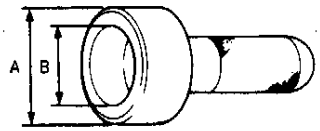
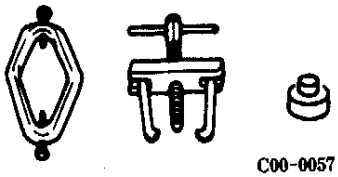
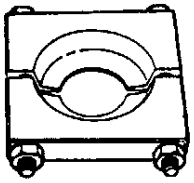
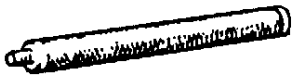
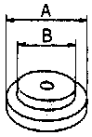
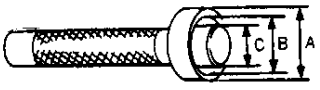
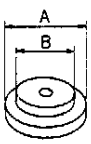
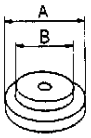
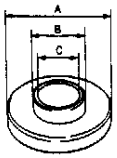
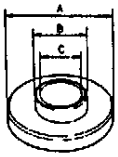
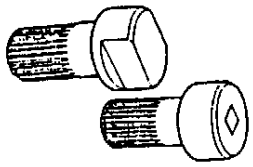
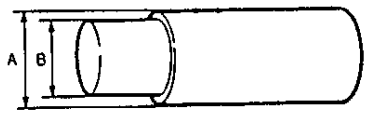
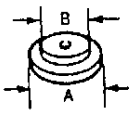
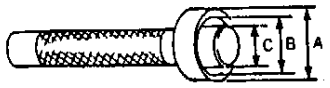
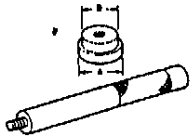
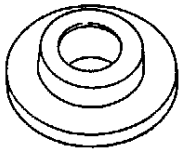
Tool name Tool number	Description	
Drift KV381 00500 ST302 0000	**A: 77 mm (3.03 in) dia.** **B: 55 mm (2.17 in) dia.**  C00-0055	Drive pinion oil seal installation Side shaft oil seal installation (retainer side)
Outer race puller ST3329 0001	 C00-0054	Side bearing outer race removal Side oil seal removal
Puller set ST3306 S001	 C00-0057	Side bearing removal
Puller ST3003 1000	 C00-0030	Drive pinion bearing removal
Drift bar ST3532 5000	 C00-0058	Drive pinion bearing outer race installation Side oil seal installation
Drift ST3061 2000	**A: 62 mm (2.44 in) dia.** **B: 40 mm (1.57 In) dia.**  C00-0059	Drive pinion bearing outer race installation
Drift ST3323 2000	**A: 51 mm (2.01 in) dia.** **B: 41 mm (1.61 in) dia.** **C: 28 mm (1.10 in) dia.**  C00-0156	Side bearing installation
Drift ST3532 1000	**A: 49 mm (1.93 in) dia.** **B: 41 mm (1.61 in) dia.**  C00-0059	Side bearing installation Side oil seal installation (gear case side)

Tool name Tool number	Description	
Drift ST3062 1000	**A: 79 mm (3.11 in) dia.** **B: 59 mm (2.32 in) dia.**  C00-0059	Side bearing outer race installation
Pin punch KV311 00300	 C00-0084	Pinion mate shaft lock pin removal and installation
Inner race adapter ST3003 2000	**A: 80 mm (3.15 in) dia.** **B: 38 mm (1.50 in) dia.** **C: 31 mm (1.22 in) dia.**  C00-0062	Drive pinion bearing installation Side shaft and retainer installation

COMMERCIAL SERVICE TOOLS

Tool name Tool number	Description	
Drift ST3090 1000	**A: 80 mm (3.15 in) dia.** **B: 45 mm (1.77 in) dia.** **C: 35 mm (1.38 in) dia.**  	Installing drive pinion rear bearing
Side flange dummy KV381 051S0		Checking side gear backlash
Drift ST337 10000	**A: 30 mm (1.18 in) dia.** **B: 23 mm (0.91 in) dia.**  	Removing drive pinion
Drift ST3306 1000	**A: 38 mm (1.50 in) dia.** **B: 28.5 mm (1.122 in) dia.**  	Removing drive pinion

Tool name Tool number	Description	
Drift ST3323 0000	**A: 51 mm (2.01 in) dia.** **B: 41 mm (1.61 in) dia. C: 28 mm (1.10 in) dia.** 	Installing side bearing
Drift ST3340 0001	**A: 60 mm (2.36 in) dia.** **B: 47 mm (1.85 in) dia.** 	Installing side oil seal
Drift KV381 02200	**A: 90 mm (3.54 in) dia.** **B: 55.3 mm (2.177 in) dia.** 	Installing drive pinion bearing outer
Differential flange tool HT7278		Companion flange nut removal and installation
Torque wrench		Tightening nuts and bolts
Puller		Companion flange removal
Dial gauge test indicator		Hypoid gear backlash measurement, drive gear rear face play measurement, companion flange play measurement
Depth gauge		Side shaft end play calculation

	Name	Application
Preparation equipment	Locktite	Prevents drive gear bolts from loosening
	Liquid gasket (Three Bond 1215)	• Side retainer installation hole • Carrier case cover • Drain, filler plug
Oil	Nissan gear oil hypoid LSD GL-5 80W-90 (Rear) GL5-85W-90 (Front)	Lubrication oil

CAUTION:
Gear oil is used at high pressure. Use of non-recommended oils may result in abnormal wear or overheating of gear surfaces.

1. Summary

This section describes the removal and installation, assembly and disassembly of parts from the side shaft in the front of vehicle. The engine and oil pan are removed and installed as a single unit. Refer to B. Engine, B-Oil Pan Removal and Installation.

1-1 SPECIFICATIONS

(1) Front final drive (F160)

Item \ Engine / Transmission		RB26DETT
		M/T
Model number		F160
Final gear ratio		4.111
Differential model		2-pinion
Number of gear teeth	Drive gear/drive pinion	37/9
	Side gear/pinion mate gear	16/10
Drive pinion adjustment spacer		Solid
Oil and volume	ℓ (Imp qt)	Nissan gear oil hypoid GL-5 85W-90 [approx. 1.0 (7/8)]

(2) Rear final drive [R200 (mechanical LSD)]

Item \ Engine / Transmission		RB26DETT
		M/T
Model number		R200 (mechanical LSD)
Final gear ratio		4.111
Differential type		4-pinion
Number of gear teeth	Drive gear/drive pinion	37/9
	Side gear/pinion mate gear	16/10
Drive pinion adjustment spacer		Solid
Oil and quantity	ℓ (Imp qt)	Nissan gear oil hypoid LSD GL-5 80W-90 [approx. 1.5 (1-3/8)]

1. Summary (Cont'd)

1-2 INSPECTION STANDARD VALUES

(1) Front final drive (F160)

Item			Standard value
Ring gear rear surface runout Companion flange deflection mm (in)			Deflection limit 0.05 (0.0020) max.
Drive pinion total preload N·m (kg-m, ft-lb)	Drive pinion preload (P)	Oil seal installation	0.8 - 1.1 (0.08 - 0.11, 0.6 - 0.8)
	Total preload	Side shaft installation	1.6 - 2.2 (0.16 - 0.22, 1.2 - 1.6) [P + 0.8 - 1.1 (0.08 - 0.11, 0.6 - 0.8)]
Tightening torque N·m (kg-m, ft-lb)	Drive pinion nut		167 - 196 (17 - 20, 123 - 145)
	Ring gear		93 - 113 (9.5 - 11.5, 69 - 83)
	Side retainer		16 - 19 (1.6 - 1.9, 12 - 14)
	Side shaft		16 - 21 (1.6 - 2.1, 12 - 15)
Side gear rear surface clearance mm (in)			0.05 - 0.15 (0.0020 - 0.0059)

Side gear thrust washer

Thickness mm (in)	Part number	Thickness mm (in)	Part number
0.68 - 0.71 (0.0268 - 0.0280)	38424 W1010	0.86 - 0.89 (0.0339 - 0.0350)	38424 W1016
0.71 - 0.74 (0.0280 - 0.0291)	38424 W1011	0.89 - 0.92 (0.0350 - 0.0362)	38424 W1017
0.74 - 0.77 (0.0291 - 0.0303)	38424 W1012	0.92 - 0.95 (0.0362 - 0.0374)	38424 W1018
0.77 - 0.80 (0.0303 - 0.0315)	38424 W1013	0.95 - 0.98 (0.0374 - 0.0386)	38424 W1019
0.80 - 0.83 (0.0315 - 0.0327)	38424 W1014	0.98 - 1.01 (0.0386 - 0.0398)	38424 W1020
0.83 - 0.86 (0.0327 - 0.0339)	38424 W1015	1.01 - 1.04 (0.0398 - 0.0409)	38424 W1021

T_1: Side bearing adjusting shim (side retainer side)

Thickness mm (in)	Part number	Thickness mm (in)	Part number
0.35 (0.0138)	38453 03V60	0.80 (0.0315)	38453 03V69
0.40 (0.0157)	38453 03V61	0.85 (0.0335)	38453 03V70
0.45 (0.0177)	38453 03V62	0.90 (0.0354)	38453 03V71
0.50 (0.0197)	38453 03V63	0.95 (0.0374)	38453 03V72
0.55 (0.0217)	38453 03V64	1.00 (0.0394)	38453 03V73
0.60 (0.0236)	38453 03V65	1.05 (0.0413)	38453 03V74
0.65 (0.0256)	38453 03V66	1.10 (0.0433)	38453 03V75
0.70 (0.0276)	38453 03V67	1.15 (0.0453)	38453 03V76
0.75 (0.0295)	38453 03V68		

T_2: Side bearing adjusting washer (carrier case side)

Thickness mm (in)	Part number	Thickness mm (in)	Part number
1.93 - 1.97 (0.0760 - 0.0776)	38453 03V00	2.33 - 2.37 (0.0917 - 0.0933)	38453 03V08
1.98 - 2.02 (0.0780 - 0.0795)	38453 03V01	2.38 - 2.42 (0.0937 - 0.0953)	38453 03V09
2.03 - 2.07 (0.0799 - 0.0815)	38453 03V02	2.43 - 2.47 (0.0957 - 0.0972)	38453 03V10
2.08 - 2.12 (0.0819 - 0.0835)	38453 03V03	2.48 - 2.52 (0.0976 - 0.0992)	38453 03V11
2.13 - 2.17 (0.0839 - 0.0854)	38453 03V04	2.53 - 2.57 (0.0996 - 0.1012)	38453 03V12
2.18 - 2.22 (0.0858 - 0.0874)	38453 03V05	2.58 - 2.62 (0.1016 - 0.1031)	38453 03V13
2.23 - 2.27 (0.0878 - 0.0894)	38453 03V06	2.63 - 2.67 (0.1035 - 0.1051)	38453 03V14
2.28 - 2.32 (0.0898 - 0.0913)	38453 03V07		

1. Summary (Cont'd)

Item		Standard value
Backlash drive gear-drive pinion gear	mm (in)	0.13 - 0.18 (0.0051 - 0.0071)

Pinion height adjusting washer

Thickness mm (in)	Part number	Thickness mm (in)	Part number
3.09 (0.1217)	38154 U1500	3.39 (0.1335)	38154 U1510
3.12 (0.1228)	38154 U1501	3.42 (0.1346)	38154 U1511
3.15 (0.1240)	38154 U1502	3.45 (0.1358)	38154 U1512
3.18 (0.1252)	38154 U1503	3.48 (0.1370)	38154 U1513
3.21 (0.1264)	38154 U1504	3.51 (0.1382)	38154 U1514
3.24 (0.1276)	38154 U1505	3.54 (0.1394)	38154 U1515
3.27 (0.1287)	38154 U1506	3.57 (0.1406)	38154 U1516
3.30 (0.1299)	38154 U1507	3.60 (0.1417)	38154 U1517
3.33 (0.1311)	38154 U1508	3.63 (0.1429)	38154 U1518
3.36 (0.1323)	38154 U1509	3.66 (0.1441)	38154 U1519

Pinion bearing preload	N·m (kg-m, ft-lb)	0.8 - 1.1 (0.08 - 0.11,0.6 - 0.8)

Pinion bearing adjustment spacer (solid)

Thickness mm (in)	Part number	Thickness mm (in)	Part number
56.2 (2.213)	38130 21000	56.8 (2.236)	38133 21000
56.4 (2.220)	38131 21000	57.0 (2.244)	38134 21000
56.6 (2.228)	38132 21000	57.2 (2.252)	38135 21000

Pinion bearing adjusting washer

Thickness mm (in)	Part number	Thickness mm (in)	Part number
2.30 - 2.32 (0.0906 - 0.0913)	38141 09400	2.46 - 2.48 (0.0969 - 0.0976)	38133 09400
2.32 - 2.34 (0.0913 - 0.0921)	38140 09400	2.48 - 2.50 (0.0976 - 0.0984)	38132 09400
2.34 - 2.36 (0.0921 - 0.0929)	38139 09400	2.50 - 2.52 (0.0984 - 0.0992)	38131 09400
2.36 - 2.38 (0.0929 - 0.0937)	38138 09400	2.52 - 2.54 (0.0992 - 0.1000)	38130 09400
2.38 - 2.40 (0.0937 - 0.0945)	38137 09400	2.54 - 2.56 (0.1000 - 0.1008)	38129 09400
2.40 - 2.42 (0.0945 - 0.0953)	38136 09400	2.56 - 2.58 (0.1008 - 0.1016)	38128 09400
2.42 - 2.44 (0.0953 - 0.0961)	38135 09400	2.58 - 2.60 (0.1016 - 0.1024)	38127 09400
2.44 - 2.46 (0.0961 - 0.0969)	38134 09400		

Side shaft axial end play	mm (in)	0 - 0.1 (0 - 0.004)

Side retainer adjusting shim

Thickness mm (in)	Part number	Thickness mm (in)	Part number
0.08 - 0.12 (0.0031 - 0.0047)	38233 03V01	0.37 - 0.43 (0.0146 - 0.0169)	38233 03V04
0.18 - 0.22 (0.0071 - 0.0087)	38233 03V02	0.46 - 0.54 (0.0181 - 0.0213)	38233 03V05
0.27 - 0.33 (0.0106 - 0.0130)	38233 03V03		

1. Summary (Cont'd)

(2) Rear final drive [R200 (mechanical LSD)]

Item \ Final drive / Engine		R200 (mechanical LSD) / RB26DETT
Ring gear rear runout Companion flange runout	mm (in)	Runout limit 0.05 (0.020) max.
Drive pinion total preload	N·m (kg-m, ft-lb)	1.4 - 3.1 (0.14 - 0.32, 1.0 - 2.3)
Side bearing preload	N·m (kg-m, ft-lb)	0.3 - 1.5 (0.03 - 0.15, 0.2 - 1.1)
Pinion nut tightening torque	N·m (kg-m, ft-lb)	186 - 294 (19 - 30, 137 - 217)
Ring gear bolt tightening torque	N·m (kg-m, ft-lb)	177 - 196 (18 - 20, 130 - 145)

Item		Standard value
Side gear rear surface clearance	mm (in)	R200 (mechanical LSD)
		Non-adjustable

Side bearing preload adjusting washer selection calculation equation

T_1: Left side (drive gear rear side) washer thickness $T_1 = (A - C + D + E + G) \times 0.01 + 2.07$

T_2: Right side (drive gear, gear tooth side) washer thickness $T_2 = (B - D + F) \times 0.01 + 2.07$

A: Housing mark [Standard value: 117 mm (4.61 in)] Note 1

B: Housing mark [Standard value: 65 mm (2.56 in)] Note 1

C: Differential case mark [Standard value: 128 mm (5.04 in)] Note 1

D: Differential case mark [Standard value: 97 mm (3.82 in)] Note 1

E: Bearing mark [Standard value: 21 mm (0.83 in)] Note 2

F: Bearing mark [Standard value: 21 mm (0.83 in)] Note 2

G: Spacer mark [Standard value: 8.1 mm (0.319 in)] Note 2

Note 1: Printed mark indicated following value marked by alphabet is based on standard value of 0. It is added to actual measured value in 0.01 increments.
For example: A2 mark indicates 117.02 mm (4.61 in).

Note 2: Printed indicates following value marked by alphabet is based on standard value of 0. It is subtracted from actual measured value in 0.01 increments.
For example: The E3 mark indicates 20.97 mm (0.8256 in).

1. Summary (Cont'd)

T_1, T_2: Side bearing preload adjusting washer R200 (mechanical LSD)

Thickness mm (in)	Part number	Thickness mm (in)	Part number
2.00 (0.0787)	38453 N3100	2.35 (0.0925)	38453 N3107
2.05 (0.0807)	38453 N3101	2.40 (0.0945)	38453 N3108
2.10 (0.0827)	38453 N3102	2.45 (0.0965)	38453 N3109
2.15 (0.0846)	38453 N3103	2.50 (0.0984)	38453 N3110
2.20 (0.0866)	38453 N3104	2.55 (0.1004)	38453 N3111
2.25 (0.0886)	38453 N3105	2.60 (0.1024)	38453 N3112
2.30 (0.0906)	38453 N3106	2.65 (0.1043)	38453 N3113

Backlash drive gear - drive pinion gear	mm (in)	0.13 - 0.18 (0.0051 - 0.0071)

Pinion height adjusting washer R200 (mechanical LSD)

Thickness mm (in)	Part number	Thickness mm (in)	Part number
3.09 (0.1217)	38154 P6017	3.39 (0.1335)	38154 P6027
3.12 (0.1228)	38154 P6018	3.42 (0.1346)	38154 P6028
3.15 (0.1240)	38154 P6019	3.45 (0.1358)	38154 P6029
3.18 (0.1252)	38154 P6020	3.48 (0.1370)	38154 P6030
3.21 (0.1264)	38154 P6021	3.51 (0.1382)	38154 P6031
3.24 (0.1276)	38154 P6022	3.54 (0.1394)	38154 P6032
3.27 (0.1287)	38154 P6023	3.57 (0.1406)	38154 P6033
3.30 (0.1299)	38154 P6024	3.60 (0.1417)	38154 P6034
3.33 (0.1311)	38154 P6025	3.63 (0.1429)	38154 P6035
3.36 (0.1323)	38154 P6026	3.66 (0.1441)	38154 P6036

Drive pinion bearing preload	N·m (kg-m, ft-lb)	1.1 - 1.7 (0.11 - 0.17, 0.8 - 1.2)

Drive pinion preload adjusting washer spacer R200 (mechanical LSD)

Thickness mm (in)	Part number	Thickness mm (in)	Part number
45.6 (1.795)	38165 10V05	46.5 (1.831)	38165 10V00
45.9 (1.807)	38165 10V06	46.8 (1.843)	38165 10V01
46.2 (1.819)	38165 10V07		

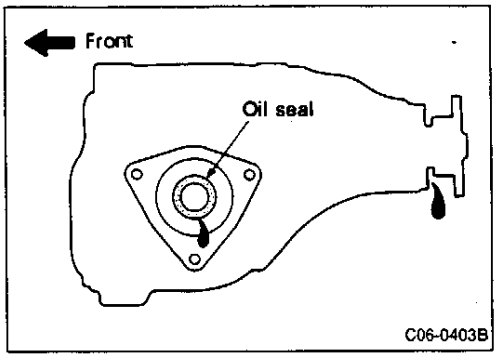
Drive pinion preload adjusting washer R200 (mechanical LSD)

Thickness mm (in)	Part number	Thickness mm (in)	Part number
3.81 (0.1500)	38125 61001	3.97 (0.1563)	38133 61001
3.83 (0.1508)	38126 61001	3.99 (0.1571)	38134 61001
3.85 (0.1516)	38127 61001	4.01 (0.1579)	38135 61001
3.87 (0.1524)	38128 61001	4.03 (0.1587)	38136 61001
3.89 (0.1531)	38129 61001	4.05 (0.1594)	38137 61001
3.91 (0.1539)	38130 61001	4.07 (0.1602)	38138 61001
3.93 (0.1547)	38131 61001	4.09 (0.1610)	38139 61001
3.95 (0.1555)	38132 61001		

LSD friction plate

Thickness mm (in)	Part number
1.75 (0.0689)	38432 N9000
1.85 (0.0728)	38432 N9001

NOTE: Pinion bearing preload and total preload refer to values measured when oil seals are install.

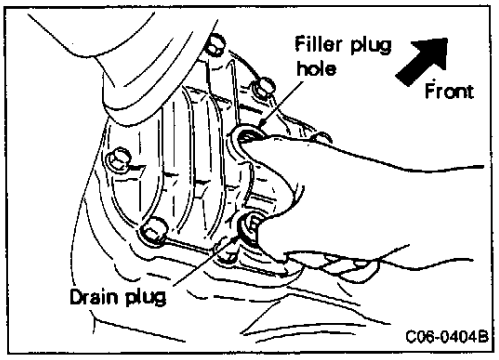


2. On-vehicle Inspection and Preparation

(1) Front final drive (F160)

[Point 1] Oil leak inspection

- Replace oil seal with unit in vehicle if oil leaks from seal.

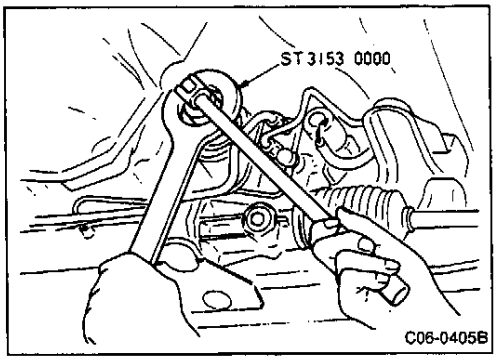


[Point 2] Oil level inspection

- Check oil level from filler plug hole.
- Use recommended Nissan gear oil hypoid GL-5 85W-90.

CAUTION:
When installing filler plug and drain plug, apply silicon bond TB1215 (KP210 00200) to thread surface. Tighten to following tightening torque.

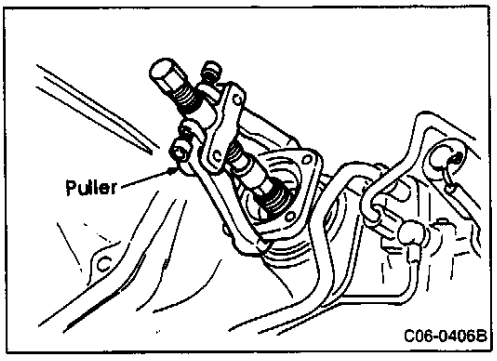
Tightening torque:
25 - 34 N·m (2.5 - 3.5 kg-m, 18 - 25 ft-lb)



[Point 3] Rear oil seal replacement

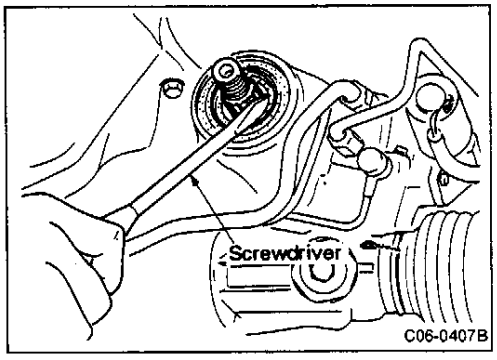
- Use flange wrench (special tool) to remove drive pinion nut.

CAUTION:
Replace drive pinion nut after every disassembly.



- Remove companion flange using puller.
- Check companion flange seal surface for wear and replace if worn.

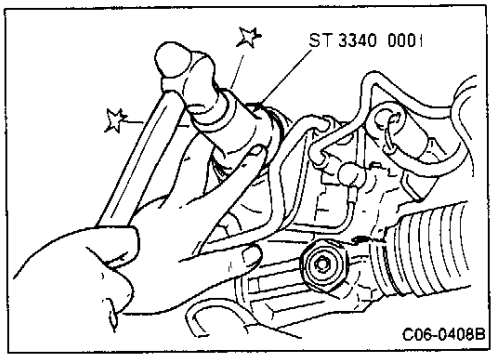
CAUTION:
Do not repair companion flange with sandpaper or use again.



- Use screwdriver to remove oil seal.

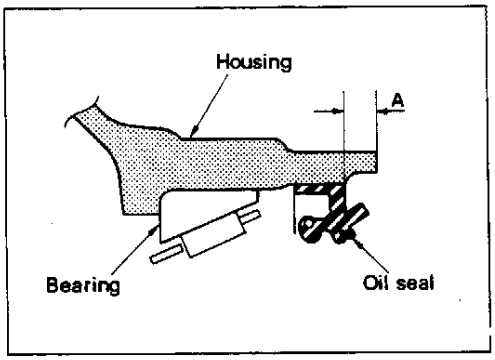
CAUTION:
Never reuse oil seal.

2. On-vehicle Inspection and Preparation (Cont'd)

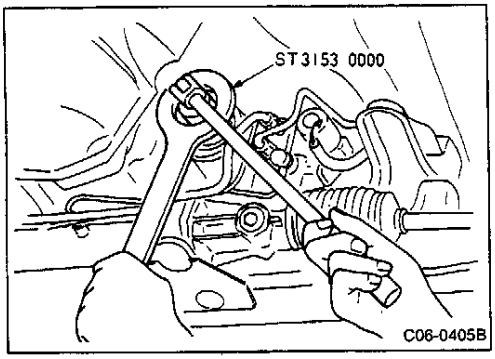


- Use suitable drift (special service tool) and install seal in position shown in figure.

CAUTION:
(1) Do not install the oil seal at an angle.
(2) Coat the sliding surface of the oil seal lip with MP special grease No. 2.



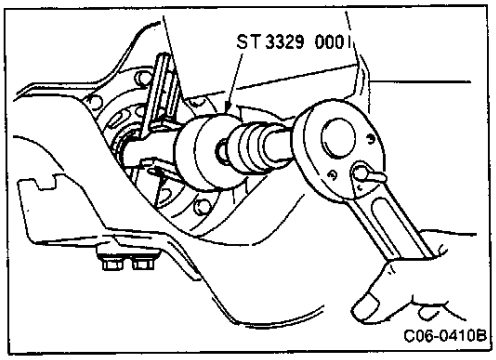
A: 2.0 ± 0.2 mm (0.079 ± 0.008 in)



- Use flange wrench (special service tool) to tighten drive pinion nut to specified torque.

Tightening torque:
167 - 196 N·m (17 - 20 kg-m, 123 - 145 ft-lb)

CAUTION:
Always use new drive pinion nut. Coat nut screws and seat with Nissan gear oil hypoid GL-5 85W-90.

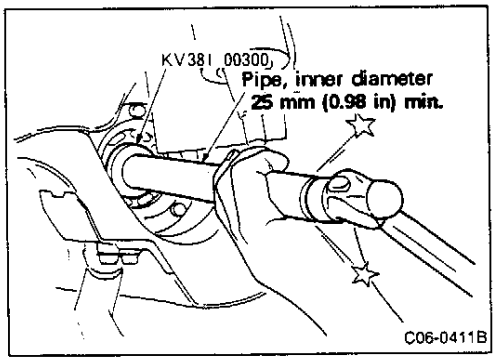


[Point 4] Side oil seal replacement

ⓐ Right oil seal

- Remove oil seal using oil seal puller (special service tool).

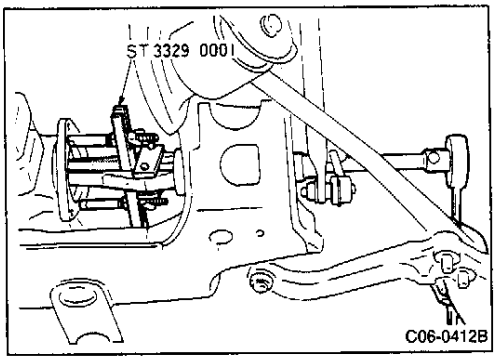
CAUTION:
Never reuse the oil seal.



- Insert drift (special service tool) on pipe with 25 mm (0.98 in) inner diameter on lip and press seal flush with case.

CAUTION:
(1) Do not install seal at angle.
(2) Coat sliding lip surface of oil seal with MP special grease No. 2.

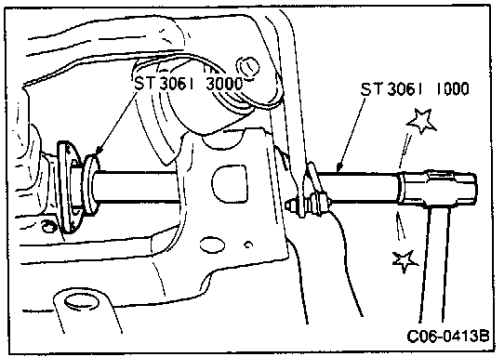
2. On-vehicle Inspection and Preparation (Cont'd)



ⓑ Left oil seal

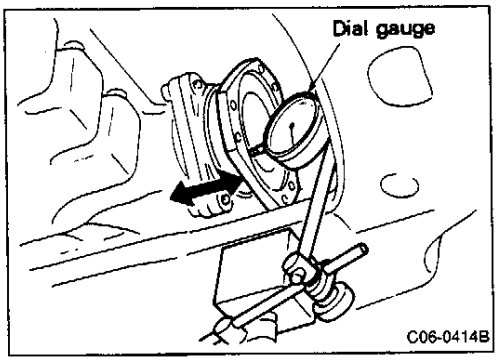
- Use oil seal puller (special service tool) to remove drive shaft (refer to C6 DRIVE SHAFT, 3 Drive Shaft Removal and Installation) and side shaft.

CAUTION:
Never reuse oil seal.



- Use drift (special service tool) and install oil seal flush with case.

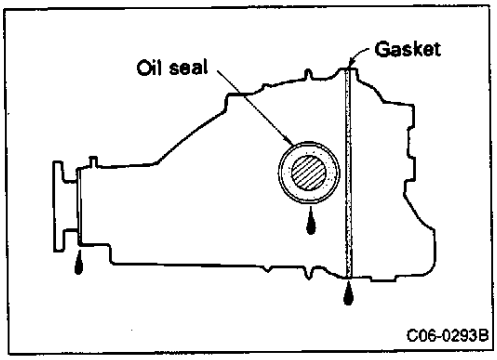
CAUTION:
(1) Do not install seal at angle.
(2) Coat sliding lip surface of oil seal with MP special grease No. 2.



[Point 5] Side shaft end play inspection

- Turn side shaft two or three times. Check for abnormal noise or improper rotation and then measure end play.
- Set dial gauge on side shaft and move in axial direction to measure end play. If end play exceeds standard value adjust with shims. Refer to 3-2 (2) Front final drive side shaft assembly and disassembly.

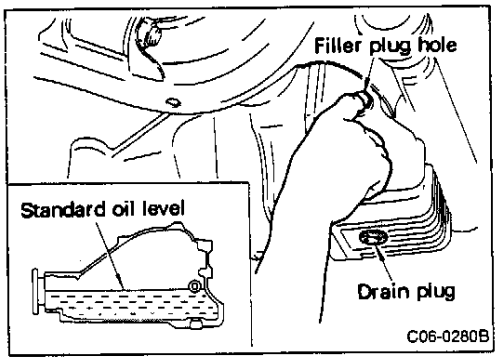
End play standard value:
0 - 0.1 mm (0.004 in)



(2) Rear final drive [R200 (Mechanical LSD)]

[Point 1] Oil leak inspection

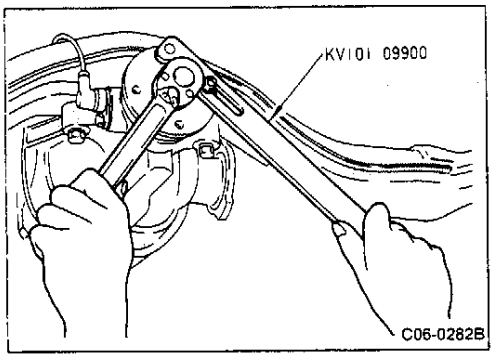
- When there is leak from oil seal, replace without removing final drive from vehicle.
- When there is leak from gasket, remove differential assembly from vehicle and replace gasket.



[Point 2] Oil level inspection

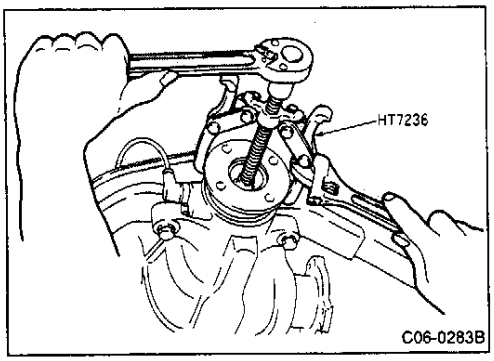
- Check oil level from filler plug hole.

2. On-vehicle Inspection and Preparation (Cont'd)

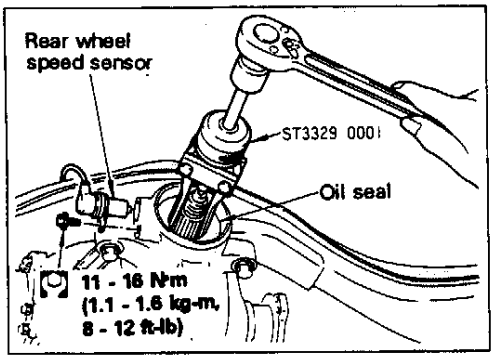


[Point 3] Front oil seal replacement

- Before oil seal replacement, measure drive pinion total preload.
- Use cam sprocket wrench (special service tool) to remove drive pinion nut.

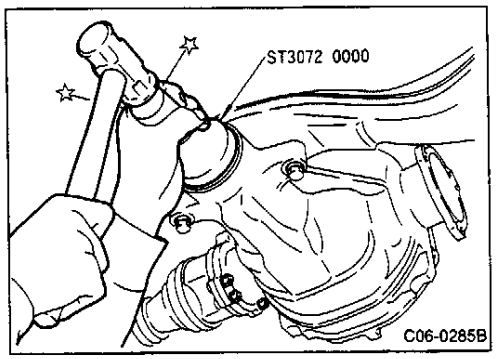


- Use puller to remove companion flange.



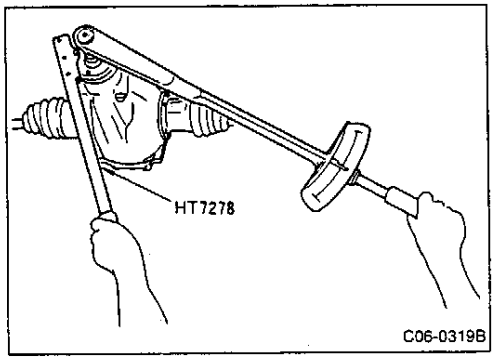
- Use oil seal puller (special service tool) to remove oil seal from gear carrier housing.

CAUTION:
Remove rear wheel speed sensor before removing oil seal.



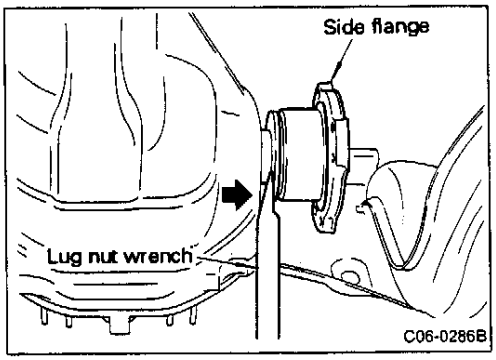
- Install oil seal using drift (special service tool).

CAUTION:
(1) Do not install seal at angle.
(2) Coat sliding surface of oil seal lip with MP special grease No. 2.



- Tighten drive pinion to torque indicated below.
  Drive pinion tightening torque:
  186 - 294 N·m (19 - 30 kg-m, 137 - 217 ft-lb)
- Adjust drive pinion total preload to same value before oil seal replacement.

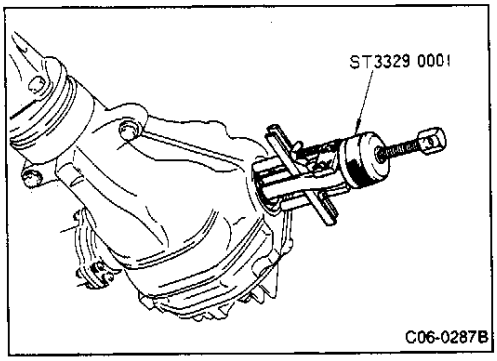
2. On-vehicle Inspection and Preparation (Cont'd)



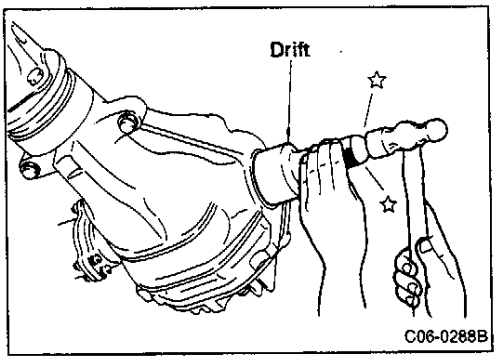
[Point 4] Side flange oil seal replacement

- Remove drive shaft (refer to C6 DRIVE SHAFT, 3 Drive Shaft Removal and Installation). Insert lug nut wrench into notch as lever and remove circlip.
- Circlip removal value

R200 (right & left)	Final drive side



- Use oil seal puller (special service tool) to remove oil seal.



- Use drift (inner diameter 42.5 mm (1.673 in) , outer diameter 70 mm (2.76 in) to install oil seal.

CAUTION:

(1) Do not install seal at angle.

(2) Coat sliding surface of oil seal lip with MP special grease No. 2.

3. Final Drive Removal and Installation, Assembly and Disassembly

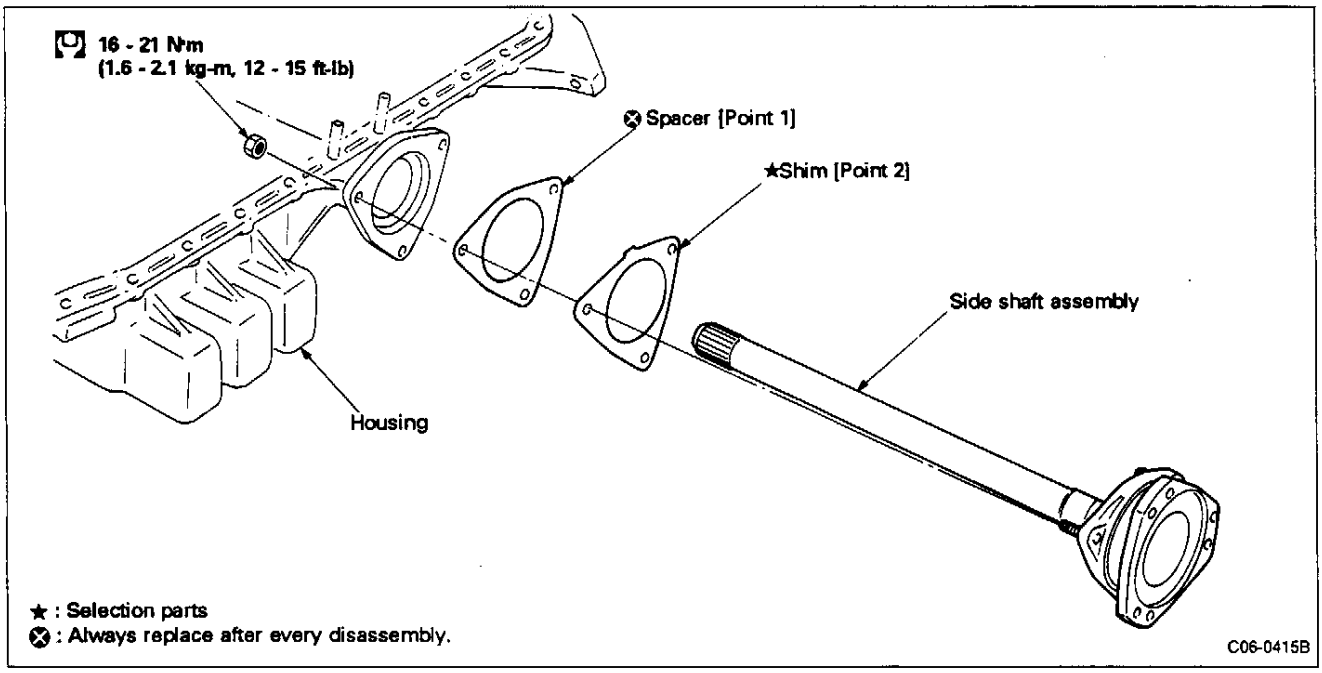
3-1 REMOVAL AND INSTALLATION FROM VEHICLE

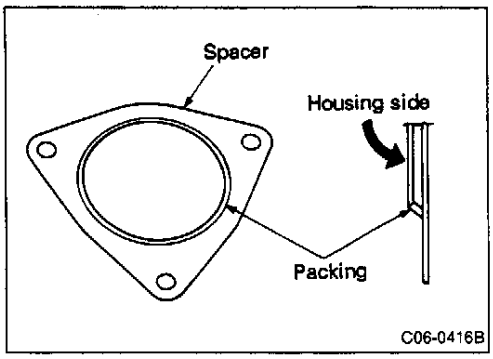
(1) Front final drive (F160)

① F160 final drive removal and installation

Remove and install front final drive (F160), engine and oil pan as a single unit (refer to section B oil pan removal and installation).

② Side shaft removal and installation

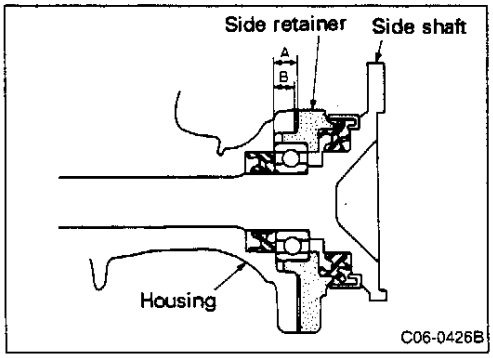




[Point 1] Spacer installation

- Install spacer so packing side faces final drive housing side.

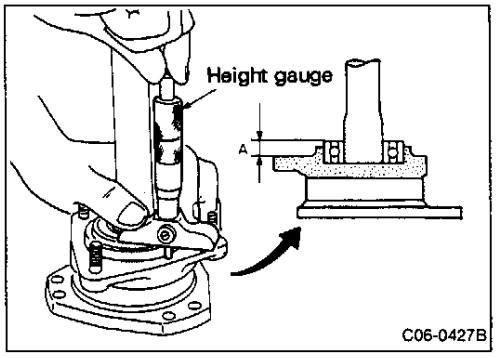
CAUTION:
Never reuse spacer.



[Point 2] Side shaft bearing end play measurement

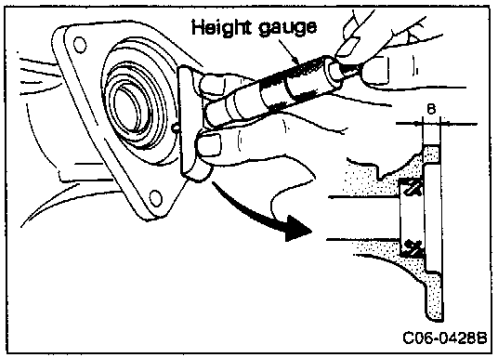
- Measure dimensions A and B shown in figure to calculate side shaft bearing end play.

3. Final Drive Removal and Installation, Assembly and Disassembly (Cont'd)



- Measure dimension A as shown in figure.

CAUTION:
Measure bearing on outer race side.



- Measure dimension B as shown in figure.

Side shaft bearing adjusting shim selection

- Use the following equation to calculate shim size required to obtain standard end play value.

End play:
0 - 0.1 mm (0 - 0.004 in)

T (shim thickness) = A – B

Adjustment Shims

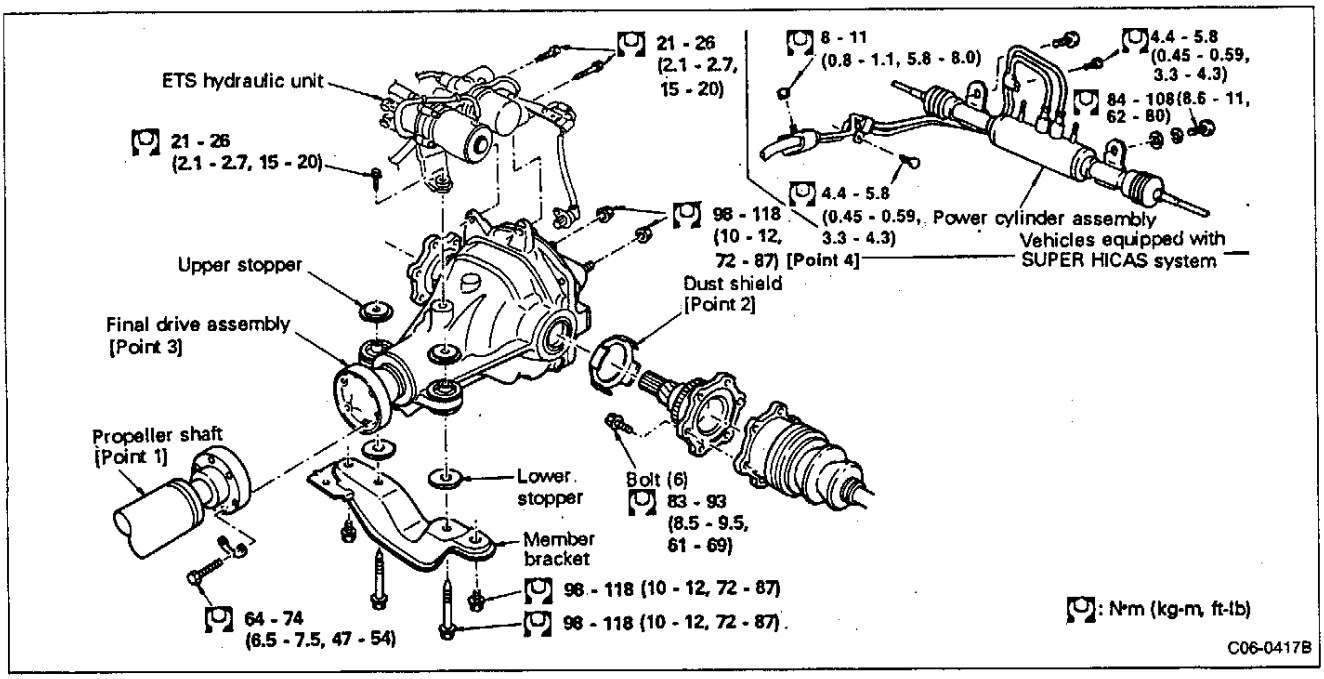
Thickness mm (in)	Part number
0.1 (0.004)	38233 03V01
0.2 (0.008)	38233 03V02
0.3 (0.012)	38233 03V03
0.4 (0.016)	38233 03V04
0.5 (0.020)	38233 03V05

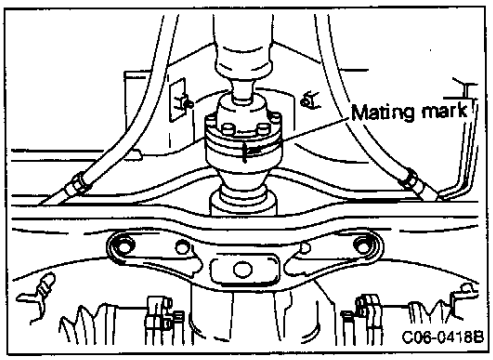
Side shaft end play inspection

- Install side shaft in vehicle and check end play. Refer to 2-5 SIDE SHAFT END PLAY INSPECTION for procedures.

3. Final Drive Removal and Installation, Assembly and Disassembly (Cont'd)

(2) Rear final drive [R200 (mechanical LSD)]

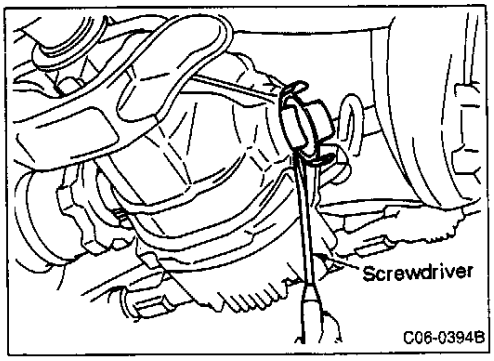




[Point 1] Propeller shaft and drive shaft separation

- Paint mating mark on companion flange before separating propeller shaft and final drive.
- Remove bolt from drive shaft and side flange and separate them.

CAUTION:
Use paint to make mating marks. Do not scratch the parts.

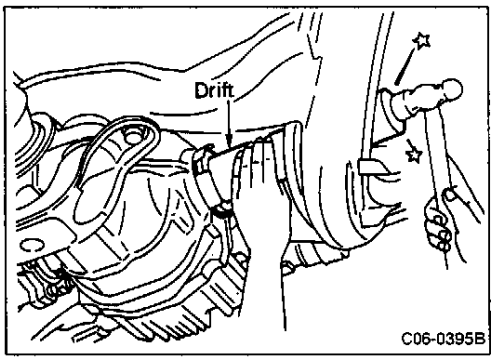


[Point 2] Dust shield removal and installation

Removal

- Use screwdriver to remove dust shield as shown in figure.

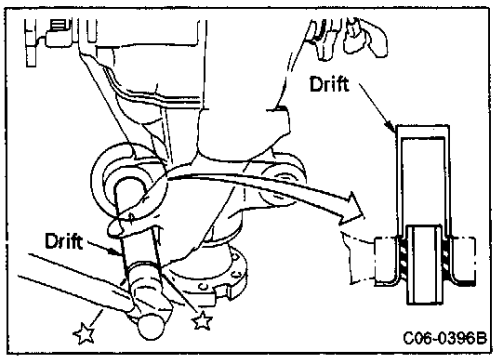
3. Final Drive Removal and Installation, Assembly and Disassembly (Cont'd)



Installation

- Install dust shield with drift [inner diameter 85 mm (3.35 in), outer diameter 67 mm (2.64 in)].

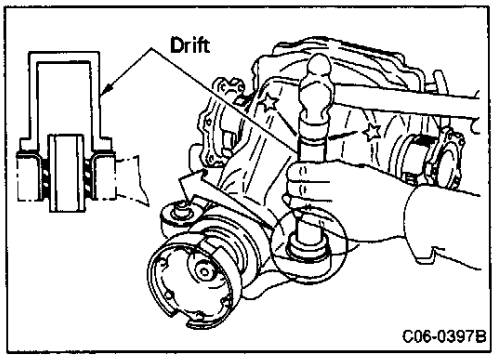
CAUTION:
Align notch with sensor before installation.



[Point 3] Differential mount insulator removal and installation

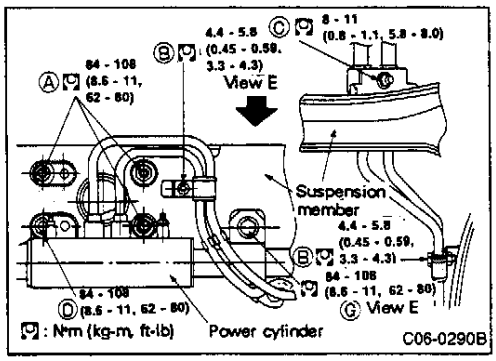
Removal

- Remove insulator with drift [outer diameter 32 mm (1.26 in), inner diameter 26 mm (1.02 in)] as shown in figure.



Installation

- Install insulator with drift [outer diameter 50 mm (1.97 in), inner diameter 25 mm (0.98 in)] as shown in figure.



[Point 4] Final drive removal and installation

- In vehicles equipped with SUPER HICAS, perform the following procedures because the the nut Ⓓ on rear side of final drive interferes with power cylinder air bleeder.

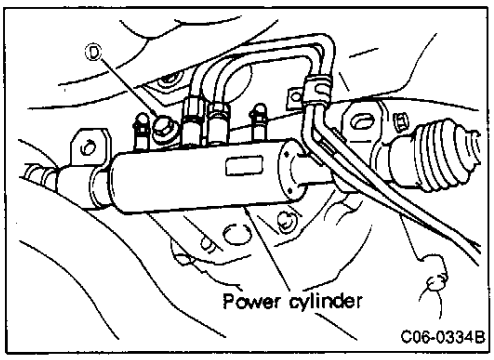
Removal

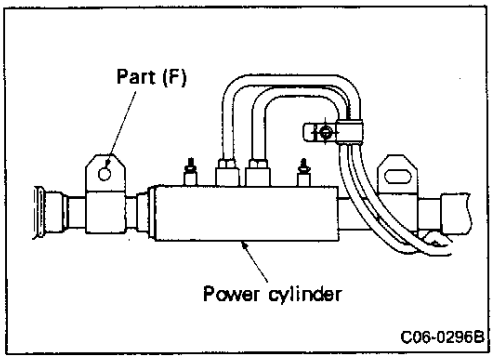
- Remove final drive and member nuts Ⓐ (3), then remove HICAS piping member bolts Ⓑ (2) and nut Ⓒ (1). Next, remove power cylinder bolts Ⓖ (2).

CAUTION:
Do not remove power cylinder piping.

- Lower power cylinder piping, remove remaining final drive nut Ⓓ and detach final drive.

CAUTION:
Always support final drive with transmission jack during removal and installation.





3. Final Drive Removal and Installation, Assembly and Disassembly (Cont'd)

Installation

- Assembly is the reverse of disassembly.

CAUTION:
Pay attention to following points when installing power cylinder.

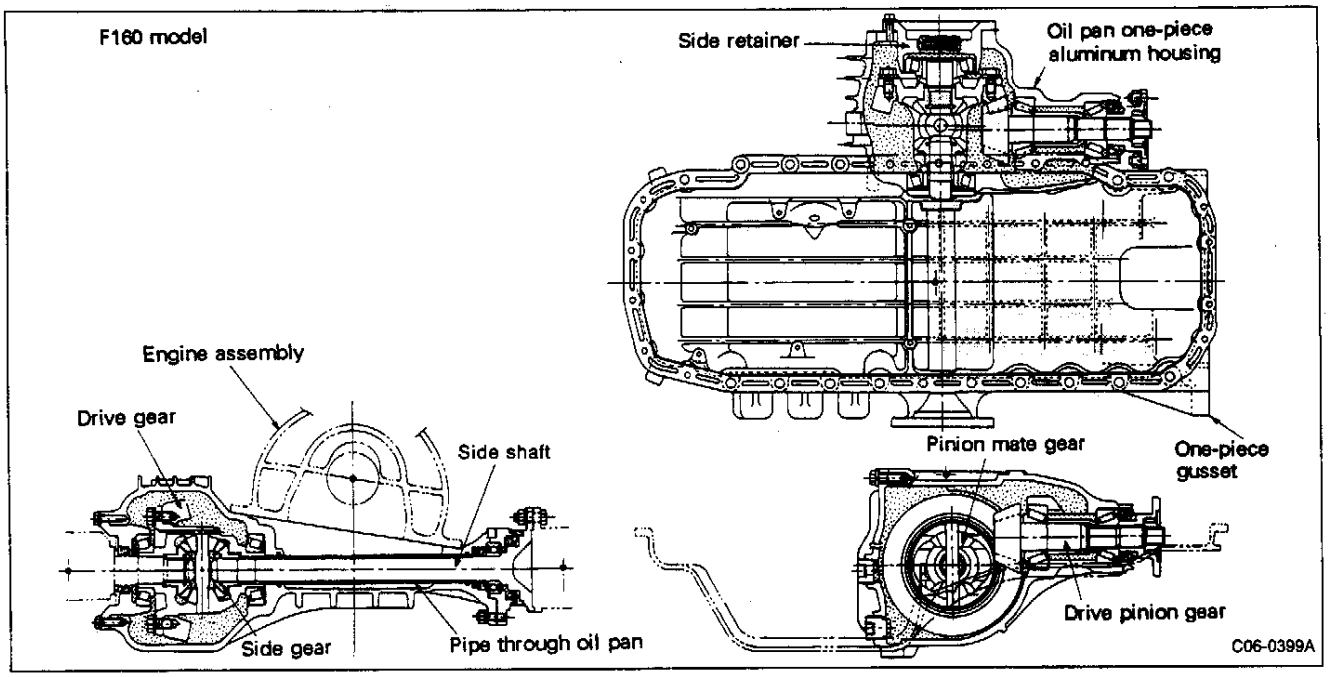
(1) Part (F) on the left side of power cylinder determines position. Install part (F) first and then install power cylinder.
Power cylinder bolt tightening torque:
84 - 108 N·m (8.6 - 11 kg-m, 62 - 80 ft-lb)

(2) Install nut Ⓒ for piping first.

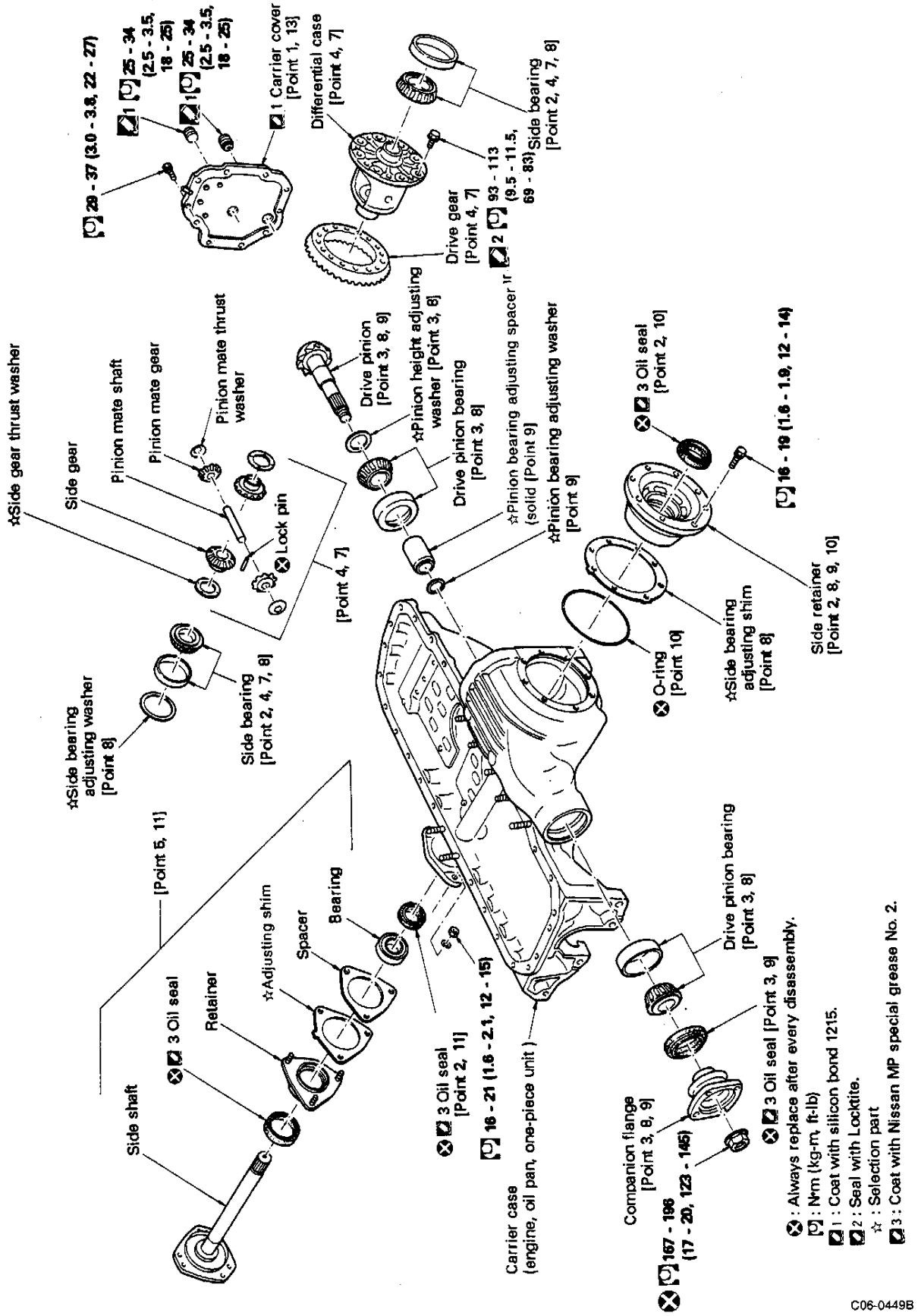
(3) After installing nut, make sure rear suspension toe-in distance conforms to specification range indicated below. If toe-in distance does not conform, make adjustment. Refer to C8 REAR SUSPENSION AND AXLE, 2-4 WHEEL ALIGNMENT INSPECTION AND ADJUSTMENT for adjustment procedures.
Standard distance:
$2.0^{+2.0}_{-2.5}$ mm ($0.079^{+0.079}_{-0.098}$ in)

3-2 FINAL DRIVE ASSEMBLY AND DISASSEMBLY

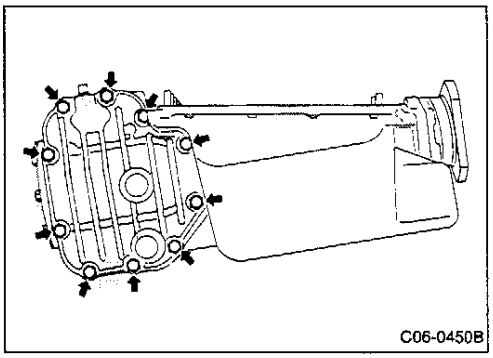
(1) Front final drive (F160)



3. Final Drive Removal and Installation, Assembly and Disassembly (Cont'd)



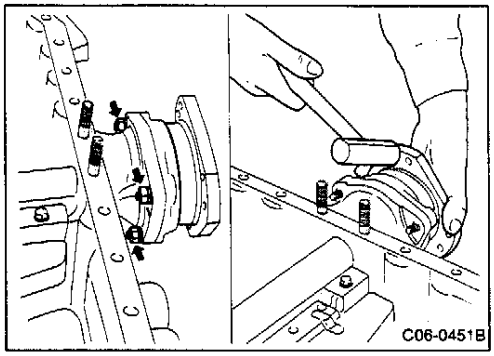
3. Final Drive Removal and Installation, Assembly and Disassembly (Cont'd)


C06-0450B

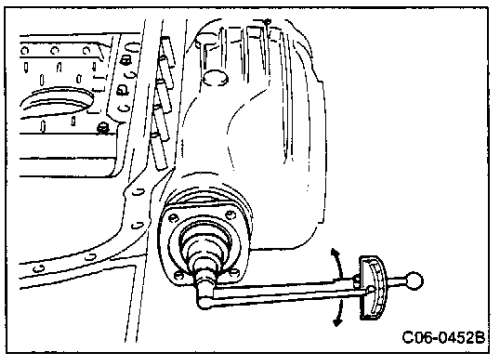
[Point 1] Inspection before disassembly

- Drain oil.
- Remove carrier cover.

CAUTION:
If carrier case is worn or cracked, replace unit assembly.


C06-0451B

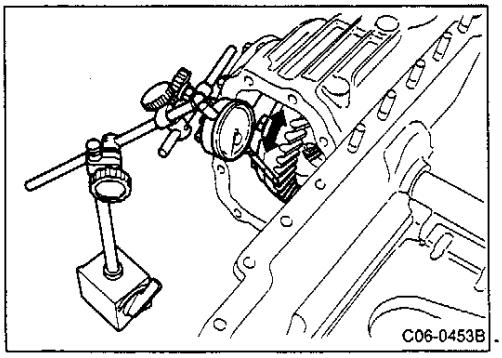
- Remove side shaft assembly nut.
- While tapping with plastic hammer, remove side shaft assembly from carrier case.


C06-0452B

ⓐ Total preload inspection

- Turn companion flange a few times. Use preload gauge to measure total preload.
  Total preload standard:
  1.6 - 2.2 N·m (0.16 - 0.22 kg-m, 1.2 - 1.6 ft-lb)
- If torque preload is not within the specification range, adjust pinion bearing preload and side bearing preload.

Excess preload:	• Use lower drive pinion spacer and thinner washer. • Use thicker side bearing retainer shim.
Insufficient preload:	• Use longer drive pinion spacer and thicker washer. • Use thinner side bearing retainer shim.

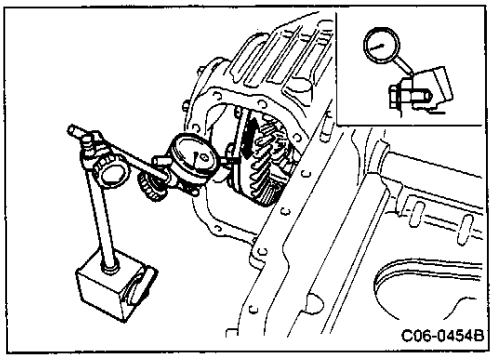

C06-0453B

ⓑ Hypoid gear and backlash inspection

- Position dial gauge on drive gear surface and measure backlash.
  Backlash standard value:
  0.13 - 0.18 mm (0.0051 - 0.0071 in)
- If backlash is not within the specification range, adjust by increasing or decreasing side bearing washer (carrier case side) thickness.

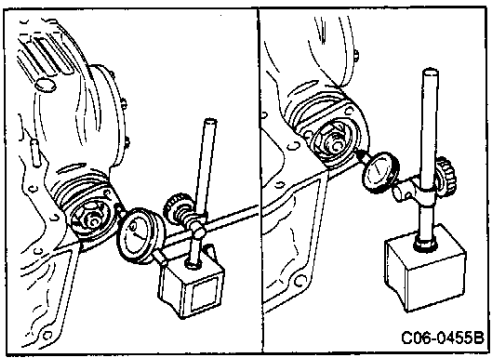
3. Final Drive Removal and Installation, Assembly and Disassembly (Cont'd)

Excess backlash:	Use thinner side bearing washer (carrier case side).
Insufficient backlash:	Use thicker side bearing washer (carrier case side).



ⓒ Drive gear runout inspection

- Position dial gauge on drive gear rear surface. Turn drive gear a few times and measure runout.
  Runout limit:
  0.05 mm (0.0020 in) max.
- If runout is not within the specification range, check drive gear contact condition (foreign matter between drive gear and differential case, differential case or drive gear deformation, etc.).
- If drive gear is worn or deformed, replace hypoid gear assembly. If there is differential case deformation, replace case.



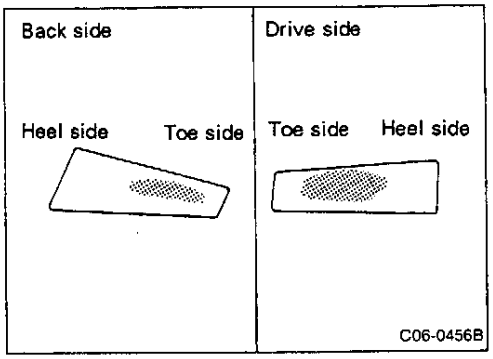
ⓓ Companion flange runout inspection

- Position dial gauge on companion flange surface (inside propeller shaft surface bolt holes) and measure runout.
  Runout limit:
  0.05 mm (0.0020 in) max.
- Set test indicator inside companion flange (inner lower surface) and measure runout.
  Runout limit:
  0.05 mm (0.0020 in) max.

