FRONT & REAR AXLE

SECTION A

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Precautions PRECAUTIONS

NRAX0001

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

NBAX0002

Tool number (Kent-Moore No.) Tool name	Description		
ST29020001 (J24319-01) Ball joint remover		C b	Removing tie-rod outer end and lower ball joint a: 34 mm (1.34 in) b: 6.5 mm (0.256 in) c: 61.5 mm (2.421 in)
	NT694		
KV401021S0 (—) Bearing race drift			Installing wheel bearing outer race
	NT153		
KV40105400 (J36001) Wheel bearing lock nut wrench	{		Removing and installing wheel bearing lock nut
	NT154		

COMMERCIAL SERVICE TOOLS

NBAX000

		NBAX0003
Tool name	Description	
1 Flare nut crowfoot 2 Torque wrench	NT360	Removing and installing each brake piping a: 10 mm (0.39 in)
Hub cap drift	NT115	Installing hub cap (2WD) a: 85 mm (3.35 in) dia. b: 72 mm (2.83 in) dia. Installing hub cap (4WD) a: 57 mm (2.24 in) dia. b: 46 mm (1.81 in) dia.

Noise, Vibration and Harshness (NVH) Troubleshooting

NVH TROUBLESHOOTING CHART

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

Reference page			AX-14	I	AX-6, 20	I	AX-4, 19	PD-4	PD-4	Refer to DRIVE SHAFT in this chart.	Refer to AXLE in this chart.	SU-3	SU-3	SU-3	BR-6	ST-6	
Possible caus			Excessive joint angle	Joint sliding resistance	Imbalance	Improper installation, looseness	Parts interference	Wheel bearing damage	PROPELLER SHAFT	DIFFERENTIAL	DRIVE SHAFT	AXLE	SUSPENSION	TIRES	ROAD WHEEL	BRAKES	STEERING
	DRIVE	Noise, Vibration	×	×					×	×		×	×	×	×	×	×
	SHAFT	Shake	×		×				×			×	×	×	×	×	×
		Noise				×	×		×	×	×		×	×	×	×	×
		Shake				×	×		×		×		×	×	×	×	×
Symptom AXLE		Vibration				×	×		×		×		×	×			×
	AXLE	Shimmy				×	×						×	×	×	×	×
		Judder				×							×	×	×	×	×
		Poor quality ride or handling				×	×	×					×	×	×		

×: Applicable



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

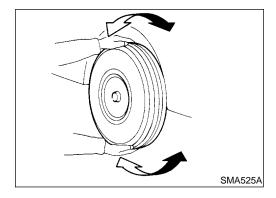


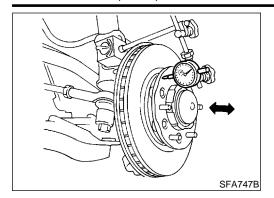
SC

- Shake each front wheel to check for excessive play.
- 2. Retighten all nuts and bolts to the specified torque.

Tightening torque:

Refer to "Wheel Hub and Rotor Disc", AX-6.





FRONT WHEEL BEARING

NBAX0005

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

Axial end play: 0 mm (0 in)

3. Adjust wheel bearing preload if there is any axial end play or wheel bearing does not turn smoothly.

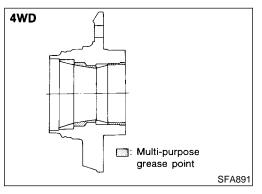
Preload Adjustment

NRAX0005S01

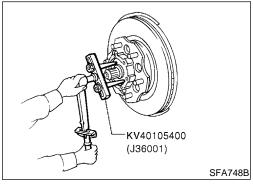
Adjust wheel bearing preload after wheel bearing has been replaced or front axle has been reassembled.

Adjust wheel bearing preload as follows:

 Before adjustment, thoroughly clean all parts to prevent dirt entry.

