

Last Modified: 3-27-2012	6.4 T	From: 201203
Model Year: 2013	Model: FR-S	Doc ID: RM000003FRR00HX
Title: DRIVE SHAFT / PROPELLER SHAFT: DRIVE SHAFT SYSTEM: PROBLEM SYMPTOMS TABLE (2013 FR-S)		

PROBLEM SYMPTOMS TABLE

HINT:

Use the table below to help determine the cause of problem symptoms. If multiple suspected areas are listed, the potential causes of the symptoms are listed in order of probability in the "Suspected Area" column of the table. Check each symptom by checking the suspected areas in the order they are listed. Replace parts as necessary.

Drive Shaft System

SYMPTOM	SUSPECTED AREA	SEE PAGE
Rear wheel shimmy	Rear drive shaft (worm)	INFO

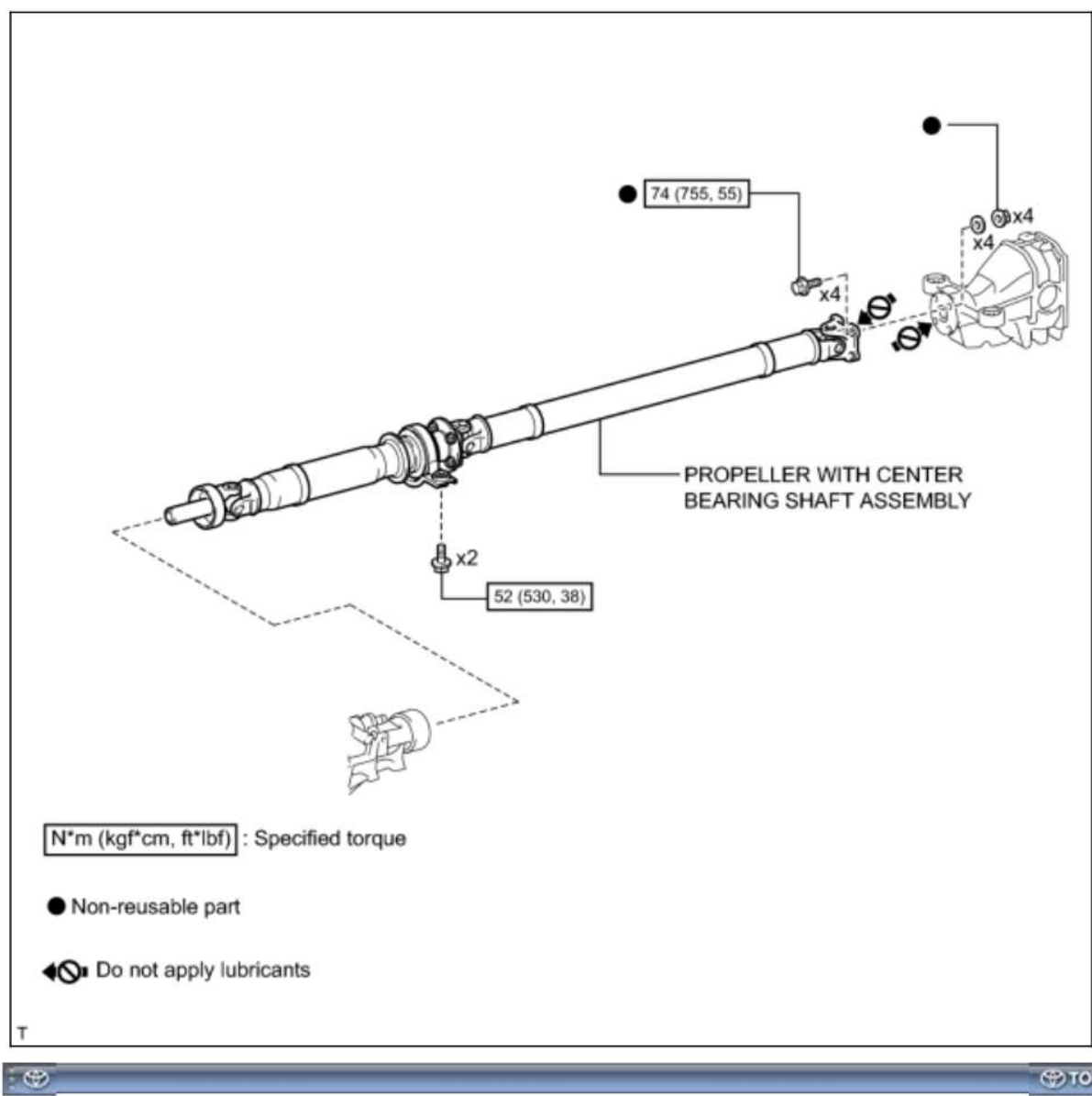


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Last Modified: 3-27-2012	6.4 K	From: 201203
Model Year: 2013	Model: FR-S	Doc ID: RM000004198009X
Title: DRIVE SHAFT / PROPELLER SHAFT: PROPELLER SHAFT ASSEMBLY: COMPONENTS (2013 FR-S)		

