General Information

Specifications

Items		Inner side	Outer side
Rear driveshaft	Joint type	Cross grove(VL)	Cross grove(VL)
	Max. permissible angle	21°	21°
Differential	Oil type	Hypoid gear oil(API GL-5, SAE 80W/90)	
	Oil capacity (L)	About0.75~0.80	
	Reduction gear type	Hypoid gear	
	Reduction gear ratio	3.091	
	Final drive gear backlashmm(in.)	0.10 ~ 0.15	
	Differential gear backlashmm(in.)	0 ~ 0.076	

Tightening Torques

Items		Nm	Kgf-m	lb-ft
Front	Wheel nut	88.3~107.9	9~11	65.1~79.6
	Driveshaft castle nut	196.1~255.0	20~26	144.7~188.1
	Strut assembly lower mounting bolt	152.0~171.6	15.5~17.5	112.1~126.6
	Inner shaft bearing bracket bolt	49.0~68.6	5~7	36.2~50.6
	Brake caliper mounting bolt	78.5~98.1	8~10	57.9~72.3
	Wheel speed sensor mounting bolt	6.9~10.8	0.7~1.1	5.1~8.0
	Brake disc mounting screw	4.9~5.9	0.5~0.6	3.6~4.3
	Hub assembly mounting bolt	78.5~98.1	8~10	57.9~72.3
	Lower arm ball joint mounting bolt	98.1~117.7	10~12	72.3~86.8
	Tie rod end ball joint mounting nut	23.5~33.3	2.4~3.4	17.4~24.6
Rear	Wheel nut	88.3~107.9	9~11	65.1~79.6
	Driveshaft castle nut	196.1~255.0	20~26	144.7~188.1
	Shock absorber upper mounting bolt	137.3~156.9	14~16	101.3~115.7
	Shock absorber upper mounting nut	98.1~117.7	10~12	72.3~86.8
	Brake caliper mounting bolt	63.7~73.5	8~10	47.0~54.2
	Wheel speed sensor mounting bolt	6.9~10.8	0.7~1.1	5.1~8.0
	Brake disc mounting screw	4.9~5.9	0.5~0.6	3.6~4.3
	Hub assembly mounting bolt	78.5~88.3	8~9	57.9~65.1
	Upper arm ball joint mounting nut	78.5~88.3	8~9	57.9~65.1
	Lower arm mounting bolt	137.3~156.9	14~16	101.3~115.7
	Assist arm ball joint mounting nut	98.1~117.7	10~12	72.3~86.8
	Trailing arm mounting bolt	137.3~156.9	14~16	101.3~115.7

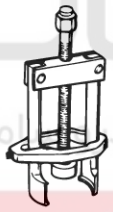
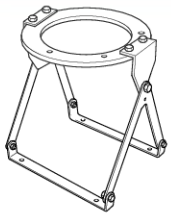
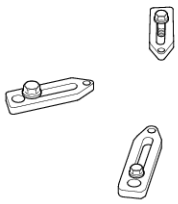
Items		Nm	Kgf-m	lb-ft
Propellersha-ft	Front propeller shaft mounting bolt	49.0~68.6	5~7	36.2~50.6
	Propeller shaft center bearing bracket mounting bolt	39.2~49.0	4~5	28.9~36.2
	Rear propeller shaft mounting bolt	49.0~68.6	5~7	36.2~50.6
Differential	Rear differential mounting bolt	68.6~88.3	7~9	50.6~65.1
	Differential cover mounting bolt	39.2~49.0	4~5	28.9~36.2

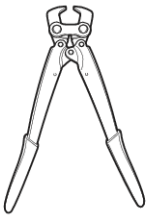
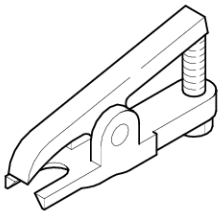
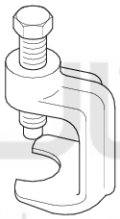
CAUTION
Replace self-locking nuts with new ones after removal.

Lubricants

Items		Lubricants	Quantity
Rear driveshaft	Cross grove(VL)	2L~584/LD	85±10g
	Cross grove(VL)	2L~584/LD	85±10g

Special Service Tools

Tool (Number and Name)	Illustration	Use
09495-33000 Puller	 D9533000	Removal of spider assembly from a drive shaft.
09517-43101 Working base	 E1743101	Support for the differential carrier
09517-43500 Adapter	 E1743500	Support for the differential carrier (Use with 09517-43101)

Tool (Number and Name)	Illustration	Use
09495-3K000 Band installer	 KINF500C	Installation of ear type boot band
09568-34000 Ball joint remover	 E6834000	Removal of the rear upper arm ball joint
09568-4A000 Ball joint remover	 KPRE103I	Removal of the front lower arm and tie rod end ball joint

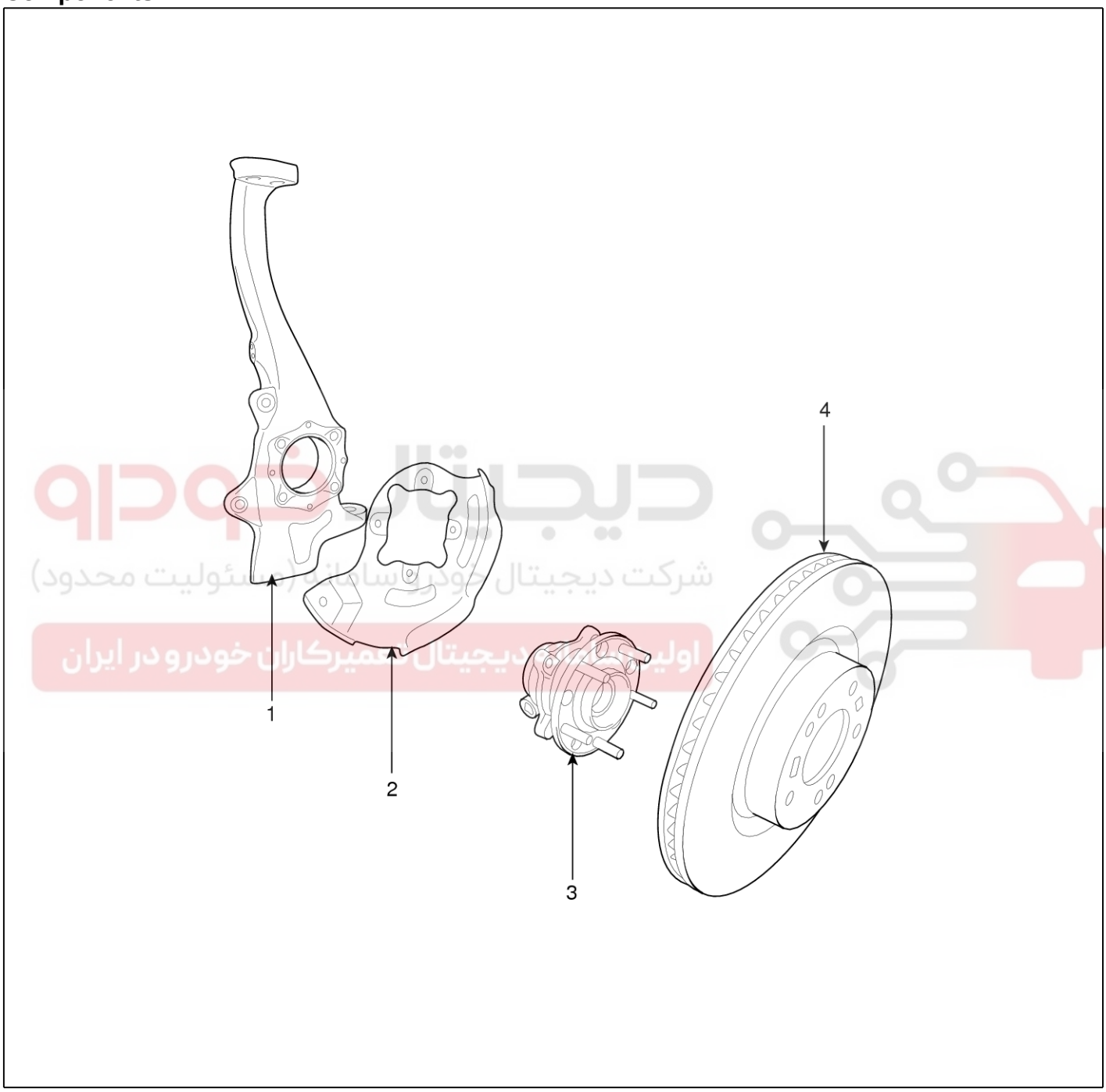
Troubleshooting

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

Front Axle Assembly

Front Hub - Axle

Components



SBHDS8001D

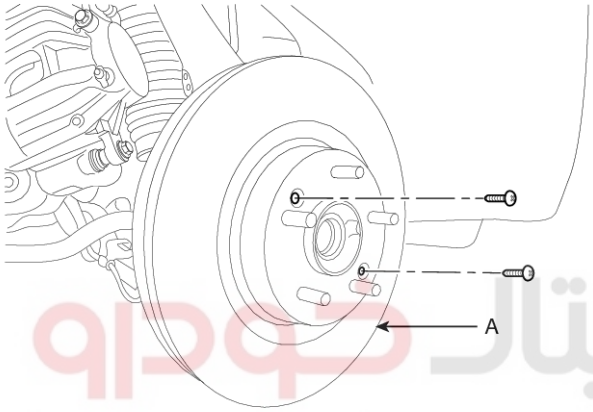
1. Front knuckle assembly
2. Dust cover
3. Hub assembly
4. Brake disc

Replacement

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

   CAUTION
   Be careful not to damage to the hub bolts when removing the front wheel and tire .
3. Loosen the mounting screw and then remove the brake disc(A).

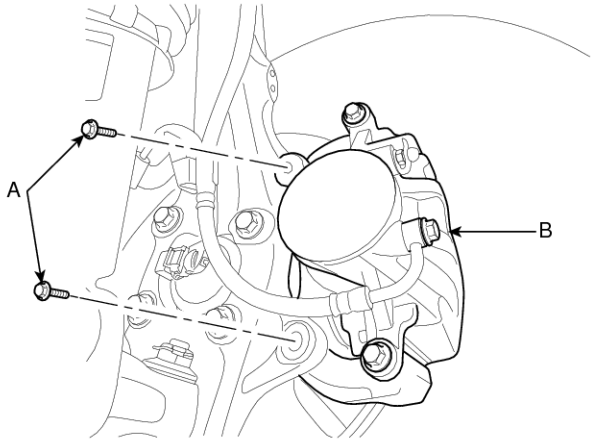
Tightening torque :
5~6N.m (0.5~0.6kgf.m, 3.6~4.3lb-ft)



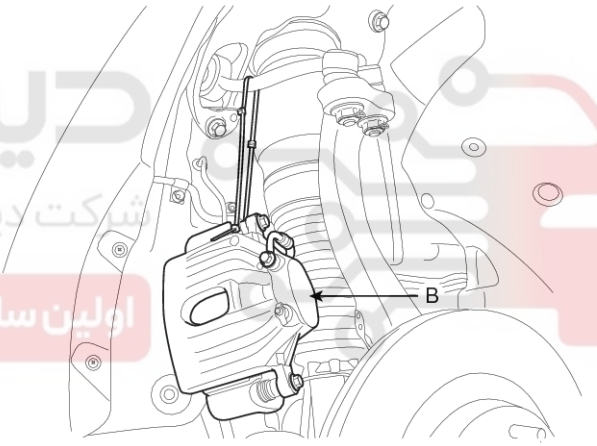
SBHDS8002D

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

Tightening torque :
80~100N.m (8.0~10.0kgf.m, 57.8~72.3lb-ft)



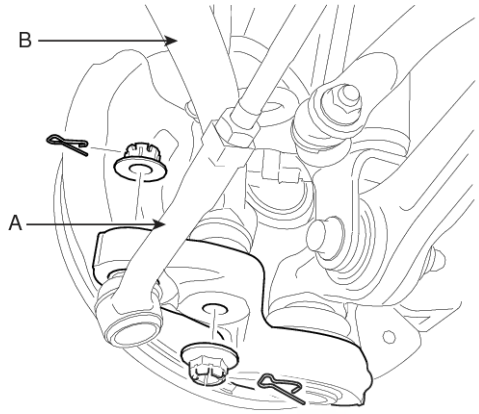
SBHDS8003D



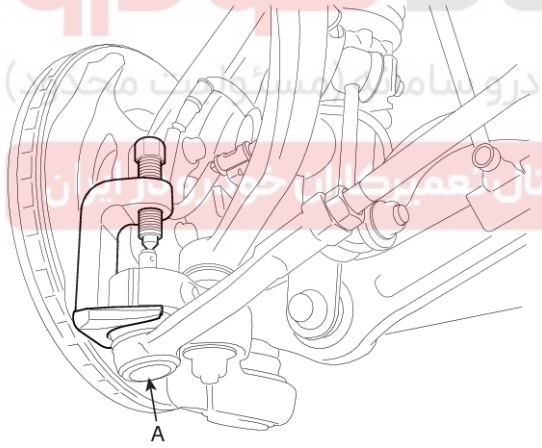
SBHDS8004D

5. Remove the tie rod end ball joint from the knuckle.
   1) Remove the split pin.
   2) Remove the castle nut.
   3) Disconnect the ball joint(A) from knuckle(B) using the special tool (09568-4A000).