CAUTION:
If surface is rusted, remove rust before measuring surface.

- If runout is not within the specification range, rotate positions of both companion flange and drive pinion 90° to minimize runout.
- If runout is still not within the specification range even after rotating relative positions of flange and drive pinion, replace companion flange.
- If runout is still not within the specification range even after replacing companion flange, the pinion bearing and drive pinion gear tooth contact pattern may be incorrect or the pinion bearing may be faulty.

3. Final Drive Removal and Installation, Assembly and Disassembly (Cont'd)

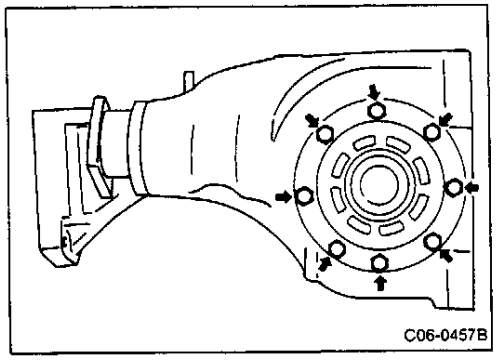


ⓔ Hypoid gear mesh inspection

- Apply a light coat of powdered titanium oxide and oil or equivalent to drive gear teeth.
  Rotate gear slowly in both directions a few times and check gear tooth contact pattern.
- Check gear contact pattern on both drive side (acceleration) and back side (deceleration).

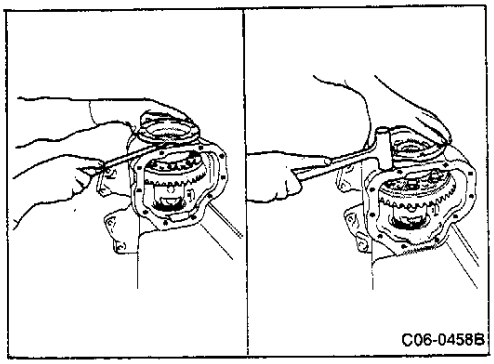
CAUTION:
Refer to h. Hypoid gear tooth contact inspection for details on applying powdered titanium oxide and gear tooth contact inspection.

- If gear tooth contact is faulty, increase or decrease height washer thickness to adjust position.

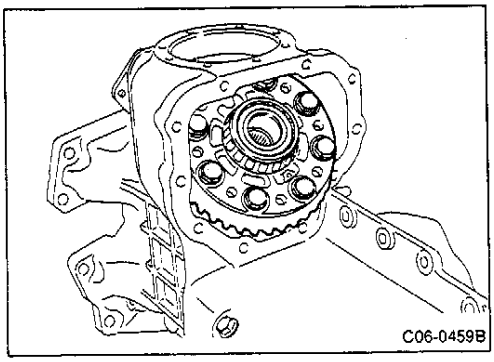


[Point 2] Drive gear and differential case assembly removal

- Remove side retainer bolts.



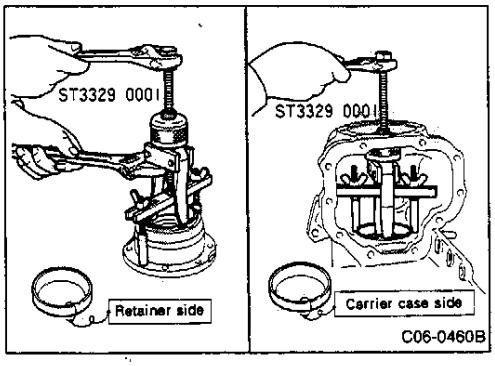
- Insert screwdriver in side retainer notch and raise retainer.
- While removing side retainer, tap gear case with plastic hammer and remove retainer.



- Remove differential case assembly from carrier case.

CAUTION:
Be careful not to scratch carrier cover during removal.

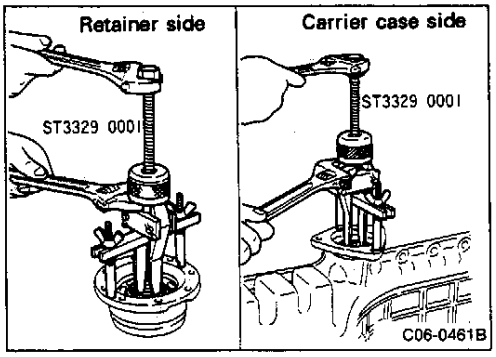
3. Final Drive Removal and Installation, Assembly and Disassembly (Cont'd)



- Use puller (special service tool) and remove side bearing and outer race.

CAUTION:
Remove side bearing and adjusting washer together in carrier case side.

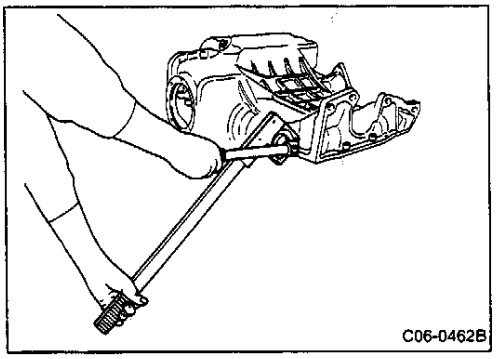
- Make an identification mark on outer race to prevent incorrect assembly of left and right sides.

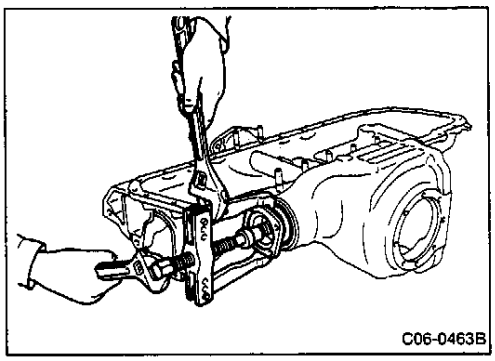


- Use puller (special service tool) to remove oil seal.

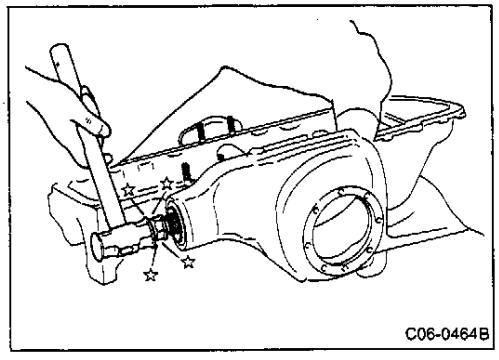
[Point 3] Drive pinion assembly removal

- Use flange wrench and remove pinion lock nut.





- Use puller to remove companion flange.

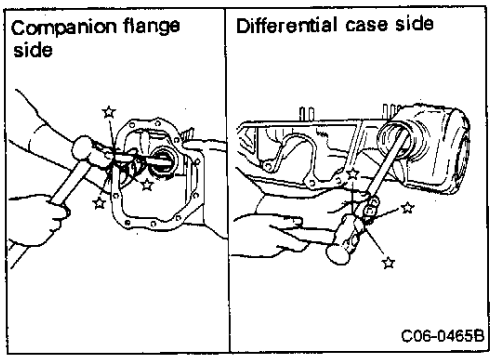


- Install pinion lock nut on drive pinion.

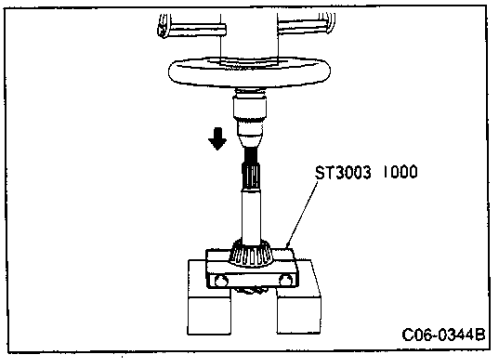
CAUTION:
Set pinion lock nut even on drive pinion to prevent damage to pinion threads.

- Using copper hammer, remove drive pinion from carrier case.

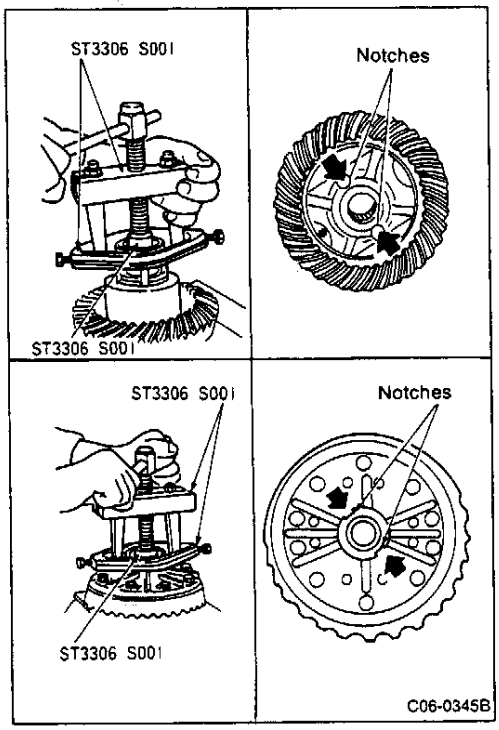
3. Final Drive Removal and Installation, Assembly and Disassembly (Cont'd)



- Use a brass shaft and tap bearing outer race evenly to remove race from carrier case.
- Remove bearing and oil seal together in companion flange side.



- Use bearing replacer (special service tool) and remove drive pinion and differential case side bearings.



[Point 4] Differential case disassembly

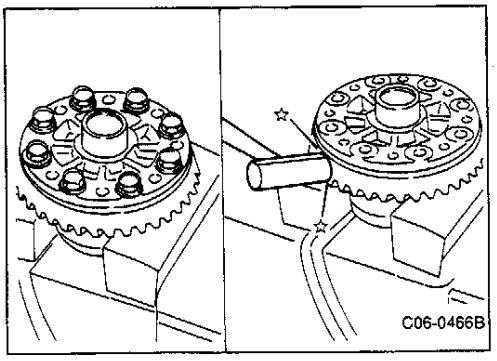
ⓐ Side bearing removal

- Set differential case assembly in vise. Using puller set (special service tool), remove side bearing.

CAUTION:

(1) When placing unit in vise, always use copper plates to prevent side bearing and drive gear from being scratched.

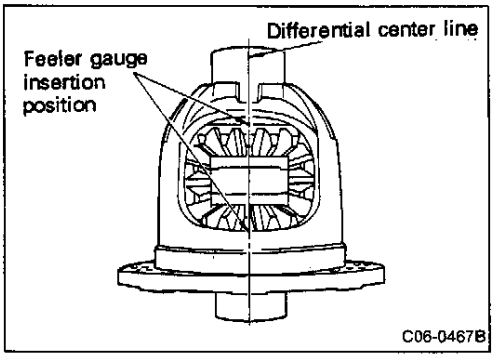
(2) Do not remove side bearing except for replacement.



ⓑ Drive gear removal

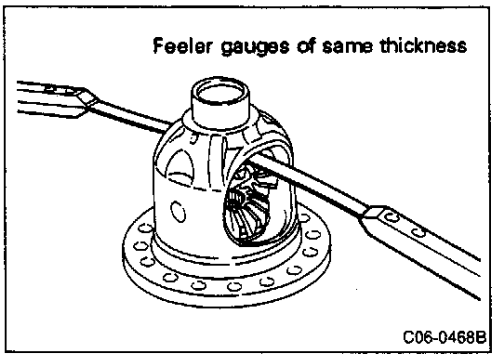
- Remove differential case bolts.
- Tap side of drive gear with plastic hammer and remove drive gear.

3. Final Drive Removal and Installation, Assembly and Disassembly (Cont'd)



ⓒ Side gear surface clearance inspection

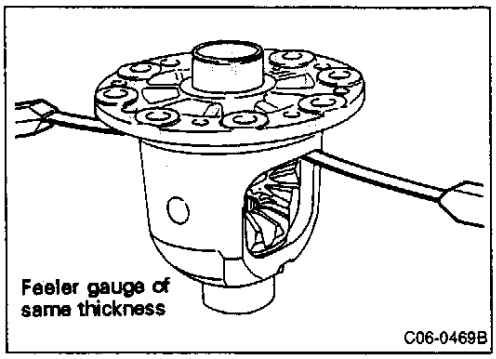
- Clean thoroughly to prevent side gear, side gear thrust washer and differential case from being coated with gear oil.
- Position differential case upright to enable side gear measurement.



- Insert feeler gauges of same thickness from both sides in rear surface of side gear to prevent side gear from falling and then measure clearance.
- Rotate side gear, measure clearance in three locations and calculate average value.

  Side gear rear clearance:

  0.15 mm (0.0059 in) max. (Gear must rotate without resistance.)



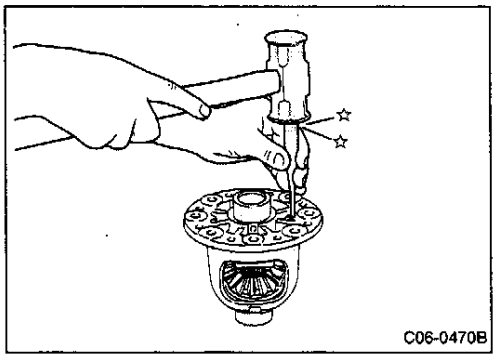
- Turn differential case upside down and measure side gear clearance on opposite side in same manner.

  Side gear rear clearance:

  0.15 mm (0.0059 in) max. (Gear must rotate without resistance.)

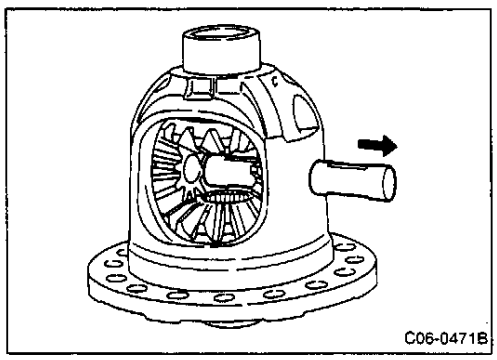
  If side gear clearance is not within specification, select proper thrust washer thickness to adjust clearance.

Excess rear clearance:	Use thicker thrust washer.
Insufficient rear clearance:	Use thinner thrust washer.



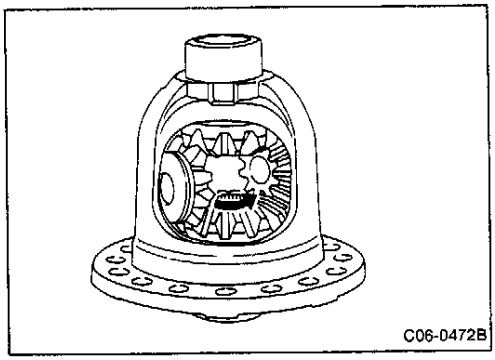
ⓓ Disassembly

- Use pin punch (special service tool) to remove pinion mate shaft lock pin.

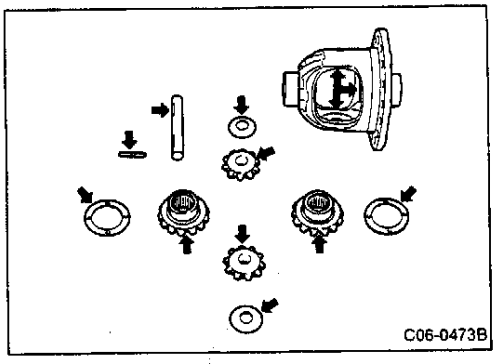


- Remove pinion mate shaft.

3. Final Drive Removal and Installation, Assembly and Disassembly (Cont'd)

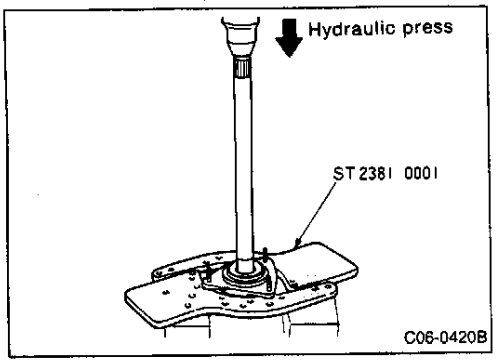


- Rotate pinion mate gear. Remove pinion mate gear and pinion mate thrust washer, side gear and side gear thrust washer from differential case.

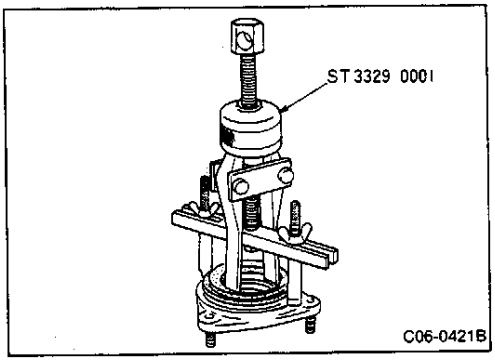


- Refer to [Point 6] (described later) for inspection procedures of side gear, side gear thrust washer, pinion mate shaft, pinion mate gear, pinion mate thrust washer and differential case.

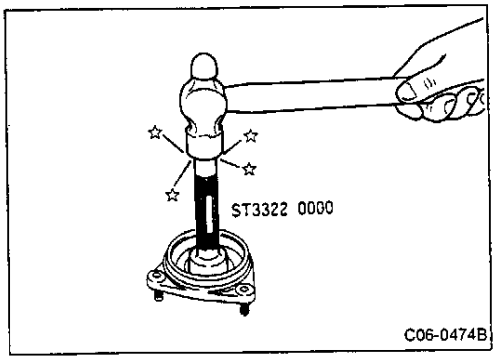
[Point 5] Side shaft assembly disassembly



- Use hydraulic press and remove side shaft from retainer.

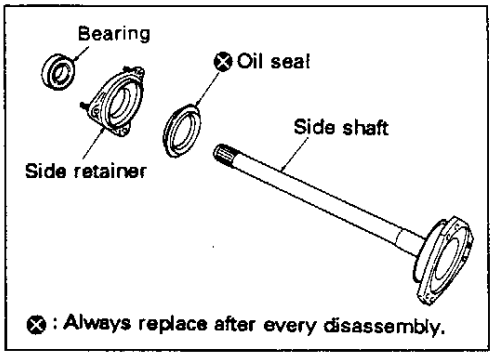


- Use hydraulic puller (special service tool) and remove oil seal from retainer.



- Use drift (special service tool) and remove bearing from retainer.

3. Final Drive Removal and Installation, Assembly and Disassembly (Cont'd)



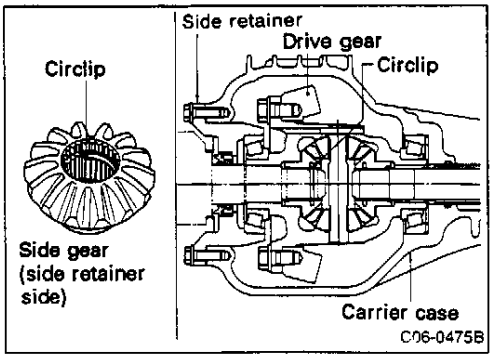
- Clean disassembled parts in suitable solvent and blow dry with compressed air. Repair or replace worn or scratched parts as follows.

Item	Processing
Side shaft	• Replace oil seal if seal lip contact surface is worn [approx. 0.1 mm (0.004 in)] or exhibits heat deformation.
Retainer	• Replace if worn, scratched or cracked.
Bearing	• Rotate bearing by hand and check for wear, scratches, pitting or flaking. Replace bearing if noisy or damaged or rotation is not smooth.
Oil seal	• Always replace with new seal after removal. Replace if there is lip wear, fatigue, damage or other problem.

[Point 6] Part inspection

- Clean disassembled parts in suitable solvent and blow dry with compressed air. Check for wear, scratches or other damage and replace as indicated below.

Item	Processing
Hypoid gear	• Check cause of abnormal gear tooth contact and correct during assembly. • If wear is excessive, replace gears which cannot be adjusted as sets. • If gears are cracked, scratched or damaged replace as set.
Bearing	• Check for wear, scratches, pitting, rust or flaking. Rotate bearing by hand and replace as necessary.
Side gear and pinion mate gear	• Check for wear, scratches, or other damage on gear surface and replace as necessary. • Check for wear, seizing of thrust washer and replace as necessary.
Side gear and pinion mate gear thrust washer	• Check for wear, seizing, scratches, or other damage and replace as necessary.
Oil seal	• Always replace with new seal after removal. Replace if there is lip wear, fatigue or other problem.
Differential case	• Replace case if sliding parts are cracked or worn.
Companion flange	• Replace seal if seal lip contact surface is worn [approx. 0.1 mm (0.004 in)] or exhibits fatigue.



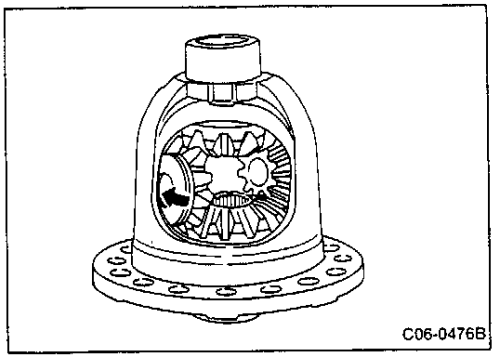
[Point 7] Differential case assembly

- Assemble thrust washer in side gear.

Note:
Make sure thrust washer used in assembly is same washer or thickness as disassembled washer.

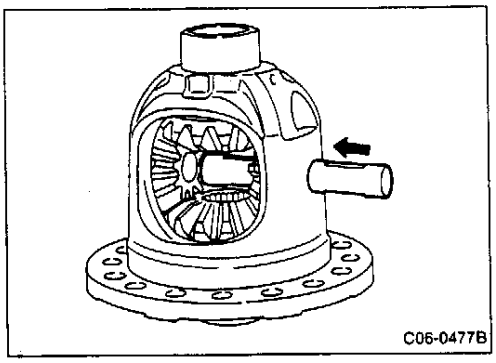
- Coat sliding parts of differential case, gears and thrust washer with gear oil.
- Assemble side gear and thrust washer, pinion mate gear and thrust washer in differential case.

3. Final Drive Removal and Installation, Assembly and Disassembly (Cont'd)

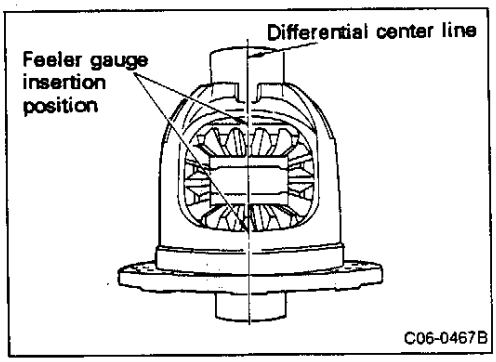


CAUTION:
Assemble side gear with circlip in side retainer side.

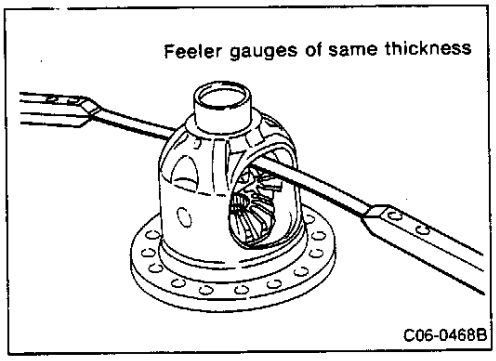
- Align two pinion mate gears in diagonal position. Rotate gears and install in differential case.



- Align differential case lock pin hole and shaft lock pin hole and assemble pinion mate shaft.

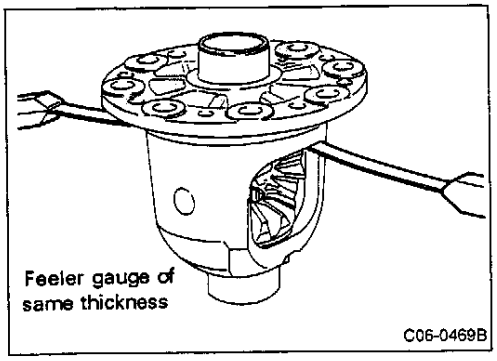


- Place differential case so side gear to be measured faces up.



- Insert feeler gauges of same thickness from both sides in rear surface of side gear to prevent side gear from falling and then measure clearance.
- Rotate side gear, measure clearance in three locations and calculate average value.
- Select side gear thrust washer so clearance is within specification shown below.

  Side gear rear clearance:
  0.15 mm (0.0059 in) max. (Gear must rotate without resistance.)



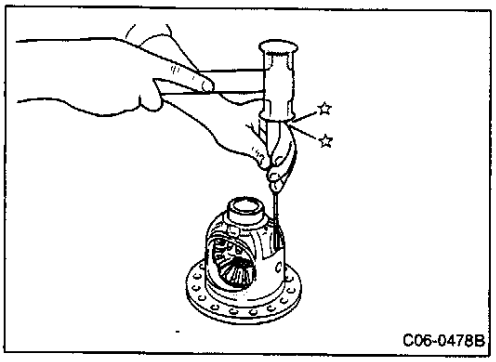
- Turn differential case upside down and measure side gear clearance on opposite side in same manner.
- If rear clearance is not within specification, select proper thrust washer thickness to adjust clearance.

Excess rear clearance:	Use thicker thrust washer.
Insufficient rear clearance:	Use thinner thrust washer.

3. Final Drive Removal and Installation, Assembly and Disassembly (Cont'd)

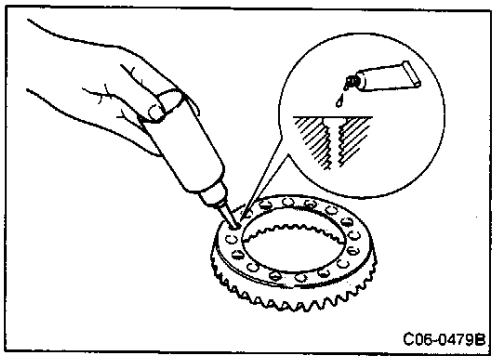
Side gear thrust washers

Thickness mm (in)	Part number	Thickness mm (in)	Part number	Thickness mm (in)	Part number
0.68 - 0.71 (0.0268 - 0.0280)	38424 W1010	0.80 - 0.83 (0.0315 - 0.0327)	38424 W1014	0.92 - 0.95 (0.0362 - 0.0374)	38424 W1018
0.71 - 0.74 (0.0280 - 0.0291)	38424 W1011	0.83 - 0.86 (0.0327 - 0.0339)	38424 W1015	0.95 - 0.98 (0.0374 - 0.0386)	38424 W1019
0.74 - 0.77 (0.0291 - 0.0303)	38424 W1012	0.86 - 0.89 (0.0339 - 0.0350)	38424 W1016	0.98 - 1.01 (0.0386 - 0.0398)	38424 W1020
0.77 - 0.80 (0.0303 - 0.0315)	38424 W1013	0.89 - 0.92 (0.0350 - 0.0362)	38424 W1017	1.01 - 1.04 (0.0398 - 0.0409)	38424 W1021

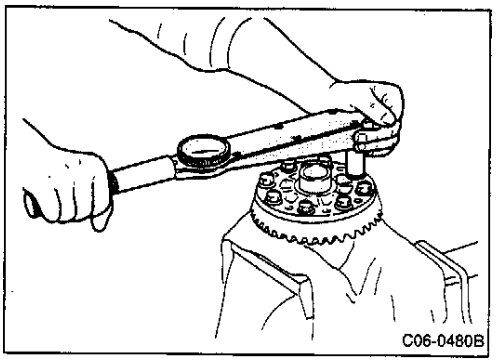

C06-0478B

- Use pin punch (special service tool) to insert lock pin in pinion mate shaft.

CAUTION:
Always replace lock pin with new part after every disassembly.


C06-0479B

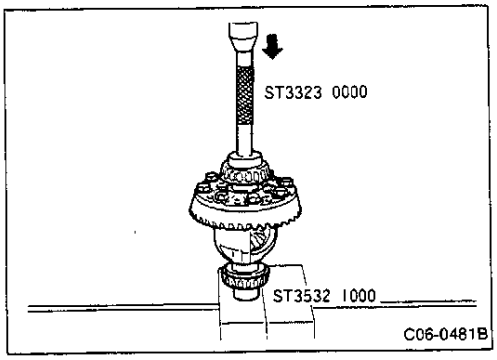
- Coat drive gear threads with one or two drops of Locktite.


C06-0480B

- Install drive gear in differential case.
- Coat bolt seat with rust preventative oil and tighten bolts evenly in criss-cross sequence.

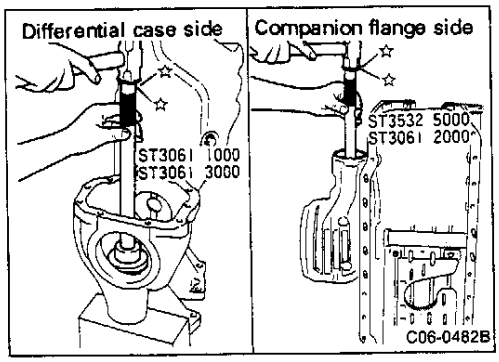
Tightening torque:
93 - 113 N·m (9.5 - 11.5 kg-m, 69 - 83 ft-lb)

3. Final Drive Removal and Installation, Assembly and Disassembly (Cont'd)



- Use drift (special service tool) and press-fit side bearing in differential case.

CAUTION:
Use hammer to start bearing installation. Set differential case and bearing in vertical position and press-fit bearing.

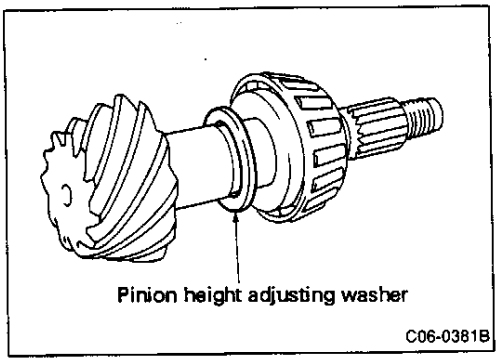


[Point 8] Hypoid gear contact and backlash inspection

ⓐ Pinion bearing outer race installation

- Use drift (special service tool) to install pinion bearing outer race in carrier case.

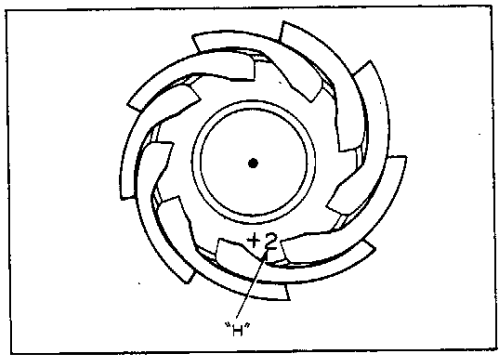
CAUTION:
Press-fit outer race straight into carrier case and not at an angle.



ⓑ Pinion height adjusting washer installation (temporary installation)

- Assemble height adjusting washer on drive pinion.

CAUTION:
Make sure height adjusting washer used for assembly is same washer or same thickness as washer that was removed.



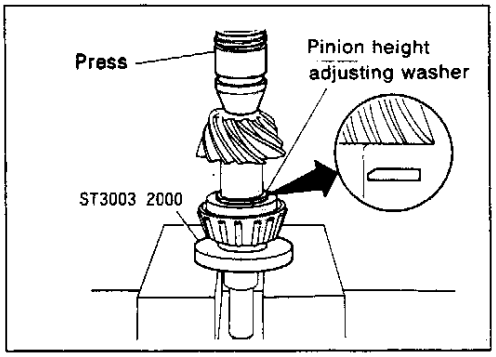
ⓒ Gear set replacement washer selection

- When replacing hypoid gear set, calculate processing error correction value for new and former drive pinion and select suitable washer.
- Processing error correction
  $T = T_0 + (t_1 - t_2)$
  T: Thickness of washer to be installed
  T_0: Thickness of removed washer
  t_1: Former drive pinion head number
  (Processing error is expressed in unit of 1/100 mm)
  t_2: New drive pinion head number
  (Processing error is expressed in unit of 1/100 mm)
  Calculation example:
  If $T_0 = 3.21$ $t_1 = +2$ $t_2 = -1$
  Then: $T = 3.21 + [(2 \times 0.01) - (-1 \times 0.01)] = 3.24$
- Install washer temporarily on drive pinion.

Pinion height adjusting washers

Thickness mm (in)	Part number	Thickness mm (in)	Part number
3.09 (0.1217)	38154 U1500	3.39 (0.1335)	38154 U1510
3.12 (0.1228)	38154 U1501	3.42 (0.1346)	38154 U1511
3.15 (0.1240)	38154 U1502	3.45 (0.1358)	38154 U1512
3.18 (0.1252)	38154 U1503	3.48 (0.1370)	38154 U1513
3.21 (0.1264)	38154 U1504	3.51 (0.1382)	38154 U1514
3.24 (0.1276)	38154 U1505	3.54 (0.1394)	38154 U1515
3.27 (0.1287)	38154 U1506	3.57 (0.1406)	38154 U1516
3.30 (0.1299)	38154 U1507	3.60 (0.1417)	38154 U1517
3.33 (0.1311)	38154 U1508	3.63 (0.1429)	38154 U1518
3.36 (0.1323)	38154 U1509	3.66 (0.1441)	38154 U1519

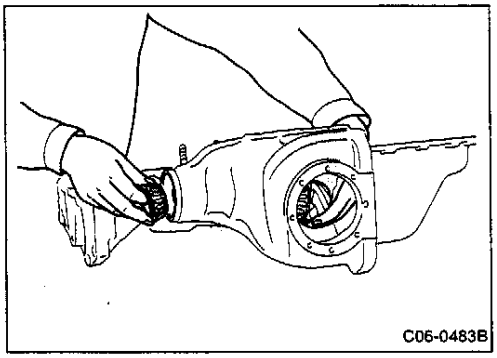
3. Final Drive Removal and Installation, Assembly and Disassembly (Cont'd)



ⓓ Pinion bearing installation

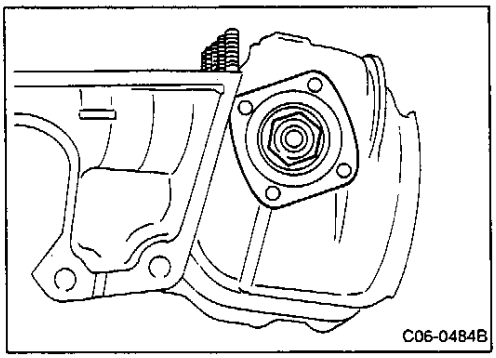
- Use drift (special service tool) and install bearing.

CAUTION:
Make sure washer is facing correct direction.

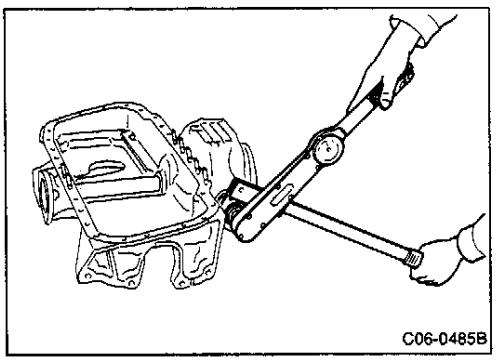


ⓔ Drive pinion and bearing installation

- Coat bearing with gear oil.
- Assemble drive pinion and bearing in carrier case without spacer and adjusting washer.

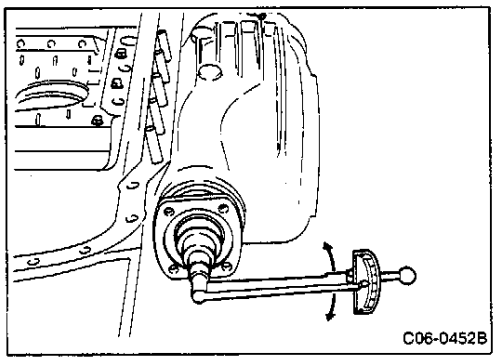


- Install companion flange without oil seal.
- Coat drive pinion threads and pinion nut seat with rust-preventative oil and install nut temporarily.

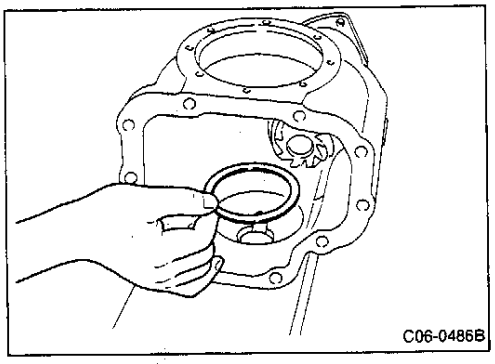


- Tighten pinion lock nut to specified preload torque.
  Pinion bearing preload standard value (without oil seal installed):
  0.7 - 1.0 N·m (0.07 - 0.10 kg-m, 0.5 - 0.7 ft-lb)

CAUTION:
Tighten pinion lock nut in 5° to 10° increments while preload is measured because spacer is not inserted. Do not tighten excessively.



3. Final Drive Removal and Installation, Assembly and Disassembly (Cont'd)

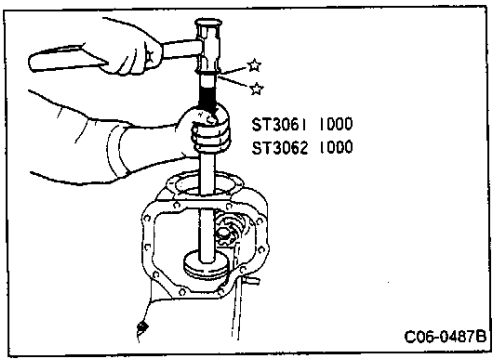


ⓕ Differential case installation

- Install side bearing adjusting washer (carrier case side) in carrier case.

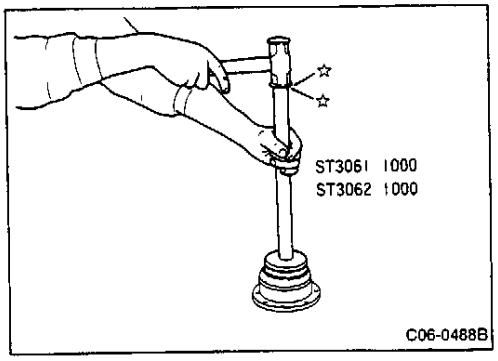
CAUTION:
Make sure adjusting washer used for assembly is same washer or same thickness as washer that was removed. Otherwise, use washer indicated below.

Thickness mm (in)	Part number
2.00 (0.0787)	38453 03V01

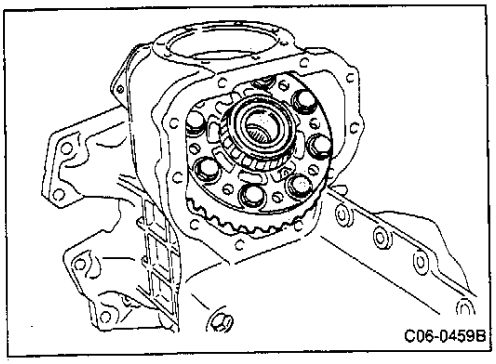


- Use drift (special service tool) and install side bearing outer race (carrier side) in differential case.

CAUTION:
Do not tap with excessive force.



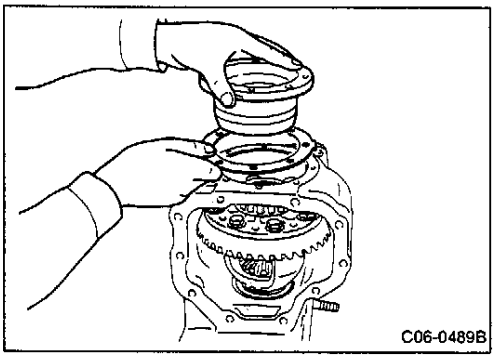
- Use drift (special service tool) and install side bearing outer race in side retainer.



- Coat bearing with gear oil.
- Install differential case assembly in carrier case.

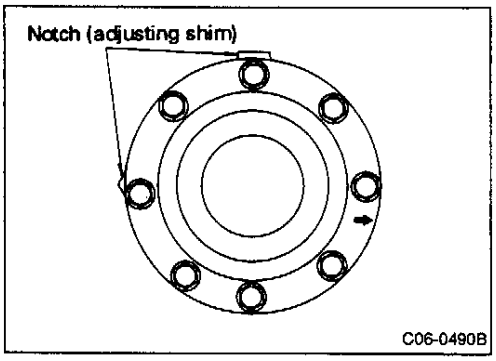
CAUTION:
Do not scratch carrier cover surface.

3. Final Drive Removal and Installation, Assembly and Disassembly (Cont'd)



- Assemble side bearing adjusting shim in side retainer.

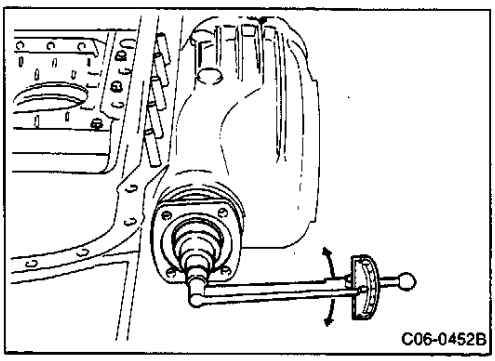
CAUTION:
Make sure adjusting shim used for assembly is same shim or same thickness as shim that was removed.



- Install side bearing adjusting shims so they face the two notches on top and rear of carrier case.
- Install side retainer in direction of arrow facing front of carrier case.

Tightening torque:
16 - 19 N·m (1.6 - 1.9 kg-m, 12 - 14 ft-lb)

CAUTION:
Do not install O-ring.



ⓖ Total preload measurement

- Rotate companion flange more than 20 times. Measure preload with preload gauge.

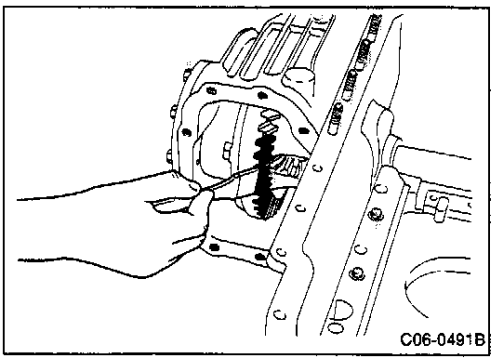
Total preload standard value
(without oil seal installed):
1.5 - 2.1 N·m (0.15 - 0.21 kg-m, 1.1 - 1.5 ft-lb)

- If preload torque is not within specification range, adjust by selecting suitable shim thickness for side retainer.

Excessive preload:	Use thicker shim.
Insufficient preload:	Use thinner shim.

Side bearing adjusting shim (side retainer side)

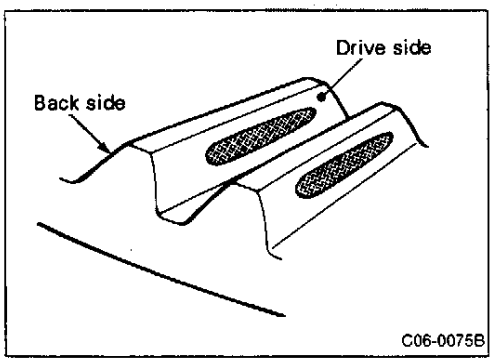
Thickness mm (in)	Part number	Thickness mm (in)	Part number	Thickness mm (in)	Part number
0.35 (0.0138)	38453 03V60	0.65 (0.0256)	38453 03V66	0.95 (0.0374)	38453 03V72
0.40 (0.0157)	38453 03V61	0.70 (0.0276)	38453 03V67	1.00 (0.0394)	38453 03V73
0.45 (0.0177)	38453 03V62	0.75 (0.0295)	38453 03V68	1.05 (0.0413)	38453 03V74
0.50 (0.0197)	38453 03V63	0.80 (0.0315)	38453 03V69	1.10 (0.0433)	38453 03V75
0.55 (0.0217)	38453 03V64	0.85 (0.0335)	38453 03V70	1.15 (0.0453)	38453 03V76
0.60 (0.0236)	38453 03V65	0.90 (0.0354)	38453 03V71		



ⓗ Gear tooth contact inspection

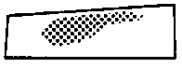
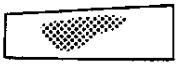
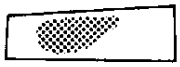
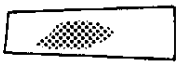
- Coat both sides of drive gear tooth surface with titanium oxide.
  Rotate drive gear and drive pinion and check gear tooth contact pattern.

3. Final Drive Removal and Installation, Assembly and Disassembly (Cont'd)

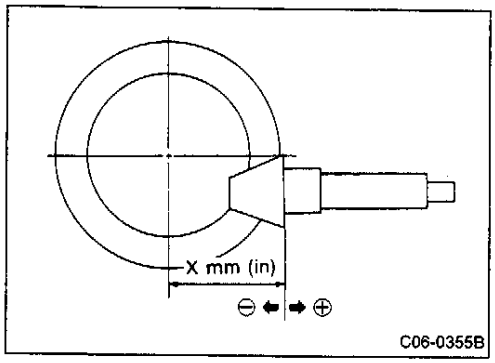


- Check drive gear tooth contact in four locations, on the drive side (acceleration side) and back side (deceleration).

Gear tooth contact pattern standard

Contact pattern		Pinion height adjusting washer selection value mm (in)	Adjustment
Back side	Drive side		
Toe contact Heel contact 	Heel contact Toe contact 	+0.15 (+0.0059)	Necessary
Toe contact Heel contact 	Heel contact Toe contact 	+0.12 (+0.0047)	↑
Toe contact Heel contact 	Heel contact Toe contact 	+0.09 (+0.0035)	↑
Toe contact Heel contact 	Heel contact Toe contact 	+0.06 (+0.0024)	Unnecessary
Toe contact Heel contact 	Heel contact Toe contact 	+0.03 (+0.0012)	↑
Toe contact Heel contact 	Heel contact Toe contact 	0 (0)	↑
Toe contact Heel contact 	Heel contact Toe contact 	−0.03 (−0.0012)	↑
Toe contact Heel contact 	Heel contact Toe contact 	−0.06 (−0.0024)	↑
Toe contact Heel contact 	Heel contact Toe contact 	−0.09 (−0.0035)	Necessary
Toe contact Heel contact 	Heel contact Toe contact 	−0.12 (−0.0047)	↑
Toe contact Heel contact 	Heel contact Toe contact 	−0.15 (−0.0059)	↑

3. Final Drive Removal and Installation, Assembly and Disassembly (Cont'd)

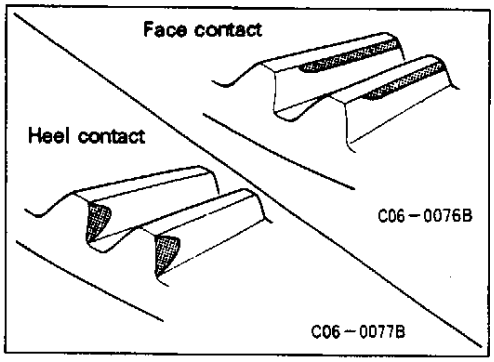


ⓘ Tooth contact adjustment

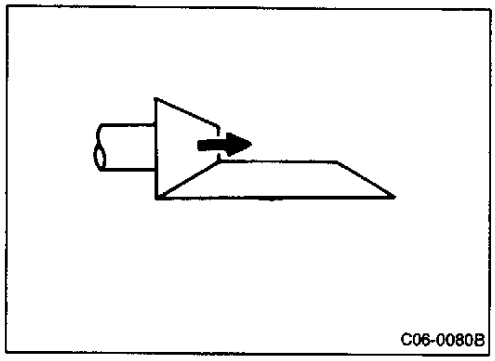
- If tooth contact is not correct, change pinion height adjusting washer thickness to adjust pinion height [X mm (in) in figure].

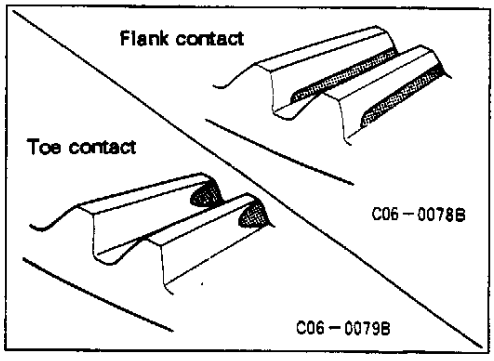
Pinion height adjusting washer

Thickness mm (in)	Part number	Thickness mm (in)	Part number	Thickness mm (in)	Part number
3.09 (0.1217)	38154 U1500	3.30 (0.1299)	38154 U1507	3.51 (0.1382)	38154 U1514
3.12 (0.1228)	38154 U1501	3.33 (0.1311)	38154 U1508	3.54 (0.1394)	38154 U1515
3.15 (0.1240)	38154 U1502	3.36 (0.1323)	38154 U1509	3.57 (0.1406)	38154 U1516
3.18 (0.1252)	38154 U1503	3.39 (0.1335)	38154 U1510	3.60 (0.1417)	38154 U1517
3.21 (0.1264)	38154 U1504	3.42 (0.1346)	38154 U1511	3.63 (0.1429)	38154 U1518
3.24 (0.1276)	38154 U1505	3.45 (0.1358)	38154 U1512	3.66 (0.1441)	38154 U1519
3.27 (0.1287)	38154 U1506	3.48 (0.1370)	38154 U1513		



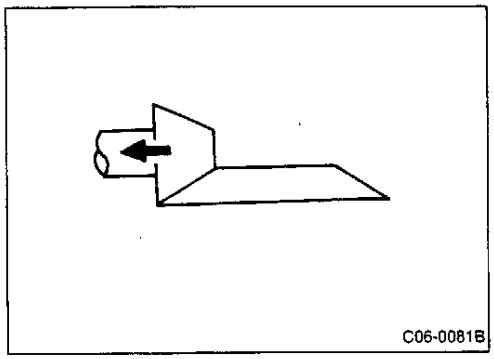
- If face contact or heel contact occur, increase pinion height adjusting washer thickness to move drive pinion closer to drive gear.

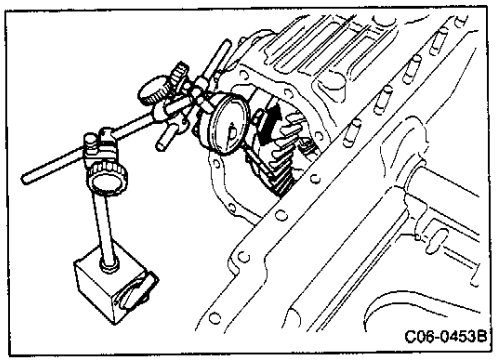




- If flank contact or toe contact occur, decrease pinion height adjusting washer thickness to move drive pinion away from drive gear.

3. Final Drive Removal and Installation, Assembly and Disassembly (Cont'd)


C06-0081B

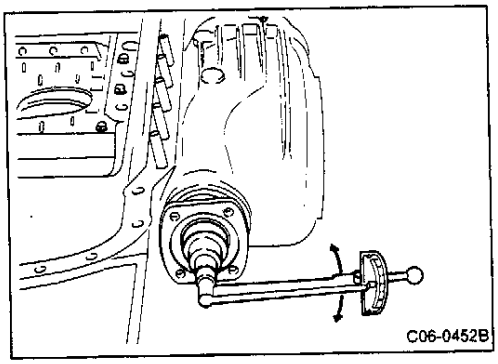

C06-0453B

- Place dial gauge on drive gear face and measure backlash.
  Backlash standard value:
  0.13 - 1.18 mm (0.0051 - 0.0465 in)
- If backlash is not within specification range, change thickness of carrier case side side bearing adjusting washer to adjust.

Excess backlash:	Use thicker washer.
Insufficient backlash:	Use thinner washer.

Side bearing adjusting washer (Carrier case side)

Thickness mm (in)	Part number	Thickness mm (in)	Part number	Thickness mm (in)	Part number
1.95 (0.0768)	38453 03V00	2.25 (0.0886)	38453 03V06	2.55 (0.1004)	38453 03V12
2.00 (0.0787)	38453 03V01	2.30 (0.0906)	38453 03V07	2.60 (0.1024)	38453 03V13
2.05 (0.0807)	38453 03V02	2.35 (0.0925)	38453 03V08	2.65 (0.1043)	38453 03V14
2.10 (0.0827)	38453 03V03	2.40 (0.0945)	38453 03V09		
2.15 (0.0846)	38453 03V04	2.45 (0.0965)	38453 03V10		
2.20 (0.0866)	38453 03V05	2.50 (0.0984)	38453 03V11		


C06-0452B

ⓘ Total preload measurement

- Rotate companion flange more than 20 times. Use preload gauge to measure preload.
  Total preload standard value (without oil seal):
  1.5 - 2.1 N·m (0.15 - 0.21 kg-m, 1.1 - 1.5 ft-lb)
- If preload is not within specification range, adjust by selecting suitable adjusting shim thickness.

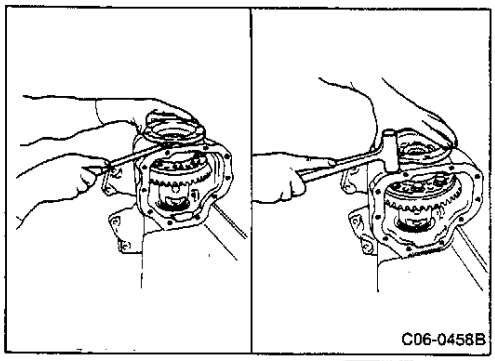
Excess preload:	Use thicker shim.
Insufficient preload:	Use thinner shim.

Side bearing adjusting washer (Carrier case side)

Thickness mm (in)	Part number	Thickness mm (in)	Part number	Thickness mm (in)	Part number
0.35 (0.0138)	38453 03V60	0.65 (0.0256)	38453 03V66	0.95 (0.0374)	38453 03V72
0.40 (0.0157)	38453 03V61	0.70 (0.0276)	38453 03V67	1.00 (0.0394)	38453 03V73
0.45 (0.0177)	38453 03V62	0.75 (0.0295)	38453 03V68	1.05 (0.0413)	38453 03V74
0.50 (0.0197)	38453 03V63	0.80 (0.0315)	38453 03V69	1.10 (0.0433)	38453 03V75
0.55 (0.0217)	38453 03V64	0.85 (0.0335)	38453 03V70	1.15 (0.0453)	38453 03V76
0.60 (0.0236)	38453 03V65	0.90 (0.0354)	38453 03V71		

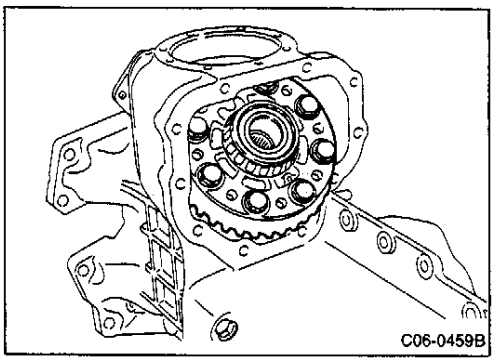
3. Final Drive Removal and Installation, Assembly and Disassembly (Cont'd)

[Point 9] Drive pinion and preload adjustment



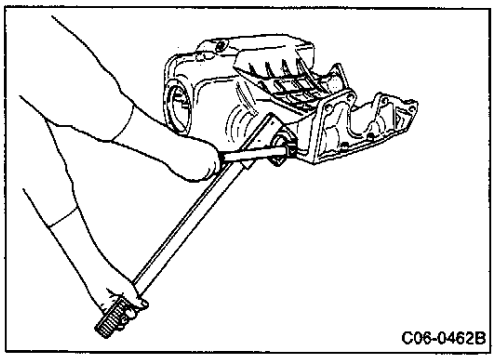
ⓐ Differential case assembly removal

- Insert screwdriver in side retainer notch and raise retainer.
- While pulling side retainer, tap gear lightly with plastic hammer and remove retainer.



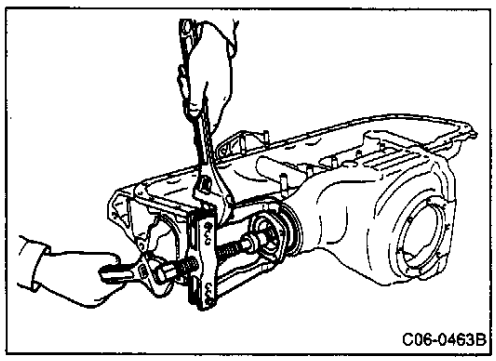
- Remove differential case assembly.

CAUTION:
Do not scratch carrier case surface.

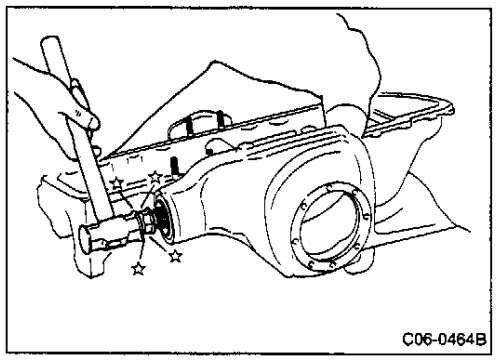


ⓑ Drive pinion assembly removal

- Use flange wrench and remove pinion lock nut.



- Use puller (special service tool) and remove companion flange.

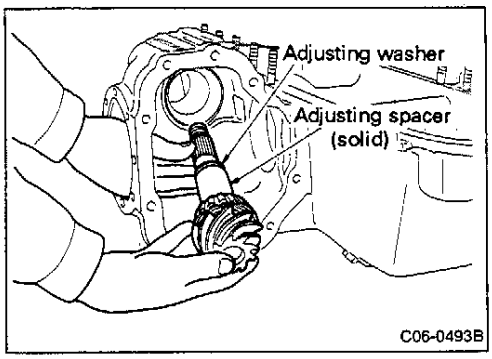


- Install pinion lock nut in drive pinion.

CAUTION:
Set drive pinion and pinion lock nut even to avoid damaging drive pinion threads.

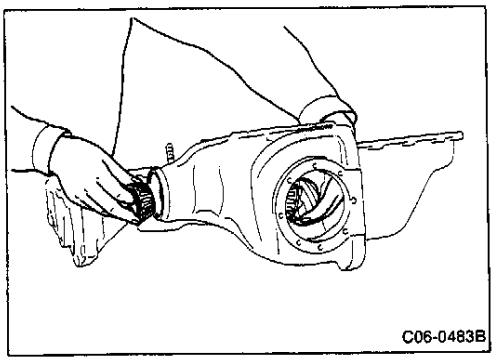
- Use copper hammer and remove drive pinion from carrier case.

3. Final Drive Removal and Installation, Assembly and Disassembly (Cont'd)

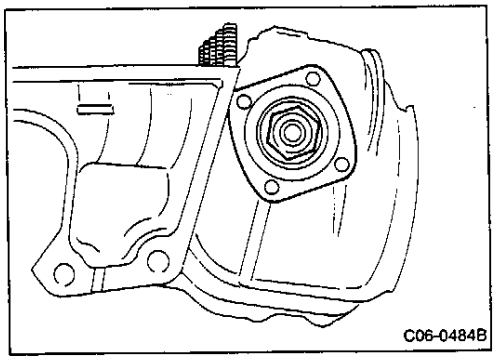


- Assemble adjusting spacer and washer on drive pinion and install in carrier case.

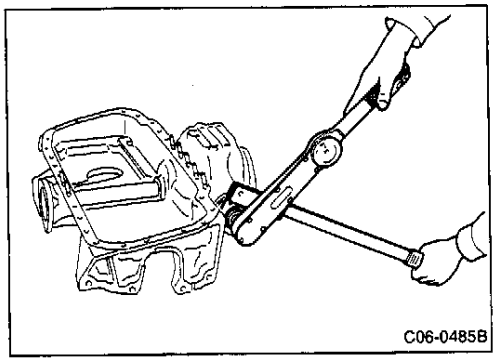
Note:
Spacer and washer must be same length and thickness as parts removed at disassembly.



- Coat bearing with gear oil.
- Assemble drive pinion and bearing in carrier case.



- Install companion flange without oil seal.
- Coat drive pinion threads and pinion nut seat with rust-preventative oil and tighten nut temporarily.

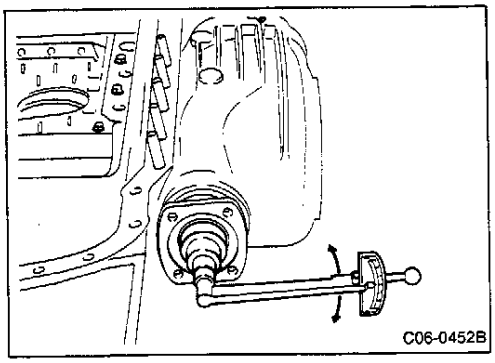


- Rotate companion flange and fit bearing.
- Use preload gauge, measure preload and tighten nut.
- When tightening to specified torque, select spacer and washer to set standard preload.

First use a long spacer and thick washer. Gradually, exchange for shorter spacer and thinner washer.

Drive pinion tightening torque:
167 - 196 N·m (17 - 20 kg-m, 123 - 145 ft-lb)
Pinion bearing preload standard value:
0.7 - 10.8 N·m (0.07 - 1.10 kg-m, 0.5 - 8.0 ft-lb)

If longer spacer and thicker washer are used:	the preload increases.
If shorter spacer and thinner washer are used:	the preload decreases.



CAUTION:
Do not increase preload excessively.

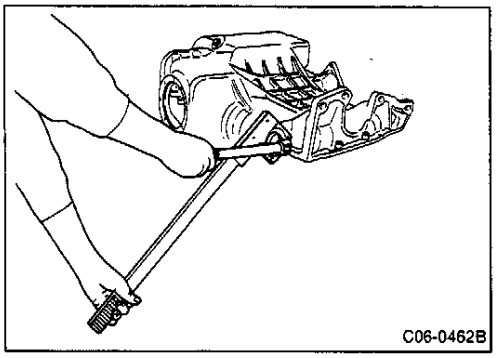
3. Final Drive Removal and Installation, Assembly and Disassembly (Cont'd)

Pinion bearing adjusting spacer (solid)

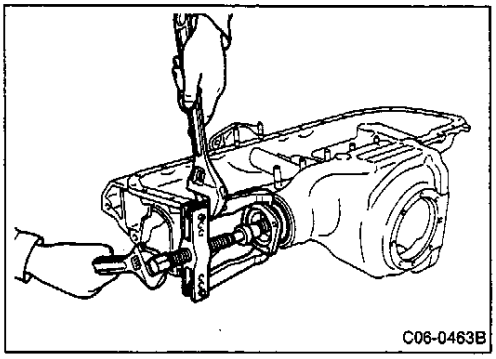
Thickness mm (in)	Part number	Thickness mm (in)	Part number	Thickness mm (in)	Part number
56.2 (2.213)	38130 21000	56.6 (2.228)	38132 21000	57.0 (2.244)	38134 21000
56.4 (2.220)	38131 21000	56.8 (2.236)	38133 21000	57.2 (2.252)	38135 21000

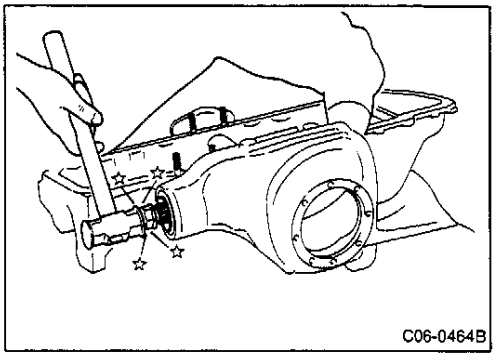
Pinion bearing adjusting washer

Thickness mm (in)	Part number	Thickness mm (in)	Part number	Thickness mm (in)	Part number
2.59 (0.1020)	38127 09400	2.47 (0.0972)	38133 09400	2.35 (0.0925)	38139 09400
2.57 (0.1012)	38128 09400	2.45 (0.0965)	38134 09400	2.33 (0.0917)	38140 09400
2.55 (0.1004)	38129 09400	2.43 (0.0957)	38135 09400	2.31 (0.0909)	38141 09400
2.53 (0.0996)	38130 09400	2.41 (0.0949)	38136 09400		
2.51 (0.0988)	38131 09400	2.39 (0.0941)	38137 09400		
2.49 (0.0980)	38132 09400	2.37 (0.0933)	38138 09400		


C06-0462B

- If the specified preload (by adjusting spacer, adjusting washer selection) is set at specified torque, remove drive pinion one time.
- Use puller (special service tool) and remove companion flange.


C06-0463B

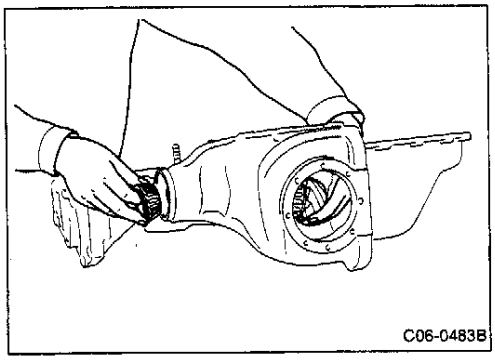

C06-0464B

- Install pinion lock nut in drive pinion.

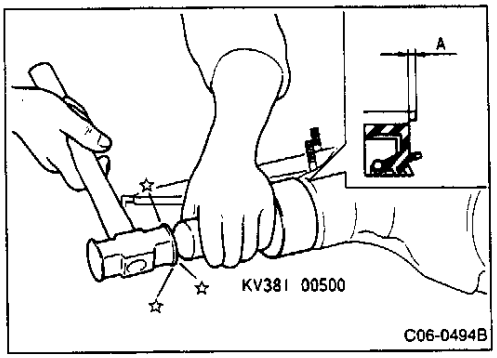
CAUTION:
Set drive pinion and pinion lock nut even to avoid damaging drive pinion threads.

- Use copper hammer and remove drive pinion from carrier case.

3. Final Drive Removal and Installation, Assembly and Disassembly (Cont'd)

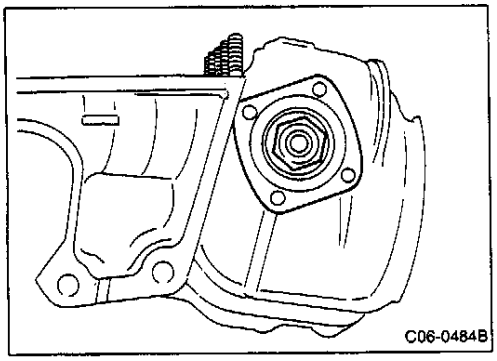


- Coat bearing with gear oil.
- Assemble drive pinion and selected adjusting spacer and washer in carrier case. Install bearing in case.



