

FRONT & REAR AXLE

SECTION **AX**

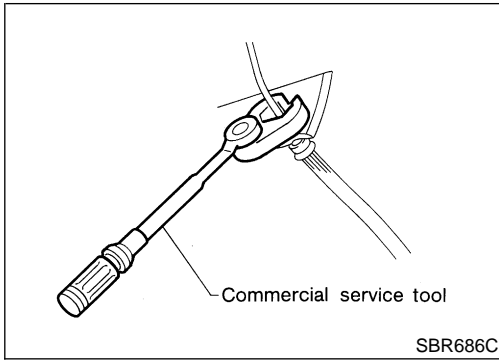
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FRONT AXLE

Precautions



Precautions PRECAUTIONS

- 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.
- After installing removed suspension parts, check wheel alignment and adjust if necessary.
- Use flare nut wrench when removing or installing brake tubes.
- Always torque brake lines when installing.

NDAX0001

Preparation

SPECIAL SERVICE TOOLS

The actual shapes of Kent-Moore tools may differ from those of special service tools illustrated here.

NDAX0002

Tool number (Kent-Moore No.) Tool name	Description	
HT72520000 (J25730-B) Ball joint remover		Removing tie-rod outer end and lower ball joint
KV38106700 (J34296) KV38106800 (J34297) Differential side oil seal protector		Installing drive shaft LH: KV38106700 (J34296) RH: KV38106800 (J34297)

COMMERCIAL SERVICE TOOL

NDAX0003

Tool name	Description	
1 Flare nut crowfoot 2 Torque wrench		Removing and installing brake piping a: 10 mm (0.39 in)

FRONT AXLE

Noise, Vibration and Harshness (NVH) Troubleshooting

Noise, Vibration and Harshness (NVH) Troubleshooting

=NDAX0004

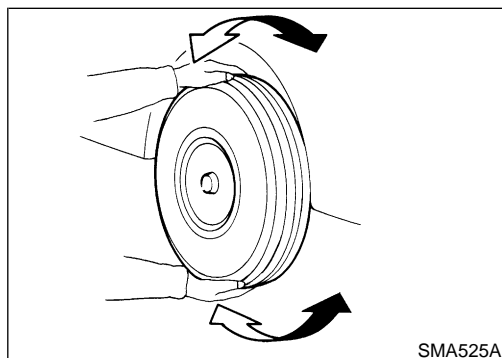
NDAX0004S01

NVH TROUBLESHOOTING CHART

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

Reference page			—	AX-13	—	AX-5,19	—	AX-4,18	Refer to DRIVE SHAFT in this chart.	Refer to AXLE in this chart.	NVH in SU-3 and SU-15	NVH in SU-3 and SU-15	NVH in SU-3 and SU-15	NVH in BR-5	NVH in ST-5
Possible cause and SUSPECTED PARTS			Excessive joint angle	Joint sliding resistance	Imbalance	Improper installation, looseness	Parts interference	Wheel bearing damage	DRIVE SHAFT	AXLE	SUSPENSION	TIRES	ROAD WHEEL	BRAKES	STEERING
Symptom	DRIVE SHAFT	Noise, Vibration	×	×						×	×	×	×	×	×
		Shake	×		×					×	×	×	×	×	×
	AXLE	Noise				×	×		×		×	×	×	×	×
		Shake				×	×		×		×	×	×	×	×
		Vibration				×	×		×		×	×			×
		Shimmy				×	×				×	×	×	×	×
		Judder				×					×	×	×	×	×
		Poor quality ride or handling				×	×	×			×	×	×		

×: Applicable



On-vehicle Service FRONT AXLE PARTS

NDAX0005

Check front axle and front suspension parts for excessive play, cracks, wear and other damage.

- Shake each front wheel to check for excessive play.
- Make sure that the cotter pin is inserted.
- Retighten all nuts and bolts to the specified torque.

Tightening torque:

Refer to “Components”, AX-5.

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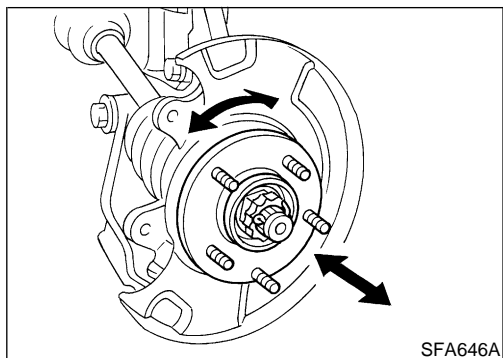
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FRONT AXLE

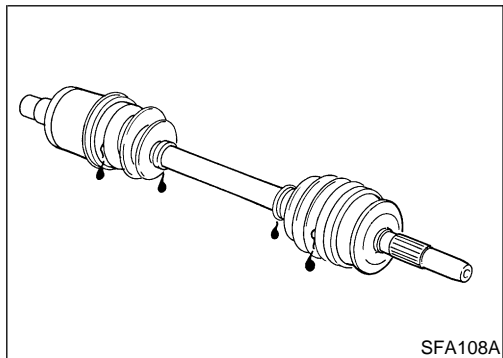
On-vehicle Service (Cont'd)



FRONT WHEEL BEARING

NDAX0006

- Check that wheel bearings operate smoothly.
- Check axial end play.
Axial end play:
0.05 mm (0.0020 in) or less
- If axial end play is not within specification or wheel bearing does not turn smoothly, replace wheel bearing assembly. Refer to "REMOVAL", AX-6.



DRIVE SHAFT

NDAX0007

Check for grease leakage and other damage.

FRONT AXLE

Wheel Hub and Knuckle

COMPONENTS

NDAX0008

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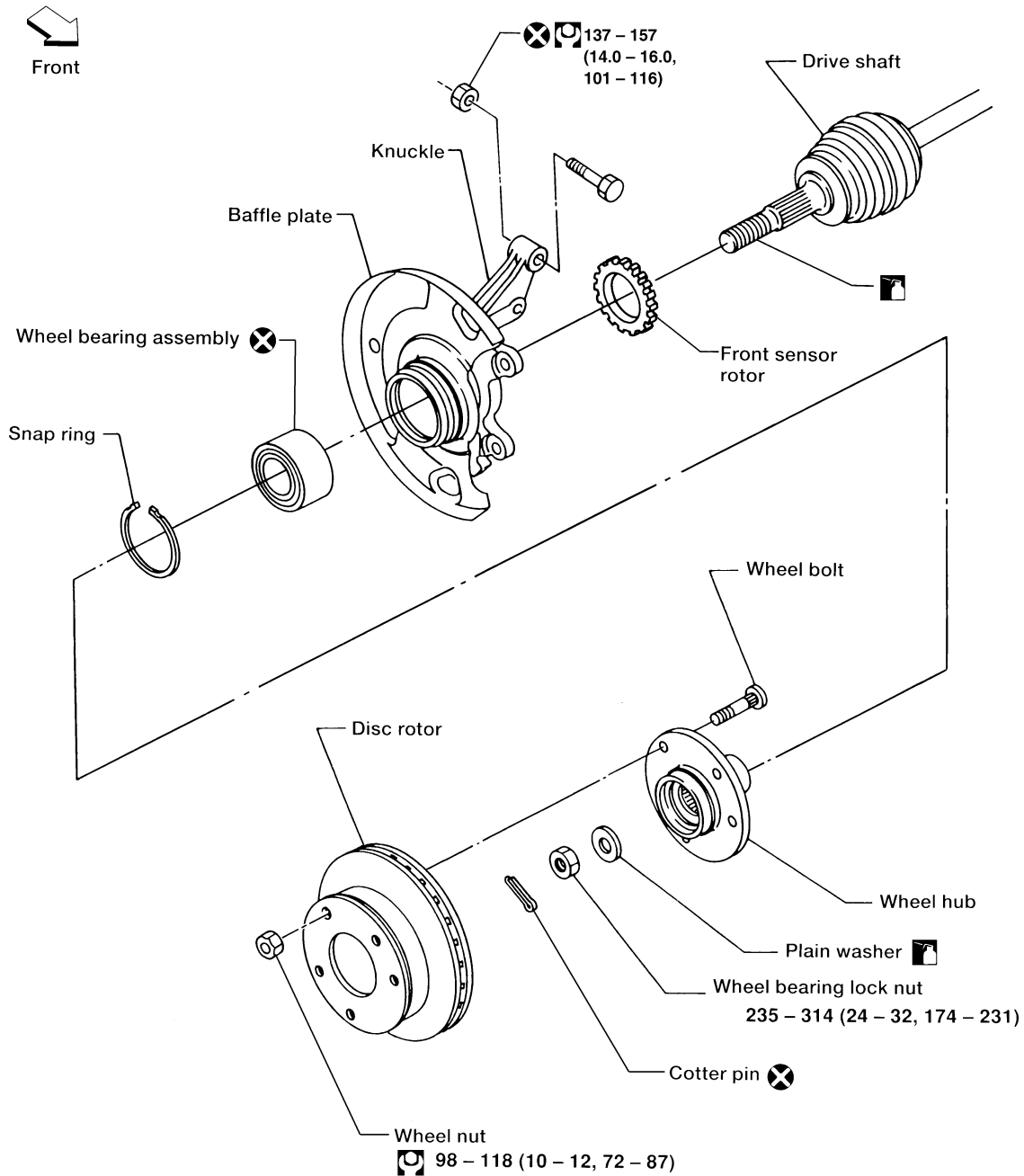
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: N·m (kg·m, ft·lb)

