

# Driveshaft and Axle

**GENERAL**

FRONT HUB / KNUCKLE

**DRIVESHAFT**

FRONT DRIVESHAFT ASSEMBLY

**REAR AXLE**

REAR HUB / AXLE

**FRONT AXLE**

## GENERAL

### SPECIFICATIONS E7A87009

Items		Specifications	
Driveshaft (RH, LH)	Joint type	Outer side	UFi
		Inner side	AARi
	Max. permissible angle	Outer side	50°
		Inner side	26°
Center bearing	Type	Radial ball bearing	
	Dimension	Outer diameter	Ø62
		Inner diameter	Ø30
Front wheel bearing	Type	Double row angular contact ball bearing	
	Starting torque	28N (0.18 kgf.m, 16 lbf.in) or less	
	Dimension	Outer diameter	Ø87
		Inner diameter	Ø45

 **NOTE**

*Inner side : On Transaxle side*

*Outer side : On Tire side*

*Ufi : Under Cut Free improved (GKN)*

*AARi : Angular Adjusted Roller improved (GKN)*

TIGHTNING TORQUE

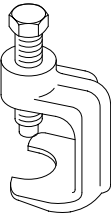
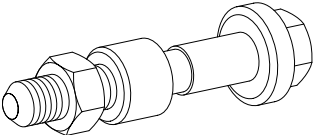
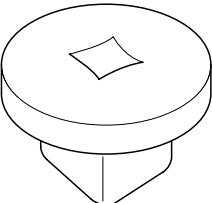
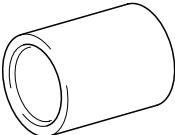
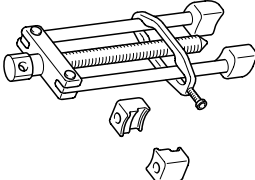
Item	Nm	kgf.m	lb-ft
Wheel nut	90 ~ 110	9 ~ 11	66 ~ 81
Drive shaft castle nut	200 ~ 280	20 ~ 28	148 ~ 207
Front Upper arm to knuckle self locking nut	35 ~ 45	3.5 ~ 4.5	26 ~ 33
Front Subframe mounting bolt	140 ~ 160	14 ~ 16	101 ~ 118
Front Shock absorber lower mounting bolt	60 ~ 80	6 ~ 8	44 ~ 59
Front lower arm connector nut (to fork)	140 ~ 160	14 ~ 16	101 ~ 118
Lower arm and ball joint	100 ~ 120	10 ~ 12	74 ~ 88
Lower arm ball joint self locking nut	75 ~ 90	7.5 ~ 9	54.2 ~ 66
Tie rod end self locking nut	24 ~ 34	2.4 ~ 3.4	18 ~ 25
Stabilizer link self locking nut	100 ~ 120	10 ~ 12	74 ~ 88
Stabilizer link mounting nut	45 ~ 55	4.5 ~ 5.5	33 ~ 39.7
Hub assembly	60 ~ 70	6 ~ 7	44 ~ 52
Wheel speed sensor	7 ~ 11	0.7 ~ 1.1	5 ~ 7.9
Brake caliper to knuckle	80 ~ 100	8 ~ 10	59 ~ 74
Rear brake disc	5 ~ 6	0.5 ~ 0.6	3.6 ~ 4.3
Rear Lower arm to knuckle	140 ~ 160	14 ~ 16	101 ~ 118
Rear Brake caliper to knuckle bolt	50 ~ 60	5 ~ 6	36 ~ 44
Rear upper arm to carrier self locking nut	80 ~ 90	8 ~ 9	59 ~ 66
Rear axle mounting bolt	60 ~ 70	6 ~ 7	44 ~ 52
Inner shaft heat cover mounting bolt	9 ~ 14	0.9 ~ 1.4	6.5 ~ 10
Inner shaft bearing bracket mounting bolt	50 ~ 65	5 ~ 6.5	36 ~ 47

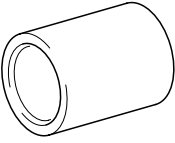
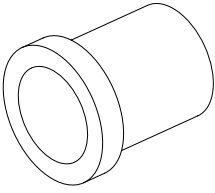
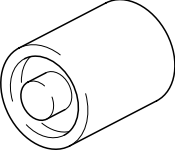
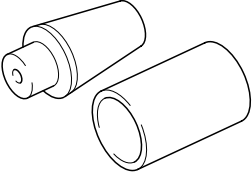
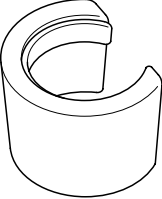


**CAUTION**

**Replace self-locking nuts with new ones after removal.**

**SPECIAL TOOLS** E2ED0EEC

Tool (Number and Name)	Illustration	Use
09568-4A000 Ball joint remover	 KPRE103I	Removal of the front lower arm and tie rod end ball joint
09517-21500 Front hub remover and installer	 EIRF001A	Removal and installation of front hub
09532-11600 Preload socket	 EIRF001C	Measurement of the wheel bearing preload (use with torque wrench)
09216-21100 Mount bushing remover and installer	 EIRF002J	<ul style="list-style-type: none"><li>• Removal of the center bearing</li><li>• Press-fitting of the front wheel bearing outer race</li></ul> (Use with 09495-33100, 09216-21600)
09432-11000 Main shaft bearing puller	 EIRF002A	Removal of the tone wheel

Tool (Number and Name)	Illustration	Use
09216-21600 Mount bushing remover and installer	 EIRF002J	Removal of the wheel bearing outer race
09545-21100 Ball joint dust cover installer	 EIRF001D	Press-fitting of the front hub to the knuckle
09545-34100 Lower arm bushing remover and installer	 EIRF002K	Removal of the bearing inner race from the front hub
09453-33000B Snap ring installer	 EIRF002L	Removal and installation of the rear axle carrier bushing (Use with 09552-38200)
09216-22100 Mount bushing remover and installation base	 EIRF002B	Removal of the wheel bearing outer race (Use with 09216-21600)

