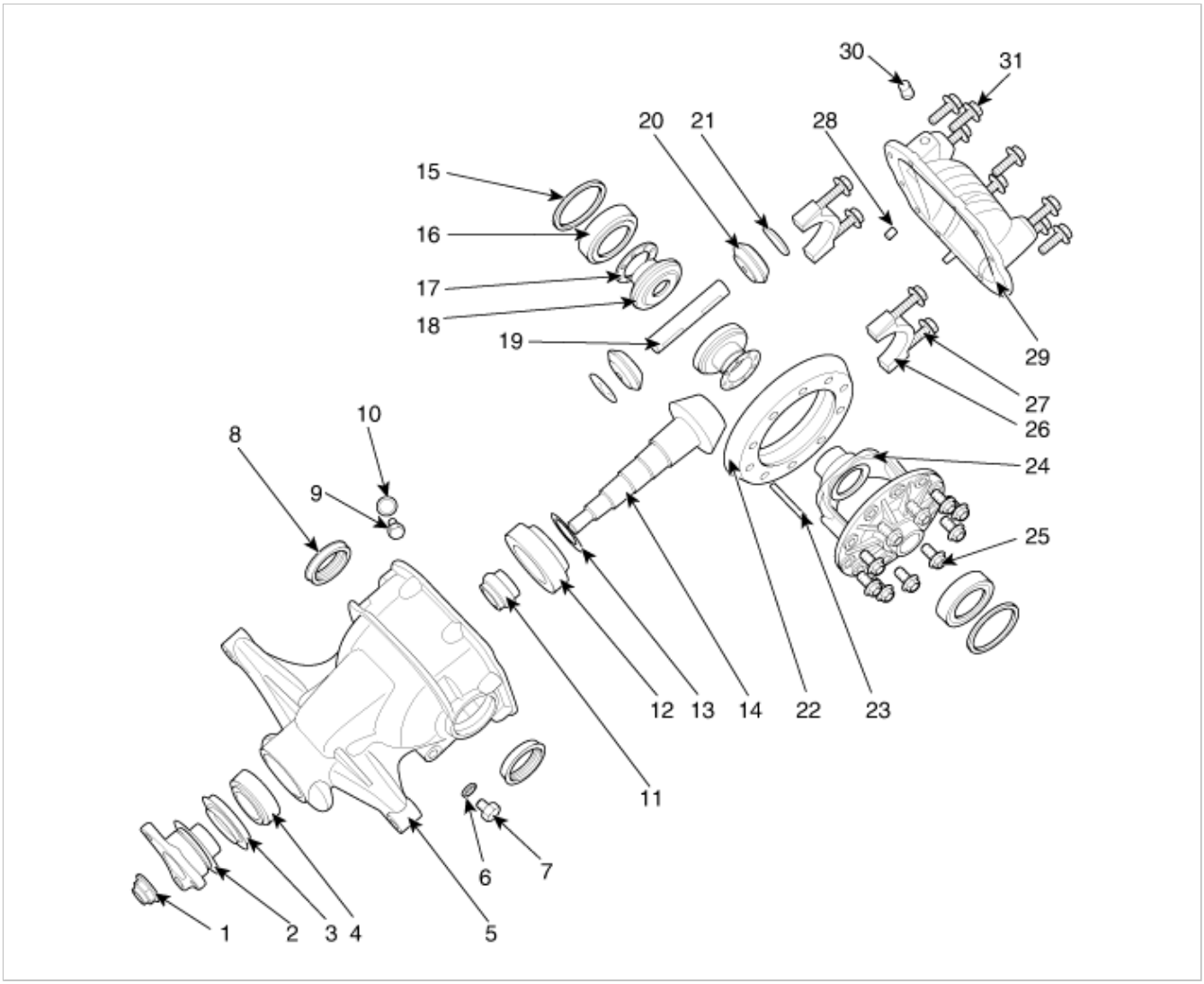
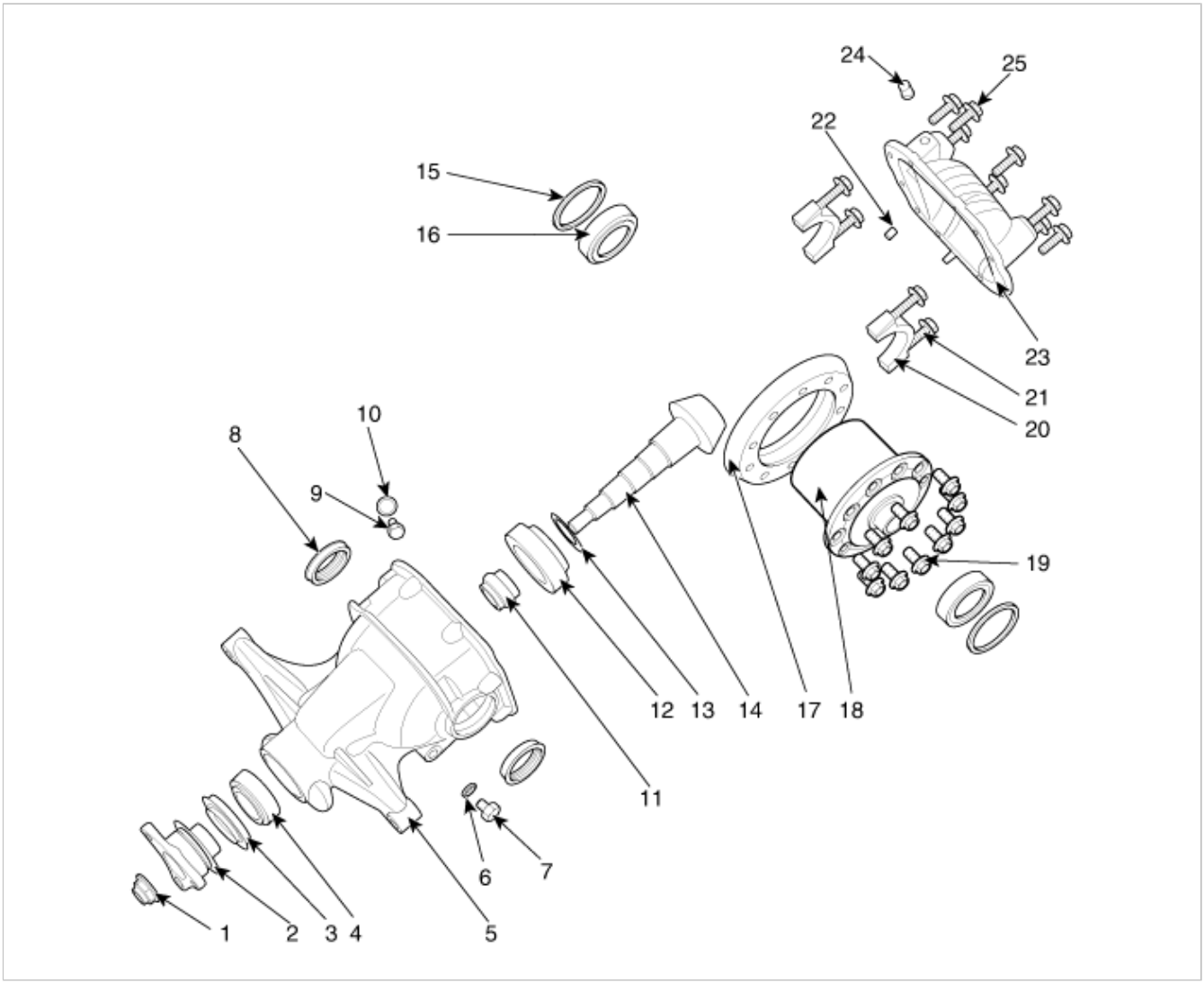
## Component (Open Type)