: Genuine NISSAN grease
or equivalent

WAX024

FRONT AXLE

Wheel Hub and Knuckle (Cont'd)

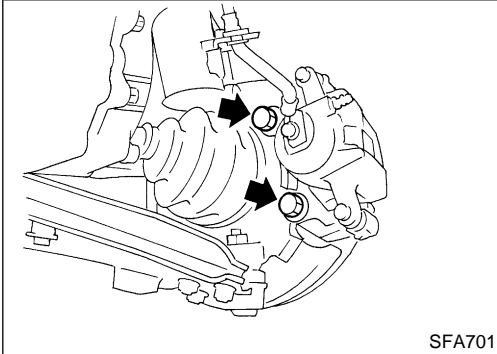
REMOVAL

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CAUTION:

Before removing front axle assembly, disconnect ABS wheel sensor from assembly. Move it from front axle assembly area. Failure to do so may result in damage to sensor wires and the sensor becoming inoperative.

1. Remove wheel bearing lock nut.



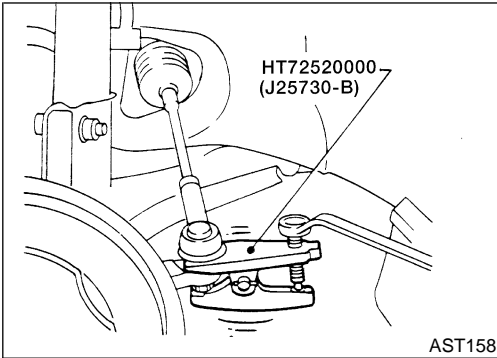
SFA701

2. Remove brake caliper assembly and rotor.

- Brake hose need not be disconnected from brake caliper. Suspend brake caliper with wire so as not to stretch brake hose.

- Be careful not to depress brake pedal, or caliper piston will pop out.

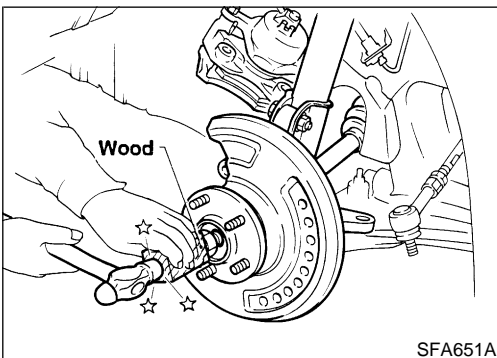
- Make sure brake hose is not twisted.



AST158

3. Separate tie-rod from knuckle with Tool.

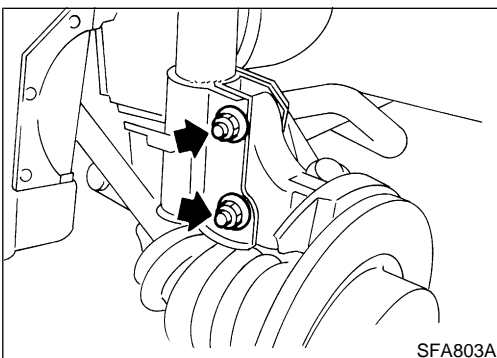
- Install stud nut on stud bolt with castellated side facing up to prevent damage to stud bolt.



SFA651A

4. Separate drive shaft from knuckle by lightly tapping it. If it is hard to remove, use a puller.

- When removing drive shaft, cover boots with a shop towel to prevent damage to them.

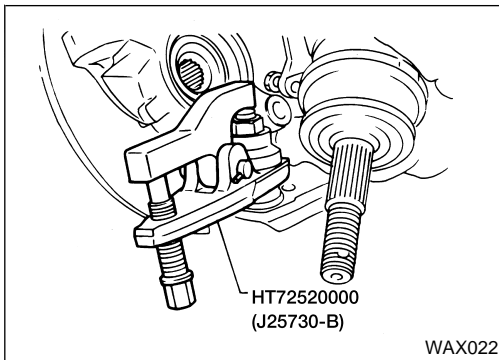


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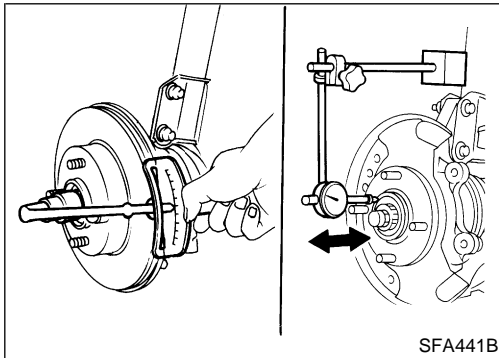
5. Remove strut lower mounting bolts.

FRONT AXLE

Wheel Hub and Knuckle (Cont'd)



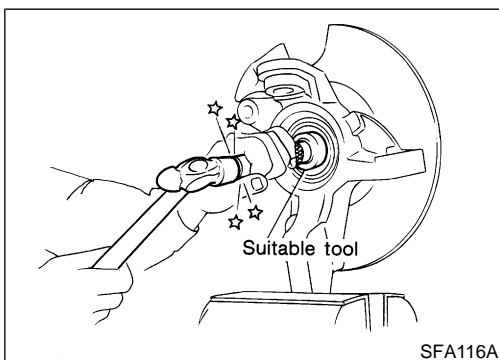
6. Loosen lower ball joint tightening nut.
7. Separate knuckle from lower ball joint stud with tool.
8. Remove knuckle from transverse link.