Tightening torque :
85~110N.m (8.5~11.0kgf.m, 61.4~79.5lb-ft)



SBHDS8304D

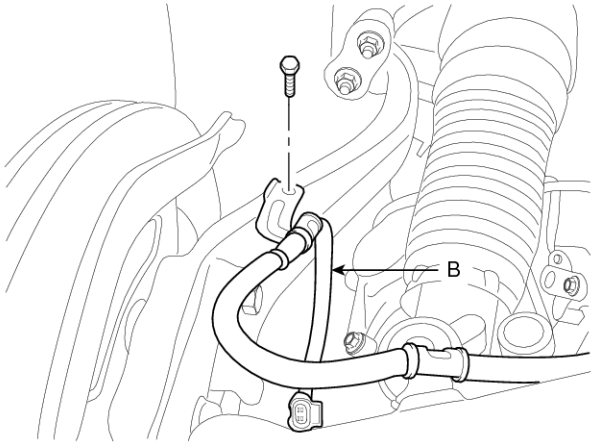


SBHDS8305D

⚠CAUTION
Apply a few drops of oil to the special tool. (Boot contact part)

6. Remove the wheel speed sensor(B), the strut lower mounting bolt and the lower arm mounting bolt from the knuckle.

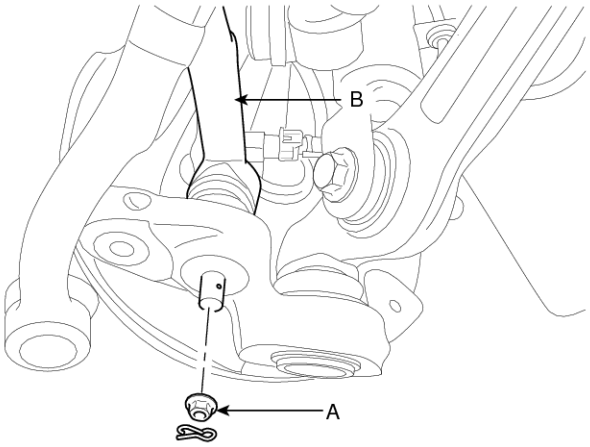
Tightening torque :
6.9~10.8N.m (0.7~1.1kgf.m, 5.1~8.0lb-ft)



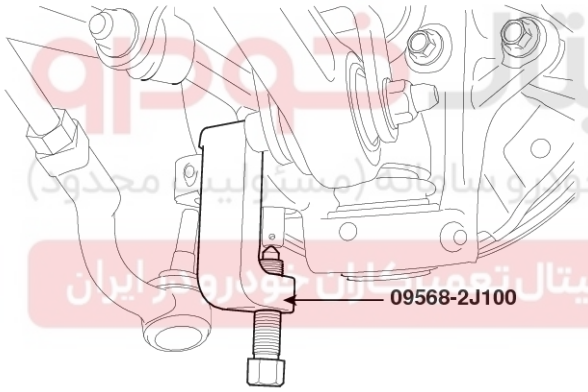
SBHDS8007D

7. Loosen the tension arm mount bolt(A), and then remove the tension arm(B).

Tightening torque :
140~160N.m (14.0~16.0kgf.m, 101.2~115.7lb-ft)



SBHDS8008D

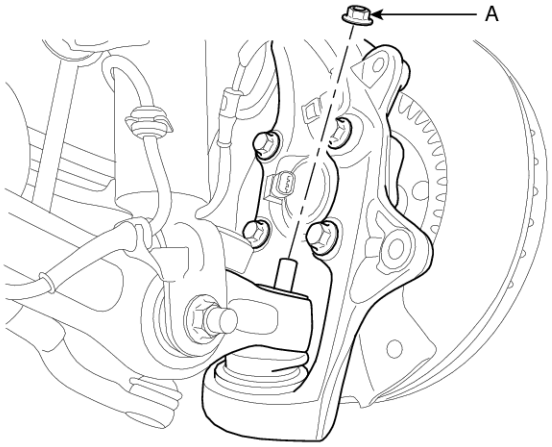


SBHDS8306D

⚠CAUTION
Be careful not to damage the boot and rotor teeth.

8. Loosen the lateral mount nut(A).

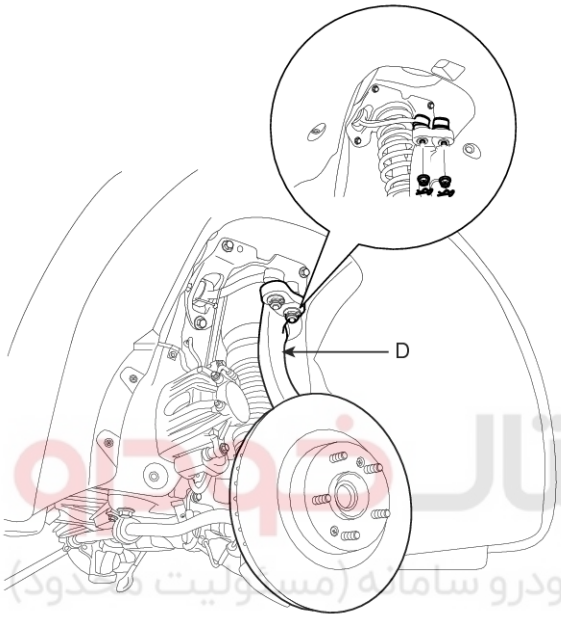
Tightening torque :
90~110N.m (9~11kgf.m, 65~79.5lb-ft)



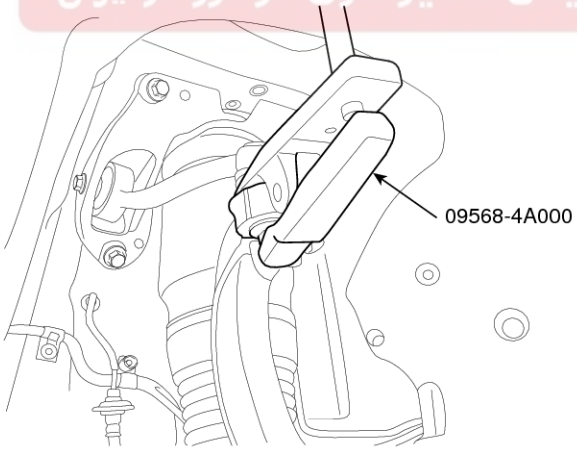
SBHDS8010D

9. Remove the hub and knuckle assembly.
   1) Remove the split pin.
   2) Remove the castle nut.
   3) Disconnect the ball joint from knuckle(D) using the special tool (09568-4A000).

Tightening torque :
35~45N.m (3.5~4.5kgf.m, 25.3~32.5lb-ft)



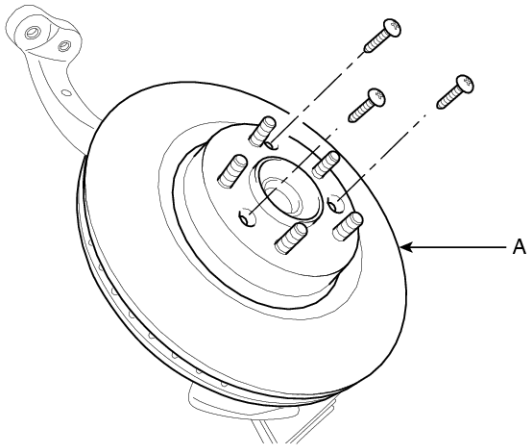
SBHDS8307D



SBHDS8012D

10. Remove the brake disc(A) from knuckle assembly.

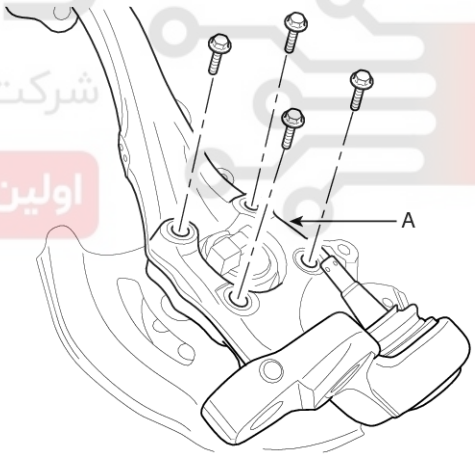
Tightening torque :
5~6N.m (0.5~0.6kgf.m, 3.6~4.3lb-ft)



SBHDS8013D

11. Remove the hub assembly(A) from knuckle assembly.

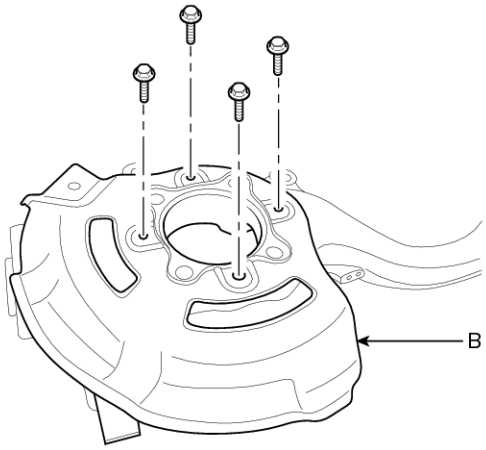
Tightening torque :
80~100N.m (8.0~10.0kgf.m, 57.8~72.3lb-ft)



SBHDS8014D

12. Loosen the dust cover mount bolts and then remove the dust cover(B).

Tightening torque :
7~11N.m (0.7~1.1kgf.m, 5.0~7.9lb-ft)