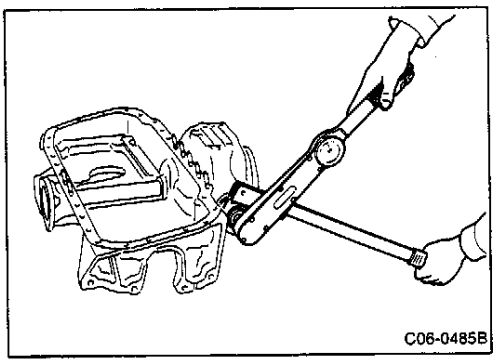
- Coat oil seal lip with Nissan MP special grease No. 2.
- Use drift (special service tool) and install oil seal to position of dimension A shown in figure on left.

Dimension A:
1.8 - 2.2 mm (0.071 - 0.087 in)



- Install companion flange.
- Coat drive pinion threads and pinion nut seat with rust-preventative oil and install new nut.

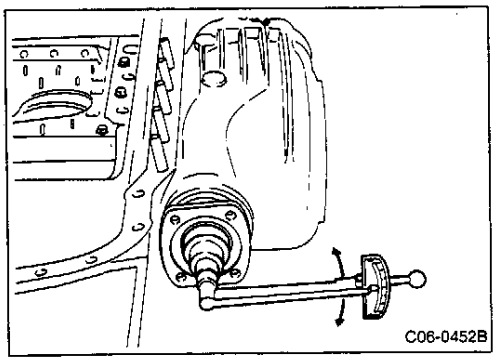
CAUTION:
Replace pinion nut with new part after every disassembly.



- Turn companion flange more than 20 times to fit bearing.
- Tighten drive pinion to specified torque.

Drive pinion tightening torque:
167 - 196 N·m (17 - 20 kg-m, 123 - 145 ft-lb)

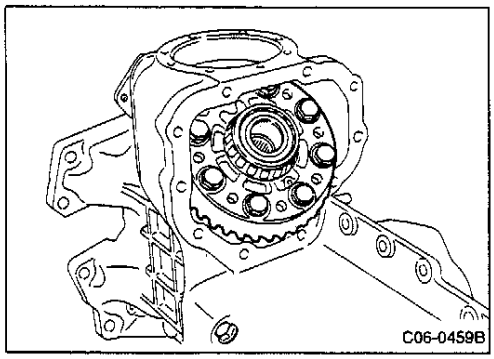
CAUTION:
Do not over-tighten.



- Use preload gauge and measure preload.

Pinion bearing preload standard value (with oil seal installed):
0.8 - 1.1 N·m (0.08 - 0.11 kg-m, 0.6 - 0.8 ft-lb)

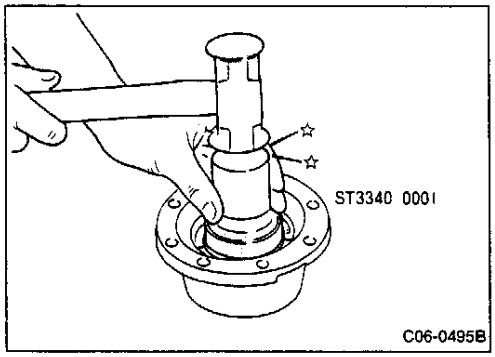
3. Final Drive Removal and Installation, Assembly and Disassembly (Cont'd)



[Point 10] Differential case assembly installation

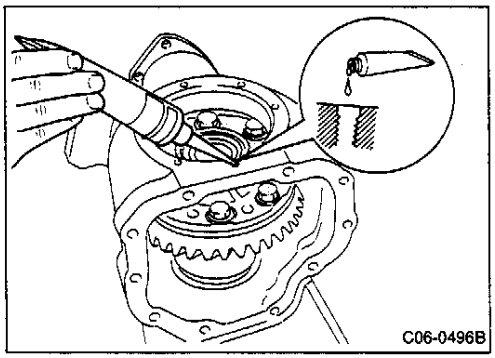
- Coat side bearing with gear oil. Install differential case assembly in carrier case.

CAUTION:
Do not scratch carrier case surface.

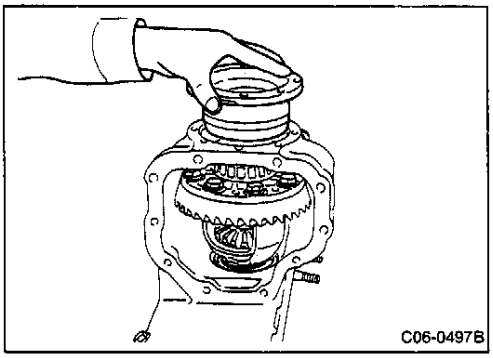


- Coat oil seal lip with Nissan MP special grease No. 2.
- Set drift (special service tool) in side retainer and install oil seal.

CAUTION:
After tightening bolt, wipe off extra liquid gasket inside case.

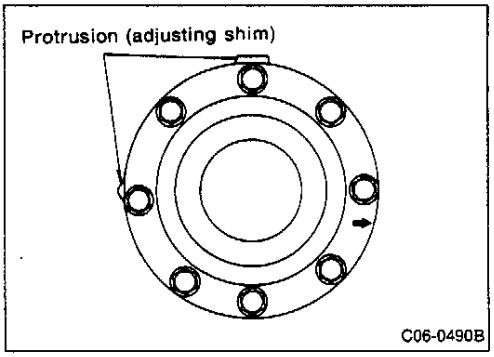


- Coat carrier case side retainer hole (through holes) with liquid gasket (silicon bond 1215 or equivalent).



- Install selected side bearing adjusting shim and O-rings in side retainer. Assemble and install them in carrier case.

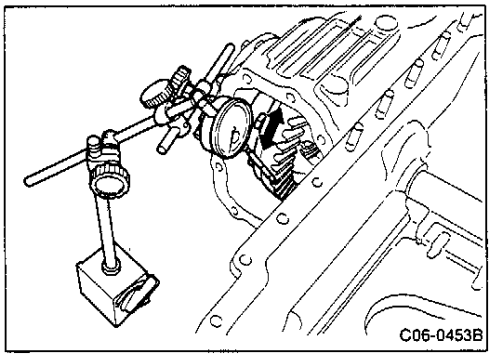
CAUTION:
Coat O-ring with gear oil and assemble after adjusting shim in carrier case side.



- Position adjusting shim so that the two protrusions face upper and rear side of carrier case and then install shim.
- Position side retainer facing front of carrier case (direction of arrow in figure) and install.

  Tightening torque:
  16 - 19 N·m (1.6 - 1.9 kg-m, 12 - 14 ft-lb)

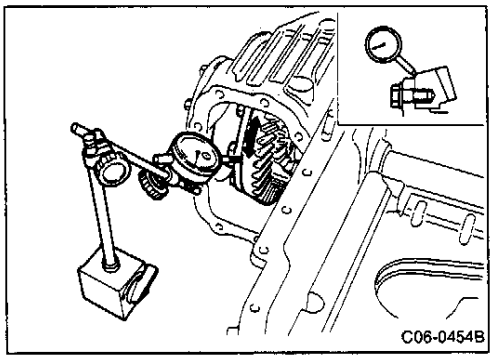
3. Final Drive Removal and Installation, Assembly and Disassembly (Cont'd)



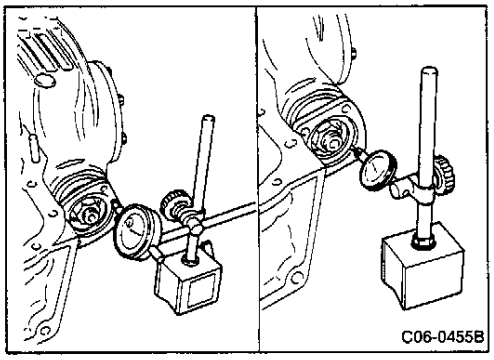
[Point 11] Inspection after assembly

- Rotate drive pinion and drive gear a number of times. Set dial gauge on drive gear surface and measure backlash.
  Backlash standard value:
  0.13 - 0.18 mm (0.0051 - 0.0071 in)
- If backlash is not within specification range, select suitable side bearing washer thickness (carrier case side) to adjust.

Excessive backlash:	Use thinner side bearing carrier case side washer.
Insufficient backlash:	Use thicker side bearing carrier case side washer.

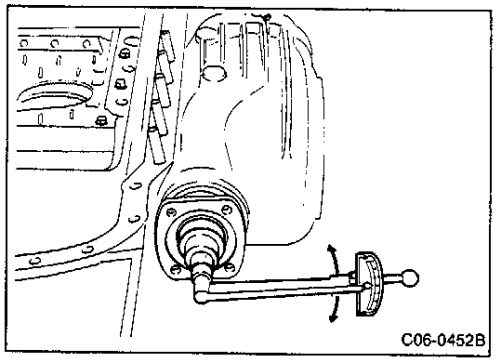


- Inspect drive gear runout.
  Runout standard value:
  0.05 mm (0.0020 in) max.
- Set dial gauge on drive gear rear surface. Rotate drive gear and measure runout.
- If runout is not within specification limit, inspect drive gear contact pattern (foreign matter between drive gear and differential case, deformation, etc.).
- If drive gear is deformed, replace hypoid assembly. If differential case is deformed, replace case.



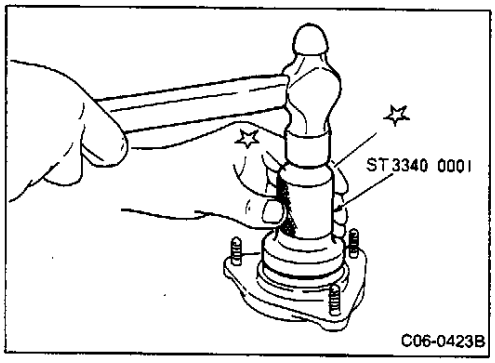
- Inspect companion flange runout.
  Runout limit value:
  0.05 mm (0.0020 in) max.
- Set dial gauge on companion flange surface (inside propeller shaft installation surface bolt hole) and measure runout.
- Set test indicator on inside of companion flange (inside lower surface) and measure runout.
- If runout exceeds specification limit, rotate relative positions of companion flange and drive pinion 90° and check if runout decreases.
- If runout still is not within specification range even if the relative position is changed, replace companion flange.
- If companion flange is replaced and runout is still not within specification range, the problem may be due to poor contact between pinion bearing and drive pinion or faulty pinion bearing.

3. Final Drive Removal and Installation, Assembly and Disassembly (Cont'd)



- Rotate companion flange more than 20 times. Use preload gauge to measure total preload.
  Total preload standard value (with oil seal installed):
  1.6 - 2.2 N·m (0.16 - 0.22 kg-m, 1.2 - 1.6 ft-lb)
- If the preload is not within specification range, adjust pinion bearing preload and side bearing preload.

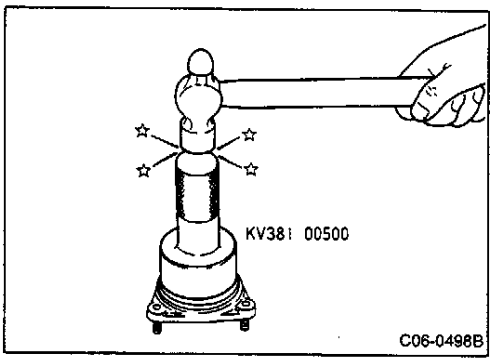
Excessive preload:	• Use shorter drive pinion spacer and thinner washer. • Use thicker side bearing retainer shim.
Insufficient preload:	• Use longer drive pinion spacer and thicker washer. • Use thinner side bearing retainer shim.



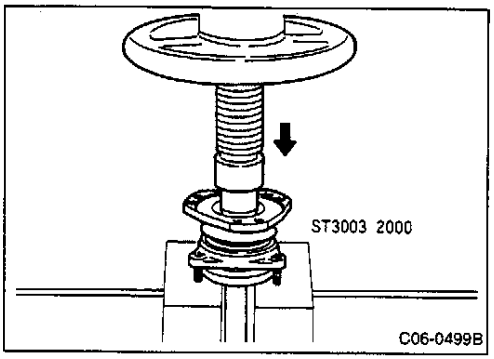
[Point 12] Side shaft assembly installation

- Use drift (special service tool) to install bearing in retainer.

CAUTION:
Do not install bearing on inclined angle.

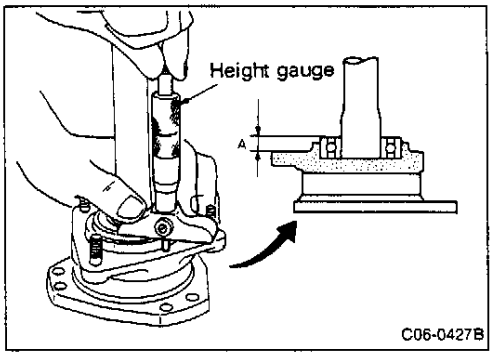


- Coat oil seal lip with Nissan MP special grease No. 2.
- Use drift (special service tool) and install oil seal in retainer.

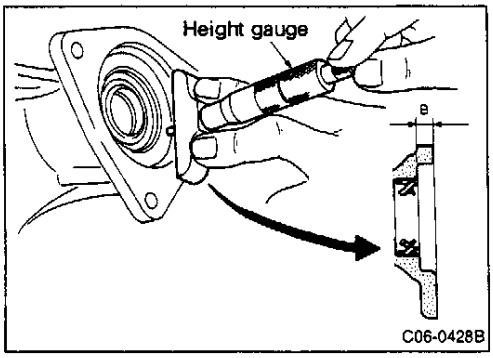


- Use drift (special service tool) and install side shaft in retainer.

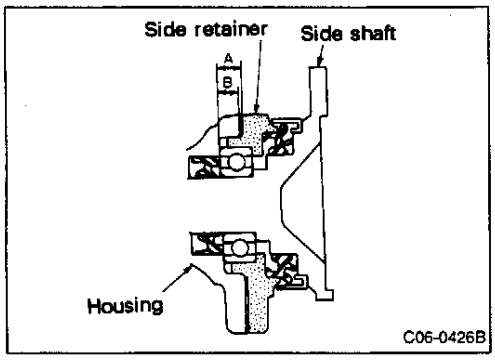
3. Final Drive Removal and Installation, Assembly and Disassembly (Cont'd)



- Measure dimension A in side shaft to calculate side shaft end play.



- Measure dimension B in carrier case.

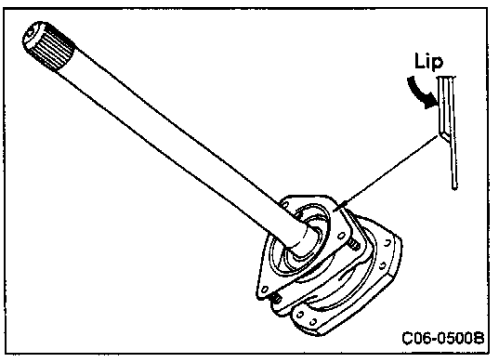


- Select adjusting shim so axial end play is within specification range indicated below.

Axial end play standard value (A - B):
0 - 0.1 mm (0 - 0.004 in)

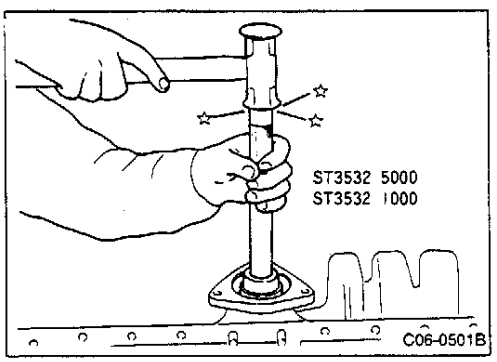
Side retainer adjusting shim

Thickness mm (in)	Part number	Thickness mm (in)	Part number
0.1 (0.004)	38233 03V01	0.4 (0.016)	38233 03V04
0.2 (0.008)	38233 03V02	0.5 (0.020)	38233 03V05
0.3 (0.012)	38233 03V03		



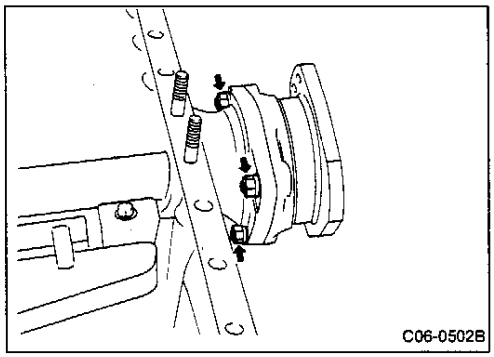
- Assemble selected adjusting shim and spacer in side shaft.

CAUTION:
Assemble adjusting shim in retainer and spacer in carrier case with lip (projection) facing carrier case side before installation.

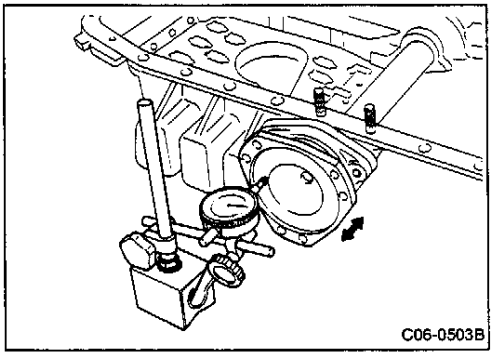


- Coat oil seal lip with Nissan MP special grease No. 2.
- Use drift (special service tool) and install oil seal in carrier case.

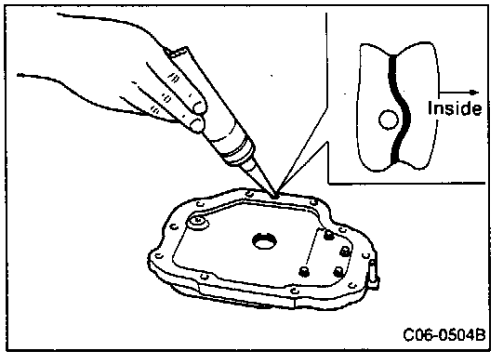
3. Final Drive Removal and Installation, Assembly and Disassembly (Cont'd)



- Install side shaft assembly in carrier case.
  Tightening torque:
  16 - 21 N·m (1.6 - 2.1 kg-m, 12 - 15 ft-lb)



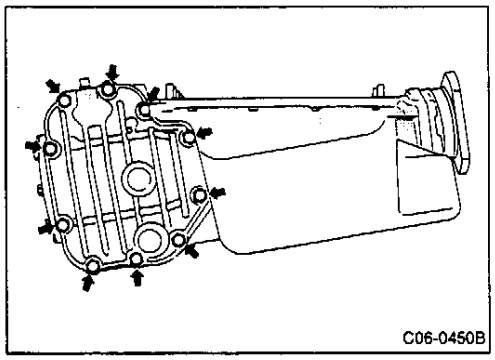
- Measure axial end play.
  Axial end play standard value:
  0 - 0.1 mm (0 - 0.004 in)



[Point 13] Carrier cover installation

- Apply a thin coat of liquid gasket (silicone bond 1215 or equivalent) to installation surface bolt holes of carrier cover and carrier case.

CAUTION:
Remove all traces of old liquid gasket from mating surfaces with a scraper. Wipe off any other oil, dust or foreign matter from mating surfaces.



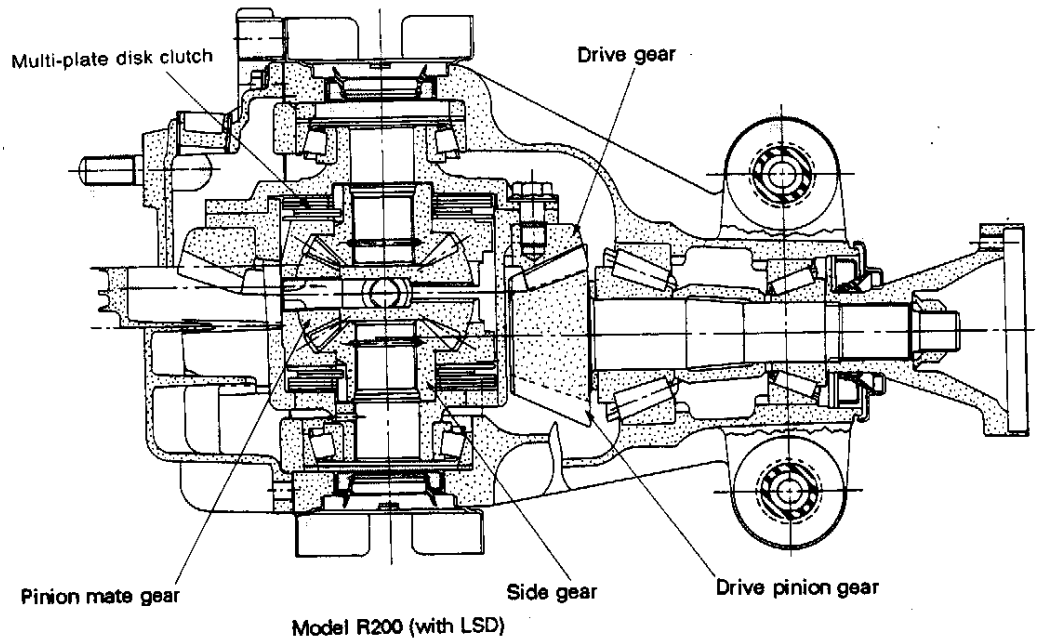
- Install carrier cover in carrier case.
  Tightening torque:
  29 - 37 N·m (3.0 - 3.8 kg-m, 22 - 27 ft-lb)
- Apply a thin coat of liquid gasket (silicon bond 1215 or equivalent) to drain plug and filler plug and install in carrier case cover.

Drain plug tightening torque	25 - 34 N·m (2.5 - 3.5 kg-m, 18 - 25 ft-lb)
Filler plug tightening torque	

Note:
Final drive must be filled with gear oil after installation in vehicle. Refer to the 1-1. SPECIFICATION for the oil volume.

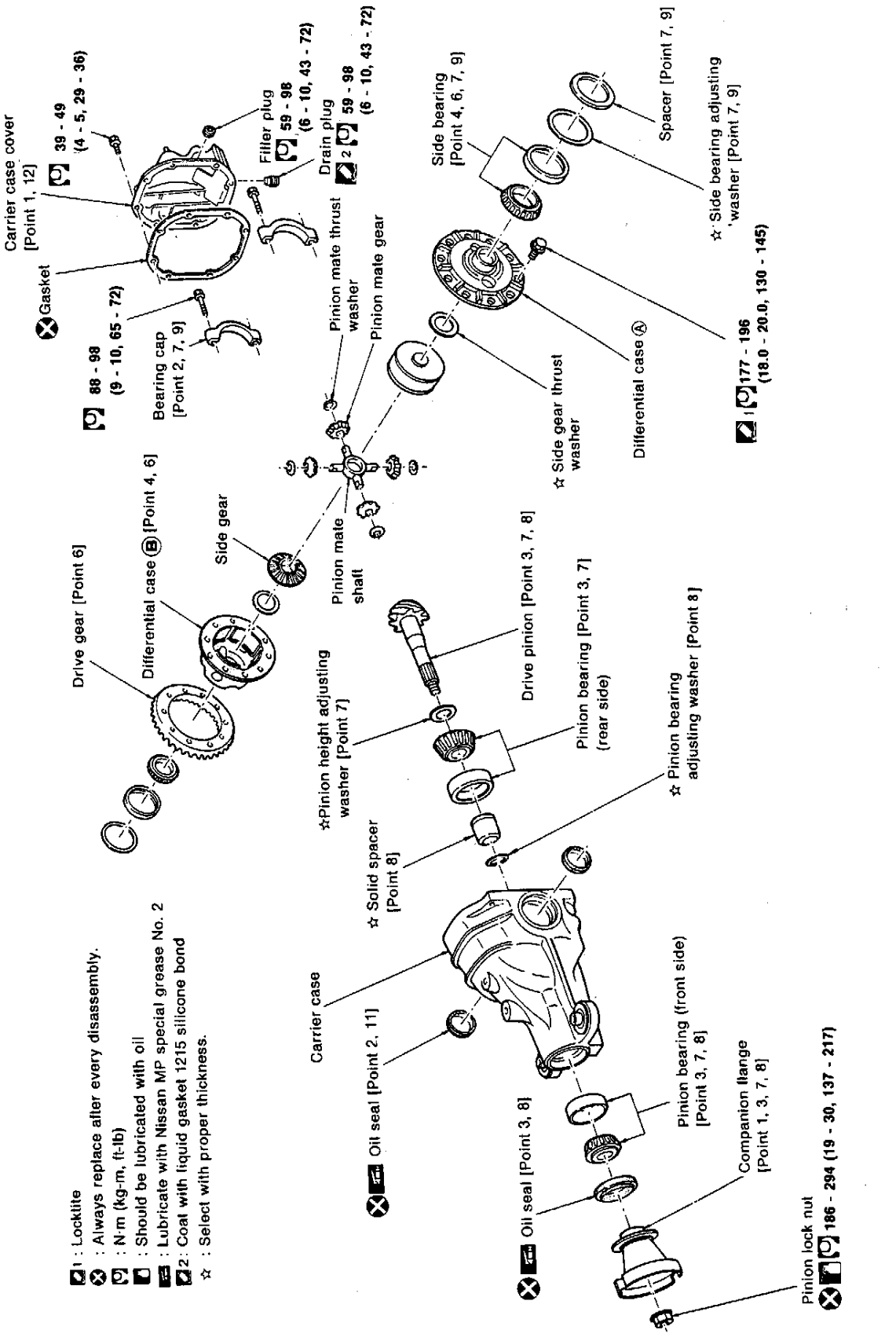
3. Final Drive Removal and Installation, Assembly and Disassembly (Cont'd)

(2) Rear final drive [R200 (mechanical LSD)]



Model R200 (with LSD)

3. Final Drive Removal and Installation, Assembly and Disassembly (Cont'd)



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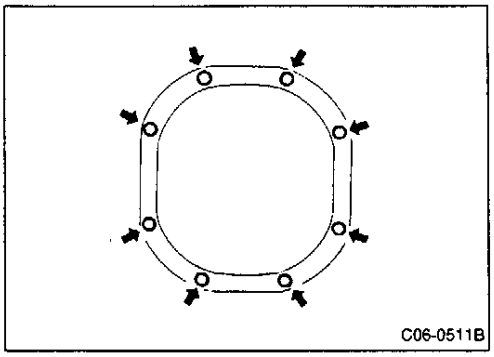
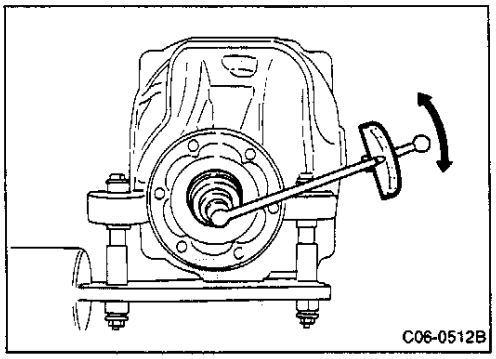
3. Final Drive Removal and Installation, Assembly and Disassembly (Cont'd)



[Point 1] Inspection before disassembly

- **Secure attachment on unit assembly.**
- **Drain oil from gears.**
- **Remove gear case cover.**

CAUTION:
If carrier case is faulty, replace unit assembly.

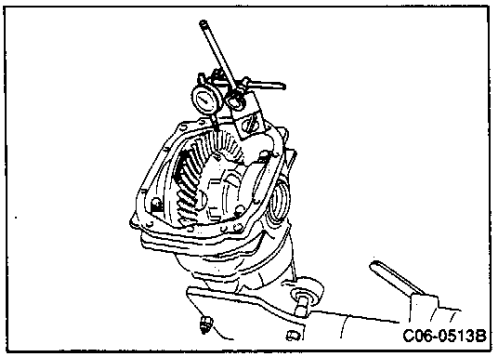


ⓐ Total preload inspection

- Rotate companion flange more than 20 times. Measure total preload with preload gauge.
  Total preload standard value: (With oil seal)
  1.4 - 3.1 N·m (0.14 - 0.32 kg-m, 1.0 - 2.3 ft-lb)
- If preload is not within specification range, adjust pinion bearing preload and side bearing preload.

Collapsible spacer

Excessive preload:	• Use longer drive pinion spacer and thicker washer. • Use thinner side bearing washer.
Insufficient preload:	• Use shorter drive pinion spacer and thinner washer. • Use thicker side bearing washer.

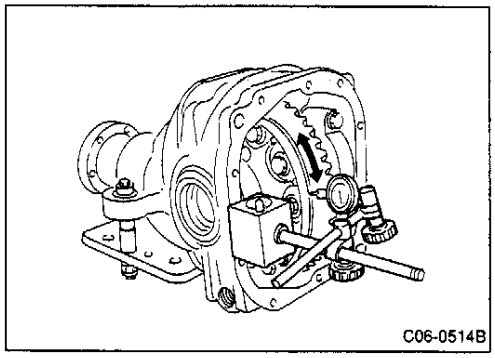


ⓑ Hypoid gear and backlash inspection

- Set dial gauge on drive gear face and measure backlash.
  Backlash standard value:
  0.13 - 0.18 mm (0.0051 - 0.0071 in)
- If the backlash is not within specification range, adjust side washer thickness by moving equally in both directions.

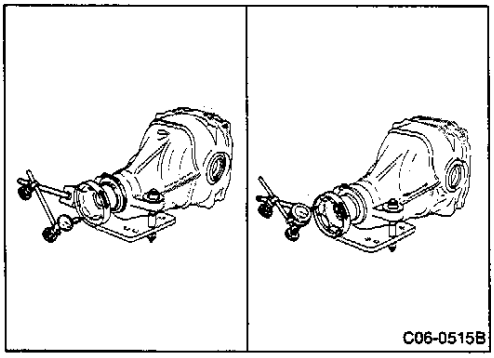
Excessive backlash:	Use thicker drive gear rear washer. Use thinner drive gear tooth surface side washer.
Insufficient backlash:	Use thinner thickness drive gear rear side washer. Use thicker drive gear tooth surface side washer.

3. Final Drive Removal and Installation, Assembly and Disassembly (Cont'd)



ⓒ Drive gear rear surface runout inspection

- Place dial gauge on rear surface of drive gear. Turn drive gear and measure runout.
  Runout limit:
  0.05 mm (0.0020 in) max.
- If runout exceeds limit, check drive gear assembly condition (foreign matter jammed between drive gear and differential case, deformation of differential case or drive gear, etc.).
- If drive gear is faulty, replace hypoid gear assembly. If differential case is faulty, replace case.

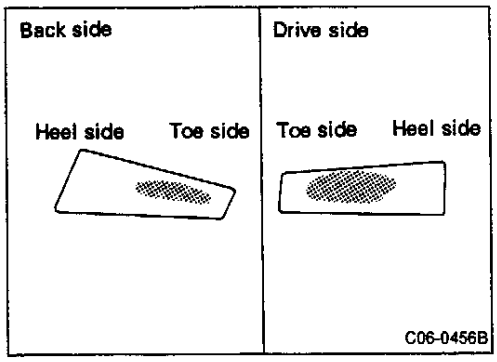


ⓓ Companion flange runout inspection

- Place dial gauge on companion flange (propeller shaft installation surface) and measure runout.
  Runout limit:
  0.05 mm (0.0020 in) max.
- Set test indicator inside companion flange (inner lower surface) and measure runout.
  Runout limit:
  0.05 mm (0.0020 in) max.

CAUTION:
If measurement surface is rusted, remove rust before measurement.

- If runout exceeds specification limit, rotate relative positions of companion flange and drive pinion 90° and find minimum value.
- If runout still is not within specification range even if the relative position is changed, replace companion flange.
- If companion flange is replaced and runout is still not within specification range, the problem may be due to poor contact between pinion bearing and drive pinion or faulty pinion bearing.



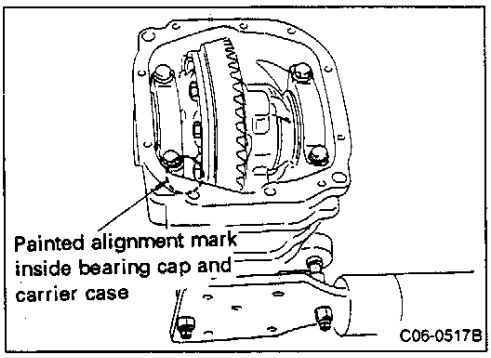
ⓔ Hypoid gear tooth contact inspection

- Clean drive gear and hypoid gear teeth. Apply a light mixture of powdered titanium oxide and oil (or equivalent compound) to 4 locations on drive gear. Rotate hypoid gear and check gear tooth contact pattern.
- Check gear tooth contact pattern on drive side (acceleration) and back side (deceleration) of gears.

CAUTION:
Refer to ⓖ Hypoid drive gear tooth contact pattern for details on using powdered titanium mixture.

- If gear tooth contact pattern is incorrect, select suitable washer to adjust gear height.

3. Final Drive Removal and Installation, Assembly and Disassembly (Cont'd)

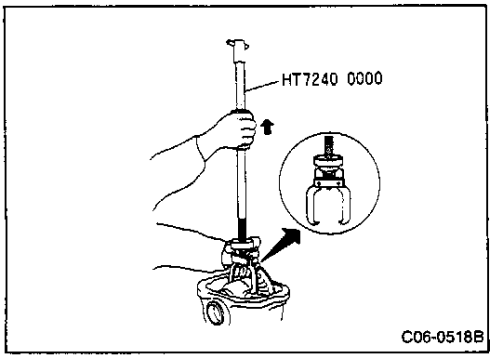


[Point 2] Drive gear and differential case assembly removal

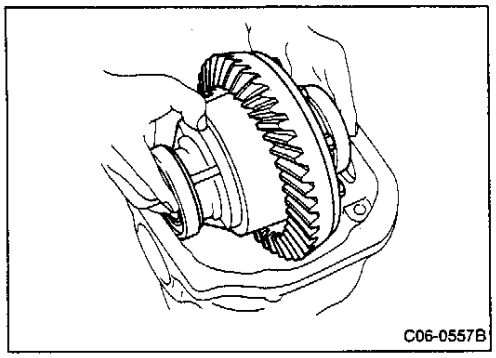
- Check for painted mark used to align side bearing cap and carrier case. If there is no mark, paint mark in correct location.

CAUTION:
The bearing cap and carrier case are assembled as a single unit. Be especially careful not to assemble incorrectly. Paint mating marks and do not scratch surfaces.

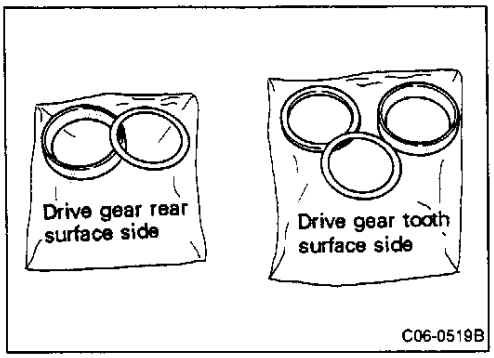
- Remove bearing cap bolts. Tap bearing caps lightly with plastic hammer and remove.
- Using slide hammer (commercial service tool) separate differential case assembly and carrier case.



- Remove differential case assembly together with side bearing outer race.

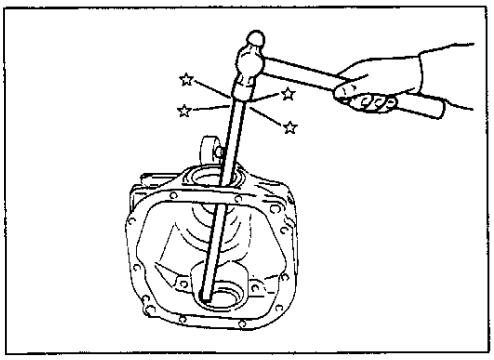


- Separate side bearing outer race, adjusting washers and bearing spacers by front surface and gear tooth surface when they are stored.
- The bearing spacer installation position varies by hypoid gear and gear ratio.

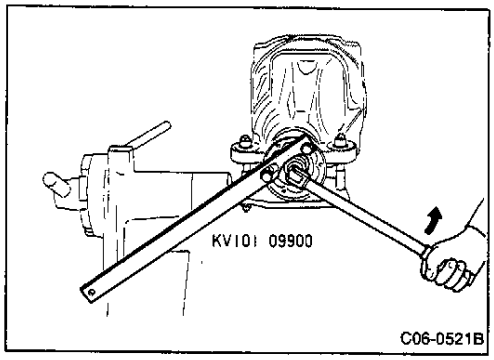


Gear ratio	Installation position
3.916 min.	Drive gear rear side

- Use brass shaft to remove oil seal from carrier case.

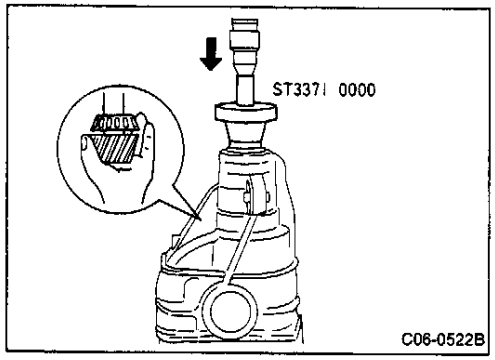


3. Final Drive Removal and Installation, Assembly and Disassembly (Cont'd)



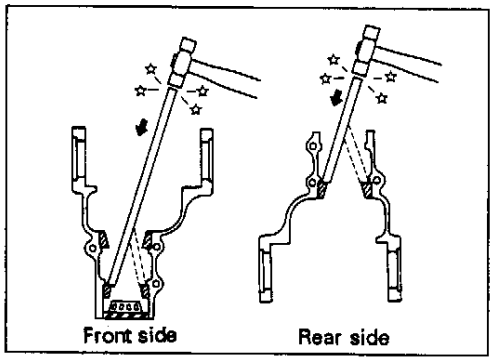
[Point 3] Drive pinion assembly removal

- Using cam sprocket wrench (special service tool), remove pinion lock nut.

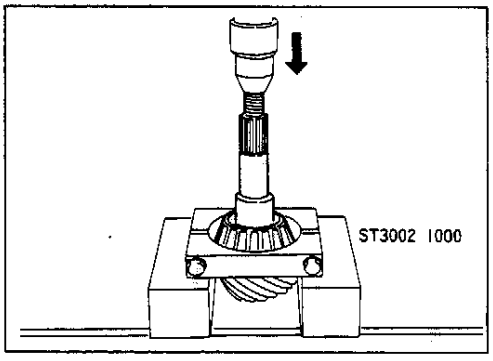


- Use drift (special service tool) to remove drive pinion assembly.

CAUTION:
Do not allow drive pinion to fall.

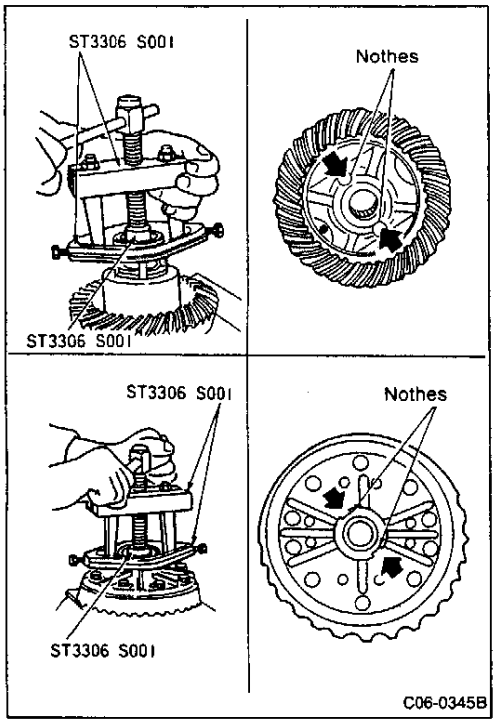


- Use brass shaft and tap evenly to remove outer bearing race.
- Remove bearing and oil seal together from front side.



- Using bearing replacer (special service tool), remove rear pinion bearing from drive pinion.

3. Final Drive Removal and Installation, Assembly and Disassembly (Cont'd)



[Point 4] Differential case disassembly

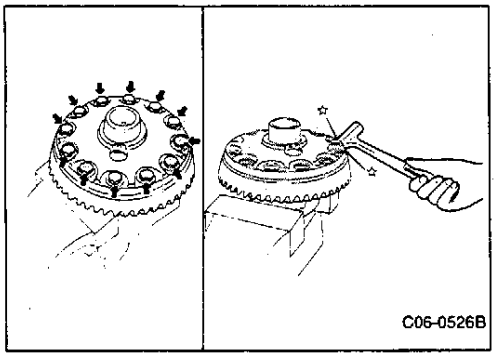
ⓐ Side bearing removal

- Secure differential case assembly in vice. Using side puller set (special service tool), remove side bearing from differential case.

CAUTION:

(1) Place copper plates on sides of bearing and drive to prevent scratches when securing case assembly in vice.

(2) Do not remove any other parts except when replacing side bearings.



ⓑ Drive gear removal

- Remove bolts from drive gear.
- Tap side of drive gear with plastic hammer to remove drive gear.

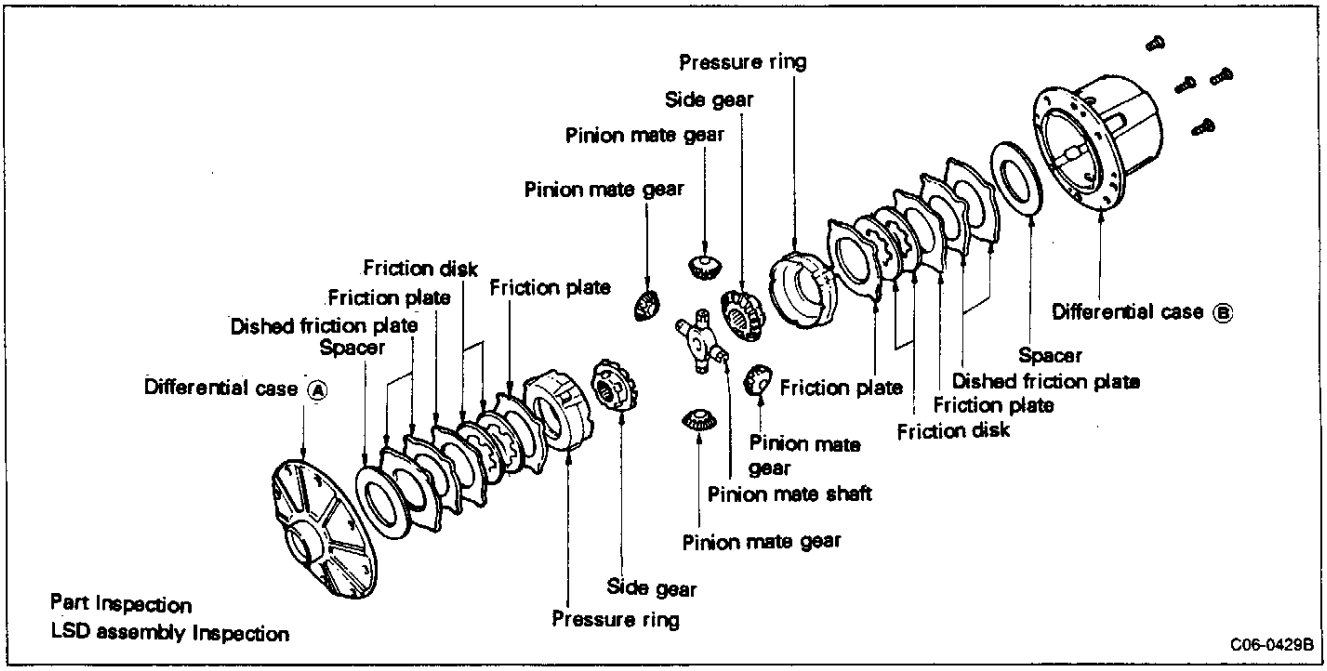
ⓒ Part inspection

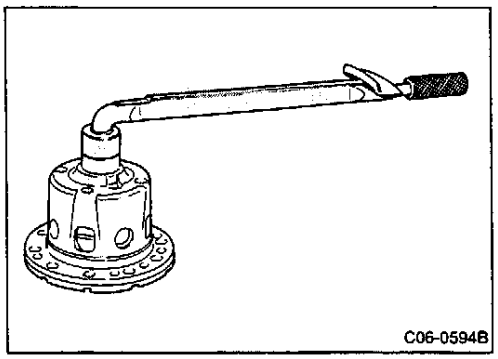
- Clean disassembled parts thoroughly and inspect for wear, damage and other abnormalities. Perform the following operations for non-standard conditions.

Item	Operation
Hypoid gear	• If gear tooth contact is incorrect, determine cause and adjust so contact is correct. • If gear tooth surface is worn, cracked or seized, replace gear set.
Bearing	• Rotate by hand to check for seizing, separation, wear and rust. Replace bearings as a matched set of inner or outer races if there is abnormal noise or other damage.
Oil seal	• Always replace after every disassembly. • Replace if lip is worn, sealing power is reduced or there is other damage.
Companion flange	• Replace if oil seal lip contact surface is worn [approx. 0.1 mm (0.004 in)] or damaged.

3. Final Drive Removal and Installation, Assembly and Disassembly (Cont'd)

[Point 5] LSD (Limited Slip Differential) assembly and disassembly



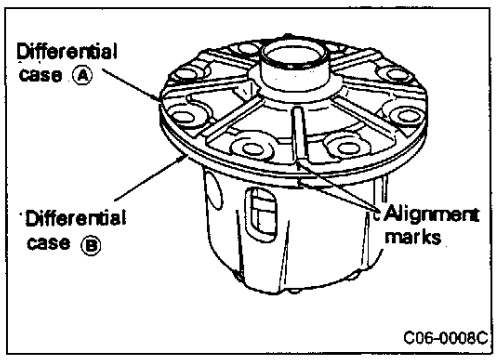


ⓐ Inspection before disassembly

- Using Side Flange Dummy (special service tool), measure sliding torque.

Sliding torque	25 - 34 N·m (2.5 - 3.5 kg-m, 18 - 25 ft-lb)

- If sliding torque is outside specifications, disassemble and check parts.



ⓑ Differential case removal and installation

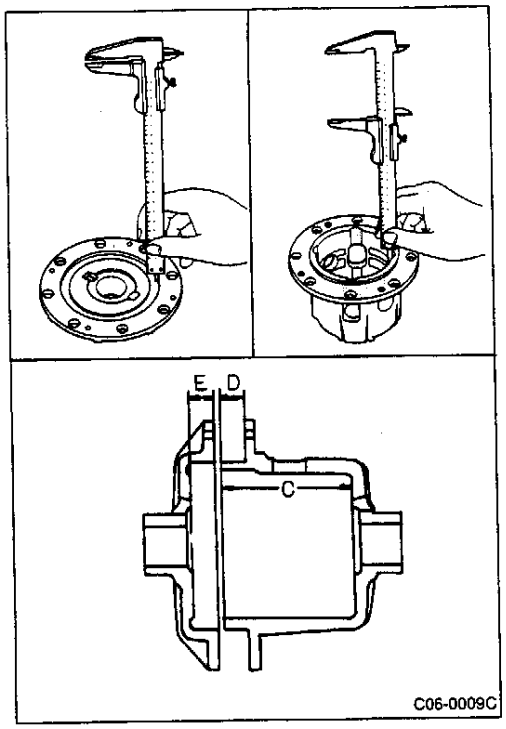
Removal

- Loosen screws in diagonal sequence and remove.

Installation

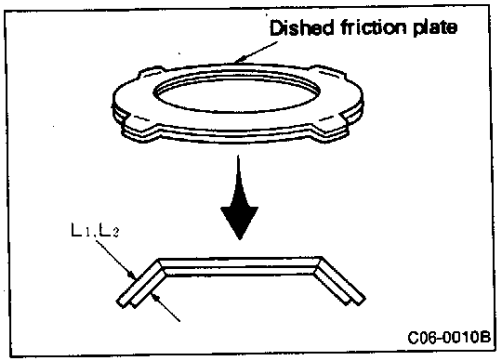
- Align marks on differential case (A) and (B) as shown in figure.
- Tighten bolts diagonally in several stages.

3. Final Drive Removal and Installation, Assembly and Disassembly (Cont'd)

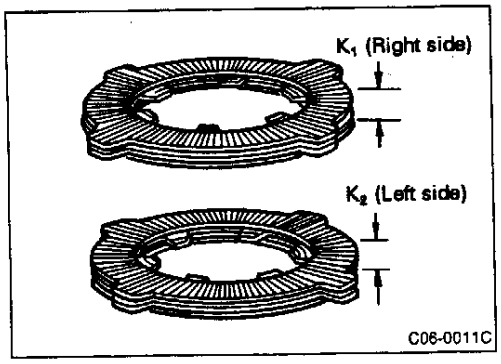


© Friction disk selection

- Before assembling differential case, select friction disk to adjust axial direction clearance of mechanical parts in case.
- Use the following method to select parts.
- Measure differential case depth as shown in figure. Use the following equation to calculate dimension "A".
  A = C + E – D
  A: Differential case depth



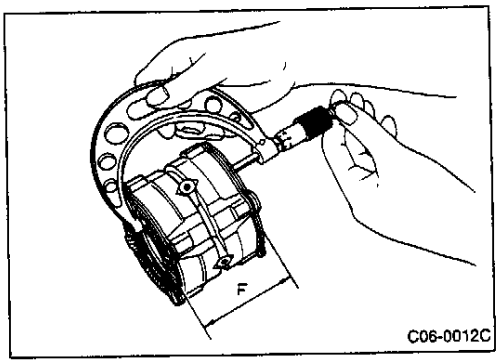
- Measure the total layered thickness of the two dished friction plates as shown in figure on left.
  Right side: L_1
  Left side: L_2



- Measure the total layered thickness of the two friction plates and one spacer as shown in figure on left.
  Right side: K_1
  Left side: K_2

- Compare the left and right total thickness of the dished friction plates, friction plate, friction disk and spacer. Change assembly alignment if difference of left and right thicknesses is not within specification.
  Difference of left and right: $B = (L_1 + K_1) - (L_2 + K_2)$
  Left-right difference limit:
  0.05 mm (0.0020 in)

3. Final Drive Removal and Installation, Assembly and Disassembly (Cont'd)



- Assemble pinion mate shaft, pressure ring, friction disk, friction plate and spacer. Measure total width of assembled parts.
  Assembly dimension: F

CAUTION:
Do not include the thickness of dished friction plates in these measurements.

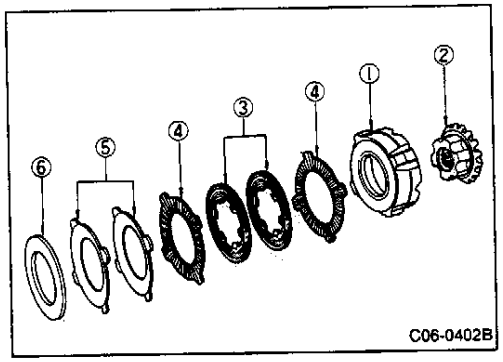
- Use the following equation to determine axial clearance from the dimension of differential case depth and friction plate assembly.
  Axial clearance: $S = A - (F + L_1 + L_2)$
  Axial clearance specification:
  0.05 - 0.20 mm (0.0020 - 0.0079 in)
- Select suitable friction disk to adjust axial clearance within specification.

Friction plate types

Thickness mm (in)	Part number
1.75 (0.0689)	38432 N9000
1.85 (0.0728)	38432 N9001

- Check the left-right difference of the friction plate types. Change the assembly alignment if the difference of left and right thicknesses is not within specification.

CAUTION:
Be careful not to mix the left and right sides of the friction plates after selection.



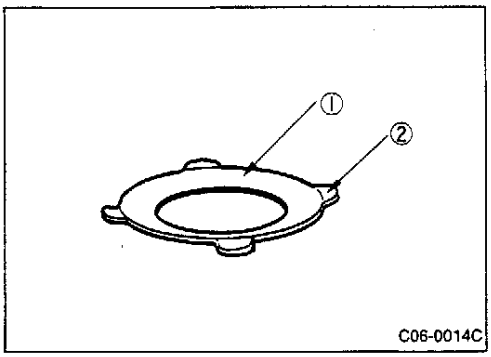
⓭ Plate assembly

- Be careful not to mistake the assembly direction and sequence of any plate.

① Pressure ring
② Side gear
③ Friction disk
④ Friction plate
⑤ Dish friction plate
⑥ Spacer

CAUTION:
Coat each part with recommended Nissan gear oil hypoid GL-5 80W-90LS.

3. Final Drive Removal and Installation, Assembly and Disassembly (Cont'd)



ⓔ Part inspection

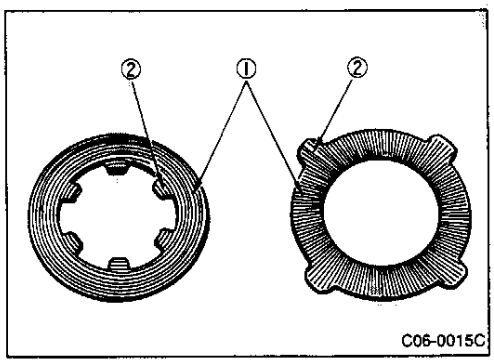
- Clean disassembled parts with proper solvent, dry with compressed air and check as follows.

Dished friction plate

- Make sure there is no seizing or discoloration on friction surface (left figure ①). Replace if necessary because damage may cause abnormal lock performance.
- Make sure there are no bumps or damage on outer protrusion (left figure ②). Correct with oil stone or replace if necessary.
- Check friction distance with micrometer. Replace plate if wear exceeds limit.

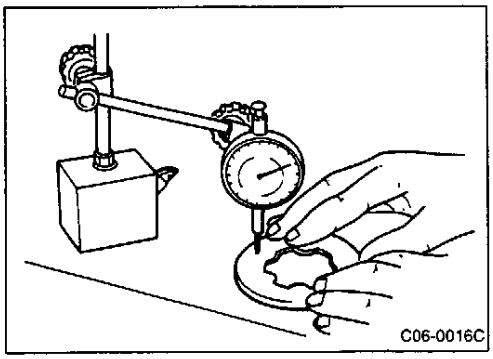
Friction distance = outer protrusion ② thickness – outer friction surface ① thickness

CAUTION:
Measure at four opposite angles.
Wear limit:
0.1 mm (0.004 in)
CAUTION:
The inside section of friction sliding surface does not wear abnormally due to strong contact force applied to spring force of the dished friction plate.



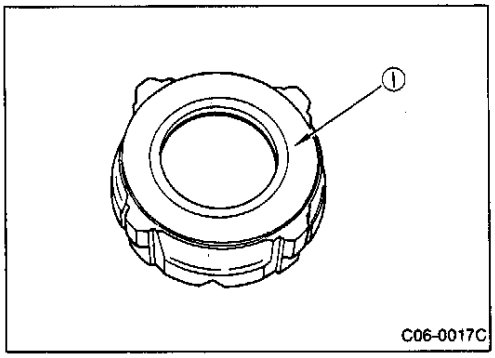
Friction plate and friction disk

- Check for seizing or discoloration on friction surface (left figure ①) and replace if necessary.
- Make sure there are no bumps or damage on outer protrusion (left figure ②). Correct with oil stone or replace if necessary.
- Check friction distance with micrometer. Replace plate if wear exceeds limit.
  Inspection items are the same as for dished friction plate.
  Wear limit:
  0.1 mm (0.004 in)



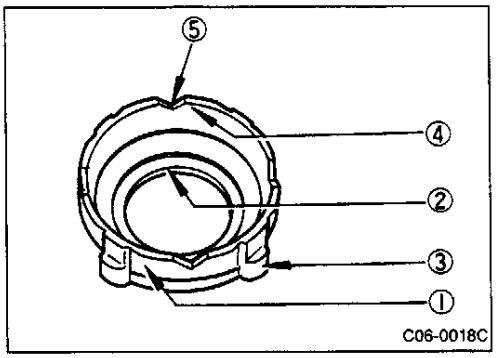
- Use dial gauge and check for distortion.
  Distortion limit:
  Total runout 0.08 mm (0.0031 in)

3. Final Drive Removal and Installation, Assembly and Disassembly (Cont'd)



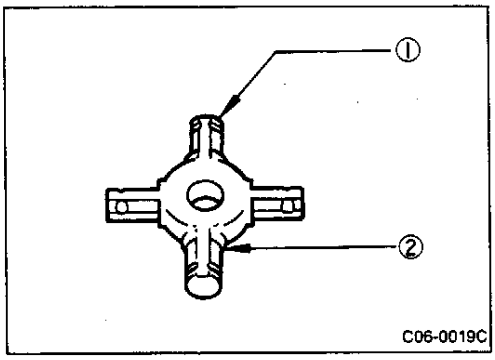
Pressure ring

- Check the contact surface of the friction disk (left figure ①) for dents, damage, or heat discoloration color. Replace if heat discoloration is evident. Use an oil stone to correct small dents or damage. Replace if correction is not possible.



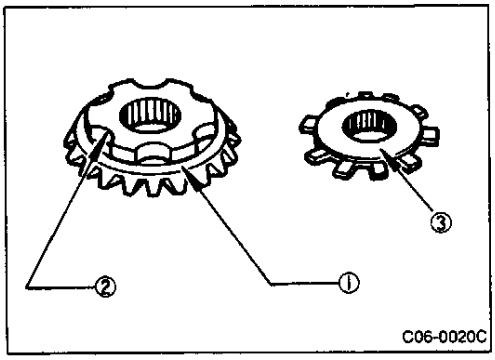
- Check for wear or damage to contact sliding part of the mechanism (described below).

① Differential case connection part
② Side gear contact part
③ Outer protrusion
④ Pinion mate gear contact part
⑤ V-shaped groove



Pinion mate shaft

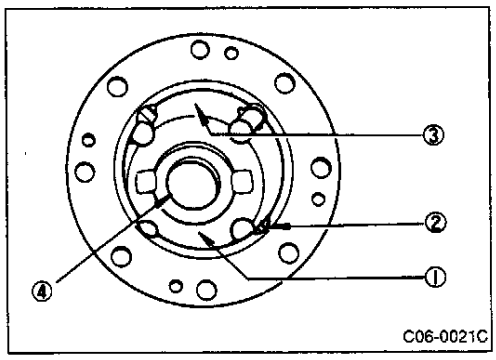
- Check cams (left figure ①) for wear or damage. Check shaft (left figure ②) for abnormal wear or heat discoloration and replace if necessary.



Side gear and pinion mate gear

- Inspect following parts and correct light damage with oil stone. Replace if there is abnormal wear or heat discoloration.

① Pressure ring sliding contact surface (left figure ①) for abnormal wear or heat discoloration.
② Groove part (left figure ②) for damage or abnormal wear.
③ Rear side (left figure ③) for abnormal wear.



Differential case

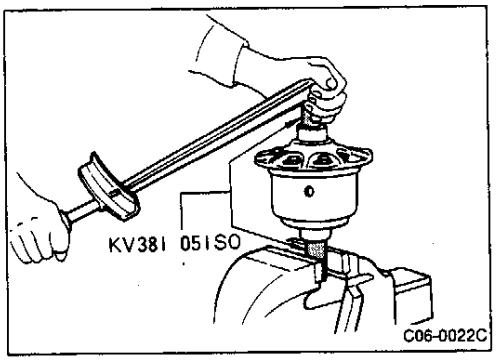
- Inspect parts described below for damage, abnormal wear and heat discoloration. Replace as necessary.

① Spacer contact surface (left figure ①) for abnormal wear or heat discoloration.
② Groove part (left figure ②) for damage or abnormal wear.
③ Pressure ring contact surface (left figure ③) for damage, abnormal wear or heat discoloration.

3. Final Drive Removal and Installation, Assembly and Disassembly (Cont'd)

Spacer

- Check pressure ring and differential case contact surfaces for damage, heat discoloration or abnormal wear.



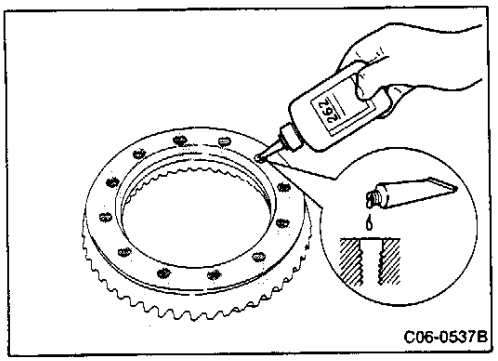
ⓘ LSD assembly inspection

- After LSD assembly is assembled, check rotary motion torque and make sure transmitted torque is correct.
- Using dummy rear acceleration shaft (special service tool) and measure rotational torque with torque wrench.

Rotational torque standard value:
25 - 34 N·m (2.5 - 3.5 kg-m, 18 - 25 ft-lb)

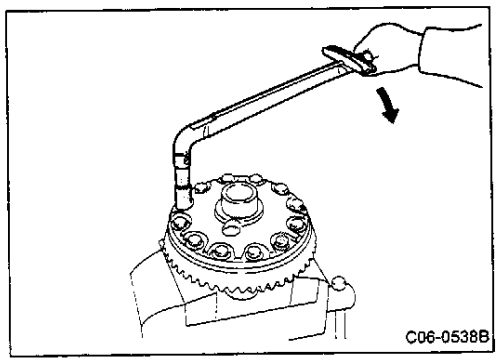
Note:
After measurement rotation is smooth, lubricate each sliding part with recommended Nissan gear oil hypoid GL-5 80W-90LS to ensure proper smoothness. Measure rotational torque again at initial rotation after lubrication.

- If rotational torque is not within specification range, inspect friction plate and friction disk and assemble again.



[Point 6] Differential case assembly

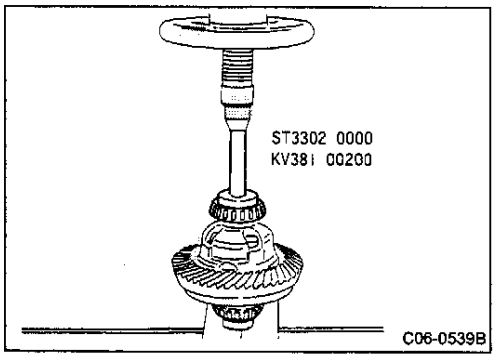
- Apply 1 - 2 drops of Locktite to drive gear threads.



- Assemble drive gear and differential case.
- Coat gear oil to bolt seat and tighten bolts in criss-cross sequence.

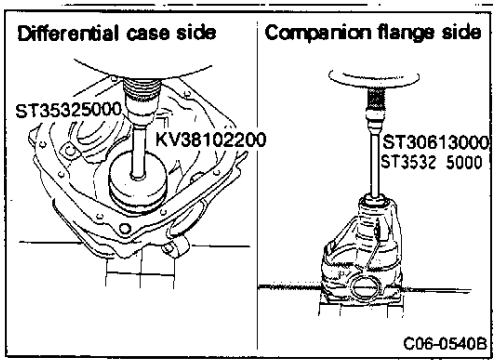
Tightening torque:
177 - 196 N·m (18.0 - 20.0 kg-m, 130 - 145 ft-lb)

3. Final Drive Removal and Installation, Assembly and Disassembly (Cont'd)



- Use drift (special service tool) and press-fit side bearing in differential case.

CAUTION:
Tap bearing lightly with hammer to start press-fit operation. Make sure bearing is perpendicular to differential case and press-fit bearing.

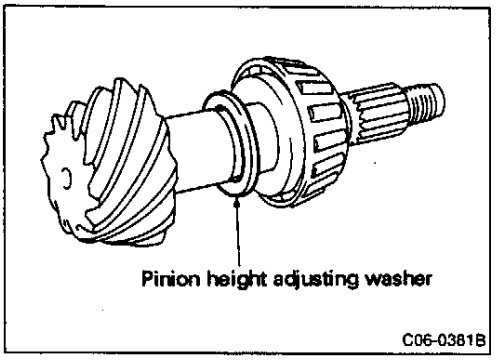


[Point 7] Hypoid gear tooth contact inspection and backlash inspection

ⓐ Pinion bearing outer race installation

- Using drift (special service tool), install pinion bearing outer race in carrier case.

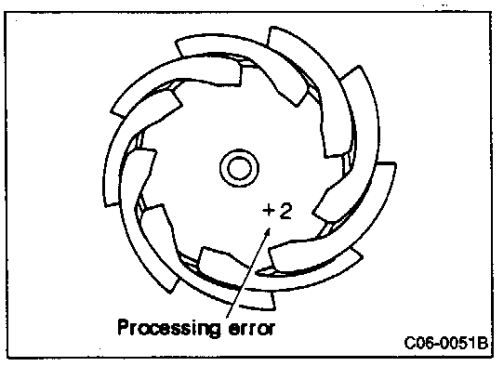
CAUTION:
Tap outer race lightly with hammer to start press-fit operation. Making sure outer race is perpendicular to carrier case and press-fit bearing.



ⓑ Pinion height adjusting washer installation (temporary assembly)

- Assemble height washer in drive pinion.

CAUTION:
Assemble height washer that was removed. When using new part, make sure it is the same thickness as when it was disassembled.



ⓒ Gear set replacement washer selection

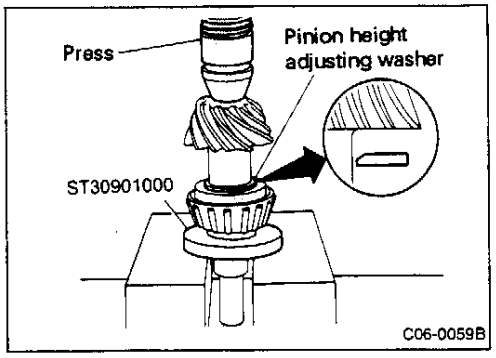
- When hypoid gear set is replaced, perform processing error correction using measurement of old and new drive pinions and select suitable washer.
- Processing error correction
  $T = T_0 + (t_1 - t_2)$
  T = Washer thickness that must be assembled
  T_0 = Thickness of removed washer
  t_1: Head number of old drive pinion

[The processing error is indicated in units of 100 × 1/100 mm.]

  t_2: Head number of new drive pinion
  [The processing error is indicated in units of 100 × 1/100 mm.]
  Calculation example:
  If: $T_0 = 3.21$, $t_1 = +2$ and $t_2 = -1$
  $T = 3.21 + [(2 \times 0.01) - (-1 \times 0.01)] = 3.24$ mm
- Assemble temporary adjusting washer (3.24 mm) in drive pinion.

Thickness mm (in)	Part number	Thickness mm (in)	Part number
3.09 (0.1217)	38154 P6017	3.39 (0.1335)	38154 P6027
3.12 (0.1228)	38154 P6018	3.42 (0.1346)	38154 P6028
3.15 (0.1240)	38154 P6019	3.45 (0.1358)	38154 P6029
3.18 (0.1252)	38154 P6020	3.48 (0.1370)	38154 P6030
3.21 (0.1264)	38154 P6021	3.51 (0.1382)	38154 P6031
3.24 (0.1276)	38154 P6022	3.54 (0.1394)	38154 P6032
3.27 (0.1287)	38154 P6023	3.57 (0.1406)	38154 P6033
3.30 (0.1299)	38154 P6024	3.60 (0.1417)	38154 P6034
3.33 (0.1311)	38154 P6025	3.63 (0.1429)	38154 P6035
3.36 (0.1323)	38154 P6026	3.66 (0.1441)	38154 P6036

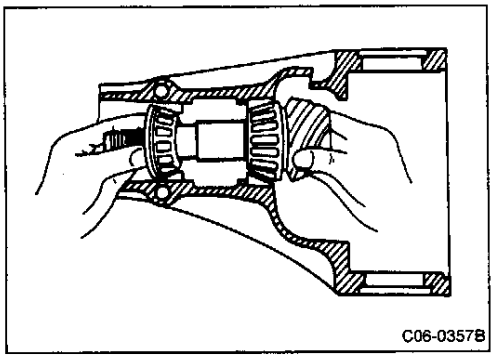
3. Final Drive Removal and Installation, Assembly and Disassembly (Cont'd)



ⓓ Pinion bearing installation

- Using drift (special service tool), install pinion bearing.