INSTALLATION

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1. Install knuckle with wheel hub.
 - Replace strut lower mounting nuts.
 - **When installing knuckle to strut, be sure to hold bolts and tighten nuts.**
 - : 137 - 157 N·m (14.0 - 16.0 kg·m, 101 - 116 ft·lb)
2. Tighten tie-rod ball joint nut.
 - : 29 - 39 N·m (3.0 - 4.0 kg·m, 22 - 29 ft·lb)
 - **Apply oil to threaded portion of drive shaft and to both sides of plain washer.**
3. Tighten wheel bearing lock nut.
 - : 235 - 314 N·m (24 - 32 kg·m, 174 - 231 ft·lb)
4. Check wheel bearing axial end play.
 - Axial end play:**
0.05 mm (0.0020 in) or less



DISASSEMBLY

NDAX0011

CAUTION:

When removing wheel hub or wheel bearing from knuckle, replace wheel bearing assembly (outer race and inner race) with a new one.

Wheel bearing does not require maintenance. If any of the following symptoms are noted, replace wheel bearing assembly.

- Growling noise is emitted from wheel bearing during operation.
- Wheel bearing drags or turns roughly. This occurs when turning hub by hand after bearing lock nut is tightened to specified torque.

Wheel Hub

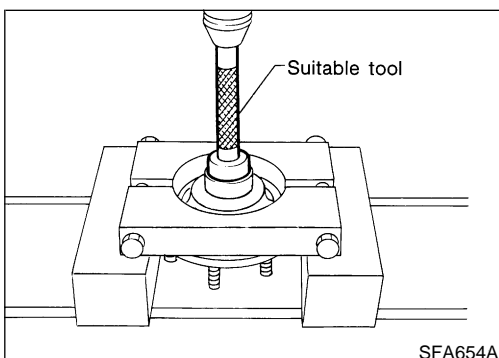
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Drive out wheel hub from knuckle with a suitable tool.

Wheel Bearing

NDAX0011S02

1. If wheel bearing inner race (outside) is removed together with wheel hub, press out wheel bearing inner race.



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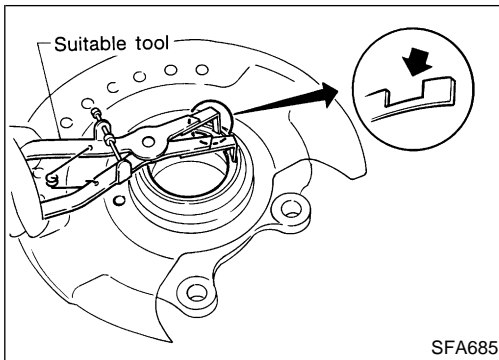
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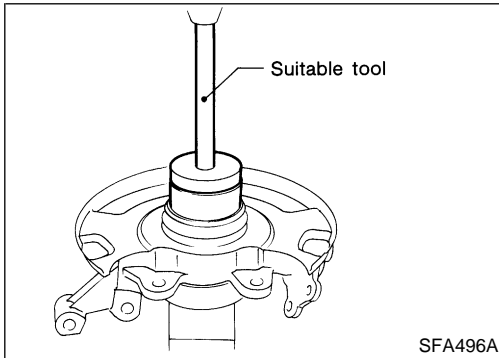
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FRONT AXLE

Wheel Hub and Knuckle (Cont'd)



2. Remove snap ring.



3. Press out bearing outer race.

INSPECTION

Wheel Hub and Knuckle

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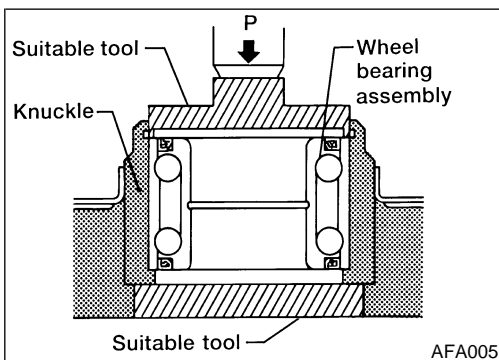
Check wheel hub and knuckle for cracks by using a magnetic exploration or dyeing test.

NDAX0012S01

Snap Ring

Check snap ring for wear and cracks. Replace if necessary.

NDAX0012S02



ASSEMBLY

1. Press new wheel bearing assembly into knuckle.

Maximum load P:

29 kN (3 ton, 3.3 US ton, 3.0 Imp ton)

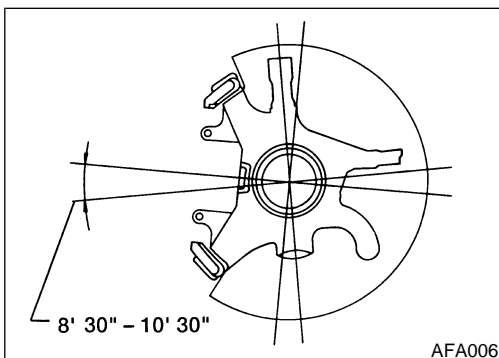
NDAX0013

CAUTION:

- Do not press on inner race of wheel bearing assembly.
- Do not apply oil or grease to mating surfaces of wheel bearing outer race and knuckle.

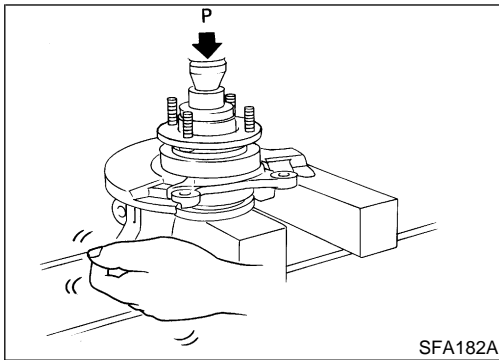
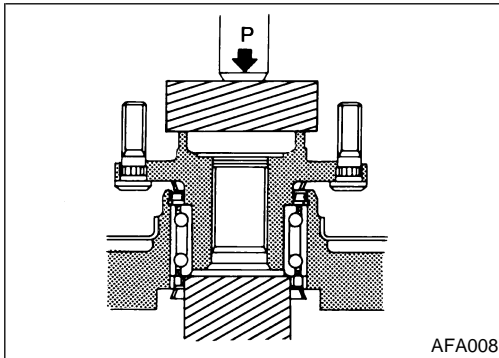
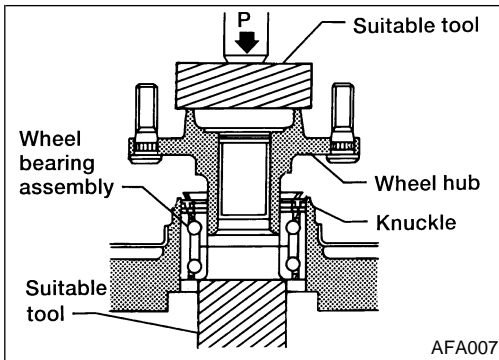
2. Install snap ring into groove of knuckle.

3. Install baffle plate and splash guard onto knuckle.



FRONT AXLE

Wheel Hub and Knuckle (Cont'd)



4. Press wheel hub into wheel bearing.

Maximum load P:

29 kN (3 ton, 3.3 US ton, 3.0 Imp ton)

- Wheel bearing inner race must be held as shown.

5. Check bearing operation.

- a. Add load P with press.

Load P:

39.2 - 82.4 kN

(4.0 - 8.4 ton, 4.4 - 9.3 US ton, 3.94 - 8.27 Imp ton)

- b. Spin knuckle several turns in both directions.
- c. Make sure that wheel bearing operates smoothly.

Drive Shaft

COMPONENTS

CAUTION:

- Circular clips should be properly meshed with differential side gear (transaxle side) and with joint assembly (wheel side). Make sure they will not come out.
- Be careful not to damage boots. Use suitable protector or cloth during removal and installation.

