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FAX

SECTION **F**
FRONT AXLE

FAX

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PRECAUTIONS

PRECAUTIONS

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Caution

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- When installing rubber parts, final tightening must be carried out under unladen condition* with tires on ground.
- Oil will shorten the life of rubber bushes. Be sure to wipe off any spilled oil.
*: 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.

Observe the following precautions when disassembling and servicing drive shaft.

- Perform work in a location which is as dust-free and dirt-free as possible.
- Before disassembling and servicing, clean the outside of parts.
- Disassembly and service location must be taken to prevent the entry of foreign objects.
- Disassembled parts must be carefully reassembled in the correct order. If work is interrupted, a clean cover must be placed over parts.
- Paper shop cloths must be used. Fabric shop cloths must not be used because of the danger of lint adhering to parts.
- Disassembled parts (except for rubber parts) should be cleaned with kerosene which shall be removed by blowing with air or wiping with paper shop cloths.

PREPARATION

PREPARATION

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Special Service Tools

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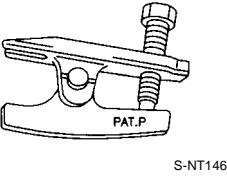
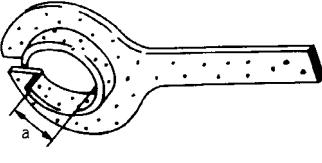
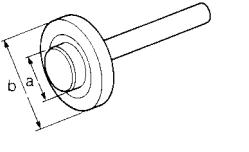
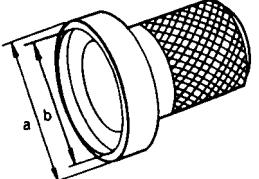
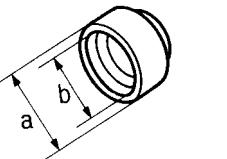
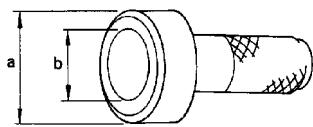
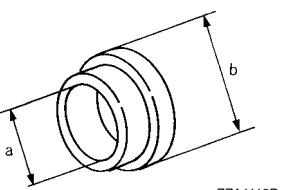
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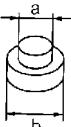
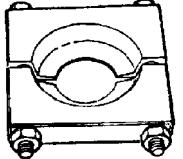
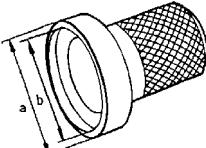
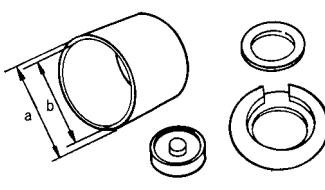
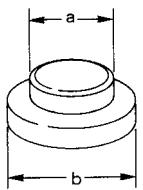
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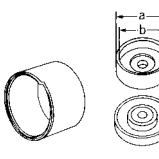
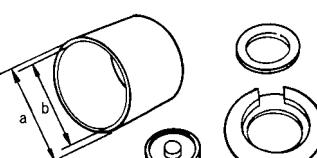
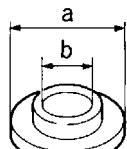
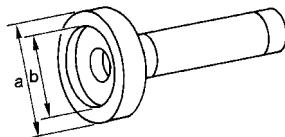
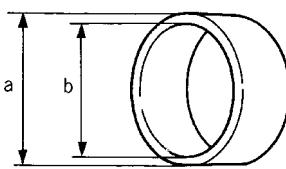
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Tool number Tool name	Description
HT7252000 Ball joint remover	 <p>Removing tie-rod outer end and lower ball joint</p>
KV38107800 Protector a: 29 mm (1.14 in) dia. KV38105500 Protector a: 40 mm (1.57 in) dia.	 <p>Installing the drive shaft</p>
ST17130000 Drift a: 32 mm (1.26 in) dia. b: 60 mm (1.57 in) dia.	 <p>Disassembling support bearings</p>
ST35271000 Drift a: 72 mm (2.83 in) dia. b: 63 mm (2.48 in) dia.	 <p>Assembling support bearings Installing wheel bearings</p>
ST33252000 Drift a: 82 mm (3.23 in) dia. b: 60 mm (2.36 in) dia.	 <p>Assembling support bearings</p>
KV38100500 Drift a: 80 mm (3.15 in) dia. b: 60 mm (2.36 in) dia.	 <p>Installing ABS sensor rotors</p>
KV40101840 Collar a: 67 mm (2.64 in) dia. b: 85 mm (3.35 in) dia.	 <p>Installing ABS sensor rotors</p>

PREPARATION

Tool number Tool name	Description
ST36230000 Sliding hammer	 ZZA0803D
KV40104100 Attachment	 ZZA0804D
ST33061000 Drift a: 28.5 mm (1.122 in) dia. b: 38.0 mm (1.496 in) dia.	 ZZA0969D
ST30031000 Bearing replacer	 ZZA0700D
ST35271000 Drift a: 72 mm (2.83 in) dia. b: 63 mm (2.48 in) dia.	 ZZA0814D
KV401053S0 Drift set KV40105310 Drift a: 89.1 mm (3.508 in) dia. b: 80.7 mm (3.177 in) dia. KV40105320 KV40105330	 ZZA0808D
ST35300000 Drift a: 45.1 mm (1.776 in) dia. b: 59 mm (2.32 in) dia.	 ZZA0881D

