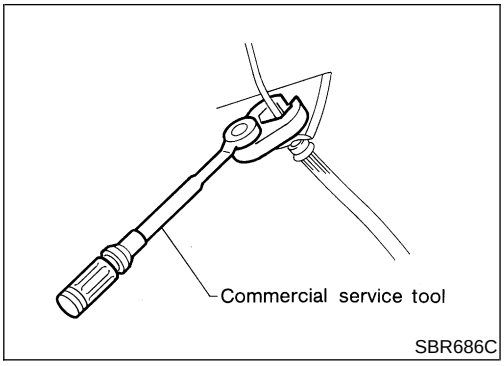
FRONT & REAR AXLE

SECTION AX

CONTENTS



SBR686C

Precautions

PRECAUTIONS

NIAX0001

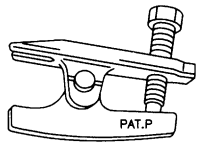
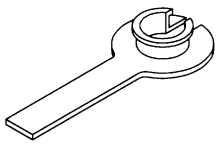
- **When installing rubber parts, final tightening must be carried out under unladen condition* with tires on ground.**
  ***: Fuel, radiator coolant and engine oil full. Spare tire, jack, hand tools and mats in designated positions.**
- **After installing removed suspension parts, check wheel alignment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

Preparation

SPECIAL SERVICE TOOLS

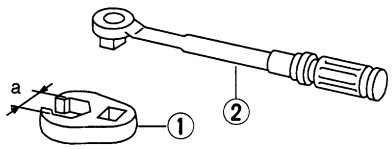
NIAX0002

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

Tool number (Kent-Moore No.) Tool name	Description	
HT72520000 (J25730-B) Ball joint remover	 NT146	Removing tie-rod outer end and lower ball joint
KV38106800 (J34297-1) Differential side oil seal protector	 NT147	Installing drive shaft

COMMERCIAL SERVICE TOOLS

NIAX0003

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

=NIAX0004

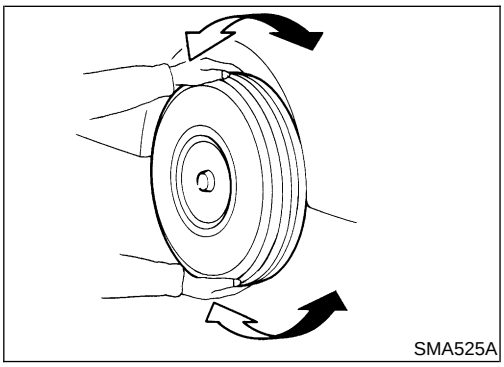
NVH TROUBLESHOOTING CHART

NIAX0004S01

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

Reference page			—	AX-15	***MA-41***, WHEEL BALANCE	AX-7, 24	AX-4	AX-4, 22	Refer to DRIVE SHAFT in this chart.	Refer to AXLE in this chart.	***SU-4***, NVH	***SU-4***, NVH	***SU-4***, NVH	***BR-6***, NVH	***ST-5***, NVH
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

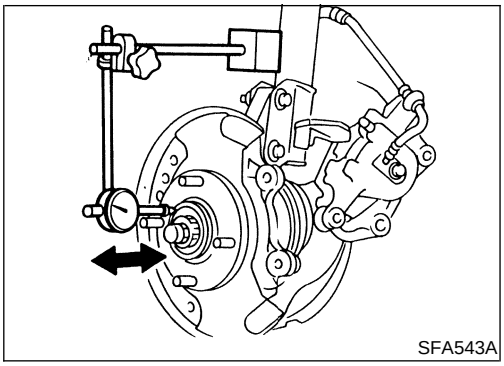
NIAX0005

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 the cotter pin is properly installed.
- Retighten all axle and suspension nuts and bolts to the specified torque.

Tightening torque:

Refer to *SU-5*, “Components”.


SFA543A

FRONT WHEEL BEARING

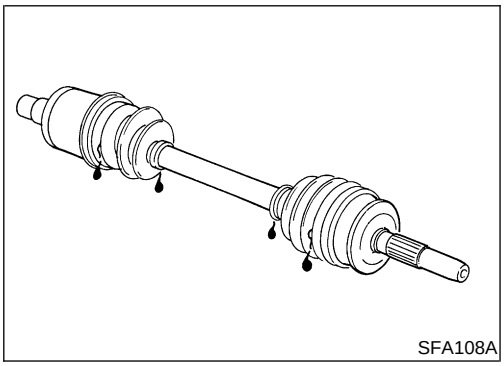
NIAX0006

- Rotate wheel hub to check that wheel bearings operate smoothly.
- Check axial end play.

Axial end play:

0.05 mm (0.0020 in) or less

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


SFA108A

DRIVE SHAFT

NIAX0007

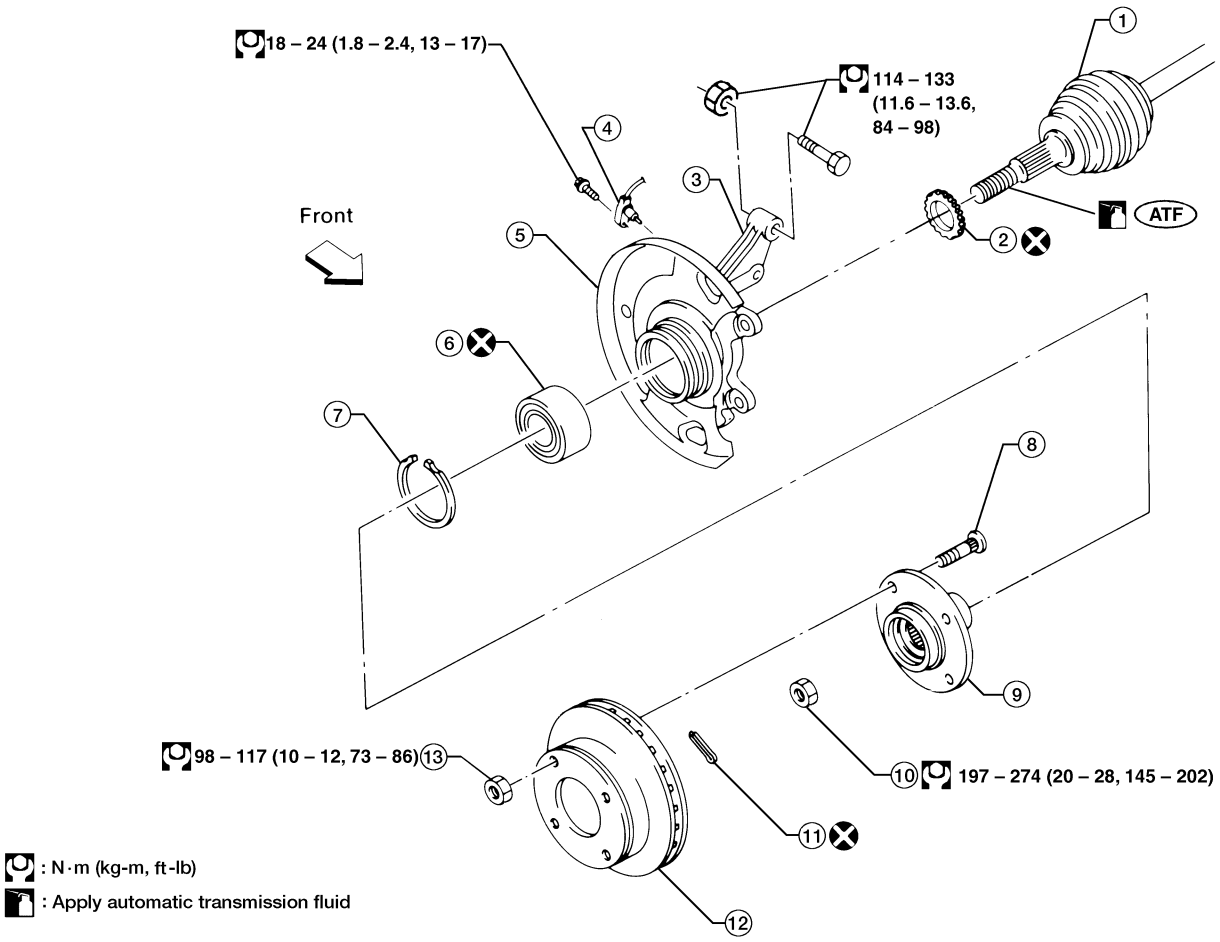
Check for grease leakage or other damage.

