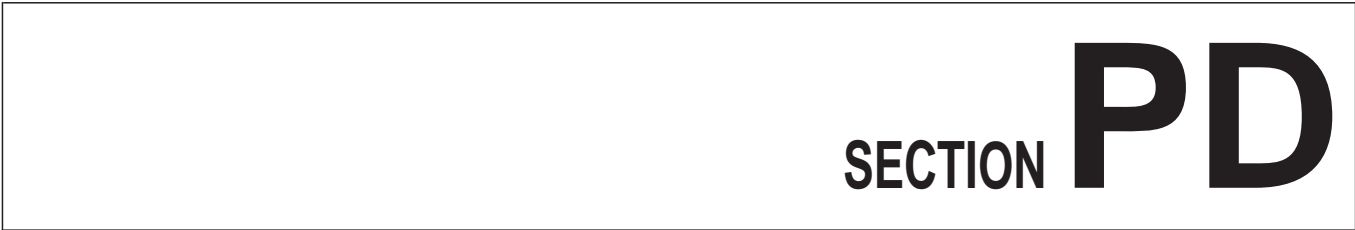


PROPELLER SHAFT & DIFFERENTIAL CARRIER



MODIFICATION NOTICE:

- Propeller shaft flange yoke has been changed.
- Rear final drive (C200) has been changed.
- Service data and specifications (SDS) have been changed.

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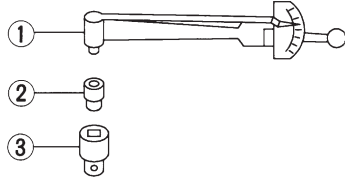
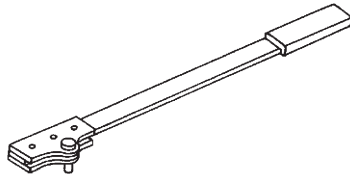
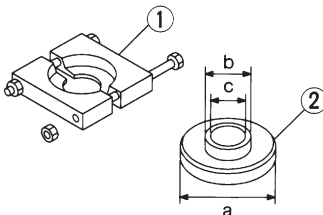
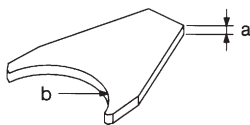
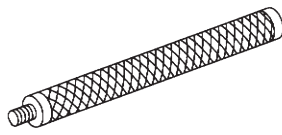
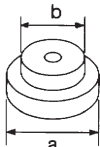
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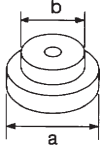
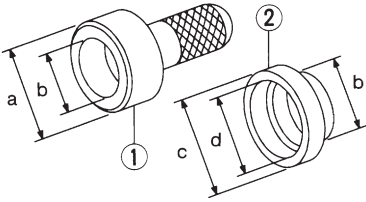
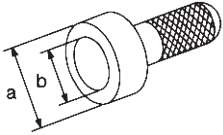
PREPARATION

Special Service Tools

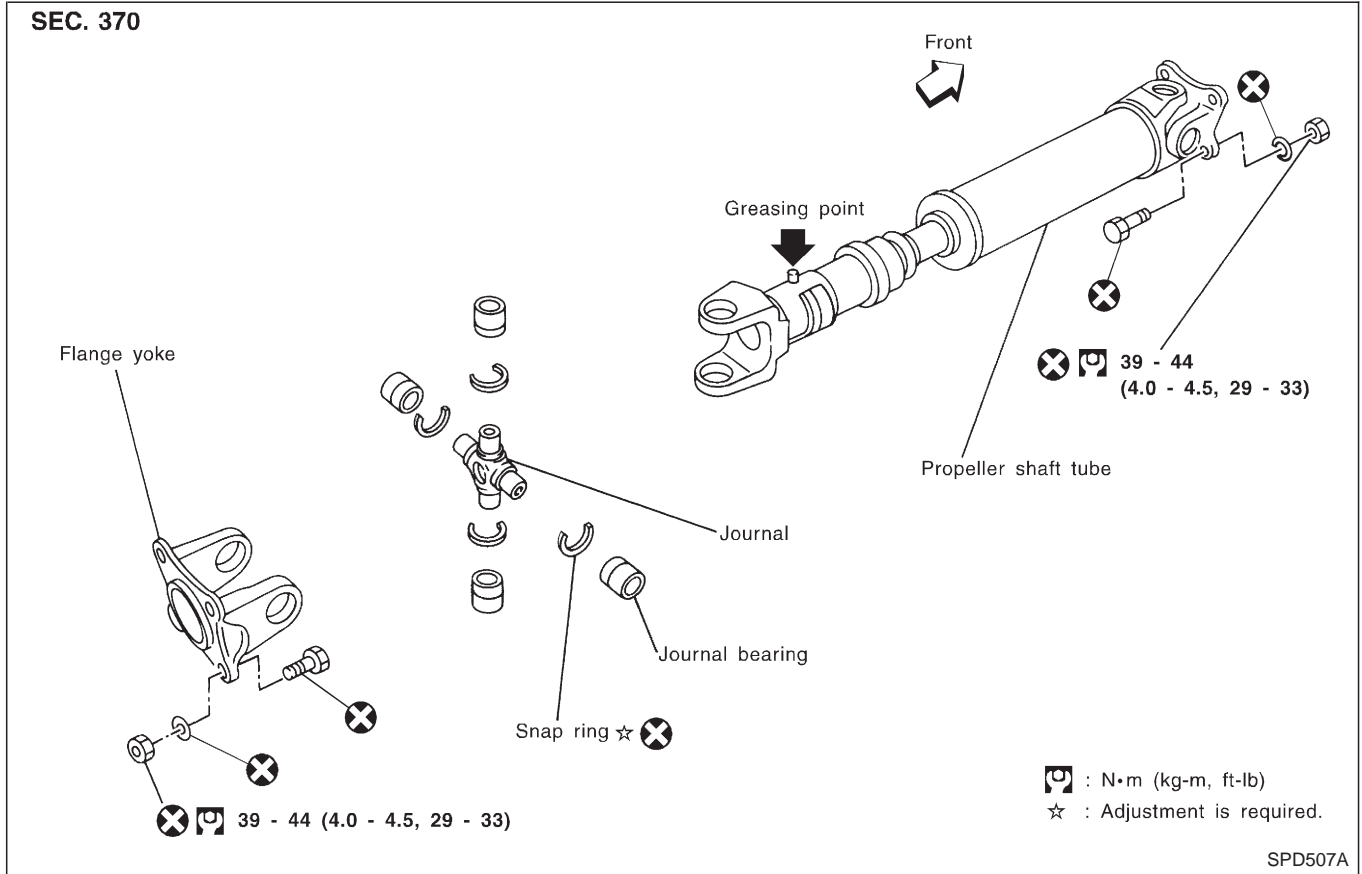
Tool number Tool name	Description	Unit appli- cation
ST3127S000 Preload gauge ① GG91030000 Torque wrench ② HT62940000 Socket adapter ③ HT62900000 Socket adapter	 <p>NT124</p>	Measuring pinion bearing preload and total preload X
KV38108300 Drive pinion flange wrench	 <p>NT771</p>	Removing and installing propeller shaft lock nut and drive pinion lock nut X
ST3090S000 Drive pinion rear inner race puller set ① ST30031000 Puller ② ST30901000 Base	 <p>NT527</p>	Removing and installing drive pinion rear inner cone (All) Removing rear wheel sensor rotor (C200) X a: 79 mm (3.11 in) dia. b: 45 mm (1.77 in) dia. c: 35 mm (1.38 in) dia.
KV38100600 Side bearing spacer drift	 <p>NT528</p>	Installing side bearing spacer X a: 8 mm (0.31 in) b: R42.5 mm (1.673 in)
ST30611000 Drift	 <p>NT090</p>	Installing pinion rear bearing outer race X
ST30621000 Drift	 <p>NT073</p>	Installing pinion rear bearing outer race X a: 79 mm (3.11 in) dia. b: 59 mm (2.32 in) dia.