**TROUBLESHOOTING**

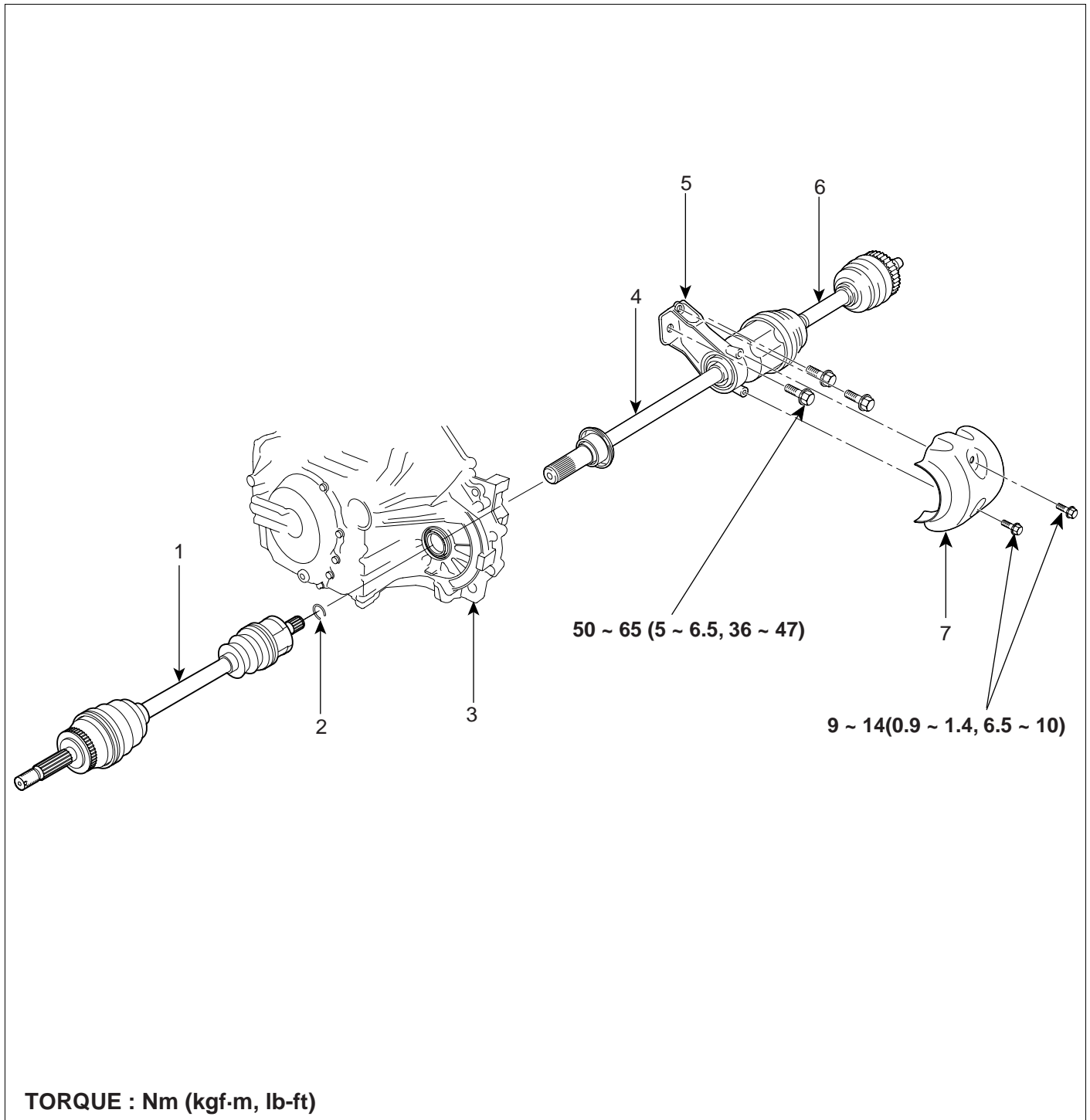
EC0E386D

Symptom	Possible cause	Remedy
Vehicle pulls to one side	Scoring of driveshaft ball joint Wear, rattle or scoring of wheel bearing Defective front suspension and steering	Replace Replace Adjust or replace
Vibration	Wear, damage or bending of driveshaft Driveshaft rattle and worn hub splines Wear, rattle or scratching of wheel bearing	Replace Replace Replace
Shimmy	Improper wheel balance Bent wheel Defective front suspension and steering	Adjust or replace Replace Adjust or replace
Excessive noise	Wear, damage or bending of driveshaft Driveshaft rattle and worn hub splines Driveshaft rattle and worn side gear splines Wear, rattle or galling of wheel bearing Loose hub nut Defective front suspension and steering	Replace Replace Replace Replace Adjust or replace Adjust or replace
Bent cage	Cage damaged by improper handling or tool usage	Replace bearing
Galling	Metal smears on roller end due to overheating, incorrect lubricant or overloading	Replace bearing Check seals, check for proper lubrication
Cracked inner race	Race cracked due to improper fit, cocking or poor bearing seats	Replace bearing
Etching	Bearing surfaces appear gray or grayish black in color accompanied by material etched away usually at roller spacing	Replace bearing Check seals, check for proper lubrication
Brinelling	Surface indentations on race surface caused by rollers being under impact loading or vibration while the bearing is not rotating	Replace bearing
Heat discoloration	Heat discoloration is dark blue resulting from overload or no lubricant (Yellow or brown color is normal)	Replace bearing Check seals and other parts
Fatigue spalling	Flaking of surface metal resulting from fatigue	Replace bearing Clean all related parts

# DRIVESHAFT

## FRONT DRIVESHAFT ASSEMBLY

### COMPONENTS E03682E3



- 1. Driveshaft (LH)
- 2. Circlip
- 3. Transaxle
- 4. Inner shaft

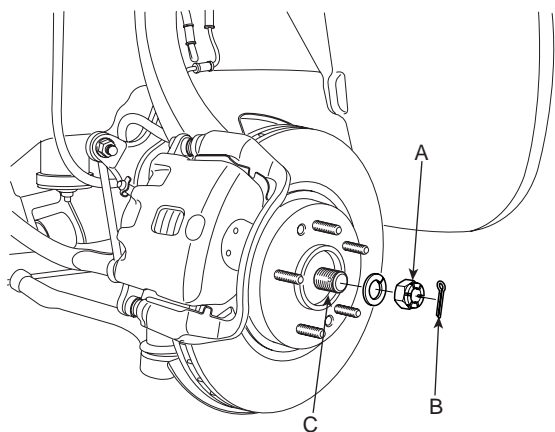
- 5. Inner shaft bearing bracket
- 6. Driveshaft (RH)
- 7. Inner shaft heat cover

**DS -8**

**DRIVESHAFT AND AXLE**

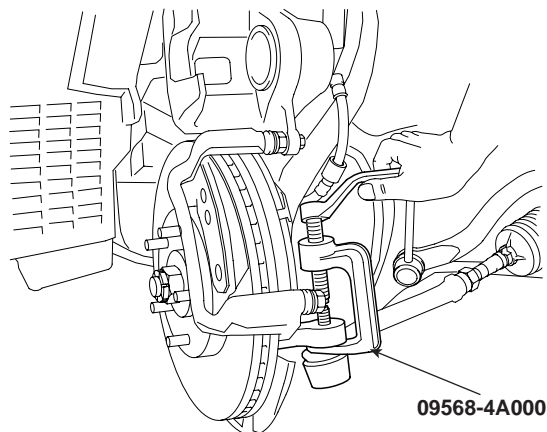
**REMOVAL** EECA17BC

1. Remove the wheel & tire assembly.
2. Remove the spilt pin (B) and driveshaft castle nut (A) and washer from the front hub (C).



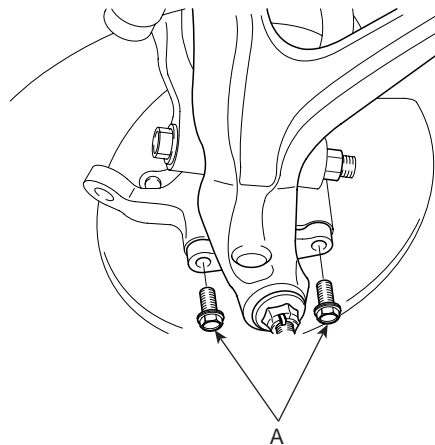
SGHDS6500D

3. Using the special tool (09568-4A000), disconnect the tie rod end (A) from the knuckle.



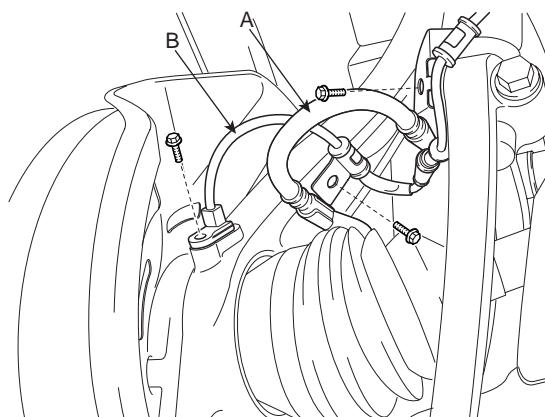
KHBF105B

4. Remove the 2 bolts(A) and disconnect the knuckle from the lower arm assembly.



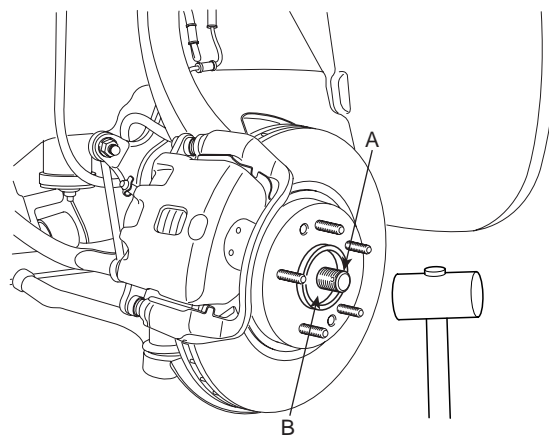
KHBF140D

5. Remove the brake hose (A) bracket and wheel speed sensor cable (B) bracket from the front strut assembly and knuckle.



SGHDS6501D

6. Using a plastic hammer, disconnect the driveshaft (A) from the axle assembly (B).

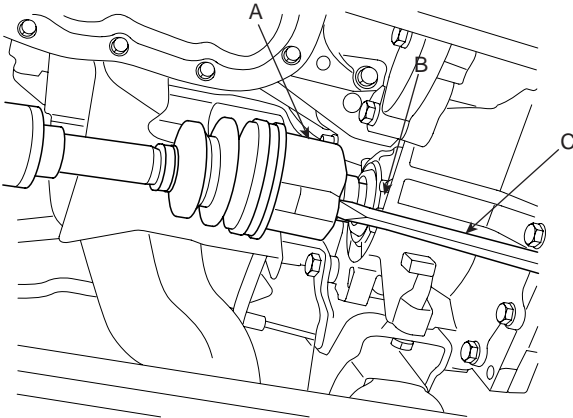


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**DRIVESHAFT**

7. Removing the driveshaft (A) from the transaxle by using a pry bar (C) as shown below.

[LH]



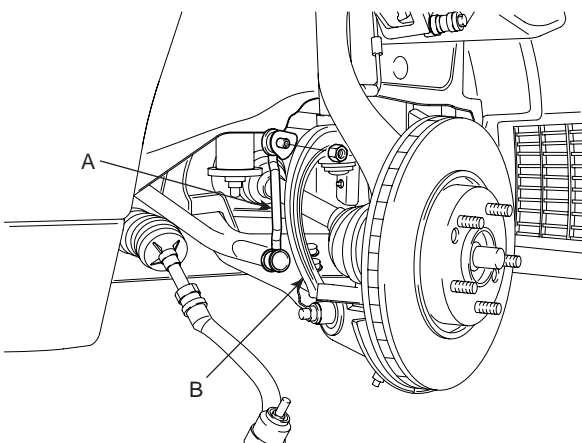
UIBG500D

**CAUTION**

- Use a pry bar so you do not damage the joint.
- If you pull the driveshaft by excessive force, components inside the joint can be displaced causing the boot to be torn and the bearing to be damaged.
- Plug the transaxle case opening with an oil seal cap in order to avoid contamination.
- Support the driveshaft properly.
- Replace the retainer ring each time the driveshaft is removed from the transaxle case.

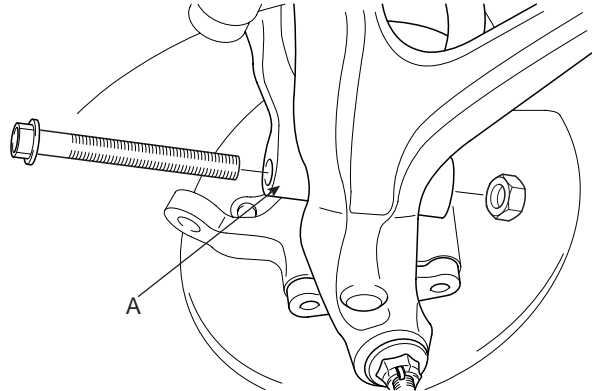
[RH]

- a. Remove the stabilizer link (A) from the fork (B).