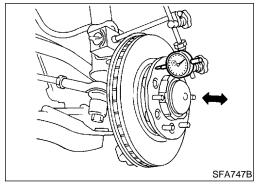


- 2. Apply multi-purpose grease sparingly to the following parts:
- Threaded portion of spindle
- Contact surface between wheel bearing lock washer (chamfered side) and outer wheel bearing
- Grease seal lip
- Wheel hub (as shown at left) 4WD —



- 3. Tighten wheel bearing lock nut with Tool.
 - (8 10 kg-m, 58 72 ft-lb)
- 4. Turn wheel hub several times in both directions.
- 5. Loosen wheel bearing lock nut so that torque becomes 0 N·m (0 kg-m, 0 ft-lb).
- Retighten wheel bearing lock nut with Tool.

(0.05 - 0.15 kg-m, 4.3 - 13.0 in-lb)

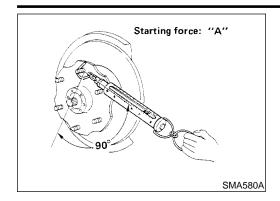


- 7. Turn wheel hub several times in both directions.
- 8. Retighten wheel bearing lock nut with Tool.

(0.05 - 0.15 kg-m, 4.3 - 13.0 in-lb)

9. Measure wheel bearing axial end play.

Axial end play: 0 mm (0 in)



10. Measure starting force "A" at wheel hub bolt.



11. Install lock washer by tightening the lock nut within 15 to 30 degrees.

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12. Turn wheel hub several times in both directions to seat wheel bearing correctly.13. Measure starting force "B" at wheel hub bolt. Refer to proce-

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dure 10.

14. Wheel bearing preload "C" can be calculated as shown below.

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C = B - A Wheel bearing preload "C":

7.06 - 20.99 N (0.72 - 2.14 kg, 1.59 - 4.72 lb)

TF

15. If wheel bearing preload "C" is outside specifications, remove lock washer. Tighten or loosen lock nut within ± 15 degrees (Refer to step 11 above). Install lock washer, then repeat steps 12, 13 and 14.

PD

16. Repeat above procedures until correct axial end play and wheel bearing preload are obtained.

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17. Install drive flange (4WD models) and wheel hub cap.

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DRIVE SHAFT (4WD)

SFA830

 Check boot and drive shaft for cracks, wear, damage and grease leakage.

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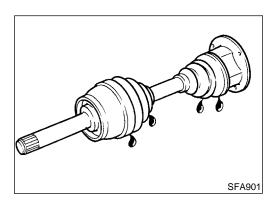
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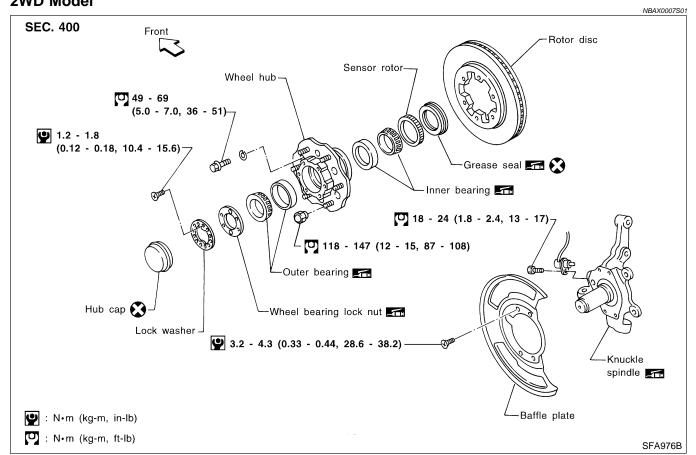
EL

