

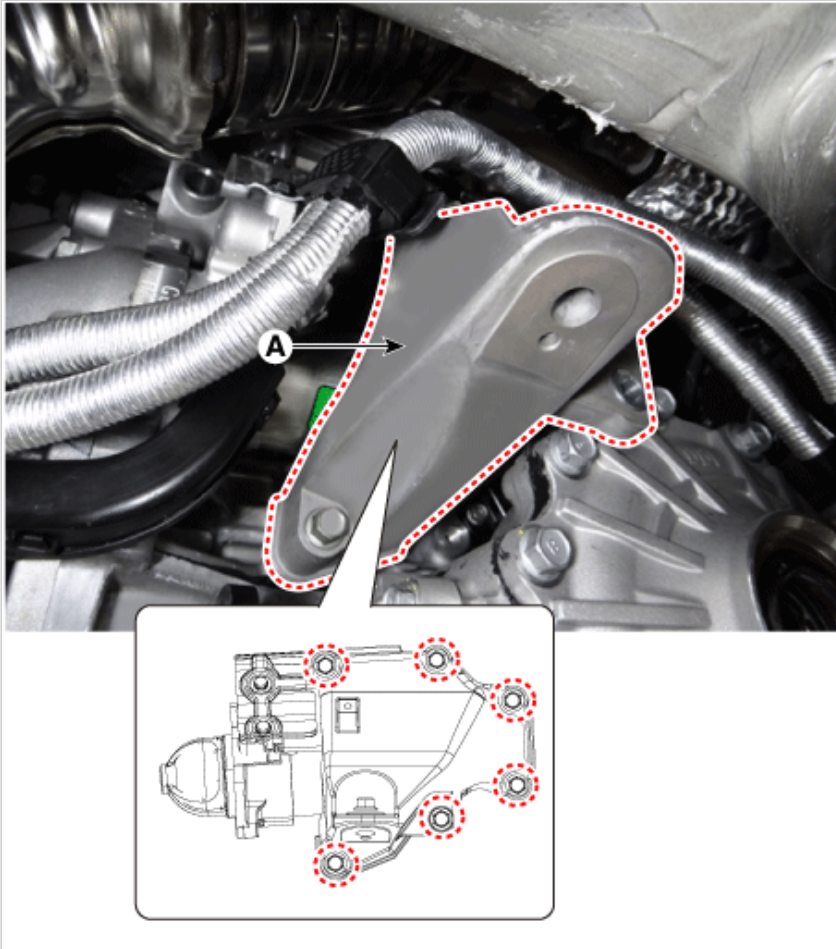


Removal

1. Remove the propeller shaft.
(Refer to Driveshaft and axle - "Front propeller shaft")
2. Remove the sub frame.
(Refer to Suspension System - "Sub frame")
3. Separate the compressor.[LAMBDA II 3.3 T-GDI only]
(Refer to Heating, Ventilation And Air Conditioning - "Compressor")
4. Remove the front driveshaft.
(Refer to Driveshaft and axle - "Front drive shaft")
5. Remove the engine support bracket (A).[RH]

Tightening torque :

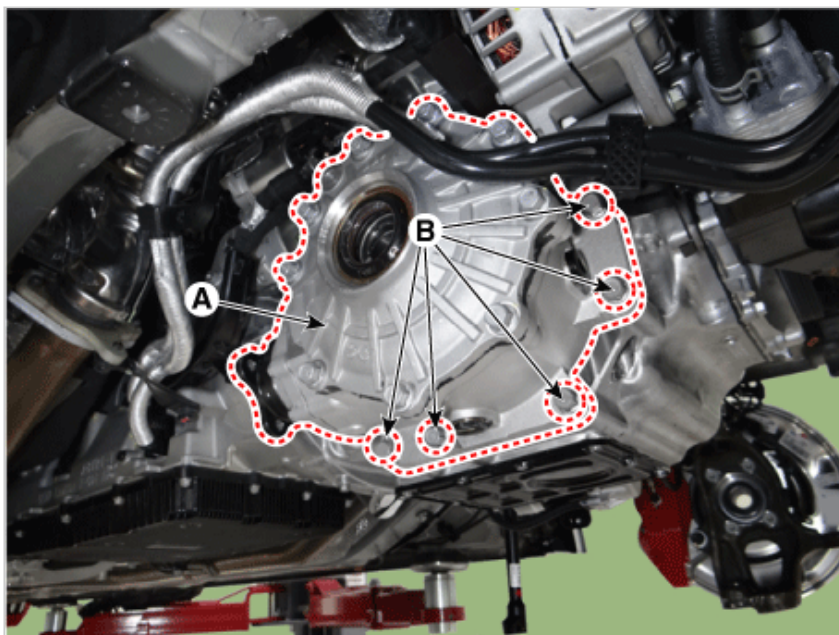
49.0 - 58.8 N·m (5.0 - 6.0 kgf·m, 36.1 - 43.4 lb·ft)



6. Loosen the front differential bolts (B) and then remove the front differential (A).

Tightening torque :

58.8 - 63.7 N·m (6.0 - 6.5 kgf·m, 43.4 - 47.0 lb·ft)

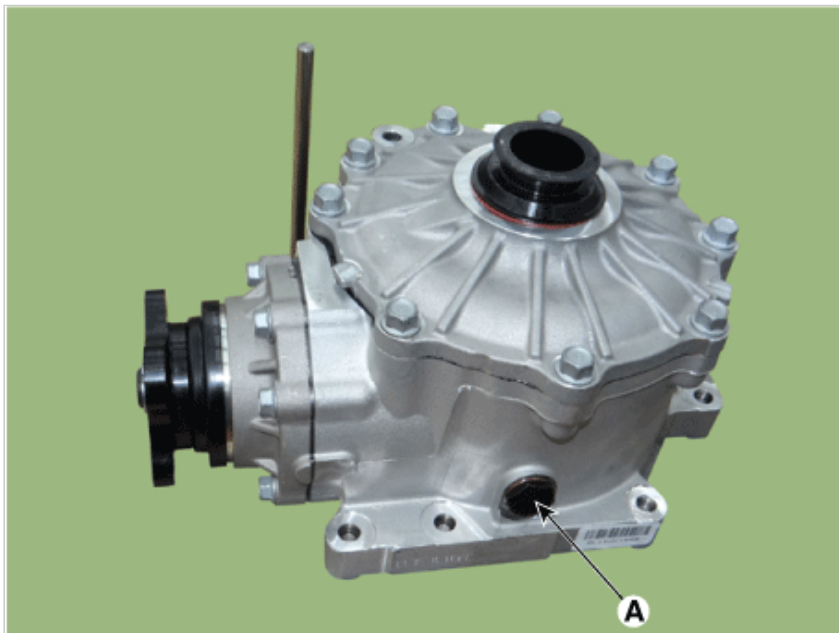


7. Install in the reverse order of removal.
8. Check the front alignment.
(Refer to Suspension System - "Alignment")

Disassembly

[Differential Case Assembly]