PREPARATION

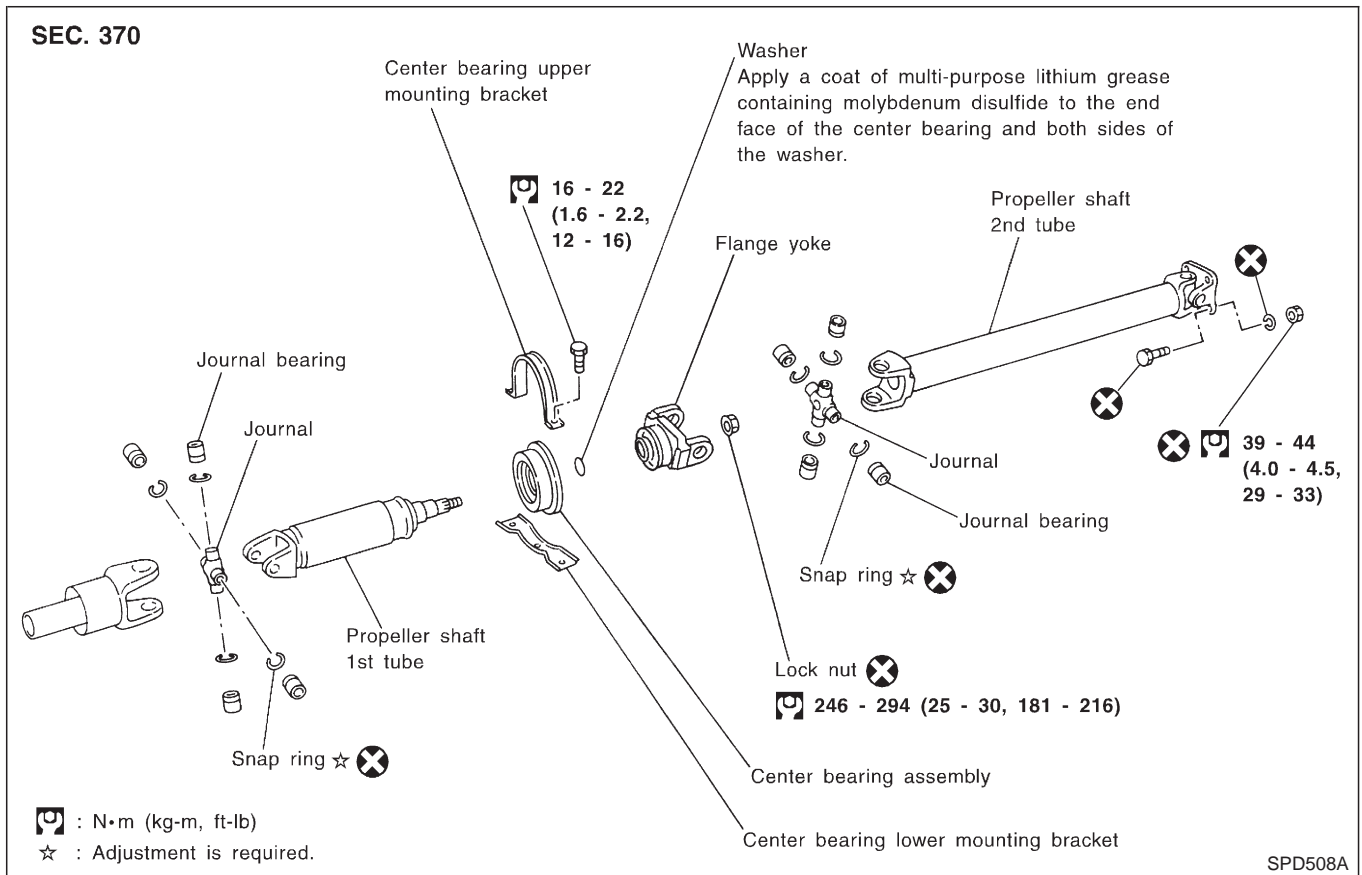
Special Service Tools (Cont'd)

