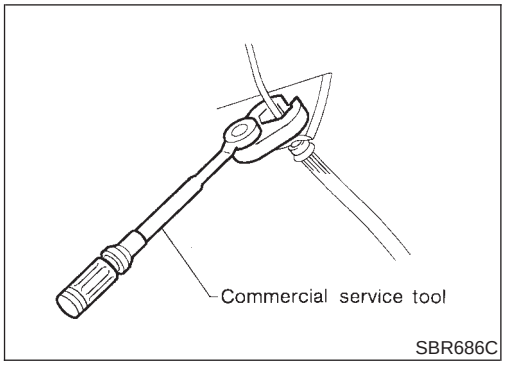
FRONT & REAR AXLE

SECTION AX

CONTENTS



SBR686C

Precautions

PRECAUTIONS

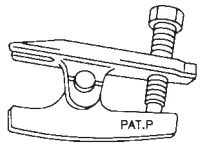
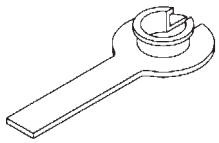
NJAX0001

- **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

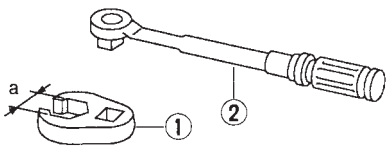
SPECIAL SERVICE TOOLS

NJAX0002

Tool number Tool name	Description	
HT72520000 Ball joint remover	 NT146	Removing tie-rod outer end and lower ball joint
KV38106800 Differential side oil seal protector	 NT147	Installing drive shaft KV38106800

COMMERCIAL SERVICE TOOLS

NJAX0003

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

Noise, Vibration and Harshness (NVH) Troubleshooting

=NJAX0004

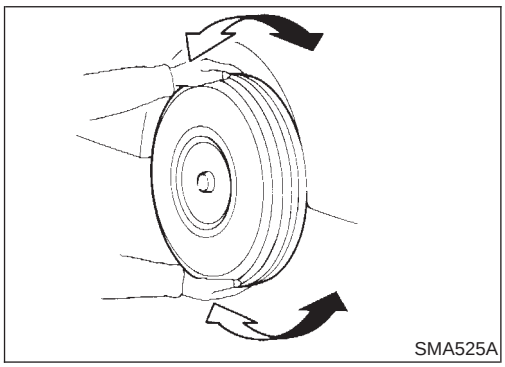
NVH TROUBLESHOOTING CHART

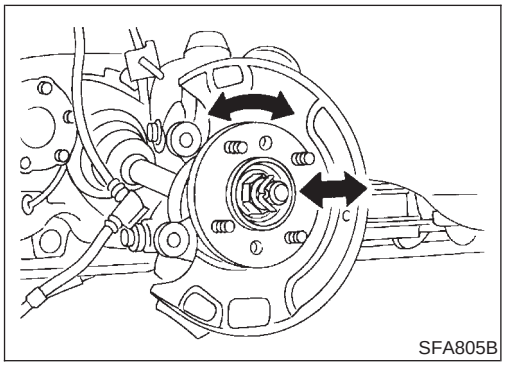
NJAX0004S01

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

Reference page			—	AX-15	—	AX-5, 24	—	AX-3, 23	—	—	SU-4	SU-4	SU-4	BR-7	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


SMA525A


SFA805B

On-vehicle Service

FRONT AXLE PARTS

NJAX0005

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

Tightening torque:
Refer to SU-9, “FRONT SUSPENSION”.

FRONT WHEEL BEARING

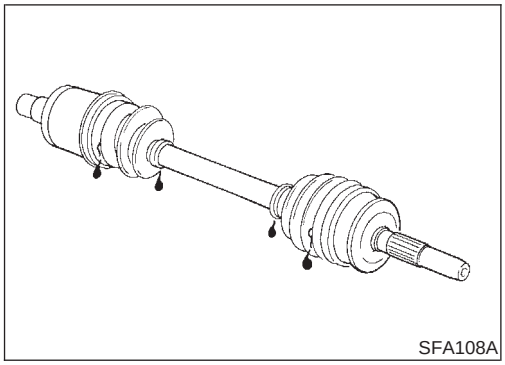
NJAX0006

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

Axial end play:
0.05 mm (0.0020 in)

If out of specification or wheel bearing does not turn smoothly, replace wheel bearing assembly.
Refer to “Wheel Hub and Knuckle”, “FRONT AXLE”, AX-5.

On-vehicle Service (Cont'd)


SFA108A

DRIVE SHAFT

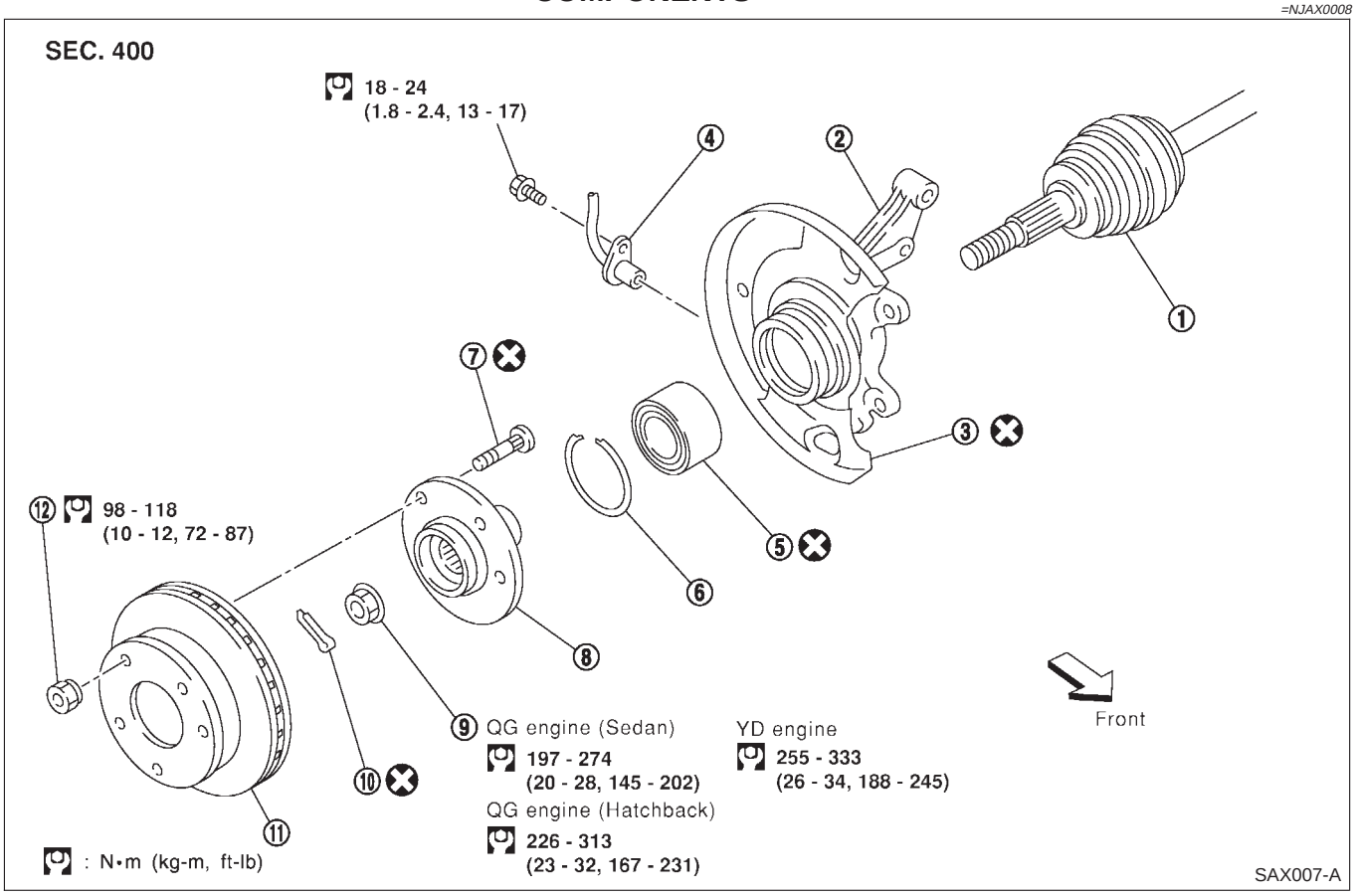
NJAX0007

Check for grease leakage or other damage.