EIRF001F

- b. Remove the fork (A) from the front lower arm.

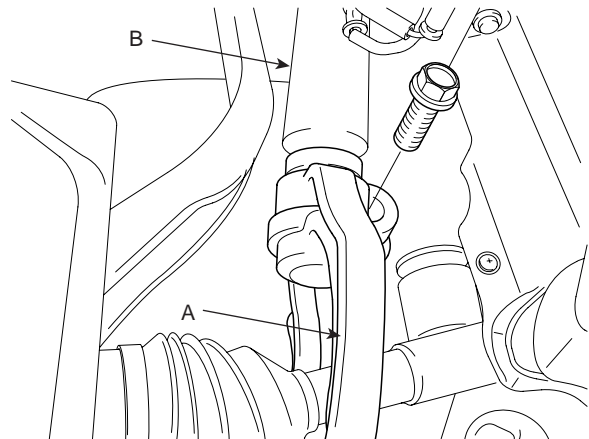


UIBG500E

**CAUTION**

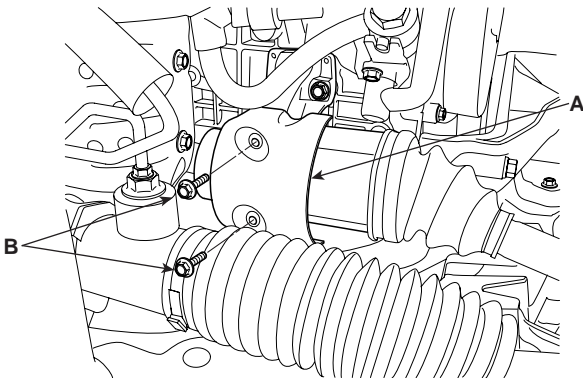
*Be careful not to damage to the aluminum lower arm.*

- c. Remove the fork (A) from the front strut assembly (B).



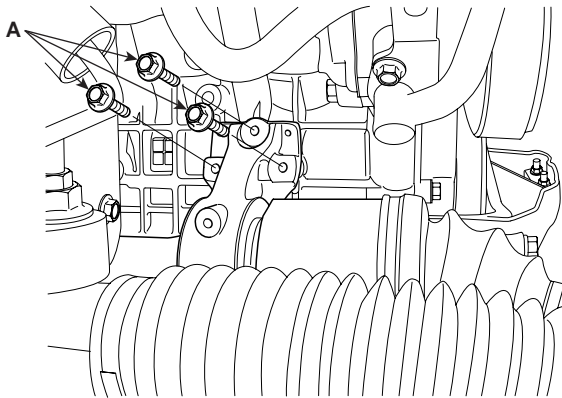
KHBF110D

- d. Remove the inner shaft heat cover (A) and the heat cover mounting bolts (B).



SGHDS6513D

- e. Remove the inner shaft bracket mounting bolts (A).

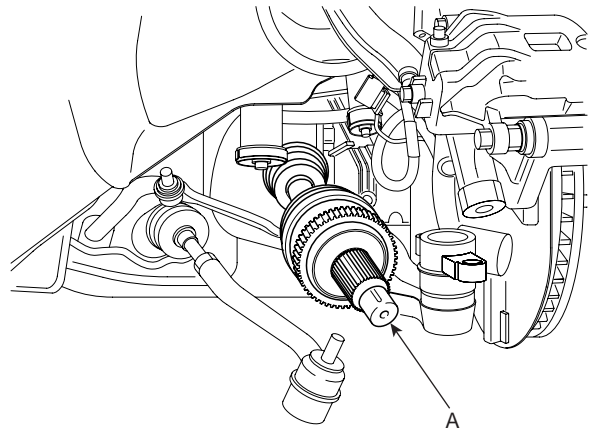


SGHDS6514D

- f. Remove the front driveshaft assembly (A) with the inner shaft from the transaxle.

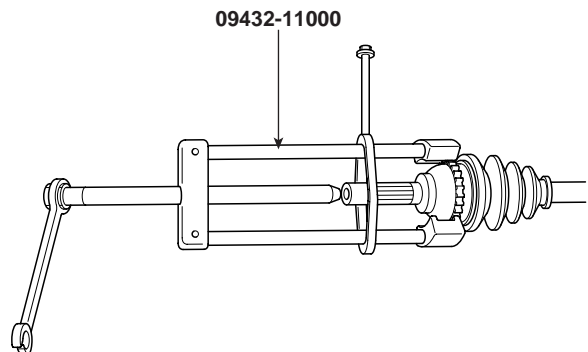
**CAUTION**

*Do not try to disconnect the inner shaft from the driveshaft. Because they can not be disconnected once assembled.  
Do not reuse the driveshaft which is disassembled from the inner shaft.*



KIBF101N

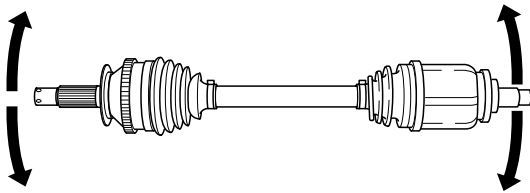
8. Using the special tool (09432-11000), remove the tone wheel.



EIRF002C

**INSPECTION** E952B96C

1. Check the driveshaft boots for damage and deterioration.
2. Check the splines for wear and damage.
3. Check the ball joints for wear and operating condition.
4. Check the boots for damage and deterioration.



EIRF002D

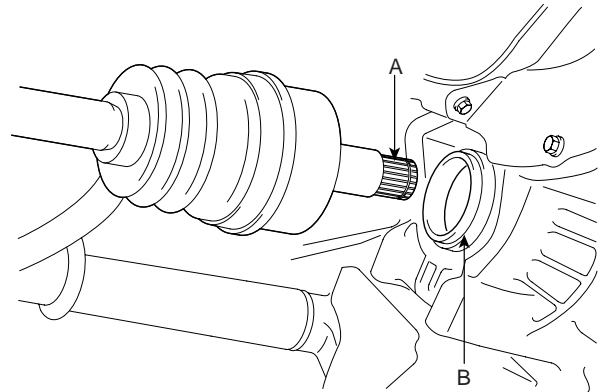
5. If the driveshaft is damaged, replace the driveshaft assembly.

**INSTALLATION** E04BDF93

**CAUTION**

**Replace the circlip with new ones after removal.**

1. Apply gear oil on the drive shaft splines (A) and the contacting surface of differential case oil seal (B).



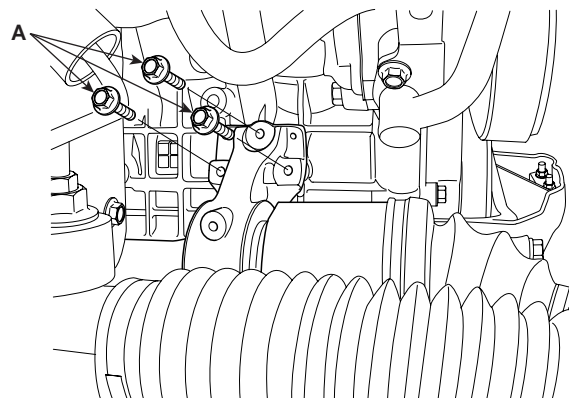
KIBF105A

2. After installation, check if the drive shaft cannot be removed.

**[RH]**

- a. Install the inner shaft bearing bracket mounting bolt (A).

**Tightening Torque Nm(kgf.m, lb-ft) :**  
50 ~ 65(5 ~ 6.5, 36 ~ 47)



SGHDS6514D

**DS -12**

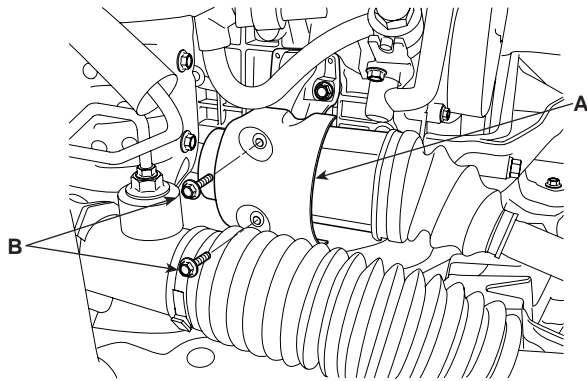
**DRIVESHAFT AND AXLE**

- b. Install the inner shaft heat cover (A) by installing the heat cover mounting bolts (B).

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**Tightening Torque Nm(kgf.m, lb-ft) :**  
9 ~ 14(0.9 ~ 1.4, 6.5 ~ 10)

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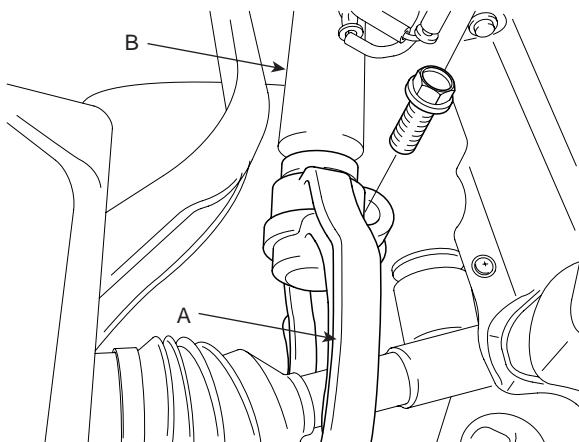
SGHDS6513D

- c. Install the fork (A) to the front strut assembly (B).

