# **FRONT & REAR AXLE**

# SECTION AX

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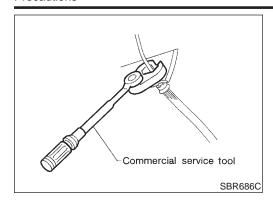












# Precautions PRECAUTIONS

NCAX0001

- 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.

## **Preparation**

#### SPECIAL SERVICE TOOLS

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

NCAX0002

Tool number (Kent-Moore No.) Tool name	Description	
HT72520000 (J25730-B) Ball joint remover	NT146	Removing tie-rod outer end and lower ball joint
KV38106700 (J34296) KV38106800 (J34297) Differential side oil seal protector	NT147	Installing drive shaft LH: KV38106700 (J34296) RH: KV38106800 (J34297)

## **COMMERCIAL SERVICE TOOLS**

Tool name	Description	
1 Flare nut crowfoot 2 Torque wrench	a 2 1 2 NT360	Removing and installing each brake piping a: 10 mm (0.39 in)

# Noise, Vibration and Harshness (NVH) **Troubleshooting**

#### **NVH TROUBLESHOOTING CHART**

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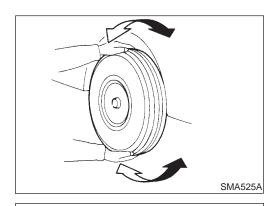
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NCAX0004S01 Use the chart below to help you find the cause of the symptom. If necessary, repair or replace these parts.

Reference page			I	AX-15	ı	AX-5, 21	ı	AX-3, 21	I	ı	SU-3.	SU-3.	SU-3.	BR-6.	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	
	DIVE OUAET	Noise, Vibration	×	×						×	×	×	×	×	×
	RIVE SHAFT	Shake	×		×					×	×	×	×	×	×
		Noise				×	×		×		×	×	×	×	×
		Shake				×	×		×		×	×	×	×	×
Symptom		Vibration				×	×		×		×	×			×
AXLE	XLE	Shimmy				×	×				×	×	×	×	×
		Judder				×					×	×	×	×	×
		Poor quality ride or handling				×	×	×			×	×	×		

×: Applicable





## **On-vehicle Service** FRONT AXLE PARTS

ST

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

- Shake each front wheel to check for excessive play.
- Make sure that cotter pin is inserted.

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Retighten all axle and suspension nuts and bolts to the specified torque.

**Tightening torque:** 

Refer to "FRONT SUSPENSION", in SU section.

#### FRONT WHEEL BEARING

SC NCAX0006

- Check that wheel bearings operate smoothly.
- Check axial end play.

**Axial end play:** 

replace wheel bearing assembly.

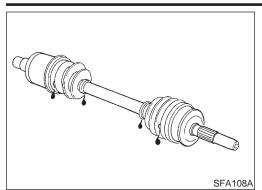
0.05 mm (0.0020 in) or less

If out of specification or wheel bearing does not turn smoothly,

Refer to "Wheel Hub and Knuckle", "FRONT AXLE", AX-5.

# **FRONT AXLE**

On-vehicle Service (Cont'd)



# **DRIVE SHAFT**

Check for grease leakage or other damage.

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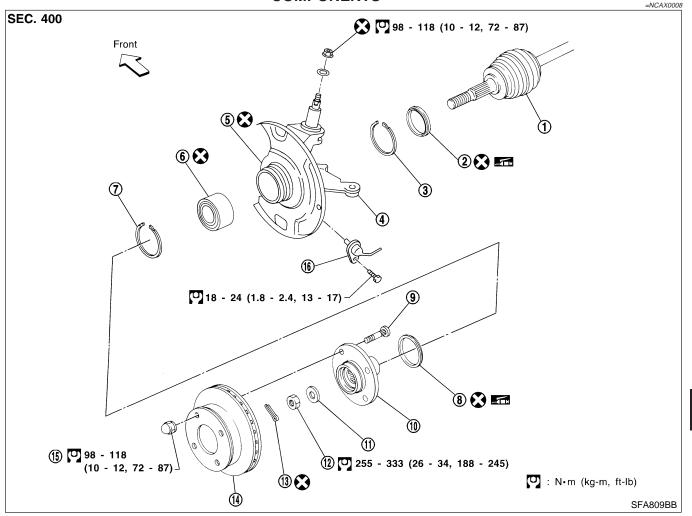
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# Wheel Hub and Knuckle COMPONENTS



