SECTION FAX

FRONT AXLE

CONTENTS

PRECAUTIONS

PFP:00001

Cautions

EDS0012H

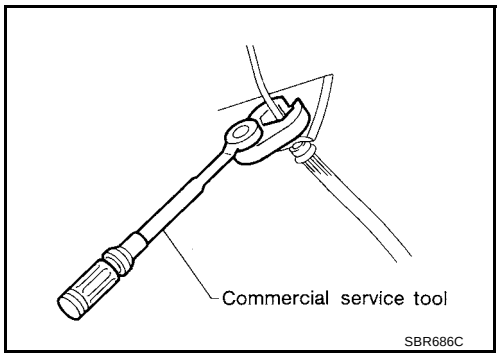
Observe the following precautions when disassembling and servicing drive shaft.

- The joint of drive shaft cannot be disassembled. Do not attempt to disassemble it.
- Perform work in a location which is as dust-free and dirt-free as possible.
- Before disassembling and servicing, clean the outside of parts.
- The disassembly and service location must be clean. Care must be taken to prevent parts from becoming dirty and to prevent the entry of foreign objects.
- Disassembled parts must be carefully reassembled in the correct order. If work is interrupted, a clean cover must be placed over parts.
- Paper shop cloths must be used. Fabric shop cloths must not be used because of the danger of lint adhering to parts.
- Disassembled parts (except for rubber parts) should be cleaned with kerosene which shall be removed by blowing with air or wiping with paper shop cloths.

Precautions for Brake System

EDS0012I

- When installing rubber parts, final tightening must be carried out under unladen condition* with tires on ground.
  *: Fuel, radiator coolant and engine oil full. Spare tire, jack, hand tools and mats in designated positions.
- Use flare nut wrench when removing or installing brake tubes.
- After installing removed suspension parts, check wheel alignment and adjust if necessary.
- Always torque brake lines when installing.

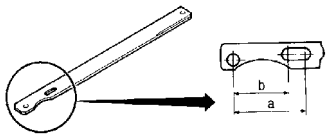
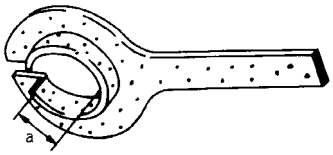
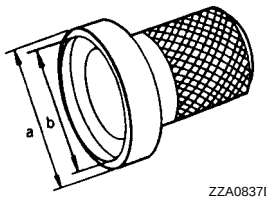
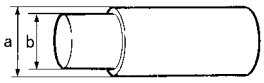
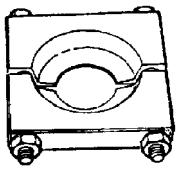
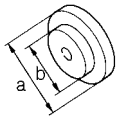


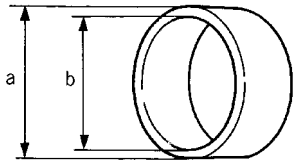
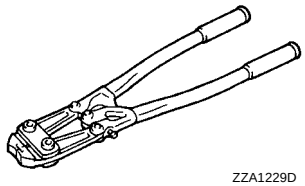
PREPARATION

PFP:00002

Special Service Tools

EDS0012J

Description	Application
Hub lock nut wrench KV40104000 a: 85 mm (3.35 in) dia. b: 65 mm (2.56 in) dia.  ZZA0802D	● Removing and installing hub lock nuts ● Removing and installing drive shaft
Protector KV38107900 a: 32 mm (1.26 in) dia.  ZZA0835D	Installing drive shaft
Drift ST35271000 a: 72 mm (2.83 in) dia. b: 63 mm (2.48 in) dia.  ZZA0837D	Installing wheel bearing
Drift ST33710000 a: 30 mm (1.18 in) dia. b: 23 mm (0.91 in) dia.  ZZA1233D	● Removing wheel hub ● Removing inner race (outside) of wheel bearing
Bearing replacer ST30031000  ZZA0700D	Removing inner race (outside) of wheel bearing
Drift ST35321000 a: 49 mm (1.93 in) dia. b: 41 mm (1.61 in) dia. ST30621000 a: 79 mm (3.11 in) dia. b: 59 mm (2.32 in) dia.  ZZA1051D	● Removing wheel bearing ● Installing wheel hub

Description	Application
Drift ST27863000 a: 74 mm (2.91 in) dia. b: 62 mm (2.44 in) dia.  ZZA0936D	Installing wheel bearing
Boot band crimping tool KV40107300  ZZA1229D	Installing boot band

NOISE, VIBRATION, AND HARSHNESS (NVH) TROUBLESHOOTING

PFP:00003

NVH Troubleshooting Chart

EDS0012K

Use the chart below to help you find the cause of the symptom. If necessary, repair or replace these parts.

			Reference page	Improper installation, looseness	Parts interference	Wheel bearing damage	TIRES	ROAD WHEEL	STEERING
				Refer to FAX-6, "FRONT WHEEL HUB AND KNUCKLE"		Refer to FAX-6, "FRONT WHEEL HUB AND KNUCKLE"	NVH in WT section.	NVH in WT section.	NVH in PS section.
Symptom	FRONT AXLE	Noise		×	×		×	×	×
		Shake		×	×		×	×	×
		Vibration		×	×		×		×
		Shimmy		×	×		×	×	×
		Judder		×			×	×	×
		Poor quality ride or handling		×	×	×	×	×	

×: Applicable

FRONT WHEEL HUB AND KNUCKLE

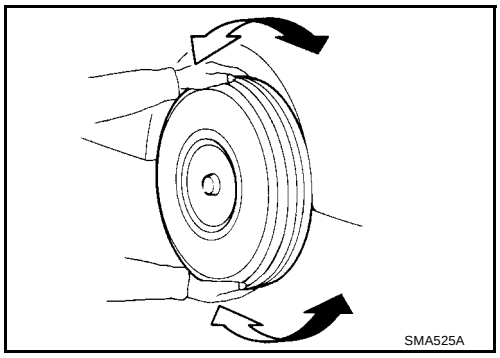
PFP:40202

On-Vehicle Inspection

EDS0012L

Inspect to check that there is no excessive play, cracking, wear, or other damage to front axle.

- Turn front wheels (left/right) and check the play.
- Check that no nails or other foreign objects are embedded.
- Retighten all axle nuts and bolts to the specified torque.



