

PROPELLER SHAFT AND AXLE

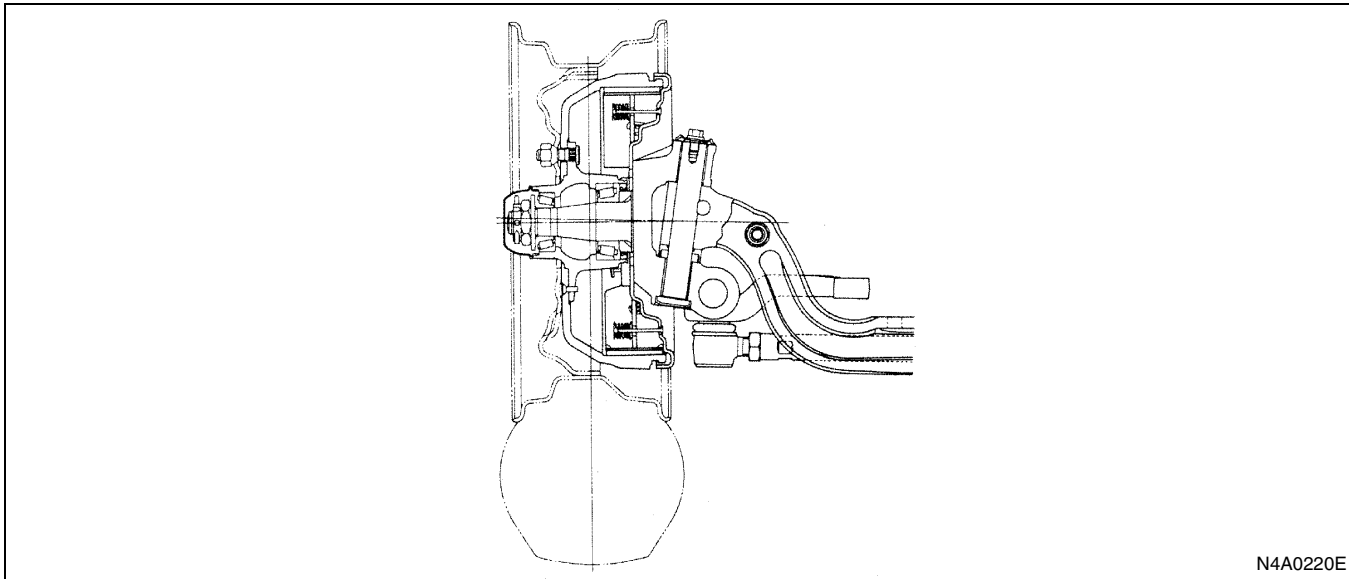
SECTION 4C FRONT AXLE

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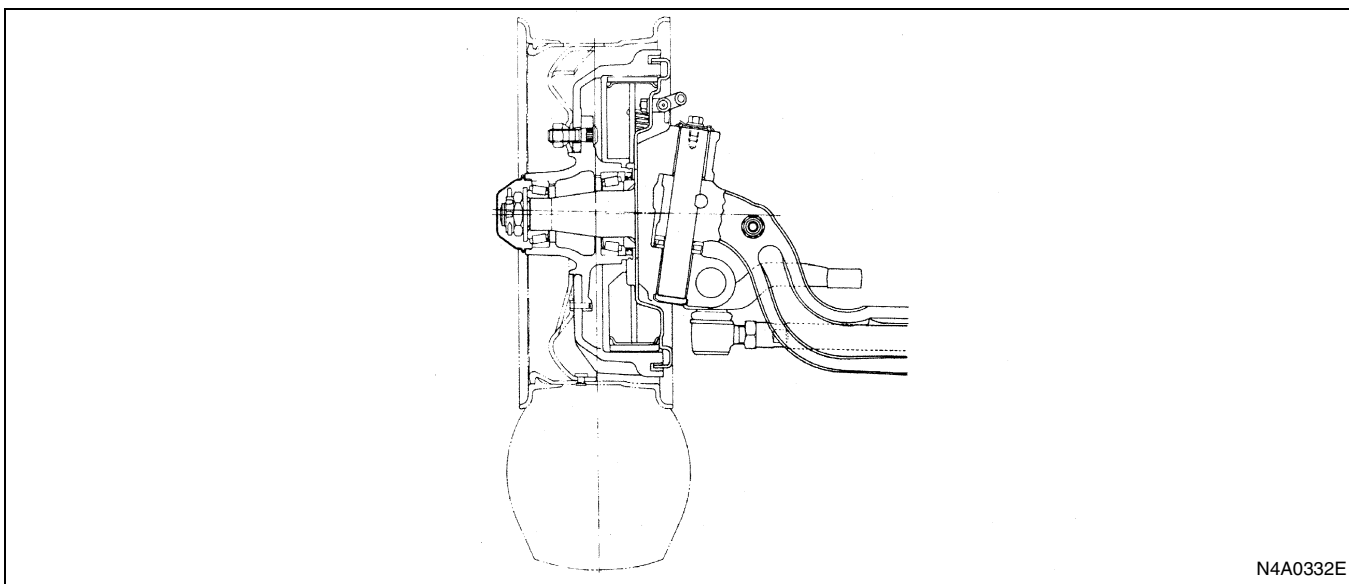
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GENERAL DESCRIPTION

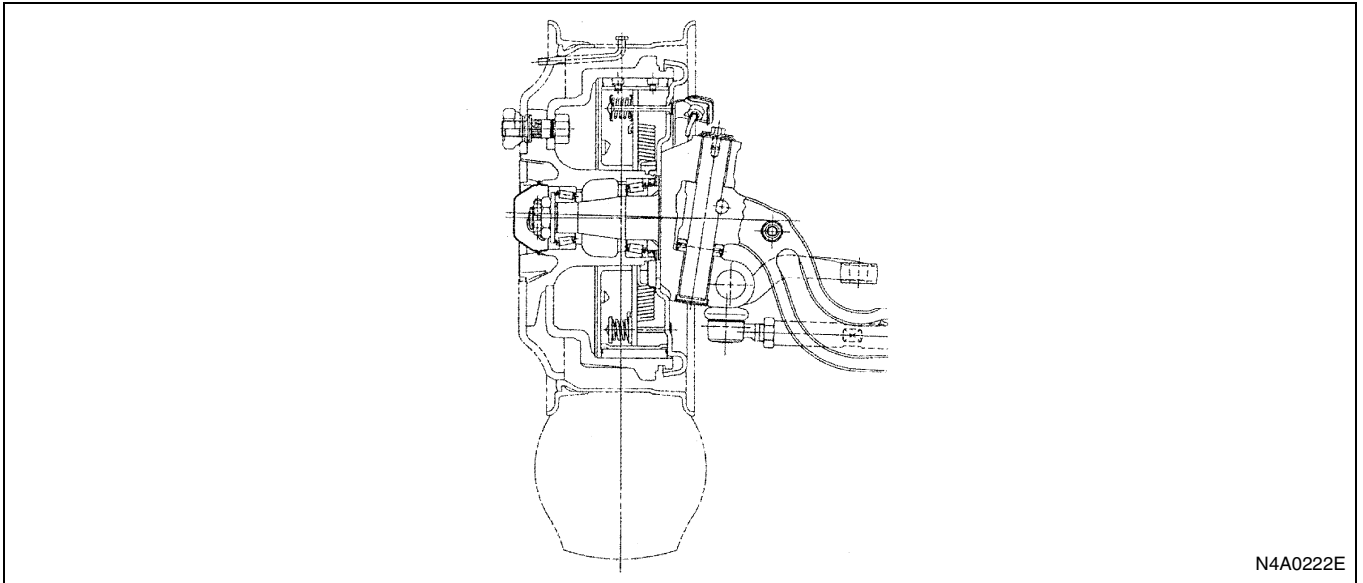
NHR Front Drum Brake Model (4 × 2 Model)



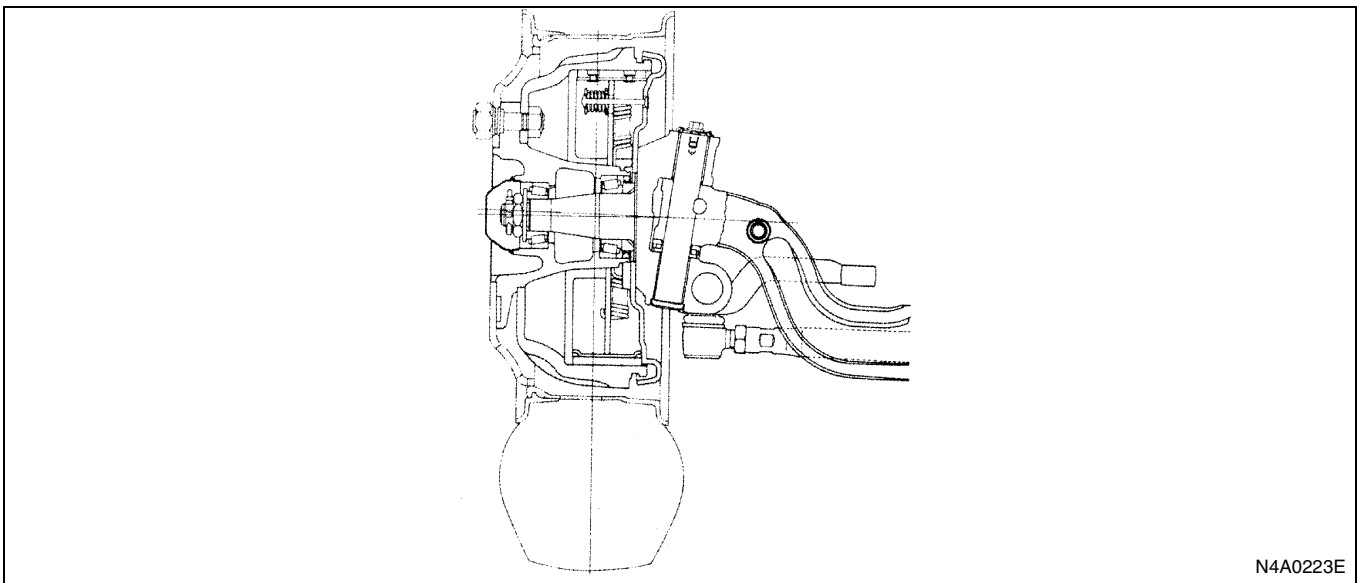
NKR Front Drum Brake Model (Rear Single Tire) (4 × 2 Model)



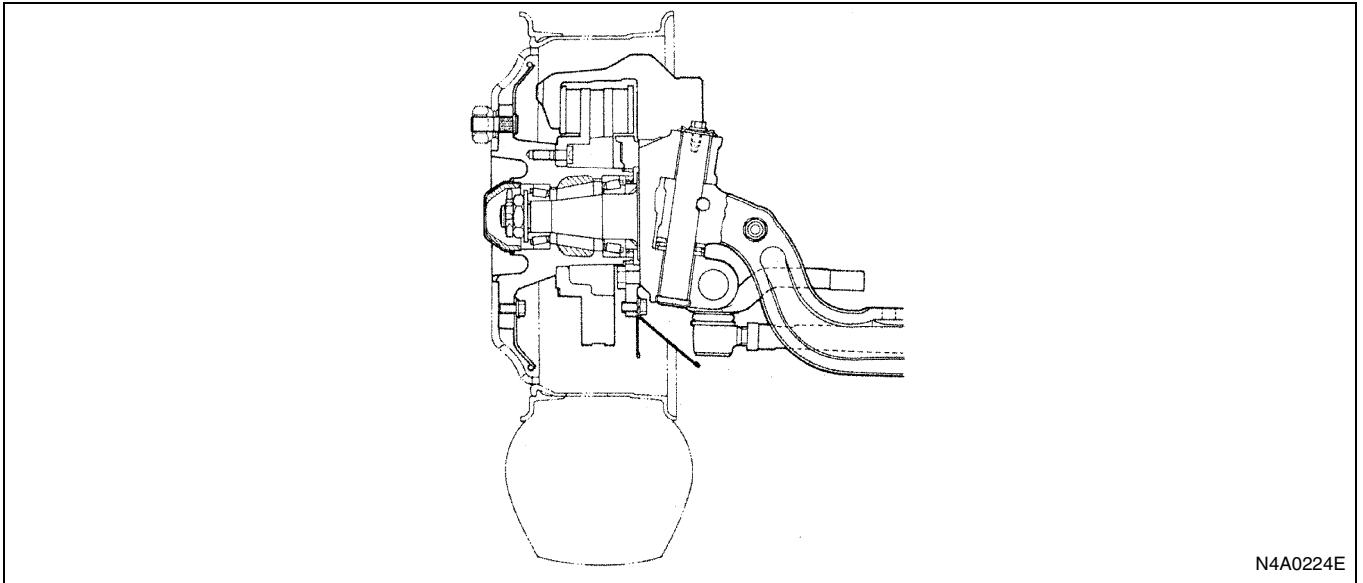
NKR Front Drum Brake Model (Rear Dual Tire) (4 × 2 Model)



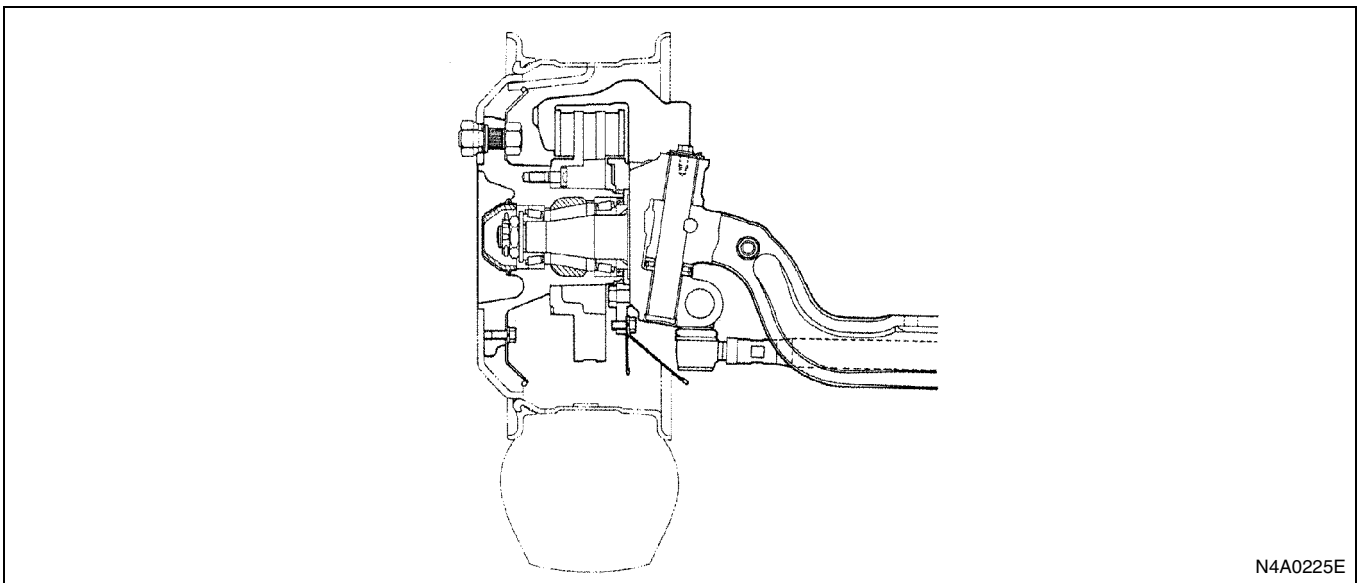
NPR, NQR Front Drum Brake Model (4 × 2 Model)



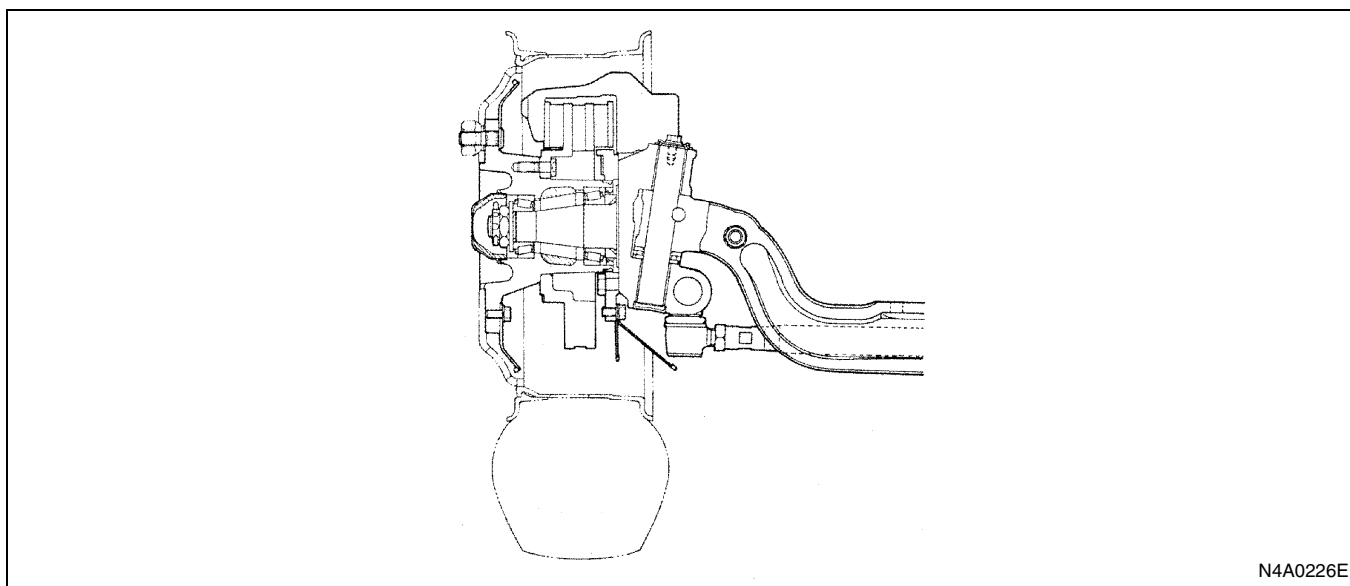
NKR Front Disc Brake Model (4 × 2 Model)



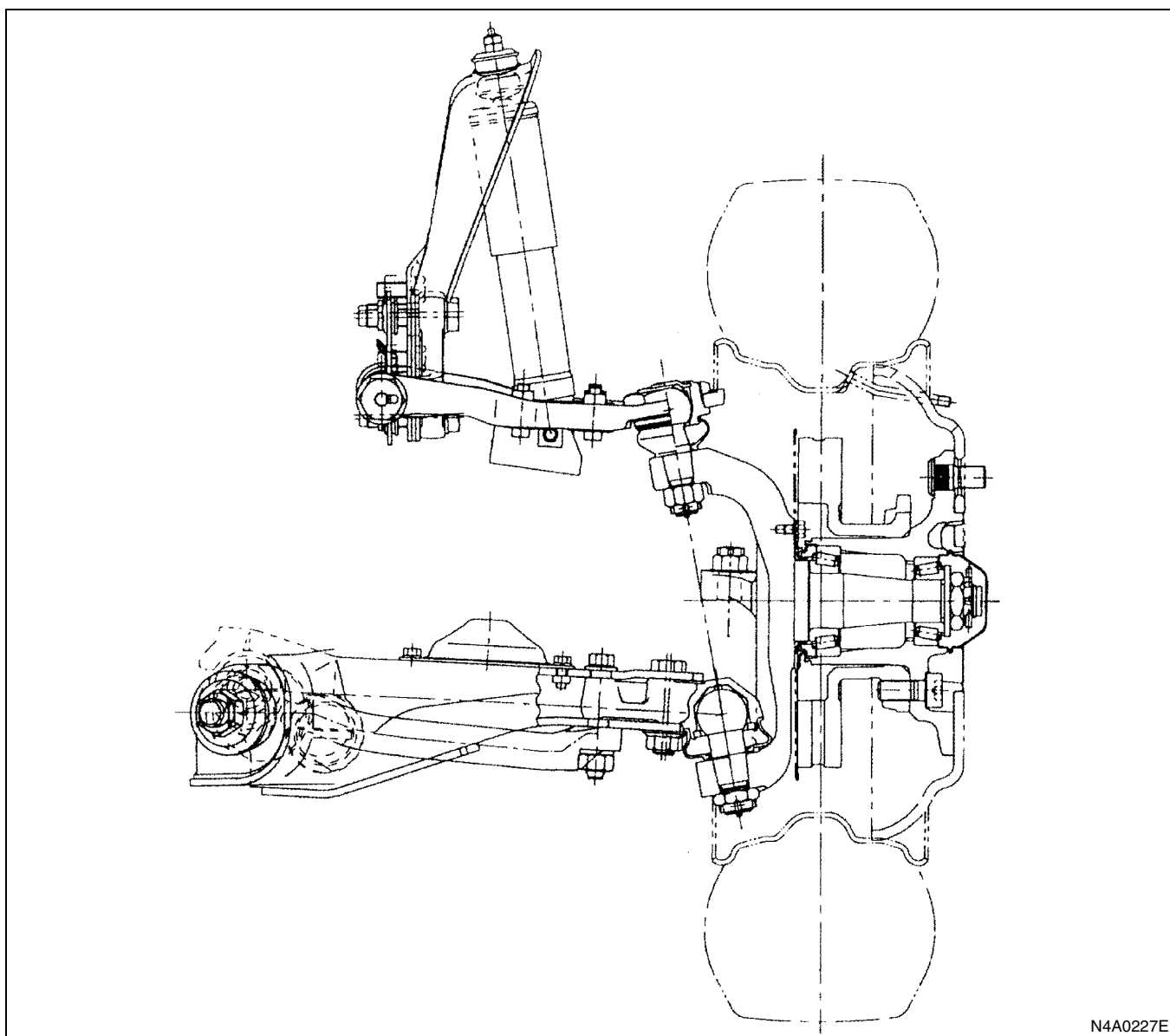
NPR Front Disc Brake Model (5 studs) (4 × 2 Model)



NPR, NQR Front Disc Brake Model (6 studs) (4 × 2 Model)

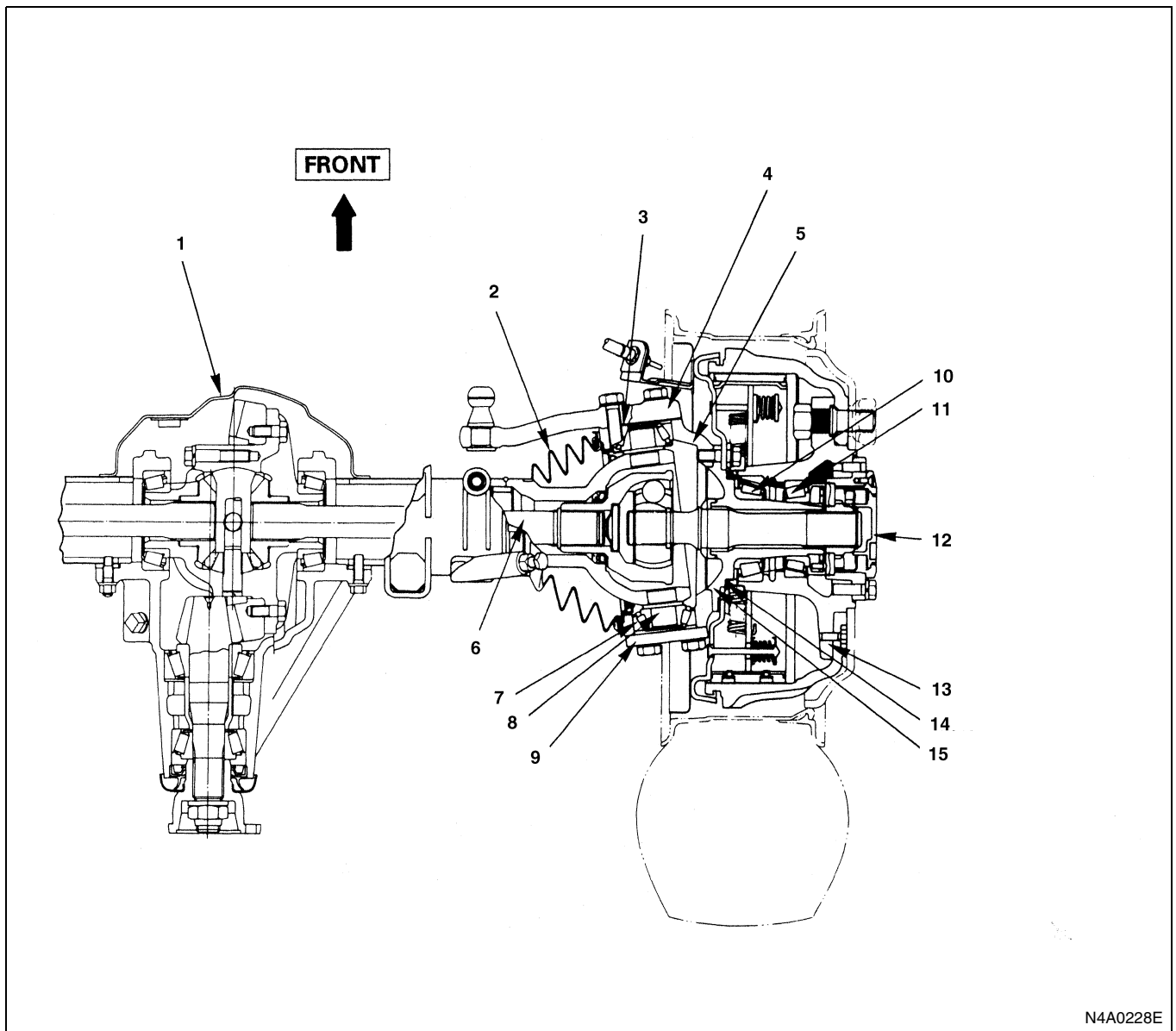


NKR Front Disc Brake Model (Independent Suspension, 4 × 2 Model)



4C-6 FRONT AXLE

Front Axle (4 × 4 Model)

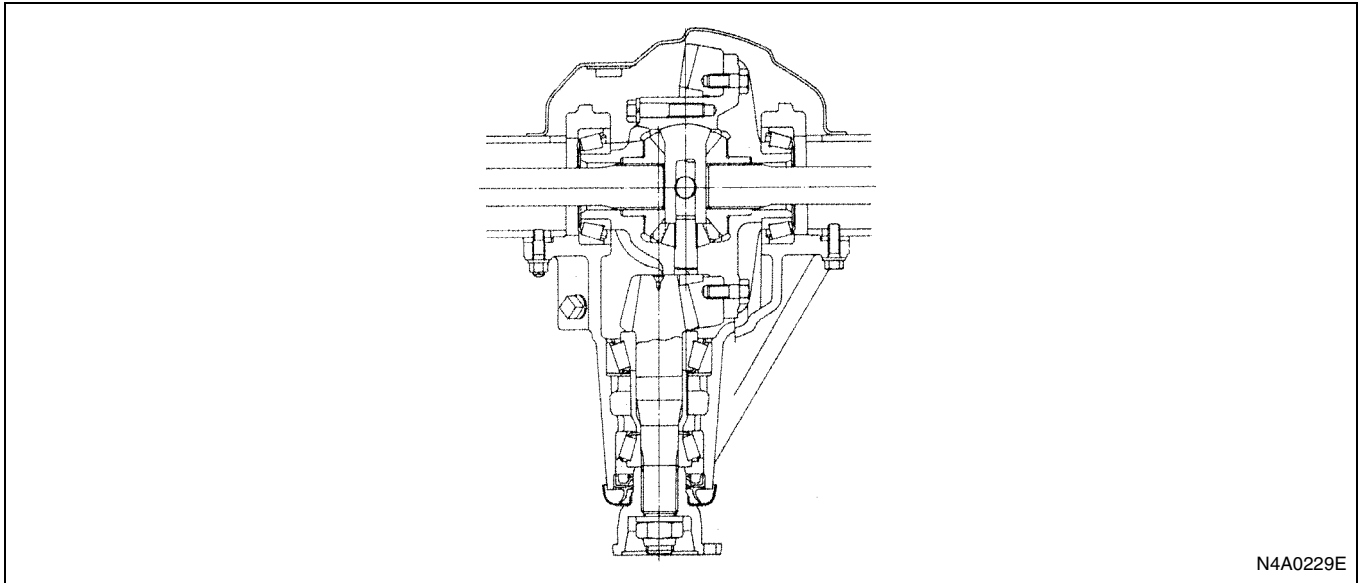


N4A0228E

Legend

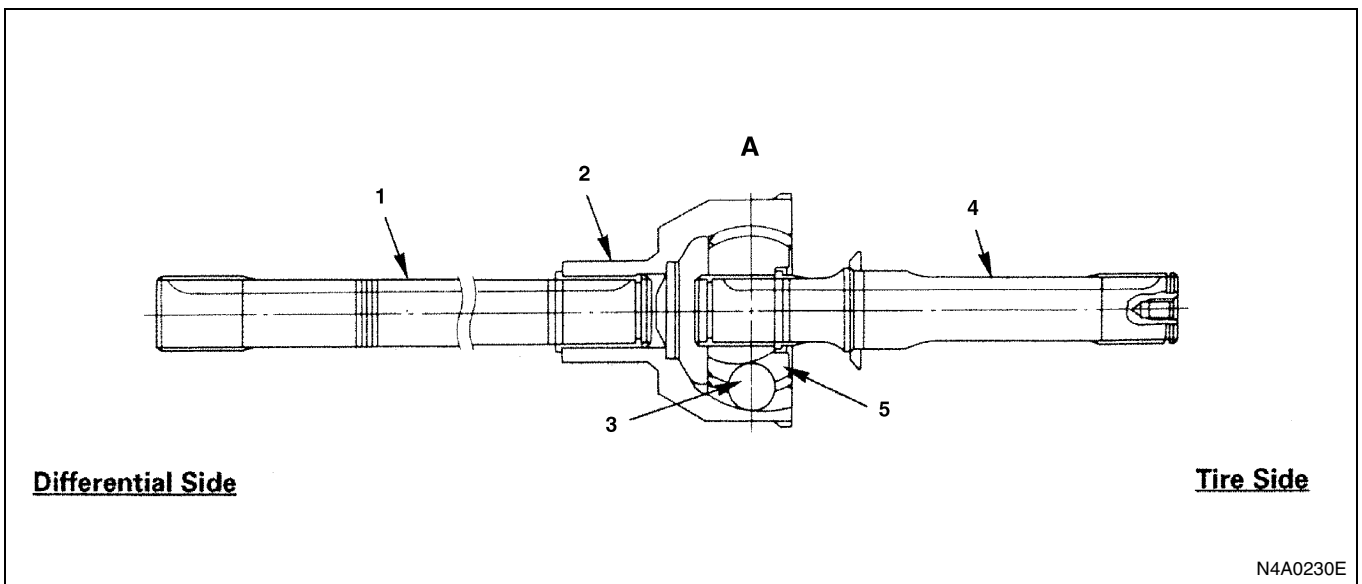
- | | |
|-----------------------------|----------------------------------|
| 1. Front final drive | 9. King pin cover |
| 2. Front axle tube end boot | 10. Front axle hub inner bearing |
| 3. Shim | 11. Front axle hub outer bearing |
| 4. Knuckle arm | 12. Free wheel hub |
| 5. Front axle knuckle | 13. Front axle hub |
| 6. Front drive shaft | 14. Front hub oil seal |
| 7. King pin bearing | 15. Spindle |
| 8. King pin | |

The front axle is full floating axle tube type with Birfield joints. The front axle supports the weight of the front of the vehicle and transfers it to the front tires. It also functions as a part of the steering system. The front axle is also designed to transmit the driving force to the front wheels in the four wheels drive mode.

Front Final Drive (244mm (9.6 in.) Size)

N4A0229E

The differential system employs a hypoid gearing which is higher in strength and durability and quieter in operation than the spiral bevel gears to lower the center of gravity of the vehicle thereby improving running stability. The differential gear box which includes the side gears and pinion gears is mounted to the differential carrier via the two (2) taper roller bearings. The final drive gear reduces and changes axial rotary force (drive power) of transfer output to rectangular direction, and also it distributes the power to the drive wheels.

Front Drive Shaft (Birfield Joint)

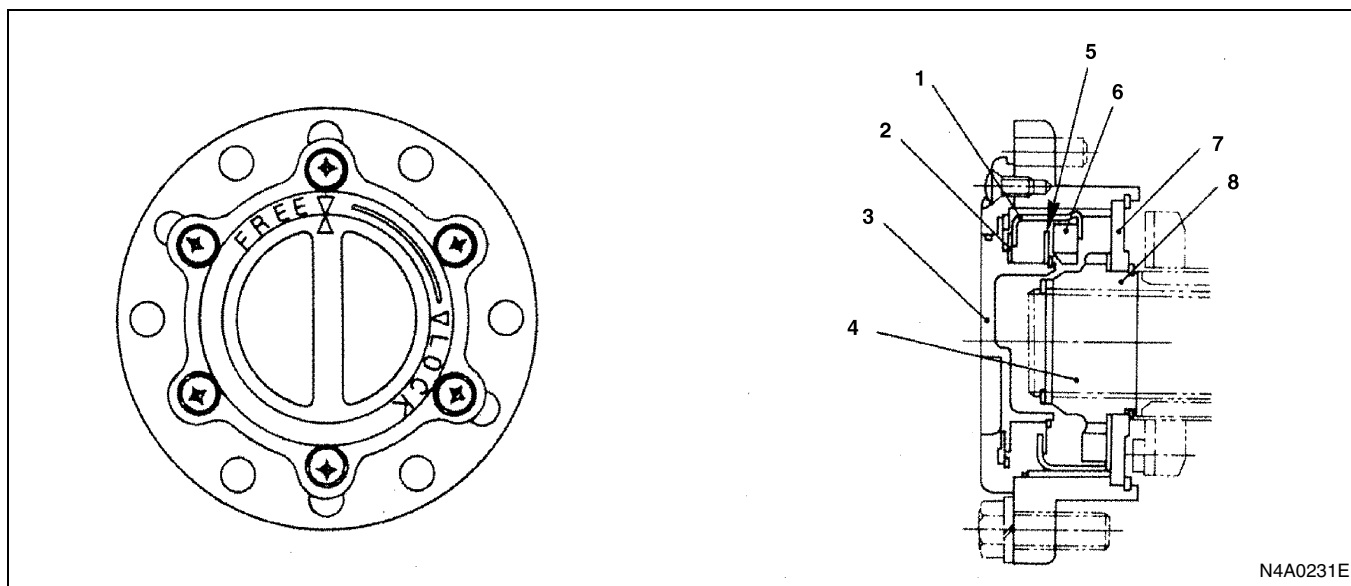
N4A0230E

Legend

- | | |
|---------------------|----------------|
| A. Birfield section | 3. Ball |
| 1. Outer shaft | 4. Inner shaft |
| 2. Outer ring | 5. Inner ring |

The drive power from the reduction and differential is transmitted from the outer drive shaft to the outer ring of Birfield joint to its ball to its inner ring to the inner drive shaft finally to drive the tire. When the vehicle is steered the balls automatically move according to the steering angle thereby operating as a complete constant velocity joint.

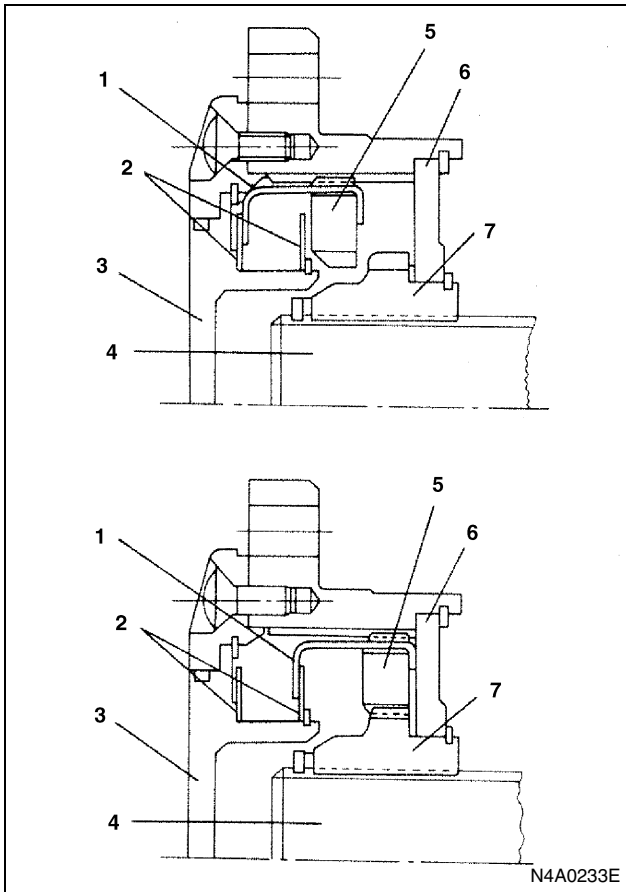
Free Wheel Hub (Manual Type)



Legend

- | | |
|----------------|--------------------|
| 1. Retainer | 5. Lock spring |
| 2. Lock spring | 6. Hub lock clutch |
| 3. Handle | 7. Hub lock ring |
| 4. Drive shaft | 8. Hub lock inner |

The free wheel hub, a hub lock device installed on the hub, transmits engine torque to the front wheels by engaging the dog clutch in the 4-wheel drive mode, or disengages the dog clutch in the 2-wheel drive mode to make free the front wheel drive system, so that it can improve fuel economy and reduce noise. Engagement or disengagement of dog clutch is done by handle operation.



Legend

1. Retainer
2. Lock spring
3. Handle
4. Drive shaft
5. Hub lock clutch
6. Hub lock ring
7. Hub lock inner

[Operational Description]

(FREE status)

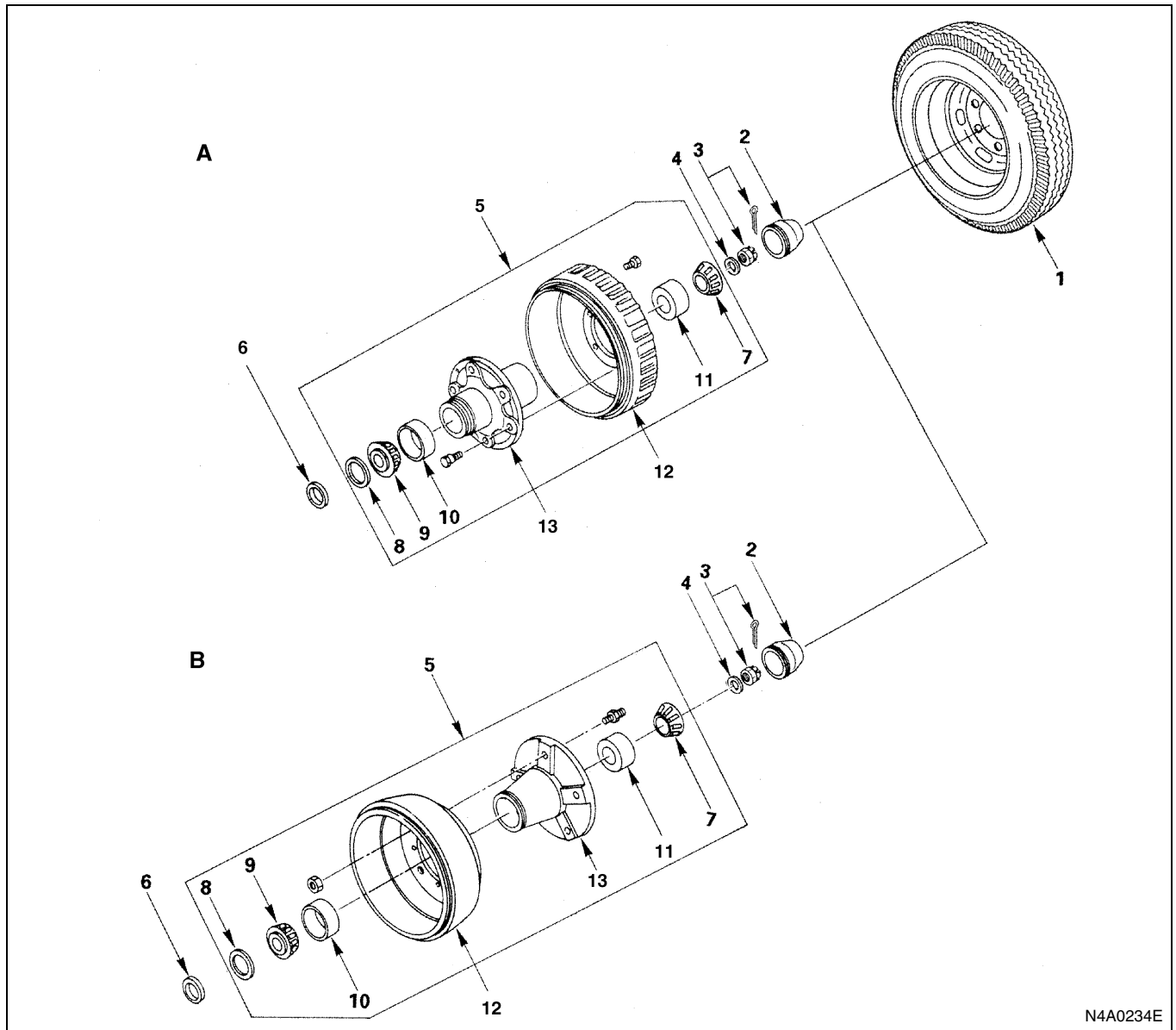
As the handle is rotated in the FREE direction, a lock spring assembled in the handle also rotates. Since the retainer lug moves along the slant face of lock spring, the hub lock clutch calked to the retainer is disengaged from lock inner, resulting in free status. If, however, the hub lock clutch is not disengaged from lock inner due to spline resistance, the lock spring is compressed to store spring force. Upon elimination of spline resistance, the hub lock clutch is disengaged by means of spring force.

(LOCK status)

As the handle is rotated in the LOCK direction, the retainer lug moves along the slant face of lock spring, and the hub lock clutch is engaged with lock inner, resulting in lock status. If, however, phase between hub lock clutch and lock inner is not coincident, the lock spring is compressed to store spring force. Upon coincidence of phase, the hub lock clutch is engaged by means of spring force.

ON-VEHICLE SERVICE

Front Hub and Brake Drum (4 × 2 Model)



N4A0234E

Legend

- | | |
|--|------------------------------|
| A. NHR, NKR models (rear single and dual small tire) | 7. Outer bearing |
| B. NKR, NPR models (rear dual tire) | 8. Oil seal |
| 1. Wheel and tire | 9. Inner bearing |
| 2. Hub cap | 10. Inner bearing outer race |
| 3. Hub bearing nut | 11. Outer bearing outer race |
| 4. Lock washer | 12. Brake drum |
| 5. Hub with brake drum assembly | 13. Hub |
| 6. Distance piece | |

Removal

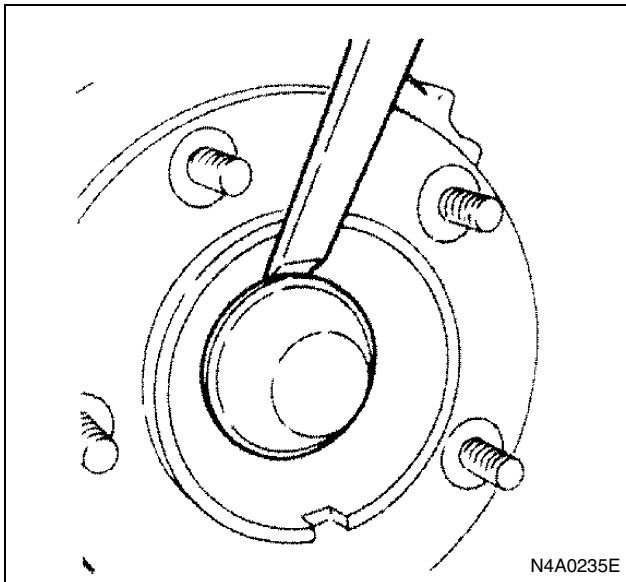
Preparation:

Jack up and support the vehicle on stands.

1. Wheel and Tire

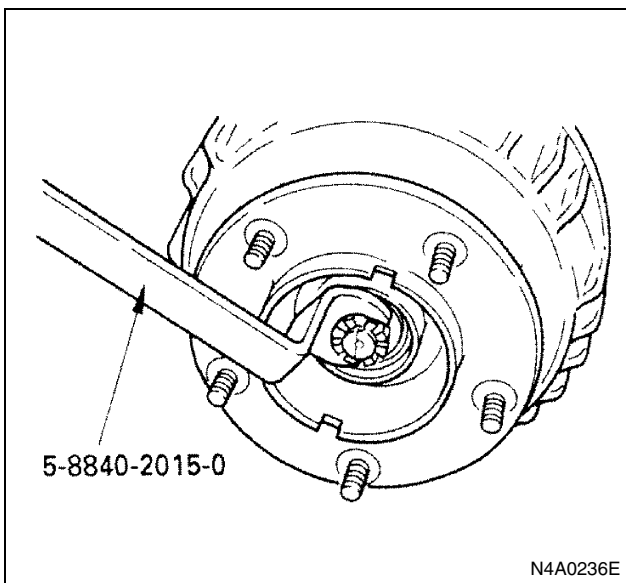
2. Hub Cap

When removing hub cap, exercise care so as not to scratch or distort hub fitting face.