- 1. Drive shaft
- 2. Inner grease seal
- 3. Snap ring
- 4. Knuckle
- 5. Baffle plate
- 6. Wheel bearing assembly

- 7. Snap ring
- 8. Outer grease seal
- 9. Hub bolt
- 10. Wheel hub
- 11. Plain washer

- 12. Wheel bearing lock nut
- 13. Cotter pin
- 14. Brake disc
- 15. Wheel nut
- 16. ABS sensor

#### **REMOVAL**

#### **CAUTION:**

Before removing the front axle assembly, disconnect the ABS wheel sensor from the assembly. Then move it away from the front axle assembly area.

Failure to do so may result in damage to the sensor wires and the sensor becoming inoperative.

1. Remove wheel bearing lock nut.



- 91
- RS





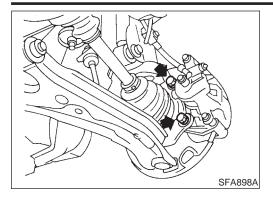
HA







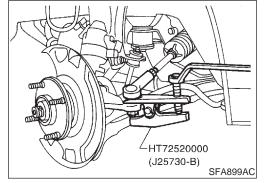




2. Remove brake caliper assembly and rotor.

Brake hose need not be disconnected from brake caliper. In this case, suspend caliper assembly with wire so as not to stretch brake hose. Be careful not to depress brake pedal, or piston will pop out.

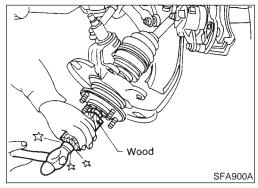
Make sure brake hose is not twisted.



3. Separate tie-rod from knuckle with Tool.

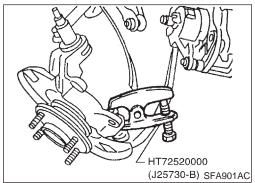
Install stud nut on stud bolt to prevent damage to stud bolt.

4. Remove kingpin cap and securing nut. Separate kingpin from knuckle.

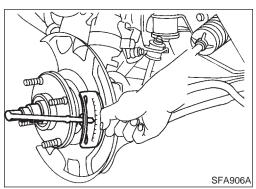


5. Separate drive shaft from knuckle by lightly tapping it. If it is hard to remove, use a puller.

Cover boots with shop towel so as not to damage them when removing drive shaft.

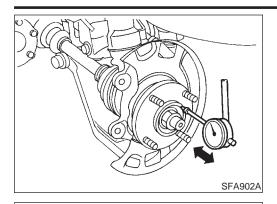


- 6. Loosen lower ball joint tightening nut.
- 7. Separate knuckle from lower ball joint stud with Tool.
- 8. Remove knuckle from transverse link.



#### **INSTALLATION**

- Install knuckle with wheel hub.
- 2. Tighten wheel bearing lock nut.
  - (24 32 kg-m, 174 231 ft-lb)
- 3. Check that wheel bearings operate smoothly.



Suitable tool

Suitable tool

SFA903A

4. Check wheel bearing axial end play.

Axial end play:

0.05 mm (0.0020 in) or less

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CAUTION:

NCAX0011

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

FE

Wheel Hub

Drive out hub with inner race (outside) from knuckle with a suitable tool.

GL

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When replacing wheel bearing, replace complete wheel bearing assembly (Inner races and outer race).

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 Remove bearing inner race (outside), then remove outer grease seal.

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2. Remove inner grease seal from knuckle.