Tool number Tool name	Description	Unit appli- cation
		C200
ST30613000 Drift	 <p style="text-align: center;">NT073</p>	Installing pinion front bearing outer race a: 72 mm (2.83 in) dia. b: 48 mm (1.89 in) dia. X
KV381025S0 Oil seal fitting tool ① ST30720000 Drift bar ② KV38102510 Drift	 <p style="text-align: center;">NT525</p>	Installing front oil seal (R180A, H233B) Installing rear wheel sensor rotor (C200) a: 77 mm (3.03 in) dia. b: 55 mm (2.17 in) dia. c: 71 mm (2.80 in) dia. d: 65 mm (2.56 in) dia. X
KV38100500 Gear carrier oil seal drift	 <p style="text-align: center;">NT115</p>	Installing front oil seal a: 85 mm (3.35 in) dia. b: 60 mm (2.36 in) dia. X

Front propeller shaft (Model 2F63H & 2F71H)

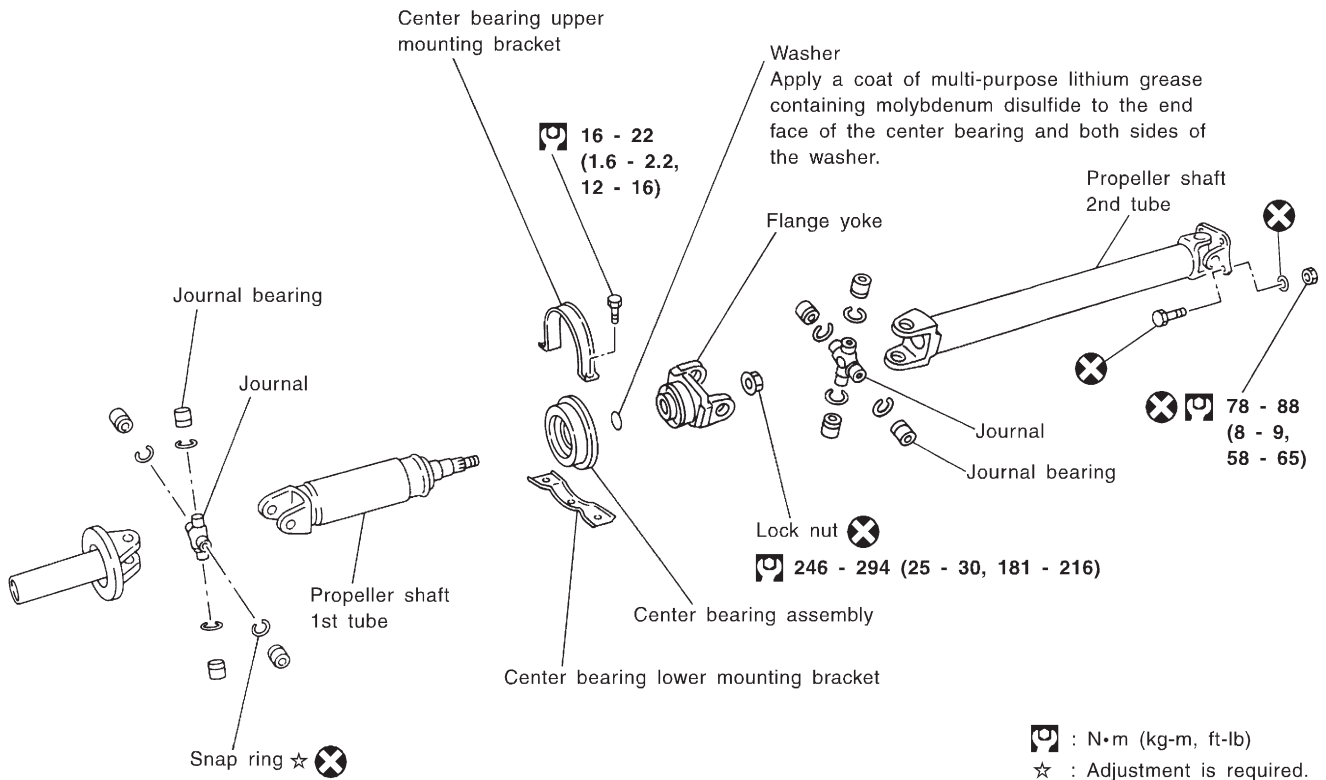


Rear propeller shaft (2WD models)

