

Instructions Created by an:



**Automotive
Service
Excellence**
MASTER AUTO TECHNICIAN



Samurai Updated Transfer Case Front Output Shaft (SKU# STC-UO)

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:

- Brake Cleaner
- Scotch-Brite Pad (or Fine Emory Cloth)
- Twin Post Lift (or Floor Jack and 4 Jack stands)
- (2) 12 mm Box End Wrenches
- 3/8" Drive Deep Socket: 12mm
- 3/8" Drive Torque Wrench
- 1/2" Drive Torque Wrench
- 1/2" Drive Sockets: 12, 24 & 27mm
- Impact Wrench, 1/2" drive (Optional)
- 1/2" Drive Impact Socket: 27mm (Optional)
- Dead Blow Hammer
- Small Sledge Hammer
- Gear Puller- 3 Jaw (2 Jaw Would Work)
- Socket and Ratchet to fit Gear Puller
- Seal Puller (or Larger Standard Screwdriver)
- Wheel Bearing Grease
- Square Nose Cold Chisel (or Punch)
- Bearing Grease
- 80 W 90 Gear Oil
- Magnetic Pickup Tool (Magnet on a stick)

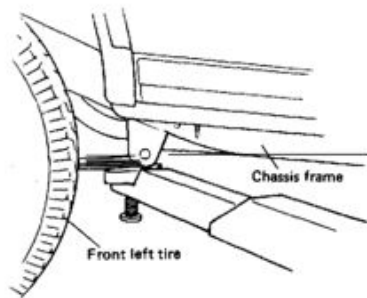
Lifting and Supporting the Vehicle



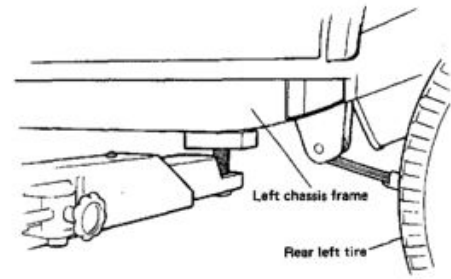
Lifting Option 1

Lift and support the vehicle on a twin post lift.

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



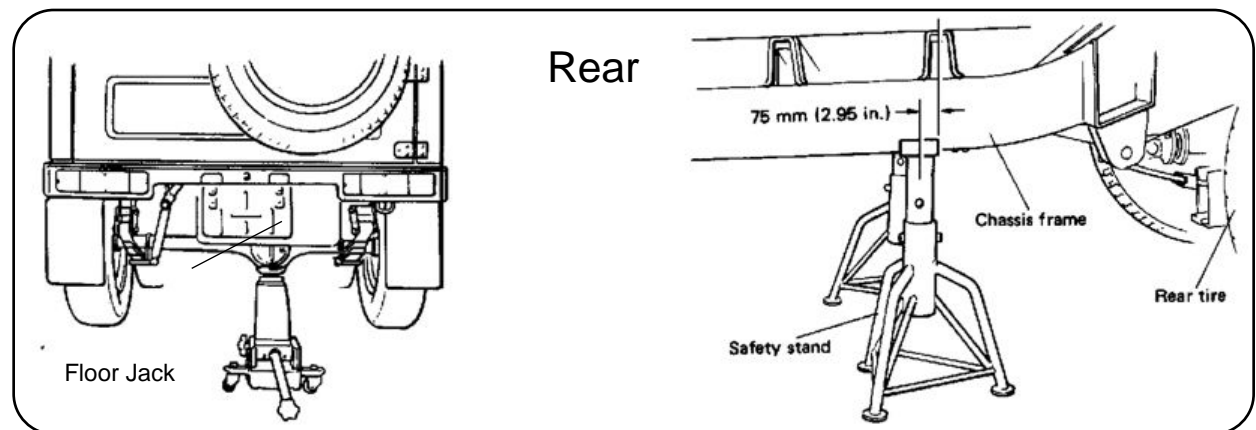
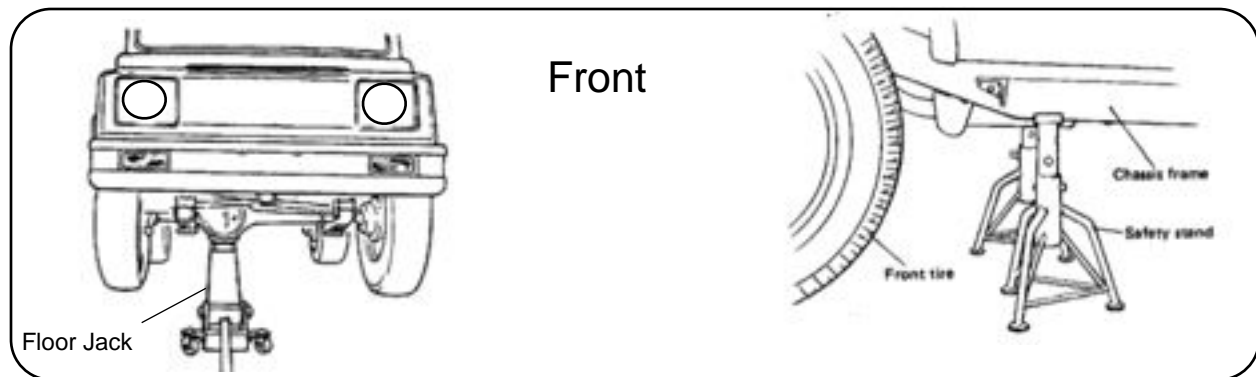
Front Support Location