3. Hub Bearing Nut

Hub Nut Wrench: 5-8840-2015-0

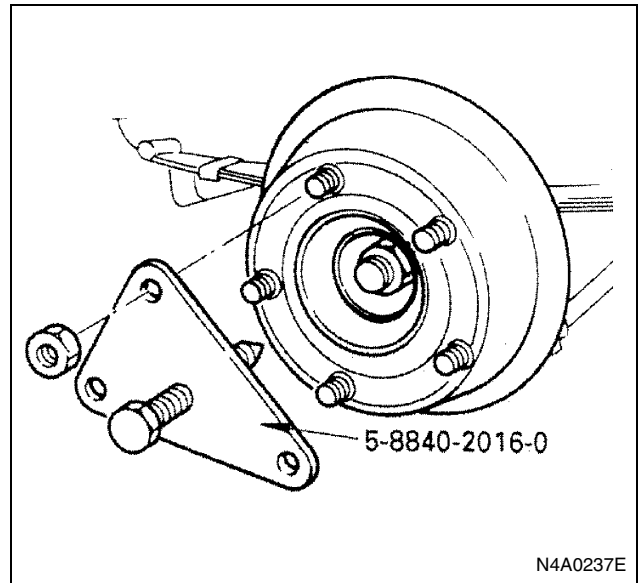


4. Lock Washer

5. Hub with Brake Drum Assembly

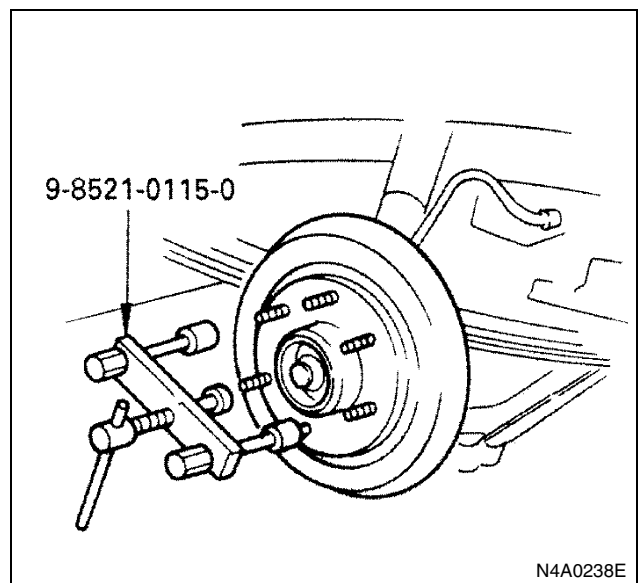
5 studs

Hub Remover: 5-8840-2016-0

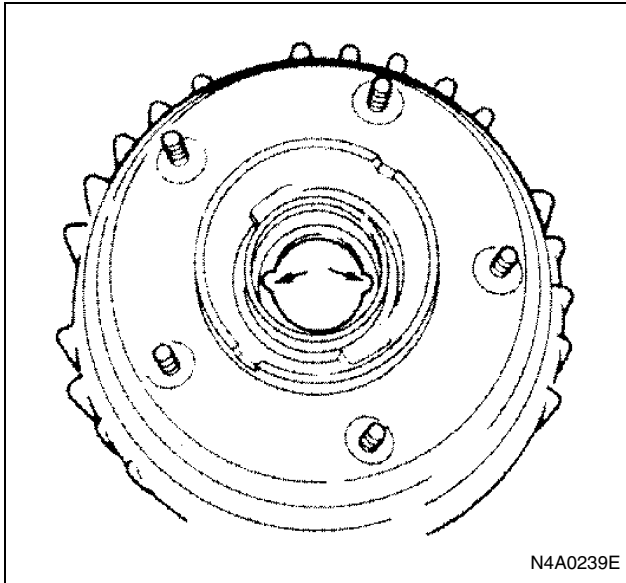


6 studs

Hub Remover: 9-8521-0115-0 (NHR, NKR rear small tire)



6. Distance Piece
 7. Outer Bearing
 8. Oil seal
 9. Inner Bearing
 10. Inner Bearing Outer Race
- Drive out the inner bearing outer race together with the oil seal with a proper bar through two notches.



11. Outer Bearing Outer Race
12. Brake Drum
13. Hub

Inspection and Repair

Make the necessary adjustments, repairs, and part replacements if excessive wear or damage is discovered during inspection.

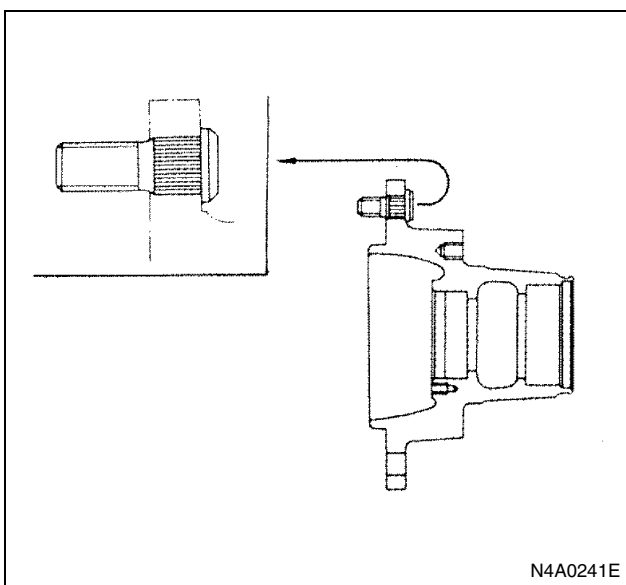
Visual Check

Inspect the following parts for wear, damage or other abnormal conditions.

- Hub
- Hub bearing, oil seal
- Knuckle spindle
- Brake
- Brake shoe, lining etc.

(NHR, NKR MODELS)

Check bolt for looseness.



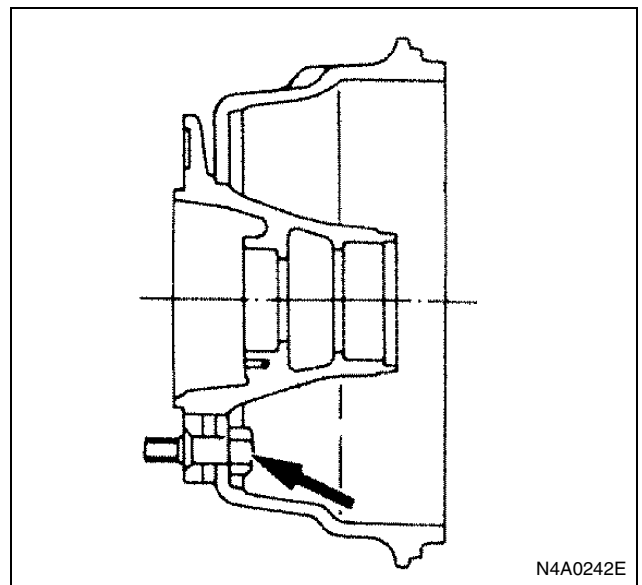
Installation

1. Hub
 2. Brake Drum
- Tighten the brake drum wheel nuts to the specified torque.

Tighten:

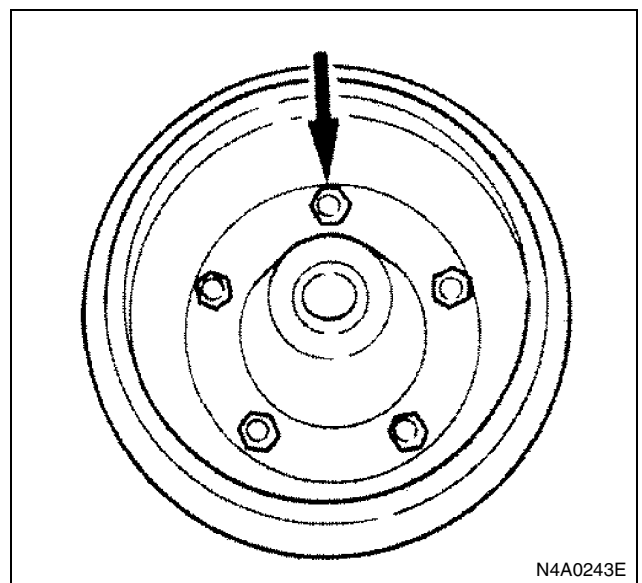
Wheel nut to

- Brake lining width 75 mm: 343 N·m (35 kg·m / 253 lb·ft)
- Brake lining width 100 mm: 392 N·m (40 kg·m / 289 lb·ft)



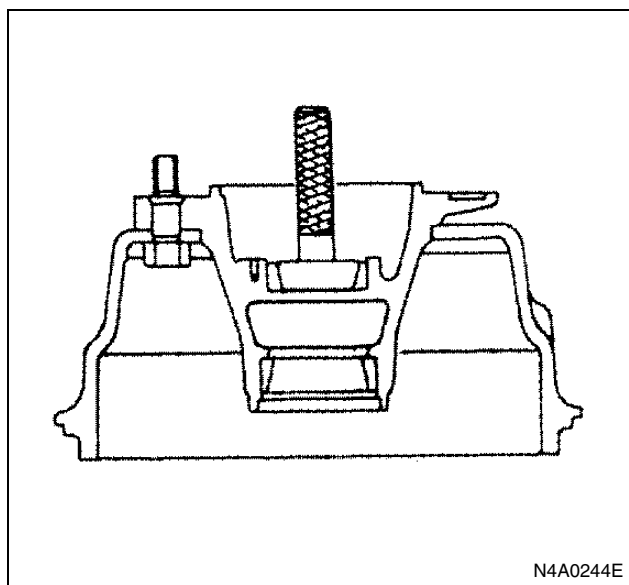
When replacement of hub or drum is completed, stake 3 portions of each wheel pin nut.

This illustration is based on 5 studs.



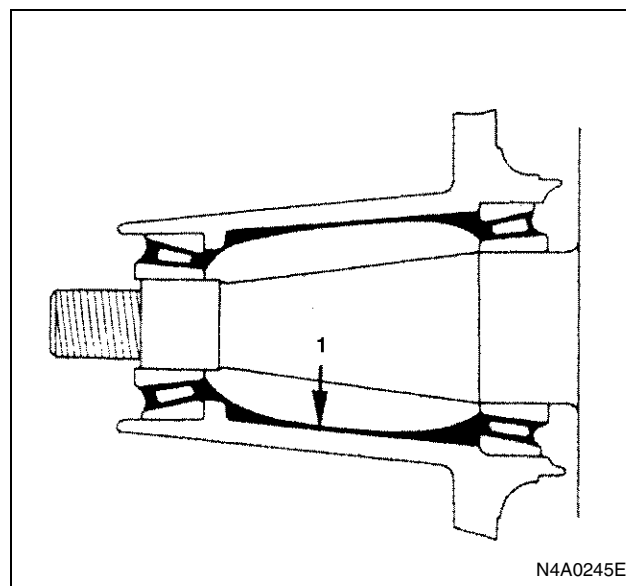
3. Outer Bearing Outer Race
4. Inner Bearing Outer Race

Bearing Outer Race Installer		
	Parts No.	Remarks
All	9-8522-1148-0	Grip
NHR	5-8840-2023-0	Inner Bearing
NKR	5-8840-2025-0	Outer Bearing
NPR	5-8840-2024-0	Inner Bearing
NQR	5-8840-2026-0	Outer Bearing



Apply grease (1) in the hub and bearing rollers

Hub Grease Amount		g (oz)	
		Hub	Hub cap
NHR	Rear Single and Dual Small Tire	55 (1.9)	30 (1.1)
NKR	Rear Single and Dual Small Tire	80 (2.8)	40 (1.4)
NKR	Rear Dual Tire	90 (3.2)	
NPR	NQR	160 (5.6)	



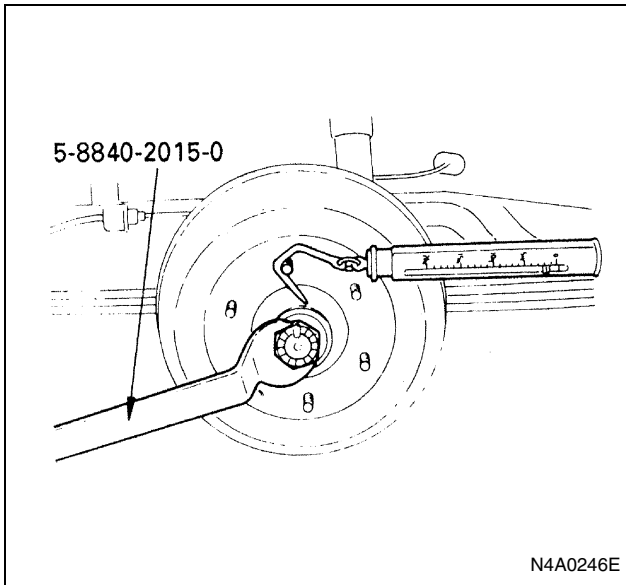
5. Inner Bearing
6. Oil Seal
Drive the oil seal into the hub flush with the hub end surface.
7. Outer Bearing
8. Distance Piece
9. Hub with Brake Drum Assembly
10. Lock Washer
11. Hub Bearing Nut
Check the brake lining clearances first to avoid friction loss.
Adjust the hub bearing preload at the wheel pin.

Hub Bearing Preload (at Wheel Pin)			N (kg/lb)
NHR	New	9.8 — 34.3 (1.0 — 3.5/2.2 — 7.7)	
	Reused	7.8 — 22.5 (0.8 — 2.3/1.8 — 5.0)	
NKR	New	11.8 — 26.5 (1.2 — 2.7/2.6 — 5.9)	
	Reused	6.9 — 21.6 (0.7 — 2.2/1.5 — 4.8)	
NPR NQR	New	9.8 — 34.3 (1.0 — 3.5/2.2 — 7.7)	
	Reused	4.9 — 19.6 (0.5 — 2.0/1.1 — 4.4)	

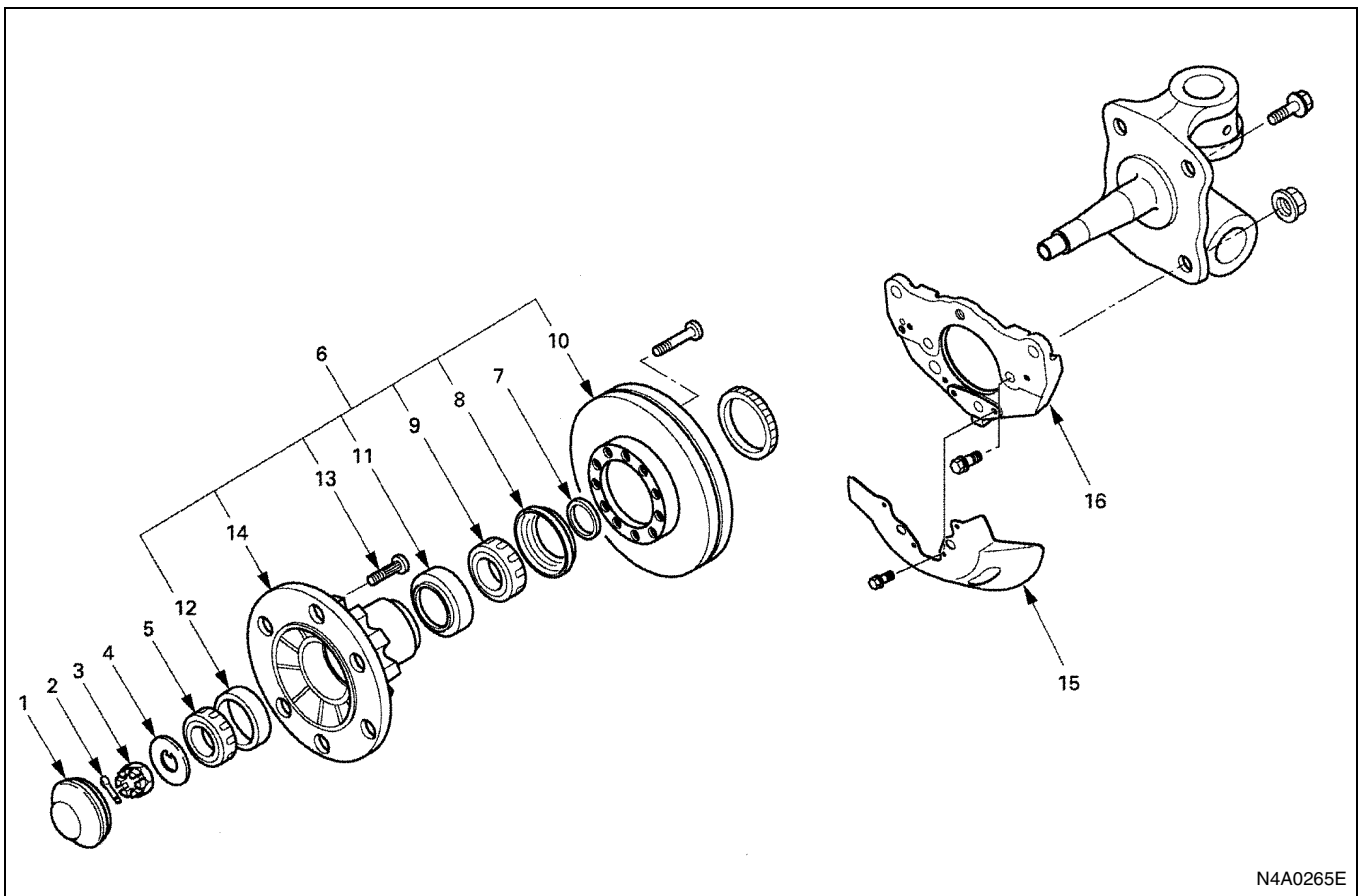
Hub Nut Wrench: 5-8840-2015-0

In case of misalignment of locking hole, align in direction of retightening.

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- 12. Hub Cap
- 13. Wheel and Tire

Front Hub and Disc (4 × 2 Model, 293 & 310mm Disc)

N4A0265E

Legend

- | | |
|--------------------------|------------------------|
| 1. Hub cap | 9. Inner bearing |
| 2. Cotter pin | 10. Disc |
| 3. Nut | 11. Inner bearing race |
| 4. Washer | 12. Outer bearing race |
| 5. Outer bearing | 13. Stud |
| 6. Hub and disc assembly | 14. Hub |
| 7. Spacer | 15. Dust shield |
| 8. Oil seal | 16. Adapter |

4C-16 FRONT AXLE

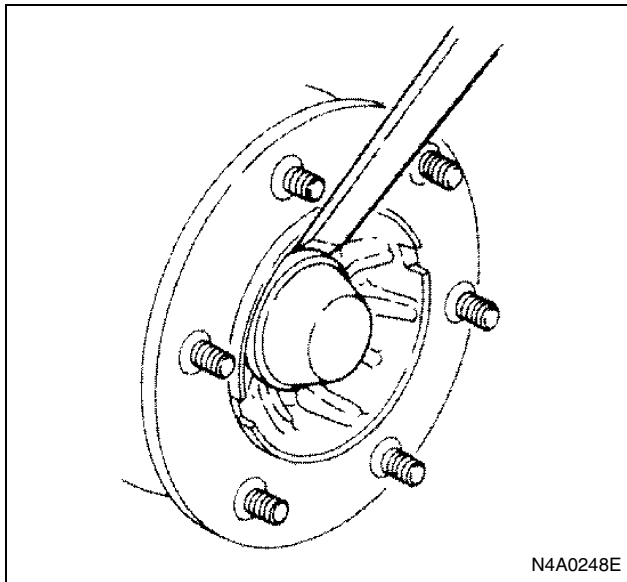
Removal

Preparation:

Jack up and support the vehicle on stands.

1. Hub cap

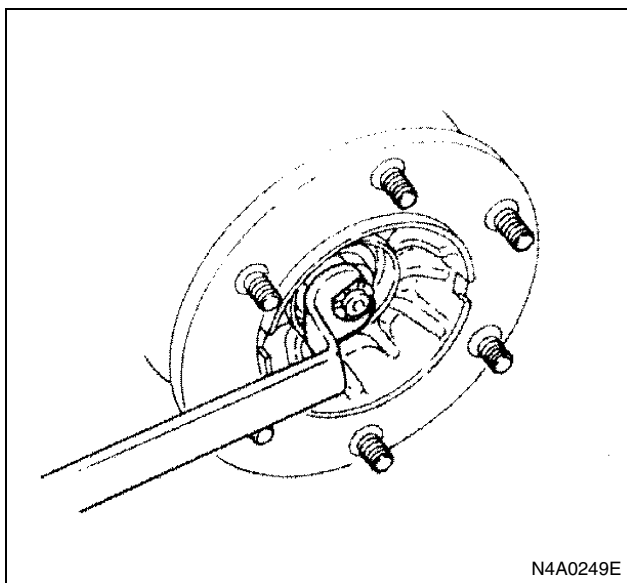
Use a lever to pry the hub cap from the hub.



2. Cotter Pin

3. Nut

Use a wrench to remove the nut.



4. Washer

5. Outer Bearing

6. Hub and Disc Assembly

1) Turn the caliper assembly up and around the guide pin.

2) Remove the hub and disc assembly from the knuckle.

7. Spacer

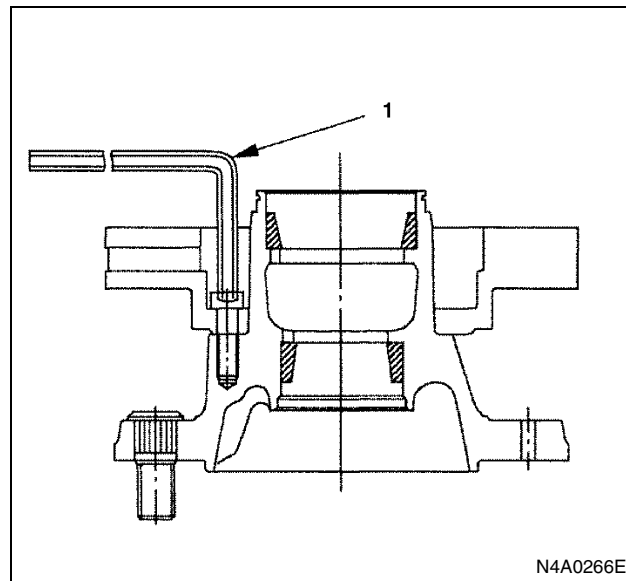
8. Oil Seal

9. Inner Bearing

10. Disc

1) Use an inner hex wrench (1) to loosen the disc fixing bolts.

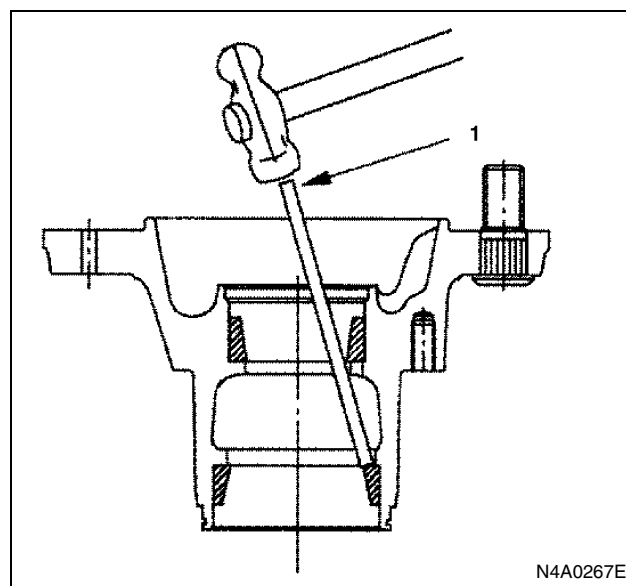
2) Remove the disc from the hub.



11. Inner Bearing Race

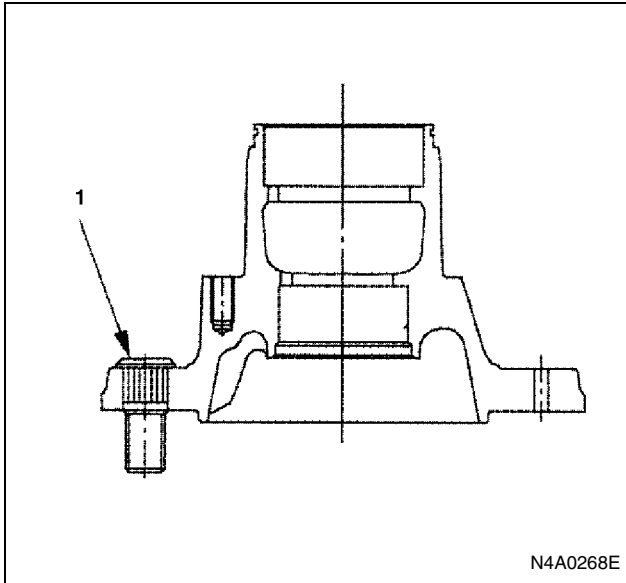
12. Outer Bearing Race

Use a hammer and a brass bar (1) to remove the inner race and the outer race from the hub.



13. Stud

Place hub on a suitable work surface and remove the studs (1) by using a hammer.



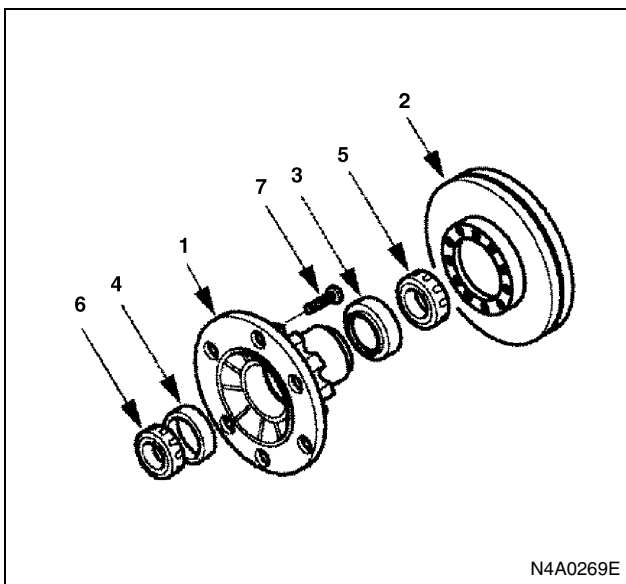
- 14. Hub
- 15. Dust Shield
- 16. Adapter

Inspection and Repair

Make the necessary adjustments, repairs, and part replacements if excessive wear or damage is discovered during inspection.

Visual Inspection

Inspect the following parts for cracking, deformation, and corrosion.



Legend

- 1. Hub
- 2. Disc
- 3. Inner bearing race
- 4. Outer bearing race
- 5. Inner bearing
- 6. Outer bearing
- 7. Wheel pins

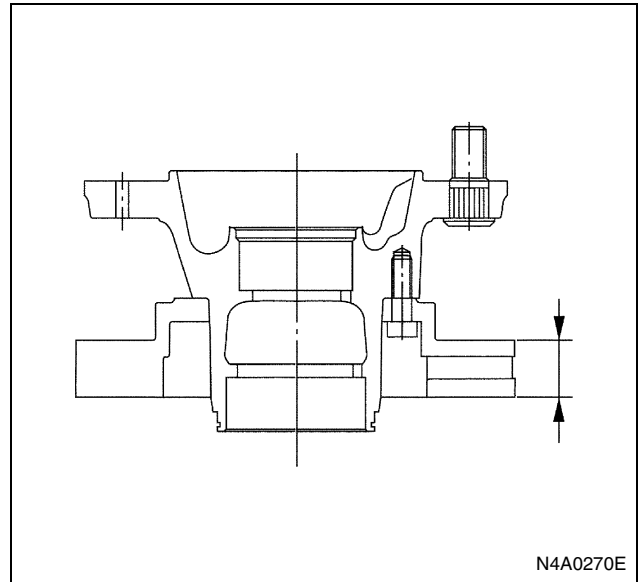
Disc

Use a vernier caliper to measure the disc thickness. If the measured value is less than the specified limit, the disc must be replaced.

Disc thickness,

Standard: 42.0 mm (1.654 in)

Limit: 39.0 mm (1.535 in)



Installation

- 1. Adapter

Tighten:

Adapter fixing bolt to 162 N·m (16.5 kg·m / 119 lb·ft)

- 2. Dust Shield

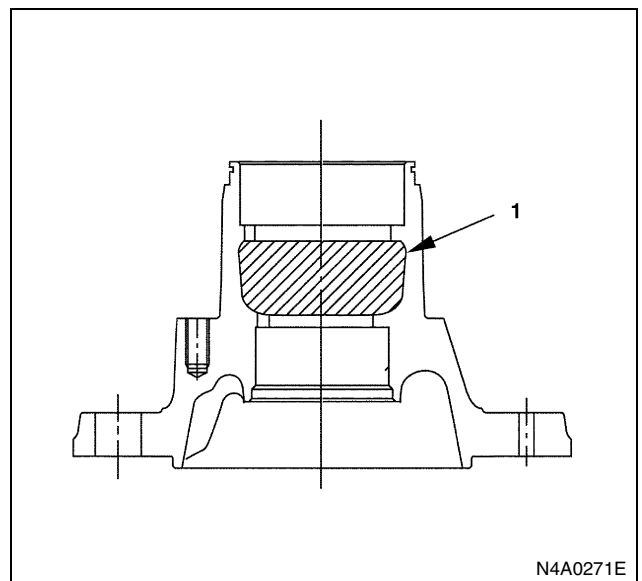
Tighten:

Dust shield fixing to 13 N·m (1.3 kg·m / 113 lb·ft)

- 3. Hub

Apply the specified amount of the approved grease to the hub cavity (1).

Grease amount: 160 g (5.6 oz)



- 4. Inner Bearing Race

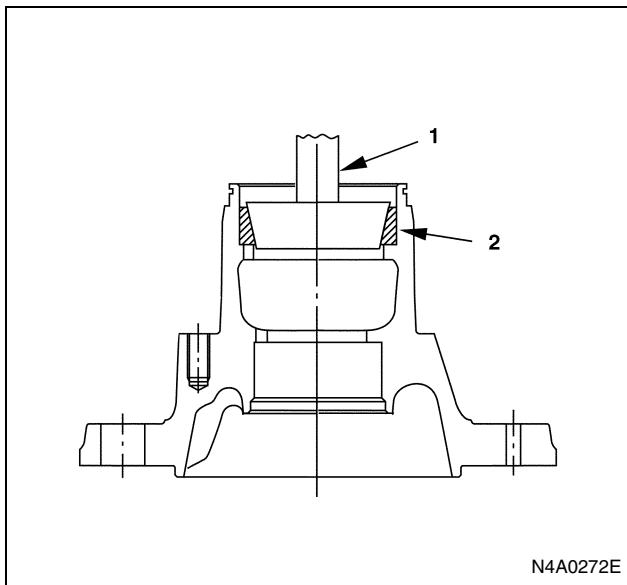
4C-18 FRONT AXLE

5. Inner Bearing

6. Oil Seal

- 1) Use a hammer and the installer (1) to install the inner bearing race (2) to the hub.
Be sure that the race is completely seated in the hub.

Installer: 5-8840-2235-0

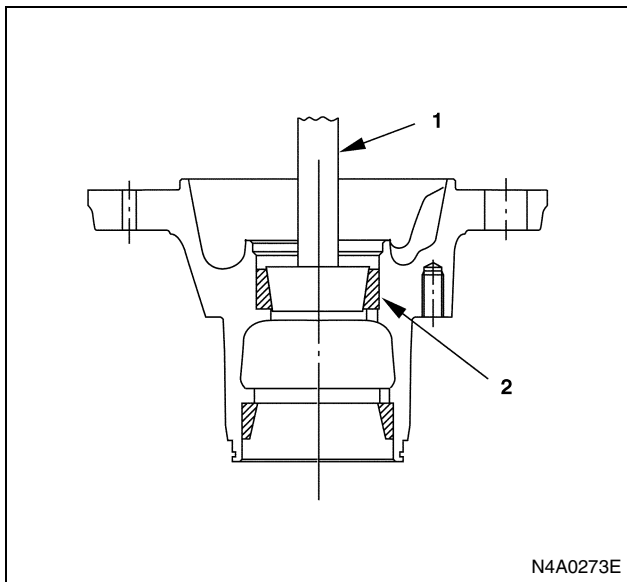


- 2) Apply grease to the inner bearing.
- 3) Install the inner bearing to the hub.
- 4) Use a plastic hammer to carefully tap the oil seal into place.
The oil seal surfaces must be flat.
Use a new oil seal.

7. Outer Bearing Race

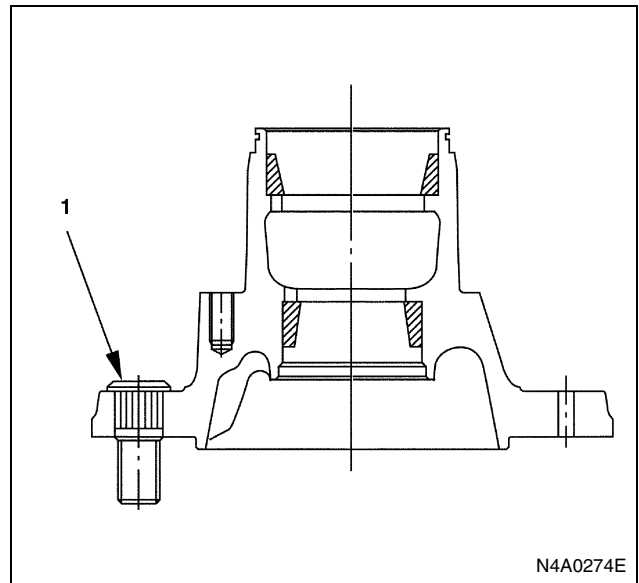
Use a hammer and the installer (1) to install the outer bearing race (2) to the hub.
Be sure that the race is completely seated in the hub.

Installer: 5-8840-2026-0



8. Stud

Insert a stud (1) using a hammer.

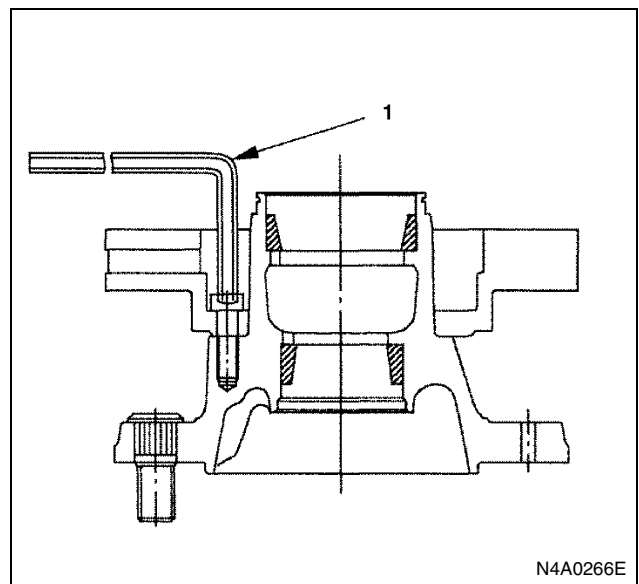


9. Disc

- 1) Install the disc to the hub.
- 2) Use an inner hex wrench (1) to tighten the disc bolts to the specified torque.

Tighten:

Disc bolt to 103 N·m (10.5 kg·m / 76 lb·ft)

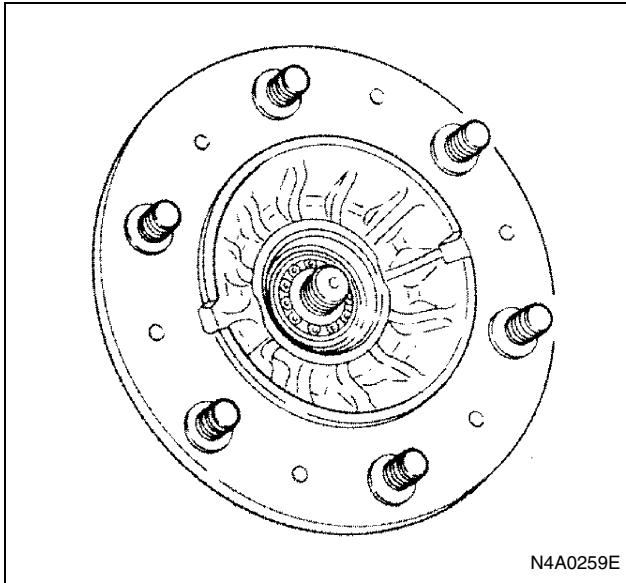


10. Spacer

11. Hub and Disc Assembly

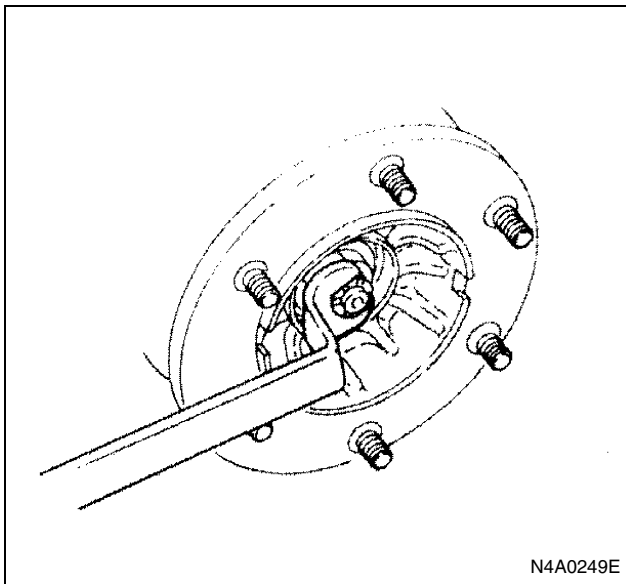
12. Outer Bearing

- 1) Turn the caliper assembly up and around the guide pin.
- 2) Install the spacer and the hub and disc assembly to the knuckle.
- 3) Apply grease to the outer bearing.
- 4) Install the bearing to the hub.



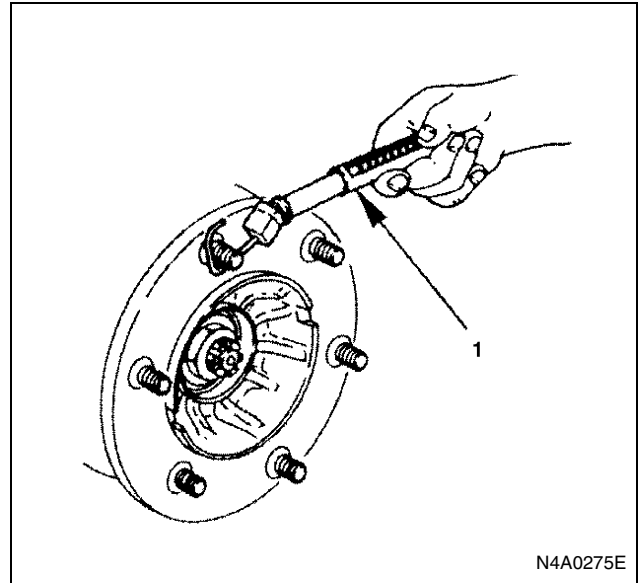
- 13. Washer
- 14. Nut
- 15. Cotter Pin

- 1) Install the washer to the hub.
- 2) Tighten the nut until you are unable to manually rotate the hub and disc assembly.



- 3) Loosen the nut.
- 4) Attach a spring balancer (1) to one wheel pin. Gradually retighten the nut until the hub and disc assembly bearing is adjusted to the specified preload.

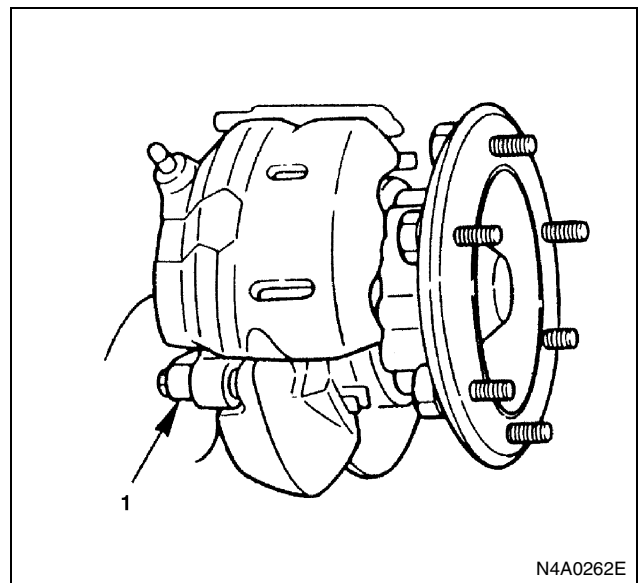
Hub bearing preload,
 New Hub bearing: 17 — 31 N (1.7 — 3.2 kg / 3.7 — 7.1 lb)
 Reused Hub bearing: 14 — 28 N (1.4 — 2.9 kg / 3.1 — 6.4 lb)



- 5) Align the nut slot with the knuckle cotter pin hole.
 If necessary, slightly tighten the nut to align the slot and the hole.
- 6) Insert the cotter pin to the slot and hole.
- 7) Bend back the cotter pin to lock the nut.
- 8) Return the caliper assembly to its original position.
- 9) Tighten the lock pin bolt (1) to the specified torque.
 Use a new cotter pin.

Tighten:

Lock pin bolt to 137 N·m (14 kg·m / 101 lb·ft)



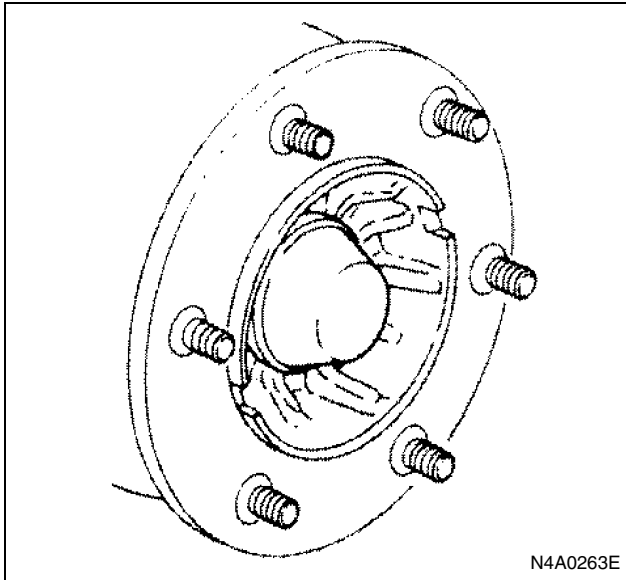
- 16. Hub Cap
 - 1) Apply LOCTITE or liquid gasket to the engagement part with hub.
 - 2) If severe deformation is found, replace with a new one.

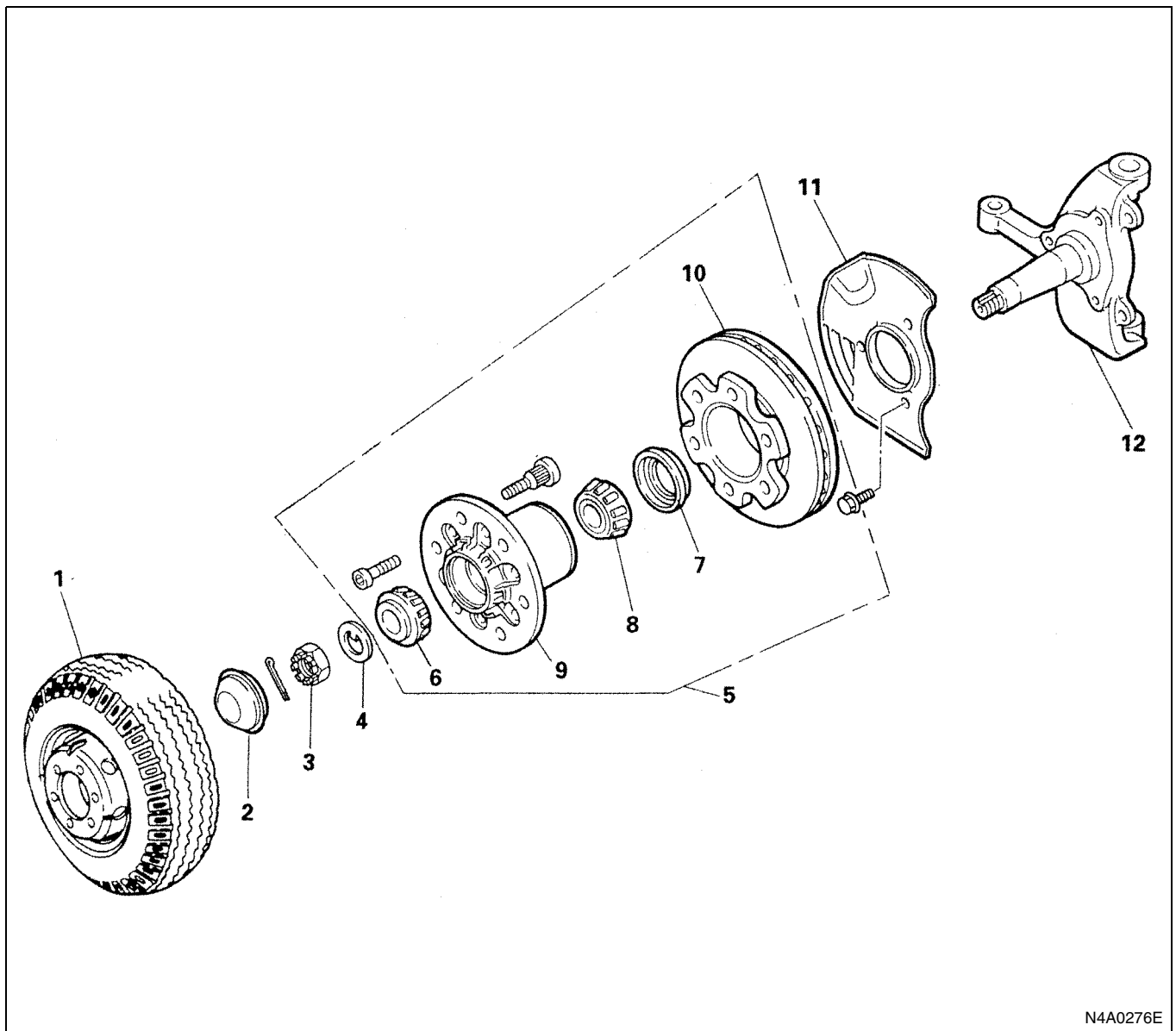
4C-20 FRONT AXLE

- 3) Apply the specified amount of the approved grease to the hub cap.