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**Tightening Torque Nm(kgf.m, lb-ft) :**  
60 ~ 80(6 ~ 8, 44 ~ 59)

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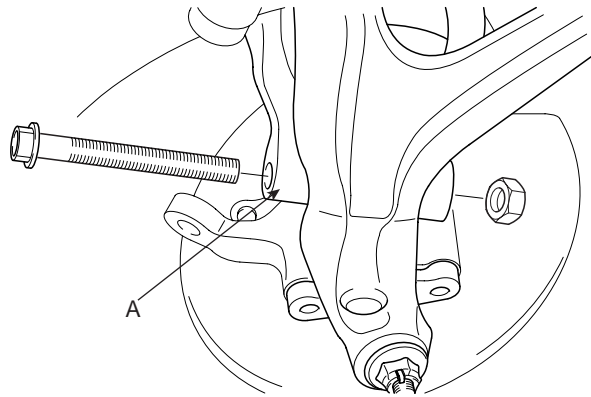
KHBF110D

- d. Install the connecting bolt between the fork (A) and the lower arm.

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**Tightening Torque Nm(kgf.m, lb-ft) :**  
140 ~ 160(14 ~ 16, 101 ~ 118)

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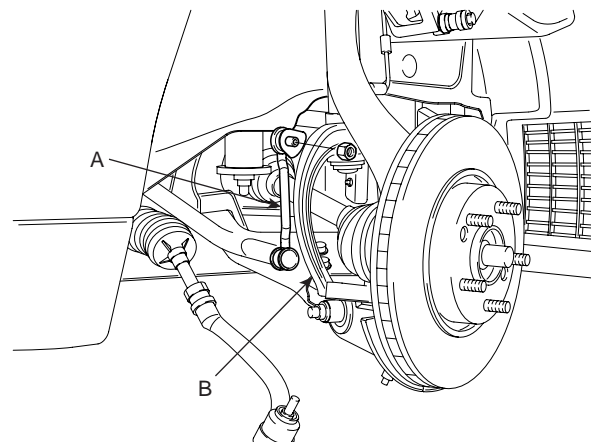
UIBG500E

- e. Install the stabilizer link (A) to the fork (B).

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**Tightening Torque Nm(kgf.m, lb-ft) :**  
100 ~ 120(10 ~ 12, 74 ~ 88)

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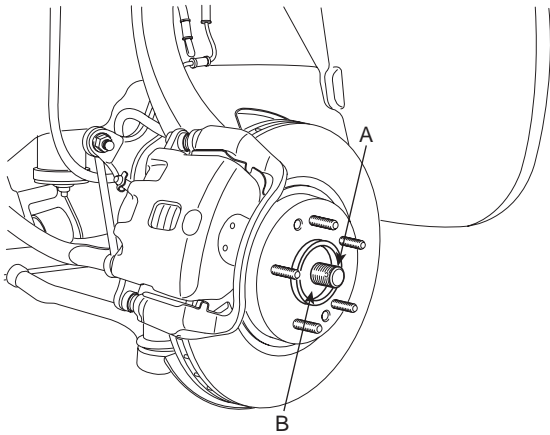


EIRF001F

3. Install the drive shaft (A) into the front axle assembly (B).

**CAUTION**

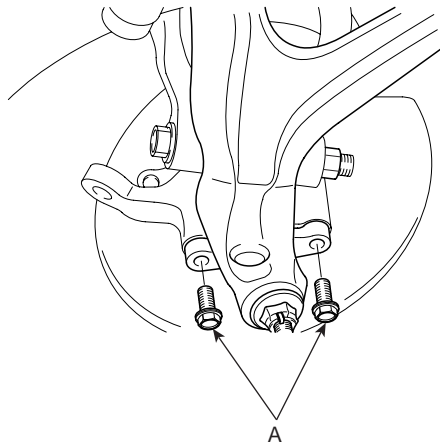
*Be careful not to damage the boot.*



SGHDS6511D

4. Install the knuckle in the lower arm assembly and tighten the bolts (A).

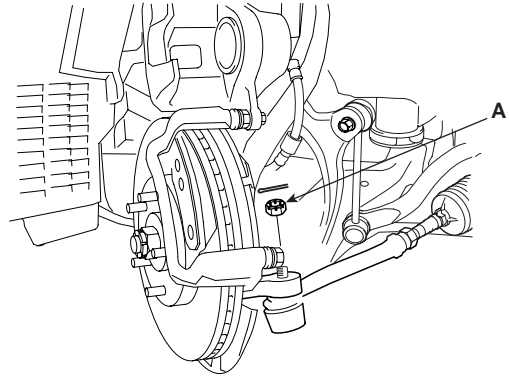
**Tightening Torque Nm(kgf.m, lb-ft) :**  
100 ~ 120(10 ~ 12, 74 ~ 88)



KHBF140D

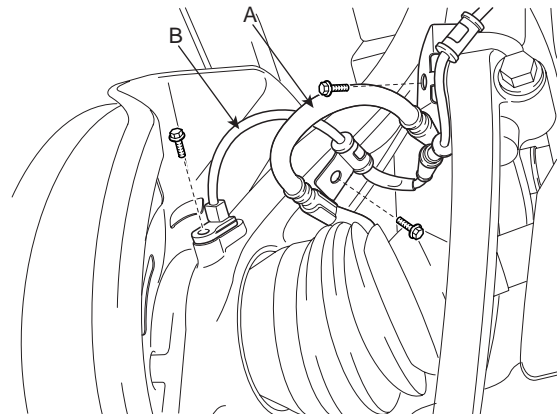
5. Install the tie rod end (A) in the knuckle.

**Tightening Torque Nm(kgf.m, lb-ft) :**  
24 ~ 34(2.4 ~ 3.4, 18 ~ 25)



KHBF140G

6. Install the brake hose (A) bracket and wheel speed sensor cable (B) bracket to the front strut assembly and knuckle.



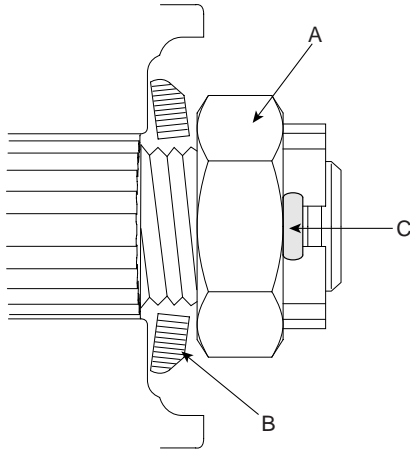
SGHDS6501D

7. After installing the washer (B) with convex surface outward, install the castle nut (A) and the split pin (C).

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**Tightening Torque Nm(kgf.m, lb-ft) :**  
200~280 (20~28, 148~207)

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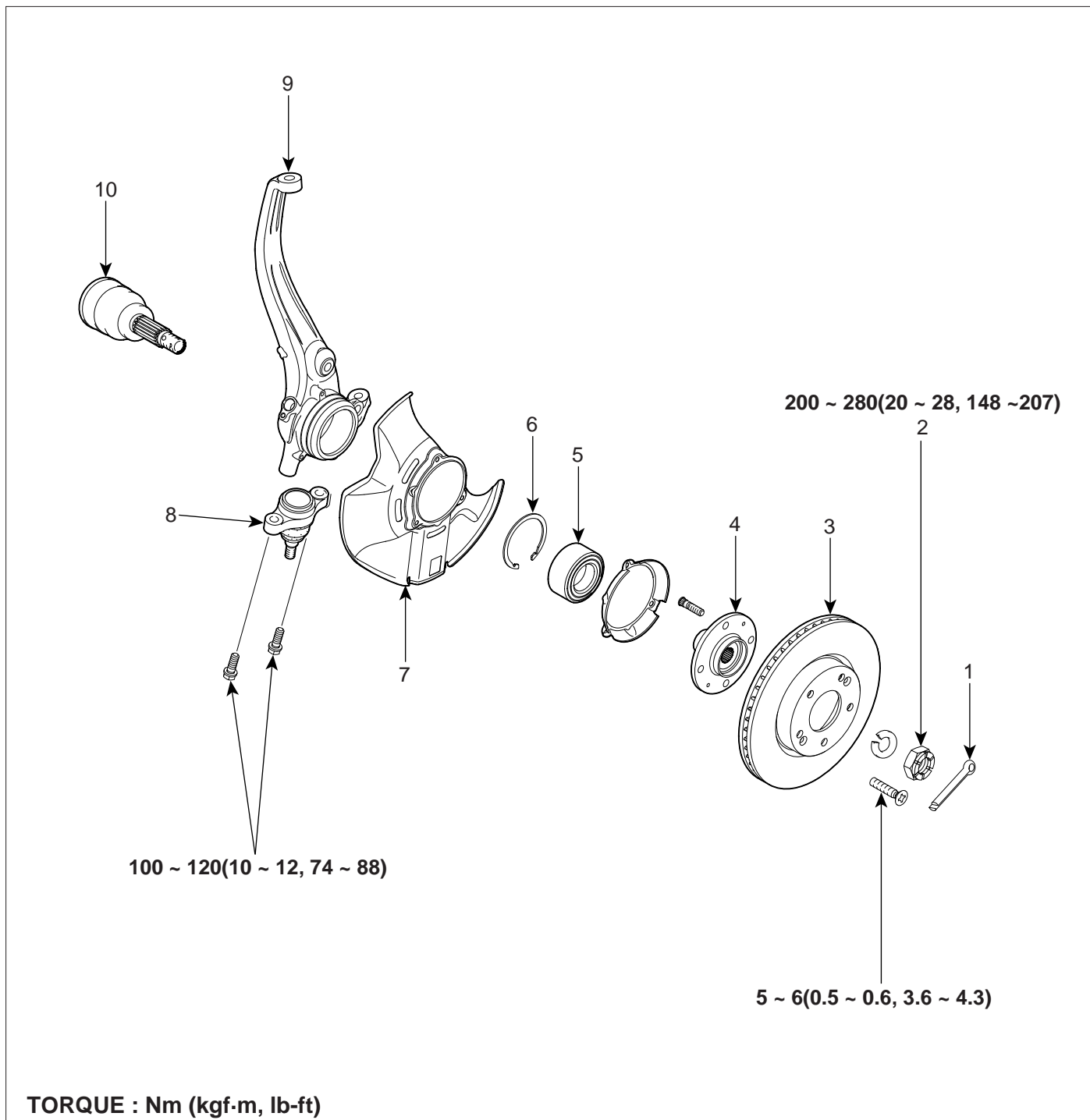
KIBF105D