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.





Tech Tip

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

Step 1

Position a drain pan under the transfer case.

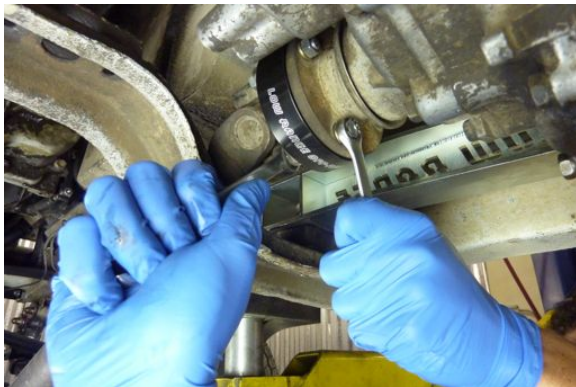
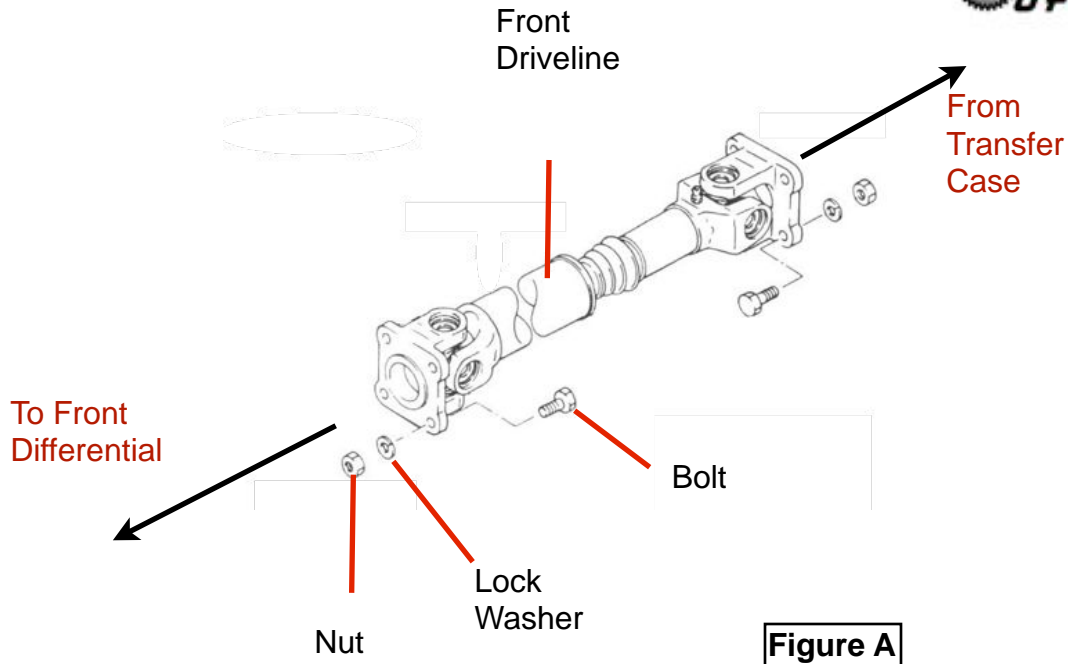


Step 2

Remove the drain plug using a 24mm socket. After the oil has drained reinstall the drain plug and tighten 13.5 to 20 ft. lbs.



Removing The Drive Shaft



Step 3

Disconnect the front drive shaft at the transfer case by removing all 4 bolts using two 12mm box end wrenches. (See Figure A)

Note: It is helpful to place the transfer case shifter in "2H" position so you can rotate the shaft allowing easier access to the remaining bolts.



Step 4

Disconnect the other end of the drive shaft by removing the (4) bolts using two 12 mm box end wrenches.





Step 5

It may be necessary to tap the drive shaft using a hammer to jar it free from the differential flange.