Grease amount: 40 g (1.4 oz)

- 4) Use a plastic hammer to install the hub cap to the hub.



Front Hub, Disc and Knuckle (4 × 2, Independent Suspension Model)

N4A0276E

Legend

- | | |
|--------------------------|------------------|
| 1. Wheel and tire | 7. Oil seal |
| 2. Hub cap | 8. Inner bearing |
| 3. Hub nut | 9. Hub |
| 4. Thrust washer | 10. Disc |
| 5. Hub and disc assembly | 11. Back plate |
| 6. Outer bearing | 12. Knuckle |

4C-22 FRONT AXLE

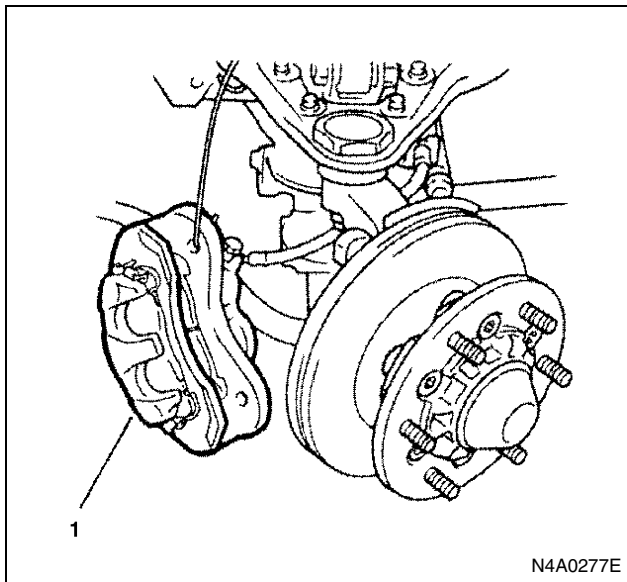
Removal

Preparation:

Jack up and support the vehicle on stands.

1. Wheel and Tire

Remove the disc brake caliper assembly (1) with brake hose and wire it to frame.



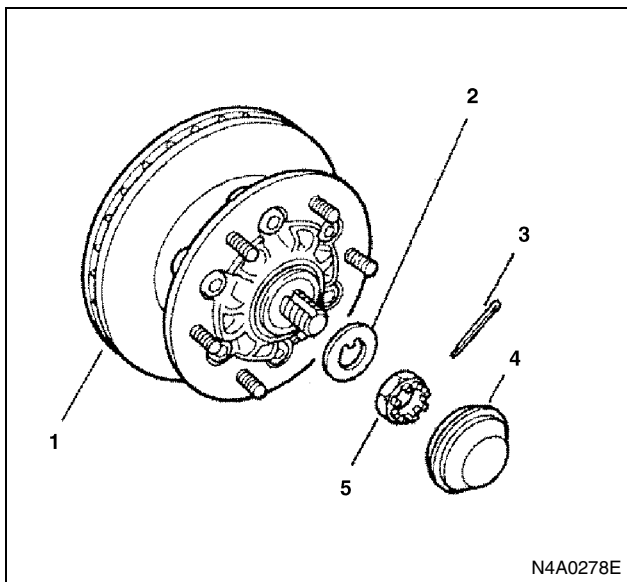
2. Hub Cap

3. Hub Nut

4. Thrust Washer

5. Hub and Disc Assembly

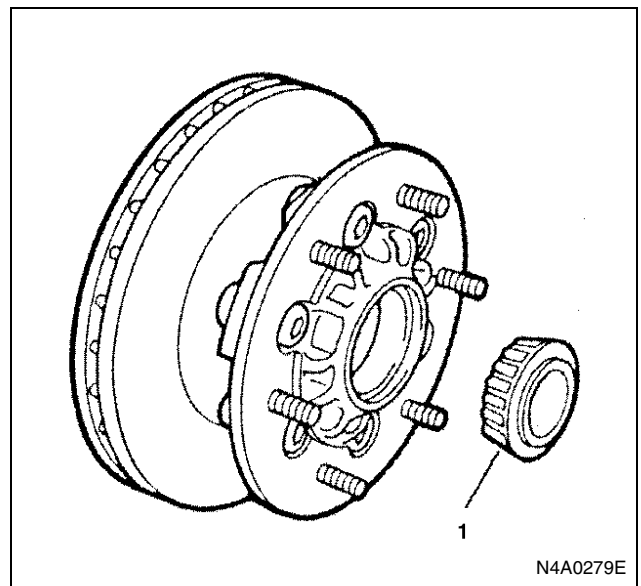
Remove the hub and disc assembly from the knuckle.



Legend

1. Hub and disc assembly
2. Thrust washer
3. Cotter pin
4. Hub cap
5. Hub nut

6. Outer Bearing

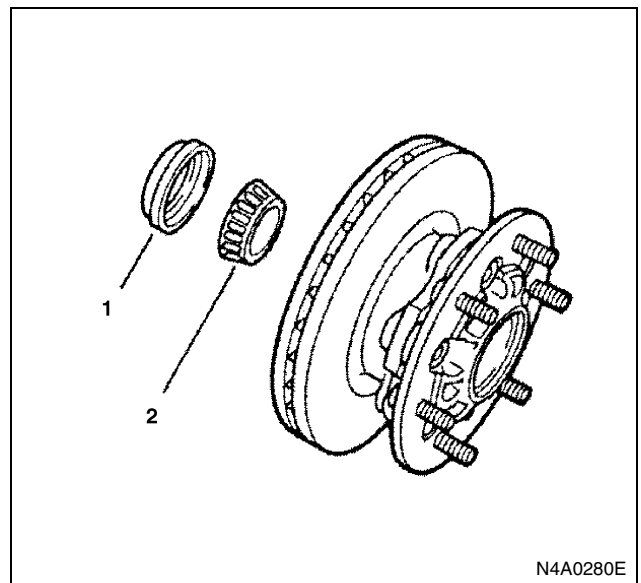


Legend

1. Outer bearing

7. Oil Seal

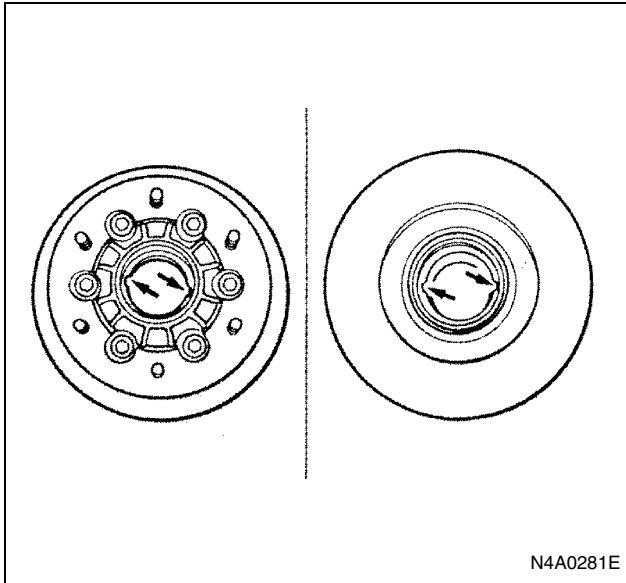
8. Inner Bearing



Legend

1. Oil seal
2. Inner bearing

- Drive out the bearing outer races using with a proper bar through two notches.

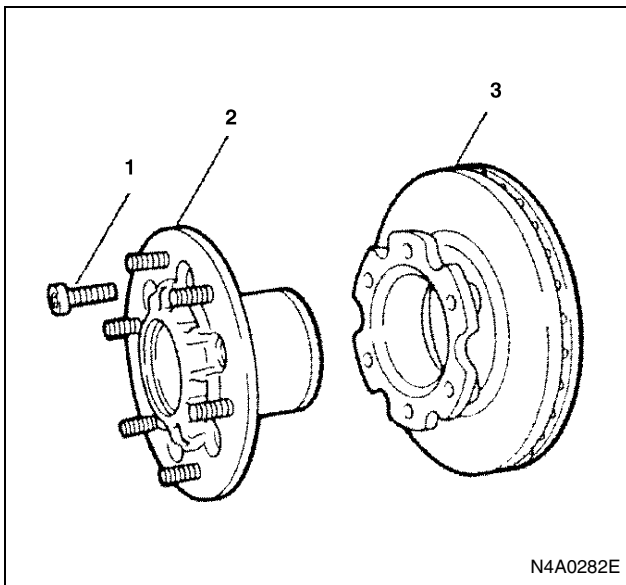


9. Hub

10. Disc

- If need, separate the hub on disc.
Torx bit (T70): 5-8840-2368-0

11. Back Plate

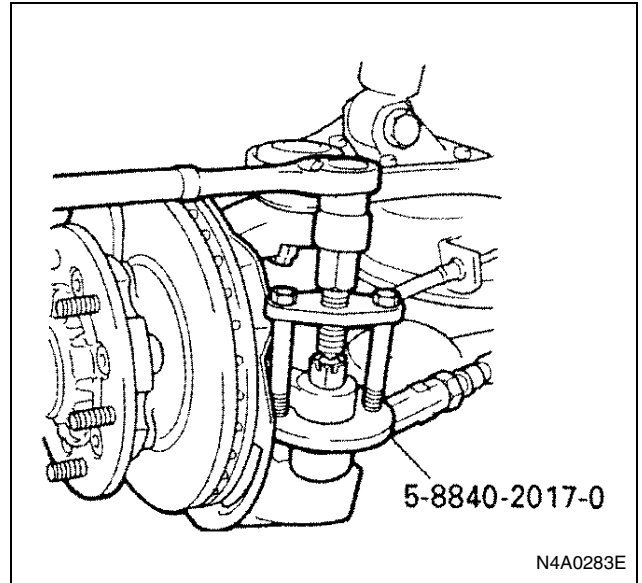


Legend

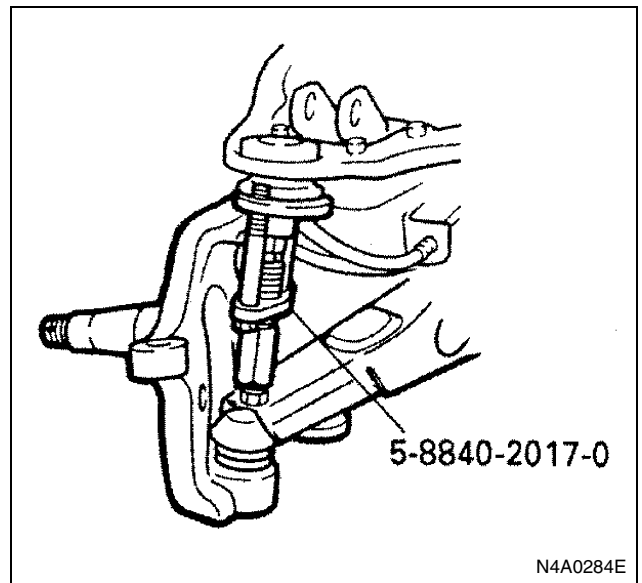
1. Bolt
2. Hub
3. Disc

12. Knuckle

- Disconnect the tie rod end joint and upper link end joint from the knuckle.
Tie Rod End Remover: 5-8840-2017-0



- Remove the two bolts fixing the lower link end and remove the knuckle together with the lower link end.
- Remove the lower link end from the knuckle.

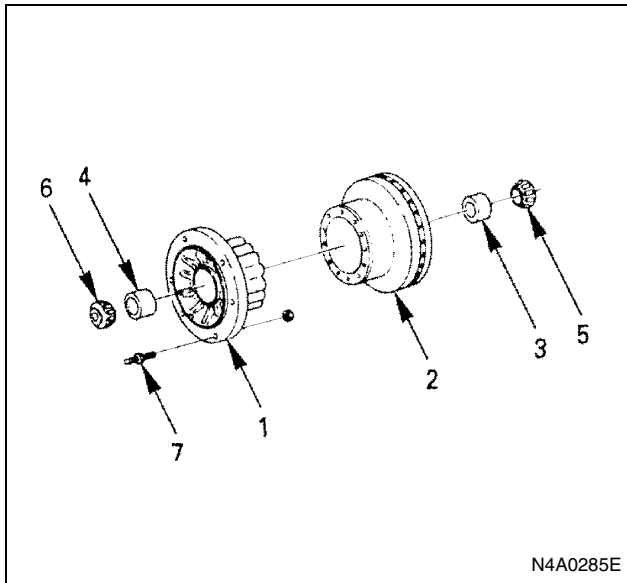


Inspection and Repair

Make the necessary adjustments, repairs, and part replacements if excessive wear or damage is discovered during inspection.

Visual Inspection

Inspect the following parts for cracking, deformation, and corrosion.



Legend

1. Hub
2. Disc
3. Inner race
4. Outer race
5. Inner bearing
6. Outer bearing
7. Wheel pins

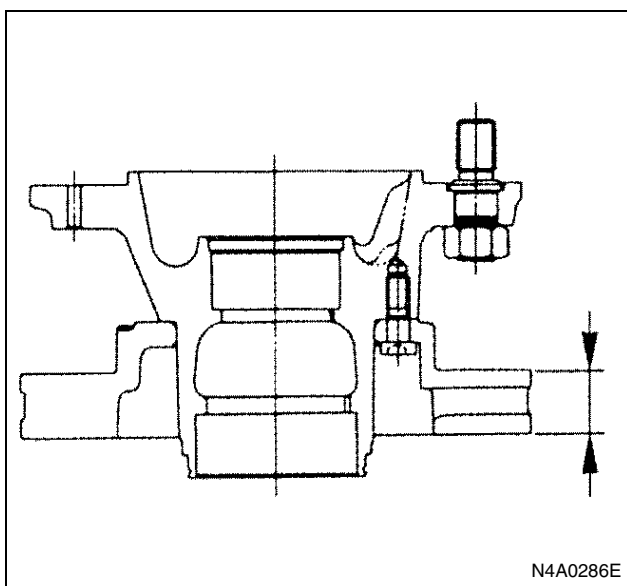
Disc

Use a vernier caliper to measure the disc thickness. If the measured value is less than the specified limit, the disc must be replaced.

Disc thickness,

Standard: 35.0 mm (1.38 in)

Limit: 33.5 mm (1.32 in)



Installation

1. Knuckle

Tighten:

- Lower link joint nut to 377 N·m (38.4 kg·m / 278 lb·ft)

- Lower link end bolt to 219 N·m (22.3 kg·m / 161 lb·ft)
- Upper link joint nut to 205 N·m (20.9 kg·m / 151 lb·ft)
- Tie rod joint nut to 108 N·m (11 kg·m / 80 lb·ft)
 - Discard used cotter pin and install new one.

2. Back Plate

Tighten:

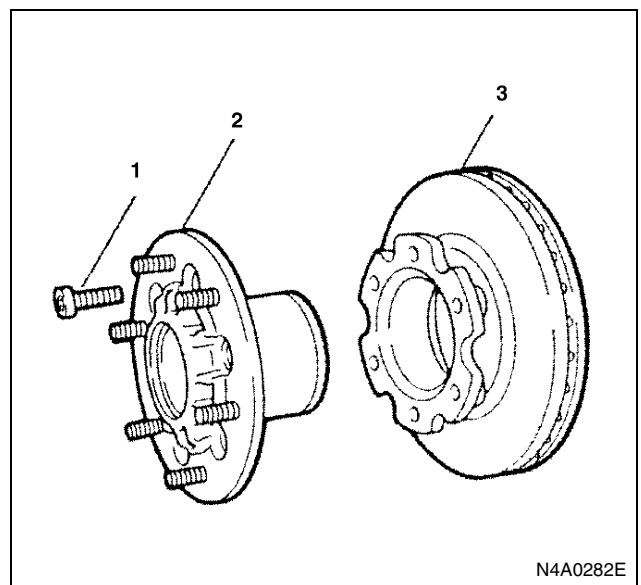
Back plate bolt to 13 N·m (1.3 kg·m / 113 lb·ft)

3. Disc
4. Hub

Tighten:

Disc bolt to

- M14: 155 N·m (15.8 kg·m / 114 lb·ft)
- M16: 219 N·m (22.3 kg·m / 163 lb·ft)

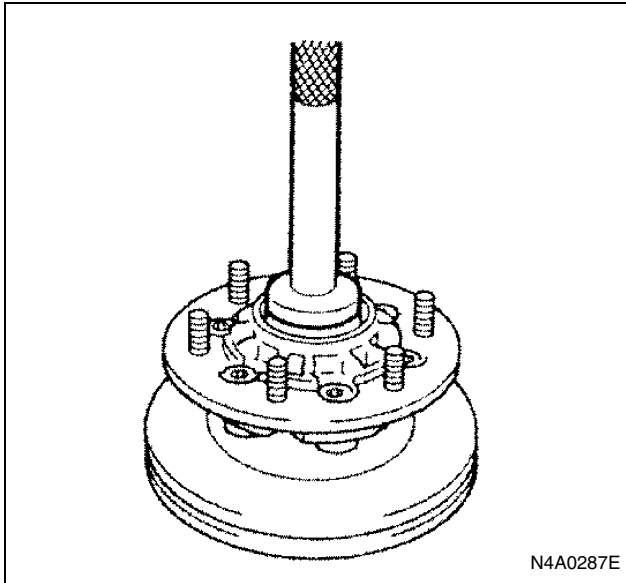


Legend

1. Bolt
2. Hub
3. Disc

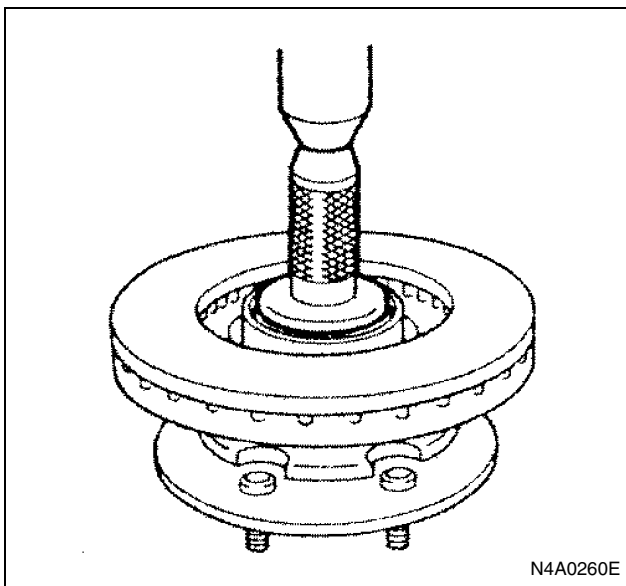
Be sure that the race is completely seated in the hub.

Outer Bearing Outer Race Installer: 5-8840-2026-0



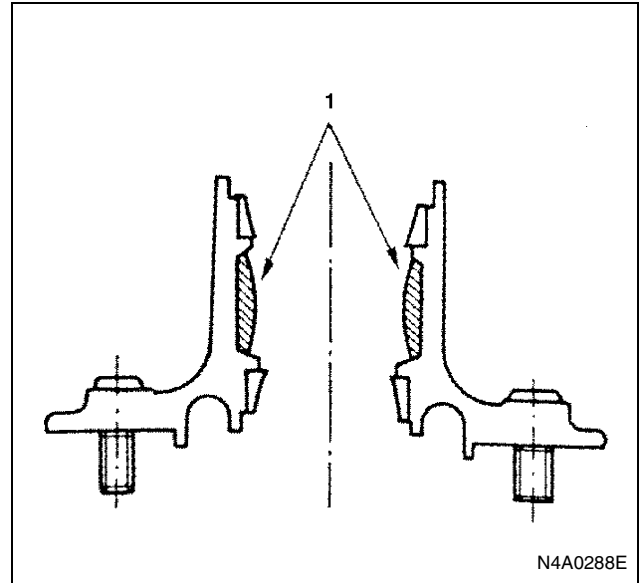
Be sure that the race is completely seated in the hub.

Inner Bearing Outer Race Installer: 5-8840-2235-0



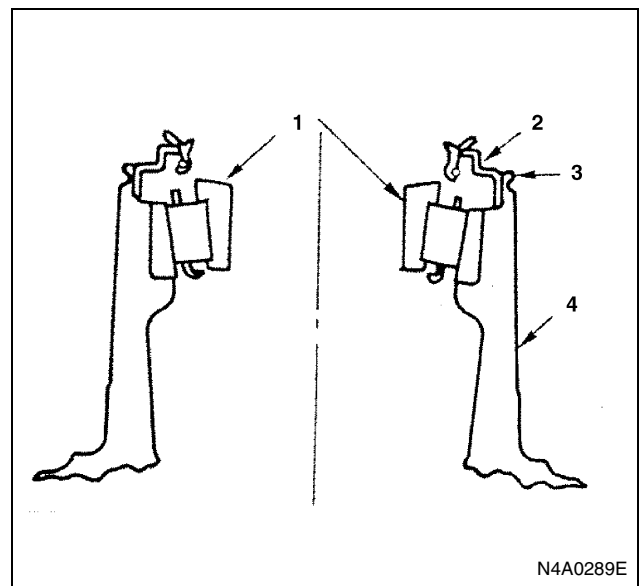
Apply the specified amount of the multipurpose type grease (1) to the hub cavity.

Grease amount: 96 g (3.4 oz)



5. Inner Bearing
Apply grease (multipurpose type) to the inner bearing.

6. Oil Seal
Use a hammer and installer to install the oil seal.
The oil seal surfaces must be flat.
Use a new oil seal.
Oil Seal Installer: 5-8840-2235-0

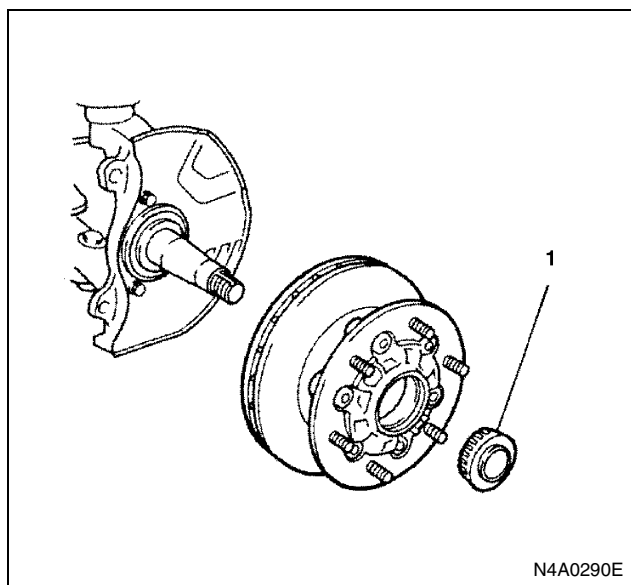


Legend

1. Inner bearing
 2. Oil seal
 3. Flat
 4. Hub
-
7. Outer Bearing
 8. Hub and Disc Assembly
 - 1) Install the hub and disc assembly to the knuckle.
 - 2) Apply grease (multipurpose type) to the outer bearing (1).

4C-26 FRONT AXLE

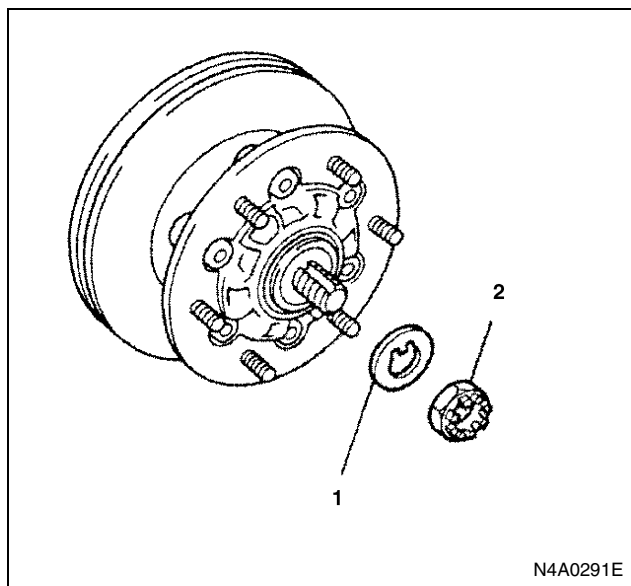
- 3) Install the bearing to the hub.



9. Thrust Washer

10. Hub Nut

- 1) Install the thrust washer (1) and hub nut (2).



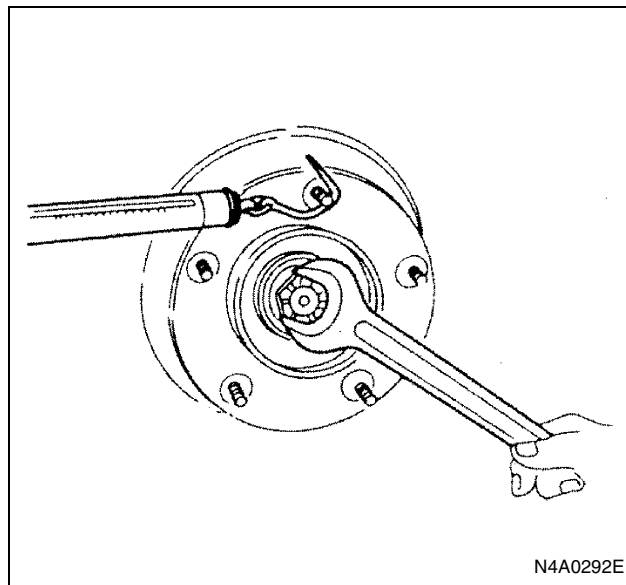
- 2) Tighten the nut until you are unable to manually rotate the hub and disc assembly.
- 3) Loosen the nut.
- 4) Attach a spring balancer to one wheel pin. Gradually retighten the nut until the hub and disc assembly bearing is adjusted to the specified preload.

Hub bearing preload,

NHR new bearing: 14 — 28 N (1.4 — 2.9 kg-m / 3 — 6 lb-ft)

NKR new bearing: 12 — 26 N (1.2 — 2.7 kg-m / 3 — 6 lb-ft)

NHR · NK R reused bearing: 7 — 22 N (0.7 — 2.2 kg-m / 2 — 5 lb-ft)



- 5) Align the nut slot with the knuckle cotter pin hole.

If necessary, slightly tighten the nut to align the slot and the hole.

- 6) Discard used cotter pin and install new cotter pin.

11. Hub Cap

- 1) Apply LOCTITE or liquid gasket to the engagement part with hub.

- 2) If severe deformation is found, replace with a new one.

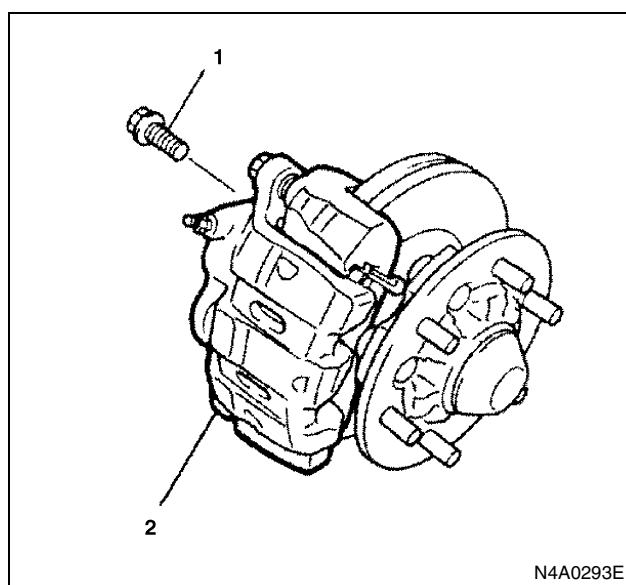
- 3) Apply the specified amount of the approved grease (Multipurpose type) to the hub cap.

Grease amount: 40 g (1.4 oz)

- 4) Install the disc brake caliper assembly to the knuckle.

Tighten:

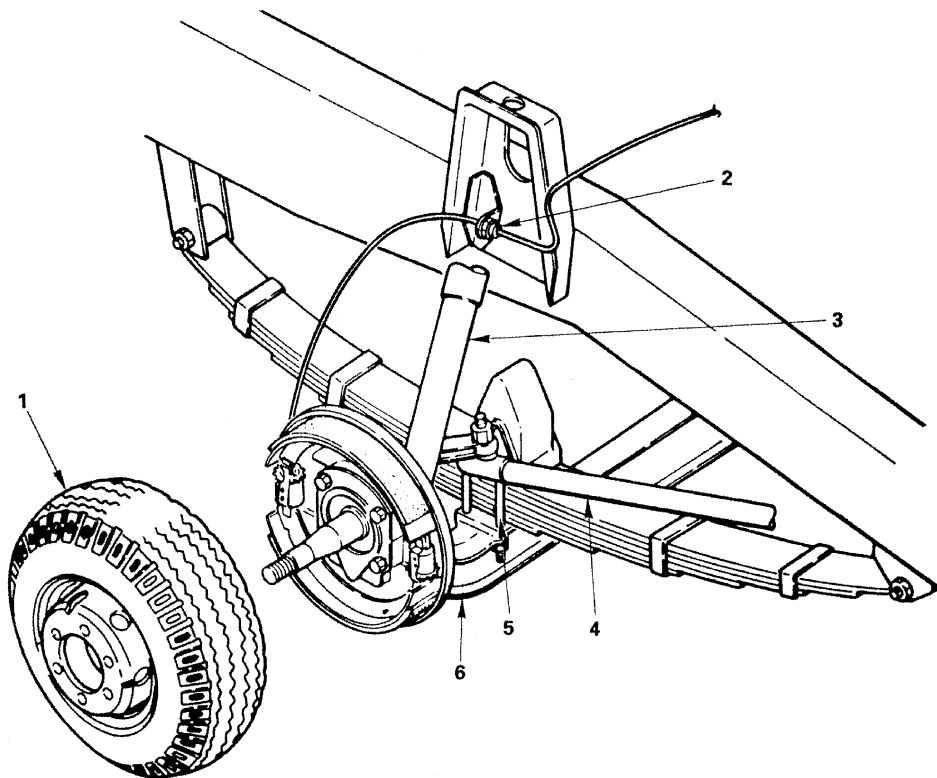
Disc brake caliper bolt to 219 N·m (22.3 kg-m / 161 lb-ft)



Legend

1. Bolt
2. Disc brake caliper assembly

12. Wheel and Tire

Front Axle Assembly (4 × 2 Model)

N4A0294E

Legend

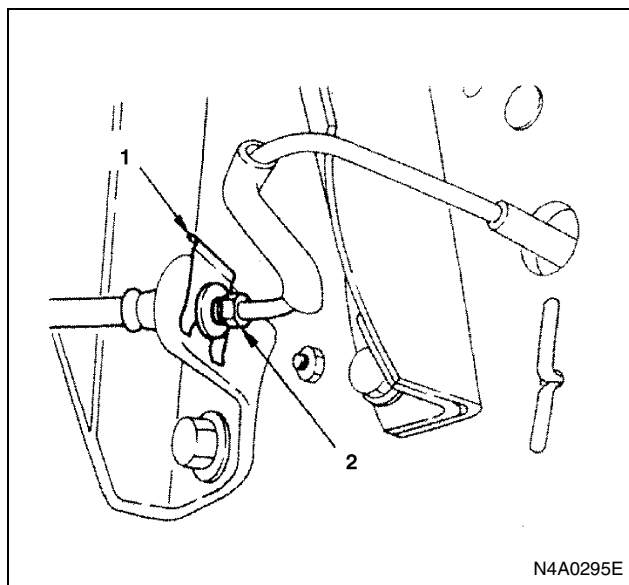
- | | |
|------------------------|------------------------|
| 1. Wheel and tire | 4. Drag link |
| 2. Brake flexible hose | 5. U-bolt |
| 3. Shock absorber | 6. Front axle assembly |

Removal

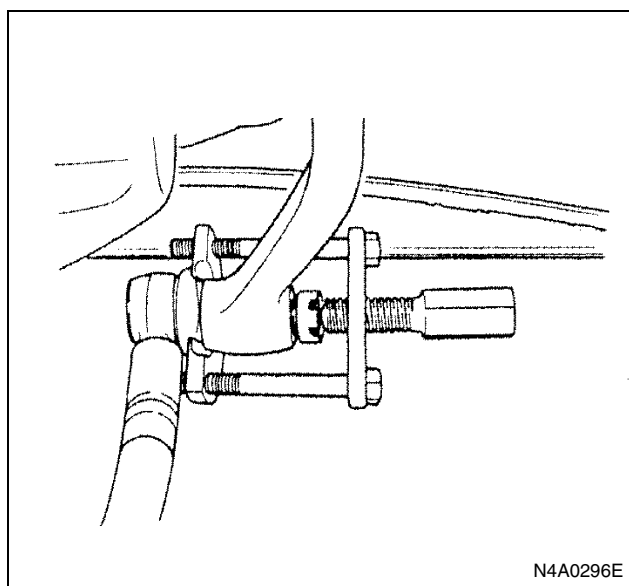
Preparation:

Jack up and support the vehicle on stands.

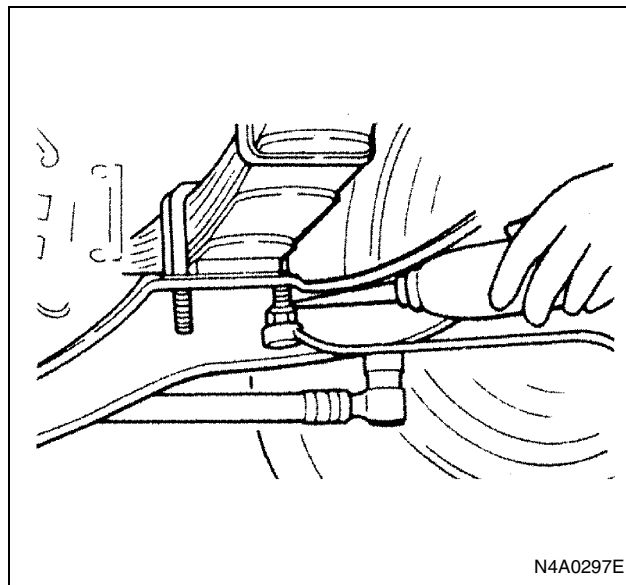
1. Wheel and Tire
2. Brake Flexible Hoses
Loosen the nut (2), then pry off a clip (1).



3. Shock Absorber
4. Drag Link
Disconnect the drag link, using a special tool.
Remover: 5-8840-2017-0



5. U-Bolt
Loosen the U-bolts after setting jack against the front axle. If the U-bolts are heavily rusted, apply a generous amount of oil to the threads before loosening them to prevent seizure.



6. Front Axle Assembly

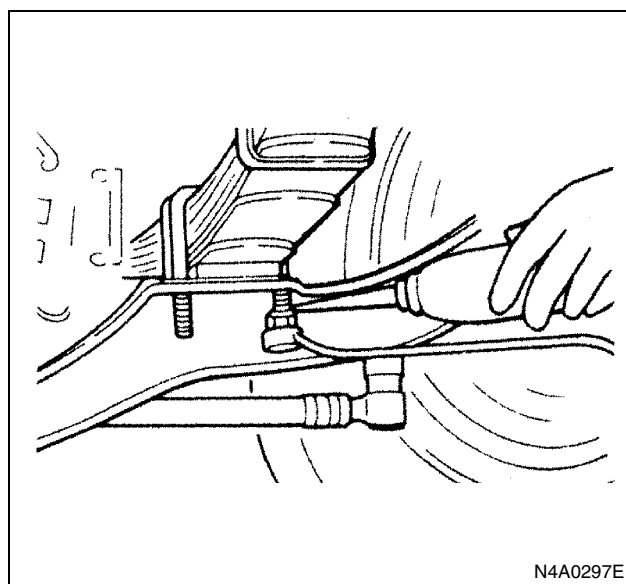
Installation

1. Front Axle Assembly
2. U-bolt and Nut
Position the U-bolts and helper rubber on the leaf spring assemblies and jack up the front axle. When tightening the nuts, apply oil as necessary to prevent damaging the threads.

Tighten:

U-bolt nut to

- NQR: 196 N·m (20 kg·m / 145 lb·ft)
- NHR, NKR, NPR: 127 N·m (13 kg·m / 94 lb·ft)



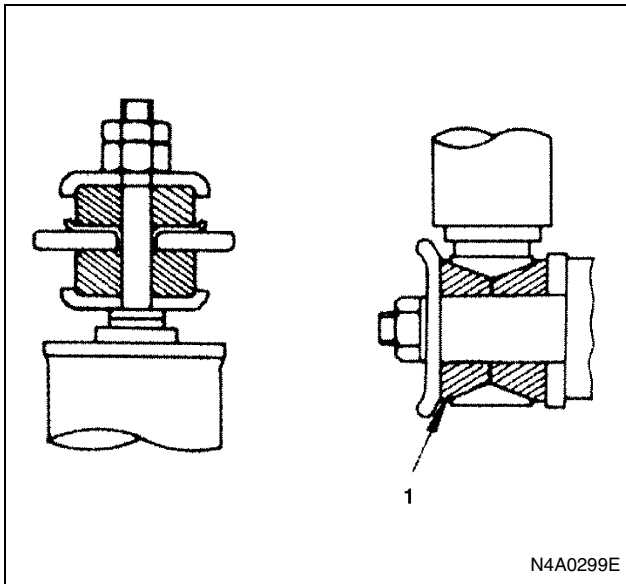
3. Drag Link
Tighten drag link nut to specified torque, with just enough additional torque to align cotter pin holes.
Install new cotter pin.

Tighten:

Drag link nut to 167 N·m (17 kg·m / 123 lb·ft)

4. Shock Absorber

Refer to illustration for installation of shock absorber, nut, washer and rubber bushing (1).



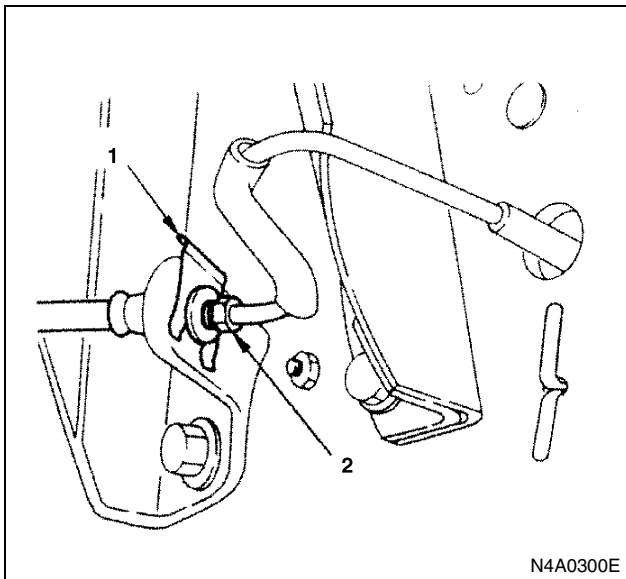
5. Brake Flexible Hose

Set first the wheels in the straight going position, then attach the flexible hose to the bracket without torsion using a (1).

Connect the pipe, then tighten the nut (2) to the specified torque.

Tighten:

Brake flexible hose to 16 N·m (1.6 kg·m / 12 lb·ft)



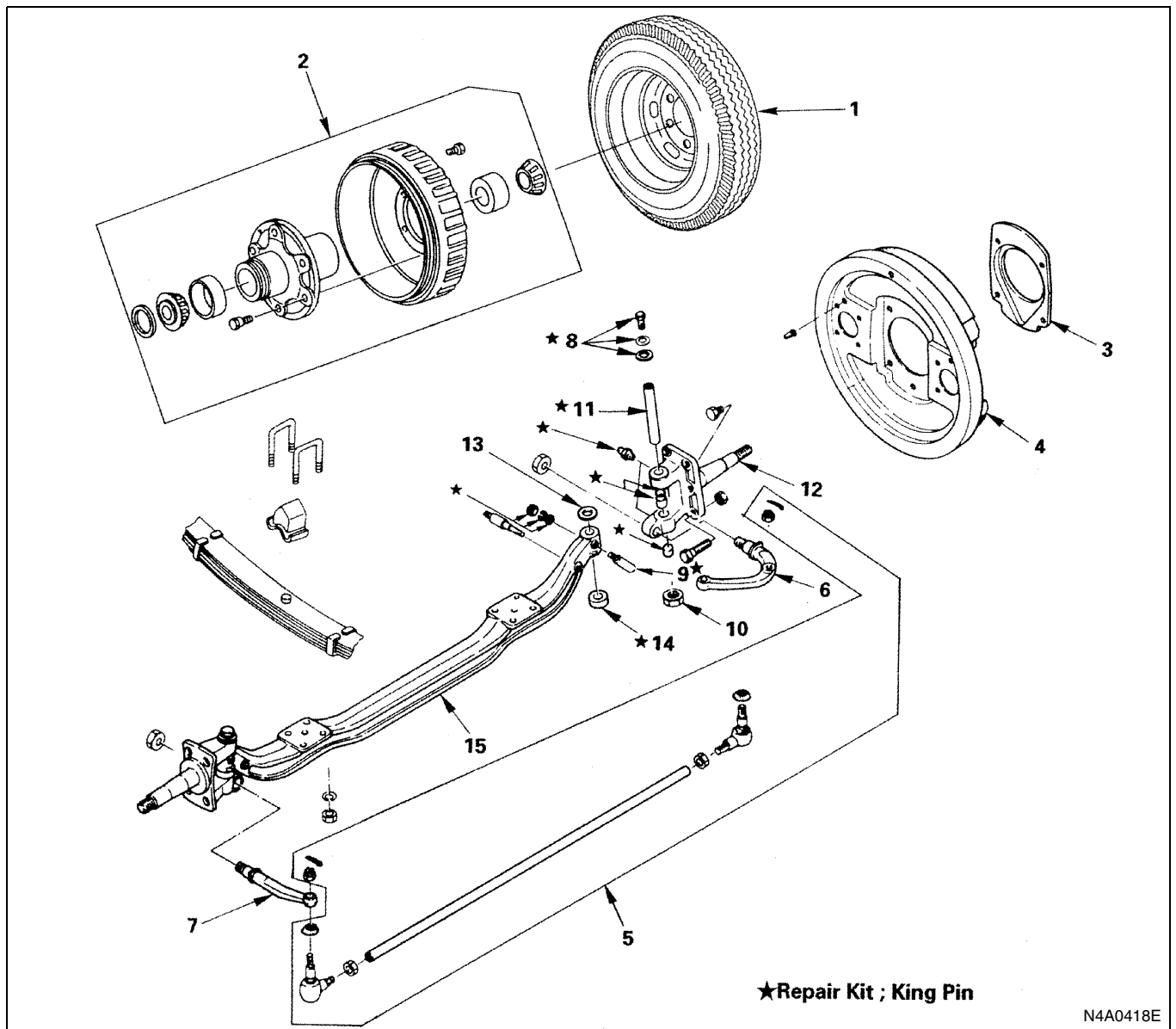
Perform bleeding operation after installation of the brake flexible hoses.

Refer to Section 5 "Service information" for brake fluid air bleeding procedure.

Also inspect wheel alignment after completion of front axle removal and installation.

6. Wheel and Tire

Knuckle and King Pin (4 × 2 Model)



N4A0418E

Legend

- | | |
|-------------------------|--------------------|
| 1. Wheel and tire | 9. Key bolt |
| 2. Hub with brake drum | 10. Plate plug |
| 3. Cover | 11. King pin |
| 4. Wheel brake assembly | 12. Knuckle |
| 5. Tie rod assembly | 13. Shim |
| 6. Knuckle arm | 14. Thrust bearing |
| 7. Tie rod arm | 15. I-beam |
| 8. King pin cover | |

Removal

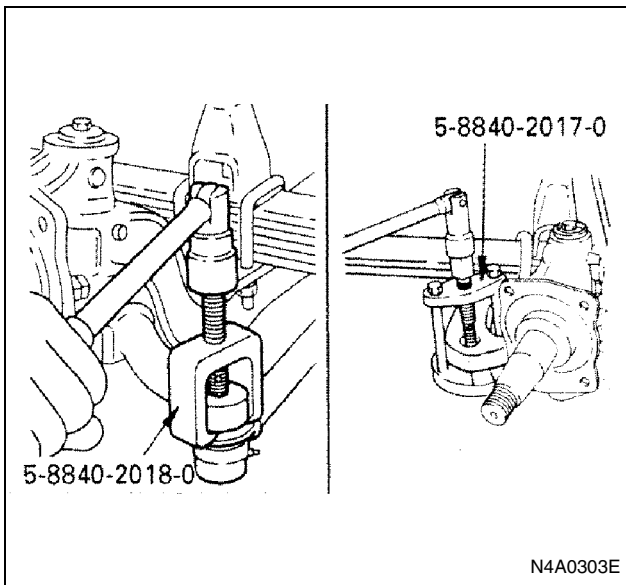
Preparation:

Jack up and support the vehicle on stands.