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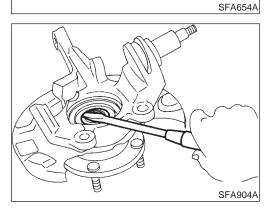
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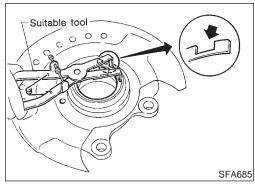
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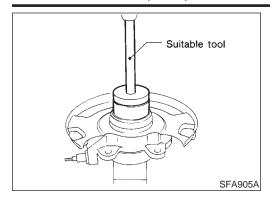
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3. Remove snap rings.



4. Press out bearing outer race.

#### **INSPECTION**

NCAX0012

#### Wheel Hub and Knuckle

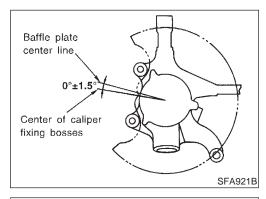
NCAX0012S01

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

#### **Snap Ring**

NCAX0012S02

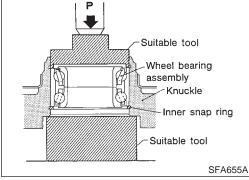
Check snap ring for wear or cracks. Replace if necessary.



#### **ASSEMBLY**

NCAX0013

- When removing baffle plate, replace it with a new one.
- When installing the baffle plate, press new plate so that it is in contact with knuckle wall. Refer to figure at left.



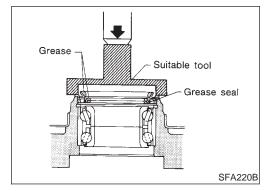
- 1. Install inner snap ring into groove of knuckle.
- 2. Press new wheel bearing assembly into knuckle until it contacts snap ring.

#### **Maximum load P:**

49 kN (5 ton, 5.5 US ton, 4.9 Imp ton)

## **CAUTION:**

- Do not press inner race of wheel bearing assembly.
- Do not apply oil or grease to mating surfaces of wheel bearing outer race and knuckle.
- 3. Install outer snap ring into groove of knuckle.
- 4. Pack grease seal lip with multi-purpose grease.
- 5. Install outer grease seal.



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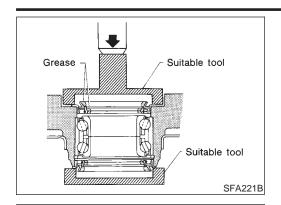
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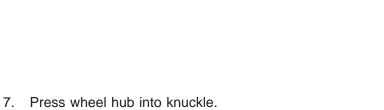
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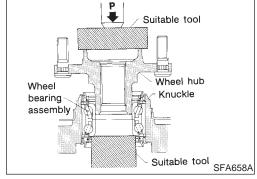
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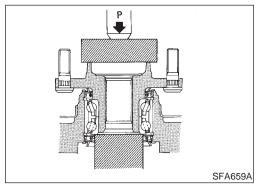
6. Install inner grease seal.





49 kN (5 ton, 5.5 US ton, 4.9 Imp ton) Be careful not to damage grease seal.

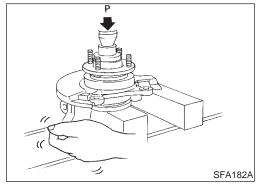
**Maximum load P:** 



8. Check bearing operation.

a. Add load P with press.

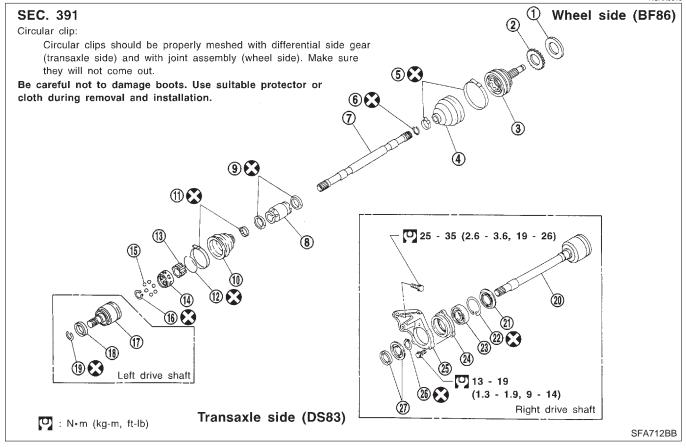
Load P: 34.3 - 49.0 kN (3.5 - 5.0 ton, 3.9 - 5.5 US ton, 3.44 - 4.92 Imp ton)



