
DAIHATSU

TERIOS

J100

FRONT & REAR DIFFERENTIAL

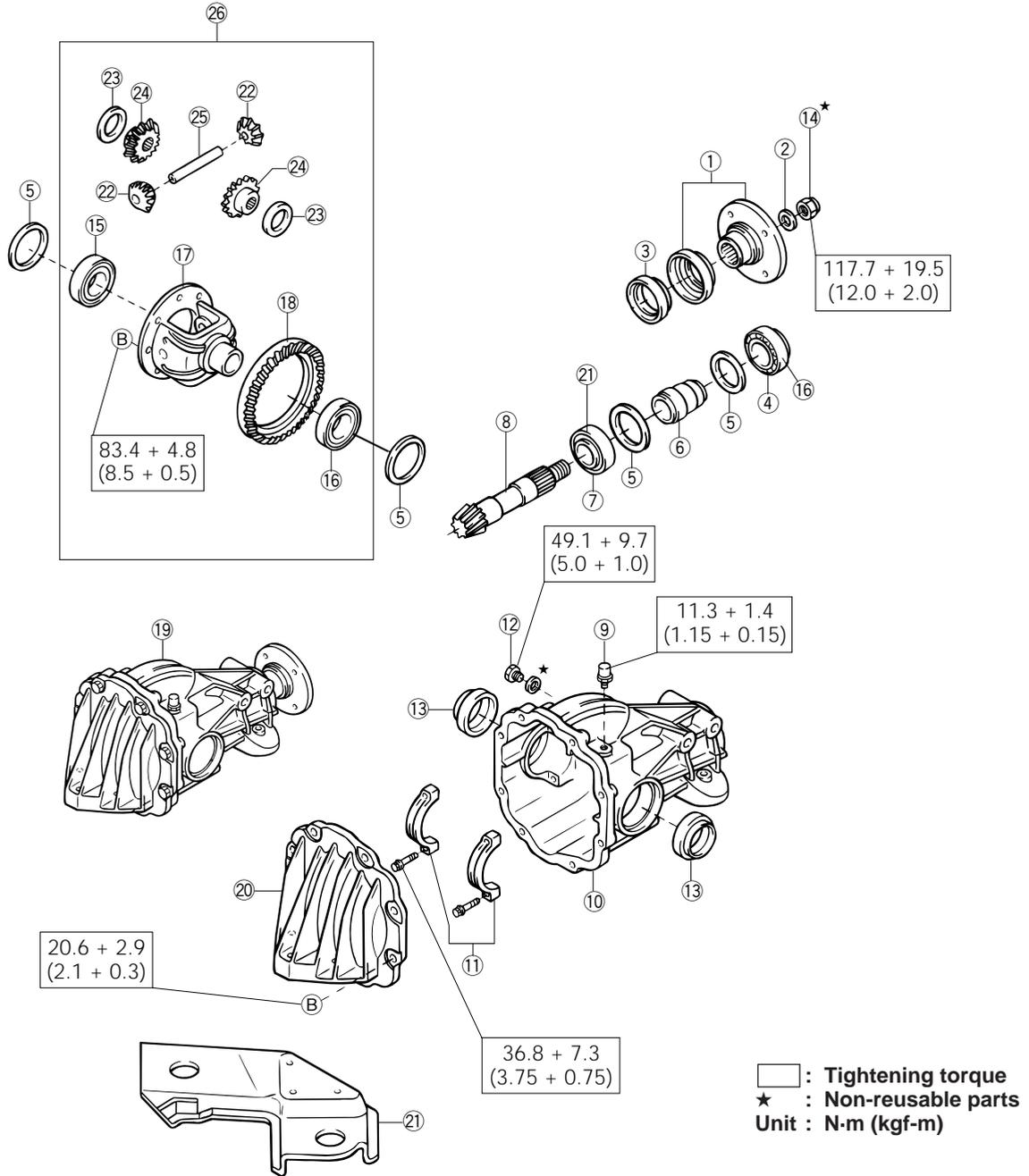
FRONT DIFFERENTIAL	DF- 2
COMPONENTS	DF- 2
REAR DIFFERENTIAL	DF- 3
COMPONENTS	DF- 3
IN-VEHICLE SERVICE	DF- 4
REPLACEMENT OF FRONT AND REAR DIFFERENTIAL COMPANION FLANGE OIL SEALS	DF- 4
REPLACEMENT OF FRONT DIFFERENTIAL SIDE OIL SEAL	DF- 7
REMOVAL	DF- 9
DISASSEMBLY	DF-11
INSPECTION	DF-16
ASSEMBLY	DF-18
INSTALLATION	DF-25
SSTs	DF-28
TIGHTENING TORQUE	DF-30

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DF

DF-2

FRONT DIFFERENTIAL COMPONENTS

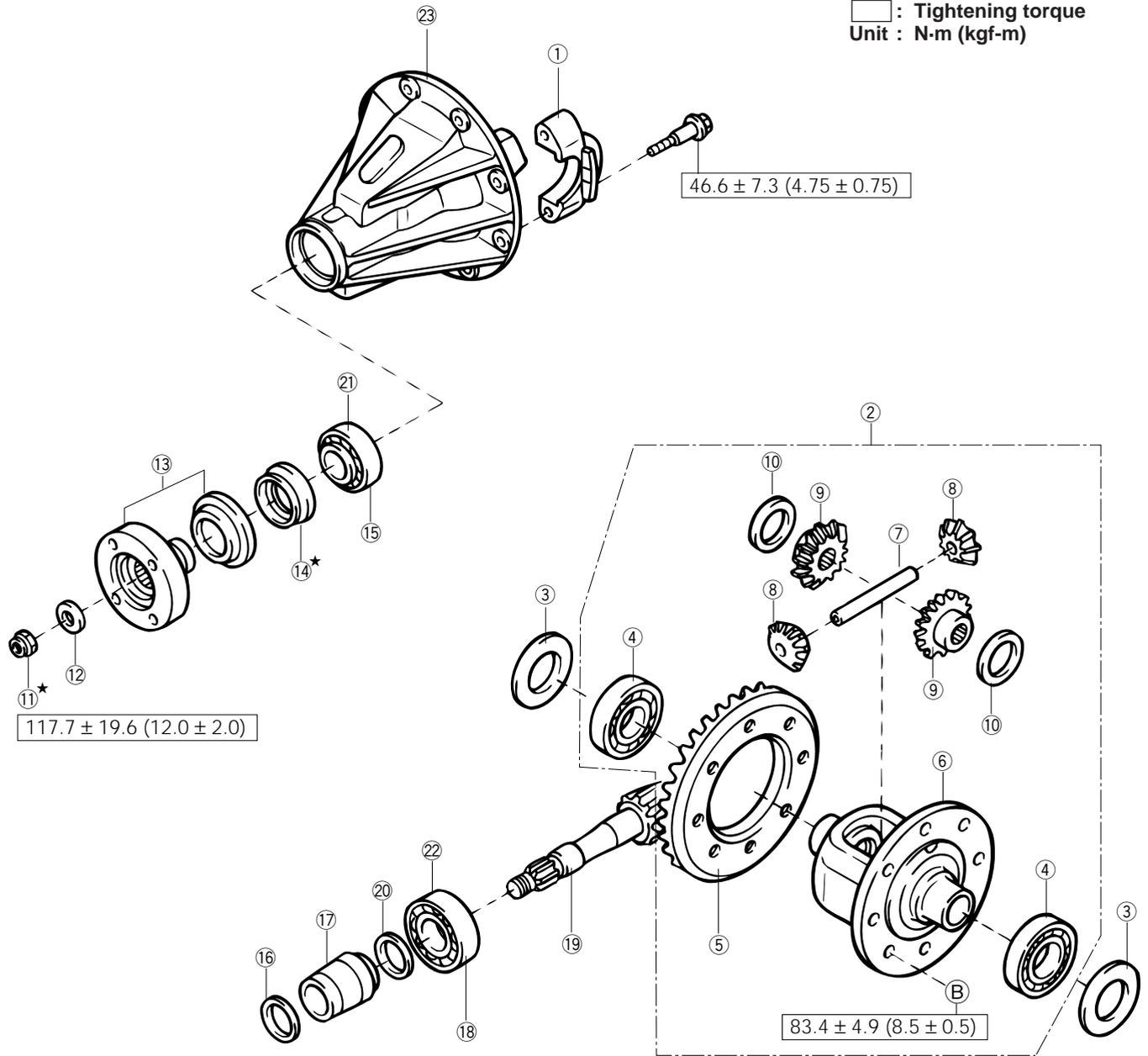


- ① Drive pinion companion flange subassembly
- ② Plate washer
- ③ T type oil seal
- ④ Tapered roller bearing (rear inner)
- ⑤ Shim
- ⑥ Differential drive pinion bearing spacer
- ⑦ Tapered roller bearing (front inner)
- ⑧ Differential drive pinion
- ⑨ Breather plug
- ⑩ Differential carrier
- ⑪ Differential bearing cap
- ⑫ W/head straight screw plug
- ⑬ T type oil seal
- ⑭ Lock nut

- ⑮ Bearing
- ⑯ Tapered roller bearing (rear outer)
- ⑰ Differential case
- ⑱ Differential ring gear
- ⑲ Differential front carrier assembly
- ⑳ Front axle housing cover subassembly
- ㉑ Tapered roller bearing (rear inner)
- ㉒ Differential pinion
- ㉓ Differential side gear thrust washer
- ㉔ Differential side gear
- ㉕ Differential pinion shaft
- ㉖ Differential case assembly
- ㉗ Front differential carrier support bracket

REAR DIFFERENTIAL COMPONENTS

★ : Non-reusable parts
 □ : Tightening torque
 Unit : N-m (kgf-m)



- ① Differential cap bearing
- ② Differential case assembly
- ③ Shim
- ④ Radial ball bearing
- ⑤ Differential ring gear
- ⑥ Differential case
- ⑦ Differential pinion shaft
- ⑧ Differential pinion
- ⑨ Differential side gear
- ⑩ Side gear thrust washer
- ⑪ Lock nut
- ⑫ Plate washer

- ⑬ Drive pinion companion flange subassembly
- ⑭ T type oil seal
- ⑮ Tapered roller bearing
- ⑯ Shim
- ⑰ Drive pinion bearing spacer
- ⑱ Tapered roller bearing
- ⑲ Differential drive pinion
- ⑳ Shim
- ㉑ Front tapered roller bearing outer race
- ㉒ Rear tapered roller bearing outer race
- ㉓ Differential carrier

IN-VEHICLE SERVICE

REPLACEMENT OF FRONT AND REAR DIFFERENTIAL COMPANION FLANGE OIL SEALS

NOTE:

- This section describes the replacement procedure both for the front and rear companion flange oil seals. Therefore, some descriptions and figures may not be applicable or differ from each other.

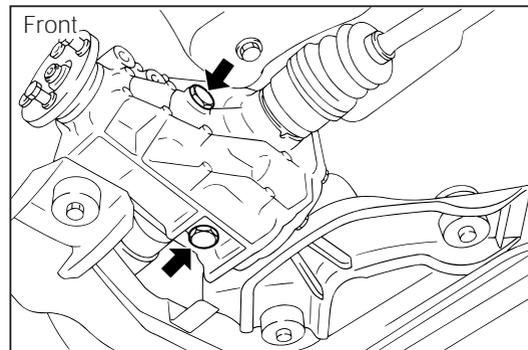
1. Jack up the vehicle and support it with safety stands. (As for the jacking-up points and support points for safety stands, refer to the GI section.)

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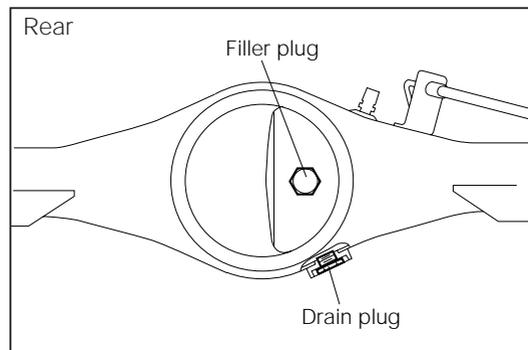
2. Drain the differential oil by removing the drain plug and gasket.

CAUTION:

- Do not reuse the used gasket.



JDF00005-00003



JDF00000-00004

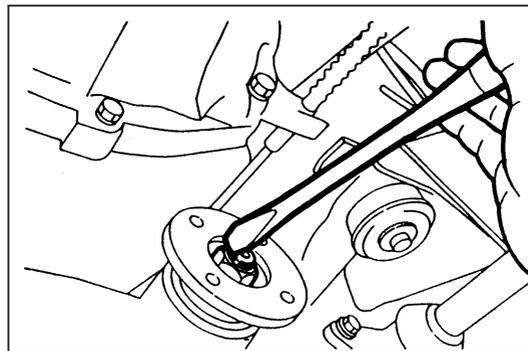
3. Disconnect the propeller shaft from the companion flange of the front or rear differential. (Refer to the PR section.)