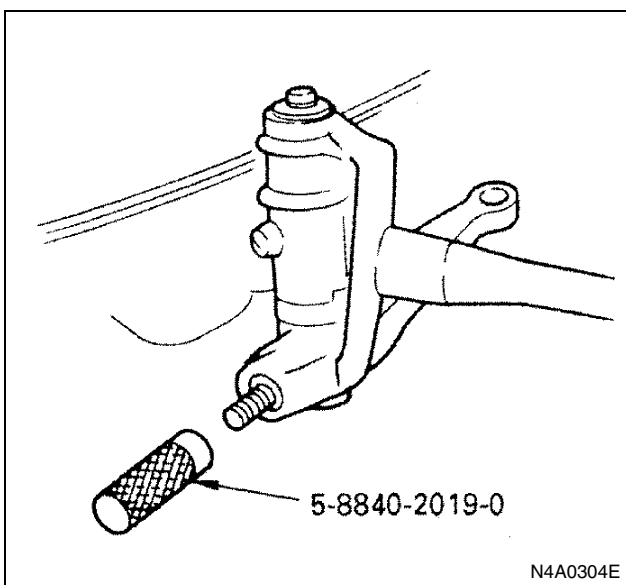
1. Wheel and Tire
2. Hub with Brake Drum
3. Cover
4. Wheel Brake Assembly
5. Tie Rod Assembly Remover

Driver Side: 5-8840-2017-0

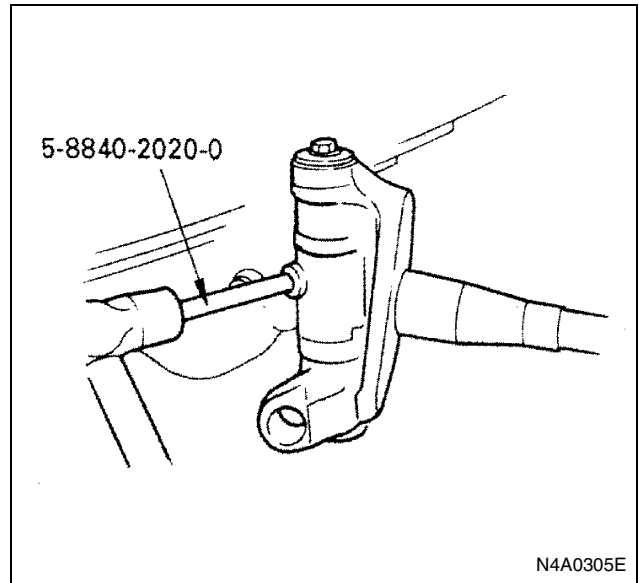
Assistant Side: 5-8840-2018-0



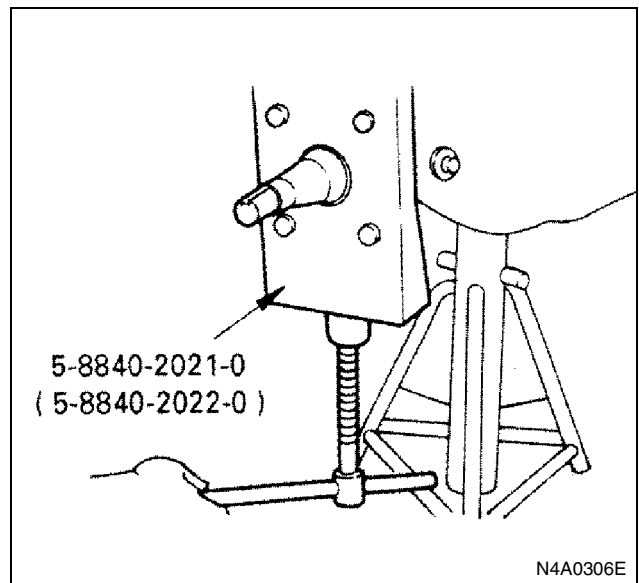
6. Knuckle Arm
 7. Tie Rod Arm Remover: 5-8840-2019-0
- Drive out with a heavy hammer.



8. King Pin Cover
9. Key Bolt Remover: 5-8840-2020-0



10. Plate Plug
11. King Pin Remover: NHR 5-8840-2021-0, NKR, NPR 5-8840-2022-0, NQR 5-8840-2022-0



12. Knuckle
13. Shim
14. Thrust Bearing
15. I-Beam

Inspection and Repair

Make the necessary adjustments, repairs, and part replacements if excessive wear or damage is discovered during inspection.

Visual Check

Inspect the following parts for wear, damage or other abnormal conditions.

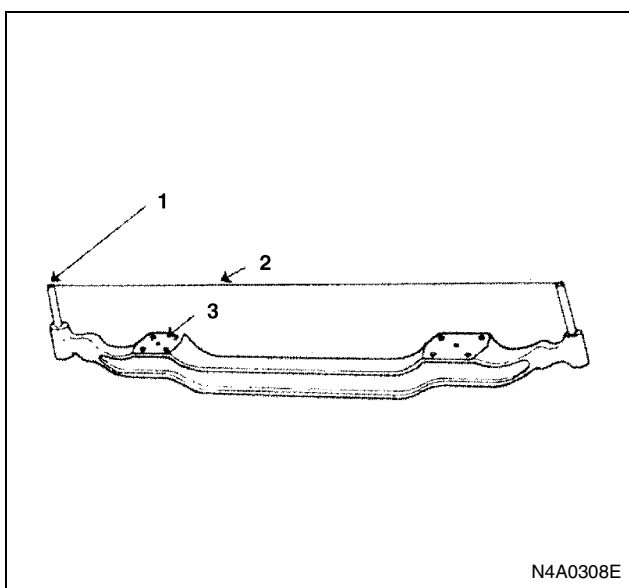
- I-beam
- Knuckle

4C-32 FRONT AXLE

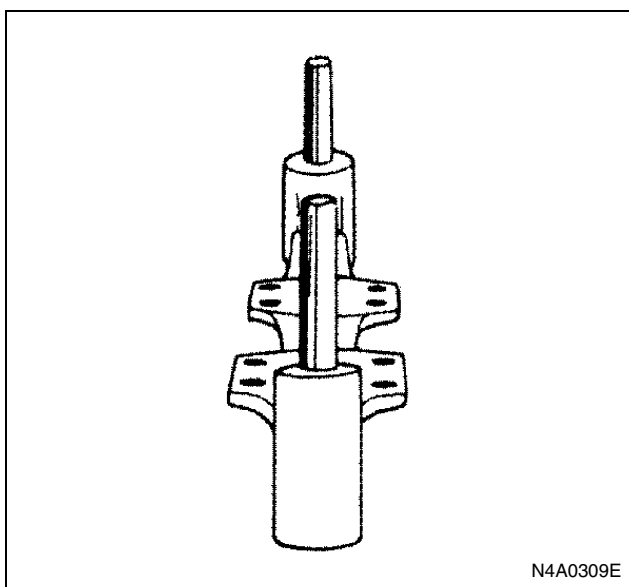
- Knuckle arm, tie rod arm
- Tie rod, tie rod end
- King pin, bushing, thrust bearing and shims
- Joint ball
- Front hub, bearing and oil seal
- Brake drum
- Brake shoe, lining etc.

I-Beam (when removed from the vehicle)

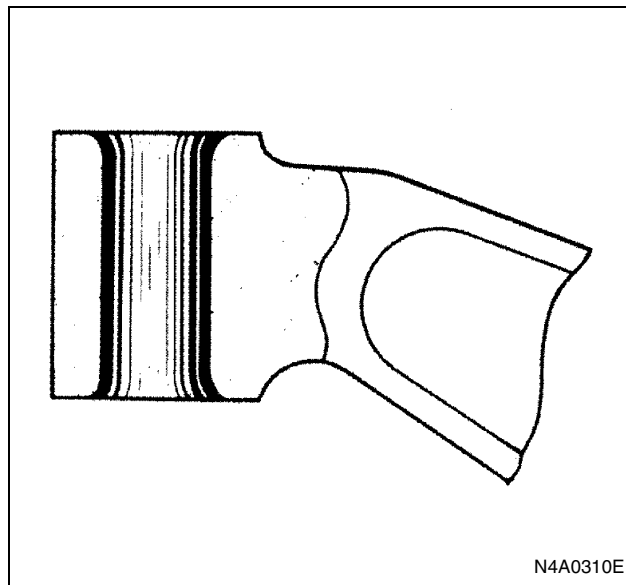
1. Fit the king pin or test bar (1) into the king pin hole.
2. Stretch a cord (2) across the centers of king pin or test bars.
3. Check to see if the cord is in line with the centers of the center bolt holes (3) in the spring seat when looked down from above the cord.



4. Also check to see if the king pins or test bar are in good parallel alignment as viewed from the side.

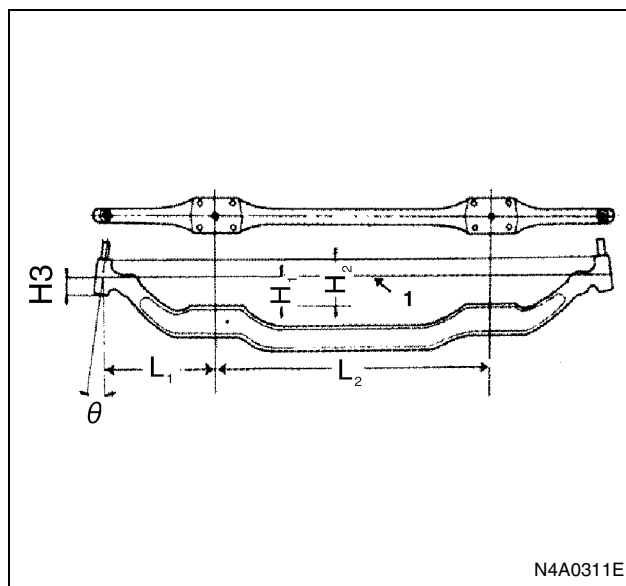


5. Check to see if the king pin holes is worn.



6. Stretch a cord (1) and check the following dimensions.

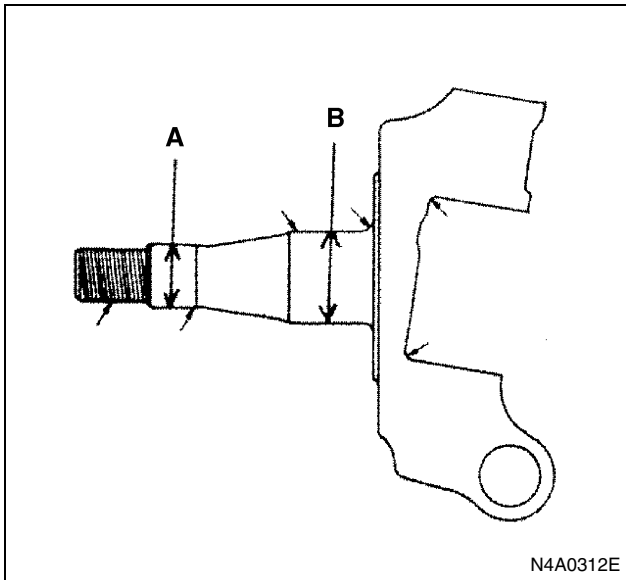
'05 model					mm (in)	
	θ	H1	H2	H3	L1	L2
NHR	12°	97 (3.8)	135.3 (5.3)	25.2 (0.99)	260 (10.2)	690 (27.2)
NKR		97 (3.8)	134.4 (5.3)		260 (10.2)	690 (27.2)
NPR		83 (3.3)	120.4 (4.7)		315 (12.4)	860 (33.9)
NQR		83 (3.3)	120.4 (4.7)		315 (12.4)	860 (33.9)



Cracks in Knuckles

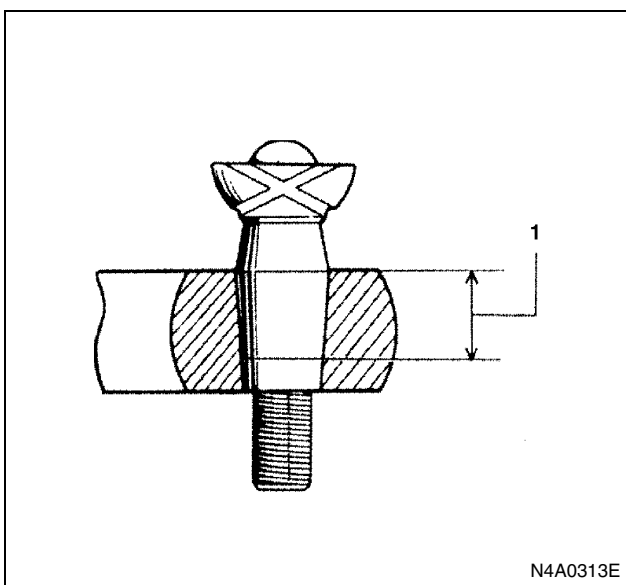
Check the knuckles for cracks or damage paying a particular attention to the areas indicated by arrows. Use a magnetic flaw detector or red check.

- NHR
A: 30 mm (1.19 in)
B: 40 mm (1.57 in)
- NKR, NPR, NQR
A: 35 mm (1.38 in)
B: 50 mm (1.97 in)



Knuckle Arm and Tie Rod Arm

Check tapered portion of the knuckle arms and tie-rod arms for abnormal contact in the following manner.:
Apply a thin coat of red check evenly to the tapered portion of the shaft and insert the shaft into the tapered hole. Remove the shaft and check impression of contact obtained on the shaft.
Correction or parts replacement is necessary if the contact is uneven or if contact area is smaller than 3/4 of the entire length of the shaft.

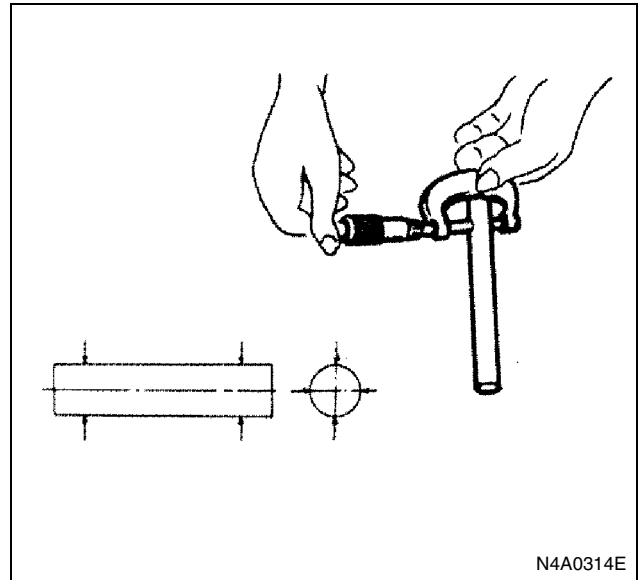


Legend

1. Contact are is longer than 3/4 of the entire length of the shaft.

King Pin Diameter

- NHR
A: 25.0 mm (0.984 in)
B: 24.9 mm (0.980 in)
- NKR, NPR, NQR
A: 30.0 mm (1.181 in)
B: 29.9 mm (1.177 in)



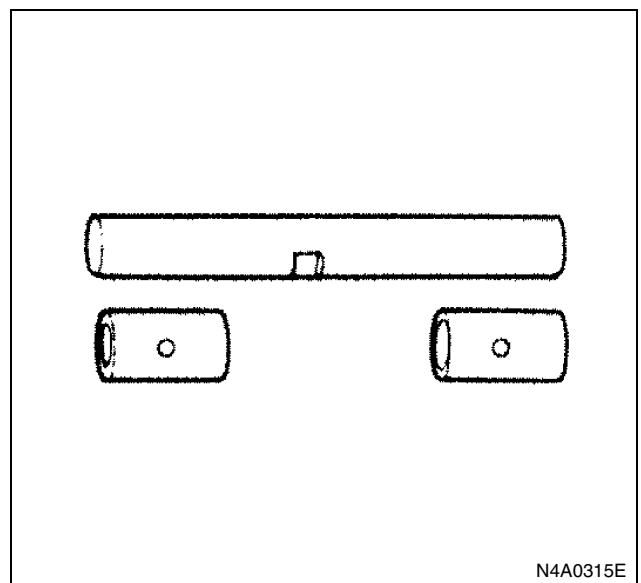
Clearance between King Pin and Bushing

Standard: 0.06 mm (0.0024 in)

Limit: 0.15 mm (0.0059 in)

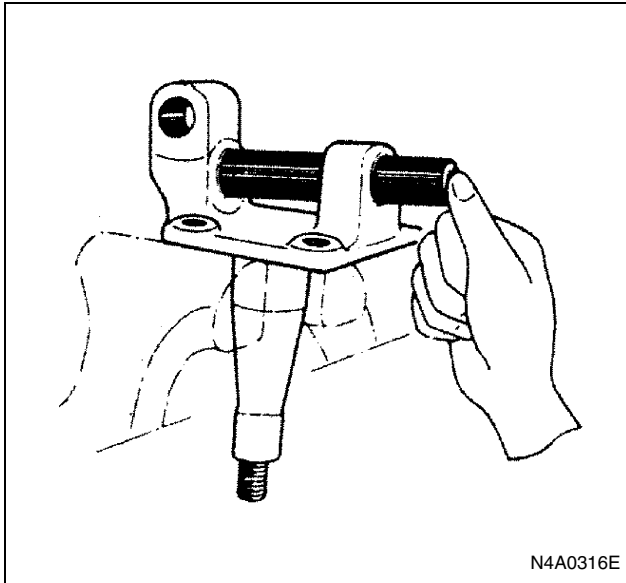
Notice:

Install the king pin bushing by aligning its grease hole with grease fitting hole in the knuckle.

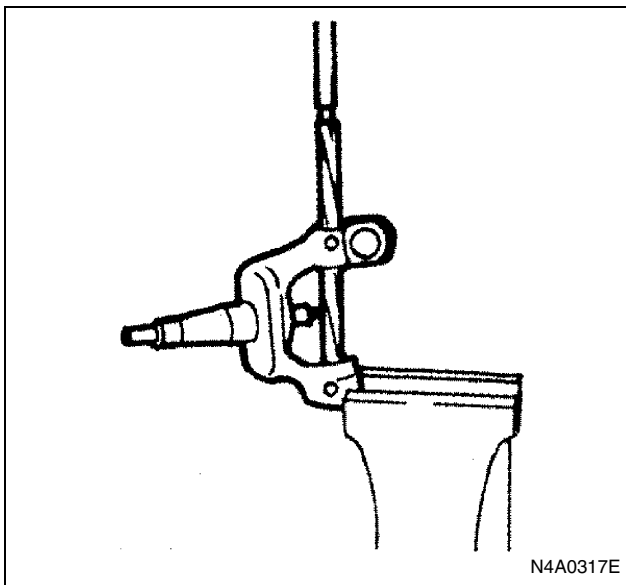


Fit of king pin into the king pin bushing can be checked in the following manner.

Clamp the knuckle with king pin bushings in a vise and insert the king pin into the bushings. Check for radial play by moving the king pin in direction at a right angle to its axis, then move the king pin endwise with finger.

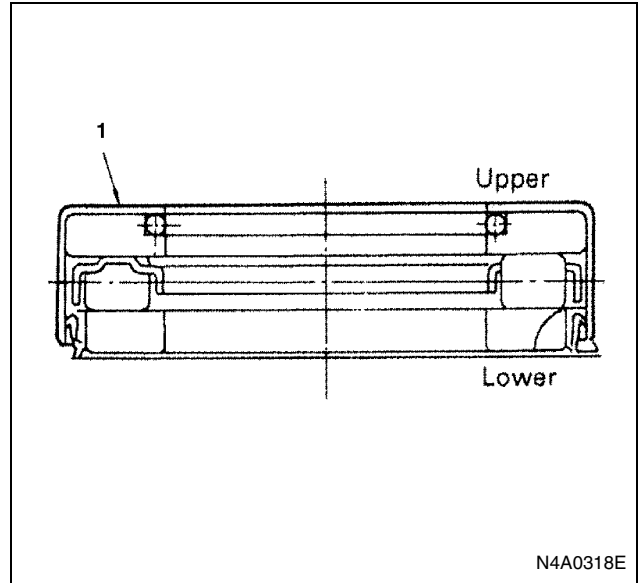


If fitting of king pin into the bushing is too tight, carefully cut inner face of the bushing with a reamer, so that upper and lower holes in the knuckle are well centered.



Installation

1. I-Beam
2. Knuckle
3. Thrust Bearing
 - 1) Apply grease.
 - 2) Turn the bearing case-side upward.



Legend

1. Case

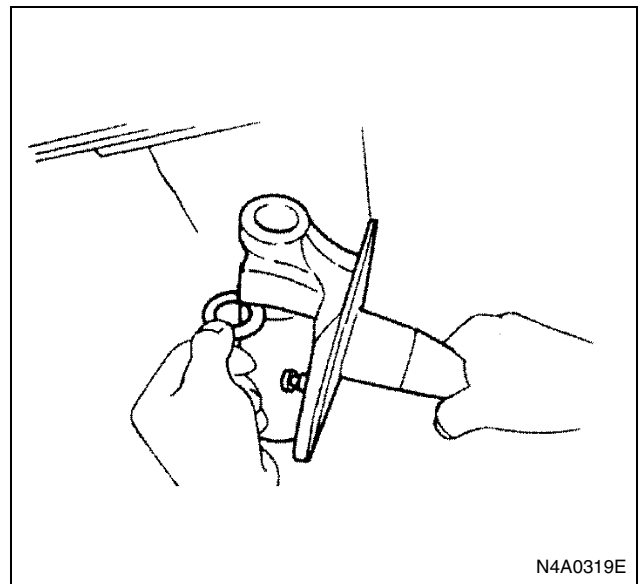
4. Shim

Check the clearance between the knuckle and front axle.

Standard: 0 — 0.10 mm (0 — 0.004 in)

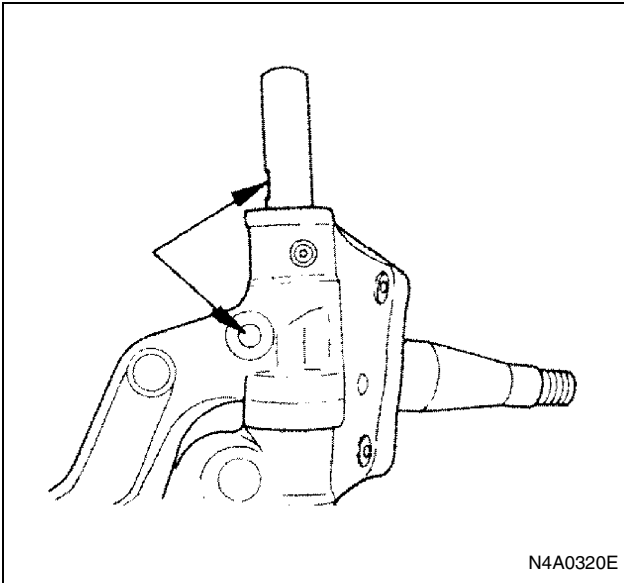
Limit: 0.20 mm (0.0079 in)

Shim available thickness, 0.50, 0.55, 0.60, 0.65, 0.70, 0.80, 0.90 mm (0.019, 0.022, 0.024, 0.026, 0.028, 0.031, 0.035 in)



5. King Pin

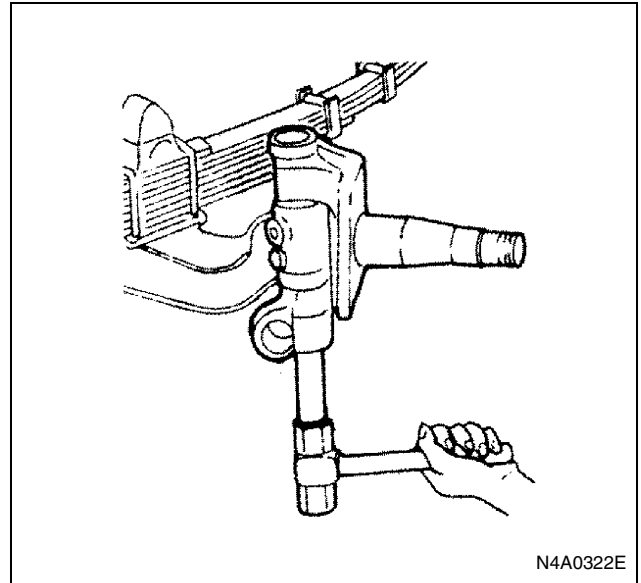
- 1) Apply grease.
- 2) Align the key groove with the key bolt hole in the front axle.
- 3) After installing the king pin, check that the knuckle turns smoothly.



6. Key Bolt

Tighten:

Key bolt to 32 N·m (3.3 kg·m / 24 lb·ft)



9. Tie Rod Arm

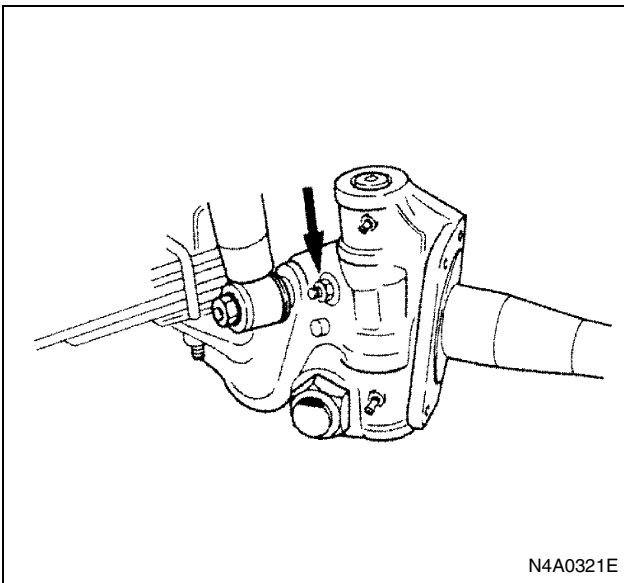
10. Knuckle Arm

Tighten:

Knuckle arm nut to 441 N·m (45 kg·m / 325 lb·ft)

After tightening, stake nut.

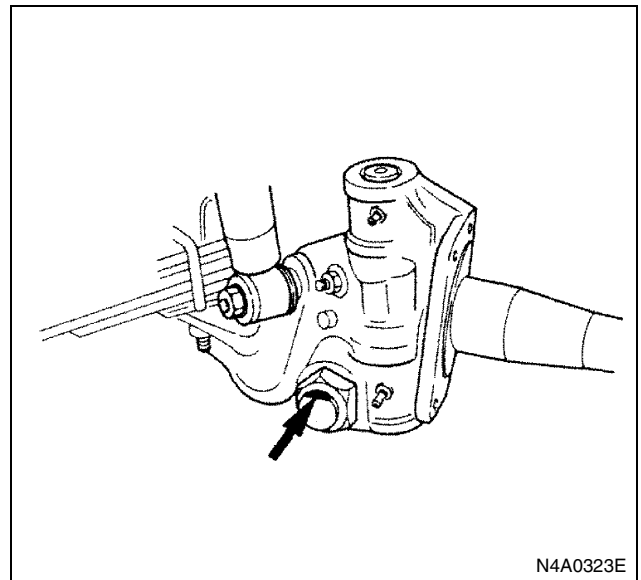
Use a new nut.



7. King Pin Cover

8. Plate Plug

Drive the plate plug upward into position with an appropriate bar fitted against the lower end.



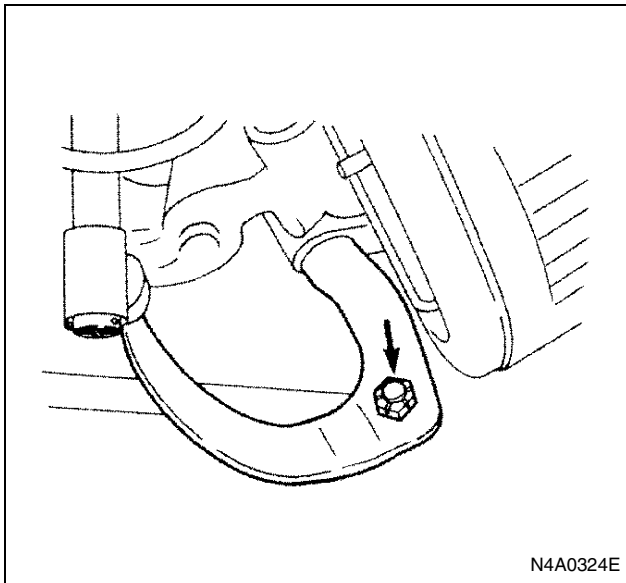
11. Tie Rod Assembly

Use a new nut.

Tighten:

Tie rod end nut to 186 N·m (19 kg·m / 137 lb·ft)

Be sure to install a new cotter pin. If the hole and the slot are not aligned, turn in the direction of tightening to align them.

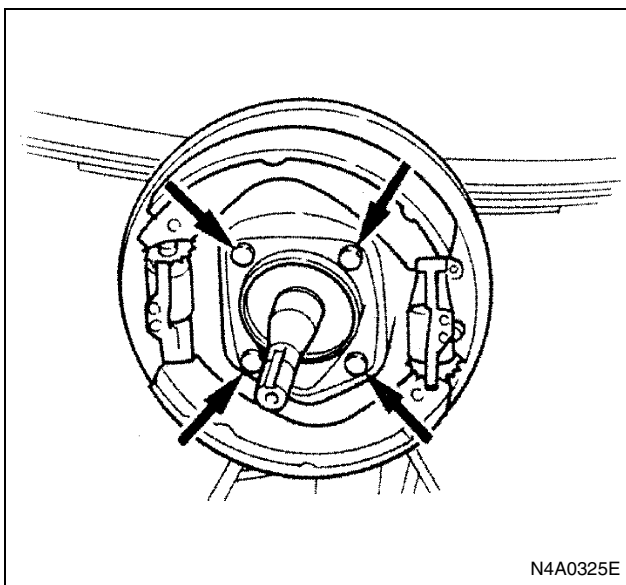


12. Wheel Brake Assembly

13. Cover

Tighten:

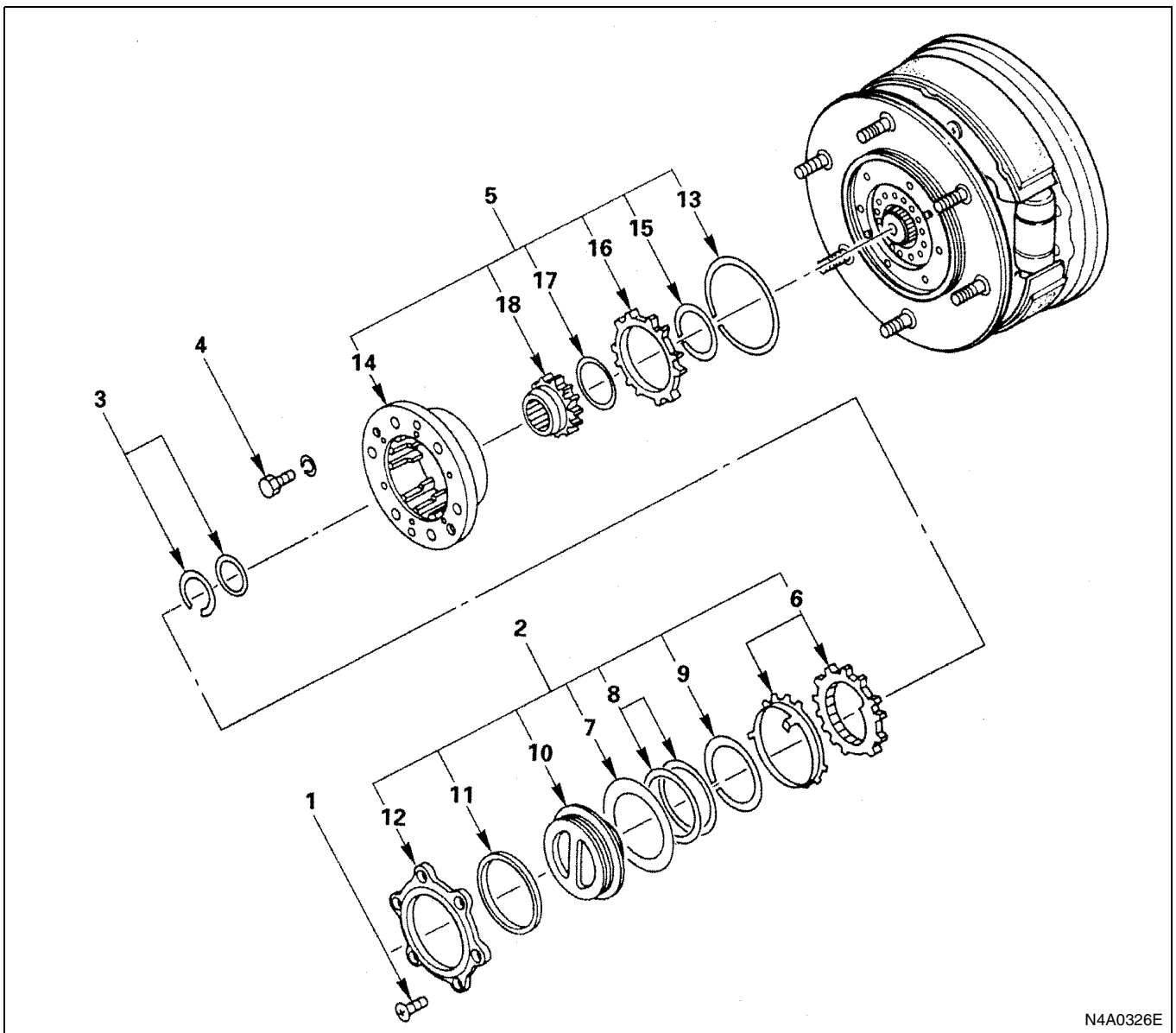
Wheel brake bolt to 69 N·m (7 kg·m / 51 lb·ft)



14. Hub with Brake Drum

15. Wheel and Tire

Free Wheel Hub (Manual Locking Hub) (4 × 4 Model)



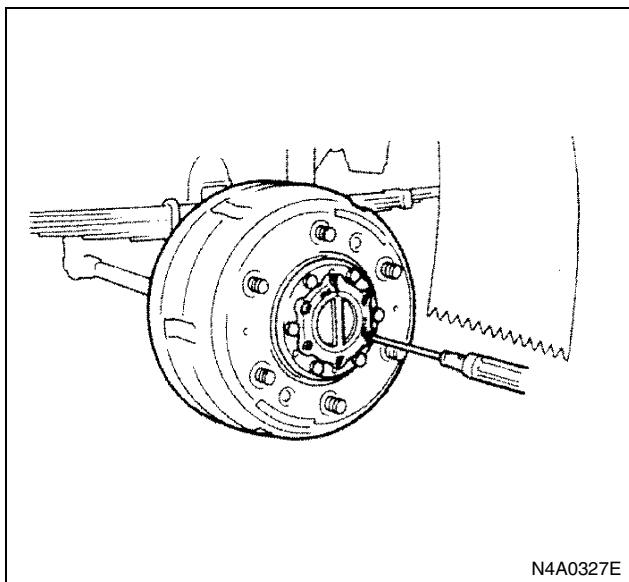
N4A0326E

Legend

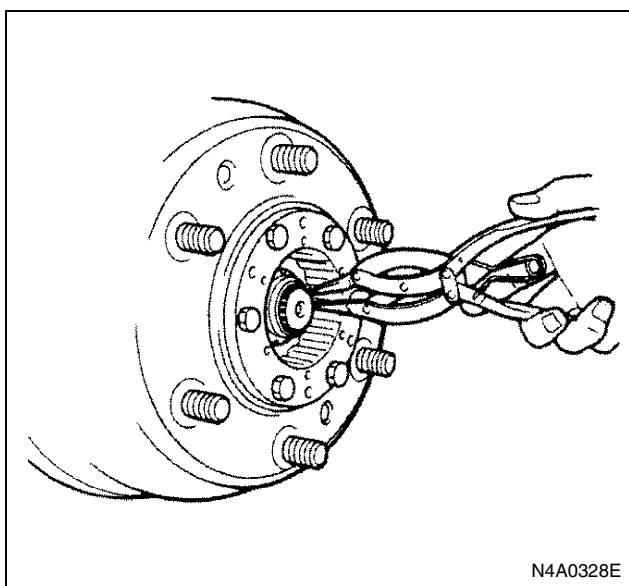
- | | |
|-----------------------|---------------------|
| 1. Screw | 10. Handle |
| 2. Cover assembly | 11. Ring |
| 3. Snap ring and shim | 12. Cover |
| 4. Bolt | 13. Inner snap ring |
| 5. Body assembly | 14. Body |
| 6. Clutch assembly | 15. Outer snap ring |
| 7. Inner snap ring | 16. Ring |
| 8. Tension spring | 17. Spacer |
| 9. Inner snap ring | 18. Inner hub lock |

Removal

1. Screw
2. Cover Assembly
Set handle into "FREE" position and then remove cover assembly.
(During removal, take care not to damage the flange on rear side of cover. Remove wheel (tire) as necessary.)

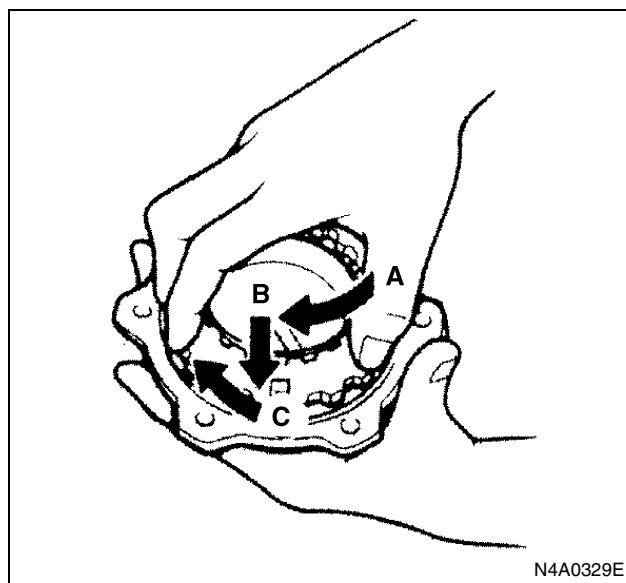


3. Snap Ring and Shim
Confirm the quantity of shims.

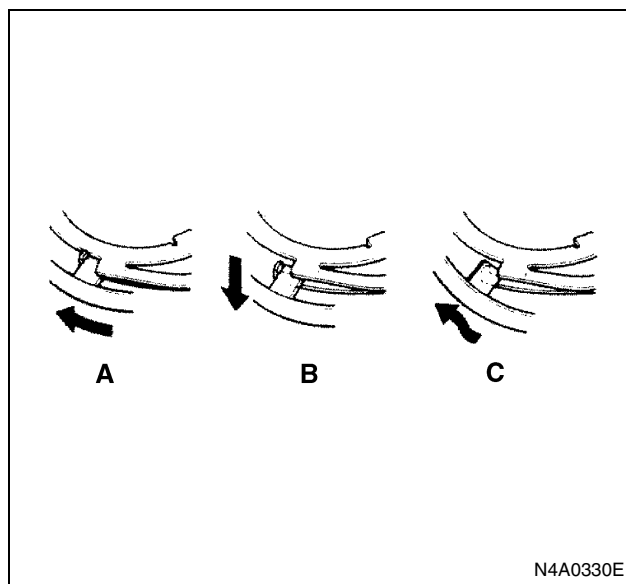


4. Bolt
5. Body Assembly
Remove the body assembly using a push bolt (M10 × 1.5).
During removal, do not damage the flange of body by hitting with a screwdriver or the like.
6. Clutch Assembly
 - 1) With the handle in FREE position, hold the cover and rotate fully the clutch assembly clockwise as shown (A).

At this time, the lug of clutch retainer gets stuck by the L-shaped part at the edge of tension spring (0 it is pinched by double parts of tension spring).

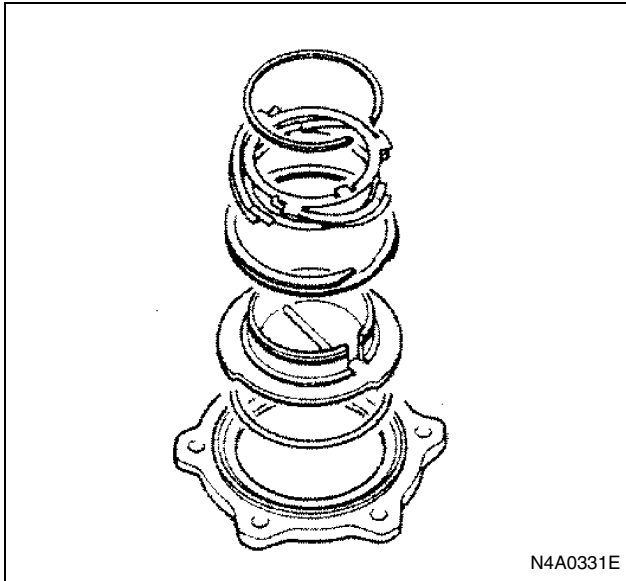


- 2) Under the condition of 1) above, rotate further the clutch assembly clockwise while pushing it (B).
Consequently, the clutch retainer lug is freed from the L-shaped part at the edge of tension spring (C).
Do not try to further disassemble the clutch assembly.

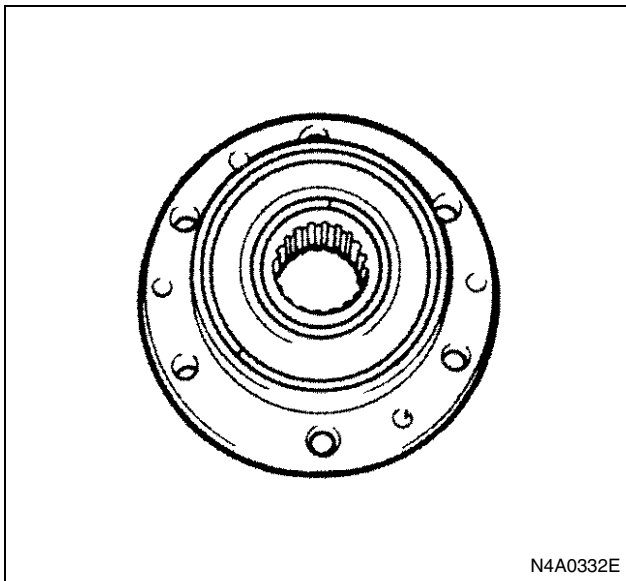


7. Inner Snap Ring
8. Tension Spring
Remove the snap ring and then remove the tension spring from the cover.
9. Inner Snap Ring
10. Handle
Remove the inner snap ring and then remove the handle from the cover.

11. Ring
Remove the ring from the handle.
12. Cover



13. Inner Snap Ring



14. Body
Remove the inner snap ring from the back of body.
15. Outer Snap Ring
16. Ring
Remove the outer snap ring that joints inner and ring, so that they are separated.
17. Spacer
18. Inner Hub Lock

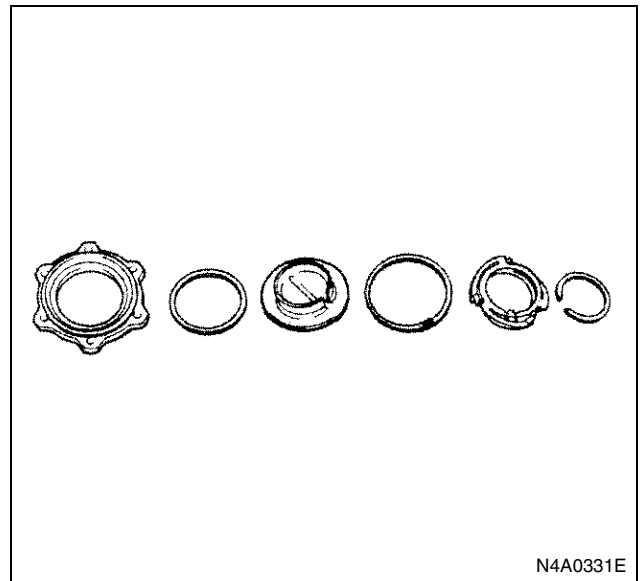
Inspection and Repair

Make the necessary adjustments, repairs, and part replacements if excessive wear or damage is discovered during inspection.

Cover Assembly

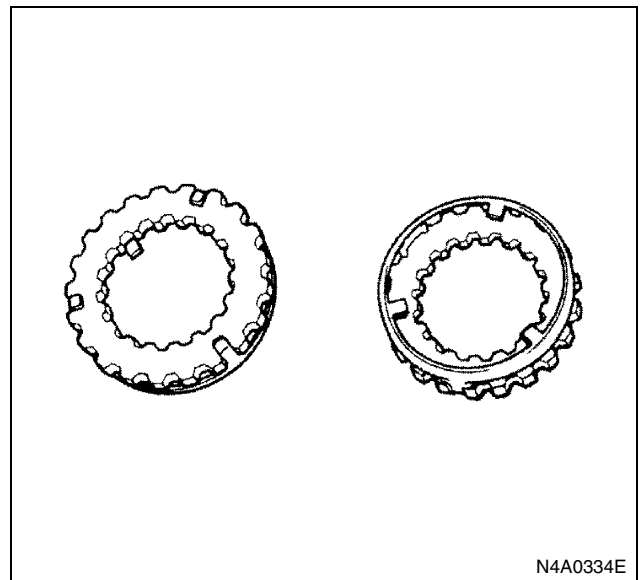
1. Inspect the cover and handle for presence of crack or damage particularly in a sliding part.

2. Inspect the inner snap ring of cover for local wear in the mounting groove.
3. Inspect the tension spring for wear, damage or break.



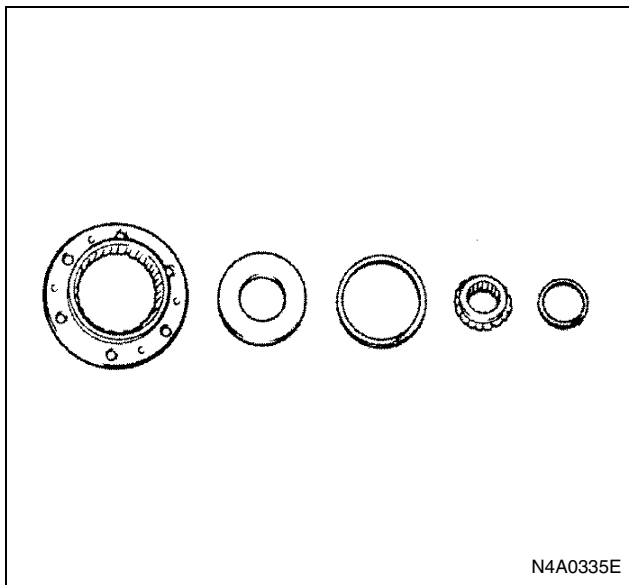
Clutch Assembly

1. Inspect the retainer of clutch assembly for play in the calked parts (3 places).
Re-calk if the axial play exceeds 0.1 mm.
2. Inspect the clutch teeth for crack, wear or damage, and also the retainer lug for break or wear. Replace the assembly if clutch or retainer is defective.