o. Spin knuckle several turns in both directions.

c. Make sure that wheel bearings operate smoothly.

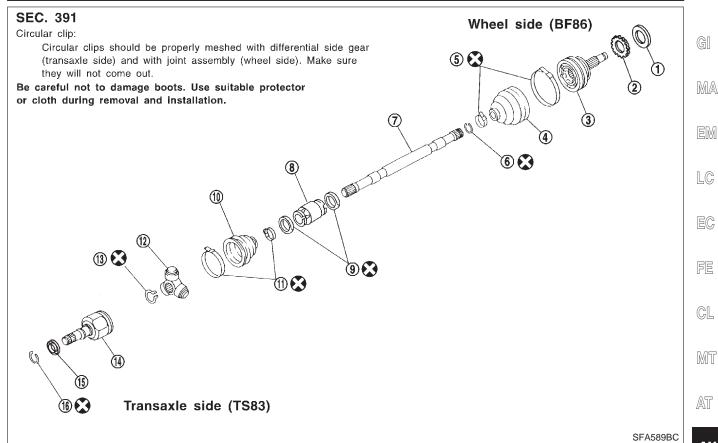
# Drive Shaft COMPONENTS



- 1. Dust shield
- 2. ABS ring
- 3. Joint assembly
- 4. Boot
- 5. Boot band
- 6. Circular clip
- 7. Drive shaft
- 8. Dynamic damper
- 9. Dynamic damper band

- 10. Boot
- 11. Boot band
- 12. Stopper ring
- 13. Inner race
- 14. Cage
- 15. Ball
- 16. Snap ring
- 17. Slide joint housing
- 18. Dust shield

- 19. Circular clip
- 20. Slide joint housing with extension shaft
- 21. Dust shield
- 22. Snap ring
- 23. Support bearing
- 24. Support bearing retainer
- 25. Bracket
- 26. Snap ring
- 27. Dust shield



- Dust shield
- 2. ABS ring
- 3. Joint assembly
- 4. Boot
- Boot band 5.
- Circular clip

- Drive shaft
- Dynamic damper
- Dynamic damper band
- 10. Boot
- 11. Boot band

- 12. Spider assembly
- 13. Snap ring
- 14. Slide joint housing
- 15. Dust shield
- 16. Circular clip

**REMOVAL** 

Remove wheel bearing lock nut.

Remove brake caliper assembly and rotor.

Brake hose need not be disconnected from brake caliper. In this case, suspend caliper assembly with wire so as not to stretch brake hose.

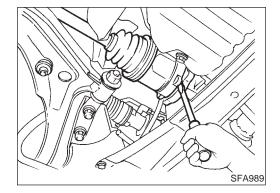
Be careful not to depress brake pedal, or piston will pop out. Make sure brake hose is not twisted.

- Remove tie-rod ball joint.
- Remove upper knuckle nut.
- Separate drive shaft from knuckle by lightly tapping it. If it is hard to remove, use a puller.

Cover boots with shop towel so as not to damage them when removing drive shaft.

Refer to "Wheel Hub and Knuckle", "FRONT AXLE", AX-5.

Remove right drive shaft from transaxle.