| | | |
|---|---|---|
| 1. Drive pinion nut | 12. Pinion rear bearing | 24. Differential case |
| 2. Companion flange | 13. Pinion height adjusting shim | 25. Ring gear bolt |
| 3. Front oil seal | 14. Drive pinion gear | 26. Bearing cap |
| 4. Pinion front bearing | 15. Side bearing adjusting washer | 27. Bearing cap bolt |
| 5. Differential carrier | 16. Side bearing | 28. Dowel pin |
| 6. Gasket | 17. Side gear thrust washer | 29. Rear cover |
| 7. Filler plug | 18. Side gear | 30. Air breather |
| 8. Side oil seal | 19. Pinion mate shaft | 31. Cover bolt |
| 9. Drain plug | 20. Pinion mate gear | |
| 10. Gasket | 21. Pinion mate thrust washer | |
| 11. Pinion bearing adjusting spacer (Collapsible spacer) | 22. Drive gear(Ring gear) | |
| | 23. Lock pin | |

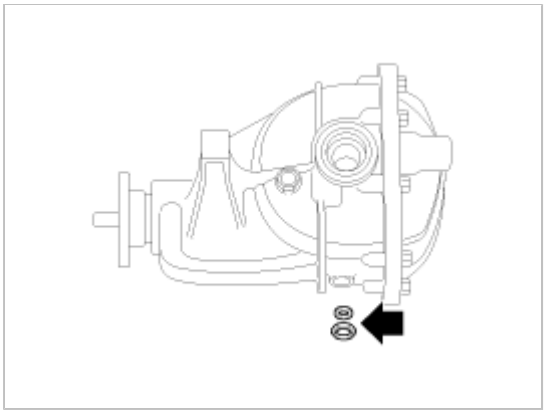
**Component (LSD Type)**




| | | |
|---|---|---|
| 1. Drive pinion nut | 10. Gasket | 19. Ring gear bolt |
| 2. Companion flange | 11. Pinion bearing adjusting spacer | 20. Bearing cap |
| 3. front oil seal | (Collapsible spacer) | 21. Bearing cap bolt |
| 4. Pinion front bearing | 12. Pinion rear bearing | 22. Dowel pin |
| 5. Differential carrier | 13. Pinion height adjusting shim | 23. Rear cover |
| 6. Gasket | 14. Drive pinion gear | 24. Air breather |
| 7. Filler plug | 15. Side bearing adjusting washer | 25. Cover bolt |
| 8. Side oil seal | 16. Side bearing | |
| 9. Drain plug | 17. Drive gear(Ring gear) | |
| | 18. Limited slip differential assy(LSD) | |