Wheel Hub and Knuckle

COMPONENTS

=NIAX0008

SEC. 400



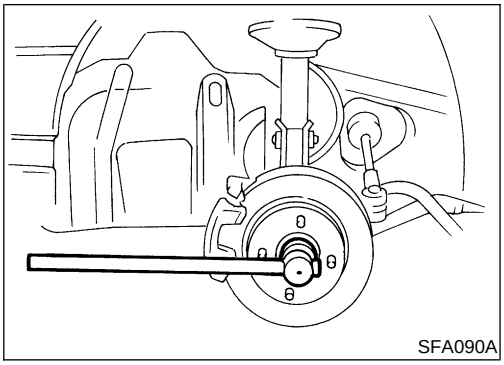
1. Drive shaft
2. ABS sensor rotor
3. Knuckle
4. ABS sensor
5. Baffle plate
6. Wheel bearing assembly
7. Snap ring
8. Wheel bolt
9. Wheel hub
10. Wheel bearing lock nut
11. Cotter pin
12. Disc rotor
13. Wheel nut

REMOVAL

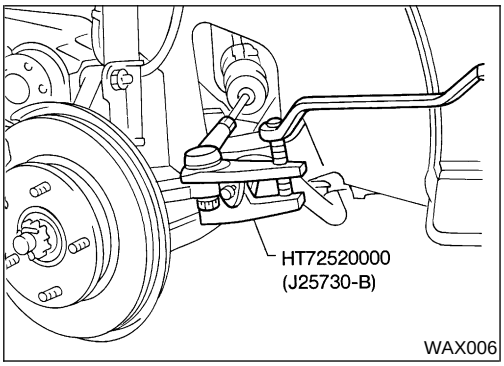
NIAX0009

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.

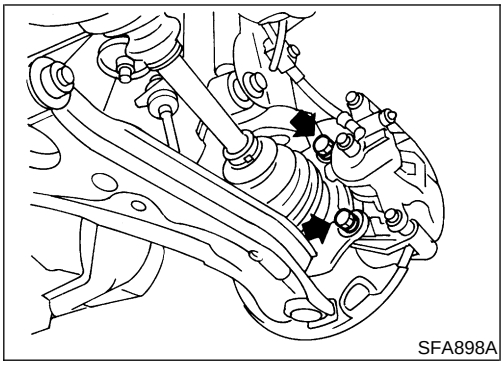

SFA090A

1. Remove cotter pin and wheel bearing lock nut.

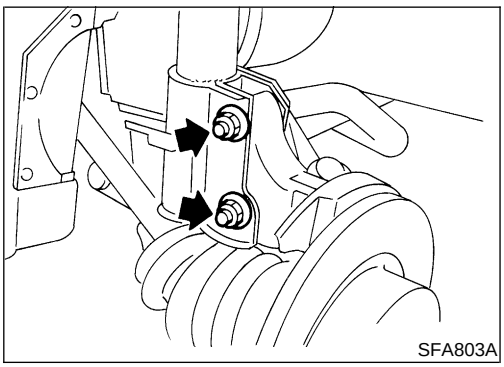


WAX006

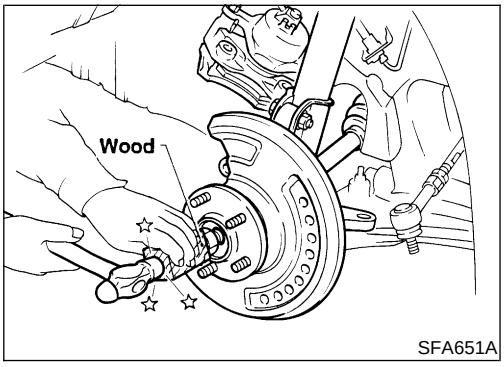
2. Separate tie-rod from knuckle with Tool.
- **Install stud nut on stud bolt to prevent damage to stud bolt.**


SFA898A

3. Remove brake caliper assembly, torque member 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.

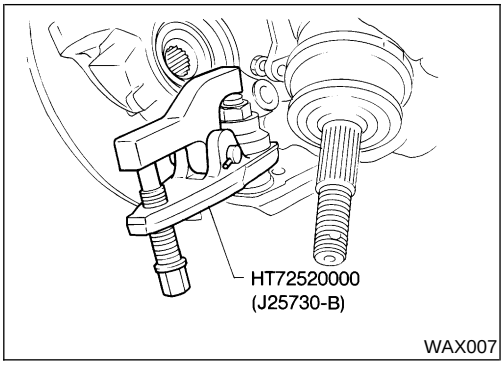

SFA803A

4. Remove strut lower mounting nuts and bolts.



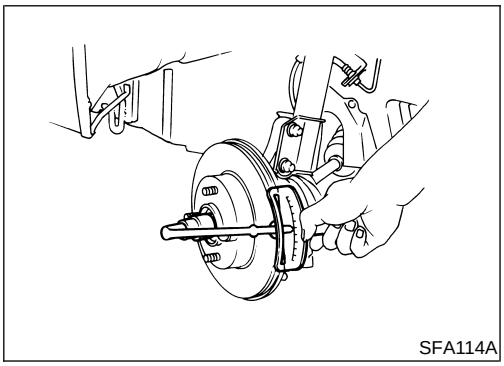
SFA651A

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.**



WAX007

6. Loosen lower ball joint nut.
7. Remove knuckle from lower ball joint stud with Tool.

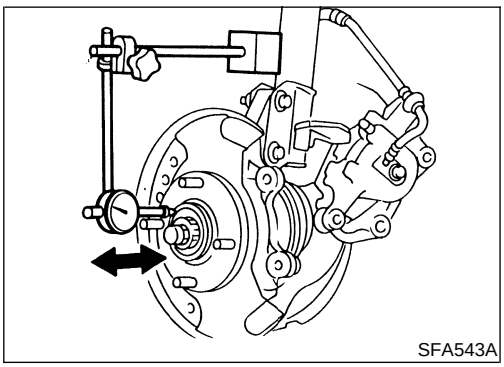

SFA114A

INSTALLATION

NIAX0010

1. Install in reverse order of removal.

- 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.
- Tighten wheel bearing lock nut.
  : 197 - 274 N·m (20 - 28 kg-m, 145 - 202 ft-lb)
- Rotate wheel hub to check that wheel bearings operate smoothly.


SFA543A

- Rotate wheel hub to check wheel bearing axial end play.
  Axial end play:
  0.05 mm (0.0020 in) or less

DISASSEMBLY

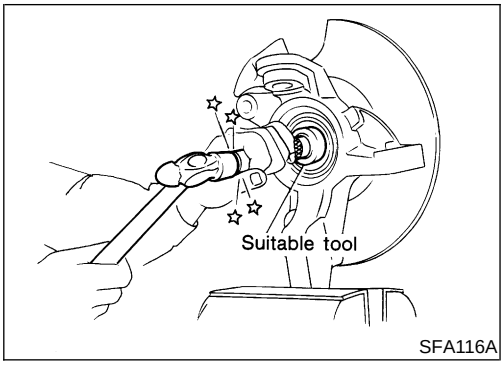
NIAX0011

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.**

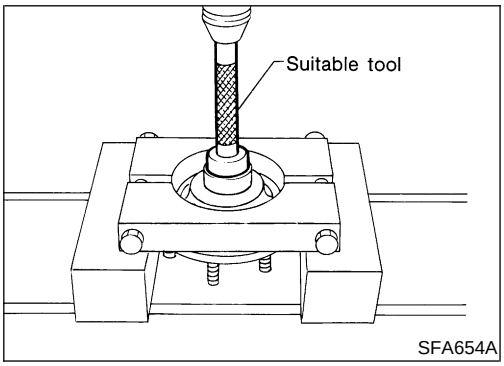


SFA116A

Wheel Hub

NIAX0011S01

Drive out hub and inner race from knuckle with a suitable tool.



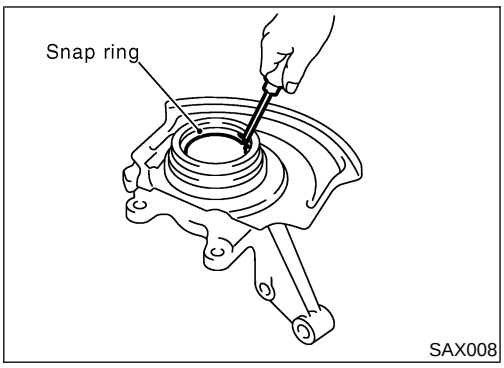
SFA654A

Wheel Bearing

NIAX0011S02

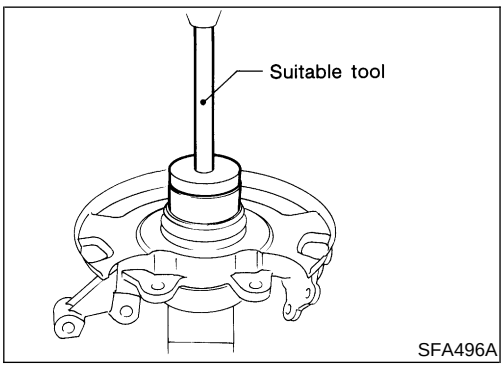
When replacing wheel bearing, replace complete wheel bearing assembly (inner race and outer race).