FRONT WHEEL BEARING

With the vehicle raised, inspect the following:

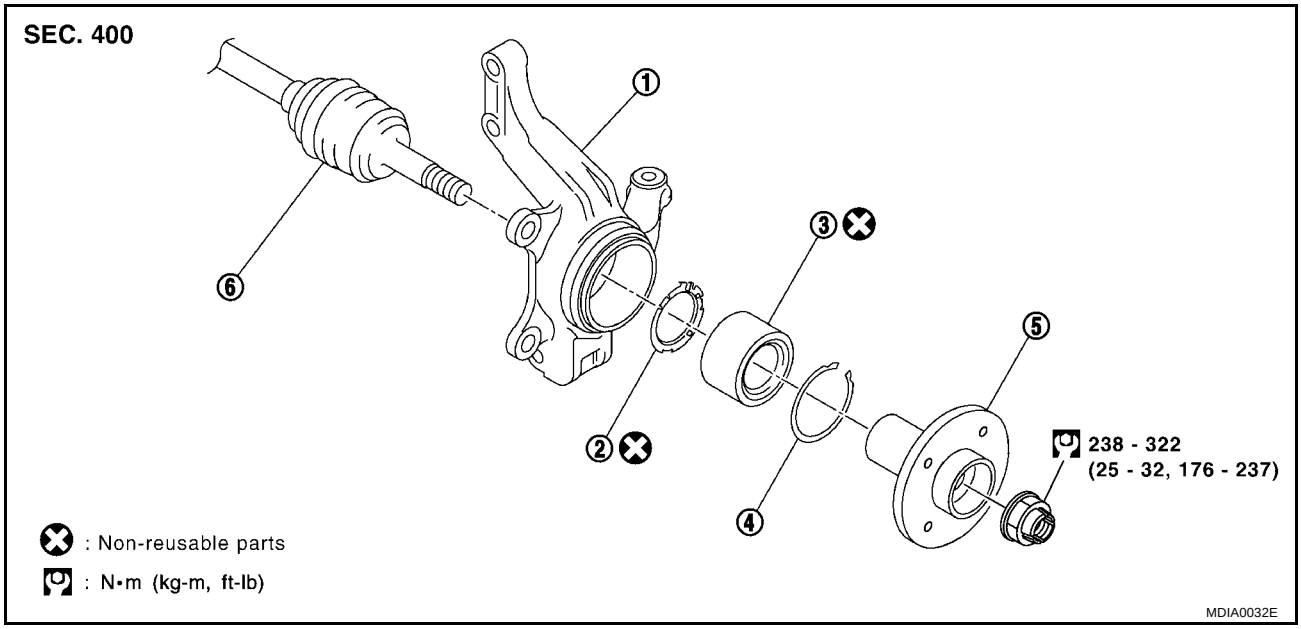
- Move wheel hub in the axial direction by hand. Check if there is no looseness of front wheel bearings.

Axial end play : 0.05 mm (0.0020 in)

- Rotate wheel hub and Make sure there is no unusual noise or other non-standard condition. If there are any non-standard conditions, replace the wheel bearing.

Removal and Installation

EDS0012M



1. Steering knuckle
2. Sensor housing
3. Wheel bearing
4. Snap rings
5. Wheel hub
6. Front drive shaft

REMOVAL

1. Lift up the vehicle and remove tire from the vehicle.
2. Remove lock plate from strut. Disconnect brake hose from strut. Refer to BR-11, "BRAKE PIPING AND HOSE" .
3. Remove brake caliper from steering knuckle. Hang it in a place where it does not interfere with work. Refer to BR-22, "Removal and Installation of Brake Caliper Assembly" .

   CAUTION:
   Avoid depressing the brake pedal with the brake caliper removed.
4. Remove disc rotor from wheel hub.
5. Pull out ABS wheel sensor from steering knuckle. Refer to BRC-36, "WHEEL SENSORS" .

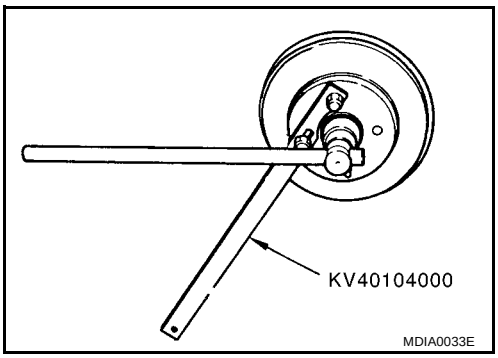
CAUTION:
Do not pull on ABS wheel sensor harness.

6. Use wheel hub lock nut wrench (SST) to remove lock nut from drive shaft.
7. Remove tie-rod from steering knuckle. If tie-rod is not easily removed, use ball joint remover (commercial service tool).

CAUTION:
To prevent damage to threads and to prevent ball joint remover (commercial service tool) from sudden coming off, temporarily tighten lock nuts.

8. Remove steering knuckle from strut.

CAUTION:
Do not place drive shaft joint at an extreme angle (22° or more). Also, hold steering knuckle tightly and do not overextend slide joint.



9. Remove drive shaft from steering knuckle.

CAUTION:
When removing drive shaft, do not place drive shaft joint at an extreme angle (22° or more). Also be careful not to overextend slide joint.

- **Do not lift drive shaft with axle attached by grasping countershaft only.**
- **Do not allow drive shaft, with transaxle inserted, to hang down without support for countershaft, wheel joints, and other parts.**

10. Remove transverse link ball joint mounting bolt and nut. Then, remove transverse link from steering knuckle.

INSTALLATION

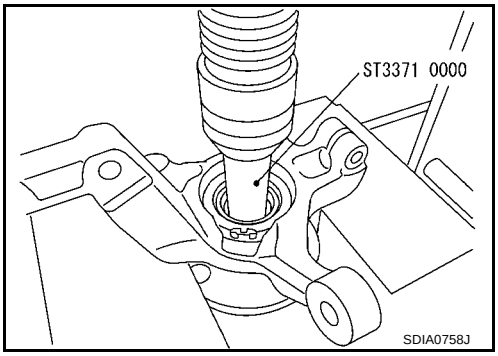
For tightening torque and other details, FAX-6, "FRONT WHEEL BEARING" , BRC-36, "WHEEL SENSORS" , FSU-5, "Components" , and tighten in the reverse order of removal.

Disassembly and Assembly

EDS0012N

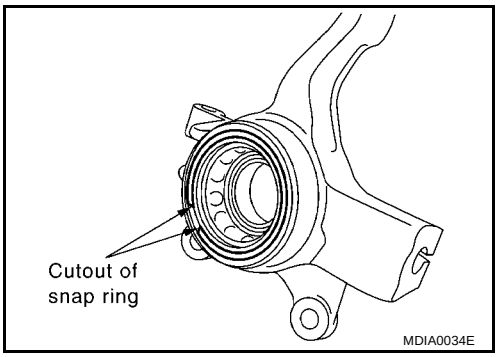
DISASSEMBLY

1. Press the wheel bearing out with a drift (SST) to remove.

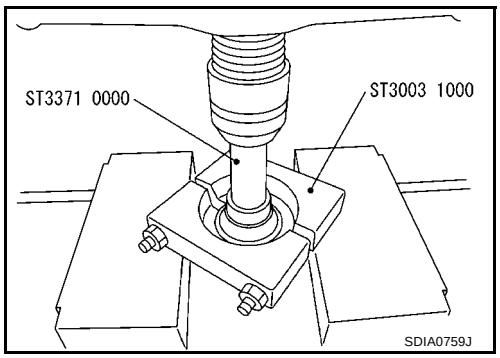


2. Insert a screwdriver into cutout of snap ring and remove it from steering knuckle.

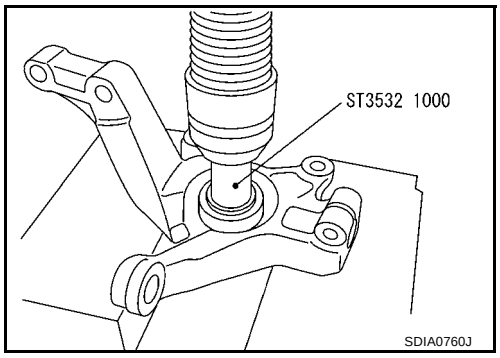
CAUTION:
Be careful not to scratch the steering knuckle.