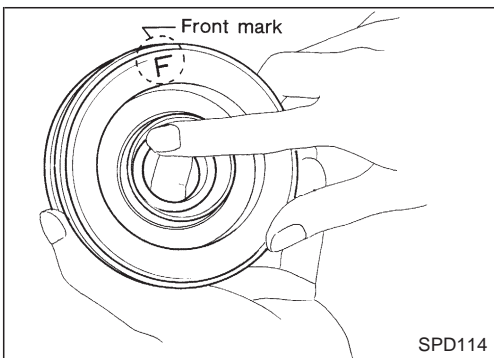
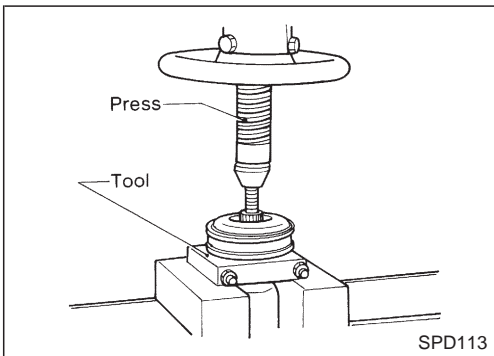
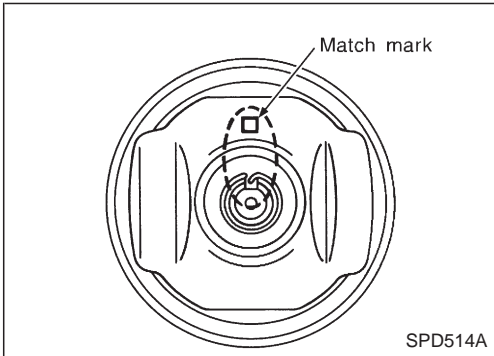
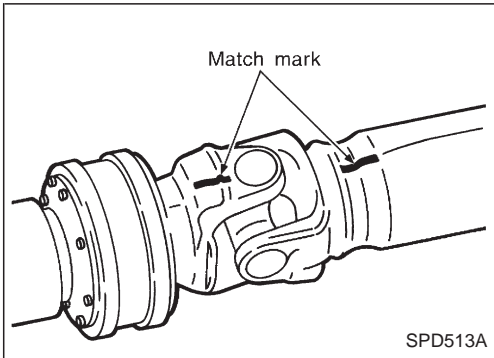


Rear propeller shaft (4WD models)

SEC. 370



SPD509A



Disassembly

CENTER BEARING

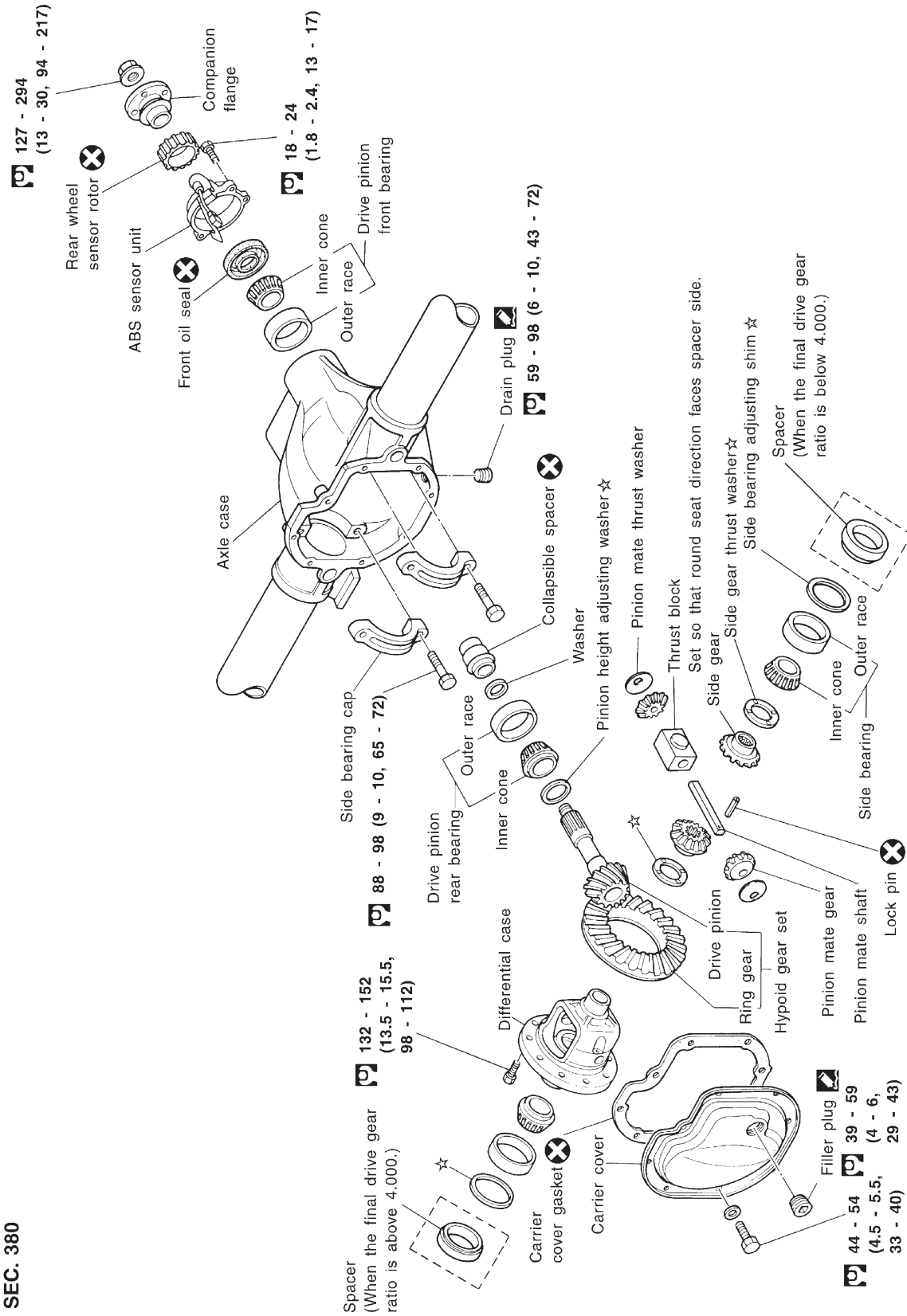
1. Place matching marks on flanges, then separate 2nd tube from 1st tube.
2. Place matching marks on the flange and shaft.
3. Secure the flange yoke with a vice and remove the lock nut.
4. Remove flange yoke using puller.
5. Remove center bearing using Tool and press.
Tool number: ST30031000