SBHDS8015D

13. Installation is the reverse order of removal.

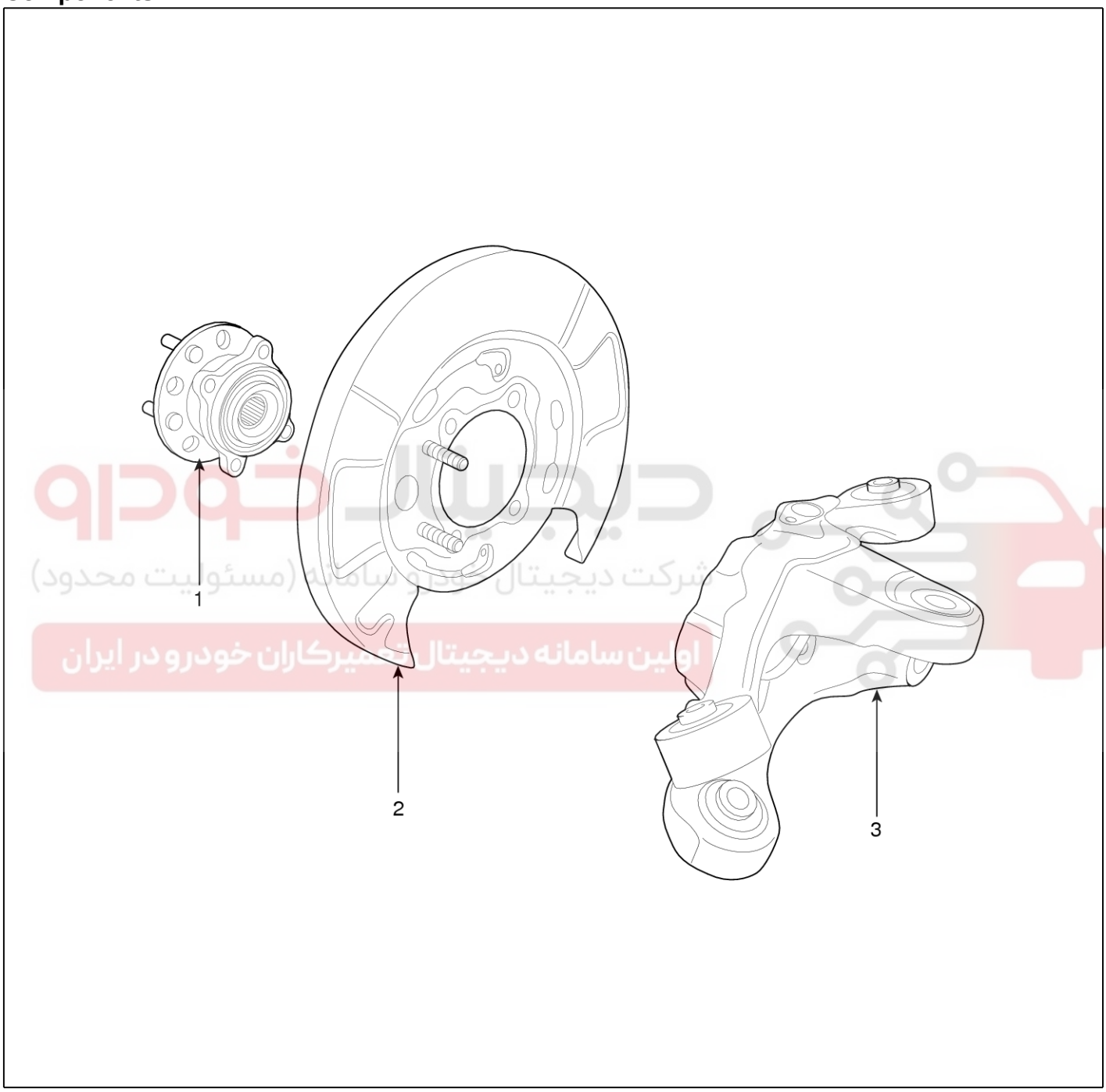
Inspection

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

Rear Axle Assembly

Rear Hub - Carrier

Components



SBHDS8016D

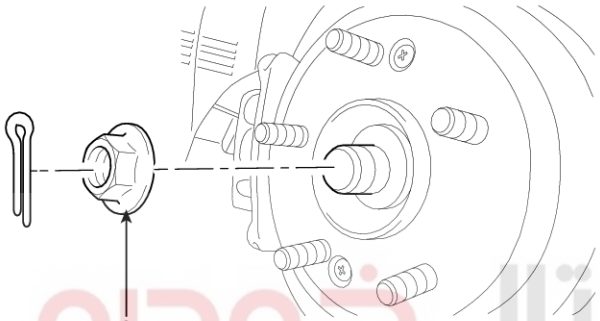
1. Rear hub assembly
2. Dust cover
3. Rear knuckle

Replacement

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

   CAUTION
   Be careful not to damage to the hub bolts when removing the rear wheel and tire .
3. Remove the split pin(, then remove castle nut(A) and washer from the front hub under applying the break.

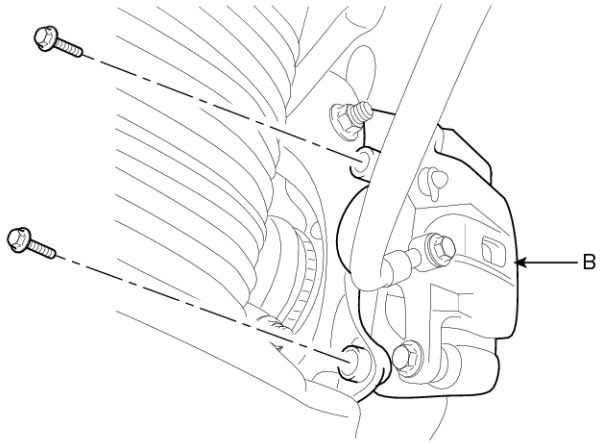
Tightening torque :
200~280N.m (20.0~28.0kgf.m, 144.6~202.5lb-ft)



SBHDS8017D

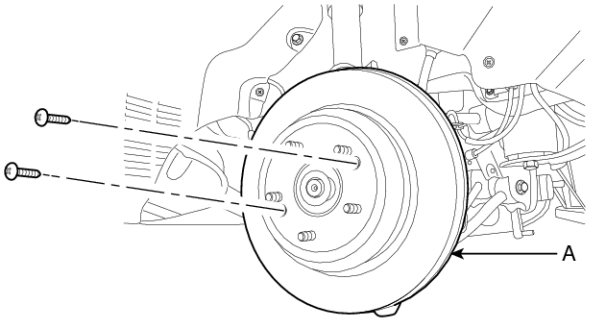
4. Remove the brake caliper mounting bolts (A), and then place the brake caliper assembly (B) with wire as shown in the illustration.

Tightening torque :
80~100N.m (8.0~10.0kgf.m, 57.8~72.3lb-ft)



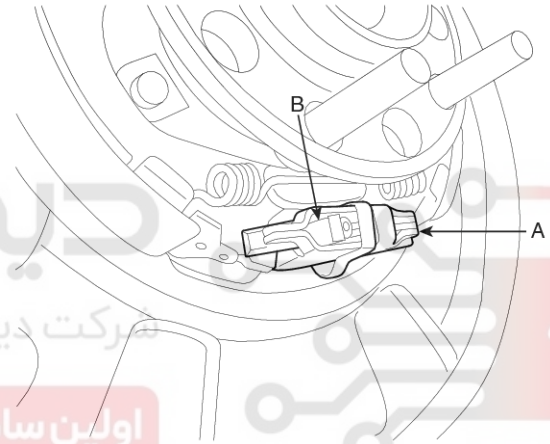
SBHDS8018D

5. Remove the rear brake disc(A).

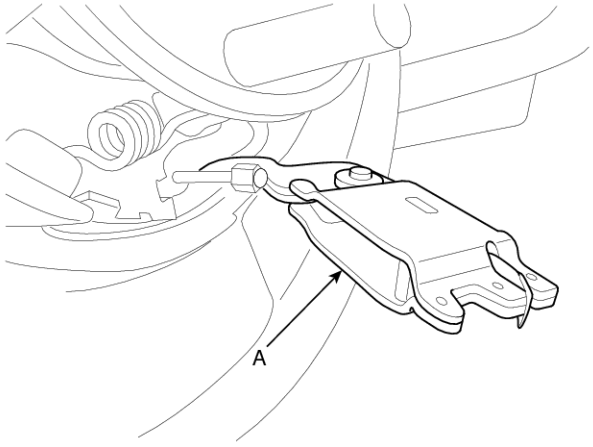


SBHDS8019D

6. Disconnect the parking brake cable and(A). From operating lever(B).



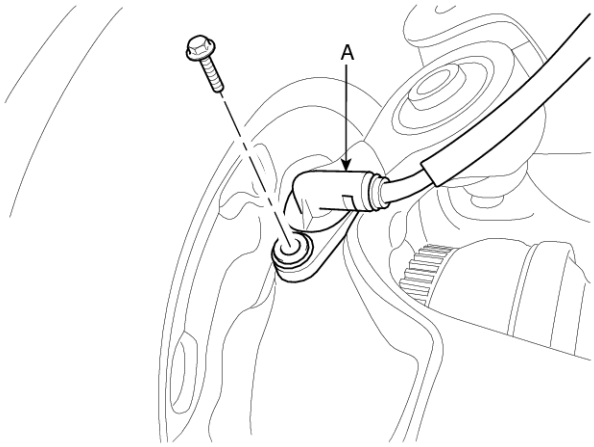
SBHDS8020D



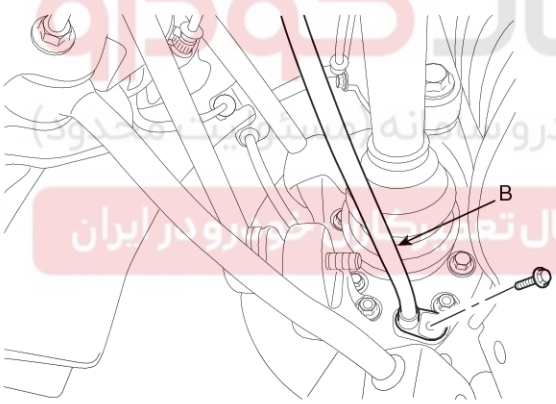
SBHDS8021D

7. Remove the rear brake lining(refer th BR group-rear brake).
8. Remove the wheel speed sensor(A) and the parking brake cable(B) from the rear axle carrier.

Tightening torque :
7~11N.m (0.7~1.1kgf.m, 5.0~7.9lb-ft)



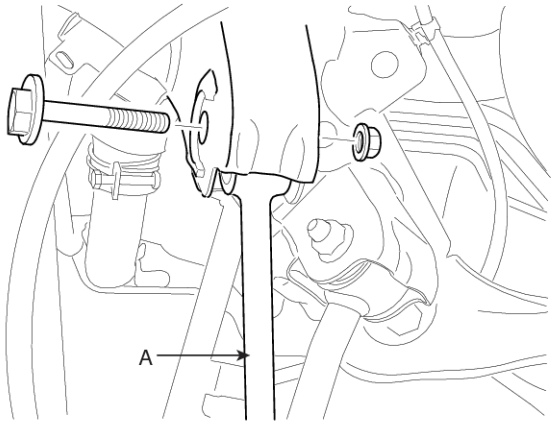
SBHDS8022D



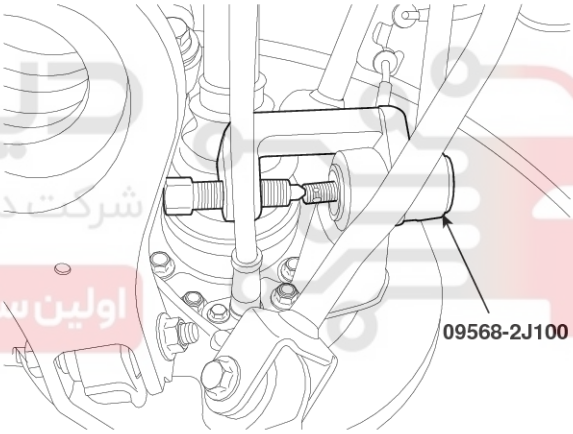
SBHDS8023D

9. Remove the assist arm(A) and the trailing arm(B) from the rear axle carrier.

Tightening torque :
80~90N.m (8.0~9.0kgf.m, 57.8~65lb-ft)

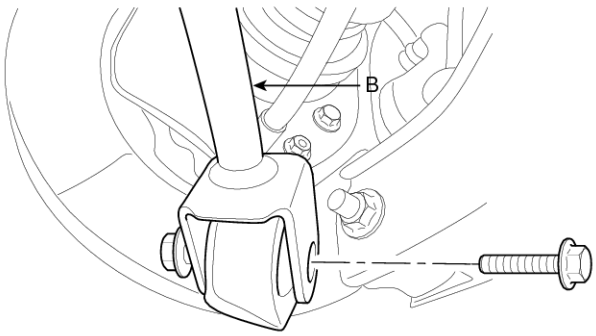


SBHDS8308D



SBHDS8309D

Tightening torque :
100~120N.m (10.0~12.0kgf.m, 72.3~86.7lb-ft)



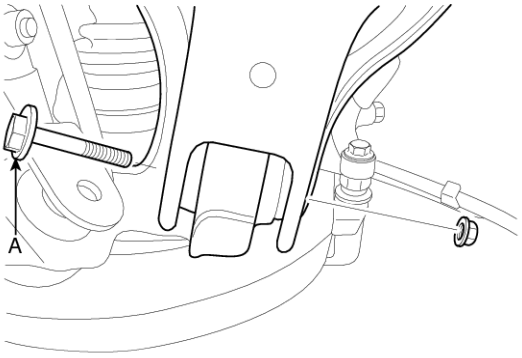
SBHDS8025D

NOTICE

Remove the rear assist arm ball joint by using the special tool(09568-4A000).