Wheel Hub and Knuckle

COMPONENTS

=NJAX0008



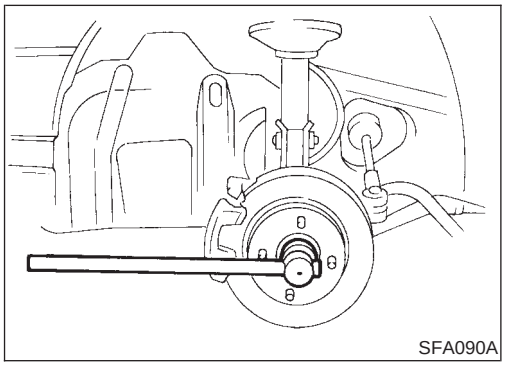
1. Drive shaft
2. Knuckle
3. Baffle plate (where fitted)
4. ABS sensor
5. Wheel bearing assembly
6. Snap ring
7. Hub bolt
8. Wheel hub
9. Wheel bearing lock nut
10. Cotter pin
11. Brake disc
12. Wheel nut

REMOVAL

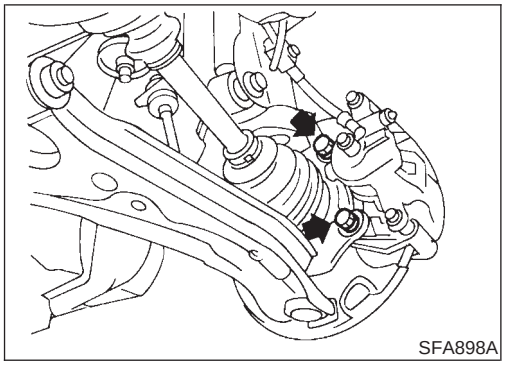
NJAX0009

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.

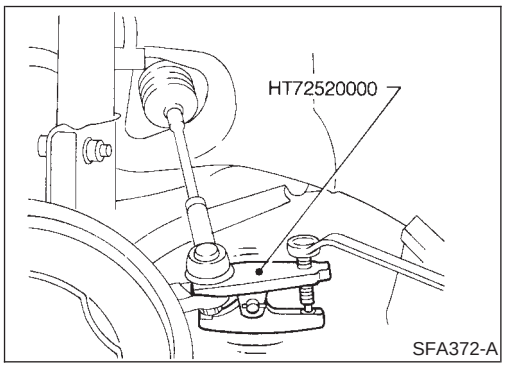


1. Remove wheel bearing lock nut.


SFA898A

2. Remove brake caliper assembly and rotor.

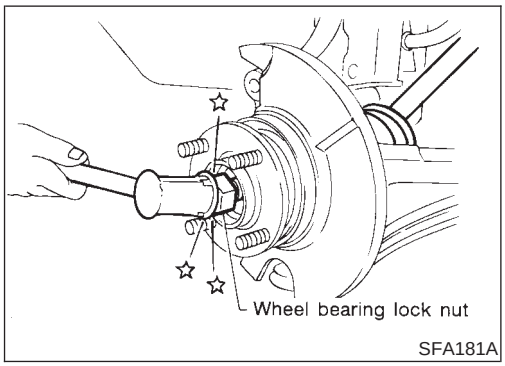
Brake hose need not be disconnected from brake caliper. In this case, suspend caliper assembly with wire so as not to stretch brake hose. Be careful not to depress brake pedal, or piston will pop out.
Make sure brake hose is not twisted.



SFA372-A

3. Separate tie-rod from knuckle with Tool.

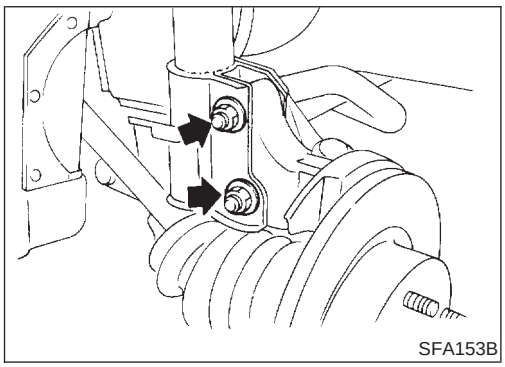
Install stud nut on stud bolt to prevent damage to stud bolt.



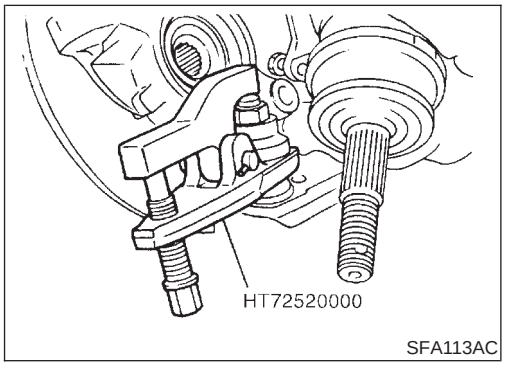
SFA181A

4. 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.

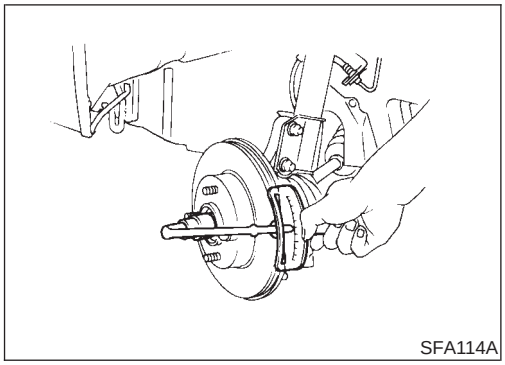

SFA153B

5. Remove strut lower mounting bolts.



SFA113AC

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


SFA114A

INSTALLATION

NJAX0010

1. Install knuckle with wheel hub.

When installing knuckle to strut, be sure to hold bolts and tighten nuts.

: 114 - 133 N·m (11.6 - 13.6 kg-m, 84 - 98 ft-lb)

Before tightening, apply oil to threaded portion of drive shaft.

2. Tighten wheel bearing lock nut.

QG engine (Sedan)

: 197 - 274 N·m (20 - 28 kg-m, 145 - 202 ft-lb)

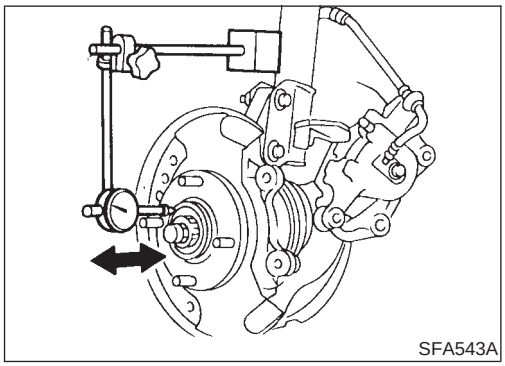
QG engine (Hatchback)

: 226 - 313 N·m (23 - 32 kg-m, 167 - 231 ft-lb)

YD engine

: 255 - 333 N·m (26 - 34 kg-m, 188 - 245 ft-lb)

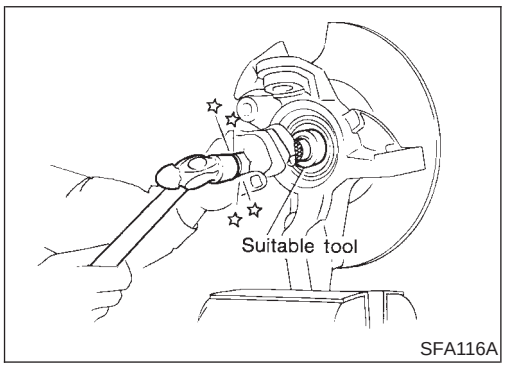
3. Check that wheel bearings operate smoothly.


SFA543A

4. Check wheel bearing axial end play.

Axial end play:

0.05 mm (0.0020 in)



SFA116A

DISASSEMBLY

NJAX0011

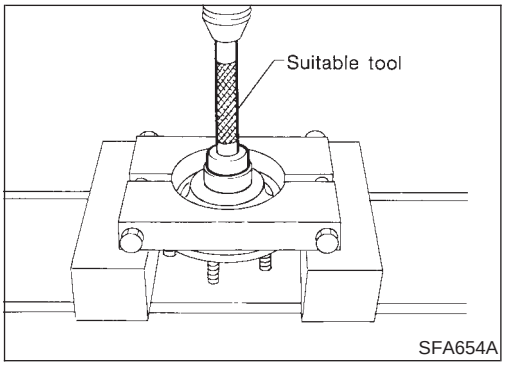
CAUTION:

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

Wheel Hub

NJAX0011S01

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



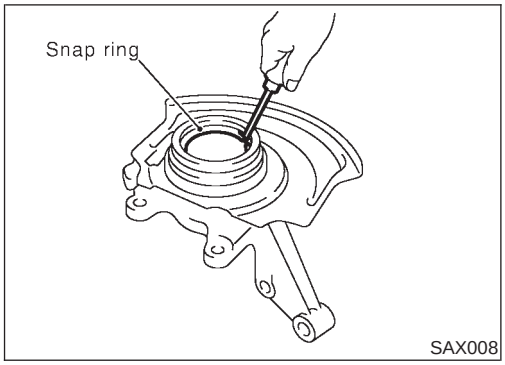
SFA654A

Wheel Bearing

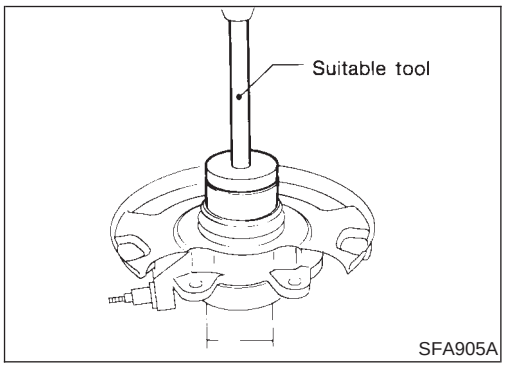
NJAX0011S02

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

1. Remove bearing inner race (outside).



2. Remove snap rings.



3. Press out bearing outer race.

INSPECTION

NJAX0012

Wheel Hub and Knuckle

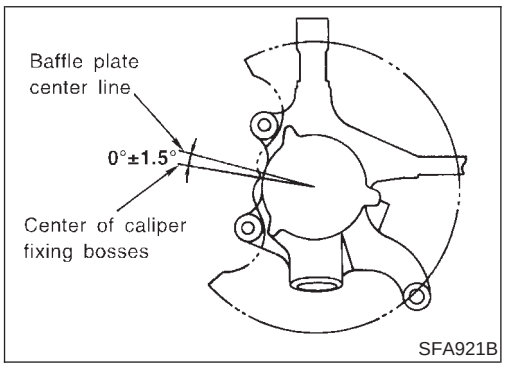
NJAX0012S01

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

Snap Ring

NJAX0012S02

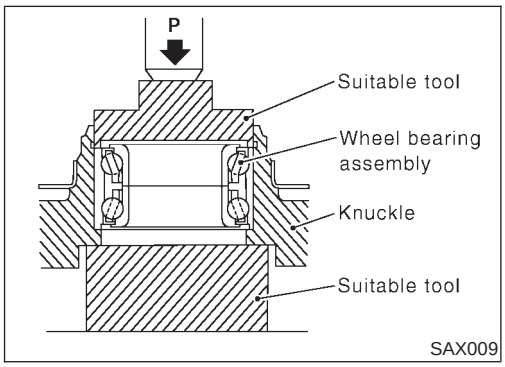
Check snap ring for wear or cracks. Replace if necessary.



ASSEMBLY

NJAX0013

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



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

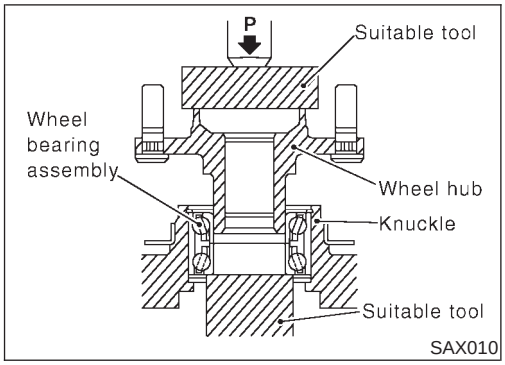
Maximum load P:

29 kN (3 ton, 3.3 US ton, 3.0 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.**

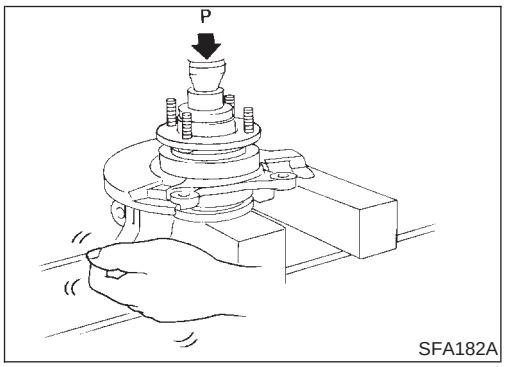
3. Install outer snap ring into groove of knuckle.



4. Press wheel hub into knuckle until it stops when the end of the wheel bearing is hit.

Maximum load P:

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



5. Check bearing operation.

a. Add load P with press.

Load P:

49.0 kN

(5.0 ton, 5.5 US ton, 4.92 Imp ton)

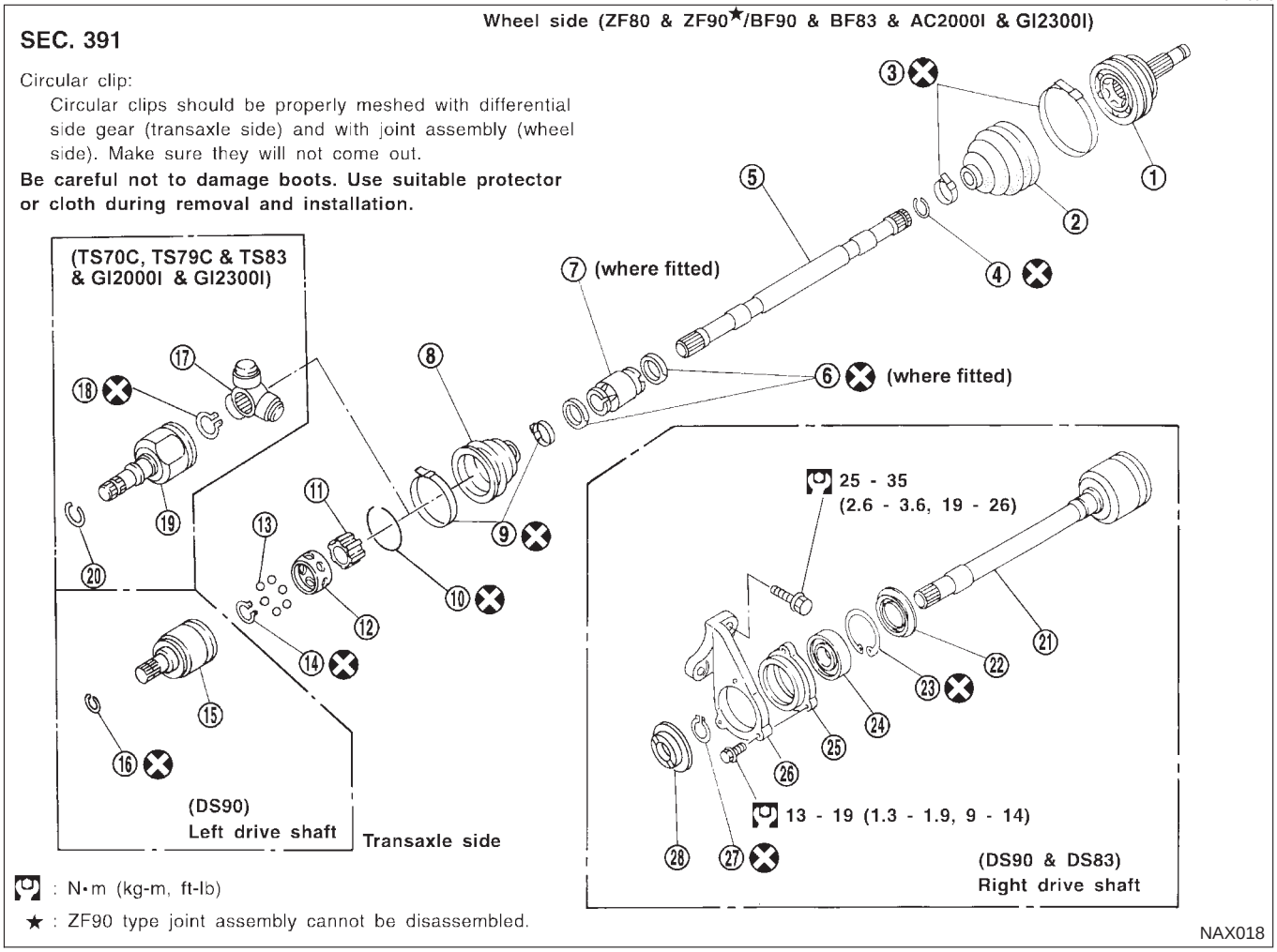
b. Spin knuckle several turns in both directions.

c. Make sure that wheel bearings operate smoothly.

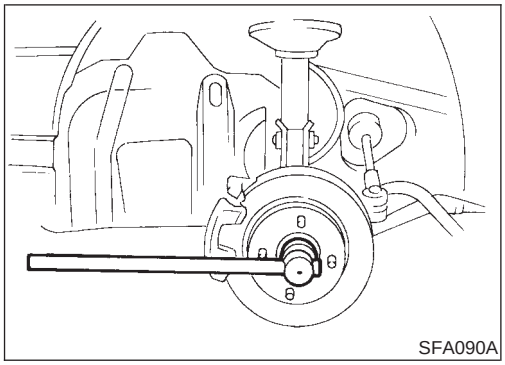
Drive Shaft

COMPONENTS

=NJAX0016



1. Joint assembly
2. Boot
3. Boot band
4. Circular clip
5. Drive shaft
6. Dynamic damper band (where fitted)
7. Dynamic damper (where fitted)
8. Boot
9. Boot band
10. Stopper ring
11. Inner race
12. Cage
13. Ball
14. Snap ring
15. Slide joint housing
16. Circular clip
17. Spider assembly
18. Snap ring
19. Slide joint housing
20. Circular clip
21. Slide joint housing with extension shaft
22. Dust shield
23. Snap ring
24. Support bearing
25. Support bearing retainer
26. Bracket
27. Snap ring
28. Dust shield