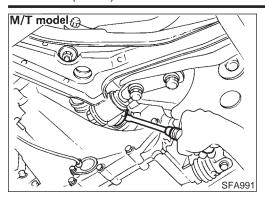


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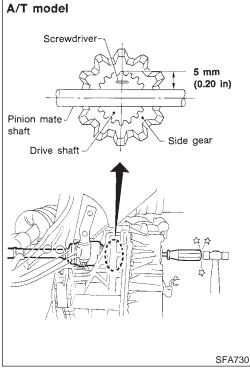
#### **FRONT AXLE**



7. Remove left drive shaft from transaxle.

#### — For M/T models —

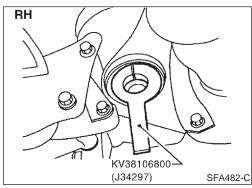
• Pry off drive shaft from transaxle as shown at left.



#### - For A/T models -

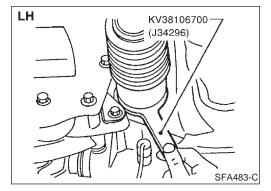
 Insert screwdriver into transaxle opening for right drive shaft and strike with a hammer.

Be careful not to damage pinion mate shaft and side gear.



# INSTALLATION Transaxle Side

- Drive a new oil seal to transaxle. Refer to MT-9 or AT-282
   "Replacing Oil Seal" or "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.
- 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 flange out of the slide joint by hand. If it pulls out, the circular clip is not properly meshed with the side gear.

#### Wheel Side

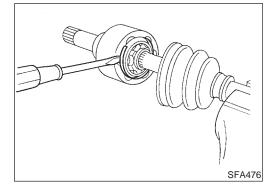
Install drive shaft into knuckle.

NCAX0015S02

Tighten upper knuckle nut and wheel bearing lock nut. Refer to section Installation in "Wheel Hub and Knuckle", "FRONT AXLE", AX-5.

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**DISASSEMBLY** Transaxle Side (DS83 type)

NCAX0017

NCAX0017S01

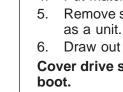
Remove boot bands. Put matching marks on slide joint housing and inner race,

before separating joint assembly.

Remove stopper ring with a screwdriver, and pull out slide joint housing.

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MT



Put matching marks on inner race and drive shaft.

Remove snap ring, then remove ball cage, inner race and balls

AT

Draw out boot.

Cover drive shaft serrations with tape so as not to damage the

AX

(TS83 type) Remove boot bands.

SFA514A

SFA963

NCAX0017S0102

Put matching marks on slide joint housing and drive shaft before separating joint assembly.

Put matching marks on spider assembly and drive shaft.

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Remove snap ring, then remove spider assembly.

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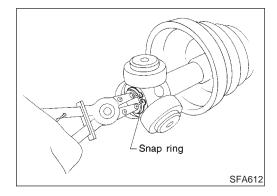


Do not disassemble spider assembly.

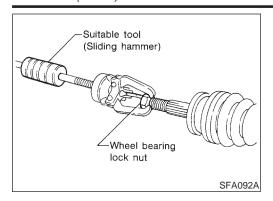
5. Draw out boot.

EL

Cover drive shaft serration with tape to prevent damage to the boot.



Matching marks



# Wheel Side (BF86 type)

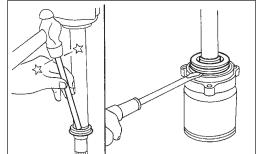
#### **CAUTION:**

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.
- 4. Draw out boot.

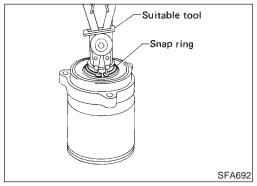


### **Support Bearing**

1. Remove dust shield.

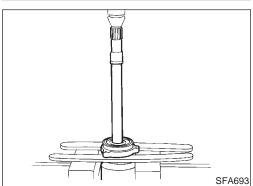
NCAX0017S03

NCAX0017S02

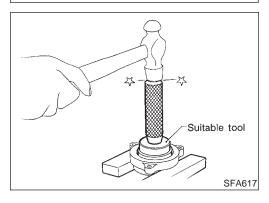


2. Remove snap ring.

SFA442B



3. Press support bearing assembly off of drive shaft.



4. Separate support bearing from retainer.

#### INSPECTION

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

**Drive Shaft** 

NCAX0018501

Replace drive shaft if it is twisted or cracked.