CAUTION:

- Sling the companion flange of the propeller shaft at the body side with a suitable string or the like to prevent the unnecessary force from applying to the spider section of each universal joint or the center bearing section of the front propeller shaft.

JDF00006-00000

4. Release the staking of the lock nut, using a suitable chisel and a hammer.



JDF00007-00005

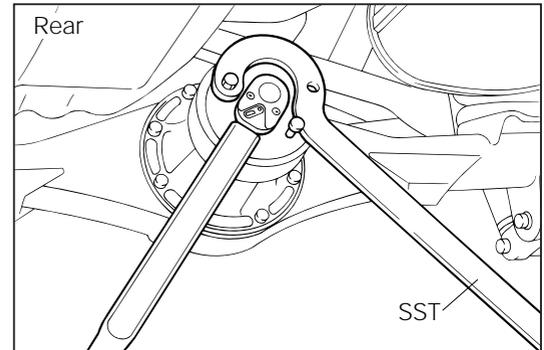
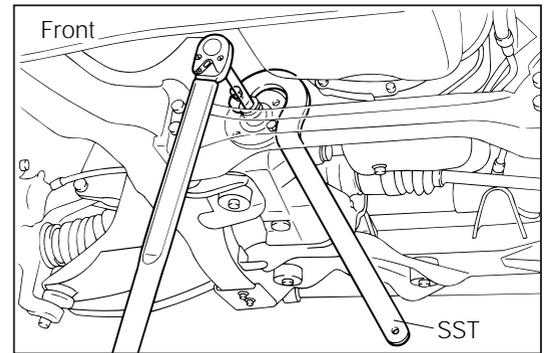
5. Loosen the lock nut of the companion flange while preventing the companion flange from turning, using the following SST in combination with a long box wrench or the like.

SST: 09330-87301-000

6. Remove the lock nut and plate washer.

CAUTION:

- Never reuse the removed lock nut and plate washer.

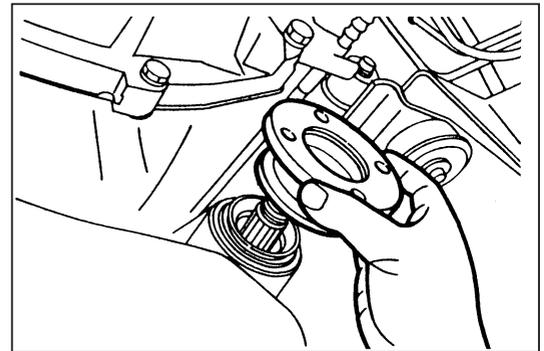


7. Remove the drive pinion companion flange subassembly.

NOTE:

- If any difficulty is encountered in removing the companion flange, use the following SST.

SST: 09950-20017-000

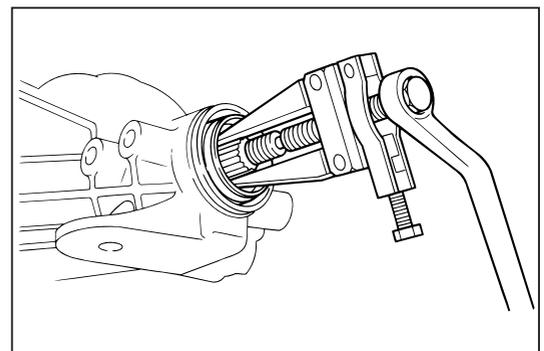


8. Remove the T type oil seal, using the following SST.

SST: 09308-10010-000

CAUTION:

- Do not reuse the used oil seal.

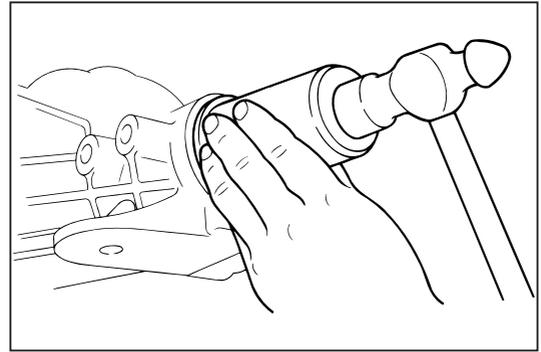


DF-6

9. Clean the T type oil seal attaching surface with a piece of cloth or the like.
10. Thinly apply the lithium soap base multi-purpose grease to the lip section of the T type oil seal.
11. Install a new T type oil seal, using the following SST.
SST: 09635-20010-000

CAUTION:

- Drive the T type oil seal until the outer surface of the T type oil seal becomes flush with the flange surface of the front differential.



JDF00011-00010

12. Install the drive pinion companion flange subassembly, a new washer plate and a new lock nut.
13. Tighten the new lock nut to the specified tightening torque while preventing the companion flange from turning, using the following SST.

SST: 09330-87301-000

Tightening Torque: 98.1 - 137.2 N·m (10.0 - 14.0 kgf·m)

14. Stake the lock nut to the recessed part of the drive pinion shaft, using a suitable chisel or the like properly.

CAUTION:

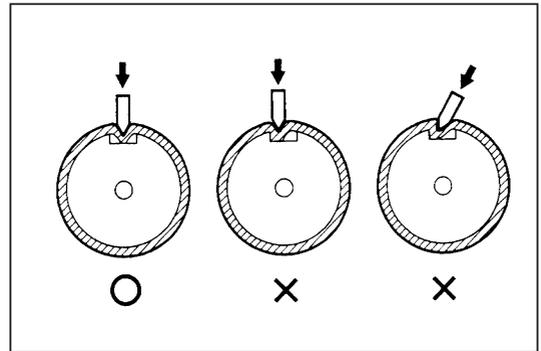
- Make sure that the lock section of the nut is positively staked down to the bottom of the drive pinion groove. Failure to observe this caution may lead to looseness.

15. Connect the propeller shaft.
(Refer to the PR section)
16. Install and tighten the drain plug with a new gasket interposed.

Tightening Torque:

Front 39.3 - 58.8 N·m (4.0 - 6.0 kgf·m)

Rear 53.9 - 68.6 N·m (5.5 - 7.0 kgf·m)



JDF00012-00011

17. Remove the oil filler plug.
18. Fill the specified differential oil from the oil filler plug hole.

Specified differential oil

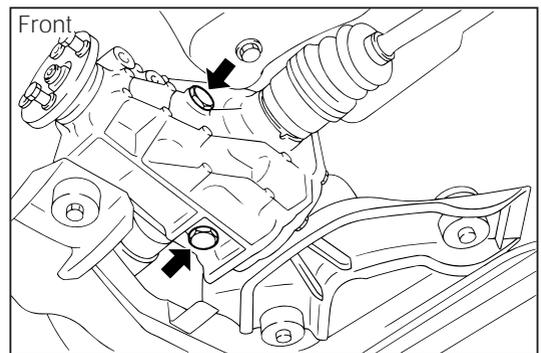
Grade : API GL-5 (Front & rear)

Viscosity: SAE 80W-90 (Standard)

: SAE 80W-90 LSD (For LSD)

Capacity: 0.7 liters (Front)

1.55 liters (Rear)



JDF00013-00012

NOTE:

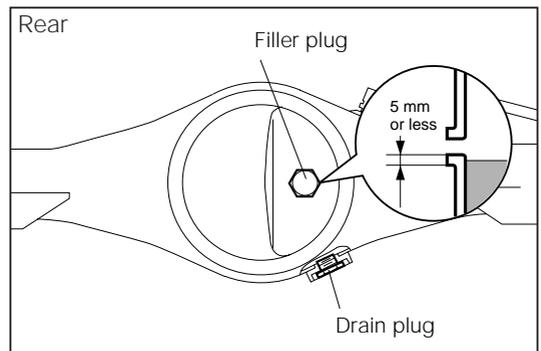
- The specified oil level is 0 to 5 mm from the lower end of the oil filler hole.

19. Install the oil filler plug with a new gasket interposed and tighten it to the specified tightening torque.

Tightening Torque:

Front 39.3 - 58.8 N·m (4.0 - 6.0 kgf·m)

Rear 53.9 - 68.6 N·m (5.5 - 7.0 kgf·m)



JDF00014-00013

20. Jack down the vehicle.
21. Ensure that no oil leakage exists.

REPLACEMENT OF FRONT DIFFERENTIAL SIDE OIL SEAL

1. Jack up the vehicle and support it with stands. (As for the jacking-up points and support points for safety stands, refer to the GI section.)
2. Remove the front wheels.
3. Drain the differential oil by removing the drain plug and gasket.

CAUTION:

- Do not reuse the removed gasket.

4. Remove the tie rod end attaching castle nut lock clip.
5. Remove the tie rod end attaching castle nut.
6. Disconnect the tie rod end from the steering knuckle, using the following SST.

SST: 09611-87701-000

7. Remove the lock clip of the castle nut for the lower arm.
8. Remove the castle nut for the lower arm.
9. Disconnect the lower arm from the steering knuckle, using the following SST.

SST: 09611-87701-000

CAUTION:

- Be sure to protect the speed sensor rotor and sensor from damage, using a piece of cloth or the like.

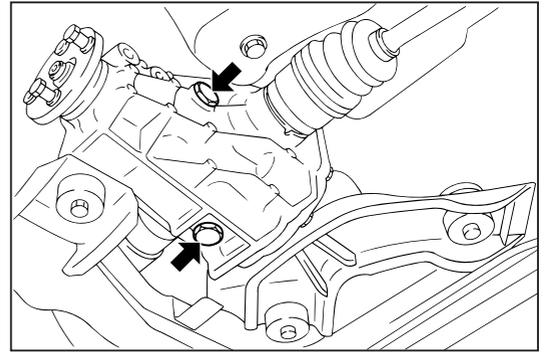
10. Loosen both sides of the suspension support attaching nuts.

CAUTION:

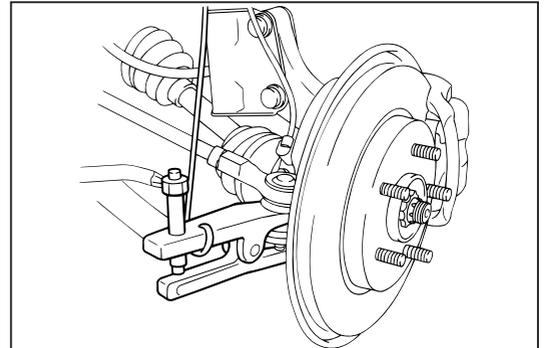
- Never reuse the used nut.

11. Disconnect the front drive shaft assembly from the front differential, using the following SST.

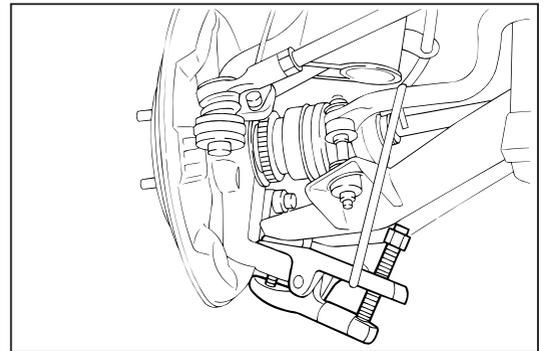
SST: 09648-87201-000



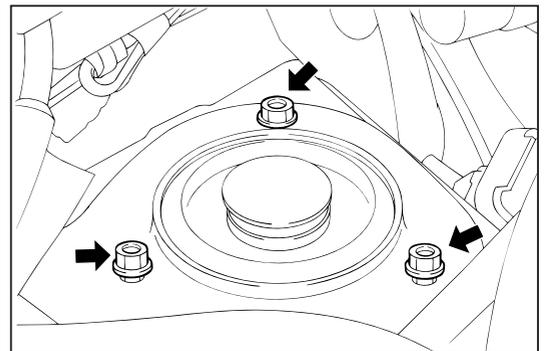
JDF00015-00014



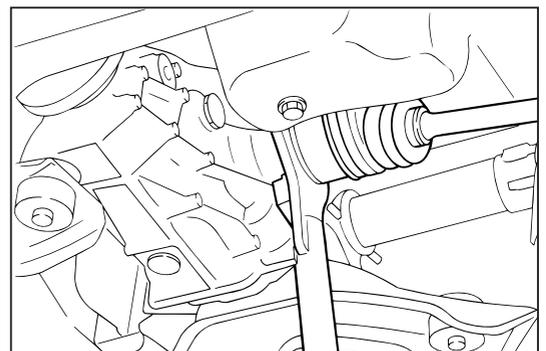
JDF00016-00015



JDF00017-00016



JDF00018-00017

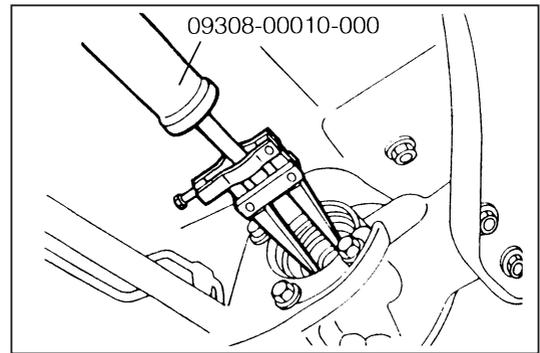


JDF00019-00018

DF-8

12. Remove the T type oil seal, using the following SST.

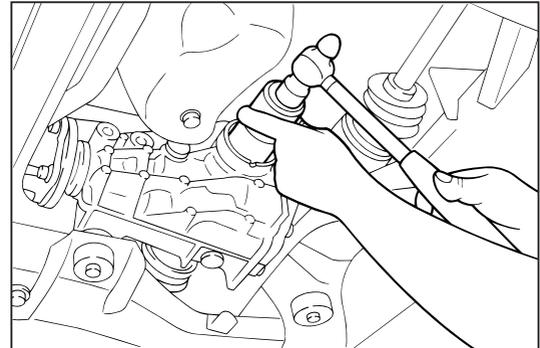
SST: 09308-00010-000



JDF00020-00019

13. Clean the oil seal attaching surface of the front differential.
14. Apply the lithium soap base multi-purpose grease to the lip section of the new oil seals.
15. Install a new T type oil seal, using the following SST.