COMPONENTS

ILLUSTRATION

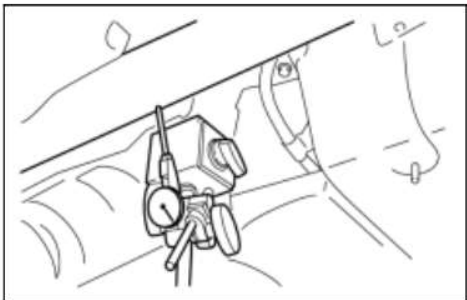


Last Modified: 3-27-2012	6.4 G	From: 201203
Model Year: 2013	Model: FR-S	Doc ID: RM000001PKS00PX
Title: DRIVE SHAFT / PROPELLER SHAFT: PROPELLER SHAFT ASSEMBLY: INSPECTION (2013 FR-S)		

INSPECTION

1. INSPECT PROPELLER WITH CENTER BEARING SHAFT ASSEMBLY

(a) Set the dial indicator so that the dial indicator measurement probe is centered on the propeller shaft with center bearing shaft assembly.



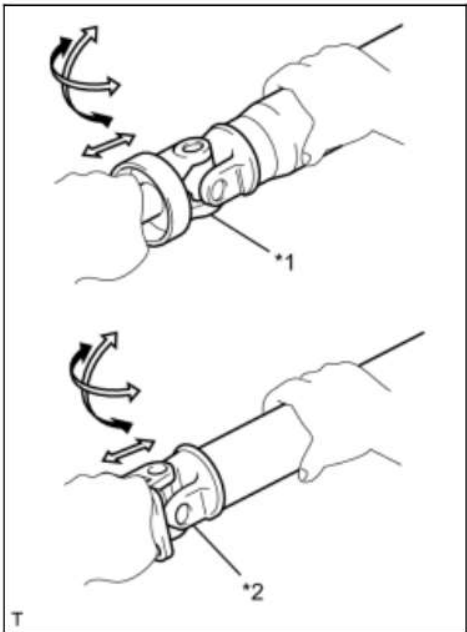
(b) Lightly turn the propeller shaft with center bearing shaft assembly by hand, and measure the deflection.

Maximum runout:
0.6 mm (0.0236 in.)

NOTICE:
The dial indicator must be placed so that it is perpendicular to the propeller shaft with center bearing shaft assembly at the center of the shaft.

If the shaft runout is more than the maximum, replace the propeller shaft with center bearing shaft assembly.

2. INSPECT SPIDER BEARING



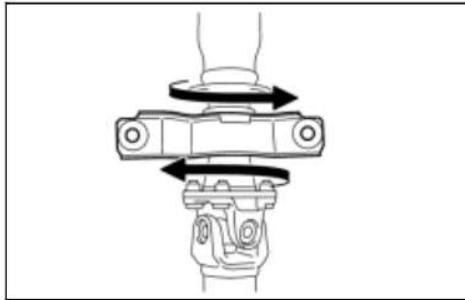
(a) Check that the spider bearing rotates smoothly.

(b) Check that there is no play in the spider bearing.

Text in Illustration

*1	Front spider bearing
*2	Rear spider bearing

3. INSPECT CENTER SUPPORT BEARING ASSEMBLY



(a) Turn the center support bearing assembly by hand. Check that the center support bearing assembly turns smoothly.

(b) Check that the center support bracket of the center support bearing assembly is not cracked or deformed.

(c) Check that the seals are not cracked or damaged.

HINT:

If the center support bearing assembly is damaged or worn, or does not turn smoothly, replace it.



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Title: DRIVE SHAFT / PROPELLER SHAFT: PROPELLER SHAFT ASSEMBLY: INSTALLATION (2013 FR-S)		

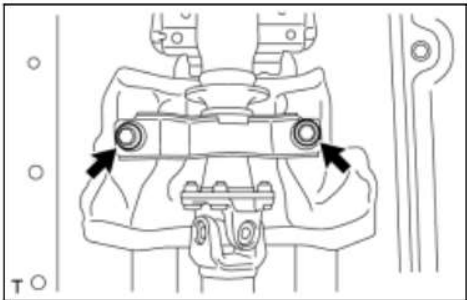
INSTALLATION

1. INSTALL PROPELLER WITH CENTER BEARING SHAFT ASSEMBLY

- (a) Completely remove any oil or the like and clean the contact surfaces of the propeller shaft assembly and the rear drive pinion companion flange.
- (b) Remove SST from the extension housing. (for Manual Transmission)
SST: 09325-20010
- (c) Remove SST from the extension housing. (for Automatic Transmission)
SST: 09325-40010
- (d) Insert the front propeller shaft assembly into the extension housing.

NOTICE:
Be careful not to damage the oil seal.

- (e) Install the 2 center support bearing washers and the center support bearing.



- (f) Install the 2 bolts and the center support bearing bracket.
Torque: 52 N·m (530 kgf·cm, 38ft·lbf)



- (g) Align the matchmarks on the differential companion flange and the flexible coupling and connect the propeller shaft.

Text in Illustration

*a	Matchmark
----	-----------

- (h) Install the rear propeller shaft assembly with the 4 new bolts, 4 washers and 4 new nuts.