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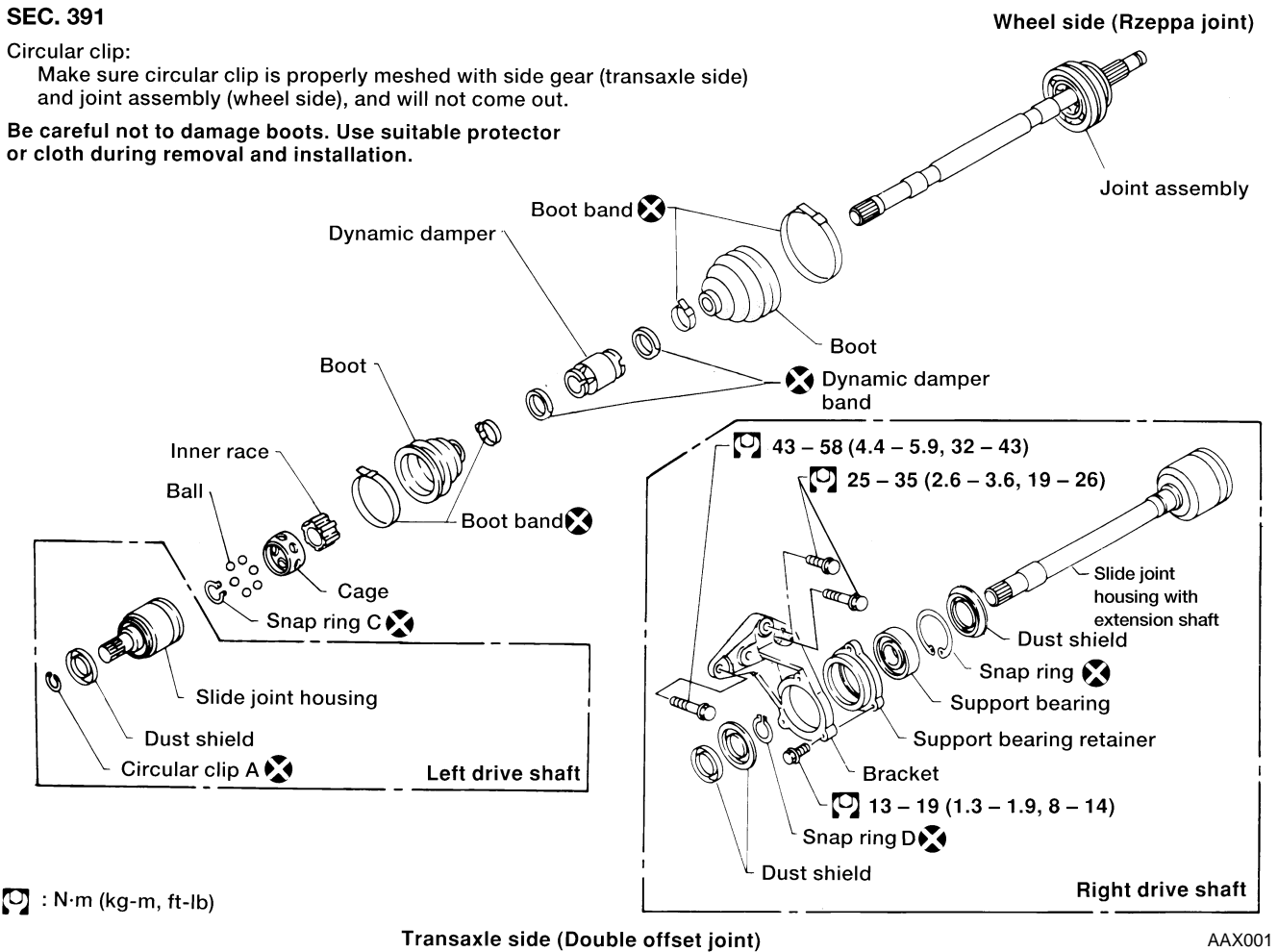
Drive Shaft (Cont'd)

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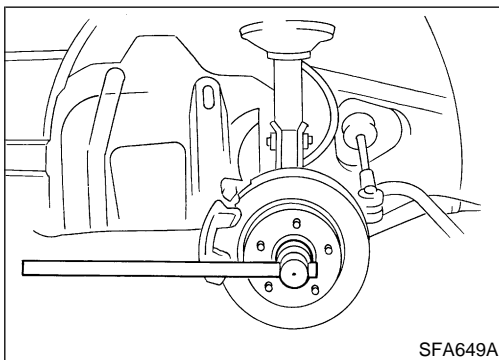
Circular clip:

Make sure circular clip is properly meshed with side gear (transaxle side) and joint assembly (wheel side), and will not come out.

Be careful not to damage boots. Use suitable protector or cloth during removal and installation.



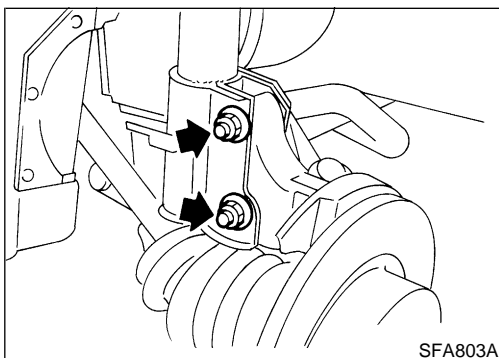
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REMOVAL

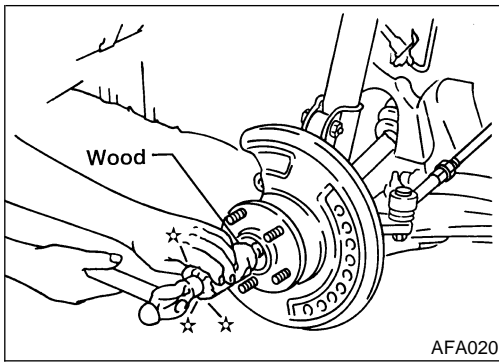
NDAX0015

1. Remove wheel bearing lock nut.
 - Tie-rod does not need to be disconnected from knuckle.
 - Suspend knuckle with wire so as not to stretch brake hose.
 - Do not pull or twist brake hose.
2. Remove clip and separate brake hose from strut.
3. Remove strut lower mounting bolts.
 - Remove brake hose clip.



FRONT AXLE

Drive Shaft (Cont'd)



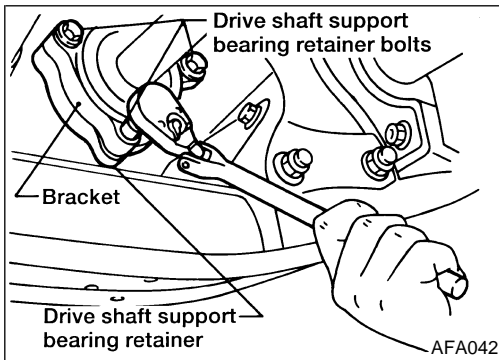
4. Separate drive shaft from knuckle by lightly tapping it. If it is hard to remove, use a puller.
- **When removing drive shaft, cover boots with a shop towel to prevent damage to them.**

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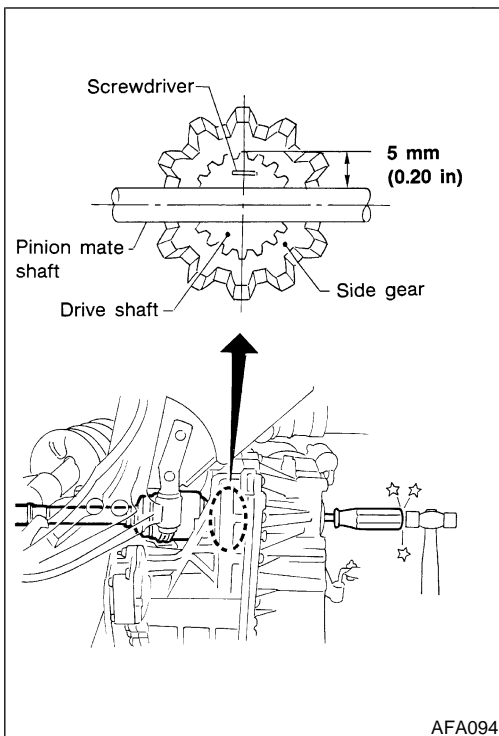
5. Remove right drive shaft from transaxle.
- Position drain pan beneath transaxle.
 - Remove support bearing bolts and pull drive shaft from transaxle.