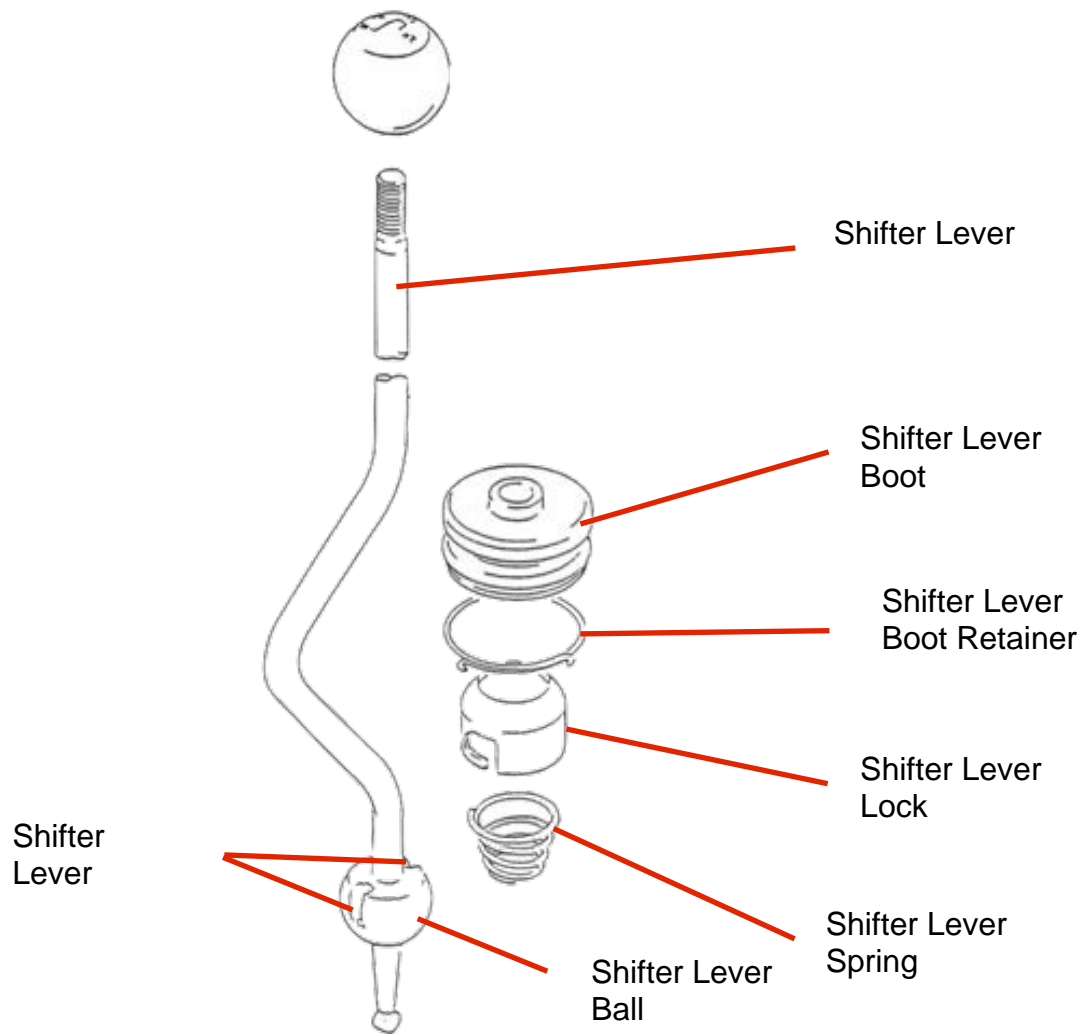


Step 6

Remove the drive shaft and set it aside.



Shifter Parts



Disconnecting The Shifter



Step 7

Release the boot retainer by pushing the 2 tabs together and slide the boot up the shifter lever.



Step 8

Disconnect the shifter lever by depressing the shifter retainer and turning it counter clockwise. (See Figure B)

Figure B

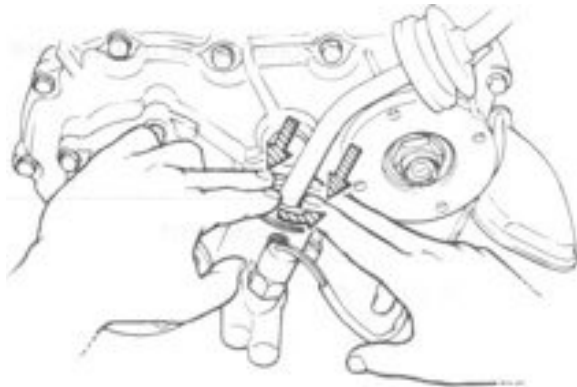


Illustration showing shift lever guide removal procedure.