PREPARATION

Tool number Tool name	Description	
KV401052S0 Drift set KV40105210 KV40105220 Drift a: 75 mm (2.95 in) dia. b: 62 mm (2.44 in) dia. KV40105230	 ZZA1101D	Installing splash guards
KV401047S0 Drift set KV40104710 Drift a: 76.3 mm (3.004 in) dia. b: 67.9 mm (2.673 in) dia. KV40104720-1 KV40104720-2 KV40104730	 ZZA0808D	Installing wheel bearings and splash guards
ST30022000 Drift a: 110 mm (4.33 in) dia. b: 46 mm (1.81 in) dia.	 ZZA0920D	Installing splash guards
KV38100200 Drift a: 65 mm (2.65 in) dia. b: 49 mm (1.93 in) dia.	 ZZA1143D	Removing wheel bearings
KV40106200 Drift a: 114.3 mm (4.50 in) dia. b: 105.3 mm (4.15 in) dia.	 ZZA0936D	Removing wheel bearings, installing splash guards

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NOISE, VIBRATION, AND HARSHNESS (NVH) TROUBLESHOOTING

NOISE, VIBRATION, AND HARSHNESS (NVH) TROUBLESHOOTING

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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

Possible cause and SUSPECTED PARTS

Symptom	DRIVE SHAFT	Noise	×	×	Excessive joint angle	—	—	—	PROPELLER SHAFT	NVH in PR section.
		Shake	×		Joint sliding resistance	FAX-14	—	—	DIFFERENTIAL	NVH in RFD section.
FRONT AXLE	Noise			×	Imbalance	—	—	REAR AXLE AND REAR SUSPENSION	REAR AXLE	NVH in RAX and RSU sections.
	Shake			×	Improper installation, looseness	FAX-7 , FAX-11	—	TIRES	TIRES	Refer to FRONT AXLE in this chart.
	Vibration			×	Parts interference	—	—	ROAD WHEEL	ROAD WHEEL	NVH in WT section.
	Shimmy			×			—	DRIVE SHAFT	DRIVE SHAFT	Refer to DRIVE SHAFT in this chart.
	Judder			×			—	BRAKES	BRAKES	NVH in BR section.
	Poor quality ride or handling			×			—	STEERING	STEERING	NVH in PS section.

×: Applicable

FRONT WHEEL HUB AND KNUCKLE

FRONT WHEEL HUB AND KNUCKLE

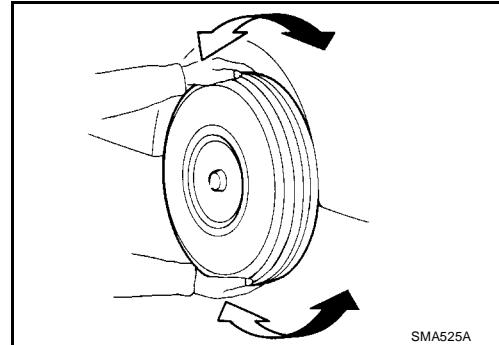
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On-Vehicle Inspection

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Inspect to check that there is no excessive play, cracking, wear, or other damage to front axle.

- Turn front wheels (left/right) and check the play.
- Check that no nails or other foreign objects are embedded.
- Retighten all axle nuts and bolts to the specified torque.



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FRONT WHEEL BEARINGS

With the vehicle raised, inspect the following.

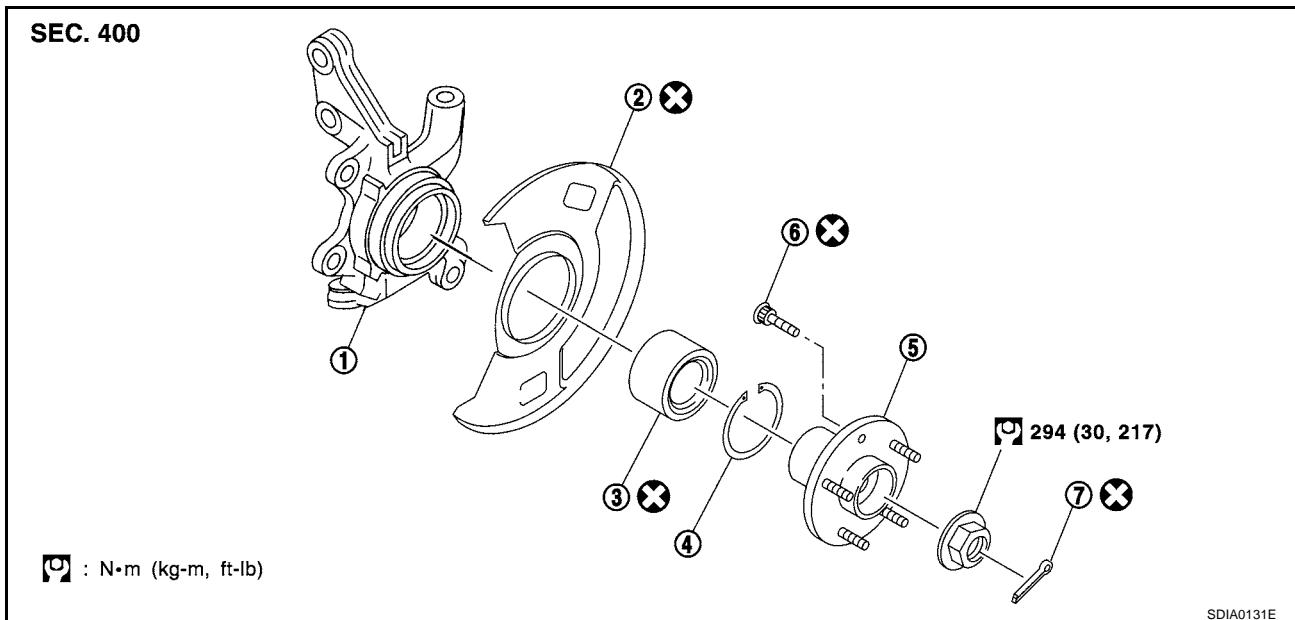
- Move wheel hub in the axial direction by hand. Check that there is no looseness of front wheel bearings.

Axial end play : 0.05 mm (0.002 in)

- Rotate wheel hub and check that there is no unusual noise or other irregular conditions. If there are any irregular conditions, replace the wheel bearing.

