VELOSTER(FS) > 2013 > G 1.6 T-GDI > Driveshaft and axle

Driveshaft and axle > General Information > Specifications

Specification

Engine	TM	Joint type		Max. permissible angle	
		Outer	Inner	Outer	Inner
Gamma 1.6 GDI	6 MT	BJ#22	TJi#22	46.5°	23°
	6 DCT	BJ#24	TJi#22		
Gamma 1.6 T-GDI	6 MT	BJ#23	TJi#23		
	6 A/T	BJ#24	TJi#24		

Tightening torque

Item		N.m	kgf.m	lb-ft
Front	Wheel Hub nuts	88.2 ~ 107.8	9.0 ~ 11.0	65.0 ~ 79.5
	Driveshaft caulking nut	196.1 ~ 274.5	20.0 ~28.0	144.6 ~ 202.5
	Strut assembly to knuckle	137.3 ~ 156.9	14.0 ~ 16.0	101.3 ~ 115.7
	Lower arm to knuckle	78.5 ~ 88.3	8.0 ~ 9.0	57.9 ~ 65.1
	Tie rod end castle nut	23.5 ~ 33.3	2.4 ~ 3.4	19.4 ~ 24.5
	Front caliper to knuckle	78.4 ~ 98.0	8.0 ~ 10.0	57.8 ~ 72.3
	Disc fixing screw	4.9 ~ 5.8	0.5 ~ 0.6	3.6 ~ 4.3
	Wheel speed sensor & bracket	7.8 ~ 11.8	0.8 ~ 1.2	5.8 ~ 8.7
Rear	Wheel Hub nuts	88.2 ~ 107.8	9.0 ~ 11.0	65.0 ~ 79.5
	Rear caliper mounting bolt	63.7 ~ 73.5	6.5 ~ 7.5	47.0 ~ 54.2
	Rear axle to torsion beam axle	49.0 ~ 58.8	5.0 ~ 6.0	36.1 ~ 43.3
	Disc fixing screw	4.9 ~ 5.8	0.5 ~ 0.6	3.6 ~ 4.3
	Wheel speed sensor & bracket	4.9 ~ 5.9	0.7 ~ 1.1	5.1 ~ 8.0

CAUTION

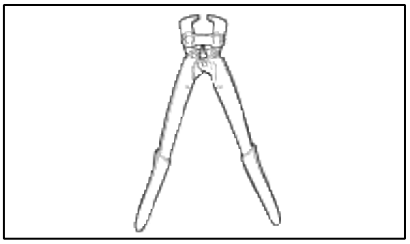
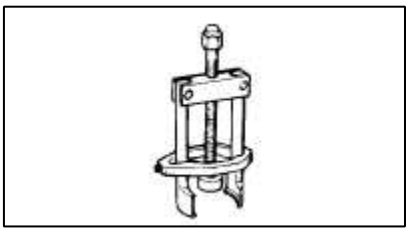
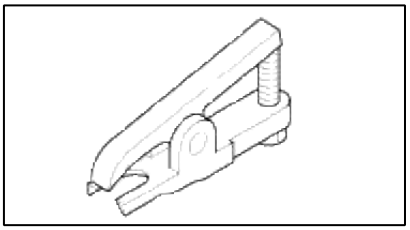
Replace self-locking nuts with new ones after removal.

Lubricants

Engine	Joint type	Lubricants	Quantity
Gamma 1.6 GDI (MT)	BJ#22	RBA	90g
	TJ#22	CW09-VX21	135g
Gamma 1.6 GDI (DCT)	BJ#22	RBA	90g
	TJi#22	CW09-VX21	135g
Gamma 1.6 T-GDI (MT)	BJ#23	RBA	90g
	TJi#23	CW09-VX21	140g
Gamma 1.6 T-GDI (AT)	BJ#24	RBA	100g
	TJi#24	CW09-VX21	145g

Driveshaft and axle > General Information > Special Service Tools

Special Service Tools

Tool(Number and Name)	Illustration	Use
09495-3K000 Band installer		Installation of ear type boot band
09495-33000 Puller		Remove the spider assembly from the drive shaft
09568-34000 Ball joint puller		Remove the ball joint front axle

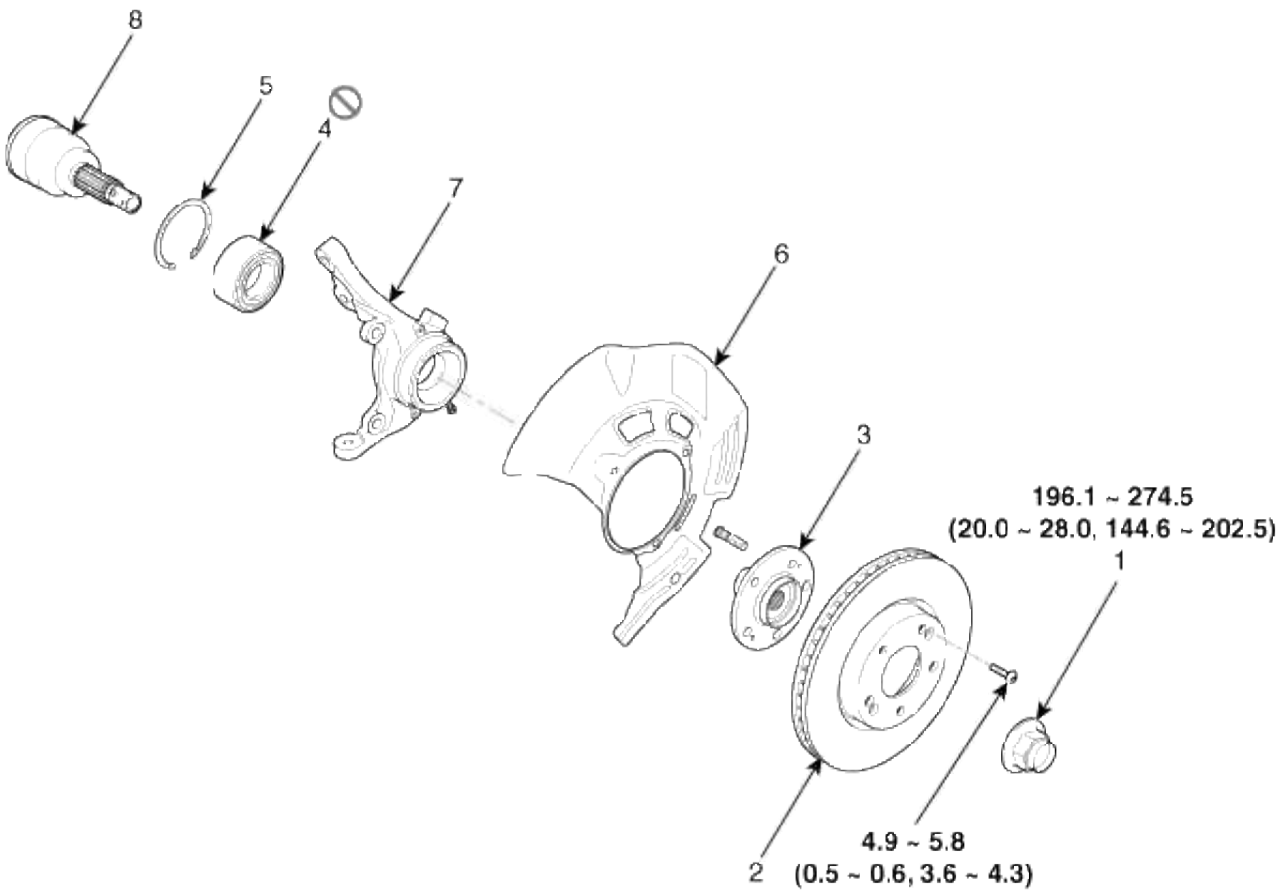
Driveshaft and axle > General Information > Troubleshooting

Troubleshooting

Trouble Symptom	Probable cause	Remedy
Vehicle pulls to one side	Scoring of driveshaft ball joint	Replace
	Wear, rattle or scoring of wheel bearing	Replace
	Defective front suspension and steering	Adjustment or Replace
Vibartion	Wear, damage or bending of driveshaft	Replace
	Driveshaft rattle and hub serration	Replace
	Wear, rattle or scratching of wheel bearing	Replace
Shimmy	Defective wheel balance	Adjustment or Replace
	Defective front suspension and steering	Adjustment or Replace
Excessive noise	Wear, damage or bending of driveshaft	Replace
	Rattle of driveshaft and worn hub splines	Replace
	Wear, rattle or scoring of wheel bearing	Replace
	Loose hub nut	Adjustment or Replace
	Defective front suspension and steering	Adjustment or Replace

Driveshaft and axle > Front Axle Assembly > Front Hub / Knuckle > Components and Components Location

Components



Torque: N.m (kgf.m, lb-ft)