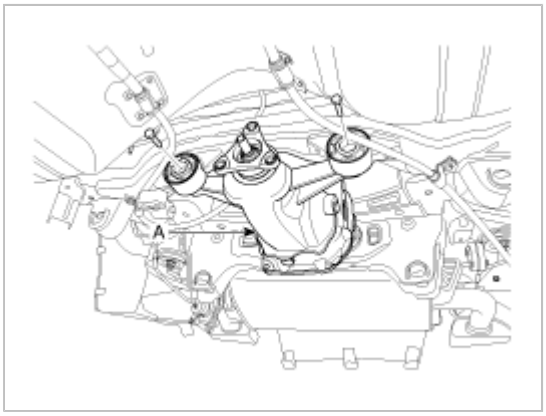
## Replacement

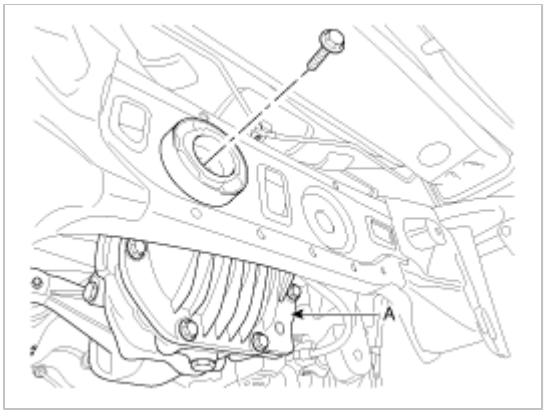
1. Drain the differential gear oil.



2. Remove the rear driveshaft(Refer to DS group-Rear driveshaft)
3. Remove the propellshaft assembly(Refer to DS group-Propellshaft)
4. Loosen the differential carrier assembly mount bolts and than remove the differential assembly(A)

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



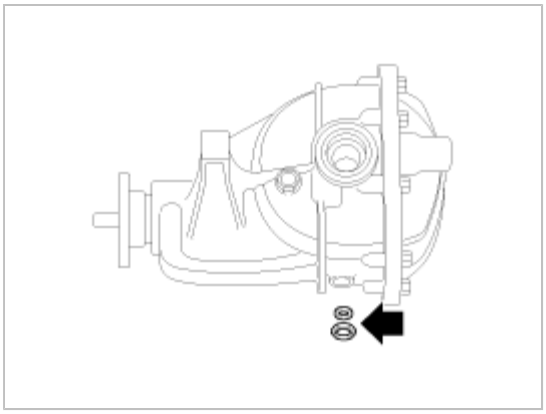




5. Installation is the reverse order of removal.

## Disassembly

**Rear differential carrier**

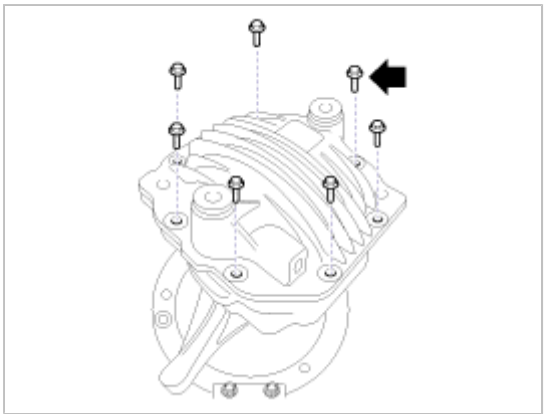
1. Before disassembling Rear differential carrier, drain off oil from Rear differential carrier.



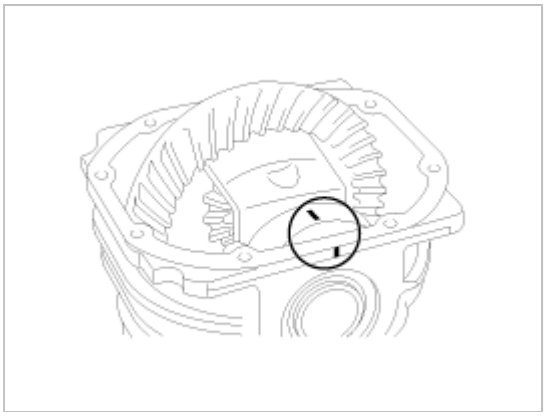
NOTE

For the first time of oil change, there is a possibility that oil color looks black due to a phosphating wear.

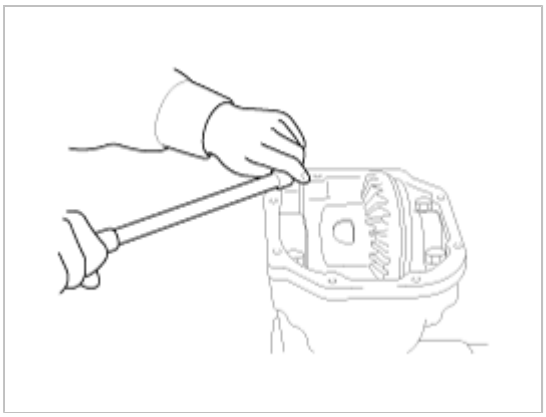
2. Remove the cover bolts.



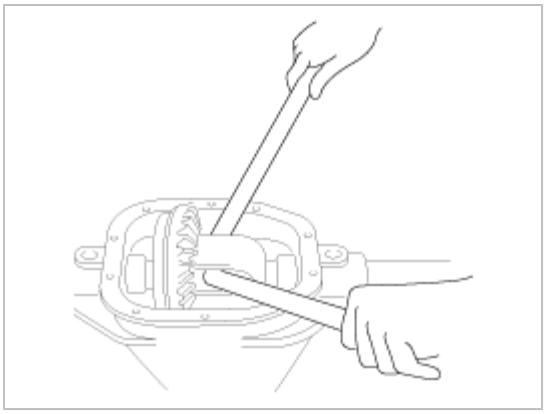
3. Before disassembling differential case assembly, paint match marks on one side of the bearing cap.