1. Remove bearing inner race.



SAX008

2. Remove snap rings.



SFA496A

3. Press out bearing outer race.
4. Remove baffle plate, if required.

INSPECTION

NIAX0012

Wheel Hub and Knuckle

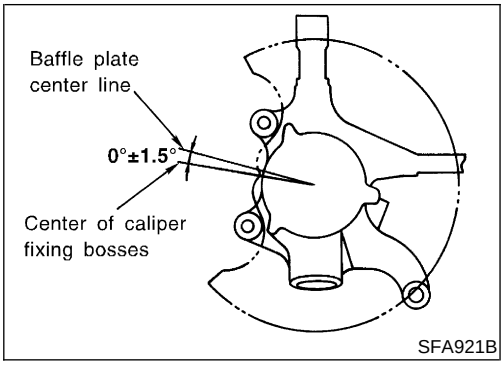
NIAX0012S01

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

Snap Ring

NIAX0012S02

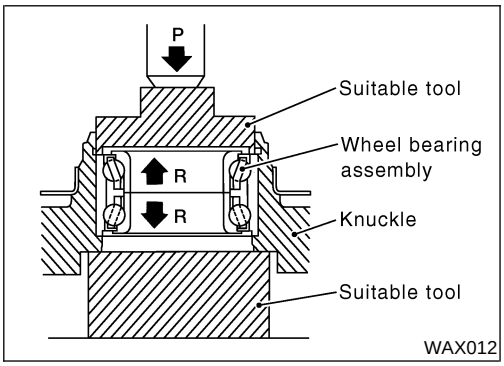
Check snap ring for wear or cracks. Replace if necessary.



ASSEMBLY

NIAX0013

- 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. Press new wheel bearing assembly into knuckle until it seats against knuckle shoulder.

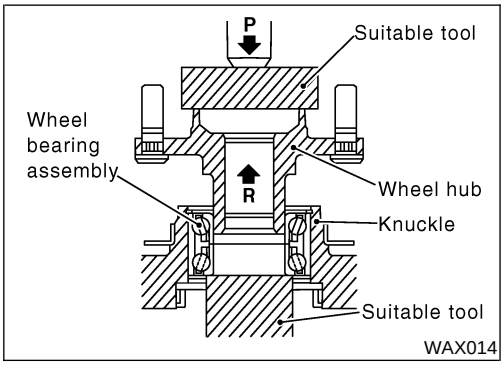
   Maximum load P:

   34 kN (3.5 ton, 3.9 US ton, 3.4 Imp ton)

CAUTION:

- **Do not apply disassembly force in direction "R". There is a possibility of breaking the seal. In case of separation (except range of initial clearance) and disassembling of inner race, the wheel bearing shall be replaced with a new part.**
- **Do not press inner race of wheel bearing assembly or seal.**
- **Do not apply oil or grease to mating surfaces of wheel bearing outer race and knuckle.**

2. Install outer snap ring into groove of knuckle.

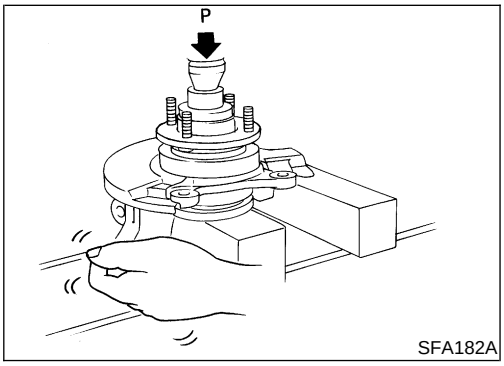


3. Press wheel hub into knuckle until it stops when the end of the wheel bearing is hit.

   Maximum load P:

   49 kN (5.0 ton, 5.5 US ton, 4.9 Imp ton)

- Do not move wheel hub in direction "R".



4. 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)

b. Spin knuckle several turns in both directions.

c. Make sure that wheel bearings operate smoothly.