1. Drain oil by removing the drain plug (A).



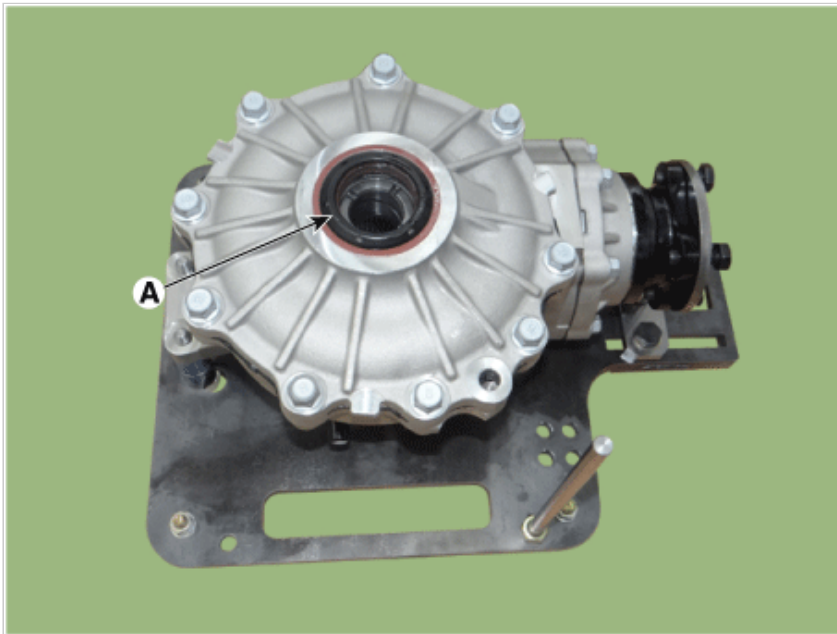
NOTICE

- Use a new washer when reinstalling the drain plug.

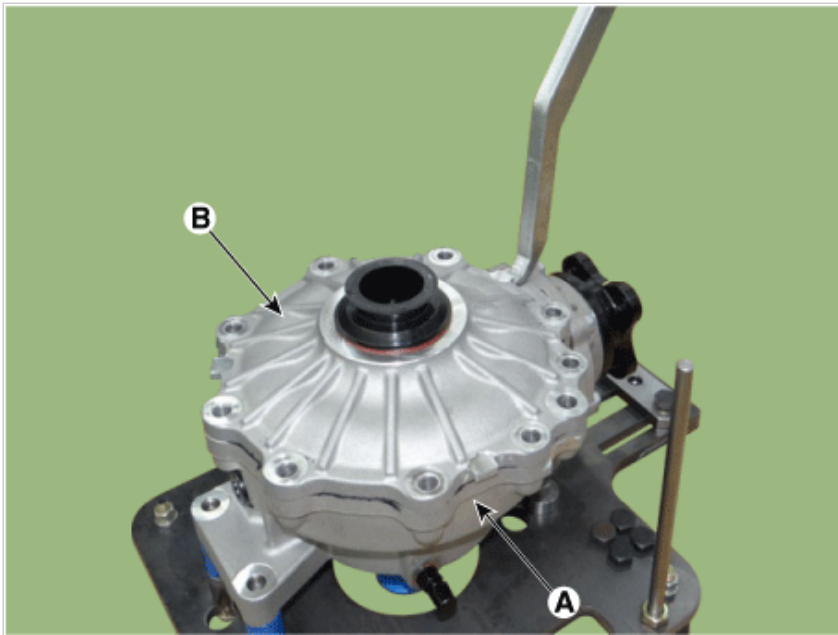
2. Place the front differential assembly in the SST (09474-4E400).



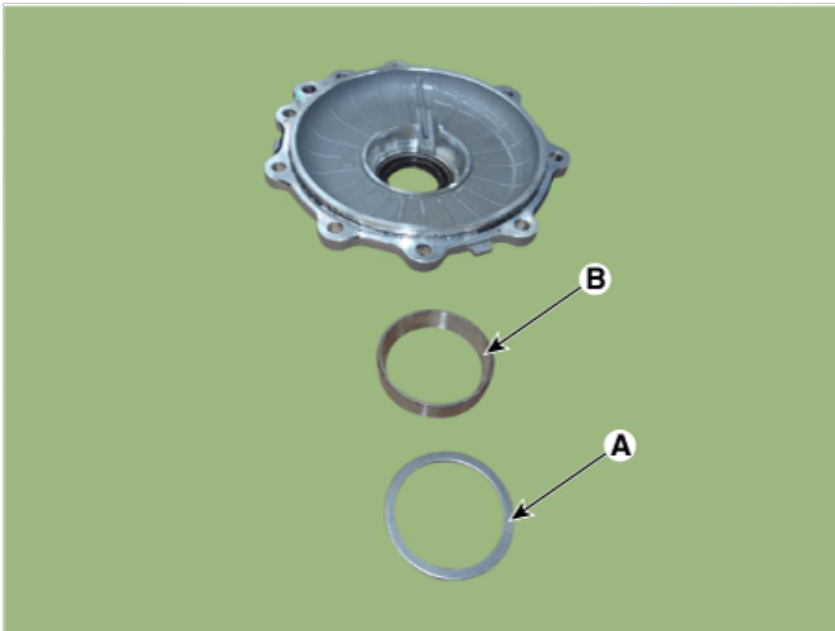
3. Remove the side oil seal (A) using a screwdriver.