Body Assembly

1. Inspect the body, ring, inner snap ring, outer snap ring and inner hub lock for crack, wear or damage particularly in the teeth.
2. Inspect the inner snap ring mounting groove of the hub lock body and the outer snap ring mounting groove of the hub lock inner for an uneven wear.



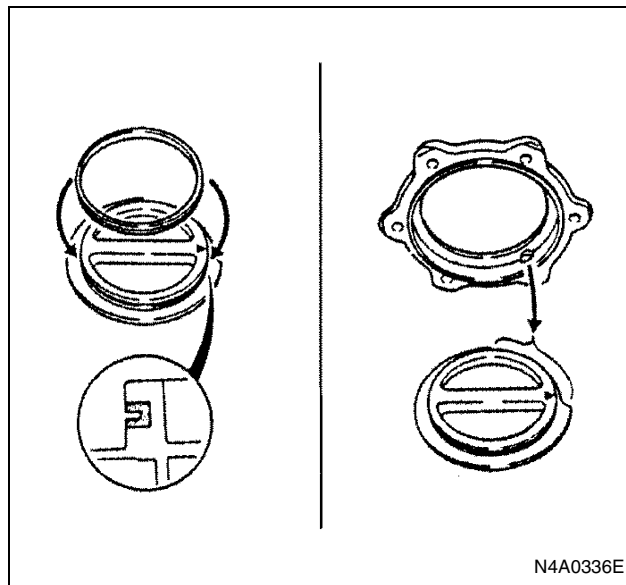
Installation

1. Inner Hub Lock
2. Spacer
3. Ring
4. Outer Snap Ring

Apply grease (Multipurpose type) to each part of inner hub lock and install it to the hub lock ring (flange should face rear side), then fix it with outer snap ring.
5. Body
6. Inner Snap Ring
 - 1) Install the inner hub lock to hub lock ring, then to the body, and fix them with inner snap ring.
 - 2) Make sure that the inner hub lock and outer snap rings are installed properly.
7. Cover
8. Ring

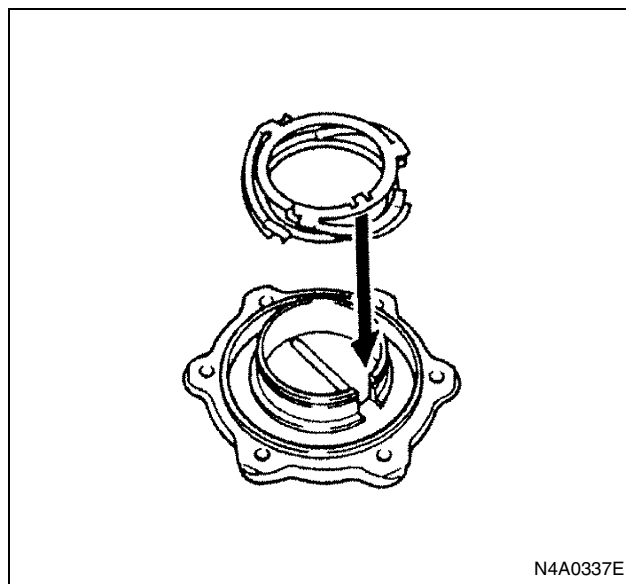
Apply grease (Multipurpose type) to the ring and install the ring to the handle.

Make sure that the ring is free from torsion.
9. Handle
10. Inner Snap Ring
 - 1) Install the handle to the cover, and fix with inner snap ring.



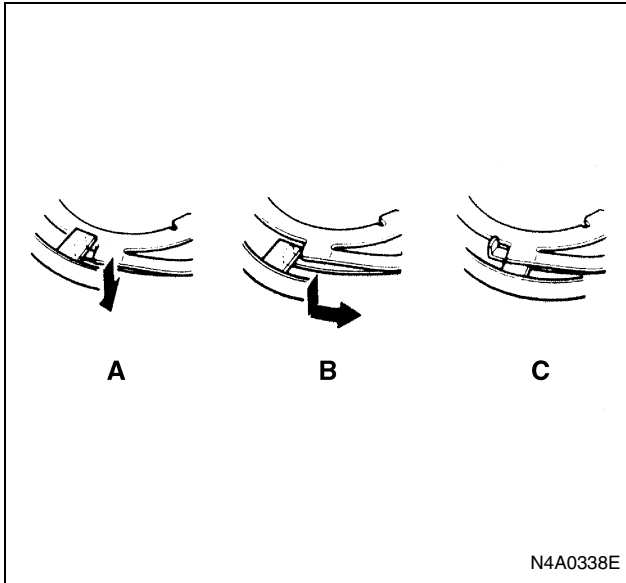
- 2) Make sure that the inner snap ring is installed properly.
11. Tension Spring
 - 1) Apply grease (Multipurpose type) to the tension spring.
 - 2) Insert the tension spring into the cover assembly with the nail of spring engaged with the groove.

There is no discrimination such as face or back in the tension spring.



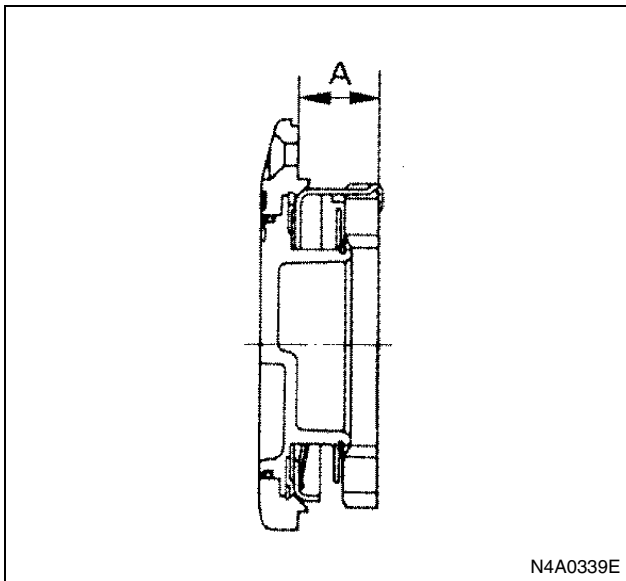
12. Inner Snap Ring

Fix the tension spring with inner snap ring.
13. Clutch Assembly
 - 1) With the retainer lugs met with L-shaped parts (3 places) at the edge of tension spring (A), push and rotate spirally the retainer (B) so that it is pinched by springs (C).



- 2) The clutch must be in retract status when the handle is set in FREE position.
- 3) Install the clutch assembly to the cover, and measure the dimension "A" to confirm that it satisfies the standard.

FREE status: 22.4 — 23.7 mm (0.88 — 0.93 in)
 LOCK status: 32.6 — 33.9 mm (1.28 — 1.33 in)



14. Body Assembly
 - 1) Apply grease (Multipurpose type) to the teeth of hub lock body assembly.
 - 2) Apply adhesive (LOCTITE 515 or equivalent) to the flange surface of the body assembly.
15. Bolt

Apply adhesive (LOCTITE 242 or equivalent) to the threads of body assembly fixing bolts, and tighten them to the specified torque.

Tighten:

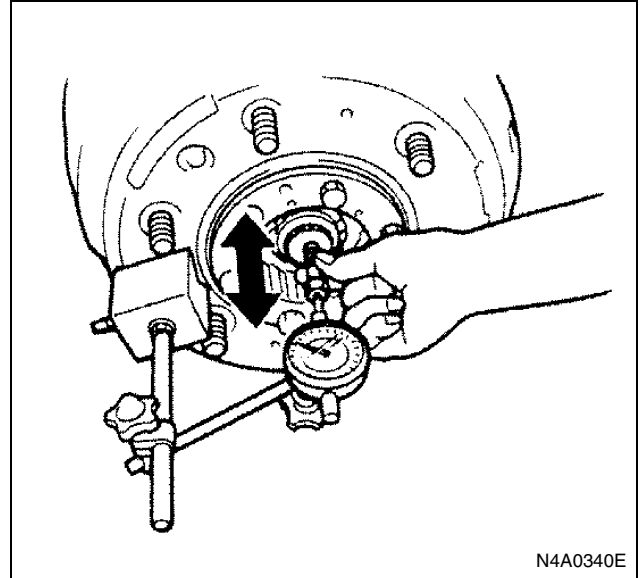
Body assembly bolt to 98 N·m (10 kg·m / 72 lb·ft)

Measurement of axial play of front drive shaft

After installation of body assembly, measure axial play of front drive shaft. If it is out of the standard range, adjust with shims listed below.

Standard play: 0 — 0.5 mm (0 — 0.020 in)

Kind of shims, 1.0, 0.5, 0.3 mm (0.039, 0.020, 0.012 in)



16. Snap Ring and Shim

Install the snap ring properly.
17. Cover Assembly

Apply adhesive (Three Bond 1215 or equivalent) to the flange surface of the cover assembly.
18. Screw

With the handle in FREE position (clutch is disengaged), adjust three grooves of body and tighten the screws to the specified torque after applying adhesive (LOCTITE 242 or equivalent) to the threads.

Tighten:

Screws to 6 N·m (0.6 kg·m / 52 lb·ft)

<Inspection of free wheel hub locking operation>

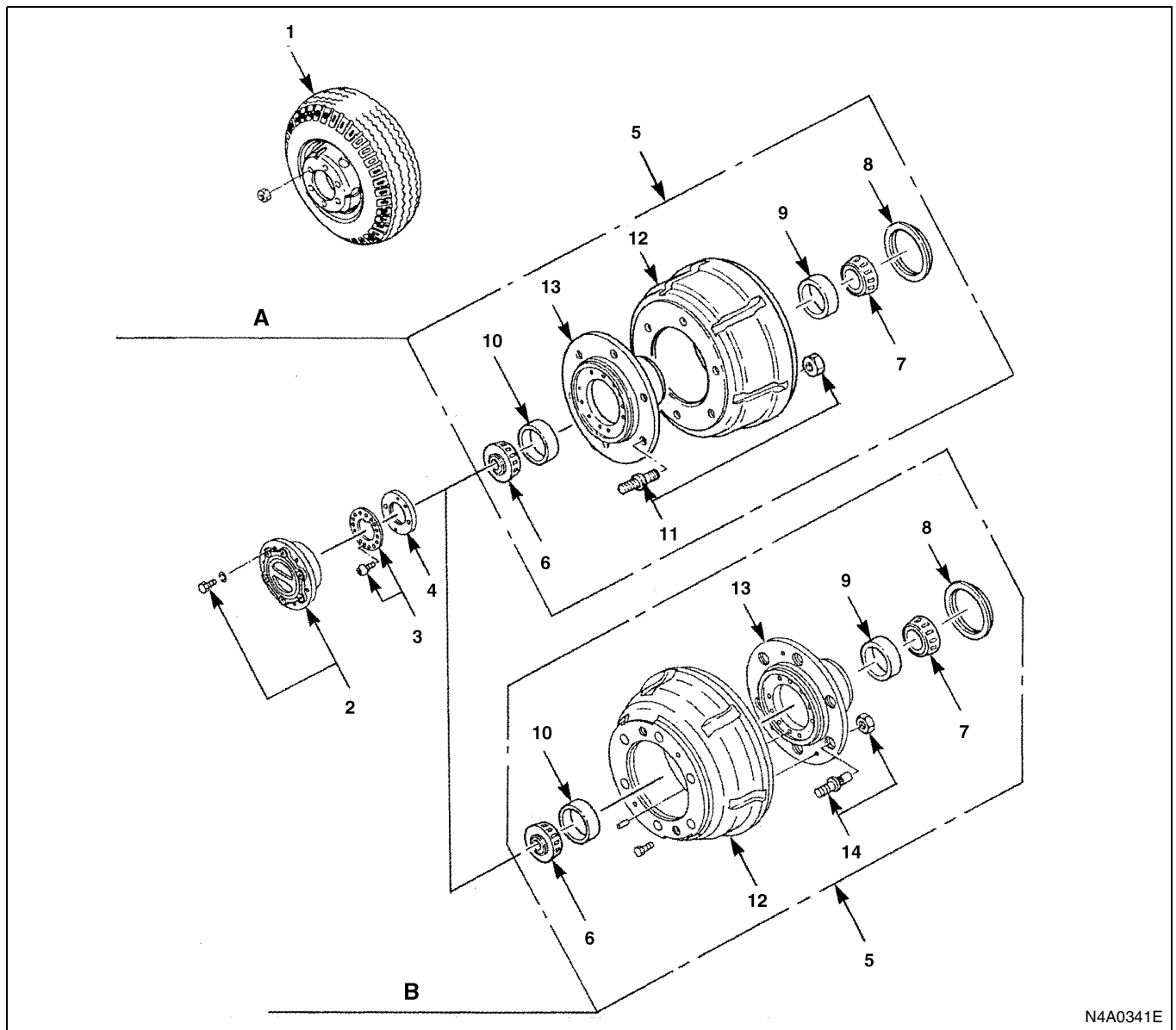
1. With the handle in FREE position, rotate the front drive shaft. Normal if no load is applied.
2. With the handle in LOCK position, rotate the front drive shaft. Normal if load is applied.
 - Reference value

Load of front drive shaft: 3 N·m (0.3 kg·m / 26 lb·ft)
3. Return the handle from LOCK to FREE position, rotate the front drive shaft. Normal if no load is applied.

<Inspection of hub lock handle operating force>

The handle should be operated smooth and be moderate in functioning when it is operated two or three times. [Reference] Handle operating force: 10 kg·cm or less at 10°C or above 100 kg·cm or less at -30°C.

Front Hub and Brake Drum (4 × 4 Model)



N4A0341E

Legend

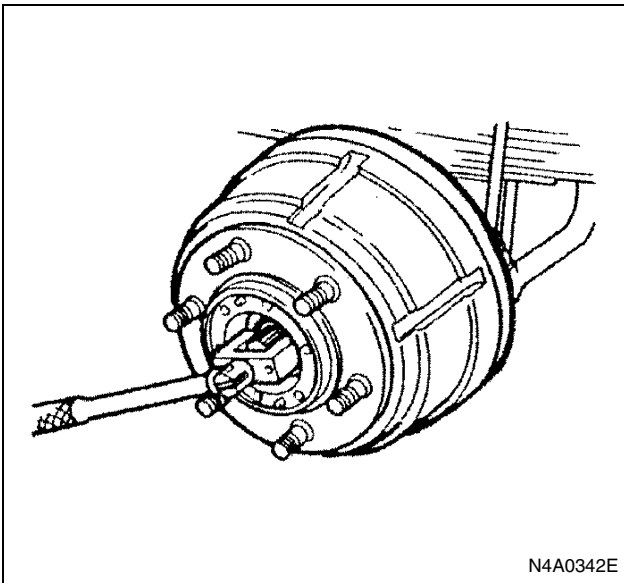
- | | |
|--------------------------------------|--|
| A. Inside drum fixing type | 7. Front axle hub inner bearing |
| B. Outside drum fixing type | 8. Front hub oil seal |
| 1. Wheel and tire | 9. Front axle hub inner bearing outer race |
| 2. Front locking hub set | 10. Front axle hub outer bearing outer race |
| 3. Front hub bearing lock washer | 11. Front wheel pin and nut (Inside drum fixing type) |
| 4. Front hub bearing lock nut | 12. Brake drum |
| 5. Front hub and brake drum assembly | 13. Front axle hub |
| 6. Front axle hub outer bearing | 14. Front wheel pin and nut (Outside drum fixing type) |

Removal

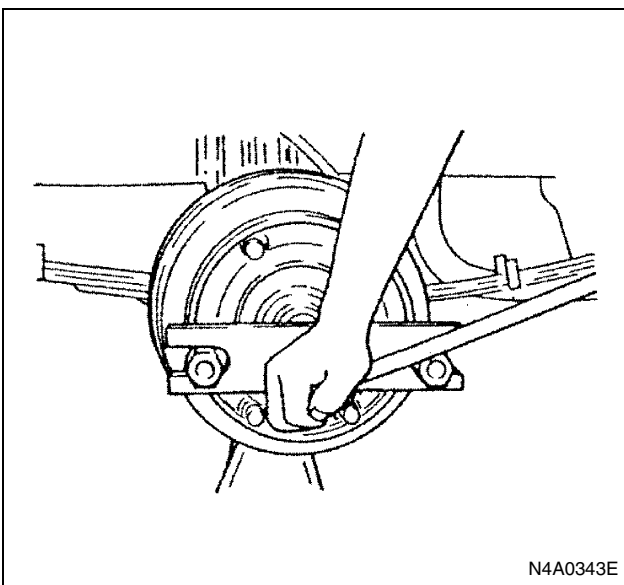
Preparation:

Jack up and support the vehicle on stands.

1. Wheel and Tire
2. Front Locking Hub Set
Refer to "FREE WHEEL HUB" previously in this section.
3. Front Hub Bearing Lock Washer
4. Front Hub Bearing Lock Nut
Front Hub Bearing Lock Nut Wrench:
5-8840-2182-0

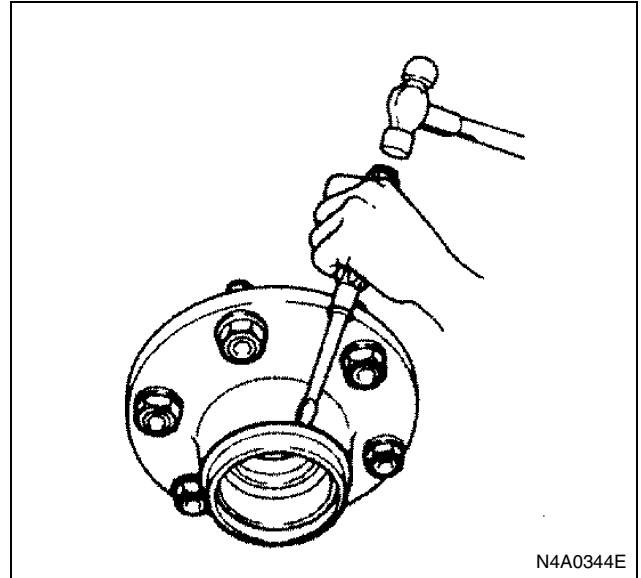


5. Front Hub and Brake Drum Assembly
Hub Remover: 9-8521-0187-0

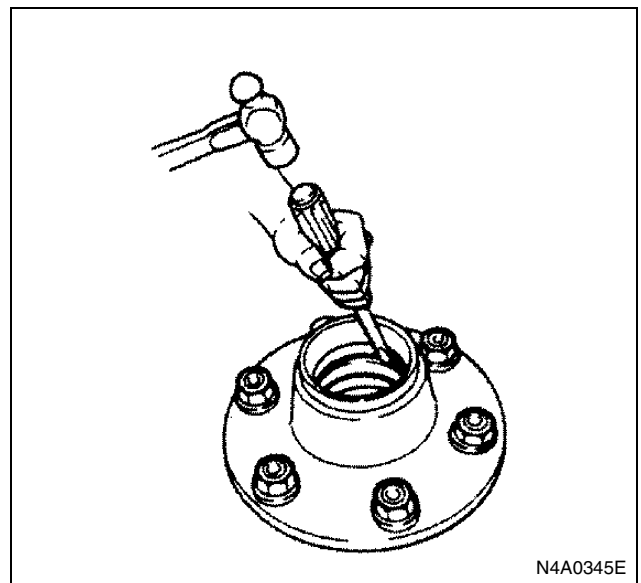


6. Front Axle Hub Outer Bearing
7. Front Axle Hub Inner Bearing
If the inner bearing is left on the spindle side, gouge from left and right with a screwdriver, and if floating up, pull to remove it.

8. Front Hub Oil Seal
When removing the oil seal, hit the outer flange of oil seal. The oil seal must not be reused.



9. Front Axle Hub Inner Bearing Outer Race



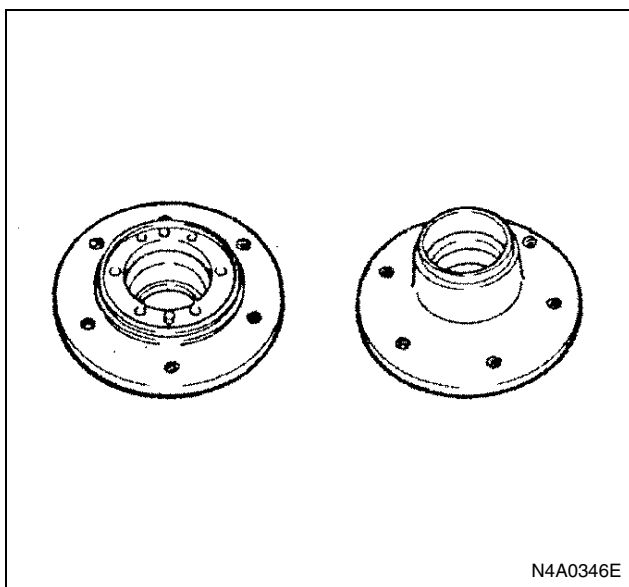
10. Front Axle Hub Outer Bearing Outer Race
Remove the outer race by driving out race from the hub with a brass drift inserted behind race in notches in the hub.
11. Front Wheel Pin and Nut (Inside Drum Fixing Type)
Remove nuts and hit with hammer, or use a press to remove wheel pin.
Remove the wheel pin as necessary.
12. Brake Drum
13. Front Axle Hub
14. Front Wheel Pin and Nut (Outside Drum Fixing Type)
Remove nuts and hit with hammer, or use a press to remove wheel pin.
Remove the wheel pin as necessary.

Inspection and Repair

Make necessary adjustments, repairs, and part replacement if excessive wear or damage is discovered during inspection.

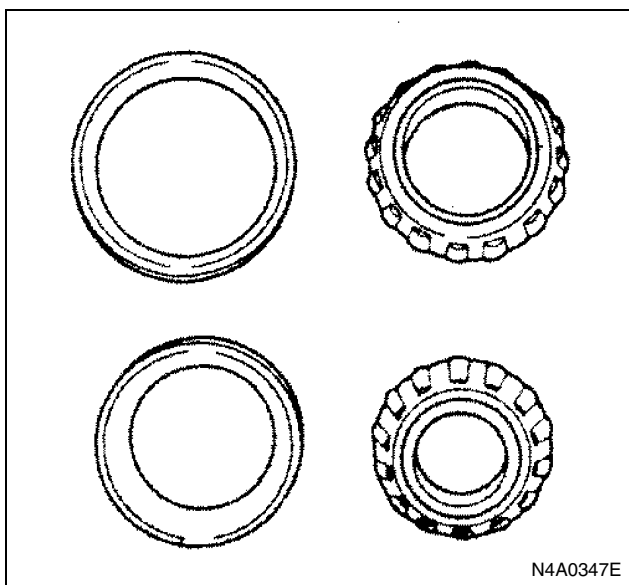
Front Axle Hub

1. Inspect the inner surface of front axle hub.
Inspect the fitting portions of front axle hub bearing outer race and hub lock body assembly for crack, damage or wear.
2. Inspect the outer surface of front axle hub.
Inspect the flange and oil seal fitting portion for crack, deformation or damage.



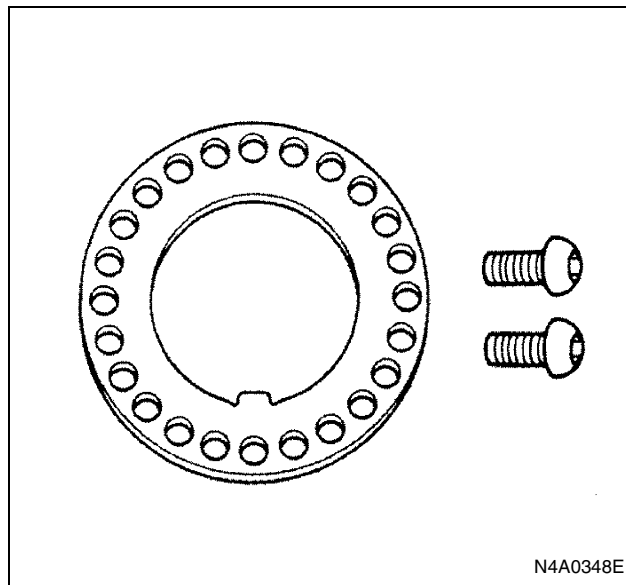
Bearing

Inspect the bearing for excessive wear, abnormal noise, rough rotation, and seizure



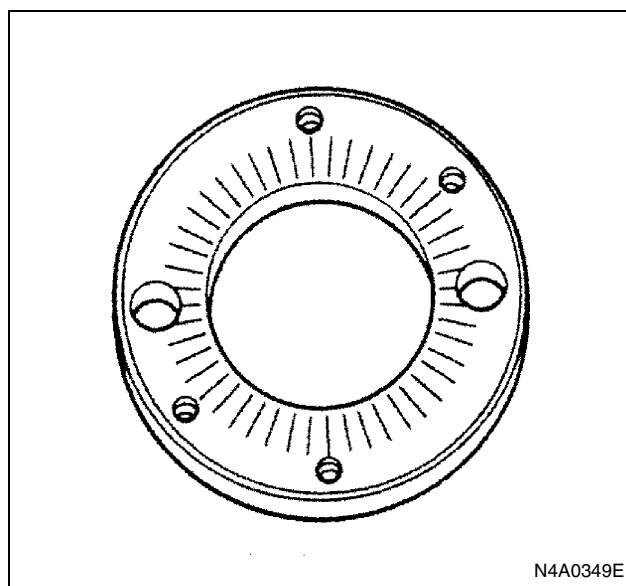
Front Hub Bearing Lock Washer

Inspect the lock washer for wear, deformation or crack, and also the lug for break.



Front Hub Bearing Lock Nut

Inspect the bearing lock nut threads and contact surfaces for excessive wear, warpage, and other damage. Light damage to the contact surfaces can be repaired with an oil stone or a piece of fine sandpaper.



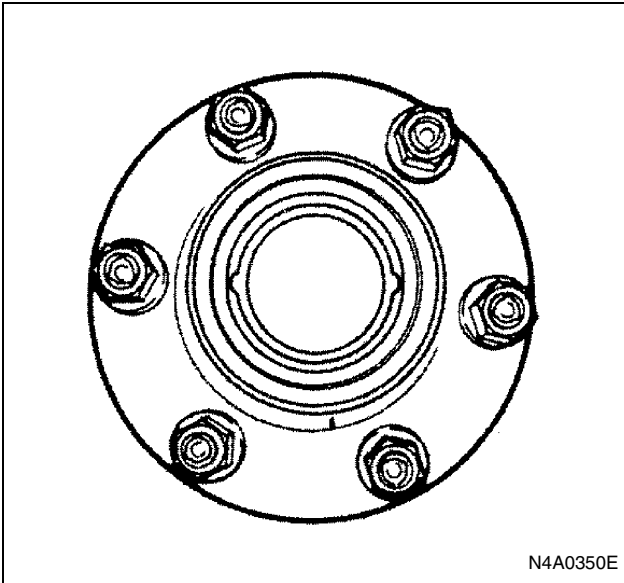
Installation

1. Front Wheel Pin and Nut (Outside Drum Fixing Type)

If a wheel pin is replaced or removed, tighten the nut to the specified torque and calk the nut at three places per pin.

Tighten:

Front wheel pin nut to 392 N·m (40 kg·m / 289 lb·ft)



2. Front Axle Hub

3. Brake Drum

On the model with outside drum fixing type, tighten the brake drum bolts to the specified torque.

Tighten:

Brake drum bolt to 13 N·m (1.3 kg·m / 113 lb·in)

4. Front Wheel Pin and Nut (Inside Drum Fixing Type)

Tighten the nut to the specified torque and calk the nut at three places per pin.

Tighten:

Front wheel pin nut to 392 N·m (40 kg·m / 289 lb·ft)

5. Front Axle Hub Outer Bearing Outer Race

6. Front Axle Hub Inner Bearing Outer Race

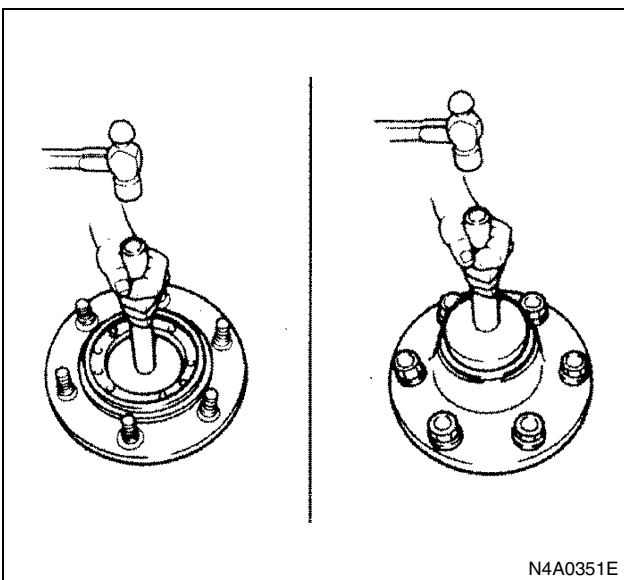
Use the bearing outer race installer to install the outer race to the hub.

Inner Bearing Outer Race Installer:

5-8840-2184-0

Outer Bearing Outer Race Installer:

5-8840-2183-0



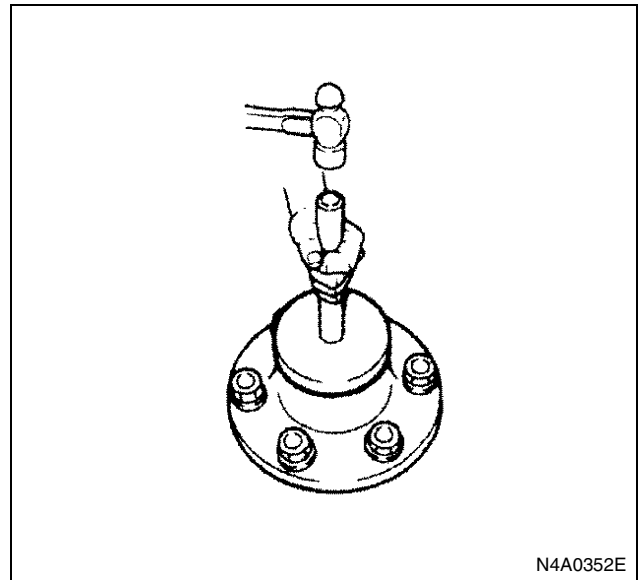
7. Front Hub Oil Seal

1) Apply grease (Multipurpose type) to the oil seal lip inner circumferences.

2) Use the oil seal installer to install the oil seal to the hub.

Oil Seal Installer: 5-8840-2187-0

During installation of oil seal, do not press or hit it other than outer flange of seal.



Apply the specified amount of the approved grease to the hub cavity, the outer bearing and the inner bearing. Grease amount: 200 g (7.1 oz) per each side

8. Front Axle Hub Inner Bearing

Install the inner bearing to the spindle.

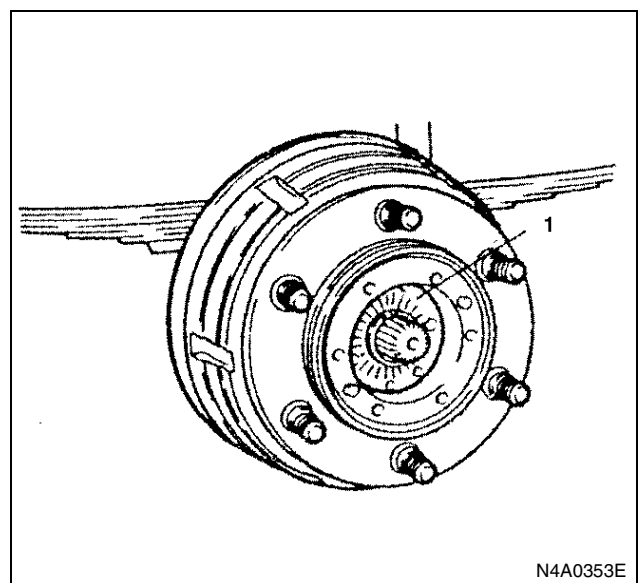
9. Front Axle Hub Outer Bearing

Install the outer bearing to the front hub assembly.

10. Front Hub and Brake Drum Assembly

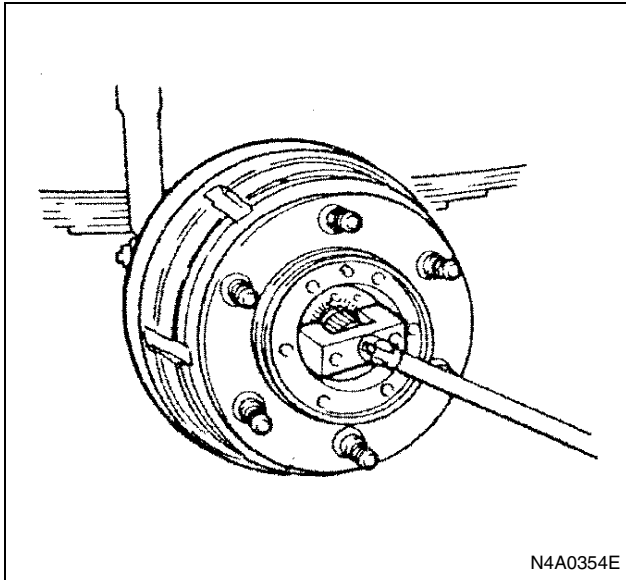
11. Front Hub Bearing Lock Nut

Install the hub bearing lock nut with (1) slits facing outside, and tighten provisionally.



<Adjustment of Hub Bearing Preload>

- 1) Turn the hub to the left and right several times to establish bearing conformity.
- 2) Use the bearing nut wrench to tighten the bearing nut until the hub can not be manually rotated.
Bearing Nut Wrench: 5-8840-2182-0
- 3) Loosen the bearing nut until hub rotates easily.

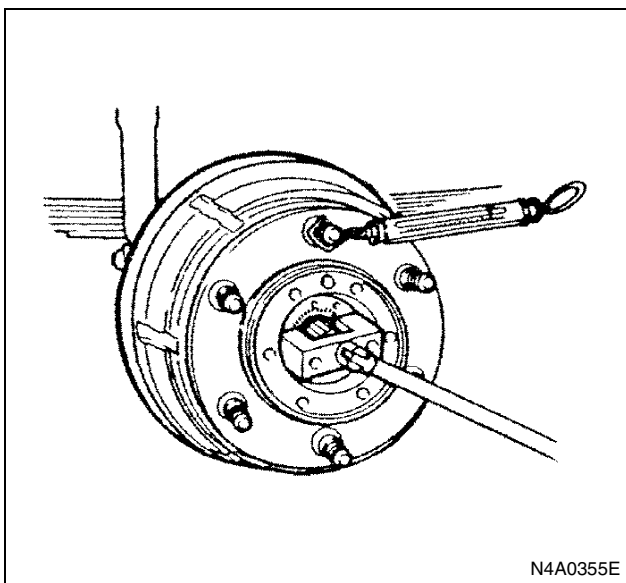


- 4) Set the spring balancer to the wheel pin in the position shown in the illustration. Gradually retighten the nut until the hub bearing is adjusted to the specified preload.

Hub bearing preload,

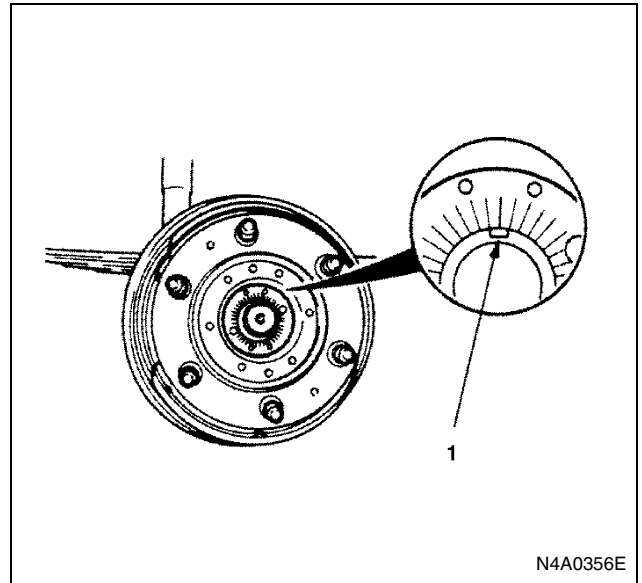
New Hub bearing: 17 — 31 N·m (1.7 — 3.2 kg·m / 3.7 — 7.1 lb·ft)

Reused Hub bearing: 14 — 28 N·m (1.4 — 2.9 kg·m / 3.1 — 6.4 lb·ft)



- 5) Rotate the hub several times to the right and left.
Measure the bearing preload a second time.

- 6) Align the axle case groove (1) with the closest bearing nut slit.



Notice:

If it is difficult to align the axle case and bearing nut, slightly tighten the bearing nut.

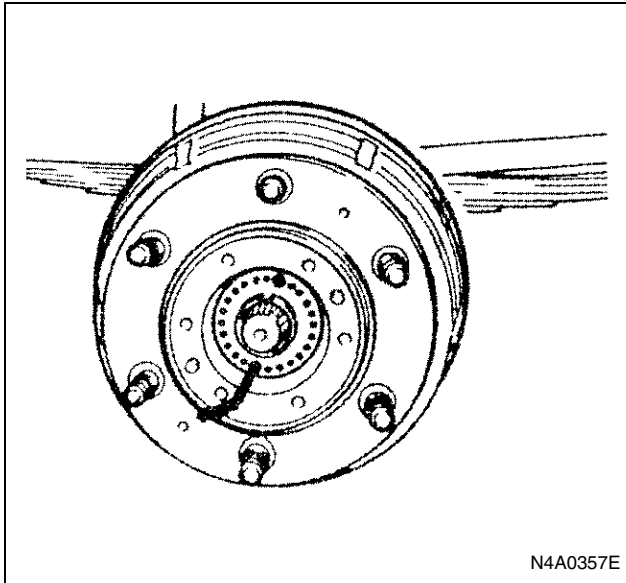
12. Front Hub Bearing Lock Washer
Engage the lug of lock washer with a notch in the spindle.
Apply adhesive (LOCTITE 242 or equivalent) to the threads of lock washer bolt, and tighten the hub bearing lock nut with lock washer.

Tighten:

Lock washer bolt to 10 N·m (1.0 kg·m / 87 lb·in)

In order to ensure locking, equally spaced 48 slits are scribed on the hub bearing lock nut. The tapped holes in hub bearing lock nut will meet either hole in lock washer (two holes provided at symmetric position) if a slit of hub bearing lock nut is aligned with the notch center at the threads of spindle end.

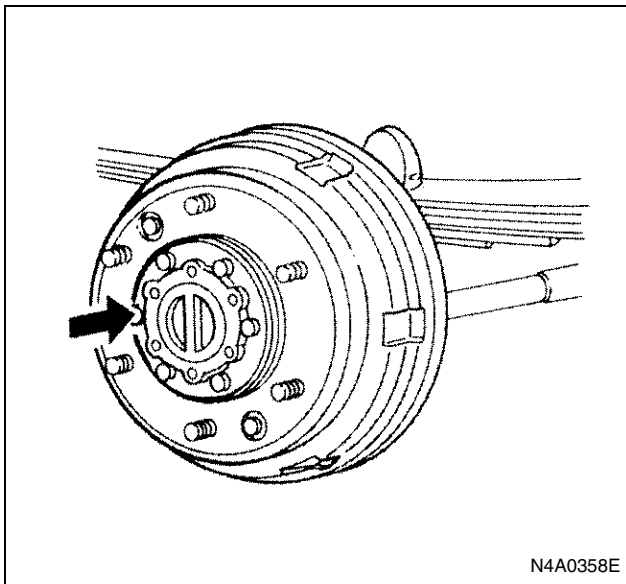
Under this condition, tightening the bolts fix surely the hub bearing lock nut.



13. Front Locking Hub Set
Refer to "FREE WHEEL HUB" previously in this section.

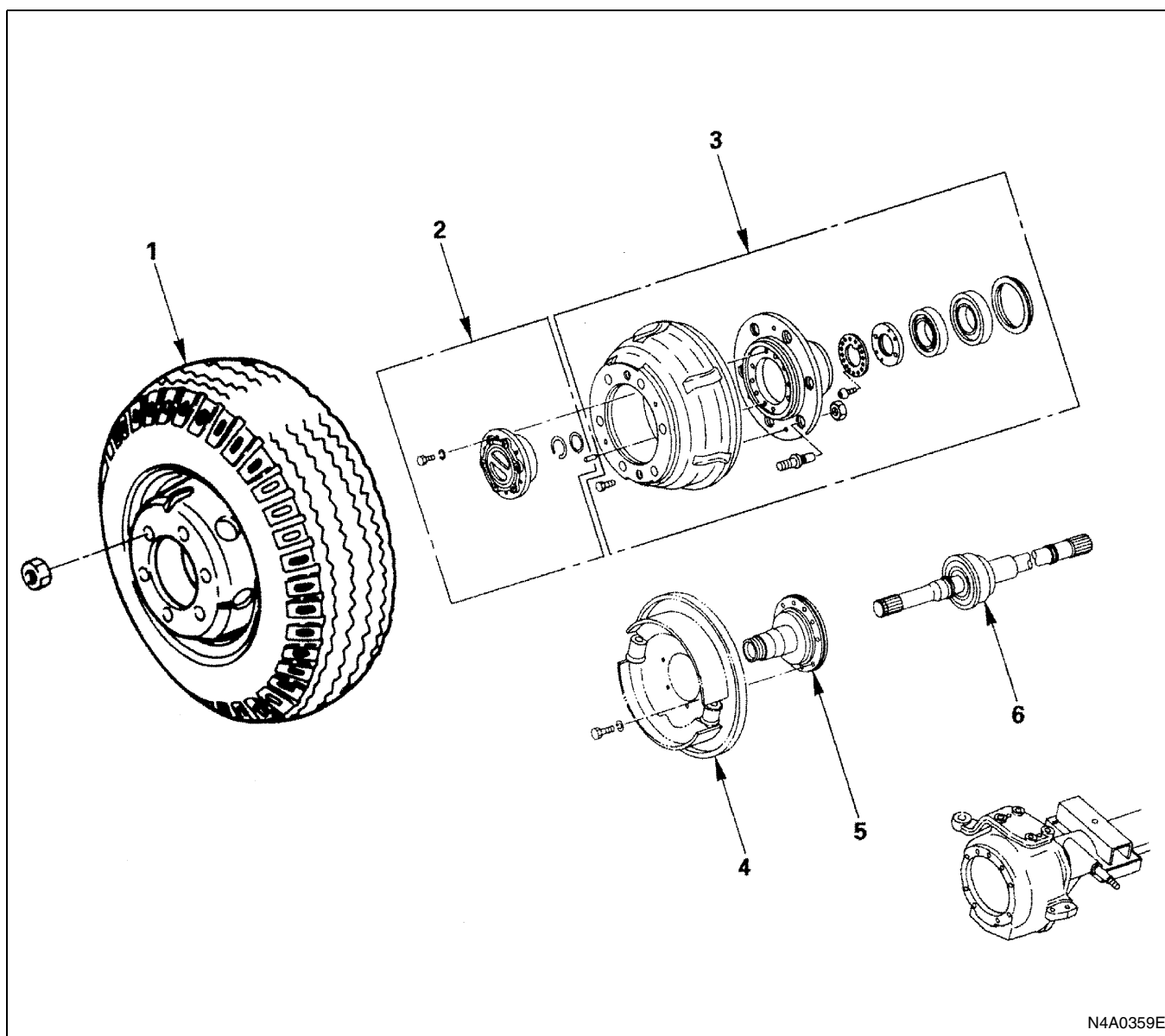
Tighten:

Front locking hub set bolt to 98 N·m (10.0 kg·m / 72 lb·ft)



14. Wheel and Tire

Spindle and Drive Shaft (4 × 4 Model)



N4A0359E

Legend

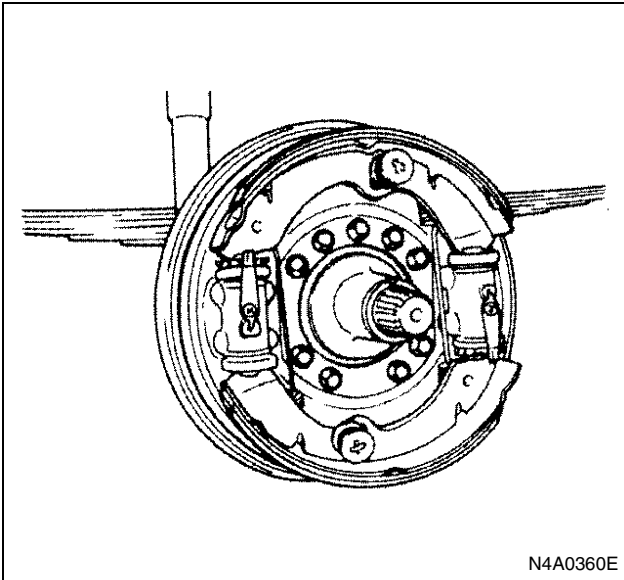
- | | |
|---|-------------------------------|
| 1. Wheel and tire | 4. Front brake assembly |
| 2. Front locking hub set | 5. Spindle |
| 3. Front axle hub, brake drum and related parts | 6. Front drive shaft assembly |

Removal

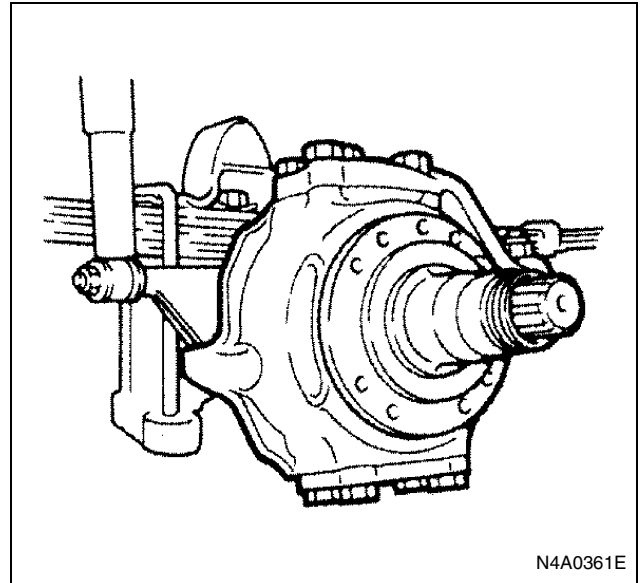
Preparation:

Jack up and support the vehicle on stands.