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6. Remove left drive shaft from transaxle.
- Insert screwdriver into transaxle opening for right drive shaft and strike with a hammer.
 - **Be careful not to damage pinion mate shaft and side gear.**

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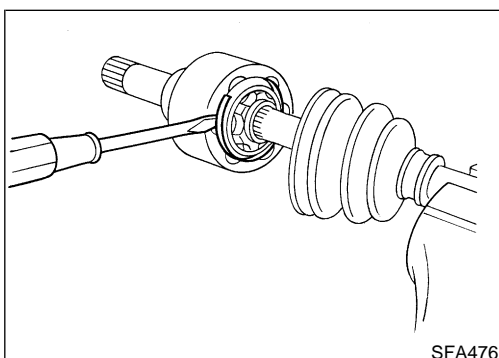
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DISASSEMBLY Transaxle Side

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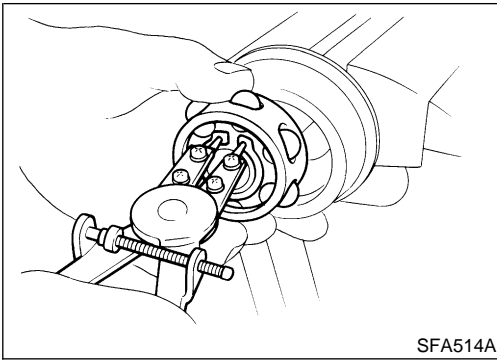


1. Remove boot bands.
2. Put matching marks on slide joint housing and inner race, before separating joint assembly.
3. Pry off snap ring "A" with a screwdriver, and pull out slide joint housing.

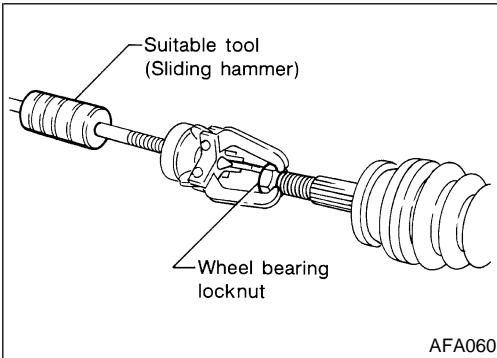
SFA476

FRONT AXLE

Drive Shaft (Cont'd)



4. Put matching marks on inner race and drive shaft.
 5. Remove snap ring "C", then remove ball cage, inner race and balls as a unit.
 6. Draw out boot.
- **Cover drive shaft serrations with tape so as not to damage the boot.**



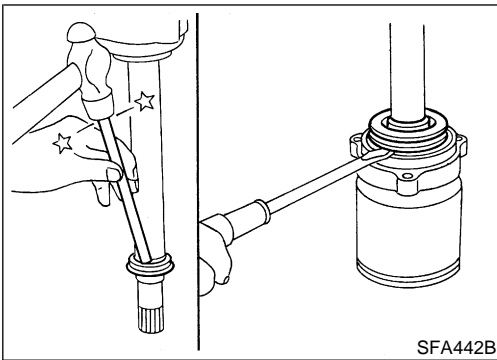
Wheel Side

NDAX0016S02

CAUTION:

The joint on the wheel side cannot be disassembled.

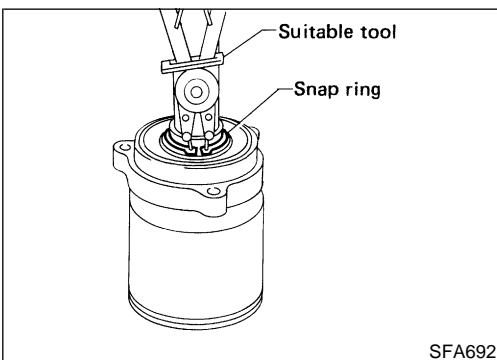
1. Before separating joint assembly, put matching marks on drive shaft and joint assembly.
 2. Separate joint assembly with a suitable tool.
- **Be careful not to damage threads on drive shaft.**
3. Remove boot bands.



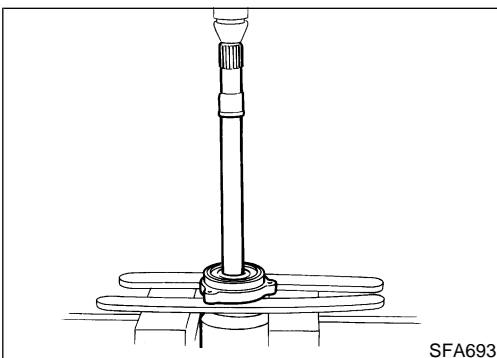
Support Bearing

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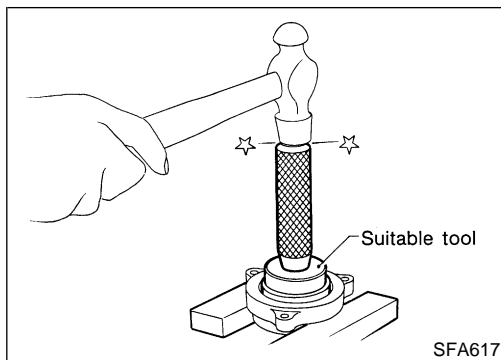
1. Remove dust shield.



2. Remove snap ring.



3. Press support bearing assembly off drive shaft.



4. Remove dust shield.
5. Remove snap ring.
6. Separate support bearing from retainer.

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INSPECTION

Thoroughly clean all parts in cleaning solvent, and dry with compressed air. Check parts for evidence of deformation and other damage.

NDAX0017

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Drive Shaft

Replace drive shaft if it is twisted or cracked.

NDAX0017S01

FE

Boot

Check boot for fatigue, cracks, and wear. Replace boot with new boot bands.

NDAX0017S02

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Joint Assembly (Transaxle side)

- Replace any parts of double offset joint which show signs of scorching, rust, wear or excessive play.
- Check serration for deformation. Replace if necessary.
- Check slide joint housing for any damage. Replace if necessary.

NDAX0017S03

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Joint Assembly (Wheel side)

Replace joint assembly if it is deformed or damaged.

NDAX0017S04

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Support Bearing

Make sure wheel bearing rolls freely and is free from noise, cracks, pitting and wear.

NDAX0017S05

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Support Bearing Bracket

Check support bearing bracket for cracks with a magnetic exploration or dye test.

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ASSEMBLY

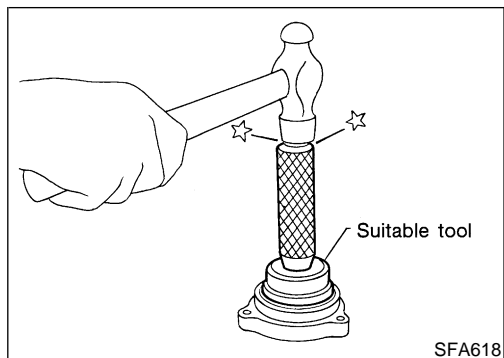
- After drive shaft has been assembled, ensure that it moves smoothly over its entire range without binding.
- Use Genuine NISSAN grease or equivalent after every overhaul.