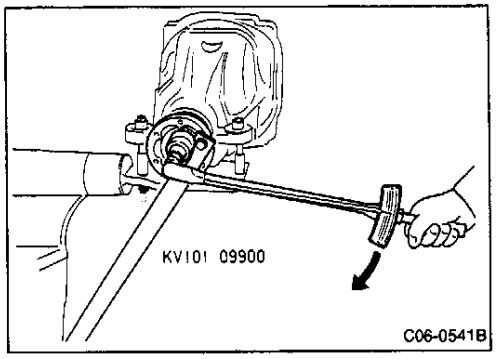
CAUTION:
Make sure not to change washer direction.



ⓔ Drive pinion and pinion bearing installation

- Coat bearing with gear oil.
- Assemble drive pinion and pinion bearing (front side) in carrier case.

CAUTION:
Do not assemble solid spacer and pinion bearing adjusting washer.



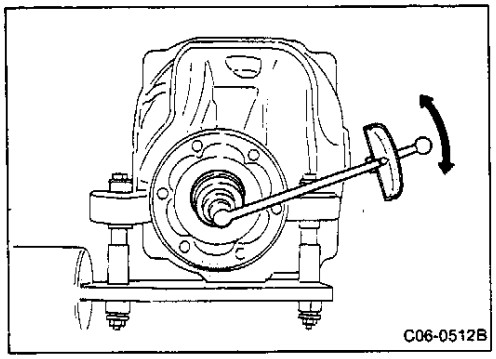
- Install companion flange.

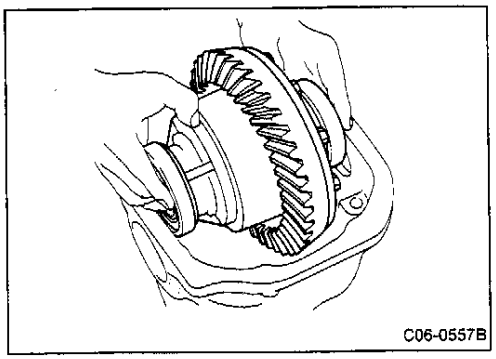
CAUTION:
Do not install oil seal.

- Coat drive pinion threads and pinion nut seat with oil. Temporarily install pinion nut.
- Tighten pinion nut to standard preload.

Pinion bearing preload standard value:
1.0 - 1.6 N·m (0.10 - 0.16 kg-m, 0.7 - 1.2 ft-lb)

CAUTION:
Tighten pinion nut in 50 - 100 increments during measurement because it does not enter spacer. Do not tighten nut with excessive force.

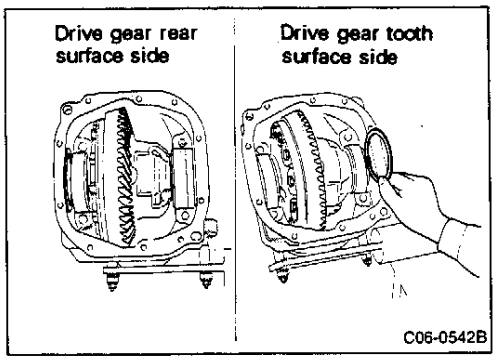




ⓕ Differential case installation

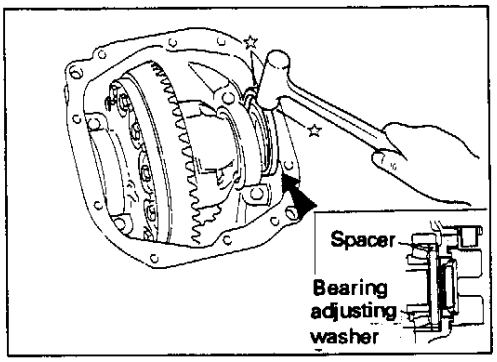
- Coat bearing with gear oil.
- Assemble differential case assembly and side bearing outer race together in carrier case.

3. Final Drive Removal and Installation, Assembly and Disassembly (Cont'd)



- Install drive gear rear surface side and tooth side washer.

CAUTION:
If washer that was removed is assembled again it must be the same thickness as it was before unit was disassembled. Do not confuse the rear side and gear side of washer.



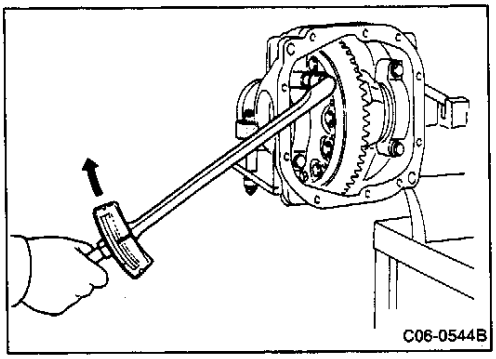
- Install bearing between bearing outer race and adjusting washer.

CAUTION:
Use plastic hammer to tap rounded spacer surfaces lightly during assembly.

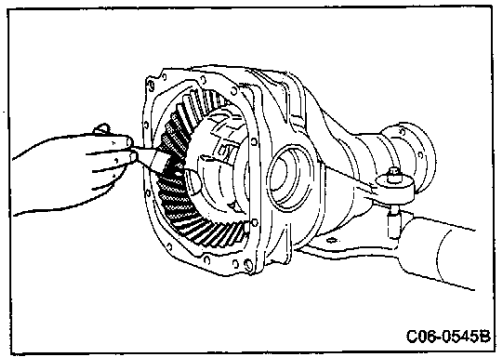
Spacer

Thickness mm (in)	Part number
8.1 (0.319)	38454 40P00

Spacer installation position: Drive gear rear side

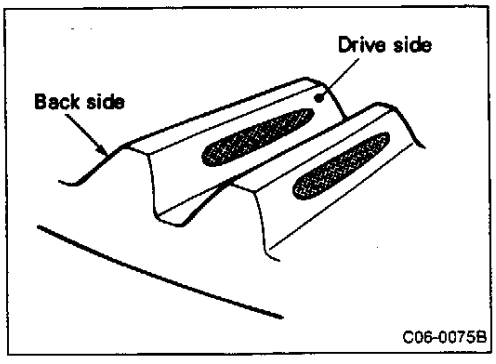


- Align mating marks, assemble bearing cap and tighten bolts.
  Tightening torque:
  88 - 98 N·m (9 - 10 kg-m, 65 - 72 ft-lb)



ⓖ Gear tooth contact inspection

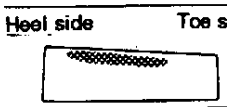
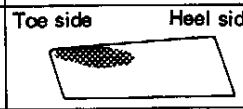
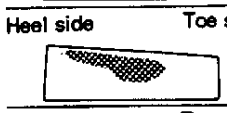
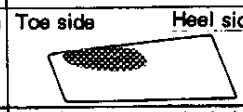
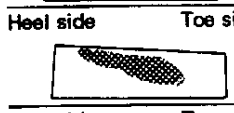
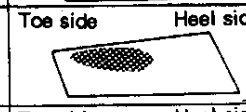
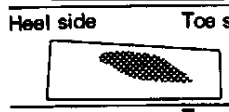
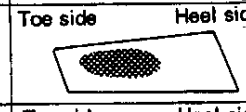
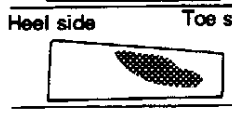
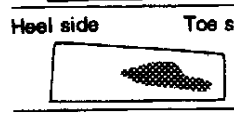
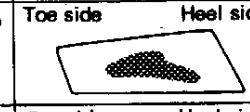
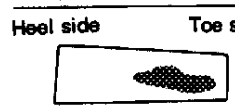
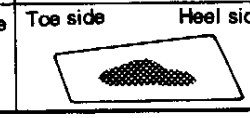
- Clean drive gear teeth. Apply a light mixture of powdered titanium oxide and oil or equivalent to both sides of drive gear. Rotate drive pinion gear and drive pinion and check gear tooth contact pattern.

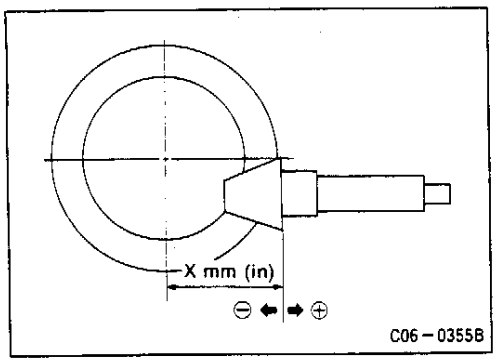


- Check gear tooth contact pattern in four locations on both surfaces of drive side (acceleration) and back side (deceleration) gears.

3. Final Drive Removal and Installation, Assembly and Disassembly (Cont'd)

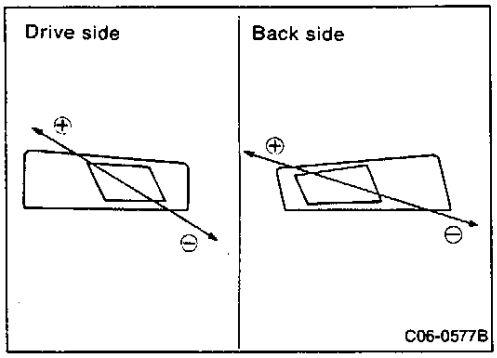
Gear tooth contact pattern chart

Contact pattern		Pinion height adjusting washer selection value mm (in)	Adjustment	Resulting problem
Drive side	Back side			
		+0.09 (+0.0035)	Necessary	Cause noise and scoring sound at all speeds.
		+0.06 (+0.0024)	↑	Causes noise during acceleration.
		+0.03 (+0.0012)	Unnecessary	
		0 (0)	↑	
		−0.03 (−0.0012)	↑	
		−0.06 (−0.0024)	Necessary	Causes noise at fixed speeds and during deceleration.
		−0.09 (−0.0035)	↑	Makes noise and scoring sound at all speeds.



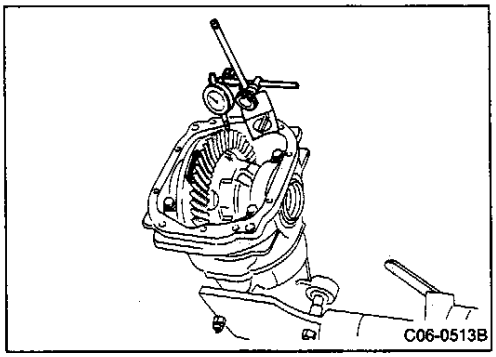
- If gear tooth contact pattern is incorrect, select pinion height adjusting washer of suitable thickness to adjust pinion height [X mm (in) figure.]

3. Final Drive Removal and Installation, Assembly and Disassembly (Cont'd)



Pinion height adjusting washer

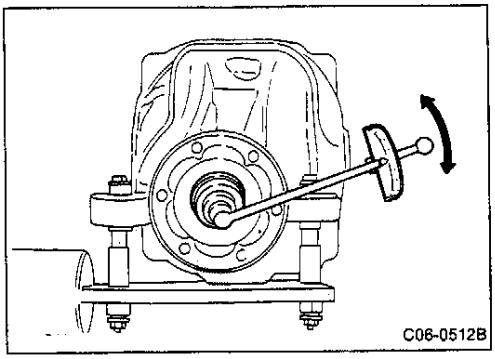
Thickness mm (in)	Part number	Thickness mm (in)	Part number
3.09 (0.1217)	38154 P6017	3.39 (0.1335)	38154 P6027
3.12 (0.1228)	38154 P6018	3.42 (0.1346)	38154 P6028
3.15 (0.1240)	38154 P6019	3.45 (0.1358)	38154 P6029
3.18 (0.1252)	38154 P6020	3.48 (0.1370)	38154 P6030
3.21 (0.1264)	38154 P6021	3.51 (0.1382)	38154 P6031
3.24 (0.1276)	38154 P6022	3.54 (0.1394)	38154 P6032
3.27 (0.1287)	38154 P6023	3.57 (0.1406)	38154 P6033
3.30 (0.1299)	38154 P6024	3.60 (0.1417)	38154 P6034
3.33 (0.1311)	38154 P6025	3.63 (0.1429)	38154 P6035
3.36 (0.1323)	38154 P6026	3.66 (0.1441)	38154 P6036



- Set dial gauge on drive gear surface and measure backlash.
  Backlash standard value:
  0.13 - 0.18 mm (0.0051 - 0.0071 in)
- If backlash is not within specification range, move side bearing adjusting washers of same thickness (carrier case side) to adjust.

Excessive backlash:	Use thicker drive gear rear side washer. Use thinner drive gear tooth side washer.
Insufficient backlash:	Use thinner drive gear rear side washer. Use thicker drive gear tooth side washer.

3. Final Drive Removal and Installation, Assembly and Disassembly (Cont'd)

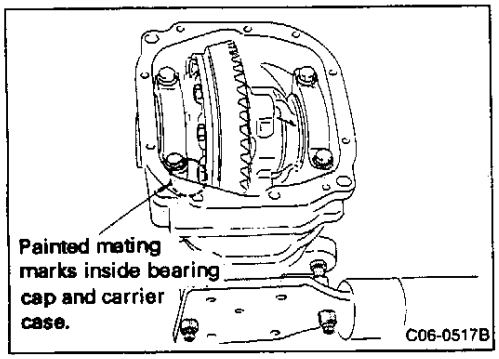


- Rotate companion flange more than 20 times. Measure total preload with preload gauge.
  Side bearing preload standard value:
  0.3 - 1.5 N·m (0.03 - 0.15 kg-m, 0.2 - 1.1 ft-lb)
  Pinion bearing preload standard value:
  1.8 - 2.6 N·m (0.18 - 0.27 kg-m, 1.3 - 2.0 ft-lb)
  Total preload standard value (Without oil seal):
  1.3 - 3.0 N·m (0.13 - 0.31, 0.9 - 2.2 ft-lb)
- If preload is not within specification range, move adjusting washers of same thickness on both sides to adjust preload.

Excessive preload:	Use thinner adjusting washer.
Insufficient preload:	Use thicker adjusting washer.

Side bearing adjusting washers

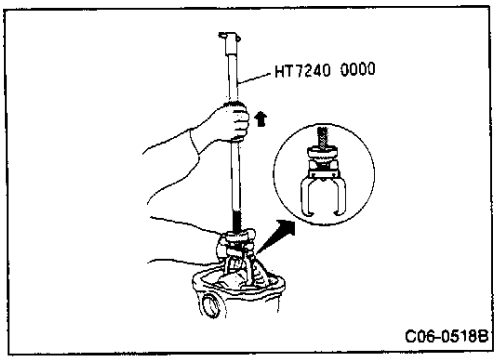
Thickness mm (in)	Part number	Thickness mm (in)	Part number	Thickness mm (in)	Part number
2.00 (0.0787)	38453 N3100	2.25 (0.0886)	38453 N3105	2.50 (0.0984)	38453 N3110
2.05 (0.0807)	38453 N3101	2.30 (0.0906)	38453 N3106	2.55 (0.1004)	38453 N3111
2.10 (0.0827)	38453 N3102	2.35 (0.0925)	38453 N3107	2.60 (0.1024)	38453 N3112
2.15 (0.0846)	38453 N3103	2.40 (0.0945)	38453 N3108	2.65 (0.1043)	38453 N3113
2.20 (0.0866)	38453 N3104	2.45 (0.0965)	38453 N3109		



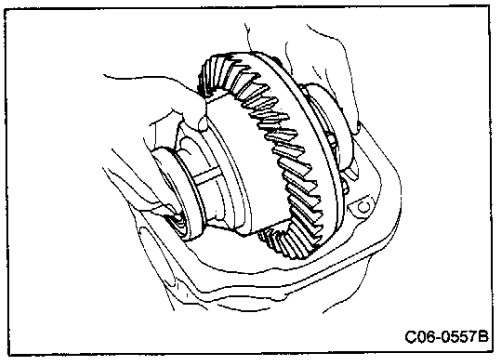
[Point 8] Drive pinion preload adjustment

ⓐ Differential case assembly removal

- Remove bearing cap bolts. Tap bearing caps lightly with plastic hammer and remove.

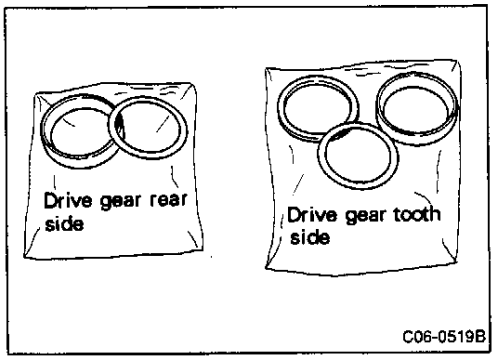


- Using sliding hammer (commercial service tool), separate differential case assembly and carrier case.



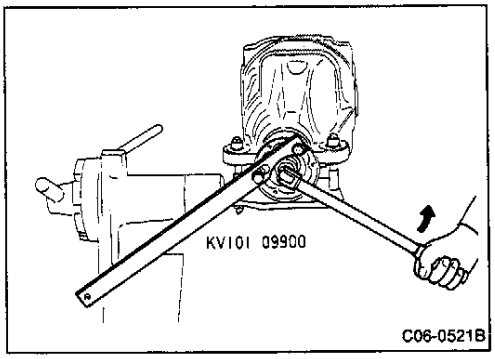
- Remove differential case assembly together with side bearing outer race.

3. Final Drive Removal and Installation, Assembly and Disassembly (Cont'd)



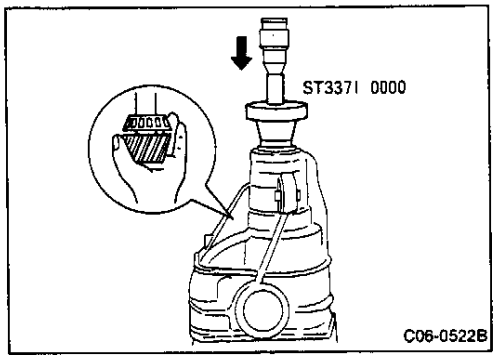
- Carefully arrange bearing outer race, adjusting washers and spacers into separate groups of rear side and gear tooth side parts.

Gear ratio	Installation position
4.000 min.	Drive gear rear side



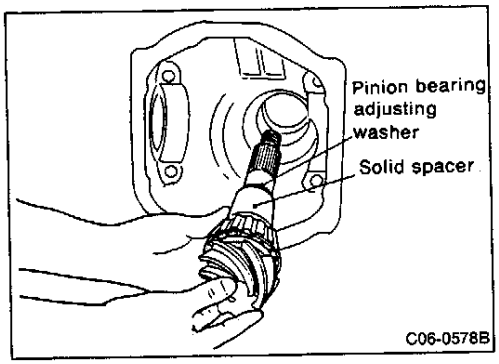
ⓑ Drive pinion assembly removal

- Using cam sprocket wrench (special service tool), remove pinion lock nut.



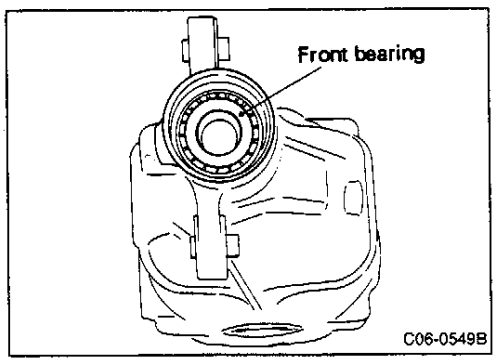
- Using drift (special service tool), remove drive pinion assembly.

CAUTION:
Do not let drive pinion fall.



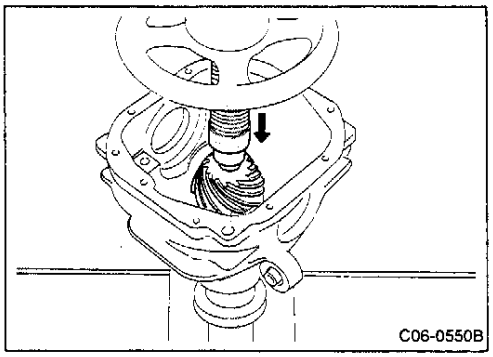
ⓒ Drive pinion assembly installation

- Install solid spacer and adjusting washer (which were used before disassembly) on drive pinion or spacer of same length and washer of same thickness that were originally used.



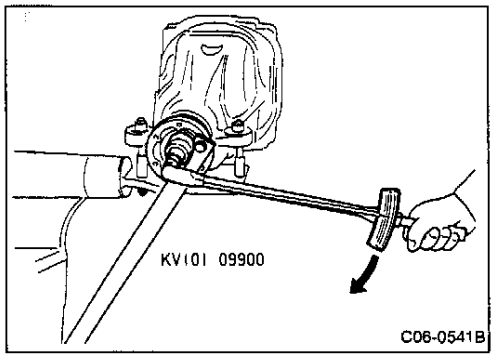
- Apply a light coat of oil to front bearing and install in carrier case.

3. Final Drive Removal and Installation, Assembly and Disassembly (Cont'd)



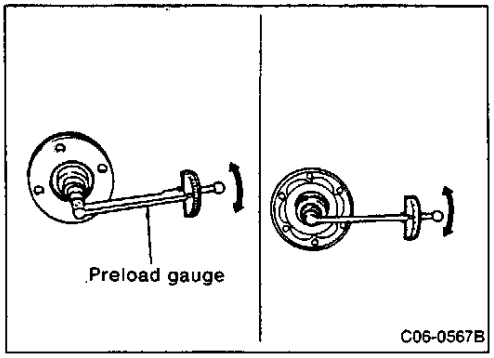
- Install drive pinion assembly with companion flange in carrier case.

CAUTION:
Do not assemble oil seal.



- Apply a light coat of oil to pinion nut seat and drive pinion threads and install nut.
- Rotate companion flange more than 20 times and make sure bearing spins smoothly.
- Tighten drive pinion nut while measuring preload using preload gauge.
- When specified torque is reached, select suitable spacer and washer to ensure specified pinion bearing preload is obtained.

Use longer spacer and thicker washer first, then change to shorter and thinner ones until specified preload is obtained.



Drive pinion tightening torque:
186 - 294 N·m (19 - 30 kg-m, 137 - 217 ft-lb)
Specified pinion bearing preload (w/o oil seal):
1.0 - 1.6 N·m (0.10 - 0.16 kg-m, 0.7 - 1.2 ft-lb)

Excessive preload:	Use longer spacer and thicker washer
Insufficient preload:	Use shorter spacer and thinner washer

CAUTION:
Do not apply excess preload to pinion bearing.

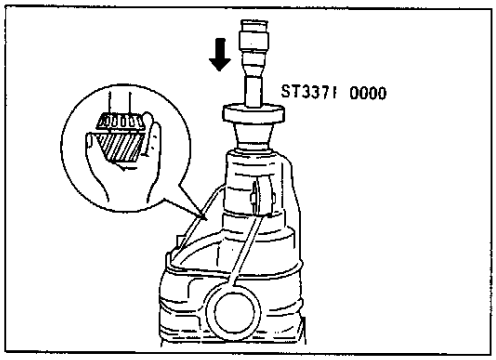
Pinion bearing adjusting spacers

Thickness mm (in)	Part number	Thickness mm (in)	Part number	Thickness mm (in)	Part number
46.5 (1.831)	38165 10V00	45.6 (1.795)	38165 10V05	46.2 (1.819)	38165 10V07
46.8 (1.843)	38165 10V01	45.9 (1.807)	38165 10V06		

Pinion bearing adjusting washers

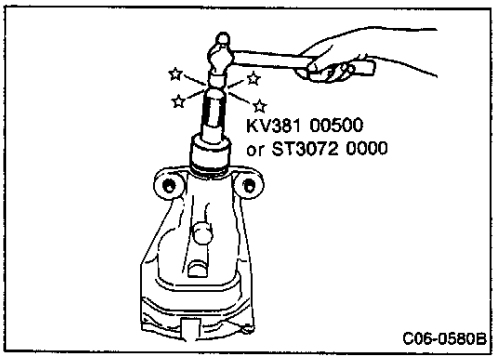
Thickness mm (in)	Part number	Thickness mm (in)	Part number	Thickness mm (in)	Part number
3.80 (0.1496)	38125 61001	3.90 (0.1535)	38130 61001	4.00 (0.1575)	38135 61001
3.82 (0.1504)	38126 61001	3.92 (0.1543)	38131 61001	4.02 (0.1583)	38136 61001
3.84 (0.1512)	38127 61001	3.94 (0.1551)	38132 61001	4.04 (0.1591)	38137 61001
3.86 (0.1520)	38128 61001	3.96 (0.1559)	38133 61001	4.06 (0.1598)	38138 61001
3.88 (0.1528)	38129 61001	3.98 (0.1567)	38134 61001	4.08 (0.1606)	38139 61001

3. Final Drive Removal and Installation, Assembly and Disassembly (Cont'd)

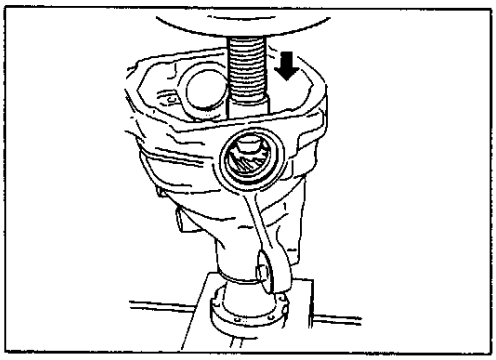


- When specified bearing preload is obtained at specified drive pinion torque (using solid spacer and adjusting washer), extract drive pinion.

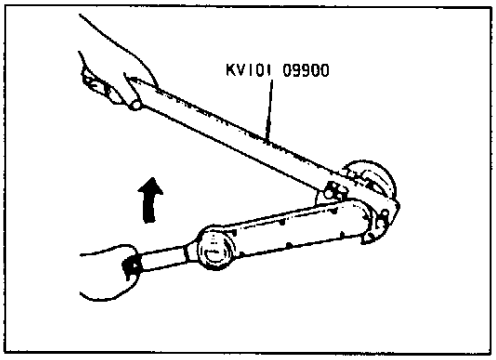
CAUTION:
Be careful not to drop drive pinion.



- Coat oil seal lip with Nissan MP special grease No. 2.
- Using drift (special service tool), install oil seal in carrier case.



- Apply gear oil to pinion bearing.
- Install drive pinion assembly (with suitable spacer and adjusting washer installed) and companion flange in carrier case as a unit.



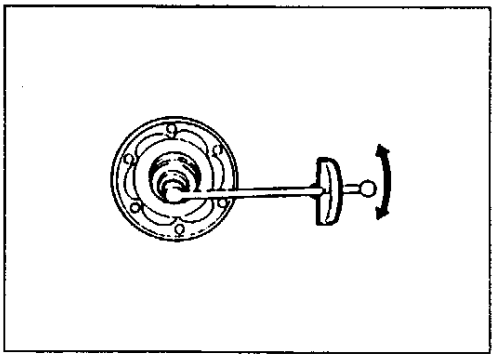
- Apply a coat of rust-preventive oil to drive pinion threads and pinion nut seat.

CAUTION:
Discard old pinion nut; replace with new one.

- Rotate companion flange more than 20 times until it wears in.
- Tighten drive pinion to specifications.

Drive pinion tightening torque:
186 - 294 N·m (19 - 30 kg-m, 137 - 217 ft-lb)

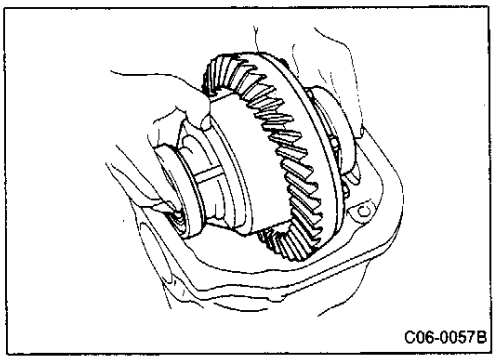
CAUTION:
Do not tighten drive pinion excessively.



- Measure preload with preload gauge.

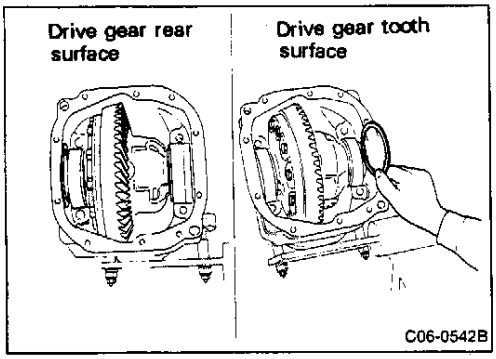
Pinion bearing standard preload (w/oil seal) :
1.1 - 1.7 N·m (0.11 - 0.17 kg-m, 0.8 - 1.2 ft-lb)

3. Final Drive Removal and Installation, Assembly and Disassembly (Cont'd)



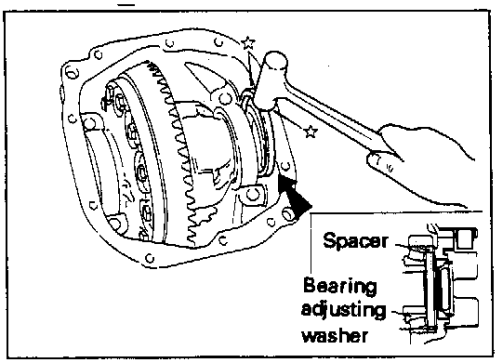
[Point 9] Differential case assembly installation

- Coat bearing with gear oil.
- Install differential case assembly together with bearing outer race in carrier case.



- Install drive gear rear side and tooth side selected washers.

CAUTION:
Do not interchange rear and tooth side washers by mistake.



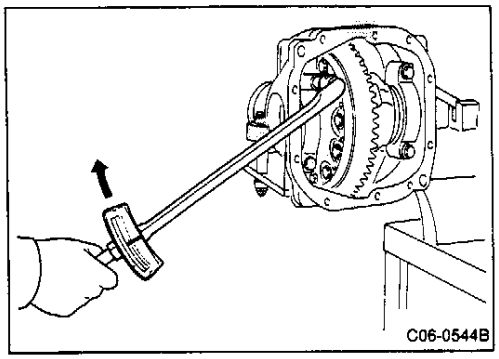
- Install spacer between bearing outer race and adjusting washer.

CAUTION:
Use plastic hammer and tap outside of spacer evenly to install.

Spacer

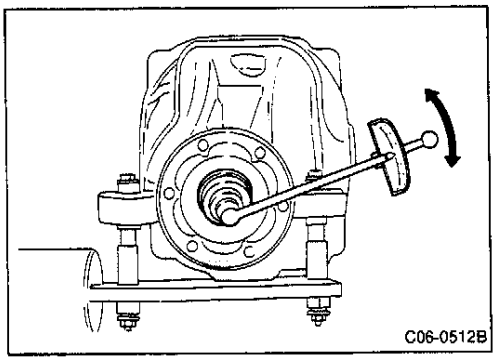
Thickness mm (in)	Part number
8.1 (0.319)	38454 N3100

Spacer installation position: Drive gear rear side



- Align mating marks, install bearing cap and tighten bolts.
  Tightening torque:
  88 - 98 N·m (9 - 10 kg-m, 65 - 72 ft-lb)

3. Final Drive Removal and Installation, Assembly and Disassembly (Cont'd)

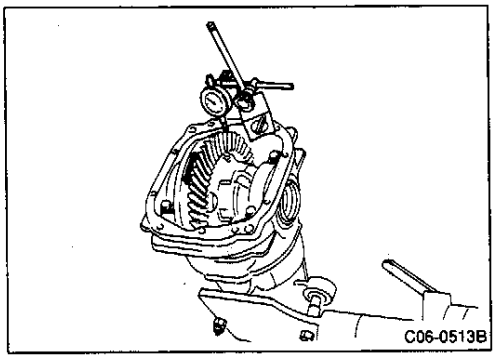


[Point 10] Inspection after assembly

ⓐ Total preload inspection

- Turn companion flange more than 20 times. Use preload gauge and measure total preload.
  Side bearing preload standard value:
  0.3 - 1.5 N·m (0.03 - 0.15 kg-m, 0.2 - 1.1 ft-lb)
  Pinion bearing preload standard value (without oil seal):
  1.1 - 1.7 N·m (0.11 - 0.17 kg-m, 0.8 - 1.2 ft-lb)
  Total preload standard value:
  1.4 - 3.1 N·m (0.14 - 0.32 kg-m, 1.0 - 2.3 ft-lb)
- If torque preload is not within the specification range, move side bearing adjusting washers of same thickness on both sides to adjust preload.

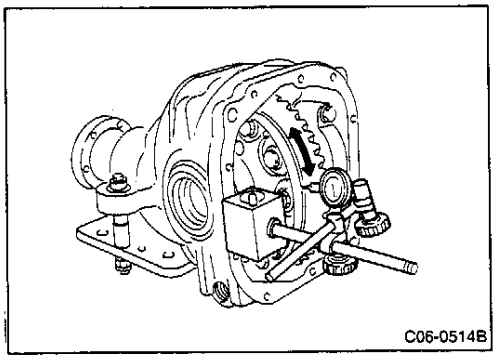
Excess preload:	• Use thinner side bearing washer.
Insufficient preload:	• Use thicker side bearing washer.



ⓑ Hypoid gear and backlash inspection

- Position dial gauge on drive gear surface and measure backlash.
  Backlash standard value:
  0.13 - 0.18 mm (0.0051 - 0.0071 in)
- If backlash is not within the specification range, adjust by increasing or decreasing side bearing washer thickness the same amount on both sides.

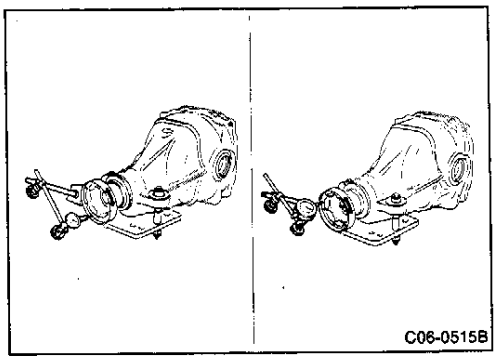
Excess backlash:	• Use thicker drive gear rear side washer and thinner drive gear tooth side washer.
Insufficient backlash:	• Use thinner drive gear rear side washer and thicker drive gear tooth side washer.



ⓒ Drive gear rear surface runout inspection

- Place dial gauge on rear surface of drive gear. Turn drive gear and measure runout.
  Runout limit:
  0.05 mm (0.0020 in) max.
- If runout exceeds limit, check drive gear assembly condition (foreign matter jammed between drive gear and differential case, deformation of differential case, etc.).
- If drive gear is faulty, replace hypoid gear assembly. If differential case is deformed, replace case.

3. Final Drive Removal and Installation, Assembly and Disassembly (Cont'd)



ⓓ Companion flange runout inspection

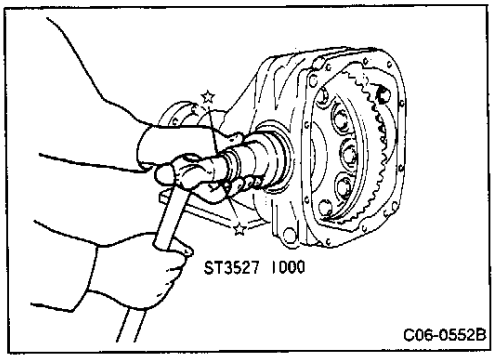
- Place dial gauge on companion flange (propeller shaft installation surface) and measure runout.
  Runout limit:
  0.05 mm (0.0020 in) max.
- Set test indicator inside companion flange (inner lower surface) and measure runout.
- Place paint mark on maximum outward runout of companion flange.
  Runout limit:
  0.05 mm (0.0020 in) max.

CAUTION:

(1) If measurement surface is rusted, remove rust before measurement.

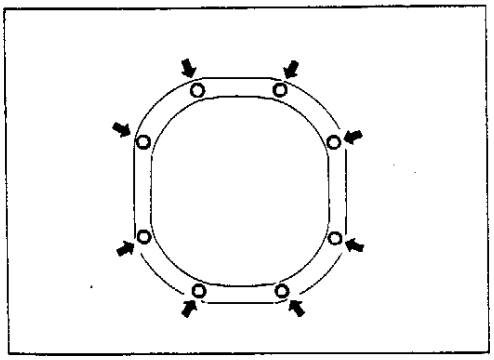
(2) Make sure old paint is cleaned away before placing new mark.

- If runout exceeds specification limit, rotate relative positions of companion flange and drive pinion 90° and check if runout decreases.
- If runout still is not within specification range even if the relative position is changed, replace companion flange.
- If companion flange is replaced and runout is still not within specification range, the problem may be due to poor contact between pinion bearing and drive pinion or faulty pinion bearing.



[Point 11] Side oil seal installation

- Coat oil seal lip with Nissan MP special grease No. 2.
- Using drift (special service tool), install oil seal in carrier case.

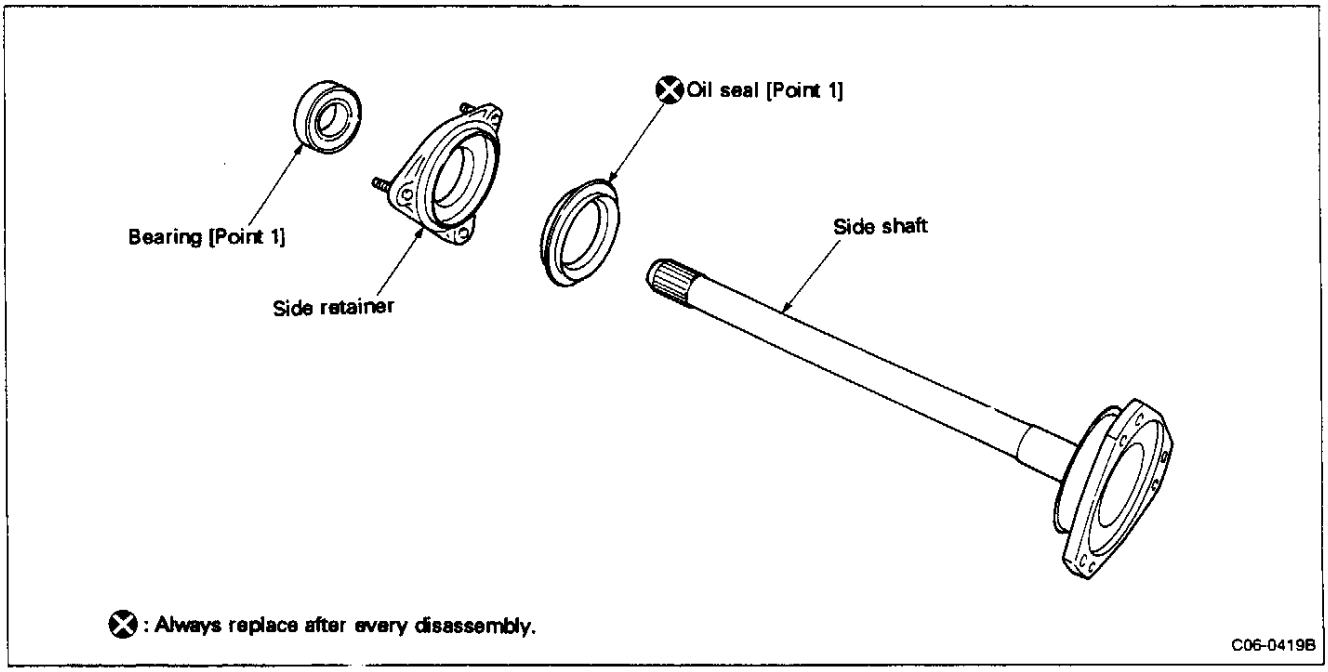


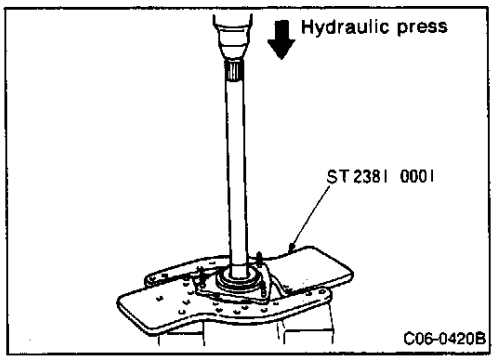
[Point 12] Installation of carrier case cover, drain plug and filler plug

- Install carrier case cover with gasket in place.
  Tightening torque:
  39 - 49 N·m (4 - 5 kg-m, 29 - 36 ft-lb)
- Apply liquid gasket (Three Bond 1215 or equivalent) to drain and filler plugs and install plugs.
  Drain plug tightening torque:
  59 - 98 N·m (6 - 10 kg-m, 43 - 72 ft-lb)
  Filler plug tightening torque:
  59 - 98 N·m (6 - 10 kg-m, 43 - 72 ft-lb)

3. Final Drive Removal and Installation, Assembly and Disassembly (Cont'd)

(2) Front final drive side shaft assembly and disassembly

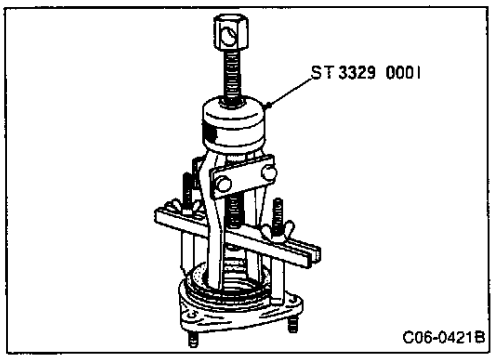




[Point 1] Side shaft bearing and oil seal removal and installation

Removal

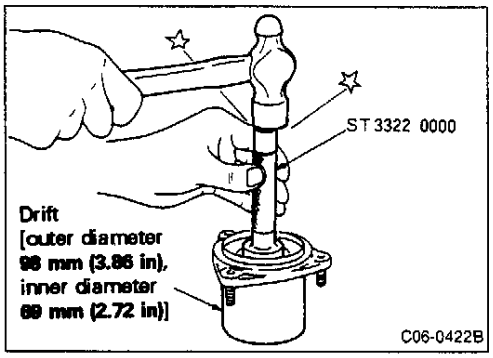
- Using two adapter setting plates and hydraulic press as shown in left figure, separate side retainer and side shaft.



- Using oil seal puller (special service tool), remove oil seal.

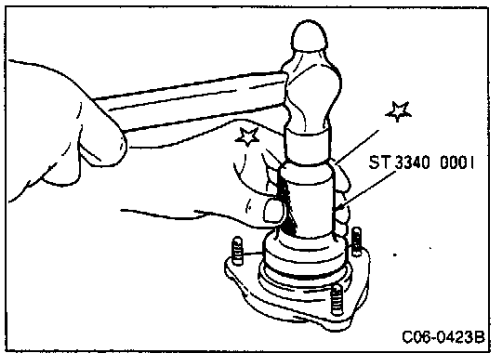
CAUTION:
Always replace oil seal after every disassembly.

3. Final Drive Removal and Installation, Assembly and Disassembly (Cont'd)



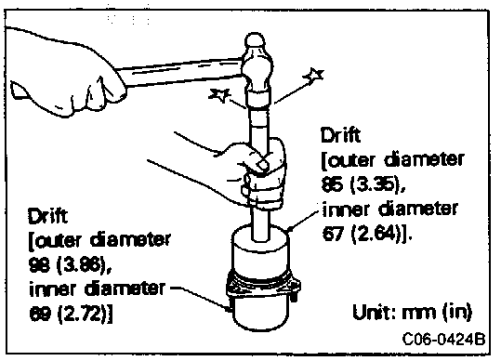
- Place drift [outer diameter 98 mm (3.86 in), inner diameter 69 mm (2.72 in)] on bottom side and remove bearing with drift (special service tool) [outer diameter 32 mm (1.26 in)].

Installation



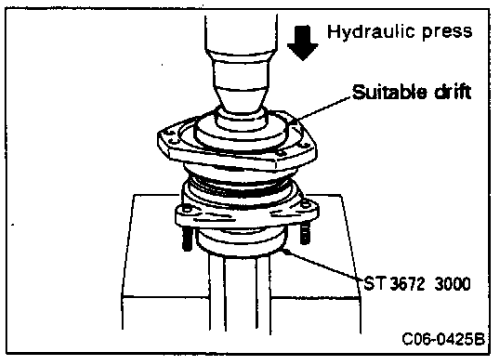
- Use drift (special service tool) as shown in figure, and press-fit bearing until it is even with lower surface of side retainer.

CAUTION:
Do not install bearing at angle.



- Place drift [outer diameter 98 mm (3.86 in), inner diameter 69 mm (2.72 in)] on bottom and use drift [outer diameter 85 mm (3.35 in), inner diameter 67 mm (2.64 in)] to press-fit oil seal even with side retainer.

CAUTION:
(1) Do not install oil seal at an inclined angle.
(2) Apply MP special grease No. 2 to oil seal lip sliding surface.

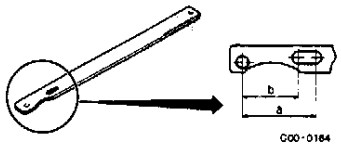
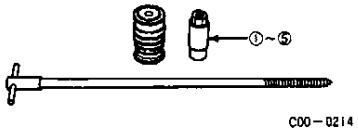


- Place suitable drift (special service tool) against side shaft and press-fit shaft on retainer.

OPERATION PRECAUTIONS

- Use torque wrench to tighten nuts and bolts.

Tools required

	Name	Description	Application	Remarks
Special service tool	Flange wrench KV401 04000		Wheel hub lock nut removal and installation	Already described
Regular tools	Pitman arm puller HT7256 0000		Side rod removal	Nissalco
	Drive shaft joint puller HT7255 Attachment HT7255 1000 ① M20 x 1.0 ② M20 x 1.5 ③ M22 x 1.0 ④ M22 x 1.5 ⑤ M24 x 1.5		Fixed joint removal	
	Note: The sliding hammer gear puller HT7240 that was previously described can be used for the drive shaft joint puller slide hammer.			

1. Summary

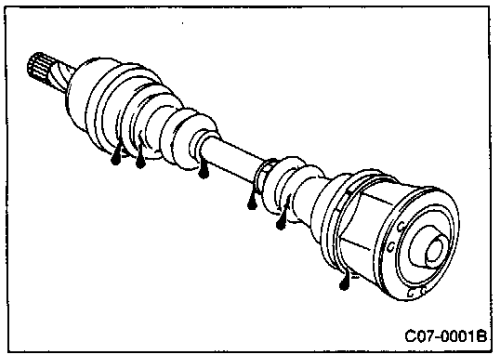
Specifications

Item \ Location		Front	Rear
Final drive type		F160	R200 mechanical LSD (RB26DETT)
Model number		Z80T70C (right) Z80T82F (left)	B100D100
Middle tube diameter mm (in)	Right	25 (0.98)	30 (1.18)
	Left	25 (0.98)	30 (1.18)
Dimension between joint L mm (in)	Right	323 (12.72)	440 (17.32)
	Left	408 (16.06)	398 (15.67)
Maximum length M mm (in)	Right	448.1 (17.64)	561.1 (22.09)
	Left	513.7 (20.22)	519.1 (20.44)
Differential insertion length ℓ mm (in)	Right	90 (3.54)	93 (13.66)
	Left	—	101 (3.98)

1. Summary (Cont'd)

Inspection specifications

Description \ Location / Model number		Front		Rear
		Z80T70C (right)	Z80T82F (left)	B100D100
Grease quantity g (oz)	Wheel hub joint	Approx. 120 (4.23)		Approx. 180 (6.35)
	Final drive joint	Approx. 190 (6.70)	Approx. 155 (5.47)	Approx. 190 (6.70)
Boot installation length mm (in)	Wheel hub joint	90.5 - 92.5 (3.563 - 3.642)		102 (4.02)
	Final drive joint	95.5 - 97.5 (3.760 - 3.839)	95 - 97 (3.74 - 3.82)	103.5 (4.07)
Drive shaft installation bolt tightening torque N·m (kg-m, ft-lb)		—	27 - 37 (2.8 - 3.8, 20 - 27)	83 - 93 (8.5 - 9.5, 61 - 69)
Axial play (wheel hub joint) mm (in)		1 (0.04) max.		



2. On-vehicle Inspection

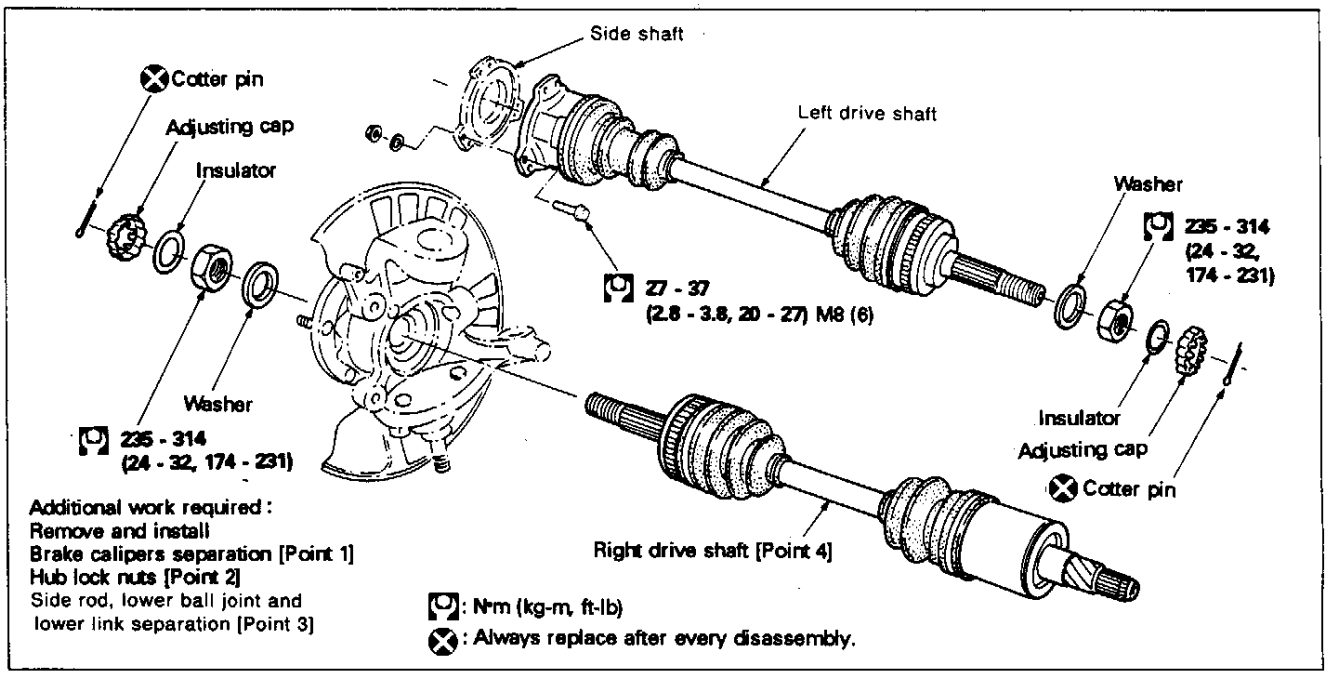
Check boot and drive shaft for damage, wear and grease leaks.

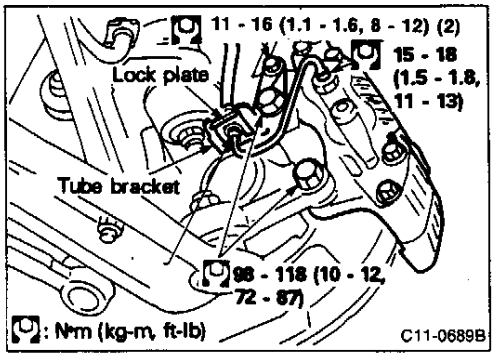
- Check boot and drive shaft for damage, wear and grease leaks. Replace parts as necessary.

3. Drive Shaft Removal and Installation, Assembly and Disassembly

3-1 REMOVAL AND INSTALLATION

(1) Front drive shaft

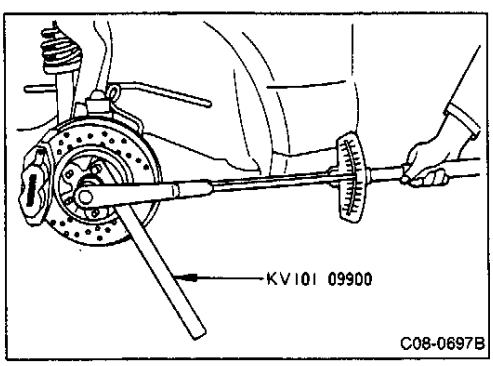




[Point 1] Brake caliper assembly separation

- Remove brake hose bracket lock plate and separate brake hose. Remove caliper assembly from disk rotor and attach to strut.

CAUTION:
Do not damage brake hose.



[Point 2] Hub lock nut removal and installation

Removal

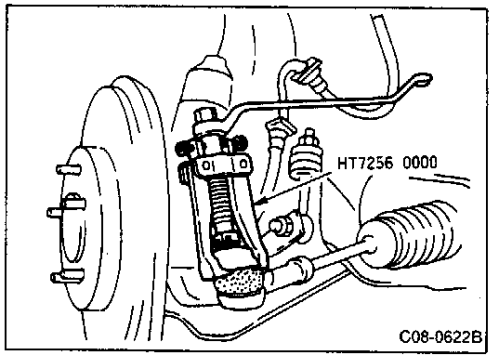
- Using hub lock nut wrench (special service tool), lock hub and loosen front hub lock nut.

Installation

- Install drive shaft and hub assembly in vehicle. Tighten lock nut to torque indicated below.

Tightening torque:
235 - 314 N·m (24 - 32 kg-m, 174 - 231 ft-lb)

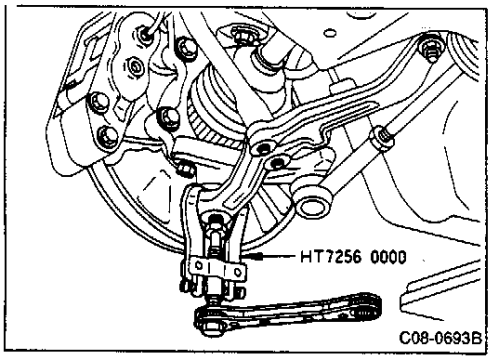
3. Drive shaft Removal and Installation, Assembly and Disassembly (Cont'd)



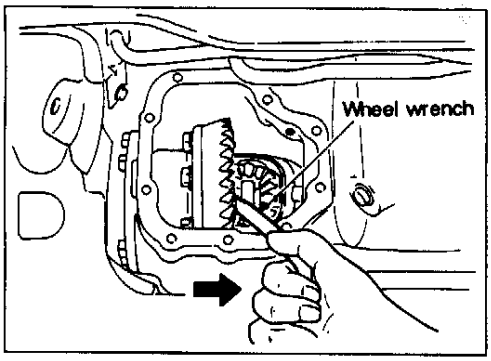
[Point 3] Tie-rod, suspension lower ball joint and lower link separation

- Using Pitman arm puller (commercial service tool), separate tie-rod and suspension lower ball joint.

CAUTION:
Be careful when removing ball joint because the knuckle is made of aluminum and scratches easily. Use Pitman arm puller and do not tap knuckle.



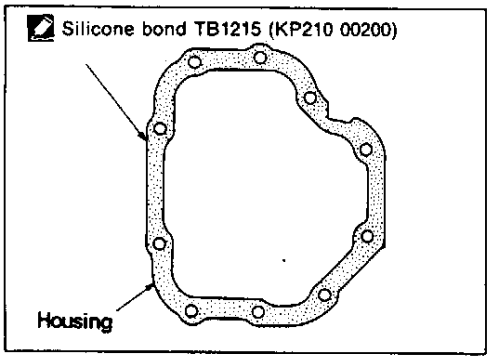
- Using Pitman arm puller (commercial service tool), separate suspension lower ball joint and lower link.



[Point 4] Right drive shaft removal and installation

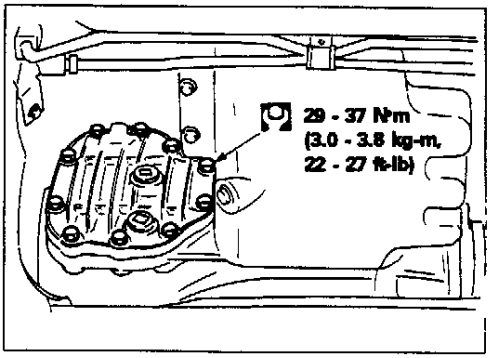
Removal

- Drain oil from front final drive and remove rear cover. Use wheel wrench as lever and remove shaft.



Installation

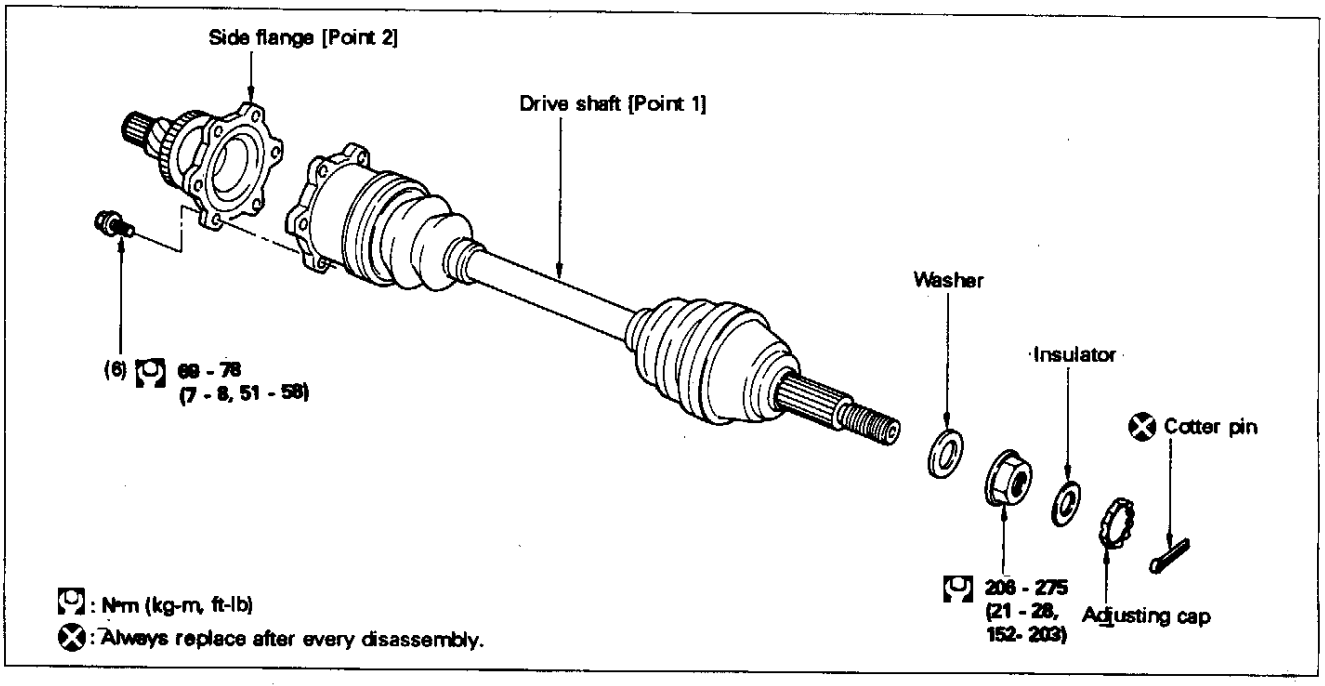
- Insert drive shaft in final drive. Apply silicon bond sealant TB1215 (KP210 00200) to rear cover sealing surfaces.

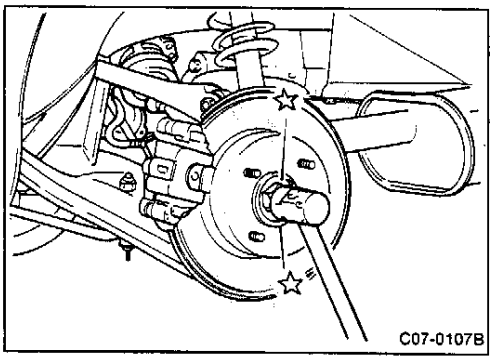


- Tighten differential cover to specified torque.
  Differential cover tightening torque:
  29 - 37 N·m (3.0 - 3.8 kg-m, 22 - 27 ft-lb)
- Fill oil from filler plug hole. Use Nissan gear oil hypoid GL-5 85W90.

3. Drive shaft Removal and Installation, Assembly and Disassembly (Cont'd)

(2) Rear drive shaft





[Point 1] Drive shaft removal and installation

Removal

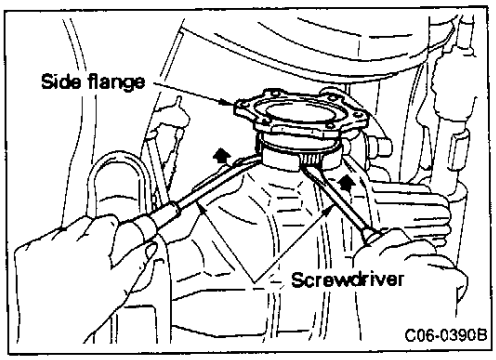
- Remove side flange bolts and separate drive shaft.
- Tap drive shaft with copper hammer as shown in figure and remove.

CAUTION:
Attach nut to prevent drive shaft threads from being damaged.

Installation

- Insert drive shaft in wheel hub side and temporarily tighten hub lock nuts.
- Tighten side flange bolts to specified torque.
- Tighten hub lock nut to specified torque.

3. Drive shaft Removal and Installation, Assembly and Disassembly (Cont'd)



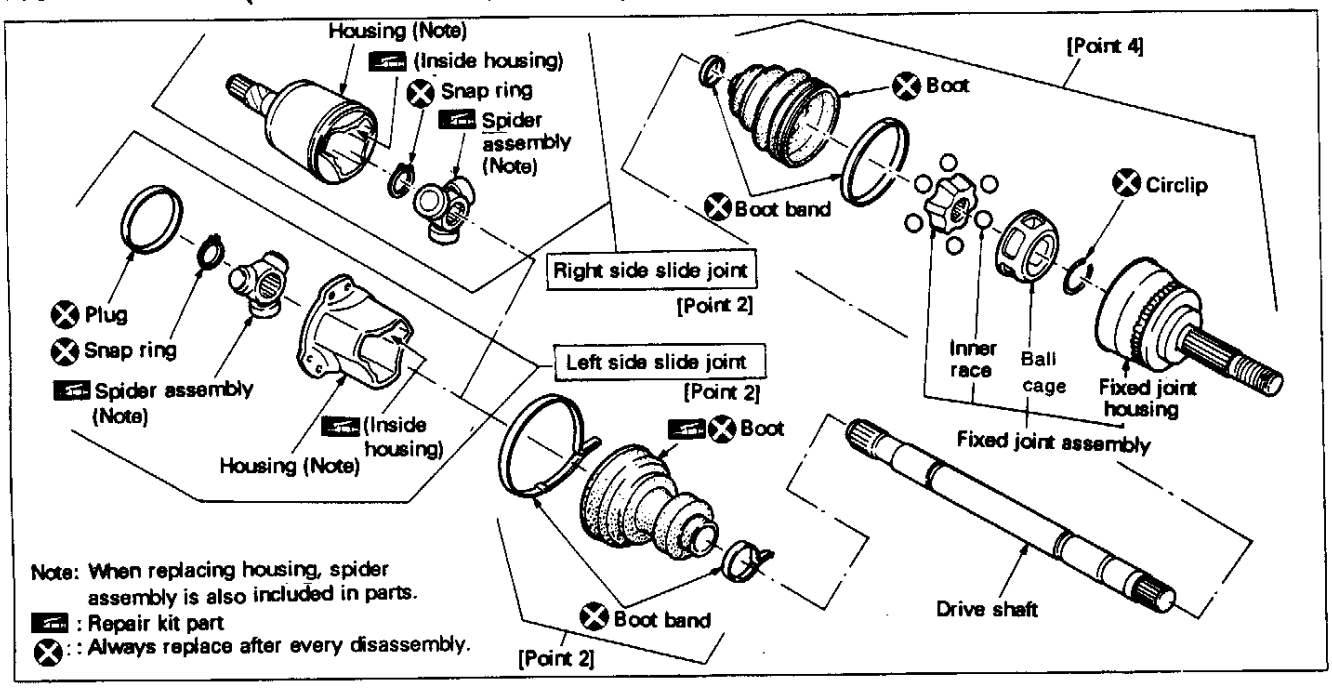
[Point 2] Side flange removal

- Use screwdriver as lever as shown in figure and remove circlip.
- Circlip installation position

F160 model	Right	Final drive side
	Left	None
R200 (mechanical LSD)	Right	Final drive side
	Left	Final drive side

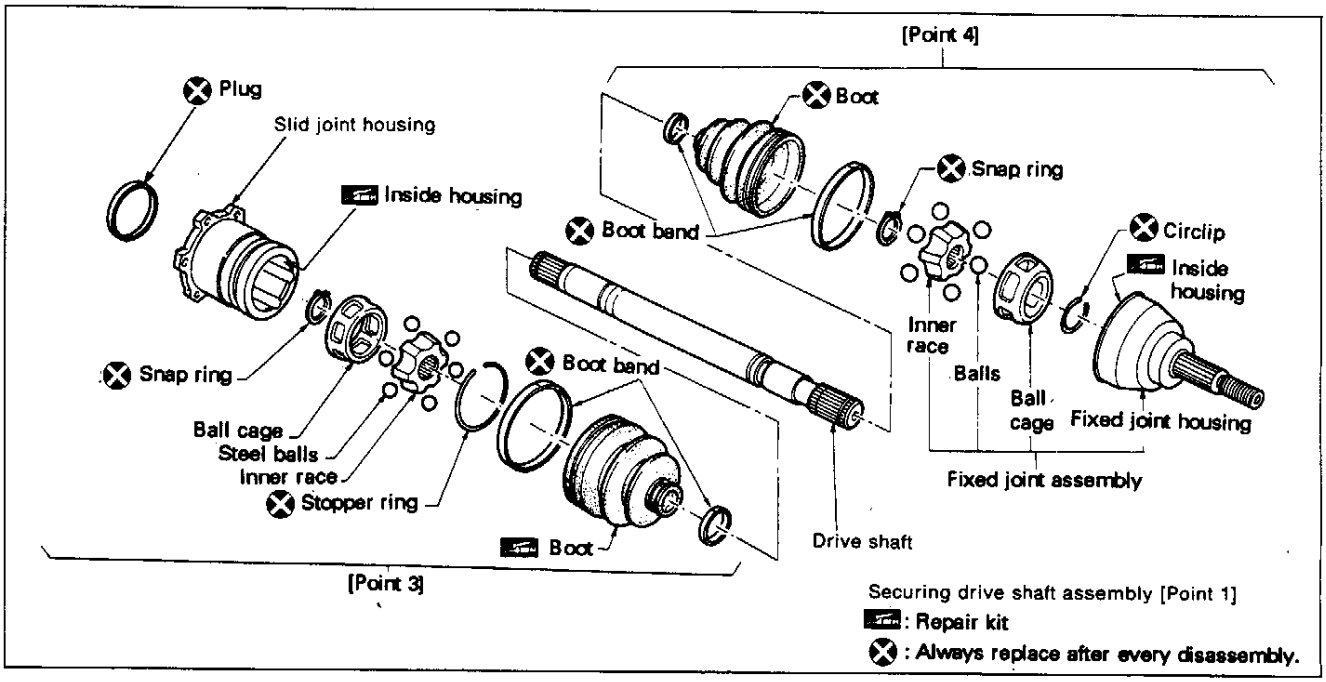
3-2 ASSEMBLY AND DISASSEMBLY

Front drive shaft (Models Z80T70C, Z80T82F)



3. Drive shaft Removal and Installation, Assembly and Disassembly (Cont'd)

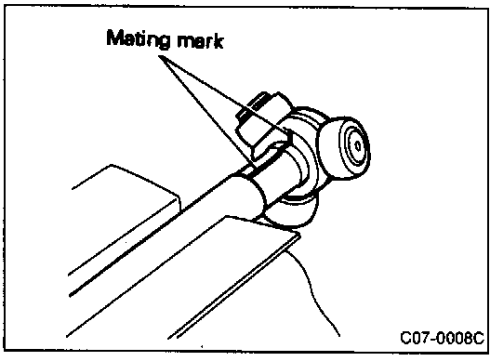
Rear drive shaft (Model B100D100)



[Point 1] Securing drive shaft assembly

- Protect drive shaft with copper or aluminum plates and secure in vise.