SST: 09636-20010-000



JDF00021-00020

16. Apply the lithium soap base multi-purpose grease to the oil seal attaching surface of the drive shafts.
17. Connect the drive shafts to the front differential carrier.

CAUTION:

- Never made scratch on the oil seal during the connection of driver shaft.

18. Replace the suspension attaching nuts with new ones.
19. Tighten the new suspension attaching nuts evenly until the tightening torque reaches the specified tightening torque.

Tightening Torque: 28.4 - 42.2 N·m (2.9 - 4.3 kgf·m)

CAUTION:

- Never reuse the used nut.

20. Connect the lower arms to the steering knuckles with a new attaching castle nut and tighten it to the specified tightening torque.

Tightening Torque: 44.1 - 58.8 N·m (4.5 - 6.0 kgf·m)

21. Install new clips securely.

NOTE:

- Never reuse the used clips.

22. Connect the tie rod end to the steering knuckle with a new attaching castle nut and tighten it to the specified tightening torque.

Tightening Torque: 39.2 - 53.9 N·m (4.0 - 5.5 kgf·m)

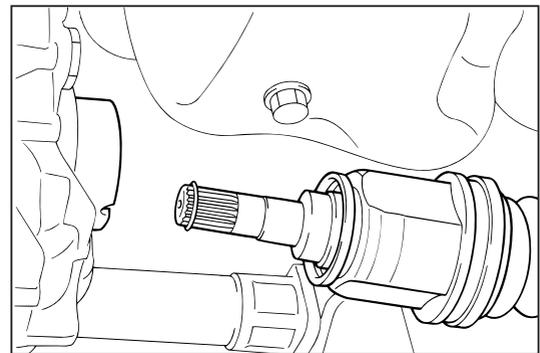
23. Install a new clip.

CAUTION:

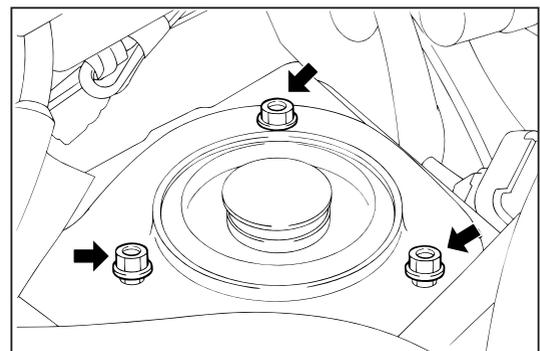
- Never reuse the removed clip.

24. Install and tighten the drain plug with a new gasket interposed.

Tightening Torque: 39.3 - 58.8 N·m (4.0 - 6.0 kgf·m)



JDF00022-00021



JDF00023-00022

25. Remove the filler plug and gasket.
26. Fill the differential oil from the filler plug.

Specified differential oil
Grade: API GL-5
Viscosity: SAE 80W-90
Capacity: 0.7 liters

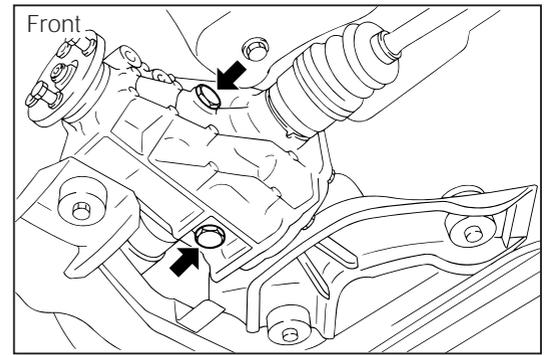
NOTE:

- The specified oil level is 0 to 5 mm from the lower end of the oil filler hole.

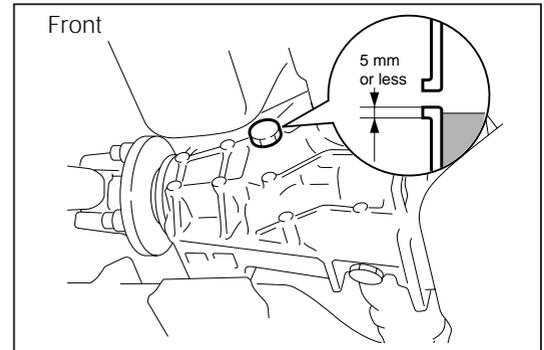
27. Install and tighten the filler plug with a new gasket interposed.

Tightening Torque: 39.3 - 58.8 N·m (4.0 - 6.0 kgf·m)

28. Install the front wheels.
29. Jack down the vehicle.
30. Inspect the front wheel alignment.
31. Ensure that no oil leakage exists.



JDF00024-00023



JDF00025-00024

REMOVAL

NOTE:

- This section describes the removal procedure both for the front and rear differentials. Therefore, some descriptions and figures may not be applicable or differ from each other.

1. Jack up the vehicle and support it with safety stands. (As for the jacking-up points and support points for safety stands, refer to the GI section.)
2. Remove the front and/or rear wheels.
3. Drain the differential oil by removing the drain plug and gasket.

CAUTION:

- Never reuse the removed gasket.

4. Disconnect the tie rod end from the steering knuckle. (For front differential)
(Refer to the procedure described in "REPLACEMENT OF FRONT DIFFERENTIAL SIDE OIL SEAL.")
5. Disconnect the lower arm from the steering knuckle. (For front differential)
(Refer to the procedure described in "REPLACEMENT OF FRONT DIFFERENTIAL SIDE OIL SEAL.")
6. Loosen the suspension support attaching nuts. (For front differential)
(Refer to the procedure described in "REPLACEMENT OF FRONT DIFFERENTIAL SIDE OIL SEAL.")

CAUTION:

- Never reuse the suspension support attaching nuts.

7. Pull out the front drive shaft assembly from the differential carrier assembly, using the following SST.
SST: 09611-87701-000

(Refer to the procedure described in "REPLACEMENT OF FRONT DIFFERENTIAL SIDE OIL SEAL.")

8. Remove the propeller shaft assembly. (Refer to the PR section.)

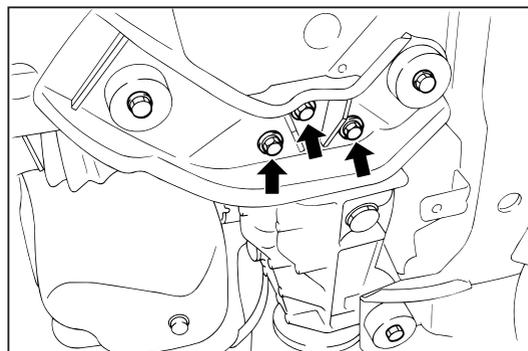
CAUTION:

- Prior to the disconnection of the propeller shaft from the transfer case, drain the transfer oil or prepare the oil stopper to prevent the transfer oil from flowing out and install it immediately after disconnecting the propeller shaft from the transfer case.

JDF00026-00000

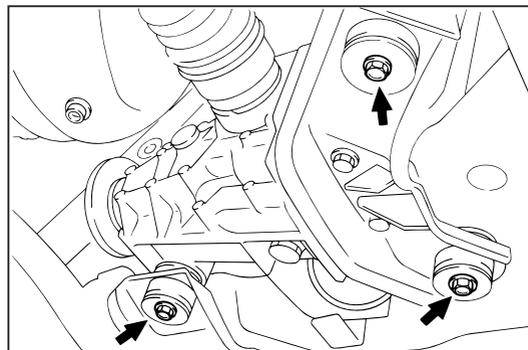
DF-10

9. Support the differential carrier, using a suitable engine hanger, transmission jacks or the like.
10. Remove the three attaching bolts of the differential carrier support bracket and differential carrier assembly.
(Only for front differential.)



JDF00027-00025

11. Remove the differential carrier assembly by removing three attaching bolts of the differential carrier support bracket mount.
(Only for front differential.)
12. Remove the front axle housing cover by removing the attaching bolts.
(Only for front differential.)

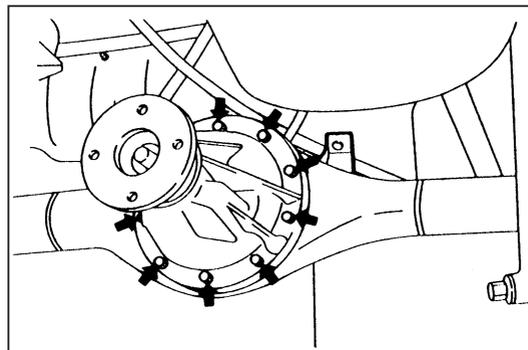


JDF00028-00026

NOTE:

- Be sure to place a suitable container under the front axle housing connected sections, for a large amount of the differential oil may flow out.

13. Remove the rear axle shaft assembly. (Refer to the RS section.)
(Only for rear differential.)
14. Remove the propeller shaft assembly. (Refer to the PR section.)
(Only for rear differential.)
15. Loosen the attaching bolts of the differential carrier assembly evenly.
(Only for rear differential.)
16. Remove the rear differential carrier assembly by removing the attaching bolts.
(Only for rear differential.)



JDF00029-00027

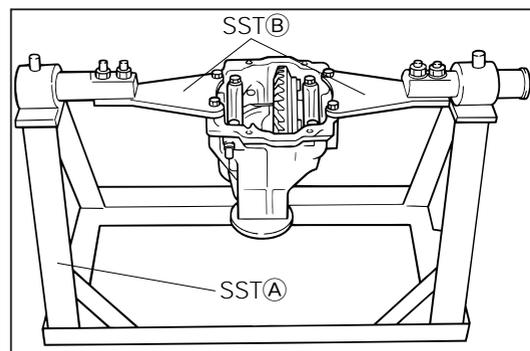
NOTE:

- It should be noted that a large amount of oil may flow out. Hence, prior to the disconnecting of the differential carrier, place a suitable container under the connected section between the differential and the rear axle housing.

DISASSEMBLY

- Place the differential carrier removed from the vehicle on a disassembly stand.

SST: 09219-87202-000 (A)
09548-87201-000 (B)



JDF00030-00028

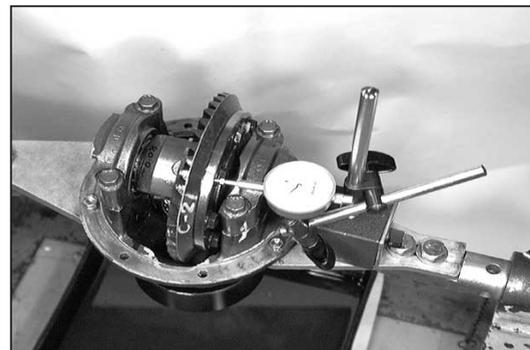
- Inspection before disassembly

- (1) Checking of ring gear runout

Ensure that the ring gear runout is within the specified value, using a dial gauge.

Maximum limit: 0.1 mm or less

If the ring gear runout fails to meet the specified value, retighten the ring gear attaching bolt evenly after loosening the bolts evenly or replace the ring gear and drive pinion as a set.