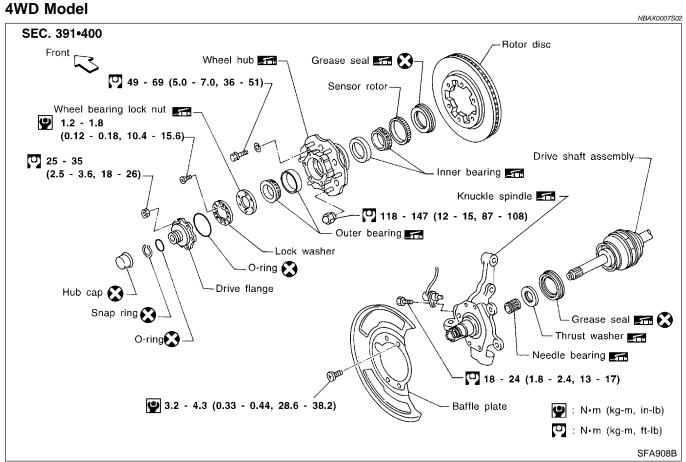


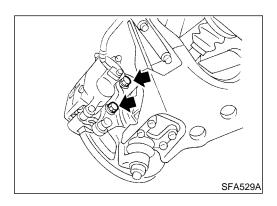
Wheel Hub and Rotor Disc

COMPONENTS 2WD Model

NBAX0007







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.

Remove brake caliper assembly.

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.

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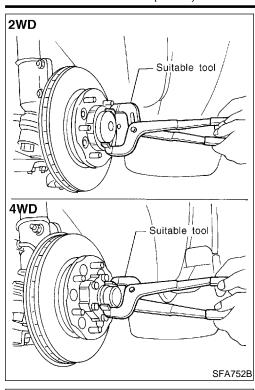
RS

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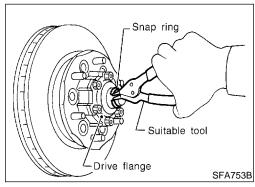
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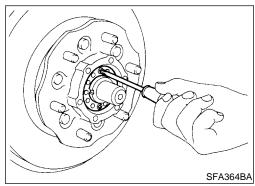


2. Remove hub cap with suitable tool.

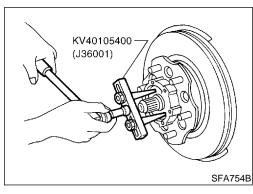


3. Remove snap ring with suitable tool. — 4WD —

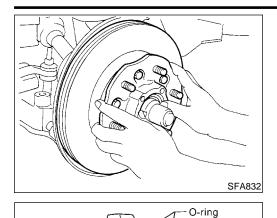
4. Remove drive flange. — 4WD —



5. Remove lock washer.



6. Remove wheel bearing lock nut.



Remove wheel hub and wheel bearing. Be careful not to drop outer bearing.

INSTALLATION

After installing wheel hub and wheel bearing, adjust wheel bearing preload.

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Refer to "Preload Adjustment", "FRONT WHEEL BEARING", "On-vehicle Service", AX-4.

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Pack drive flange groove with grease, apply grease to O-ring (two places) and mating surface of drive flange, and install flange. — 4WD —

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Install snap ring. — 4WD —

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4. Install hub cap using a suitable tool.

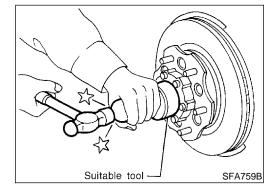
Do not reuse hub cap. When installing, replace it with a new one.

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Drive flange

SFA755B

FA858

Groove

DISASSEMBLY

Remove grease seal and bearing outer races with suitable brass bar.

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Thoroughly clean wheel bearings and wheel hub.

NBAX0011

Wheel Bearing

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

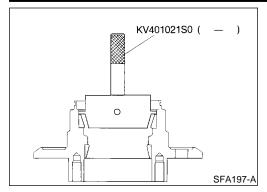
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Wheel Hub

Check wheel hub for crack by using a magnetic exploration or dyeing test.