CAUTION:
Tighten vise lightly because boots may be deformed if vise is tightened excessively.



[Point 2] Slide joint assembly and disassembly (Models Z80T70C and Z80T82F)

Disassembly

- Remove boot and pull out shaft.

CAUTION:
Always replace boot after every disassembly.

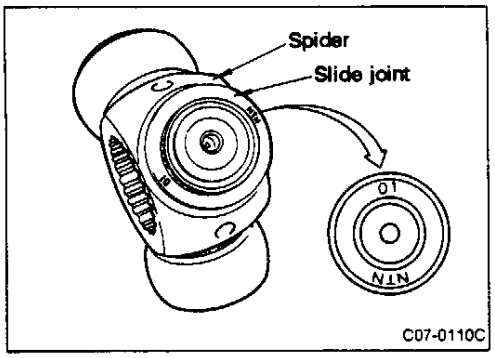
- Inscribe mating marks on drive shaft and spider assembly.
- Remove snap ring and detach spider assembly from drive shaft.
- Remove boot assembly from drive shaft.

CAUTION:
Spider assembly cannot be disassembled.

3. Drive shaft Removal and Installation, Assembly and Disassembly (Cont'd)

Part inspection

Part name	Inspection and operation
Shaft	• Check drive shaft for runout, cracks and damage. Replace if necessary.
Housing	• If housing roller surface is scratched or worn, check entire spider assembly. Replace housing and spider assembly as set if necessary.
Spider assembly	• If rollers are pitted or scored in rotation direction, replace spider assembly. • If serrated parts are deformed or scored, also inspect drive shaft. If worn or damaged, replace both spider assembly and drive shaft. • If rollers are scratched or worn, inspect housing. If worn or damaged, replace both spider assembly and housing.
Boot and band	• Replace if cracked. **CAUTION:** **After removing boot band, always replace with new part.**
Other	• Replace if deformed or damaged.



Assembly

- When replacing only spider assembly, select part with same identification number inscribed on slide joint as indicated in following charts. After selecting correct part, assemble unit.

CAUTION:
When replacing housing, replace as set with spider assembly.

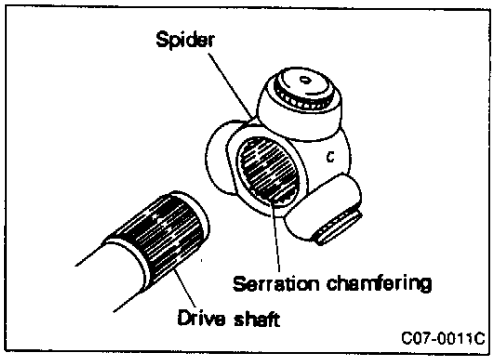
Z80T70C (Right side)

Identification mark	Part number
01	39720 51E01
02	39720 51E02
03	39720 51E03

Z80T82F (Left side)

Identification mark	Part number
10	39720 10V10
11	39720 10V11
12	39720 10V12

3. Drive shaft Removal and Installation, Assembly and Disassembly (Cont'd)



- When installing spider assembly, align mating marks and install shaft.
- Secure spider assembly with snap ring.

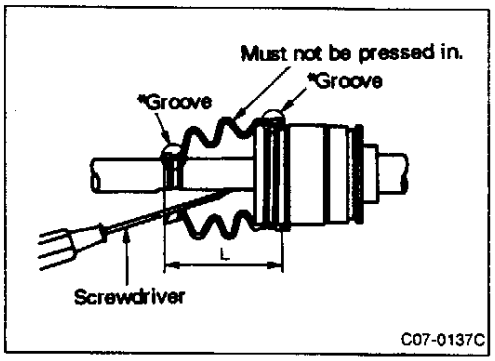
CAUTION:

(1) Before installing spider assembly, mount boot on shaft.

(2) Position insertion direction as shown in figure.

- Apply repair kit grease to spider and sliding parts. Insert parts in housing and apply remaining grease in quantities indicated below.

Model	Grease quantity g (oz)
Z80T70C	Approx. 190 (6.70)
Z80T82F	Approx. 155 (5.47)



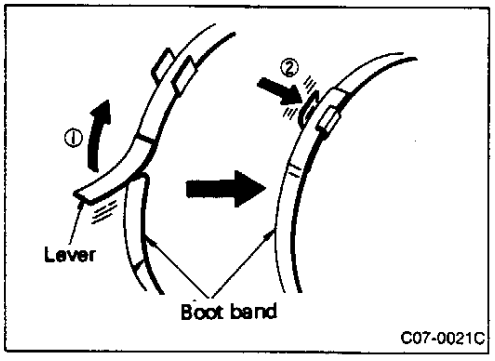
- Install boot securely in grooves (parts indicated by *) as shown in figure.
- Set boot length (L) as indicated below. Insert screwdriver in small diameter side, adjust inner and outer pressure of boot to avoid deformation.

CAUTION:

(1) If boot installation length is shorter than indicated below it may cause boot to break or split.

(2) Be careful not to touch the inside surface of boot with end of screwdriver.

Model	Installation length L mm (in)
Z80T70C	95.5 - 97.5 (3.760 - 3.839)
Z80T82F	95 - 97 (3.74 - 3.82)

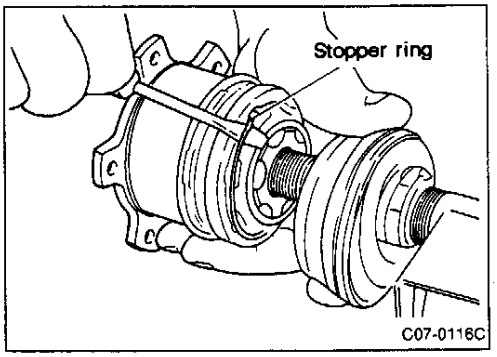


- Secure boot band on large and small diameter side of boot.

CAUTION:

Rotate joint and make sure boot installation position does not change. If position moves, install new boot band.

3. Drive shaft Removal and Installation, Assembly and Disassembly (Cont'd)



[Point 3] Slide joint assembly and disassembly (Model B100D100)

CAUTION:
Replace joint assembly if parts are worn or damaged.

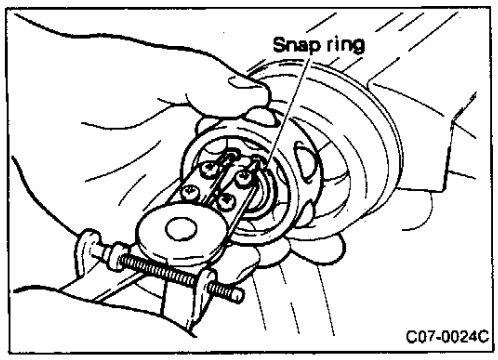
Disassembly

- Remove boot band.

CAUTION:
Always replace boot band with new part after disassembly.

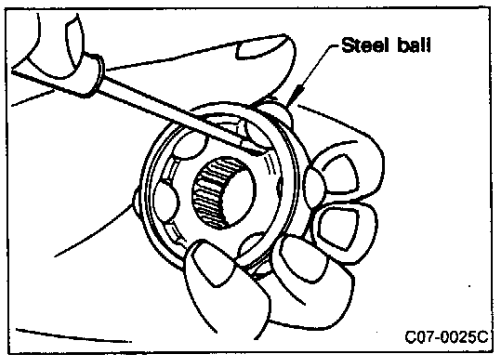
- Remove stopper ring and remove slide joint housing.

CAUTION:
(1) Always replace stopper ring with new part after disassembly.
(2) Stopper ring is used for slide stopper. Remove ring before removing slide joint housing.



- Remove snap ring and detach ball cage and steel ball assembly.
- Remove boot.

CAUTION:
If boot is cracked and foreign matter is mixed with grease inside, disassemble and inspect ball cage and steel ball assembly.



The ball cage and steel ball assembly should only be disassembled to clean the grease. If the steel balls or other parts are worn or damaged, replace joint assembly.

- Use screwdriver to remove steel balls one at a time.
- Remove inner race from large side of ball cage.

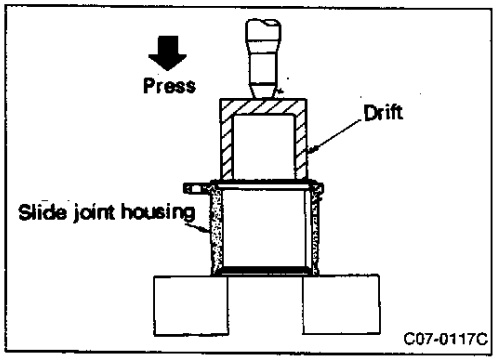
CAUTION:
When removing steel balls, do not scratch surface of steel balls and inner race contact surface.

3. Drive shaft Removal and Installation, Assembly and Disassembly (Cont'd)

Disassembly inspection

- Clean parts and inspect following items.

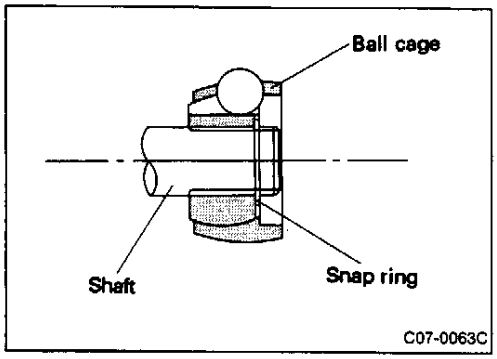
Part name	Inspection and operation
Shaft	• Check shaft for runout, cracks and damage. • Check threads for damage.
Joint assembly	• Check joint rotation and abnormal play in axial direction. • Check foreign matter inside joint.
Outer race	• Check ball contact surface damage or abnormal wear. • Check for deformation of boot installation.
Ball cage	• Check for damage or abnormal wear in sliding parts.
Steel ball	• Check for damage or abnormal wear.
Inner race	• Check ball contact surface for scratches or abnormal wear. • Check for damage in serration holes. (Check shaft serration holes at same time.)



Assembly

- Using drift [outer diameter 78 mm (3.07 in), inner diameter 72 mm (2.83 in)], press-fit plug.
- Insert inner race in large diameter side of ball cage.
- Apply grease to cage pocket and assemble 6 balls in cage. At this time, rotate inserted cage one-half pitch (one-half the width of one drive shaft spline) to position inner race on axis correctly and then install.

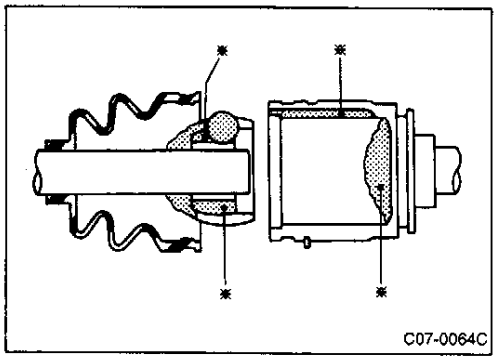
CAUTION:
The inner race can be installed in either direction.



- Install new boot on shaft. Install ball cage and steel ball assembly.

CAUTION:
(1) Install boot on shaft before assembling steel ball assembly.
(2) The ball cage installation direction is shown in figure. Be careful to position cage in correct direction.

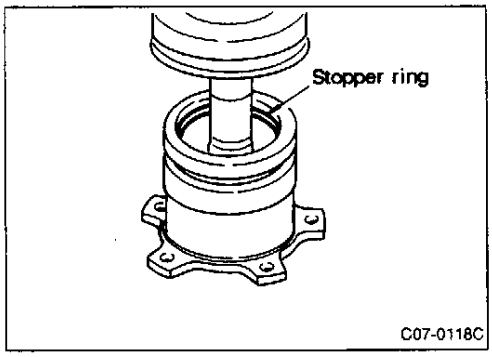
- Secure ball cage and steel ball assembly with snap ring.



- Apply repair kit grease to slide joint housing (* part) in quantity indicated below.

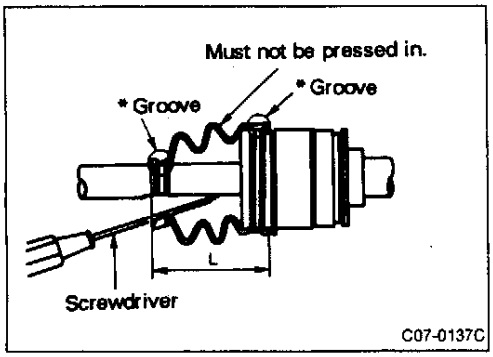
Grease quantity:
190 g (6.70 oz)

3. Drive shaft Removal and Installation, Assembly and Disassembly (Cont'd)



- Install stopper ring in slide joint housing.

CAUTION:
After installation, pull shaft out and make sure slide joint assembly and stopper ring engage correctly.



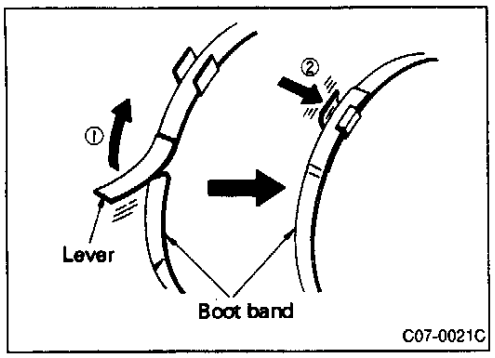
- Install boot securely in grooves (parts indicated by *) as shown in figure.

CAUTION:
Remove grease attached to boot installation surface (parts indicated by * in figure). Grease on surface may cause boot to slip off.

- Set boot length (L) as indicated below. Insert screwdriver in small diameter side, adjust inner and outer pressure of boot to avoid deformation.

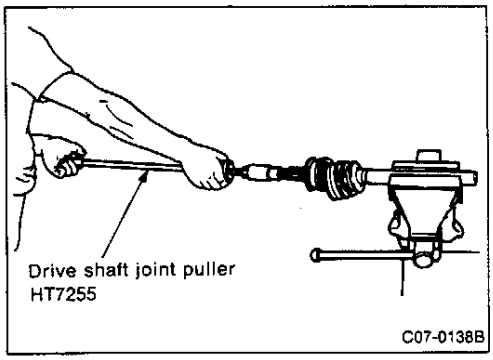
CAUTION:
(1) If boot installation length is shorter than dimension indicated below it may cause boot to break or split.
(2) Be careful not to touch the inside surface of boot with end of screwdriver.

Installation length L:
103.5 mm (4.07 in)



- Secure large and small side of boot with new boot band.

CAUTION:
Rotate joint and make sure boot installation position does not change. If position moves, install boot band one more time.



[Point 4] Fixed joint assembly and disassembly (Models Z80T70C, Z80T82F, B100D100)

CAUTION:
Replace joint assembly if parts are worn or damaged.

Disassembly

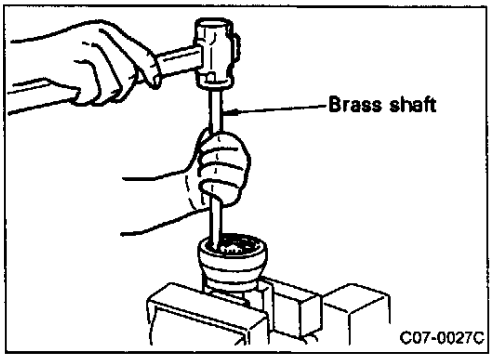
- Remove boot band and remove boot from housing.
- Using drive shaft joint puller, remove housing assembly from shaft.

3. Drive shaft Removal and Installation, Assembly and Disassembly (Cont'd)

CAUTION:

(1) Screw drive shaft joint puller more than 30 mm (1.18 in) into housing threads.

(2) If removal of housing assembly has been attempted more than five times and assembly cannot be detached, replace drive shaft assembly.

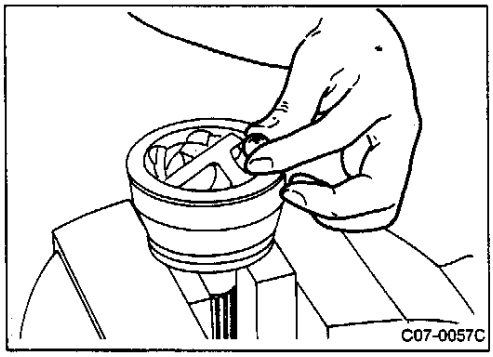


- Remove circlip and snap ring from shaft.
- Secure fixed joint assembly in vise.

CAUTION:

Place copper or aluminum plates on side of assembly to prevent damage before tightening vise.

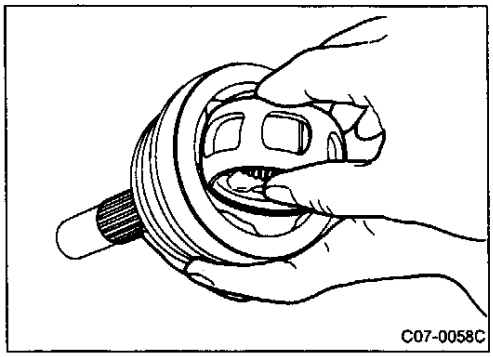
- Clean off old grease.
- Using brass shaft, rotate ball cage and remove steel balls from small holes in cage.



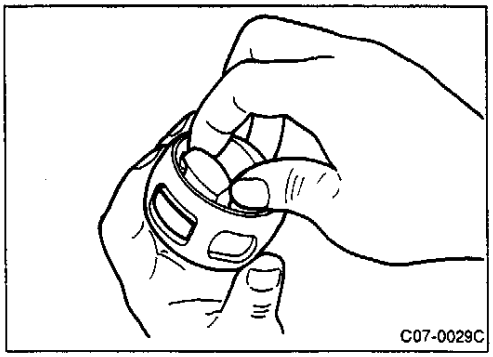
- After steel balls in four small holes have been removed, then remove steel balls from two large holes.

CAUTION:

The ball cage may break if steel balls are removed from large holes first.



- Align outer race protrusion in large hole of ball cage. Remove ball cage and inner race from outer race at same time.



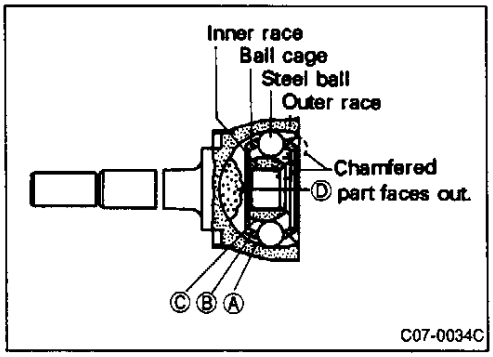
- Align inner race protrusion in large hole of ball cage and remove inner race from chamfered side of ball cage.

3. Drive shaft Removal and Installation, Assembly and Disassembly (Cont'd)

Disassembly inspection

- Clean parts and check following items.

Part	Description
Fixed joint assembly	• Joint rotational condition, abnormal play in axial direction • Foreign matter inside joint
Outer race	• Damage or abnormal wear in ball contact surface • Damage to drive shaft threads • Boot installation deformation
Ball cage	• Damage or abnormal wear in sliding surfaces
Steel balls	• Damage or abnormal wear
Inner race	• Damage or abnormal wear to ball contact surface • Damage to serration holes (Check drive shaft serration holes at same time.)



Assembly

- Coat outer race ball contact surface, ball cage sliding parts, inner race ball contact surface with repair kit grease.
- Install inner race in ball cage.

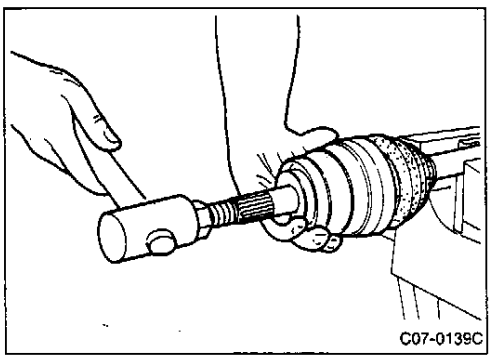
CAUTION:
Check that the installation direction of the inner race and ball cage (refer to figure) is correct.

- Install ball cage and inner race in outer race.
- Install steel balls in ball cage.

CAUTION:
Install steel balls in reverse sequence of disassembly. First install steel balls in the two large holes and then install remaining balls one at a time in the four small holes.

- Insert repair kit grease from inner race serration holes.

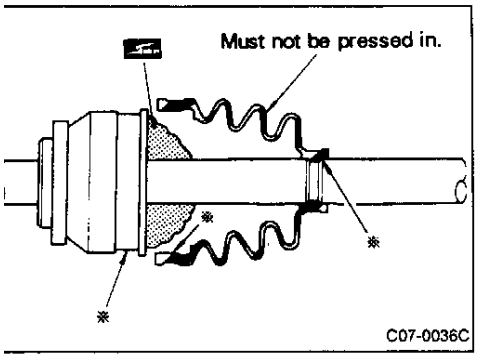
Part	Grease quantity g (oz)
Outer race ball contact surface (A)	Approx. 10 (0.35) each, total 30 (1.06)
Ball cage sliding parts (B)	
Inner race ball contact surface (C)	
Inner race serration holes (D)	30 (1.06)



- Install boot with new boot band on drive shaft.
- Install snap ring and circlip on drive shaft.
- Install nut on fixed joint assembly and tap with wooden hammer to press-fit on drive shaft.

CAUTION:
Circlip must be inserted in shaft groove securely.

3. Drive shaft Removal and Installation, Assembly and Disassembly (Cont'd)



- Apply remaining repair kit grease to inside of housing from large opening of boot.

Model	Grease quantity g (oz)
Z80T70C	Approx. 120 (4.23)
Z80T82F	Approx. 120 (4.23)
B100D100	Approx. 180 (6.35)

CAUTION:

Remove grease from fixed joint boot installation surface (locations indicated by * in figure). The boot may come off if there is grease on the boot installation surface.

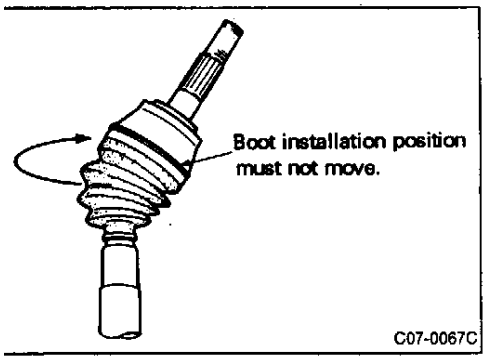
- Install boot securely in grooves (locations indicated in figure).
- Set boot length (L) as indicated below and secure with boot band.

CAUTION:

(1) If boot installation length is shorter than dimension indicated below it may cause boot to break or split.

(2) Be careful not to touch the inside surface of boot with end of screwdriver.

Model	Installation length mm (in)
Z80T70C	90.5 - 92.5 (3.563 - 3.642)
Z80T82F	90.5 - 92.5 (3.563 - 3.642)
B100D100	102 (4.02)

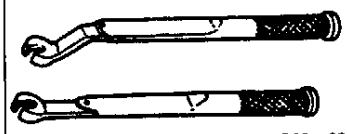
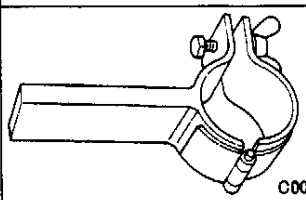
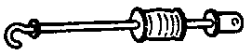
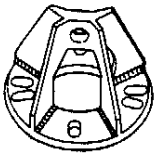
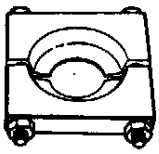
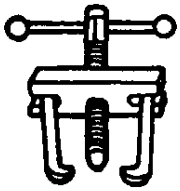
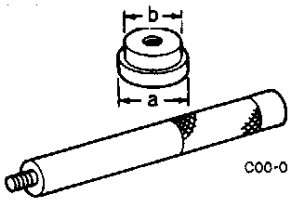


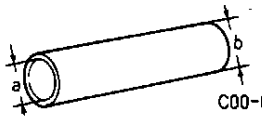
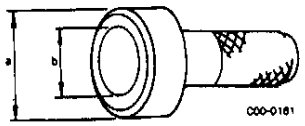
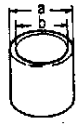
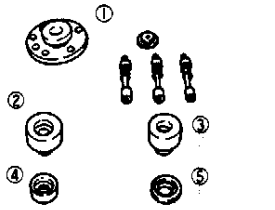
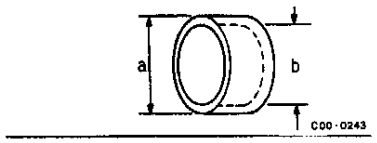
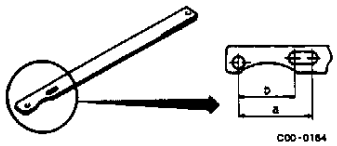
- Check boot installation. Rotate joint as shown in figure and check that boot installation position does not move. If position moves, install boot band one more time.

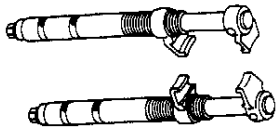
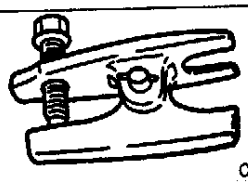
OPERATION PRECAUTIONS

- When installing each rubber bushing, final tightening must be carried out with vehicle on ground in unladen condition. Clean off all oil from rubber parts thoroughly because it may lower durability.
- Use flare wrench to remove brake piping. Use flare torque wrench (special service tool: GG9431 0000) to remove brake piping.
- Use flare nut wrench for removal and installation of steering piping flare nuts.
- Check wheel alignment when servicing suspension parts.

Required tools

	Name		Description	Remark
Special service tools	Brake tube torque wrench GG9431 0000	 C00—0002	Tightening brake tube flare nuts	Already described
	Strut attachment ST3565 2000	 C00—0004	Removing coil springs	
	Slide hammer ST3623 0000	 C00—0010	Removing hub outer bearings	
	Attachment KV401 04100	 C00-0104	Same as above	
	Bearing replacer ST3003 1000	 C00-0014	Same as above	
	Bearing puller ST3305 1001	 C00-0203	Same as above	
	Drift ST3070 1000 Drift bar ST3532 5000 **a: 61.5 mm (2.421 in) dia.** **b: 41 mm (1.61 in) dia.**	 C00-0152	Removing wheel (unit) bearing outer race	

	Name		Description	Remark
Special service tools	Drift KV401 5110 **a: 48 mm (1.89 in) dia.** **b: 40 mm (1.57 in) dia.**		Wheel hub and outer bearing installation	Already described
	Drift ST3340 0001 **a: 60 mm (2.36 in) dia.** **b: 47 mm (1.85 in) dia.**		• Installing knuckle spindle and wheel hub • Removing and installing tension rod bushings	
	Drift KV401 04710 **a: 76.2 mm (3.000 in) dia.** **b: 68 mm (2.68 in) dia.**		Removing and installing tension rod bushings Installing wheel (unit) bearing outer race	
	CCK gauge attachment KV991 040S0 ① KV991 04010 Plate assembly ② KV991 04020 Adapter A [outer diameter 72 mm (2.83 in)] ③ KV991 04030 Adapter B [outer diameter 65 mm (2.56 in)] ④ KV991 04040 Adapter C [outer diameter 57 mm (2.24 in)] ⑤ KV991 04050 Adapter D [outer diameter 53.4 mm (2.102 in)]		Inspecting and measuring wheel alignment	
	Drift KV401 05220 **a: 75 mm (2.95 in) dia.** **b: 62 mm (2.44 in) dia.**		Installing wheel (unit) bearing outer race	
	Flange wrench KV101 09900 **a: 100 mm (3.94 in)** **b: 54 mm (2.13 in)**		Tightening wheel bearing lock nut	

	Name		Description	Remark
Commercial service tools	Spring compressor HT7178 0000	 C00-0007	Removing and installing coil springs	Already described
	Pitman arm puller HT7256 0000	 C00-0231	Removing side rod and lower ball joint	
	Ball joint remover HT7275 0000	 C00—0006	Removing suspension lower ball joint bolts	
Measurement tools	Turning radius gauge (IM2355)		Measuring wheel alignment	—
	Alignment gauge (IM2360)			
	Toe-in gauge			
	Side slip tester			

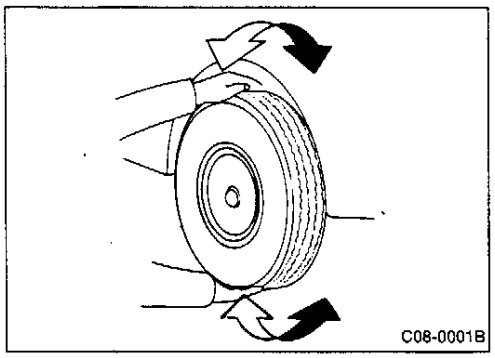
1. Summary

Specifications

Description \ Engine			RB26DETT
Suspension type			Multi-link independent suspension
Wheel alignment (unladen vehicle)	Toe-in	mm (in)	1 ± 1 (0.04 ± 0.04)
	Camber	(°)	–0°55′ ± 45′
	Caster	(°)	3°40′ ± 45′
	King pin inclination angle	(°)	15°25′ ± 45′
	Side slip (reference)	mm (in)	–5 to 5 (–0.20 to 0.20)
Shock absorber	Damping force [at 0.3 m (1.0 ft)/s] N (kg, lb)	Extension side	1,746 (178, 392)
		Compression side	500 (51, 112)
Coil spring	Spring constant	N/mm (kg/mm, lb/in)	23.5 (2.4, 134)
	Free length right/left	mm (in)	405 (15.94)
	Coil average diameter	mm (in)	110 (4.33) [low side 80 (3.15)]
	Line diameter	mm (in)	12.3 (0.484)
	Number of active coils		7.92
Tension rod diameter		mm (in)	20 (0.79)
Stabilizer outer diameter (non-solid)		mm (in)	20 (0.79)

Inspection specifications

Description			Standard Value	
Wheel alignment			Refer to "Specifications".	
Steering angle (°)	Inner wheel		$38^{\circ}{}^{+1^{\circ}}_{-3^{\circ}}$	
	Outer wheel		31°	
Wheel bearing lock nut tightening torque N·m (kg-m, ft-lb)			235 - 314 (24 - 32,174 - 231)	
Wheel bearing axial end play mm (in)			0.05 (0.0020) max.	
Toe pre-adjustment side rod length mm (in)			126.5 (4.98)	
Lower link ball joint and suspension lower ball joint	Description		Lower link ball joint	Suspension lower ball joint
	Swing torque (spring balance conversion value) N (kg, lb)		8.8 - 63.7 (0.9 - 6.5, 2.0 - 14.3)	6.9 - 50.0 (0.7 - 5.1, 1.5 - 11.2)
	Sliding torque N·m (kg-m, ft-lb)		0.5 - 3.4 (0.05 - 0.35, 0.4 - 2.5)	
	Axial end play mm (in)		0 (0)	
	Tightening torque N·m (kg-m, ft-lb)		96 - 120 (9.8 - 12.2, 71 - 88)	

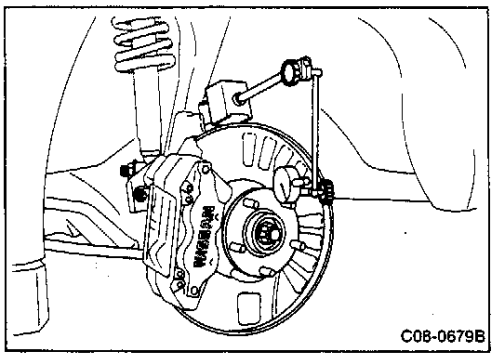


2. On-vehicle Inspection and Preparation

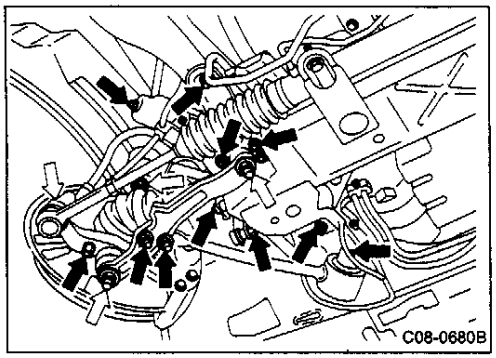
2-1 FRONT SUSPENSION AND AXLE INSPECTION

- Shake left and right front tires. Check tires, wheel bearing and king pin bearings for looseness. Rotate tire by hand and check for abnormal noise.
- Replace if there is looseness or damage.

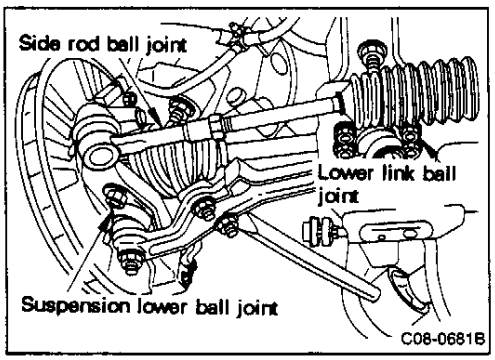
CAUTION:
There may be a small amount of play in the upper link but this is not abnormal.



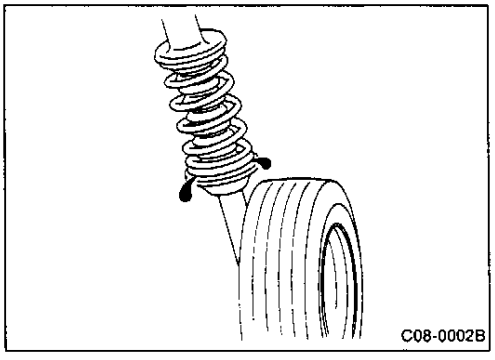
- If there is axial play in locations other than upper link, check axle end play.
  End play standard value:
  0.05 mm (0.0020 in) max.
- The normal preload adjustment is not necessary because a unit bearing is used.
- If problem is found in inspection, disassemble and analyze problem to determine cause.



- Check suspension parts (⬅) for looseness and make sure cotter pins (⇦) are inserted.



- Check ball joints for grease leaks and dust cover for damage.



2-2 SHOCK ABSORBER OIL LEAK INSPECTION

- Check shock absorber for oil leakage.
- Check for fatigue, damage or deformation.
- The front shock absorber cannot be disassembled. Replace entire shock absorber assembly if necessary.

2. On-vehicle Inspection and Preparation (Cont'd)

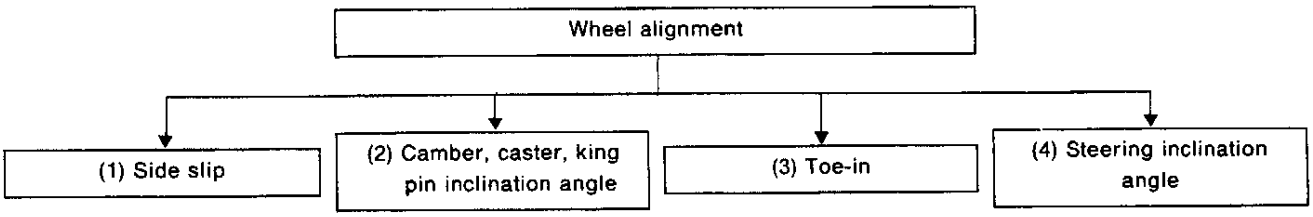
2-3 WHEEL ALIGNMENT INSPECTION AND ADJUSTMENT

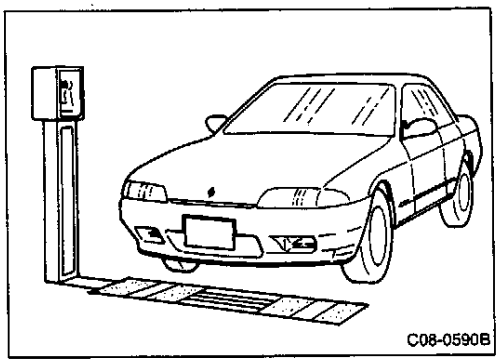
Operation inspection

- Is tire wear and inflation pressure normal? (Refer to C9 WHEELS AND TIRES.)
- Is wheel bearing axial end play normal?
- Is there deformation in load wheel?
- Is there looseness in suspension ball joint and lower link ball joint?
- Is shock absorber operation normal?
- Are axle and suspension parts loose or damaged?
- Is vehicle posture normal?
- Is there damage, cracks or deformation in suspension link?
- Is vehicle unladen*?

  * Fuel, radiator coolant and engine oil full. Spare tire, jack, hand tools and mats in designated positions.

Operation procedures





(1) Side slip distance inspection

- Check side slip distance. If it is within standard specification, wheel alignment can be considered to be normal.

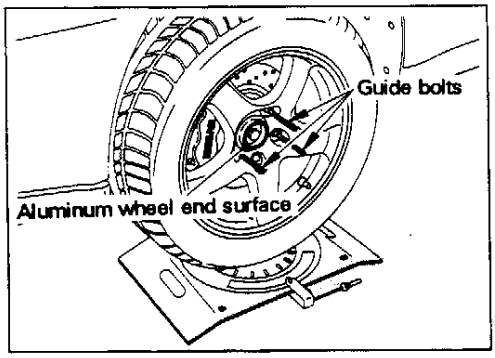
CAUTION:
This can only be considered only when operational vertical stability is incorrect and there are no abnormalities in pre-operational inspection.

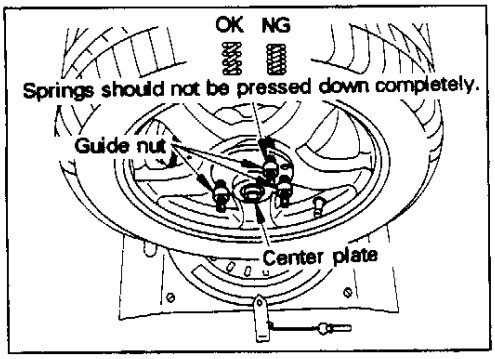
Front side slip distance standard value:
–5 to 5 mm (–0.20 to 0.20 in)

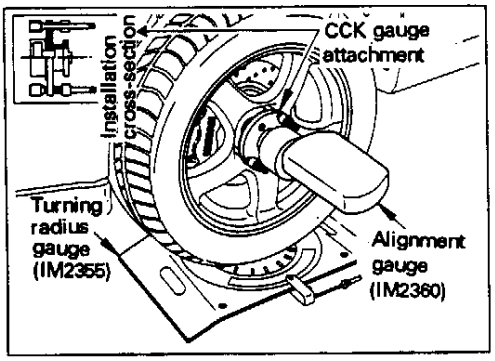
2. On-vehicle Inspection and Preparation (Cont'd)

(2) Camber, caster, king pin angle inspection and measurement

If vehicles equipped with aluminum road wheels or if the alignment gauge installation surface (hub end) is more concave than road wheels, then use the CCK gauge attachment (special service tool: KV991 040S0) to perform the operations described below.







Set turning radius gauge on front wheels with vehicle on level ground.

↓

Set rear wheels on stand that is same height as turning radius gauge.

↓

Remove the wheel nuts and center caps. Screw the guide bolts on hub bolts as shown in figure.

↓

Install adapter B on attachment.

↓

Note 1: Screw nuts until adapter is mounted securely on attachment.

↓

Tighten guide nuts uniformly until adapter is seated securely on aluminum wheel end surface.

↓

Note 2: Do not tighten nuts until springs are pressed completely down.

↓

Set alignment gauge on CCK gauge attachment and perform measurement.

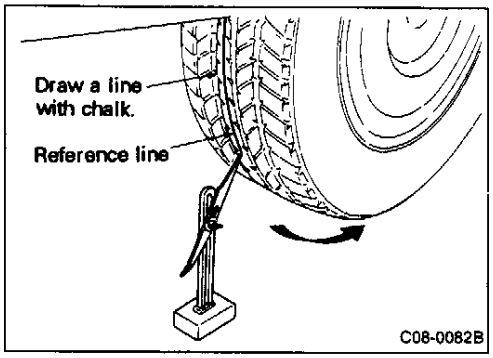
Description	Specification
Camber	-0°55' ± 45'
Caster	RB26DETT: 3°40' ± 45'
King pin angle	15°25' ± 45'

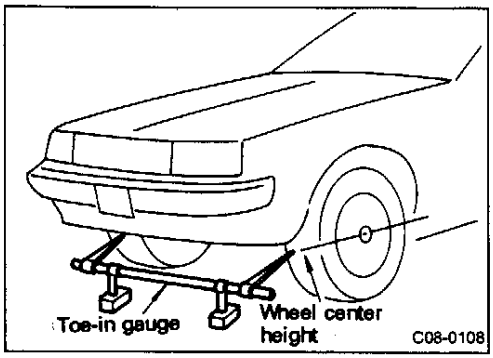
↓

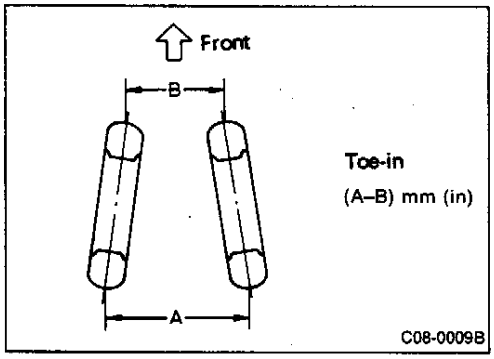
Measure toe-in.

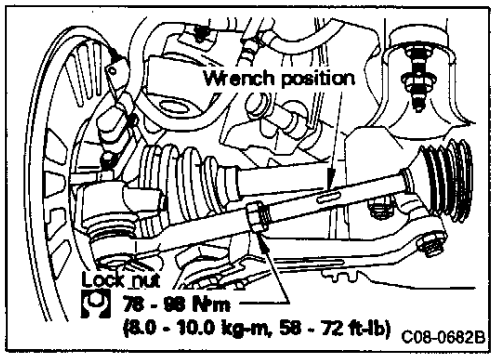
2. On-vehicle Inspection and Preparation (Cont'd)

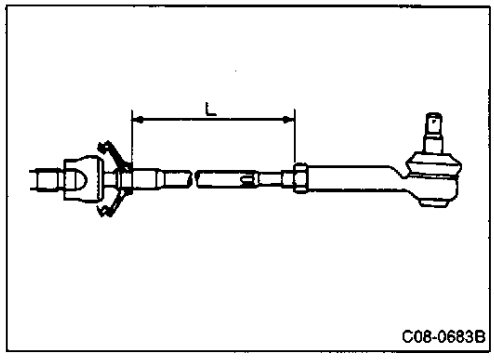
(3) Toe-in inspection and adjustment











Jack up front of vehicle and set on stands. Draw a base line on tread surface of tires with chalk.

↓

After lowering front of vehicle, move it up and down to eliminate friction.

↓

Set steering wheel in straight-ahead position.

↓

Adjust toe-in gauge to wheel center height and measure distance from standard line.

↓

Measure dimensions A and B at same height as hub center as shown in figure and calculate toe-in.
Toe-in = A – B mm (in)

Toe-in standard value: 1 ± 1 mm (0.04 ± 0.04 in)

When toe-in is out of specification

↓

Loosen lock nut as shown in figure. Adjust toe-in by varying the length of steering tie-rods.

CAUTION:

(1) When adjusting steering tie-rods, turn the tie-rods the same distance forwards or backwards.

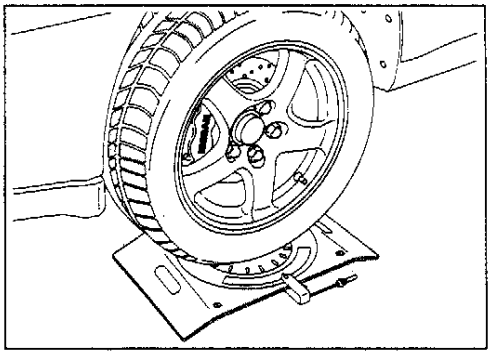
(2) When replacing tie-rods, set the length to the specification indicated below and adjust toe-in.

(3) When tightening lock nuts, secure tie rod with another wrench.

(4) After adjustment, the tie-rod outer ball socket must face straight ahead.

Tie-rod standard length "L" dimension: 126.5 mm (4.98 in)

2. On-vehicle Inspection and Preparation (Cont'd)



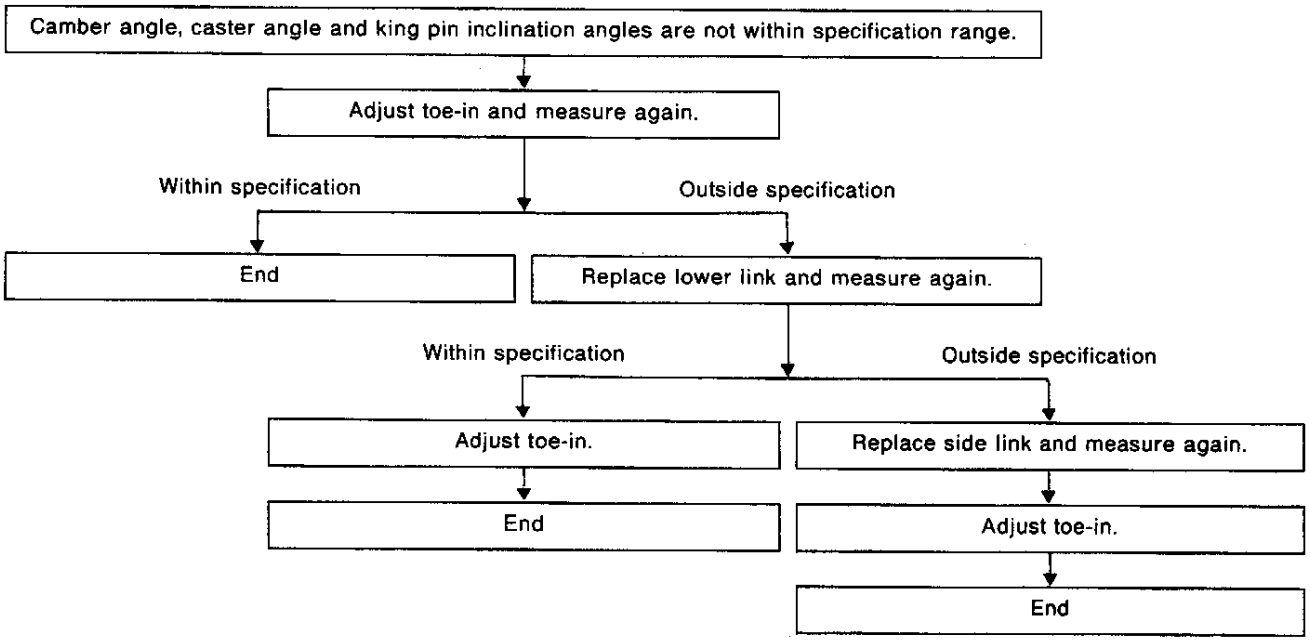
(4) Front wheel turning angle

- Set wheels in straight-ahead position and then move vehicle forward until front wheels rest on turning radius gauge properly. Rotate steering wheels all the way right and left and measure turning angle.

Standard value	Inner wheel	$38^{\circ}{}^{+1^{\circ}}_{-3^{\circ}}$
	Outer wheel	32°

CAUTION:
Turning angle is set by the stroke length of steering gear, and cannot be adjusted.

(5) Trouble diagnosis

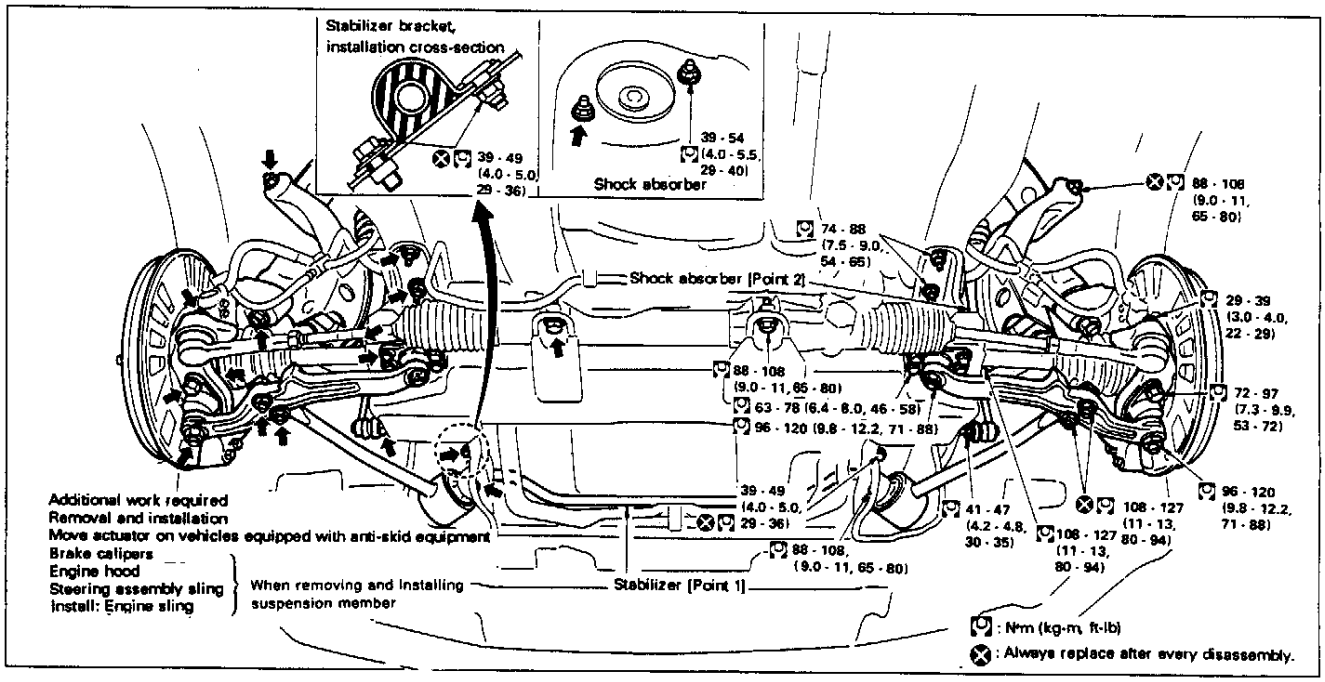


Item	Specification
Camber	-0°55' ± 45'
Caster	RB26DETT: 3°40' ± 45'
King pin angle	15°25' ± 45'

3. Part Removal and Installation, Assembly and Disassembly

3-1 FRONT SUSPENSION

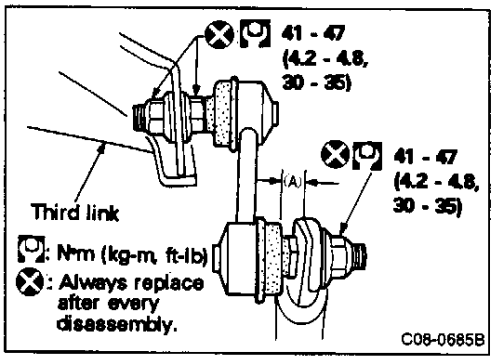
(1) Removal and installation from vehicle



CAUTION:

(1) When tightening links, first tighten temporarily and then tighten again under unladen condition*.
*** Fuel, radiator coolant and engine oil full. Spare tire, jack, hand tools and mats in designated positions.**

(2) Do not press brake pedal while brake caliper assembly is removed.

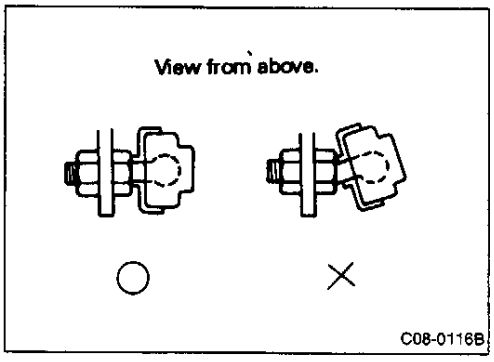


[Point 1] Stabilizer installation

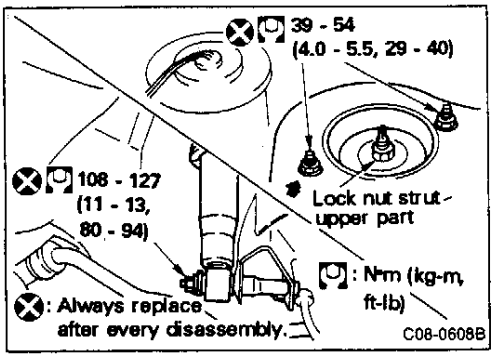
- The stabilizer uses a pillow-ball type connecting rod system. Observe following precautions when setting ball joint position during assembly.

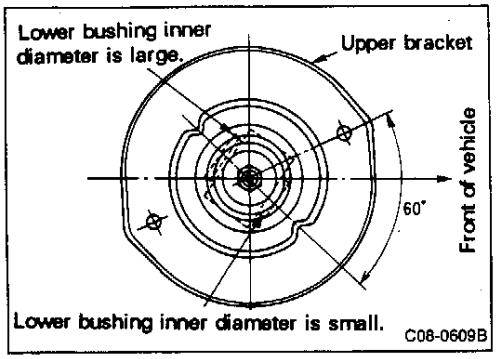
CAUTION:

The distance "A" must be set so pillow-ball and connecting rod are perpendicular to stabilizer bar as shown in figure.



- Apply torque to inner nut on third link side and then tighten.
- Insert seating nut in lock hole on stabilizer side and tighten.





3. Part Removal and Installation, Assembly and Disassembly (Cont'd)

[Point 2] Shock absorber assembly removal and installation

Removal

- Remove shock absorber fixing nuts from body when shock is extended.

CAUTION:

Do not remove piston rod lock nut.

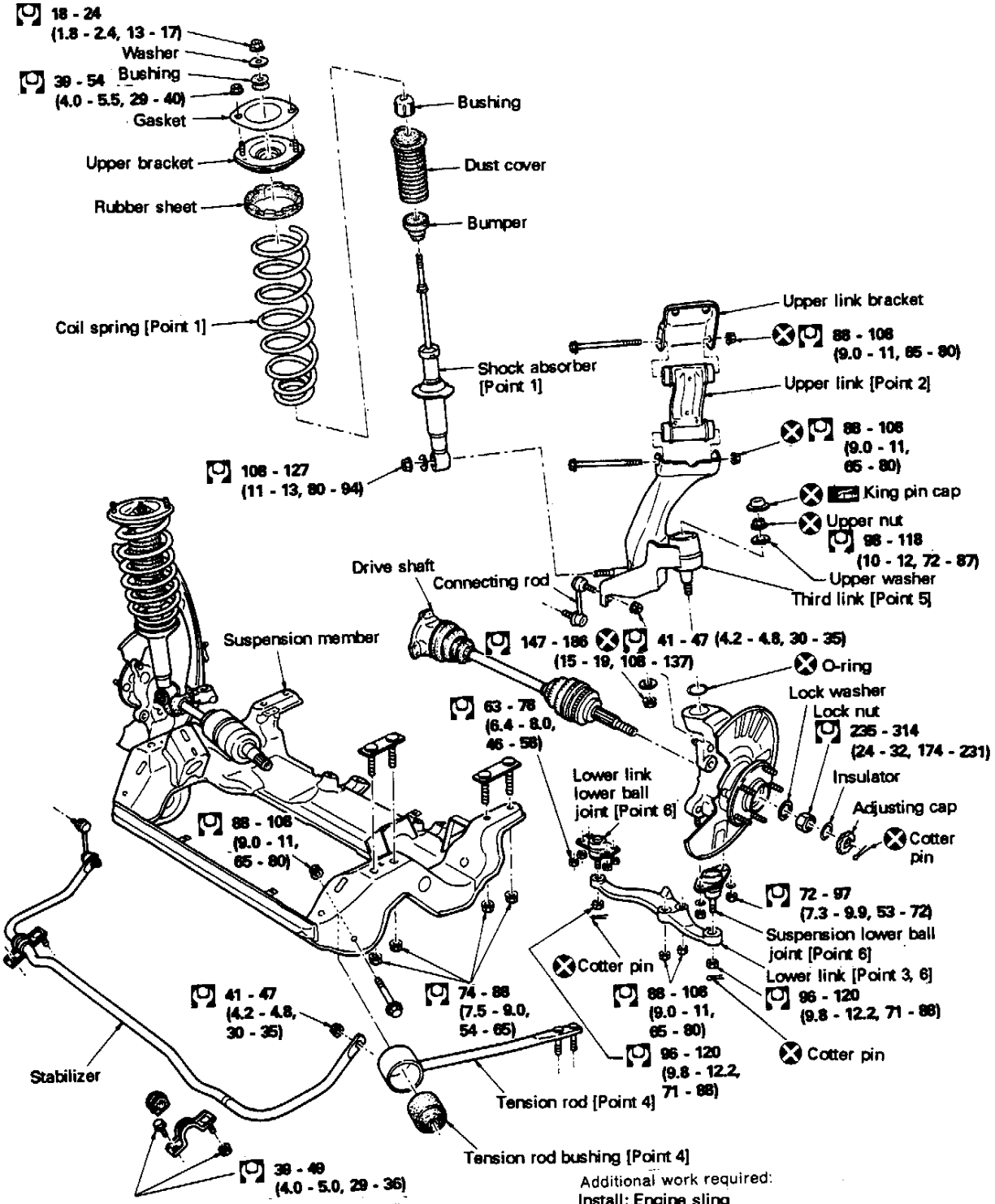
- Remove nuts from lower part of shock absorber (installed in third link).

Installation

- Position small diameter side of shock absorber lower bushing so it faces front of vehicle. Assembly is reverse of disassembly sequence.
  (The figure is cross-section of left shock absorber viewed from above.)

3. Part Removal and Installation, Assembly and Disassembly (Cont'd)

(2) Assembly and disassembly



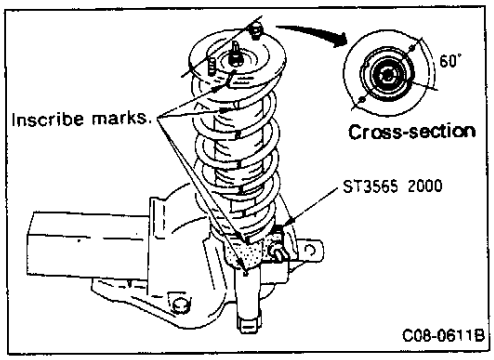
- After installing each suspension part, check and adjust wheel alignment.
- All bushings and washers have a specified direction. Pay attention to direction during installation.
- Be careful not to get grease and oil on bushing.
- When tightening tension rods, the vehicle must be in unladen condition with wheels on ground for final tightening.
- The knuckle spindle is made of aluminum and electrical corrosion will occur where it contacts other metallic objects. Apply bitumen wax after assembly and disassembly.

Additional work required:
Install: Engine sling
Remove and install:
Engine mount nuts
Engine hood
Separate brake hoses and tube
Inspect all parts [Point 6]

: N·m (kg-m, ft-lb)
: Always replace after every disassembly.
: Apply Nissan MP special grease No. 2.

C08-0686B

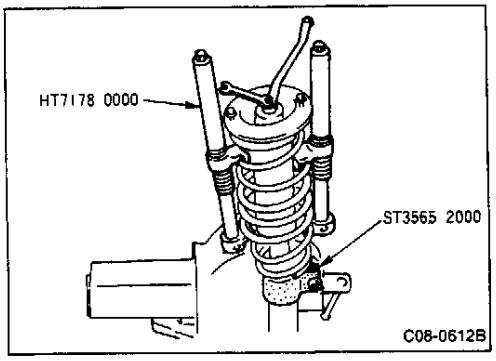
3. Part Removal and Installation, Assembly and Disassembly (Cont'd)



[Point 1] Coil spring removal and installation

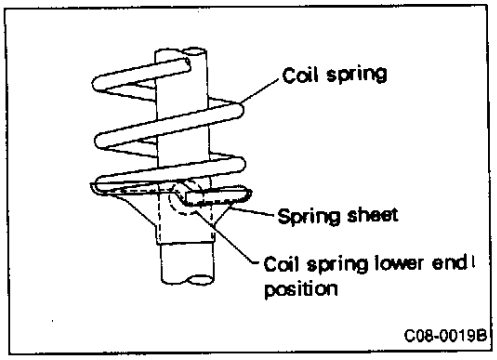
Removal

- Before removal, inscribe mating marks on shock absorber and coil spring as shown in figure.



- Secure attachment (special service tool) to shock absorber assembly and place in vise.
- Use a spring compressor (commercial service tool) and compress coil spring.
- Do not damage piston rod. Remove piston rod lock nut as shown in figure.

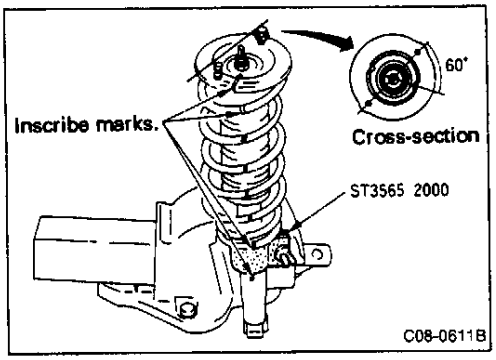
CAUTION:
Compress coil spring. Check that coil spring is free between upper sheet and lower sheet and remove piston rod lock nut.



Installation

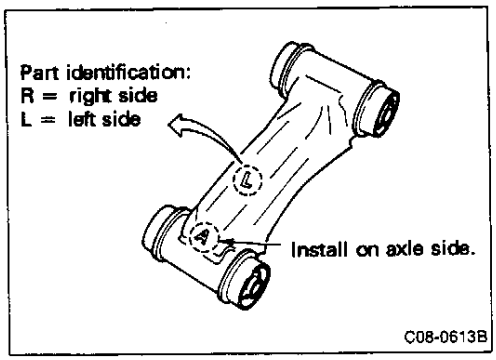
- Pay attention to vertical direction and assemble spring.

CAUTION:
Make sure the small diameter spring end faces down and large diameter end is on top.



- Check that spring is seated securely in spring seat. Position spring so upper side (body side) and lower side (third link side) are at 60° angle as shown in figure.

CAUTION:
If the angle is not correct the shock absorber cannot be installed in vehicle.

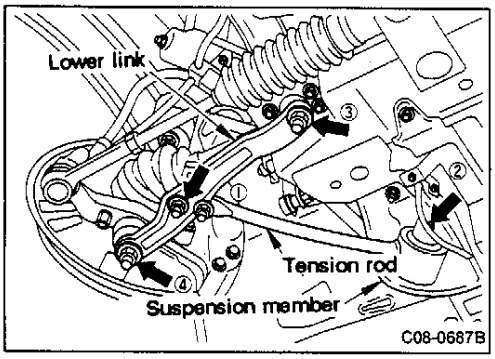


[Point 2] Upper link installation

- Check that directional marks are positioned correctly for upper link installation. Always install upper link with 'A' side facing axle and unmarked side facing body.

CAUTION:
Upper link bushing cannot be disassembled.

3. Part Removal and Installation, Assembly and Disassembly (Cont'd)



[Point 3] Lower link and tension rod removal and installation and assembly sequence

Removal

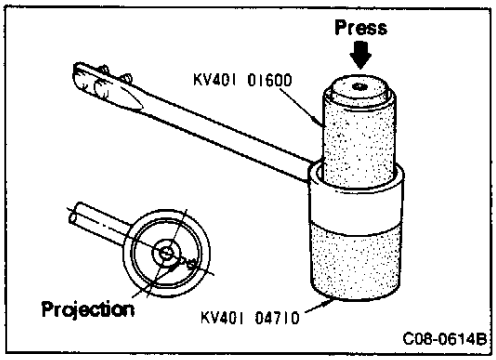
- Loosen nuts at positions indicated by arrow marks in figure.

Installation

- When suspension is not compressed (rebound):

① Temporarily tighten lower link and tension rod.
② Temporarily tighten tension rod bushing and front suspension member connection.
③ Temporarily tighten lower link and suspension member lower ball joint connection.
④ Temporarily tighten lower link and suspension lower ball joint connection.

- When vehicle is unladen, tighten nuts to specified torque in sequence ②, ③, ①, ④.



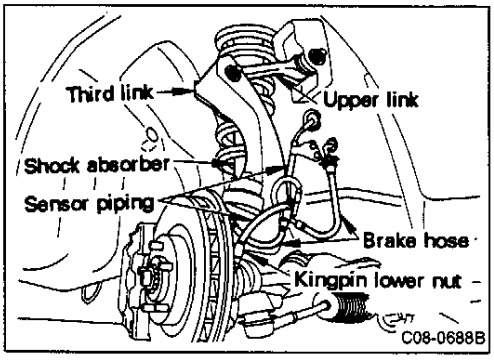
[Point 4] Tension rod bushing replacement

- To replace tension rod bushing, place drift [inner diameter 66 mm (2.60 in), outer diameter 75 mm (2.95 in)] below rod and drift [inner diameter 25 to 55 mm (0.98 to 2.17 in), outer diameter 62 mm (2.44 in)] on top and remove or install in press.
- Align bushing arrow mark in opposite direction from rod and then assemble.
  Reference: Use the following special service tools.
  Upper drift: KV401 01600
  Lower drift: KV401 04710

[Point 5] Third link inspection and removal and installation

Inspection

- The kingpin bearing installed in third link usually does not require maintenance. Do not disassemble bearing unless there is a problem.