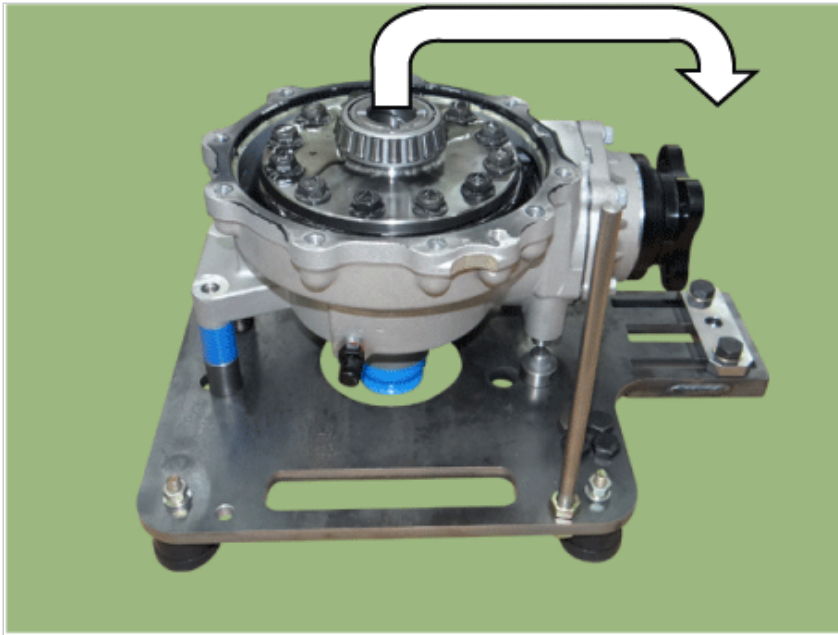
4. Loosen the bolts to remove the cover (B) from the differential carrier.



5. Remove the spacer (A), side bearing race (B) using a hammer and chisel.



6. Separate the differential case assembly from the differential carrier.



7. Remove the oil seal (A) from the differential carrier.



8. Using the SST (09452-2W300), remove the spacer & bearing race from the differential carrier.



9. Using the SST (09474-4E200), remove the side bearing.

**NOTICE**

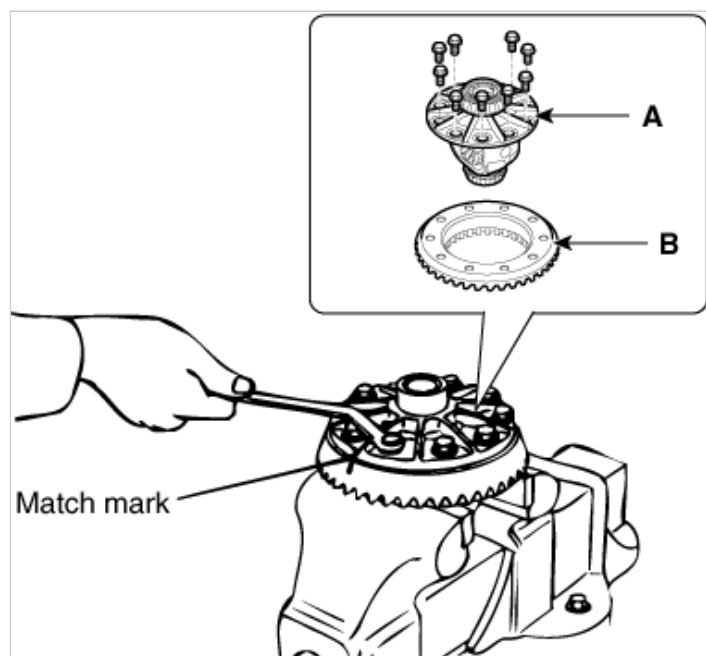
- Use a new bearing when reinstalling.
- A spray lubricant can be used to facilitate the removal of the bearings.
- Attach "Left" or "Right" tags to each bearing.



10. Attach "Left" or "Right" tags to each bearing.
11. Loosen the bolts and then remove the differential case (A) and ring gear (B).

NOTICE

- Put the match marks on the differential case and the ring gear.



[Pinion drive gear assembly]

1. Remove the pinion cage.
 - (1) Using the SST (09474-4E400), place the front differential carrier.
 - (2) Loosen the lock nut and remove the companion flange (A).



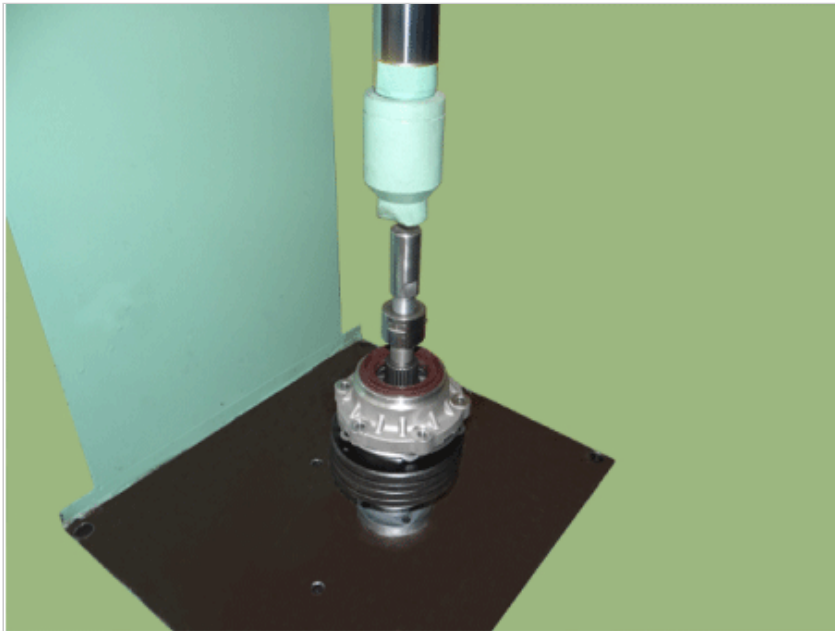
2. Loosen the bolts and remove the pinion cage(A).

Tightening torque :

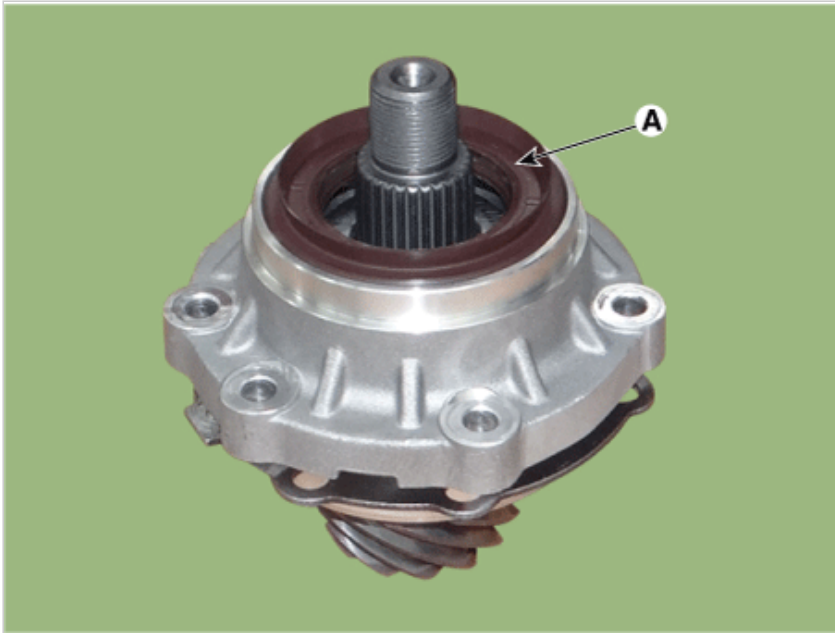
34.3 - 37.3 N·m (3.5 - 3.8 kgf·m, 25.3 - 27.5 lb·ft)