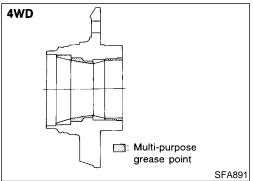


Brass bar

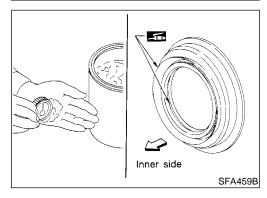


ASSEMBLY

1. Install bearing outer race with Tool until it seats in hub.



2. Pack multi-purpose grease into wheel hub. — 4WD —

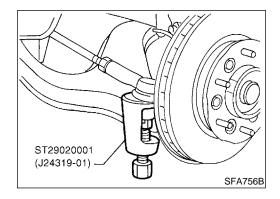


- 3. Apply multi-purpose grease to each bearing cone.
- 4. Pack grease seal lip with multi-purpose grease, then install it into wheel hub with suitable drift.

Knuckle Spindle REMOVAL

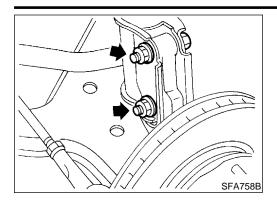
NBAX0013

 Remove drive shaft. — 4WD — Refer to "Drive Shaft", AX-12.



Separate tie-rod end and lower ball joint from knuckle with Tool.

Install stud nut conversely on stud bolt so as not to damage stud bolt.



3. Separate knuckle from strut.

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INSPECTION

Knuckle Spindle

NBAX0014

, EC

Check knuckle spindle for deformation, cracks and other damage by using a magnetic exploration or dyeing test.

Needle Bearing — 4WD —

NBAX0014S02

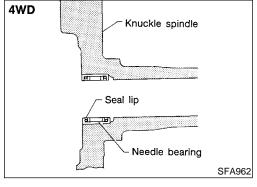
 Check needle bearing for wear, scratches, pitting, flaking and burn marks.

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INSTALLATION

NBAX0015

1. Install needle bearing into knuckle spindle. — 4WD —

Make sure that needle bearing is facing in proper direction. Apply multi-purpose grease.

2. Install knuckle with wheel hub.

3. Install tie-rod end and lower ball joint.

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4. After installing knuckle spindle, adjust wheel bearing preload. Refer to "Preload Adjustment", "FRONT WHEEL BEARING", "On-vehicle Service", AX-4.

 After installing drive shaft, check drive shaft axial end play. — 4WD —

RS

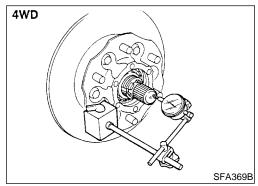
Do not reuse snap ring once it has been removed. Refer to "Drive Shaft", AX-12.

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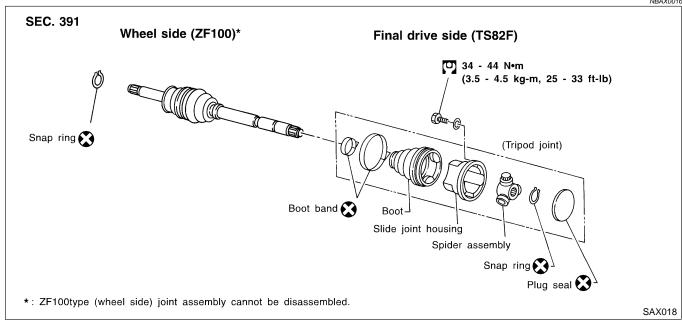
HA

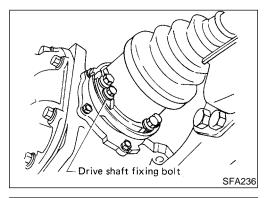
SC

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Drive Shaft (4WD) COMPONENTS

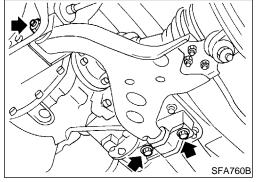




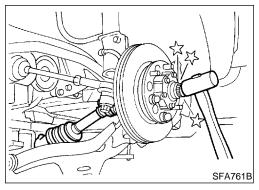
REMOVAL

NBAX0017

- Remove hub cap and snap ring. Refer to "REMOVAL", "Wheel Hub and Rotor Disc", AX-7.
- Remove bolts fixing drive shaft to final drive.