JDF00031-00029

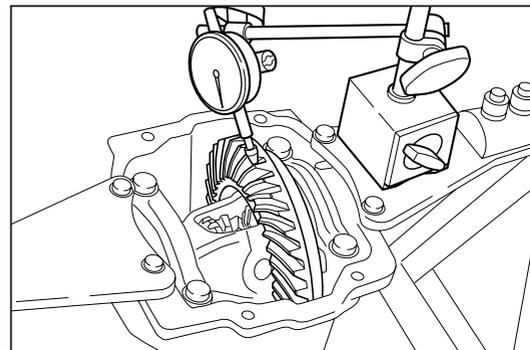
- (2) Checking of ring gear backlash

Ensure that the backlash of the ring gear is within the specified value.

Ring gear backlash: 0.08 - 0.15 mm

NOTE:

- If the measured backlash fails to meet the specified value, replace the ring gear and drive pinion as a set.



JDF00032-00030

- (3) Ensure that the backlash of the side gear is within the specified value.

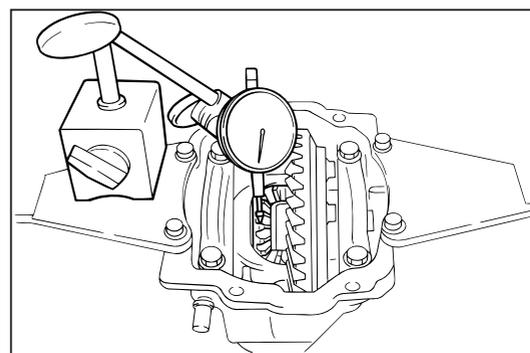
Side pinion backlash: 0.025 - 0.10 mm

CAUTION:

- Be sure to employ the shims which have the same thickness at the right and left side.

NOTE:

- If the measured backlash fails to meet the specified value, adjust the backlash with the thrust washer thickness.



JDF00033-00031

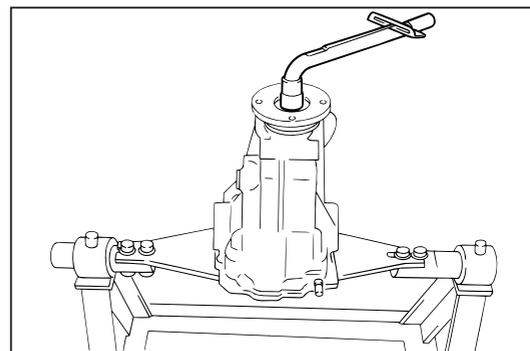
- (4) Measure the preload of the drive pinion.

Preload: 0.59 - 0.98 N·m (0.06 - 0.1 kgf·m)

NOTE:

- If the measured preload fails to meet the specified value, adjust the preload by selecting the thickness of shims.

- (5) Check of tooth contact between ring gear and pinion (Refer to page DF-21)



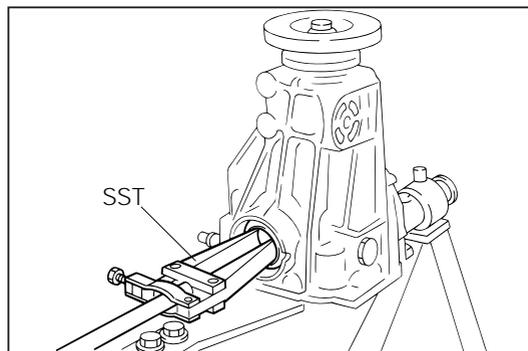
JDF00034-00032

DF-12

- Remove the T type oil seals, using the following SST.

SST: 09308-00010-000

(For front differential)



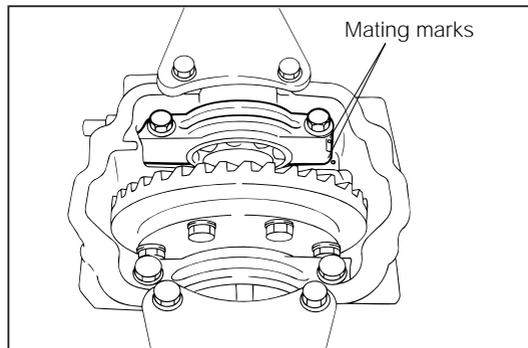
JDF00035-00033

- Put mating marks (paint or the like) on the bearing caps and differential carrier.

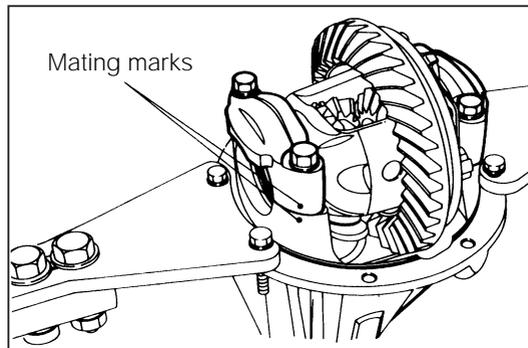
NOTE:

- Machining process should be carried out with carrier and cap as a set. Arrange the removed bearing caps in order.

- Remove the bearing caps by removing the four attaching bolts.



JDF00036-00034

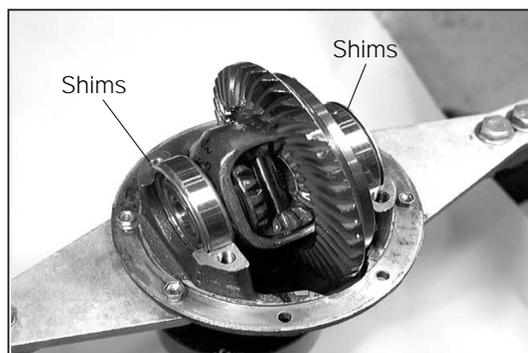


JDF00000-00035

- Remove the shims and differential case assembly from the carrier.

CAUTION:

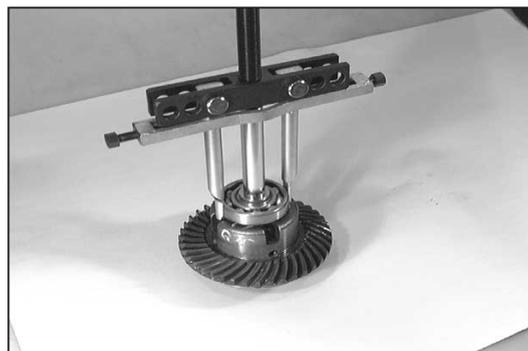
- Be sure to keep the shims installed at the right and left sides separately as a reference value for assembly.



JDF00037-00036

- Remove the side bearings, using the following SST.

SST: 09950-20017-000



JDF00038-00037

8. Put mating marks on the differential case and ring gear.
9. Loosen the differential ring gear attaching bolts evenly.

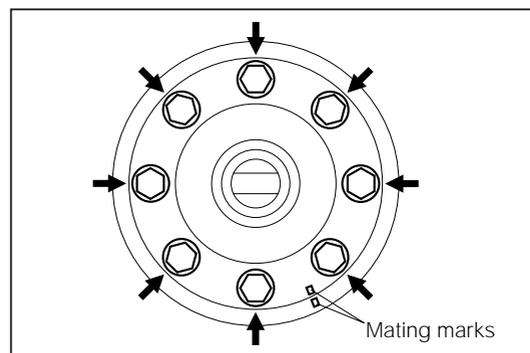
CAUTION:

- Be sure to loosen the attaching bolts evenly. Failure to observe this caution may damage the ring gear or the differential case.

10. Remove the differential ring gear by removing the eight attaching bolts.

NOTE:

- If any difficulty is encountered in separating the ring gear from the differential case, lightly tap the ring gear evenly, using a plastic hammer or the like.

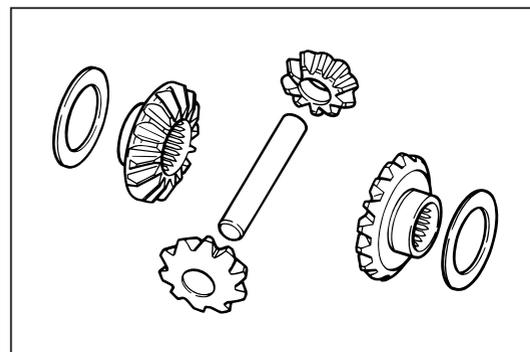


JDF00039-00038

11. Remove the differential pinion, differential side gear and differential thrust washer from the differential case. (Except LSD)

CAUTION:

- Arrange the removed differential side gears and thrust washers as a set.
- Never disassemble the LSD. The inner parts are not available as spare parts.



JDF00040-00039

12. Release the staking of the lock nut, using a chisel and a hammer. (Refer to the procedure described in "REPLACEMENT OF FRONT DIFFERENTIAL COMPANION FLANGE OIL SEAL.").
13. Loosen the companion flange attaching nut while preventing the companion flange from turning, using the following SST. (Refer to the procedure described in "(REPLACEMENT OF FRONT DIFFERENTIAL COMPANION FLANGE OIL SEAL.").

JDF00041-00000

14. Remove the lock nut and plate washer.

CAUTION:

- Do not reuse the used lock nut and plate washer.

15. Remove the drive pinion companion flange subassembly, using the following SST. (Refer to the procedure described in "REPLACEMENT OF FRONT DIFFERENTIAL COMPANION FLANGE OIL SEAL.").

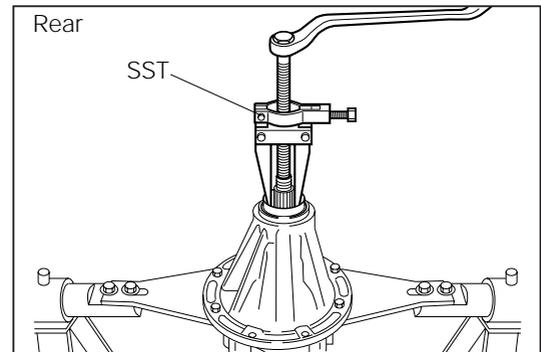
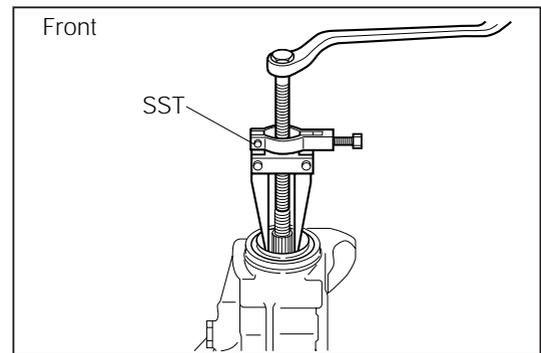
SST: 09950-20017-000

JDF00042-00000

DF-14

16. Remove the T type oil seal, using the following SST.

SST: 09308-10010-000



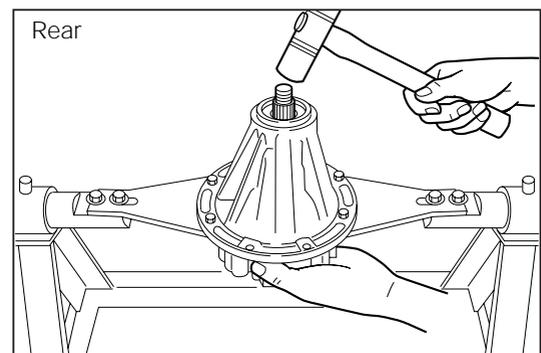
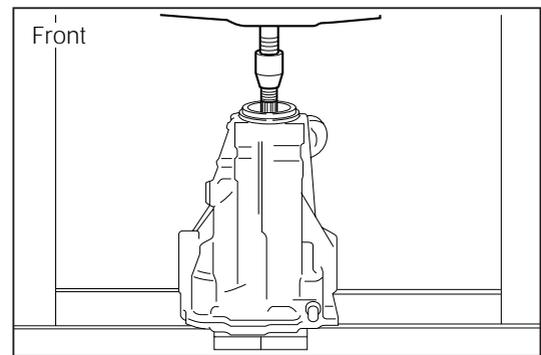
17. Remove the differential drive pinion spacer and shims from the differential carrier, using a hydraulic press or tapping the drive pinion, using a hydraulic press.

CAUTION:

- Never drop the drive pinion on the floor.
- Be very careful not to damage the threaded section of the drive pinion.

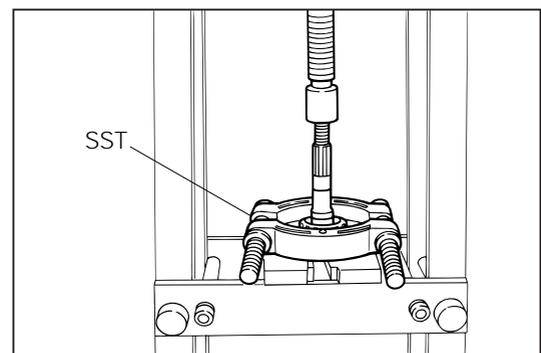
NOTE:

- Measure the thickness of the removed shims for the reference value at assembly.