NOTICE:
Hold the nut and tighten the bolt.
Torque: 74 N·m (755 kgf·cm, 55ft·lbf)

2. INSTALL CENTER EXHAUST PIPE ASSEMBLY

INFO



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Model Year: 2013	Model: FR-S	Doc ID: RM000000O3X01KX
Title: DRIVE SHAFT / PROPELLER SHAFT: PROPELLER SHAFT ASSEMBLY: REMOVAL (2013 FR-S)		

REMOVAL

1. REMOVE CENTER EXHAUST PIPE ASSEMBLY

INFO

2. REMOVE PROPELLER WITH CENTER BEARING SHAFT ASSEMBLY

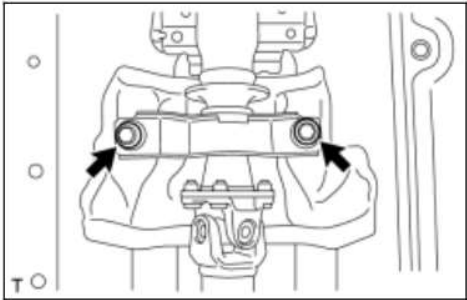


(a) Place matchmarks on the differential companion flange and flexible coupling.

Text in Illustration

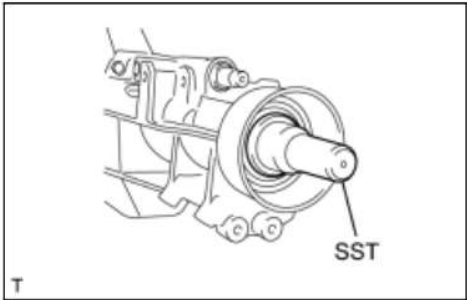
*a	Matchmark
----	-----------

(b) Remove the 4 nuts, 4 bolts and 4 washers.



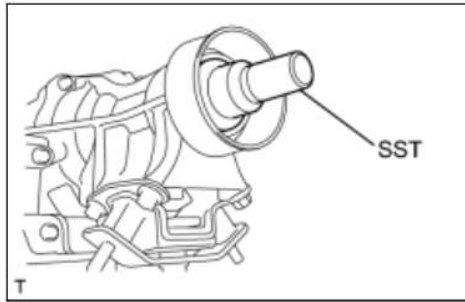
(c) Remove the 2 bolts.

- (d) Disconnect the center support bearing.
- (e) Remove the front propeller shaft with the center bearing assembly.



(f) Insert SST in the transmission to prevent oil leaks. (for Manual Transmission)

NOTICE:
Be careful not to damage the oil seal.
SST: 09325-20010



(g) Insert SST in the transmission to prevent oil leaks. (for Automatic Transmission)

NOTICE:

Be careful not to damage the oil seal.

SST: 09325-40010



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Title: DRIVE SHAFT / PROPELLER SHAFT: PROPELLER SHAFT SYSTEM: PROBLEM SYMPTOMS TABLE (2013 FR-S)		

PROBLEM SYMPTOMS TABLE

HINT:

Use the table below to help determine the cause of problem symptoms. If multiple suspected areas are listed, the potential causes of the symptoms are listed in order of probability in the "Suspected Area" column of the table. Check each symptom by checking the suspected areas in the order they are listed. Replace parts as necessary.

Propeller Shaft Assembly

SYMPTOM	SUSPECTED AREA	SEE PAGE
Noise and Vibration	Center support bearing (Worn)	INFO
	Propeller with center bearing shaft assembly (Runout)	INFO
	Spider bearing (Worn or stuck)	INFO