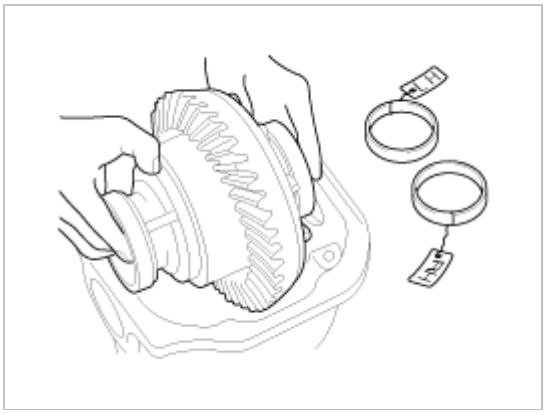
4. Loosen bearing cap bolts and remove bearing caps.



5. Lift differential case assembly out with tool.



6. Keep the side bearing outer races together with inner races.

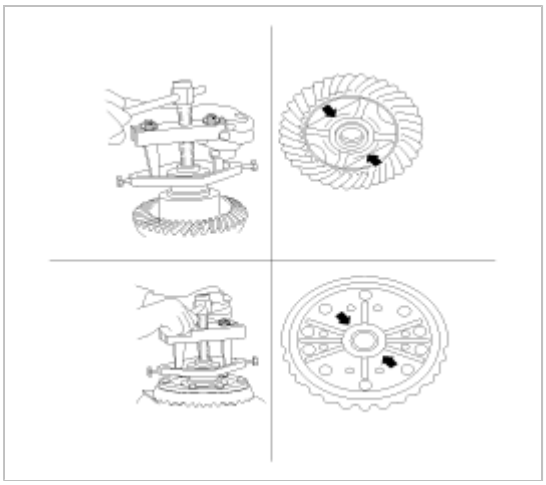


NOTE

Do not mix them up.
Also, keep side bearing adjusting washers together with bearings.

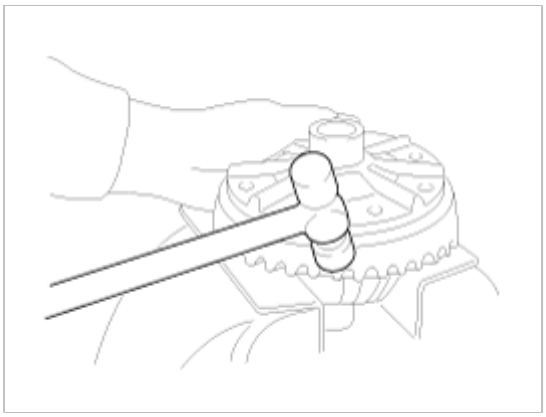
**Diff assembly Disassembly**

1. Remove side bearing inner races. To prevent damage to bearing, engage puller jaws in groove.

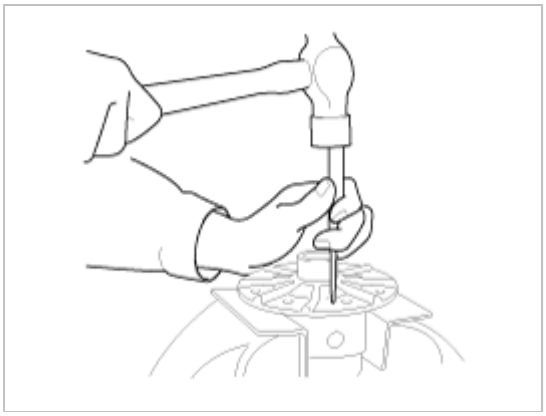


2. Be careful not to confuse left- and right-hand parts.

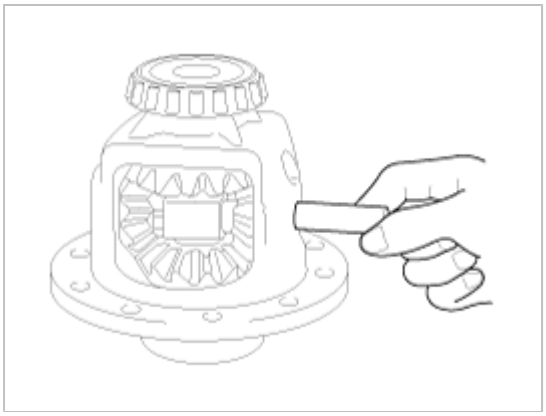

3. Loosen ring gear bolts.
   Tap drive gear off the differential case with a soft hammer.
   Tap evenly all around to keep drive gear from binding.



4. Drive out pinion mate shaft lock pin with punch from drive gear side.



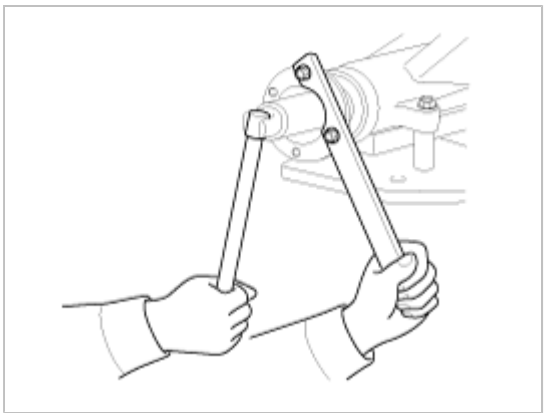
5. Remove the pinion mate shaft.