Step 9

Disconnect the shifter lever from the transfer case by pulling up on the shifter lever.



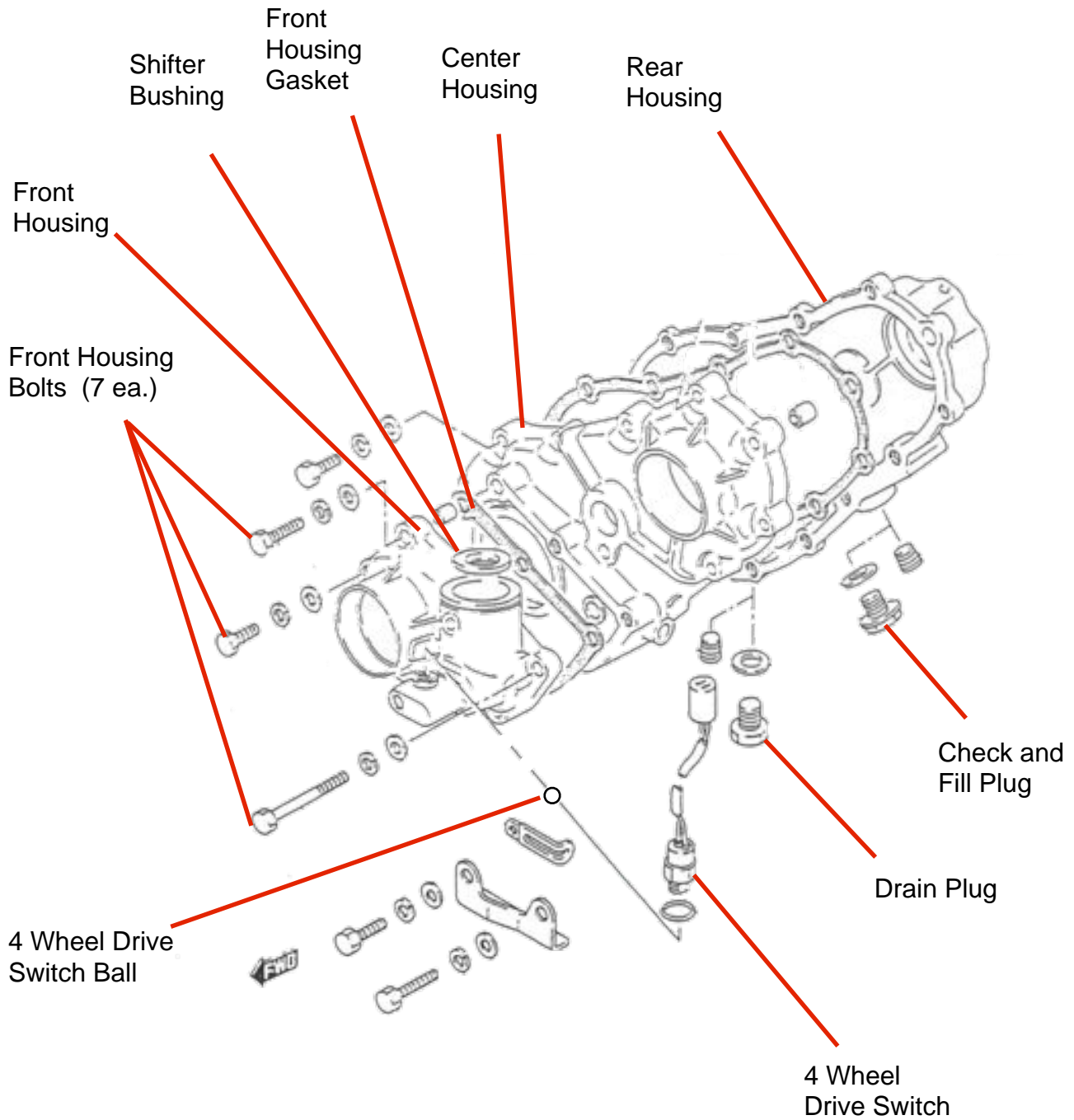


Step 10

Position the shifter lever up out of the way as shown here.



Transfer Case Parts



Removing the 4Wheel Drive Indicator Switch Assembly



Step 11

Disconnect the 4wheel drive indicator wire. Simply lift **UP** on the tab and pull the connector halves apart.



Step 12

Remove the 4Wheel drive indicator switch using a 21mm open (or adjustable) end wrench.



Step 13

Remove the four wheel drive switch ball using a small magnet pickup tool or small magnetic screwdriver.