Removal and Installation

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1. Steering knuckle
2. Splash guard
3. Wheel bearing assembly
4. Snap ring
5. Wheel hub
6. Hub bolt
7. Cotter pin

REMOVAL

1. Remove tire. Remove brake hose lock plate from strut.
2. Remove brake caliper from steering knuckle. Hang it in a place where it will not interfere with work.

CAUTION:

Avoid depressing the brake pedal with brake caliper removed.

3. Remove ABS wheel speed sensor from steering knuckle.

CAUTION:

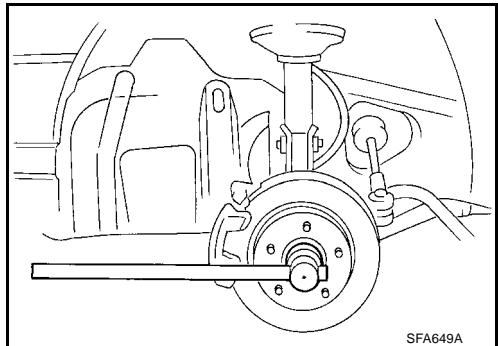
Do not pull on ABS wheel speed sensor harness.

FRONT WHEEL HUB AND KNUCKLE

4. Remove cotter pin. Use a hub lock nut wrench to remove lock nuts from drive shaft.
5. Remove disc rotor from wheel hub.
6. Remove cotter pin. Use a ball joint remover to remove tie rod from steering knuckle.

CAUTION:

When using a ball joint remover, install nuts temporarily.



7. Remove steering knuckle from strut.
8. Remove drive shaft from steering knuckle.
9. Remove cotter pin. Use a ball joint remover to remove transverse link from steering knuckle.

CAUTION:

When using a ball joint remover, install nuts temporarily.

INSTALLATION

For tightening torque and other information, refer to the component parts drawing. For installation, follow removal procedure in reverse order.

Disassembly and Assembly

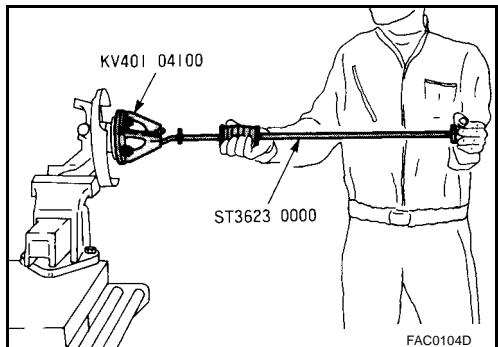
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DISASSEMBLY

1. Set steering knuckle on bench vise at point where strut is attached. Use a sliding hammer and attachment to remove wheel hub from steering knuckle.

CAUTION:

When placing onto bench vise, be careful not to damage strut mounting surface of steering knuckle. Use an aluminum plate or another suitable tool.

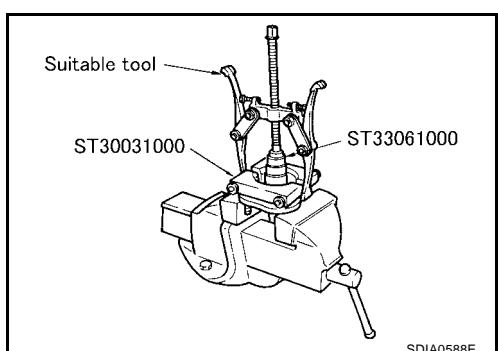


2. As shown in the figure, use a puller, drift, and bearing replacer to remove inner race of outer wheel bearing from wheel hub.
3. Use a flat bladed screwdriver or similar tool to remove snap ring.

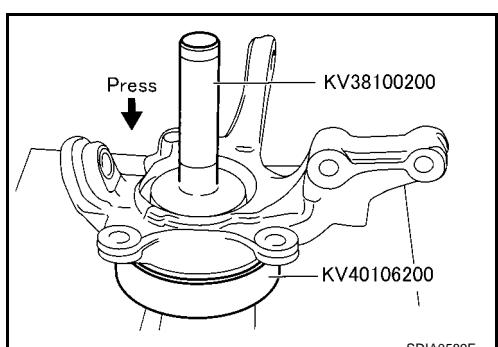
CAUTION:

Be careful not to scratch the steering knuckle.

4. Fix steering knuckle to bench vise. Use a flat bladed screwdriver and hammer to remove splash guard from steering knuckle.



5. Use a drift and a press to remove wheel bearings.



FRONT WHEEL HUB AND KNUCKLE

INSPECTION AFTER DISASSEMBLY

Wheel Hub

- Check wheel bearings for damage, seizure, and corrosion. Also check wheel hubs for cracks (using a die test or other method). Replace if any irregular conditions are found.

Steering Knuckle

- Check steering knuckle for deformation, cracks, and other damage. Replace if any irregular conditions are found.

Snap Ring

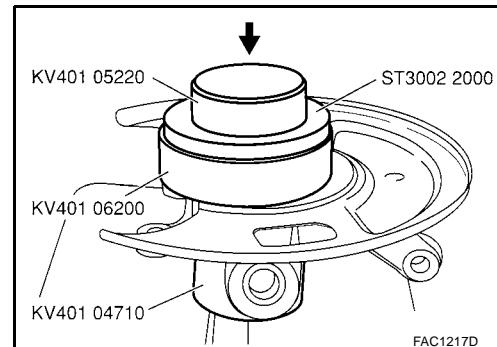
- Check snap ring for wear or other damage. Replace if any irregular conditions are found.

ASSEMBLY

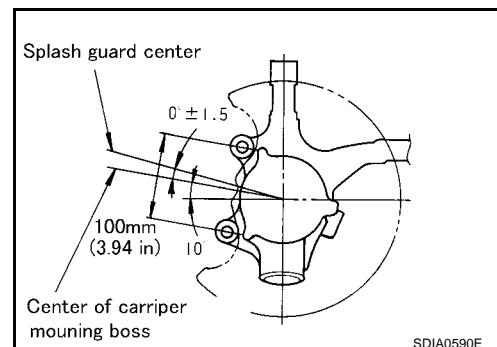
- Use a drift to install splash guard onto steering knuckle.