18. Remove the tapered roller bearing from the drive pinion, using the following SST or the like.

SST: 09950-87701-000



19. Remove the front and rear tapered roller bearing outer races and shims, using a press in combination with the following SST.

SST: 09608-87501-000

(Use No. 2 and No. 5 in the above component, in case front differential.)

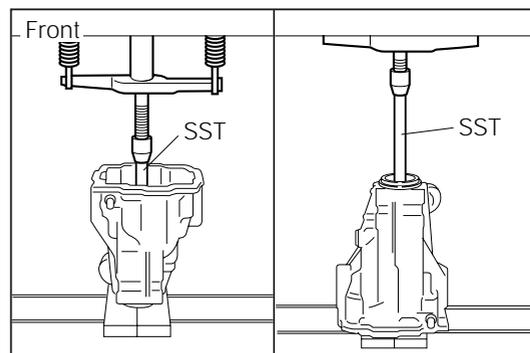
(Use No. 3 and No. 5 in the above component, in case rear differential.)

CAUTION:

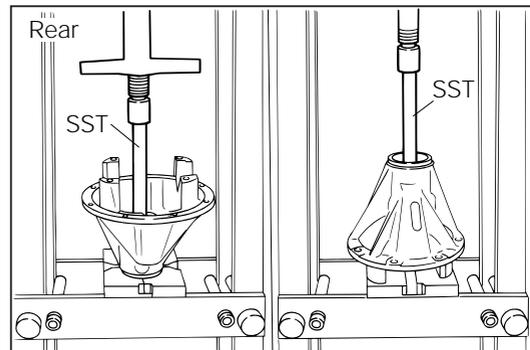
- Care must be exercised so that the outer race may not be tilted during removal.

NOTE:

- Measure the thickness of the removed shim for the reference value at assembly.
- Be sure to remove the smaller sized bearing outer race first, otherwise some SST can not utilized.



JDF00046-00045



JDF00000-00046

DF-16

INSPECTION

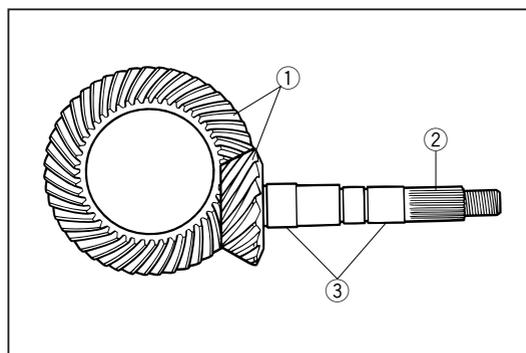
Inspect each section of the following parts for any sign of damage, wear or excessive looseness. Replace any parts which exhibit defects.

1. Differential drive pinion & ring gear

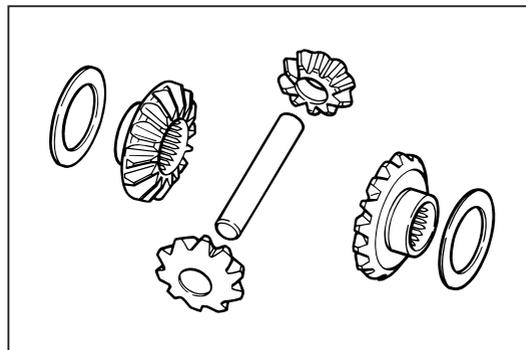
- (1) Gear teeth ①
- (2) Spline portion ② of drive pinion
- (3) Bearing fitting section ③

CAUTION:

- Replace the drive pinion and ring gear as a set, if any damage is found on either drive pinion or ring gear.

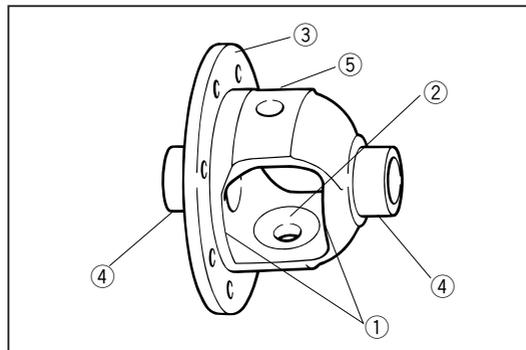


2. Differential side gear, differential pinion and differential pinion shaft



3. Differential case

- (1) Side gear boss contact sections ①
- (2) Pinion contact section ②
- (3) Ring gear attaching section ③
- (4) Side bearing press-fitting section ④
- (5) The differential case proper ⑤

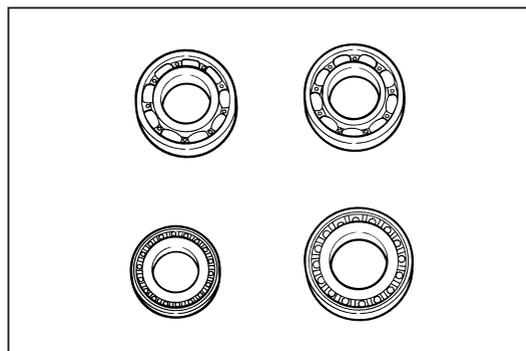


4. Bearings

Turn the bearings lightly. Ensure that the tapered roller bearing (front and rear) and bearing (differential side) rotate smoothly without any binding or abnormal noise.

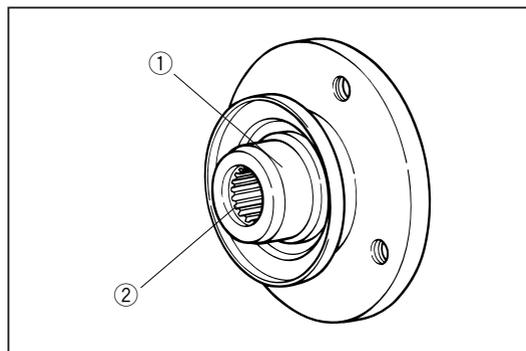
CAUTION:

- Replace the front and rear bearings as a set, if any damage is found on any bearing.



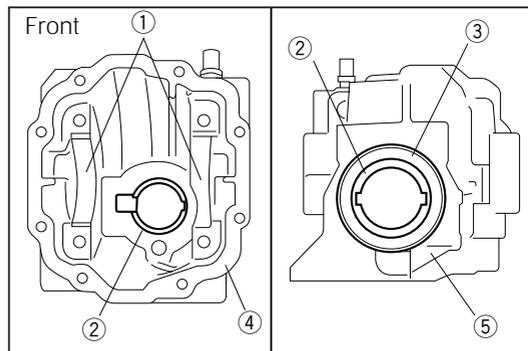
5. Drive pinion companion flange

- (1) Oil seal contact section ①
- (2) Spline section ②

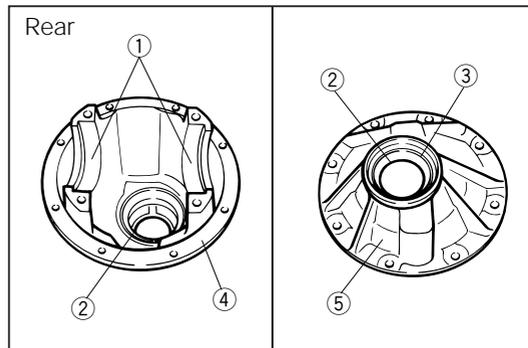


6. Differential carrier

- (1) Side bearing fitting sections ①
- (2) Tapered roller bearing outer race fitting sections ②
- (3) Oil seal inserting section ③
- (4) Carrier cover attaching section ④
- (5) The differential case proper ⑤



JDF00052-00052



JDF00000-00053

7. Inspection of the LSD (Limited Slip Differential)

(For LSD only)

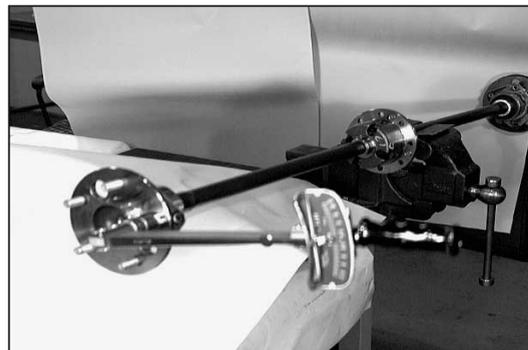
- (1) Install the rear axle shaft to a vise.
- (2) Connect the differential case to the rear axle.
- (3) Connect the rear axle shaft to the differential case.
- (4) Install the wheel hub nut to one of the hub bolt with a suitable spacer interposed.
- (5) Install the torque wrench to the hub nut.
- (6) Ensure that the starting torque (a reading of the torque wrench at time when it is turned) is within the specified value.

Starting torque: 49.0 ± 9.8 N·m (5.0 ± 1.0 kgf·m)

If the specified measured starting torque fails to meet the specified value, replace the differential case with a new one.

NOTE:

- The distance from the shaft center to the hub bolt center is 57.15 mm. When measuring the starting torque with a torque wrench, the reading of the torque wrench should be compensated using this value.



JDF00053-00054

ASSEMBLY

1. Installation of differential drive pinion

- (1) Install the shim which was assembled or a shim having the same thickness with the one which was assembled as well as the front and rear tapered roller bearing outer races to the differential carrier, using the following SST in combination with a hydraulic press.

SST: 09608-87501-000

(Use No. 7 of the above SST in case front differential.)

(Use No. 7 and 8 of the above SST in case rear differential.)

CAUTION:

- If any problem is found on the shims, replace the shims with new ones which have the same thickness with the former one.
- Never apply a force beyond 19.6 kN (2000 kgf) during the installation.
- Care must be exercised so that the race may not be tilted during the press-fitting operation.

- (2) Install the tapered roller bearing to the differential drive pinion, using the following SST in combination with a hydraulic press.

SST: 09515-10010-000

- (3) Install the drive pinion shaft assembly, drive pinion and companion flange to the differential carrier temporarily.

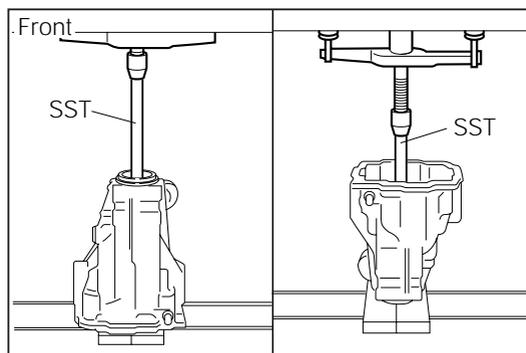
CAUTION:

- Liberally apply the specified differential oil to the tapered roller bearings.
- Do not assemble the drive pinion shaft bearing spacer and shims at this moment.

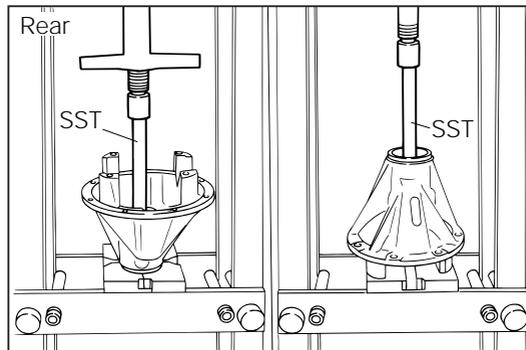
- (4) Press the drive pinion shaft tapered roller bearing into position, using a hydraulic press.

CAUTION:

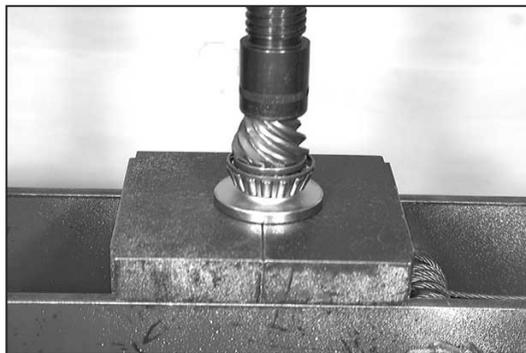
- Never apply excessive force to the bearings during pressing.
- Ensure that no excessive force is applied to the bearings by turning the differential carrier.