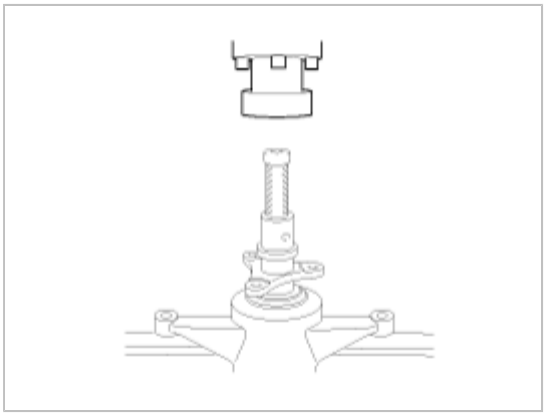
6. Remove side gears, pinion mate gears, side gear thrust washers, pinion mate thrust washers from differential case.

**Pinion assembly disassembly**

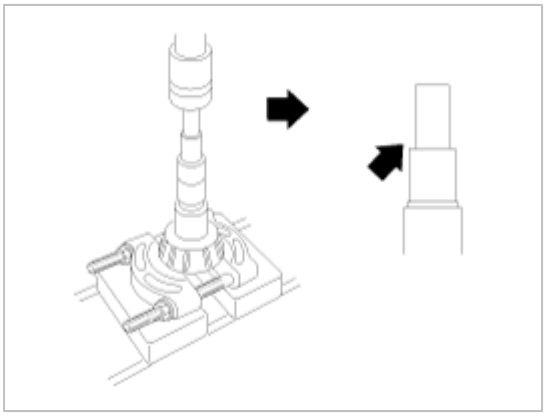
1. Loosen the pinion locking nut.



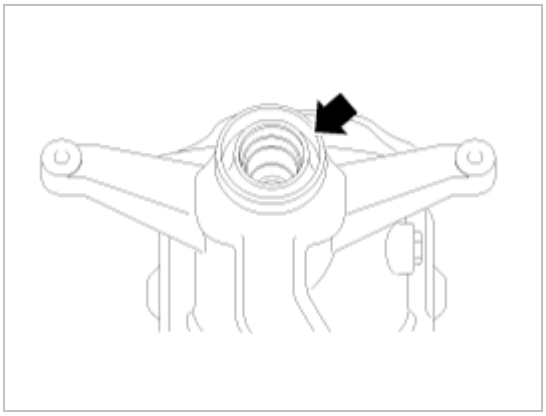
2. Using the press, take out drive pinion (together with pinion rear bearing inner race,pinion bearing adjusting spacer)
   Remove companion flange.



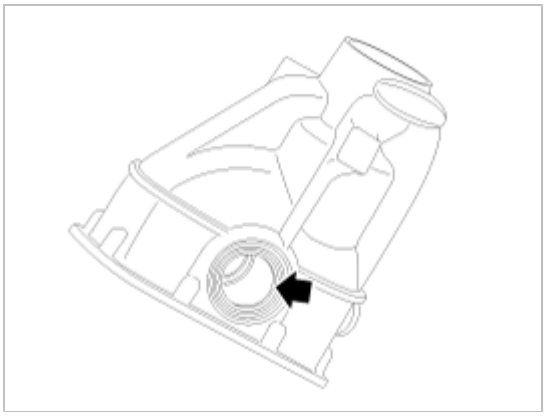
3. Using the press, remove pinion rear bearing inner race and pinion height adjusting shim .



4. Using the screwdriver, remove front oil seal.

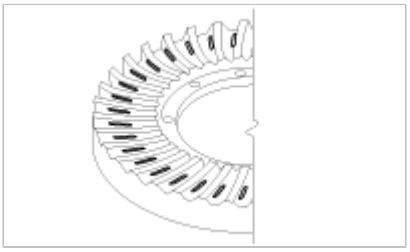
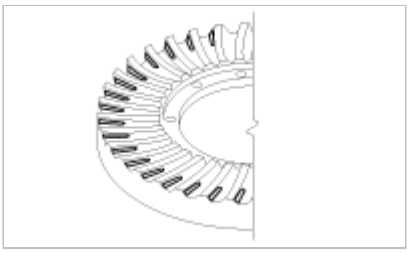
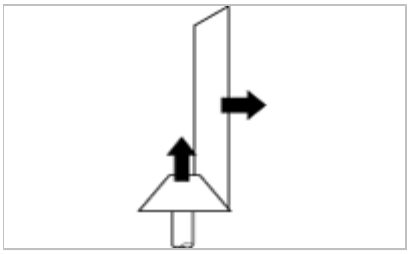
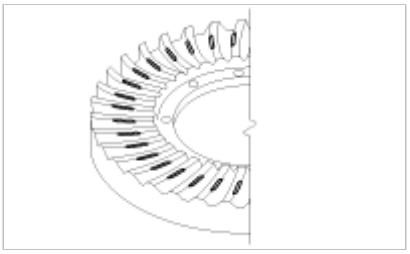
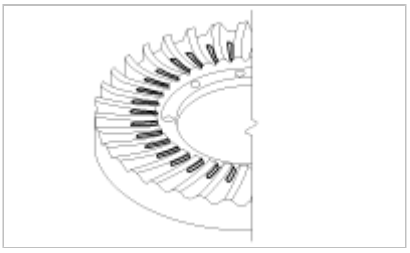
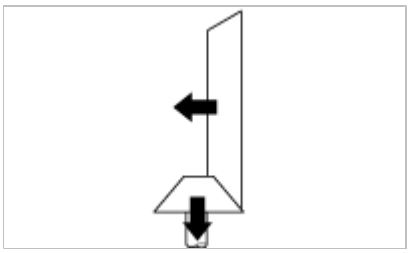


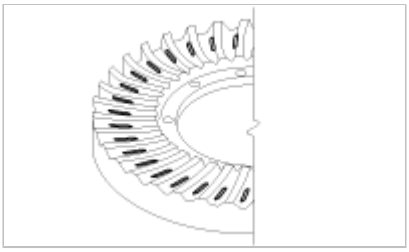
5. Using the screwdriver, Remove side oil seals.