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FRONT AXLE

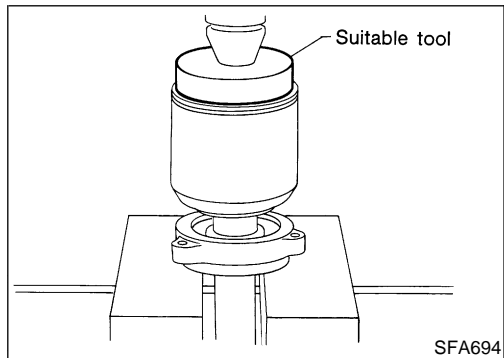
Drive Shaft (Cont'd)



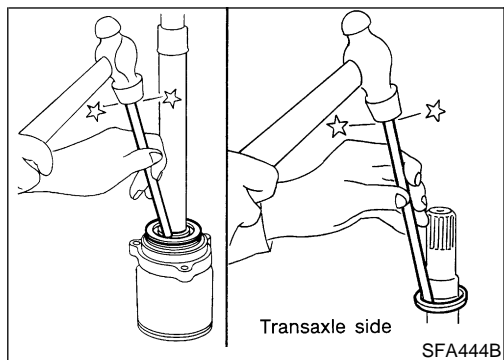
Support Bearing

1. Install bearing into retainer.

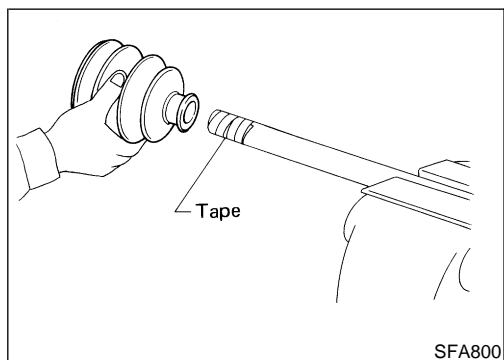
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2. Install snap ring.
3. Install dust shield.
4. Press drive shaft into bearing.



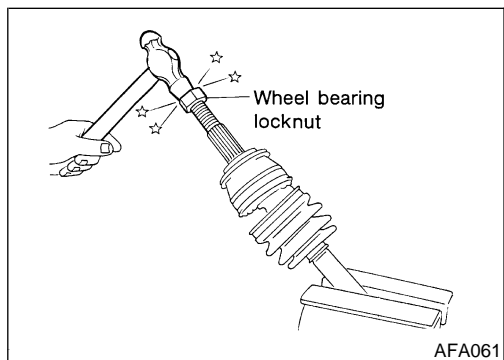
5. Install snap ring.
6. Install new dust shield.



Wheel Side

1. Install boot and new small boot band on drive shaft.
 - **Cover drive shaft serration with tape so as not to damage boot during installation.**

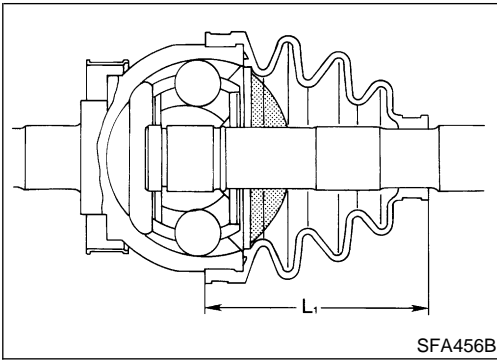
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2. Set joint assembly onto drive shaft by lightly tapping it. Ensure that marks which were made during disassembly are properly aligned.

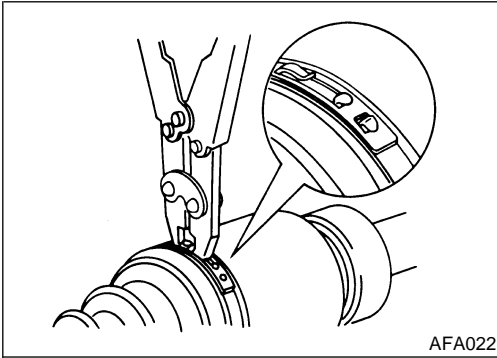
FRONT AXLE

Drive Shaft (Cont'd)



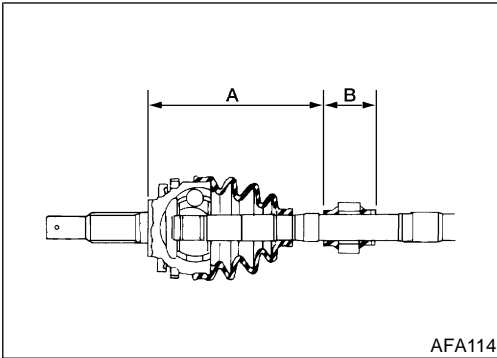
3. Pack drive shaft with specified amount of grease.
Specified amount of grease:
175 - 195 g (6.17 - 6.88 oz)
4. Make sure that boot is properly installed on the drive shaft groove.
Set boot so that it does not swell and deform when its length is "L₁".
Length "L₁":
87.5 - 89.5 mm (3.445 - 3.524 in)

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5. Lock new larger and smaller boot bands securely with a suitable tool.

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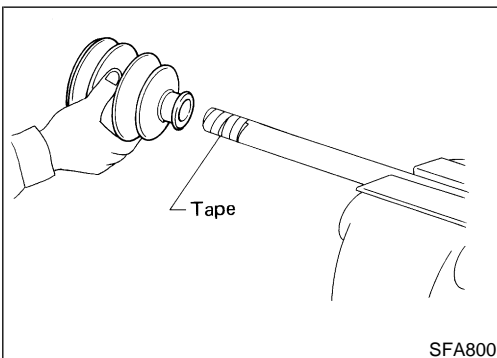


Dynamic Damper

NDAX0018S03

1. Use a new damper band when reinstalling.
2. Install dynamic damper from stationary-joint side while holding it securely:
Length:
"A" 199 - 205 mm (7.83 - 8.07 in)
"B" 70 mm (2.76 in)

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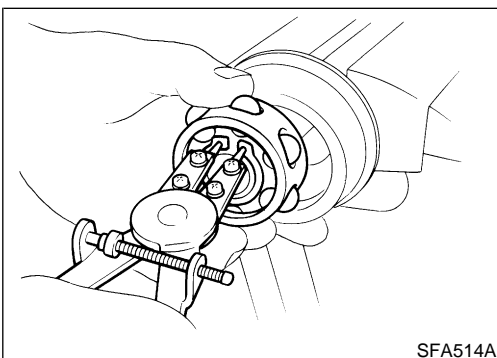


Transaxle Side

NDAX0018S04

1. Install boot and new small boot band on drive shaft.
 - **Cover drive shaft serration with tape to prevent damage to boot during installation.**