Drive Shaft

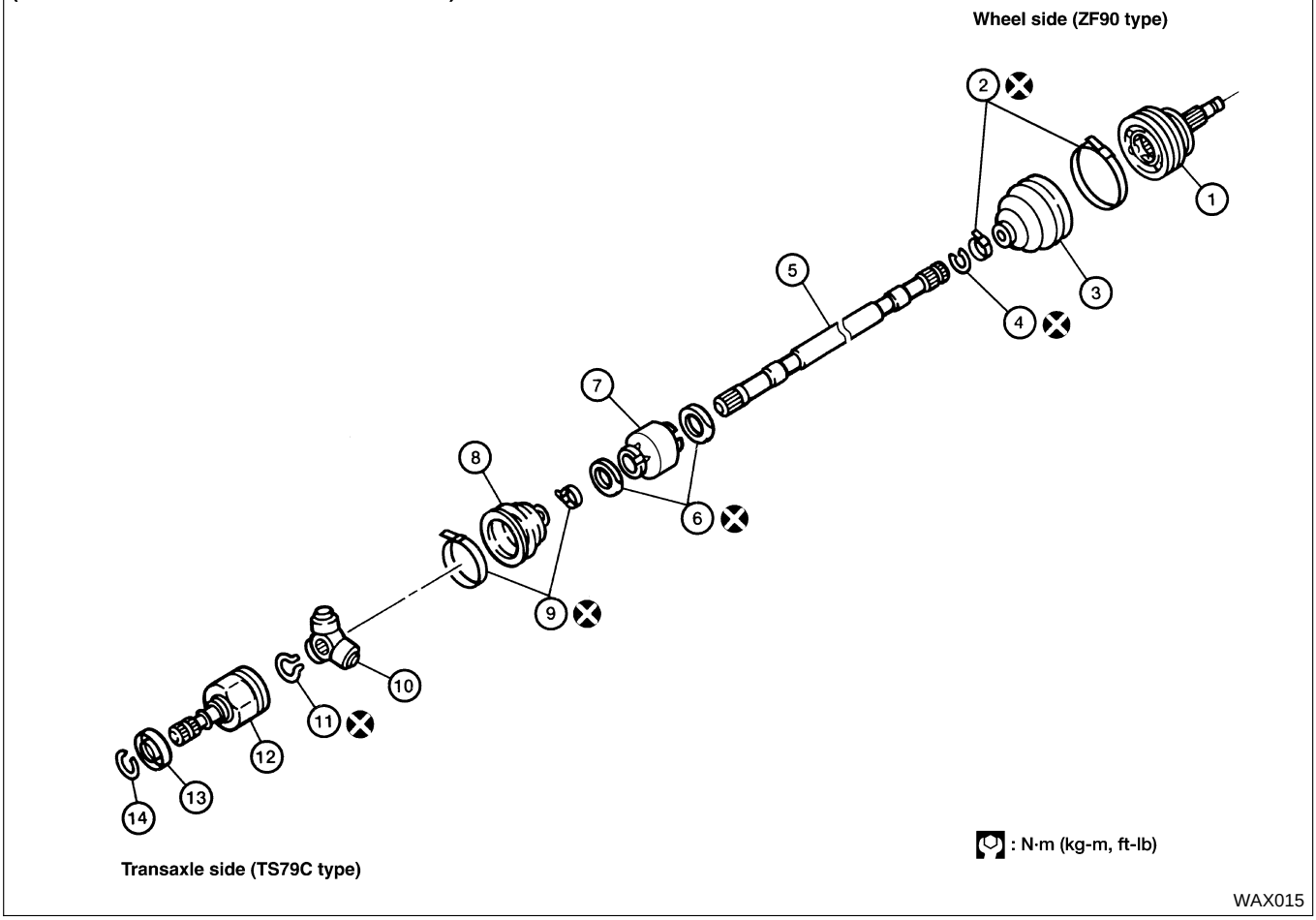
COMPONENTS

=NIAX0016

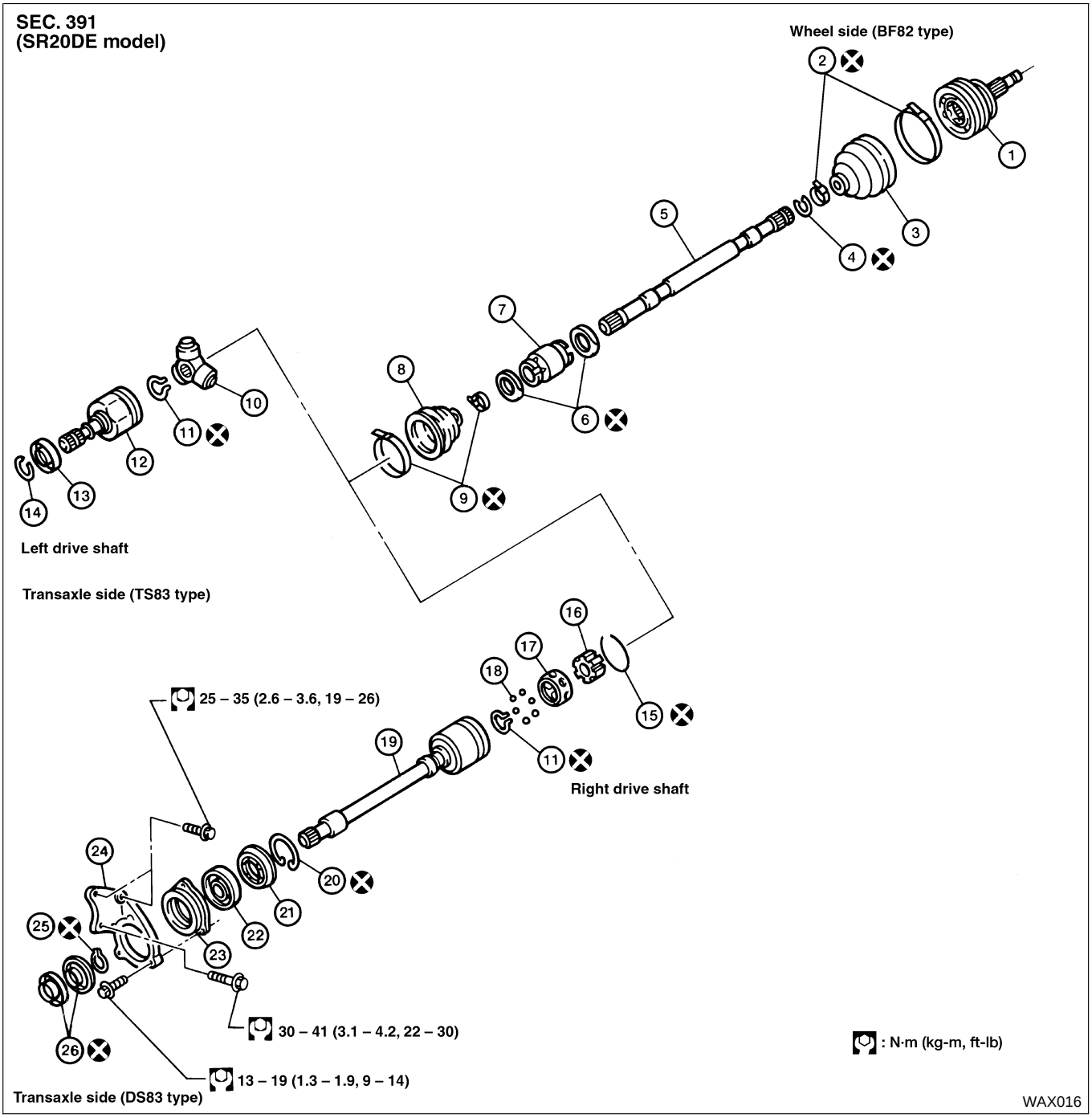
CAUTION:

- **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.**

SEC. 391
(QG18DE and QG18DE Calif. CA Models)



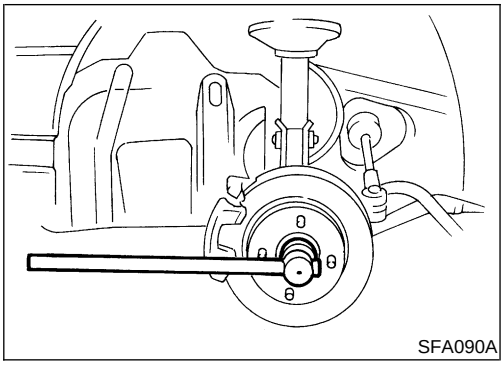
1. Joint assembly
2. Boot band
3. Boot
4. Circular clip B
5. Drive shaft
6. Band
7. Dynamic damper
8. Boot
9. Boot band
10. Spider assembly
11. Snap ring C
12. Slide joint housing
13. Dust shield
14. Circular clip A



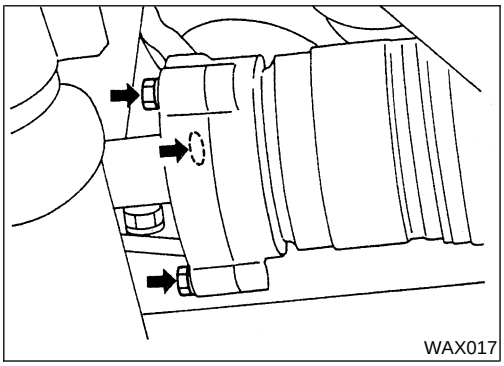
1. Joint assembly
2. Boot band
3. Boot
4. Circular clip B
5. Drive shaft
6. Band
7. Dynamic damper
8. Boot
9. Boot band
10. Spider assembly
11. Snap ring C
12. Slide joint housing
13. Dust shield
14. Circular clip A
15. Snap ring A
16. Inner race
17. Cage
18. Ball
19. Slide joint housing with extension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

REMOVAL

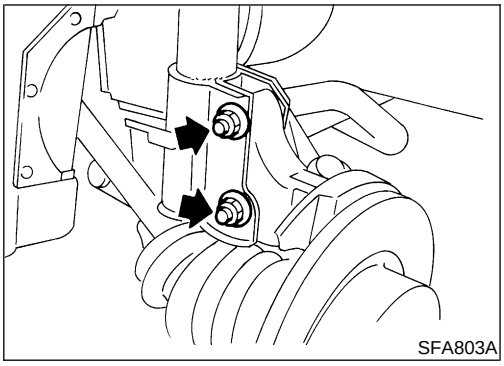
NIAX0014


SFA090A

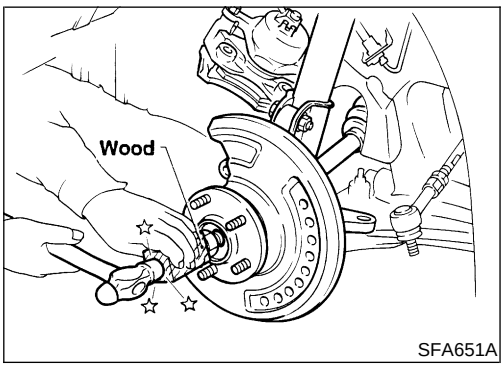
1. Remove cotter pin and wheel bearing lock nut.


WAX017

2. Remove drive shaft center support bearing bolts.


SFA803A

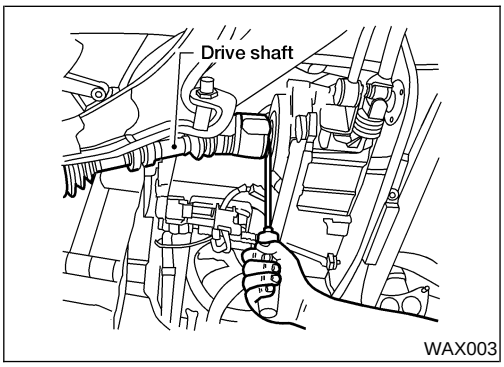
3. Remove strut lower mounting nuts and bolts.
4. Remove brake hose clip.



SFA651A

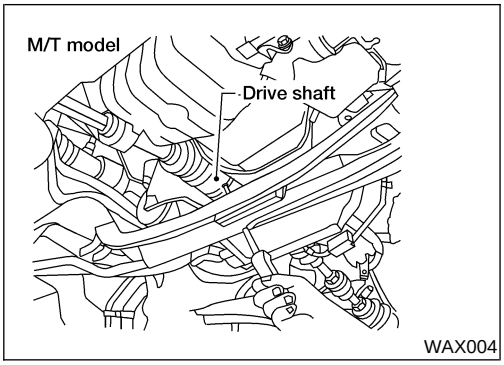
5. Separate drive shaft from knuckle by lightly tapping it. If it is hard to remove, use a puller.

- **Cover boots with shop towel so as not to damage them when removing drive shaft.**
- Refer to "Wheel Hub and Knuckle", "FRONT AXLE", AX-5.



WAX003

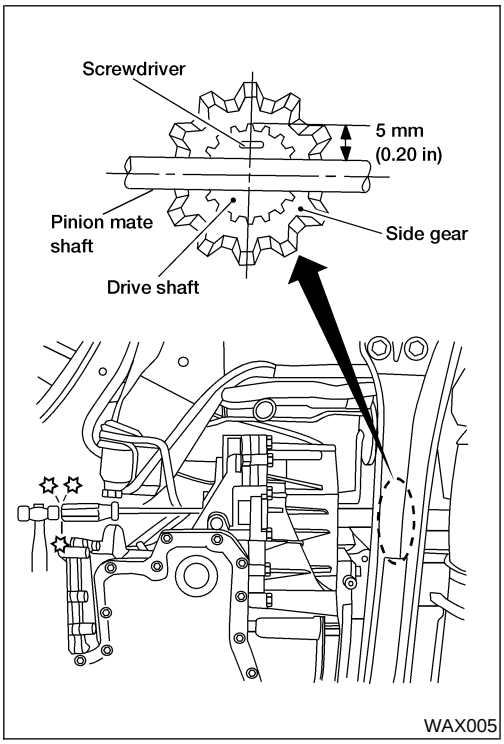
6. Remove left drive shaft from transaxle.