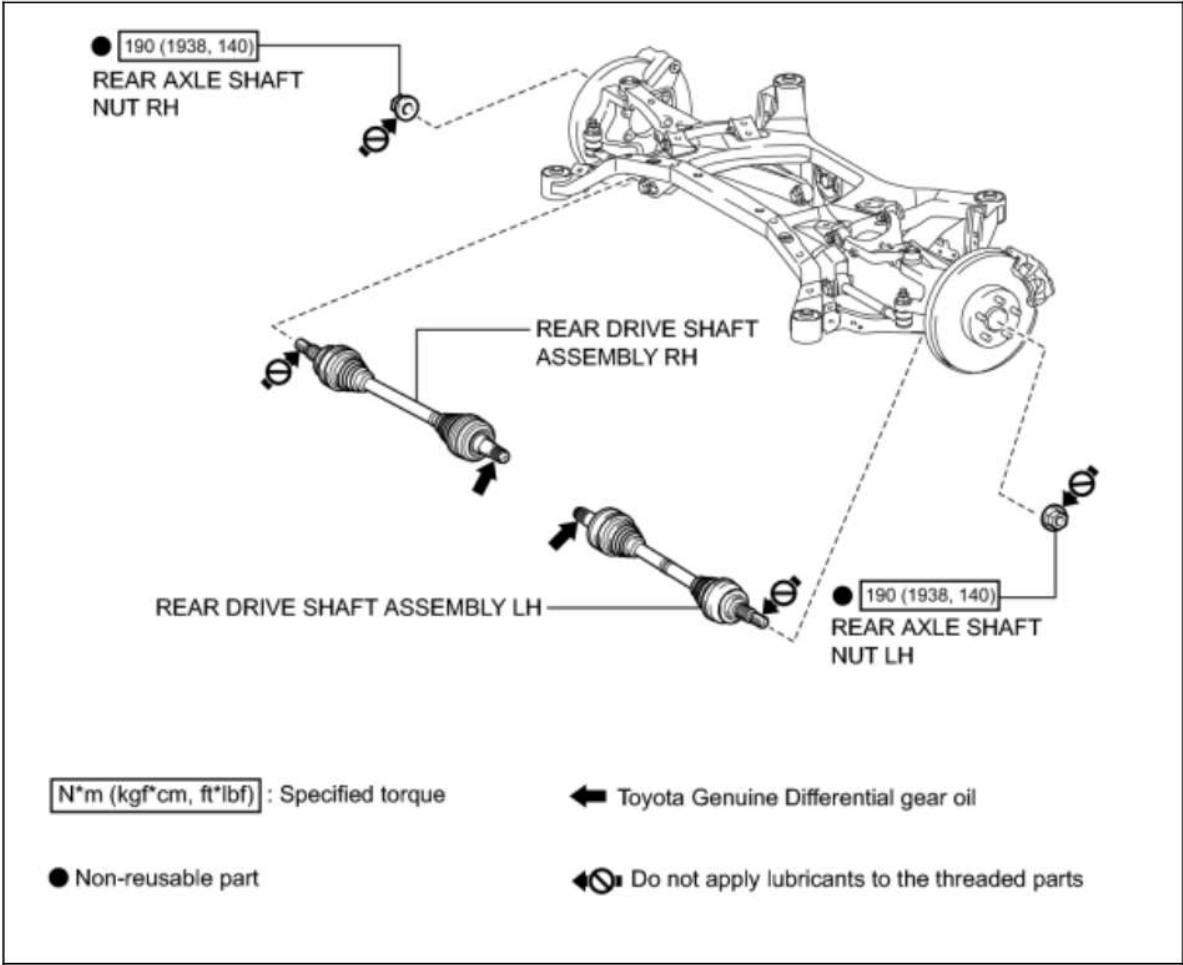
TOYOTA

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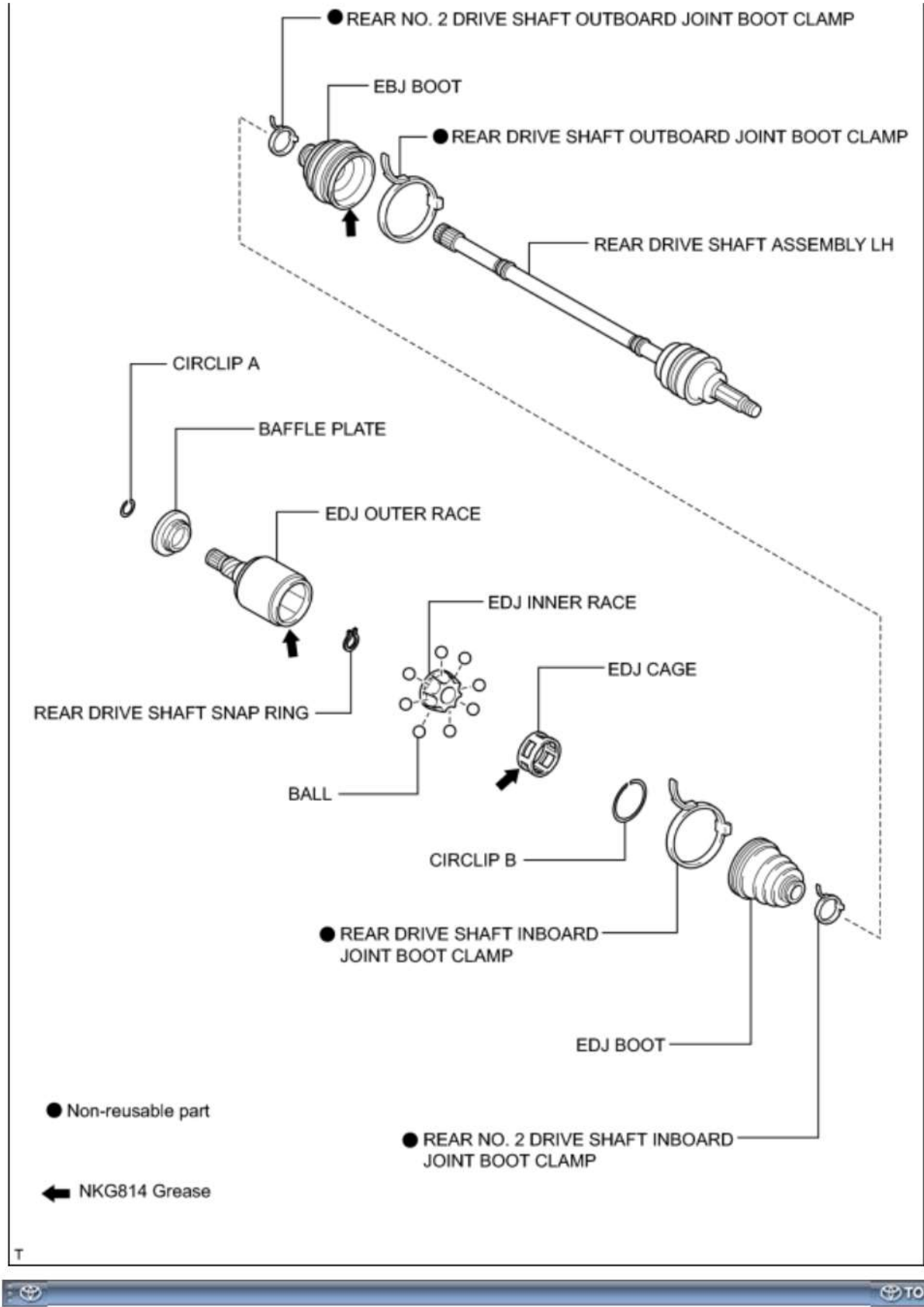
Last Modified: 3-27-2012	6.4 K	From: 201203
Model Year: 2013	Model: FR-S	Doc ID: RM000000O4701JX
Title: DRIVE SHAFT / PROPELLER SHAFT: REAR DRIVE SHAFT ASSEMBLY: COMPONENTS (2013 FR-S)		