Assembly

CENTER BEARING

- When installing center bearing, position the "F" mark on center bearing toward front of vehicle.
- **Apply a coat of multi-purpose lithium grease containing molybdenum disulfide to the end face of the center bearing and both sides of the washer.**
- Stake the nut. Always use new one.
- Align match marks when assembling tubes.

2-pinion model



Ⓜ : N•m (kg-m, ft-lb)

⊗ : Always replace when disassembled.

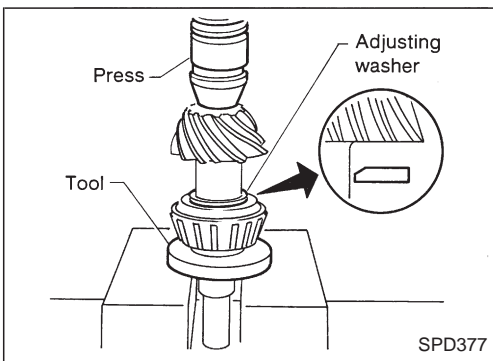
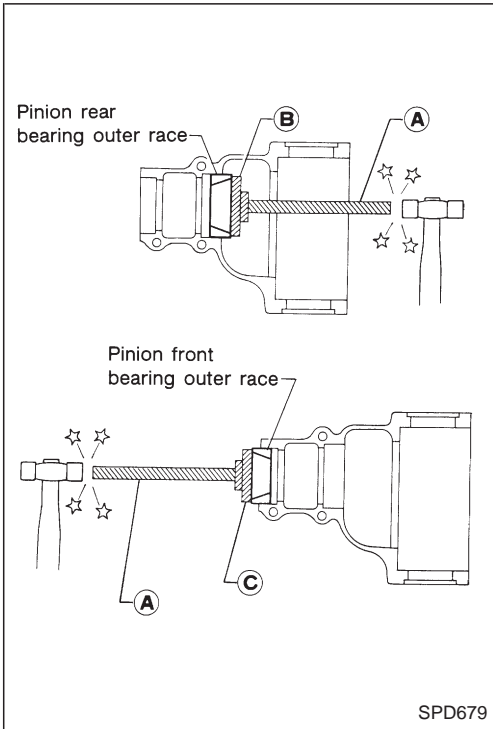
☆ : Adjustment is required.

Differential Carrier

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

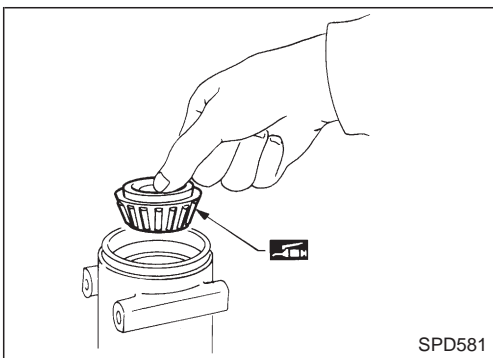
Tool numbers:

- (A) ST30611000
- (B) ST30621000
- (C) ST30613000

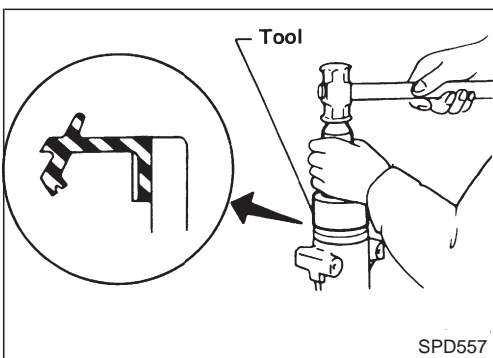


2. Select pinion height adjusting washer. Refer to "ADJUSTMENT" of original Service Manual.
3. Install pinion height adjusting washer in drive pinion, and press-fit rear bearing inner cone in it, with press and Tool.

Tool number: ST30901000



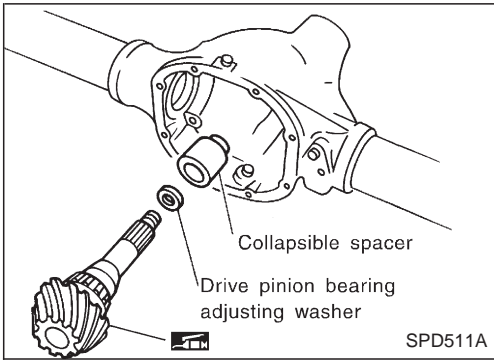
4. Place pinion front bearing inner cone in gear carrier.