Caution: Failure to remove this ball at this point in the procedures may result in loosing the ball down inside the transfer case when the front housing is removed.

Removing the Front Housing



Step 14

Place the transfer case in 4H and remove the front output flange nut using a 27mm socket and breaker bar. Be sure to turn the nut in a counter clockwise direction.

Note: It may be necessary to hit the breaker bar with a hammer to get the nut to break loose.

Tech Tip 14

If you have a 1/2" drive impact wrench (electric or pneumatic) and a 27mm impact socket, this works very well.



Step 15

Remove the output flange nut.

Step 16

Remove the output flange washer.





Step 17

Remove the (7) front housing bolts using a 12mm box end wrench or socket.

Note: There are 3 different length bolts holding this housing on. Be sure to note their location so they can be reinstalled in the correct locations.



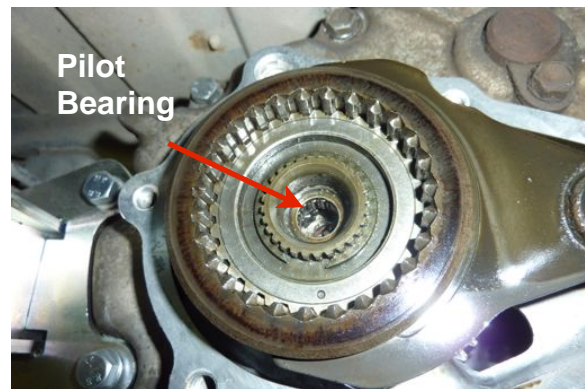
Step 18

Jar the front output housing loose by tapping it with a dead blow hammer on the tab as shown here.



Step 19

Remove the front housing and set it aside.



Step 20

Inspect the output shaft pilot bearing. If it is scored, discolored (blue or brown) or has cage damage it should be replaced.

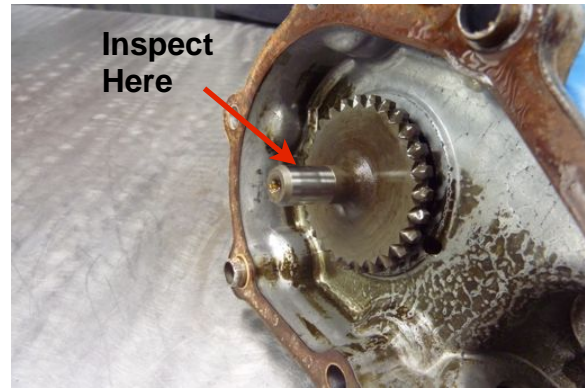
Click [HERE](#) for this bearing and many other transfer case parts.





Step 21

Inspect the output shaft bearing by rotating output shaft and flange. It should turn smoothly with no binding. It should not allow the shaft to move up and down or in and out. If any problems including looseness is felt, the bearing will need replacing. We will show you when and how this is done later.