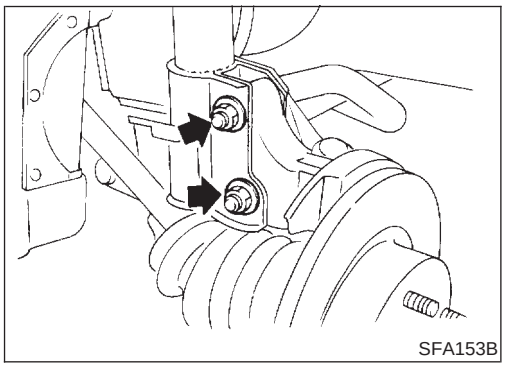

SFA090A

REMOVAL

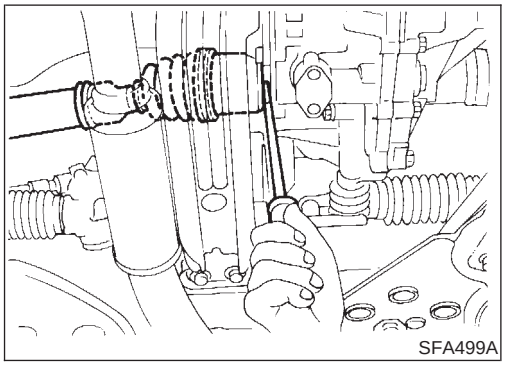
NJAX0014

1. Remove wheel bearing lock nut.

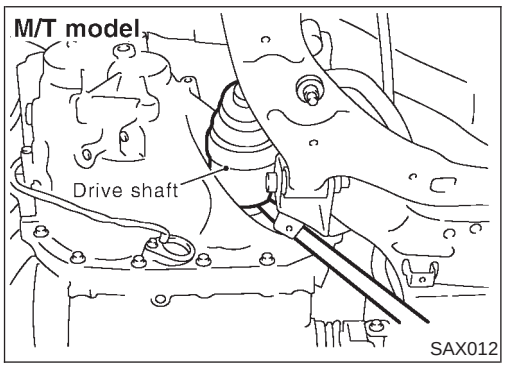
Brake caliper need not be disconnected. Do not twist or stretch brake hose when moving components.


SFA153B

2. Remove strut lower mount bolts.
3. Remove brake hose clip.


SFA499A

4. 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.
5. Remove right drive shaft from transaxle.

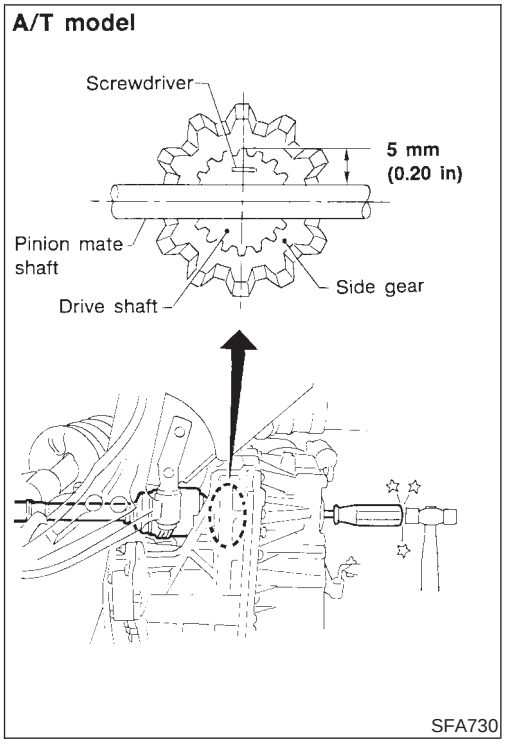


SAX012

6. 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.

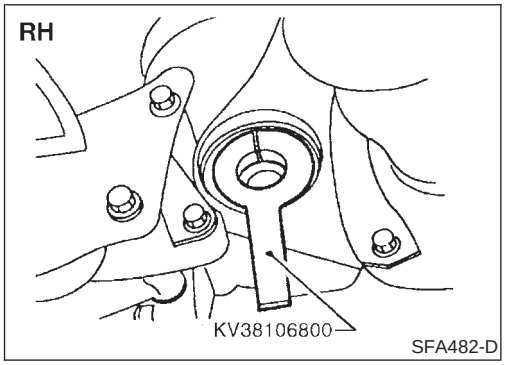
INSTALLATION

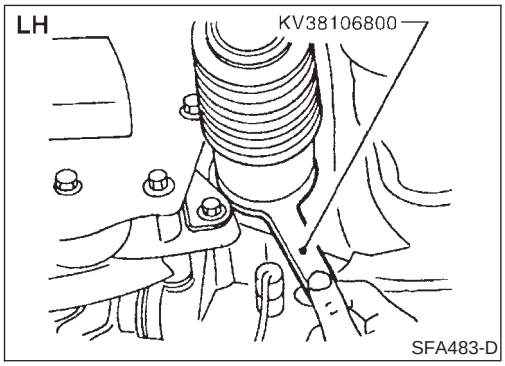
NJAX0015

Transaxle Side

NJAX0015S01

1. Drive a new oil seal to transaxle. Refer to MT-20 or AT-353, "Replacing Oil Seal" or "Differential Side Oil Seal Replacement", "ON-VEHICLE SERVICE".
2. Set Tool along the inner circumference of oil seal.



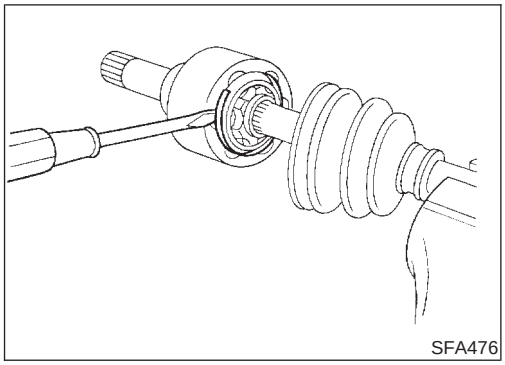


3. Insert drive shaft into transaxle. Be sure to properly align the serrations and then withdraw Tool.
4. Push the drive shaft until the circular clip on the drive shaft fits into the circular clip groove of the side gear.
5. After its insertion, try to pull the flange out of the slide joint by hand. If it pulls out, the circular clip is not properly meshed with the side gear.

Wheel Side

NJAX0015S02

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


SFA476

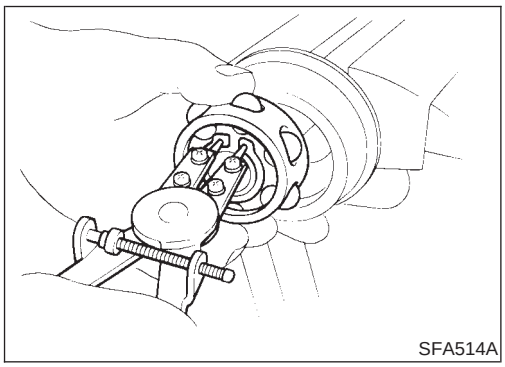
DISASSEMBLY

NJAX0017

Transaxle Side (DS90 and DS83 types)

NJAX0017S01

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


SFA514A

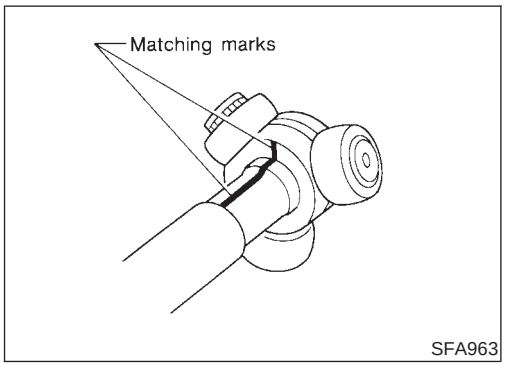
4. Put matching marks on inner race and drive shaft.
5. Remove snap ring, then remove ball cage, inner race and balls as a unit.
6. Draw out boot.

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

Transaxle Side (TS70C, TS79C, TS83, GI2000I and GI2300I types)

NJAX0017S04

1. Remove boot bands.
2. Put matching marks on slide joint housing and drive shaft before separating joint assembly.
3. Put matching marks on spider assembly and drive shaft.



SFA963

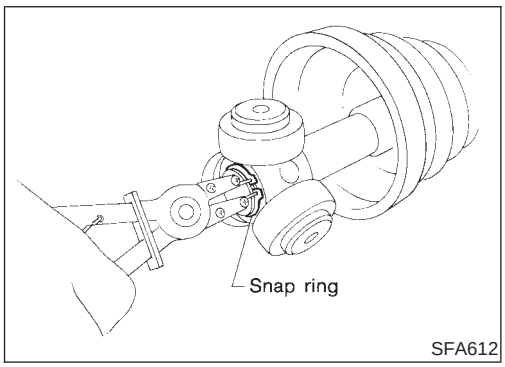
4. Pry off snap ring, then remove spider assembly.

CAUTION:

Do not disassemble spider assembly.