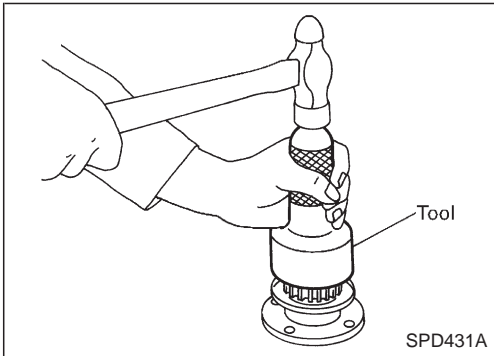
5. Apply multi-purpose grease to cavity at sealing lips of oil seal. Install front oil seal.

Tool number: KV38100500

Differential Carrier (Cont'd)



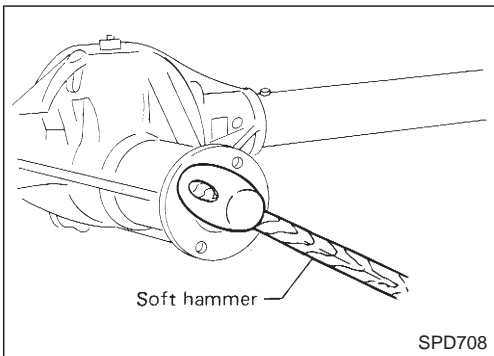
6. Place drive pinion bearing spacer, drive pinion bearing adjusting washer and drive pinion in gear carrier.



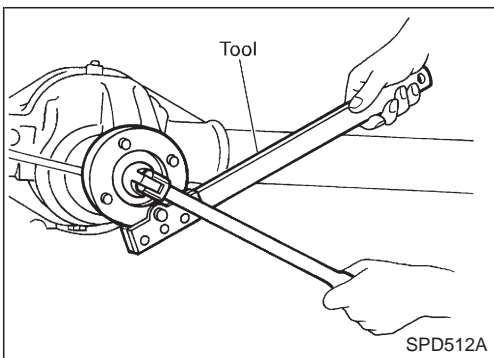
7. Insert sensor rotor into companion flange with Tool.

Tool number: ST30720000

8. Install ABS sensor unit on gear carrier.



9. Insert companion flange into drive pinion by tapping the companion flange with a soft hammer.

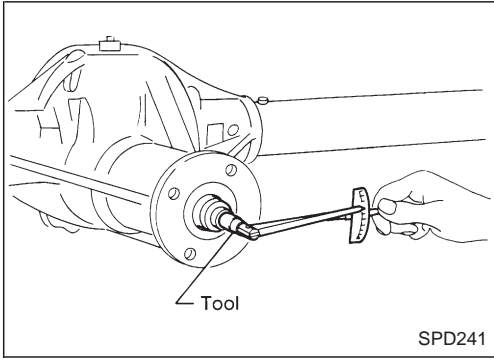


10. Tighten pinion nut to 127 N·m (13 kg-m, 94 ft-lb).

The threaded portion of drive pinion and pinion nut should be free from oil or grease.

Tool number: KV38108300

Differential Carrier (Cont'd)



11. Turn drive pinion in both directions several revolutions and measure pinion bearing preload.

Tool number: ST3127S000

Pinion bearing preload (With front oil seal):

1.1 - 1.4 N-m

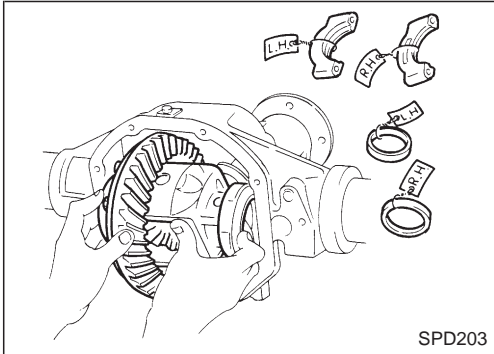
(11 - 14 kg-cm, 9.5 - 12.2 in-lb)

Pinion bearing preload (Without front oil seal):

1.0 - 1.3 N-m

(10 - 13 kg-cm, 8.7 - 11.3 in-lb)

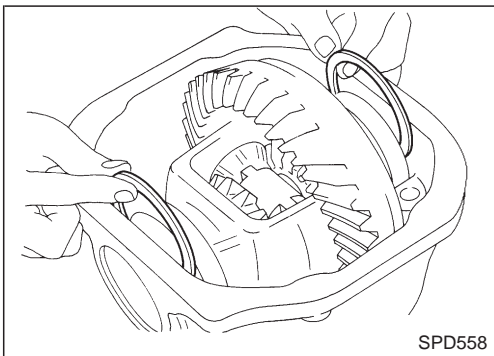
When pinion bearing preload is outside the specifications, replace pinion bearing adjusting washer and spacer with a different thickness.



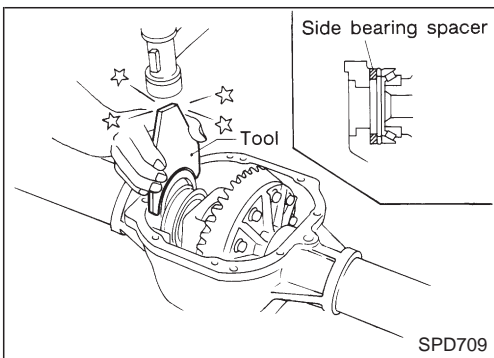
12. Select side bearing adjusting washer.