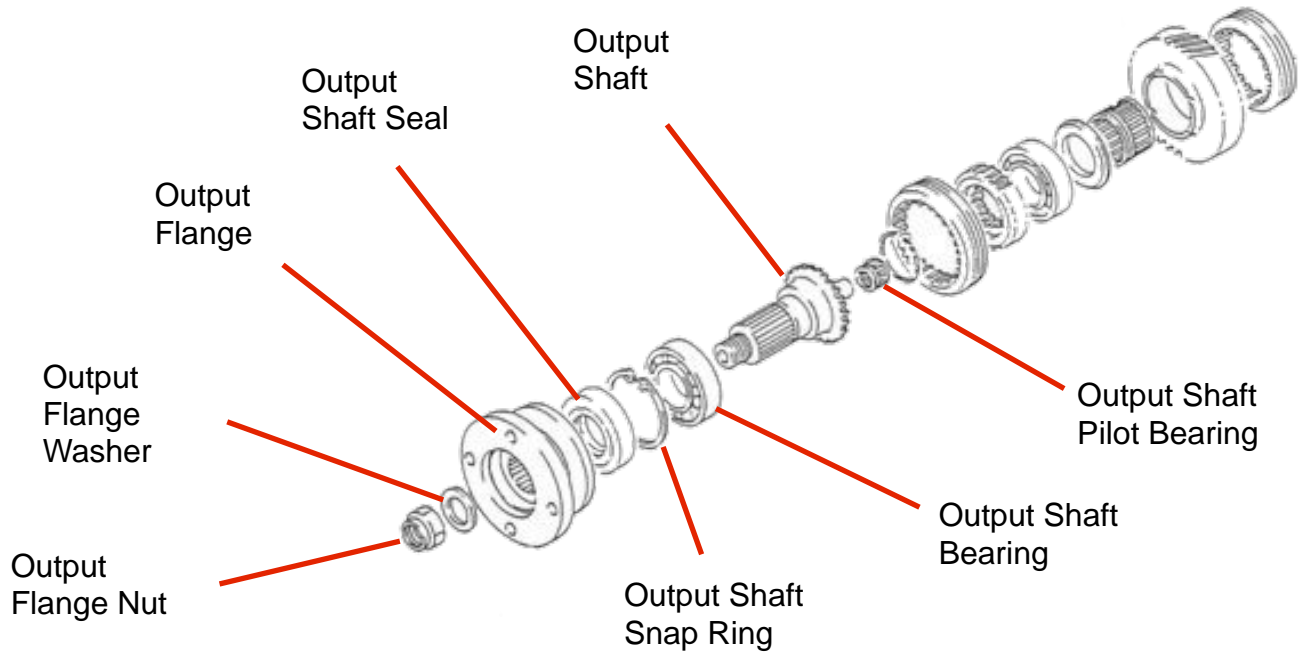


Step 22

Inspect the part of the output shaft that fit inside the pilot bearing. Even though we will be replacing this shaft, if the old shaft (shown here) has discoloration, scoring or wear of any kind you should replace the pilot bearing along with the output shaft.



Front Output Shaft Parts





Step 23

Remove the front housing gasket. This gasket will need to be replaced. It is a specified thickness that maintains specified tolerances inside the transfer case and should not be substituted with silicone gasket maker or sealer of any kind.

Click [HERE](#) for this gasket and many other transfer case parts.



Step 24

Inspect the front output housing where the shifter rods are positioned. If there is excessive wear, the front output housing will need replacing.



Step 25

Remove the output flange by striking it with a dead blow (or brass) hammer as shown. If this method is unsuccessful, see the next step.



Step 26

Skip this step if the flange came off in the previous step. If the flange did not come off in the previous step you will need to use a three jaw puller as shown here.





Step 27

Remove the flange.



Step 28

Inspect the flange seal surface for grooving.

Note: If you can feel a groove with your finger nail you may need to replace this part.



Tech Tip 28 A

Some flange seal surfaces can be improved by cleaning them with a Scotch Bright pad.



Tech Tip 28 B

This is the hub sealing surface after being cleaned with a Scotch Bright pad. Notice the groove is no longer visible. (See Step 28) This flange is reusable.

Removing the Front Output Shaft



Step 29

Support the front housing in one hand and strike sharply the front output shaft with a dead blow hammer. It will take several sharp blows to remove the shaft.

Tech Tip 29

If the output shaft will not come out using a dead blow hammer, it may be necessary to use a small sledge hammer. This is okay here because we are replacing the shaft. You would not want to strike this shaft with a hard hammer if you wanted to reuse the shaft. Using a hard hammer damages the threads and the flange nut will not reinstall.

Caution: Be sure to wear Safety Glasses.



Step 30

Continue pounding until the shaft comes out of the housing.

Step 31

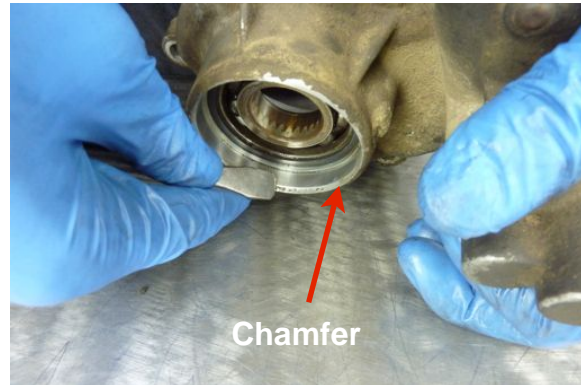
Remove the output shaft seal using a seal puller or large standard screwdriver.





Step 32

If the bearing is good, skip this step. If the bearing was determined to be bad now is the time to replace it. Remove the snap ring, press the bearing out in the direction of the snap ring groove, press in the new bearing and reinstall the snap ring. When pressing in a new bearing be sure to press against the outside bearing race.



Step 33

Clean the seal chamfered surface using a standard screwdriver (or putty knife) to make sure the seal slides into place easily.

Caution: Do not gouge the aluminum.



Installing the Front Output Seal



Step 34

Position the new seal as shown.

Note: This seal is not supplied with the front output shaft. Click [HERE](#) for this seal and many other transfer case parts.

Tech Tip 34

The garter spring goes down (or toward the fluid being sealed).



Step 35

Tap the seal into place using a hammer.

Note: The seal must be driven in evenly. It may be helpful to use a socket that is a little smaller than the outside diameter of the seal. Place the socket on the seal and tap the socket driving the seal into place.