**Boot** 

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

LC

MA

Joint Assembly (Transaxle side)

Check spider assembly for needle bearing and washer damage. Replace if necessary. (TS83 type)

EC

Check roller surfaces for scratches, wear or other damage. Replace if necessary. (TS83 type)

Replace any parts of double offset joint which show signs of scorching, rust, wear or excessive play. (DS83 type)

Check serration for deformation. Replace if necessary.

Check slide joint housing for any damage. Replace if necessary.

NCAX0018S04

#### Joint Assembly (Wheel side)

Replace joint assembly if it is deformed or damaged.

MT

#### Support Bearing

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

AX

#### **Support Bearing Bracket**

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

#### **ASSEMBLY**

After drive shaft has been assembled, ensure that it moves smoothly over its entire range without binding.

ST

Use NISSAN GENUINE GREASE or equivalent after every overhaul.

HA

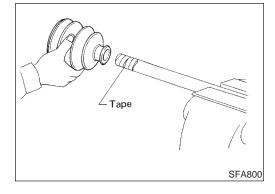
## Wheel Side (BF86 type)

NCAX0019S01

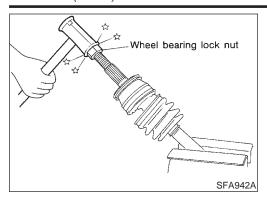
Install boot and new small boot band on drive shaft.

SC

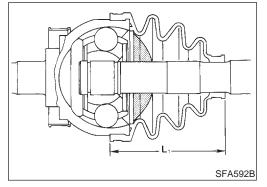
Cover drive shaft serration with tape so as not to damage boot during installation.



#### Drive Shaft (Cont'd)



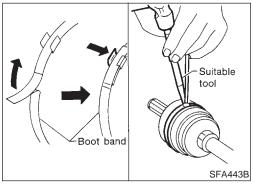
2. Set joint assembly onto drive shaft by lightly tapping it. Install joint assembly securely, ensuring marks which were made during disassembly are properly aligned.



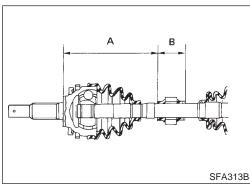
3. Pack drive shaft with specified amount of grease.

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 "L<sub>1</sub>".



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



#### **Dynamic Damper**

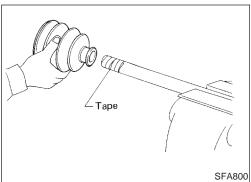
NCAX0019S02

- 1. Use new damper bands when installing.
- Install dynamic damper from stationary-joint side while holding it securely.

#### Length:

Unit: mm (in)

Applied	R	Н		LH	
model	BF86/DS83 + B		BF86	/DS83	BF86/TS83
Transaxle	Without	With vis-	With viso	cous type	Without vis-
Transaxle viscous type	cous type	M/T	A/T	cous type	
"A"	205.1 (8.07)	186.0 (7.32)	163.5 (6.44)	157.8 (6.21)	181.0 (7.13)
"B"	70 (2.76)				



## Transaxle Side (DS83 type)

NCAX0019S03

NCAX0019S0301

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.

MA

LC

Install ball cage, inner race and balls as a unit, making sure the marks which were made during disassembly are properly aligned.

EC

Install new snap ring. 3.

FE

GL

MT



Specified amount of grease:

115 - 135 g (4.06 - 4.76 oz)

AT

Install slide joint housing, then install new snap ring.

AX

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": 98 mm (3.86 in)

ST

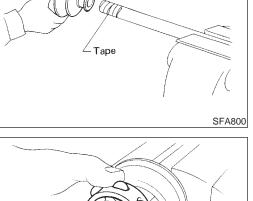
Lock new larger and smaller boot bands securely with a suitable tool.