Refer to "ADJUSTMENT" of original Service Manual.

13. Install differential case assembly with side bearing outer races into gear carrier.



14. Insert left and right side bearing adjusting washers in place between side bearing and carrier.

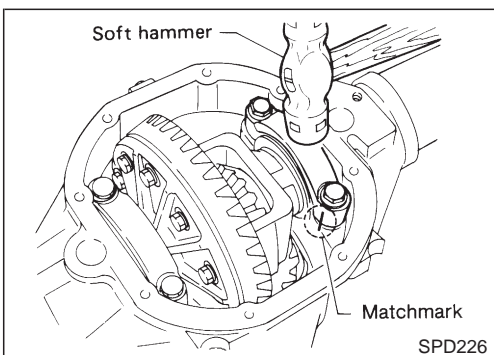


15. Drive in side bearing spacer with Tool.

Tool number: KV38100600

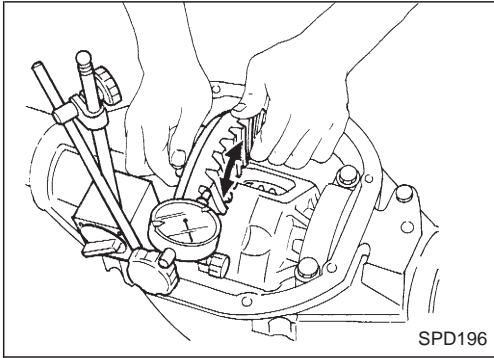
CAUTION:

Be aware that the spacer is installed in different locations on different models. Refer to PD-2007.



16. Align mark on bearing cap with that on gear carrier and install bearing cap on gear carrier.

Differential Carrier (Cont'd)



17. Measure ring gear-to-drive pinion backlash with a dial indicator.

Ring gear-to-drive pinion backlash:

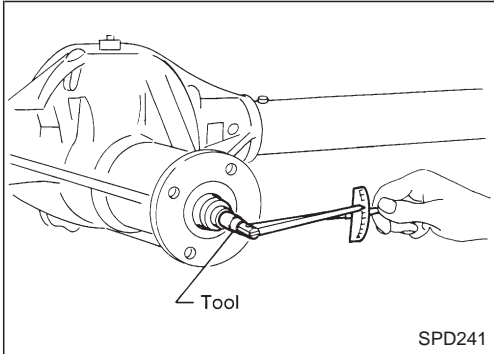
0.13 - 0.18 mm

(0.0051 - 0.0071 in)

- If backlash is too small, decrease thickness of right shim and increase thickness of left shim by the same amount.

If backlash is too great, reverse the above procedure.

Never change the total amount of shims as it will change the bearing preload.



18. Check total preload with Tool.

When checking preload, turn drive pinion in both directions several times to seat bearing rollers correctly.

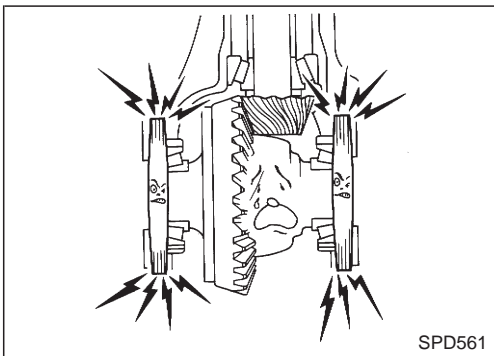
Total preload:

$P_1 + [0.3 \text{ to } 1.5 \text{ N}\cdot\text{m} (3 \text{ to } 15 \text{ kg}\cdot\text{cm}, 2.6 \text{ to } 13.0 \text{ in}\cdot\text{lb})]$

P_1 : Pinion bearing preload

Refer to SDS, PD-2014.

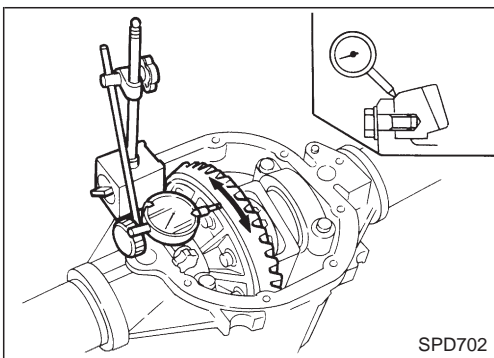
Tool number: ST3127S000



- If preload is too great, remove the same amount of shim from each side.
- If preload is too small, add the same amount of shim to each side.

Never add or remove a different number of shims for each side as it will change ring gear-to-drive pinion backlash.

19. Recheck ring gear-to-drive pinion backlash because increase or decrease in thickness of shims will cause change of ring gear-to-pinion backlash.



20. Check runout of ring gear with a dial indicator.

Runout limit:

0.05 mm (0.0020 in)

- If backlash varies excessively in different places, the variance may have resulted from foreign matter caught between the ring gear and the differential case.

- If the backlash varies greatly when the runout of the ring gear is within a specified range, the hypoid gear set or differential case should be replaced.

21. Check tooth contact.

Refer to "ADJUSTMENT" of original Service Manual.