COMPONENTS

ILLUSTRATION



ILLUSTRATION



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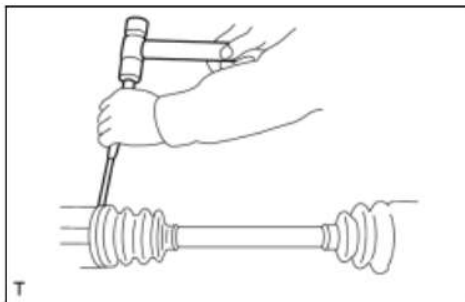
Last Modified: 3-27-2012	6.4 A	From: 201203
Model Year: 2013	Model: FR-S	Doc ID: RM0000021T700VX
Title: DRIVE SHAFT / PROPELLER SHAFT: REAR DRIVE SHAFT ASSEMBLY: DISASSEMBLY (2013 FR-S)		

DISASSEMBLY

HINT:

- Use the same procedure for both the RH and LH sides.
- The procedure described below is for the LH side.

1. REMOVE REAR NO. 2 DRIVE SHAFT INBOARD JOINT BOOT CLAMP



- (a) Using a flat tip screwdriver or needle-nose pliers, loosen the boot band on the large end of rear No.2 drive shaft inboard joint boot clamp.

NOTICE:

Do not damage the rear drive shaft outboard joint boot.

2. REMOVE REAR DRIVE SHAFT INBOARD JOINT BOOT CLAMP

HINT:

Remove the rear drive shaft inboard joint boot clamp on the small end of rear No.2 drive shaft inboard joint boot clamp in the same manner.

3. REMOVE REAR NO. 2 DRIVE SHAFT OUTBOARD JOINT BOOT CLAMP

HINT:

Remove the rear No. 2 drive shaft outboard joint boot clamp on the small end of rear drive shaft inboard joint boot No.2 clamp in the same manner.

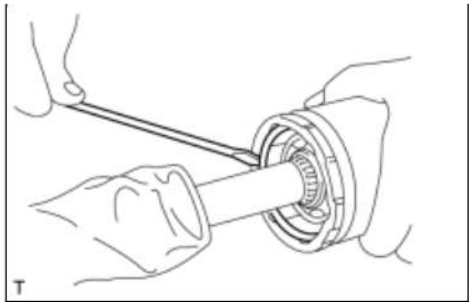
4. REMOVE REAR DRIVE SHAFT OUTBOARD JOINT BOOT CLAMP

HINT:

Remove the rear drive shaft outboard joint boot clamp on the small end of rear drive shaft inboard joint boot No.2 clamp in the same manner.

5. REMOVE CIRCLIP B

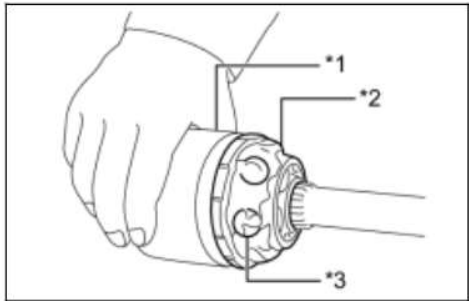
- (a) Using screwdriver, remove the round circlip Bat the neck of the EDJ outer race.



6. REMOVE EDJ OUTER RACE

- (a) Take out the EDJ outer race from the shaft assembly.
- (b) Wipe off the grease and take out the balls.

Text in Illustration



*1	EDJ outer race
*2	Grease
*3	Balls (8 pieces)

NOTICE:
The grease is a special grease (grease for constant velocity joints). Do not mix it with other greases.

HINT:
Disassemble exercising care not to lose the balls (8 pieces).

- (c) To remove the EDJ cage from the EDJ inner race, turn the EDJ cage by a half pitch to the track groove of the EDJ inner race and shift the EDJ cage.

7. REMOVE EDJ INNER RACE

- (a) Using pliers, remove the snap ring fixing the EDJ inner race to the shaft.
- (b) Remove the EDJ inner race.

8. REMOVE EDJ BOOT

- (a) Disconnect the EDJ cage from the shaft and remove the EDJ boot.

NOTICE:
Wrap the shaft splines with vinyl tape to protect the boot from scratches.

9. REMOVE EBJ BOOT

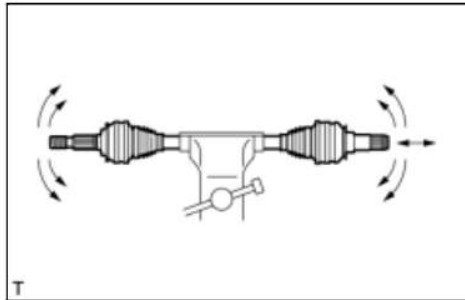
- (a) Remove the EDJ boot or EBJ boot in the same procedure as for the EDJ boot.