1. Drive shaft caulking nut 2. Brake disc 3. Hub 4. Wheel bearing	6. Snap ring 7. Dust cover 8. Knuckle 9. Drive shaft

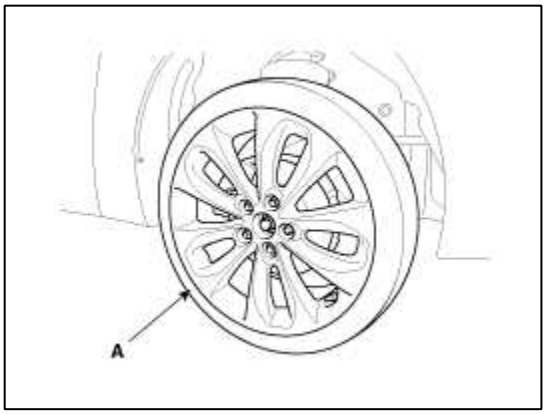
Driveshaft and axle > Front Axle Assembly > Front Hub / Knuckle > Repair procedures

Replacement

1. Loosen the wheel nuts slightly.
   Raise the vehicle, and make sure it is securely supported.

2. Remove the front wheel and tire (A) from front hub .

Tightening torque:
88.2 ~ 107.8 N.m (9.0 ~ 11.0 kgf.m, 65.0 ~ 79.5 lb-ft)

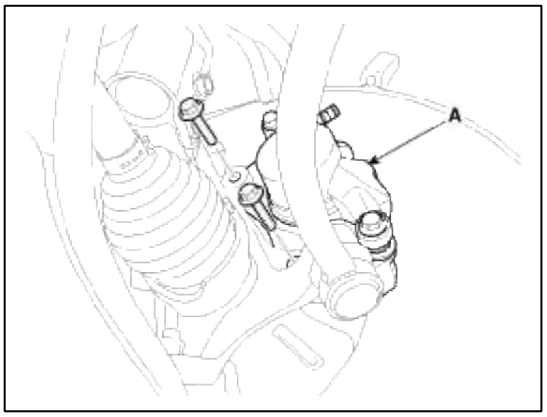


CAUTION

Be careful not to damage to the hub bolts when removing the front wheel and tire (A).

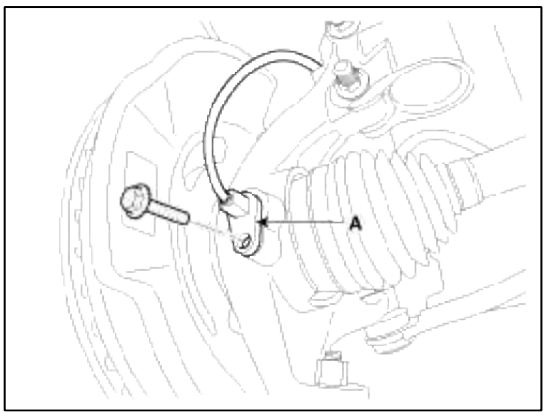
3. Remove the brake caliper mounting bolts , and then hold the brake caliper assembly (A) with wire.

Tightening torque:
78.4 ~ 98.0 N.m (8.0 ~ 10.0 kgf.m, 57.8 ~ 72.3 lb-ft)



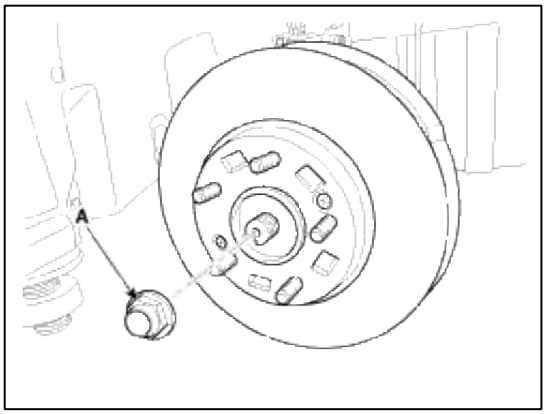
4. Remove the wheel speed sensor (A).

Tightening torque:
7.8 ~ 11.8 N.m (0.8 ~ 1.2 kgf.m, 5.8 ~ 8.7 lb-ft)



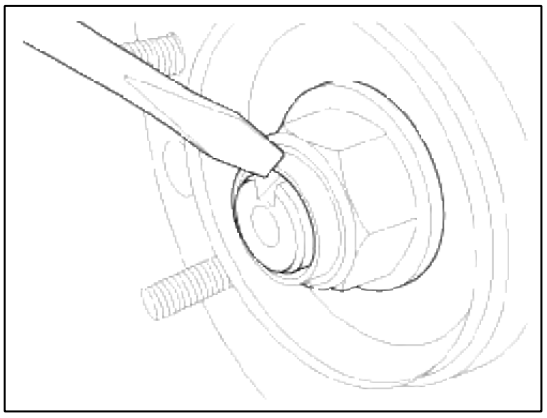
5. Remove driveshaft caulking nut (A) from the front hub under applying the brake.

Tightening torque:
196.1 ~ 274.5 N.m (20.0 ~ 28.0 kgf.m, 144.6 ~ 202.5 lb-ft)



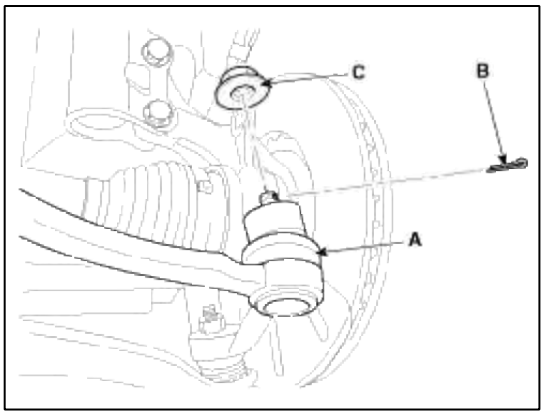
CAUTION

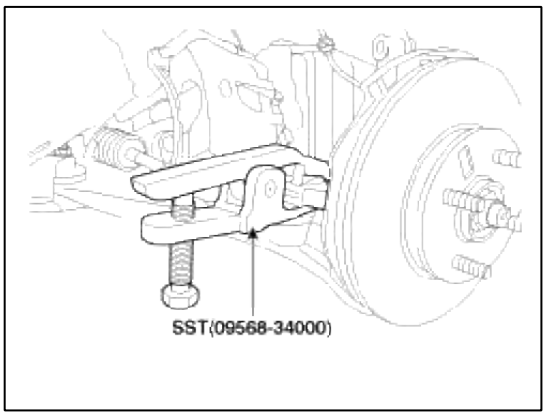
- The driveshaft lock nut should be replaced with new ones.
- After installation driveshaft lock nut, stake the lock nut using a chisel and hammer as shown in the illustration below.



6. Remove the tie rod end ball joint (A) from the knuckle.
   (1) Remove the split pin (B).
   (2) Remove the castle nut (C).
   (3) Use the SST (09568-3400)

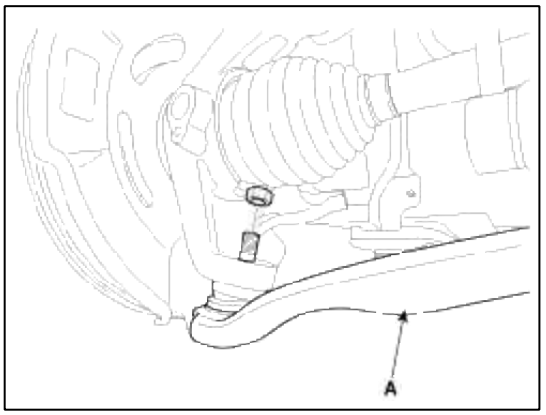
Tightening torque:
23.5 ~ 33.3 N.m (2.4 ~ 3.4 kgf.m, 19.4 ~ 24.5 lb-ft)



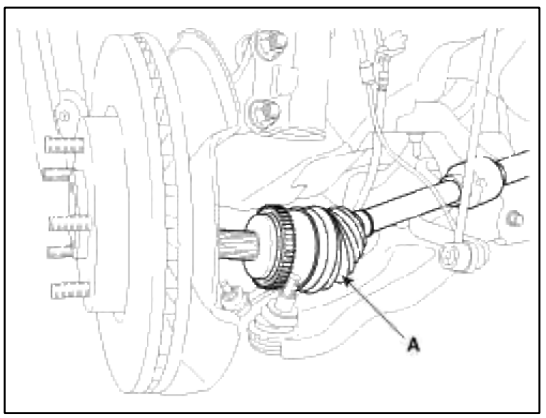


7. Remove the lower arm (A) from the knuckle by using SST (09568-34000)

Tightening torque:
98.5 ~ 88.3 N.m (8.0 ~ 9.0 kgf.m, 57.9 ~ 65.1 lb-ft)

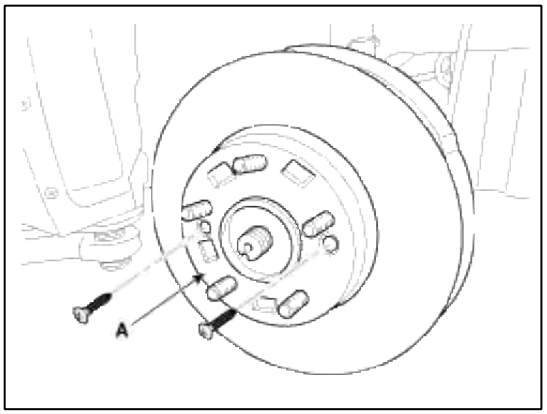


8. Disconnect the driveshaft (A) from the front hub assembly.



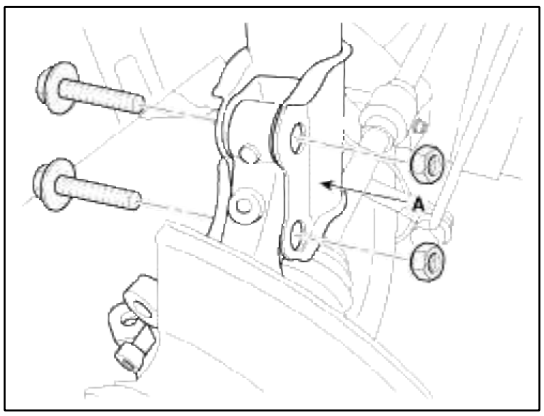
9. Remove the disc (A) by loosening the screw.