8. Install the wheel & tire assembly.

# FRONT AXLE

## FRONT HUB / KNUCKLE

### COMPONENTS E401E1E1



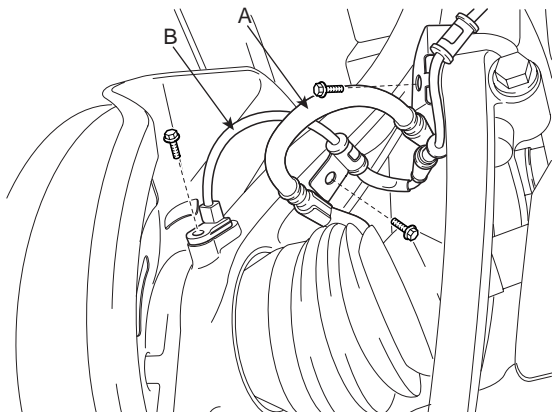
- |                   |                         |
|-------------------|-------------------------|
| 1. Split pin      | 6. Snap ring            |
| 2. Driveshaft nut | 7. Dust cover           |
| 3. Brake disc     | 8. Lower arm ball joint |
| 4. Hub            | 9. Knuckle              |
| 5. Wheel bearing  | 10. Driveshaft          |

**DS -16**

**DRIVESHAFT AND AXLE**

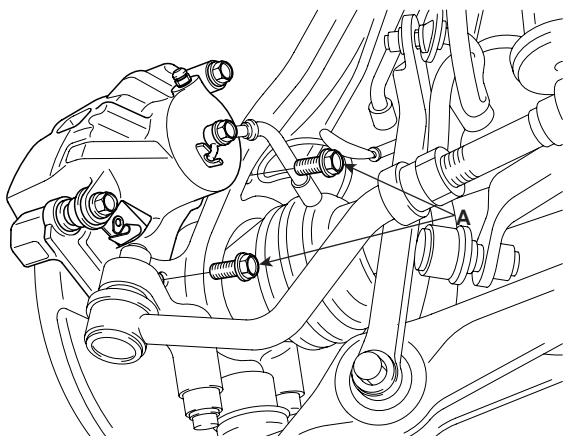
**REMOVAL** E4DCFEF2

1. Remove the wheel & tire assembly.
2. Remove the brake hose (A) bracket and wheel speed sensor cable (B) bracket from the front strut assembly and knuckle.

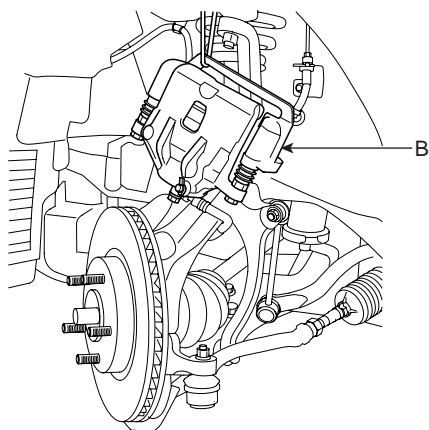


SGHDS6501D

3. After loosening the bolts (A), remove the caliper assembly (B) and suspend it with wire.

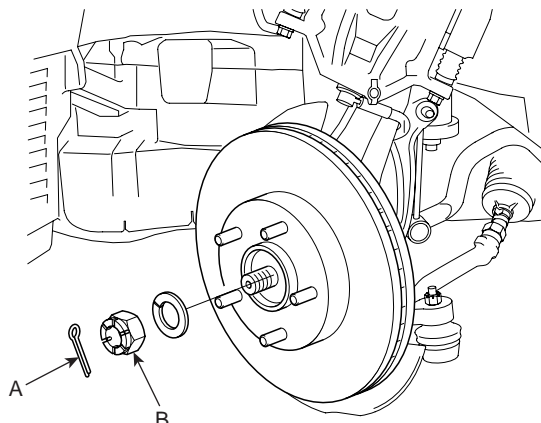


KIBF311A



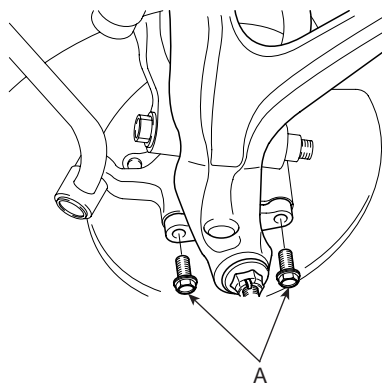
KIBF301A

4. Remove the split pin (A) and driveshaft castle nut (B) from the front hub.



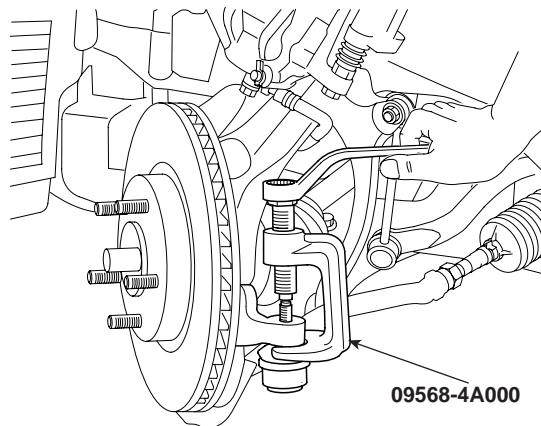
KIBF301B

5. Remove the 2 bolts (A) and disconnect the knuckle from the lower arm assembly.



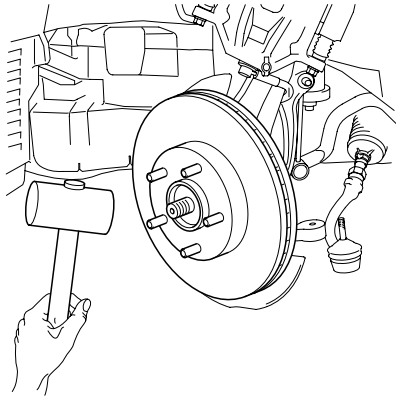
KHBF120A

6. Using the special tool (09568-4A000), disconnect the tie rod end from the knuckle.



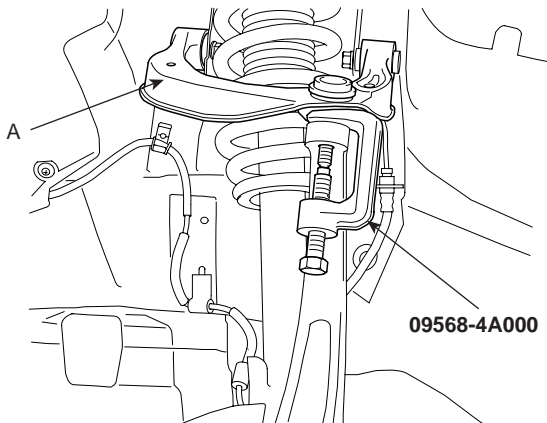
KIBF301E

7. Using a plastic hammer, disconnect the driveshaft from the axle hub.



EIRF0010

8. Loosen the upper arm mounting nut but do not remove it.
9. Using the special tool (09568-4A000), disconnect the knuckle from the upper arm assembly (A).