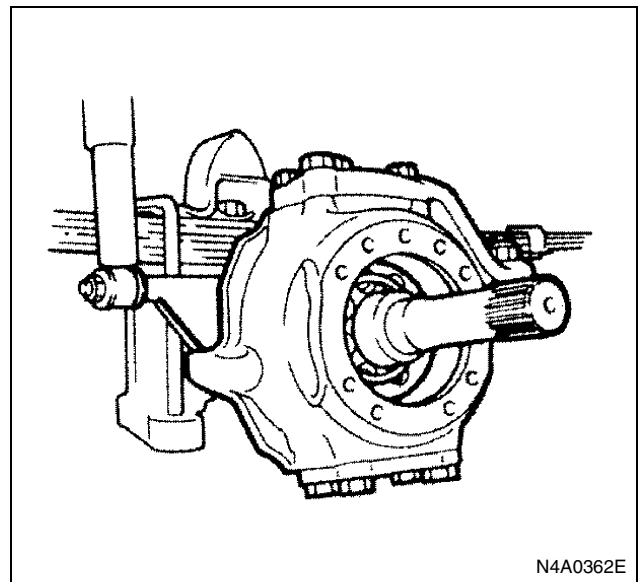
1. Wheel and Tire
2. Front Locking Hub Set
Refer to "FREE WHEEL HUB" previously in this section.
3. Front Axle Hub, Brake Drum and Related Parts
Refer to "FRONT HUB and BRAKE DRUM (4 × 4 Model)" previously in this section.
4. Front Brake Assembly
 - 1) Remove fixing bolts and front oil shield cover, then the brake assembly.
The front oil shield cover, spindle and back plate are tightened together.
 - 2) Using a wire, sling the brake assembly to the frame to hold. At this time, take care not to damage or bend the brake hose.



5. Spindle
Hitting lightly the spindle end with a wood or plastic hammer, remove the spindle from knuckle.
Do not use an iron hammer. Special care should be taken to protect the threads at the spindle end from damage.



6. Front Drive Shaft Assembly
Pull and remove the front drive shaft to your side.

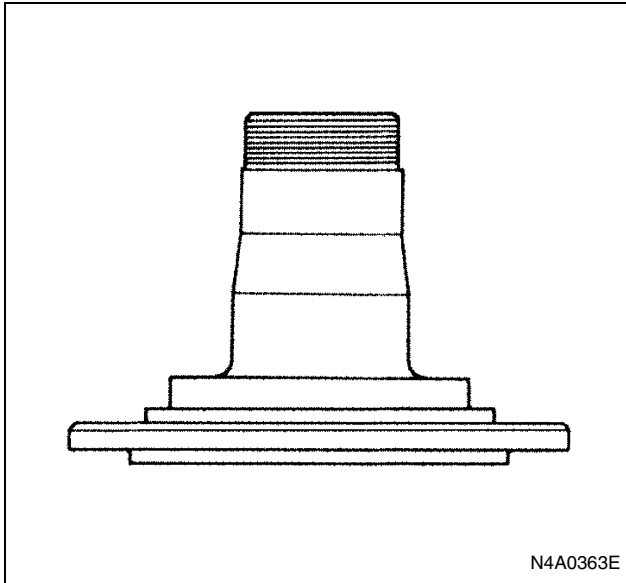


Inspection and Repair

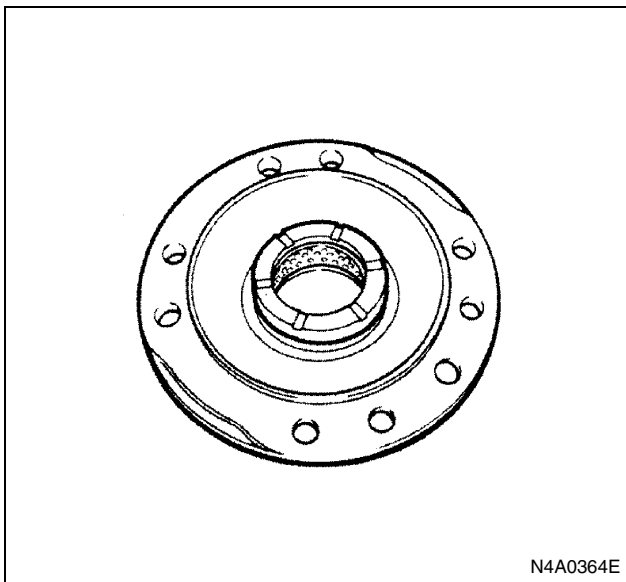
Make the necessary adjustments, repairs, and part replacements if excessive wear or damage is discovered during inspection.

Spindle

1. Inspect the whole of the spindle for crack, wear or damage.
Replace the spindle if any abnormal condition is noticeable.
Use a visible dye-penetrant flaw detection method or a magnetic flaw detector.

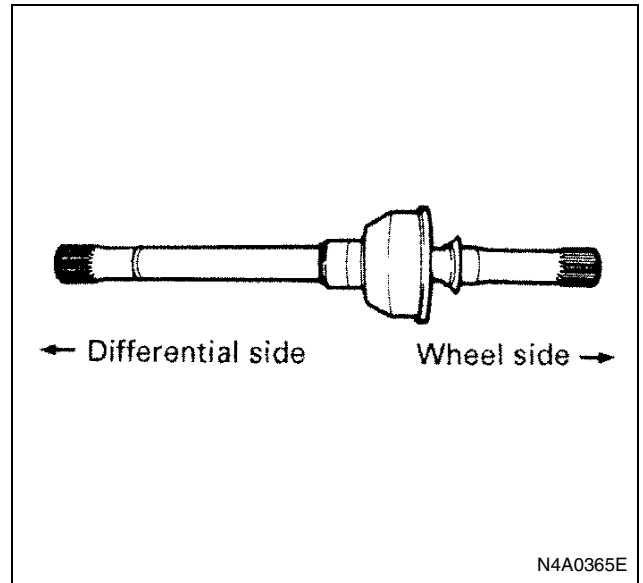


2. Inspect the front axle shaft thrust washer or bushing for wear and damage.

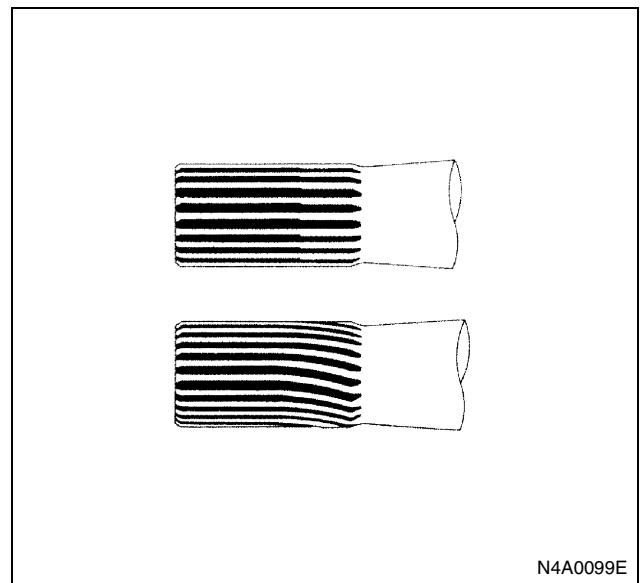


Front Drive Shaft Assembly

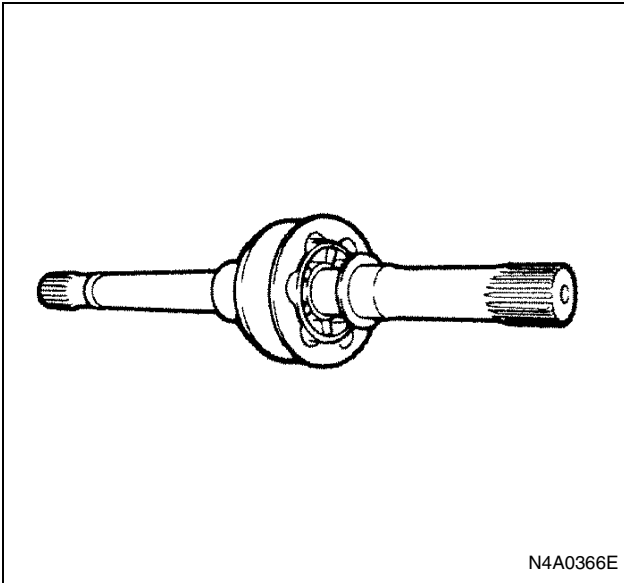
1. Inspect the front drive shaft for bending or distortion.



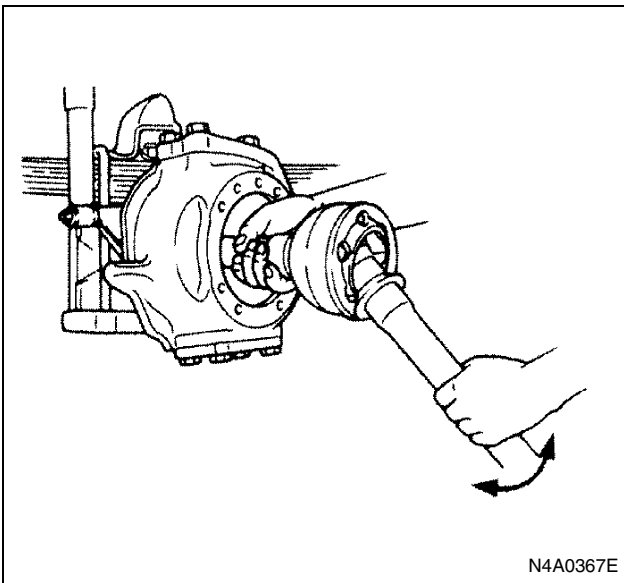
2. Inspect the front drive shaft spline for wear or distortion. Replace the front drive shaft assembly if wear or distortion is found.



3. Inspect the stopper contact face (on the spindle's side) for wear or damage.

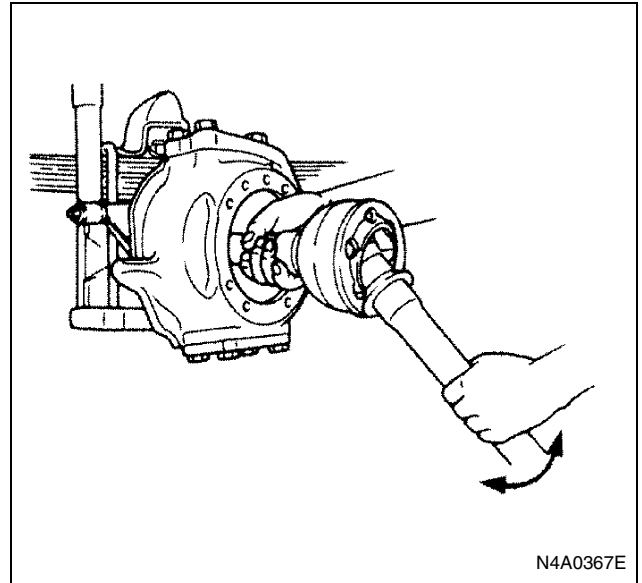


4. Moving the front drive shaft joint as shown, inspect for smooth operation or presence of excessive play.
Replace the front drive shaft assembly if it does not move smoothly or there is excessive play.



Installation

1. Front Drive Shaft Assembly
 - 1) Apply the MoS2 contained type grease into the universal joint.
Grease amount: 94 — 106 g (3.3 — 3.7 oz)
 - 2) Install the front drive shaft assembly into the front axle case.
During installation, take care not to damage the oil seal lip on the front axle case side.
To install, bend the front drive shaft as shown, and moving the shaft a little to the left or right, push it into the spline on the differential side gear.



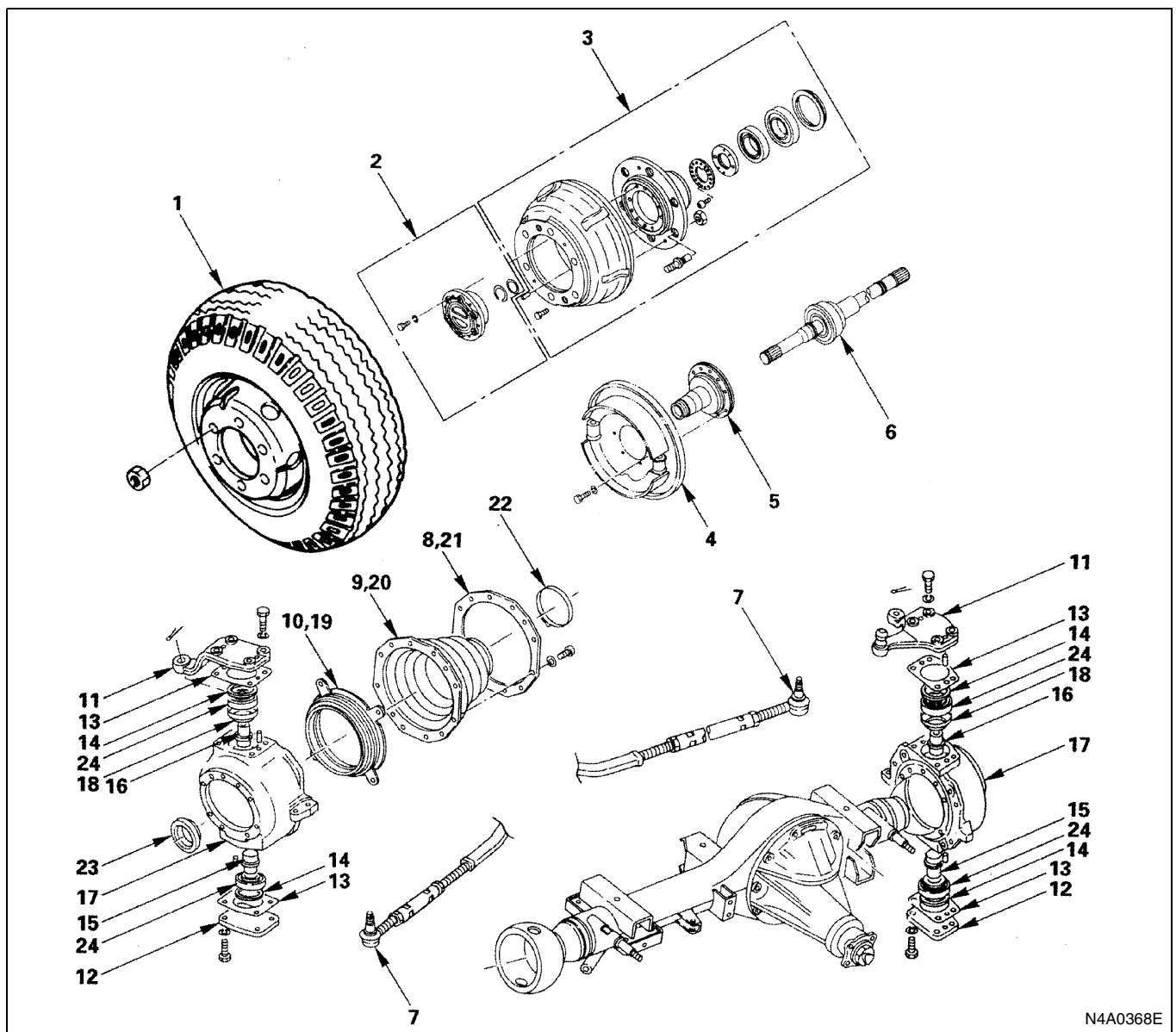
2. Spindle
 - 1) Apply MoS2 contained type grease to the surfaces of the thrust washer and bushing of spindle.
 - 2) Apply adhesive (LOCTITE 515 or equivalent) to the spindle flange, and install the spindle to the knuckle. At this time, a bolt hole of the spindle should be met with that of knuckle.
3. Front Brake Assembly
 - 1) Install the front oil shield cover with a cut in outer surface facing inside.
 - 2) Apply adhesive (LOCTITE 242 or equivalent) to the threads of fixing bolts and tighten them to the specified torque.

Tighten:

Front brake assembly fixing bolt to 98 N·m (10 kg·m / 72 lb·ft)

4. Front Axle Hub, Brake Drum and Related Parts
Refer to "FRONT HUB and BRAKE DRUM (4 × 4 Model)" previously in this section.
5. Front Locking Hub Set
Refer to "FREE WHEEL HUB" previously in this section.
6. Wheel and Tire

Knuckle and King Pin (4 × 4 Model)



N4A0368E

Legend

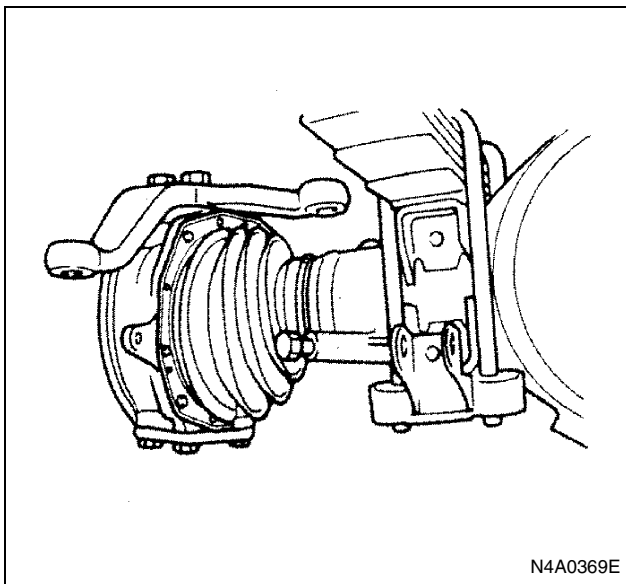
- | | |
|--|-------------------------------------|
| 1. Wheel and tire | 13. King pin bearing shim |
| 2. Front locking hub set | 14. Bearing distance collar |
| 3. Front axle hub, brake drum and relative parts | 15. Front axle lower king pin |
| 4. Front brake assembly | 16. Front axle upper king pin |
| 5. Spindle | 17. Front axle knuckle |
| 6. Front drive shaft assembly | 18. King pin receiver |
| 7. Tie rod end | 19. Knuckle oil seal |
| 8. Front axle tube end boot holder | 20. Front axle tube end boot |
| 9. Front axle tube end boot | 21. Front axle tube end boot holder |
| 10. Knuckle oil seal | 22. Front axle tube end boot band |
| 11. Knuckle arm and tie rod arm | 23. Front axle shaft oil seal |
| 12. King pin cover | 24. King pin bearing |

Removal

Preparation:

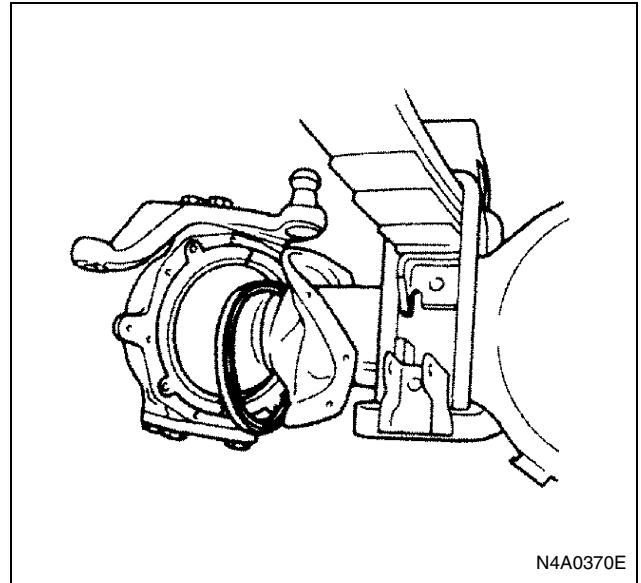
Jack up and support the vehicle on the stands.

1. Wheel and Tire
2. Front Locking Hub Set
Refer to "FREE WHEEL HUB" previously in this section.
3. Front Axle Hub, Brake Drum and Relative Parts
Refer to "FRONT HUB and BRAKE DRUM (4 × 4 Model)" previously in this section.
4. Front Brake Assembly
5. Spindle
6. Front Drive Shaft Assembly
7. Tie Rod End
8. Front Axle Tube End Boot Holder
Remove the front axle tube end boot holder at the back of knuckle. (The front axle tube end boot holder is divided into two pieces in horizontal directions.)
9. Front Axle Tube End Boot
Remove the front axle tube end boot fixing bolts, and peel and shift the boot toward the differential.

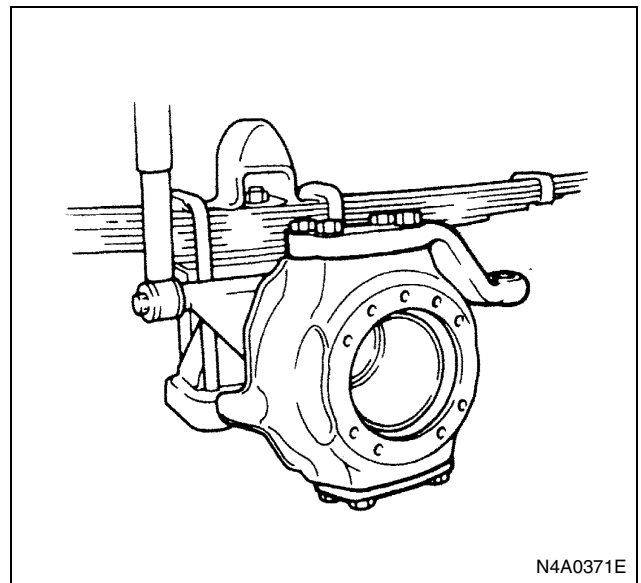


10. Knuckle Oil Seal

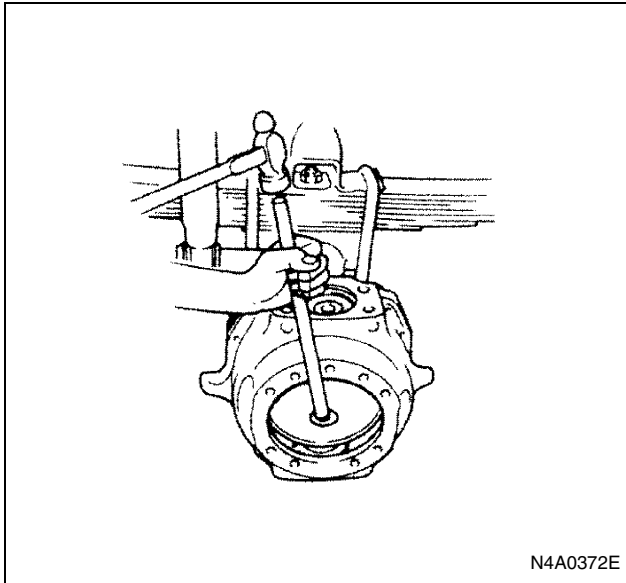
- 1) Remove the outer side of oil seal holder. (The oil seal holder outer is divided into two pieces in vertical direction.)
- 2) Shift the oil seal toward the front axle tube end boot (on Differential side).
- 3) Remove the inner side of oil seal holder. (The oil seal holder inner is divided into two pieces in horizontal direction.)



11. Knuckle Arm and Tie Rod Arm
12. King Pin Cover
13. King Pin Bearing Shim
Confirm the quantity of shims and components when removing the knuckle arm, tie rod arm and king pin cover.



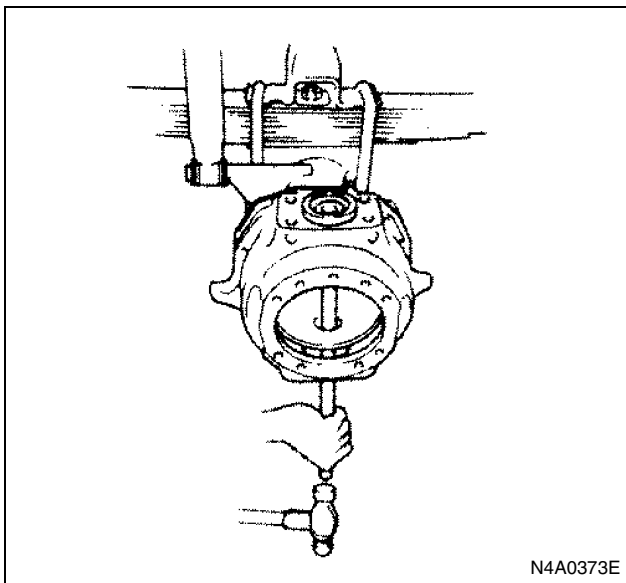
14. Bearing Distance Collar
15. Front Axle Lower King Pin
Attach a bar to the center recess of king pin from tube end (spherical part) of front axle case, and hit with a hammer to remove the king pin downward.



16. Front Axle Upper King Pin

17. Front Axle Knuckle

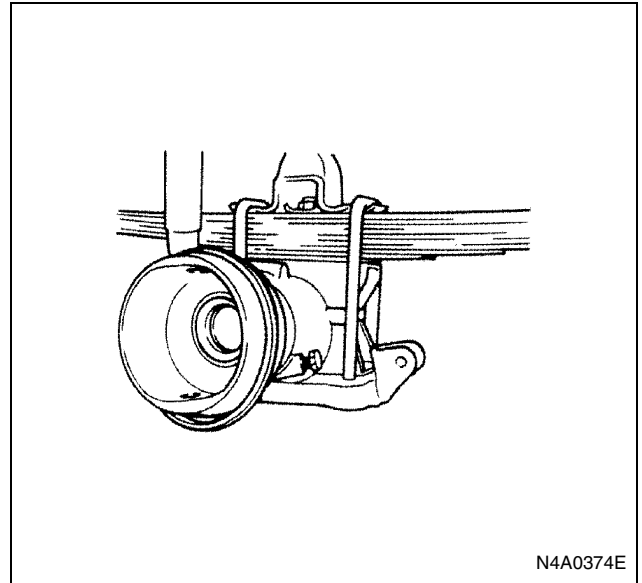
- 1) From under the knuckle, hit a bar attached to the upper king pin to remove the outer race of king pin bearing first.
- 2) At this time, support the knuckle with both hands and raise it to remove to your side.
- 3) Again hit the king pin to remove.



18. King Pin Receiver

19. Knuckle Oil Seal

Remove the oil seal from the front axle case.
At this time, make sure the direction of oil seal.



20. Front Axle Tube End Boot

21. Front Axle Tube End Boot Holder

22. Front Axle Tube End Boot Band
Loosen and remove the tube end boot band.

Avoid frequent removal of tube end boot band except when it is to be replaced or removal is necessary for servicing.

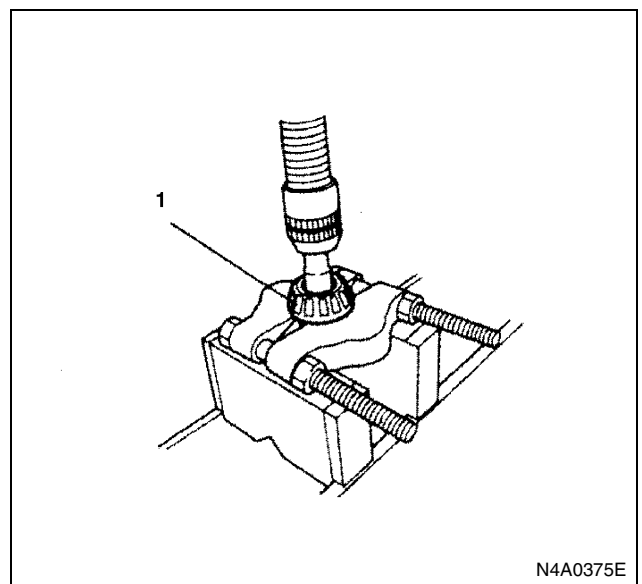
23. Front Axle Shaft Oil Seal

The oil seal must not be reused.

24. King Pin Bearing

Remove the bearing with a press.

Some components are different between upper and lower king pin bearings (1), and do not confuse them.



Inspection and Repair

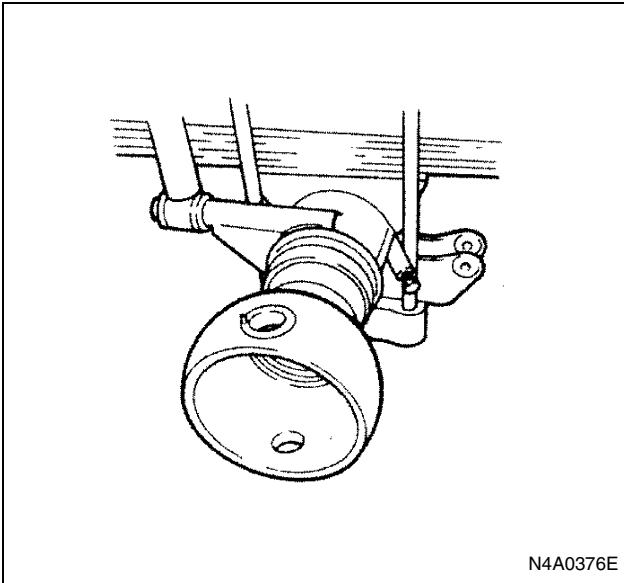
Make the necessary adjustments, repairs, and part replacements if excessive wear or damage is discovered during inspection.

Front Axle Tube End

Inspect the front axle case tube end sphere for crack, wear, damage or rust. Slight rust of sphere should be polished with a sand paper.

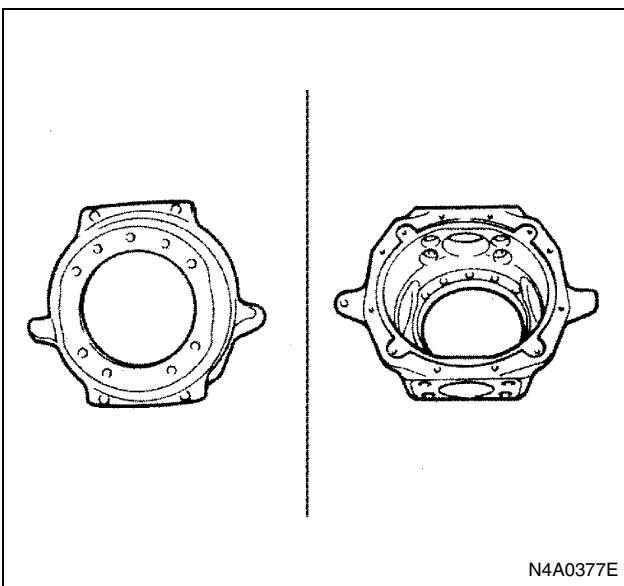
To check the tube end sphere for crack, use a red-check or a magnetic flaw detector.

If a crack is found, replace the front axle case assembly.



Front Axle Knuckle

Inspect the whole of the knuckle for cracks, wear or damage using a magnetic flaw detector or red-check. Replace the knuckle if any abnormal condition is noticeable.



King Pin

Inspect the king pin for cracks.

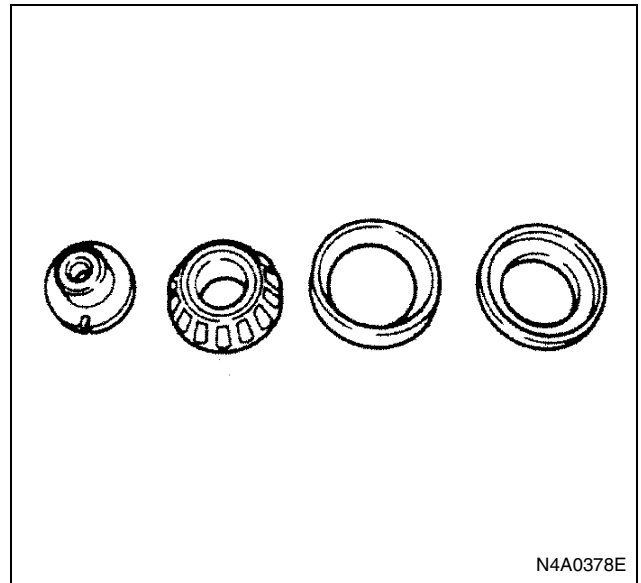
Use a magnetic flaw detector or red-check.

Replace king pin, if any cracks are found.

King Pin Bearing

Inspect the bearing for wear, seizure, damage and rough rotation.

Replace any flawed or damaged bearing.



Knuckle Arm

Tie Rod Arm

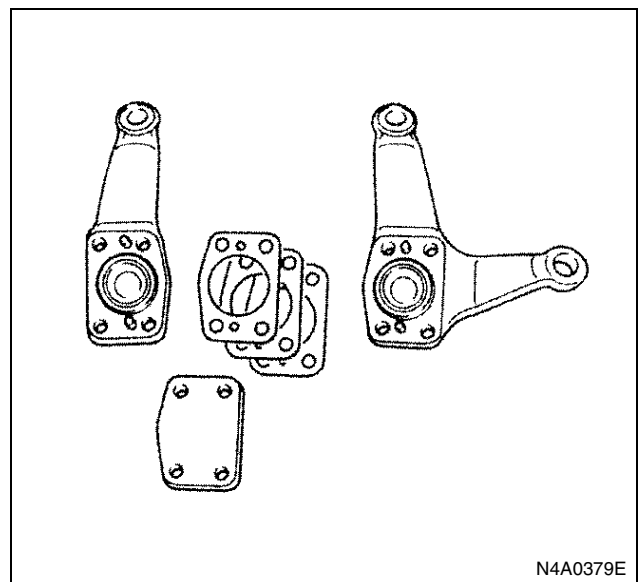
King Pin Cover

Inspect the knuckle arm, tie rod arm and king pin cover for cracks, damage or wear.

Replace the these parts if any abnormal condition is noticeable.

To check the arm for crack, use a visible dye-penetrant flaw detection method or a magnetic flaw detector.

Replace the arm if a crack is found.

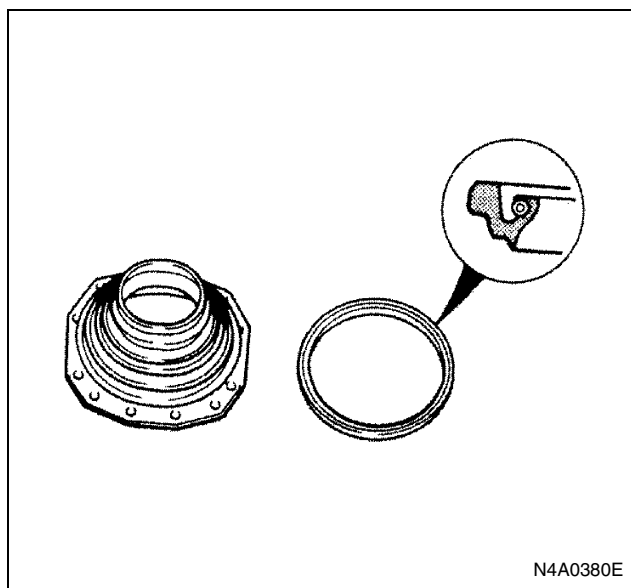


Front Axle Tube End Boot

Inspect the front axle tube end boot and replace if broken. It should be replaced if even one hole or crack is found.

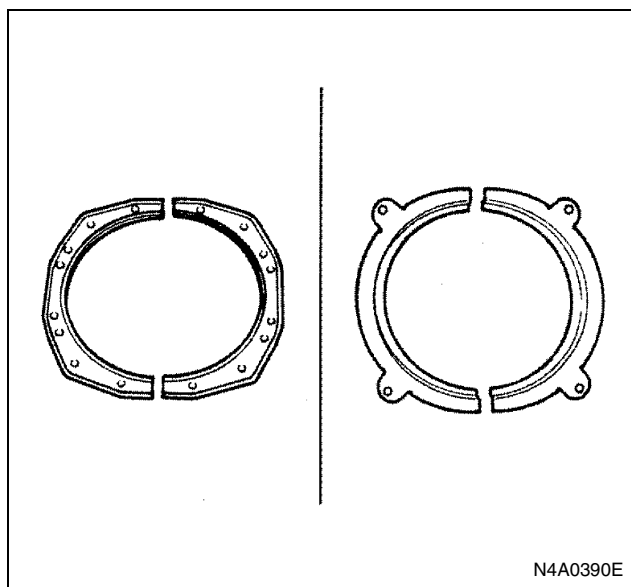
Oil Seal

Inspect the oil seal, and replace it if its lip is damaged, worn or hardened.



Front Axle Tube End Boot Holder, Oil Seal Holder

Inspect the oil seal holder and front axle tube end boot holder, and replace if excessive deformation or rust is found.

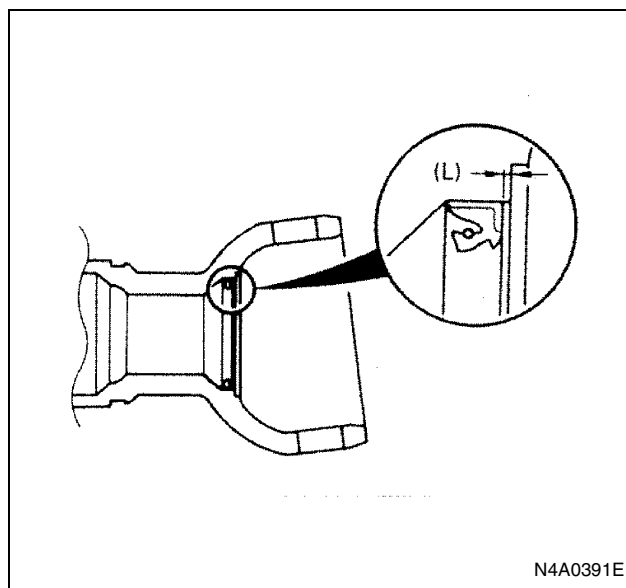


Installation

1. Front Axle Shaft Oil Seal

- 1) Drive in the oil seal to the dimension as shown. Take care not to damage the oil seal lip.
- 2) Apply grease (Multipurpose type) to the oil seal lip.

Oil seal drive in depth (L): 0 — 0.5 mm (0 — 0.020 in)



2. Front Axle Tube End Boot Holder

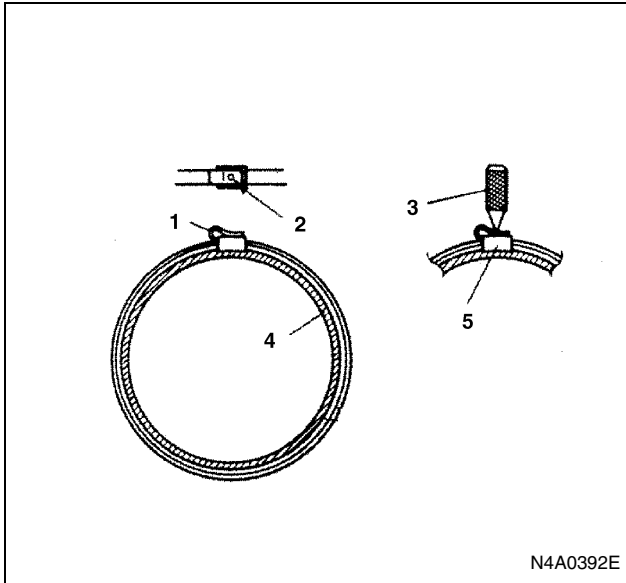
3. Front Axle Tube End Boot

- 1) Apply gear oil GL-5 grade (SAE90) to the entire surface of front axle tube end sphere.
- 2) Warm the front axle tube end boot to 70 — 80°C with hot water.
- 3) Reverse the front axle tube end boot, and install into the front axle case. During this work, do not touch the front axle tube end boot by bare hand because it is too hot.
- 4) After installation in the front axle case, remove the moisture immediately.
- 5) Return the front axle tube end boot to original form, and insert the leading end of boot into the front axle tube end boot groove of the front axle case.

4. Knuckle Oil Seal

5. Front Axle Tube End Boot Band

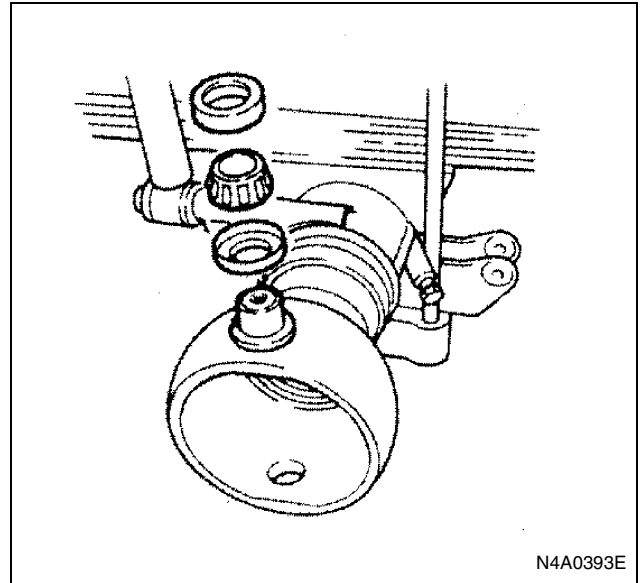
- 1) Fix the boot with front axle tube end boot band. Wind the front axle tube end boot band twice and tighten it up to eliminate looseness.
- 2) Then, calk the center of fitting on the front axle tube end boot band with a punch.
- 3) Turn back the front axle tube end boot band at the fitting, and again calk the center of front axle tube end boot band.
- 4) Cut the front axle tube end boot band at the end face of fitting.

**Legend**

1. Bend
2. Calking point
3. Punch
4. Front axle tube end boot
5. Fitting

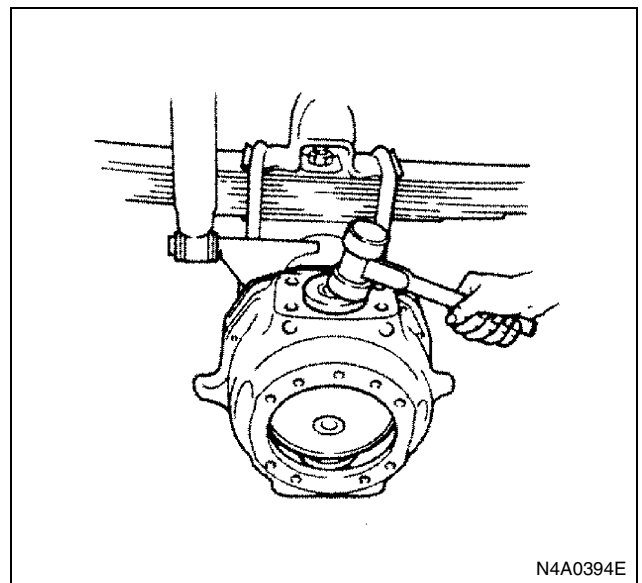
Install the oil seal to the front axle. (Apply Multipurpose type grease, to the entire surface of oil seal, and install it with care not to damage the oil seal lip. In installing the oil seal, position the spring side on the differential side.)

6. Front Axle Upper King Pin
7. Front Axle Lower King Pin
 - 1) Seal multi-purpose grease NLGI No.2 in the king pin bearing.
 - 2) Install only the king pins (both upper and lower) in the front axle case.
 - 3) Align the locking groove of the king pin with the locking pin on the front axle tube end surface, and then drive in the king pin.



8. King Pin Receiver
9. King Pin Bearing

Install the king pin bearing to the king pin. For the upper side, install the receiver, king pin bearing in this order.
10. Front Axle Knuckle
 - 1) Install the knuckle to the front axle. (Holding the knuckle with both hands, align the upper hole of knuckle to the upper king pin bearing and lower it slowly while passing the lower king pin bearing.)
 - 2) Install upper and lower king pin bearing outer races. (Fit the king pin bearing outer race completely with the knuckle, and hit lightly the outer race until it gets stuck.)