Tightening torque:
4.9 ~ 5.8 N.m (0.5 ~ 0.6 kgf.m, 3.6 ~ 4.3 lb-ft)



10. Loosen the strut mounting bolts and then remove the knuckle assembly (A).

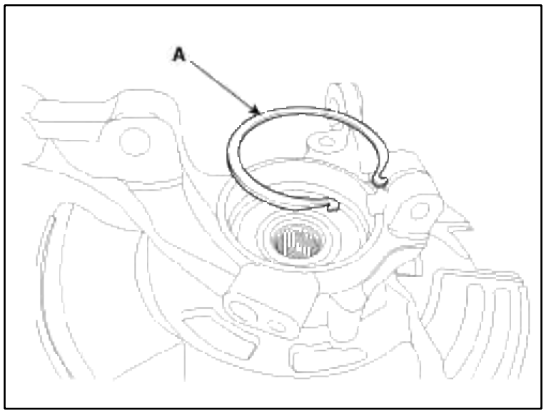
Tightening torque:
137.3 ~ 156.9 N.m (14.0 ~ 16.0 kgf.m, 101.3 ~ 115.7 lb-ft)



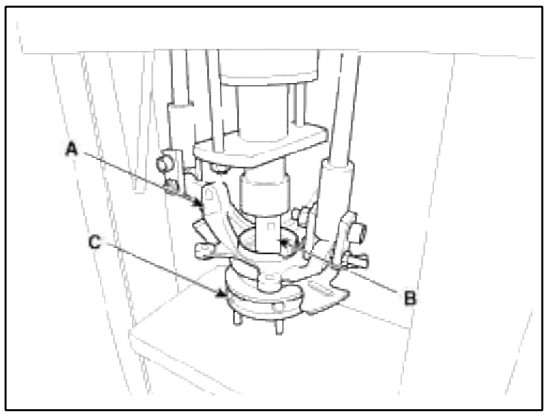
11. Install in the reverse order of removal.

Disassembly

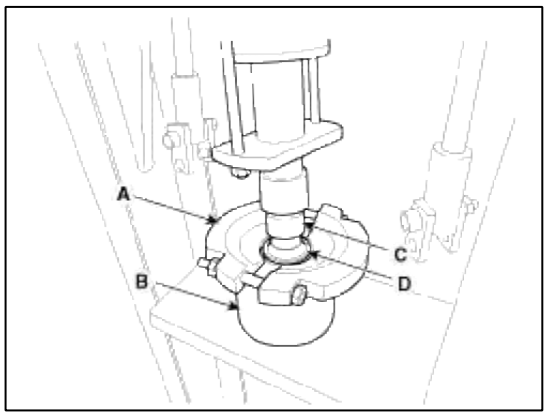
1. Remove the snap ring (A).



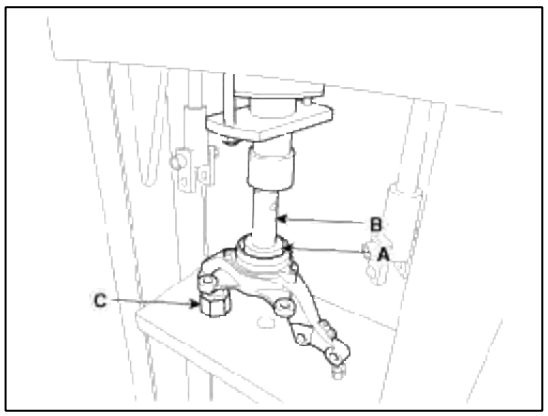
2. Remove the hub assembly from the knuckle assembly.
   (1) Install the front knuckle assembly (A) on press.
   (2) Lay a suitable adapter (B) upon the hub assembly shaft.
   (3) Remove the hub assembly (C) from the knuckle assembly (A) by using press.



3. Remove the hub bearing inner race from the hub assembly.
   (1) Install a suitable tool (A) for removing the hub bearing inner race on the hub assembly.
   (2) Lay the hub assembly and tool (A) upon a suitable adapter (B).
   (3) Lay a suitable adapter (C) upon the hub assembly shaft.
   (4) Remove the hub bearing inner race (D) from the hub assembly by using press.



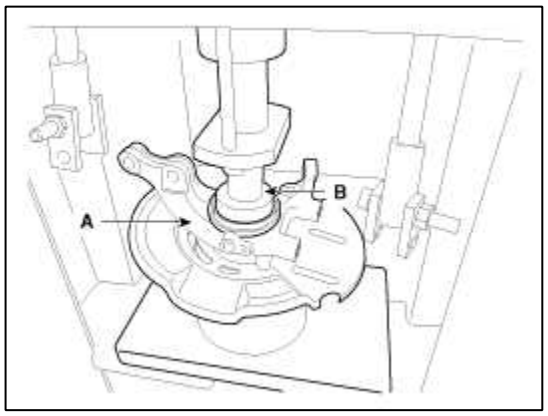
4. Remove the hub bearing outer race from the knuckle assembly.
   (1) Lay the hub assembly (A) upon a suitable adapter (B).
   (2) Lay a suitable adapter (C) upon the hub bearing outer race.
   (3) Remove the hub bearing outer race from the knuckle assembly by using press.



5. Replace hub bearing with a new one.

Reassembly

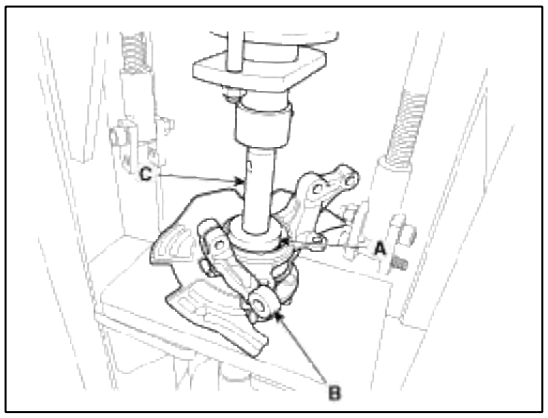
1. Install the hub bearing to the knuckle assembly.
   (1) Lay the knuckle assembly (A) on press.
   (2) Lay a new hub bearing upon the knuckle assembly (A).
   (3) Lay a suitable adapter (B) upon the hub bearing.
   (4) Install the hub bearing to the knuckle assembly by using press.



CAUTION

- Do not press against the inner race of the hub bearing because that can cause damage to the bearing assembly.
- Always use a new wheel bearing assembly.

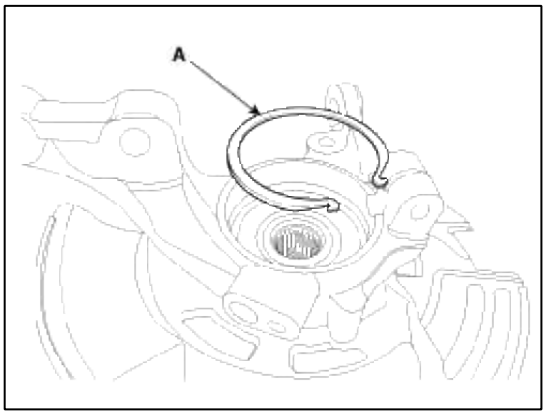
2. Install the hub assembly to the knuckle assembly.
   (1) Lay the hub assembly (A) upon a suitable adapter (C).
   (2) Lay the knuckle assembly (B) upon the hub assembly (A).
   (3) Lay a suitable adapter (C) upon the hub bearing.
   (4) Install the hub assembly (A) to the knuckle assembly (B) by using press.



CAUTION

Do not press against the inner race of the hub bearing because that can cause damage to the bearing assembly.