7. Remove right 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.**

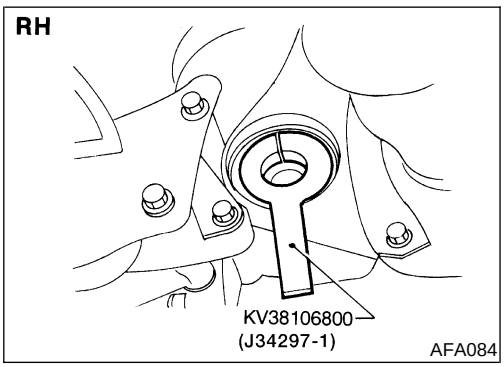
INSTALLATION

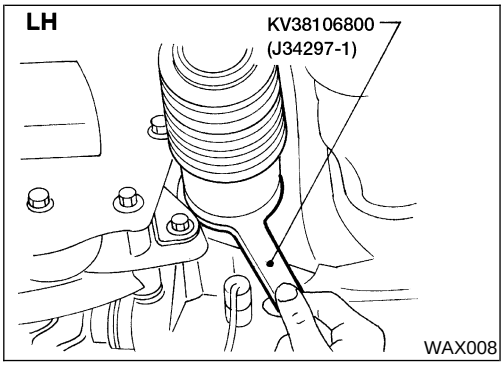
NIAX0015

Transaxle Side

NIAX0015S01

1. Drive a new oil seal to transaxle. Refer to ***MT-9***, "Replacing Oil Seal" or ***AT-435***, "Differential Side Oil Seal Replacement".
2. Set Tool along the inner circumference of oil seal.



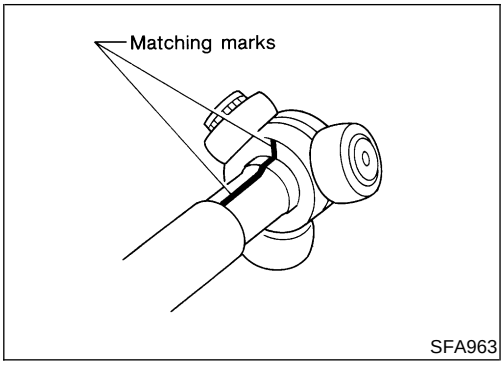


3. Insert drive shaft into transaxle. Be sure to properly align the serrations and then withdraw Tool.
4. Push drive shaft, then press-fit circular clip on the drive shaft into circular clip groove of side gear.
5. After its insertion, try to pull the flange out of the slide joint by hand. If it pulls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

Wheel Side

NIAX0015S02

1. Install drive shaft into knuckle.
2. Tighten strut lower mounting nuts and wheel bearing lock nut. Refer to section Installation in "Wheel Hub and Knuckle", AX-5.



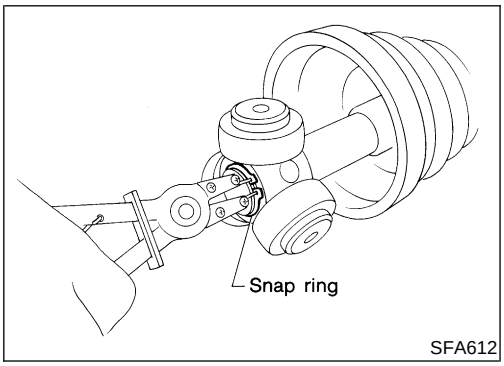
DISASSEMBLY

NIAX0017

Transaxle Side (TS79C and TS83 type)

NIAX0017S01

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.



4. Remove snap ring, then remove spider assembly.

CAUTION:

Do not disassemble spider assembly.

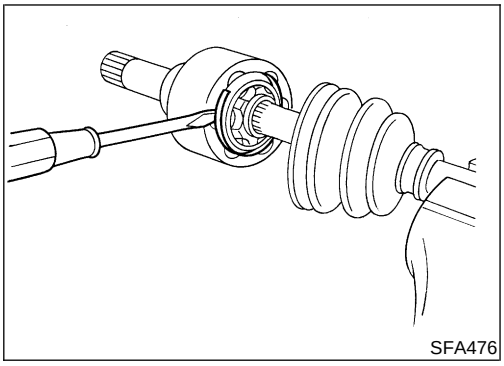
5. Draw out boot.

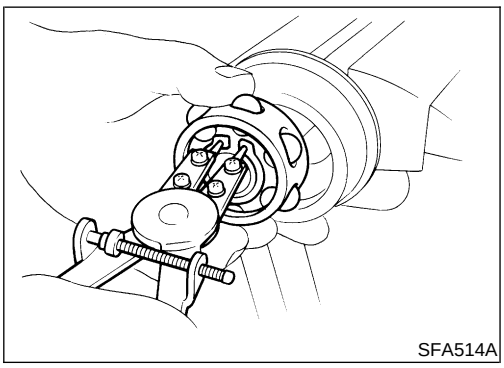
- **Cover drive shaft serrations with tape so as not to damage the boot.**

Transaxle Side (DS83 type)

NIAX0017S04

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.





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 to prevent damage to the boot.**

Wheel Side

NIAX0017S02

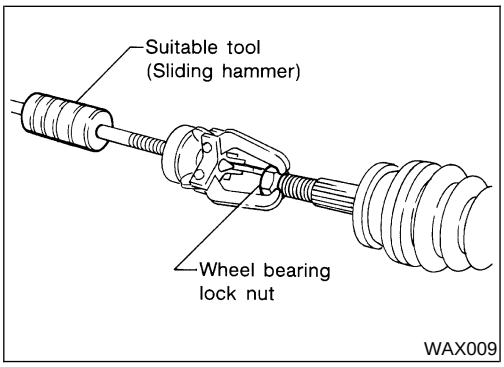
CAUTION:

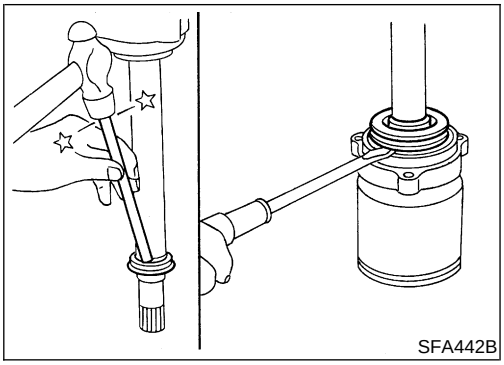
The joint on the wheel side cannot be disassembled.

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.

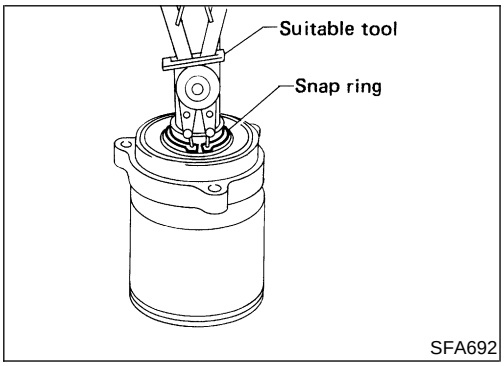



SFA442B

Support Bearing

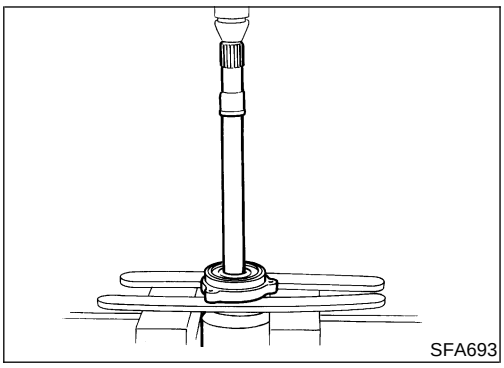
NIAX0017S05

1. Remove dust shield.

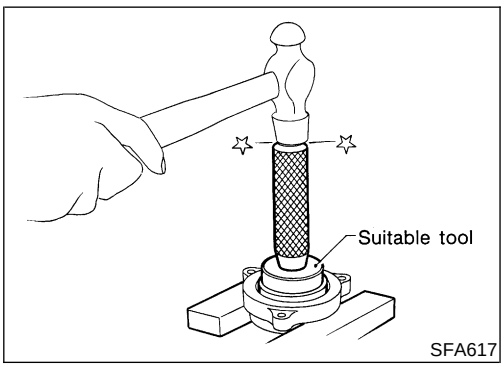


SFA692

2. Remove snap ring.


SFA693

3. Press support bearing assembly off drive shaft.



SFA617

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

INSPECTION

NIAX0018

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

Drive Shaft

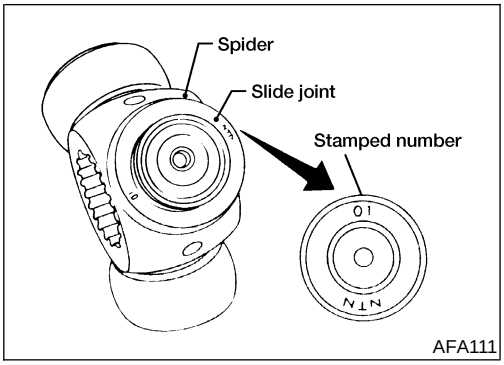
NIAX0018S01

Replace drive shaft if it is twisted or cracked.

