# **Driveshaft and axle**

### **General Information**

#### **SPECIAL TOOLS**

Tool (Number and Name)	Illustration	Use
09568-4A000 Ball joint remover		Removal of the front lower arm and tie rod end ball joint
09517-21500 Front hub remover and installer		Removal and installation of front hub
09532-11600 Preload socket  (مسئوليت محدود)	شرکت دروسا	Measurement of the wheel bearing pre- load (use with torque wrench)
09216-21100 Mount bushing remover and installer		Removal of the center bearing     Press-fitting of the front wheel bearing outer race     (Use with 09495-33100, 09216-216 00)
09432-11000 Main shaft bearing puller		Removal of the tone wheel

# **General Information**

**DS-3** 

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

# **Driveshaft and axle**

#### TROUBLESHOOTING

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 خودرو در ایران	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	

# **General Information**

**DS-5** 

#### **SPECIFICATIONS**

Items		Specifications	
Driveshaft (RH, LH)	Joint type	Outer side	UFi
		Inner side	AARi
	Many manufacible and	Outer side	50°
	Max. permissible angle	Inner side	26°
Center bearing	Туре		Radial ball bearing
	Dimension	Outer diameter	Ø62
		Inner diameter	Ø30
Front wheel bearing	Туре		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

MOTICE

Inner side : On Transaxle side

Outer side : On Tire side

Ufi : Under Cut Free improved (GKN)

AARi : Angular Adjusted Roller improved (GKN)

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# **Driveshaft and axle**

#### **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.

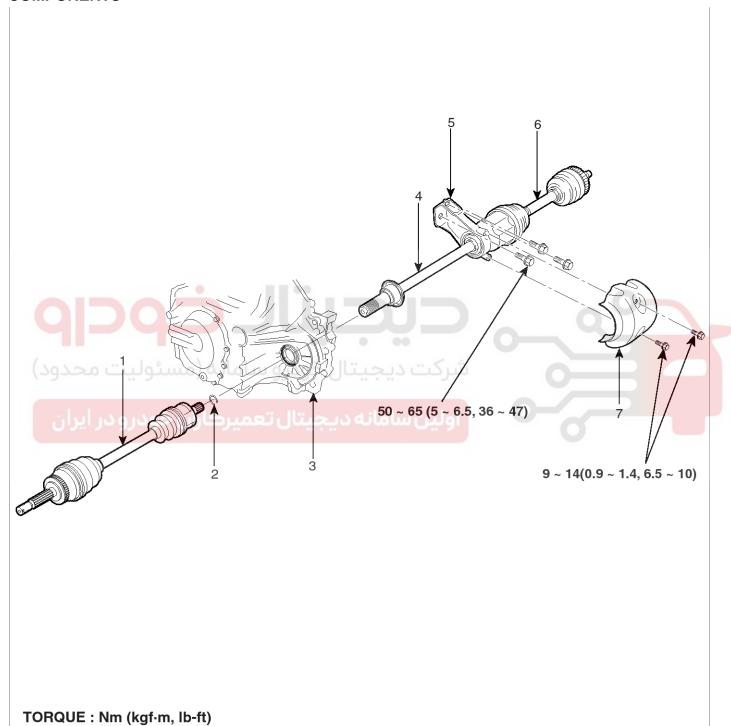
# **Driveshaft Assembly**

**DS-7** 

### **Driveshaft Assembly**

#### **Front Driveshaft**

#### **COMPONENTS**



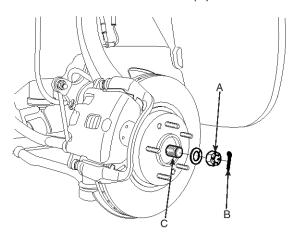
- 1. Driveshaft (LH)
- 2. Circlip
- 3. Transaxle
- 4. Inner shaft