10. Remove lower arm mount bolt(A) from rear axle carrier.

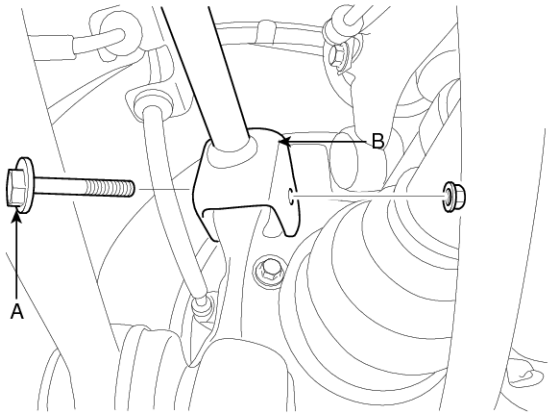
Tightening torque :
140~160N.m (14.0~16.0kgf.m, 101.2~115.7lb-ft)



SBHDS8026D

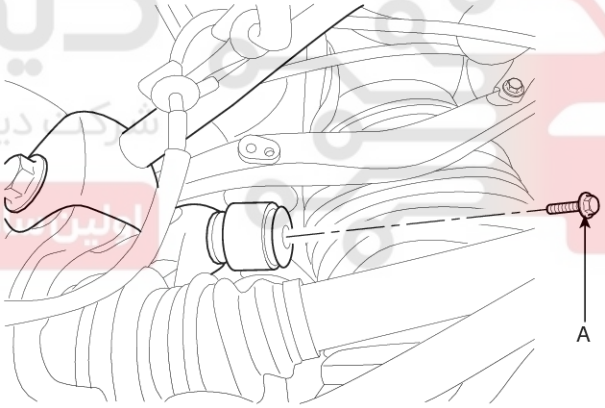
11. Loosen the upper arm link mount bolt and then remove the upper arm link(B).

Tightening torque :
120~140N.m (12.0~14.0kgf.m, 86.7~101.2lb-ft)



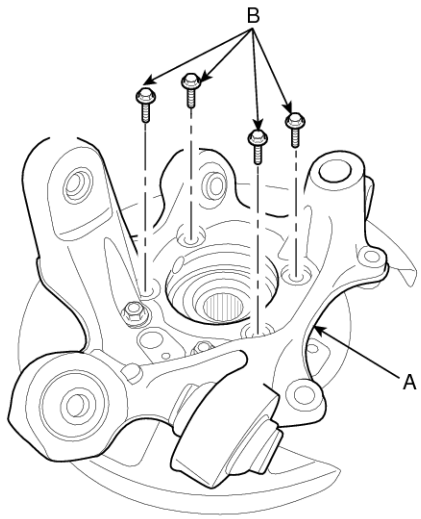
SBHDS8027D

12. Loosen the strut mount bolt(A) and then remove the knuckle assembly.

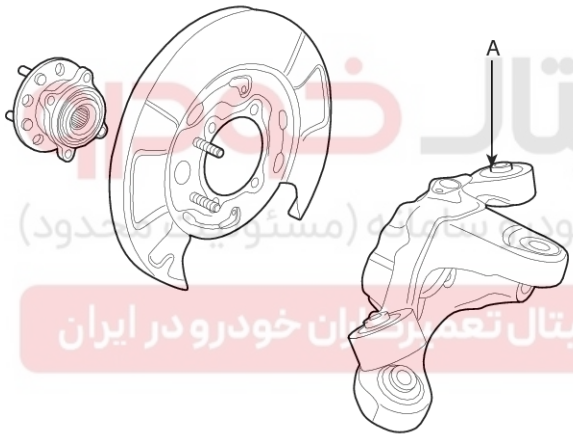


SBHDS8028D

13. Remove the hub assembly mount bolts(B) from the rear axle carrier(A).



SBHDS8029D



SBHDS8300D

14. Install the heater core in the reverse order of removal.

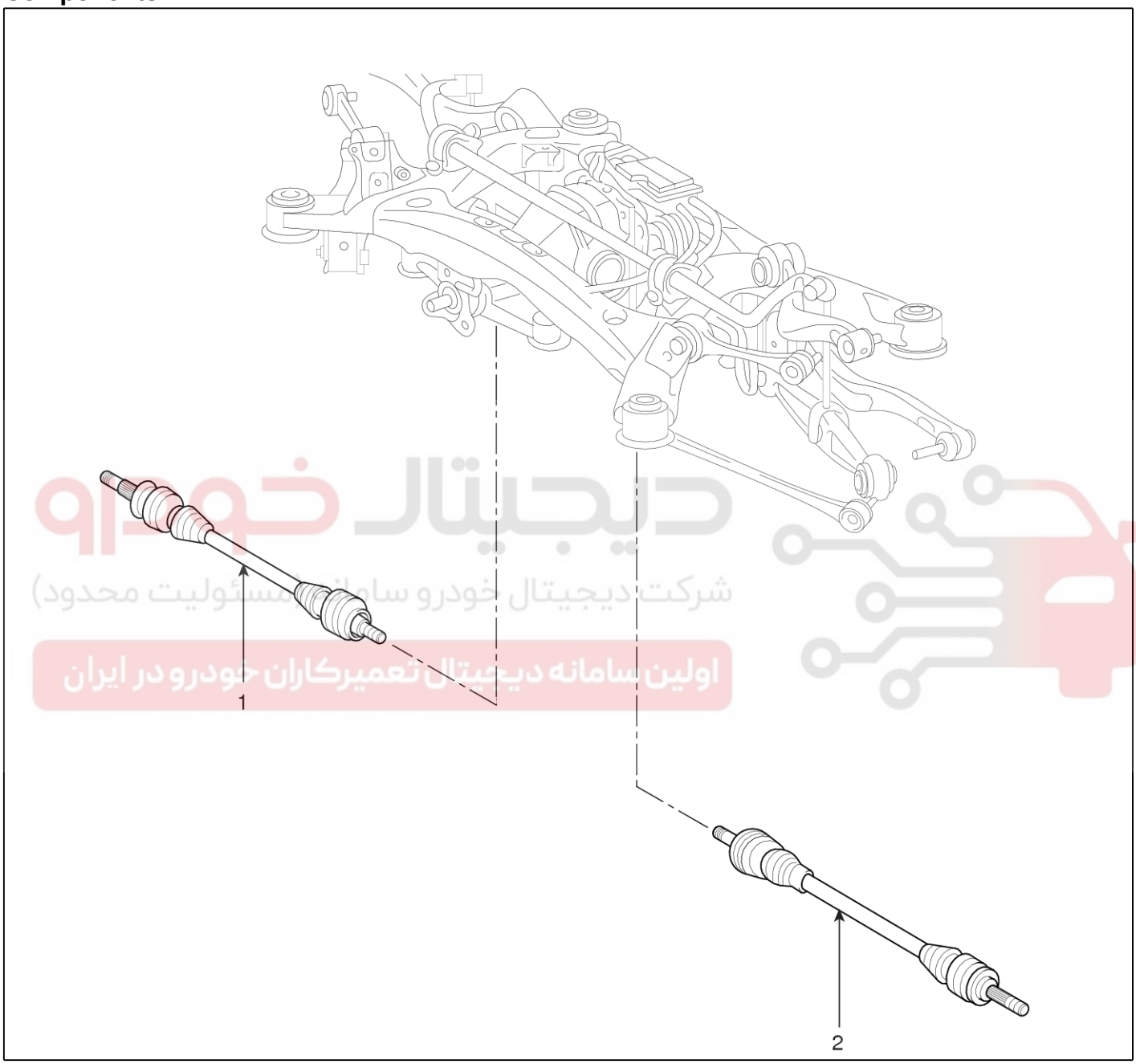
Inspection

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

Rear Driveshaft Assembly

Rear Driveshaft

Components



SBHDS8301D

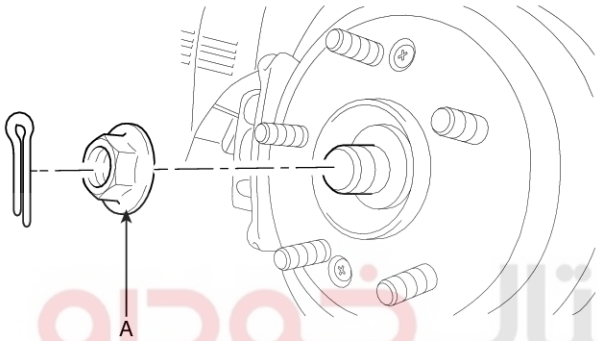
1. Rear driveshaft assembly(R)
2. Rear driveshaft assembly(L)

Replacement

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

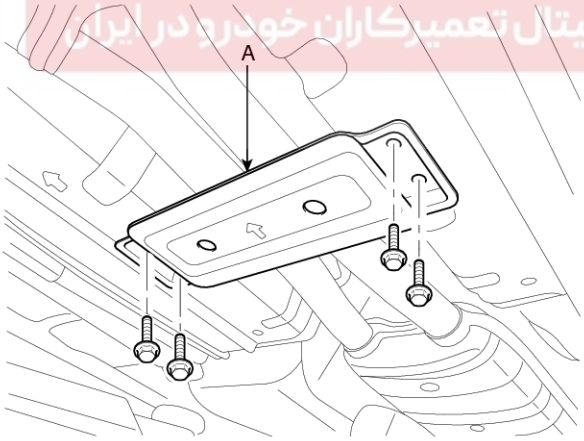
   CAUTION
   Be careful not to damage to the hub bolts when removing the rear wheel and tire .
3. Remove the split pin, then remove castle nut(A) and washer from the front hub under applying the break.

Tightening torque :
200~280N.m (20.0~28.0kgf.m, 144.6~202.5lb-ft)



SBHDS8017D

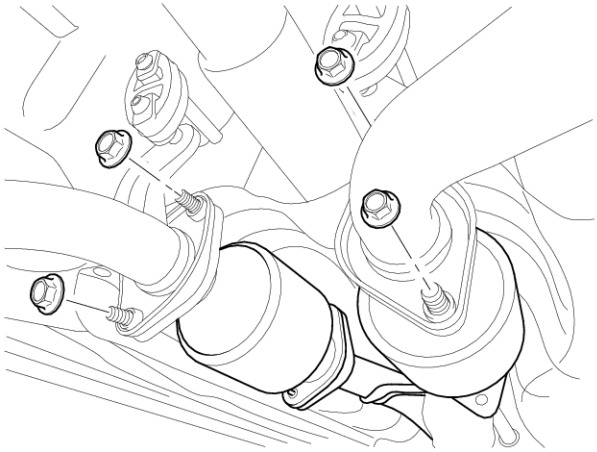
4. Loosen the mount bolts and then remove the bracket(A).