CAUTION:

Discard the old splash guard; replace with a new one.



- Install splash guard in position shown in the figure.

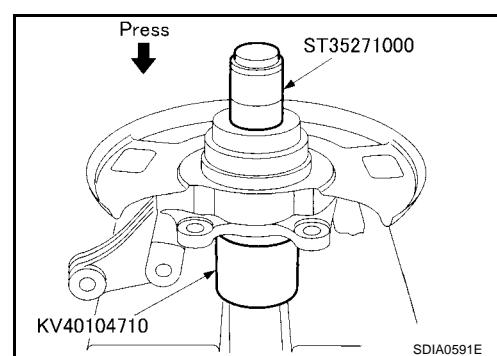


- Use a drift and a press to press-fit wheel bearing onto steering knuckle.

CAUTION:

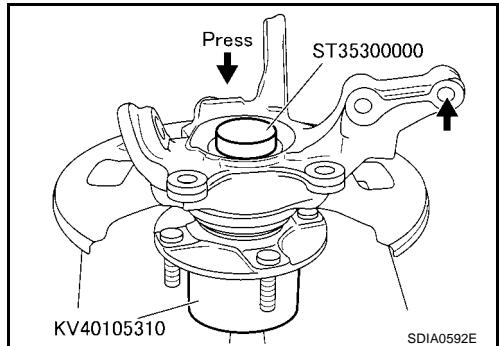
Discard the old wheel bearing; replace with a new one.

- Install snap ring onto steering knuckle.



FRONT WHEEL HUB AND KNUCKLE

4. Use a drift and a press to install wheel hub.
5. As shown in the figure, apply a load of 49,030 N (5,000 kg, 11,025 lb). Rotate in forward and reverse directions 10 times each to ensure a good fit.



6. At a rotation speed of 8 - 12 rpm, place a spring balance at the point where strut is joined (upper-side bolt hole). Measure rotation torque. Refer to [FAX-17, "Wheel Bearing"](#).

Rotation torque : 1.645 N·m (0.168 kg·m, 15 in-lb) or less

Spring balance reading : 10.6 N (1.1 kg, 2.4 lb) or less

NOTE:

If a load of 49,030 N (5,000 kg, 11,025 lb) cannot be applied, carry out the following actions.

- Assemble drive shaft and tighten wheel hub lock nuts to specified torque. Then rotate in forward and reverse direction 10 times each to ensure a good fit.
- At a rotation speed of 8 - 12 rpm, place a spring balance on hub bolt to measure torque.