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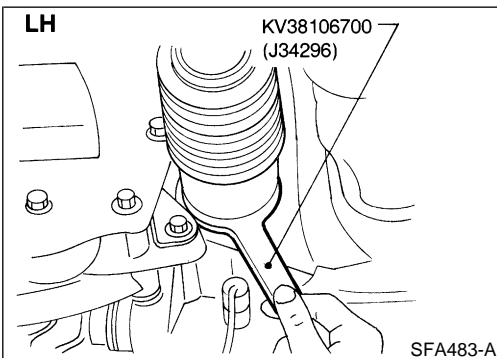
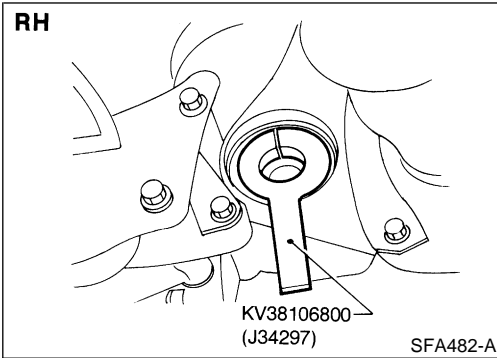
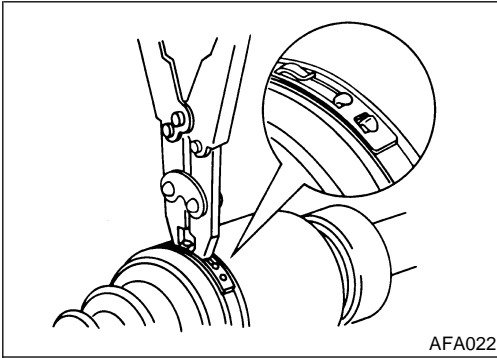
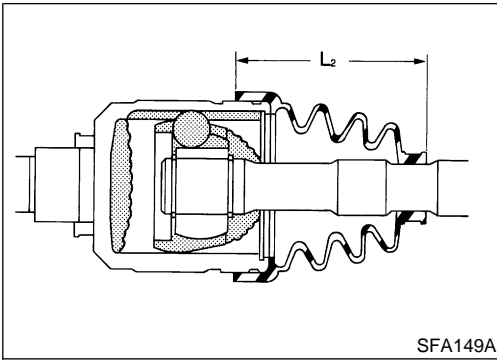


2. Install ball cage, inner race and balls as a unit, making sure that the matching marks which were made during disassembly are properly aligned.
3. Install new snap ring "C".

IDX

FRONT AXLE

Drive Shaft (Cont'd)



4. Pack drive shaft with specified amount of grease.
Specified amount of grease:
210 - 230 g (7.41 - 8.11 oz)
5. Install slide joint housing, then install new snap ring "A".
6. Make sure that boot is properly installed on the drive shaft groove.
Set boot so that it does not swell and deform when its length is "L₂".
Length "L₂":
102.4 - 104.4 mm (4.03 - 4.11 in)
7. Lock new larger and smaller boot bands securely with a suitable tool.

INSTALLATION

Transaxle Side

NDAX0019

NDAX0019S01

1. Drive a new oil seal to transaxle. Refer to **AT-272**, "Differential Side Oil Seal Replacement".
2. Set Tool along the inner circumference of oil seal.

3. Insert drive shaft into transaxle. Be sure to properly align the serrations and then withdraw Tool.
 - No circular clip is used on RH side.
 - Use new circular clip on LH side.
4. Push drive shaft, then press-fit circular clip on the drive shaft into circular clip groove of side gear.
5. After its insertion, try to pull the slide joint out of the transaxle by hand. If it pulls out, the circular clip is not properly meshed with the side gear.

Wheel Side

NDAX0019S02

1. Install drive shaft into knuckle.
2. Tighten wheel bearing lock nut. Refer to "INSTALLATION", AX-7.

FRONT AXLE

Service Data and Specifications (SDS)

Service Data and Specifications (SDS)

WHEEL BEARING (FRONT)

NDAX0020

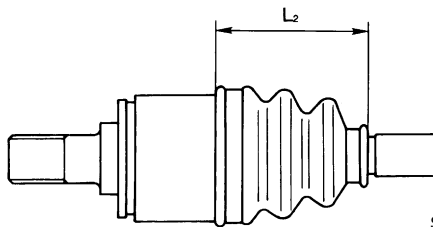
Wheel bearing axial end play	0.05 mm (0.0020 in) or less
Wheel bearing lock nut tightening torque	235 - 314 N·m (24 - 32 kg·m, 174 - 231 ft·lb)

DRIVE SHAFT

NDAX0021

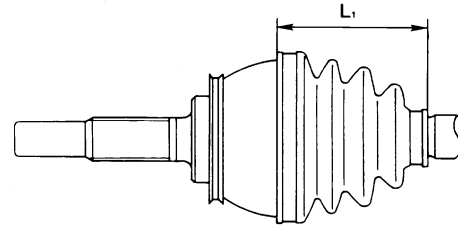
Applied model	All	
Joint type	Transaxle side	DOJ
	Wheel side	Rzeppa
Grease	Nissan genuine grease or equivalent	
Capacity	Transaxle side	210 - 230 g (7.41 - 8.11 oz)
	Wheel side	175 - 195 g (6.17 - 6.88 oz)
Boot length	Transaxle side "L ₂ "	102.4 - 104.4 mm (4.03 - 4.11 in)
	Wheel side "L ₁ "	87.5 - 89.5 mm (3.445 - 3.524 in)

Transaxle side



SFA961A

Wheel side



SFA962A

GI

MA

EM

LC

EC

FE

AT

AX

SU

BR

ST

RS

BT

HA

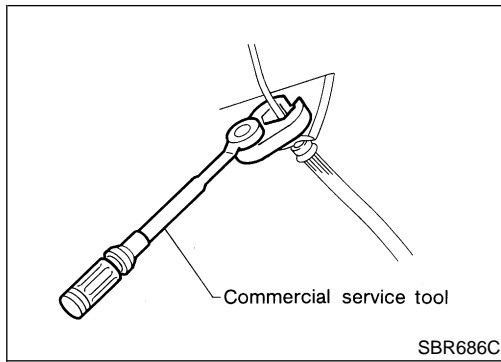
SC

EL

IDX

REAR AXLE

Precautions



Precautions PRECAUTIONS

- 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.
- When installing suspension components, check wheel alignment and adjust if necessary.
- Always torque brake lines when installing.

NDAX0022

Preparation

COMMERCIAL SERVICE TOOL

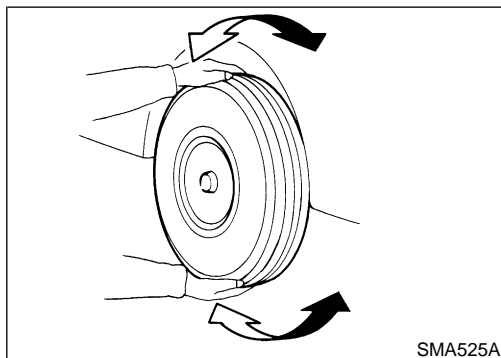
NDAX0023

Tool name	Description
1 Flare nut crowfoot 2 Torque wrench	<p>Removing and installing brake piping a: 10 mm (0.39 in)</p>

Noise, Vibration and Harshness (NVH) Troubleshooting

Refer to "NVH TROUBLESHOOTING CHART", AX-3.

NDAX0024



On-vehicle Service

REAR AXLE PARTS

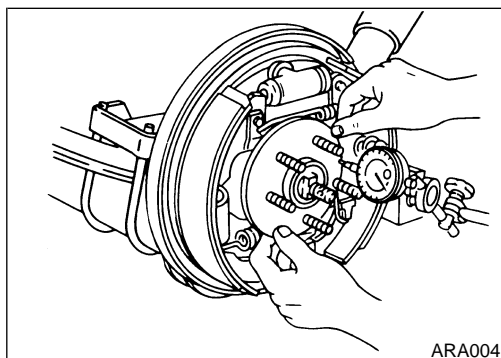
Check axle and suspension parts for excessive play, wear or damage.

NDAX0025

- Shake each rear wheel to check for excessive play.
- Make sure that all cotter pins are inserted.
- Retighten all nuts and bolts to the specified torque.

Tightening torque:

Refer to "Components", AX-19.