Boot

NIAX0018S02

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



Joint Assembly (Transaxle side)

NIAX0018S03

TS79C and TS83 Type

NIAX0018S0301

- Check spider assembly for needle bearing and washer damage. Replace if necessary.
- Check roller surfaces for scratches, wear and other damage. Replace if necessary.
- Check serration for deformation. Replace if necessary.
- Check slide joint housing for any damage. Replace if necessary.
- When replacing only spider assembly, select a new spider assembly from among those listed in table below. Ensure that the number stamped on slide joint is the same as that stamped on new part.

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

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

*: Always check with the Parts Department for the latest parts information.

DS83 Type

NIAX0018S0302

- 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.

Joint Assembly (Wheel side)

NIAX0018S04

Replace joint assembly if it is deformed or damaged.

Support Bearing

NIAX0018S0401

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

Support Bearing Bracket

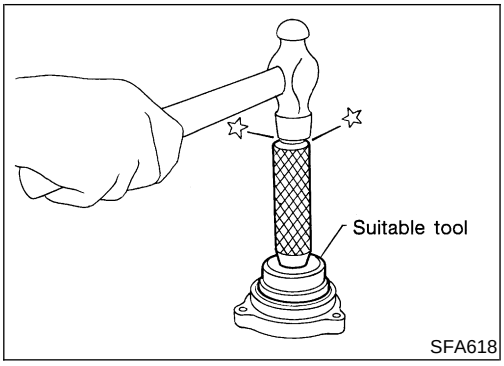
NIAX0018S0402

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

ASSEMBLY

NIAX0019

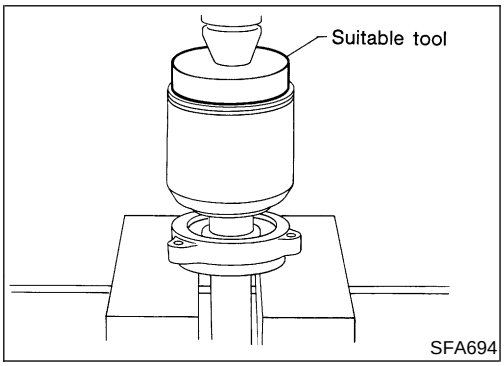
- **After drive shaft has been assembled, ensure that it moves smoothly over its entire range without binding.**
- **Use NISSAN GENUINE GREASE or equivalent after every overhaul.**



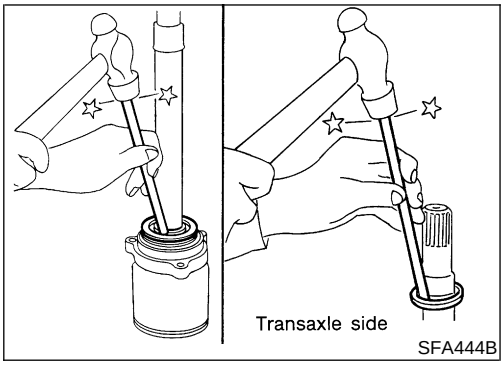
Support Bearing

NIAX0019S05

1. Install bearing into retainer.



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



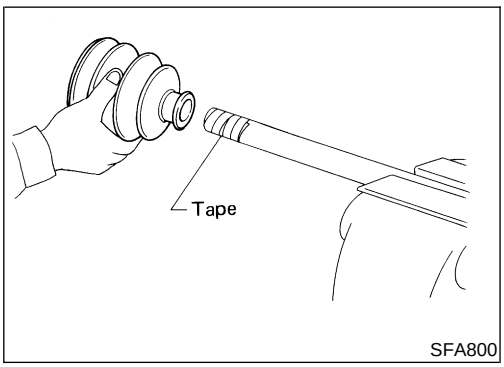
5. Install snap ring.
6. Install new dust shield.

Wheel Side

NIAX0019S01

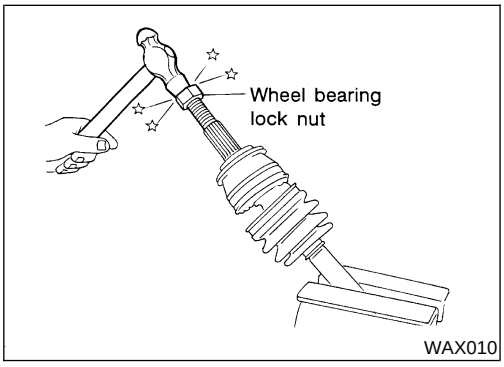
1. Install boot and new small boot band on drive shaft.

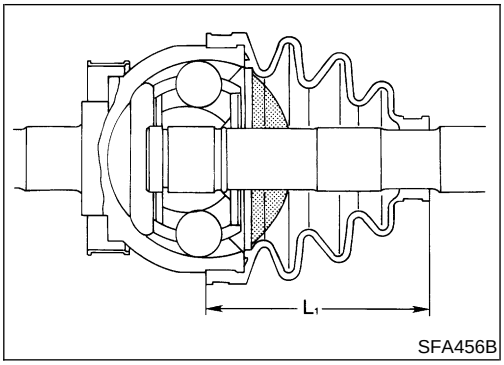
- **Cover drive shaft serration with tape to prevent damage to boot during installation.**



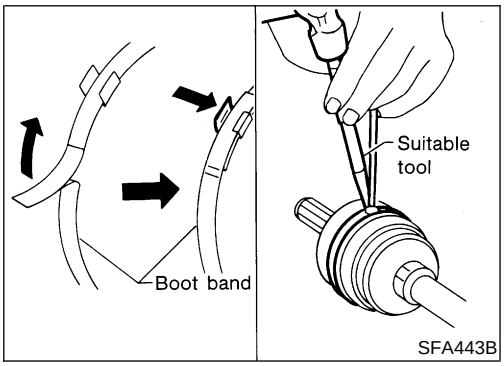
2. Set joint assembly onto drive shaft by lightly tapping it.

- **Ensure that marks which were made during disassembly are properly aligned.**

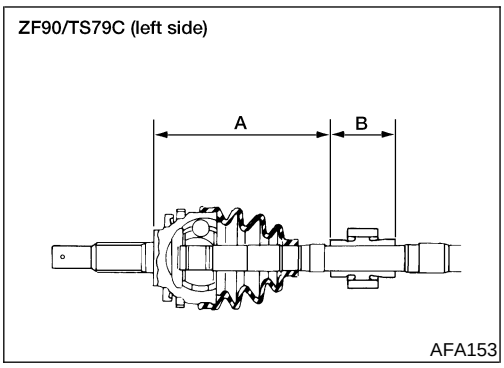




3. Pack drive shaft with specified amount of grease.
   Specified amount of grease:
   80 - 100 g (2.82 - 3.53 oz)
4. Make sure that boot is properly installed on the drive shaft groove.
   Set boot so that it does not swell and deform when its length is "L_1".
   Length "L_1":
   QG18DE: 97 mm (3.82 in)
   SR20DE: 95 mm (3.74 in)



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



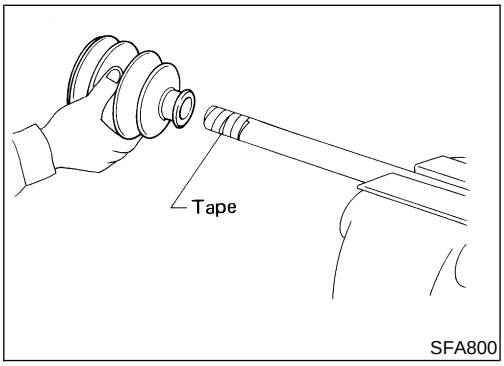
Dynamic Damper

NIAX0019S02

1. Use a new damper band when reinstalling.
2. Install dynamic damper from stationary-joint side while holding it securely:
   Length:

Unit: mm (in)

Applied model	QG18DE		SR20DE
	LH	RH	
"A"	175-185 (6.89 - 7.28)	420-430 (16.54 - 16.93)	169-175 (6.65 - 6.89)
"B"	70 (2.76)	64 (2.52)	70 (2.76)

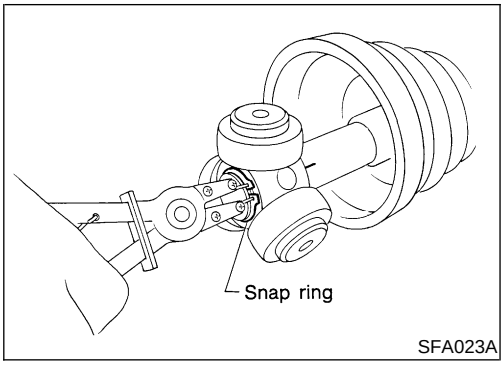


Transaxle Side (TS79C)

NIAX0019S03

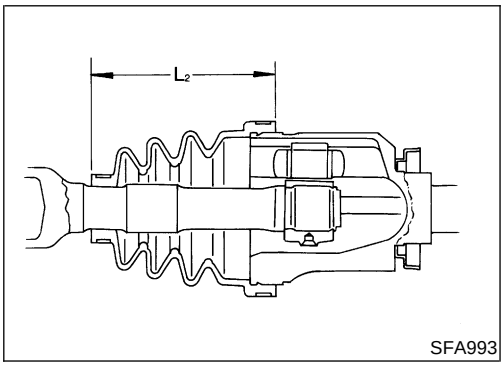
1. Install boot and new small boot band on drive shaft.