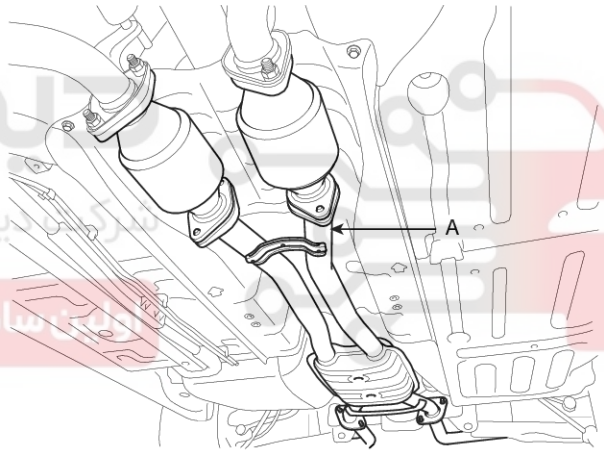
SBHDS8030D

5. Loosen the muffler mount nut and then remove the muffler(A).

Tightening torque :
40~60N.m (4.0~6.0, 28.9kgf.m~43.3lb-ft)

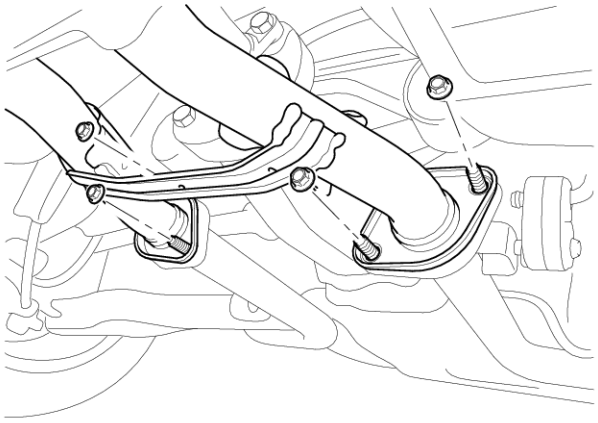


SBHDS8031D



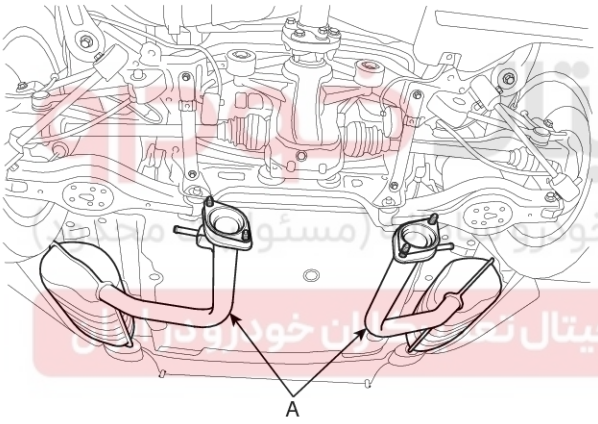
SBHDS8032D

Tightening torque :
40~60N.m (4.0~6.0kgf.m, 28.9~43.3lb-ft)



SBHDS8033D

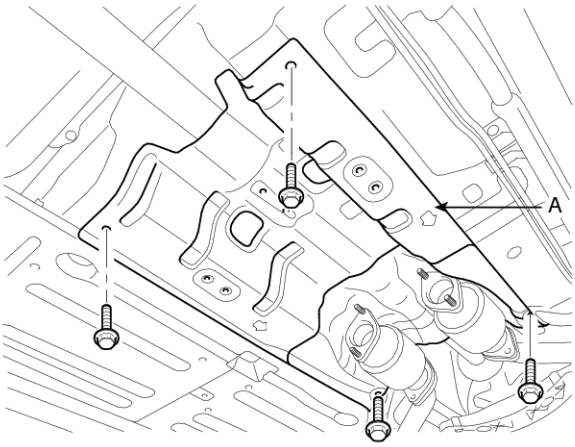
6. Remove the rear muffler(A).



SBHDS8034D

7. Loosen the mount bolts and then aluminum cover(A).

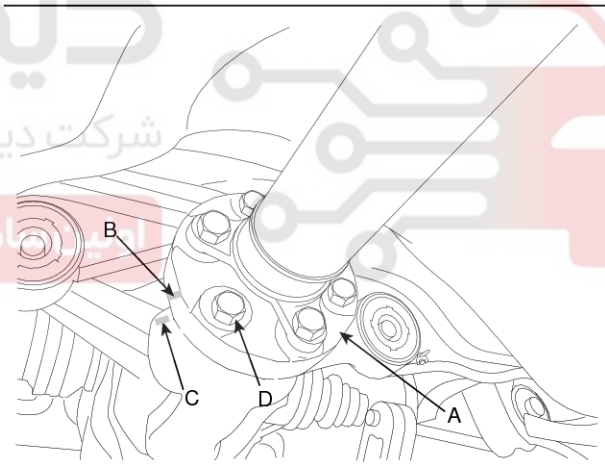
Tightening torque :
5~8N.m (0.5~0.8kgf.m, 3.6~5.7lb-ft)



SBHDS8035D

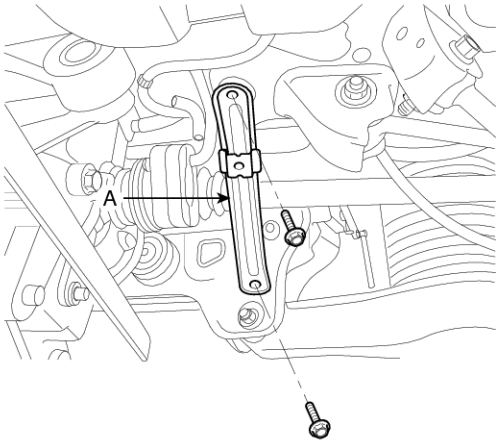
8. Loosen the propeller shaft rear mount bolts(A).

Tightening torque :
90~110N.m (9.0~11.0kgf.m, 65.0~79.5lb-ft)



SBHDS8036D

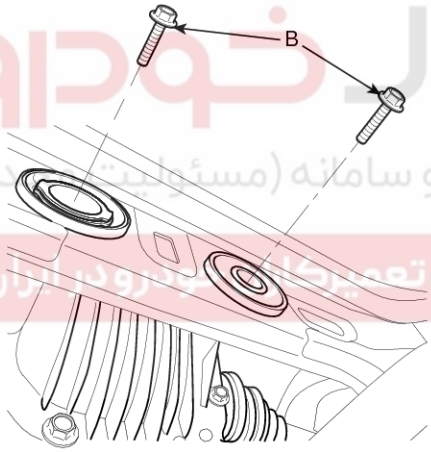
9. Remove the bracket(A)



SBHDS8037D

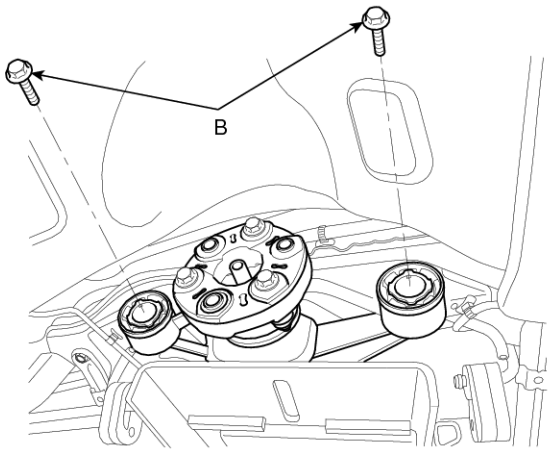
10. Remove the differential carrier assembly mount bolts(B)

Tightening torque :
80~100N.m (8.0~10.0kgf.m, 57.8~72.3lb-ft)



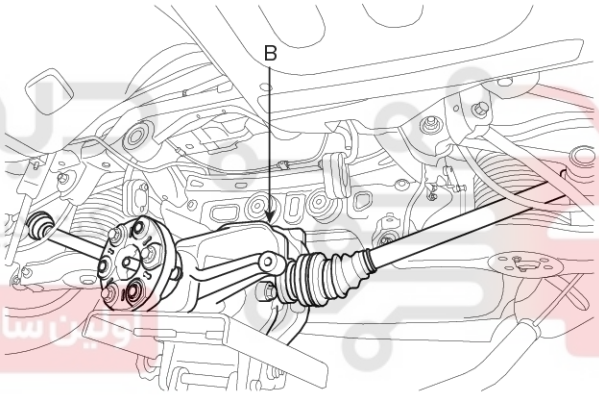
SBHDS8038D

Tightening torque :
80~100N.m (8.0~10.0kgf.m, 57.8~72.3lb-ft)



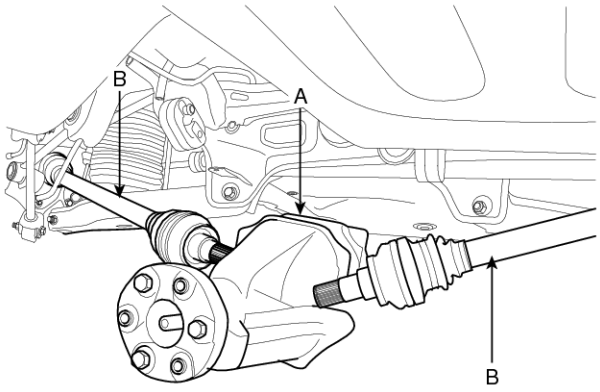
SBHDS8039D

11. Remove the rear drive shaft assembly(B).



SBHDS8040D

12. Insert a pry bar(A) between the differential case(A) and joint case, and separate the driveshaft(B) from the differential case.



SBHDS8041D

13. Install the heater core in the reverse order of removal.

⚠CAUTION

- **Use a pry bar(A) being careful not to damage the differential 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 differential case with the oil seal cap to prevent contamination.**
- **Support the driveshaft properly.**
- **Replace the retainer ring whenever the driveshaft is removed from the differential case.**
- **Do not take the drive shaft a part. Please, replace drive shaft with assembly.**

Inspection

1. Check the driveshaft boots for damage and deterioration.
2. Check the ball joint for wear and damage.
3. Check the splines for wear and damage.
4. Check the dynamic damper for cracks, wear and position.