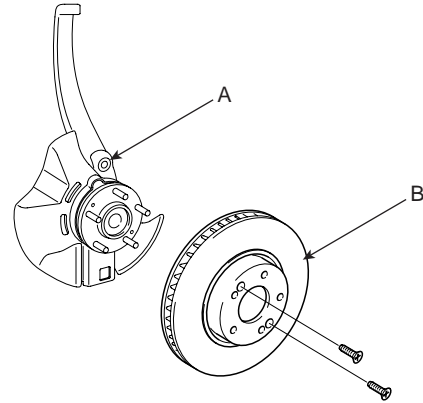


KIBF301F

10. Remove the front axle and knuckle together.
11. Installation is the reverse of removal.

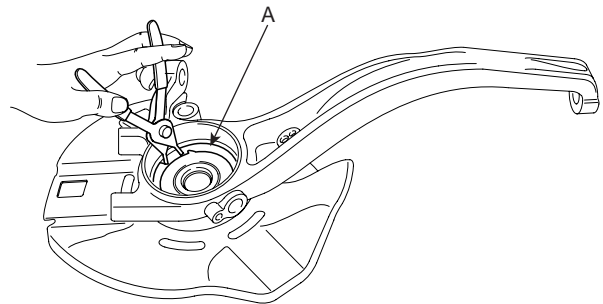
**DISASSEMBLY** E52FFF4B

1. Remove the brake disc (B) from the hub (A).



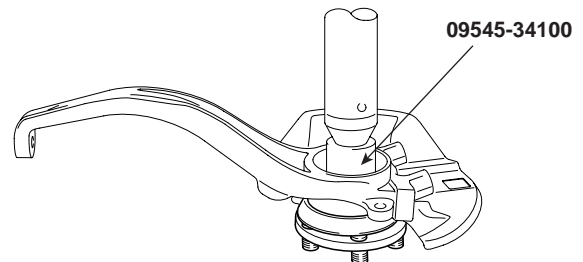
KIBF311B

2. Remove the snap ring (A).



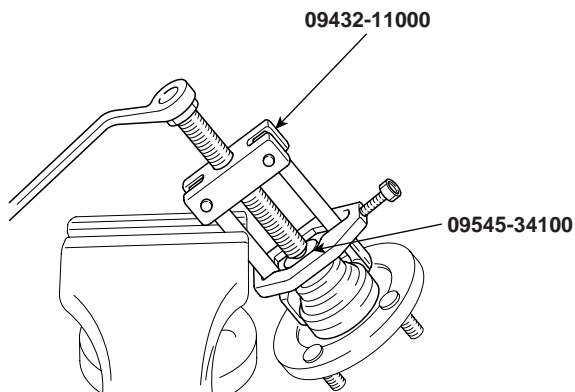
KIBF302A

3. Using the special tool (09545-34100), disconnect the hub from the knuckle.



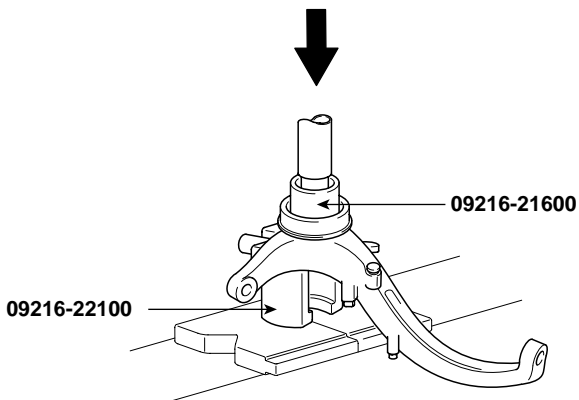
KIBF302B

4. Using the special tools (09432-11000, 09545-34100), remove the wheel bearing inner race from the hub.



EIRF002F

5. Using the special tools (09216-21600, 09216-22100), remove the wheel bearing outer race from the knuckle.



EIRF002G

**INSPECTION** ED2E59D9

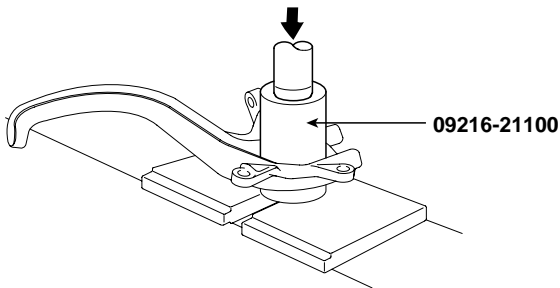
1. Check the hub for cracks and splines for wear.
2. Check the oil seal for cracks or damage.
3. Check the brake disc for scoring or damage.
4. Check the knuckle for cracks.
5. Check the bearing for cracks or damage.

REASSEMBLY EF6C3524

1. Apply a thin coat of multi-purpose grease to the knuckle and bearing contact surface.
2. Using the special tool (09216-21100), press-in the bearing to the knuckle.

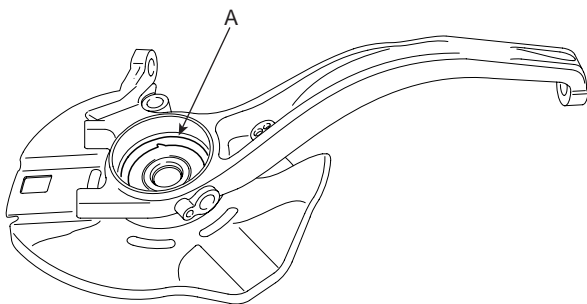
 **NOTE**

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



EIRF404A

3. Install the snap ring into the groove of the knuckle.

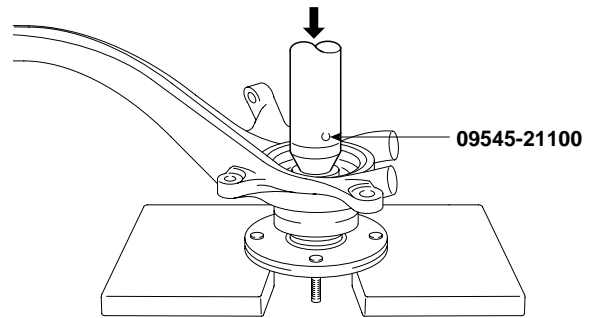


EIBF500E

4. Using the special tool (09545-21100), press the hub on to the knuckle.

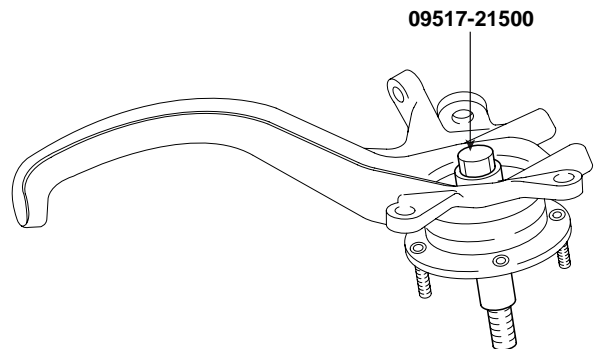
 **NOTE**

*Do not press against the outer race of the wheel bearing because that can cause damage to the bearing assembly.*



EIRF404B

5. Tighten the hub to the knuckle to 200 Nm (20 kgf-m, 148 lb-ft) with the special tool (09517-21500).



EIRF404C

6. Rotate the hub to seat the bearing.

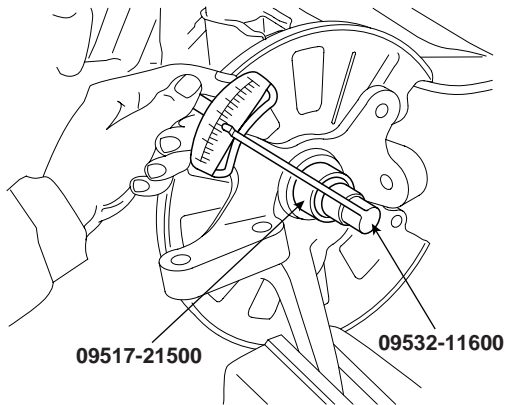
7. Measure the wheel bearing starting torque.

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**Standard value**

Starting torque : 1.8 Nm (0.18 kgf-m, 16 lb-ft) or less

---



EIRF404D

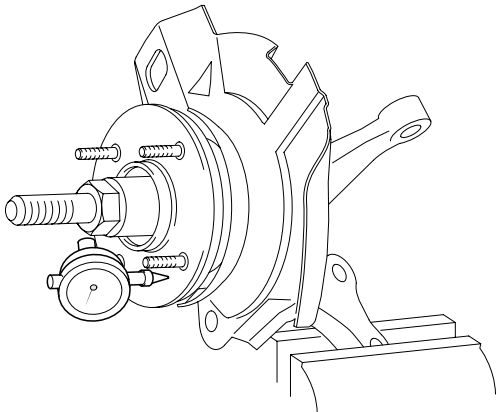
8. Fix a dial gauge and measure the hub end play. Check that it is within the standard value.