3. Use a puller (commercial service tool), drift (SST), and bearing replacer (SST) to remove inner race of outer wheel bearing from wheel hub.



4. Press the wheel bearing and sensor housing out of the steering knuckle with a drift (SST).



INSPECTION AFTER DISASSEMBLY

Wheel Hub

- Check wheel hub for cracks (with magnetic exploration or dye testing). Replace if necessary.

Steering Knuckle

- Check steering knuckle for deformation, cracks, and other damage. Replace if any non-standard conditions are found.

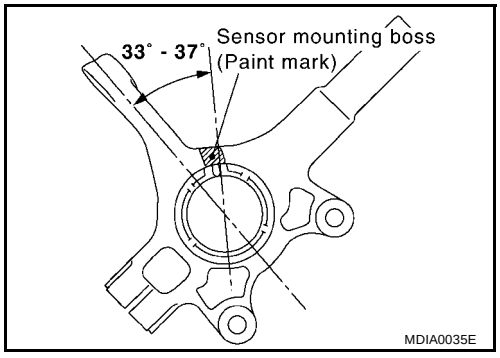
Snap Rings

- Check snap ring for wear or cracks. Replace if necessary.

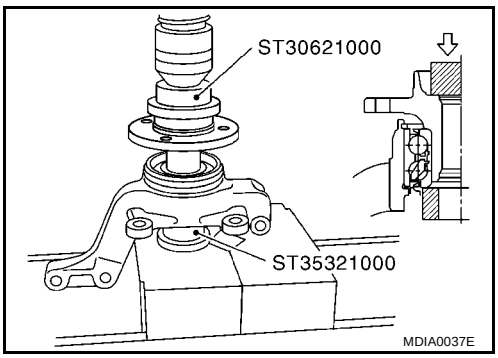
ASSEMBLY

1. Temporarily put sensor housing on steering knuckle.

   CAUTION:
   Protrusion of sensor housing ABS sensor mounting should fit in cutout of steering knuckle (as shown in figure).



2. Press-fit a wheel bearing into the steering knuckle with a drift (SST) from steering knuckle outer side.



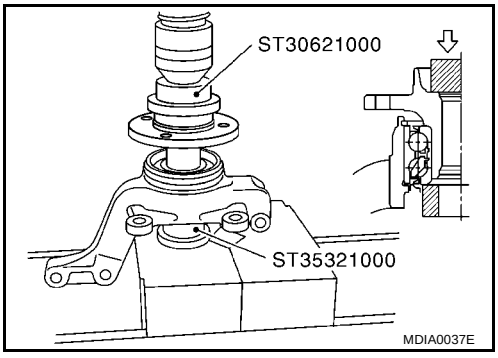
CAUTION:

- **Be sure that wheel bearing is completely press-fit until sensor housing contacts the body tightly.**
- **Be sure that protrusion of ABS sensor mounting does not roll onto steering knuckle.**
- **Be sure to mount so that sensor rotor (rubber side) side comes to steering knuckle inner side.**
- **Do not press and weigh on wheel bearing inner lace and sealing part.**

NOTE:
Final press-loading guideline [49,000 N (5,000 kg, 11,015 lb)]

3. Install snap ring onto steering knuckle.

4. Press-fit a wheel bearing into the steering knuckle with a drift (SST) from steering knuckle outer side.

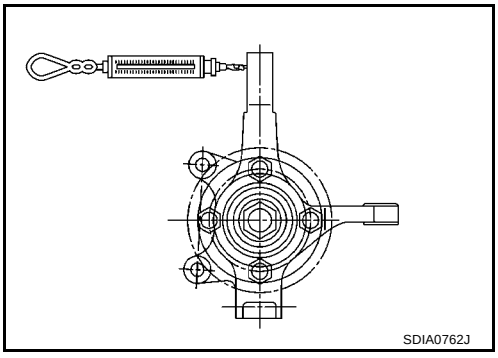


NOTE:
Final press-loading guideline [49,000 N (5,000 kg, 11,015 lb)]

CAUTION:
Drift (special tool) which touches wheel bearing inner lace shall not touch sensor housing.

INSPECTION AFTER ASSEMBLY

1. Apply a load of 34,300 to 49,000 N (3,500 to 5,000 kg, 7,710 - 11,015 lb). In this condition, rotate in forward and reverse directions 10 times each to insure a good fit.
2. Set a spring balance on strut mounting hole (upper). Measure rotating torque at an rpm of 8 - 12 rpm.



Rotating torque : 0.19 N·m (0.02 kg-m) or less
Spring balance measurement : 13.0 N (1.3 kg) or less

NOTE:
In case the above loading is not possible

- Assemble drive shaft and tighten wheel hub lock nuts to specified torque. Then rotate in forward and reverse direction 10 times each to insure a good fit.
- At a rotating speed of 8 - 12 rpm, place a spring balance on hub bolt to measure torque.

Rotating torque : 0.23 N·m (0.024 kg-m) or less
Spring balance measurement : 15.9 N (1.6 kg) or less

FRONT DRIVE SHAFT

PFP:39100

On-Vehicle Inspection and Service

EDS0012O

DRIVE SHAFT BOOT

Replacement

CAUTION:

When noise or vibration occur from drive shaft, replace entire drive shaft assembly.

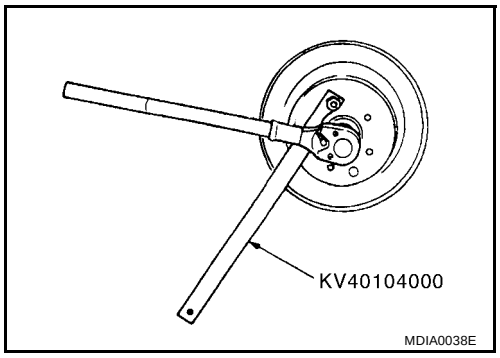
1. Lift up the vehicle and remove tire from the vehicle.
2. Remove lock plate from strut. Disconnect brake hose from strut. Refer to BR-11, "BRAKE PIPING AND HOSE" .
3. Remove the ABS wheel sensor from the steering knuckle. Refer to BRC-36, "WHEEL SENSORS" .