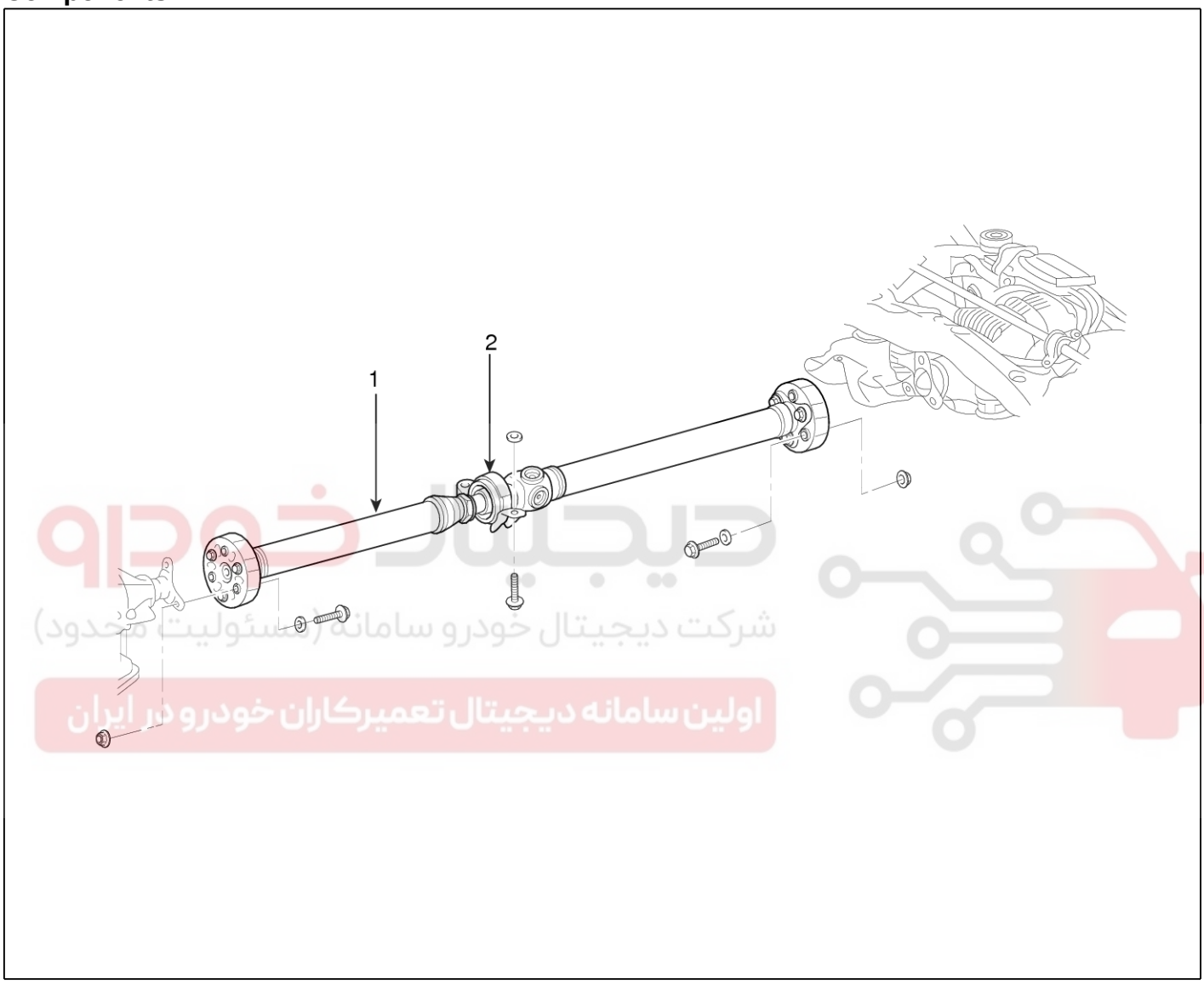
SBHDS8302D

5. Check the driveshaft for cracks and wears.

Propeller Shaft Assembly

Propeller Shaft

Components



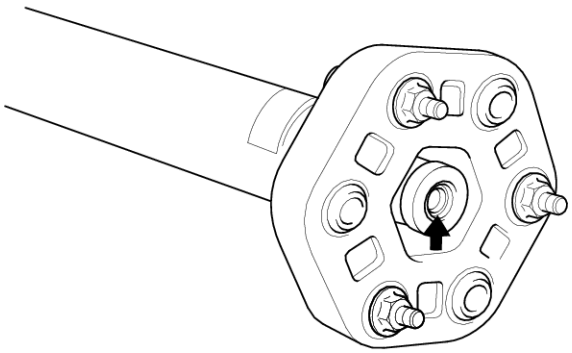
SBHDS8043D

1. Propeller shaft
2. Center bearing bracket

Inspection

Inspect Flexible Coupling

1. Check the front and rear flexible couplings for cracks or damage.
2. Inspect the flexible coupling centering bushing.If the busing is damaged, replace the propeller shaft assembly.

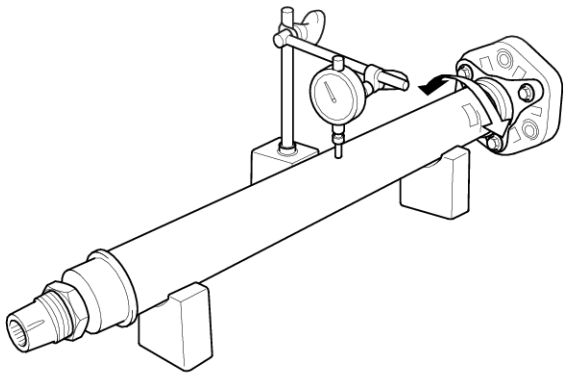


SBHDS8310D

Propeller Shaft Runout

1. Install a dial indicator with its needle on the center of front propeller shaft or rear propeller shaft.
2. Turn the propeller shaft slowly and check the runout. Repeat this procedure for the other propeller shaft.

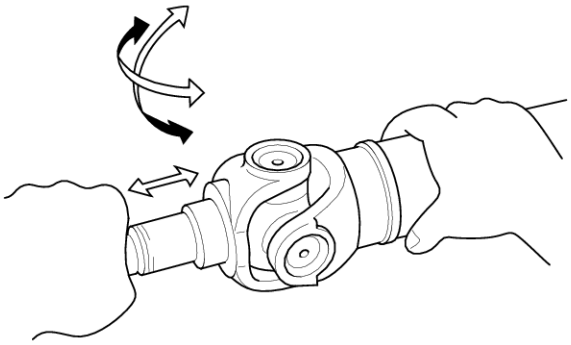
Front Propeller Shaft Runout : 0.3mm (0.012in.)



SBHDS8311D

Universal Joint Inspect

1. Check that the spider bearing rotates smoothly.
2. Check that there is no play in the spider bearing if necessary, replace the propeller shaft.

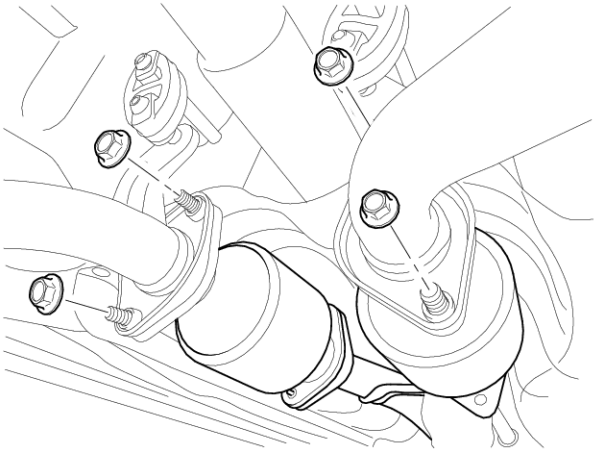


SBHDS8312D

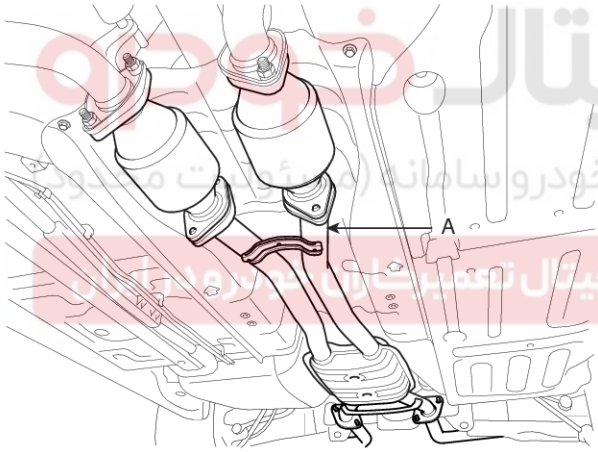
Replacement

1. Loosen the muffler mount nut and then remove the muffler(A).

Tightening torque :
40~60N.m (4.0~6.0kgf.m, 28.9~43.3lb-ft)

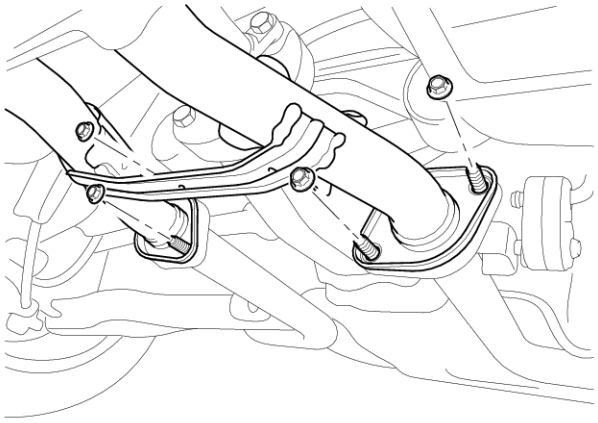


SBHDS8031D



SBHDS8032D

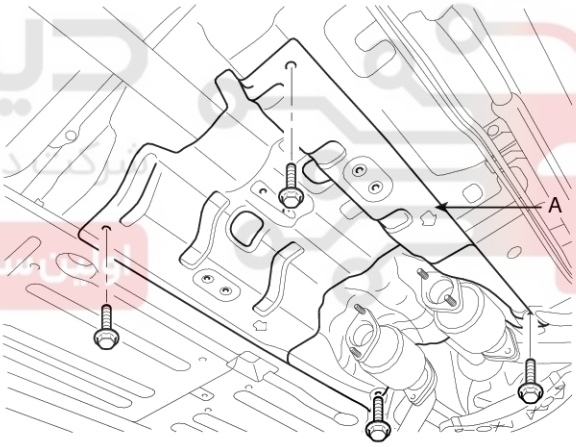
Tightening torque :
40~60N.m (4.0~6.0kgf.m, 28.9~43.3lb-ft)



SBHDS8033D

2. Loosen the mount bolts and then aluminum cover(A).

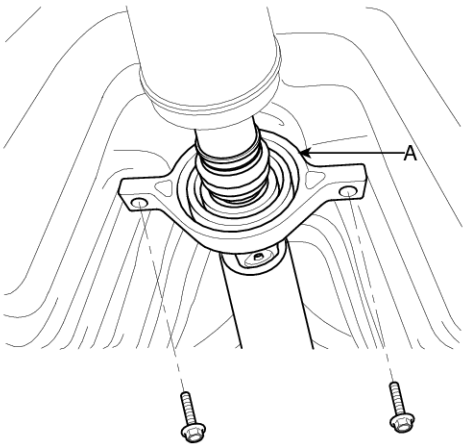
Tightening torque :
5~8N.m (0.5~0.8kgf.m, 3.6~5.7lb-ft)



SBHDS8035D

3. Remove the center bearing bracket(A) mounting bolts(B).

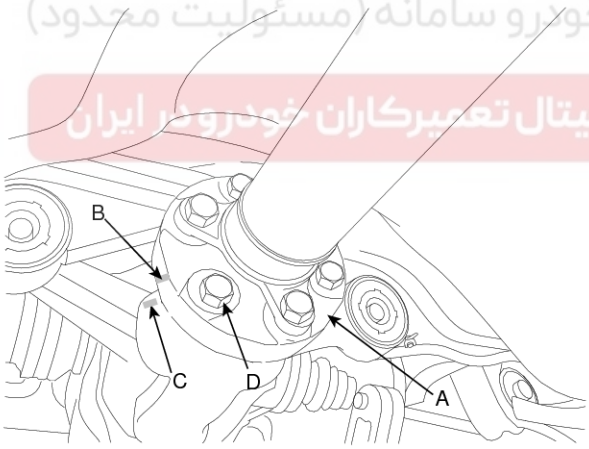
Tightening torque :
5~8N.m (0.5~0.8kgf.m, 3.6~5.7lb-ft)



SBHDS8044D

4. After making a match mark(C) on the rubber coupling(A) and rear differential companion(B), remove the propeller shaft mounting bolts(D).