Removal

- Remove shock absorber.
- Remove brake hoses. Remove speed sensor piping in vehicles equipped with anti-skid system.
- Loosen kingpin lower nut.
- Loosen third link and upper link connections and remove.

3. Part Removal and Installation, Assembly and Disassembly (Cont'd)

Installation

- Insert third link and kingpin assembly in knuckle spindle and tighten lower nuts to specified torque.
- Connect third link and upper link.
- Install brake hoses. Install speed sensor piping in vehicles equipped with anti-skid system.
- Install shock absorber.

King pin lower nut tightening torque:
147 - 186 N·m (15 - 19 kg-m, 108 - 137 ft-lb)

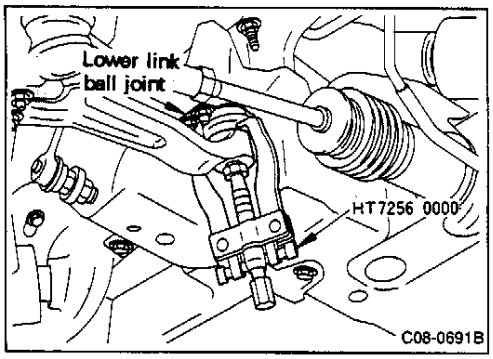
[Point 6] Inspection

① Coil spring
- Replace if cracked or deformed.

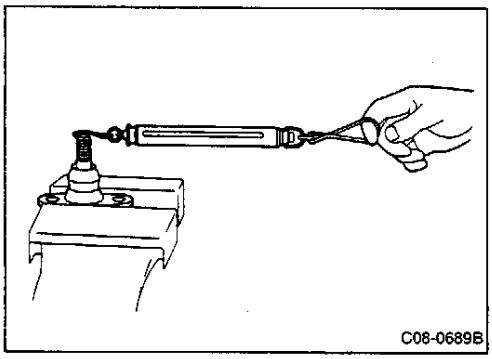
② Front suspension member
- Replace if cracked or deformed.

③ Third link
- If third link is cracked or deformed, replace kingpin bearing assembly.

④ Lower link
- Replace if cracked or deformed.



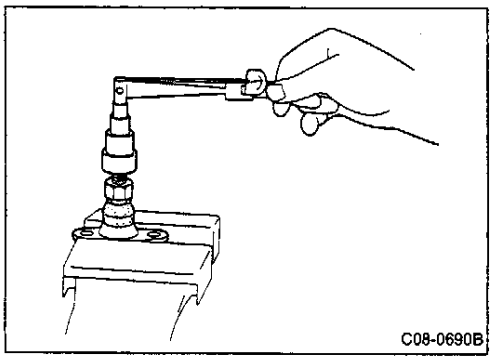
⑤ Suspension lower and lower link ball joints
- Use Pitman arm puller (commercial service tool) to separate suspension lower ball joint and lower the lower link ball joint from lower link as shown in figure.



Swing torque inspection

Specification (spring balance reading): N (kg, lb)
Suspension lower ball joint
6.9 - 50.0 (0.7 - 5.1, 1.5 - 11.2)
Lower link lower ball joint
8.8 - 63.7 (0.9 - 6.5, 2.0 - 14.3)

CAUTION:
Swing more than 10 times by hand before measurement.
Measure the spring balance at height of ball stud cotter pin ball.



Sliding torque inspection

Specification: N·m (kg-m, ft-lb)
Suspension lower ball joint
0.5 - 3.4 (0.05 - 0.35, 0.4 - 2.5)
Lower link lower ball joint
0.5 - 3.4 (0.05 - 0.35, 0.4 - 2.5)

CAUTION:
Swing more than 10 times by hand before measurement.

3. Part Removal and Installation, Assembly and Disassembly (Cont'd)

Axial end play inspection

Specification: mm (in)

Suspension lower ball joint 0 (0)

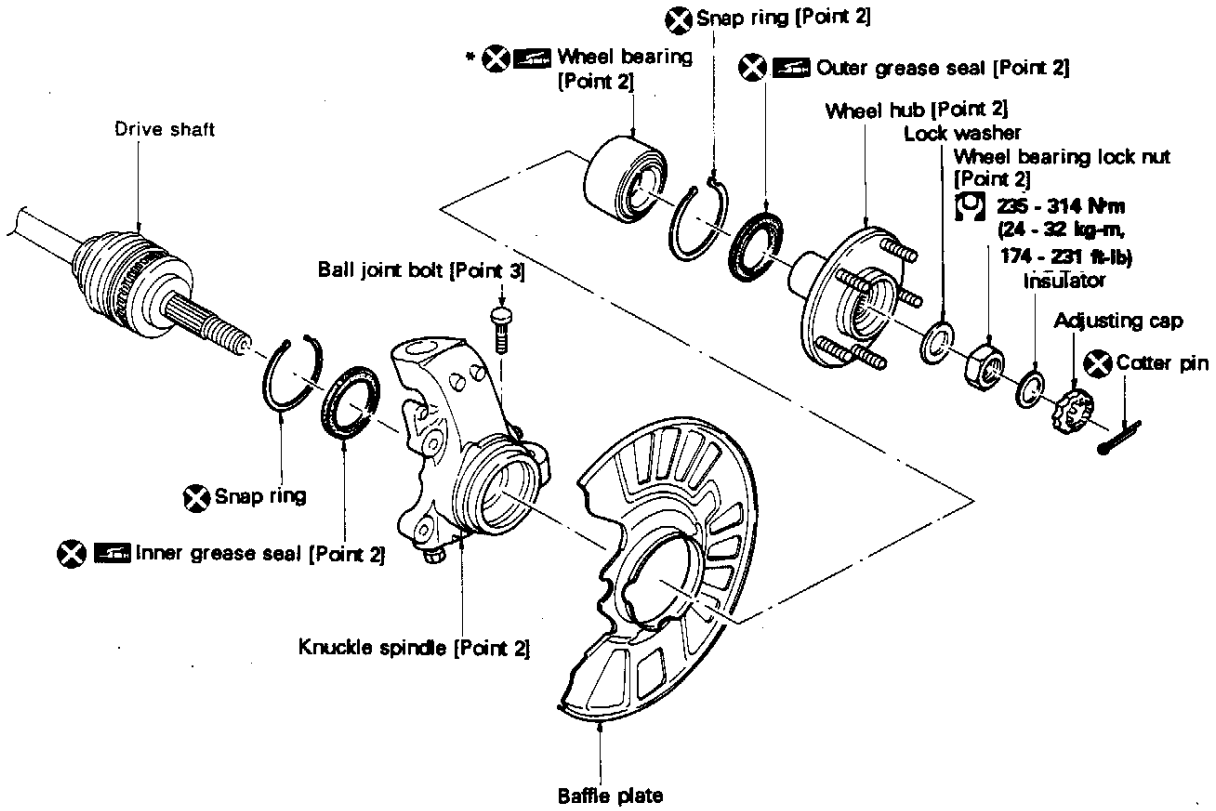
Lower link lower ball joint 0 (0)

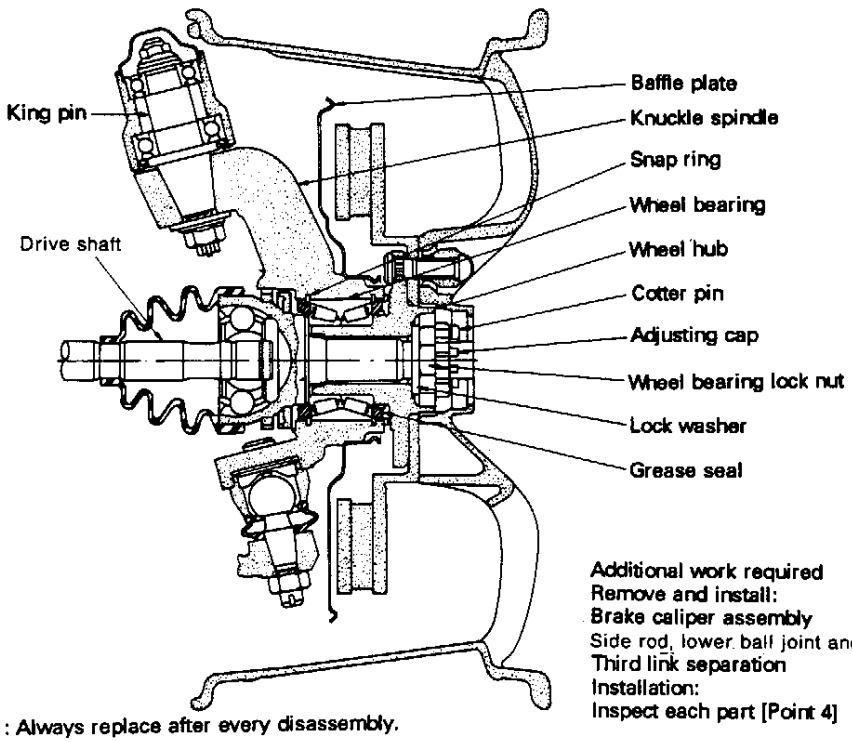
- If measurement value is outside standard specification range, replace ball joints.

3. Part Removal and Installation, Assembly and Disassembly (Cont'd)

3-2 FRONT AXLE

(1) Removal and installation, assembly and disassembly



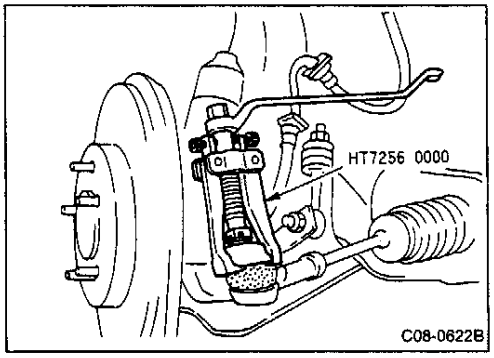


Additional work required
Remove and install:
Brake caliper assembly
Side rod, lower ball joint and lower link separation [Point 1]
Third link separation
Installation:
Inspect each part [Point 4]

: Always replace after every disassembly.
: Apply Nissan MP special grease No. 2.
*: Replace as set.

C08-0692B

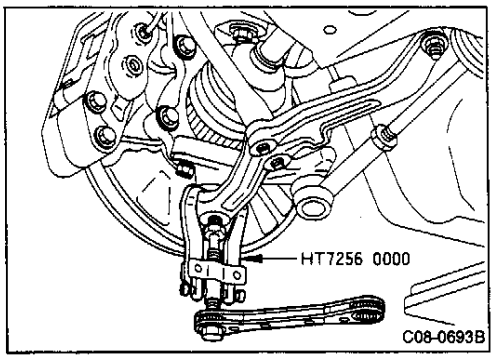
3. Part Removal and Installation, Assembly and Disassembly (Cont'd)



[Point 1] Separation of side rod, lower ball joint and lower link

- Place Pitman arm puller (commercial service tool) as shown in figure and separate side rod and suspension lower ball joint.

CAUTION:
The knuckle spindle is made of aluminum and scratches easily. Pay attention not to tap when using Pitman arm puller for removal.

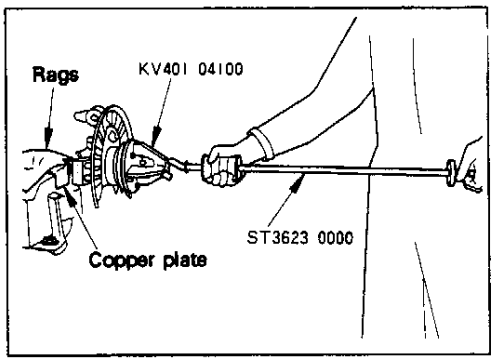


- Use Pitman arm puller (commercial service tool) to separate suspension lower ball joint and lower link.

[Point 2] Wheel bearing removal and installation

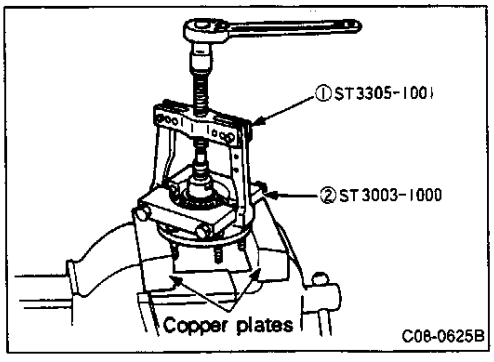
- The wheel bearing usually does not require measurement. If any of the following problems are noted, replace wheel bearing assembly (including grease seal and snap ring).

① Wheel bearing makes growling noise during vehicle operation.
② When bearing lock nut is tightened to specified torque, wheel bearing drags or turns roughly when hub is turned by hand.
③ When bearing is removed from hub.



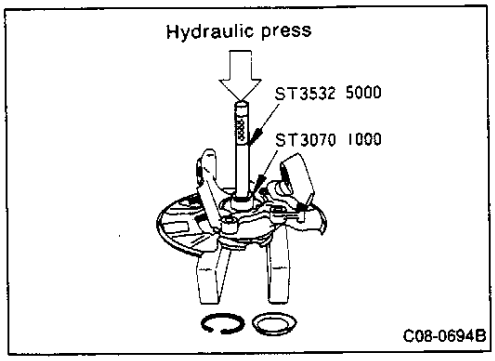
Removal

- Protect knuckle hub with copper plates and rags and secure it in vise.
- Place attachment (special service tool) on knuckle hub bolts. Use sliding hammer (special service tool) to separate knuckle spindle.



- ① Place bearing puller (special service tool), ② bearing replacer (special service tool) as shown in figure. Tighten on wheel hub and remove outer bearing.

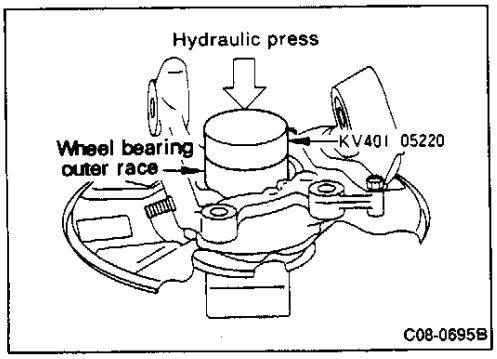
3. Part Removal and Installation, Assembly and Disassembly (Cont'd)



- Remove inner grease seal with screwdriver.

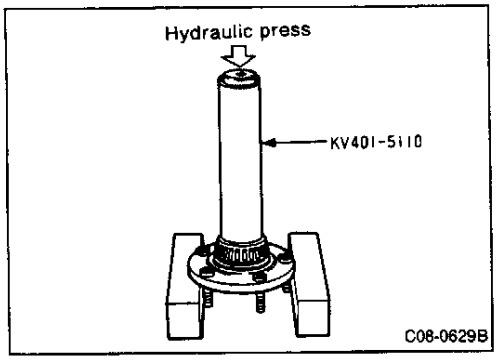
CAUTION:
Do not scratch knuckle spindle.

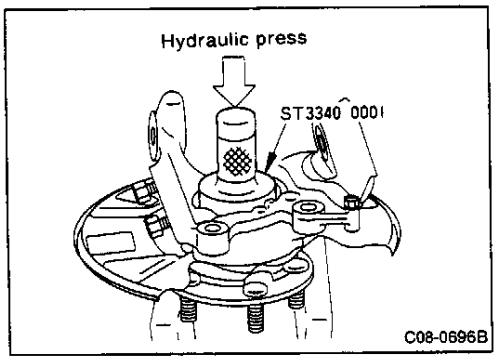
- Remove snap ring with snap ring pliers.
- Place drift (special service tool 61.5 mm dia.) against drift bar (special service tool) as shown in figure. Press out inner bearing and remove bearing outer race.



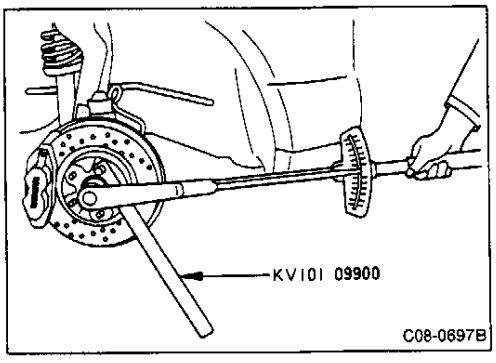
Installation

- Install new snap ring securely in groove on outside of knuckle spindle.
- Place wheel bearing outer race horizontally on knuckle spindle and press-fit with drift (special service tool). Stop insertion when bearing contacts snap ring on outer side.
- Install new snap ring securely in groove on inside of knuckle spindle. Install inner and outer bearings and inner and outer grease seals inside wheel.



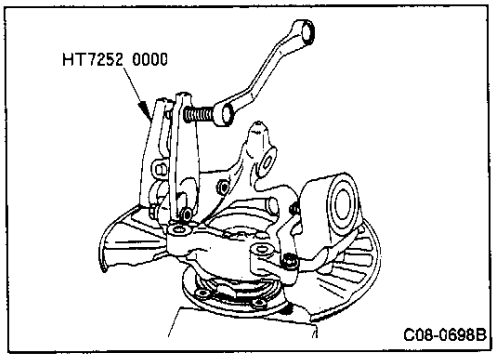


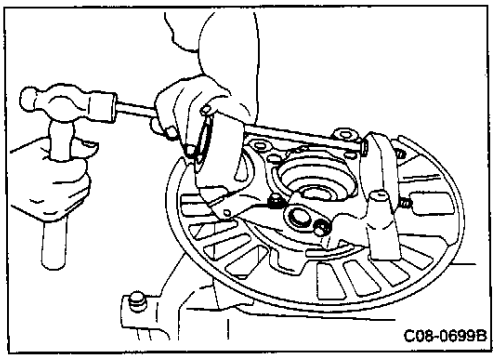
- Place wheel hub horizontally on block.
- Place drift [special service tool: inner diameter 46 mm (1.81 in), outer diameter 60 mm (2.36 in)] on knuckle spindle as shown in figure and press-fit assembly.



- Assemble drive shaft and install in vehicle.
- Tighten lock nuts to specified torque.
  Lock nut standard torque:
  235 - 314 N·m (24 - 32 kg-m, 174 - 231 ft-lb)
- Insert cotter pins and bend to secure.

3. Part Removal and Installation, Assembly and Disassembly (Cont'd)





[Point 3] Suspension lower ball joint bolt removal and installation

Removal

- The length below bolt head is serrated just like hub bolts. Use ball joint remover (commercial service tool) and remove bolts.

CAUTION:
Do not scratch knuckle spindle when pounding out bolts with hammer.

Installation

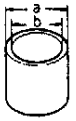
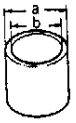
- Align serration of bolt below head with knuckle spindle serration hole and tap in with brass shaft.

[Point 4] Inspection

- Inspect all parts and replace if the following problems are noted.

① Wheel bearing is damaged, seized, rusted or does not turn easily.
② Front hub is cracked. (Check with dyeing test damage detection method.)
③ Knuckle spindle is deformed, dented, cracked (check with dyeing test damage detection method) or threads are damaged.

Tools required

	Name		Application	Remark
Special service tool	Drift KV401 04710 **a: 76.2 mm (3.000 in) dia.** **b: 68 mm (2.68 in) dia.**	 C00-0195	Axle housing dust seal removal and installation	Already described
	Drift ST2786 1000 **a: 62 mm (2.44 in) dia.** **b: 52 mm (2.05 in) dia.**	 C00-0195	Axle housing bushing (shock absorber) removal and installation	

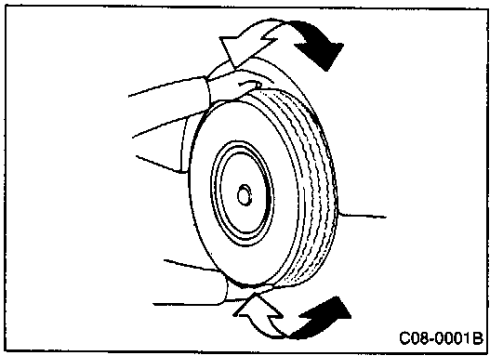
1. Summary

Specifications

Description			Engine: RB26DETT
Suspension type			Multi-link independent suspension
Wheel alignment (unladen vehicle)	Toe-in	mm (in)	2 ± 2 (0.08 ± 0.08)
	Camber	mm (in)	−1°05′ ± 30′
	Side slip distance (reference)	mm (in)	−5 to 5 (−0.20 to 0.20)
Shock absorber	Damping force [at 0.3 m (1.0 ft)/s]	Expansion side	1,108 (113, 249)
		Compression side	402 (41, 90)
Coil spring	Spring constant	N/mm (kg/mm, lb/in)	26.5 (2.7, 151)
	Free length	mm (in)	345 (13.58)
	Coil center diameter	mm (in)	100 (3.94) [lower side 90 (3.54)]
	Wire diameter	mm (in)	11.8 (0.465)
	Number of active coils		7.29
Stabilizer outer diameter (non-solid)		mm (in)	25.4 (1.000)

Inspection specifications

Item			Specification
Wheel alignment			Refer to "Specifications".
Wheel bearing lock nut tightening torque		N·m (kg-m, ft-lb)	206 - 275 (21 - 28, 152 - 203)
Wheel bearing axial end play		mm (in)	0 (0)
Suspension ball joint	Swing torque (spring balance conversion)	N (kg, lb)	7.8 - 54.9 (0.8 - 5.6, 1.8 - 12.3)
	Sliding torque	N·m (kg-m, ft-lb)	0.5 - 3.4 (0.05 - 0.35, 0.4 - 2.5)
	Axial end play	mm (in)	0 (0)
	Tightening torque	N·m (kg-m, ft-lb)	78 - 93 (8.0 - 9.5, 58 - 69)



2. On-vehicle Inspection and Preparation

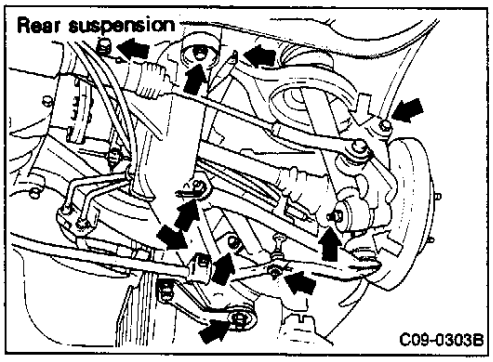
2-1 REAR SUSPENSION AND AXLE INSPECTION AND ADJUSTMENT

Inspection

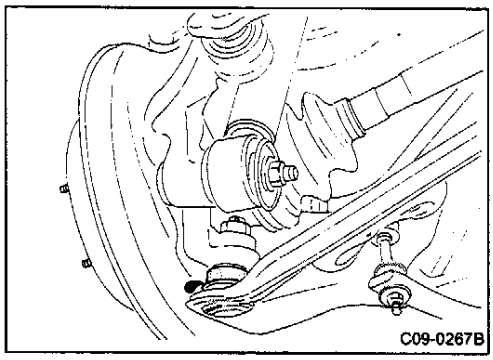
- Check axle and suspension parts for looseness, wear or damage. Shake each rear wheel and check for noise and excessive play.

Adjustment

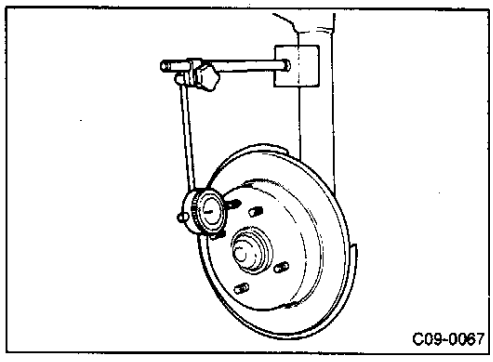
- If loose, retighten to specified torque.
- Replace all damaged parts.



- Tighten rear suspension parts (⬅) and check if cotter pins (⇦) are inserted.



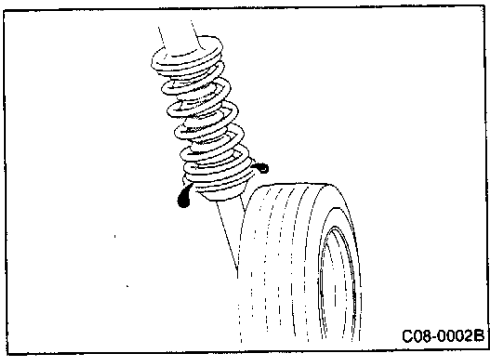
- Check ball joints for grease leakage and dust cover for cracks or other damage.



2-2 WHEEL BEARING INSPECTION

- If there is any axial end play, tighten wheel nuts to specified torque and check axle end play again.
  End play standard value: 0 mm (0 in)
- A unit bearing is used so no preload adjustment is normally required.
- If any problem is noted, check axle.

2. On-vehicle Inspection and Preparation (Cont'd)



2-3 SHOCK ABSORBER INSPECTION

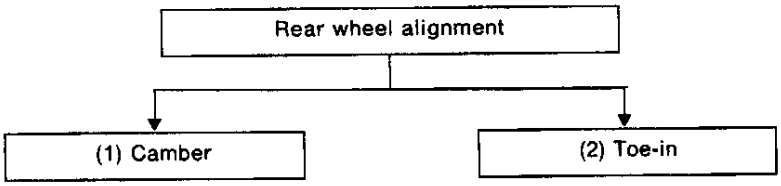
- Check shock absorber for grease leakage.
- Check for fatigue, cracks, deformation or other damage.
- The shock absorber cannot be disassembled. Replace entire unit if necessary.

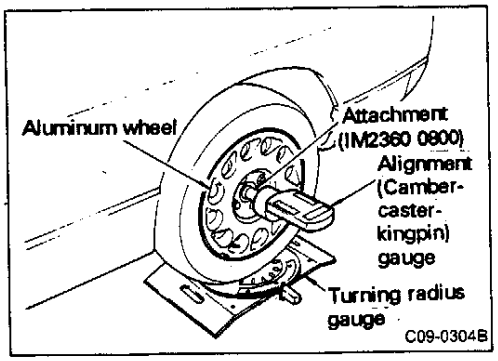
2-4 WHEEL ALIGNMENT INSPECTION AND ADJUSTMENT

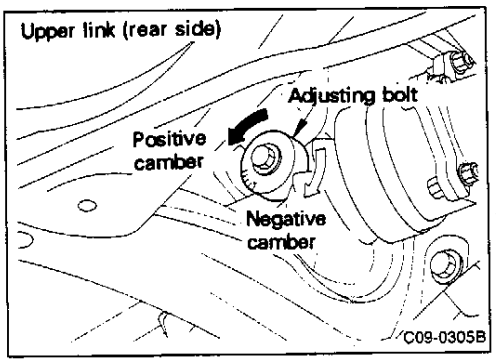
Inspection before operation

- Check tires for wear or improper inflation. Refer to C9 ROAD WHEEL AND TIRES.
- Check if wheel bearing axial end play is within specification.
- Check wheels for deformation.
- Check suspension ball joint for play.
- Check if shock absorbers operate properly.
- Check axle and suspension for looseness or deformation.
- Check if vehicle posture is normal.
- Check suspension link for damage, cracks or deformation.
- Check that vehicle is unladen*.
  * (Unladen: Fuel, radiator coolant and engine oil full. Spare tire, jack, hand tools and mats in designated positions.

Operation sequence







(1) Camber inspection and adjustment

Move vehicle so rear wheels rest on turning radius gauge correctly and check that vehicle is horizontal.

↓

Raise front wheels on stand so they are the same height as rear wheels.

↓

Attach alignment gauge to wheel and measure camber. (Note)

Note: The same attachment can be used for both the front and rear wheels.

Specification:

If camber is not within specification: Camber: −0°55′ ± 30′

↓

Adjust camber.

↓

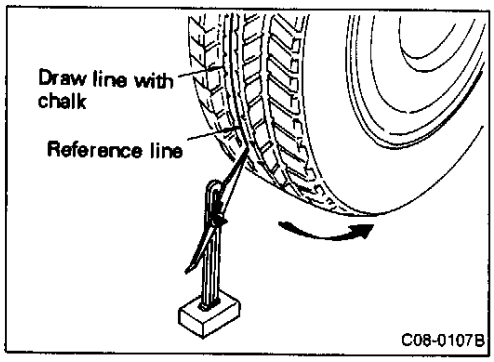
Turn adjusting bolt on upper link (rear side) suspension member to adjust camber.

↓

Adjustment must always be made after camber and toe-in adjustment.

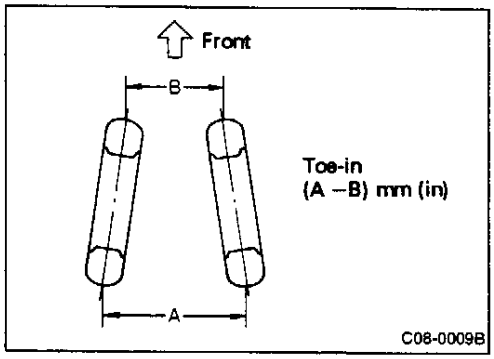
2. On-vehicle Inspection and Preparation (Cont'd)

(2) Toe-in inspection and adjustment



Jack up rear of vehicle and draw a base line on the tread.

After lowering rear of vehicle, move it up and down to eliminate friction.

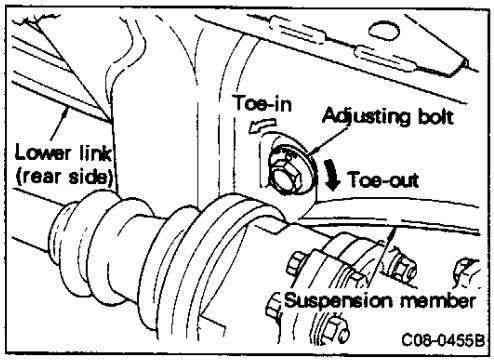


Set toe-in gauge at same height as wheel center and measure reference line distance.

Measure dimensions A and B as shown in figure and calculate toe-in.
Toe-in = A – B mm (in)

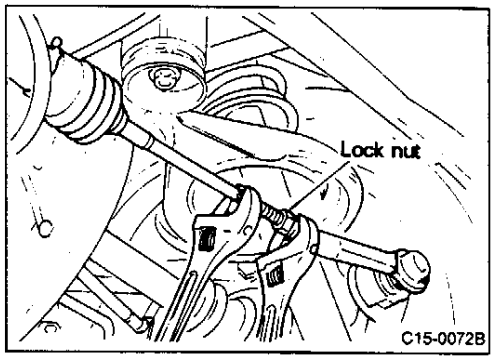
Toe-in standard value:
2 ± 2 mm (0.08 ± 0.08 in)

If not within specification:



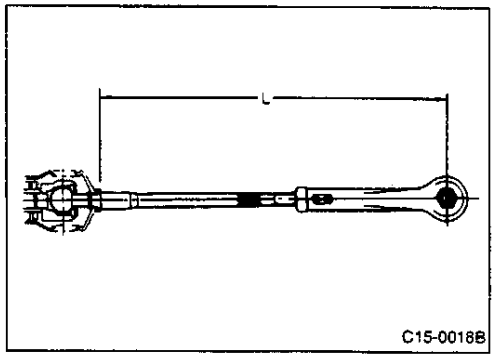
Turn lower link (rear side) suspension member (adjusting bolt) to adjust toe-in.

For models equipped with SUPER HICAS system, loosen lock nut and turn power cylinder lower link toe adjustment rod as shown in figure to adjust toe-in.



CAUTION:
(1) When adjusting lower link, turn left and right rods same distance.
(2) When replacing lower link rod, set rod length as indicated below to adjust toe-in.

For models equipped with SUPER HICAS system, set power cylinder lower link length to following specification before toe-in adjustment.

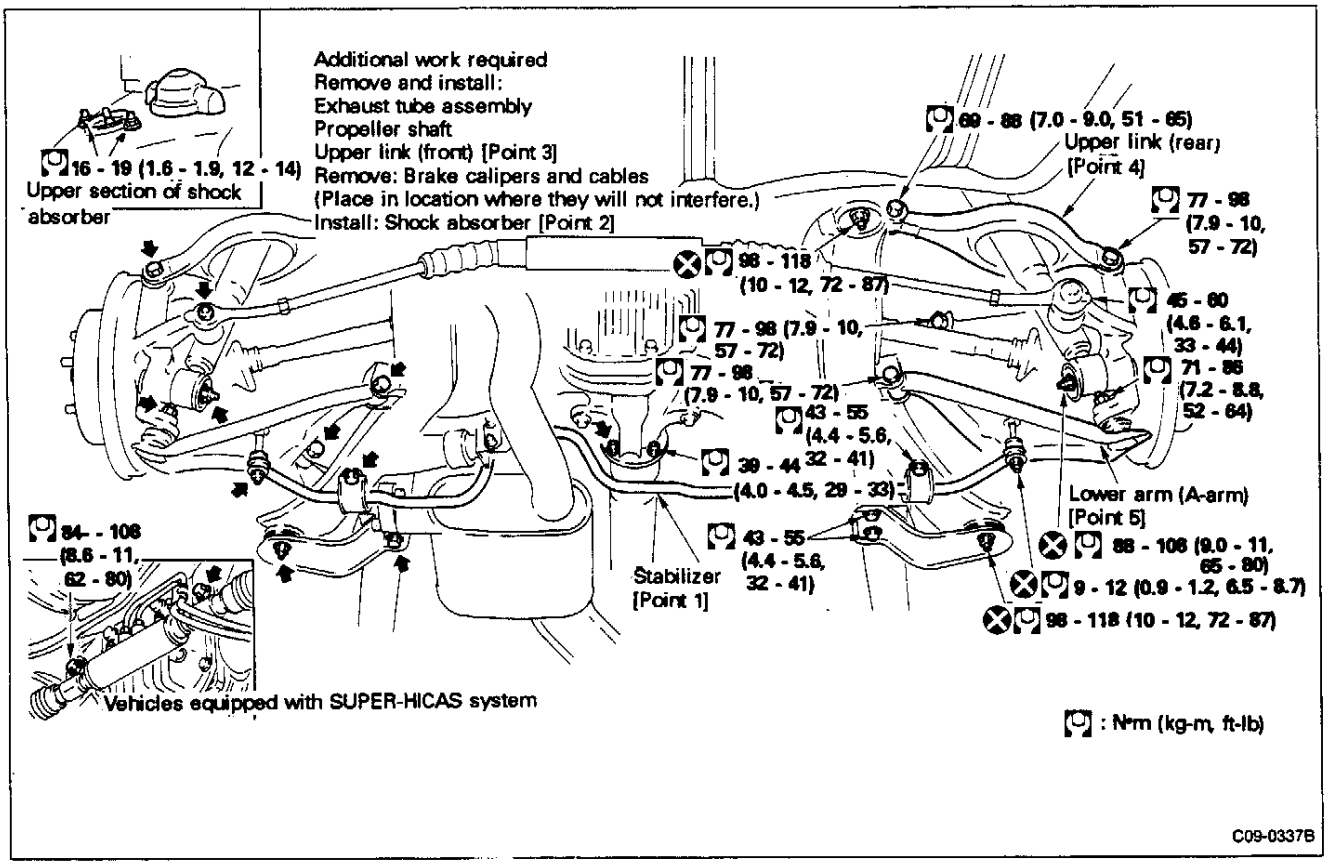


Lower link standard dimension (L) :
309.4 mm (12.18 in)

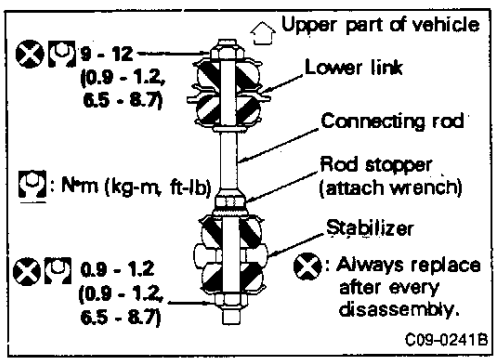
3. Removal and Installation, Assembly and Disassembly

3-1 REAR SUSPENSION

(1) Removal and installation from vehicle



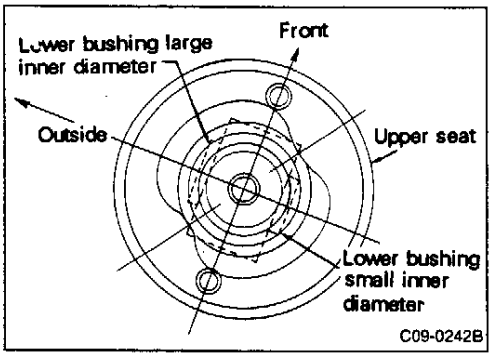
CAUTION:
(1) Tighten links temporarily on vehicle and then tighten again with vehicle in unladen condition.
(2) Do not press on brake pedal when brake caliper assembly and brake drum are removed.



[Point 1] Stabilizer installation

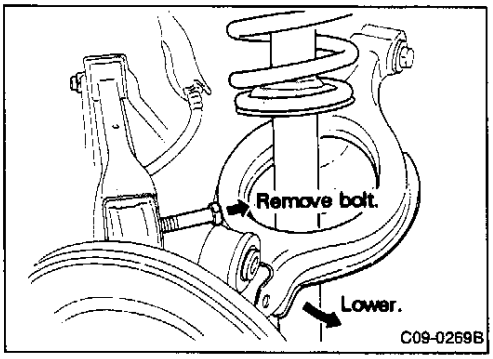
- Assemble stabilizer on connecting rods as shown in figure.

3. Removal and Installation, Assembly and Disassembly (Cont'd)



[Point 2] Rear shock absorber installation

- Install shock absorber with large inner diameter lower bushing side facing outside of vehicle. (The figure on left is a cross-section of left side shock absorber viewed from above.)



[Point 3] Upper link (front) removal and installation

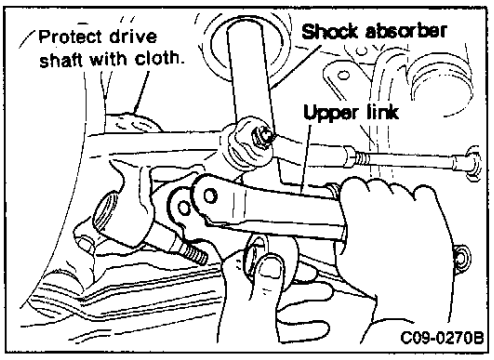
Removal

- To remove upper link (front), first remove bolts from upper link (rear) rear housing then remove bolts from upper link (front) rear housing.
- Remove suspension member.

CAUTION:
Do not remove link bushing from link.

Installation

- Assembly is reverse sequence from disassembly.



[Point 4] Upper link (rear) removal and installation

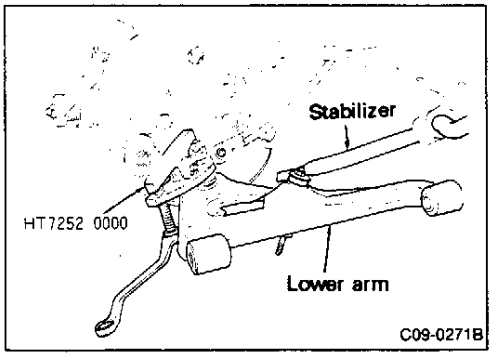
Removal

- Remove lower side of rear shock absorber.
- Remove bolts from upper link (rear) (on both rear housing and suspension member).
- Press shock absorber towards inside of vehicle and lower it without touching rear housing.

CAUTION:
Place cloth on drive shaft boot to protect it from damage during removal and installation.

Installation

- Assembly is the reverse sequence from disassembly.



3. Removal and Installation, Assembly and Disassembly (Cont'd)

[Point 5] Lower arm (A arm) removal and installation

Removal

- Remove lower side of stabilizer connecting rod and bracket.
- Remove drive shaft.
- Remove suspension member bolts.
- Use ball joint remover (commercial service tool) to for rear housing separation.

CAUTION:
(1) Do not damage ball joint boot.
(2) Do not remove link bushing from link.

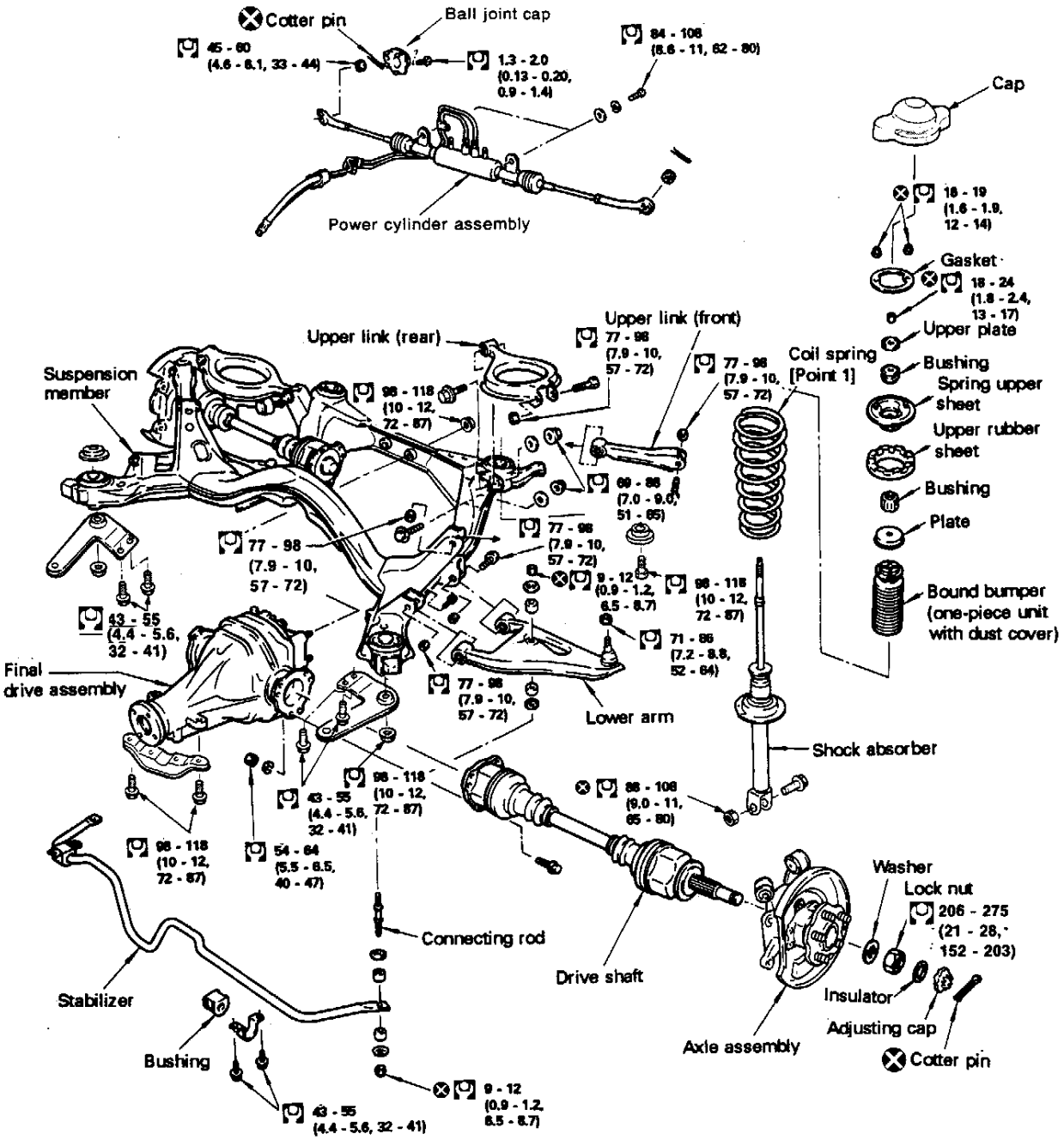
Installation

- Assembly is the reverse sequence from disassembly.

CAUTION:
Check wheel alignment after link removal and installation.

3. Removal and Installation, Assembly and Disassembly (Cont'd)

(2) Rear suspension disassembly

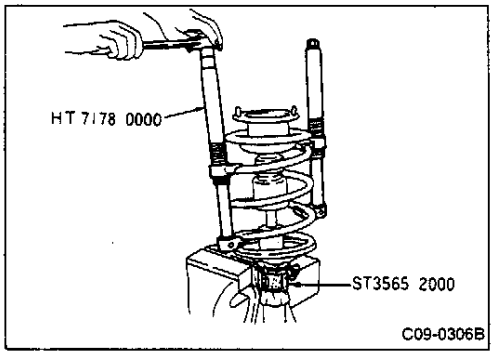


- After installing each suspension part, check and adjust wheel alignment
- Make sure bushing and washer are installed in correct direction.
- Do not let grease or oil contact bushing.
- When stabilizer and link are installed, tighten parts with vehicle on level ground in unladen condition.
- Do not replace suspension side bushing of upper link and lower arms (link). Only replace axle bushing when necessary.
- The suspension member insulator cannot be disassembled.

Additional work required
Install: Exhaust tube assembly
Propeller shaft
Parking brake cable
Brake calipers
Inspect each part [Point 2]

⊗ : Always replace after every disassembly.
[ ] : N·m (kg-m, ft-lb)

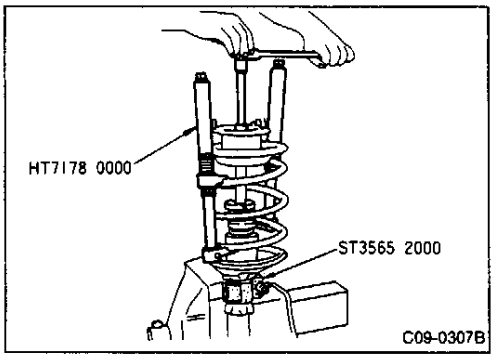
3. Removal and Installation, Assembly and Disassembly (Cont'd)



[Point 1] Coil spring removal and installation

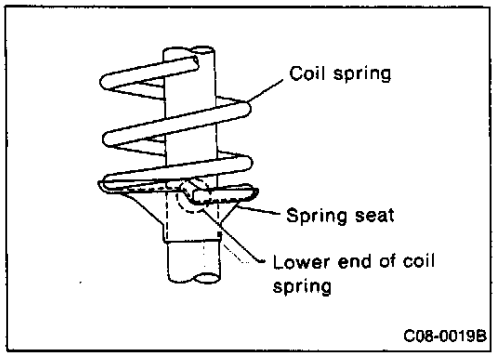
Removal

- Install attachment (special service tool) to strut assembly and secure in vice.
- Using spring compressor (commercial service tool), compress coil spring.



- Remove piston rod lock nut without damaging piston rod.

CAUTION:
Compress coil spring. Make sure it is free between the upper sheet and lower sheet and then remove piston rod lock nut.



Installation

- Check that spring is set securely in spring sheets and gradually loosen spring compressor (commercial service tool).

[Point 2] Inspection

① Coil spring

- **Check for cracks and deformation and replace if necessary.**

② Rear suspension member

- **If suspension member is cracked or deformed or member insulator is damaged, replace member assembly.**

③ Upper and lower links

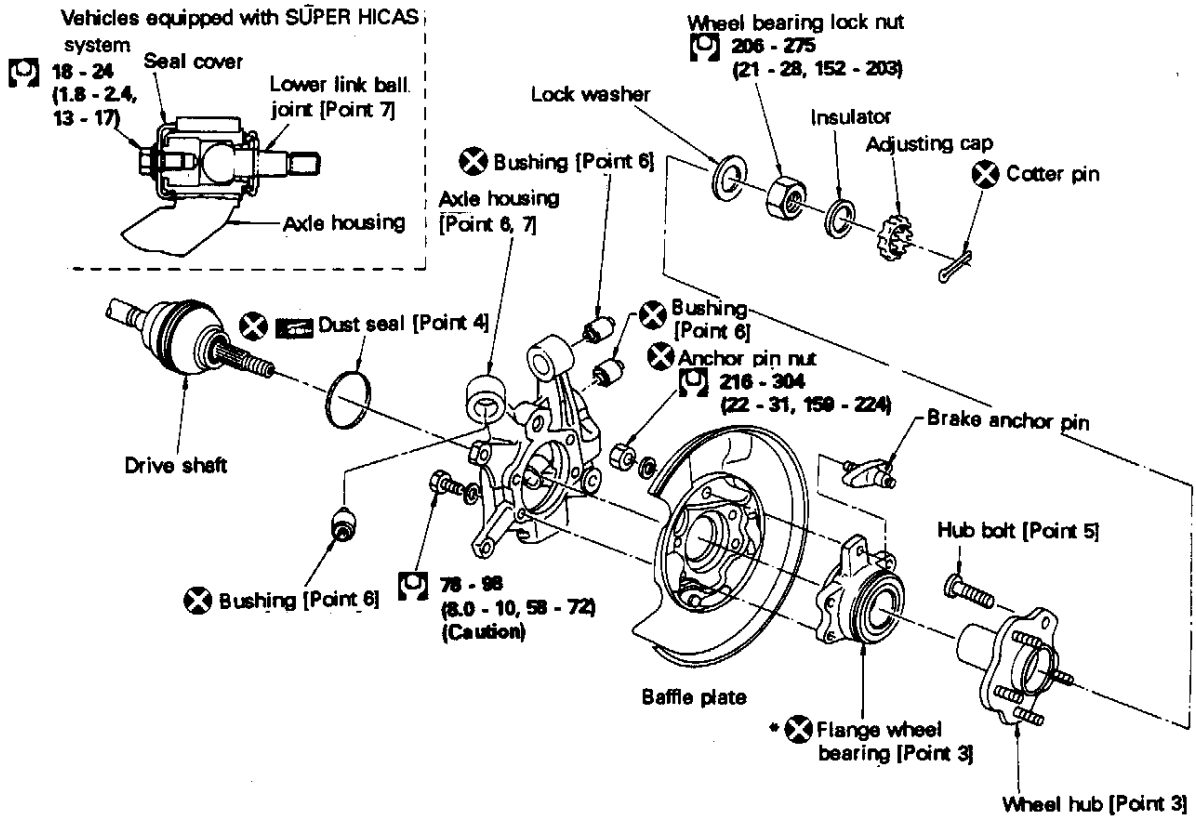
- **If upper and lower links are deformed or cracked or bushing is damaged, replace each link.**

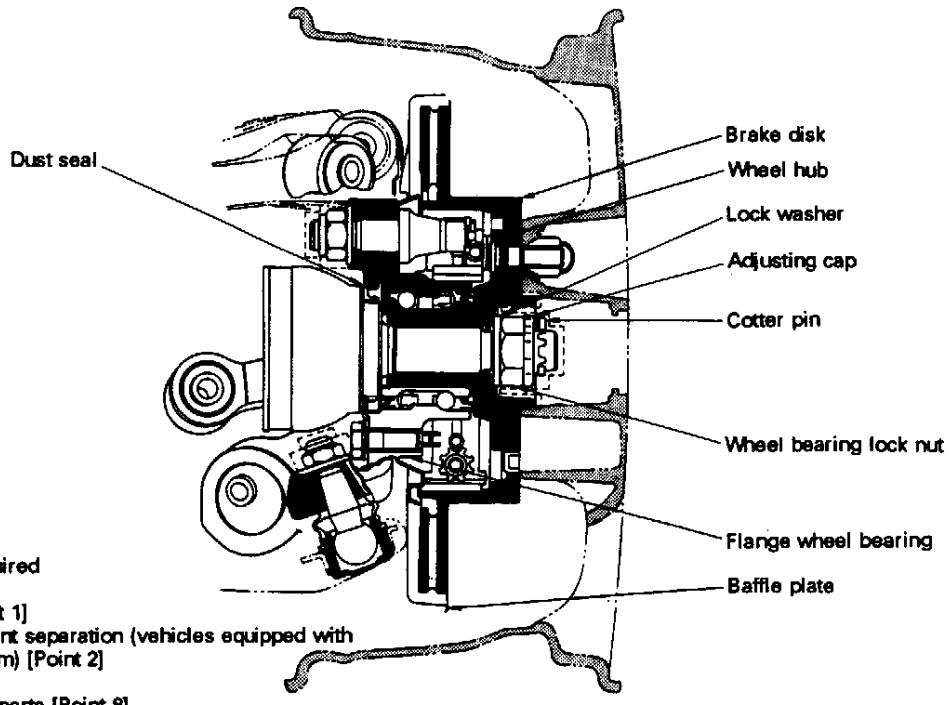
④ Suspension lower ball joint

- **Measure ball joint swing torque, sliding torque and axial end play. The measurements are the same as for the front suspension lower.**

3. Removal and Installation, Assembly and Disassembly (Cont'd)

3-2 REAR AXLE REMOVAL AND INSTALLATION, ASSEMBLY AND DISASSEMBLY





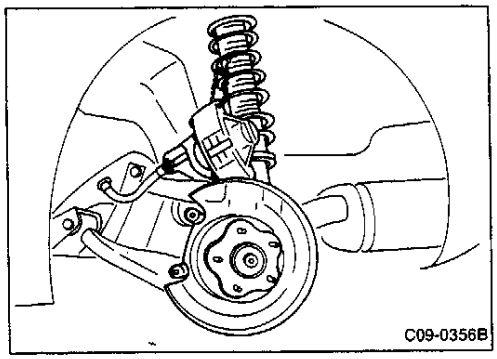
Additional work required
Remove and install:
Brake calipers [Point 1]
Axle housing ball joint separation (vehicles equipped with SUPER HICAS system) [Point 2]
Shock absorber unit
Inspect all installed parts [Point 8]

: N·m (kg-m, ft-lb)
: Always replace after every disassembly.
: Apply Nissan MP special grease No. 2
* Replace as set.

CAUTION:
(1) Tighten bolts in criss-cross pattern 2-3 separate times.
(2) Conditions are same as for NES standard bolts. Pay attention not to make mistakes because strength varies.

C09-0355B

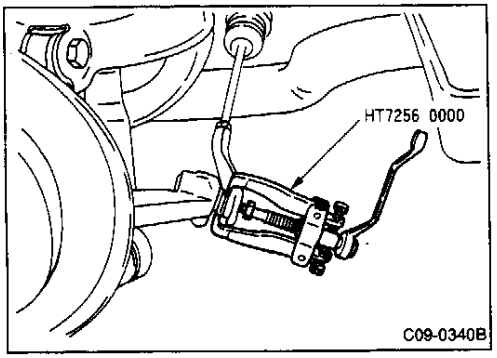
3. Removal and Installation, Assembly and Disassembly (Cont'd)



[Point 1] Brake caliper separation

- Remove caliper from axle housing. Set it where it will not cause interference. (It is not necessary to remove brake cable.)

CAUTION:
Do not press brake pedal while brake caliper assembly is removed.



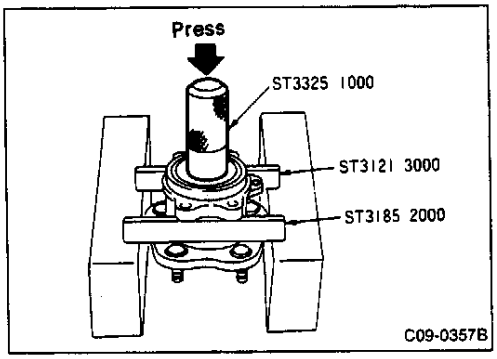
[Point 2] Lower link and ball joint separation

- Use Pitman arm puller (commercial service tool) to separate axle housing ball joint and lower link.

[Point 3] Wheel bearing removal and installation

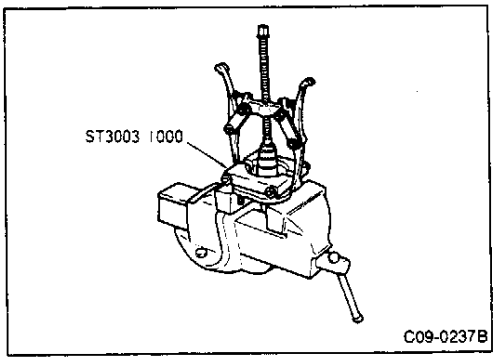
- Wheel bearing with flange does not require maintenance. If any of the following symptoms are noted, replace wheel bearing assembly (including inner and outer grease seals.)

① Wheel bearing makes growling noise during operation.
② Wheel bearing drags or turns roughly when hub is turned by hand after bearing lock nut is tightened to specified torque.
③ After wheel bearing is removed from hub.



Removal

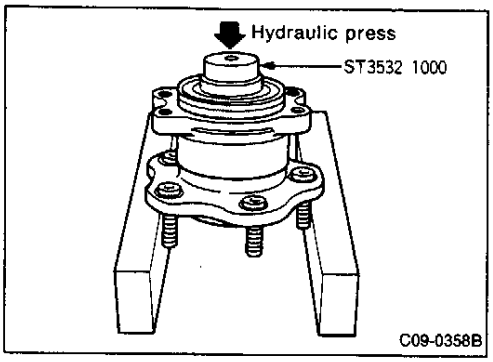
- Separate wheel bearing with flange and wheel hub from axle housing and wheel hub assembly.
- Set wheel bearing in press as shown in figure. Use drift (special service tool) to remove bearing.
- Replace bearing assembly with new unit. Do not reuse old bearing.



- Set bearing replacer (special service tool) on inner race remaining on hub as shown in figure. Using puller (commercial service tool), remove inner race.

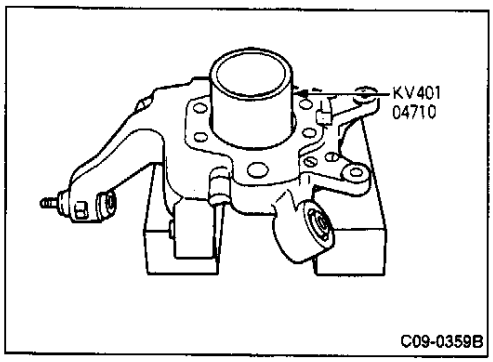
CAUTION:
(1) Never use the inner race remaining on hub again.
(2) Discard old wheel bearing assembly. Replace with new part. (The grease seal is not available as an individual part).

3. Removal and Installation, Assembly and Disassembly (Cont'd)



Installation

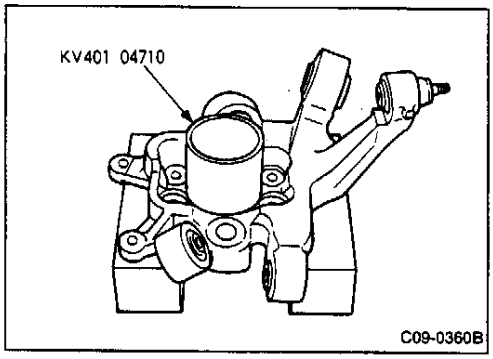
- Leave hub on block, and position drift (special service tool) and wheel bearing on flange as shown in figure. Use hydraulic press to press-fit bearing.



[Point 4] Axle housing dust seal removal and installation

Removal

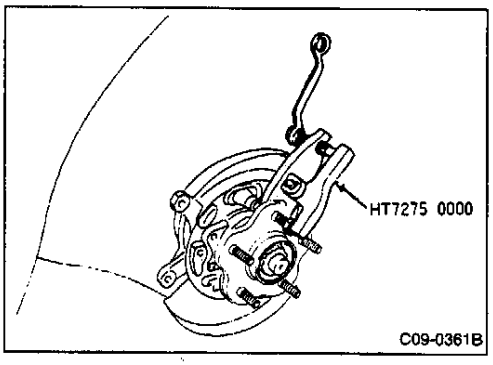
- Using drift (special service tool) and hammer, press out dust seal.



Installation

- Using drift (special service tool), press-fit dust seal with hydraulic press.

CAUTION:
Coat dust seal lip with Nissan MP special grease No. 2.



[Point 5] Hub bolt replacement

Removal

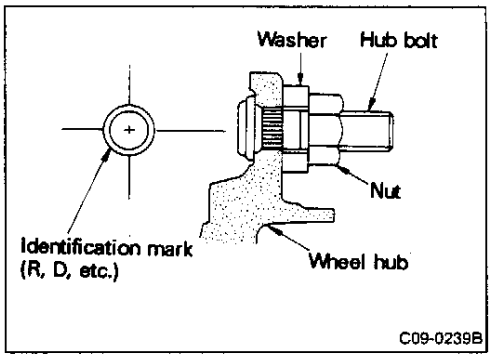
- To replace hub bolts, first remove brake caliper assembly, disk rotor and brake shoes. Operation can then be performed on vehicle.

CAUTION:
Do not remove hub and wheel bearing.

- Use ball joint remover (commercial service tool) as shown in figure.

CAUTION:
Do not hit hub bolts with hammer. (This will apply impact to wheel bearings.)

3. Removal and Installation, Assembly and Disassembly (Cont'd)



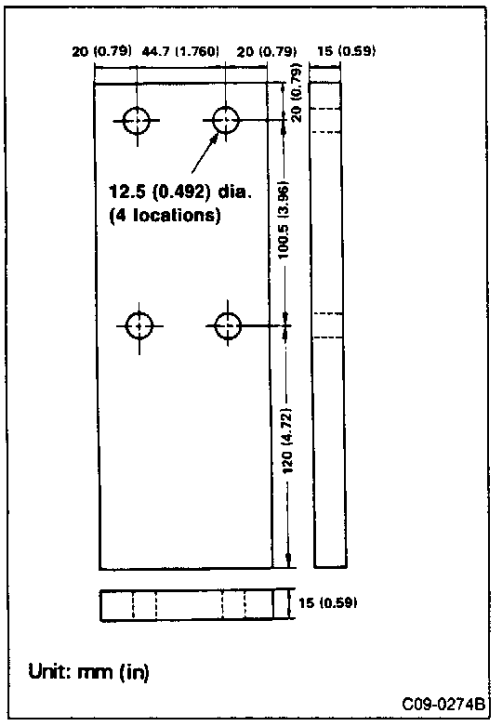
Installation

- To press-fit hub bolts, insert washers as shown in figure and tighten bolts.
- When replacing a single hub bolt, use new bolt with same identification number.

Hub bolt identification number	43222 06R61

CAUTION:

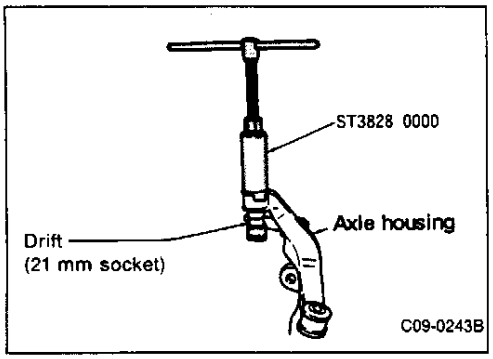
After replacing hub bolt, check that disk runout is 0.07 mm (0.0028 in) maximum.



[Point 6] Axle housing bushing removal and installation

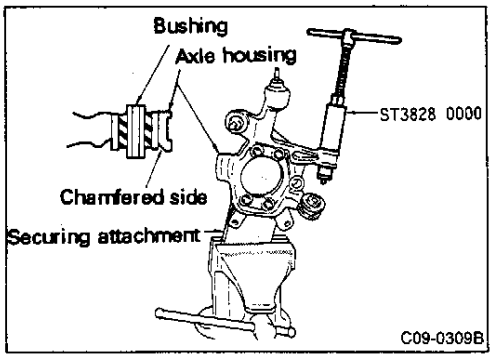
Bushing removal and installation precautions

- Do not secure axle housing mechanical unit directly in vise. Protect housing with wood panels or rags before tightening vise.
- Install attachment described in previous operation.



Removal

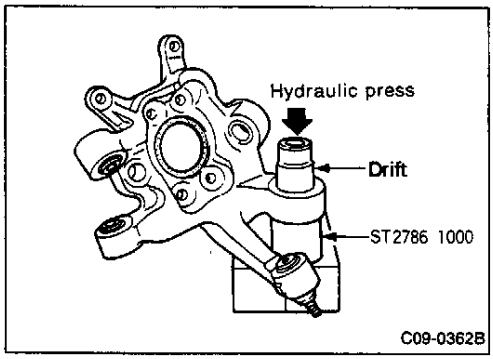
- Attach drift and socket (21 mm) on outer shell of as shown in figure and use arm bushing remover (special service tool) to remove bushing.



Installation

- Make sure that axle housing bore is free from scratches or deformities before pressing bushing into it.
- Lubricate bushing with detergent.
- Set arm bushing remover (special service tool), insert from direction of axle housing bore chamfering and press-fit bushing flush with end surface.

3. Removal and Installation, Assembly and Disassembly (Cont'd)

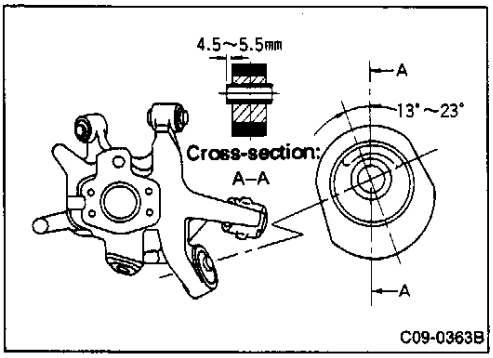


Axle housing bushing (shock absorber) removal and installation

Removal

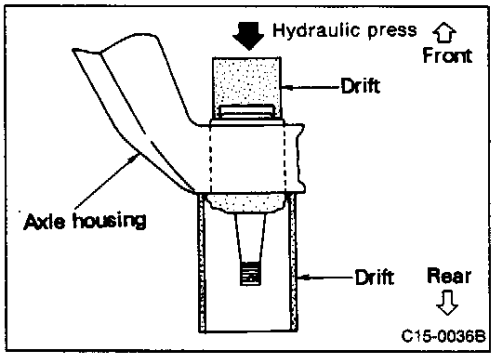
- Set drift (special service tool) on lower side of axle housing as shown in figure. Set drift [inner diameter 37 mm (1.46 in), outer diameter 45 mm (1.77 in)] on upper side and press out bushing.

CAUTION:
Check bushing position before removal.



Installation

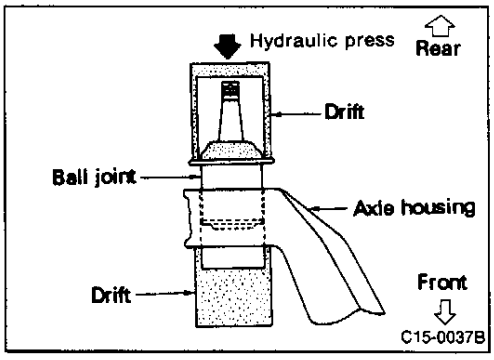
- Install bushing using same tools as for removal. Assembly is reverse sequence from disassembly.



[Point 7] Axle housing and lower link ball joint separation

Removal

- Remove ball joint seal cover.
- Set drift [inner diameter 37 mm (1.46 in), outer diameter 40 mm (1.57 in)] on rear side of axle housing as shown in figure. Set drift [inner diameter 23 mm (0.91 in), outer diameter 27 mm (1.06 in)] on front side of axle housing as shown in figure and press out ball joint.