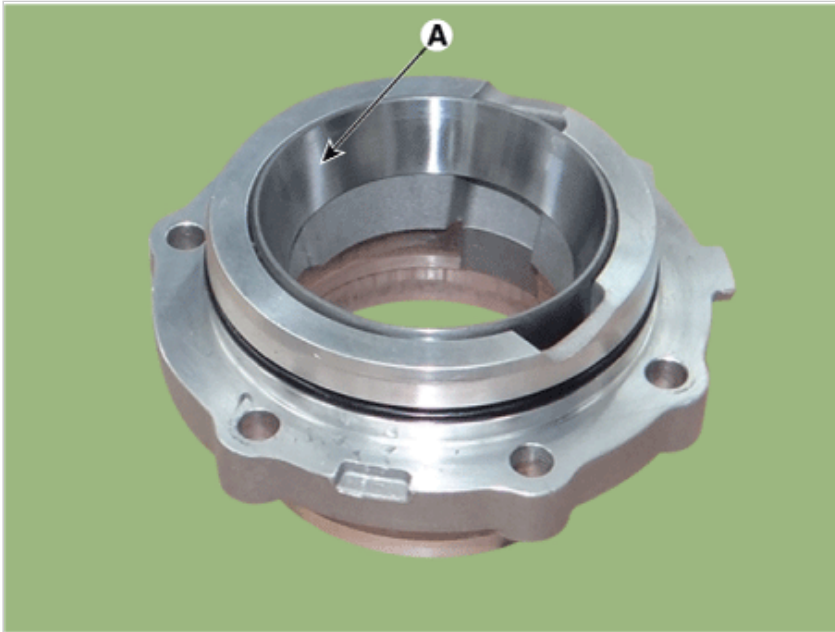
3. Remove the pinion drive gear from pinion Drive gear assembly using a press.



4. Remove the pinion oil seal (A) & pinion front bearing from the pinion cage by a screwdriver.



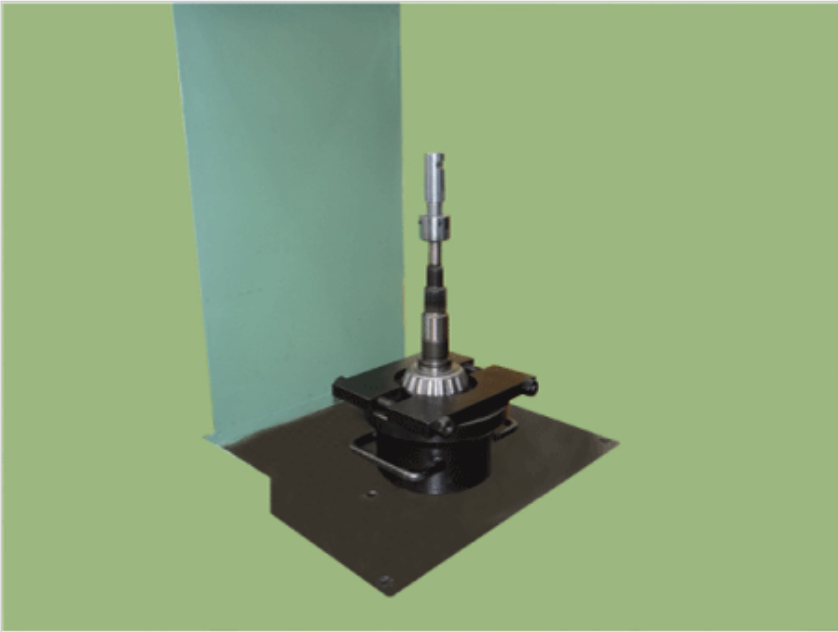
5. Using a hammer and chisel, remove the pinion rear bearing race (A).



6. Separate the pinion bearing spacer(A) and pinion front bearing(B).



7. Using a press, remove the pinion rear bearing.



Inspection

1. After clearing, check for damage parts or abrasion. Follow the method below, if any are noticed.

Item		Identify
Gear set (drive pinion gear & drive gear)		The gear set must be replaced with a new one if the gear tooth is damaged (crack/pits/dents).
Bearing		The bearing must be replaced with a new one if the bearing roller or race is damaged (crack/pits/dents).
Oil seal		The oil seal must be replaced with a new one if disassembled.
Differential carrier		The carrier must be replaced with a new one if the inside of the carrier bearing is damaged (crack/pits/dents) or a crack is found inside/outside.
Companion flange		The pinion oil seal must be replaced with a new one if the contact surface is damaged (crack/pits/dents).
Open type	Diff gear set (Diff side gear & diff pinion gear)	The gear set must be replaced with a new one if the gear tooth or tooth surface is damaged (crack/pits/dents).
	Diff washer (Diff side gear washer & diff pinion gear washer)	The washer must be replaced with a new one if the washer surface is damaged (crack/pits/dents).