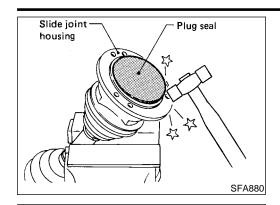


3. Remove transverse link fixing nut and bolts.



Separate drive shaft from knuckle by lightly tapping it with a copper hammer.

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



DISASSEMBLY

Final Drive Side (TS82F)

NBAX0018

Remove plug seal from slide joint housing by lightly tapping around slide joint housing.

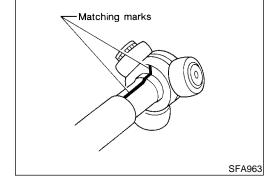
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Remove boot bands.

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Move boot and slide joint housing toward wheel side, and put

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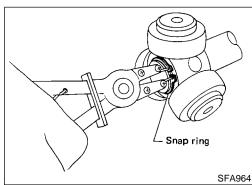


matching marks.

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Remove snap ring.

5. Detach spider assembly with press.

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Draw out boot.



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



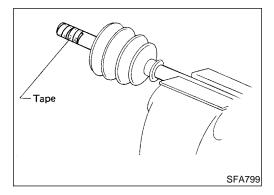
Wheel Side (ZF100)

NBAX0018S02



SFA392

The joint on the wheel side cannot be disassembled. ZF100 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.



INSPECTION

IBAX0019

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

Drive Shaft

NBAX0019S01

Replace drive shaft assembly if it is twisted or cracked.

Boot (Final drive side)

BAX0019S

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

Joint Assembly (Final drive side)

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- 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)

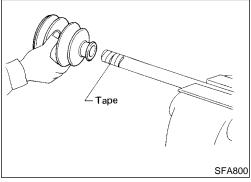
NBAX0019S04

Replace drive shaft assembly if joint is deformed or damaged.

ASSEMBLY

IBAX0020

- 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.

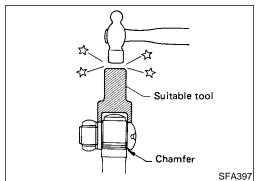


Final Drive Side (TS82F)

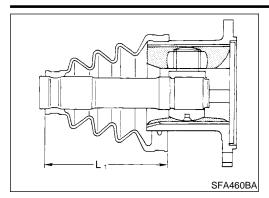
NBAX0020S

 Install new small boot band, boot and side joint housing to drive shaft.

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



- 2. Install spider assembly securely, ensuring marks are properly aligned.
- Press-fit with spider assembly serration chamfer facing shaft.
- Install new snap ring.





Specified amount of grease: 95 - 105 g (3.35 - 3.70 oz)

Make sure that boot is properly installed on the drive shaft groove. Set boot so that it does not swell and deform when its length is "L₁".

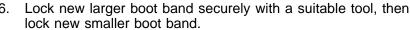
Length "L₁": 95 - 97 mm (3.74 - 3.82 in)



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Install new plug seal to slide joint housing by lightly tapping it. Apply sealant to mating surface of plug seal.

Wheel Side (ZF100)

CAUTION:

NBAX0020S02

The joint on the wheel side cannot be disassembled. ZF100 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.

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INSTALLATION

1. Apply multi-purpose grease.

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NRAX0021



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Install thrust washer onto drive shaft.

selecting a suitable snap ring.

Make sure that thrust washer is facing in proper direction, apply multi-purpose grease.



BT

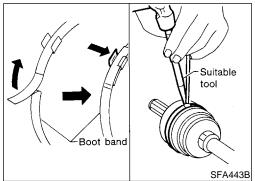
HA

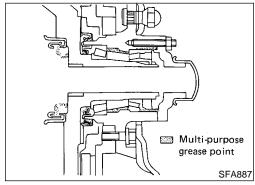
When installing drive shaft, adjust drive shaft axial end play by

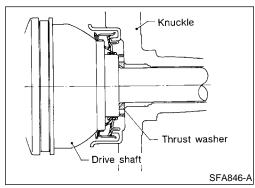
SC

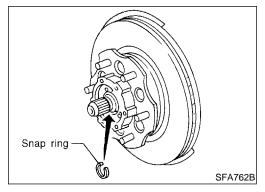
Temporarily install new snap ring on drive shaft in the same thickness as it was installed before removal.