HINT:
Further disassembly of the drive shaft is impossible because the DOJ and EBJ cannot be disassembled.



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Title: DRIVE SHAFT / PROPELLER SHAFT: REAR DRIVE SHAFT ASSEMBLY: INSPECTION (2013 FR-S)		

INSPECTION



1. INSPECT DRIVE SHAFT

- (a) Check that there is no excessive play in the outboard joint.
- (b) Check that the inboard joint slides smoothly in the thrust direction.
- (c) Check that there is no excessive play in the radial directions of the inboard joint.
- (d) Check the boots for damage.



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Title: DRIVE SHAFT / PROPELLER SHAFT: REAR DRIVE SHAFT ASSEMBLY: INSTALLATION (2013 FR-S)		

INSTALLATION

1. INSTALL REAR DRIVE SHAFT ASSEMBLY LH

- (a) Align the rear axle carrier splines and rear drive shaft assembly splines, and install the rear drive shaft assembly.

2. INSTALL REAR AXLE SHAFT NUT LH INFO

3. INSTALL REAR DRIVE SHAFT ASSEMBLY RH

HINT:

Use the same procedure described for the LH side.

4. INSTALL REAR AXLE SHAFT NUT RH

HINT:

Use the same procedure described for the LH side.

5. INSTALL REAR DIFFERENTIAL CARRIER ASSEMBLY

INFO



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Model Year: 2013	Model: FR-S	Doc ID: RM0000021T800VX
Title: DRIVE SHAFT / PROPELLER SHAFT: REAR DRIVE SHAFT ASSEMBLY: REASSEMBLY (2013 FR-S)		

REASSEMBLY

HINT:

- Use the same procedure for both the RH and LH sides.
- The procedure described below is for the LH side.

1. INSTALL EBJ BOOT

- (a) Wrap the shaft splines with vinyl tape.

NOTICE:

Wrap the shaft splines with vinyl tape to protect the boot from scratches.

- (b) Install the EDJ boot in the specified position, and fill of the specified grease.

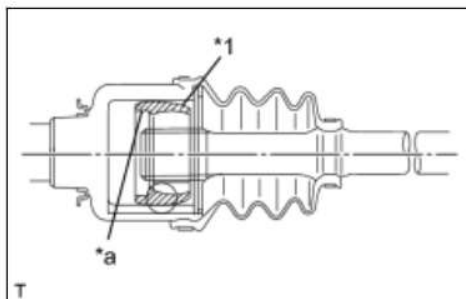
Standard grease capacity:

50 to 60g (1.76 to 2.12 oz.)

2. INSTALL EDJ BOOT

- (a) Place the EDJ boot at the center of the shaft.

- (b) Insert the EDJ cage onto the shaft.

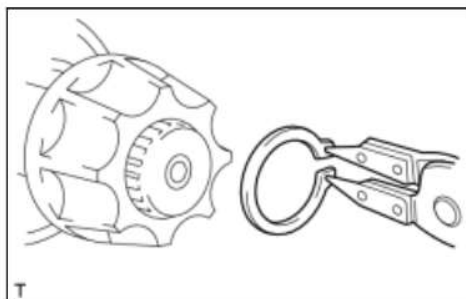


Text in Illustration

*1	EDJ cage
*a	Cutout portion

HINT:

Insert the EDJ cage with the cutout portion facing the shaft end, since the EDJ cage has an orientation.



3. INSTALL EDJ INNER RACE

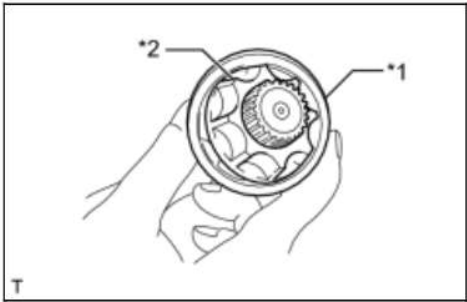
- (a) Install the EDJ inner race on the shaft and fix the rear drive the shaft snap ring in place using pliers.

HINT:

Confirm that the rear drive the shaft snap ring is completely fitted into the shaft groove.

4. INSTALL EDJ CAGE

- (a) Install the EDJ cage to EDJ inner race fixed upon the



shaft.

Text in Illustration

*1	EDJ cage
*2	EDJ inner race

HINT:

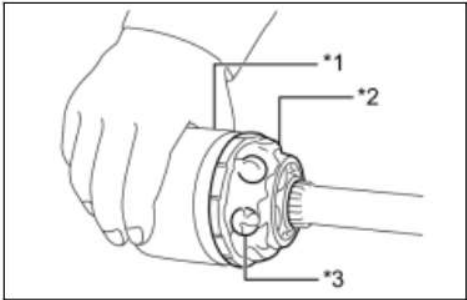
Fit the cage with the protruding section aligned with the track on the EDJ inner race, and turn by a half pitch.

(b) Fill of the specified grease into the inner side of the EDJ outer race.

Standard grease capacity:
80 to 90 g (2.82 to 3.17 oz)

(c) Apply a thin coat of the specified grease to the cage pocket and 8 ball bearings.