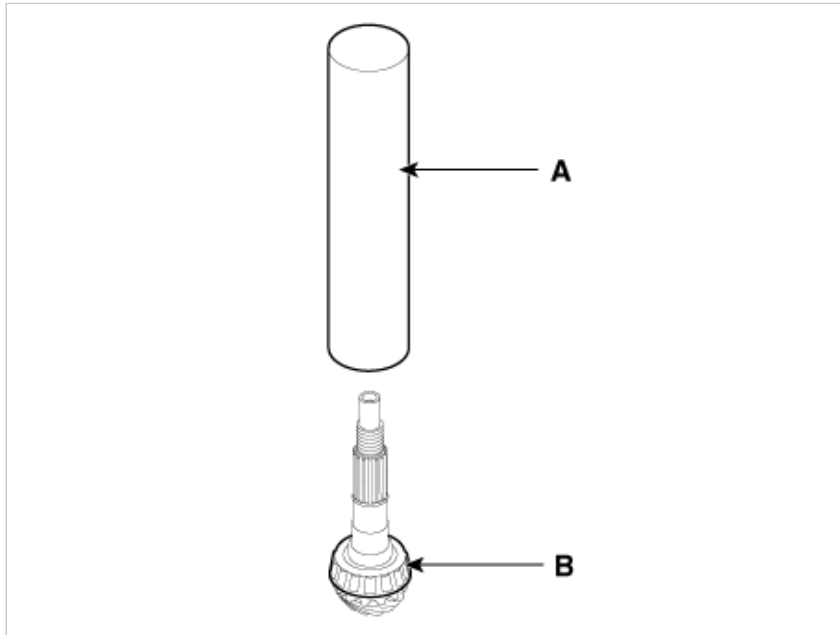
Reassembly

NOTICE

- Use the already adopted spacer for controlling the inner bearing on the front differential assembly. (Use the same thickness controlling spacer in case of destruction)
- The front differential assembly shall be replaced with a new one when the differential carrier or differential case assembly is failed.
- The noise or vibration can be caused by the current inner bearing not matching the gear control spacer when exchanging the carrier or differential case assembly as one unit.

[Pinion drive gear assembly]

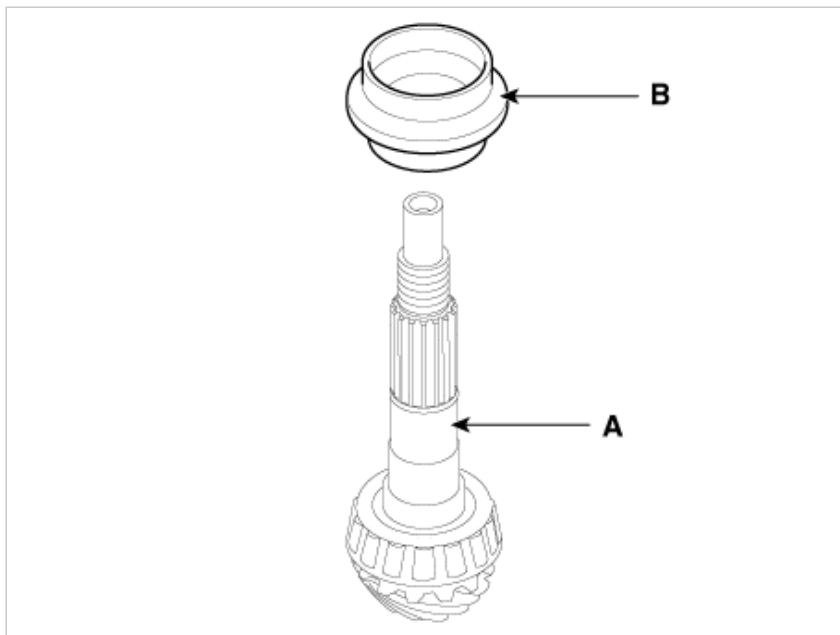
1. Using the round pipe (A), press in the pinion rear bearing (B).



NOTICE

- Do not reuse the bearing. Be sure to install a new one.

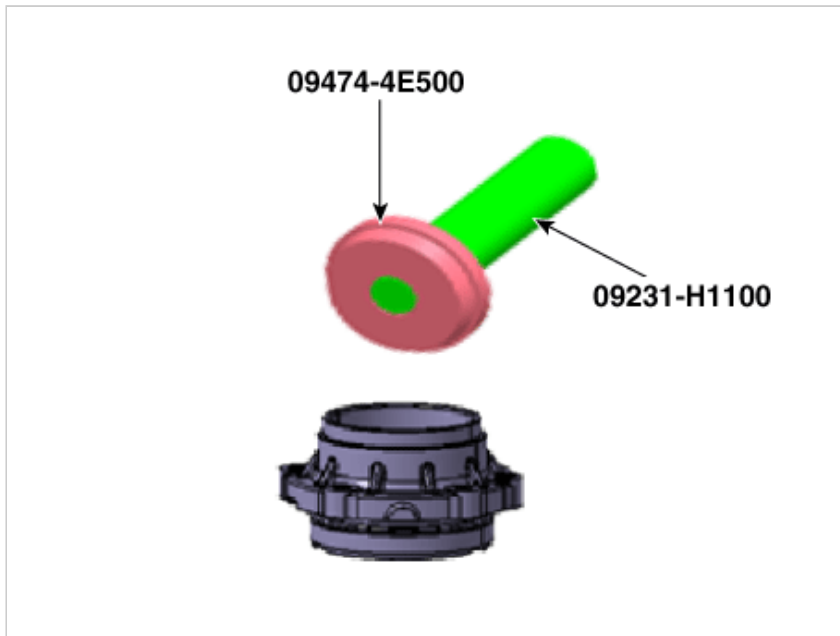
2. Install the pinion bearing spacer (B) at the pinion drive gear (A).



NOTICE

- Do not reuse the spacer. Be sure to install a new one.

3. Using the SST (09474-4E500), install the pinion front bearing race.

**NOTICE**

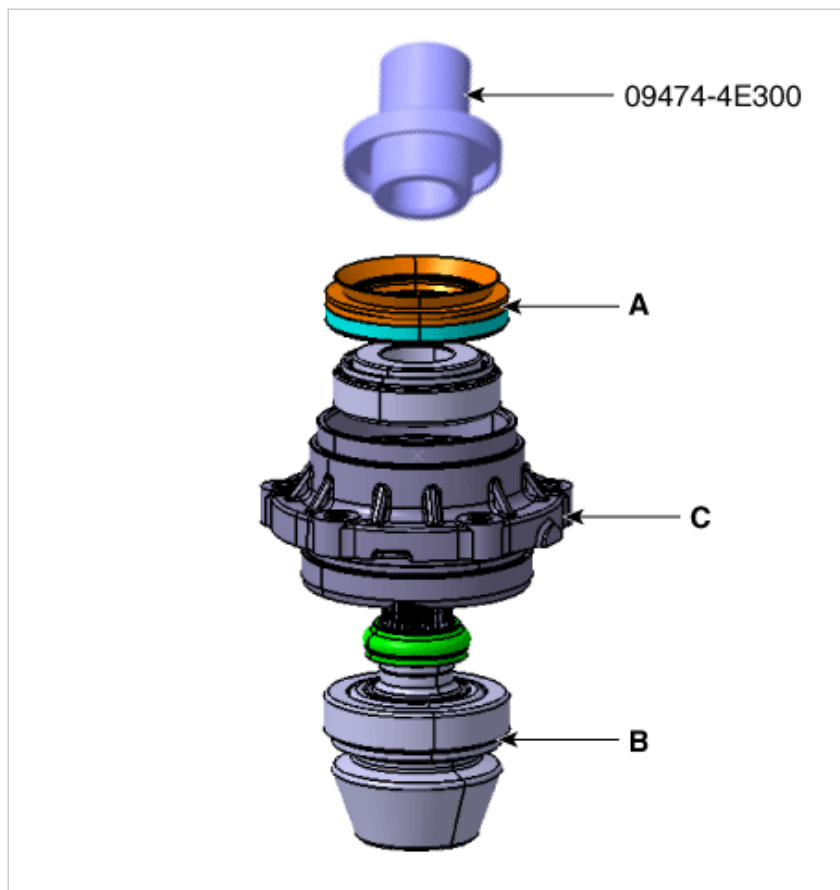
- Do not reuse the race. Be sure to install a new one.