---

**Standard value**

Hub end play : 0.008 mm (0.0003 in) or less

---



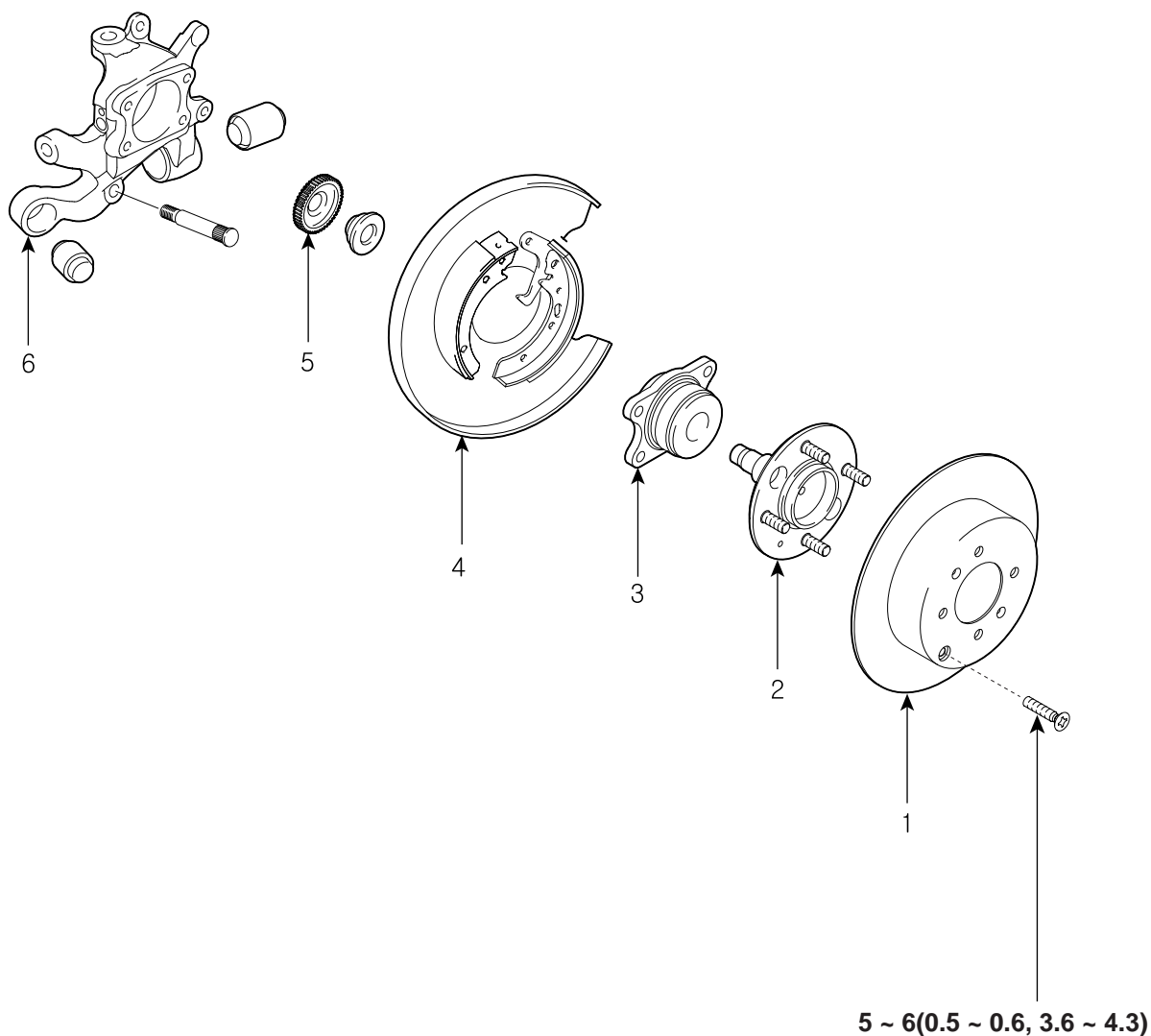
EIRF404E

9. Remove the special tool.
10. Install the disc to the hub.

# REAR AXLE

## REAR HUB / AXLE

### COMPONENTS EE544E61

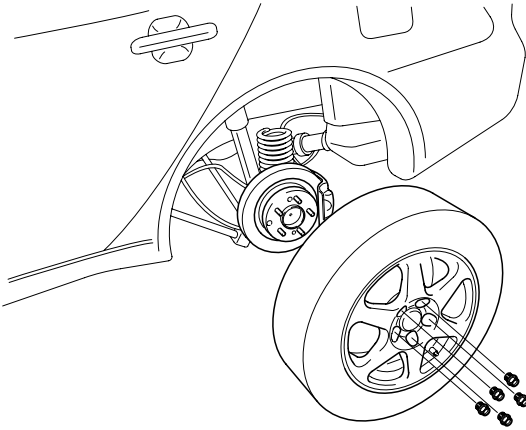


**TORQUE : Nm (kgf·m, lb-ft)**

- |                         |                            |
|-------------------------|----------------------------|
| 1. Brake disc           | 4. Brake assembly          |
| 2. Hub                  | 5. Tone wheel (ABS System) |
| 3. Hub bearing assembly | 6. Carrier assembly        |

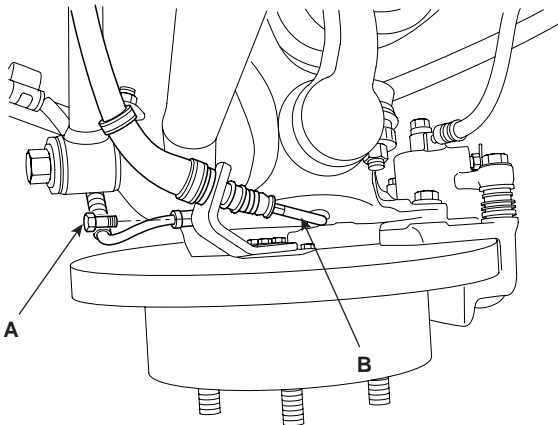
**REMOVAL** E23A2AED

1. Release the parking brake.
2. Remove the wheel & tire assembly.



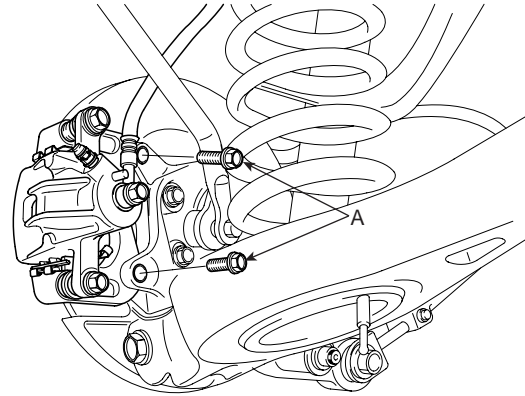
EIRF001L

3. Remove the wheel speed sensor bolt (A) and parking brake wire (B) from the carrier.

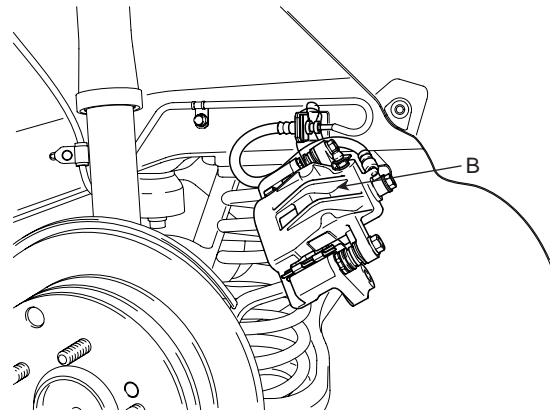


KIBF220A

4. After loosening the bolts (A), remove the caliper assembly (B) from the carrier assembly and suspend it with wire.

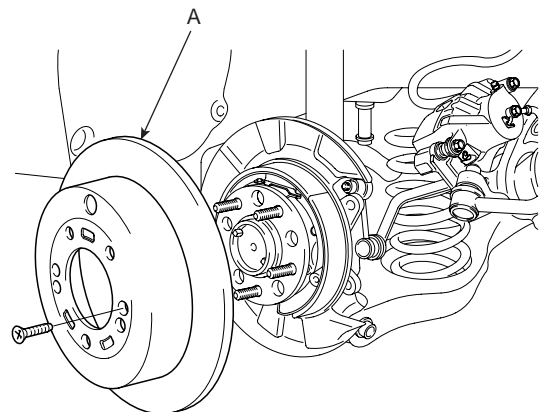


KHBF220F



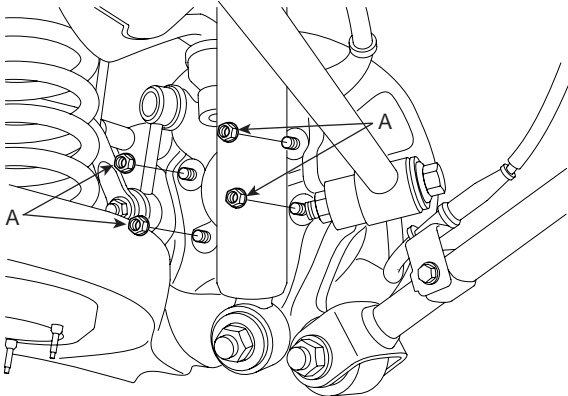
KHBF220G

5. Remove the brake disc (A).



KIBF401K

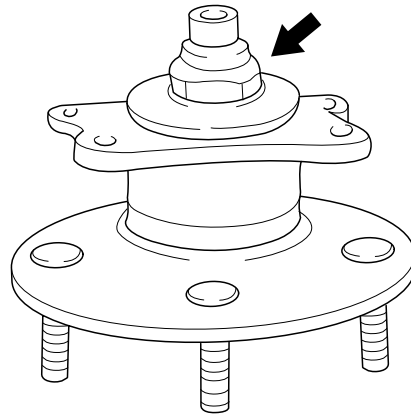
6. Remove the rear axle hub mounting bolts (A).



KIBF401A

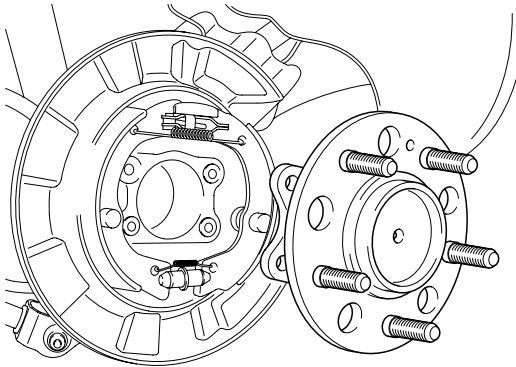
8. Remove the carrier assembly.