## Inspection

1. Check the tooth contact pattern.

| Tooth contact | Contact state | Solution | |
|---|---|---|---|
| Standard contact |  | | |
| 1. Heal contact |  | Increase the thickness of the pinion height adjusting shim, and position the drive pinion closer to the center of the drive gear.<br>Also, for backlash adjustment, reposition the drive gear further from the drive pinion. |  |
| 2. Face contact |  | | |
| 3. Toe contact |  | Decrease the thickness of the pinion height adjusting shim, and position the drive pinion further from the center of the drive gear.<br>Also, for backlash adjustment, reposition the drive gear closer to the drive pinion. |  |
| 4. Flank contact | | | |

| | | | |
|---|---|---|---|
| |  | | |

NOTE

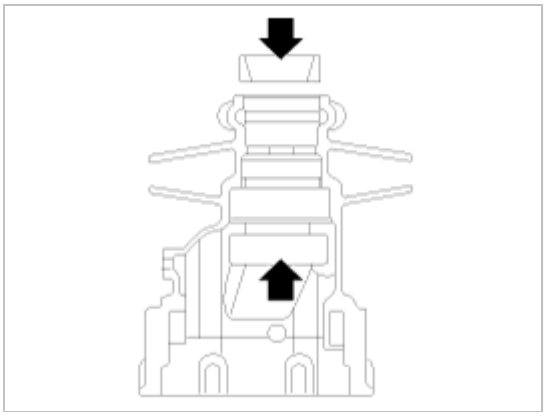
1. Tooth contact pattern is a method for judging the result of the adjustmentof drive pinion height and final drive gear backlash. The adjustment of drivepinion height and final drive gear backlash should be repeated until the toothcontact patterns are similar to the standard tooth contact pattern.
2.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

| Content | | Measures |
|---|---|---|
| Hypoid gear set(14+22)<br>(Drive pinion & Drive gear) | | If the gear teeth do not mesh or line-up correctly, determine the cause and adjust, repair, or replace as necessary. If the gear are worn, cracked, damaged, pitted or chipped (by friction) noticeably, replace with a new gear set. |
| Bearing (4, 12, 16) | | If found any chipped (by friction), pitted, worn, rusted, scratched mark, or unusual noise from the Bearing, replace with a new bearing ASSY (as a new set) |
| Oil seal (3, 8) | | Oil seals must be replaced with a new one whenever disassembled. |
| Differential carrier (5) | | Replace with a new one if found any wear or cracks on the contact sides of the Differential carrier. |
| Companion flange (2) | | Replace with a new one if found any chipped marks or other damage on the contact sides of the Lips of the front oil seal. |
| Open type diff assy | side gear(18) & pinion mate gear(20) | Replace with a new one if found that it is chipped (by friction), damaged, or unusual worn. |
| | side gear thrust washer(17) & pinion mate thrust washer (21) | Replace with a new one if found that it is chipped (by friction), damaged, or unusual worn. |
| Lsd type diff assy | Limited slip differential assy (18) | Replace with a new one if found any wear or cracks on the contact sides of the Limited slip differential assy. |

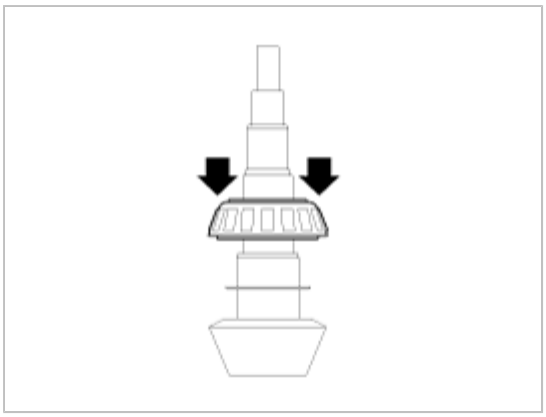
## Reassembly

**Pinion assembly**

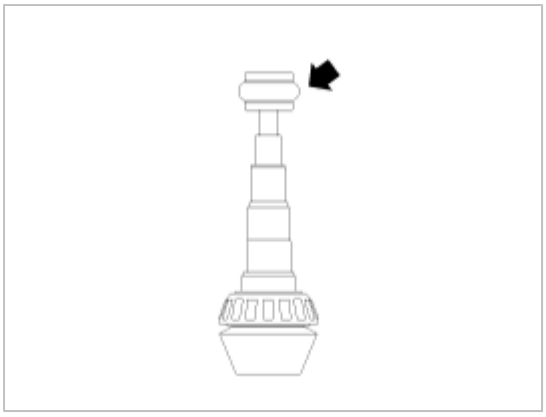
1. Press-fit pinion front and rear bearing outer races with tools.



2. Install selected pinion height adjusting shim in drive pinion gear.
   Using press and tool, press-fit pinion rear bearing inner race into it.