EL

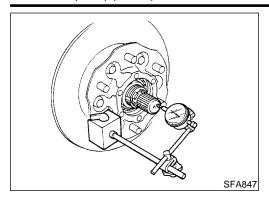








3.



- b. Set dial gauge on drive shaft end.
- c. Measure axial end play of drive shaft.

Axial end play: 0.45 mm (0.0177 in) or less

d. If axial end play is not within the specified limit, select another snap ring.

1.9 mm (0.075 in)
2.1 mm (0.083 in)
2.3 mm (0.091 in)

Service Data and Specifications (SDS)

WHEEL BEARING (FRONT)

NBAX0022

	Tightening torque	78 - 98 N·m (8 - 10 kg-m, 58 - 72 ft-lb)
	Retightening torque after loosening wheel bearing lock nut	0.5 - 1.5 N·m (0.05 - 0.15 kg-m, 4.3 - 13.0 in-lb)
Wheel bearing lock nut	Axial end play	0 mm (0 in)
	Starting force at wheel hub bolt N (kg, lb)	A
	Turning angle	15° - 30°
	Starting force at wheel hub bolt N (kg, lb)	В
Wheel bearing preload at wheel hub bolt	B – A	7.06 - 20.99 N (0.72 - 2.14 kg, 1.59 - 4.72 lb)

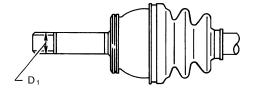
DRIVE SHAFT (4WD)

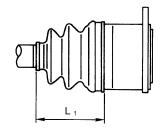
NBAYOOS

	•		NBAX0033
	Final drive side		TS82F
Drive shaft joint type	Wheel side		ZF100*
	Fixed joint axial end play limit		1 mm (0.04 in)
Diameter	Wheel side (D ₁)		29.0 mm (1.142 in)
Cross	Quality		Nissan genuine grease or equivalent
Grease	Specified amount of grease	Final drive side	95 - 105 g (3.35 - 3.70 oz)
Drive shaft axial end play		0.45 mm (0.0177 in) or less	
Boot length	Final drive side (L ₁)		95 - 97 mm (3.74 - 3.82 in)

Wheel side







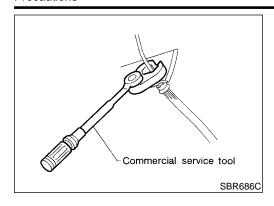
SAX019

^{*:} ZF100 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.

FRONT AXLE

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		Service Data an	d Specifications (SDS) (Cont'd
Shaft End Snap Ri	ng		=NBAX0033S0
Thickness mm (in) 1.1 (0.043)	Part No. 39253-88G10	Thickness mm (in) 1.9 (0.075)	Part No. 39253-88G14
1.3 (0.051) 1.5 (0.059) 1.7 (0.067)	39253-88G11 39253-88G12 39253-88G13	2.1 (0.083) 2.3 (0.091)	39253-88G15 39253-88G16



Precautions PRECAUTIONS

NBAX0023

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

NBAX0024

Tool number (Kent-Moore No.) Tool name	Description	
KV40101000 (J25604-01) Axle stand		Removing rear axle shaft
	NT159	
ST36230000 (J25840-A) Sliding hammer		Removing rear axle shaft
	NT126	
ST38020000 (—) Bearing lock nut wrench		Removing wheel bearing lock nut
	NT160	
HT72480000 or HT72210000 (J25852-B) Rear axle shaft bearing puller	NT161	Removing wheel bearing
ST37840000 (—) Rear axle shaft guide		Installing rear axle shaft
	NT162	

COMMERCIAL SERVICE TOOLS NBAX0025 Tool name Description GI 1 Flare nut crowfoot Removing and installing each brake piping 2 Torque wrench a: 10 mm (0.39 in) MA EM NT360 Rear axle oil seal drift Installing oil seal LC a: 74 mm (2.91 in) dia. b: 68 mm (2.68 in) dia. c: 10 mm (0.39 in) EC NT163

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

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

AX

ST

BT

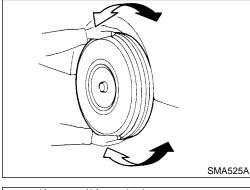
HA

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PD



On-vehicle Service REAR AXLE PARTS

Check rear axle parts for excessive play, wear and damage.