Tech Tip 35

The seal is properly installed when it is just below the chamfer.



Installing the Front Output Shaft



Step 36

Clean the output shaft using a good degreasing solvent such as brake cleaner or something similar.



Step 37

Place the front output shaft through the bearing as shown here.



Step 38

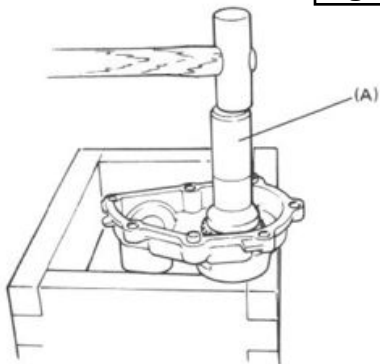
Place an 18 mm standard socket over the shaft to protect it and support the front housing in your hand



Step 39

. . . then strike the socket sharply, using a dead blow hammer, driving the input shaft into the bearing. Continue striking the socket (and shaft) until the shaft is seated all the way into the bearing.

Figure C



Bearing installer (A) : (09913-76010)



Tech Tip 39 A

The Suzuki Samurai service manual recommends what is shown above as an alternative way of installing the front output shaft into the bearing. You could substitute tool (A) with a 1/2" driver 18 mm standard socket. (See Figure C)

Tech Tip 39 B

Using a flash light, look down between the teeth and the front housing to see that the shaft is all the way in.



Installing the Shifter Bushing



Step 40

Remove and inspect the shifter bushing. It should be pliable and not cracked, hardened or damaged in any way. If it is damaged it should be replaced. For a replacement part click [HERE](#). If the shifter bushing is in good shape, reinstall it.



Important Notice: Even if the shifter bushing appears to be in good shape, we recommend replacing it with one of our upgraded Nylatron shifter bushings. Especially, if you are experiencing looseness in your transfer case shifter. This looseness is common in many Suzuki Samurais. This newly designed part is guaranteed to solve part, and perhaps even all the loose shifter problem.

Installing the LROR Nylatron Shifter Bushing

If you are not replacing the shifter bushing skip to the next section.



Step 41

Wipe the shifter bushing area clean.

Note: To see a YouTube Video of how to install this shifter bushing click [HERE](#). Or you could continue to the next step.



Step 42

Turn the bushing upside-down, align the (2) grooves in the bushing with the (2) pins in the housing and install the bushing on the pins.





Step 43

Rotate the bushing, using the pins as a pivot, 180° or until the bushing drops into place.



Tech Tip 43

This shows the shifter bushing properly installed.



Installing the Front Output Flange



Step 44

Apply some grease to the seal surface of the flange.

Note: This is to lubricate the seal.



Step 45

Install the flange on the output shaft.



Step 46

Leave the washer and nut off for now.

Installing the Shifter Lever



Step 47

Clean and inspect the shifter ball. It should be uniformly rounded with no flat spots or scoring.

Step 47 Continued

The sides of both grooves should be straight with no wear. If wear is observed the shifter lever should be replaced.

Note: Some have found success with filing the groove and getting it close to its original shape. This can only be done if the damage is minor.



Step 48

If the shifter is being reused, clean the ball area with a Scotch Bright pad or some very fine emery cloth.

Step 49

Push the shifter back up out of the way for now.

Installing the Front Housing



Step 50

Wipe the mating surface of the center housing with a cloth. Be sure this area is free of any dirt, grit, old gasket, gasket sealer, etc.

Step 51

Place a small amount of wheel bearing grease on the pilot bearing surface of the output shaft.



Step 52

Place a new gasket on the front housing. Insure that the gasket is aligned with the (2) alignment pins and that the holes in the gasket align with the holes in the housing.

Step 53

Install the front housing on the middle housing. Be sure the shifter rods are properly positioned in the support holes and that the output shaft fits into pilot bearing.



Step 54

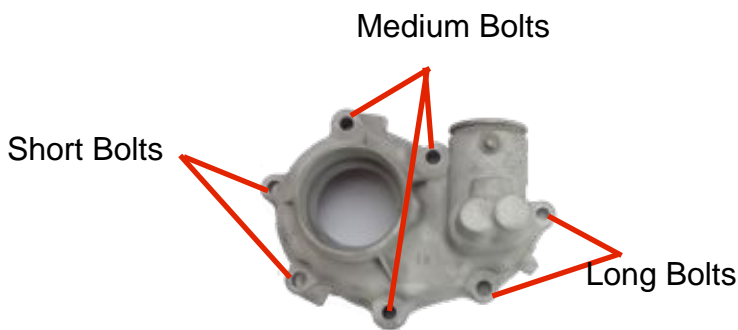
Continue installing the front housing until it fits against the center housing. There should be no gap between the housings.