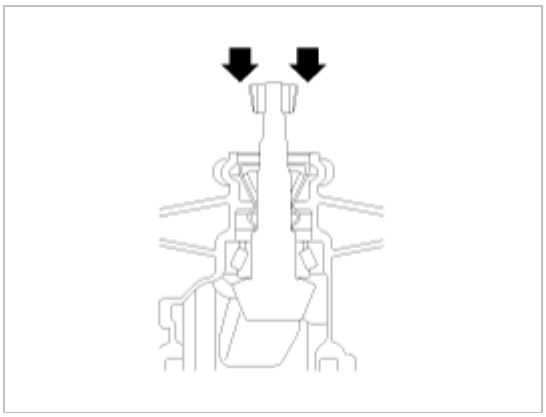


3. Install the pinion bearing adjusting spacer to the drive pinion.



> **CAUTION**
>
> Pinion bearing adjusting spacer is not reusable.
> Never reuse pinion bearing adjusting spacer.

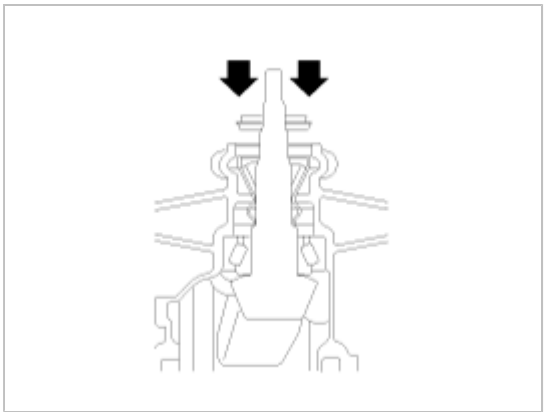
4. Using press and tool, press-fit pinion front bearing inner race.



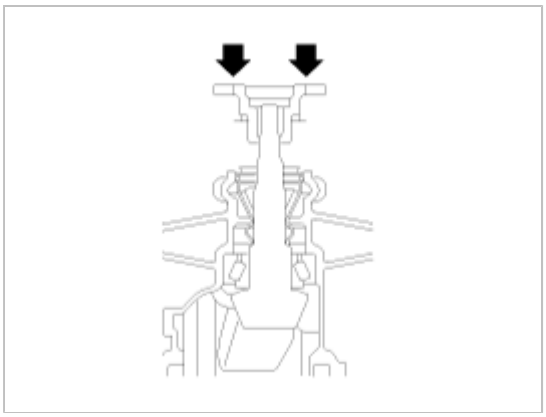
NOTE

The pressure do not exceed 5ton.

5. Using press and tool, press-fit front oil seal.



6. Using press and tool, press-fit companion flange.

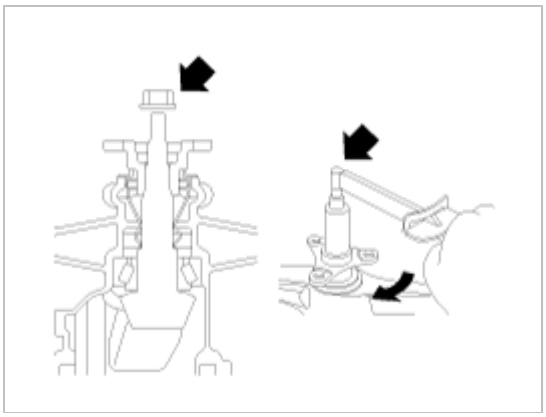


NOTE

The pressure do not exceed 5ton.

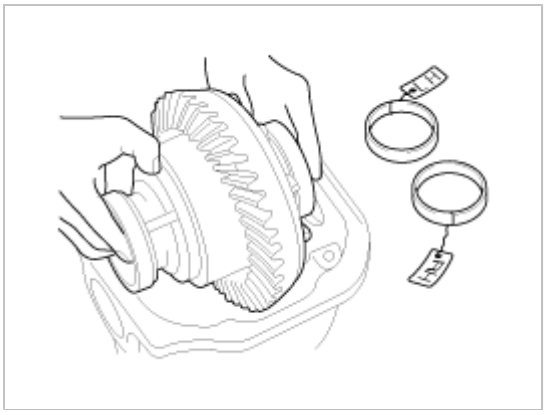
7. Install the pinion locking nut to make that the bearing freeroad is standard.

**Tightening torque Nm (kgf.m, lb-ft) :**
112.7~161.8 (11.5~16.5, 83.1~119.3)

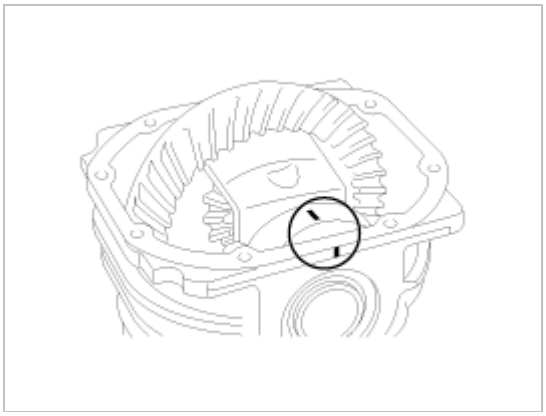


**Differential case**

1. Fix the diff assembly with both hands and install it to the differential carrier.

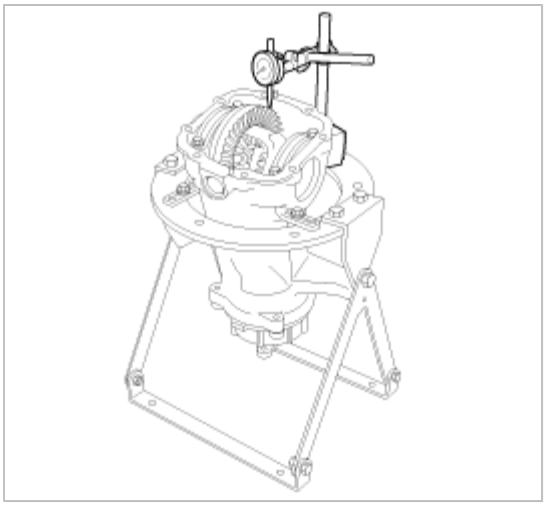


2. Instert the left/right diff shim between the diff side bearing and carrier. And then install the bearing cap with marks.