5. Draw out boot.

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



SFA612

Wheel Side

NJAX0017S02

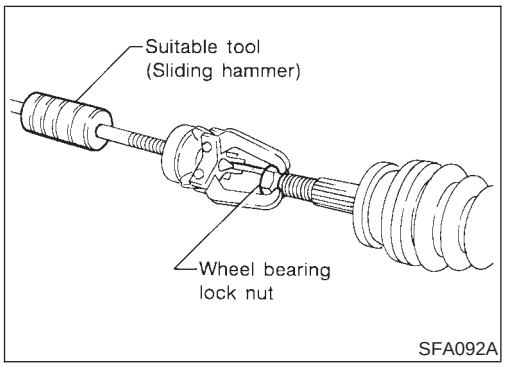
CAUTION:

The joint on the wheel side cannot be disassembled.

ZF90F type joint assembly cannot be disassembled because a plastic boot and special boot band are used. Do not use other drive shaft boots. If the boot or joint is damaged, replace the drive shaft assembly.

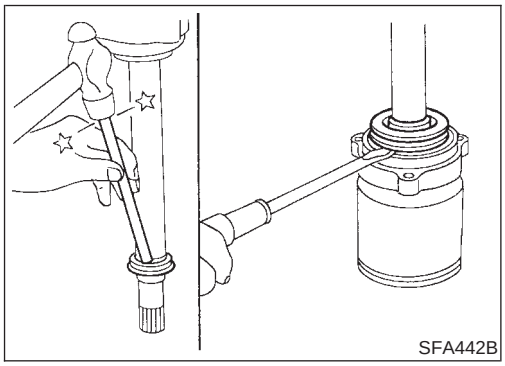
1. Before separating joint assembly, put matching marks on drive shaft and joint assembly.
2. Separate joint assembly with a suitable tool.

Be careful not to damage threads on drive shaft.



SFA092A

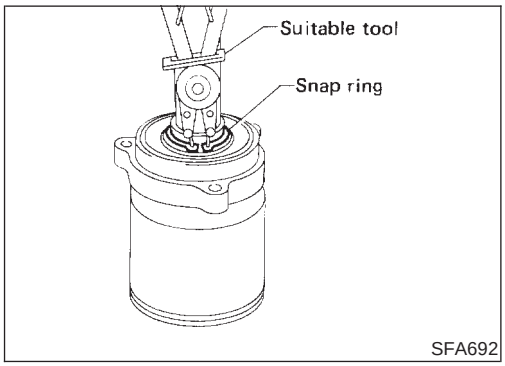
3. Remove boot bands.
4. Draw out boot.


SFA442B

Support Bearing

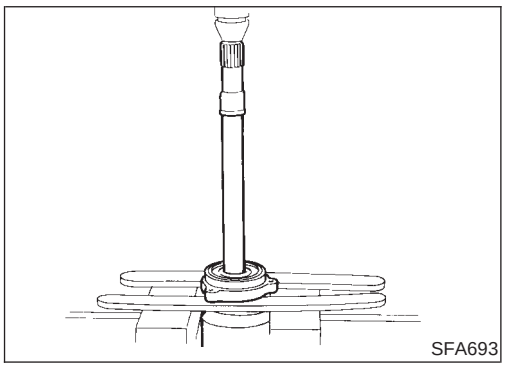
NJAX0017S03

1. Remove dust shield.

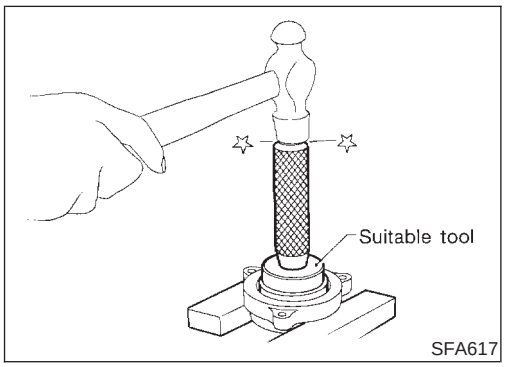


SFA692

2. Remove snap ring.


SFA693

3. Press support bearing assembly off of drive shaft.



SFA617

4. Separate support bearing from retainer.

INSPECTION

NJAX0018

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

Drive Shaft

NJAX0018S01

Replace drive shaft if it is twisted or cracked.

Boot

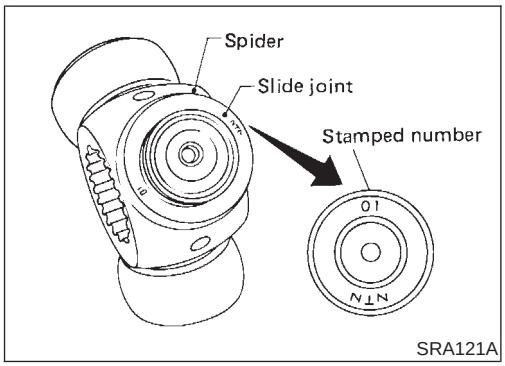
NJAX0018S02

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

Joint Assembly (Transaxle side)

NJAX0018S03

- Check spider assembly for needle bearing and washer damage. Replace if necessary. (Tripod type)
- Check roller surfaces for scratches, wear or other damage. Replace if necessary. (Tripod type)
- Replace any parts of double offset joint which show signs of scorching, rust, wear or excessive play. (Double offset type)
- Check serration for deformation. Replace if necessary.
- Check slide joint housing for any damage. Replace if necessary.



SRA121A

- When replacing only spider assembly, select a new spider assembly from among those listed in table below. Ensure the number stamped on sliding joint is the same as that stamped on new part.

Housing alone cannot be replaced. It must be replaced together with spider assembly.

TS70C

Stamped number	Part No.
00	39720-51E00
01	39720-51E01
02	39720-51E02
03	39720-51E03

TS79C

Stamped number	Part No.
01	39720-61E01
02	39720-61E02
03	39720-61E03
04	39720-61E04
05	39720-61E05
06	39720-61E06
07	39720-61E07

Joint Assembly (Wheel side)

NJAX0018S04

Replace joint assembly if it is deformed or damaged.

Support Bearing

NJAX0018S05

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

Support Bearing Bracket

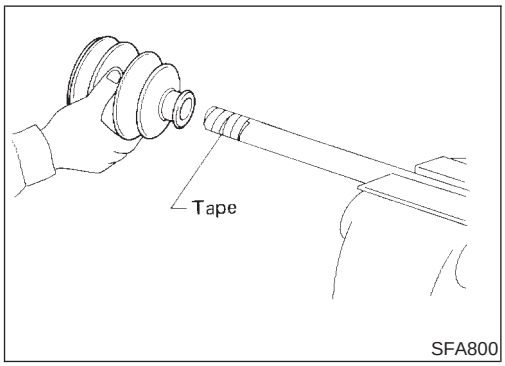
NJAX0018S06

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

ASSEMBLY

NJAX0019

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



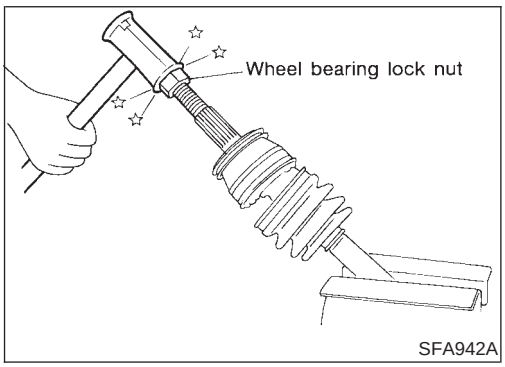
SFA800

Wheel Side

NJAX0019S01

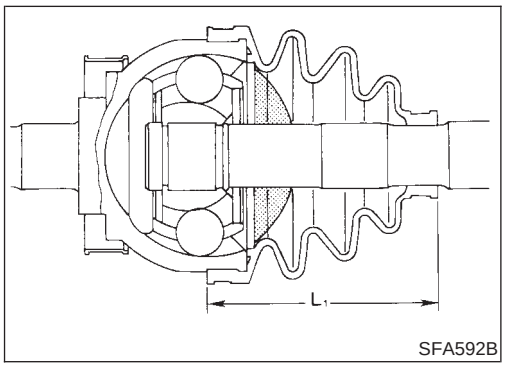
1. Install boot and new small boot band on drive shaft.

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



SFA942A

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.



SFA592B

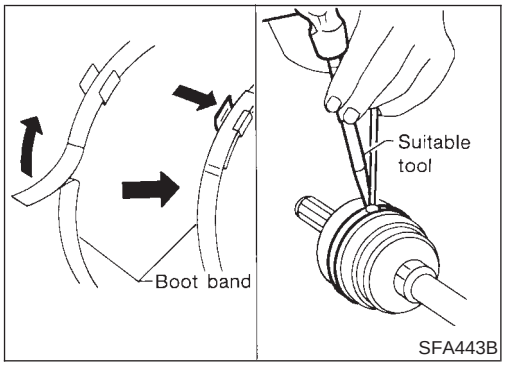
3. Pack drive shaft with specified amount of grease.