- **Cover drive shaft serration with tape to prevent damage to boot during installation.**



SFA023A

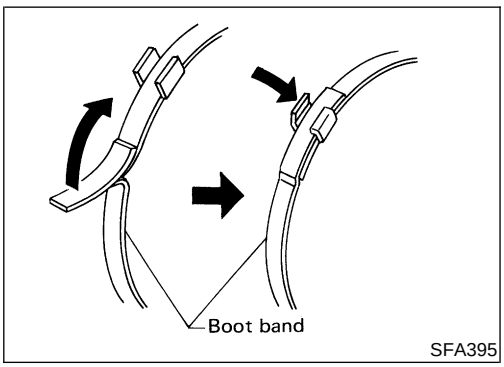
2. Install spider assembly securely, making sure the matching marks which were made during disassembly are properly aligned.
3. Install new snap ring.



SFA993

4. Pack drive shaft with specified amount of grease.
   Specified amount of grease:
   125 - 145 g (4.41 - 5.11 oz)
5. Install slide joint housing.
6. Set boot so that it does not swell and deform when its length is "L_2".
   Length "L_2":
   QG18DE: 102.5 mm (4.035 in)
   SR20DE: 99 mm (3.90 in)

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



SFA395

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

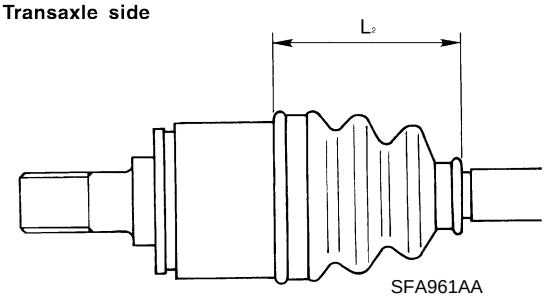
Service Data and Specifications (SDS)

DRIVE SHAFT

=NIAX0020

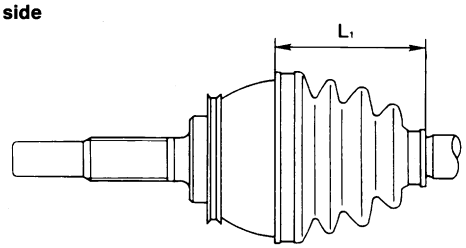
Applied model			QG18DE	SR20DE
Joint type	Transaxle side		TS79C	
	Wheel side		ZF90	
Grease	Quality		Nissan genuine grease or equivalent	
	Capacity g (oz)	Transaxle side	125 - 145 (4.41 - 5.11)	
		Wheel side	80 - 100 (2.82 - 3.53)	
Boot length mm (in)	Transaxle side "L_2"		102.5 (4.035)	99 (3.90)
	Wheel side "L_1"		97 (3.82)	95 (3.74)

Transaxle side



SFA961AA

Wheel side

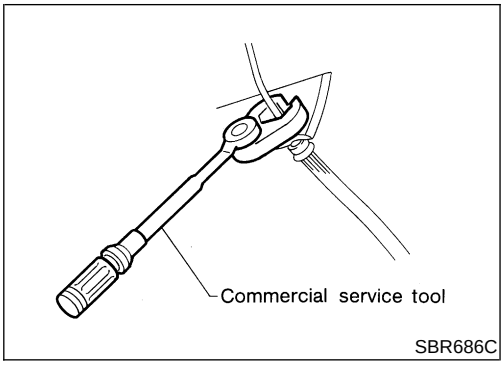


SFA962A

WHEEL BEARING (FRONT)

NIAX0021

Wheel bearing axial end play limit mm (in)	0.05 (0.0020 in) or less
Wheel bearing lock nut tightening torque N·m (kg-m, ft-lb)	197 - 274 (20 - 28, 145 - 202)
Knuckle to strut tightening torque N·m (kg-m, ft-lb)	114 - 133 (11.6 - 13.6, 84 - 98)



SBR686C

Precautions

PRECAUTIONS

NIAX0022

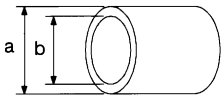
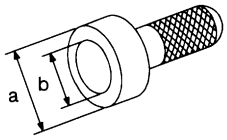
- **When installing each rubber part, final tightening must be carried out under unladen condition* with tires on ground. *: Fuel, radiator coolant and engine oil full. Spare tire, jack, hand tools and mats in designated positions.**
- **Use flare nut wrench when removing or installing brake tubes.**
- **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

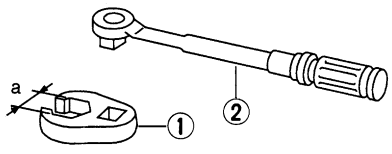
NIAX0032

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

Tool number (Kent-Moore No.) Tool name	Description	
KV40104710 (—) Drift	 NT474	Install ABS sensor rotor **a: 76.3 mm (3.004 in) dia.** **b: 67.9 mm (3.673 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

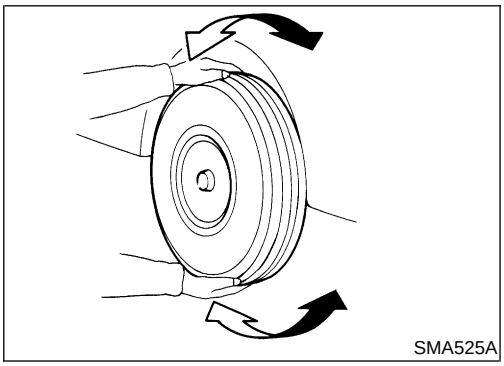
NIAX0024

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

NIAX0025

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


SMA525A

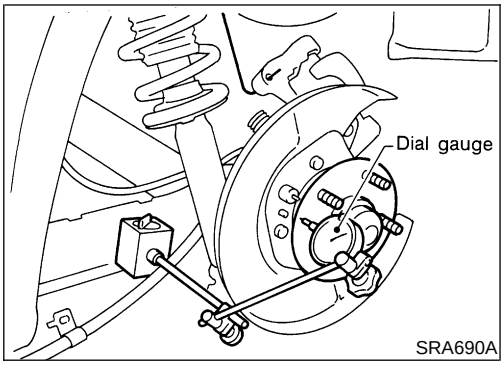
On-vehicle Service

REAR AXLE PARTS

NIAX0026

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

- Shake each rear wheel to check for excessive play.



SRA690A

REAR WHEEL BEARING

NIAX0027

- 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.