4. Using the SST (09432-33700), install the pinion rear bearing race.

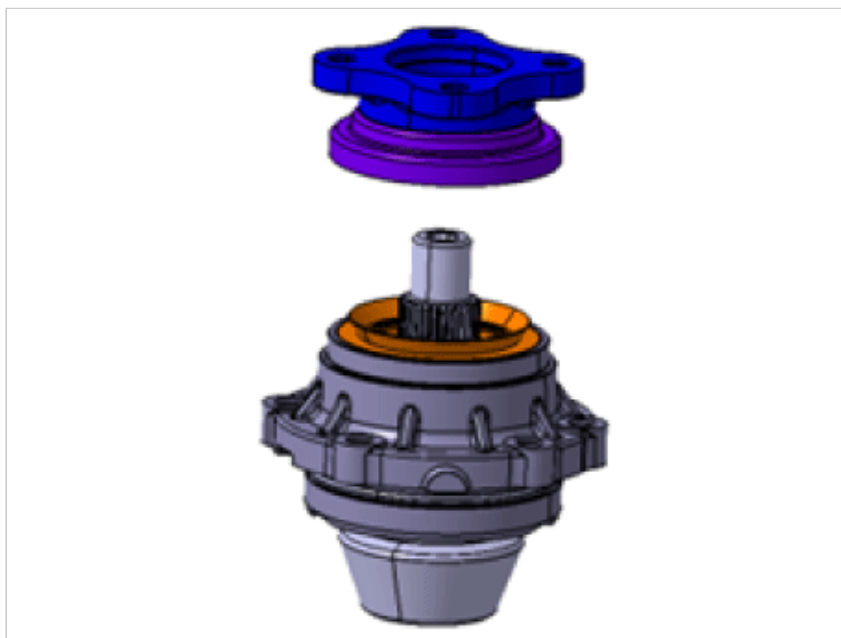
**NOTICE**

- Do not reuse the race. Be sure to install a new one.

5. After installing the pinion oil seal(A), install the pinion gear assembly(B) at the pinion cage(C).



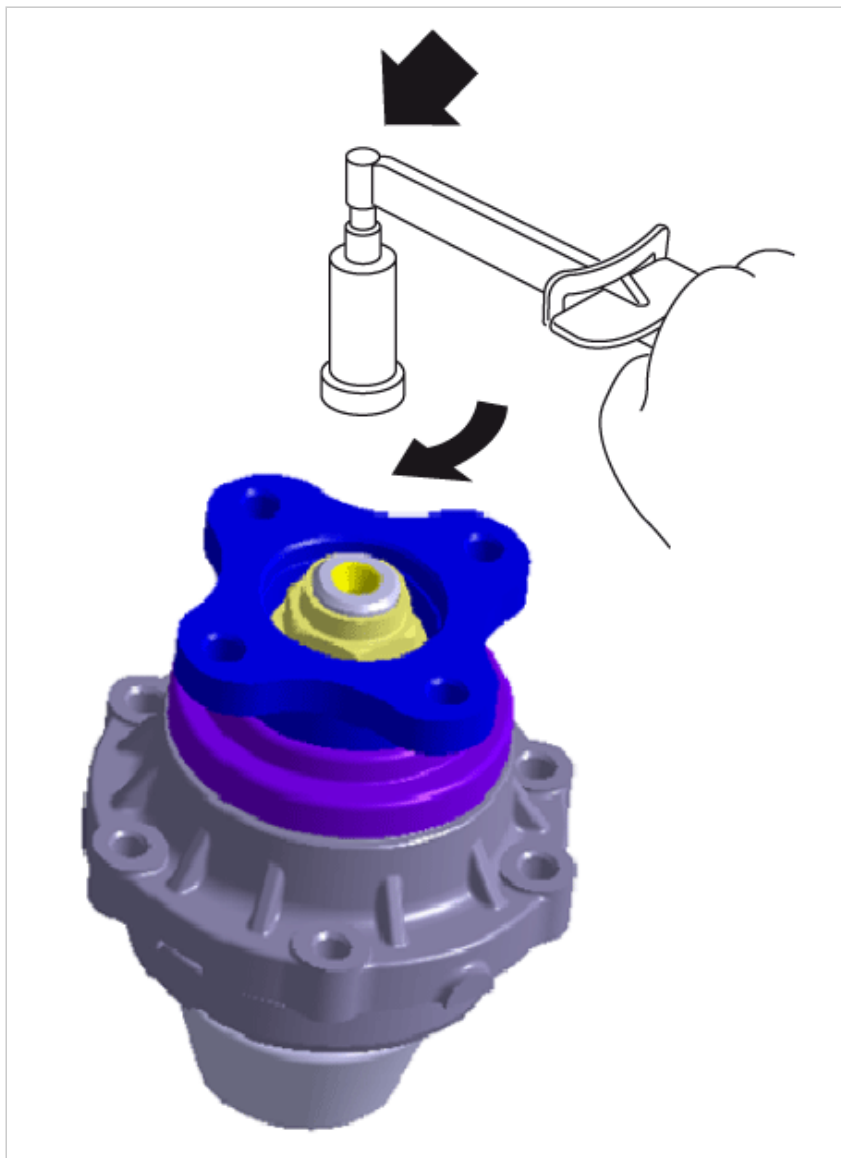
6. Install the companion flange.