   Specified amount of grease:

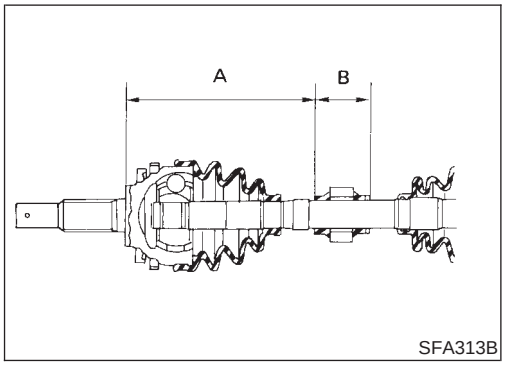
   AC2300I type 40 - 50 g (1.41 - 1.76 oz)
   AC2000I type 118 g (4.16 oz)
   ZF80 type 75 - 85 g (2.65 - 3.00 oz)
   BF83 type 80 - 100 g (2.82 - 3.53 oz)
   BF90 type 100 - 120 g (3.53 - 4.23 oz)

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 "L_1".

Length "L_1":
AC2300I type 94 - 96 mm (3.70 - 3.78 in)
AC2000I type 90 mm (3.54 in)
ZF80 type 91.4 - 91.6 mm (3.598 - 3.606 in)
BF83 type 95 mm (3.74 in)
BF90 type 85.5 mm (3.366 in)



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

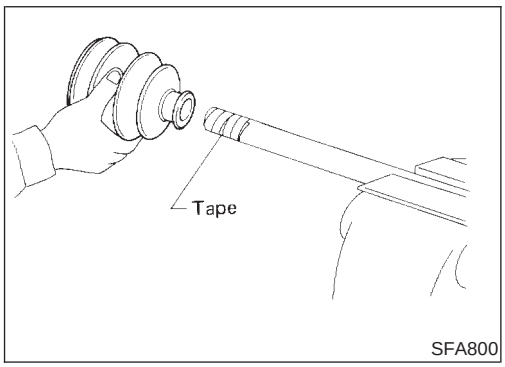


Dynamic Damper (Where Fitted)

NJAX0019S02

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

Length:
Refer to AX-21, SDS.

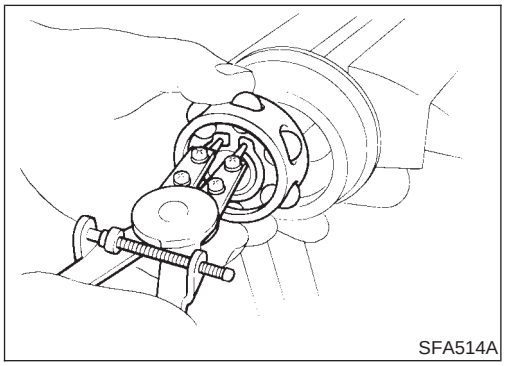


Transaxle Side (TS70C, TS79C, TS83, DS90, DS83, GI2000I and GI2300I types)

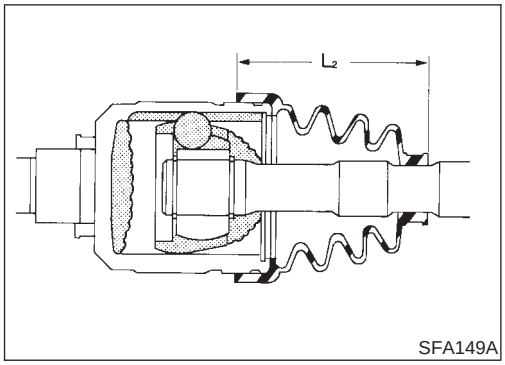
NJAX0019S03

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

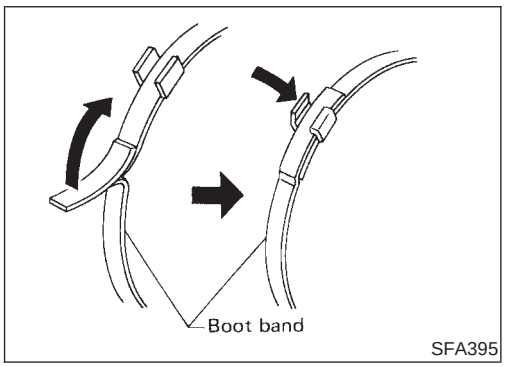
Cover drive shaft serration with tape so as not to damage boot during installation.



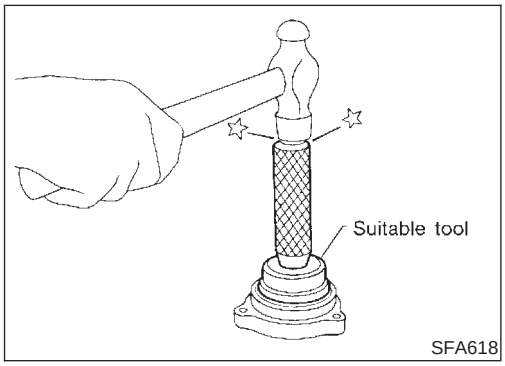
2. Install ball cage, inner race and balls or spider assembly as a unit, making sure the marks which were made during disassembly are properly aligned.
3. Install new snap ring.



4. Pack drive shaft with specified amount of grease.
   Specified amount of grease:
   GI2300I type 125.5 - 135.5 g (4.42 - 4.77 oz)
   GI2000I type 90 g (3.17 oz)
   TS79C type 155 - 165 g (5.47 - 5.82 oz)
   TS70C type 110 - 120 g (3.88 - 4.23 oz)
   TS83 type 125 - 145 g (4.41 - 5.11 oz)
   DS83 type 115 - 135 g (4.06 - 4.76 oz)
   DS90 type 145 - 165 g (5.11 - 5.82 oz)
5. Install slide joint housing, then install new snap ring.
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 "L_2".
   Length "L_2":
   TS70C type
   96.4 - 96.6 mm (3.795 - 3.803 in)
   TS79C type
   101.5 - 103.5 mm (3.996 - 4.075 in)
   TS83 type
   99 mm (3.90 in)
   DS83 type
   98 mm (3.86 in)
   DS90 type
   98 mm (3.86 in)
   GI2000I type
   90 mm (3.54 in)
   GI2300I type
   98 - 100 mm (3.86 - 3.94 in)



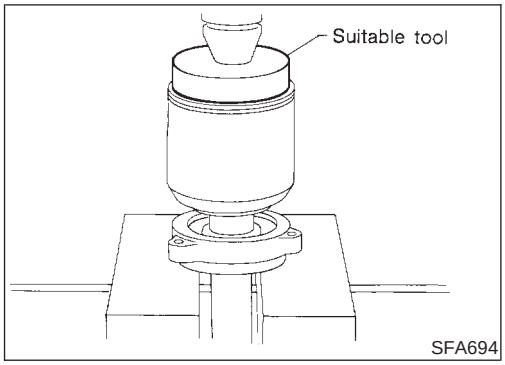
7. Lock new larger and smaller boot bands securely with a suitable tool.



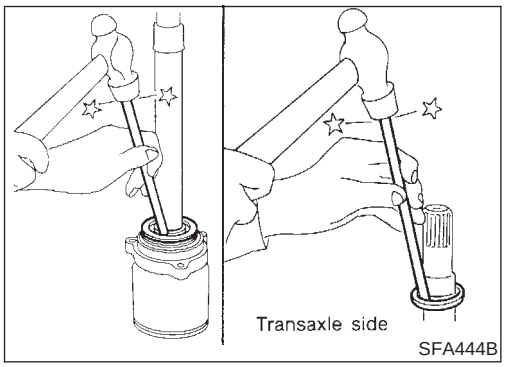
Support Bearing

NJAX0019S04

- Press bearing into retainer.



- Press drive shaft into bearing.



- Install snap ring.
- Install new dust shield.

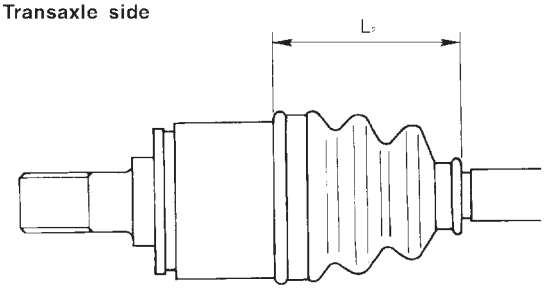
Service Data and Specifications (SDS)

DRIVE SHAFT

=NJAX0020

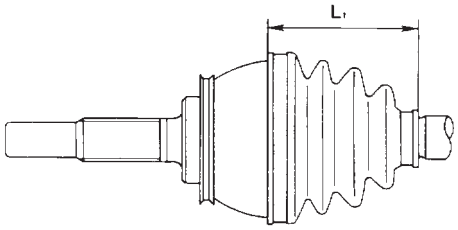
Applied model	Engine	QG15DE		QG18DE		YD22T
	Body	Hatchback	Sedan	All		All
	Transaxle	M/T		All		M/T
Joint type	Transaxle side	GI2000I	TS70C	TS79C	GI2300I	DS90 + B
	Wheel side	AC2000I	ZF80	ZF90	AC2300I	BF90
Grease	Quality	Nissan genuine grease or equivalent*2				
Capacity g (oz)	Transaxle side	90 (3.17)	110 - 120 (3.88 - 4.23)	155 - 165 (5.47 - 5.82)	125.5 - 135.5 (4.42 - 4.77)	145 - 165 (5.11 - 5.82)
	Wheel side	118 (4.16)	71 - 81 (2.50 - 2.86)	—*3	40 - 50 (1.41 - 1.76)	100 - 120 (3.53 - 4.23)
Boot length mm (in)	Transaxle side "L_2"	90 (3.54)*1	95.5 - 97.5 (3.760 - 3.839)	101.5 - 103.5 (3.996 - 4.075)	98 - 100 (3.86 - 3.94)*1	97 - 99 (3.82 - 3.90)
	Wheel side "L_1"	90 (3.54)*1	90.5 - 92.5 (3.563 - 3.642)	—*3	94 - 96 (3.70 - 3.78)*1	84.5 - 96.5 (3.327 - 3.799)