REAR WHEEL HUB BEARING

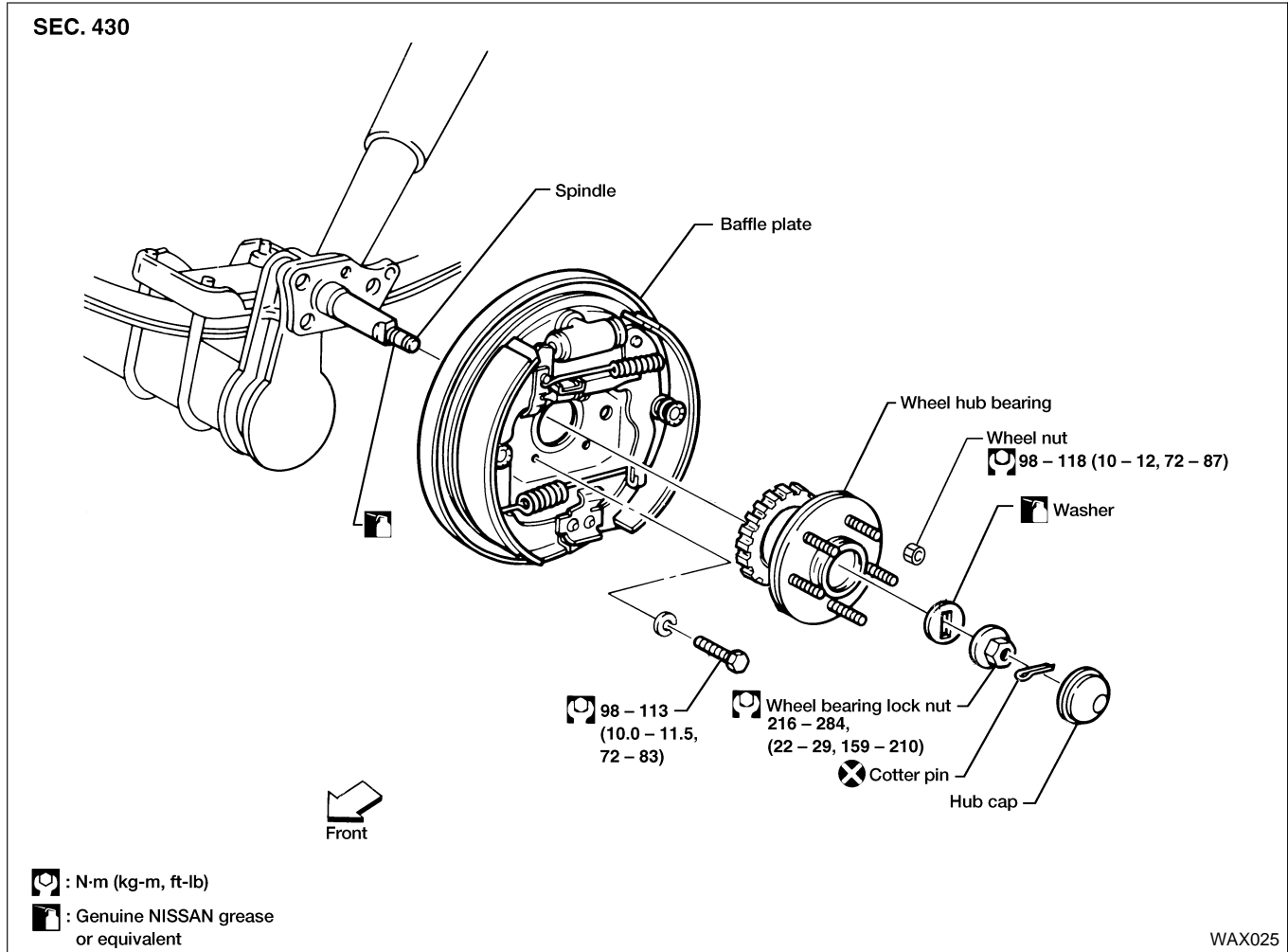
NDAX0026

- Check axial end play.
Axial end play:
0.05 mm (0.0020 in) or less
- Check that wheel hub bearing operates smoothly.
- Check tightening torque of wheel bearing lock nut.
🔩 : 216 - 284 N·m (22 - 29 kg·m, 159 - 210 ft·lb)
- If axial end play is not within specification, or wheel hub bearing does not turn smoothly, replace wheel hub bearing. Refer to "REMOVAL", AX-19.

Wheel Hub

COMPONENTS

NDAX0027



GI
MA
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EC
FE
AT
AX
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RS

REMOVAL

NDAX0028

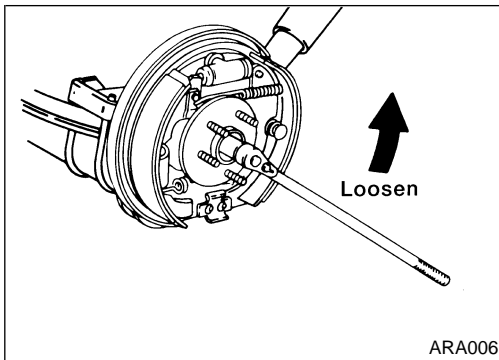
CAUTION:

- Before removing the wheel hub bearing, disconnect the ABS wheel sensor from the assembly. Then move it away from the hub. Failure to do so may result in damage to the sensor wires and the sensor becoming inoperative.
- Wheel hub bearing does not require maintenance. If any of the following occurs, replace wheel hub bearing.
 - 1) Growling noise is emitted from wheel hub bearing during operation.
 - 2) Wheel hub bearing drags or turns roughly. This occurs when turning hub by hand after bearing lock nut is tightened to specified torque.
 - 3) Rear sensor rotor is damaged.

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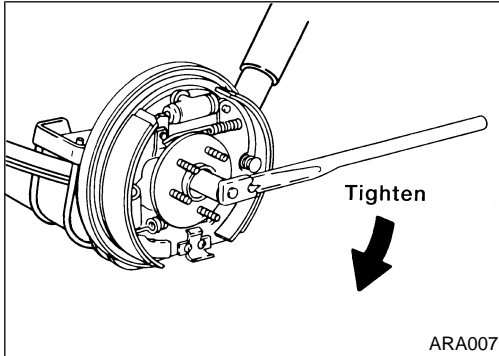
REAR AXLE

Wheel Hub (Cont'd)



ARA006

1. Remove brake drum.
2. Remove wheel bearing lock nut.
3. Remove wheel hub bearing assembly.




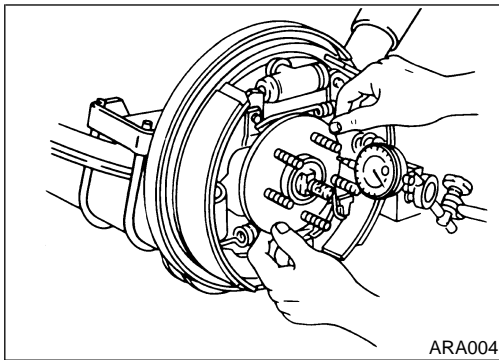
ARA007

INSTALLATION

NDAX0029

1. Install wheel hub bearing assembly.
2. Tighten wheel bearing lock nut.
Before tightening, apply oil to threaded portion of rear spindle and both sides of plain washer.
3. Check that wheel bearing operates smoothly.

 : 216 - 284 N·m (22 - 29 kg·m, 159 - 210 ft·lb)



ARA004

4. Check wheel hub bearing axial end play.

Axial end play:
0.05 mm (0.0020 in) or less

Service Data and Specifications (SDS)

WHEEL BEARING (REAR)

NDAX0030

Wheel bearing axial end play	0.05 mm (0.0020 in) or less
Wheel bearing lock nut tightening torque	216 - 284 N·m (22 - 29 kg·m, 159 - 210 ft·lb)