Installation

- Set drift [inner diameter 29 mm (1.14 in), outer diameter 35 mm (1.38 in)] on rear side of axle housing as in removal. Set drift [inner diameter 31 mm (1.22 in), outer diameter 41 mm (1.61 in)] on front side of axle housing and press-fit ball joint .
- Install seal cover.

[Point 8] Inspection

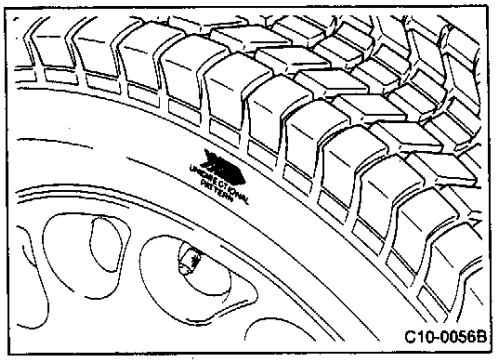
- Inspect all parts and replace if following items are noticed.

① Check ball bearings for damage, seizing, rust and rotation.
② Check wheel hub for cracks. (Use dyeing damage analysis method.)
③ Check axle housing for dents, deformities and cracks. (Use dyeing damage analysis method.)

1. Summary

Specifications

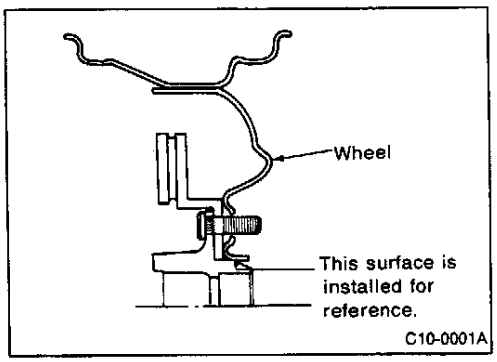
Wheels					Suitable tire size	Remarks
Rim size	Material (color)	Offset mm (in)	Hub bolts P.C.D. mm (in) × number of bolts	Hub hole diameter mm (in)		
16 x 8 JJ 16 × 6 1/2JJ (for snow)	Aluminum (silver)	30 (1.18)	114.3 (4.50) × 5	66 (2.60)	225/50R16 92V 205/55R16 88V (for snow)	Models equipped with RB26DETT
16 × 4T (spare tire for emergency use)	Steel (yellow)	20 (0.79)			T125/90D16	Models equipped with RB26DETT


C10-0056B

2. Wheels

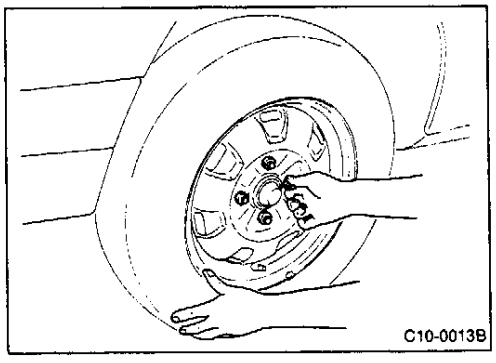
2-1 INSTALLATION ON VEHICLE

- An arrow mark on tire as shown in figure indicates that a directional tread is used. The tire must be mounted so it turns in the indicated direction.



C10-0001A

- Place holes in middle of wheel (hub holes) on bolts and tighten to install.

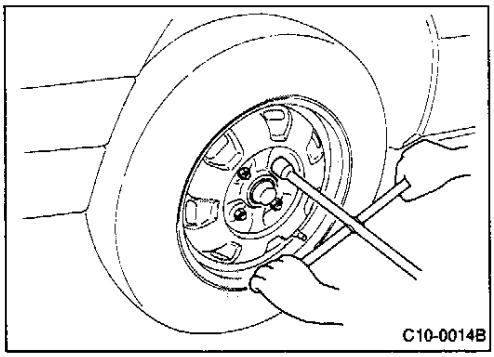

C10-0013B

- Tighten lug nuts by hand.

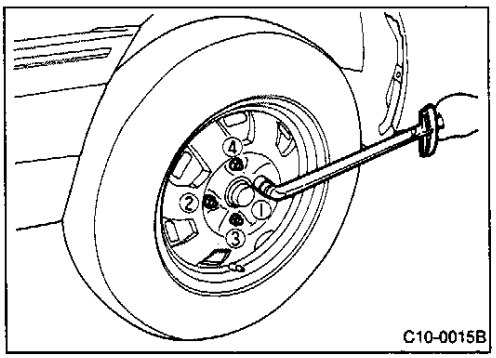
CAUTION:
The tapered side of the lug nut must face the wheel.

- Rotate tire by hand and tighten again by hand.

2. Wheels (Cont'd)



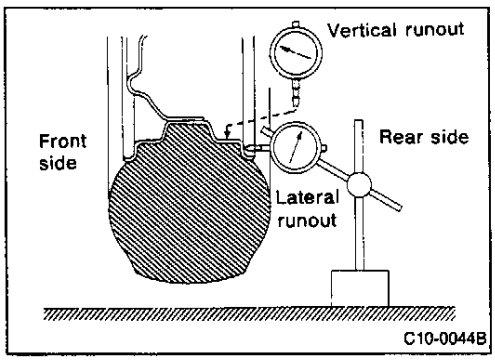
- While rotating tire and changing position, tighten with tool (If wheel is loose, tighten slightly less than specified torque until wheel does not move.)



- Lower vehicle to ground and tighten to specified torque. (Tighten wheel evenly in criss-cross pattern 2 - 3 times.)

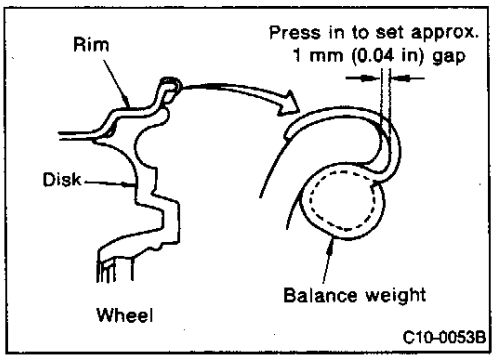
Wheel tightening torque:
98 - 118 N·m (10 - 12 kg-m, 72 - 87 ft-lb)

CAUTION:
When using straight cone to balance wheels, check that vertical installation position on vehicle is the same when set on balancer.



- Check wheel runout.

	Lateral runout limit	Vertical runout limit
Steel wheel	0.8 mm (0.031 in) max.	0.5 mm (0.020 in) max.
Aluminum wheel	0.3 mm (0.012 in) max.	



2-2 WHEEL BALANCE ADJUSTMENT

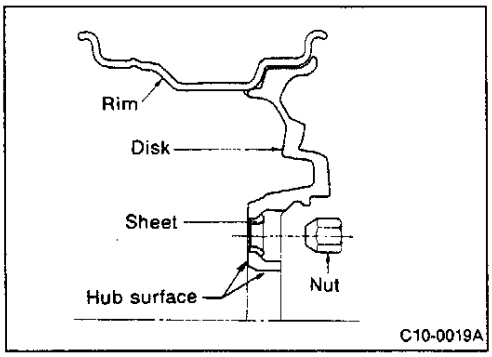
- Use straight cone type attachment to adjust the wheel balance.
- Be sure to attach cone to rear side of aluminium and steel wheels at this time with wheel balancer.
- When using regular taper cone to adjust steel wheel, support wheel from front.

CAUTION:
(1) Always use genuine Nissan balance weights.
(2) Always use plastic coated balance weights for aluminum wheels.
(3) Do not reuse balance weights.
(4) Always use plastic hammer to hit weights.

Unit: g (o

Allowable remaining unbalance amount	Dynamic (on ear)	10 (0.35) max. (one side)
	Static (on ear)	20 (0.71) max.
Balance weight maximum correction amount	Steel wheel	60 (2.12)
	Aluminum wheel	60 (2.12)

2. Wheels (Cont'd)



2-3 ALUMINUM ROAD WHEEL INSTALLATION PRECAUTIONS

- Nissan aluminum wheels are specifically designed for a particular vehicle and should not be used other vehicles.
- Use genuine Nissan taper nuts because the steel sheet is press-fitted in the wheel disk holes.
- Always balance wheels before use. Only use genuine Nissan plastic coated weights for wheel balancing.
- Be careful during balancing because aluminum wheels scratch easily. Do not use abrasive cleanser or wire brush to clean off dirt. Only use neutral detergent for cleaning.
- Avoid using high-speed car washing equipment.
- After driving on roads which have salt deposits to prevent icing and roads close to the ocean, wash off accumulated dirt with water.
- Wash off back side of wheel when tires are exchanged or washing bottom of vehicle.
- Wipe off dirt and foreign matter from hub surface before installing wheels.
- Never coat wheels, nut threads or nut seats with oil.
- Do not drive on sharp objects, curbs or sidewalks.

3. Tires

3-1 TIRE INFLATION PRESSURE AND WEAR LIMITS

- The tire inflation pressure are indicated for cold tire conditions [after parking for more than three hours or driving less than 1.6 km (1 mile)].
- Check tire pressure once a month or before driving long distances.

CAUTION:
The tire pressure rises to 29 kPa (0.3 kg/cm^2, 4 psi) during driving. Do not remove air to lower tire pressure immediately after driving.

Tire size	Inflation pressure kPa (kg/cm^2, psi)	
	Front wheels	Rear wheels
205/55R16 88V	216 (2.2, 31)	216 (2.2, 31)
225/50R16 92V	226 (2.3, 33)	226 (2.3, 33)
T125/90D16	412 (4.2, 60)	412 (4.2, 60)

CAUTION:
The tire inflation pressure is the same for high-speed driving as it is for normal driving.

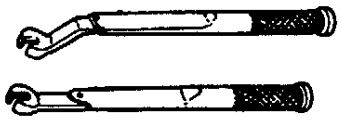
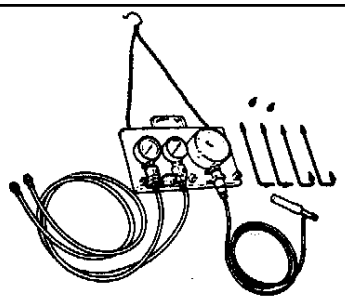
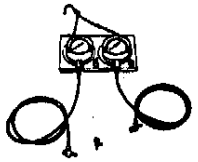
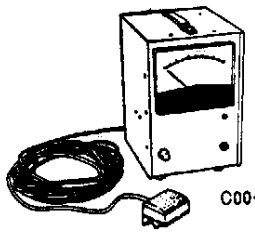
Tread wear limit:

Remaining groove depth 1.6 mm (0.063 in)

PRECAUTIONS

- Recommended brake fluid is brake fluid NR-3 (No. 2500).
- Never reuse drained brake fluid.
- Be careful not to splash brake fluid on painted areas because it may cause paint damage. If brake fluid is splashed on painted areas, wipe it off immediately.
- For safety reasons, if any brake fluid leak is discovered, disassemble parts and replace as necessary.
- Use brake tube torque wrench (special service tool) to loosen or tighten brake pipe flare nuts.

SPECIAL SERVICE TOOLS

Tool name Tool number	Description	
Brake tube torque wrench GG9431 0000	 C00—0002	• Removing and installing brake tube piping
Booster tester set KV991 019S0 KV991 01910 KV991 01920 KV991 01930 KV991 01940 KV991 01950 EG1521	 C00-0031	• Measuring booster pressure • Measuring brake fluid pressure
Brake fluid pressure gauge KV991 V0010	 C00-0034	• Measuring brake fluid pressure
Pedal pressure gauge IM2182	 C00-0032	• Measuring brake pedal pressure force

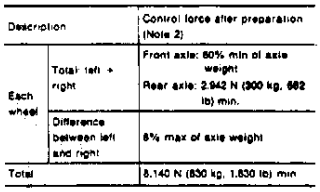
1. Summary

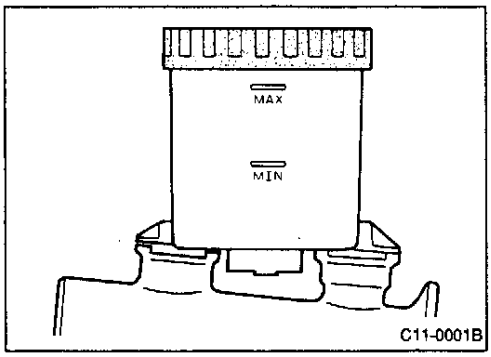
Specifications

Description				Engine: RB26DETT / Anti-lock braking system: Equipped
Main brake	Front	Model number		OPZ25VR
		Disc outer diameter/thickness	mm (in)	296/32 (11.65/1.26)
		Pad dimension (length × width × thickness)	mm (in)	116 × 50 × 10 (4.57 × 1.97 × 0.39)
		Cylinder inner diameter	mm (in)	40.4 × 2 (1.591 × 2)
		Pad material		AP50H
		Pad wear warning equipment		Equipped
	Rear	Brake model		OPZ11VB
		Disc outer diameter thickness	mm (in)	297/18 (11.69/0.71)
		Pad dimension (length × width × thickness)	mm (in)	71.8 × 36.5 × 11.5 (2.827 × 1.437 × 0.453)
		Cylinder inner diameter	mm (in)	38.1 (1.500)
		Pad material		AP50
		Pad wear warning equipment		Equipped
Parking brake		Model number		DS17HD
		Drum inner diameter	mm (in)	172 (6.77)
		Lining dimension (length × width × thickness)	mm (in)	154.1 × 25.0 × 3.0 (6.07 × 0.984 × 0.118)
		Lining material		AKD201
		Lining gap adjustment dimension		Manual adjustment
Master cylinder		Cylinder inner diameter	mm (in)	25.40 (1)
Power booster	Booster	Model number		M215T (JKC)
		Diaphragm diameter	mm (in)	205 + 230 (8.07 + 9.06)
Rear control equipment		Model number		Proportioning valve (one-piece, contained in master cylinder)
		Split point	kPa (kg/cm^2, psi)	1,961 (20, 284)
		Reducing ratio		0.4
Recommended brake fluid				Nissan brake fluid NR-3 (No. 2500)

1. Summary (Cont'd)

Inspection and adjustment

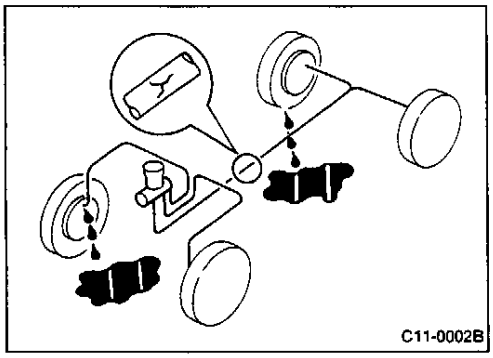
Description			Specification
Brake pedal	Free height (above floor) mm (in)		M/T: 172.5 - 182.5 (6.79 - 7.19)
	Depressed [under force of 490N (50 kg, 110 lb)] with engine running (measured from top of dash panel) mm (in)		85 (3.35) max.
	Clevis pin play (measured at pedal upper surface) mm (in)		1 - 3 (0.04 - 0.12)
	Play mm (in)		3 - 11 (0.12 - 0.43)
	Stop lamp switch screw end and pedal stopper clearance mm (in)		0.3 - 1.0 (0.012 - 0.039)
Brake application conditions [Depressed force 883 N (90 kg, 198 lb)] OPZ25VR model + OPZ11VB **Note:** **(1) The indicated values are intended for reference to determining control force after inspection preparation.** **(2) The term "after preparation" means the condition of braking ten times [speed 40 to 50 km/h → 0 km/h (25 to 31 MPH → 0 MPH)] with a deceleration force of 0.2 to 0.3 G for break-in after replacing lining and pad replacement, or after cleaning and sandpaper lapping of drums and shoes. (0.2 to 0.3 G indicates a control force stronger than normal braking.)**			
Booster vacuum leak [at force of 66.7 kPa (500 mmHg, 19.69 inHg)] kPa (mmHg, inHg)			3.3 (33.25, 0.98) in 15 sec
Check valve vacuum leak [at force of 66.7 kPa (500 mmHg, 19.69 inHg)] kPa (mmHg, inHg)			1.3 (13.10, 0.39) in 15 sec
Disc brake	Pad wear limit minimum thickness mm (in)		2 (0.08)
	Brake disk wear limit minimum thickness mm (in)	OPZ25VR	30 (1.18)
		OPZ11VB	16 (0.63)
	Brake disk runout limit mm (in)		0.07 (0.0028)
Brake drum	Lining wear limit minimum thickness mm (in)		1.5 (0.059)
	Drum wear limit (inner diameter) mm (in) DS17HD		173 (6.81)
Parking brake	Pedal stroke [under force of 196 N (20 kg, 44 lb)] (notches)	Center lever type	6 - 8
	Number of notches when brake warning lamp lights (notches)	Center lever type	1 max.



2. On-vehicle Inspection

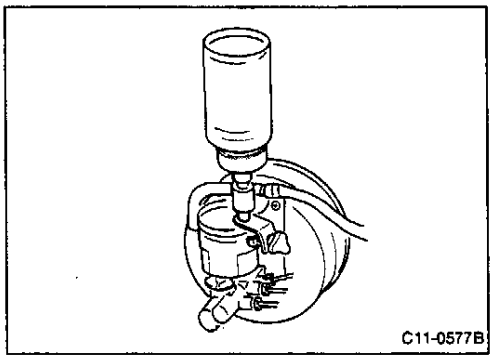
2-1 CHECKING BRAKE FLUID LEVEL

- Check fluid level in reservoir tank. It should be between Max. and Min. lines on reservoir tank.
- If fluid level is extremely low, check brake system for leaks.



2-2 CHECKING BRAKE SYSTEM

- Check brake lines (tubes and hoses) for leaks, damage, twisting, deterioration or other damage.
- Check if connections and clamps are loose.
  Flare nut tightening torque:
  15 - 18 N·m (1.5 - 1.8 kg-m, 11 - 13 ft-lb)
- Fully depress brake pedal with force of 785 N (80 kg, 176 lb) for approximately 5 seconds with engine running and check for leaks.



2-3 CHANGING BRAKE FLUID AND AIR BLEEDING

(1) Standard vehicles

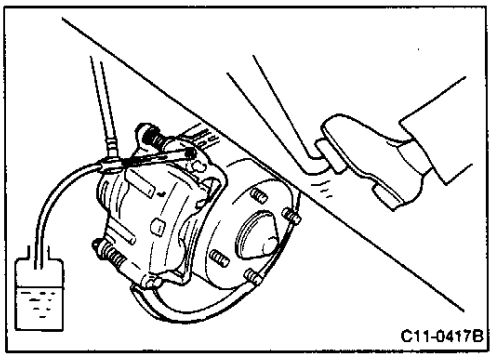
- Change brake fluid and air bleeding in the following order.

① Clean inside reservoir tank and fill with new brake fluid.
② Open left rear air bleeder valve.
③ Fully depress brake pedal. Allow pedal to return and depress again after 2 - 3 seconds and repeat this operation.
④ Close rear left wheel air bleeder valve.
⑤ Bleed air from calipers in following order.
Rear right wheel → front left wheel → front right wheel

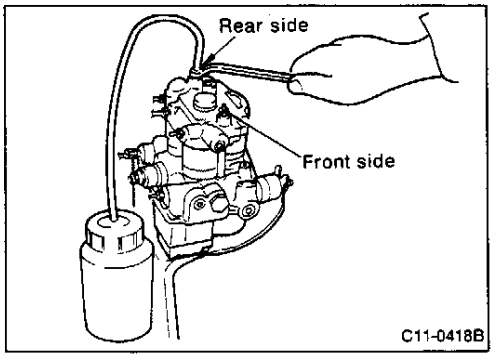
CAUTION:

(1) Connect a transparent vinyl tube to air bleeder and be careful fluid does not spill on body.

(2) Make sure reservoir is filled with brake fluid at all times during air bleeding operation.



- Tighten air bleeder value to specified torque.
  Tightening torque:
  7 - 9 N·m (0.7 - 0.9 kg-m, 5.1 - 6.5 ft-lb)



(2) Vehicles equipped with anti-lock braking systems (ABS)

- In vehicles equipped with ABS, bleed air from the following locations in the indicated sequence after performing the procedures described for vehicles with standard brake systems.
  Front side actuator bleeder valve → Rear side air bleeder.

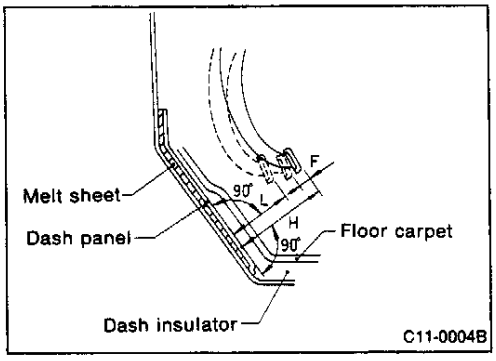
CAUTION:

(1) Air bleeding must be performed after the battery terminal is removed in vehicles equipped with ABS.

2. On-vehicle Inspection (Cont'd)

(2) Carefully monitor reservoir brake fluid level during bleeding. Make sure it is more than half-full at all times because air entering brake system may cause operation failure in vehicles equipped with ABS.

- Tighten air bleeder valve to specified torque.
  Tightening torque:
  7 - 9 N·m (0.7 - 0.9 kg-m, 5.1 - 6.5 ft-lb)



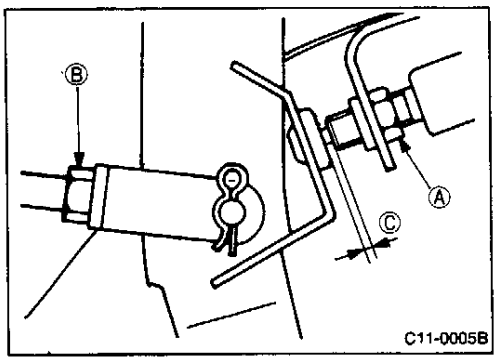
2-4 BRAKE PEDAL INSPECTION AND ADJUSTMENT

Inspection

Unit: mm (in)

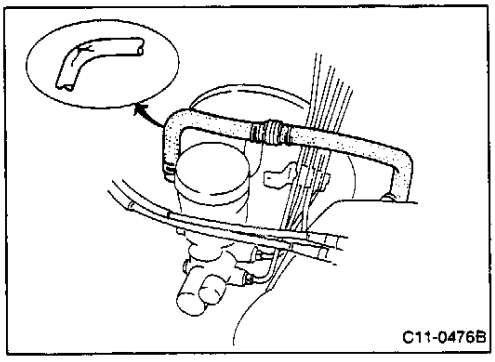
Free pedal height "H"	M/T: 172.5 - 182.5 (6.79 - 7.19 in)
Clevis play "F" (from upper pedal surface)	1 - 3 (0.04 - 0.12)
Depressed pedal height "L" Under force or 490 N (50 kg, 110 lb) with engine running	85 (3.35)/min.
When brake pedal is operated, make sure it does not scrap or move abnormally.	

- Adjust pedal height as necessary.



Adjustment

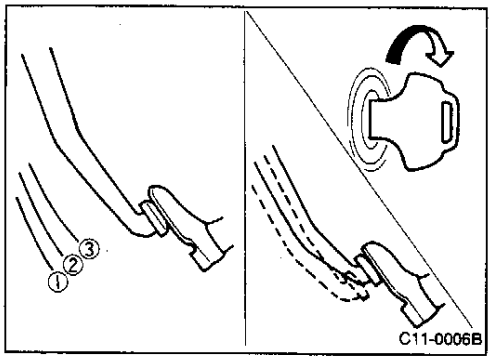
① Loosen stop lamp switch lock nut Ⓐ.
② Loosen push rod lock nut Ⓑ, rotate push rod, adjust pedal to specified height and tighten lock nut.
③ Rotate switch so clearance Ⓒ between stopper rubber and stop lamp switch thread end is 0.3 to 1.0 mm (0.012 to 0.039 in) and tighten lock nut.
Lock nut tightening torque:
Ⓐ 12 - 15 N·m (1.2 - 1.5 kg-m, 9 - 11 ft-lb)
Ⓑ 16 - 22 N·m (1.6 - 2.2 kg-m, 12 - 16 ft-lb)



2-5 VACUUM PIPING INSPECTION

- Apply vacuum to hoses, tubes and connections and make sure there are no scratches, damage or deformation.
- Check that all clamps are tight.
- Check the arrow on check valve E-mark faces engine side.

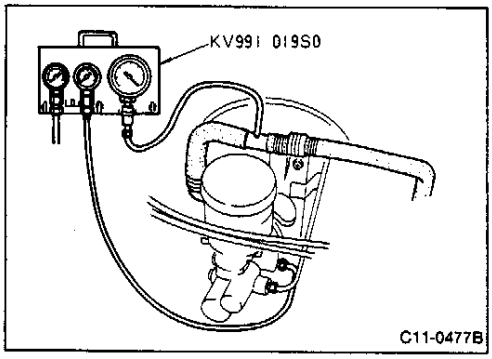
2. On-vehicle Inspection (Cont'd)



2-6 BOOSTER OPERATING CHECK

Operation procedure

① Idle engine for approximately one minute. Apply vacuum to booster and turn ignition switch OFF.
② Depress brake several times with normal pressure and check for any change in pedal stroke. (A slight change is normal.)
③ Depress brake pedal and check that there is no change in pedal height. Turn on engine in this condition and check that pedal goes down. (Moving down is normal.)



2-7 BOOSTER FUNCTION INSPECTION

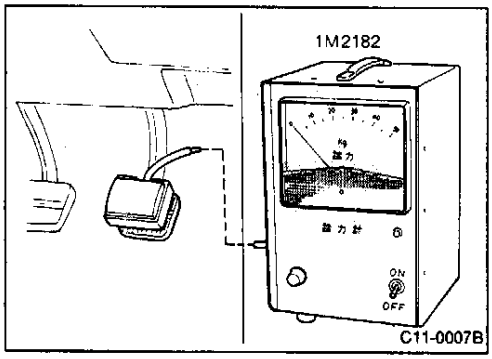
Operation procedures

① Install special service tools (booster tester set: KV991 019S0, pedal pressure gauge: IM2182) in vehicle.
② Start engine and measure vacuum. Stop engine when vacuum reaches 66.7 kPa (500 mmHg, 19.69 inHg).
③ Measure lowest vacuum pressure when brake does not operate.
④ Measure lowest vacuum pressure when brake is under full load [pedal pressure 245 N (25 kg, 55 lb)].

Specification value (③, ④):

Lowest vacuum level for 15 sec at maximum force of 13.3 kPa (25 mmHg, 0.98 inHg)

⑤ Set load in booster to 0 kPa (0 mmHg, 0 inHg) and measure generated hydraulic pressure.
⑥ Start engine and measure generated hydraulic pressure when idling [at force of 66.7 kPa (500 mmHg, 69 in Hg)]



CAUTION:

(1) Measure hydraulic pressure on front side.
(2) Always bleed air from system after measure is completed.

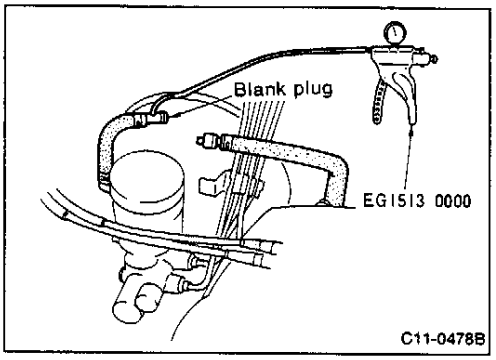
Specification [⑤: Vacuum 0 kPa (0 mmHg, 0 inHg)]

Pedal pressure N (kg, lb)	Hydraulic pressure kPa (kg/cm², psi)
	M215T
98 (10, 22)	0 (0, 0)
196 (20, 44)	392 (4, 57)
294 (30, 66)	1,177 (12, 171)

Specification [⑥: Vacuum 66.7 kPa (500 mmHg, 19.69 inHg)]

Pedal pressure N (kg, lb)	Hydraulic pressure kPa (kg/cm², psi)
	M215T
49 (5, 11)	686 (7, 100)
98 (10, 22)	2,158 (22, 313)
147 (15, 33)	3,825 (39, 555)

2. On-vehicle Inspection (Cont'd)

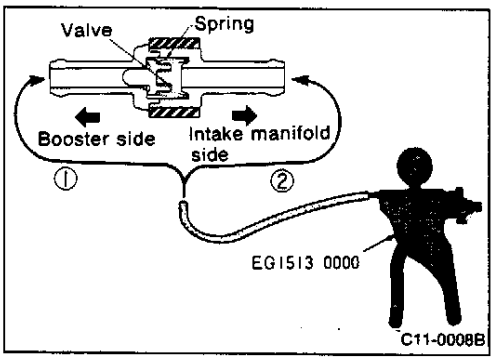


2-8 BOOSTER AIRTIGHTNESS

- Attach hand vacuum pump (special service tool) as shown in figure.

Specification:

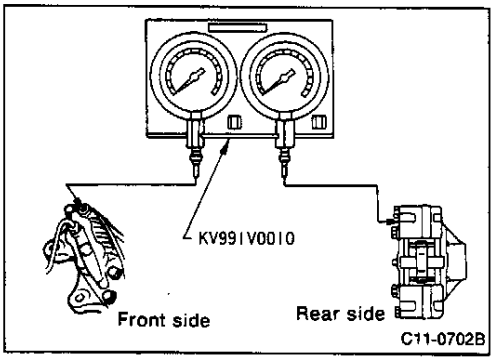
When –66.7 kPa (–500 mmHg, –19.69 inHg) vacuum lowers for 15 sec at maximum of 3.3 kPa (25 mmHg, 0.98 inHg)



2-9 CHECK VALVE INSPECTION

- Check vacuum with a vacuum pump.

Connect to booster side ①	Vacuum should exist when –66.7 kPa (–500 mmHg, –19.69 inHg) vacuum lowers for 15 sec at maximum of 3.3 kPa (25 mmHg, 0.98 inHg).
Connect to engine side ②	Vacuum should not exist.



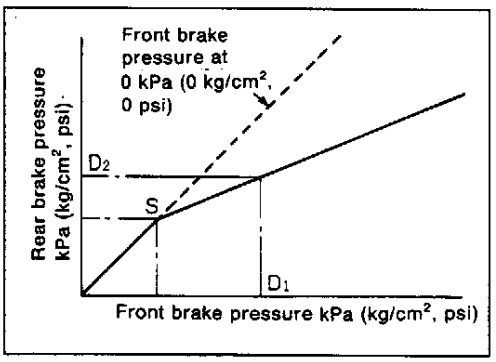
2-10 REAR CONTROL EQUIPMENT FUNCTION INSPECTION

- Use brake fluid pressure gauge (special service tool) to measure front and rear brake fluid pressure.

CAUTION:

Bleed air after measurement is completed.

- The front and rear brake fluid pressure is set to a 1 : 1 ratio at the split point (S). Check that the rear brake fluid pressure is reduced according to the following specifications.
- D_2 indicates the rear brake pressure hydraulic pressure when the front brake pressure is added to D_1.



Specifications

kPa (kg/cm², psi)

Engine	RB26DETT
S (split point)	1,765 - 2,550 (18 - 26, 256 - 370)
D_1 (front brake pressure)	5,394 (55, 782)
D_2 (rear brake pressure)	3,138 - 3,923 (32 - 40, 455 - 569)

Reference: Rear brake fluid pressure D_2 is determined as follows.

$D_2 = LP + S$

L (reducing ratio) = 0.4

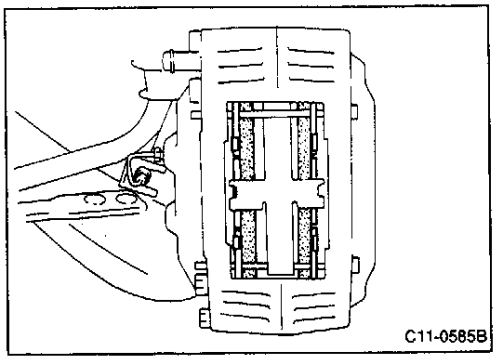
S (split point) = $1{,}961^{+588}_{-196}$ kPa (20^{+6}_{-2} kg/cm², 284^{+85}_{-28} psi)

P (additional pressure from split point) = 3,432 kPa (35 kg/cm², 498 psi)

$D_2 = 0.4 \times 35 + 20^{+6}_{-2}$ = 3,138 - 3.923 kPa (32 - 40 kg/cm², 455 - 569 psi)

2. On-vehicle Inspection (Cont'd)

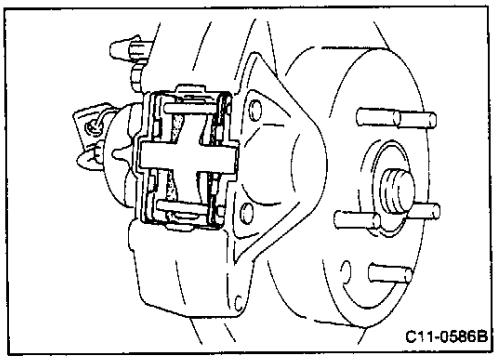
2-11 DISK PAD THICKNESS INSPECTION



OPZ25VR models

- Check pad thickness at middle hole in cylinder body as shown in figure.

Model	OPZ25VR
Wear limit thickness	2 mm (0.08 in)
Reference: new part thickness	10 mm (0.39 in)

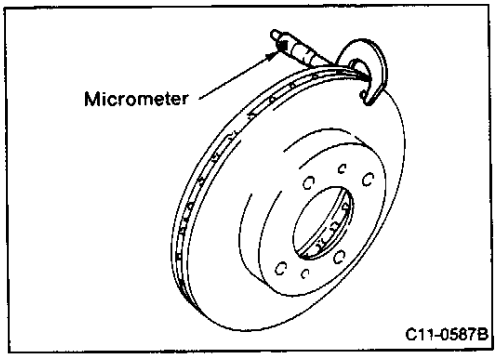


OPZ11VB models

- Check pad thickness at middle hole in cylinder body as shown in figure.

Model	OPZ11VB
Wear limit thickness	2 mm (0.08 in)
Reference: new part thickness	11.5 mm (0.453 in)

2-12 DISC ROTOR INSPECTION



(1) Disc thickness inspection

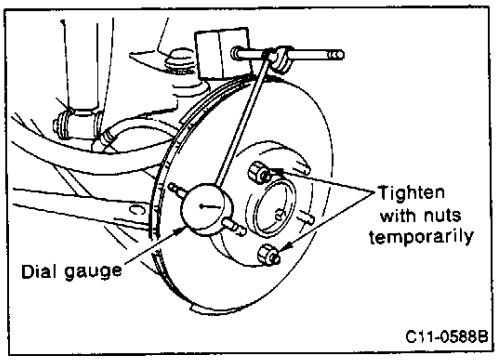
- After removing caliper assembly, check following items.
- Check disc rotor for wear or damage.
- Measure disk thickness.

Front

Model	OPZ25VR
Wear limit thickness	30 mm (1.18 in)
Reference: New part thickness	32 mm (1.26 in)

Rear

Model	OPZ11VB
Wear limit thickness	16 mm (0.63 in)
Reference: New part thickness	18 mm (0.71 in)



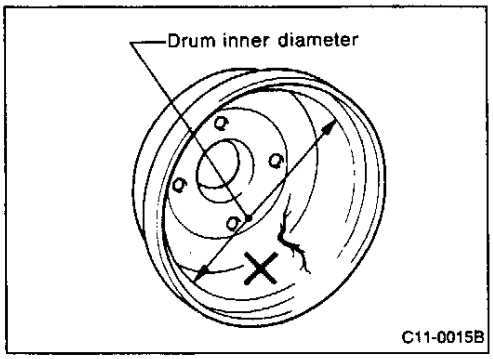
(2) Disk rotor runout inspection

- Make sure that front axial end play is less than 0.03 mm (0.0012 in) before measuring disk surface runout.
- Secure rotor on axle and measure runout.

CAUTION:
Secure rotor to wheel hub with two nuts in criss-cross direction.

Measurement location	Check within 10 mm (0.39 in) from outside edge of rotor.
Runout limit	0.07 mm (0.0028 in)

2. On-vehicle Inspection (Cont'd)

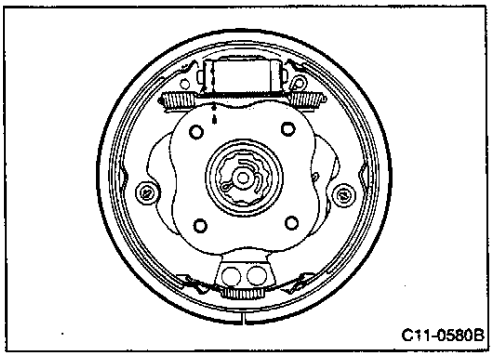


2-13 BRAKE DRUM INSPECTION

Check following items.

- Check for cracks or damage.
- Check for scoring, partial wear or stepped wear inside of drum.
- Measure inside of drum.

Model	DS17HD
Wear limit	173 mm (6.81 in) diameter
Reference: new part inner diameter	172 mm (6.77 in) diameter



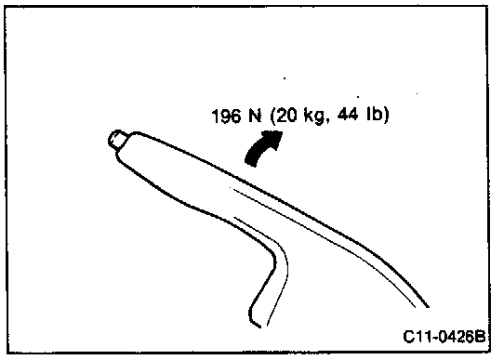
2-14 BRAKE SHOE INSPECTION

Check following items when installing brake drum.

- Check lining for abnormal wear, damage or separation.
- Check that assembly for loose conditions.
- Measure lining thickness.

Model	DS17HD
Wear thickness limit	1.5 mm (0.059 in)
Reference: New part thickness	3.0 mm (0.118 in)

- Check wheel cylinder for leakage.



2-15 PARKING BRAKE INSPECTION AND ADJUSTMENT

Check and adjust following items.

- Make sure that parking brake lever operates smoothly.
- Check rods and cables for cracks, wear, deformation and rust.
- Check clamps and connections for looseness.
- Check that brake warning lamp lights within one notch.
- The catch operates within a specified number of notches when an operating force of 196 N (20 kg, 44 lb) is applied. Adjust rear shoe clearance if brake does not engage with specified number of notches. Adjust cable so brake engages at specified number of notches.

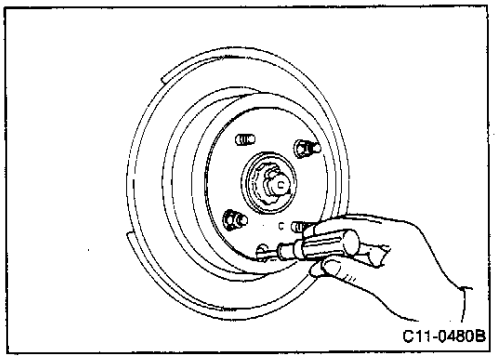
  Specified number of notches:

  6 - 8 notches

CAUTION:

If the cable and notch adjustment is made without adjusting shoe clearance, the rear brake may not engage.

2. On-vehicle Inspection (Cont'd)



(1) Shoe clearance adjustment

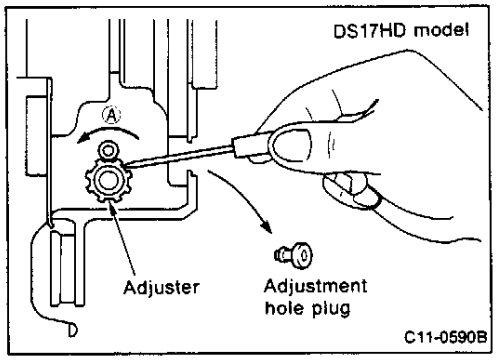
Return lever completely. When cable is adequately loose (Refer to (2) Cable adjustment), adjust rear shoe clearance.

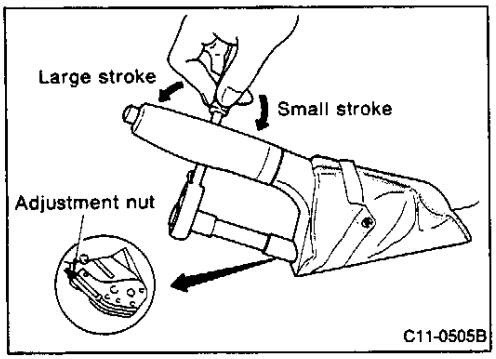
Model DS17HD

- Install wheel.
- Use suitable nuts (M12 x 1.25) so disk is installed securely as shown in figure and attach disk rotor to hub.
- Remove disc adjustment hole plug from disc. Use screwdriver and turn adjuster in direction Ⓐ shown in figure until disc locks. After disc locks turn adjuster five or six notches in opposite direction.
- Turn rotor and make sure brakes do not engage. Install stroke adjustment hole plug.

CAUTION:

After adjusting shoe clearance, always adjust lever by cable so brake engages at specified number of notches.





(2) Cable adjustment

After adjusting rear shoe clearance, adjust cable when rear brake is not engaged.

- Raise lever 4 - 5 notches.
- Insert ratchet wrench (use taped socket) in lever opening and turn self-locking adjustment nut to adjust lever stroke.
- Operate lever 3 - 4 times and adjust stroke so lever engages within specified number of notches.
- Return lever completely and make sure there is no drag between shoes and brake drum when rotating disc rotor.

(3) Breaking-in parking brake DS17HD model shoes

Perform following procedures if braking is inadequate after replacing DS17HD parking brake, shoes and disc rotor.

Operation

① Adjust parking brake control lever to specified number of notches.
[Refer to (1) Shoe clearance adjustment and (2) Cable adjustment.]

② Break-in parking brake by driving vehicle as follows.

- Drive forward at approximately 35 km/h (22 MPH).
- Depress parking brake pedal with a force of approx. 88 N (9 kg, 20 lb).
- While depressing the pedal, continue to drive the vehicle forward 100 m (328 ft).
- Repeat this procedure three more times. [Total distance is approximately 300 m (984 ft).]

③ Perform parking brake stroke inspection. Adjust if brake engagement has changed from specified number of notches.

2. On-vehicle Inspection (Cont'd)

CAUTION:

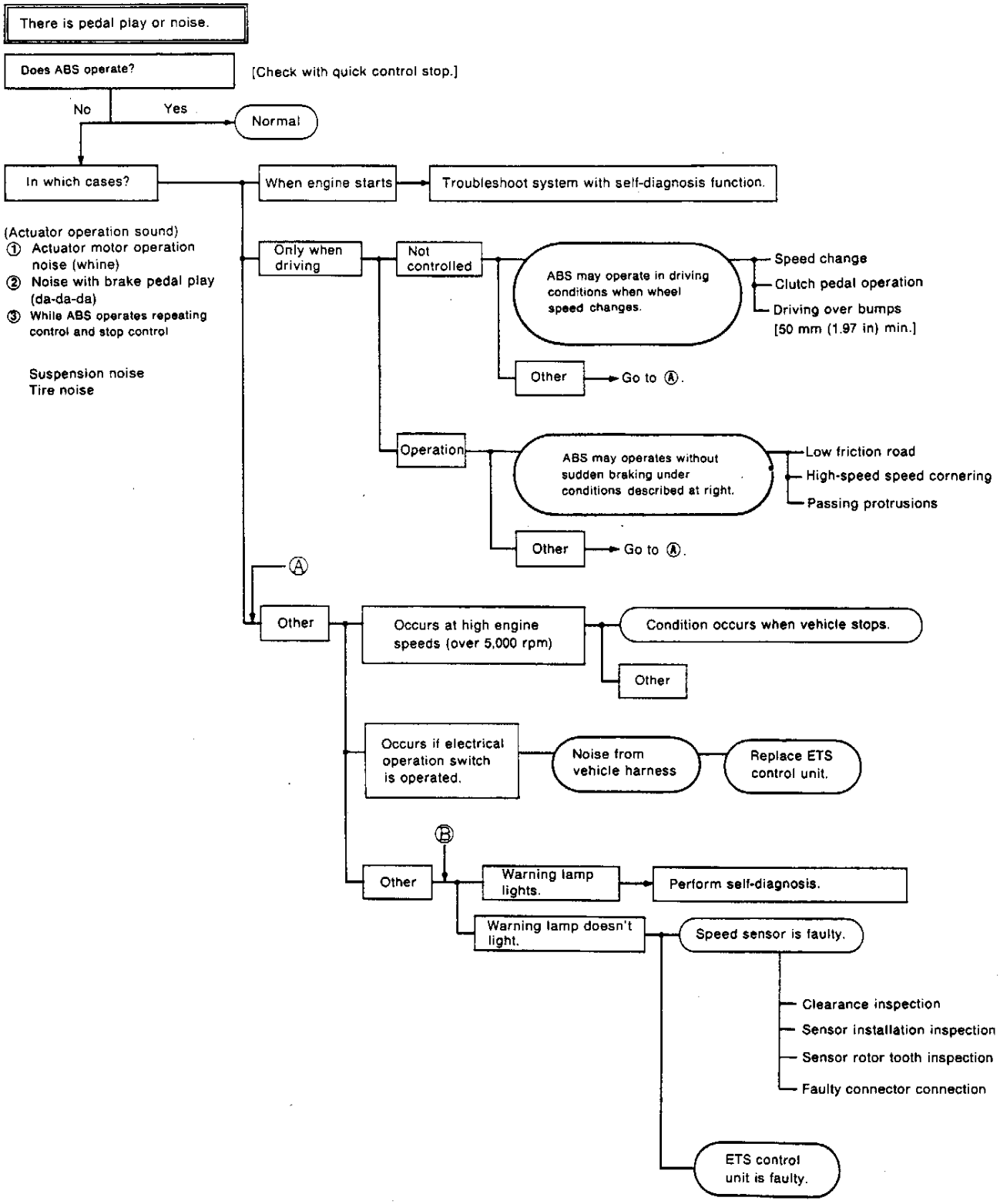
(1) Perform break-in operation in a location with good visibility and at a distance from other vehicles.

(2) Allow unit to cool off 5 min after each break-in procedure to prevent linings from overheating.

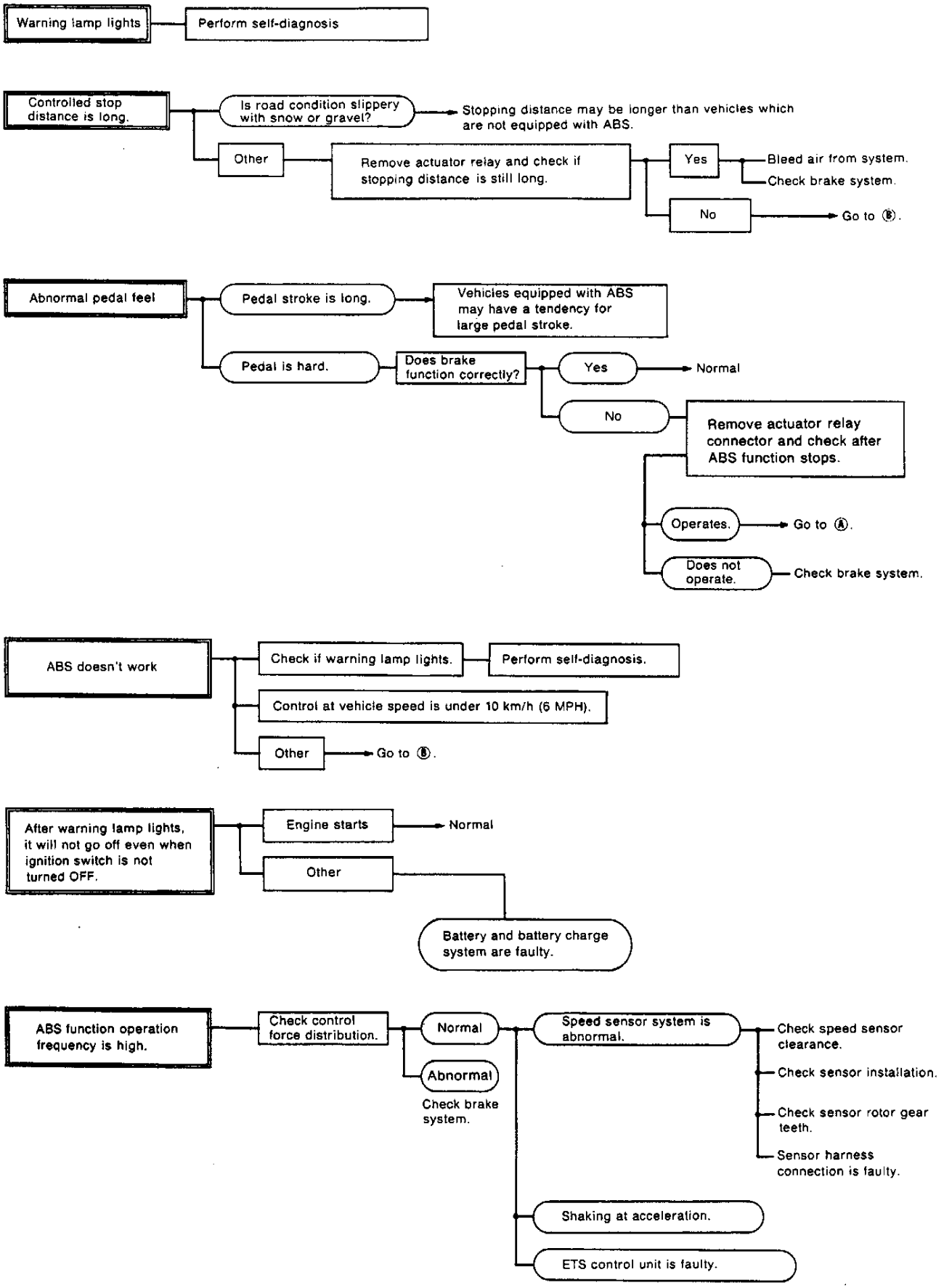
(3) Do not perform the break-in procedure too many times because it may cause uneven or premature wear.

3. Trouble Diagnosis (Anti-Lock Braking System)

3-1 TROUBLESHOOTING



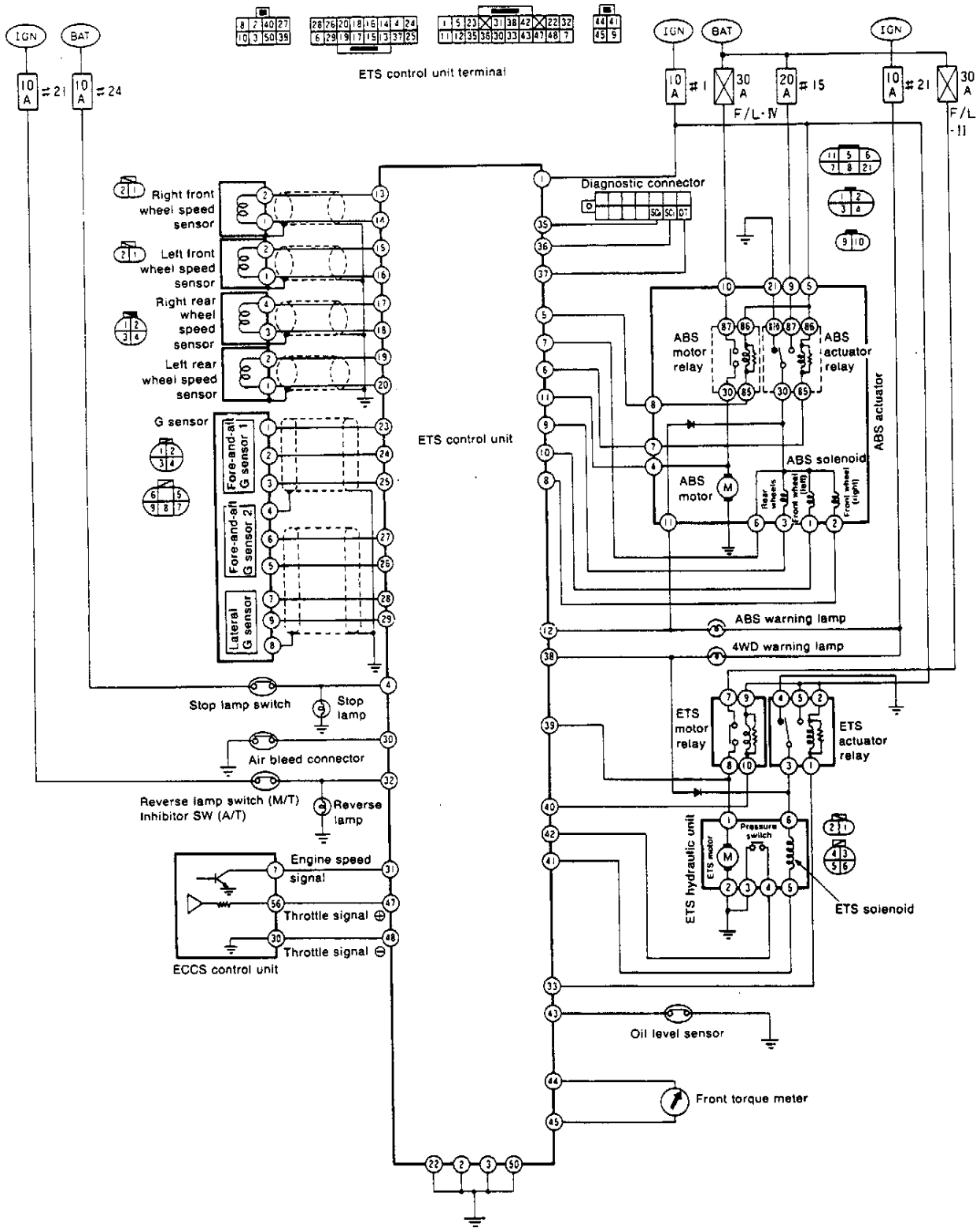
3. Trouble Diagnosis (Anti-Lock Braking System) (Cont'd)



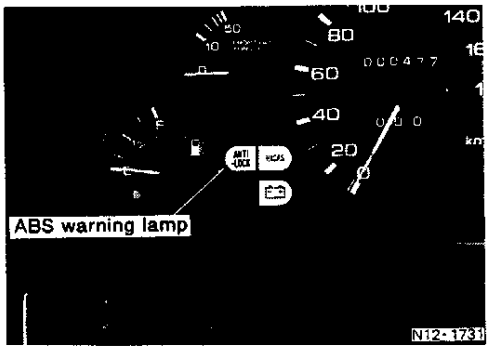
3. Trouble Diagnosis (Anti-Lock Braking System) (Cont'd)

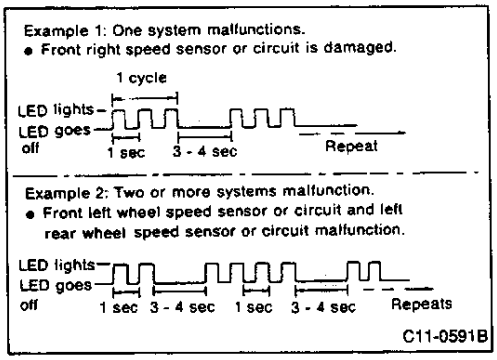
3-2 INSPECTION PREPARATION

(1) Circuit diagram



C04-0533A





3. Trouble Diagnosis (Anti-Lock Braking System) (Cont'd)

(2) Trouble diagnosis by self-diagnosis

① When CONSULT is not used

ⓐ Self-diagnosis description

- If ABS is normal, the ABS warning lamp lights when ignition switch is ON and goes off within one second after engine starts. When the warning lamp does not go out, abnormal conditions are indicated by the number of times the LED flashes in the ETS control unit below the rear parcel shelf.
- Warning lamp lights or LED flashes to indicate connection condition after damage repair when ignition switch is not turned OFF. Be sure to turn ignition switch OFF one time after repair for this reason and then perform self-diagnosis again. If two or more systems malfunction, all faulty systems are displayed sequentially and displayed by number of LED flashes.

3. Trouble Diagnosis (Anti-Lock Braking System) (Cont'd)

Problems are classified by the following code numbers.

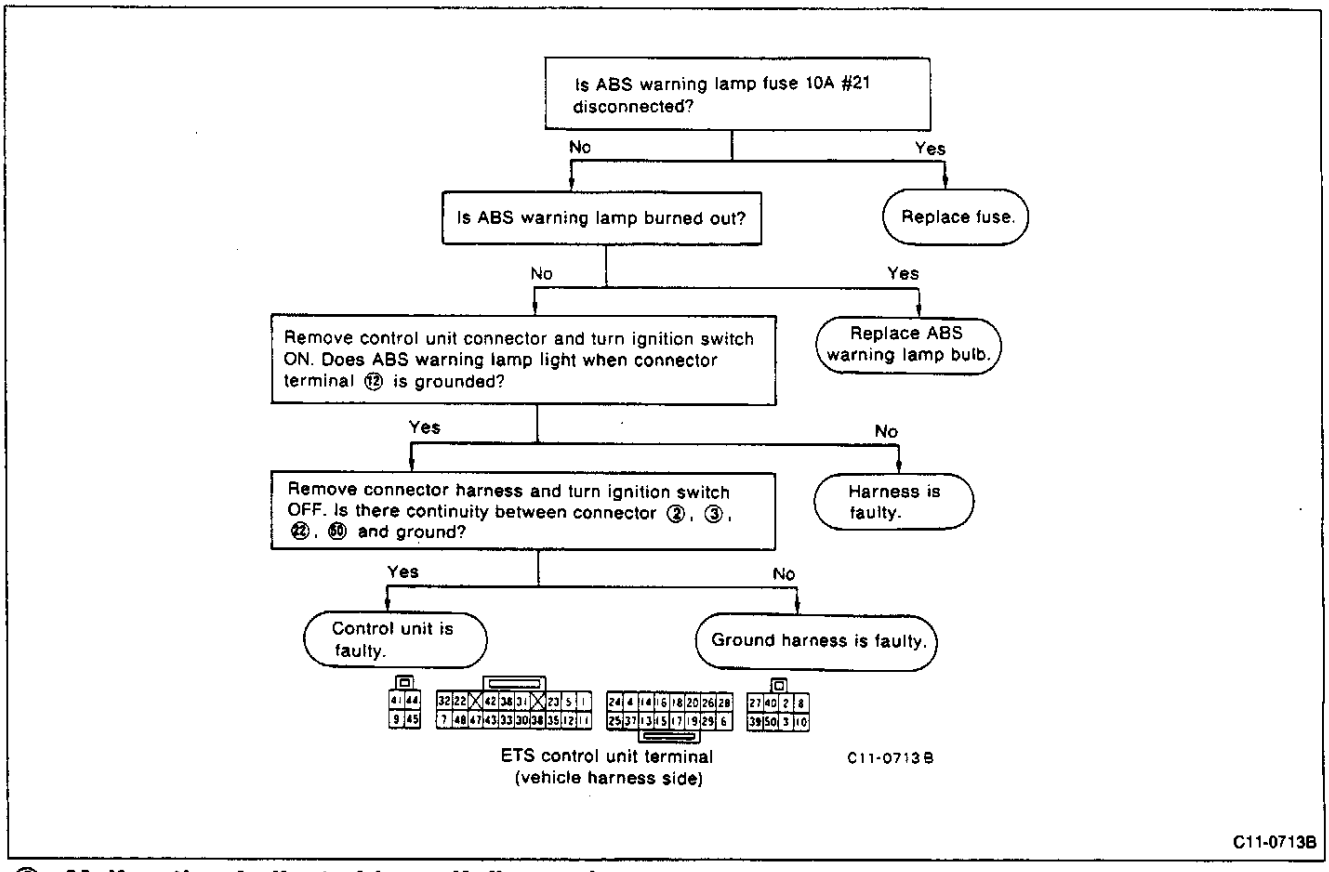
Number of LED flashes	Malfunction location	Detection cycle		Warning lamp		Flow chart (Note 3)
		Engine starts	During driving	ABS	ETS	
1	Front right wheel speed sensor circuit	○ (Note 1)	○	○	○	*
2	Front left wheel speed sensor circuit	○ (Note 1)	○	○	○	*
3	Rear right wheel speed sensor circuit	○ (Note 1)	○	○	○	*
4	Rear left wheel speed sensor circuit	○ (Note 1)	○	○	○	*
5	ABS front right side actuator solenoid valve circuit	○	○	○		A
6	ABS front left side actuator solenoid valve circuit	○	○	○		B
7	ABS rear actuator solenoid valve circuit	○	○	○		C
8	ABS actuator motor and motor relay circuit	○	○	○		D
9	ABS actuator relay and circuit	○	○	○		E
10	ETS control unit power supply circuit	○	○	○		F
11	Fore-and-aft G sensor 1 circuit	○	○	○	○	*
12	Fore-and-aft G sensor 2 circuit	○	○	○	○	*
13	Fore-and-aft rear G sensor 1 and G sensor 2 circuit	○	○	○	○	*
14	G sensor power supply 1 circuit	○	○	○	○	*
15	G sensor power supply 2 circuit	○	○	○	○	*
16	Lateral G sensor circuit	○	○	○	○	*
17	Air bleeding connector circuit		○		○ (Note 2)	—
18	ETS pressure switch circuit	○	○		○	—
19	ETS motor, motor relay circuit	○	○		○	—
20	ETS solenoid circuit	○	○		○	—
21	Throttle sensor circuit	○	○		○	—
22	ETS reservoir tank oil level sensor circuit	○	○		○	—
23	—	—	—		—	—
24 Or stays ON or stays OFF	ETS control unit, ground circuit	○	○	○	○	*

Note: 1) Detection may not be possible if there is sensor short-circuit malfunction.
2) During driving, 4WD warning lamp lights during normal control.
3) Refer to C3 Electrical control torque split 4WD system, 3. Troubleshooting for items marked *.

3. Trouble Diagnosis (Anti-Lock Braking System) (Cont'd)

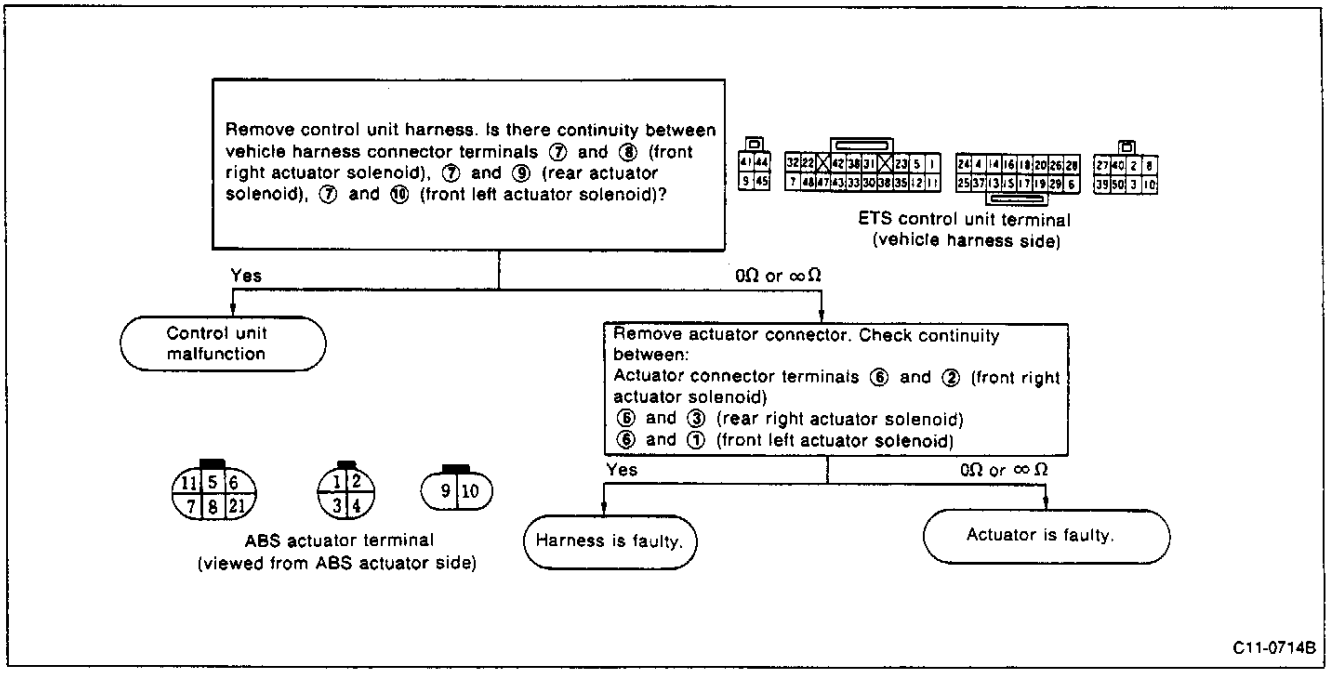
(3) Diagnostic procedure

① ABS warning lamp does not light when ignition switch is in ON position (before engine starts).