Transaxle side



SFA961AA

Wheel side



SFA962A

*1: Fit boot to boot groove in bar shaft

*2: Use grease sachet 39209 BM510 in service for wheel side and 39709 BM500 for transaxle side. (Genuine GKN grease for 20001 joints)

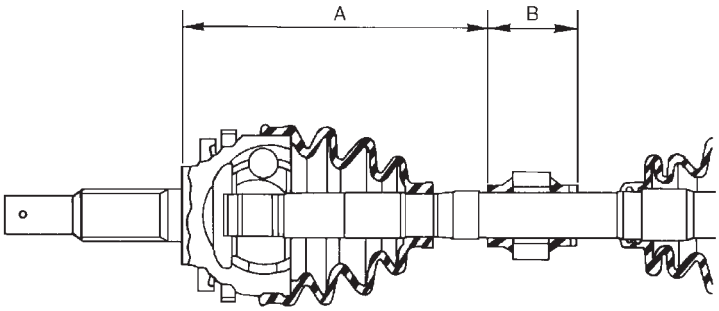
*3: ZF90F type joint assembly cannot be disassembled because a plastic boot and special boot band are used. Do not use other drive shaft boots. If the boot or joint is damaged, replace the drive shaft assembly.

DYNAMIC DAMPER (WHERE FITTED)

=NJAX0033

Unit: mm (in)

Applied model	Engine	QG15DE				QG18DE			YD22T	
		Hatchback		Sedan						
	Drive shaft	LH	RH	LH	RH	LH	RH (TS79C & ZF90)	RH (AC/ GI2300I)	LH	RH
Length	"A"	175 - 185 (6.89 - 7.28)	432 - 442 (17.01 - 17.40)	175 - 185 (6.89 - 7.28)	420 - 430 (16.54 - 16.93)	175 - 185 (6.89 - 7.28)	420 - 430 (16.54 - 16.93)	375 - 381 (14.76 - 15.00)	161 - 167 (6.34 - 6.57)	200 - 206 (7.87 - 8.11)
	"B"	62 (2.44)	62 (2.44)	70 (2.76)	64 (2.52)	70 (2.76)	64 (2.52)		70 (2.76)	70 (2.76)

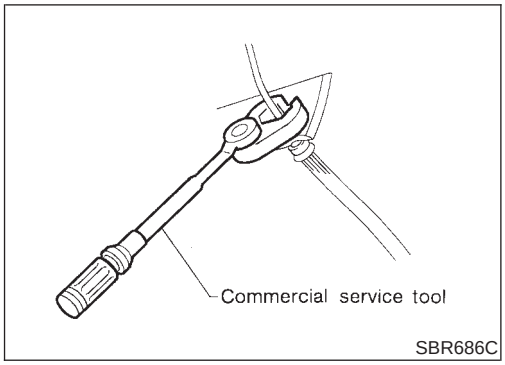


SAX015

WHEEL BEARING (FRONT)

NJAX0021

Wheel bearing axial end play limit mm (in)			0.05 (0.0020)
Wheel bearing lock nut tightening torque N·m (kg-m, ft-lb)	QG engine	Sedan	197 - 274 (20 - 28, 145 - 202)
		Hatchback	226 - 313 (23 - 32, 167 - 231)
	YD engine		255 - 333 (26 - 34, 188 - 245)



SBR686C

Precautions

PRECAUTIONS

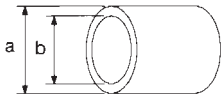
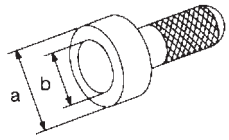
NJAX0022

- **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

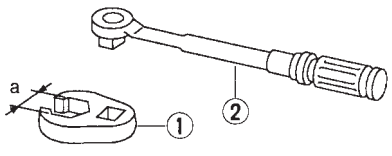
SPECIAL SERVICE TOOLS

NJAX0032

Tool number Tool name	Description	
KV40104710 Drift	 NT474	Install ABS sensor rotor **a: 76.3 mm (3.004 in) dia.** **b: 67.9 mm (2.673 in) dia.**
ST3072000 Drift	 NT115	Install ABS sensor rotor **a: 77 mm (3.03 in) dia.** **b: 55.5 mm (2.185 in) dia.**

COMMERCIAL SERVICE TOOLS

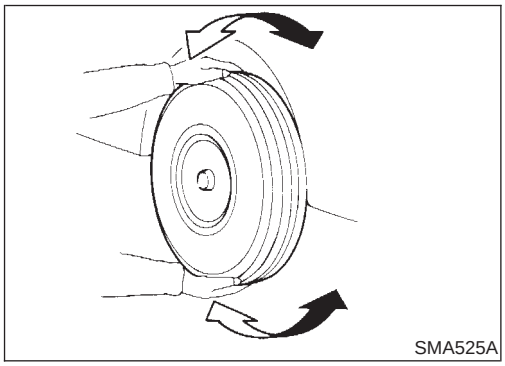
NJAX0024

Tool name	Description	
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

NJAX0025

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


SMA525A

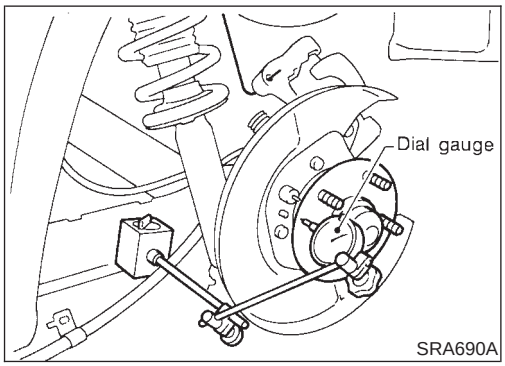
On-vehicle Service

REAR AXLE PARTS

NJAX0026

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

- Shake each rear wheel to check for excessive play.



SRA690A

REAR WHEEL BEARING

NJAX0027

- Check axial end play.

  Axial end play:

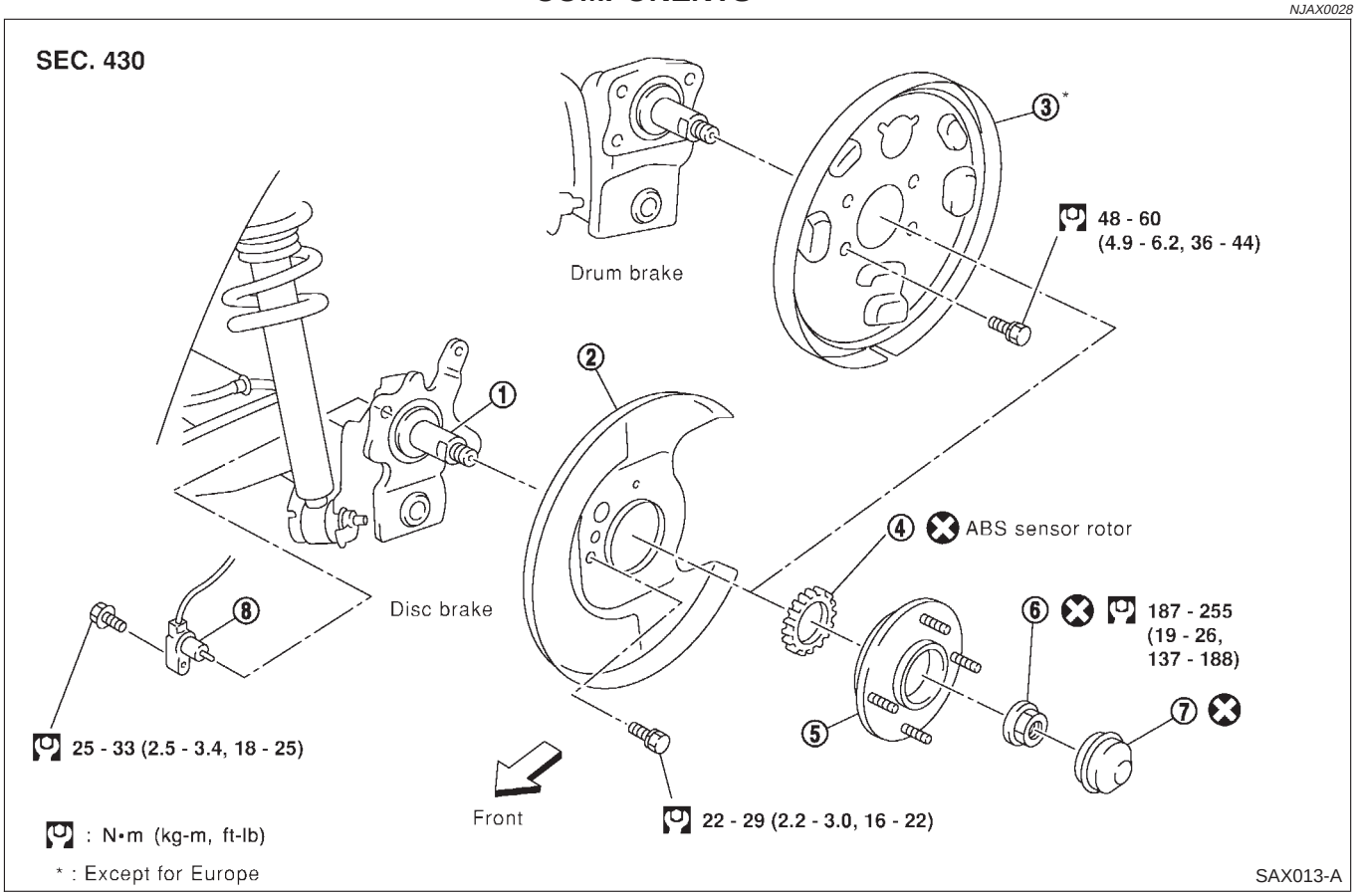
  0.05 mm (0.0020 in)
- Check that wheel hub bearings operate smoothly.
- Check tightening torque of wheel bearing lock nut.