7. Tighten the pinion lock nut.

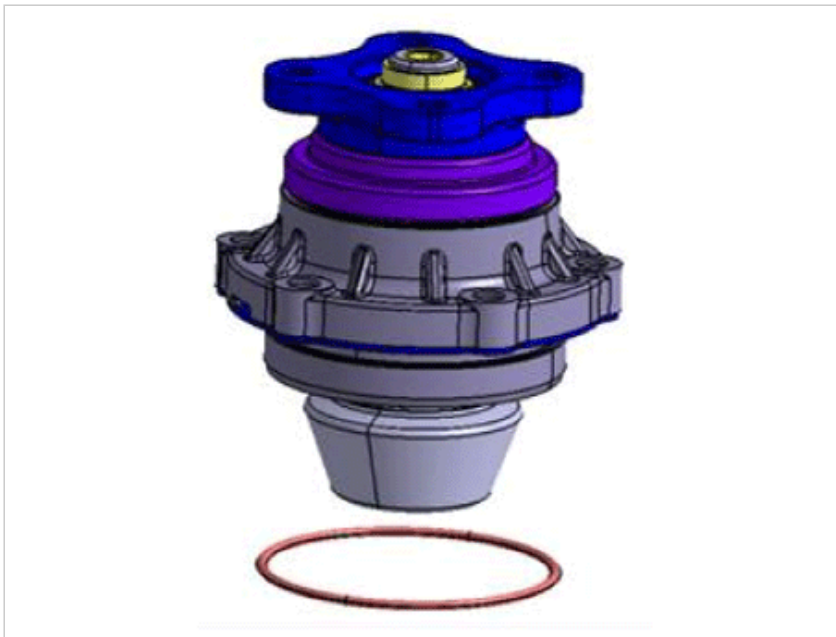
Pinion bearing preload :

1.2 - 1.8 N·m (12.0 - 18.3 kgf·cm, 0.87 - 1.3 lb·ft)

**NOTICE**

- Maintain the constant speed rotation (60rpm).

8. Install the pinion O-ring.



NOTICE

- Do not reuse the O-ring.
- Be sure to install a new one. Apply some oil along the O-ring.

9. Install the pinion sub assembly (A).

Tightening torque :

34.3 - 37.3 N·m (3.5 - 3.8 kgf·m, 25.3 - 27.5 lb·ft)

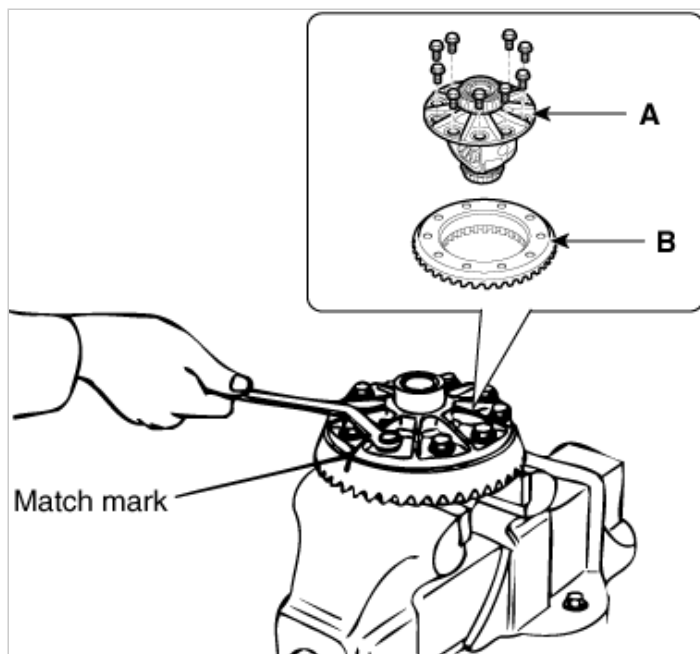


[Differential case assembly]

1. Install the differential case and ring gear.

Tightening torque :

78.4 - 88.3 N·m (8.0 - 9.0 kgf·m, 57.7 - 65.1 lb·ft)

**NOTICE**

- Tighten the bolts in a diagonal sequence.

2. Using SST (09432-3D500), install the side bearing.

**NOTICE**

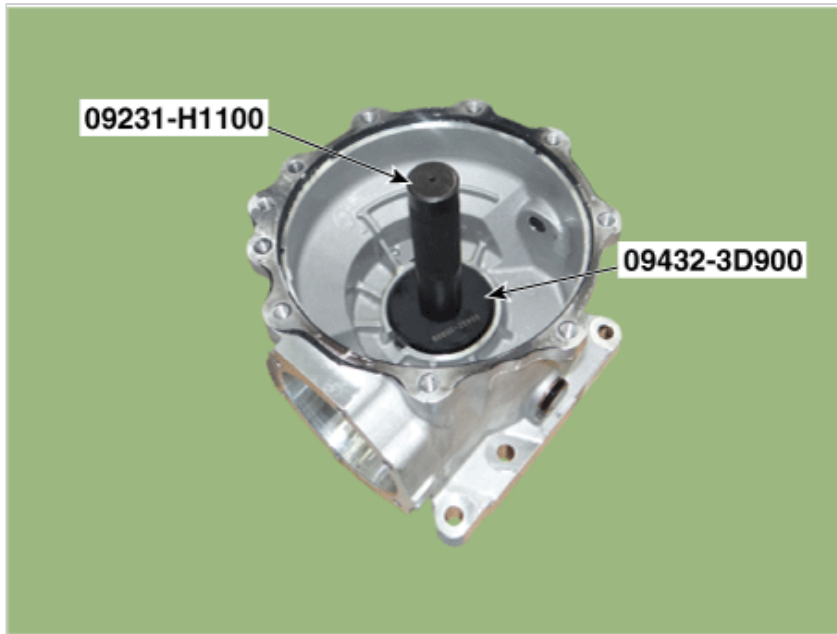
- Do not reuse the bearing. Be sure to install a new one.

3. Using SST (09474-4E100), install the differential carrier oil seal.

**NOTICE**

- Do not reuse the oil seal. Be sure to install a new one.

4. Using SST (09432-3D900), install a spacer and race at the differential carrier.

**NOTICE**

- Do not reuse the race. Be sure to install a new one.