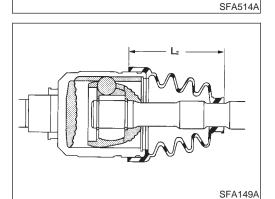
HA

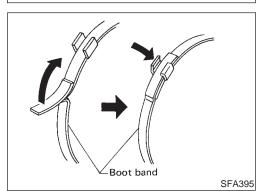
SC

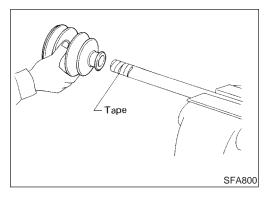
Cover drive shaft serration with tape to prevent damage to

EL

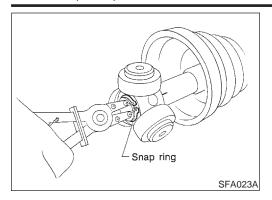




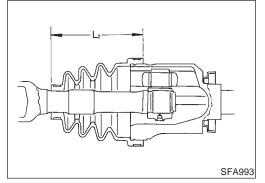




1. Install boot and new small boot band on drive shaft.



- 2. Install spider assembly securely, making sure the marks which were made during disassembly are properly aligned.
- 3. Install new snap ring.

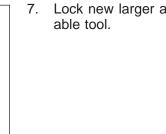


4. Pack drive shaft with specified amount of grease.

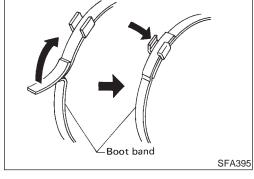
Specified amount of grease:

- 5. Install slide joint housing.
- 6. Set boot so that it does not swell and deform when its length is "L<sub>2</sub>".

Make sure that boot is properly installed on the drive shaft groove.



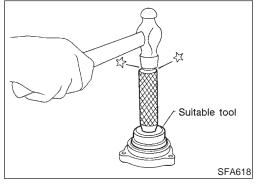
7. Lock new larger and smaller boot bands securely with a suitable tool



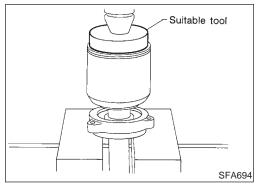
# **Support Bearing**

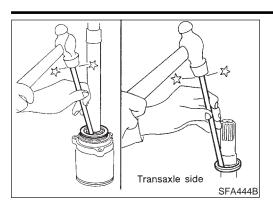
Press bearing into retainer.





Press drive shaft into bearing.





- Install snap ring.
- Install new dust shield.

G[

MA

LC

# Service Data and Specifications (SDS) **DRIVE SHAFT**

NCAX0020

FE

GL

MT

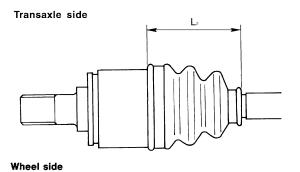
AT

Applied model		RH	Н				
Applied Model			Both	With viscous type	Without viscous type		
Joint type	Transaxle side		DS	DS83			
зопт туре	Wheel side					BF86	
	Quality		Nissa	ivalent			
Grease	Consoity a (oz)	Transaxle side	115 - 135 (	4.06 - 4.76)	125 - 145 (4.41 - 5.11)		
	Capacity g (oz)	Wheel side		95 - 115 (3.35 - 4.06)			
Doct longth many (in)			98 (	3.86)	99 (3.90)		
boot length mm (in)				100.5 (3.96)			

SU

BR

ST



SFA961AB

RS

BT

HA	

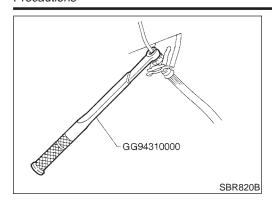
WHEEL E	BEARING	(FRONT)
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NCAX0021

SFA962A

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

EL



## **Precautions PRECAUTIONS**

- When installing each rubber part, 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.
- Do not jack up at the trailing arm and lateral link.
- Always torque brake lines when installing.