  : 187 - 254 N·m (19 - 26 kg-m, 138 - 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-24.

Wheel Hub

COMPONENTS

NJAX0028



1. Spindle
2. Baffle plate
3. Back plate
4. ABS sensor rotor
5. Wheel hub bearing
6. Wheel bearing lock nut
7. Hub cap
8. ABS sensor

REMOVAL

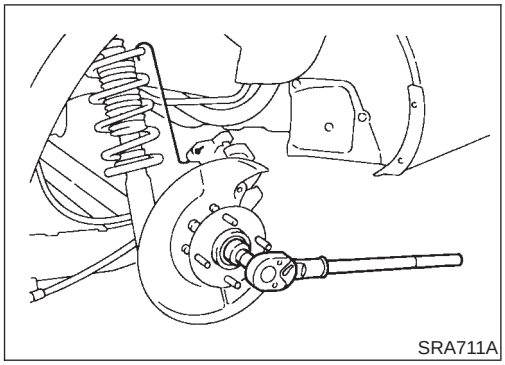
NJAX0029

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

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.

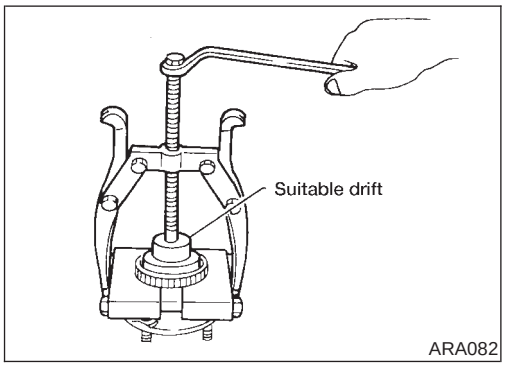

SRA711A

1. Remove brake caliper assembly.
2. Remove wheel bearing lock nut.
3. Remove brake rotor (models with disk brake) or brake drum (models with drum brakes).
4. Remove wheel hub bearing from spindle.

CAUTION:

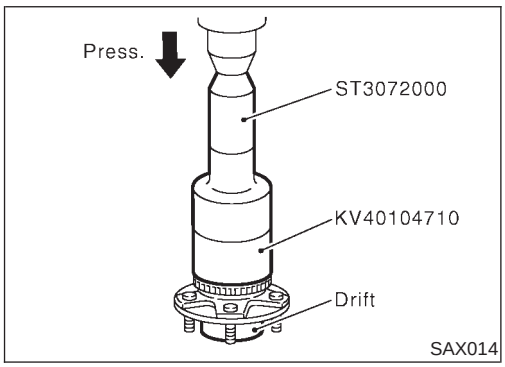
Do not disconnect brake hose from caliper.

- **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.



ARA082

5. Remove the sensor rotor using suitable puller, drift and bea ring replacer.

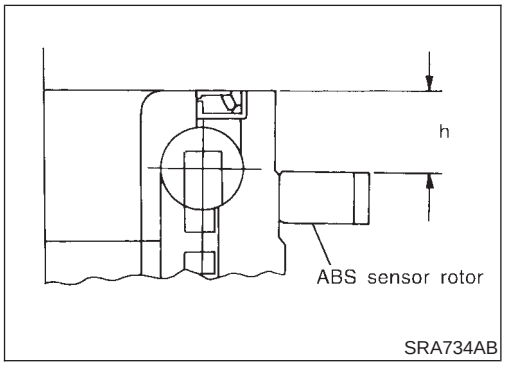


SAX014

INSTALLATION

NJAX0030

- With vehicles equipped with ABS, press-fit ABS sensor rotor into wheel hub bearing using a drift.
  Do not reuse ABS sensor rotor. When installing, replace it with a new one.



SRA734AB

- Press-fit ABS sensor rotor as far as the location shown in figure at left.

  Height "h":

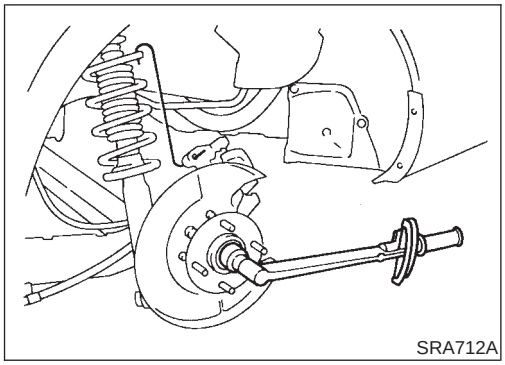
  Models with disk brakes

  1.5 - 2.5 mm (0.059 - 0.098 in)

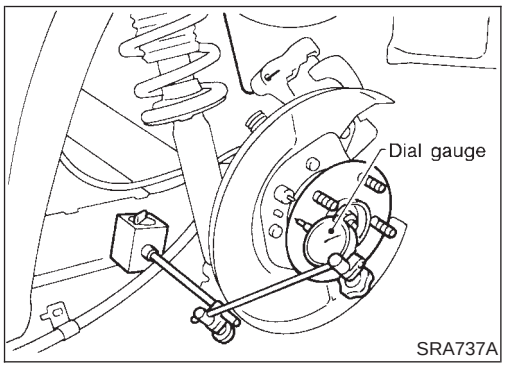
  Models with drum brakes

  17.7 - 18.7 mm (0.697 - 0.736 in)

Wheel Hub (Cont'd)

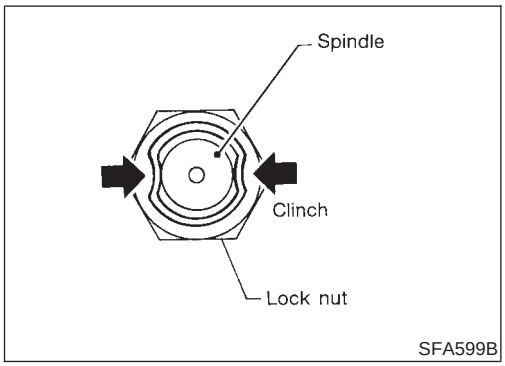

SRA712A

- Install wheel hub bearing.
- Tighten wheel bearing lock nut.
  Before tightening, apply oil to threaded portion of rear spindle.
  Do not reuse wheel bearing lock nut.
  : 187 - 254 N·m (19 - 26 kg-m, 138 - 188 ft-lb)
- Check that wheel bearings operate smoothly.



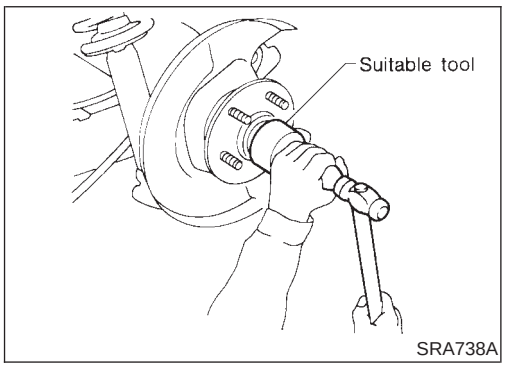
SRA737A

- Check wheel hub bearing axial end play.
  Axial end play:
  0.05 mm (0.0020 in)



SFA599B

- Clinch two places of lock nut.



SRA738A

- Install hub cap using a suitable tool.
  Do not reuse hub cap. When installing, replace it with a new one.

Service Data and Specifications (SDS)

WHEEL BEARING (REAR)

=NJAX0031

Wheel bearing axial end play mm (in)	0.05 (0.0020)
Wheel bearing lock nut tightening torque N·m (kg-m, ft-lb)	187 - 254 (19 - 26, 138 - 188)