Rotation torque : 2.125 N·m (0.217 kg·m, 19 in-lb) or less

Spring balance reading : 37.2 N (3.8 kg, 8.4 lb) or less

FRONT DRIVE SHAFT

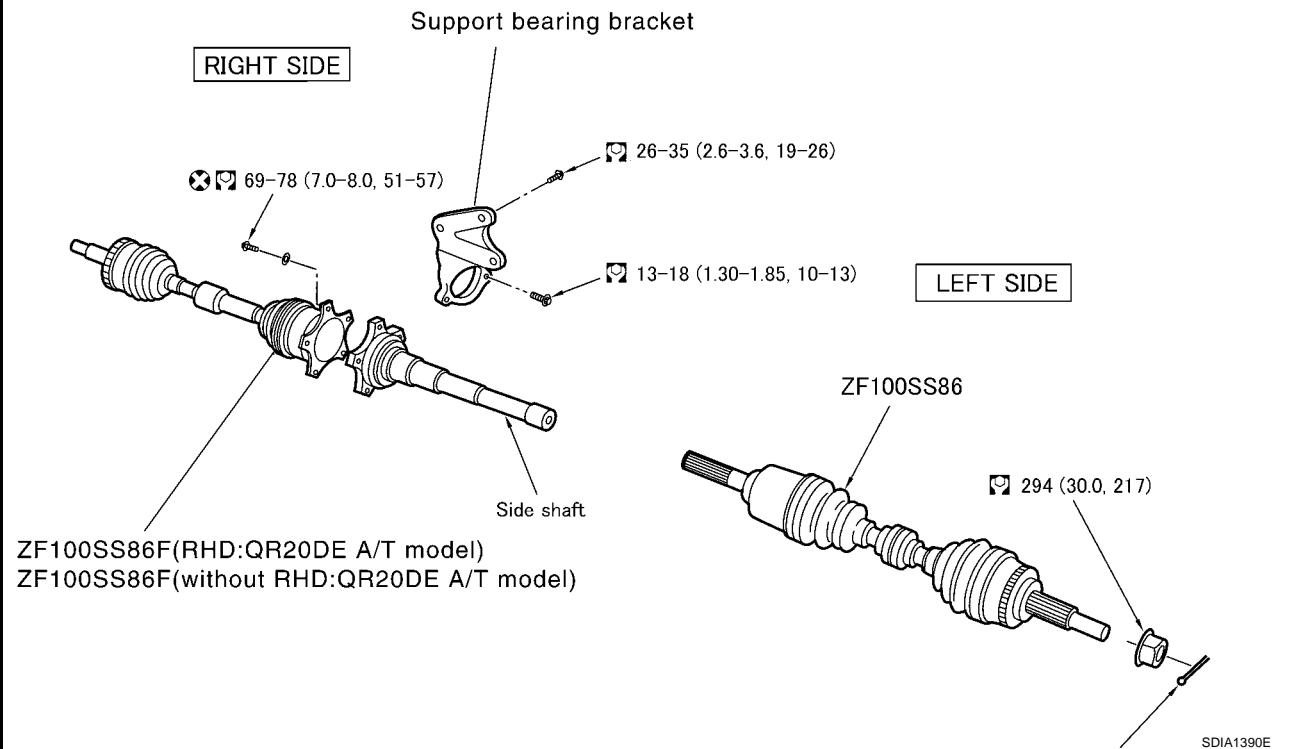
FRONT DRIVE SHAFT

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Removal and Installation

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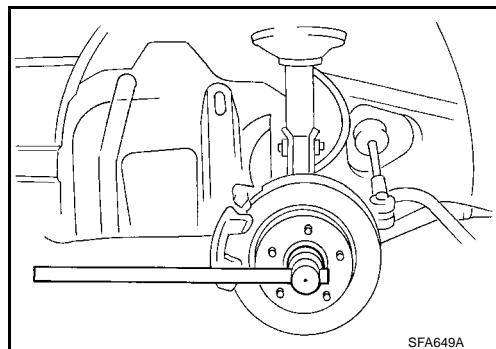


REMOVAL

1. Remove cotter pin. Use a hub lock nut wrench to remove lock nuts.
2. Remove ABS wheel speed sensor from steering knuckle.
3. Use a pitman arm puller to remove tie rod from steering knuckle.
4. Remove lock plate from strut. Disconnect brake hose from strut.
5. Remove steering knuckle and strut installation bolt.

CAUTION:

Do not apply an excessive angle (22° or more) to drive shaft joint. Firmly support steering knuckle so that slide joint is not excessively extended.

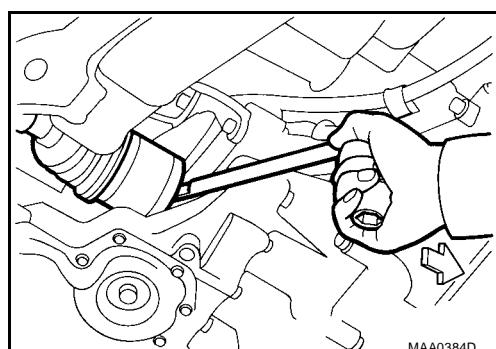


6. Use a puller to remove drive shaft from steering knuckle.

7. As shown in the figure, use a wheel wrench or other tool to remove drive shaft from transaxle.

CAUTION:

- When removing drive shaft from vehicle, be careful to avoid interfering with brake hose, ABS wheel speed sensor harness, and other parts.
- When removing drive shaft, do not apply an excessive angle (22° or more) to drive shaft joint. Also be careful not to excessively extend slide joint.
- Do not lift drive shaft, with axle attached, by grasping counter shaft only.
- Do not allow drive shaft, with transaxle inserted, to hang down without support for counter shaft, wheel joints, and other parts.



FRONT DRIVE SHAFT

- When the drive shafts listed below have been removed, check that a circular clip is attached to the end.

Engine type	Drive shaft with circular clip	
	Right	Left
QR20DE and QR25DE	–	×
YD22DDTi	–	×

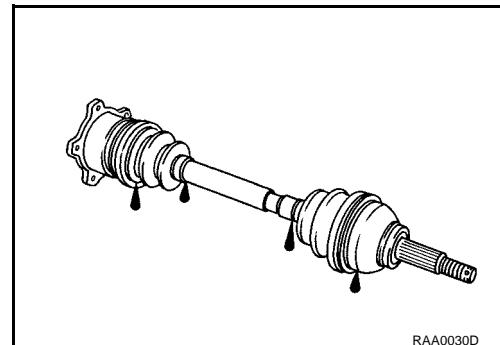
×: Applicable

–: Not applicable

- Remove installation bolt from right-side drive shaft support bearing bracket. Then remove bracket from engine.
- Remove installation bolt from right-side drive shaft and remove drive shaft from side shaft.

INSPECTION AFTER REMOVAL

- Move joint in up/down, left/right, and axial directions. Check for motion that is not smooth and for significant looseness.
- Check for cracking and damage of boots, and for grease leakage.



INSTALLATION

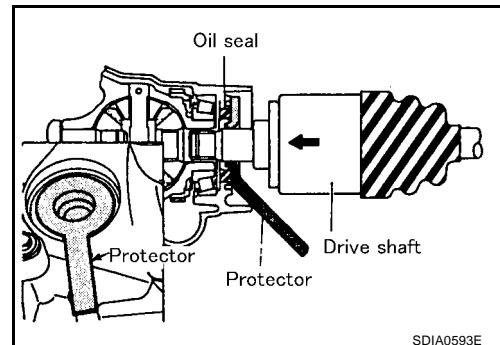
- Install support bearing bracket onto engine and tighten installation bolts to specified torque.
- Install drive shaft to side shaft and tighten installation bolts to specified torque.

- In order to prevent damage to differential side oil seal, first fit a protector onto oil seal before inserting drive shaft. Slide drive shaft slide joint and tap with a hammer to install securely.

CAUTION:

Be sure to check that circular clip is securely fastened.

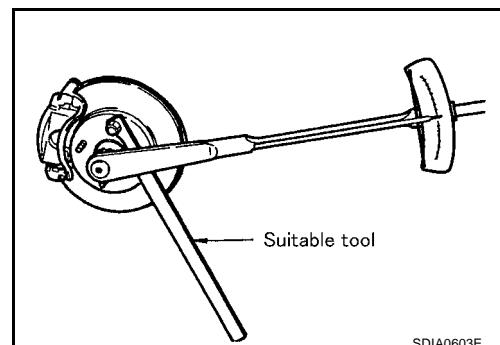
Model type	Protector SST No.
RH	KV38107800
LH	KV38105500



- Insert drive shaft into steering knuckle. Install lock nut and then temporarily tighten lock nuts.
- Install installation bolt for steering knuckle and strut.
- Use lock plate to fix brake hose to strut.
- Install tie rod to steering knuckle.
- Install ABS wheel speed sensor.
- Tighten lock nuts to specified torque.
- Install cotter pin.