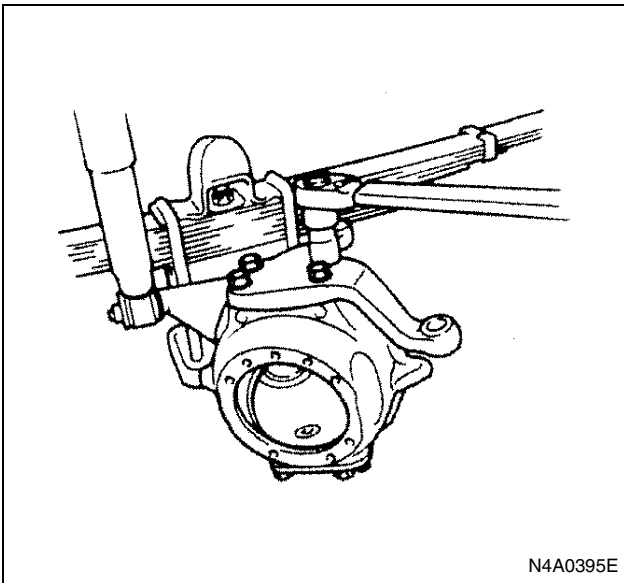


11. Bearing Distance Collar
12. King Pin Bearing Shim
13. King Pin Cover
14. Knuckle Arm and Tie Rod Arm

- 1) Install the knuckle arm (or tie rod arm) and the king pin cover. (Install the distance collar and shim in this order. Then, install knuckle arm (or tie rod arm) and the king pin cover and fix provisionally with bolts. Use the number of shims that were removed previously, and tighten the bolts lightly. At this time, do not apply LOCTITE to the shims, arms and king pin cover yet.
- 2) Tighten the bolts on knuckle arm (or tie rod arm) and king pin cover to the specified torque while turning the knuckle to the left and right several times to run-in the king pin bearing.

Tighten:

Knuckle arm, tie rod arm and king pin cover bolt to 147 N·m (15 kg·m / 108 lb·ft)



<Adjustment of Front Axle Knuckle Preload>

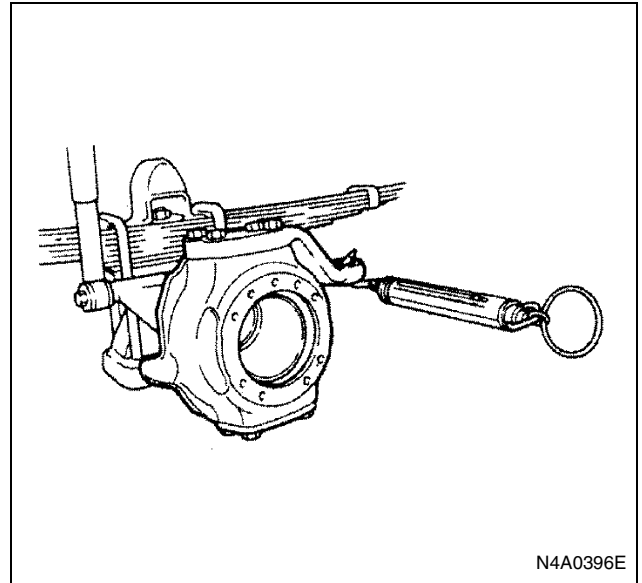
- 1) Hook a spring balance to the edge of knuckle arm (or tie rod arm), and pull it in tangential direction to check if the spring balance reading at the start of movement is within the standard range.
(Measure preload in tangential direction.)

Front axle knuckle preload, 3.1 — 5.5 N (6.8 — 12.1 kg / 30.4 — 53.9 lb)

- 2) If it does not satisfy the standard, adjust with shims.

Shim thickness available: 0.3 mm (0.01 in)

- 3) After adjustment, measure the preload again.



<Tighten completely the knuckle arm (or tie rod arm) and king pin cover>

- 1) Remove each arm and king pin cover once, and apply adhesive (LOCTITE 515 or equivalent) to the shims, each arm and king pin cover evenly.
- 2) Tighten fixing bolts to the specified torque.

Tighten:

Knuckle arm, tie rod arm and king pin cover bolt to 147 N·m (15 kg·m / 108 lb·ft)

- 3) Reconfirm the preload.
If it is out of standard, readjust by repeating the above steps.

15. Knuckle Oil Seal

- 1) Install the inner oil seal holder to the knuckle. Install the inner oil seal holder in longitudinal direction.
- 2) Install the oil seal, then the outer oil seal holder. Install the outer oil seal holder in vertical direction (a mating face should be shifted 90° against the inner holder).

16. Front Axle Tube End Boot

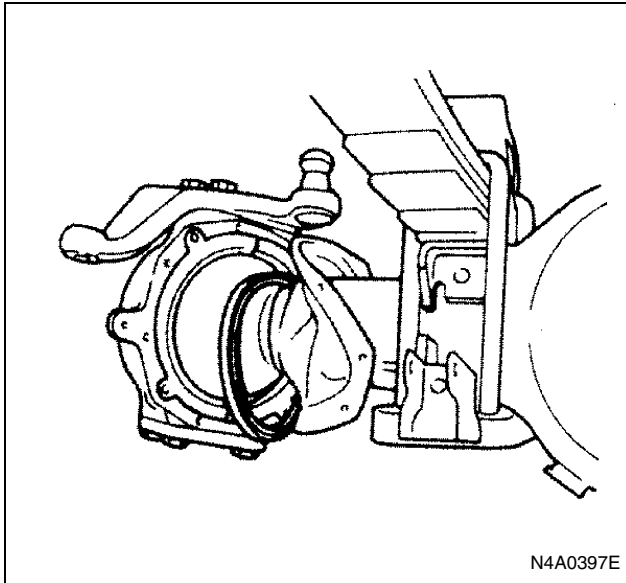
17. Front Axle Tube End Boot Holder

Install the front axle tube end boot, and tighten bolts to the specified torque via the front axle tube end boot holder.

Install the front axle tube end boot holder in longitudinal direction.

Tighten:

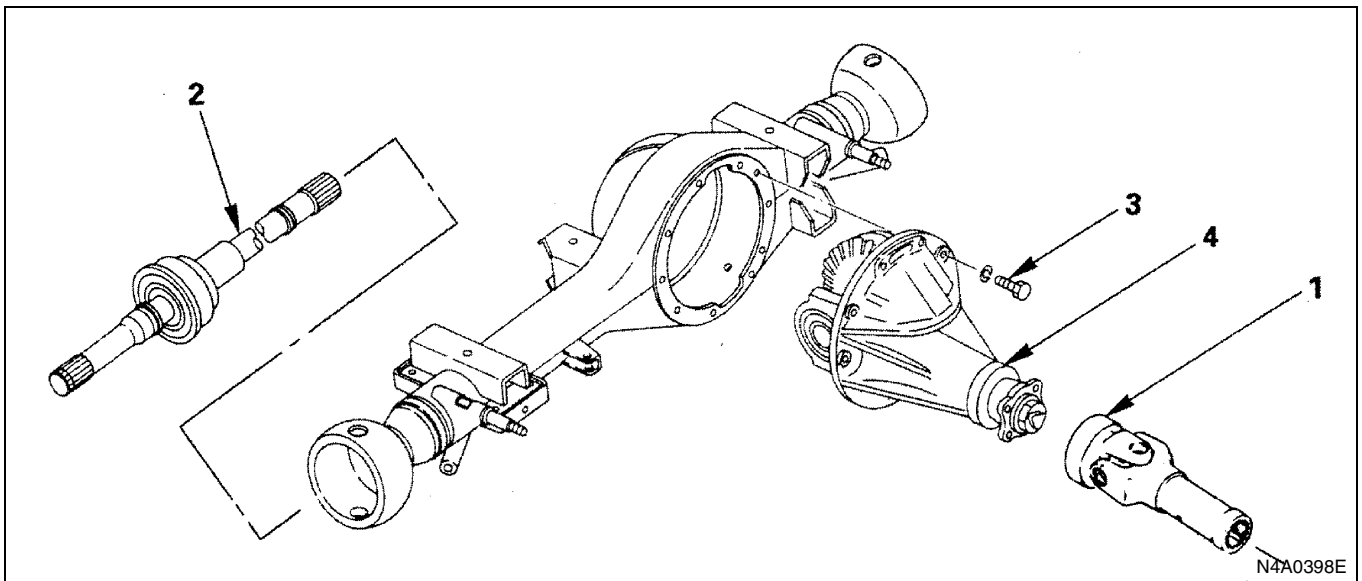
Front axle tube end boot holder bolt to 6 N·m (0.6 kg·m / 52 lb·ft)



- 18. Tie Rod End
- 19. Front Drive Shaft Assembly
- 20. Spindle
- 21. Front Brake Assembly

- 22. Front Axle Hub, Brake Drum and Relative Parts
Refer to "FRONT HUB and BRAKE DRUM (4 × 4 Model)" previously in this section.
- 23. Front Locking Hub Set
Refer to "FREE WHEEL HUB" previously in this section.
- 24. Wheel and Tire

Front Differential Assembly (4 × 4 Model)



Legend

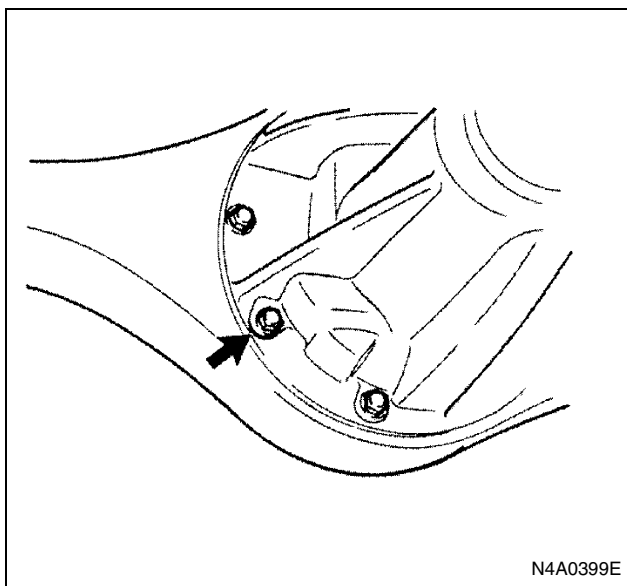
- | | |
|-------------------------------|--------------------------------|
| 1. Propeller shaft assembly | 3. Front axle case bolt |
| 2. Front drive shaft assembly | 4. Front differential assembly |

Removal

Support the front axle with a suitable jack and chassis stands.

Drain the front axle case by removing the drain plug on the lower part of the front axle case.

1. Propeller Shaft Assembly
Remove the propeller shaft assembly.
2. Front Drive Shaft Assembly
Refer to "Spindle and Drive Shaft" previously in this section.
3. Front Axle Case Bolt
Put jack under the center of front axle then remove the front axle case bolts.
4. Front Differential Assembly
Remove the front differential assembly from the front axle case.



Installation

1. Front Differential Assembly
Clean the faces of the front axle case and the final drive carrier.
Apply the recommended liquid gasket (Three Bond 1215 or its equivalent) to the sealing side of the front axle case and the final drive carrier.
2. Front Axle Case Bolt
Attach the front final drive assembly to the front axle case and tighten the bolts.

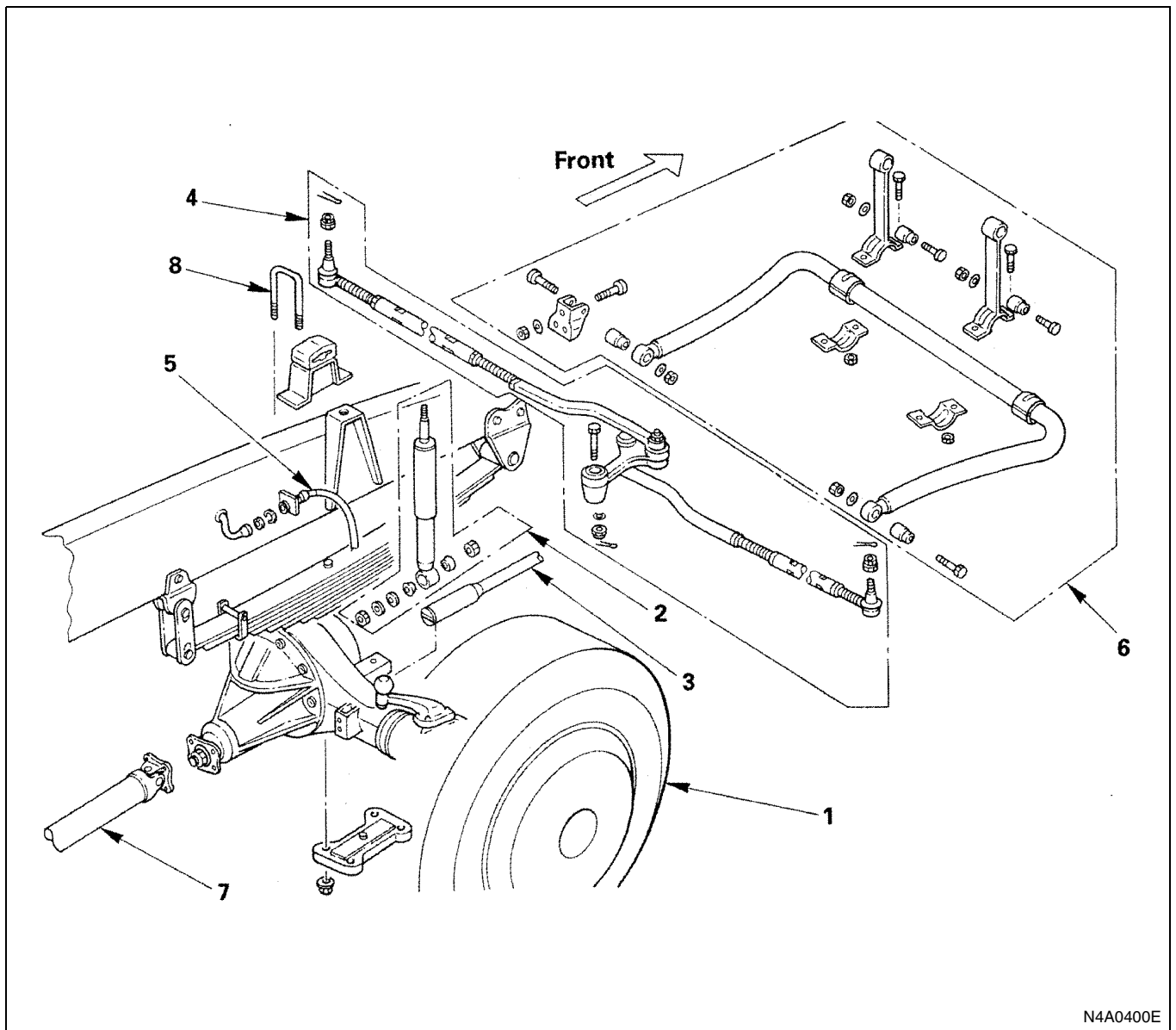
Tighten:

Front axle case bolt to 67 N·m (6.8 kg·m / 49 lb·ft)

3. Front Drive Shaft Assembly
4. Propeller Shaft Assembly
Fill the axle case with hypoid gear lubricant to just below the filler hole.

Lubricant capacity, 2.7 liter (2.9 US qt / 2.4 Imp qt)

Front Axle Assembly (4 × 4 Model)



Legend

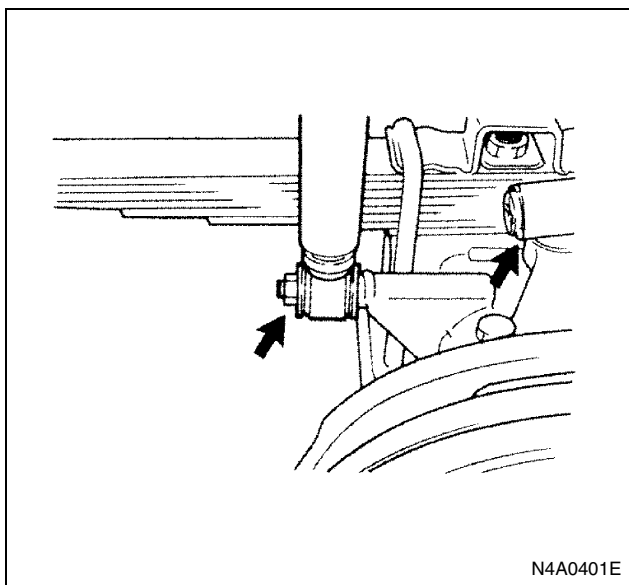
- | | |
|---------------------|--------------------------|
| 1. Wheel and tire | 5. Brake flexible hose |
| 2. Shock absorber | 6. Stabilizer assembly |
| 3. Drag link | 7. Front propeller shaft |
| 4. Tie rod assembly | 8. Leaf spring U-bolt |

Removal

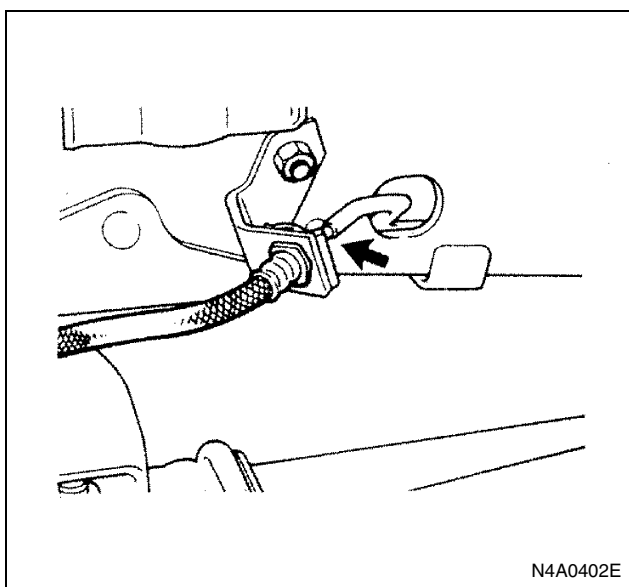
Preparation:

Jack up and support the vehicle on stands.

1. Wheel and Tire
2. Shock Absorber
Remove lower side of shock absorber.



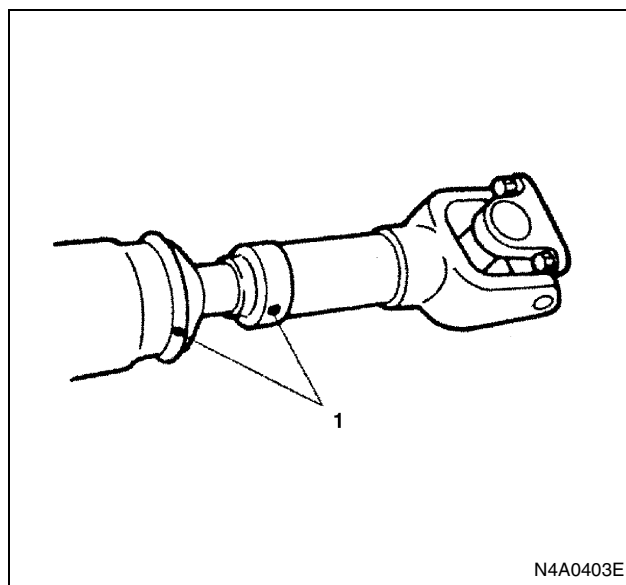
3. Drag Link
Remove the drag link (on the knuckle arm side).
4. Tie Rod Assembly
Remove the tie rod assembly (with relay lever attached). Refer to STEERING LINKAGE (4 × 4 Model) in section 3B.
5. Brake Flexible Hose
Remove a clip on the brake hose bracket.
After the hose is disconnected, prevent brake fluid running out and invasion of foreign matters.



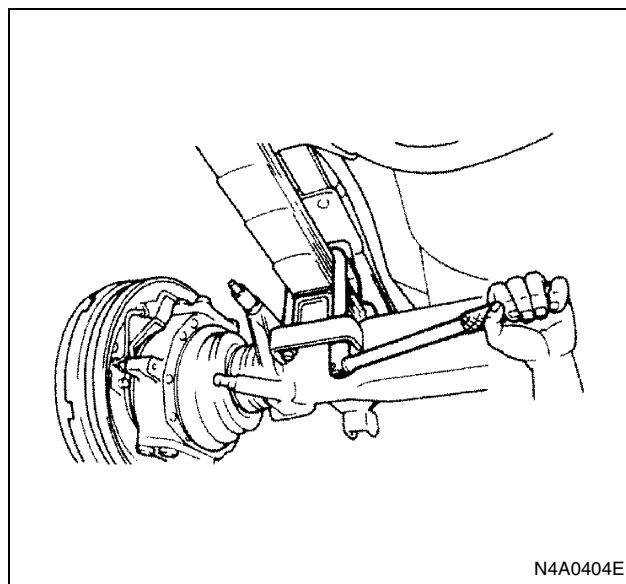
6. Stabilizer Assembly
Refer to STABILIZER in section 3C.
7. Front Propeller Shaft

Draw setting marks (1) on the front and rear flanges.

Also, draw setting marks as shown if the propeller shaft is removed at the spline yoke.



8. Leaf Spring U-Bolt
 - 1) Put jack under the center part of front axle then remove the U-bolts.
 - 2) Lower the front axle assembly and roll out toward the front of vehicle.
Use care so as not to cause damage to brake hose, back plate and front axle tube end boot.



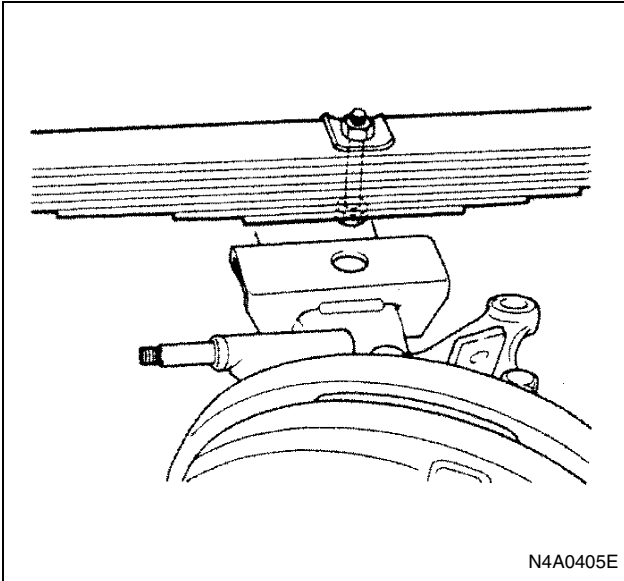
9. Front Axle Assembly

Installation

1. Front Axle Assembly
2. Leaf Spring U-Bolt
Align a hole in the center of spring seat in the front axle case with the center bolt of leaf spring, and tighten the leaf spring U-bolt.

Tighten:

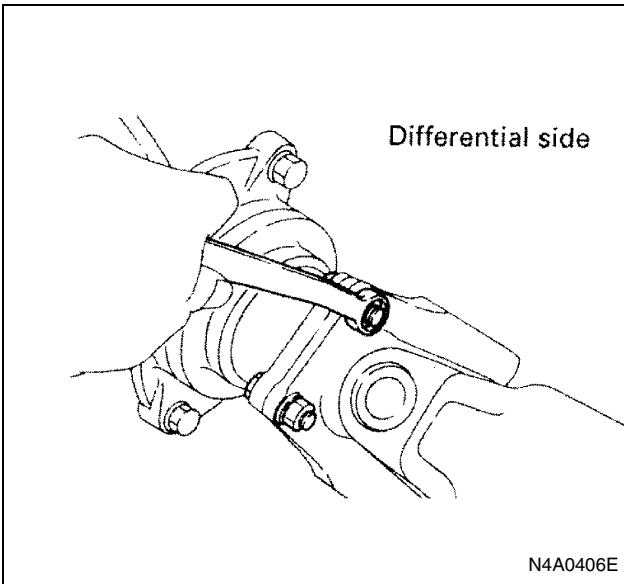
U-bolt nut to 126 N·m (12.9 kg·m / 93 lb·ft)



3. Front Propeller Shaft

Tighten:

Front propeller shaft bolt to 103 N·m (10.5 kg·m / 76 lb·ft)



4. Stabilizer Assembly

1) Refer to STABILIZER.

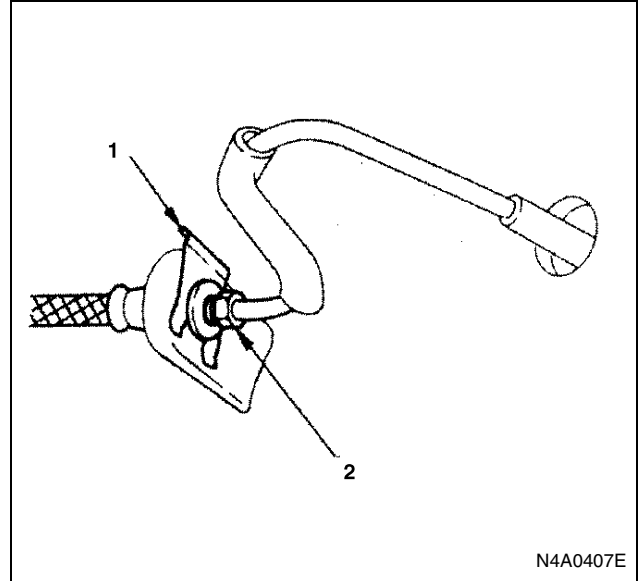
5. Brake Flexible Hose

Set first the wheels in the straight going position, then attach the flexible hose to the bracket without torsion using a clip (1).

Connect the pipe, then tighten the nut (2) to the specified torque.

Tighten:

Brake flexible nut to 16 N·m (1.6 kg·m / 12 lb·ft)



Perform bleeding operation after installation of the brake flexible hoses.

Refer to "Service information" for brake fluid air bleeding procedure.

6. Tie Rod Assembly

Refer to STEERING LINKAGE (4 × 4 Model).

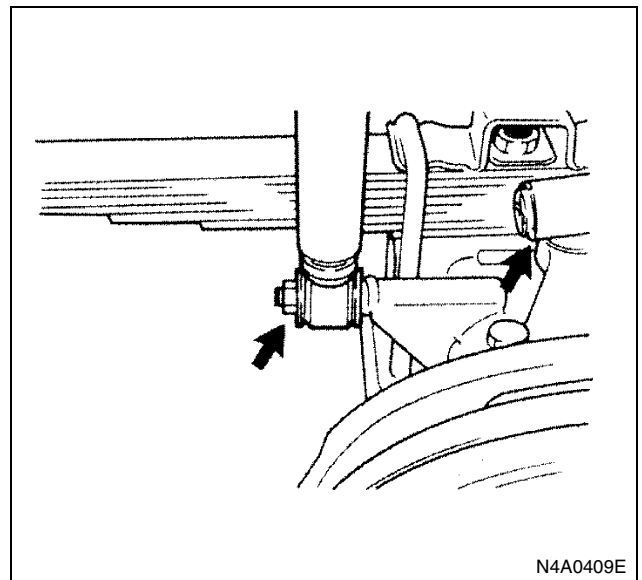
7. Drag Link

Refer to STEERING LINKAGE (4 × 4 Model).

8. Shock Absorber

Tighten:

Shock absorber under side nut to 95 N·m (9.7 kg·m / 70 lb·ft)



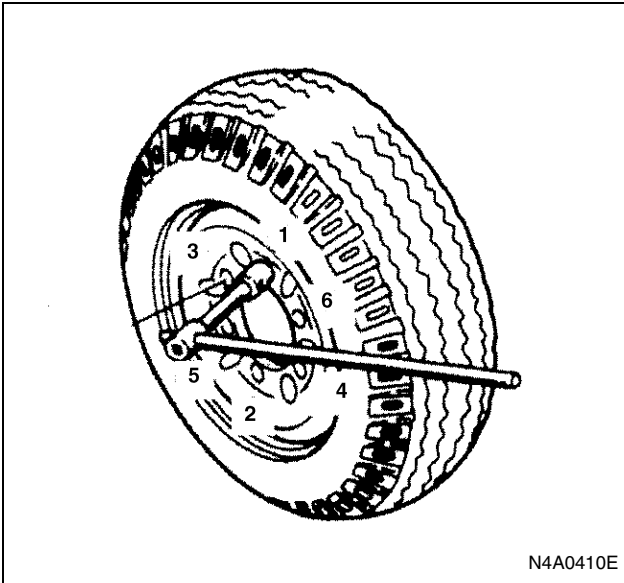
9. Wheel and Tire

Tighten:

Wheel nut to 441 N·m (45 kg·m / 325 lb·ft)

4C-64 FRONT AXLE

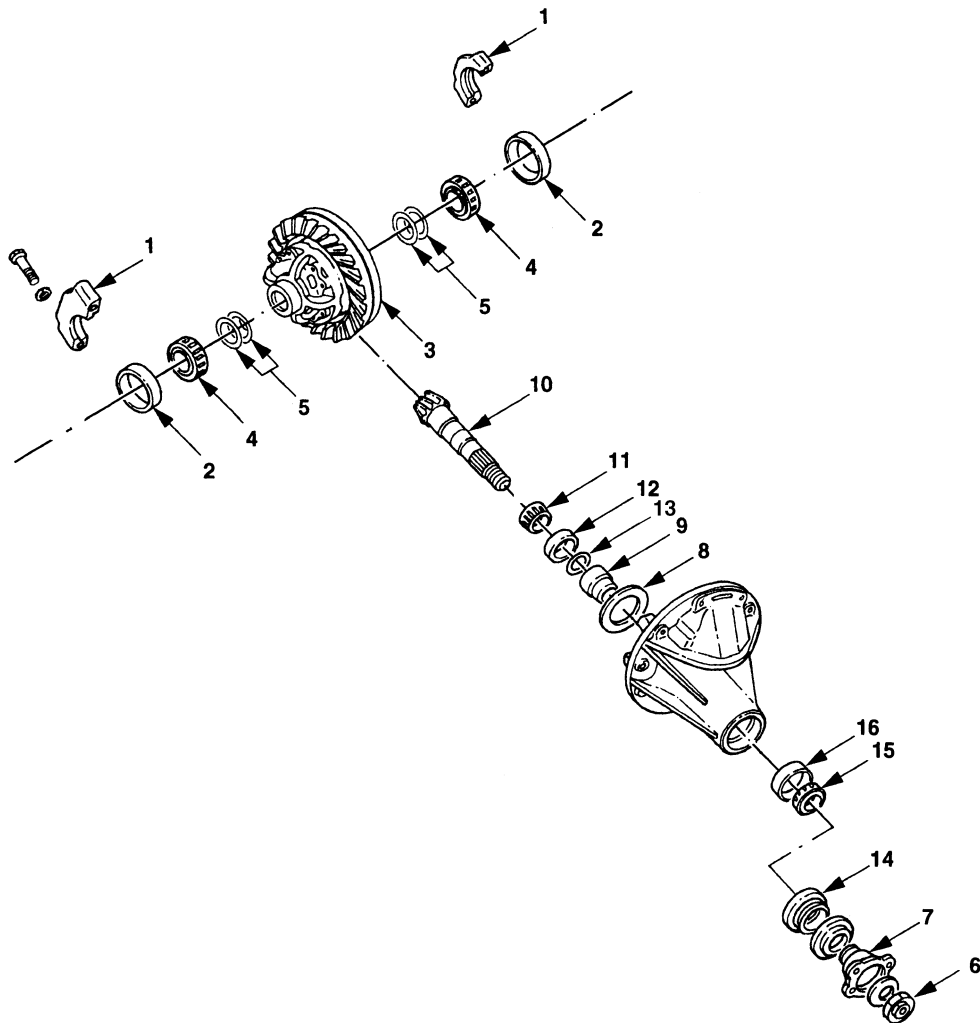
6 studs



UNIT REPAIR

Front Differential

Major Components



N4A0411E

Legend

- | | |
|--|---------------------------------|
| 1. Bearing cap | 9. Distance piece |
| 2. Side bearing outer race | 10. Drive pinion |
| 3. Differential cage assembly | 11. Inner bearing inner race |
| 4. Side bearing inner race | 12. Inner bearing outer race |
| 5. Backlash and preload adjusting shim | 13. Pinion depth adjusting shim |
| 6. Flange nut | 14. Oil seal |
| 7. Flange | 15. Outer bearing inner race |
| 8. Bearing preload adjusting shim | 16. Outer bearing outer race |

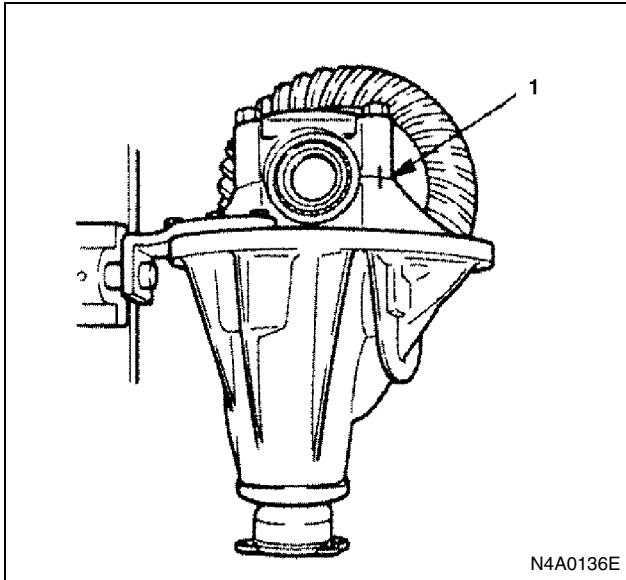
Disassembly

1. Bearing Cap

Set the differential assembly onto a special fixture.
Apply a setting mark (1) to the side bearing cap and differential carrier.

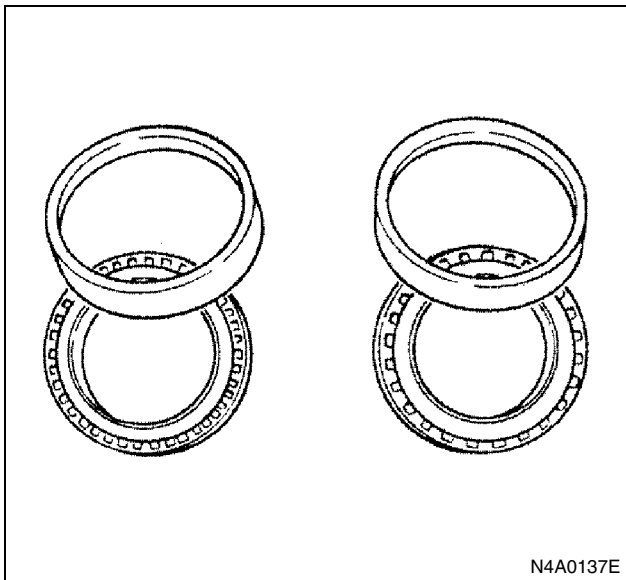
Fixture: 5-8840-2029-0

Base: 5-8840-0003-0



2. Side Bearing Outer Race

After removal, keep right and left side bearing assemblies separate to maintain inner and outer race combinations.



3. Differential Cage Assembly

4. Side Bearing Inner Race

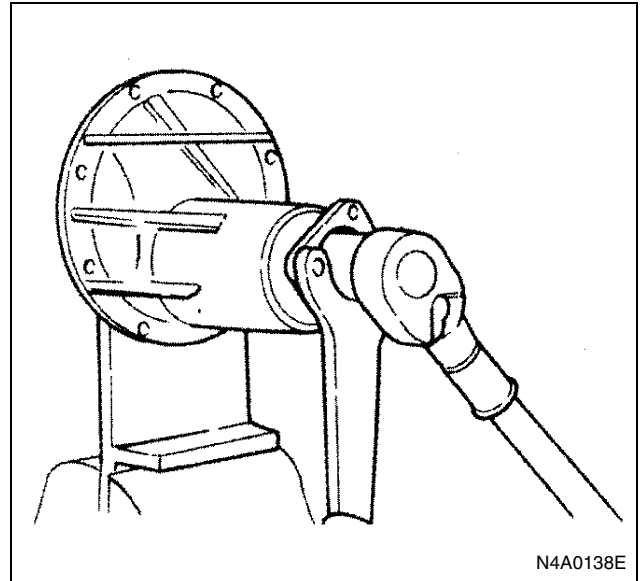
Remover: 9-8521-0061-0

Adapter: 5-8840-2031-0

5. Backlash and Preload Adjusting Shim

6. Flange Nut

Holding wrench: 9-8511-1507-0



7. Flange

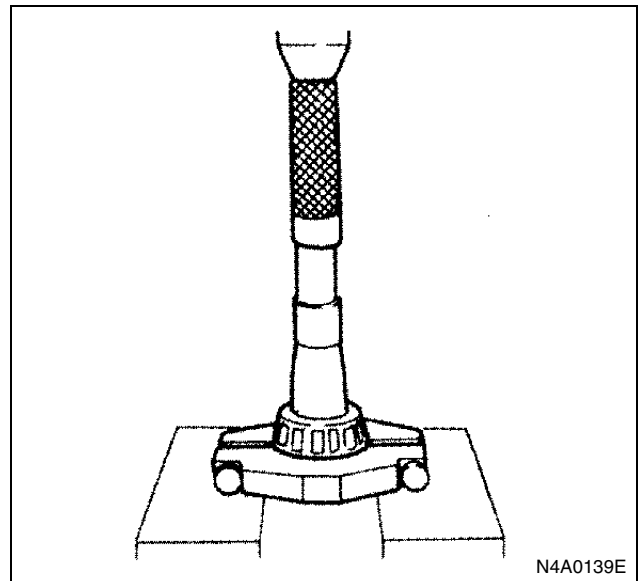
8. Bearing Preload Adjust Shim

9. Distance Piece

10. Drive Pinion

11. Inner Bearing Inner Race

Remover: 5-8840-0015-0



12. Inner Bearing Outer Race

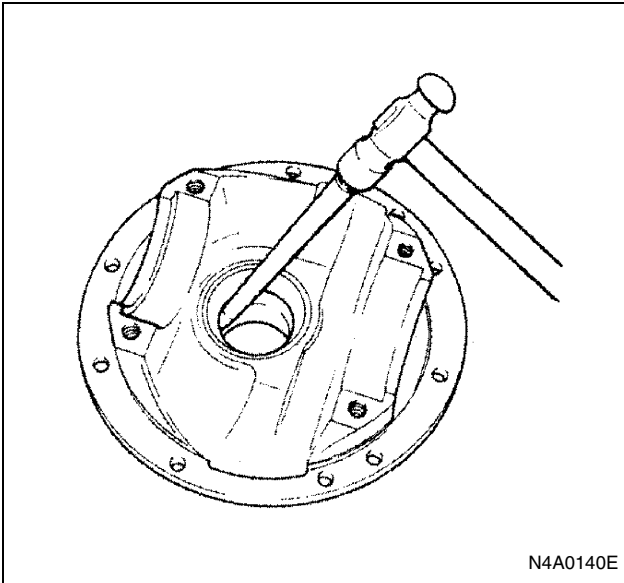
13. Pinion Depth Adjusting Shim

14. Oil Seal

15. Outer Bearing Inner Race

16. Outer Bearing Outer Race

Drive out the inner bearing outer race or the outer bearing outer race together with the outer bearing inner race and oil seal by using a proper bar through two notches.



REASSEMBLY

Measurement of ring gear run-out.

Install dummy bearing into the differential assembly, then install these parts in the differential carrier. Install and tighten the bearing cap.

Dummy bearing: 9-8522-1137-0

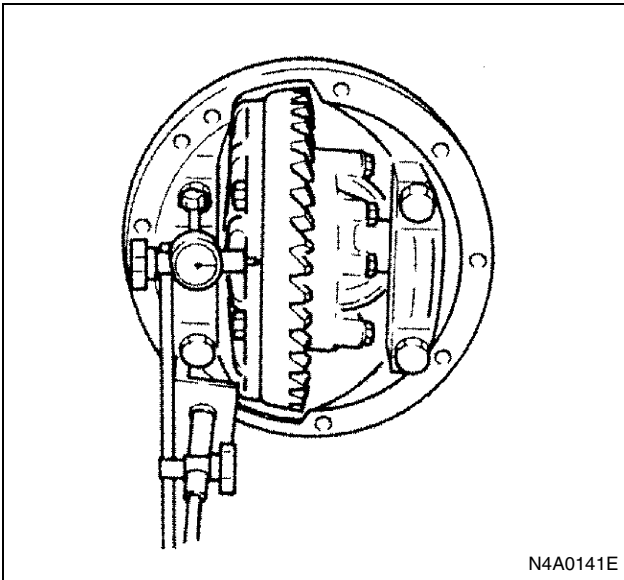
Tighten:

Bearing cap bolt to 108 N·m (11.0 kg·m / 80 lb·ft)

Ring gear run-out,

Standard: 0.05 mm (0.002 in)

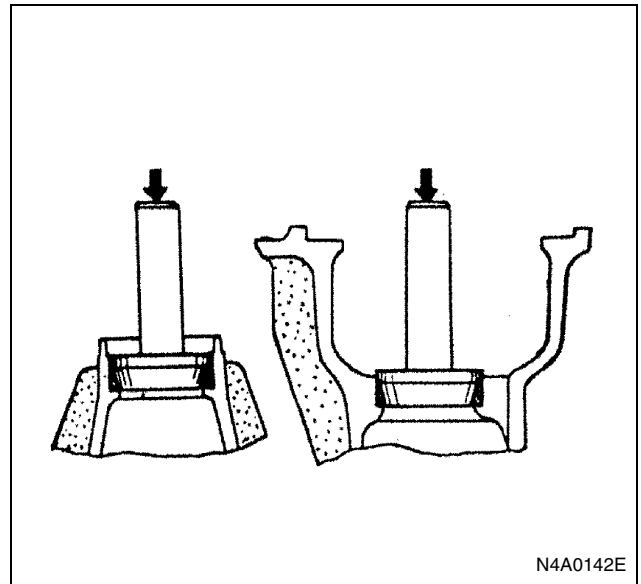
Limit: 0.2 mm (0.008 in)



1. Outer Bearing Outer Race
 2. Pinion Depth Adjusting Shim
 3. Inner Bearing Outer Races
- Adjustment of drive pinion engagement depth.
- Install the inner and outer bearing outer races with-out shims into the differential carrier using a bench press.
- Installer (Inner): 9-8522-1196-0

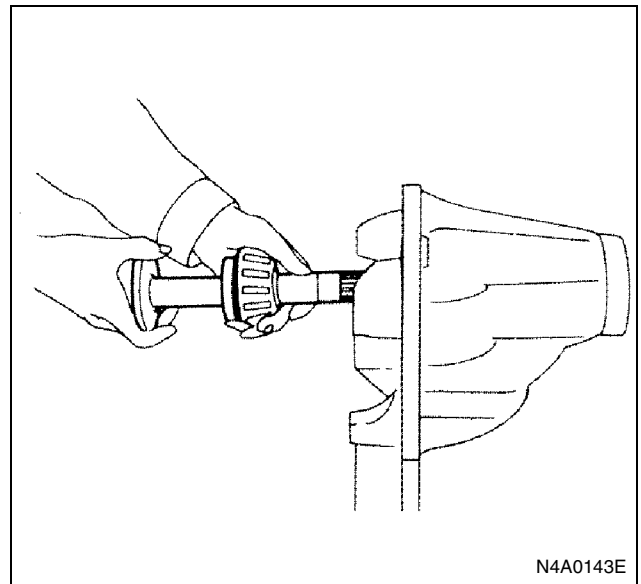
(Outer): 9-8522-1197-0

Grip: 9-8522-1148-0



Assemble the inner bearing inner race to the dummy pinion shaft, then install these parts into the carrier.

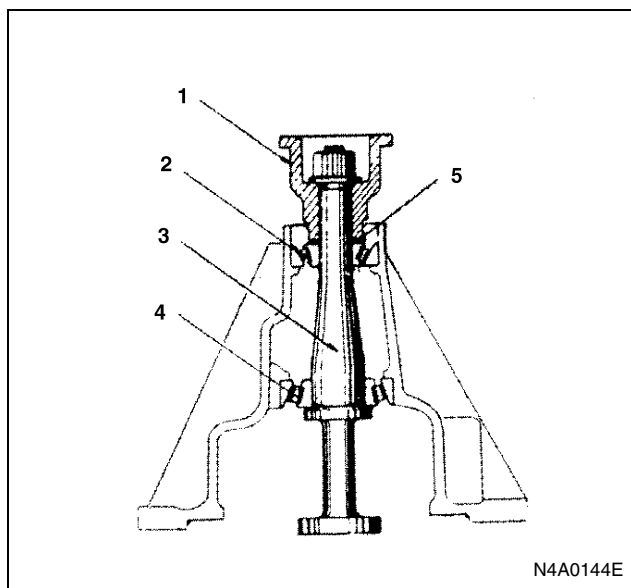
Dummy Pinion Shaft: 9-8522-1603-0



Install the outer bearing inner race flange, washer and dummy nut.

Lubricate the bearing before tighten the dummy nut.

Dummy Nut: 9-8522-1624-0



Legend

1. Coupling driver
2. Outer bearing
3. Dummy pinion shaft
4. Inner bearing
5. Shim

Tighten the dummy nut until specified preload are required to rotate the bearing.