   CAUTION:

   Do not pull on ABS wheel sensor harness.
4. Use a hub lock nut wrench (SST), remove lock nuts.
5. Remove tie-rod from steering knuckle. If tie-rod is not easily removed, use ball joint remover (commercial service tool).

   CAUTION:

   To prevent damage to threads and to prevent ball joint remover (commercial service tool) from sudden coming off, temporarily fix lock nuts.



6. Remove steering knuckle and strut installation bolt.

   CAUTION:

   Do not place drive shaft joint at an extreme angle (22° or more). Also, hold steering knuckle tightly and do not over-extend slide joint.
7. Using a puller (commercial service tool), remove the drive shaft from the steering knuckle.

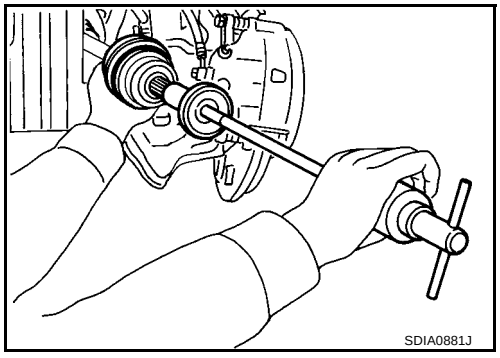
   CAUTION:

   When removing drive shaft, do not place drive shaft joint at an extreme angle (22° or more). Also be careful not to overextend slide joint.

   - **Do not lift drive shaft with axle attached by grasping countershaft only.**
   - **Do not allow drive shaft, with transaxle inserted, to hang down without support for countershaft, wheel joints, and other parts.**
8. Remove boot bands and remove boot from the joint subassembly.
9. Screw drive shaft puller (commercial service tool) into joint subassembly screw part in depth of 30 mm (1.18in) or more. Fix drive shaft by one hand and pull out joint subassembly with sliding hammer (commercial service tool) from shaft.

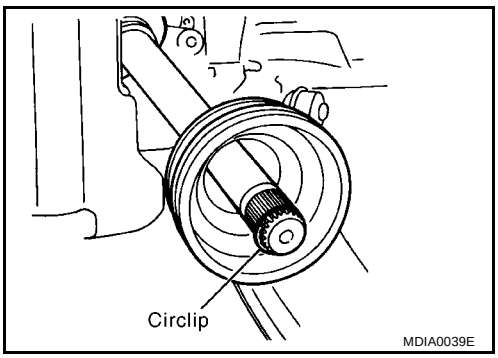
   CAUTION:

   - **Align sliding hammer and drive shaft and remove them by pulling firmly and uniformly.**
   - **When joint subassembly is not able to be pulled out, try after removing drive shaft from the vehicle.**



10. Remove boot from shaft.

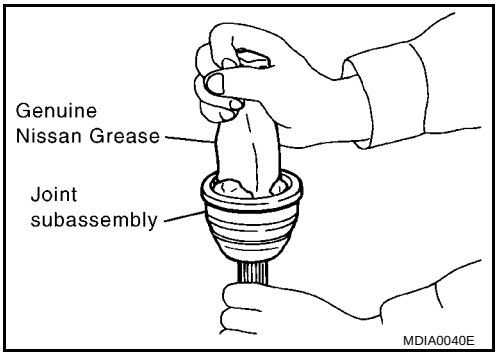
11. Remove circlip from the shaft.



12. While rotating ball cage, remove old grease on joint subassembly with paper towels.

CAUTION:
Visually check joint subassembly for compression scar, cracks, fractures. If any non-standard condition is detected, replace entire joint subassembly.

13. Inject Genuine Nissan Grease (see parts catalog) into the joint subassembly serration hole until the grease begins to ooze from the ball groove and serration hole.
After injecting the grease, wipe off the old grease that has oozed out with towel.

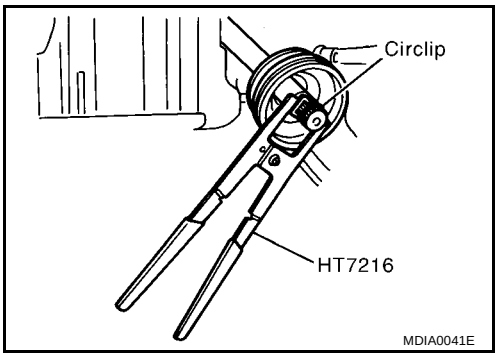


14. Cover drive shaft serration with tape so as not to damage boot during installation. Install new boot and boot bands to the shaft.

CAUTION:
Do not reuse the boot bands and boot.

15. Remove the tape wrapped around the serration on the shaft.
16. Mount circlip on circlip groove at the shaft edge. Align the shaft edge and joint subassembly center axle. Then, assemble on the circlip groove, holding circlip with screwdriver tip. Drive joint inserter (commercial service tool) is recommended as an assisting tool when mounting circlip.

CAUTION:
Do not reuse the circlip.

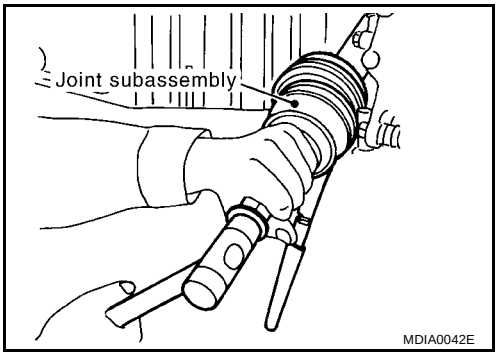


17. Press joint subassembly into shaft with plastic hammer.

CAUTION:
Confirm that joint subassembly is correctly engaged while rotating.

18. Working from the big end of the boot, add enough Genuine Nissan Grease (refer to the part catalog) to the housing to equal the quantity mentioned below.

Grease quantity : 45 - 55 g (1.59 - 1.94 oz)

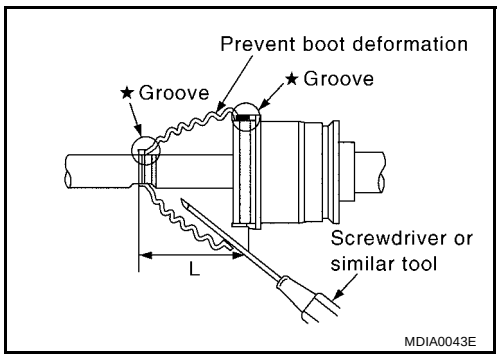


19. Remove grease on the boot mounting surface.

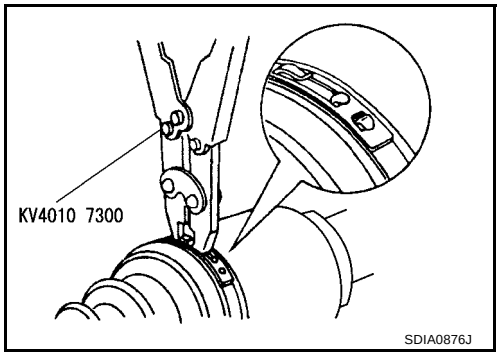
20. Mount boot firmly on the groove shown in the figure (with * mark) and confirm the length of the boot (L) is same diameter as shown below. Insert a screwdriver or fitting tool from the large-diameter side. Bleed air out of the inside boot (to adjust pressure outside and inside of boot) to prevent deformation of boot.