3. Install the snap ring (A).

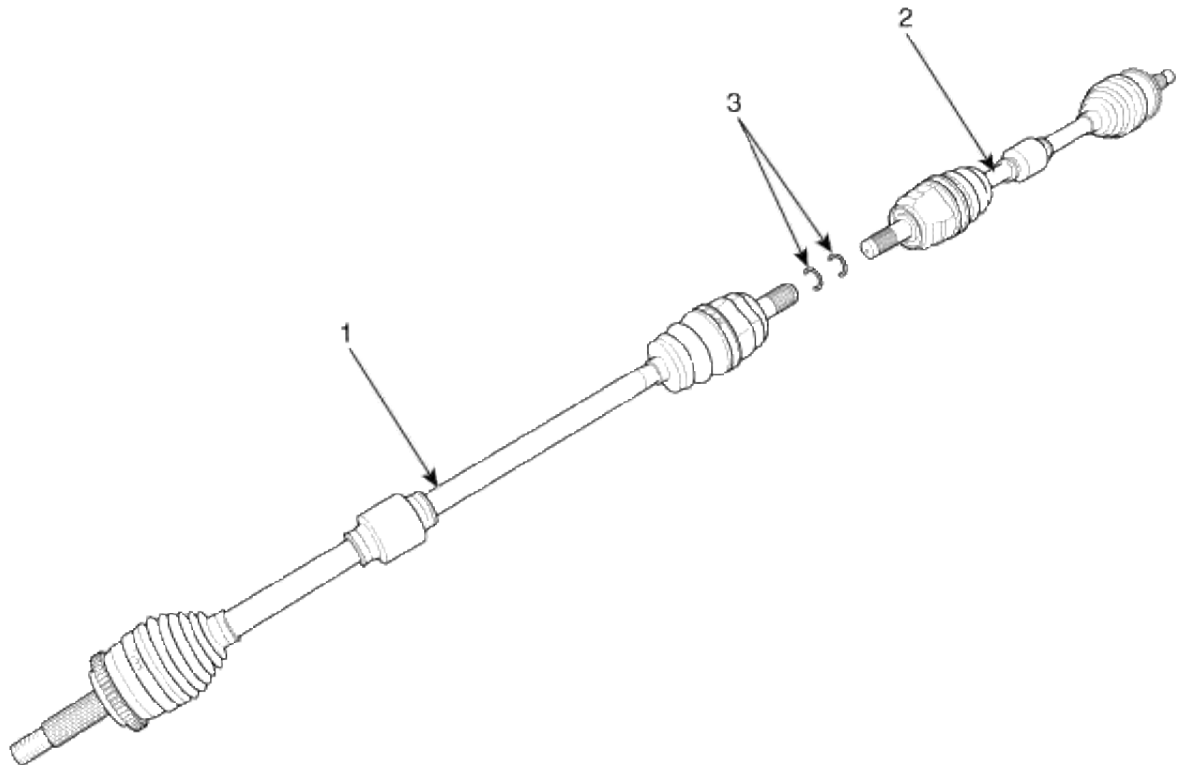


Inspection

1. Check the hub for cracks and the splines for wear.
2. Check the brake disc for scoring and damage.
3. Check the knuckle for cracks.

Driveshaft and axle > Driveshaft Assembly > Front Driveshaft > Components and Components Location