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

SGHDS6500N

#### **REMOVAL**

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

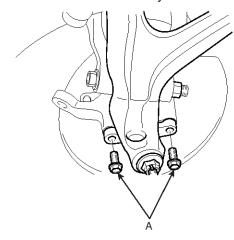


SGHDS6500D

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

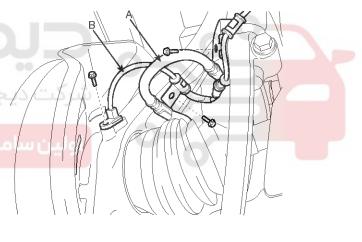


4. Remove the 2 bolts(A) and disconnect the knuckle from the lower arm assembly.

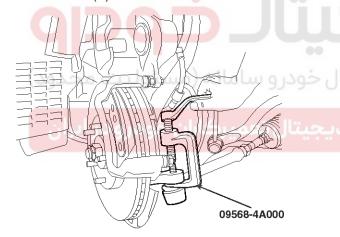


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5. Remove the brake hose (A) bracket and wheel speed sensor cable (B) bracket from the front strut assembly and knuckle.



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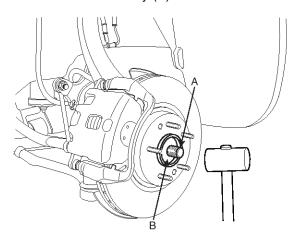


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## **Driveshaft Assembly**

**DS-9** 

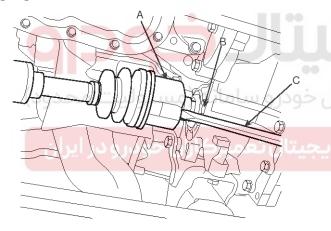
6. Using a plastic hammer, disconnect the driveshaft (A) from the axle assembly (B).



SGHDS6503D

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

[LH]



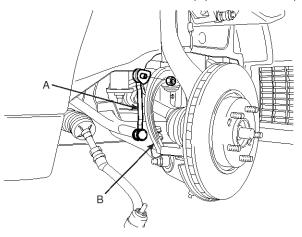
UIBG500D

#### 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.

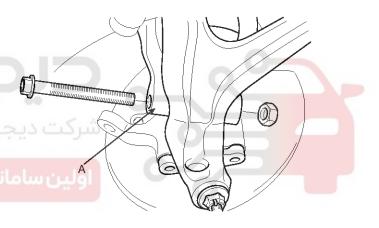
#### [RH]

a. Remove the stabilzer link (A) from the fork (B).



EIRF001F

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

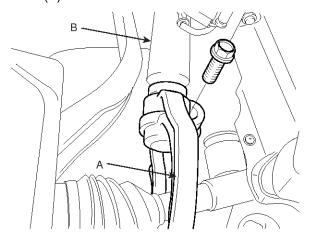


UIBG500E

#### **A**CAUTION

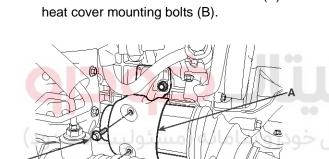
Be careful not to damage to the aluminum lower arm.

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



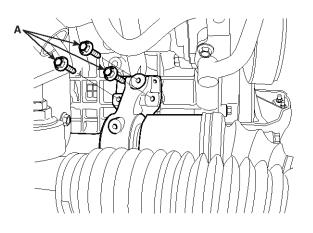
KHBF110D

d. Remove the inner shaft heat over (A) and the



SGHDS6513D

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



SGHDS6514D

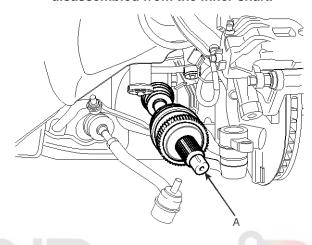
### **Driveshaft and axle**

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

#### CAUTION

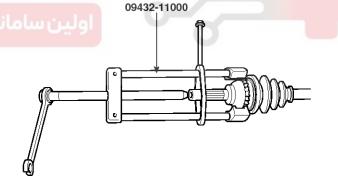
Do not try to disconnect the inner shaft from the driveshaft. Because they can not be disconnected once assembled.