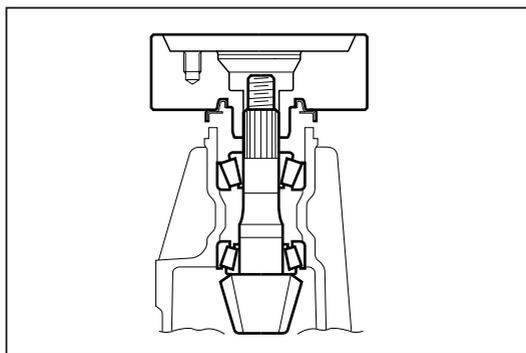
JDF00054-00055



JDF00000-00056



JDF00055-00057



JDF00056-00058

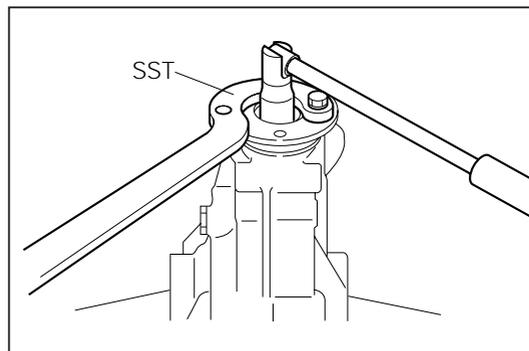


JDF00057-00059

- (5) Install the washer plate and lock nut for drive pinion companion flange subassembly.

CAUTION:

- Apply the specified differential oil to the threaded portion of the lock nut and drive pinion before the installation.
- Do not install the spacer, shim and T type oil seal at this moment.



JDF00058-00060

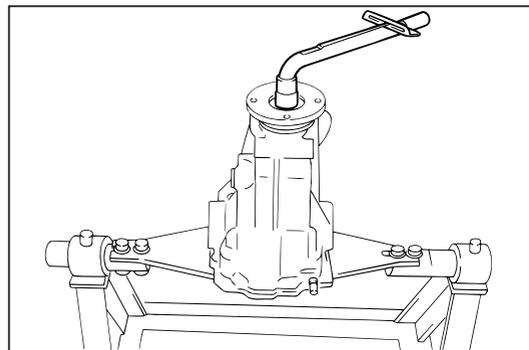
- (6) Tighten the lock nut until the preload of the tapered bearings becomes the following specified value while preventing the companion flange from turning, using the following SST.

SST: 09330-87301-000

Preload: 0.59 - 0.98 N·m (0.06 - 0.1 kgf·m)

NOTE:

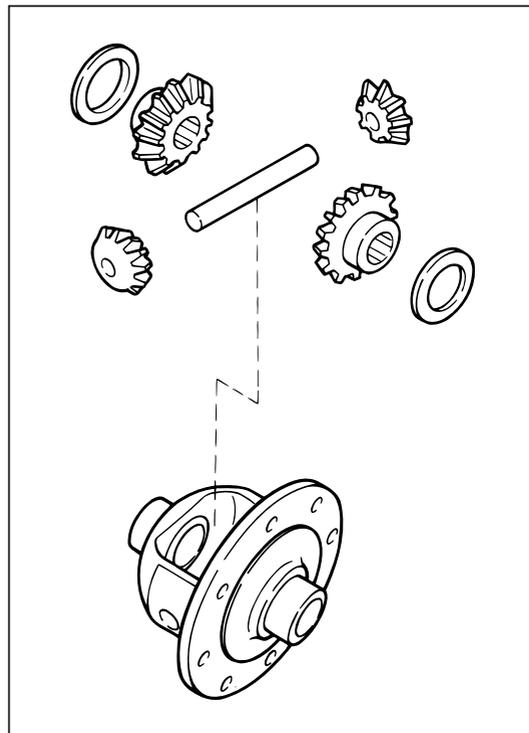
- Be sure to turn the companion flange several turns to stabilize the bearing contacting condition before measuring the preload.



JDF00059-00061

2. Assembly of differential case

- (1) Liberally apply the specified differential oil to the sliding surfaces of all component parts.
- (2) Install the side gear thrust washer, side gear, pinion and pinion shaft to the differential case.



JDF00060-00062

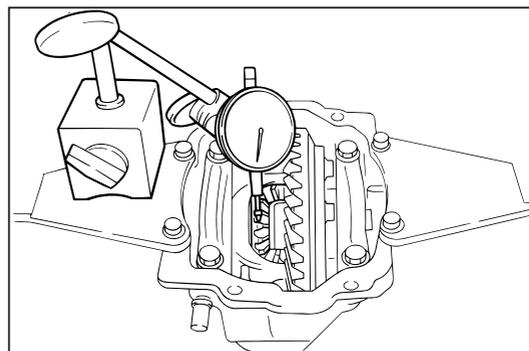
- (3) Ensure that the backlash of the differential side gear is within the specified value with a dial gauge.

Backlash: 0.025 - 0.1 mm

If the backlash is not within the specified value, select a suitable washer from the spare parts mentioned below.

Thrust washer availability:

- 0.8 mm
- 0.9 mm
- 1.0 mm



JDF00061-00063

DF-20

CAUTION:

- Be sure to adjust the backlash in such a manner that the thickness of the thrust washers at both sides should be the same or differ not more than 0.1 mm.

- (4) Install the differential gear to the differential case while aligning the mating marks put at the disassembly procedure.
- (5) Install and tighten the attaching bolts evenly to the specified tightening torque.

Tightening Torque: 78.5 - 88.2 N·m (8.0 - 9.0 kgf·m)

- (6) Install the radial ball bearings into position, using a hydraulic press in combination with the following SST.
- SST: 09309-87201-000

3. Inspection and adjustment of ring gear backlash

- (1) Install the differential case assembly to the differential carrier. Also, install shims having the same thickness as the one that was assembled to the back side of the differential gear tooth.

CAUTION:

- Apply the specified differential oil to the sliding surface of the component parts.
- Be sure to assemble the differential case assembly to the differential case while pushing the differential case assembly against the inserted shim side.

- (2) Install the differential bearing caps with bolts to the differential carrier according to the mating marks which were put during the disassembling.

CAUTION:

- Be sure to push the differential case assembly against the inserted shim side when assembling the bearing cap.

- (3) Tighten the attaching bolts evenly to the specified tightening torque.

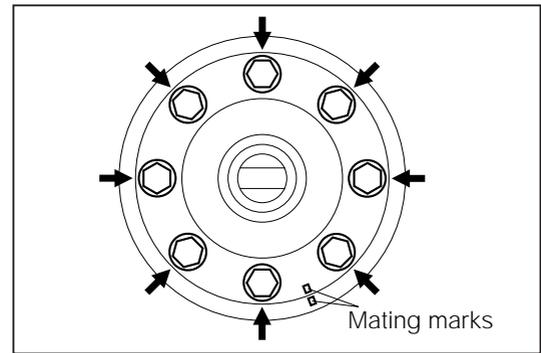
Tightening Torque: 29.5 - 44.1 N·m (3.0 - 4.5 kgf·m)

- (4) While applying a dial gauge perpendicular to the tooth surface of the differential ring gear, secure the flange of the driving pinion. Under this condition, measure the backlash by moving the ring gear.

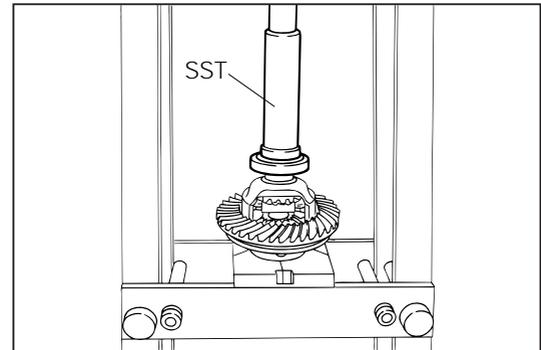
Specified value: 0.08 - 0.15 mm

CAUTION:

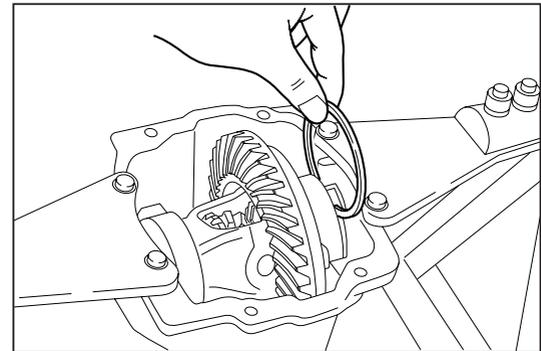
- The measurement should be performed at three or more points on the circumference of the ring gear.
- In cases where a backlash is too large, increase shims. Conversely, in cases where a backlash is too small, decrease shims.



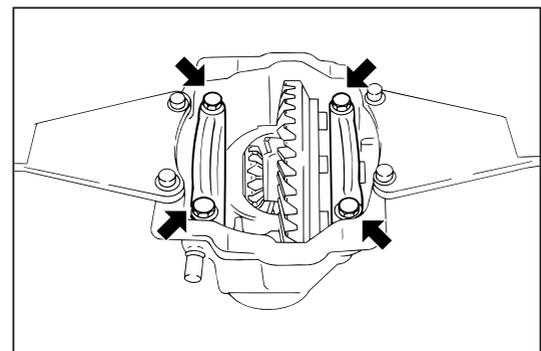
JDF00062-00064



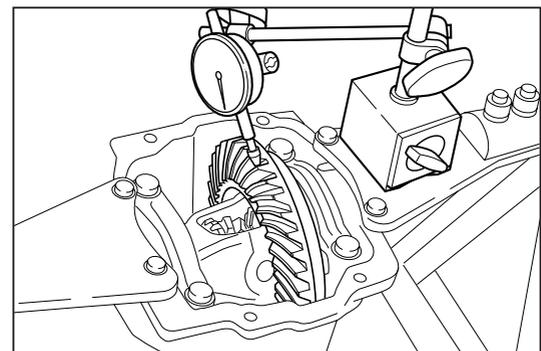
JDF00063-00065



JDF00064-00066



JDF00065-00067



JDF00066-00068

- (5) Adjust the backlash to the specified value by selecting suitable shims from spare part, if the backlash fails to meet the specified value.

Shim availability: 0.15 mm
0.20 mm
0.25 mm
0.50 mm

- (6) Note the selected shim thickness.

4. Adjustment of play of differential case assembly in axial direction

- (1) Remove the bearing cap.
- (2) Measure the clearance between the bearing at the ring gear tooth surface side and the differential carrier, using a thickness gauge. Select and insert shims so that the clearance may become the specified value.

Specified Value: 0 - 0.05 mm

NOTE:

- If any difficulty is encountered in assembling shims, first insert shims at the back gear tooth surface side.
- Then, insert shims at the back side by lightly tapping the back side, using a plastic hammer.

Shim availability: 0.15 mm
0.20 mm
0.25 mm
0.50 mm

- (3) Note the selected shim thickness.
- (4) While aligning the mating marks that were put during the disassembling, assemble the differential bearing cap. Gradually tighten the four bolts evenly to the specified tightening torque.

Tightening Torque: 29.5 - 44.1 N·m (3.0 - 4.5 kgf·m)

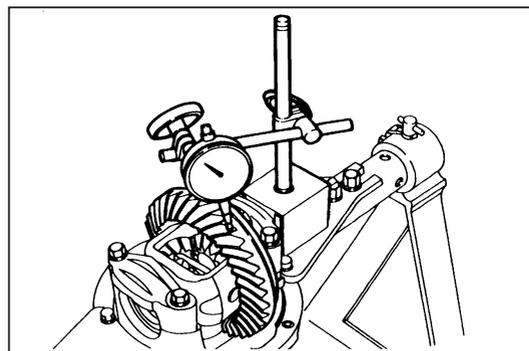
- (5) Ensure that the ring gear runout is within the specified value. (Refer to page DF-11.)
If the ring gear runout fails to meet the specified value, retighten the attaching bolts of the ring gear evenly after loosening them once or replace the ring gear and drive pinion gear as a set.

5. Check and adjustment of tooth contact condition with ring gear and drive pinion.

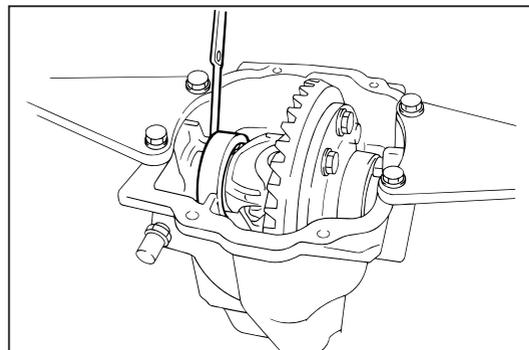
Apply blue lead to the gear teeth. Turn the flange to check the tooth contact between the ring gear and the drive pinion.