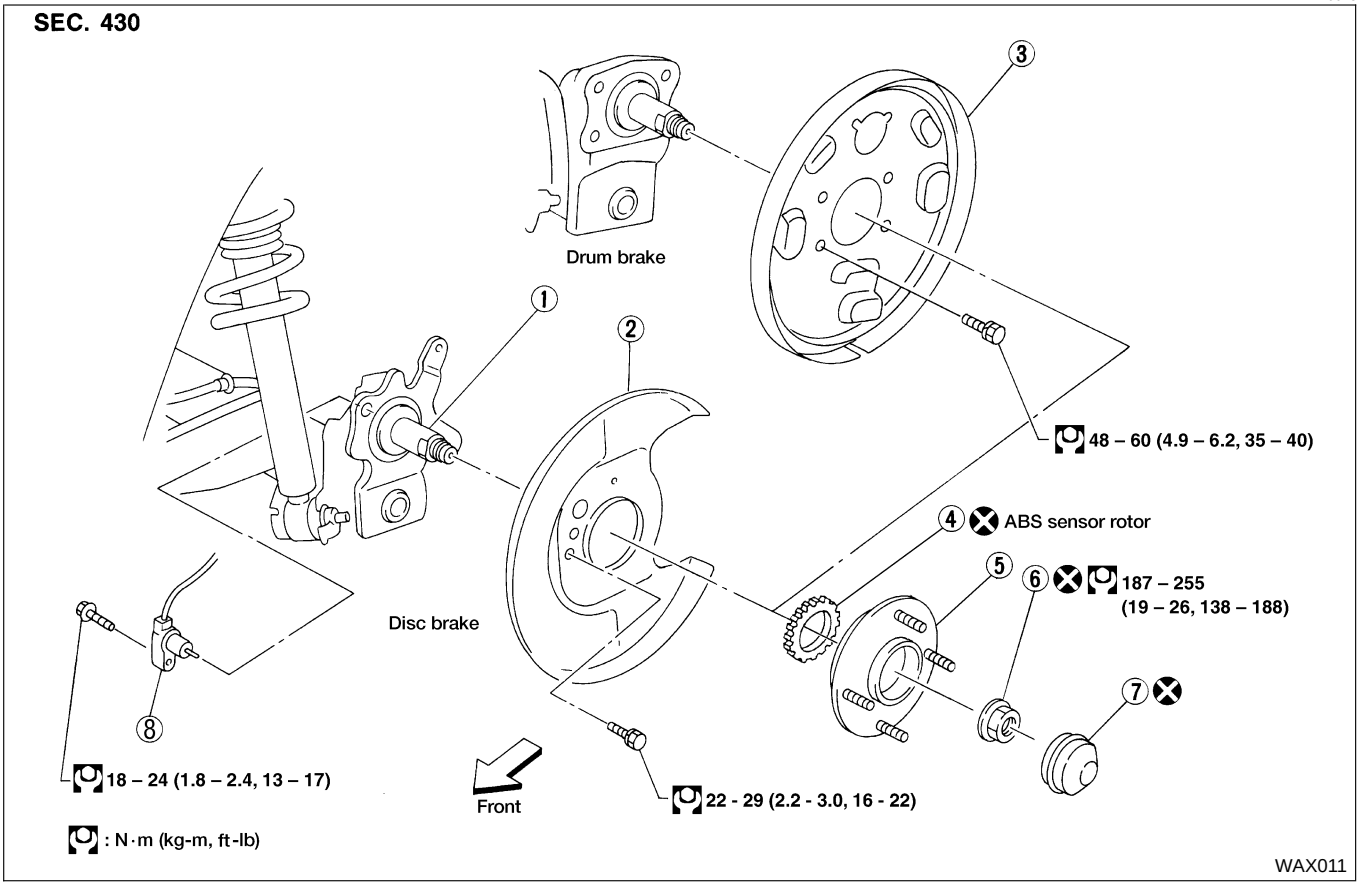
  : 187 - 255 N·m (19 - 26 kg-m, 138 - 188 ft-lb)

- Replace wheel bearing assembly if there is axial end play or wheel bearing does not turn smoothly. Refer to “Wheel Hub”, AX-23.

Wheel Hub

COMPONENTS

NIAX0028



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 wheel sensor

REMOVAL

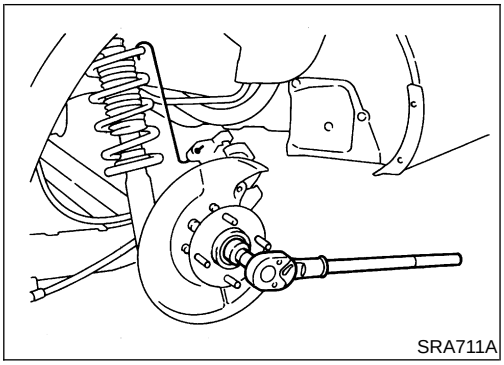
NIAX0029

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.**

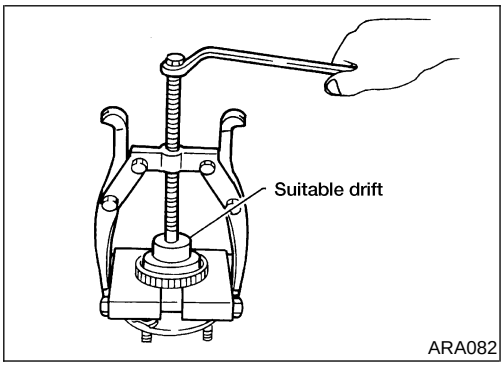
1) Growling noise is emitted from wheel hub bearing during operation.

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.
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.



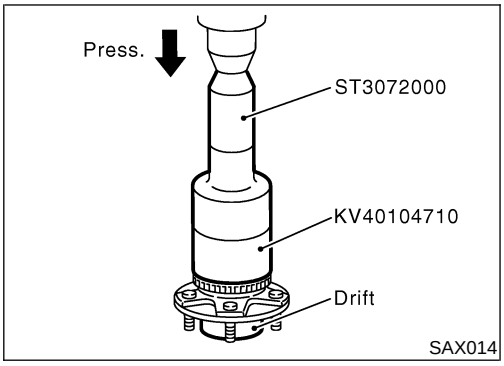
ARA082

5. Remove the ABS sensor rotor using suitable puller, drift and bearing replacer.

INSTALLATION

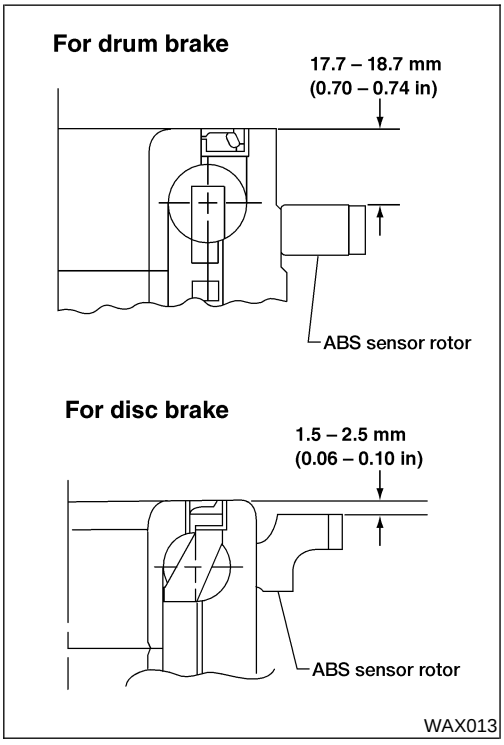
NIAX0030

- 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.

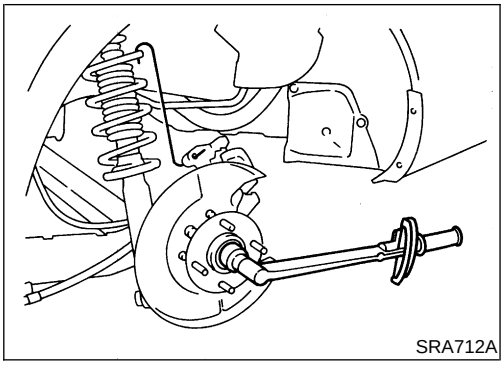


SAX014

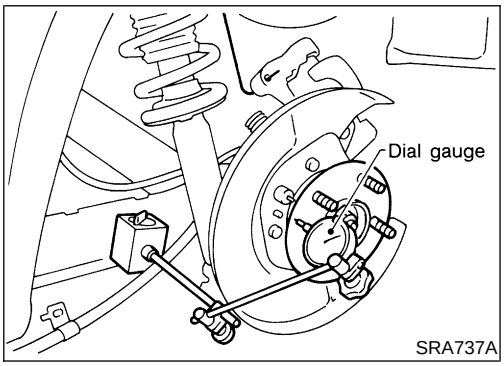
- Press-fit ABS sensor rotor as far as the location shown in figure at left.



WAX013

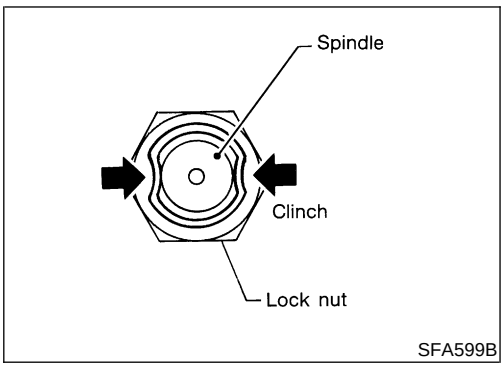

SRA712A

- 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 - 255 N·m (19 - 26 kg-m, 138 - 188 ft-lb)
- Check that wheel bearings operate smoothly.



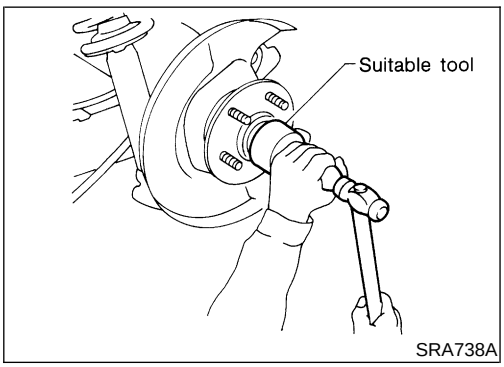
SRA737A

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



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)

=NIAX0031

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)	187 - 255 (19 - 26, 138 - 188)