CAUTION:

Discard the old cotter pin; replace with a new one.

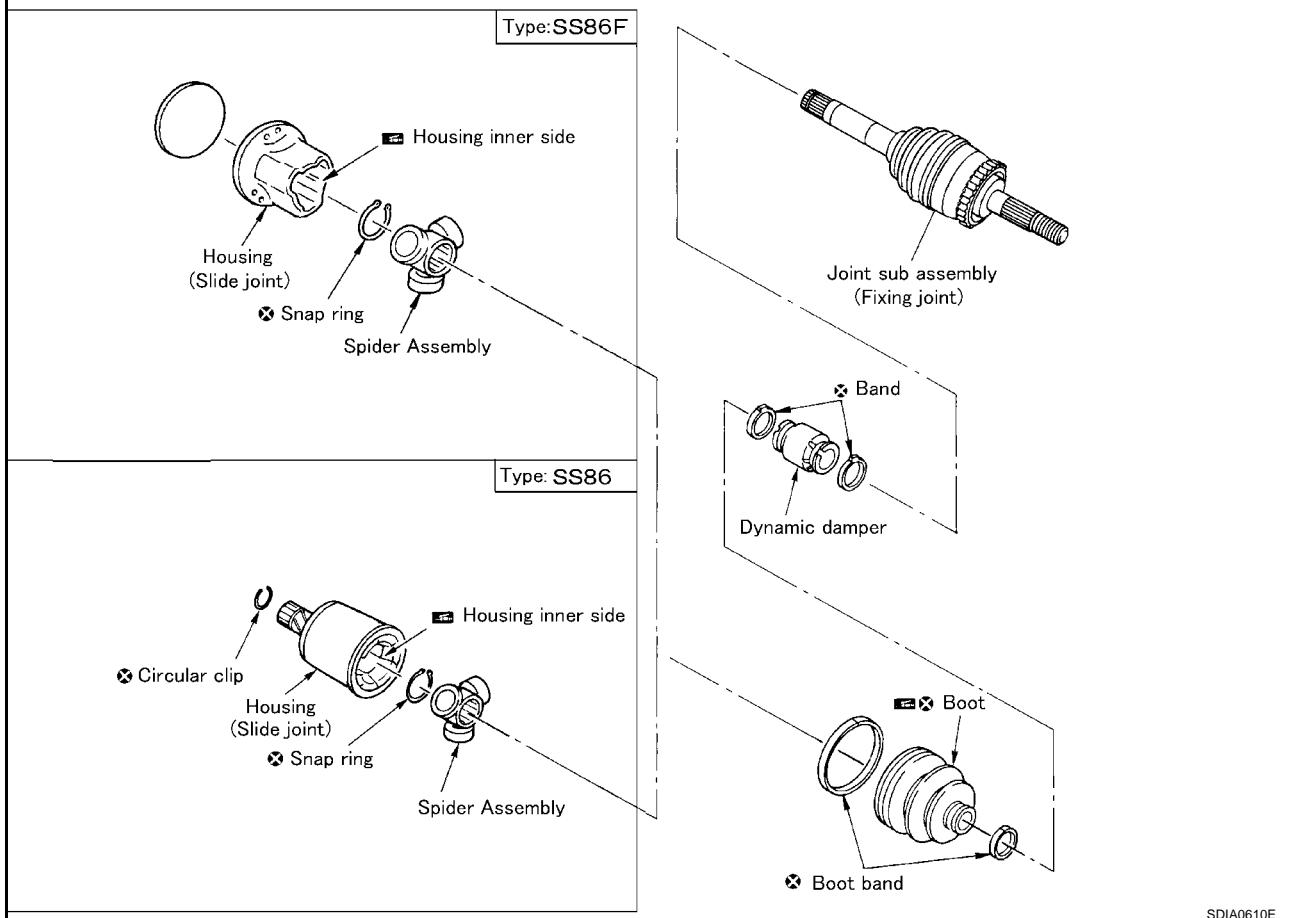


FRONT DRIVE SHAFT

Disassembly and Assembly

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DISASSEMBLY

Transaxle Side

1. Remove boot band.
2. Fix shaft to bench vise.

CAUTION:

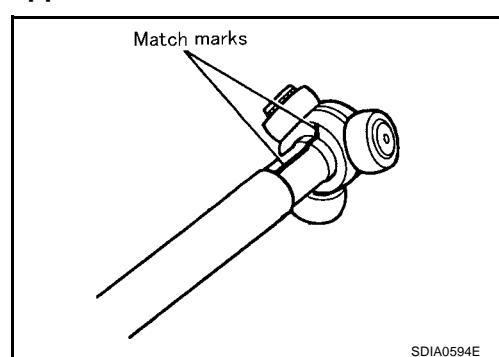
When fixing shaft to bench vise, be sure to protect it with a copper or aluminum sheet.

3. Put match marks on shaft and spider assembly.

CAUTION:

Use paint or similar substance for alignment marks. Do not scratch the surface.

4. Remove snap ring. Remove spider assembly from shaft.
5. Remove boot from shaft.
6. Remove dynamic damper from shaft.



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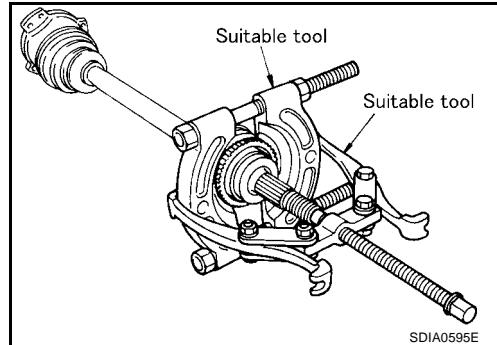
FRONT DRIVE SHAFT

Wheel Side

- As shown in the figure, use a bearing replacer and puller to remove sensor rotor from drive shaft.