Shake each rear wheel to check for excessive play.

Retighten all nuts and bolts to the specified torque.

Tightening torque: Refer to "Components", AX-20.



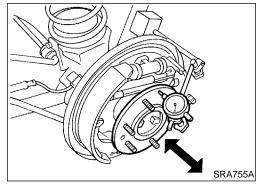
SC NBAX0027

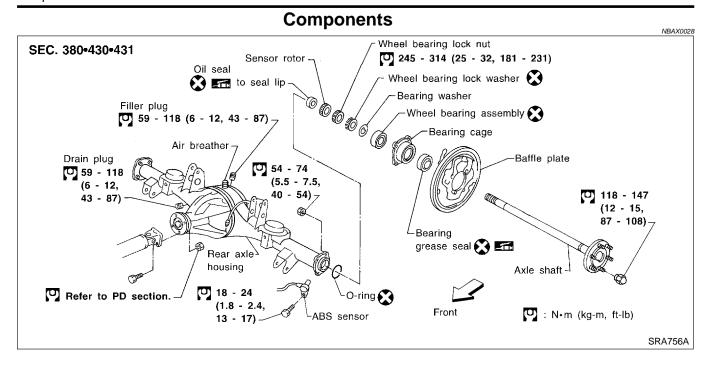
Check that wheel bearings operate smoothly.

2. Check axial end play.

Axial end play: 0 mm (0 in)

EL



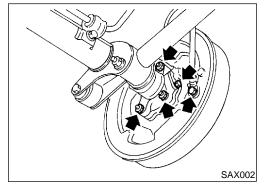


Removal CAUTION:

 Before removing the rear axle, disconnect the ABS wheel sensor from the assembly. Then move it away from the axle. Failure to do so may result in damage to the sensor wires and the sensor becoming inoperative.

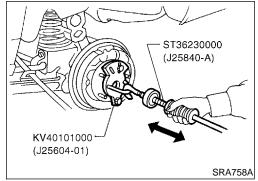
Wheel bearing does not require maintenance.

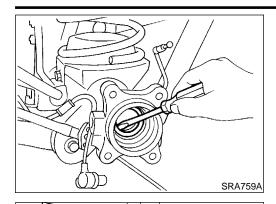
- If growling noise is emitted from wheel bearing during operation, replace wheel bearing assembly.
- If the wheel bearing assembly is removed, it must be renewed. The old assembly must not be re-used.
- 1. Disconnect parking brake cable and brake tube.
- 2. Remove nuts securing wheel bearing cage with baffle plate.



3. Draw out axle shaft with Tool.

When drawing out axle shaft, be careful not to damage oil seal.





Remove oil seal with a screwdriver.

Do not reuse oil seal once it is removed. Always install new one.

5. Remove ABS sensor rotor.



MA

EM

LC

6. Unbend lock washer with a screwdriver.

Do not reuse lock washer once removed. Always install new



EC







Remove bearing lock nut with Tool.



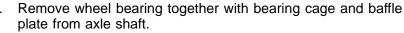
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ST













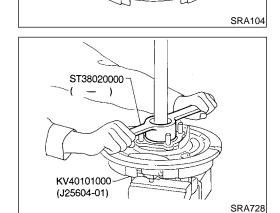


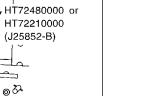




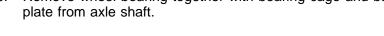


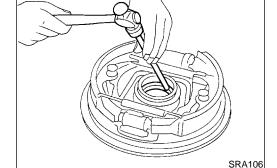






SRA729-B





0

- Remove grease seal with a screwdriver.
- 10. Remove wheel bearing assembly with a brass drift.