    Boot mounting length : 90.4±1 mm

    CAUTION:
    - **If boot mounting length is outside the standard, it may cause breakage in the boot.**
    - **Be careful not to touch inside of the boot with the tip of a screwdriver.**



21. As shown in the figure, secure the big and small ends of the boot with new boot bands.



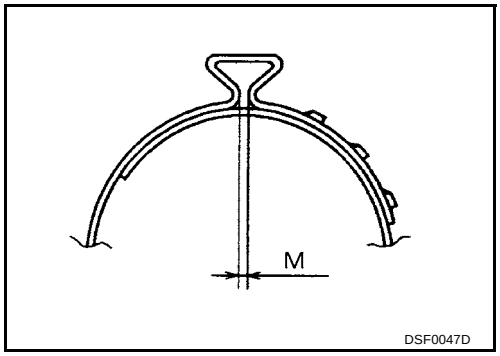
22. Rotate joint part and confirm that mounting position of boot does not deviate. When it deviates, mount a new boot band again.

    CAUTION:
    When fixing boot band, fix so that the M diameter on the drawing becomes as follows.

    M diameter

    Large-diameter side : 2.5±0.5 mm

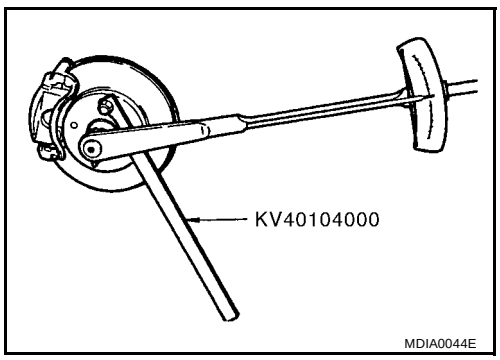
    Small-diameter side : 2.5±0.5 mm



23. Confirm that circlip on the transaxle side is not pulled out.
24. Insert the drive shaft to the steering knuckle, and tighten the lock nut.
25. Install bolts securing steering knuckle to the strut. For tightening torque, refer to FSU-5, "Components" .
26. Fix the brake hose onto the strut with the lock plate.
27. Install tie-rod to steering knuckle. For tightening torque, refer to FSU-5, "Components" .
28. Install ABS wheel sensor. Refer to BRC-36, "WHEEL SENSORS" .
29. Using a hub lock nut wrench (SST), tighten lock nut to the specified torque.

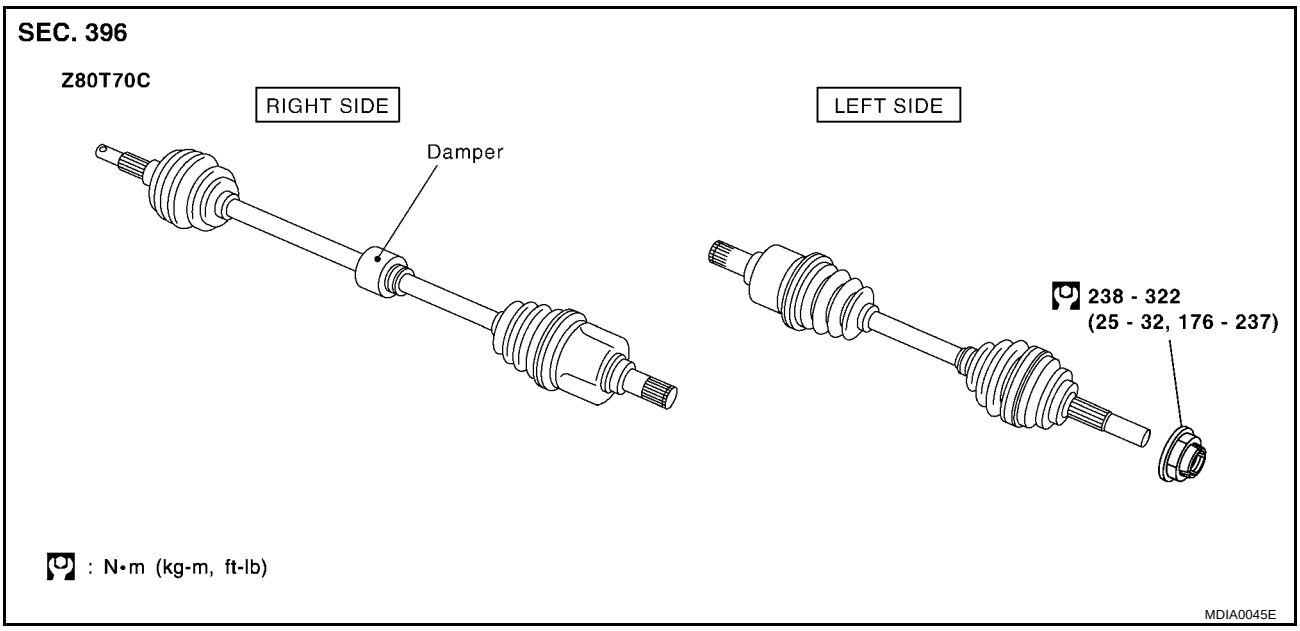
    Tightening torque : 238 - 322 N·m (25 - 32 kg-m, 176 - 237 ft-lb)

30. Mount tire and lower lift.



Removal and Installation

EDS0012P

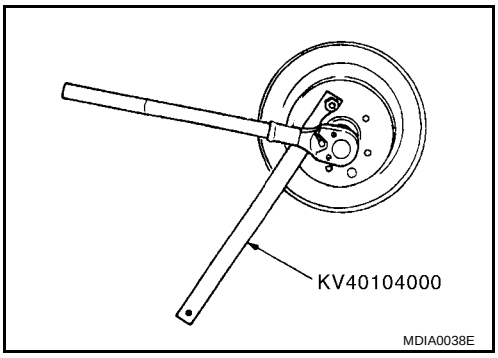


REMOVAL

1. Lift up the vehicle and remove tire from the vehicle.
2. Remove lock plate from strut. Disconnect brake hose from strut. Refer to BR-11, "BRAKE PIPING AND HOSE" .
3. Remove the ABS wheel sensor from the steering knuckle. Refer to BRC-36, "WHEEL SENSORS" .