# **Preparation**

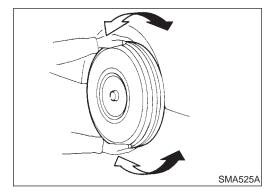
#### **COMMERCIAL SERVICE TOOLS**

NCAX0024

Tool name	Description	
GG94310000 1 Flare nut crowfoot 2 Torque wrench	NT360	Removing and installing brake piping a: 10 mm (0.39 in)

# Noise, Vibration and Harshness (NVH) **Troubleshooting**

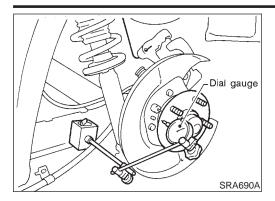
Refer to "Noise, Vibration and Harshness (NVH) Troubleshooting", "FRONT AXLE", AX-3.



# **On-vehicle Service REAR AXLE PARTS**

Check axle and suspension parts for excessive play, wear or dam-

Shake each rear wheel to check for excessive play.



#### **REAR WHEEL BEARING**

Check axial end play.

**Axial end play:** 

0.05 mm (0.0020 in) or less

- Check that wheel hub bearings operate smoothly.
- Check tightening torque of wheel bearing lock nut.

(19 - 26 kg-m, 137 - 188 ft-lb)

Replace wheel bearing assembly if there is axial end play or wheel bearing does not turn smoothly. Refer to "Wheel Hub". "REAR AXLE", AX-21.

# Wheel Hub **COMPONENTS**

SEC. 430 (4) 186 - 255 (19 - 26, 137 - 188) Disc brake ⑤₩ 22 - 29 (2.2 - 3.0, 16 - 22) LO 25 - 33 (2.5 - 3.4, 18 - 25) Front : N•m (kg-m, ft-lb) SRA790AB

- Spindle 1.
- Baffle plate
- Wheel hub bearing

- Wheel bearing lock nut
- Cotter pin

- Hub cap
- ABS sensor

#### **REMOVAL**

**CAUTION:** 

- Before removing the rear wheel hub assembly, disconnect the ABS wheel sensor from the assembly. Then move it away from the hub assembly. Failure to do so may result in damage to the sensor wires and the sensor becoming  $\mathbb{D}\mathbb{X}$ inoperative.
- Wheel hub bearing does not require maintenance. If any of the following symptoms are noted, replace wheel hub bearing assembly.

MA

LC

EC

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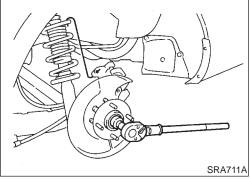
AT

AX

HA

SC

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



- 1. Remove brake caliper assembly.
- 2. Remove wheel bearing lock nut.
- 3. Remove brake rotor.
- 4. Remove wheel hub bearing from spindle.

Brake hose does not need to be disconnected from brake caliper.

Suspend caliper assembly with wire so as not to stretch brake hose.

Be careful not to depress brake pedal, or piston will pop out. Make sure brake hose is not twisted.

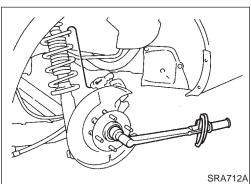


NCAX0030

- Install wheel hub bearing.
- Tighten wheel bearing lock nut.
   Before tightening, apply oil to threaded portion of rear spindle and both sides of plain washer.

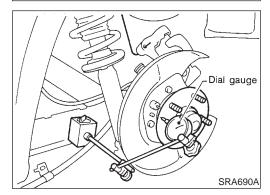
(19 - 26 kg-m, 137 - 188 ft-lb)

Check that wheel bearings operate smoothly.



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)

Wheel bearing axial end play mm (in)	0.05 (0.0020) or less
Wheel bearing lock nut tightening torque N·m (kg-m, ft-lb)	186 - 255 (19 - 26, 137 - 188)