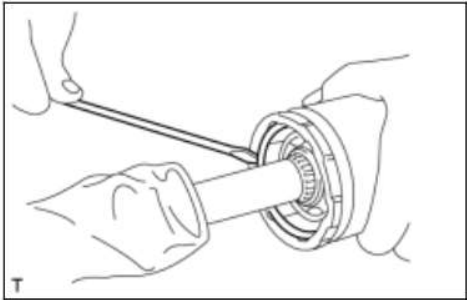
(d) Insert the 8 ball bearings into the cage pocket.



(e) Align the outer race track and ball positions, and place the shaft, EDJ inner race, cage and ball bearings in the original positions, and then fix the outer race in place.

Text in Illustration

*1	Outer race
*2	Grease
*3	Balls (8 pieces)



(f) Install the circlip B in the groove on the EDJ outer race.

HINT:

- Assure that the balls, cage and EDJ inner race are completely fitted in the outer race of EDJ.
- Use care not to place the matched position of rear drive shaft snap ring in the ball groove of outer race.
- Pull the shaft lightly and assure that the circlip is completely fitted in the groove.

(g) NKG814 apply an even coat of the specified grease to the entire inner surface of the boot. Also apply grease to the shaft.

Standard grease capacity:
20 to 30 g (0.71 to 1.06 oz)

(h) Install the EDJ boot taking care not to twist it.

HINT:

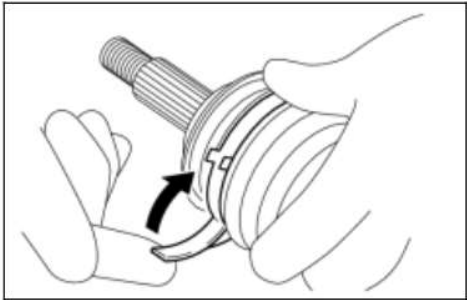
- The inside of the large end of EDJ boot and the boot groove shall be cleaned so as to be free from

grease and other substances.

- When installing the EDJ boot, position the outer race of EDJ at center of the stroke.

5. INSTALL REAR NO. 2 DRIVE SHAFT OUTBOARD JOINT BOOT CLAMP

(a) Apply NKG814 grease to the interior surface of the new rear No. 2 drive shaft outboard joint boot clamp.



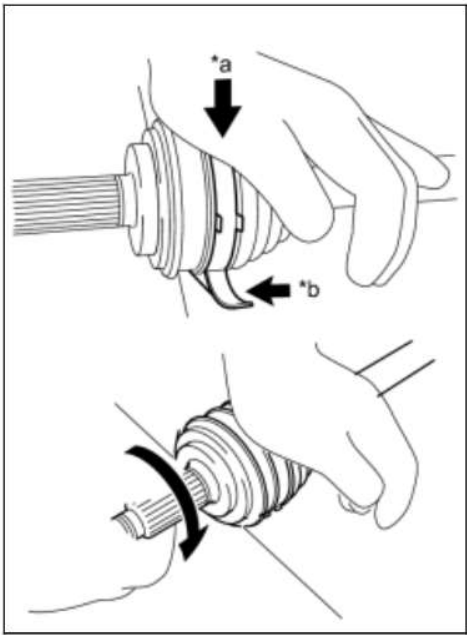
(b) Mount the rear No. 2 drive shaft outboard joint boot clamp to the EDJ boot, and temporarily bend the lever.

CAUTION:

Make sure that protective gloves are worn during work in order to prevent injury to hands, etc.

NOTICE:

- When temporarily bending the lever, make sure that the band and lever are not twisted.
- In order to prevent breakage of the rear No. 2 drive shaft outboard joint boot clamp, do not repeatedly bend the lever.



(c) While pushing the joint towards the work surface, press down using one hand, and fold the lever while turning the drive shaft forward.

Text in Illustration

*a	Weight
*b	Ground

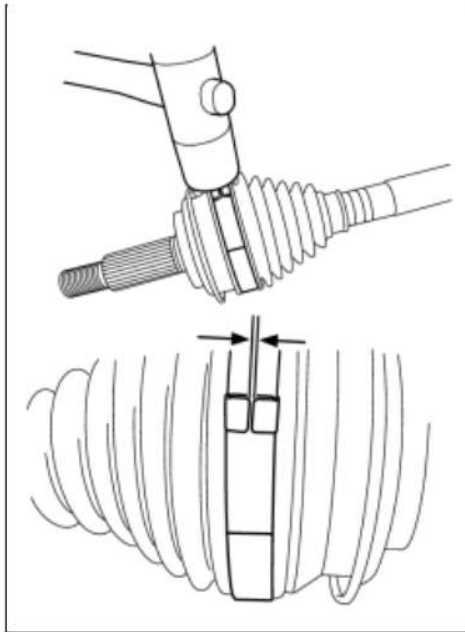
NOTICE:

- Do not damage the deflector.
- Do not raise the joint off the work surface.

(d) Using a plastic hammer, tap the buckle to affix.