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

# **Driveshaft Assembly**

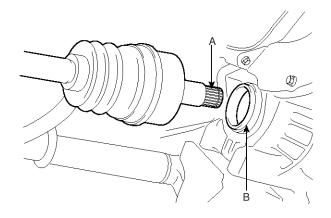
**DS-11** 

#### **INSTALLATION**

#### **ACAUTION**

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

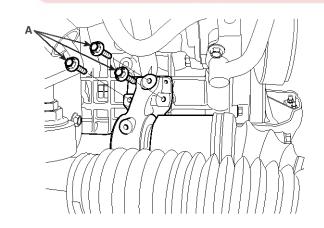
After installation, check if the drive shaft cannot be removed.

#### [RH]

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

### Tightening Torque Nm(kgf.m, lb-ft):

 $50 \sim 65(5 \sim 6.5, 36 \sim 47)$ 

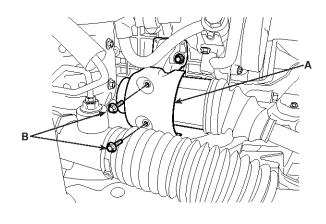


SGHDS6514D

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

#### **Tightening Torque Nm(kgf.m, lb-ft):**

 $9 \sim 14(0.9 \sim 1.4, 6.5 \sim 10)$ 

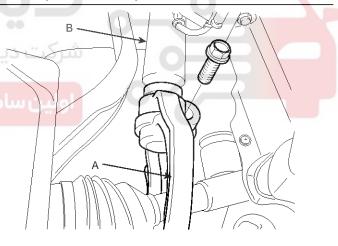


SGHDS6513D

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

### Tightening Torque Nm(kgf.m, lb-ft) :

 $60 \sim 80(6 \sim 8, 44 \sim 59)$ 

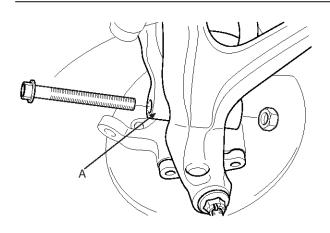


KHBF110D

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

### Tightening Torque Nm(kgf.m, lb-ft) :

140 ~ 160(14 ~ 16, 101 ~ 118)

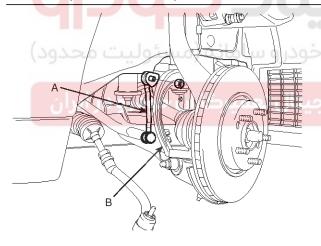


UIBG500E

e. Install the stabilizer link (A) to the frok (B).

#### Tightening Torque Nm(kgf.m, lb-ft):

100 ~ 120(10 ~ 12, 74 ~ 88)



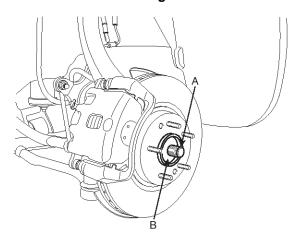
EIRF001F

### **Driveshaft and axle**

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

#### **A**CAUTION

Be careful not to damage the boot.

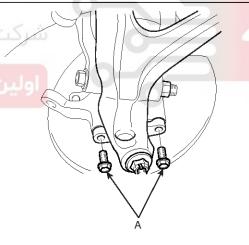


SGHDS6511D

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

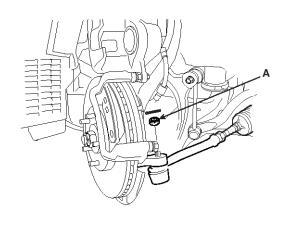
## **Driveshaft Assembly**

**DS-13** 

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

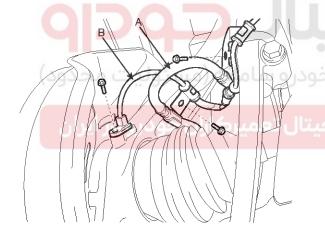
Tightening Torque Nm(kgf.m, lb-ft):

 $24 \sim 34(2.4 \sim 3.4, 18 \sim 25)$ 



KHBF140G

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

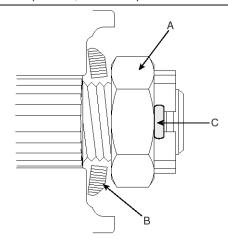


SGHDS6501D

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

#### Tightening Torque Nm(kgf.m, lb-ft):

200~280 (20~28, 148~207)