Bearing preload,

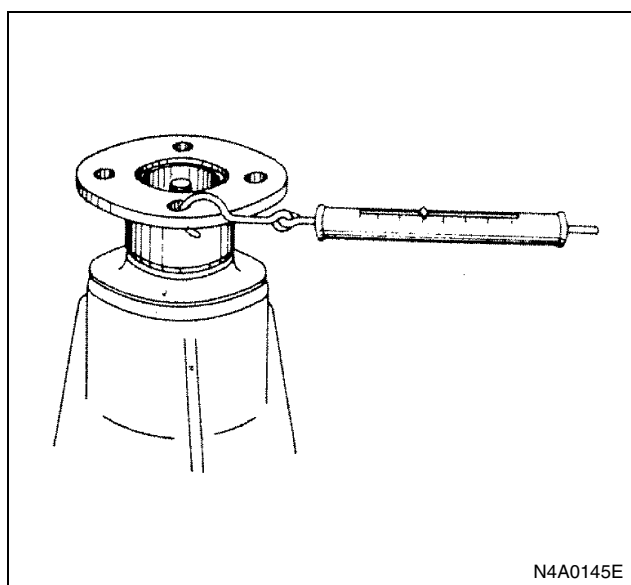
New bearing: 16 — 29 N (1.6 — 3.0 kg / 3.5 — 6.6 lb)

Used bearing: 8 — 14.5 N (0.8 — 1.5 kg / 1.8 — 3.3 lb)

Tighten:

Bearing starting to

- New bearing: 0.69 — 1.27 N·m (7.0 — 13.0 kg·cm / 6.1 — 11.3 lb·in)
- Used bearing: 0.35 — 0.64 N·m (3.5 — 6.5 kg·cm / 3.1 — 5.7 lb·in)



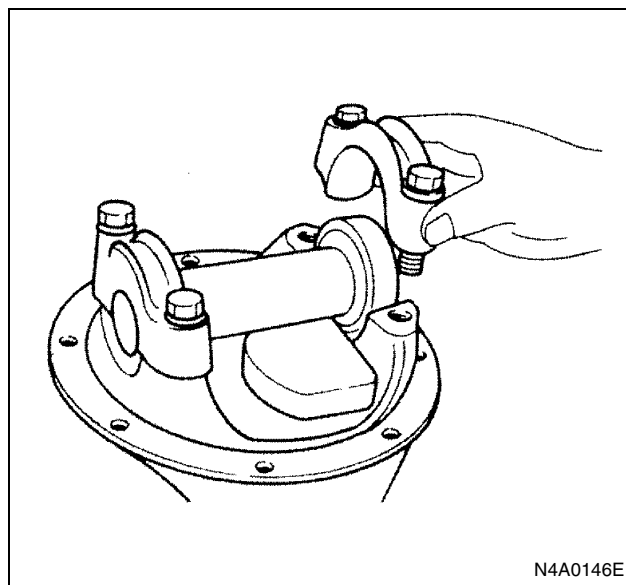
Install dummy bearing on dummy shaft and install these parts into the carrier. Install and tighten the bearing cap.

Dummy Shaft: 9-8522-1138-0

Dummy Bearing: 9-8522-1137-0

Tighten:

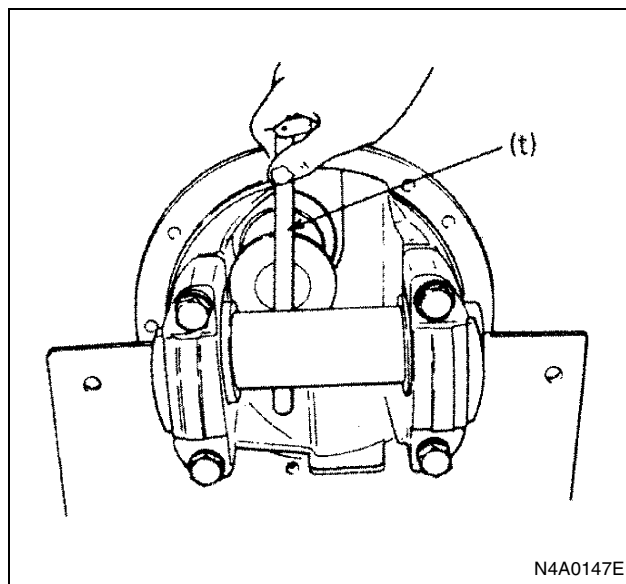
Bearing cap bolt to 108 N·m (11.0 kg·m / 80 lb·ft)



Measure the clearance (t) with a feeler gauge.

The clearance (t) is equal to the shim in thickness.

Thickness of shim available: 2.12, 2.16 ... 2.52, 2.56 mm (0.083, 0.085 ... 0.099, 0.100 in)

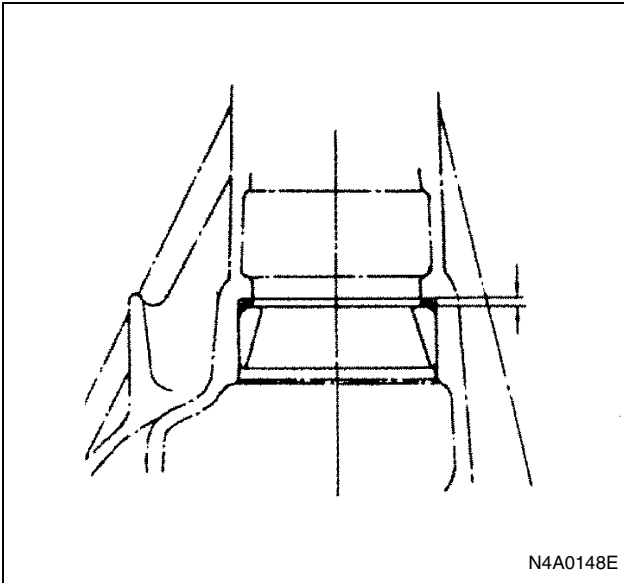


Remove dummy pinion, dummy shaft, dummy bearing and inner bearing outer race.

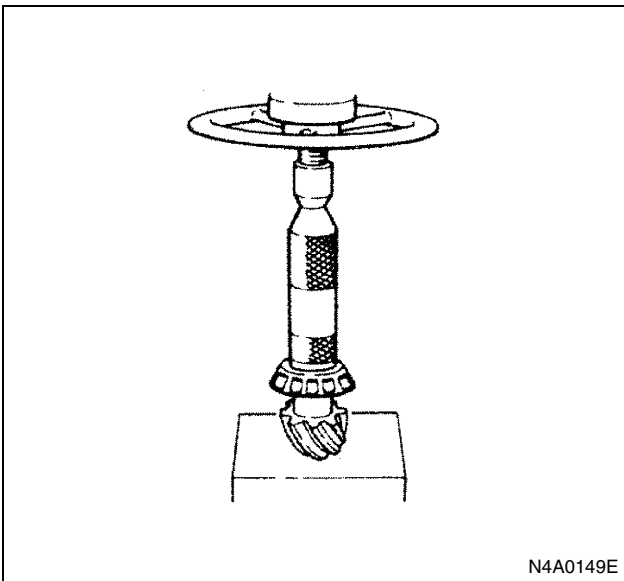
Install pinion depth adjusting shim of specified thickness in position between the inner bearing outer race and the carrier, then install the inner bearing outer race.

Installer: 9-8522-1196-0

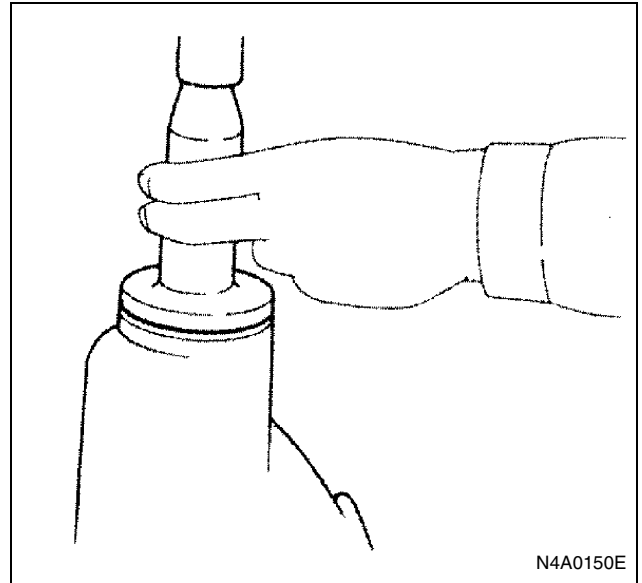
Grip: 9-8522-1148-0



4. Inner Bearing Inner Race
 Installer: 9-8522-0018-0
 Apply gear oil to the pinion shaft before installing final drive pinion assembly into carrier.



5. Outer Bearing Inner Race
 6. Oil Seal
 Installer: 5-8840-2047-0



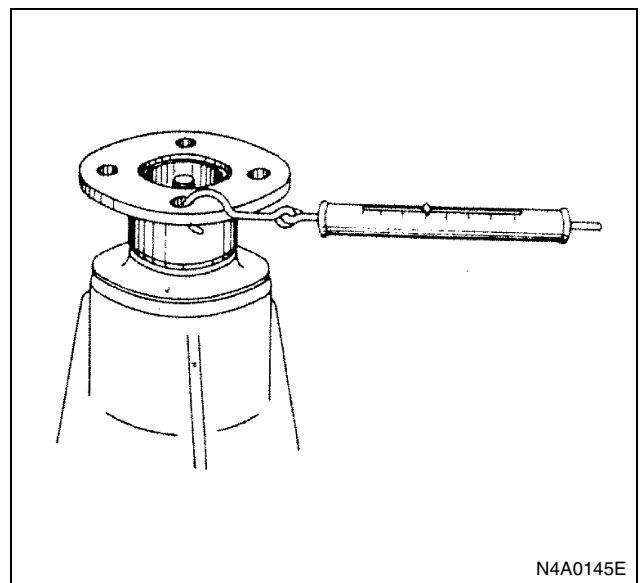
7. Drive Pinion
 8. Distance Piece (NKR model)
 9. Bearing Preload Adjusting Shim
 Use a dummy nut until specified bearing preload is obtained.

Bearing preload,
 New bearing: 16 — 29 N (1.6 — 3.0 kg / 3.5 — 6.6 lb)
 Used bearing: 8 — 14.5 N (0.8 — 1.5 kg / 1.8 — 3.3 lb)

Tighten:

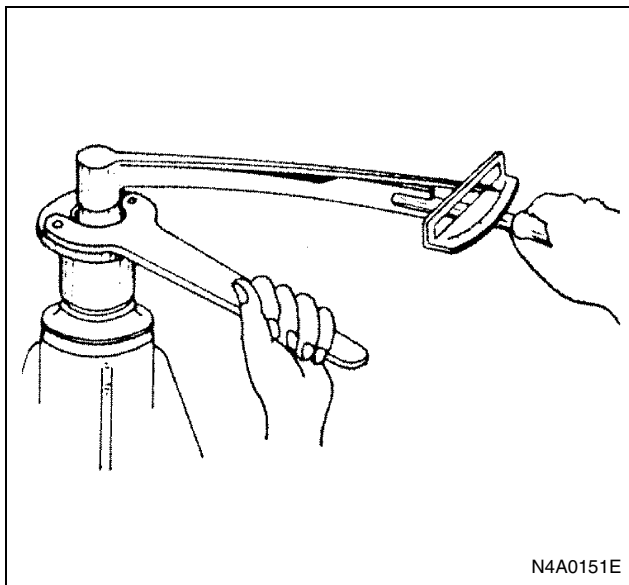
Bearing starting to

- New bearing: 0.69 — 1.27 N·m (7.0 — 13.0 kg·cm / 6.1 — 11.3 lb·in)
- Used bearing: 0.35 — 0.64 N·m (3.5 — 6.5 kg·cm / 3.1 — 5.7 lb·in)



Tighten:

Dummy nut to 270 N·m (27.5 kg·m / 199 lb·ft)



Thickness of shim available: 1.53, 1.56 ... 2.07, 2.10 mm (0.060, 0.061 ... 0.081, 0.082 in)

10. Flange

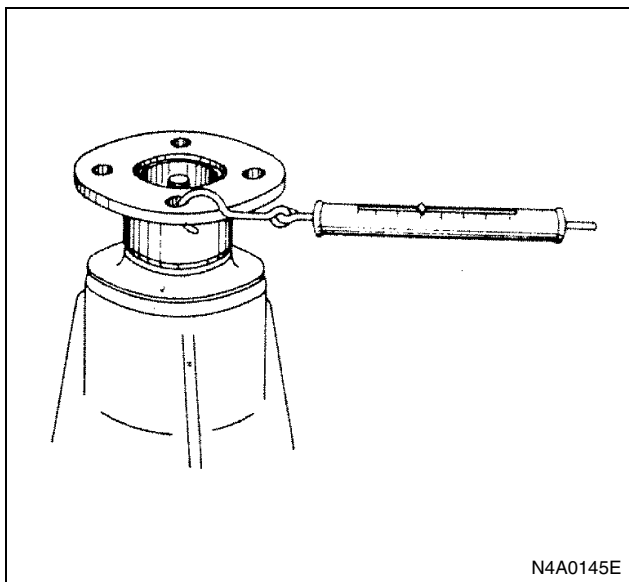
11. Flange Nut

Once specified bearing preload is obtained by dummy nut, remove dummy nut and replace with flange nut.

Tighten the flange nut until specified bearing preload and nut torque.

Using special tool, stake the flange nut at two points.

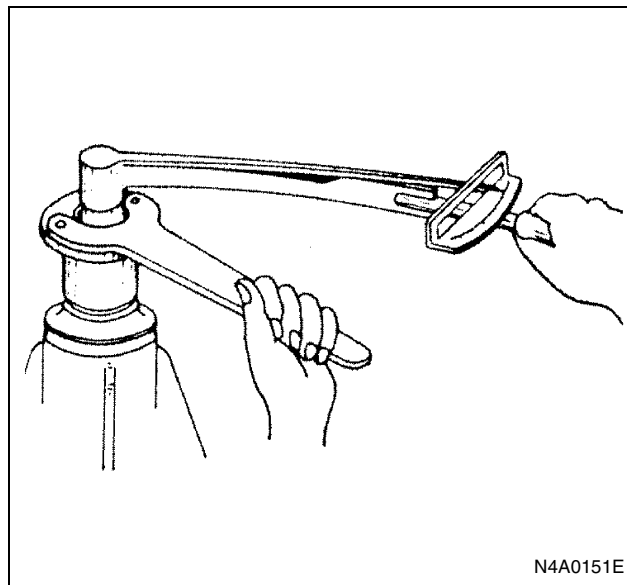
Punch: 5-8840-2293-0



12. Backlash and Preload Adjusting Shim

1) Adjustment of Backlash

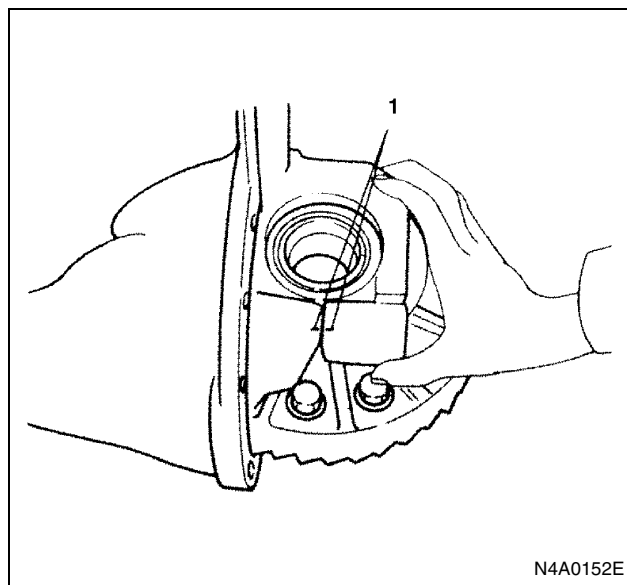
- Install dummy bearing in the differential cage assembly, then install differential cage assembly and ring gear into the differential carrier.



Install the bearing caps after checking to make certain setting marks (1) applied at disassembly are in alignment.

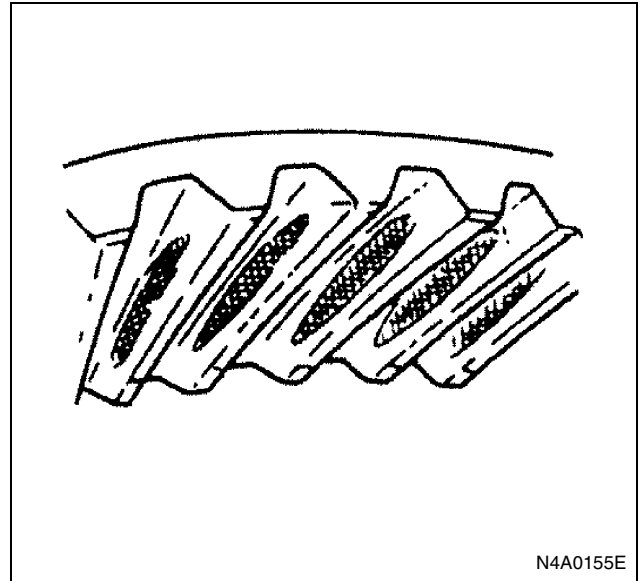
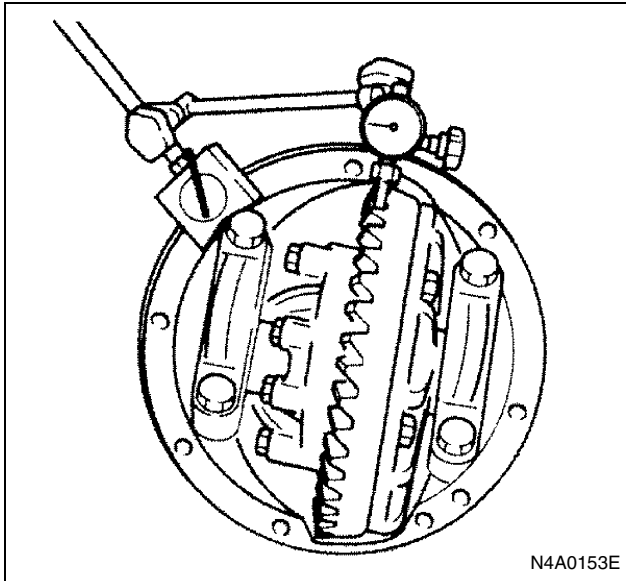
Tighten:

Bearing cap bolt to 108 N·m (11.0 kg·m / 80 lb·ft)

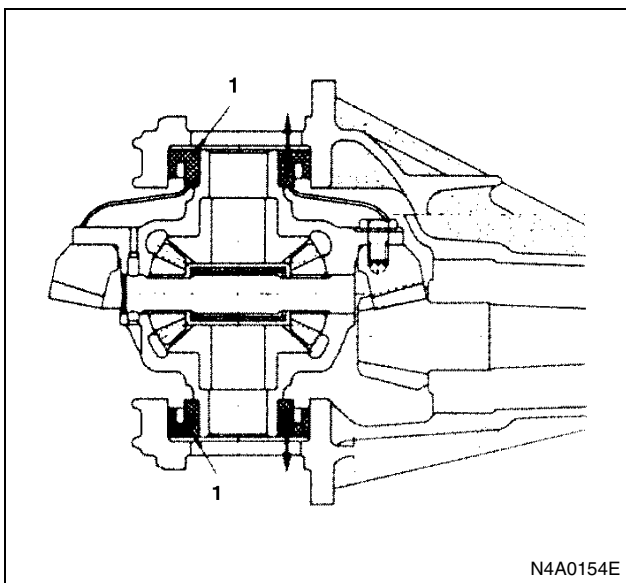


- Set the dial indicator and measure the backlash between the drive pinion and ring gear at the foot portion of the ring gear.

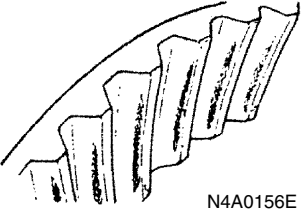
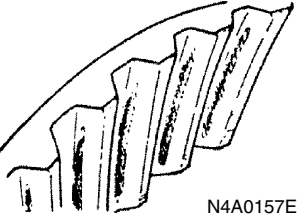
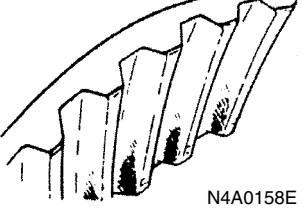
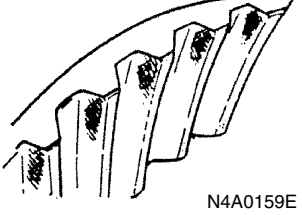
Backlash: 0.15 — 0.20 mm (0.006 — 0.008 in)



- To adjust backlash, loosen bearing cap bolts slightly and move the dummy bearing (1) as necessary.
A clearance should not be provided between dummy bearing and bearing fitting face of the differential cage.

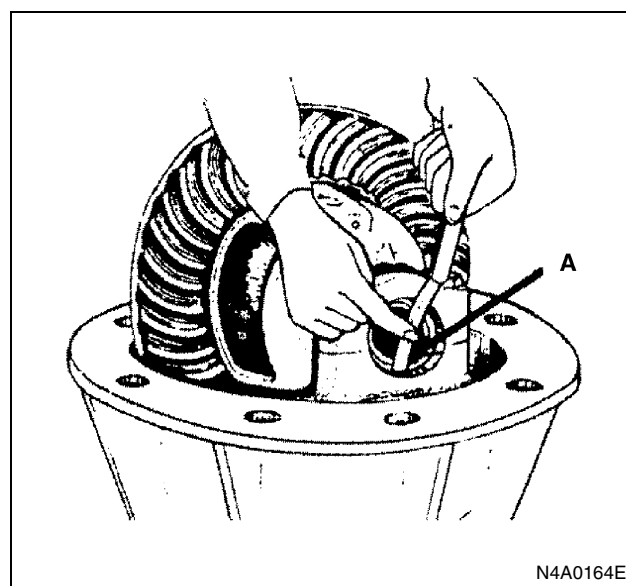


- 2) Inspection of drive pinion and ring gear tooth contact.
 - Apply a thin coat of red check to faces of the 7 — 8 teeth of the ring gear.
 - Check the impression of contact obtained on the ring gear teeth and make necessary adjustment as described below if the contact is abnormal.

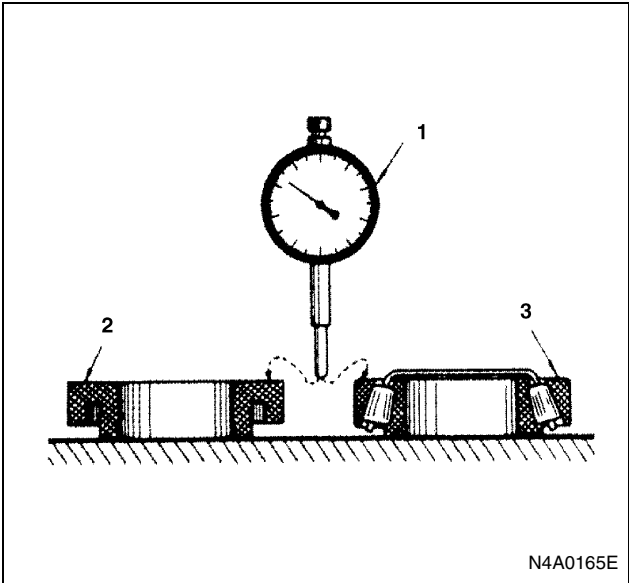
TOOTH CONTACT	CASE	ADJUSTMENT PROCEDURE
 N4A0156E	Drive pinion is too far away from ring gear.	1. Move the drive pinion in toward the ring gear by decreasing the thickness of pinion depth adjusting shims. 2. Adjust the backlash by moving ring gear away from the drive pinion.  N4A0160E
 N4A0157E	Drive pinion is too close to the ring gear.	1. Move the drive pinion away from the ring gear by increasing thickness of pinion depth adjusting shims. 2. Adjust the backlash by moving ring gear in toward the drive pinion.  N4A0161E
 N4A0158E	Ring gear is too close to the drive pinion.	1. Move the drive pinion in toward the ring gear by decreasing thickness of pinion depth adjusting shims. 2. Adjust the backlash by moving ring gear away from the drive pinion.  N4A0162E
 N4A0159E	Ring gear is too far away from drive pinion.	1. Move the drive pinion away from the ring gear by increasing thickness of pinion depth adjusting shims. 2. Adjust the backlash by moving ring gear in toward the drive pinion.  N4A0163E

3) Selection of Preload Adjusting Shim

- Measure the clearance between the differential carrier and right and left side (dummy) bearings by using a feeler gauge. Carefully note the relationship between the values obtained through measurement at each side and dummy bearings.



- Measure the thickness of dummy bearing and side bearing. Comparison should be made between the thicknesses of dummy bearing and side bearing installed in the same position.



N4A0165E

Legend

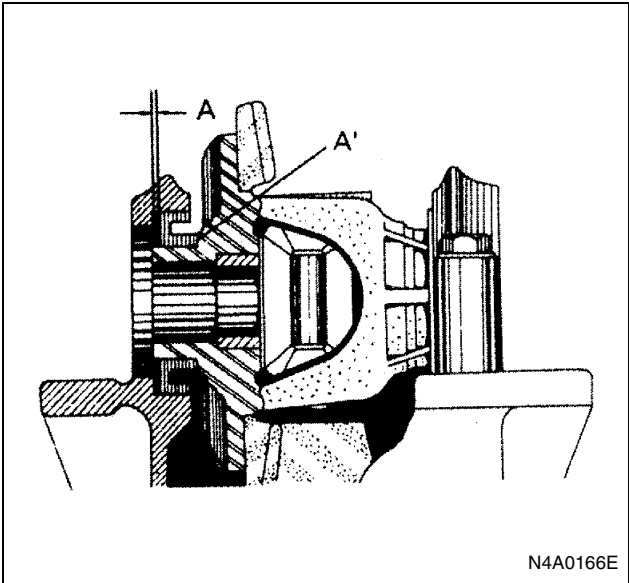
- 1. Dial gauge
- 2. Dummy bearing
- 3. Side bearing

When side bearing is thinner:
 $A + (\text{dummy bearing thickness} - \text{side bearing thickness}) = (X)$
When side bearing is thicker:
 $A - (\text{side bearing thickness} - \text{dummy bearing thickness}) = (X)$

- $(X) + 0.025 = \text{Shim thickness}$
Allowance for bearing preload at one side = 0.025
- Example of calculation

	mm (in.)
Measured Clearance A:	+0.85 (+0.033)
Suppose that the side bearing is thicker [thinner] than dummy bearing by 0.05 mm	-0.05 (-0.002) [+0.05 (+0.002)]
An allowance for bearing preload:	+0.025 (+0.0009)
Thickness of shims to be installed:	0.825 (0.032) [0.925 (0.036)]

Thickness of shim available: 0.25, 0.30, 0.35, 0.5 mm (0.009, 0.012, 0.014, 0.019 in)

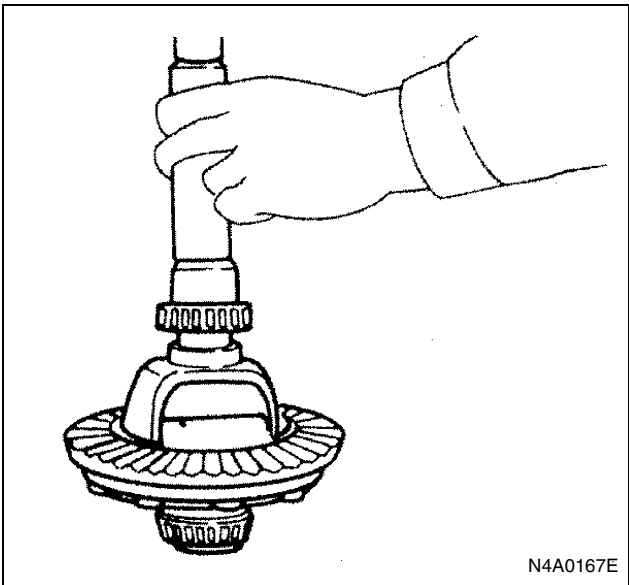


N4A0166E

Legend

- A. Measured clearance
- A'. Shim installed position

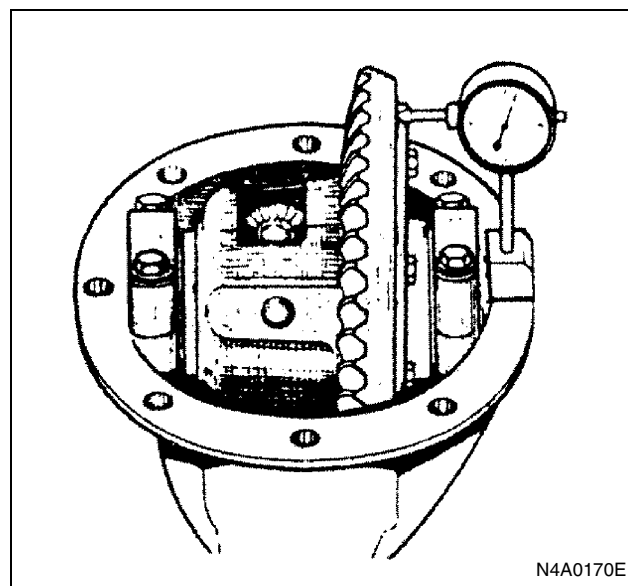
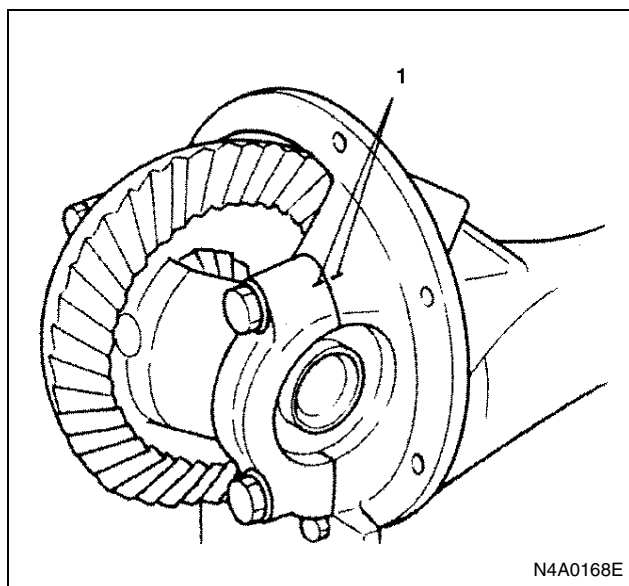
- 13. Side Bearing Inner Race
Installer: 5-8840-2050-0
Grip: 9-8522-1608-0



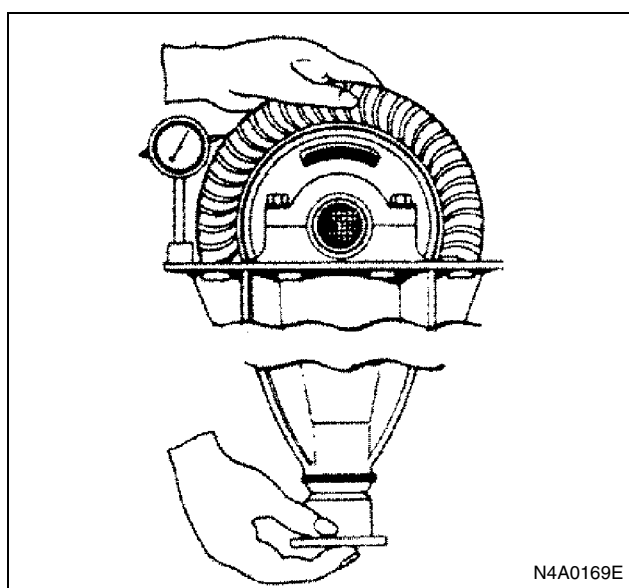
N4A0167E

- 14. Differential Cage Assembly and Ring Gear
- 15. Side Bearing Outer Race
- 16. Bearing Cap
 - 1) Install bearing caps by aligning setting marks (1) applied at disassembly.

Tighten:
Bearing cap bolt to 108 N·m (11.0 kg·m / 80 lb·ft)



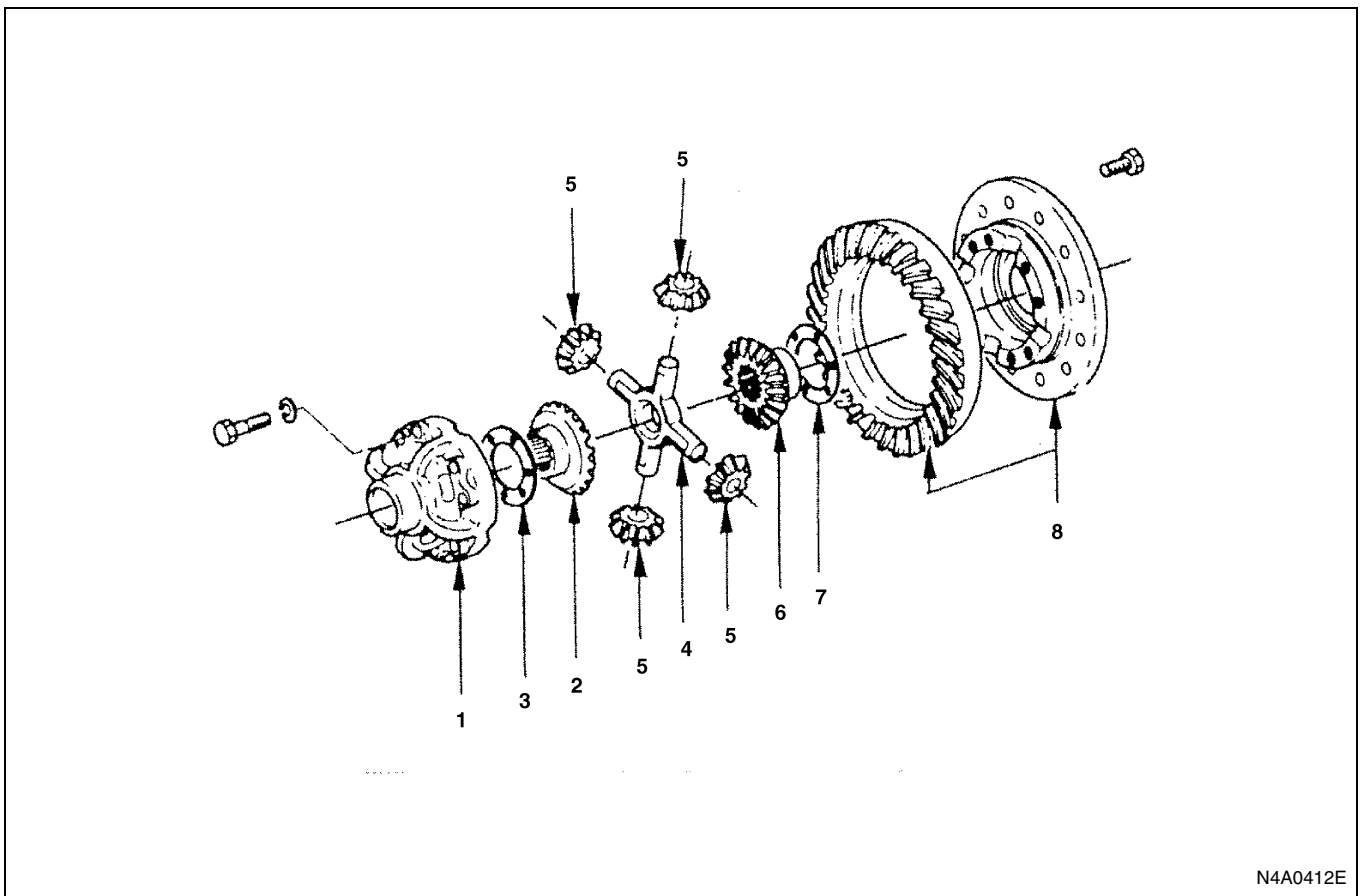
- 2) Recheck the backlash. If measurement indicates that the backlash deviates from the specified range, make an adjustment by shifting the position of shims in use without varying the total thickness.



Recheck the ring gear for run-out at the rear face.

If the amount of run-out is excessive, repeat the disassembly and reassembly steps.

Ring gear run-out,
Standard: 0.05 mm (0.002 in)
Limit: 0.2 mm (0.008 in)

Differential Cage Assembly

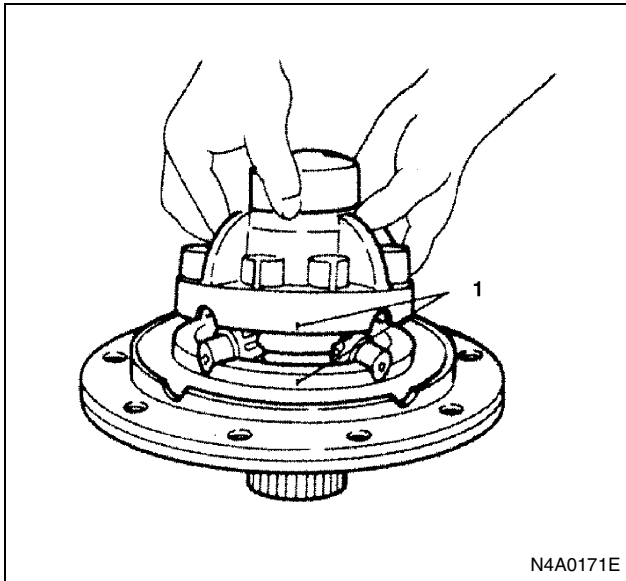
N4A0412E

Legend

- | | |
|------------------------|--------------------------------------|
| 1. Differential cage B | 5. Differential pinion |
| 2. Side gear | 6. Side gear |
| 3. Thrust washer | 7. Thrust washer |
| 4. Spider | 8. Differential cage A and ring gear |

Disassembly

1. Differential Cage B
Apply a setting mark (1) to the differential cage assembly.



2. Side Gear
3. Thrust Washer
4. Spider
5. Differential Pinion
6. Side Gear
7. Thrust Washer
8. Differential Cage A and Ring Gear

Inspection and Repair

Make necessary correction or parts replacement if wear, damage or any other abnormal conditions are found through inspection.

Visual Check

Inspect the following parts for wear, damage or other abnormal conditions.

- Gear
- Bearing
- Oil seal
- Differential cage
- Drive pinion cage
- Parts organizing limited slip differential assembly

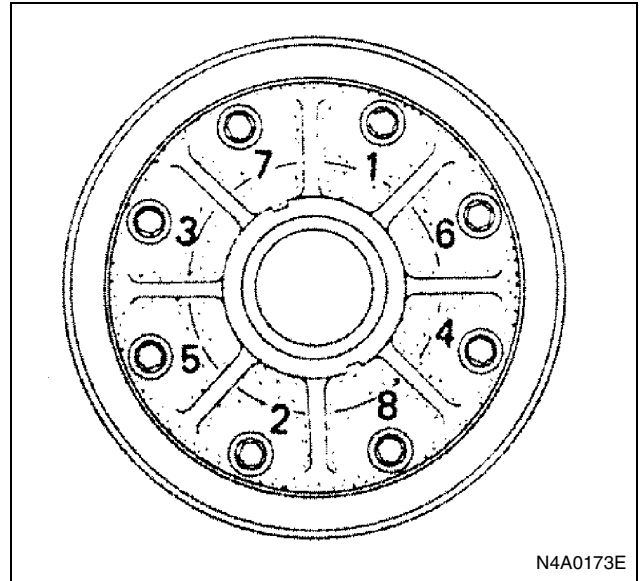
Ring Gear Replacement

The ring gear should always be replaced with drive pinion as a set.

When installing ring gear, apply stud lock to the threaded holes and bolts after treatment of the bolts with primer N.

Tighten:

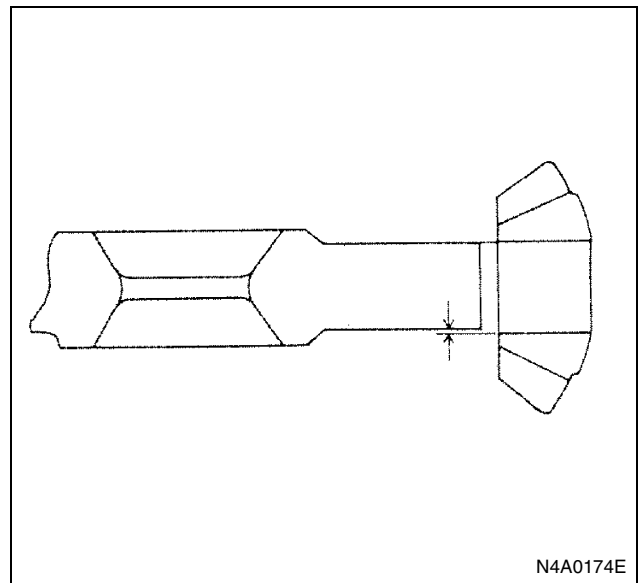
Ring gear bolt to 127 N·m (13.0 kg·m / 94 lb·ft)



Clearance between Differential Pinion and Spider

Standard: 0.07 — 0.13 mm (0.003 — 0.005 in)

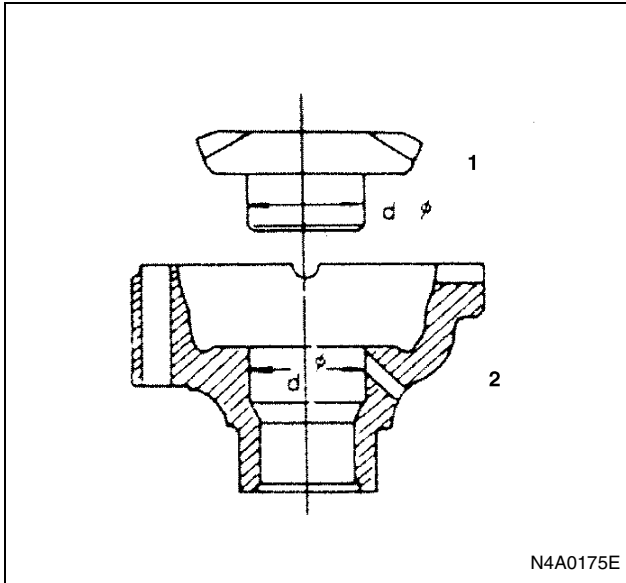
Limit: 0.2 mm (0.008 in)



Clearance between Side Gear and Differential Cage

Standard: 0.05 — 0.11 mm (0.002 — 0.004 in)

Limit: 0.25 mm (0.01 in)



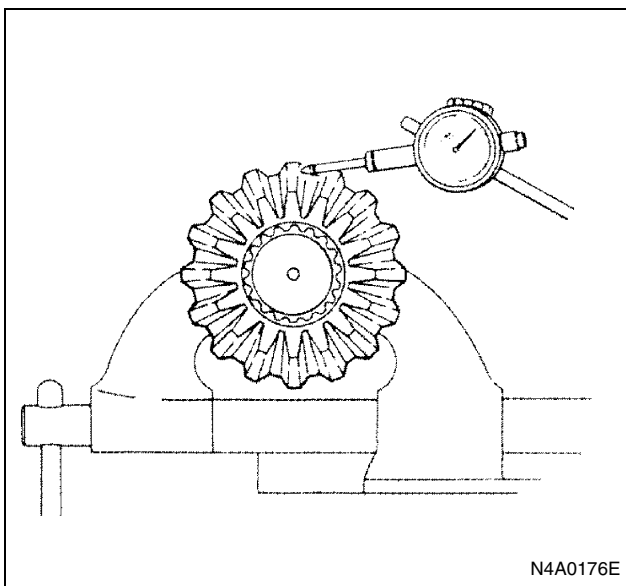
Legend

- 1. Side gear
- 2. Differential cage

Play in Splines between Side Gear and Axle Shaft

Standard: 0.02 — 0.12 mm (0.0008 — 0.005 in)

Limit: 0.25 mm (0.01 in)



Reassembly

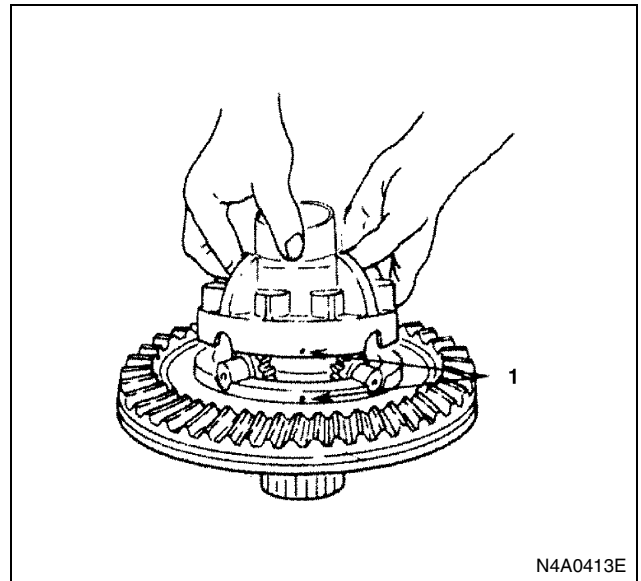
- 1. Differential Cage A and Ring Gear
- 2. Thrust Washer
- 3. Side Gear
- 4. Differential Pinion
- 5. Spider
- 6. Thrust Washer
- 7. Side Gear
- 8. Differential Cage B

- 1) Apply oil to the threaded portion of the bolts before installation.

- 2) Fasten the differential cages A and B so that the setting marks (1) are correctly aligned.

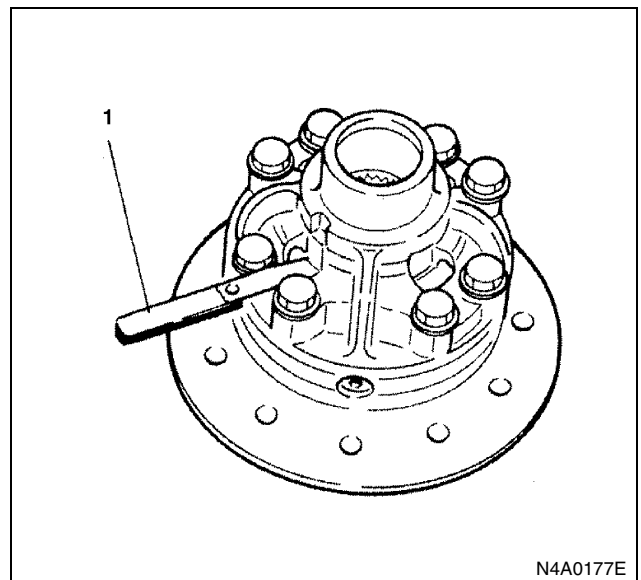
Tighten:

Differential cage bolt to 78 N·m (8.0 kg·m / 58 lb·ft)



- 3) Measure the clearance between the back face of the side gear and the differential cage B by inserting a feeler gauge (1) through the hole on the cage B.

Clearance: 0.13 — 0.18 mm (0.005 — 0.007 in)



When the clearance exceed a limit, replace the thrust washer or side gear.