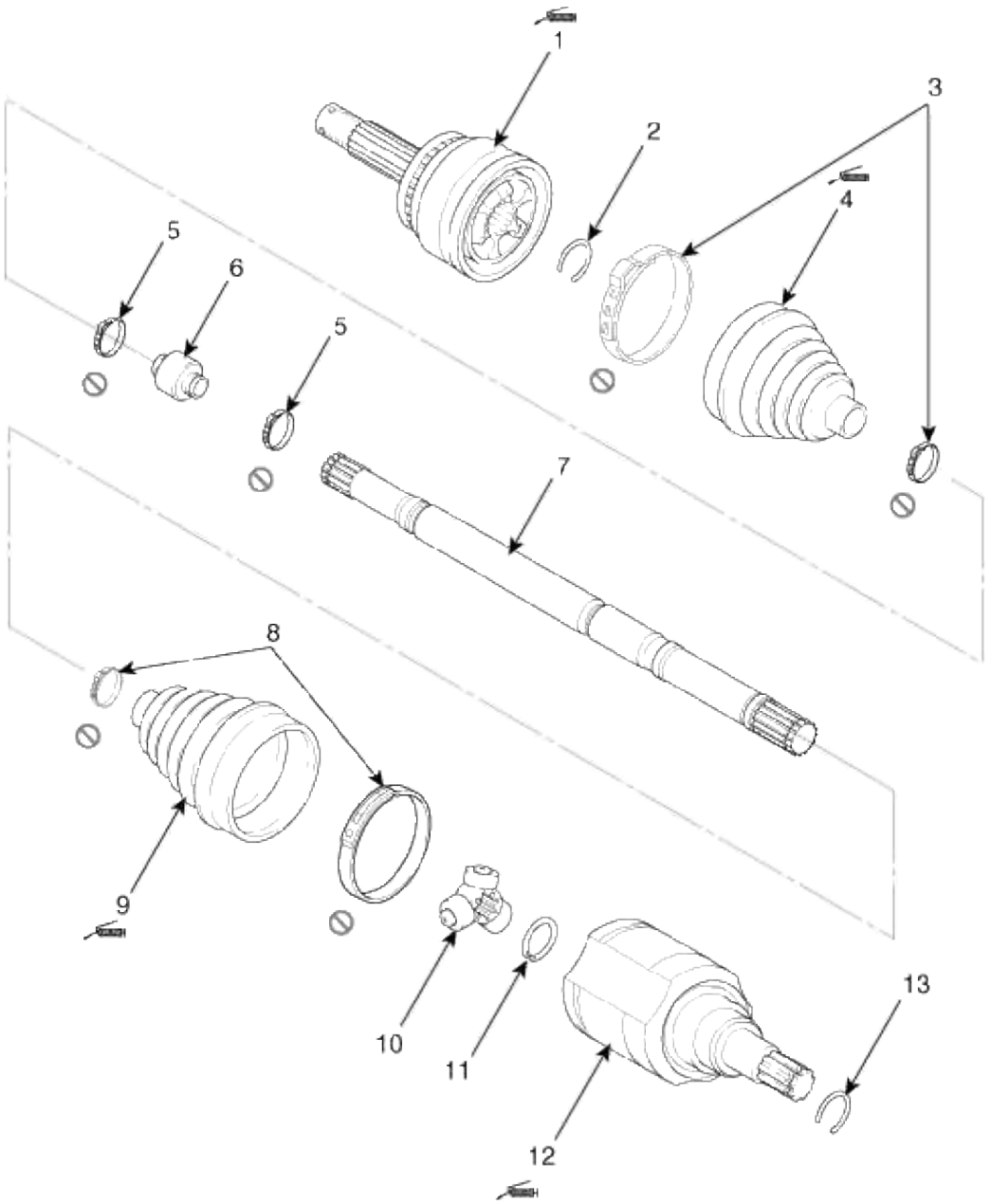
Component location



1. Driveshaft (RH) 2. Driveshaft (LH)	3. Circlip

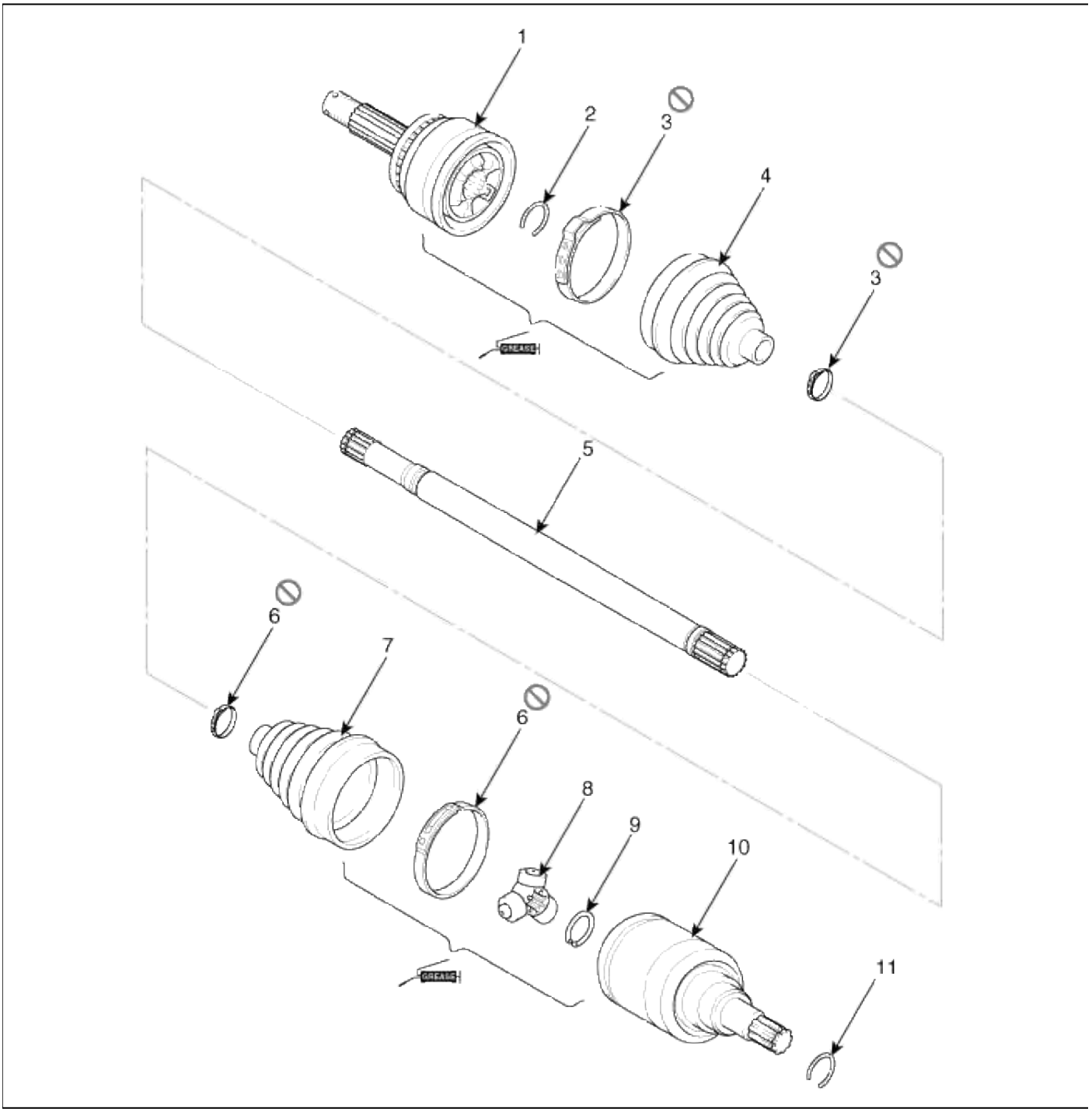
Components

[RH]



1. BJ assembly 2. Circlip 3. BJ boot band 4. BJ boot	5. Dynamic damper band 6. Dynamic damper 7. Shaft 8. TJ boot band	9. TJ boot 10. Spider assembly 11. Snap ring 12. TJ case	13. Circlip

[LH]



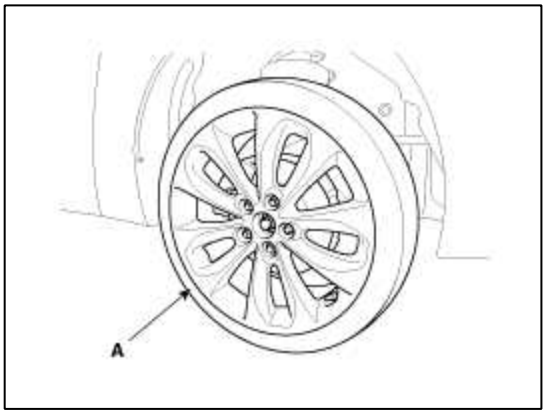
1. BJ assembly 2. BJ circlip 3. BJ boot band 4. BJ boot	5. Shaft 6. TJ boot band 7. TJ boot 8. Spider assembly	9. Snap ring 10. TJ case 11. Circlip

Driveshaft and axle > Driveshaft Assembly > Front Driveshaft > Repair procedures

Replacement

1. Loosen the wheel nuts slightly.
   Raise the vehicle, and make sure it is securely supported.
2. Remove the front wheel and tire (A) from front hub.

Tightening torque:
88.2 ~ 107.8 N.m (9.0 ~ 11.0 kgf.m, 65.0 ~ 79.5 lb-ft)

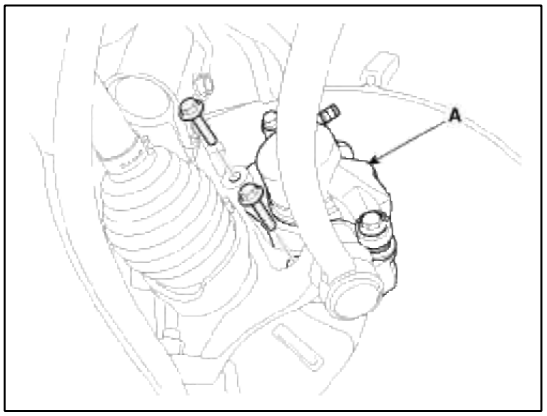


CAUTION

Be careful not to damage to the hub bolts when removing the front wheel and tire (A).

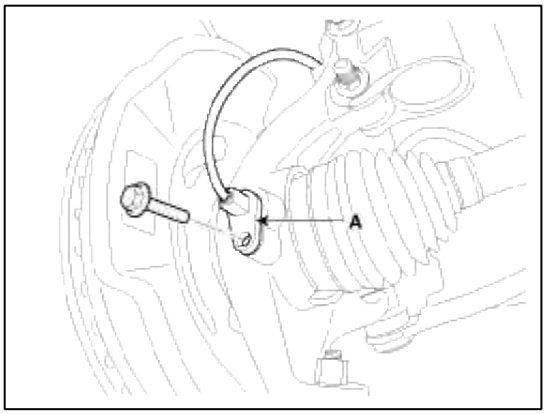
3. Remove the brake caliper mounting bolts, and then place the brake caliper assembly (A) with wire.

Tightening torque:
78.4 ~ 98.0 N.m (8.0 ~ 10.0 kgf.m, 57.8 ~ 72.3 lb-ft)



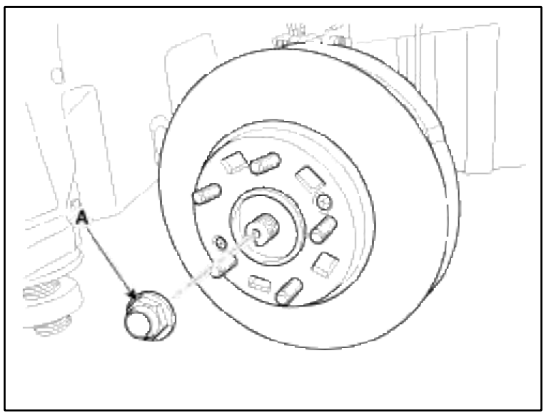
4. Remove the wheel speed sensor (A).

Tightening torque:
7.8 ~ 11.8 N.m (0.8 ~ 1.2 kgf.m, 5.8 ~ 8.7 lb-ft)



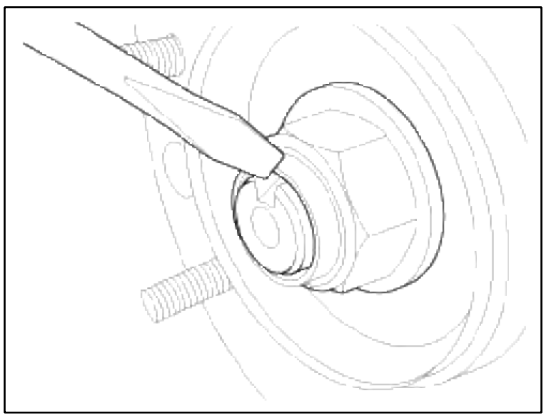
5. Remove driveshaft caulking nut (A) from the front hub under applying the brake.

Tightening torque:
196.1 ~ 274.5 N.m (20.0 ~ 28.0 kgf.m, 144.6 ~ 202.5 lb-ft)



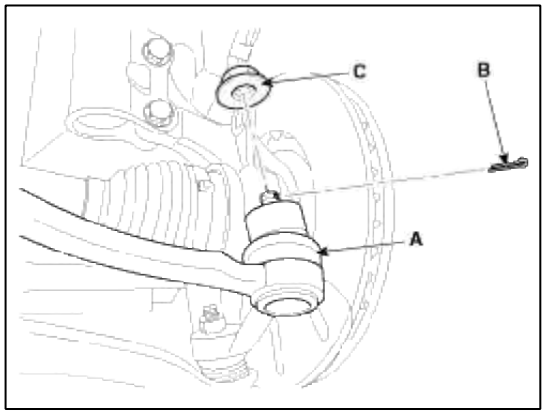
CAUTION

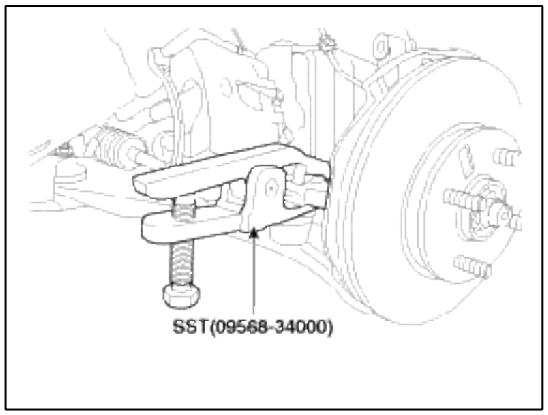
- The driveshaft lock nut should be replaced with new ones.
- After installation driveshaft lock nut, stake the lock nut using a chisel and hammer as shown in the illustration below.



