush with the yoke at this point.

Step 39

Rotate the drive shaft 180°. Hold the universal joint upward and place the second bearing cap into the yoke from the bottom.

Caution: Do not let the universal spider drop down and risk letting the roller bearings drop out.



Step 40

Press the bearing cap in as far as you can by hand.



Step 41

Keeping the universal joint somewhat centered between the two caps, set the yoke on the vice anvil or workbench.

Note: You may need to have an assistant hold the drive shaft at this point.



Step 42

Keeping the universal joint centered between the two bearing caps, pound the bearing cap into place using a dead blow hammer.

Note: Both Bearing caps should now be flush with the yoke.



Step 43

Continue driving the bearing cap into place using a 17mm deep socket and a dead blow hammer.



Step 44

Continue driving the bearing cap into the yoke until you can install a new snap ring.



Tech Tip 44

It is a good idea to drive the bearing cap a little farther than needed at this point. This will make the snap ring easier to install.



Step 45

Install a new snap ring using needle nose pliers.

Note: If you have snap rings with holes in them (like the OEM snap rings) simply use snap ring pliers.



Step 46

Turn the drive shaft 180°, rest it on the vice anvil and drive the second bearing cap into place. This will take a bit more force than before because you are driving two bearing caps at once.



Step 47

Continue driving the bearing cap until there is enough room to install the second snap ring.



Step 48

Install the second snap ring.



Tech Tip 48 A

The second snap ring may be difficult to install. There may not be enough of the groove exposed to fit the snap ring. There are a couple of things you can try. One option is to place the 17 mm socket on top of the snap ring and hit the socket with a dead blow hammer.



Tech Tip 48 B

Another option you can try is to place a flat nose chisel on the bearing cap (NOT the snap ring) and hit the chisel with a hammer.

Caution: Do not place the chisel against the snap ring. It could deform it making it unusable.



Step 49

Once the snap ring is in place we recommend seating it with a flat nose chisel as shown. This simply ensures the snap rings are secured properly and will not come out.



Step 50

Remove and inspect the remaining (2) bearing caps. Be sure the rollers are still in place.



Step 51

Place one of the bearing caps in the slip yoke as shown. Push it in as far as it will go by hand.



Tech Tip 51

Be sure the roller bearings are still in place.



Step 52

Place the universal joint in the bearing cap as shown.



Step 53

Press the slip yoke onto the bearing cap by pound the slip yoke using a dead blow hammer as shown.

Caution: To keep the roller bearings in place, be sure to push down on the drive shaft (and spider) during this process.



Step 54

Once the bearing cap is flush with the yoke, as shown here, move to the next step.



Step 55

Place the last bearing cap on the vice anvil and keeping the spider shaft upward to keep the needle bearings in place, lower the slip yoke into place over the bearing cap as shown.



Step 56

Once the bearing cap is in place



Step 57

. . . . drive the yoke on to the bearing cap using a dead blow hammer.

Caution: It is vitally important to keep the spider equally distributed between both bearing caps in order to prevent the roller bearings from falling out of place.



Step 58

Continue driving the slip yoke down until the bearing cap is flush with the yoke.



Step 59

Rotate the drive shaft 180° and place it on the bench vice anvil. Using a 17 mm deep socket and a dead blow hammer, drive the bearing cap down until the snap ring groove is completely exposed.



Step 60

Install the 3rd snap ring using needle nose pliers.



Step 61

Rotate the drive shaft 180°, set it on the anvil and drive the last bearing cap into place using a 17mm deep socket and a dead blow hammer.



Step 62

Install the last snap ring. You may need to use the Tech Tips shown before (Tech Tip 48A and 48B) to get this last snap ring into place.



Tech Tip 62 B

Move the universal joint throughout its full range. It should move smoothly with out binding. If it is smooth in every direction skip to Step 66. If it is binding at any point continue to the next step.

Reducing Universal Joint Binding



Step 63

Place the drive shaft in the vice jaws (jaws loose) as shown. Strike the yoke with a dead blow hammer. This will move the bearing cap tight against the snap ring and allow for maximum clearance between the bearing cap and the universal spider.



Step 64

Repeat the previous step on the remaining (3) bearing caps.



Step 65

If the new universal joint has a grease fitting, install it using an 8mm open end wrench.

Tech Tip 65 A

There have been times when the grease fitting will not fit down between the snap ring ends. If this happens, install an OEM style snap ring on the bearing cap that has the grease fitting in it and a second OEM Style snap ring on the opposite (180°) bearing cap. Just remember, If you use one OEM style snap ring, you must use the same style on the opposite side to keep the universal joint centered in the yoke.



Reinstalling the Drive Shaft



Step 66

Apply some 80W90 gear oil to the slip yoke to lubricate the transmission seal and install the slip yoke into the transmission.



Step 67

Position the rear of the drive shaft with the transfer case and install the bolts, lock washers and nuts. Gradually tighten them in a criss-cross pattern until an estimated 17–21.5 ft. lbs. is reached.



Congratulations!

You have successfully installed a universal joint. 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.

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