CAUTION:

Aside from sensor rotor, this part cannot be disassembled.
Do not attempt to disassemble it.



INSPECTION AFTER DISASSEMBLY

Shaft

- Replace shaft if there is any runout, cracking or damage.

Boot and Boot Band

- Replace boot if there are any cracks.

CAUTION:

For the wheel side, boot must be replaced together with drive shaft assembly.

- Once removed, boot bands must be replaced with new ones

Joint Sub-Assembly (Fixed Joint)

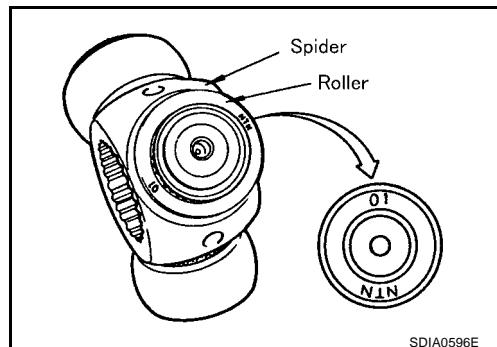
CAUTION:

Joint sub-assembly cannot be disassembled. Do not attempt to disassemble it.

Joint Assembly (Transaxle Side)

S-type sliding joints

- If there is scratching or wear of housing roller contact surface or spider roller contact surface, replace housing and spider assembly.
- If there is circumferential looseness or rough rotation of spider roller, replace spider assembly.
- If there are any irregular conditions of joint assembly component parts, replace the joint assembly.
- For housing replacement, spider assembly and joint assembly are a set.
- As shown in the figure, the spider roller has a stamped number which corresponds to a part number. Select a suitable replacement part with the same stamp number from the table below.



Stamped No.	Part No.	Model
0	39720 8H300	SS86, SS86F, SS86F+B
1	39720 8H301	
2	39720 8H302	

Joint Assembly (Wheel Side)

CAUTION:

Joint assembly cannot be disassembled. Do not attempt to disassemble it.

FRONT DRIVE SHAFT

ASSEMBLY

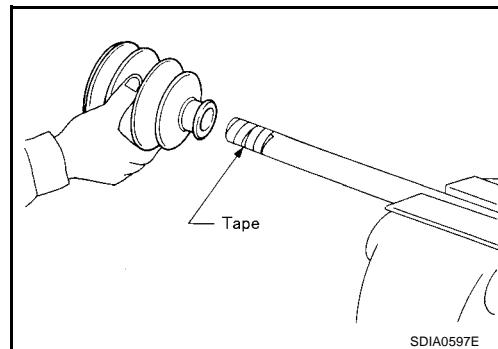
Transaxle Side

1. Wind serrated part of drive shaft with tape. Install boot band and boot to shaft. Be careful not to damage boot.

CAUTION:

Discard the old boot band and boot: replace with new ones.

2. Remove protective tape wound around serrated part of shaft.



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3. Line up alignment marks which were made when spider assembly was removed. Install spider assembly, with serration chamfer facing drive shaft.

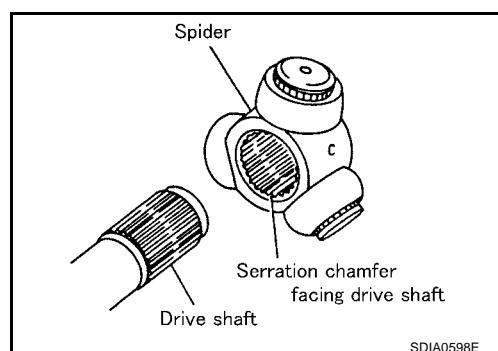
4. Secure spider assembly with snap ring.

CAUTION:

Discard the old snap ring: replace with new ones.

5. Apply Nissan genuine grease or equivalent to spider assembly and sliding surface.

6. Install sliding joint housing to spider assembly. Add remaining grease up to the amount listed below.



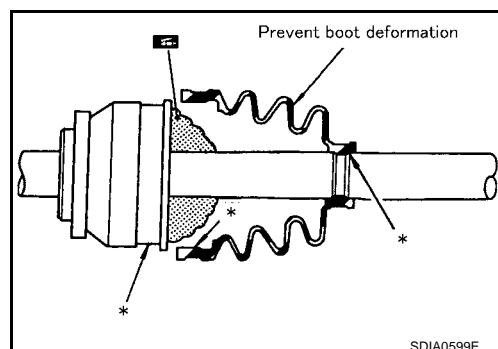
E
F
G
H

Grease amount : 133 - 143 g (4.69 - 5.04 oz)

7. Install boot securely into grooves (indicated by * marks) shown in the figure.

CAUTION:

If there is grease on boot mounting surfaces (indicated by * marks) of joint, boot may come off. Remove all grease from surfaces.



I
J
K
L

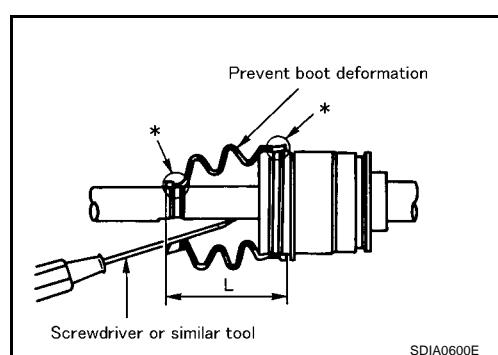
8. Check that boot installation length "L" is the length indicated below. Insert flat bladed screwdriver or similar tool into smaller side of boot. Remove air from boot to prevent boot deformation.

Boot installation length:

84 - 86 mm (3.31 - 3.39 in)

CAUTION:

- Boot may break if boot installation length is less than standard value.
- Be careful that screwdriver tip does not contact inside surface of boot.