5. Using SST (09432-3D900), install a spacer and race at the differential carrier cover.



6. Install the differential case assembly to the differential carrier.



7. Check the backlash at the companion flange.

Backlash :

Standard : 0.07 - 0.15 mm (0.003 - 0.006 inch)

Companion flange PCD part equivalent :

0.11 - 0.23 mm (0.004 - 0.009 inch)

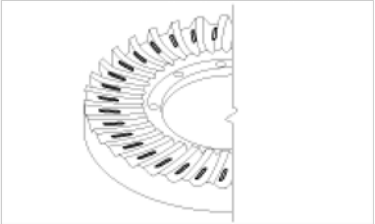
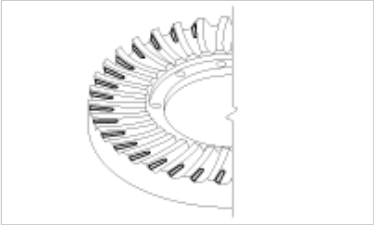
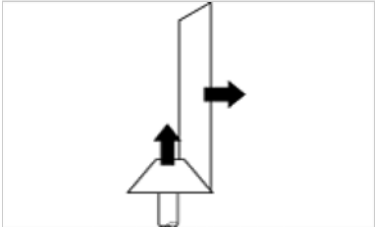
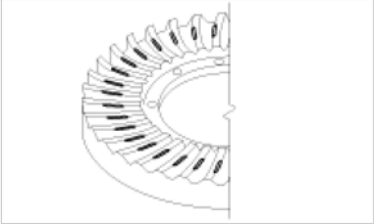
Companion flange standard torque :30kgf.cm

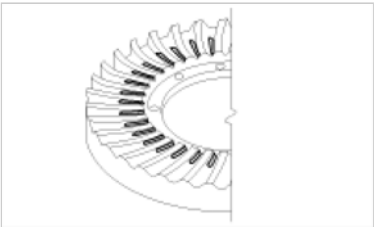
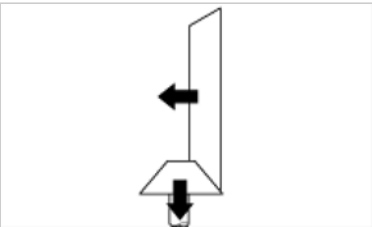
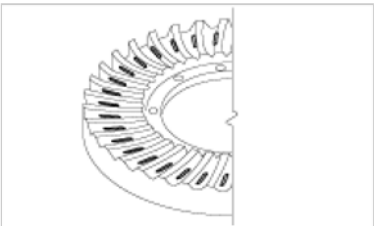


NOTICE

- Measure the backlash by applying the torque of 30kgf.cm to the companion flange in both directions.
- The thickness of both spacers shall be adjusted by disassembling again when the backlash is bigger or smaller than the tolerance.
- Increase the spacer thickness on the cover side by one unit and reduce the spacer thickness on the carrier side by one unit when backlash is bigger than the tolerance.
- Increase the spacer thickness on the carrier side by one unit and reduce the spacer thickness on the cover side by one unit when backlash is smaller than the tolerance.
- The adjusting unit of the spacer is 0.02mm.

NOTICE

Tooth contact		Solution	
Standard contact			
1. Wheel contact		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 farther from the drive pinion.	
2. Face contact			
3. Toe contact			

		Decrease the thickness of the pinion height adjusting shim, and position the drive pinion farther from the center of the drive gear. Also, for backlash adjustment, reposition the drive gear closer to the drive pinion.	
4. Flank contact			

1) 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.

2) When you can not obtain a correct pattern, the drive gear and drive pinion have exceeded their limits. Both gears should be replaced as a set.

8. Install the differential carrier cover and then install the oil seal.

Tightening torque :

39.2 - 49.0 N·m (4.0 - 5.0 kgf·m, 28.9 - 36.2 lb·ft)

Sealant: LIQUID GASKET LT5060 equivalent

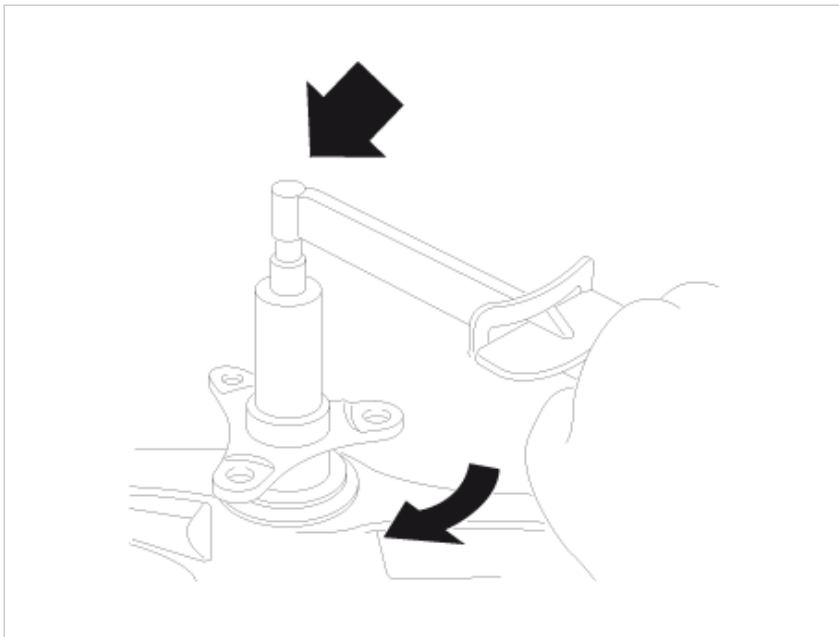


NOTICE

- Remove the remaining sealant before coating.
- Remove the remaining sealant on the surface and apply sealant in thickness of 2-3 mm evenly along the rear cover surface.

9. Measure the total preload.

Total preload :Pinion bearing preload (12.0 - 18.3 kgf.cm) + (15.0 - 45.0 kgf.cm) / Reduction gear ratio



NOTICE

- Maintain the constant speed rotation (60rpm).

10. Install the drain plug (A).

Tightening torque :

49.0 - 68.6 N·m (5.0 - 7.0 kgf·m, 36.2 - 50.63 lb·ft)



NOTICE

- Do not reuse the drain plug. Be sure to install a new one.

11. Install the rear differential assembly to the vehicle. Loosen the filler plug (A) and fill the oil.

Tightening torque :

44.1 - 53.9 N·m (4.5 - 5.5 kgf·m, 32.5 - 39.8 lb·ft)

Oil type : Hypoid gear oil MS517-15 GT 75W/85 (GL-5)

(SK HK SYN GEAR OIL 75W/85 Equivalent)

Oil capacity (L) : 0.7 ± 0.05