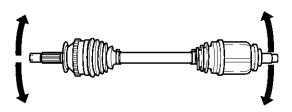


KIBF105D

8. Install the wheel & tire assembly.

#### INSPECTION

- 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

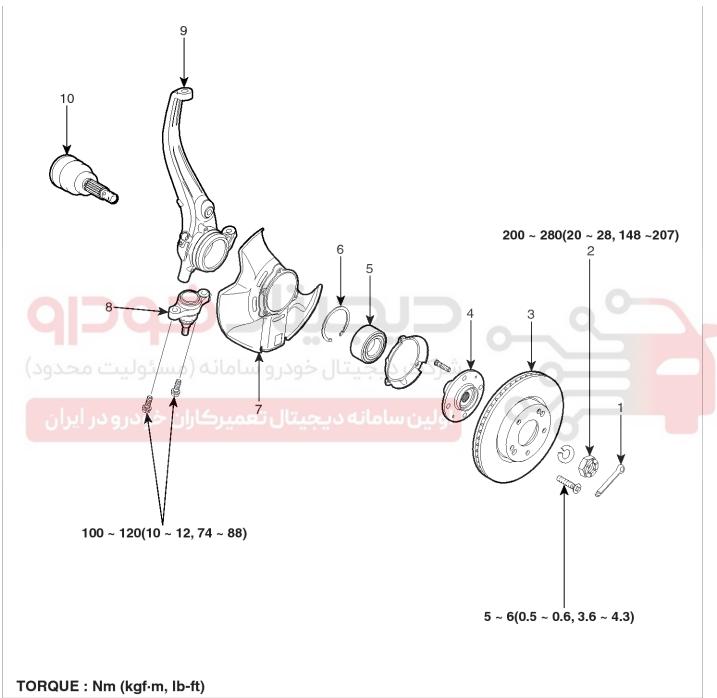
5. If the driveshaft is dmaged, replace the driveshaft assembly.

## **Driveshaft and axle**

### **Front Axle Assembly**

#### Front Hub - Axle

#### **COMPONENTS**



- 1. Split pin
- 2. Driveshaft nut
- 3. Brake disc
- 4. Hub
- 5. Wheel bearing

- 6. Snap ring
- 7. Dust cover
- 8. Lower arm ball joint
- 9. Knuckle
- 10. Driveshaft

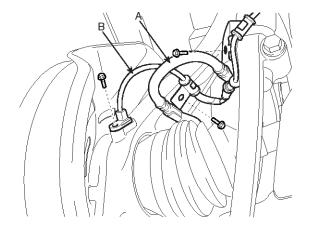
EIBF500C

# **Front Axle Assembly**

**DS-15** 

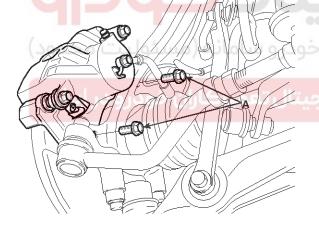
#### **REMOVAL**

- 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.

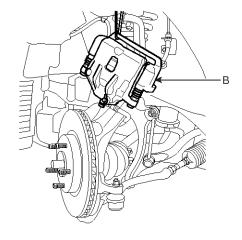


SGHDS6501D

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

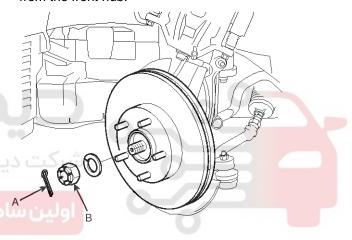


KIBF311A



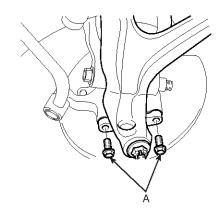
KIBF301A

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



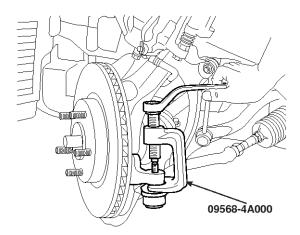
KIBF301B

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.