CAUTION:

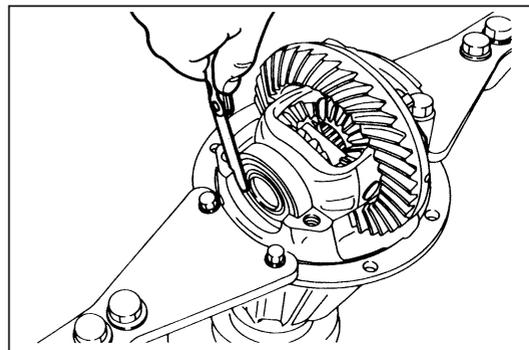
- Be sure to turn the flange in both the forward and backward directions and check the tooth contact pattern at several points.



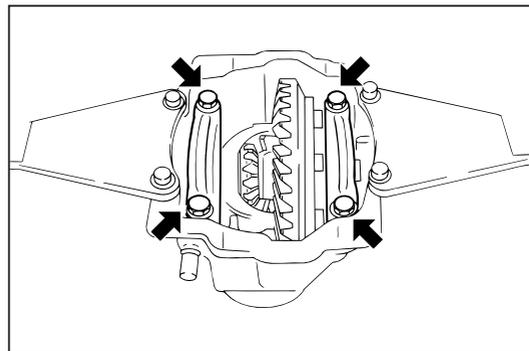
JDF00067-00069



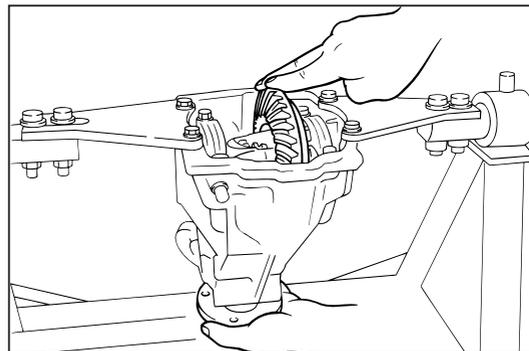
JDF00068-00070



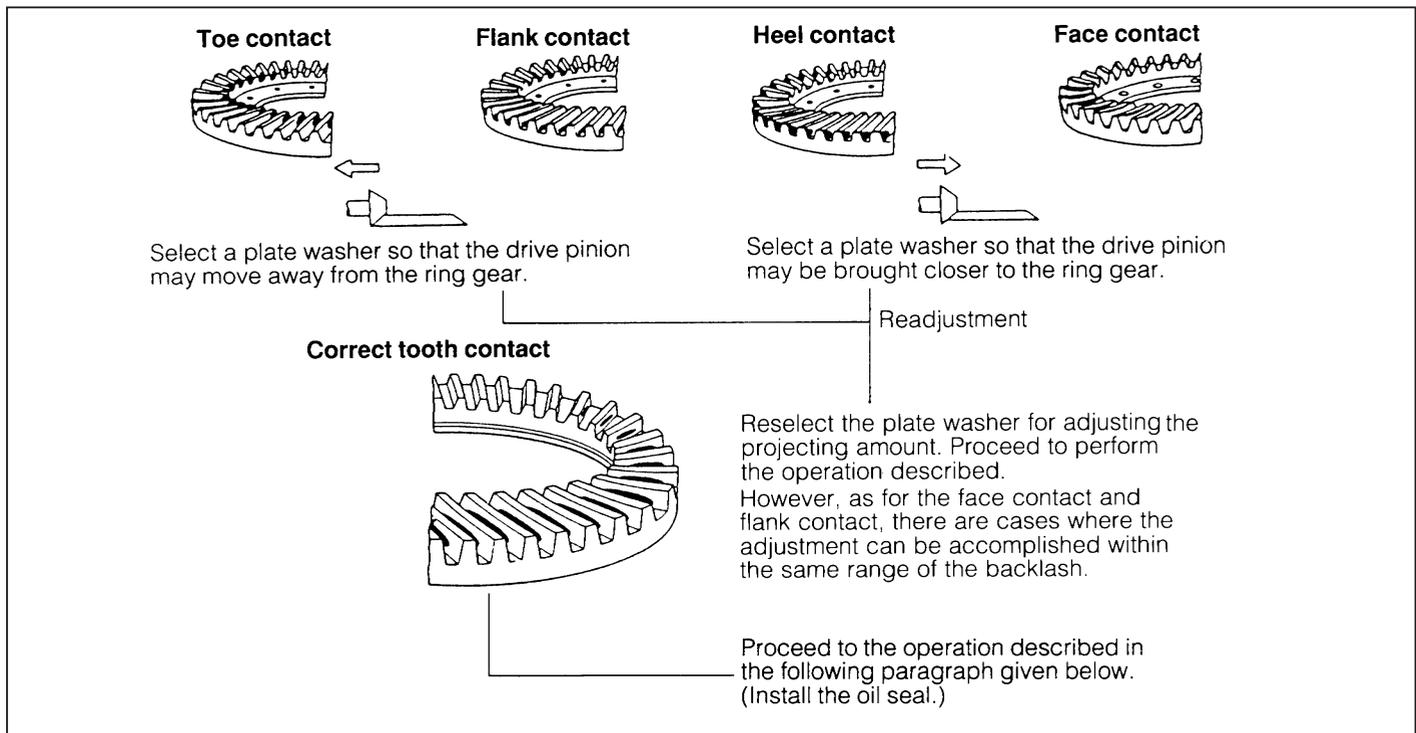
JDF00069-00071



JDF00070-00072



JDF00071-00073



JDF00000-00074

6. Adjustment of drive pinion bearing preload

(1) Remove the differential bearing caps by removing the attaching bolts and differential case with the shims. (Refer to the disassembly procedure.)

NOTE:

- Be sure to keep the removed shims at the right and left sides separately for reassembly.

(2) Loosen the lock nut of the drive pinion while preventing the companion flange from turning, using the following SST. (Refer to the disassembly procedure.)

SST: 09330-87301-000

(3) Remove the lock nut.
(Refer to the disassembly procedure.)

(4) Remove the companion flange from the pinion shaft, using the following SST in combination with an adjustable wrench or the like.
(Refer to the disassembly procedure.)

SST: 09950-20017-000

(5) Remove the drive pinion from the differential carrier, using a hydraulic press or lightly tapping the drive pinion, using the plastic hammer.
(Refer to the disassembly procedure.)

(6) Remove the outer race of the tapered roller bearing. (Pinion gear side.)

JDF00072-00000

(7) Assemble the drive pinion spacer and shims having the same thickness as those measured during the disassembling to the drive pinion.

NOTE:

- Replace the shims to new ones which have the same thickness with former shims, if they are damaged.

JDF00073-00000

- (8) Install the drive pinion shaft assembly, drive pinion and companion flange to the differential carrier temporarily.
- (9) Press the drive pinion shaft bearing into position, using a hydraulic press.

CAUTION:

- Never apply excessive force to the bearings during pressing.
Ensure that the no excessive force is applied to the bearings by turning the differential carrier.

- (10) Apply the specified differential oil to the threaded section of the drive pinion and lock nut.
- (11) Install the plate washer and lock nut. Then, tighten the lock nut to the specified tightening torque while preventing the companion flange from turning, using the following SST.

(Refer to the assembly procedure.)

SST: 09330-87301-000

**Tightening torque: 98.1 - 137.2 N·m
(10.0 - 14.0 kgf·m)**

- (12) Ensure that the preload is within the specified value, using a torque wrench.

Preload: 0.59 - 0.98 N·m (0.6 - 1.0 kgf·m)

If the measured preload fails to meet the specified value, select suitable preload adjusting shims from the spare parts. Then, repeat the preload adjustment, until the specified preload is obtained.

**Shim availability: 0.25 mm
0.30 mm
0.40 mm
0.50 mm**

7. Installation of drive pinion oil seal

- (1) Remove the drive pinion shaft lock nut while preventing the companion flange from turning, using the following SST. (Refer to the assembly procedure.)

SST: 09330-87301-000

- (2) Remove the companion flange, using the following SST in combination with a suitable adjusting wrench. (Refer to the disassembling procedure.)

SST: 09950-20017-000

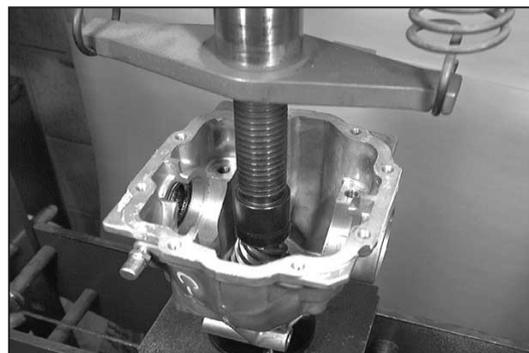
8. Assembly of companion flange

- (1) Install a new T type oil seal to the differential case, using the following SST.

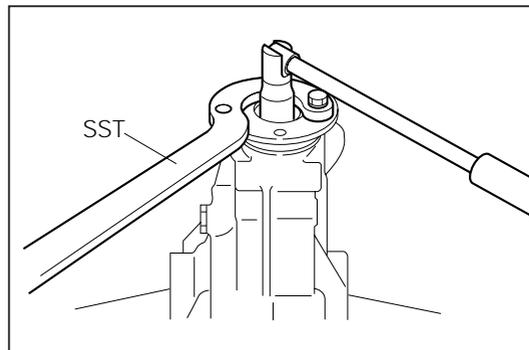
SST: 09635-20010-000

CAUTION:

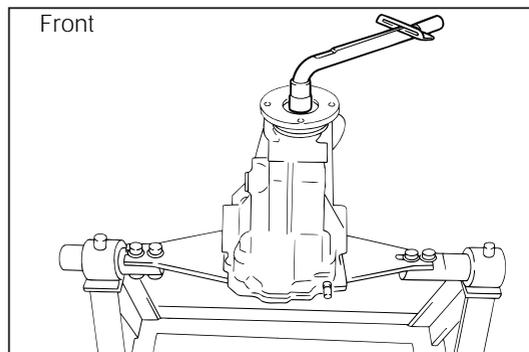
- Apply lithium soap base multi purpose grease to the lip section of the oil seal.
- Make certain to drive the oil seal into position so that it becomes flush with the edge surface of the housing.



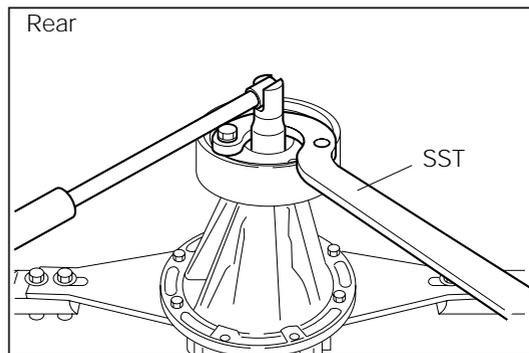
JDF00074-00075



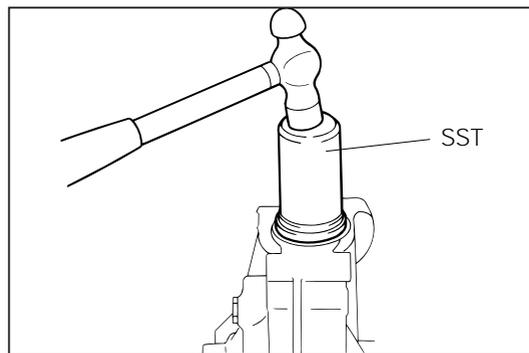
JDF00075-00076



JDF00076-00077



JDF00077-00078



JDF00078-00079

DF-24

- (2) Install the companion flange subassembly, washer plate and lock nut.
- (3) Tighten the lock nut to the specified tightening torque while preventing the companion flange from turning, using the following SST.

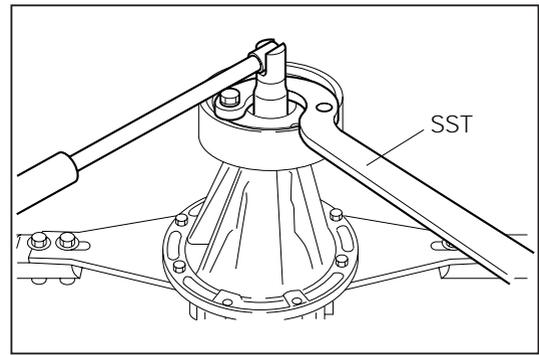
SST: 09330-87301-000

**Tightening Torque: 98.1 - 137.2 N·m
(10.0 - 14.0 kgf·m)**

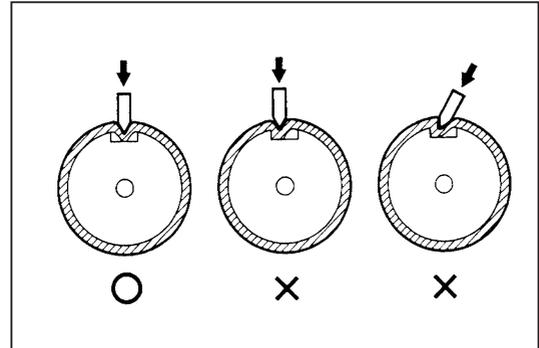
- (4) Turn the drive pinion shaft several times.
- (5) Ensure that the preload is within the specified value. If not, adjust the preload to the specified value by replacing the adjusting shims, as required.
- (6) Stake the lock nut to the recessed section of the drive pinion shaft by a chisel of the like.