6. Remove the tie rod end ball joint (A) from the knuckle.
   (1) Remove the split pin (B).
   (2) Remove the castle nut (C).
   (3) Use the SST (09568-3400)

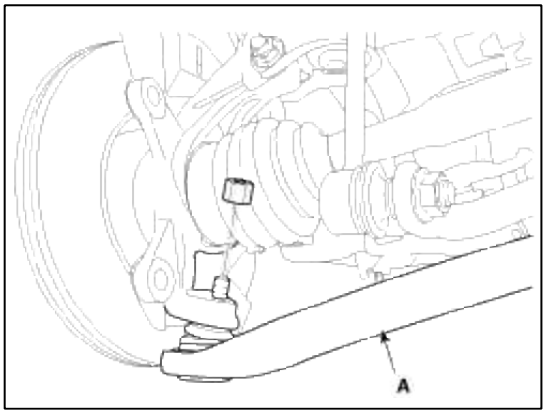
Tightening torque:
23.5 ~ 33.3 N.m (2.4 ~ 3.4 kgf.m, 19.4 ~ 24.5 lb-ft)



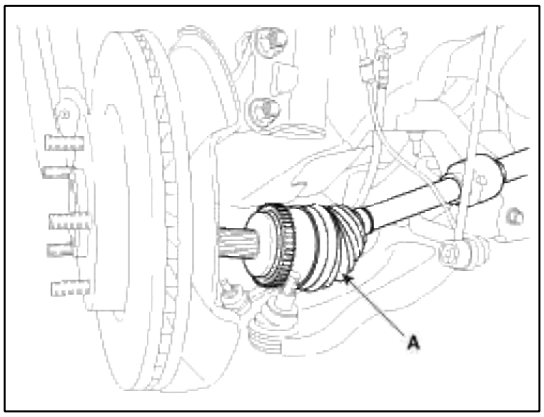


7. Remove the lower arm (A) from the knuckle by using SST (09568-34000)

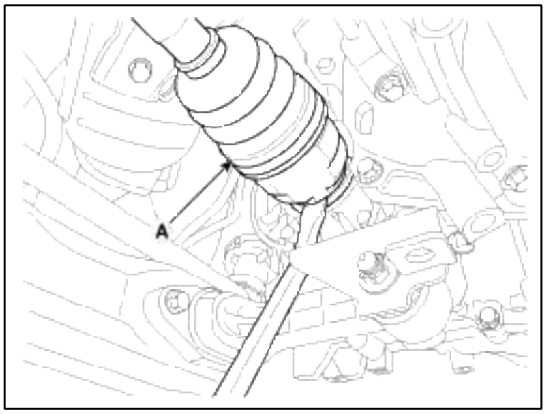
Tightening torque:
78.5 ~ 88.3 N.m (8.0 ~ 9.0 kgf.m, 57.9 ~ 65.1 lb-ft)



8. Disconnect the driveshaft (A) from the front hub assembly.



9. Insert a pry bar (A) between the transaxle case and joint case, and separate the drive shaft (B) from the transaxle case.



10. Install in the reverse order of removal.

CAUTION

- Use a pry bar (A) being careful not to damage the transaxle and joint.
- Do not insert the pry bar (A) too deep, as this may cause damage to the oil seal.
- Do not pull the driveshaft by excessive force it may cause components inside the joint kit to dislodge resulting in a torn boot or a damaged bearing.
- Plug the hole of the transaxle case with the oil seal cap to prevent contamination.
- Support the driveshaft properly.
- Replace the retainer ring whenever the driveshaft is removed from the transaxle case.

Inspection

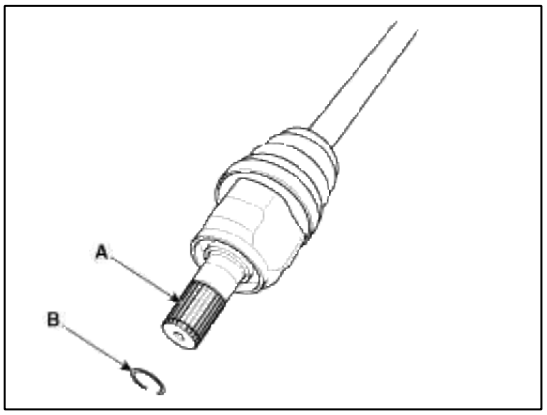
1. Check the driveshaft boots for damage and deterioration.
2. Check the driveshaft spline for wear or damage.
3. Check that there is no water or foreign material in the joint.
4. Check the spider assembly for roller rotation, wear or corrosion.
5. Check the groove inside the joint case for wear or corrosion.
6. Check the dynamic damper for damage or cracks.

Disassembly

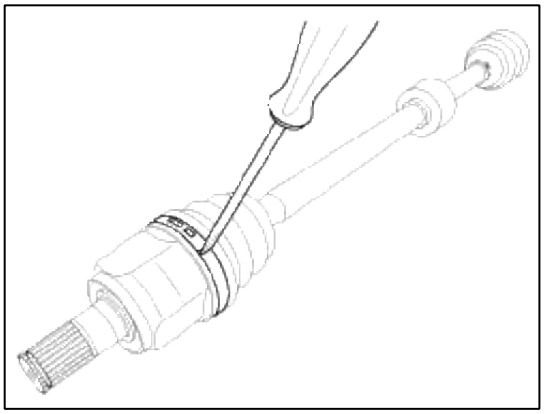
CAUTION

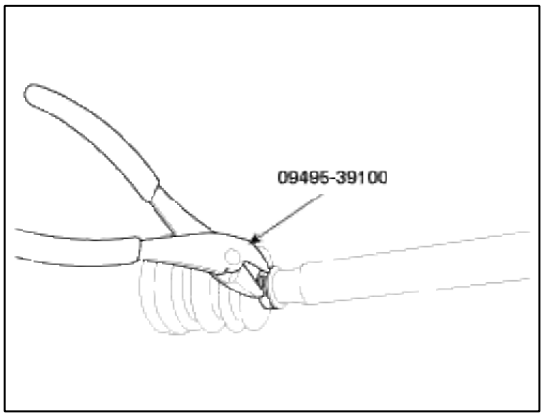
- Do not disassemble the BJ assembly.
- Special grease must be applied to the driveshaft joint. Do not substitute with another type of grease.
- The boot band should be replaced with a new one.

1. Remove the circlip (B) from the driveshaft spline (A).



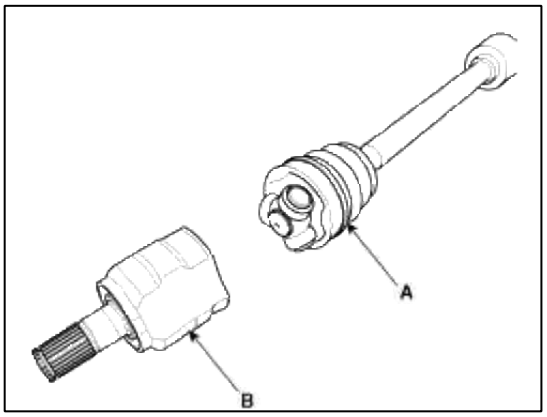
2. Remove both boot bands from the transaxle side joint(TJ) case.





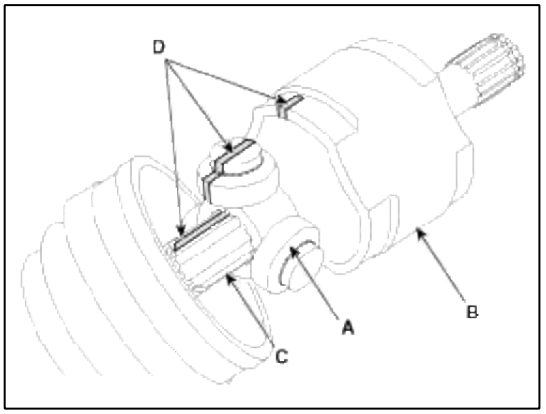
3. Pull out the boot from transaxle side joint case (B).

4. While dividing joint(TJ) boot (A) of the transaxle side, wipe the grease in TJ case (B) and collect them respectively.