Tightening torque :
90~110N.m (9.0~11.0kgf.m, 65.0~79.5lb-ft)

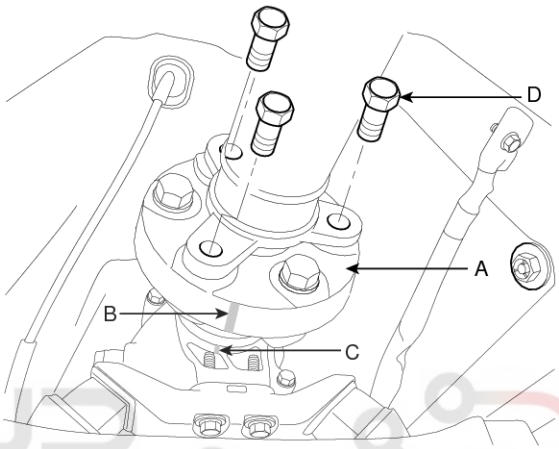


SBHDS8036D

NOTICE

1. *When retightening the propeller shaft mounting bolts after removing them, each bolt and washer must be placed in its original position and bolt insertion direction must be the same as before, so make marks not to allow the bolts and washers to be mixed up before removing the propeller shaft.*
2. *If the position and direction of the propeller shaft mounting bolts and washers are reversed, it may cause vibration and noise at high vehicle speeds due to imbalance in the propeller shaft.*
3. *If abnormal vibration and noise occur at high vehicle speeds after replacing propeller shaft with new one, balance the propeller shaft with a balancing machine.*

Tightening torque :
90~110N.m (9.0~11.0kgf.m, 65.0~79.5lb-ft)



SBHDS8060D

CAUTION

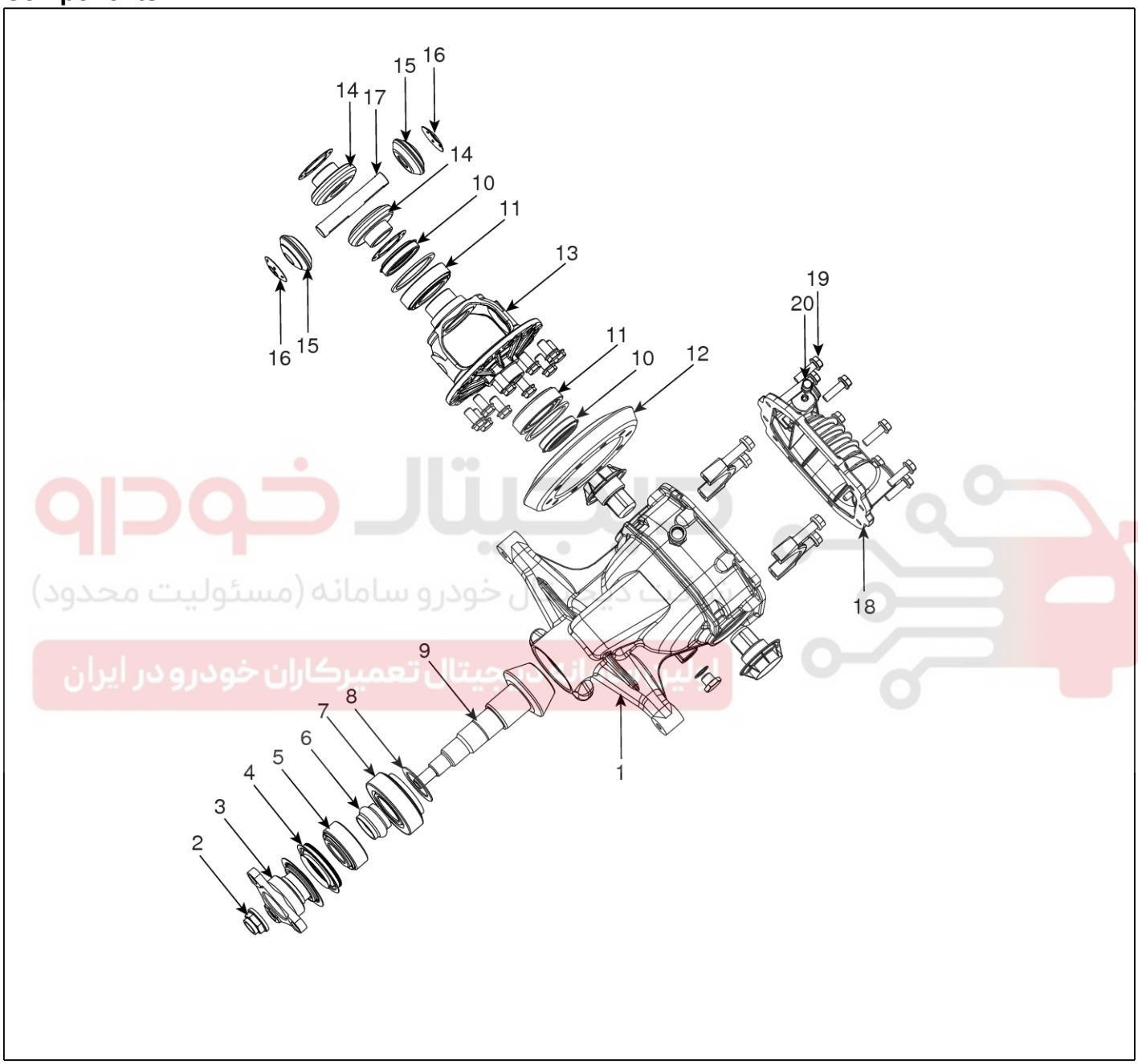
Use the hexagonal wrench to prevent damage of bolt head when removing bolts(D).

5. Install the heater core in the reverse order of removal.

Differential Carrier Assembly

Front Differential Carrier(4WD)

Components

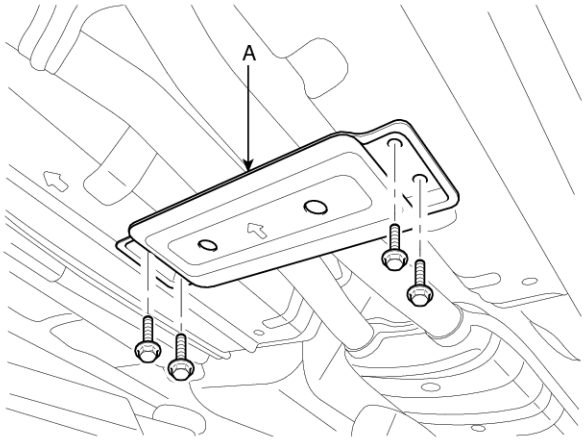


SBHDS8303D

1. Differential
2. Pinion locking nut
3. Oil seal guide
4. Pinion oil swal
5. Outer pinion bearing
6. Pinion bearing spacer
7. Inner pinion bearing
8. Inner bearing adjust shim
9. Drive gear
10. Oil seal
11. Differential side bearing
12. Ring gear
13. Differential
14. Cam side gear
15. Pinion gear
16. Thrust washer
17. Differential pinion shaft
18. Differential cover
19. Differential cover mounting bolts
20. Air breather
21. Filler piug

Replacement

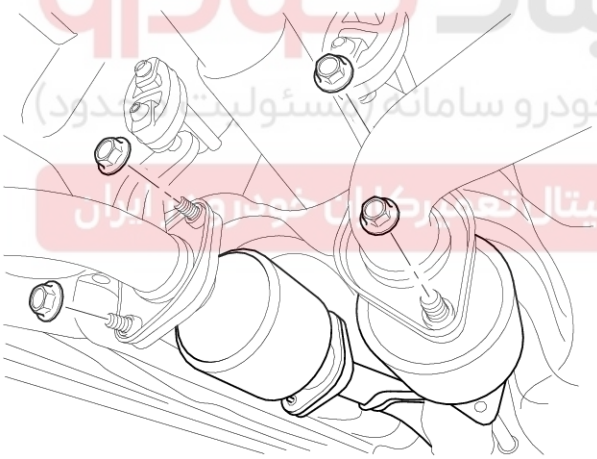
1. Loosen the mount bolts and then remove the bracket(A).



SBHDS8030D

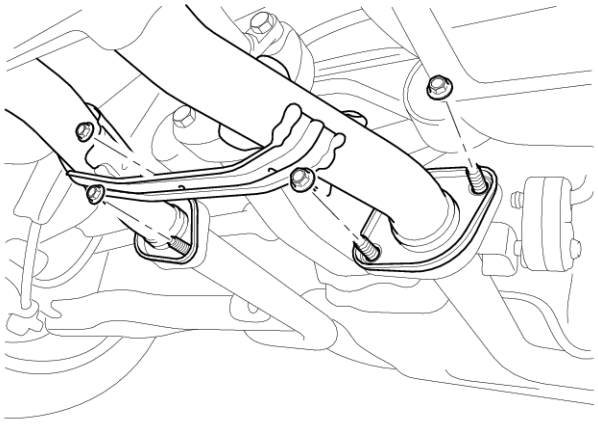
2. Loosen the muffler mount nut and then remove the muffler(A).

Tightening torque :
40~60N.m (4.0~6.0kgf.m, 28.9~43.3lb-ft)



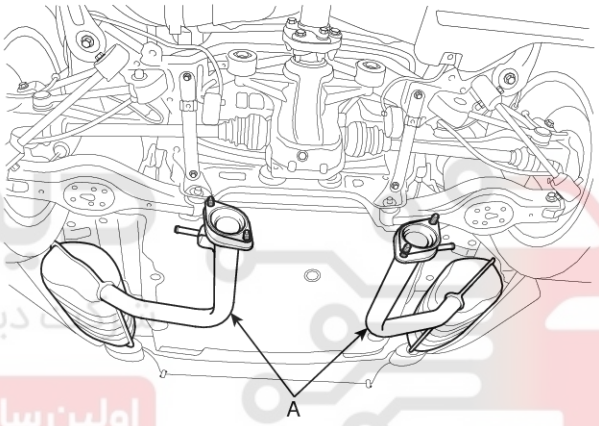
SBHDS8031D

Tightening torque :
40~60N.m (4.0~6.0kgf.m, 28.9~43.3lb-ft)



SBHDS8033D

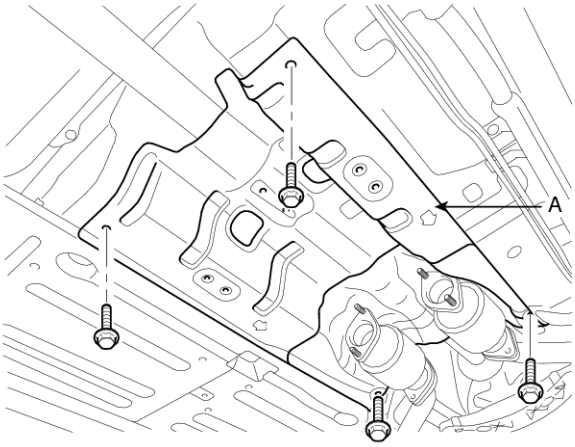
3. Remove the rear muffler (A).



SBHDS8034D

4. Loosen the mount bolts and then aluminum cover(A).

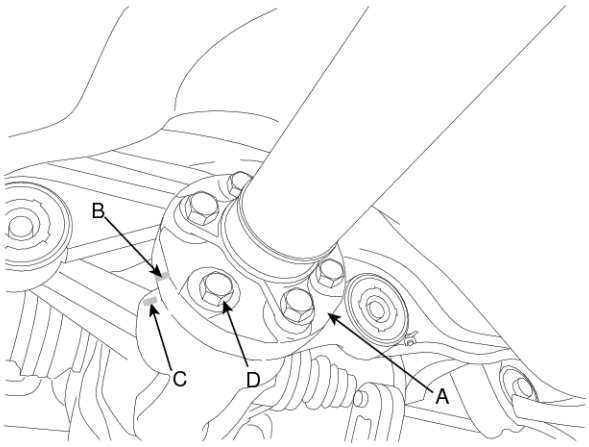
Tightening torque :
5~8N.m (0.5~0.8kgf.m, 3.6~5.7lb-ft)



SBHDS8035D

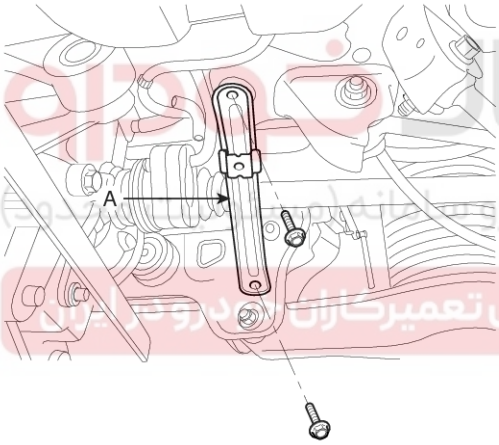
5. Loosen the propeller shaft rear mount bolts(A).