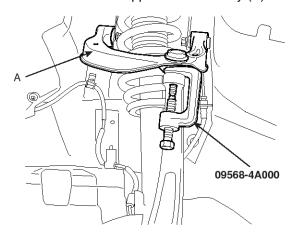


EIRF001O

8. Loosen the upper armmounting nut but do not remove it.

### **Driveshaft and axle**

9. Using the special tool (09568-4A000), disconnect the knuckle from the upper arm assembly (A).

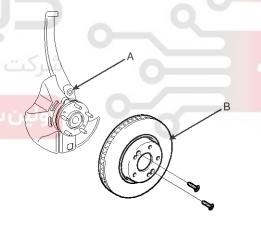


KIBF301F

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

#### **DISASSEMBLY**

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

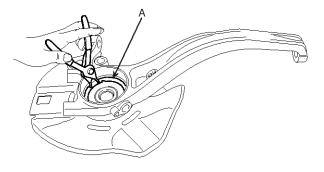


KIBF311B

## **Front Axle Assembly**

**DS-17** 

2. Remove the snap ring (A).



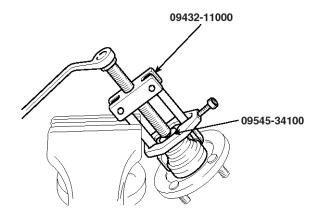
KIBF302A

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



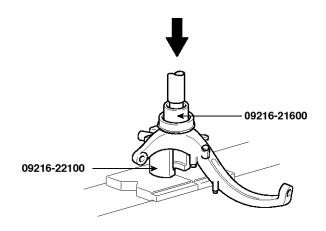
KIBF302B

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**

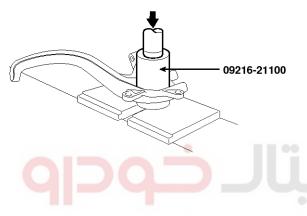
- 1. Check the hub for cracks and splines for wear.
- 2. Check the oil seal for cracks or damage.
- 3. Check the brake disc for scoring or damage.
- 4. Check the knuckle for cracks.
- 5. Check the bearing for cracks or damage.

#### **REASSEMBLY**

- 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.

#### MOTICE

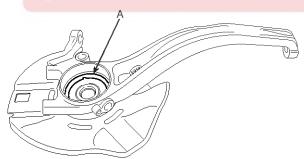
- Do not press against the inner race of the wheel bearing because that can cause damage to the bearing assembly.
- · Always use a new bearing assembly.



EIRF404A

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

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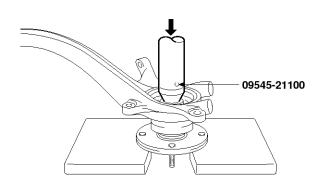
EIBF500E

### **Driveshaft and axle**

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

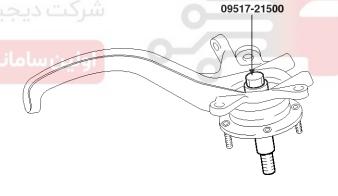
#### MOTICE

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.