   CAUTION:
   Do not pull on ABS wheel sensor harness.
4. Use a hub lock nut wrench (SST), remove lock nuts.
5. Remove tie-rod from steering knuckle. If tie-rod is not easily removed, use ball joint remover (commercial service tool).

   CAUTION:
   To prevent damage to threads and to prevent ball joint remover (commercial service tool) from sudden coming off, temporarily fix lock nuts.

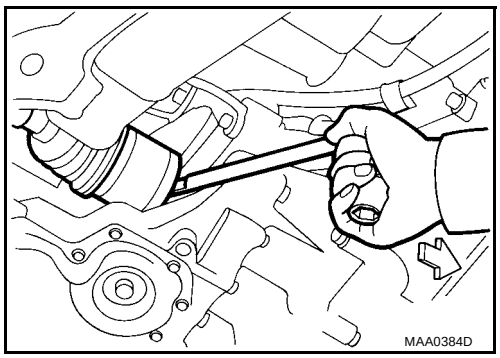


6. Remove steering knuckle and strut installation bolt.

   CAUTION:
   Do not place drive shaft joint at an extreme angle (22° or more). Also, hold steering knuckle tightly and do not over-extend slide joint.
7. Using a puller (commercial service tool), remove the drive shaft from the steering knuckle.

   CAUTION:
   When removing drive shaft, do not place drive shaft joint at an extreme angle (22° or more). Also be careful not to overextend slide joint.
   - **Do not lift drive shaft with axle attached by grasping countershaft only.**
   - **Do not allow drive shaft, with transaxle inserted, to hang down without support for countershaft, wheel joints, and other parts.**

8. Remove driveshaft from transaxle with a wheel wrench or equivalent, as shown in figure.

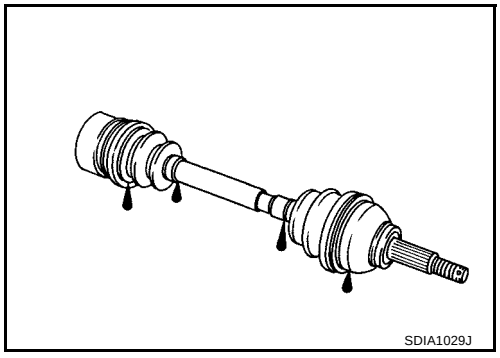


CAUTION:
When removing drive shaft from vehicle, be careful to avoid interfering with brake hose, ABS wheel sensor harness, and other parts.

- Confirm that circlip is attached on the edge.

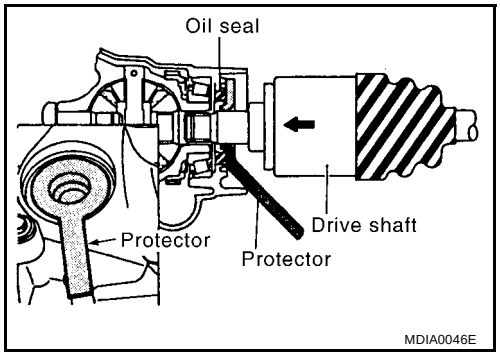
INSPECTION AFTER REMOVAL

- Move joint in up/down, left/right, and axial directions. Check for motion that is not smooth and for significant looseness.
- Check the boot for cracks, damage, and leakage of grease.



INSTALLATION

1. In order to prevent damage to differential side oil seal, first fit a protector (SST) onto oil seal before inserting drive shaft. Slide drive shaft slide joint and tap with a hammer to install securely.

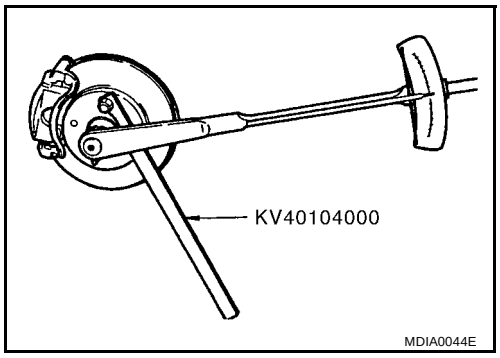


CAUTION:
Make sure the circlip is fully engaged.

Protector SST (special service tool) No. : KV38107900

2. Insert the drive shaft to the steering knuckle, and tighten the lock nut.
3. Install bolts securing steering knuckle to the strut. For tightening torque, refer to FSU-5, "Components" .
4. Fix the brake hose onto the strut with the lock plate.
5. Install tie-rod to steering knuckle. For tightening torque, refer to FSU-5, "Components" .
6. Install ABS wheel sensor. Refer to BRC-36, "WHEEL SENSORS" .
7. Using a hub lock nut wrench (SST), tighten lock nut to the specified torque.

Tightening torque : 238 - 322 N·m (25 - 32 kg·m, 176 - 237 ft-lb)



8. Mount tire and lower lift.

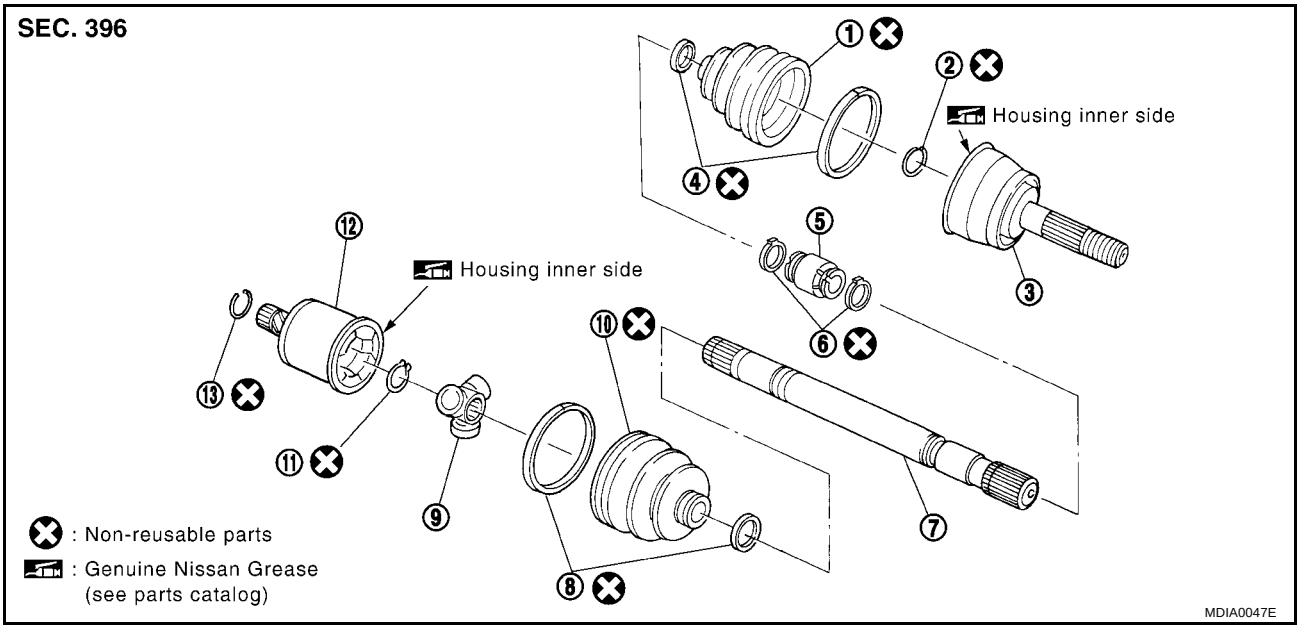
Disassembly and Assembly

EDS0012Q

INSPECTION BEFORE DISASSEMBLY

- Move joint in up/down, left/right, and axial directions. Check for motion that is not smooth and for significant looseness.
- Check the boot for cracks, damage, and leakage of grease.