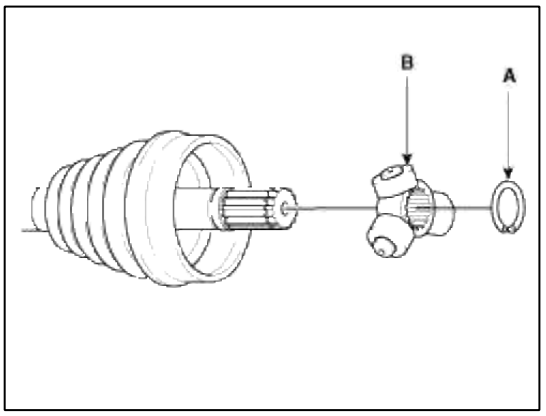


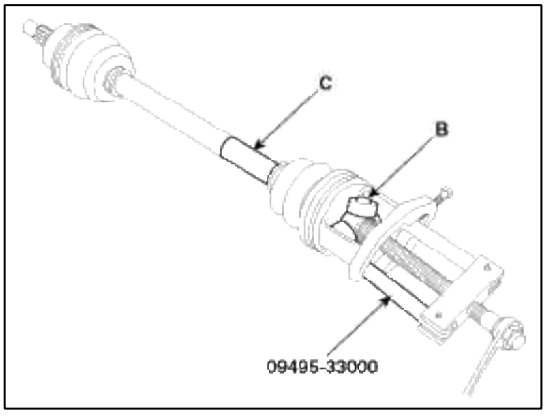
CAUTION

Make alignment marks on spider roller assembly (A), joint case (B), and shaft spline (C) to aid reassembly.



5. Remove the snap ring (A) and spider assembly (B) from the driveshaft (C) using the special tool (09495-33000).

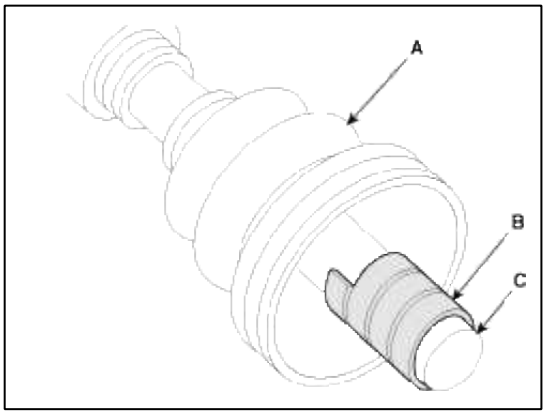




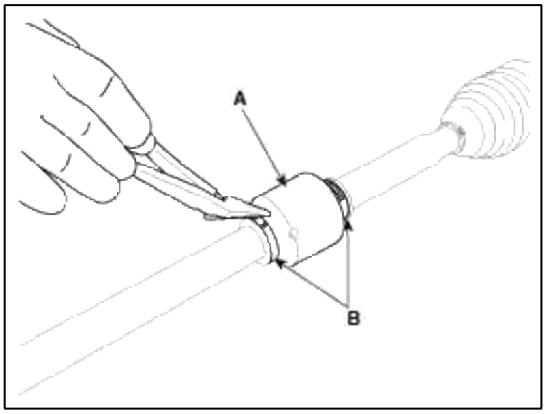
6. Clean the spider assembly.

7. Remove the boot (A) of the transaxle side joint(TJ).

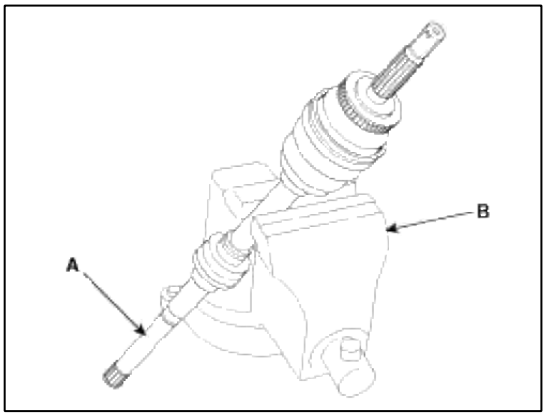
> CAUTION
>
> For reusing the boot (A), wrap tape (B) around the driveshaft splines (C) to protect the boot (A).



8. Using a plier or flat-tipped (-) screwdriver, remove the both side of clamp (B) of the dynamic damper (A).

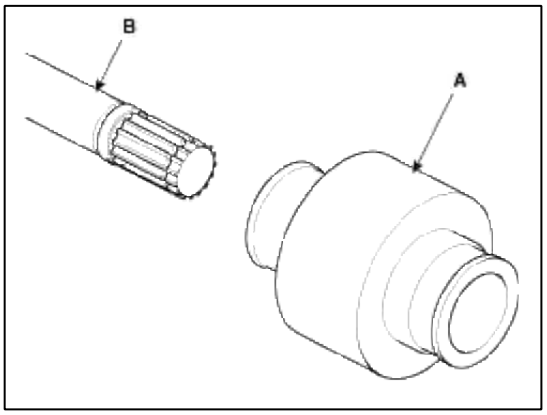


9. Fix the driveshaft (A) with a vice (B) as illustrated.



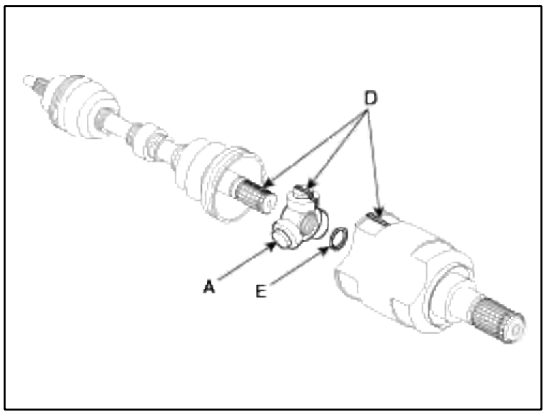
10. Apply soap powder on the shaft to prevent being damaged between the shaft spline and the dynamic damper when the dynamic damper is removed.

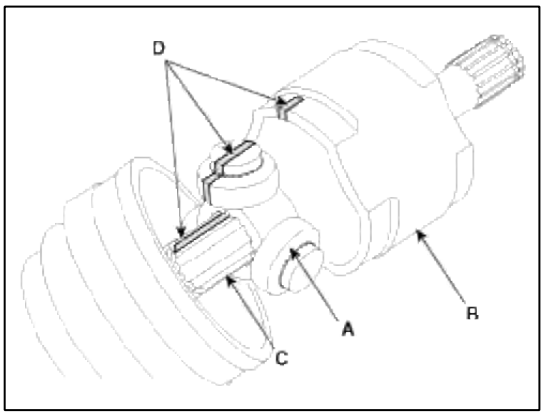
11. Saperate the dynamic damper (A) from the shaft (B) carefully.



Reassembly

1. Wrap tape around the driveshaft spline(TJ) to prevent damage to the boots.
2. Assemble the transaxle side joint boot and bands.
3. Using the alignment marks (D) made during disassembly as a guide, install the spider assembly (A) and snap ring (B) on the driveshaft splines (C).

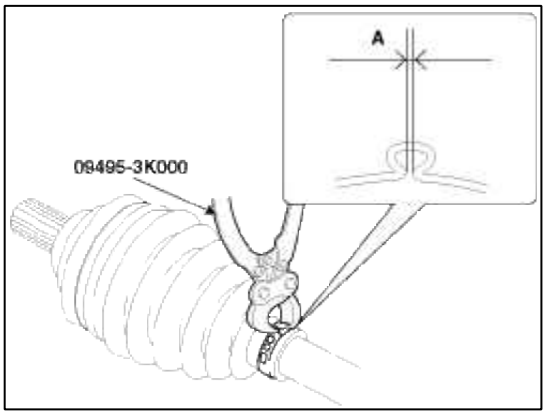




4. Add specified grease to the joint boot as much as it was wiped away at inspection.
5. Install the both boot band.
6. To control the air in the TJ boot, keep the specified distance between the boot bands when they are tightened.