Inspection

AXLE SHAFT

NBAX0030

Check axle shaft for straightness, cracks, damage, wear and distortion. Replace if necessary.

BEARING CAGE

NRAYOO3OSO2

Check bearing cage for deformation and cracks. Replace if necessary.

REAR AXLE HOUSING

IDA VAASASAS

Check rear axle housing for yield, deformation and cracks. Replace if necessary.

Installation

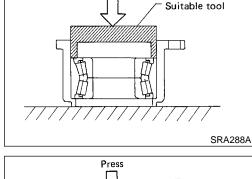
/D 4 \/0004

 Press new wheel bearing until it bottoms end face of bearing cage.

Maximum load P:

39 kN (4 ton, 4.4 US ton, 3.9 Imp ton)

Always press outer race of wheel bearing during installation.



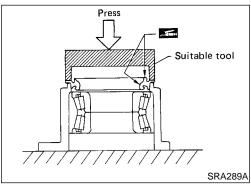
Press

2. Press new grease seal until it bottoms end face of bearing cage.

Maximum load P:

8,300 N (847 kg, 1,866 lb)

After installing new grease seal, coat sealing lip with multipurpose grease.

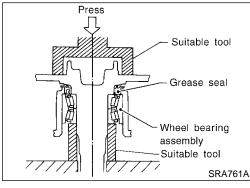


3. Press axle shaft into inner race of wheel bearing.

Maximum load P:

47.1 kN (4.8 ton, 5.3 US ton, 4.72 Imp ton)

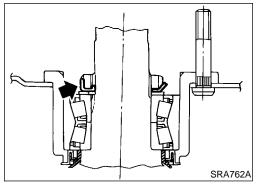
Be careful not to damage and deform grease seal.

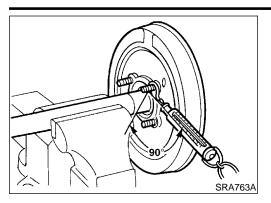


- 4. Install bearing washer and a new wheel bearing lock washer.
- 5. Tighten wheel bearing lock nut to specified torque.

(25 - 314 N·m (25 - 32 kg-m, 181 - 231 ft-lb)

Fit wheel bearing lock washer lip in wheel bearing lock nut groove correctly by tightening lock nut. Be sure to bend it up.





Suitable tool

SRA292A

SRA755A



Turn bearing cage (with respect to axle shaft) two or three times. It must turn smoothly.

Attach spring gauge to bearing cage bolt (as shown at left) and pull it at a speed of 10 rpm to measure preload.

Spring gauge indication:

6.7 - 47 N (0.68 - 4.79 kg, 1.51 - 10.57 lb)

EM

LC

MA

7. Install new oil seal to rear axle housing using a suitable tool.

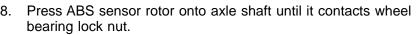
After installing new oil seal, coat sealing lip with multi-purpose grease.



FE

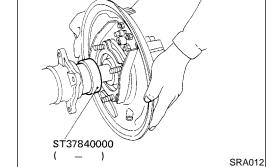
AT

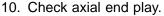
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PD

Position axle shafts in rear axle housing with Tool as a guide. Be careful not to damage oil seal.





Check that wheel bearings operate smoothly.

b. Check axial end play.

Axial end play: 0 mm (0 in)

ST

BT

HA

SC



WHEEL BEARING (REAR)

	NBAX0032	
Wheel bearing axial end play	0 mm (0 in)	EL
Wheel bearing lock nut tightening torque	245 - 314 N·m (25 - 32 kg-m, 181 - 231 ft-lb)	
Wheel bearing preload measured at bearing cage bolt	6.7 - 47 N (0.68 - 4.79 kg, 1.51 - 10.57 lb)	

NOTES