DISASSEMBLY



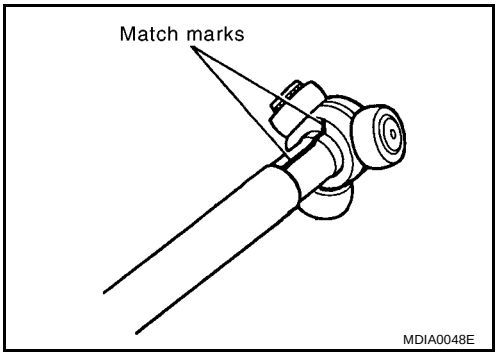
1. Boot
2. Circlip
3. Joint subassembly (fixed joint)
4. Boot band
5. Dynamic damper (right side only)
6. Band
7. Shaft
8. Boot band
9. Spider assembly
10. Boot
11. Snap rings
12. Housing (slide joint)
13. Circlip

Transaxle Side

1. Remove the boot bands.
2. Fix shaft on a vise. Remove stopper ring and housing.

   CAUTION:
   When securing in a vise, use aluminum plates, copper plates or something similar to protect the shaft.
3. Put mating marks onto the shaft and spider assembly.

   CAUTION:
   Use paint or similar substance for alignment marks. Do not scratch the surface.
4. Remove the snap ring, and remove the spider assembly from the shaft.
5. Remove boot from shaft.



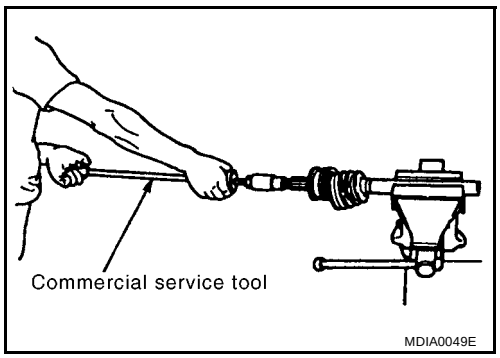
Wheel Side

1. Using a vise, secure the shaft.

   CAUTION:
   When securing in a vise, use aluminum plates, copper plates or something similar to protect the shaft.
2. Remove boot bands and remove boot from the joint subassembly.

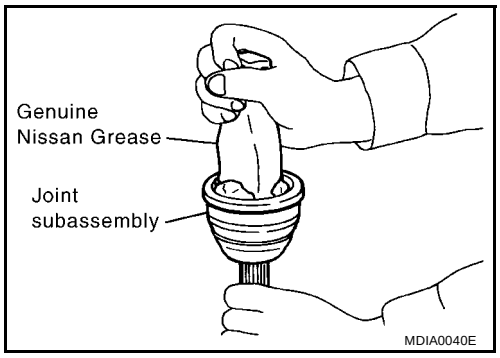
3. Screw the drive shaft puller (commercial service tool) 30 mm (1.18 in) or more over the thread on joint subassembly, and pull the joint subassembly out of the shaft.

   CAUTION:
   - **Align sliding hammer and drive shaft and remove them by pulling firmly and uniformly.**
   - **If joint subassembly cannot be removed after five or more unsuccessful attempts, replace entire drive shaft assembly.**
4. Remove boot from shaft.
5. Remove circlip from the shaft.



6. While rotating ball cage, remove old grease on joint subassembly with paper towels.

   CAUTION:
   Visually check joint subassembly for compression scar, cracks, fractures. If any non-standard condition is detected, replace entire joint subassembly.



Dynamic Damper (Right drive shaft)

- Remove band. Then, remove dynamic damper from shaft.

INSPECTION AFTER DISASSEMBLY

Shaft

- If the shaft has runout, cracks, or damage, replace the shaft.

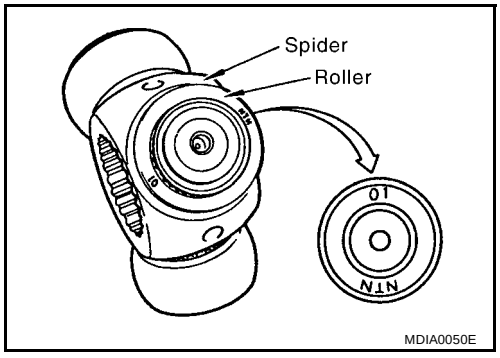
Joint Subassembly (Fixed Joint)

- Check the joint for rough rotation and abnormal axial looseness.
- Check if there is any compression scar, cracks, or fractures.

  CAUTION:
  If there are any non-standard conditions of joint assembly component parts, replace the joint assembly.

Joint Assembly (Sliding Joint)

- If there is scratching or wear of housing roller contact surface or spider roller contact surface, replace housing and spider assembly.
- If there is circumferential looseness or rough rotation of spider roller, replace spider assembly.
- As shown in the figure, the spider roller has a stamped number which corresponds to a part number. Select a suitable replacement part with the same stamp number from the table below.
- If there are any non-standard conditions of joint assembly component parts, replace the joint assembly.
- For housing replacement, spider assembly and joint assembly are in a set.



Stamped number	Part No.	Type
00	3972051E00	T70C
01	3972051E01	
02	3972051E02	
03	3972051E03	

Housing (Slide Joint)

- Check the ball rolling surface for damage and abnormal wear.
- Check the shaft thread for damage.
- Check the boot mount for deformation.

Dynamic Damper (Right Drive Shaft)

- Check for cracks, wear, and damage. Replace if necessary.

ASSEMBLY

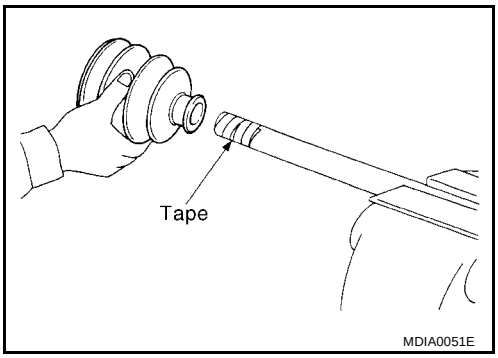
Wheel Side

For mounting, perform steps 13 to 20 of On-Vehicle Inspection and Service,FAX-10, "On-Vehicle Inspection and Service" .