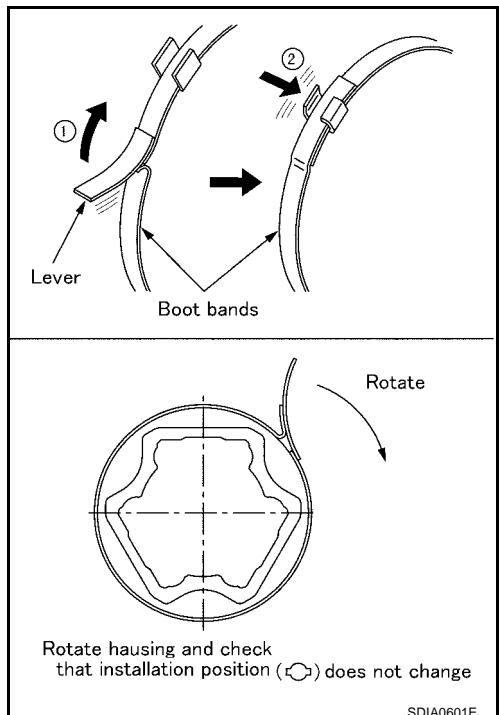
M

FRONT DRIVE SHAFT

9. Secure big and small ends of boot with new boot bands as shown in figure.

CAUTION:

Rotate housing and check that boot installation position does not change. If position changes, reinstall boot bands.



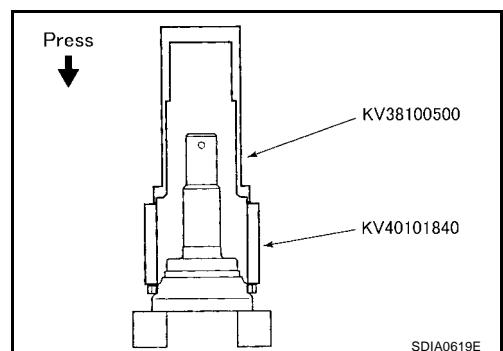
SDIA0601E

Wheel Side

1. Use a drift to press-fit sensor rotor into joint sub-assembly.

CAUTION:

- Discard the old sensor rotor; replace with a new one.
- Joint assembly cannot be disassembled. Do not attempt to disassemble it.



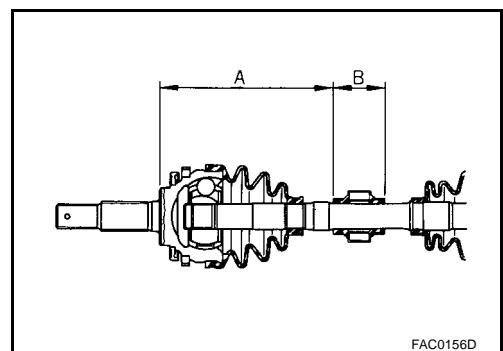
SDIA0619E

Dynamic Damper

- When dynamic damper has been removed, secure with bands as shown in the figure so that measurements from fixed-joint side are as listed below.

CAUTION:

Discard the old dynamic damper: replace with a new one.



FAC0156D

Mounting Dimensions

Drive shaft model	Applied model	Specification	Dimension A	Dimension B		
ZF100SS86	All	Left	207 - 213 mm (0.15 - 0.39 in)	70 mm (2.76 in)		
ZF100SS86F	RHD: QR20E A/T models		267 -273 mm (10.51 - 10.75 in)	68 mm (2.68 in)		
ZF100SS86F+B	LHD: QR20DE A/T models	Right	207 - 213 mm (0.15 - 0.39 in)	70 mm (2.76 in)		
	RHD: QR25DE A/T models			50 mm (1.97 in)		
QR25DE: M/T models						
QR20DE/YD22DDTi: M/T models						

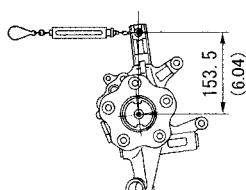
SERVICE DATA AND SPECIFICATIONS (SDS)

SERVICE DATA AND SPECIFICATIONS (SDS)

PFP:00030

Wheel Bearing

EDS000IG

Drive type	4WD
Rotation torque	1.645 N·m (0.168 kg·m, 15 in·lb) or less
Spring balance reading	10.6 N (1.1 kg, 2.4 lb) or less
Installation location of spring scale	 SDIA0148E
Axial end play	0.05 mm (0.0020 in) or less

Drive Shaft

ZF100SS86, ZF100SS86F, ZF100SS86F+B

EDS000IH

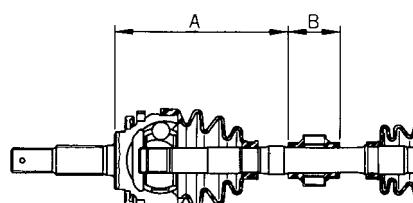
Joint type	Transaxle side and transfer side	SS86, SS86F, SS86F+B
Grease amount		133 - 143 g (4.69 - 5.04 oz)
Boot length		84 - 86 mm (3.31 - 3.39 in)
Transaxle-side and transfer-side spider assemblies	Stamped No.	Part No.
	0	39720 8H300
	1	39720 8H301
	2	39720 8H302

Wheel side ZF100 type joint assembly cannot be disassembly 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

EDS000II

Drive shaft model	Applied model	Specification	Dimension A	Dimension B
ZF100SS86	ALL	Left	207 - 213 mm (8.15 - 8.39 in)	70 mm (2.76 in)
ZF100SS86F	RHD: QR20DE A/T models	Right	267 - 273 mm (10.51 - 10.75 in)	68 mm (2.68 in)
ZF100SS86F+B	LHD: QR20DE A/T models RHD: QR25DE A/T models QR25DE: M/T models		267 - 273 mm (10.51 - 10.75 in)	70 mm (2.76 in)
	QR20DE/YD22DDTi M/T models			50 mm (1.97 in)



FAC0156D

SERVICE DATA AND SPECIFICATIONS (SDS)