CAUTION:

- Make sure that the lock section of the lock nut is positively staked down to the bottom of the driving pinion groove.
- Never damage the threaded section of the drive pinion shaft.



JDF00079-00080



JDF00080-00081

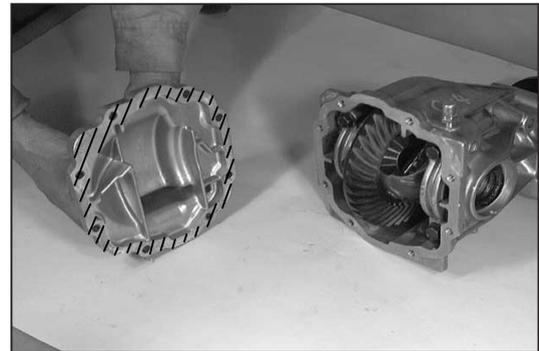
9. Installation of front axle housing cover
(For front differential)

- (1) Degrease the surface of the front axle housing cover attaching surface and front axle housing cover.
- (2) Apply the specified seal adhesive to the front axle housing cover attaching surface.

Seal adhesive: Three bond 1216 or equivalents

- (3) Install the front axle housing cover with attaching bolts and tighten them evenly to the specified tightening torque.

Tightening torque: 17.7 - 23.5 N·m (1.8 - 2.4 kgf·m)



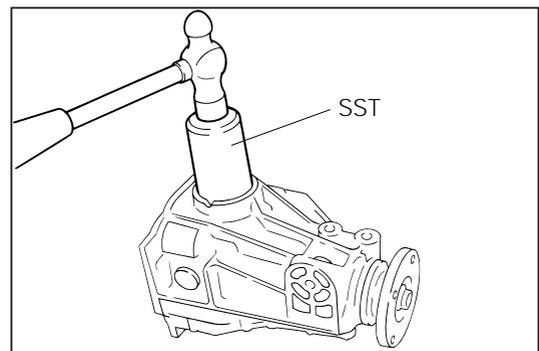
JDF00081-00082

10. Installation of drive shaft oil seal
(For front differential)

- (1) Install new T type oil seals to the differential case, using the following SST.

SST: 09635-20010-000

- (2) Apply the lithium soap base multi-purpose grease to the lip section of the T type oil seals.



JDF00082-00083

INSTALLATION

(Front differential)

1. Install the differential carrier assembly and differential support bracket with the attaching bolts.
2. Tighten the bolts to the specified tightening torque.

Tightening Torque: Differential carrier
68.6 - 83.4 N·m
(7.0 - 8.5 kgf·m)
Differential support
34.3 - 61.8 N·m
(3.5 - 6.3 kgf·m)

3. Install the propeller shaft to the front differential with the attaching bolts and tighten them to the specified tightening torque.
(Refer to PR section)

4. Insert the drive shaft assembly into the differential carrier assembly. (Refer to the procedure described in "Replacement of Front differential side Oil Seal" and FS section.)

CAUTION:

- Apply lithium soap base multi-purpose grease to the lip section of the differential side oil seal.

5. Tighten the new attaching nut of the suspension support to the specified tightening torque.

Tightening Torque: 28.4 - 42.2 N·m (2.9 - 4.3 kgf·m)

6. Install the lower arm to the steering nuckle and tighten the castle nut to the specified tightening torque.
(Refer to the procedure described in "Replacement of Front differential side oil seal.")

Tightening Torque: 44.1 - 58.8 N·m (4.5 - 6.0 kgf·m)

7. Install a new clip.
(Refer to the procedure described in "Replacement of Front differential side oil seal.")

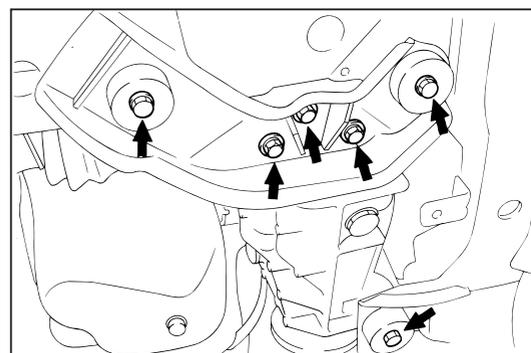
8. Install the tie rod end to the steering knuckle and tighten the castle nut to the specified tightening torque.
(Refer to the procedure described in "Replacement of Front differential side oil seal.")

Tightening Torque: 39.2 - 53.9 N·m (4.0 - 5.5 kgf·m)

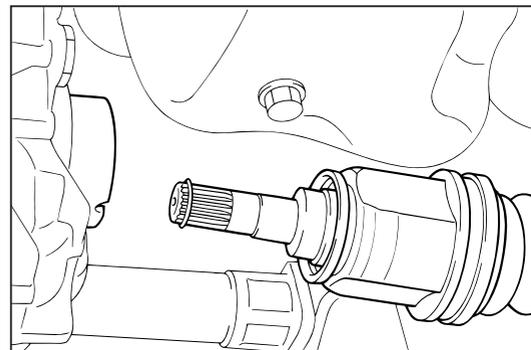
9. Install a new clip.
(Refer to the procedure described in "Replacement of Front differential side oil seal.")

10. Install the drain plug with a new gasket interposed and tighten the drain plug to the specified tightening torque.

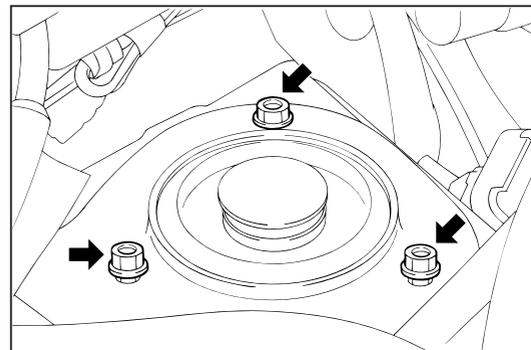
Tightening Torque:
Front 39.3 - 58.8 N·m (4.0 - 6.0 kgf·m)



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JDF00084-00085



JDF00085-00086

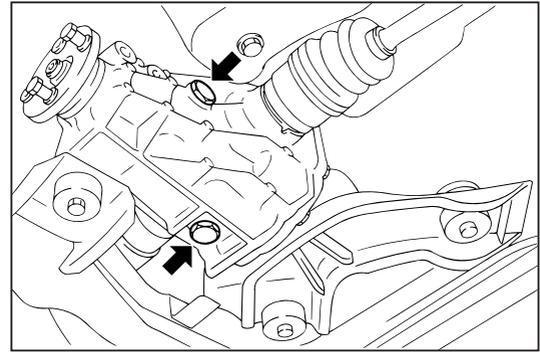
DF-26

11. Fill the specified differential oil from the filler plug.
(Refer to the "REPLACEMENT OF FRONT DIFFERENTIAL COMPANION FLANGE OIL SEAL" section.)
12. Install the filler plug with a new gasket interposed and tighten it to the specified tightening torque.

Tightening Torque:

Front 39.3 - 58.8 N·m (4.0 - 6.0 kgf·m)

13. Install the front wheels.
14. Jack down the vehicle.
15. Ensure that no trouble persists.



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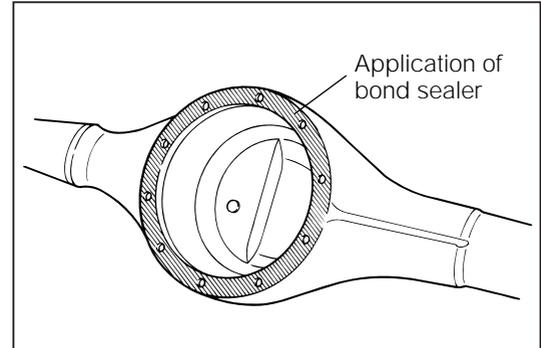
(Rear differential)

1. Apply liquid gasket to the mating surface of the rear axle housing cover.
 - (1) Degrease the surface of the rear differential attaching surface or the rear axle housing.
 - (2) Apply the specified seal adhesive to the rear axle.

Seal adhesive: Three bond 1217 or equivalents

2. Install the rear differential carrier assembly with the attaching bolts.
3. Tighten the attaching bolts to the specified tightening torque evenly.

Tightening Torque: 24.5 - 39.2 N·m (2.5 - 4.0 kgf·m)



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4. Install the propeller shaft assembly. (Refer to the PR section.)
5. Install the rear axle shaft. (Refer to the RS section.)
6. Install the drain plug with a new gasket interposed and tighten the drain plug to the specified tightening torque.

Tightening Torque: 53.9 - 68.6 N·m (5.5 - 7.0 kgf·m)

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7. Fill the specified differential oil from the filler plug.

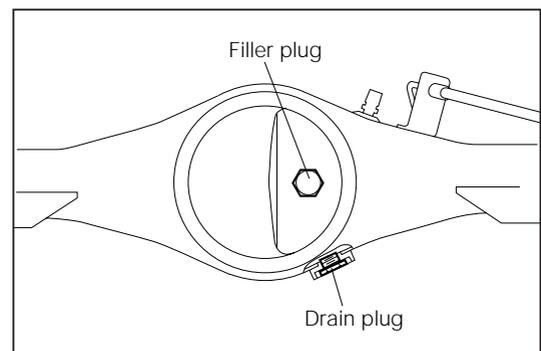
Specified differential oil

Grade : API GL-5

Viscosity : SAE 80W-90 (Standard)

SAE 80W-90 LSD (For LSD)

Capacity : 1.55 liters



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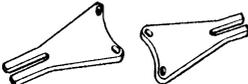
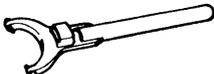
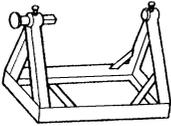
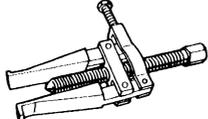
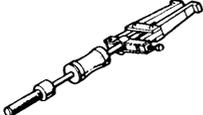
8. Install the filler plug with a new gasket interposed and tighten it to the specified tightening torque.

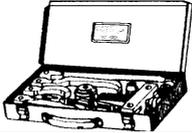
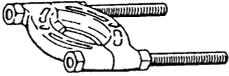
Tightening Torque: 53.9 - 68.6 N·m (5.5 - 7.0 kgf-m)

9. Install the rear wheel.
10. Jack down the vehicle.
11. Ensure that no trouble is persists.

DF-28

SSTs

	09515-10010-000	Rear axle bearing replacer
	09309-87201-000	Transmission bearing replacer
	09608-87501-000	Axle hub & drive pinion bearing tool set
	09635-20010-000	Lower ball joint dust cover replacer
	09548-87201-000	Differential overhaul attachment
	09330-87301-000	Drive pinion flange holding tool
	09611-87701-000	Tie rod end puller
	09648-87201-000	Drive shaft replacer
	09636-20010-000	Upper ball joint dust cover replacer
	09219-87202-000	Engine overhaul stand
	09308-10010-000	Oil seal puller
	09308-00010-000	Oil seal puller

	09950-20017-000	Universal puller
	09950-87701-000	Bearing pulling attachment

DF-30

TIGHTENING TORQUE

Tightening compartment	Tightening torque	
	N·m	kgf·m
Drive pinion companion flange subassembly × lock nut	98.1 - 137.2	10.0 - 14.0
Drain plug (Front) (Rear)	39.3 - 58.8 53.9 - 68.6	4.0 - 6.0 5.5 - 7.0
Oil filler plug (Front) (Rear)	39.3 - 58.8 53.9 - 68.6	4.0 - 6.0 5.5 - 7.0
Suspension support attaching nut	28.4 - 42.2	2.9 - 4.3
Lower arm × steering knuckle	44.1 - 58.8	4.5 - 6.0
Tie rod end × steering knuckle	39.2 - 53.9	4.0 - 5.5
Differential gear × differential case	78.5 - 88.2	8.0 - 9.0
Differential bearing cap × differential carrier	29.5 - 44.1	3.0 - 4.5
Front axle housing cover × front axle	17.7 - 23.5	1.8 - 2.4
Differential carrier × differential support bracket	68.6 - 83.4	7.0 - 8.5
Differential support bracket × frame Differential carrier × frame	34.3 - 61.8	3.5 - 6.3

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