22. Install rear cover and gasket.

SERVICE DATA AND SPECIFICATIONS (SDS)

Propeller Shaft

GENERAL SPECIFICATIONS

2WD models

Applied model	Short body		Long body	
	Without ABS	With ABS	Without ABS	With ABS
Propeller shaft model	3S71H			
Number of joints	3			
Coupling method with transmission	Sleeve type			
Types of journal bearings	Solid type (disassembly type)			
Shaft length (Spider to spider) mm (in)	1st	641 (25.24)		
	2nd	704 (27.72)	678 (26.69)	978 (38.50)
Shaft outer diameter mm (in)	1st	75 (2.95)		
	2nd	65 (2.56)		

4WD models

Location	Front	Rear
Applied model	KA24E	KA24E
Propeller shaft model	2F63H	3S71H
Number of joints	2	3
Coupling method with transmission	Flange type	Sleeve type
Types of journal bearings	Solid type (disassembly type)	
Shaft length (Spider to spider) mm (in)	1st	396 (15.59)
	2nd	866 (34.09)
Shaft outer diameter mm (in)	1st	75.0 (2.953)
	2nd	65.0 (2.559)

SERVICE DATA AND SPECIFICATIONS (SDS)

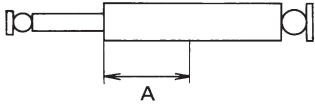
Propeller Shaft (Cont'd)

INSPECTION AND ADJUSTMENT

Front propeller shaft

Unit: mm (in)

Propeller shaft model	2F63H	2F71H
Journal axial play limit	0.02 (0.0008)	
Propeller shaft runout limit	0.6 (0.024)	
Measuring point A	134 (5.276)	137.5 (5.413)

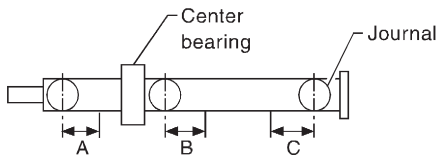


SPD996

Rear propeller shaft

Unit: mm (in)

Propeller shaft model	3S71H	3S80B
Journal axial play limit	0.02 (0.0008)	
Propeller shaft runout limit	0.6 (0.024)	
Measuring point		
A	162 (6.38)	
B	172 (6.77)	
C	192 (7.56)	



SPD418A

SERVICE DATA AND SPECIFICATIONS (SDS)

Propeller Shaft (Cont'd)

GENERAL SPECIFICATIONS

INSPECTION AND ADJUSTMENT (C200)

Drive pinion preload adjustment

Drive pinion bearing preload adjusting method	Collapsible spacer
Drive pinion preload [P ₁] N-m (kg-cm, in-lb)	
With front oil seal	1.1 - 1.4 (11 - 14, 9.5 - 12.2)
Without front oil seal	1.0 - 1.3 (10 - 13, 8.7 - 11.3)

Total preload adjustment

Total preload N-m (kg-cm, in-lb)	$P_1^* + [0.3 \text{ to } 1.5]$ (3 to 15, 2.6 to 13.0)
Ring gear backlash mm (in)	0.13 - 0.18 (0.0051 - 0.0071)

*: P₁: Drive pinion preload

— Additional service for LSD model —

Differential torque adjustment

Differential torque N-m (kg-m, ft-lb)	88 - 108 (9.0 - 11.0, 65 - 80)
Number of discs and plates	
Friction disc	12
Friction plate	12
Spring plate	2
Wear limit of plate and disc mm (in)	0.1 (0.004)
Allowable warpage of friction disc and plate mm (in)	0.08 (0.0031)
Total thickness mm (in)	18.24 - 20.36 (0.7181 - 0.8016)

Available discs and plates

Part name	Thickness mm (in)	Part number
Friction disc	1.5 (0.059)	38433-C6002 (Standard type)
	1.6 (0.063)	38433-C6003 (Adjusting type)
Friction plate	1.5 (0.059)	38432-C6001
Spring plate	1.5 (0.059)	38435-C6011

INSPECTION AND ADJUSTMENT (H233B)

Drive pinion preload adjustment

Drive pinion bearing preload adjusting method	Adjusting shim and spacer
Drive pinion preload [P ₂] N-m (kg-cm, in-lb)	
With front oil seal	1.4 - 2.2 (14 - 22, 12 - 19)
Without front oil seal	1.2 - 2.0 (12 - 20, 10 - 17)

Available drive pinion preload adjusting shims

Thickness mm (in)	Part number
2.31 (0.0909)	38125-82100
2.33 (0.0917)	38126-82100
2.35 (0.0925)	38127-82100
2.37 (0.0933)	38128-82100
2.39 (0.0941)	38129-82100
2.41 (0.0949)	38130-82100
2.43 (0.0957)	38131-82100
2.45 (0.0965)	38132-82100
2.47 (0.0972)	38133-82100
2.49 (0.0980)	38134-82100
2.51 (0.0988)	38135-82100
2.53 (0.0996)	38136-82100
2.55 (0.1004)	38137-82100
2.57 (0.1012)	38138-82100
2.59 (0.1020)	38139-82100

Available drive pinion preload adjusting spacers

Length mm (in)	Part number
4.50 (0.1772)	38165-76000
4.75 (0.1870)	38166-76000
5.00 (0.1969)	38167-76000
5.25 (0.2067)	38166-01J00
5.50 (0.2165)	38166-01J10

Total preload adjustment

Total preload with front oil seal N-m (kg-cm, in-lb)	$P_2^* + [0.3 \text{ to } 0.4]$ (3 to 4, 2.6 to 3.5)	
Ring gear backlash mm (in)	Gear ratio	
	4.636	0.10 - 0.15 (0.0039 - 0.0059)
	4.875 5.143	0.13 - 0.18 (0.0051 - 0.0071)

*: P₂: Drive pinion preload