Caution: Do **NOT** force these two parts together. If they do not go together easily, remove the front housing and check for obstructions.



Step 55

Install and hand tighten the (7) front housing bolts making sure the bolts are located in their original locations. (See Next Tech Tip)



Tech Tip 55

Bolt length placement.



Step 56

Torque the bolts in an increasingly tighter criss-cross pattern until 9.5 to 16.5 ft. lbs. is reached.



Installing the 4Wheel Drive Indicator Assembly



Step 57

Install the 4Wheel drive indicator ball.



Step 58

Install and tighten the 4Wheel drive indicator switch.



Step 59

Plug in the 4Wheel drive indicator connector.

Note 1: Push the coupler halves together until they snap onto place.

Note 2: Be sure the wires are routed properly and secure.



Installing the Shifter Lever



Step 60

Install the shifter lever. Be sure to align the grooves of the ball with the pins in the housing and the lower shift lever with the shifting rods.

Note: It may take a bit of work to get the lever to align with the shifter rods. Be patient but persistent. It will go into place.



Step 61

Slide the spring down into place and position the shift lever retainer grooves with the pins inside the front housing and . . .

Step 62

. . . press down on the shift lever retainer and lock it into place by rotating it clockwise.





Step 63

Slide the boot back into place.



Step 64

Reposition the boot retainer.



Step 65

Place the shifter in 4H.

Note: This is done so the flange nut can be torqued more easily.



Installing the Front Drive Shaft Assembly



Step 66

Install the washer and flange nut.

Note: We recommend using a new flange nut if possible. Click [HERE](#) to purchase a new flange nut from Low Range Off-Road.



Step 67

Torque the flange nut 80 to 108 ft. lbs.



Step 68

Stake the nut collar using a hammer and punch in 2 locations.



Tech Tip 68

Flange nut properly staked.



Step 69

Position the front of the drive shaft on the front differential flange and install the (4) bolts, lock washers, and nuts. Tighten the nuts 17 to 21.5 ft. lbs.



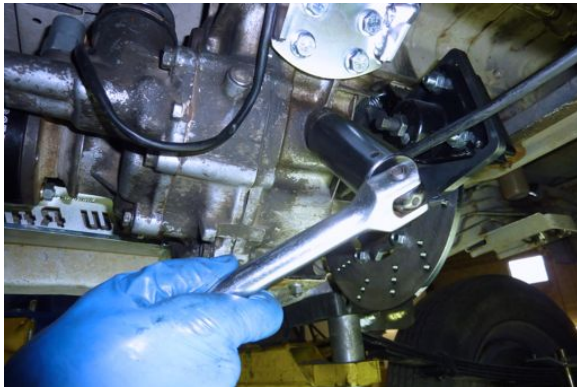
Step 70

Connect the other end of the drive shaft to the transfer case output flange. Tighten the nuts 17 to 21.5 ft. lbs.

Note: Be sure to reinstall the drive line spacer if removed earlier.



Refilling and Final Testing



Step 71

Remove the check and fill plug using a 27mm socket

Note: Be sure the DRAIN plug is installed and tight.

Step 72

Add 80W90 Gear Oil until fluid begins to run out; and quickly reinstall the plug. Tighten the plug 13.5 to 20 ft. lbs. (See Figure D for refill capacity)

Transfer Case Oil

Oil capacity	0.8 liters (1.7/1.4 US/lmp. pt.)
Type of oil	Gear oil SAE 80W-90, 75W-80 or 75W-90

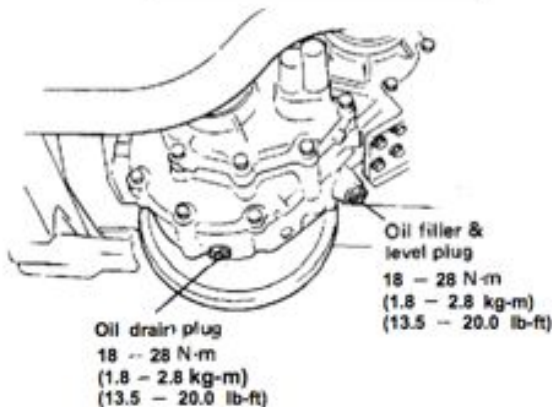


Figure D

Step 73

Shift the transfer case into all positions to insure smooth operation.



Congratulations!

You have successfully installed a front output shaft on a Suzuki Samurai transfer case. We sincerely hope these instructions have been helpful. If you have suggestions on how we could improve our instructions or products please email us at sales@lowranceoffroad.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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