Transaxle Side

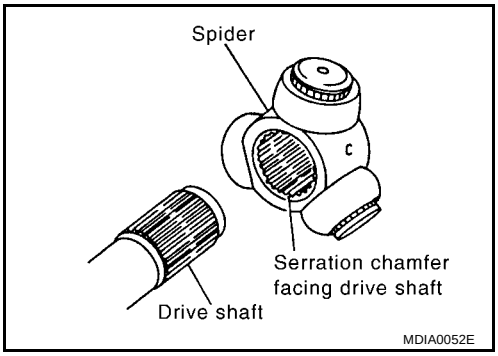
1. Cover drive shaft serration with tape so as not to damage boot during installation. Install new boot and boot bands to the shaft.

   CAUTION:
   Do not reuse the boot bands and boot.



2. Remove the tape wrapped around the serration on the shaft.
3. Align mating marks painted when spider assembly was removed. Install spider assembly with serrated mounting surface facing drive shaft.
4. Secure the spider assembly with a snap ring.

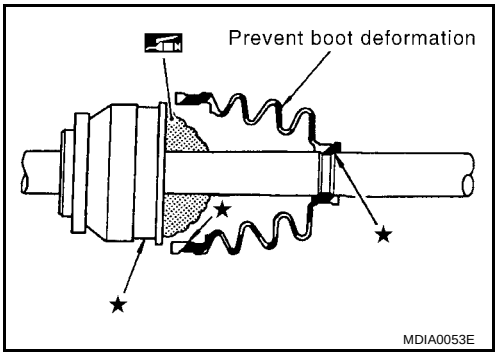
   CAUTION:
   Do not reuse the snap ring.
5. Apply Genuine Nissan Grease (refer to the part catalog) onto the spider assembly and sliding surface.
6. Assemble the sliding joint housing onto spider assembly, and add enough grease to equal the value mentioned below.



   Grease quantity : 115±5 g

7. Install boot securely into grooves (indicated by * marks) shown in figure.

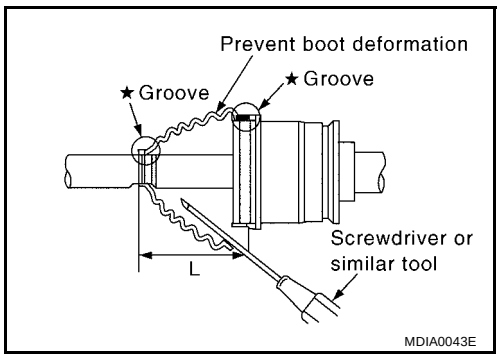
   CAUTION:
   If grease adheres to the boot mounting surface (with * mark) on the joint, the boot may come off. Remove all grease from the surface.



8. Make sure boot installation length “L” is the length indicated below. Insert a screwdriver or similar tool into the large-diameter side. Bleed air out of the inside boot (to adjust pressure outside and inside of boot) to prevent deformation of boot.

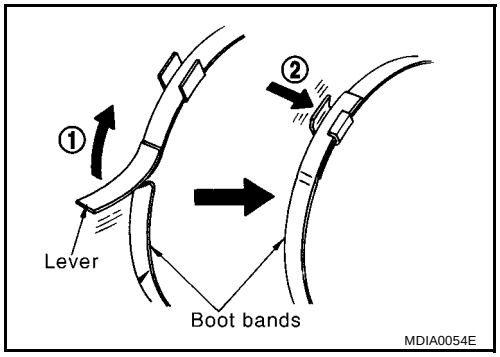
   Boot mounting length : 96.5±1 mm

   CAUTION:
   - **If boot mounting length is outside the standard, it may cause breakage in the boot.**
   - **Be careful not to touch inside of the boot with the tip of a screwdriver.**



9. Secure big and small ends of boot with new boot bands as shown in figure.

   CAUTION:
   Rotate housing and check if boot installation position does not change. If position changes, reinstall boot bands.



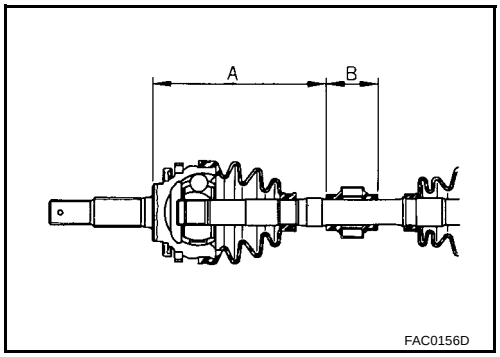
Dynamic Damper (Right Drive Shaft)

- When dynamic damper has been removed, secure with bands as shown in figure so that measurements from fixed-joint side are as listed below.

  CAUTION:
  Do not reuse dynamic damper bands.

  Dimension A : 434 - 440 mm (17.09 - 17.32 in)

  Dimension B : 70 mm (2.76 in)

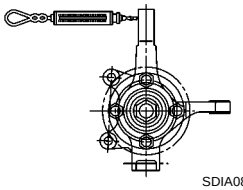


SERVICE DATA AND SPECIFICATIONS (SDS)

PFP:00030

Wheel Bearing

EDS0012R

Drive type	2WD
Axial end play	0.05 mm (0.0020 in)
Rotating torque	0.19 N·m (0.02 kg-m) or less
Spring balance measurement	13.0 N (1.3 kg) or less
Spring balance mounting position (Strut mounting hole upper side)	 SDIA0833J

Drive shaft

EDS0012S

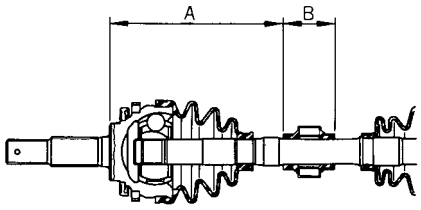
Z80T70C

Joint type		Z80 (Wheel side)	T70C (Transaxle side)
Amount of grease g (oz)		45 - 55 (1.59 - 1.94)	115±5 g
Boot length mm (in)		90.4±1 mm	96.5±1 mm
T70C (Transaxle side) spider assembly	Stamped number	Part No.	
	00	3972051E00	
	01	3972051E01	
	02	3972051E02	
	03	3972051E03	

Dynamic Damper

EDS0012T

Type	Drive type	Specification	Dimension A mm (in)	Dimension B mm (in)
Z80T70C	2WD	RH	434 - 440 (17.09 - 17.32)	70 (2.76)



FAC0156D

Tightening Torque

EDS0012U

Unit: N·m (kg-m, ft-lb)

Hub lock nut	238 - 322 (20 - 32, 176 - 237)