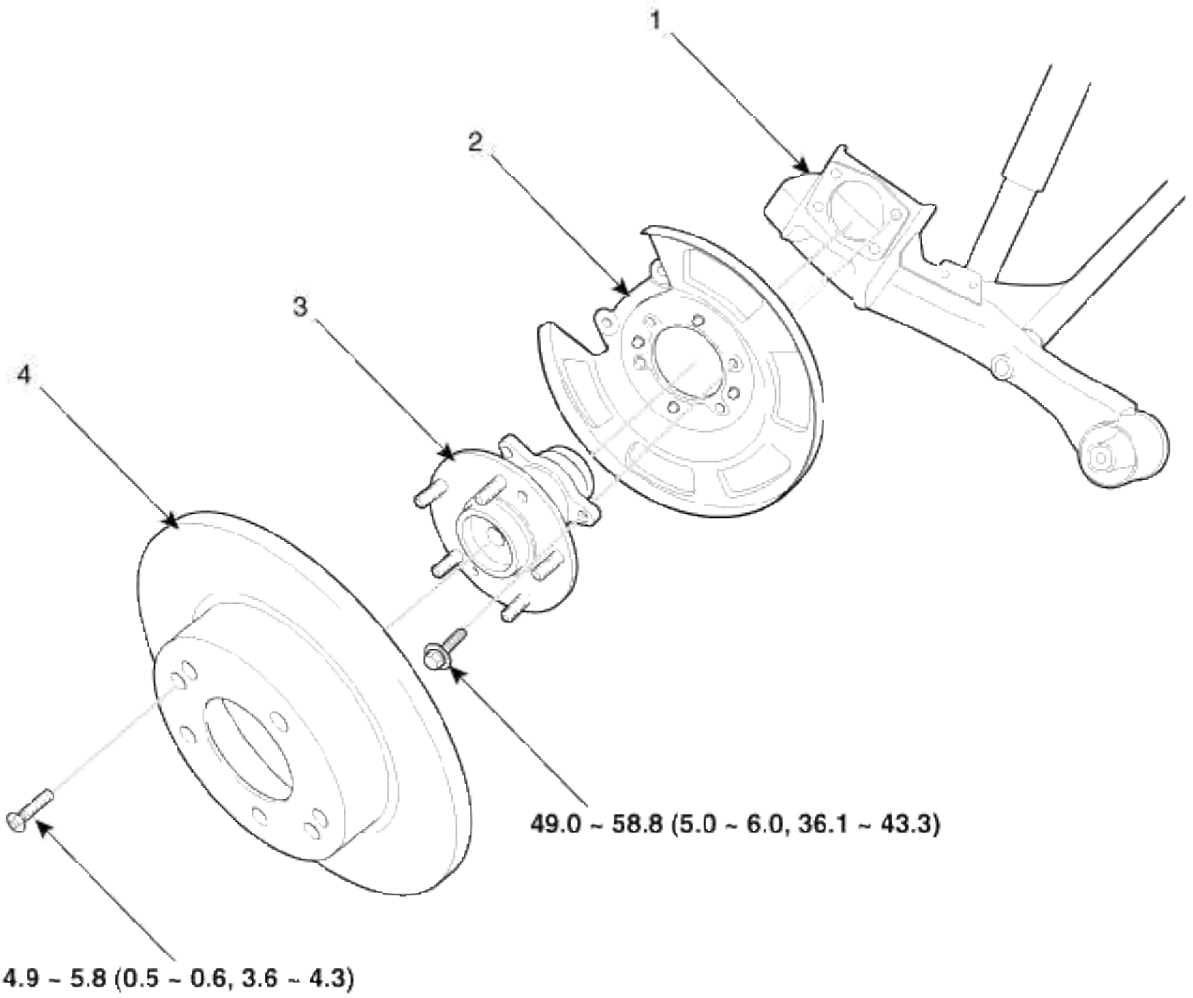
Engine	TM	Distance (L) mm (in.)	
		LH	RH
Gamma 1.6 GDI	MT	546.1(21.5000)	826.4(32.5354)
	DCT	493.3(20.5984)	878.8(32.0866)
Gamma 1.6 T-GDI	MT	530.8(20.8976)	518.0(20.3937)
	AT	522.1(20.5551)	537.8(21.1732)

7. Using the SST (09495-3K000), secure the TJ boot band.



Driveshaft and axle > Rear Axle Assembly > Rear Hub - Carrier > Components and Components Location

Components



Torque: N.m (kgf.m, lb-ft)

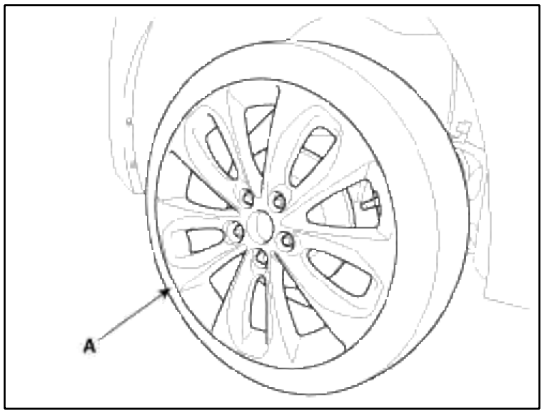
1. Rear torsion beam assembly 2. Rear dust cover	3. Rear wheel hub assembly 4. Rear brake disc

Driveshaft and axle > Rear Axle Assembly > Rear Hub - Carrier > Repair procedures

Replacement

1. Loosen the wheel nuts slightly.
   Raise the vehicle, and make sure it is securely supported.
2. Remove the rear wheel and tire (A) from rear hub .

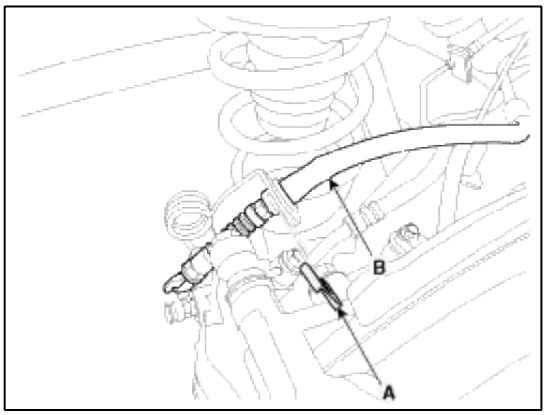
Tightening torque:
88.2 ~ 107.8 N.m (9.0 ~ 11.0 kgf.m, 65.0 ~ 79.5 lb-ft)



CAUTION

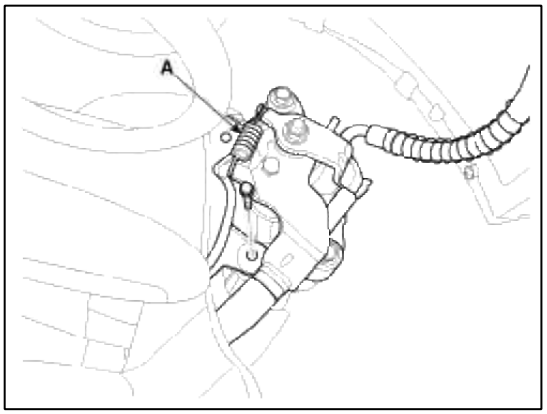
Be careful not to damage to the hub bolts when removing the rear wheel and tire (A).

3. Remove the clip (A) and then remove the parking brake cable (B).



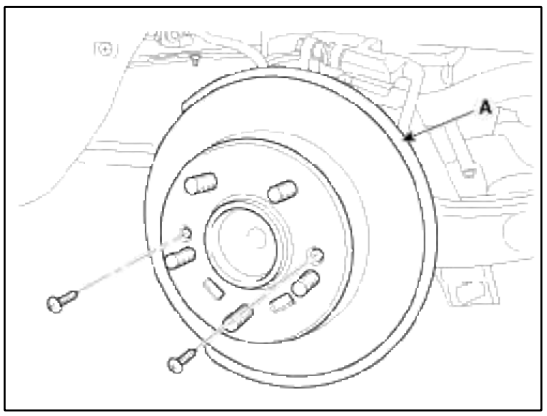
4. Remove the brake caliper mounting bolts, and then place the brake caliper assembly (A) with wire.

Tightening torque:
63.7 ~ 73.5 N.m (6.5 ~ 7.5 kgf.m, 47.0 ~ 54.2 lb-ft)



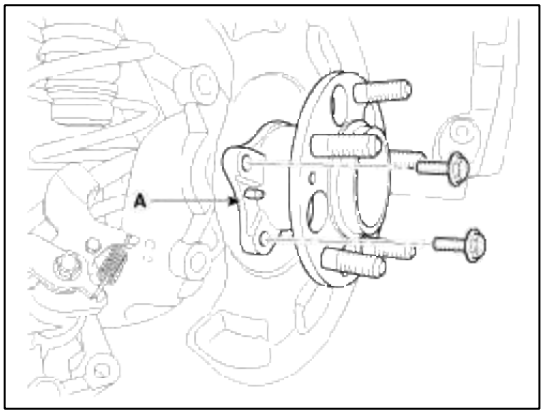
5. Loosen the mounting screws and then brake disc (A).

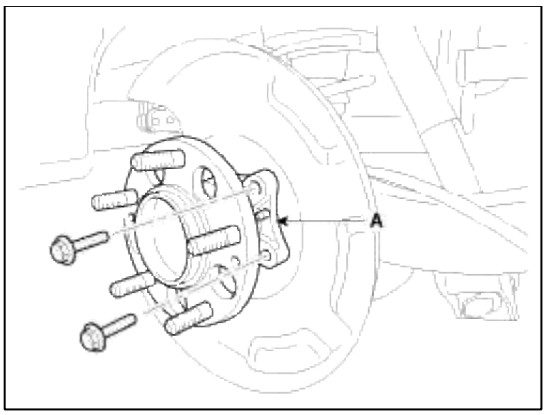
Tightening torque:
4.9 ~ 5.8 N.m (0.5 ~ 0.6 kgf.m, 3.6 ~ 4.3 lb-ft)



6. Loosen the hub mounting bolt and then remove the hub (A) from torsion beam axle.

Tightening torque:
49.0 ~ 58.8 N.m (5.0 ~ 6.0 kgf.m, 36.1 ~ 43.3 lb-ft)





7. Install in the reverse order of removal.

Inspection

1. Check the hub for cracks and the splines for wear.
2. Check the brake disc for scoring and damage.
3. Check the rear axle carrier for cracks
4. Check the bearing for cracks or damage.