Tightening torque :
90~110N.m (9.0~11.0kgf.m, 65.0~79.5lb-ft)



SBHDS8036D

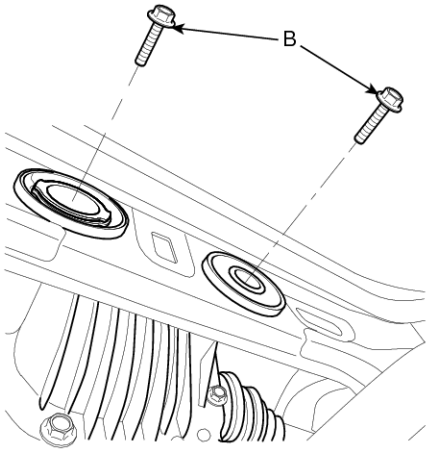
6. Remove the bracket(A)



SBHDS8037D

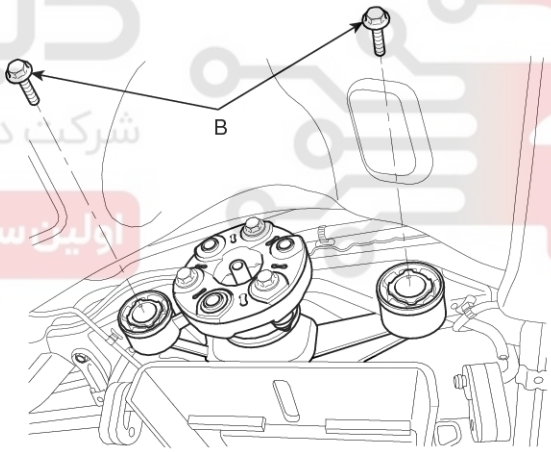
7. Remove the differential carrier assembly mount bolts(B).

Tightening torque :
80~100N.m (8.0~10.0kgf.m, 57.8~72.3lb-ft)



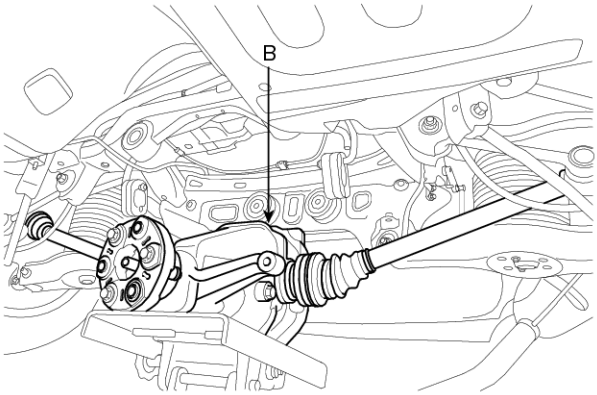
SBHDS8038D

Tightening torque :
80~100N.m (8.0~10.0kgf.m, 57.8~72.3lb-ft)



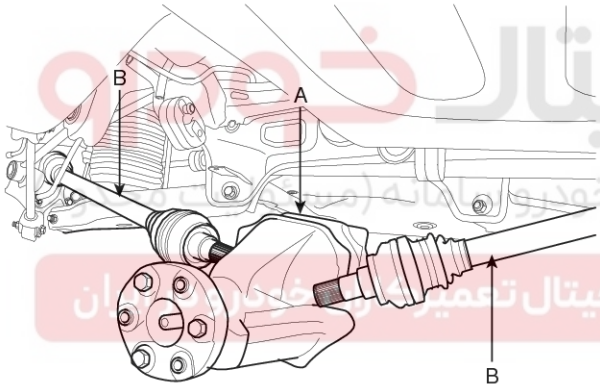
SBHDS8039D

8. Remove the rear drive shaft assembly(B).



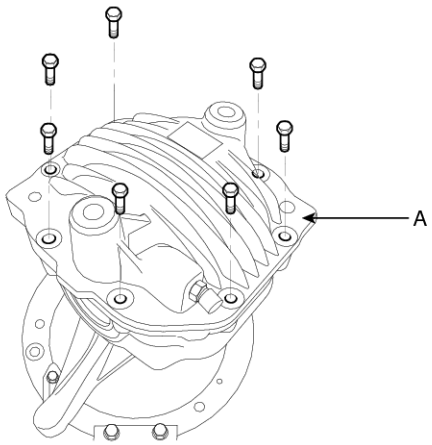
SBHDS8040D

9. Insert a pry bar(A) between the differential case(A) and joint case, and separate the driveshaft(B) from the differential case.



SBHDS8041D

10. Loosen the mount bolts and then remove the cover(A).

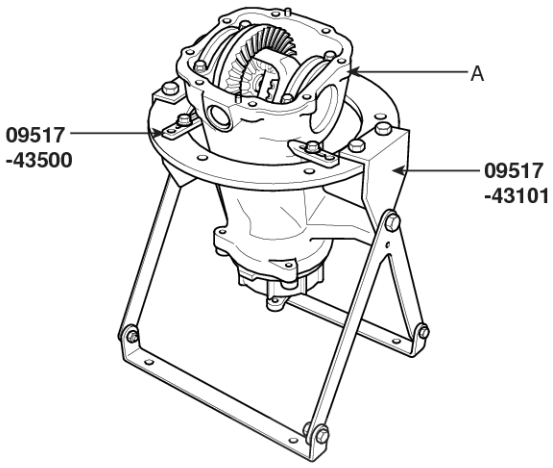


SBHDS8062D

11. Install the heater core in the reverse order of removal.

Inspection

1. Install the differential carrier assembly(A) with the special tools(09517-43101 & 09517-43500).Then carry out the following inspection.



KIQE610A

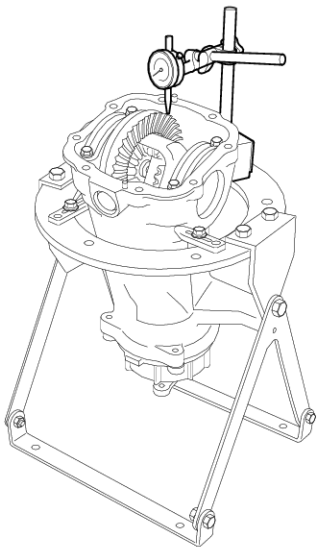
2. Check the final drive gear backlash by the following procedure.
   1) Place the drive pinion and move the drive gear to check backlash is within the standard range.

NOTICE

Measure at 4 points on the gear periphery.

Standard value :

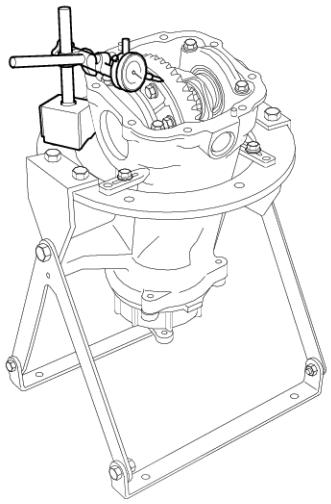
0.10 ~ 0.15mm (0.0039 ~ 0.0059in.)



KIQE610B

3. Check the drive gear back-face lash by the following procedure.
   1) Place a dial gauge on the back-face of the drive gear and measure the runout.

Limit : 0.05 mm (0.002 in)



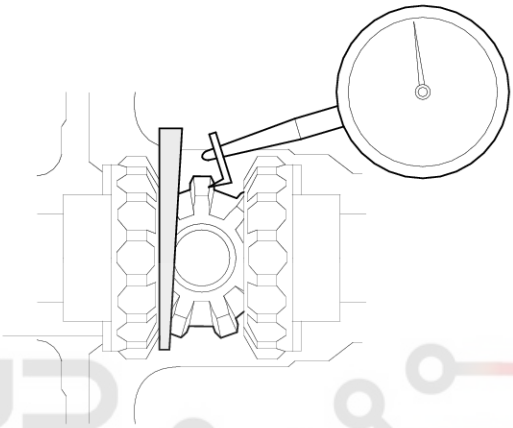
KIQE610C

   2) If the runout is beyond the limit, check that there are no foreign substances between the drive gear and differential case and, that the bolts fixing the drive gear are not loose.

4. Check the differential carrier backlash by the following procedure.
   1) Fix the side gear with a wedge so it cannot move and measure the differential gear backlash with a dial indicator on the pinion gear.

Standard value :
0 ~ 0.05 mm (0 ~ 0.002 in)

NOTICE
Take the measurements at two places on the pinion gear.

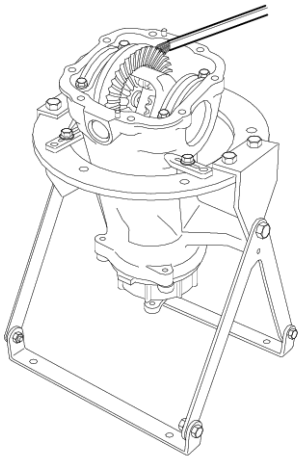


KISE610E

   2) If the backlash exceeds the limit, adjust using side bearing spacers.

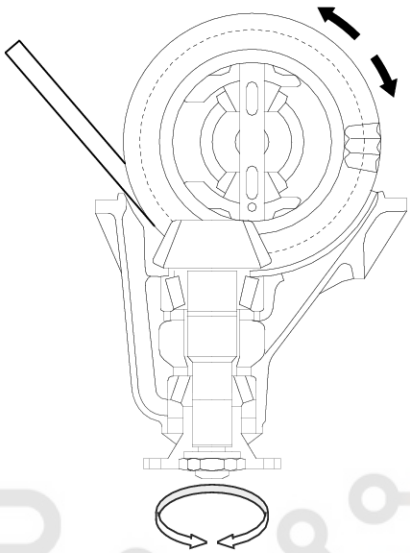
NOTICE
If adjustment is impossible, replace the side gear and pinion gear as a set.

5. Check the tooth contact of the final drive gear by the following procedure.
   1) Apply the same amount of machine blue slightly to both surfaces of the drive gear teeth.



KIQE610D

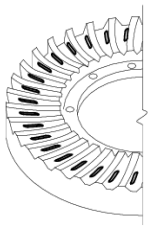
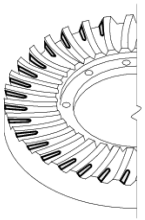
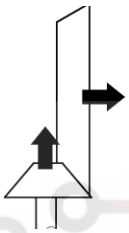
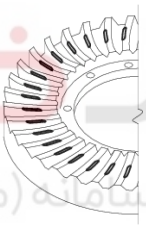
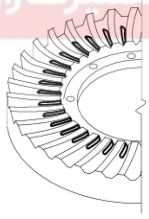
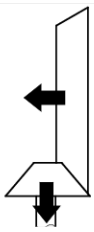
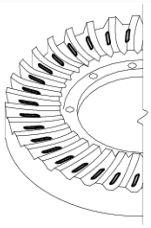
   2) Insert a brass rod between the differential carrier and the differential case, and then rotate the companion flange by hand (once in the normal direction, and then once in the reverse direction) while applying a load to the drive gear so that some torque (approximately 25~30Nm) is applied to the drive pinion.



KISE610G

⚠CAUTION
If the drive gear is rotated too much, the tooth contact pattern will become unclear and difficult to check.

3) Check the tooth contact pattern.

<table>
<tr><th>Tooth contact</th><th>Contact state</th><th colspan="2">Solution</th></tr>
<tr><td>Standard contact</td><td> 
KISE610H</td><td></td><td></td></tr>
<tr><td>1. Heal contact</td><td> 
KISE650A</td><td rowspan="2">Increase the thickness of the pinion height adjusting shim, and position the drive pinion closer to the center of the drive gear.
Also, for backlash adjustment , reposition the drive gear further from the drive pinion.</td><td rowspan="2"> 
KISE630A</td></tr>
<tr><td>2. Face contact</td><td> 
KISE650B</td></tr>
<tr><td>3. Toe contact</td><td> 
KISE650C</td><td rowspan="2">Decrease the thickness of the pinion height adjusting shim, and position the drive pinion further from the center of the drive gear.
Also, for backlash adjustment , reposition the drive gear closer to the drive pinion.</td><td rowspan="2"> 
KISE630B</td></tr>
<tr><td>4. Flank contact</td><td> 
KISE650D</td></tr>
</table>

NOTICE

- *Tooth contact pattern is a method for judging the result of the adjustment of drive pinion height and final drive gear backlash. The adjustment of drive pinion height and final drive gear backlash should be repeated until the tooth contact patterns are similar to the standard tooth contact pattern.*
- *When you cannot obtain a correct pattern, the drive gear and drive pinion have exceeded their limits. Both gears should be replaced as a set.*

6. Check the oil leaks and the lip part for chew or wear.
7. Check the bearings for wear or discoloration.
8. Check the gear carrier for cracks.
9. Check the drive pinion and drive gear for wear or cracks.
10. Check the side gears, pinion gears and pinion shaft for wear or damage.
11. Check the side gear spline for wear or damage.