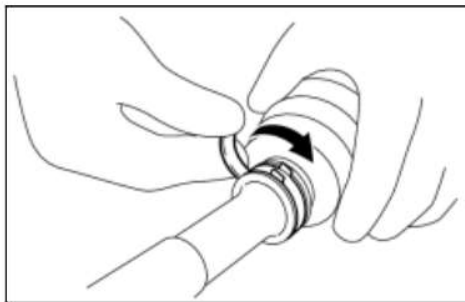
NOTICE:

- Do not hit the buckle with the plastic hammer excessively hard



- Install the clamp so that the lever does not rise.
- Make sure that the gap between the two buckles is parallel.

6. INSTALL REAR DRIVE SHAFT OUTBOARD JOINT BOOT CLAMP



- (a) Install a new rear drive shaft outboard joint boot clamp to the EDJ boot and temporarily bend the lever.

CAUTION:

Make sure that protective gloves are worn during work in order to prevent injury to hands, etc.

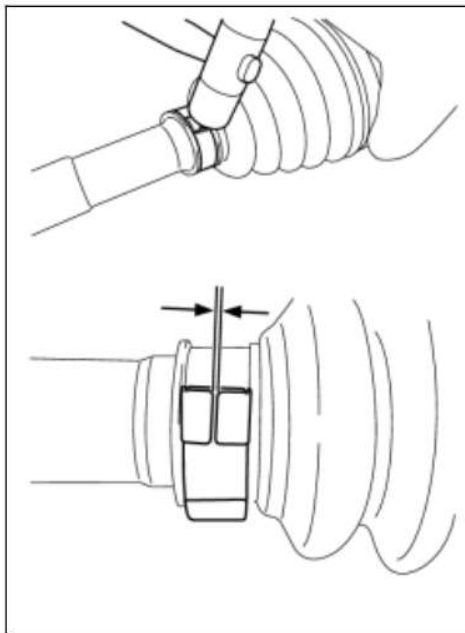
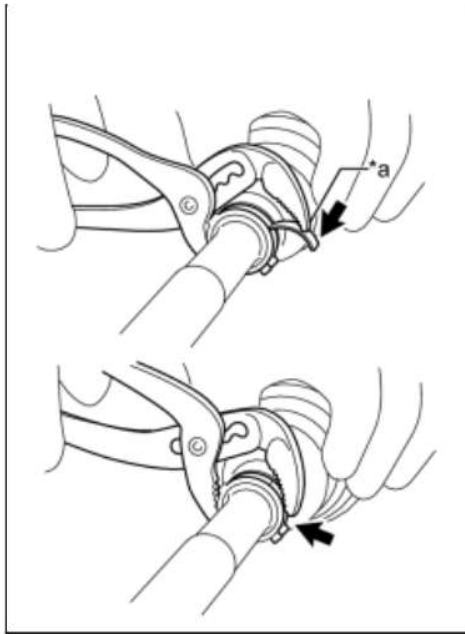
NOTICE:

- When temporarily bending the lever, make sure that the band and lever are not twisted.
- In order to prevent breakage of the rear drive shaft outboard joint boot clamp, do not repeatedly bend the lever.

- (b) Use water pump pliers to tighten the rear drive shaft outboard joint boot clamp, and temporarily fasten.

Text in Illustration

*a	The end is near the center of the lever.
----	--



(c) Use a plastic hammer to tap the buckle to affix.

NOTICE:

- Do not hit the buckle with the plastic hammer excessively hard.
- Affix the lever so that it does not rise.
- Make sure that the gap between the two buckles is parallel.

7. INSTALL REAR NO. 2 DRIVE SHAFT INBOARD JOINT BOOT CLAMP

HINT:

Work on the rear No. 2 drive shaft inboard joint boot clamp in the same way as the rear No. 2 drive shaft outboard joint boot clamp.

8. INSTALL REAR DRIVE SHAFT INBOARD JOINT BOOT CLAMP

HINT:

Work on the rear drive shaft inboard joint boot clamp in the same way as the rear drive shaft outboard joint boot clamp.



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Title: DRIVE SHAFT / PROPELLER SHAFT: REAR DRIVE SHAFT ASSEMBLY: REMOVAL (2013 FR-S)		

REMOVAL

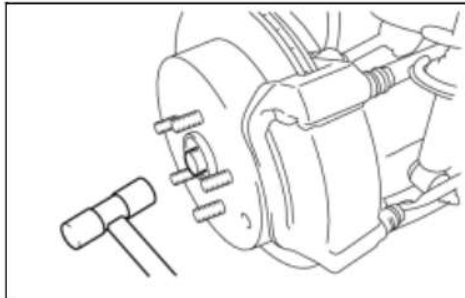
1. REMOVE REAR DIFFERENTIAL CARRIER ASSEMBLY

INFO

2. REMOVE REAR AXLE SHAFT NUT LH

INFO

3. REMOVE REAR DRIVE SHAFT ASSEMBLY LH



- (a) Using a plastic hammer, separate the rear drive shaft assembly LH from the rear axle carrier. If it is difficult to separate, tap the end of the rear drive shaft assembly LH using a brass bar and a hammer.

- (b) Remove the rear drive shaft assembly LH.

NOTICE:

- Be careful not to damage the joint boot or speed sensor.
- Do not push out the rear axle carrier excessively.

4. REMOVE REAR AXLE SHAFT NUT RH

HINT:

Use the same procedure described for the LH side.

5. REMOVE REAR DRIVE SHAFT ASSEMBLY RH

HINT:

Use the same procedure described for the LH side.