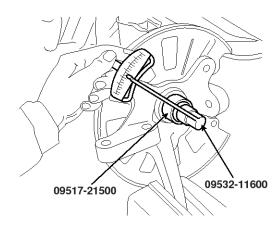
# **Front Axle Assembly**

**DS-19** 

7. Measure the wheel bearing starting torque.

#### 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

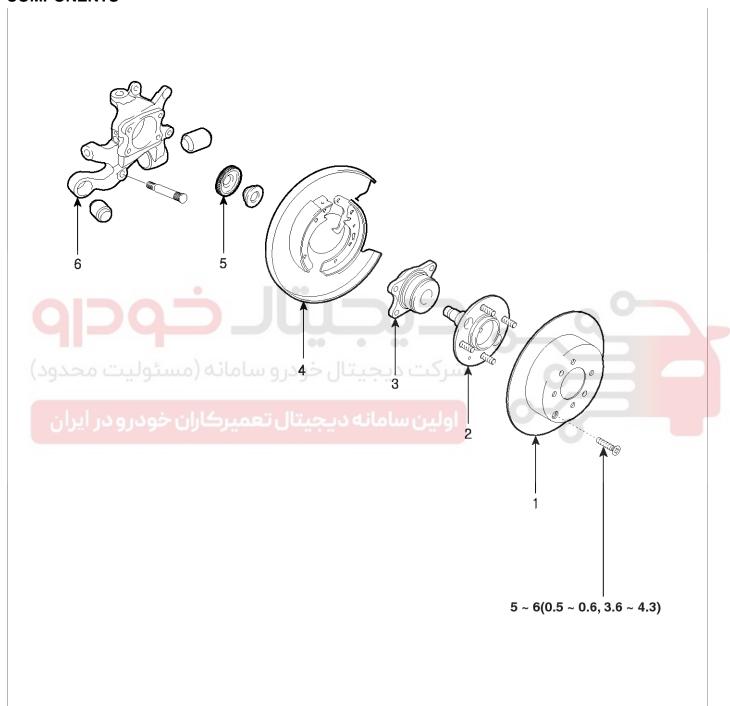
- 9. Remove the special tool.
- 10. Install the disc to the hub.

### **Driveshaft and axle**

### **Rear Axle Assembly**

Rear Hub - Axle

**COMPONENTS** 



- 1. Brake disc
- 2. Hub
- 3. Hub bearing assembly

TORQUE: Nm (kgf-m, lb-ft)

- 4. Brake assembly
- 5. Tone wheel (ABS System)
- 6. Carrier assembly

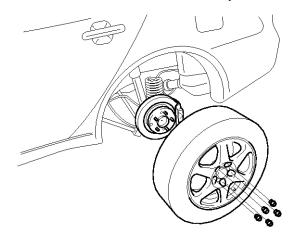
EIBF500D

# **Rear Axle Assembly**

### **DS-21**

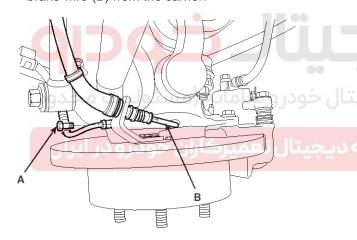
#### **REMOVAL**

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



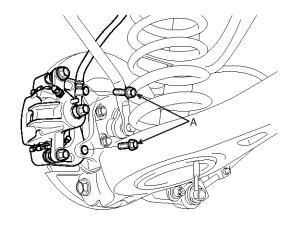
EIRF001L

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

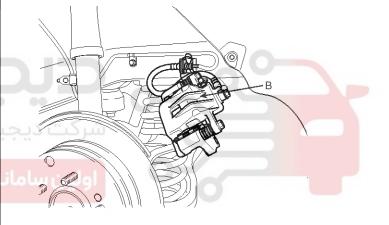


KIBF220A

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

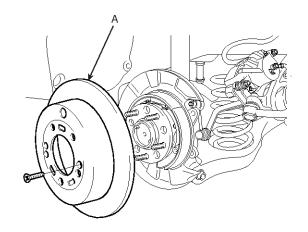


KHBF220F



KHBF220G

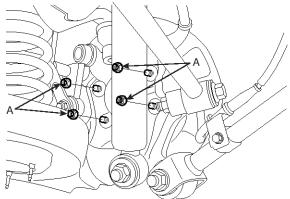
5. Remove the brake disc (A).