9. After unstaking the flange nut, remove the nut.

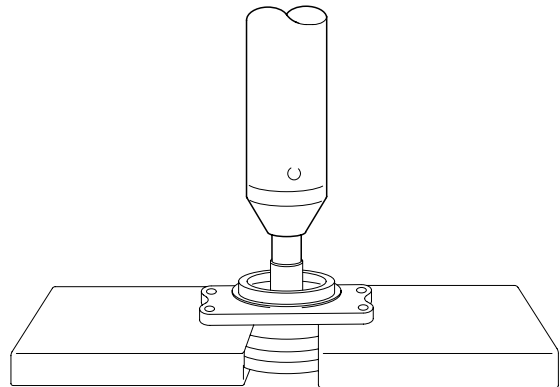


EIRF501C

10. While supporting the flange area of the bearing outer race, press out the rear axle hub.

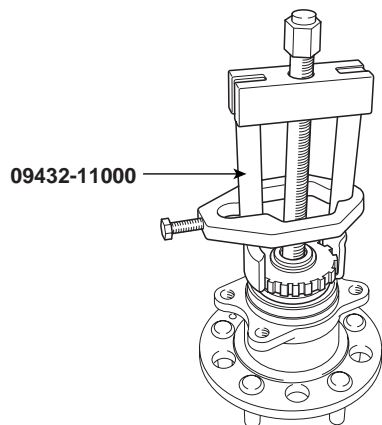


KIBF401G



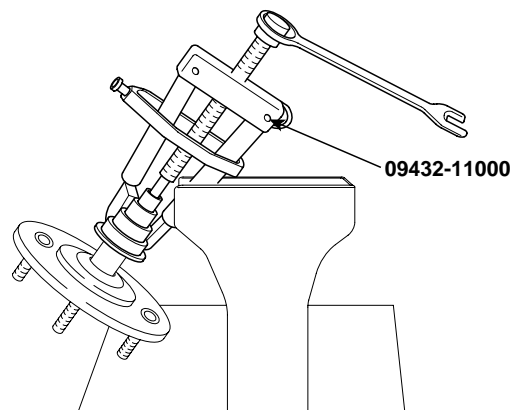
EIRF501D

7. Using the special tool (09432-11000), remove the tone wheel.



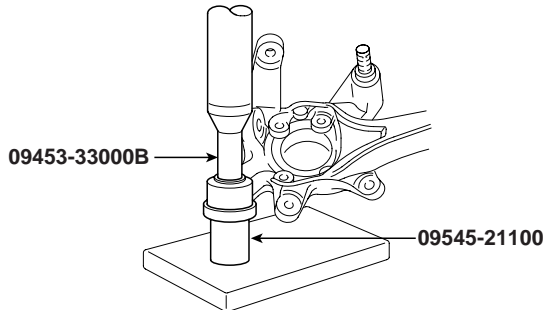
SGHDS6509D

11. Using the special tool (09432-11000), remove the bearing inner race from the axle hub.



EIRF501E

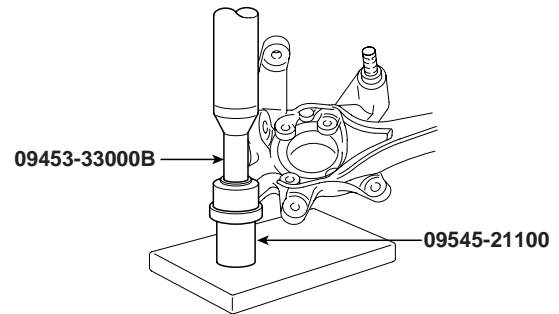
- Using the special tools (09453-33000B, 09545-21100), remove the 2 bushings from the carrier.



EIRF501F

**REASSEMBLY** E7E45962

- Using the special tools (09453-33000B, 09545-21100) press-in the 2 bushings to the carrier.

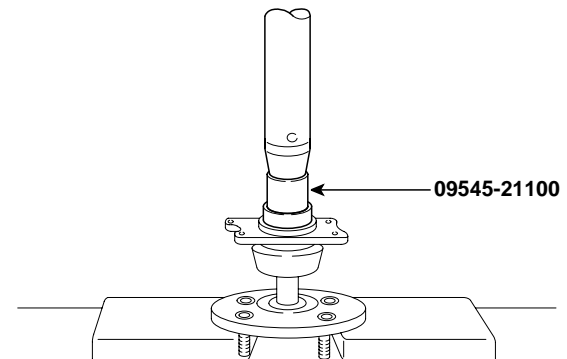


EIRF501F

**INSPECTION** EB89B00D

- Check the rear hub bearing for wear or damage.
- Check the rear tone wheel for chipped teeth.
- Check the hub inner surface for scoring.
- Check the carrier for cracks.

- Apply a thin coat of multi-purpose grease to the hub and bearing contact surface.
- Using the special tool (09545-21100), press-in the bearing to the hub.

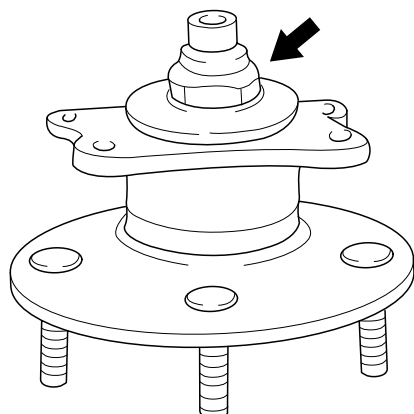


EIRF504C

**NOTE**

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

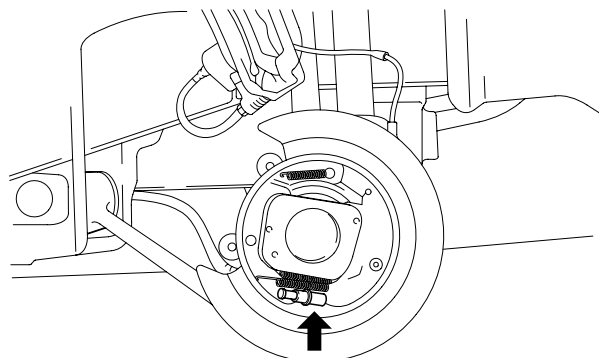
4. After tightening the flange nut, stake the nut to meet the concave portion of the spindle.



EIRF501C

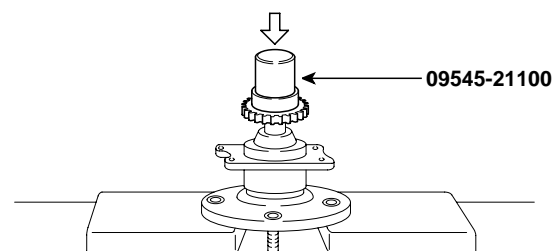
 **NOTE**

If it is difficult to fix, adjust the parking brake adjusting nut in clockwise direction to enlarge the space between the shoe and lining assembly.



EIRF504F

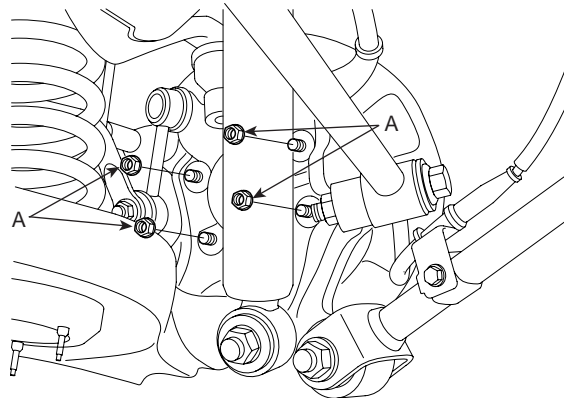
5. Using the special tool (09221-21000), press-in the tone wheel.



EIRF504D

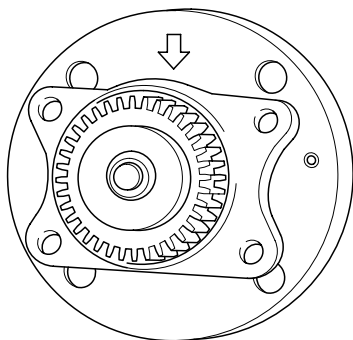
7. Tighten the 4 bolts (A) to the specified torque.

**Tightening Torque Nm(kgf.m, lb-ft) :**  
60 ~ 70(6 ~ 7, 44 ~ 52)



KIBF401A

6. Fix the hub and bearing assembly to the brake backing plate so that the rounded area of the bearing outer race is placed facing upward.



EIRF002I

8. Rotate the hub to seat the bearing.

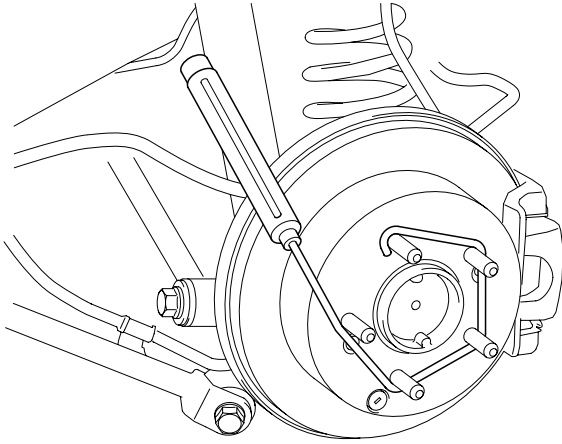
9. Using a spring balance, measure the wheel bearing starting torque.

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**Standard value**

Starting torque : 1.47 Nm (0.15 kgf.m, 1.1 lb-in) or less

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KIRE504A

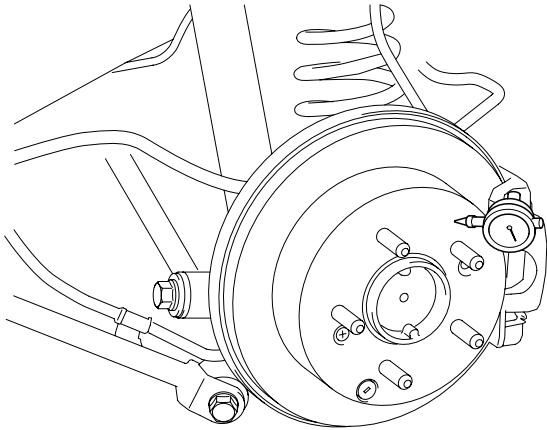
10. Fix a dial gauge and measure the hub end play. Check that it is within the standard value.

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**Standard value**

Hub axial play : 0.008 mm (0.0003 in) or less

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SGHDS6510D