3. Measure drive gear-to-drive pinion backlash with a dial indicator at several point.

**Standard** :0.10~0.15mm

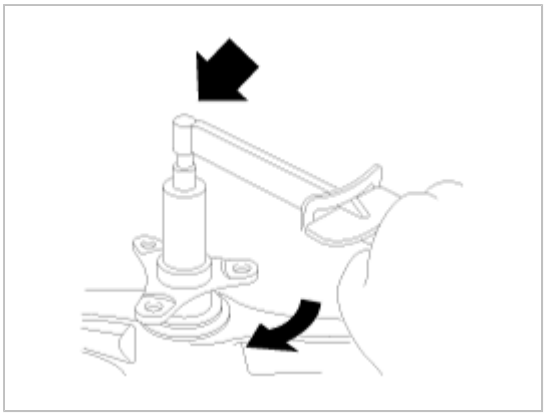


NOTE

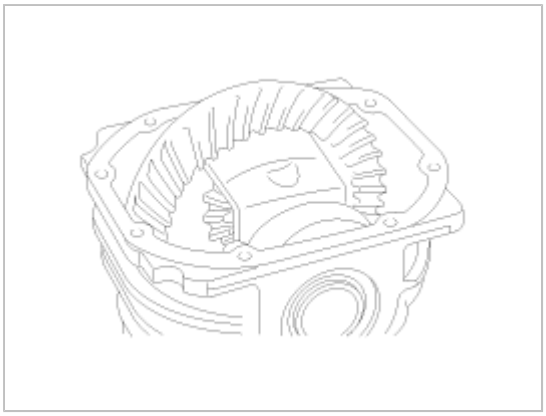
Thickness of the diff shim need to adjusted if backrash is small. Lessen the thickness of the left side diff shim. By contraries enlarge the thickness of the right side diff shim that much.

4. Check total preload with tool.

Standard : Pinion freeroad : 1.9~4.9(0.2~0.5, 1.4~3.6)

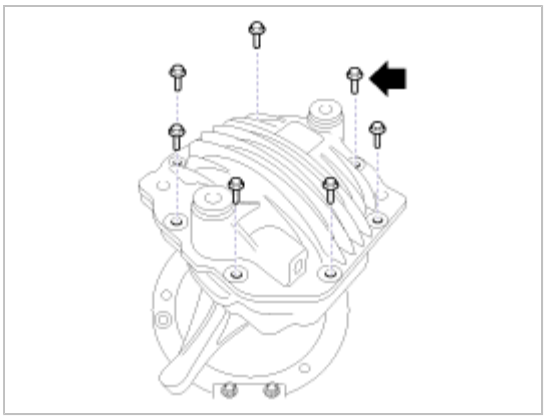


5. Applies liquid sealant to differential carrier as shown in figure

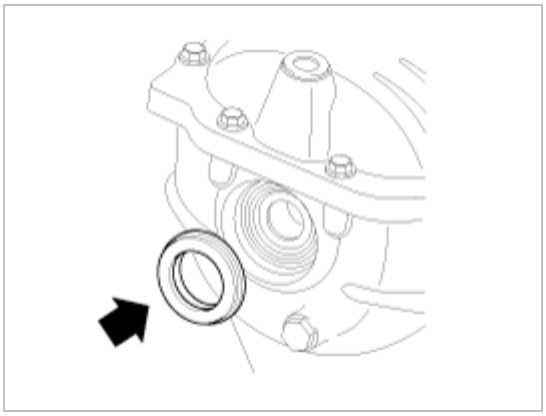


6. Install the differential cover.

**Tightening torque Nm (kgf.m, lb-ft) :**
39.2~49.0 (4.0~5.0, 28.9~39.1)

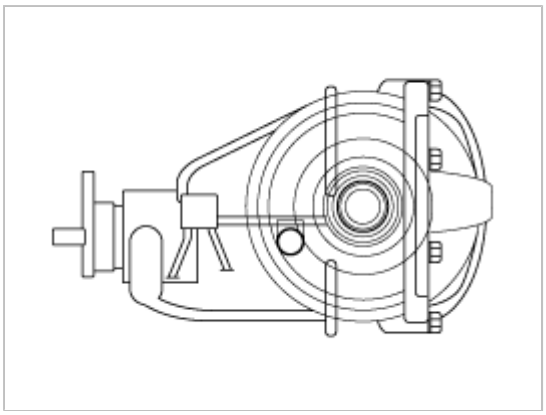


7. Using press and tool, press-fit side oil seals.



8. Install the drain plug and pinar plug.

**Pillar plug** : 39.2~58.8(4.0~5.0, 28.9~43.3)
**Drain plug** : 49.0~68.6(5.0~7.0, 36.1~50.6)



9. Tighten air breather.

**Tightening torque Nm (kgf.m, lb-ft) :**
9.8~19.6 (1.0~2.0, 7.2~14.4)