KIBF401K

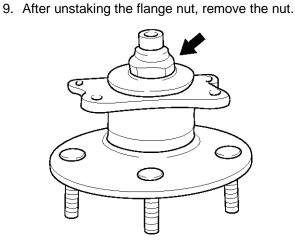
### **Driveshaft and axle**

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



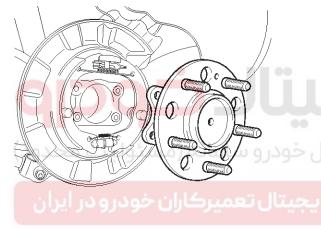


KIBF401A



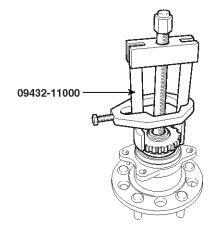
EIRF501C

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



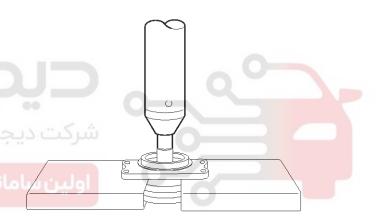
KIBF401G

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



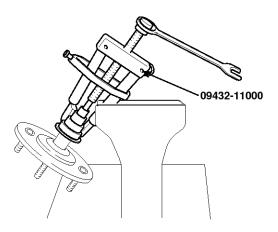
SGHDS6509D

8. Remove the carrier assembly.



EIRF501D

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

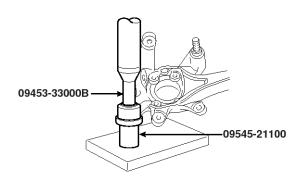


EIRF501E

# **Rear Axle Assembly**

**DS-23** 

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



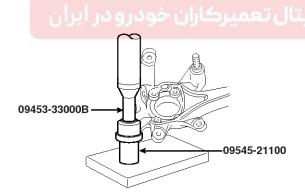
EIRF501F

#### **INSPECTION**

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

#### **REASSEMBLY**

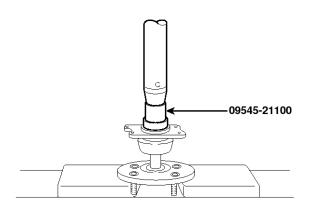
1. Using the special tools (09453-33000B, 09545-21100) press-in the 2 bushings to the carrier.



EIRF501F

2. Apply a thin coat of multi-purpose grease to the hub and bearing contact surface.

3. Using the special tool (09545-21100), press-in the bearing to the hub.



EIRF504C

#### MOTICE

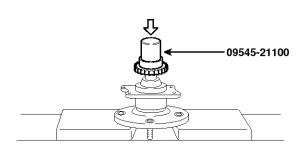
- Do not press against the outer race of the bearing because that can cause damage to the bearing assembly.
- · Always use a new bearing assembly.
- 4. After tightening the flange nut, stake the nut to meet the concave portion of the spindle.



EIRF501C

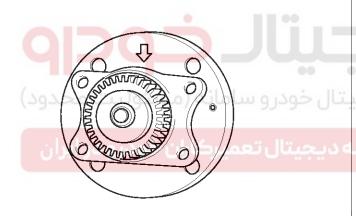
### **Driveshaft and axle**

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



EIRF504D

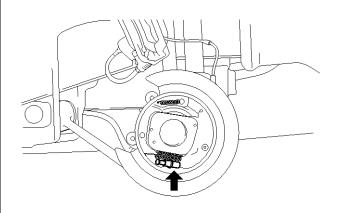
6. Fix the hub and bearing assembly to the brake backing plate so that the rounded area of the bearing outer race is placed facing upward.



EIRF002I

#### **MNOTICE**

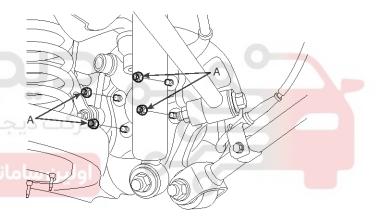
If it is difficult to fix, adjust the parking brake adjusting nut in clockwise direction to enlarge the space between the shoe and lining assembly.



EIRF504F

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

Tightening Torque Nm(kgf.m, lb-ft) :  $60 \sim 70(6 \sim 7, 44 \sim 52)$ 



KIBF401A

8. Rotate the hub to seat the bearing.

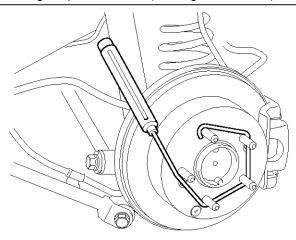
# **Rear Axle Assembly**

**DS-25** 

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

#### Standard value

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



KIRE504A

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

#### Standard value

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