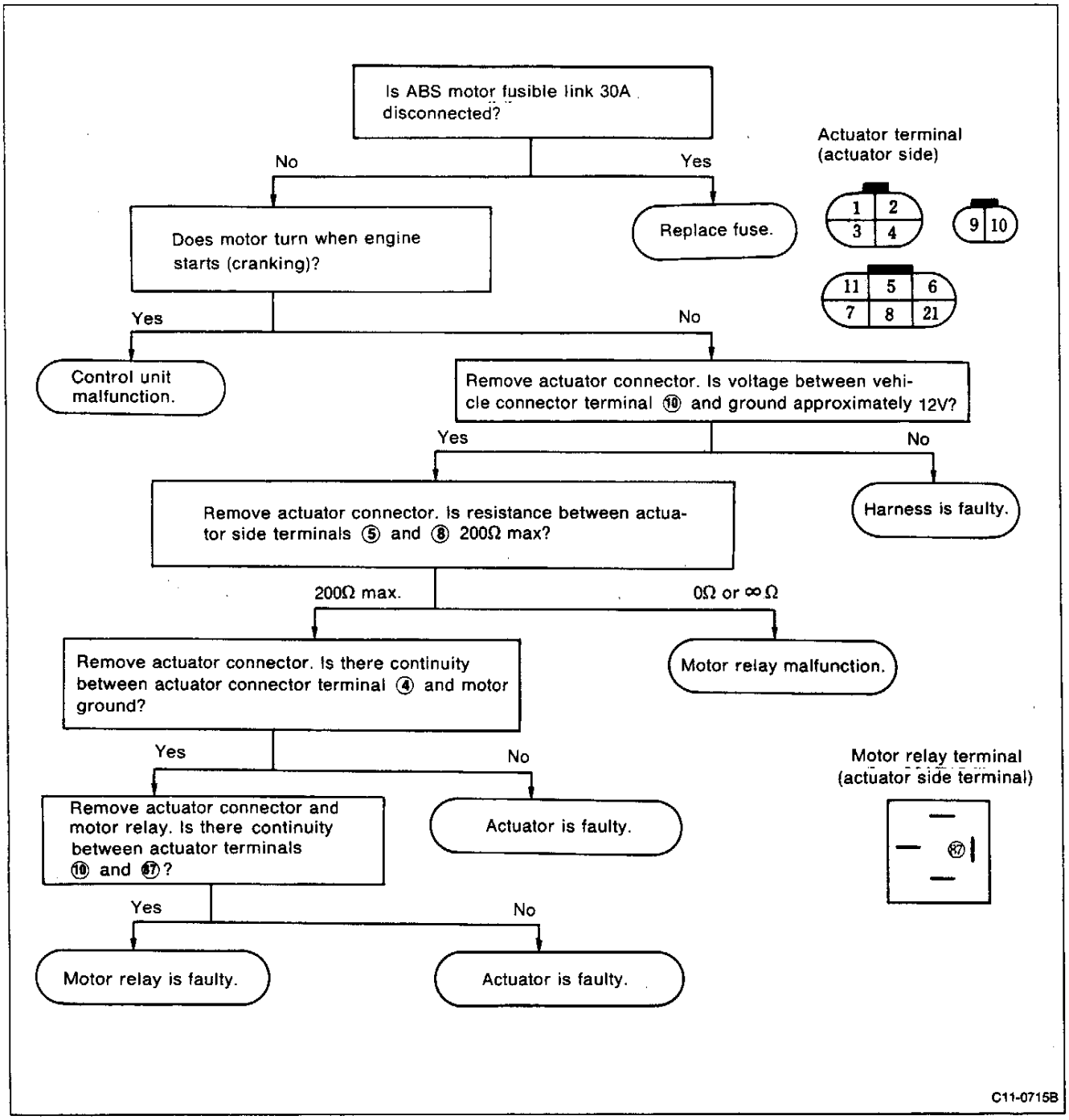
② Malfunction indicated by self-diagnosis

A. Front right actuator solenoid valve circuit malfunction (LED flashes 5 times)
B. Front left actuator solenoid valve circuit malfunction (LED flashes 6 times)
C. Rear actuator solenoid circuit solenoid valve malfunction (LED flashes 7 times)



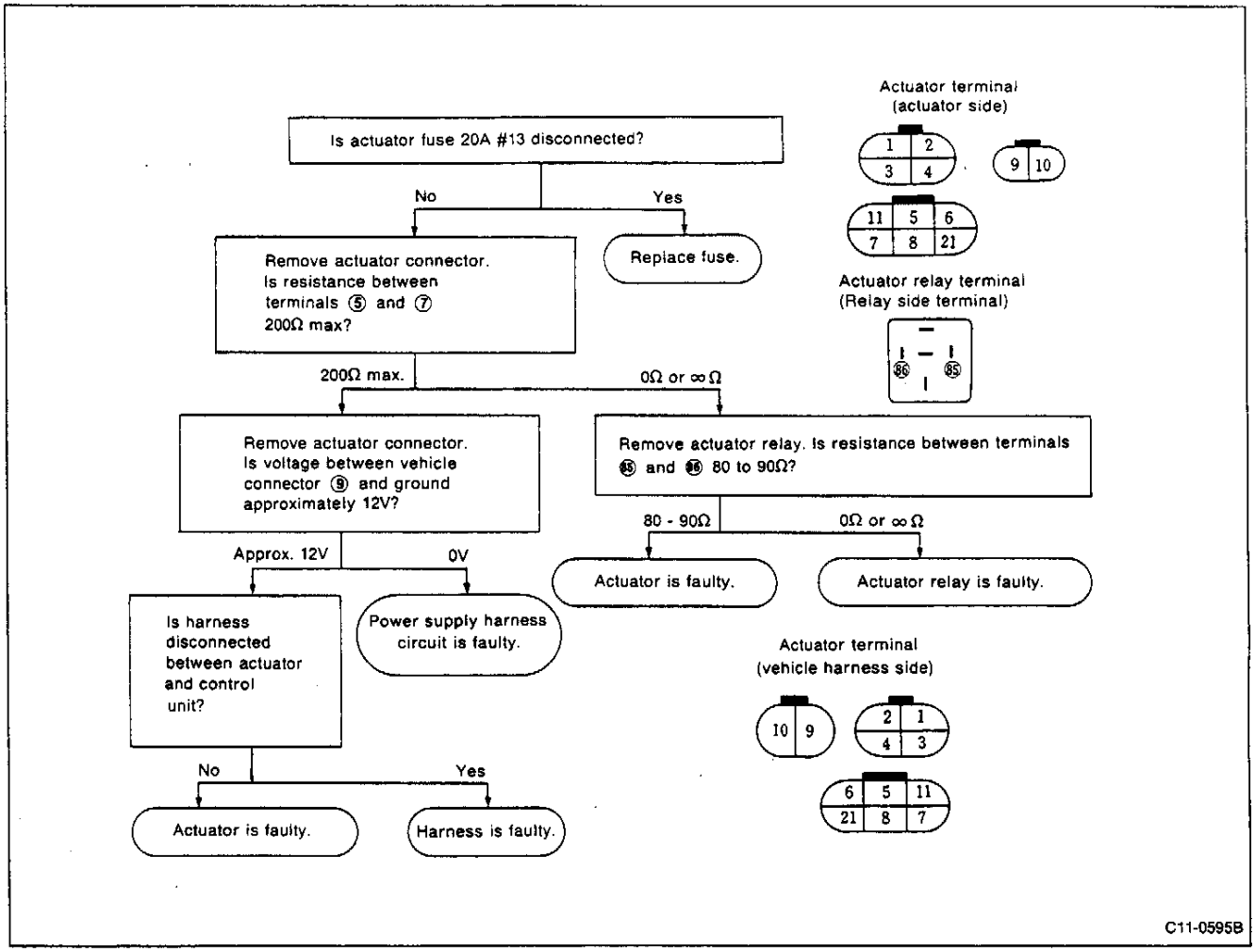
3. Trouble Diagnosis (Anti-Lock Braking System) (Cont'd)

D. ABS motor, motor relay and circuit malfunction (LED flashes 8 times)

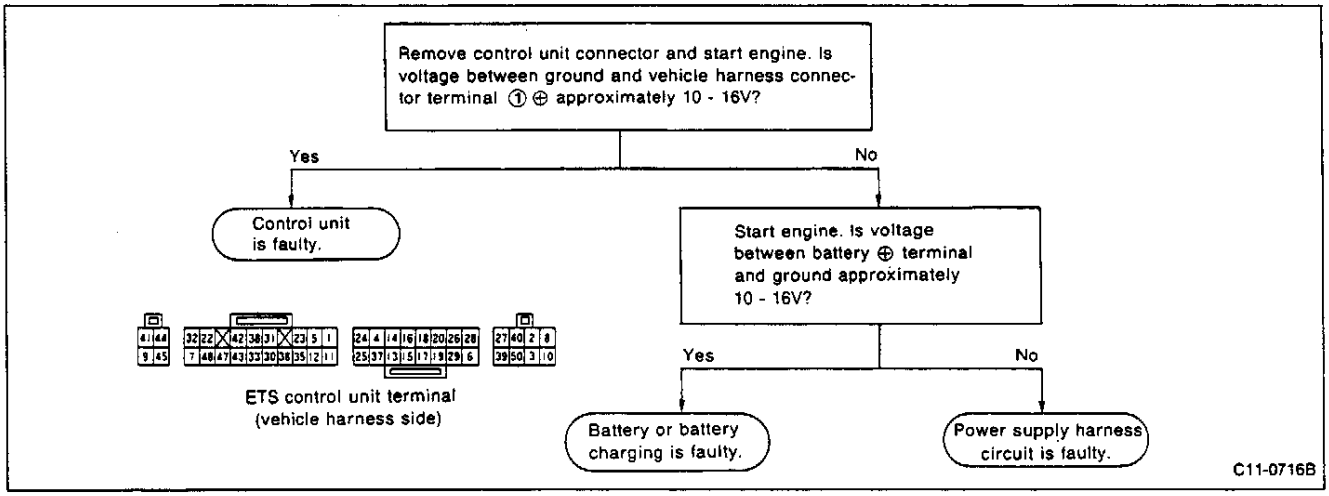


3. Trouble Diagnosis (Anti-Lock Braking System) (Cont'd)

E. Actuator relay circuit malfunction (LED flashes 9 times)



F. ETS control unit power supply circuit malfunction (LED flashes 10 times)



3. Trouble Diagnosis (Anti-Lock Braking System) (Cont'd)

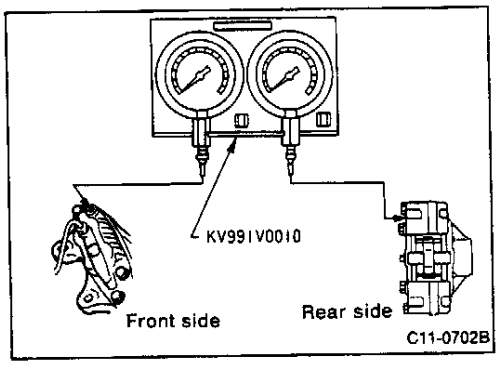
3-3 DAMAGE INSPECTION

- For items ①, ② and ③, refer to "C3 ELECTRICAL CONTROL TORQUE SPLIT 4WD SYSTEM, 3-3 DAMAGE INSPECTION".

① Check speed sensor installation.
② Check speed sensor clearance.
③ Check sensor rotor or G sensor.
- Refer to "C3 ELECTRICAL CONTROL TORQUE SPILT 4WD SYSTEM, 3-3 DAMAGE INSPECTION"

④ Check front suspension and axle (wheel hub play).
- Check that there is no wheel hub play. If there is hub play, refer to "C7 FRONT SUSPENSION AND AXLE, 2-1 FRONT SUSPENSION AND AXLE INSPECTION".

⑤ Rear suspension and axle inspection
- Check that there is no wheel hub play. If there is hub play, refer to "C8 REAR SUSPENSION AND AXLE, 2-1 REAR SUSPENSION AND AXLE INSPECTION".



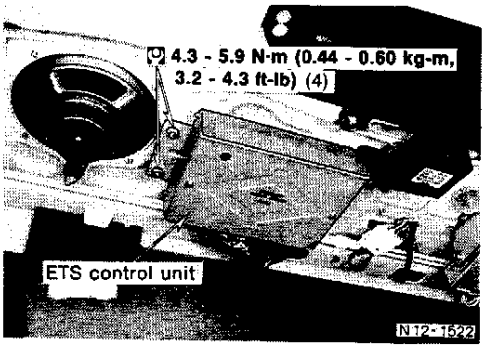
⑥ Control split inspection
- Use brake fluid pressure gauge (special service tool) as shown in figure and measure front brake and rear brake pressure.
- Refer to 2-2 CHECKING BRAKE SYSTEM. The inspection procedures are the same.

⑦ Brake system inspection
- Check that the brake system is not leaking or clogged. Replace parts as necessary.

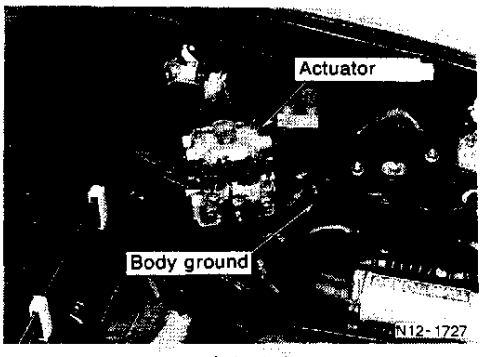
⑧ Air bleeding
- Refer to 2-3 CHANGING BRAKE FLUID AND AIR BLEEDING.

3. Trouble Diagnosis (Anti-Lock Braking System) (Cont'd)

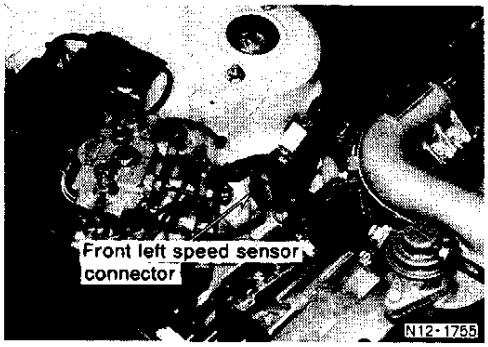
3-4 COMPONENT PARTS LOCATION



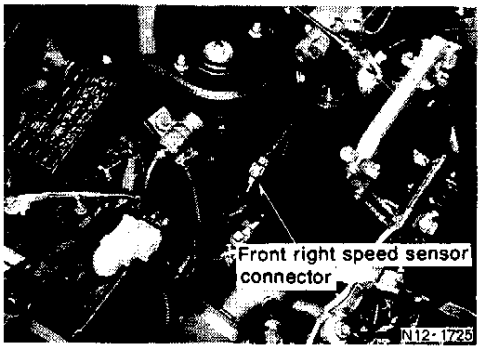
ETS control unit



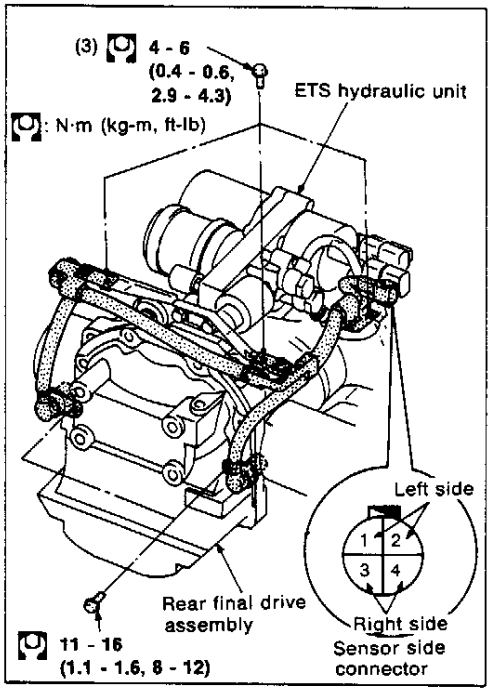
Actuator



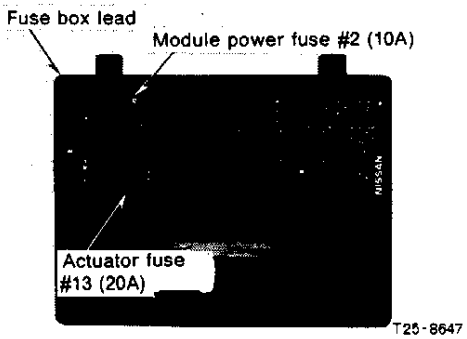
Front left speed sensor



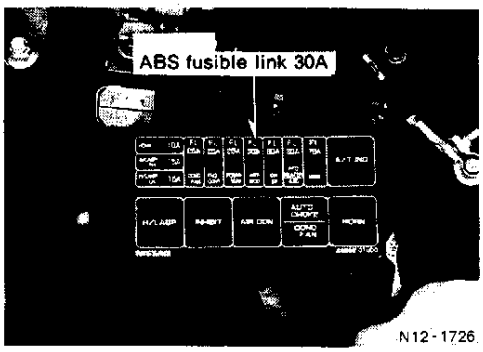
Front right speed sensor



Rear speed sensor



ABS fuses



ABS fusible link

4. Removal and Installation, Assembly and Disassembly

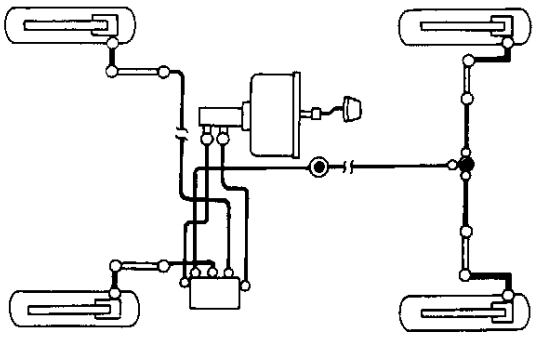
4-1 BRAKE PIPING

Vehicles equipped with ABS

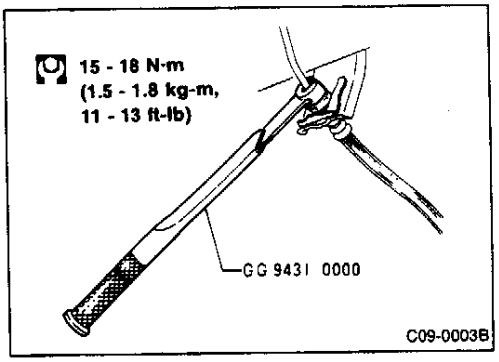
- Remove brake fluid before removal and installation.
- After removal and installation always bleed air from system.
- Brake hose installation [Point 2]

○ Flare nut 15 - 18 N·m (1.5 - 1.8 kg-m, 11 - 13 ft-lb) [Point 1]
■ Union bolt 17 - 20 N·m (1.7 - 2.0 kg-m, 12 - 14 ft-lb)
⊙ Connector 17 - 20 N·m (1.7 - 2.0 kg-m, 12 - 14 ft-lb)

: Brake tube
: Brake hose

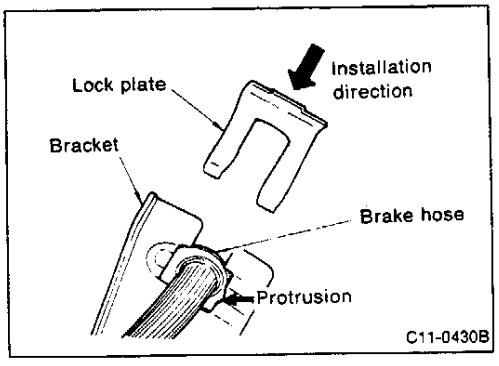


OPZ25VR models



[Point 1] Flare nut removal and installation

- Use a flare nut wrench to remove flare nuts. Use a flare nut torque wrench (special service tool) to tighten flare nuts. Be careful not to scratch or damage brake pipes or flare nuts.



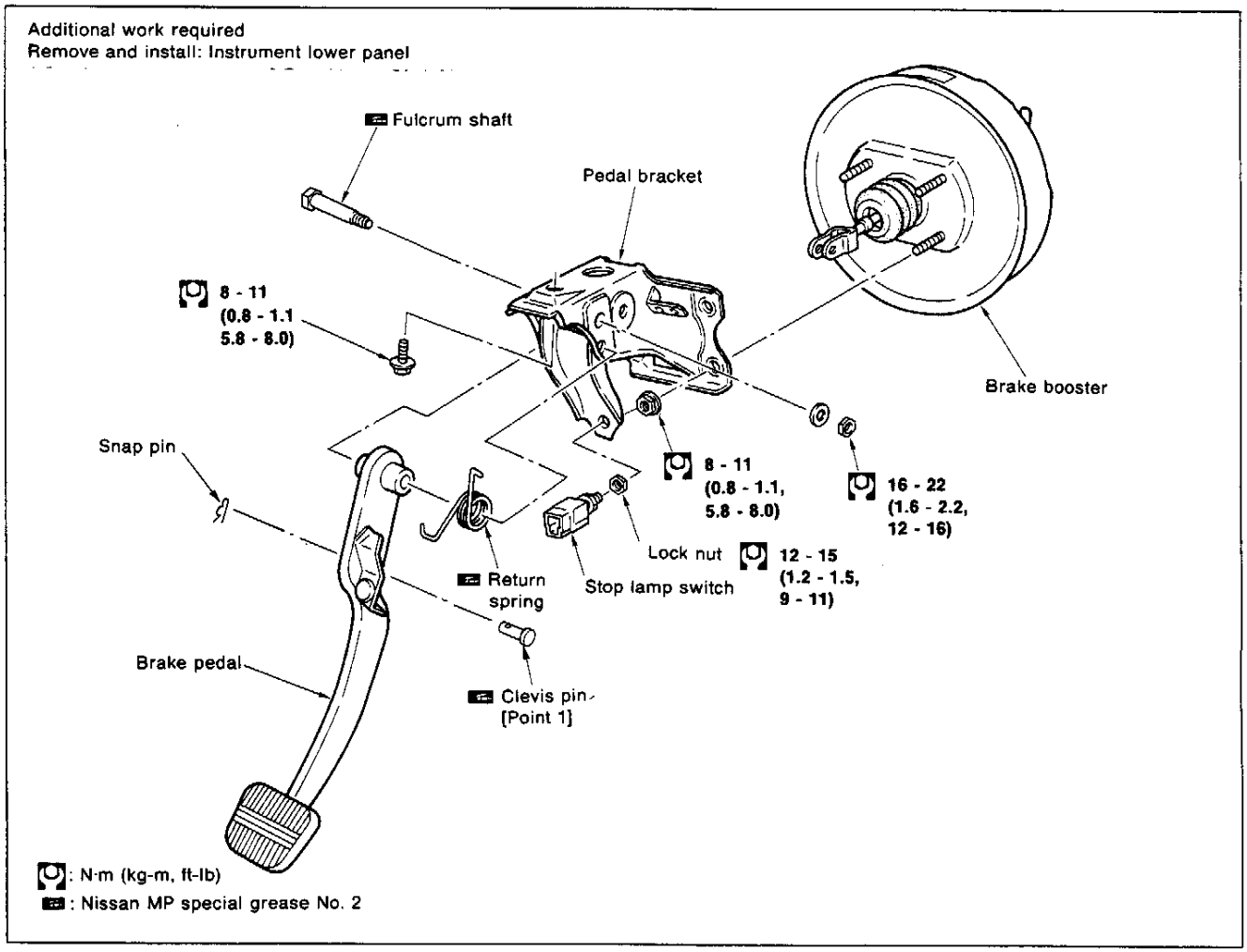
[Point 2] Brake hose installation

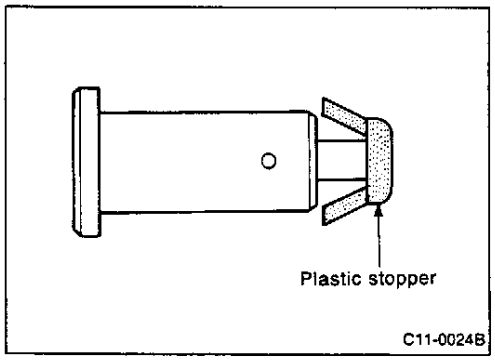
- The left and right front brake hoses are the same for all models.
- Assemble hose from cylinder body. Align lock plate direction as shown in figure and secure.

CAUTION:
(1) Align protrusions on each hose with the hose bracket.
(2) After installation check that hose is not twisted or bent and does not interfere with other parts.

4. Removal and Installation, Assembly and Disassembly (Cont'd)

4-2 BRAKE PEDAL BRACKET REMOVAL AND INSTALLATION, ASSEMBLY AND DISASSEMBLY



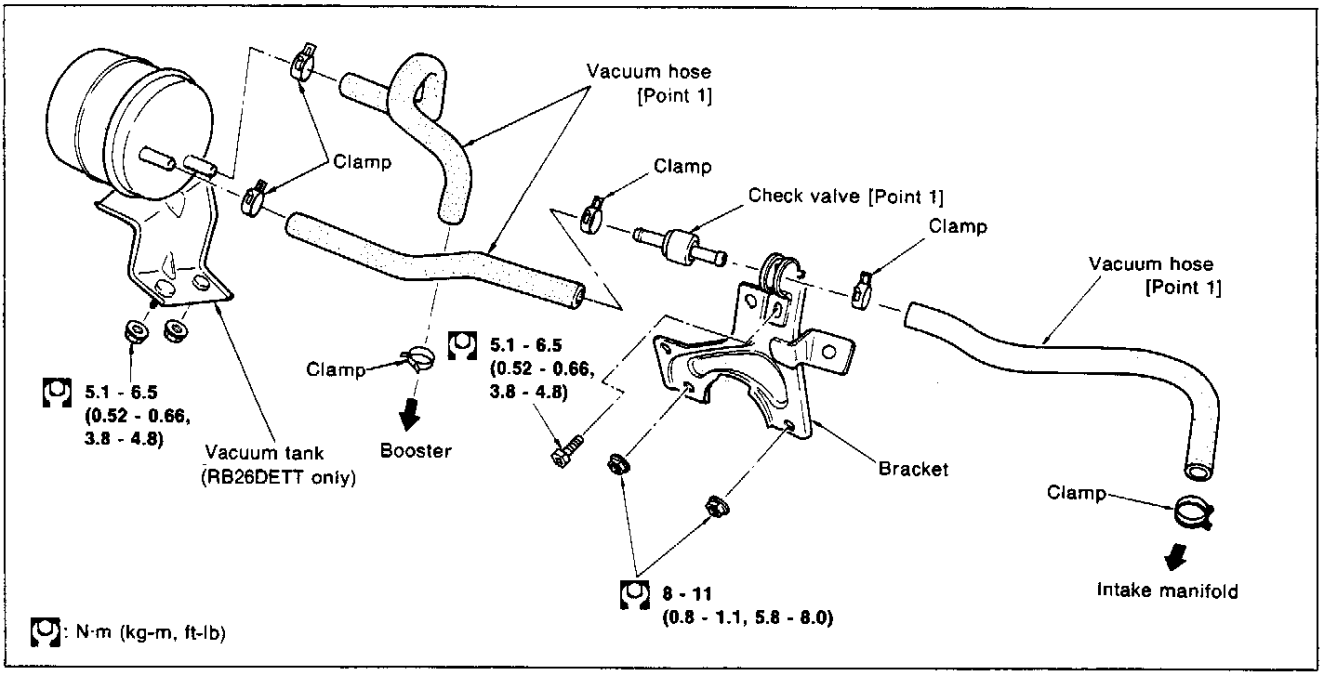


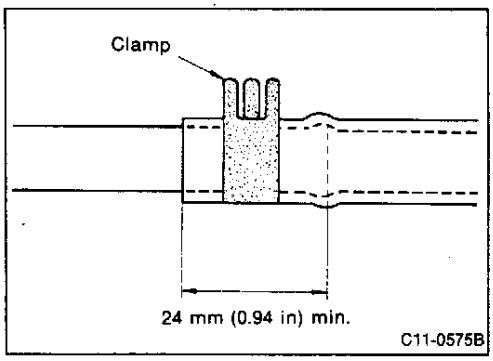
[Point 1] Clevis pin removal and installation

- Check that plastic stopper on end of clevis pin is not damaged or deformed. Replace if necessary.
- Insert clevis pin from right side as shown in figure. Install securely with snap pin.

4. Removal and Installation, Assembly and Disassembly (Cont'd)

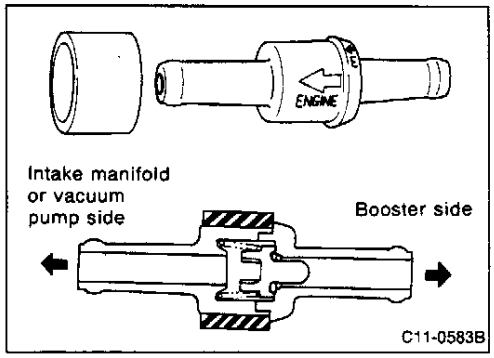
4-3 VACUUM PIPE REMOVAL AND INSTALLATION (vehicles equipped with RB26DETT engine)





[Point 1] Vacuum hose installation

- Insert hose at least 24 mm (0.94 in).
- Do not use lubrication oil to install hose.



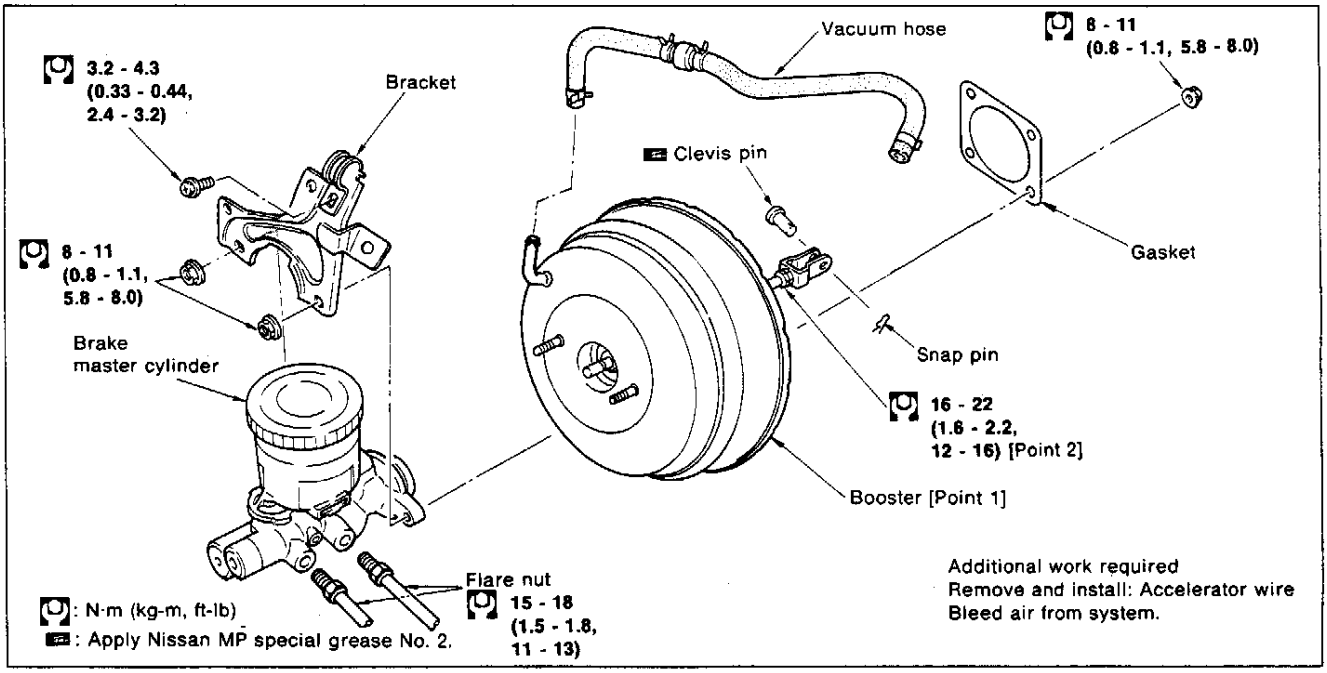
[Point 2] Check valve installation

- Assemble check valve with arrow mark facing engine side (intake manifold side).

4. Removal and Installation, Assembly and Disassembly (Cont'd)

4-4 MASTER CYLINDER AND BOOSTER

(1) Removal and installation



[Point 1] Booster removal and installation

Removal

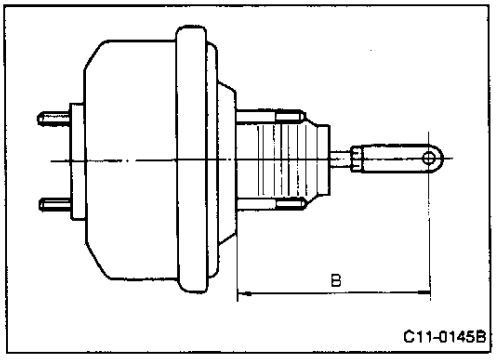
- Separate master cylinder and brake tube.
- Remove snap pin and clevis pin.
- Remove pedal bracket and nuts (4) and remove from engine compartment.

Installation

- Assembly is the reverse of disassembly.
- After installing booster, temporarily tighten master cylinder. Install brake tubes and then tighten master cylinder bolts to specified torque.

CAUTION:

Be careful not to scratch reservoir tank or body during removal and installation.



[Point 2] Operating rod standard dimension adjustment

- Loosen lock nut and adjust operating rod so dimension B is standard length.

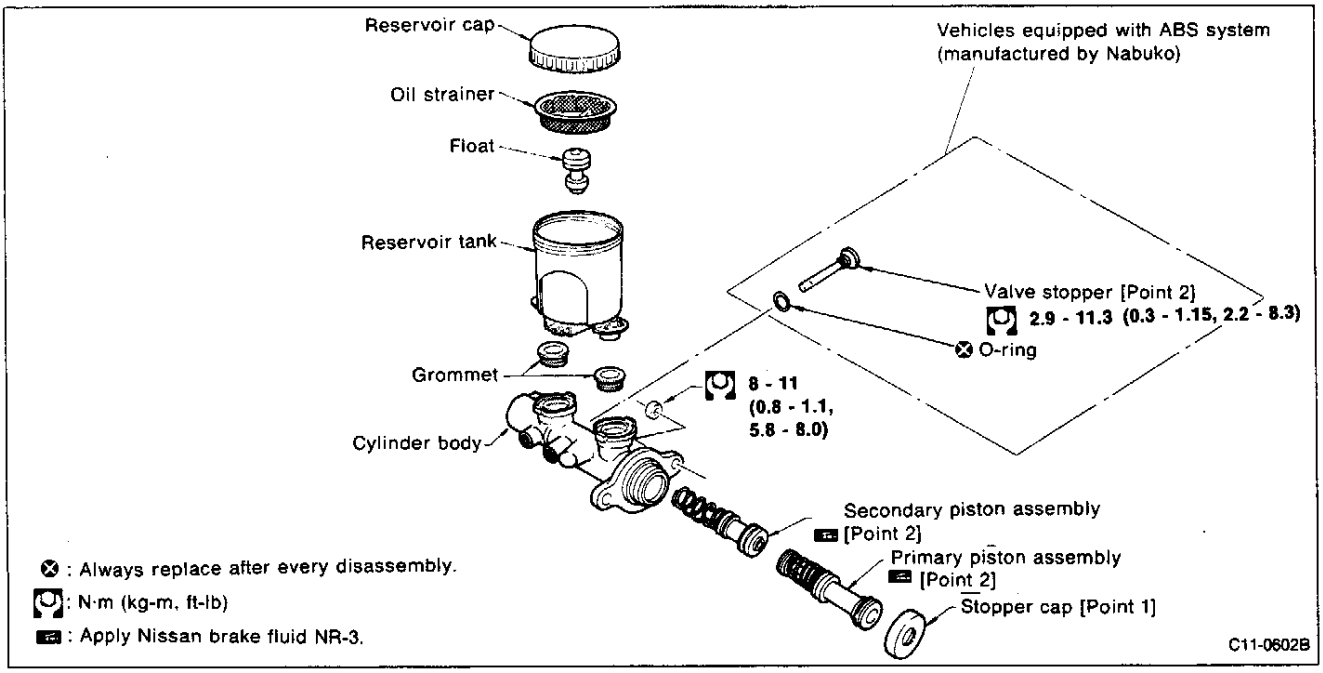
  B dimension specification length:

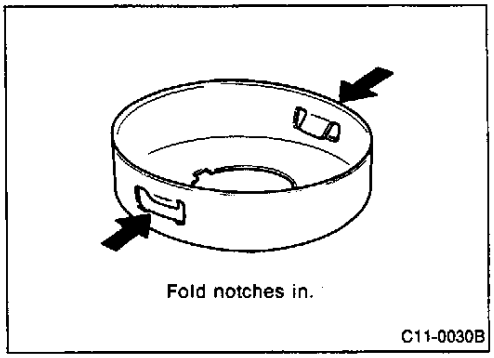
  142 - 149 mm (5.59 - 5.87 in)

- After adjustment, temporarily tighten lock nut. After installation in vehicle, adjust pedal height and play. Tighten lock nut to specified torque.

4. Removal and Installation, Assembly and Disassembly (Cont'd)

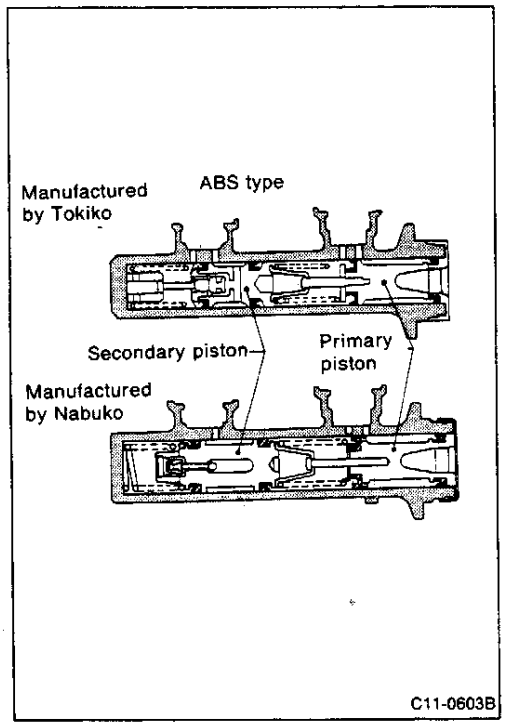
(2) Master cylinder assembly and disassembly





[Point 1] Stopper cap installation

- If notches are bent or deformed replace stopper cap.
- Fold notches in and insert cap.



4. Removal and Installation, Assembly and Disassembly (Cont'd)

[Point 2] Inner kit assembly installation

- Always replace assembly with inner kit.
- Check cup direction and install.
- While pressing primary piston with Phillips screwdriver, install valve stopper.

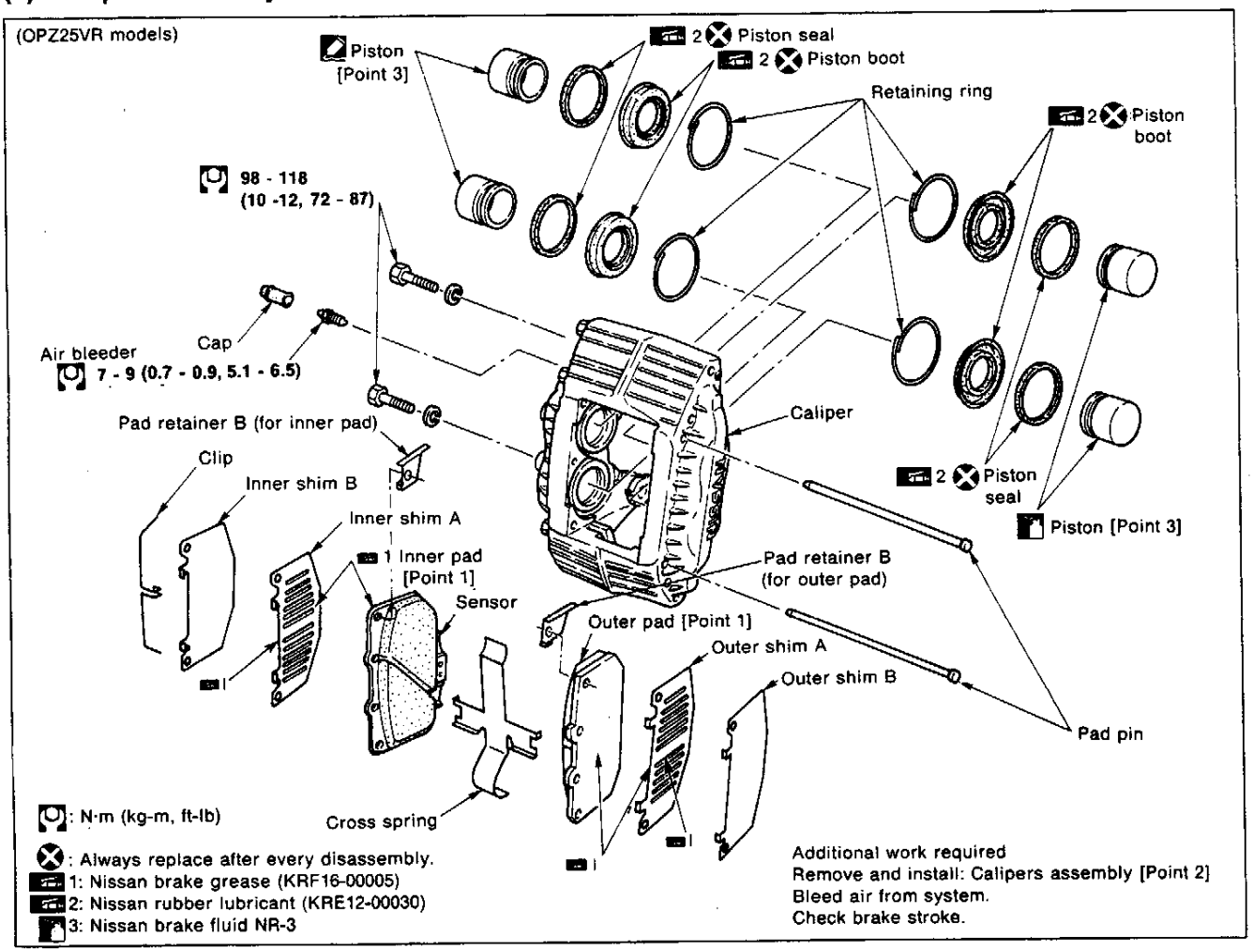
CAUTION:

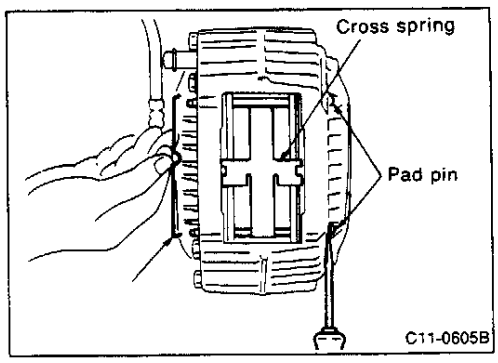
Do not wash with mineral oil because it may deform or damage rubber parts.

4. Removal and Installation, Assembly and Disassembly (Cont'd)

4-5 FRONT BRAKE

(1) Caliper assembly removal and installation, assembly and disassembly (OPZ25VR model)





[Point 1] Pad removal and installation

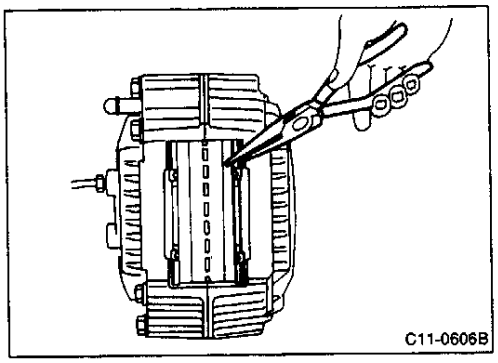
Removal

- Remove clip from pad pins.
- While pressing cross spring, remove pad pins.

CAUTION:

Check pad pins and clips for fatigue, deformation, damage and rust. Replace with new parts if necessary.

4. Removal and Installation, Assembly and Disassembly (Cont'd)



- Use pliers to remove pads when attached to shims.

CAUTION:
Check calipers and piston boot for damage, rust and deformation. Replace parts as necessary.

- Remove shim and pad retainer from pads.

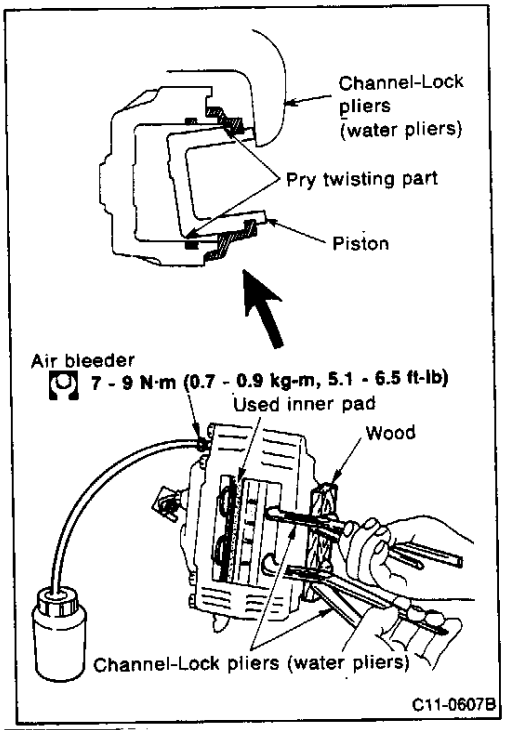
CAUTION:
If the shim or shim cover are rusted or rubber coat is peeled, replace with new part.

Pad replacement

- If pad thickness does not exceed wear limit indicated below, compress inner and outer pistons to install new pads.

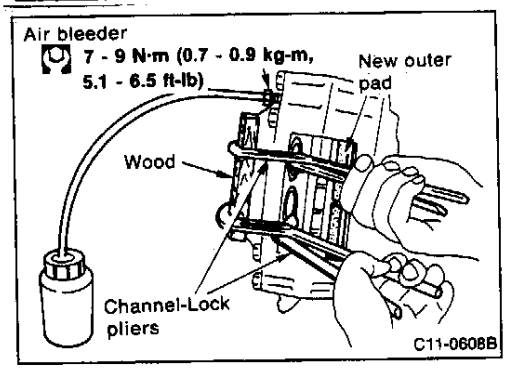
Inspection specifications

Model	OPZ25VR
Wear limit mm (in)	2 (0.08)
(Reference) New pad thickness mm (in)	11.5 (0.453)



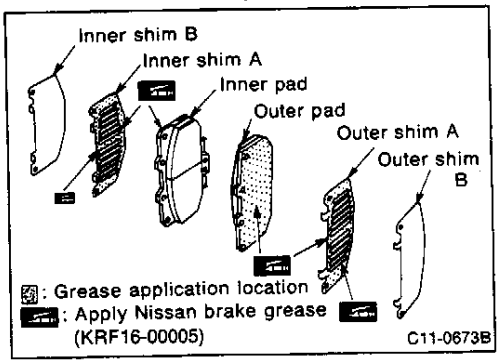
- Install old inner pad as shown in figure to prevent piston from popping out.
- Release air bleeder and use pliers to compress two outer pistons simultaneously. Place wood on outside to prevent scratching calipers.

CAUTION:
(1) Connect vinyl tube to air bleeder and be careful not to get brake fluid on body.
(2) When pressing piston into calipers, change pressure position of outer pliers so piston does not jam in cylinder.
(3) Temporarily tighten wheel nuts so disc does not incline.



- Remove old inner pad and install new outer pad as shown in figure so outside piston does not pop out.
- Place wood on outer side as described above. Use pliers to compress two inner pistons simultaneously.
- Tighten air bleeder.
- Remove new outer pad to compress inner and outer pistons and complete operation.

CAUTION:
(1) After replacing brake pads, bleed air from system.
(2) Replace pads as a set on both left and right wheels at the same time.

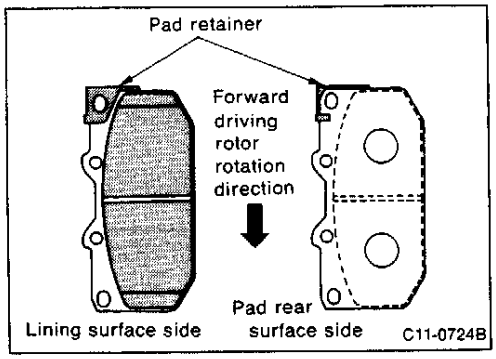


Installation

- Apply a uniform coat of Nissan brake grease [approx. 0.7 to 10 g (0.025 to 0.353 oz)] to rear metal surface of inner and outer pads and to both sides of shim A.

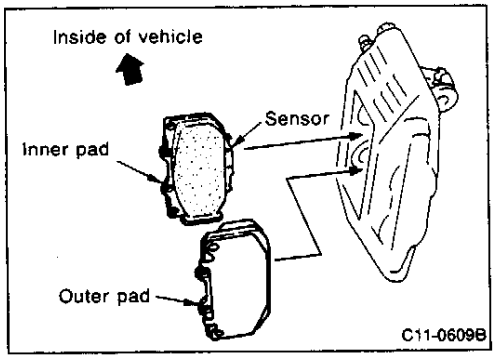
CAUTION:
(1) Wipe off excess brake grease so it does not adhere to pad friction surface or caliper installation surface.
(2) Install shims A and B in sequence shown in figure.

4. Removal and Installation, Assembly and Disassembly (Cont'd)

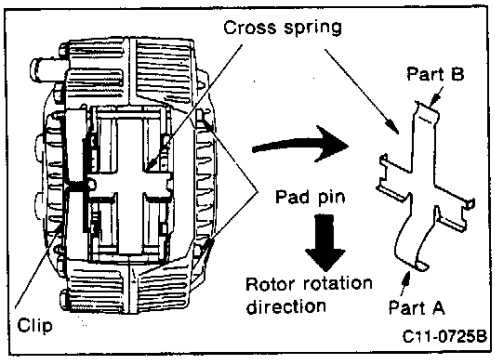


- Assemble inner and outer pad so pad retainer faces opposite side of forward driving disc rotation direction (upper side of installed calipers).

CAUTION:
Omission or incorrect assembly of pad retainer may cause abnormal brake noise.



- Assemble pad so sensor faces inside of vehicle.



- Insert lower pad pin securely from outer cylinder side through lower pad hole to inner cylinder side.
- Set part A of cross spring on lower pad pin as shown in figure. Press part B in and insert upper pad pin from outer cylinder side to inner cylinder side and secure with cross spring.

CAUTION:
If the cross spring installation direction and position are incorrect it may cause squeaking or abnormal noise.

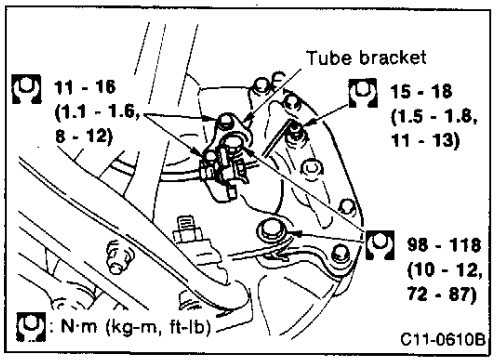
- Insert clip securely in small hole in the end of upper pad pin.
- Rotate pad pin and insert clip in the small hole in the end of pad pin. Next, insert curved projection in middle of clip into hole in middle of inner cylinder.

CAUTION:
(1) If clip assembly is incorrect, the pad pin or pad itself may fall out during driving causing braking malfunction.
(2) When replacing pads with new parts, bleed air from system.

[Point 2] Caliper removal and installation

CAUTION:
(1) Do not remove four caliper inner and outer sides. Do not tighten these bolts.
(2) The caliper and knuckle housing are manufactured of aluminum alloy and are softer than steel. Be sure to use a half-seat washer for the caliper washer to prevent scratching the installation surface.

4. Removal and Installation, Assembly and Disassembly (Cont'd)

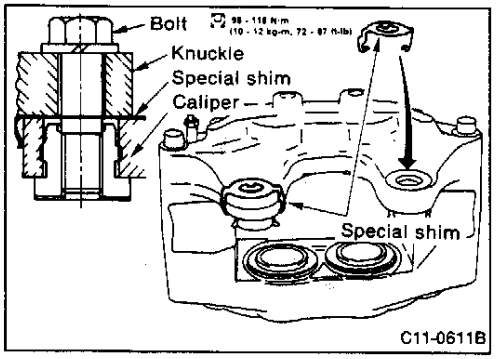


Removal

- Remove brake tube and tube bracket.
- Remove mounting bolts and remove calipers.

CAUTION:

Suspend caliper assembly with wire to prevent brake hose fro stretching.



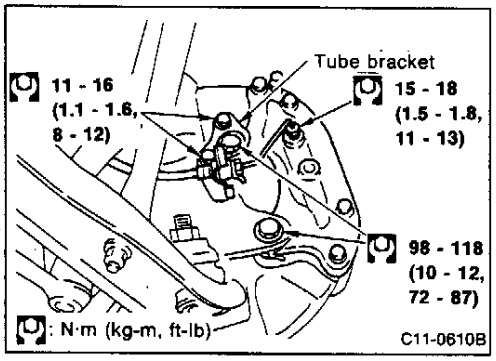
Installation

- Install special shims on both sides of caliper as shown i figure. Next, install knuckle housing.

CAUTION:

(1) The caliper and knuckle housing are manufactured of alu minum alloy and are softer than steel. Be especially care ful not to damage the seating surface during installatio because this may cause bolt looseness or abnormal oper ation noise.

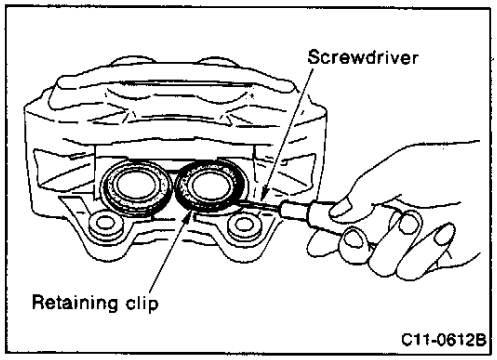
(2) Make sure there is no water or oil on knuckle housing an caliper installation surface or threads, bolts and washers



- Install calipers as shown in figure and tighten mountin bolts to specified torque.
- Install brake tube and tube bracket and tighten to specifie torque.

CAUTION:

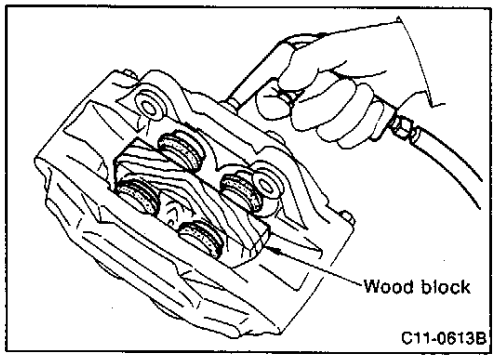
Check that brake tubes are not twisted or bent.



[Point 3] Piston removal and installation

Removal

- Remove retaining ring with screwdriver.



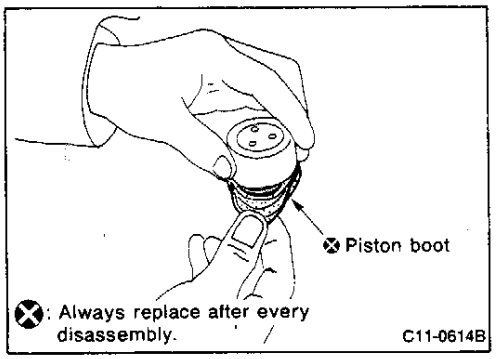
- Insert wood block as shown in figure, blow compressed a into brake tube installation hole and to push out piston an boot. Adjust air so four pistons all extend the same distanc from calipers.

CAUTION:

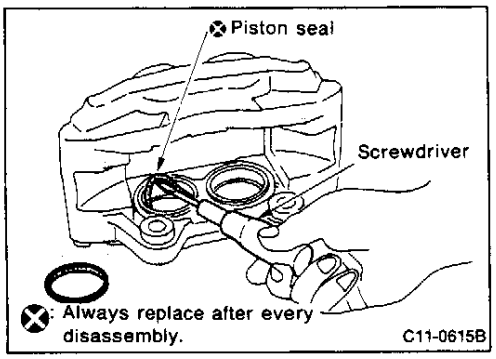
(1) Be careful so brake fluid does not spray out.

(2) When pressing out piston with compressed air, be carefi so fingers are not pinched between wood and piston.

4. Removal and Installation, Assembly and Disassembly (Cont'd)



- Remove piston boot from piston.

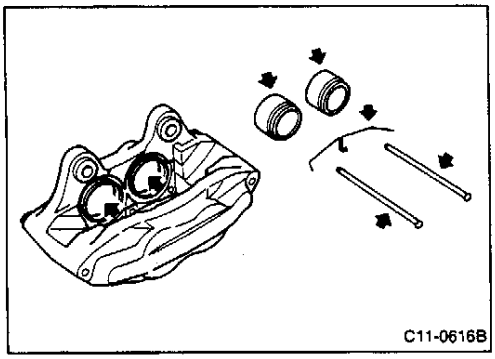


- Remove piston seal with screwdriver.

CAUTION:

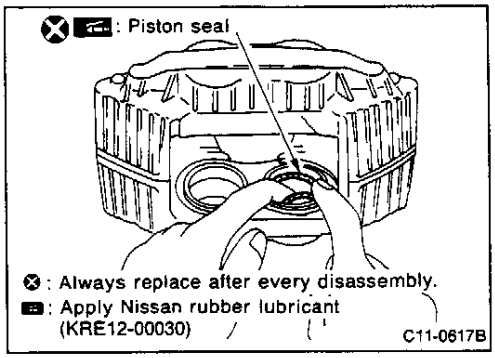
(1) Be careful not to scratch or score inside of cylinder with screwdriver.

(2) Do not remove the four mounting bolts on the inner and outer side of caliper. Do not tighten bolts either.



Disassembly inspection

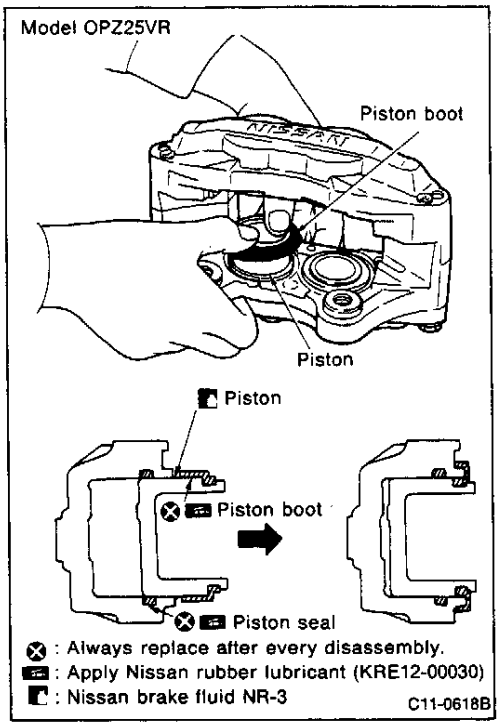
- Check inside surface of cylinder and piston for damage, wear or rust. If any of these conditions are observed replace parts as necessary.
- If there is leakage from aligned surface of cylinder body or other problem, replace caliper assembly.
- Check pad pin, cross spring, clip and shim for damage, deformation or rust. Replace if any of these conditions are noted.



Installation

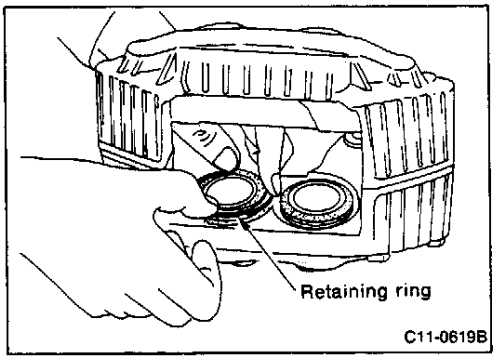
- Apply Nissan rubber lubricant to piston seal and install cylinder body.

4. Removal and Installation, Assembly and Disassembly (Cont'd)

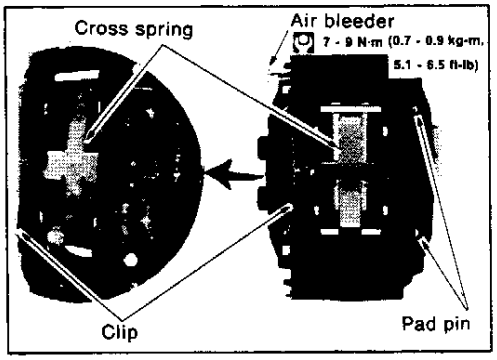


- Attach piston boot to rear of piston and install correctly in piston groove. (Apply rubber lubricant to boot before installing piston.)
- Insert piston in cylinder body by hand. Install cylinder lip correctly in piston boot groove.

CAUTION:
When pressing piston, change pressure position on piston to prevent insertion at incorrect angle.



- Secure piston boot with retaining ring.



[Point 4] Misalignment inspection

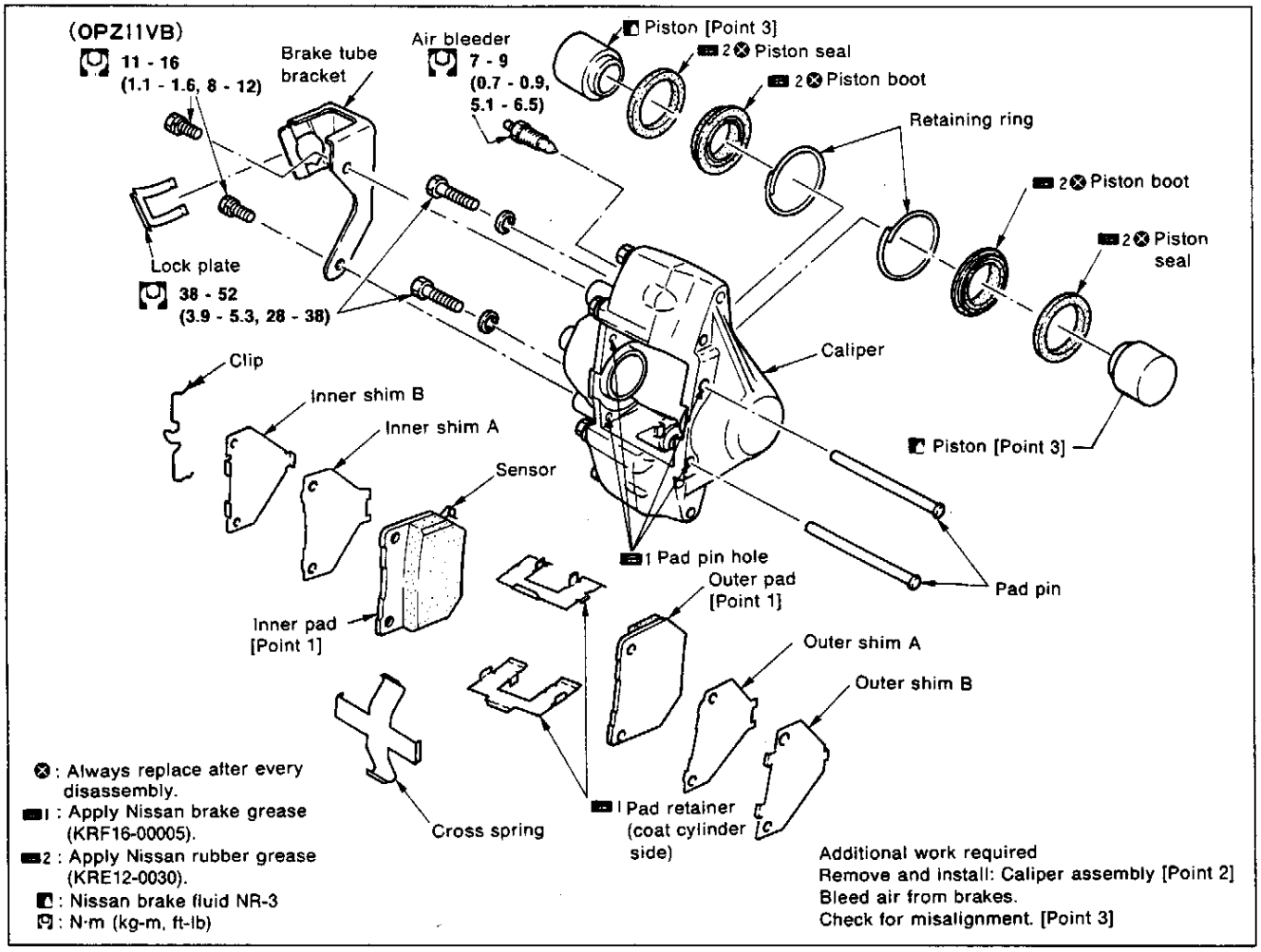
- Assemble pad and bleed air from brakes. Press on brake pedal with approximately 196 N (20 kg, 44 lb) of force for 5 seconds.
- Release brake pedal, turn disc 10 times and check for misalignment or binding.

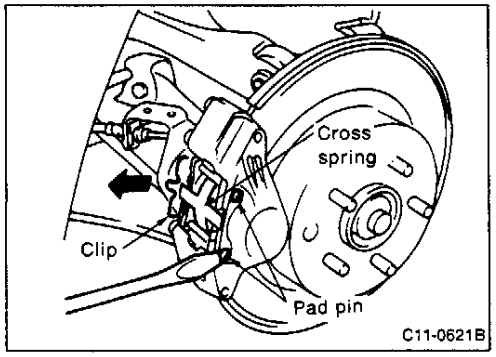
CAUTION:
(1) The pad and disc must be dry.
(2) The wheel bearing must be normal.

4. Removal and Installation, Assembly and Disassembly (Cont'd)

4-6 REAR BRAKE

(1) Disc brake caliper assembly removal and installation, assembly and disassembly (model OPZ11VB)





[Point 1] Pad removal and installation

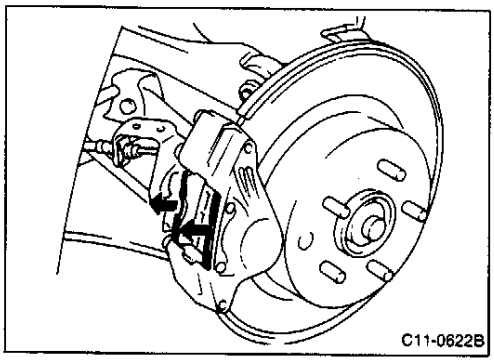
Removal

- Remove clip from pad pin.
- While pressing cross spring by hand, remove pad pin.

CAUTION:

Check pad pin and clip for fatigue, damage and rust. If any of these conditions are observed, replace with new part.

4. Removal and Installation, Assembly and Disassembly (Cont'd)



- Remove pad from calipers with shims attached.

CAUTION:
Check calipers and piston for fatigue, damage and rust. If any of these conditions are observed, replace with new part.

- Remove shims and shim cover from pad.

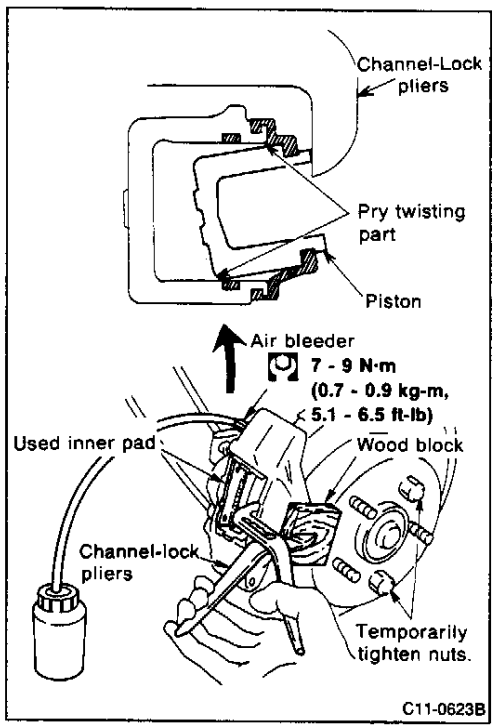
CAUTION:
If there is rust or a rubber peeling coat on shim and shim cover, replace with new parts.

Pad replacement

- If pad thickness exceeds wear limit indicated below, compress inner and outer pistons to install new pads.

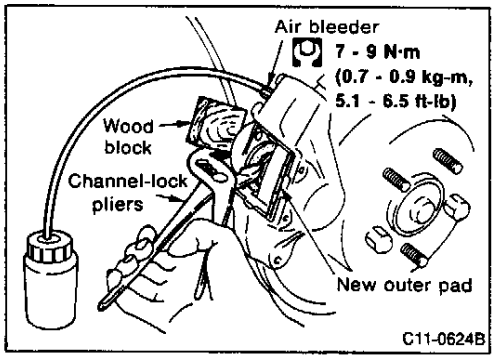
Inspection specifications

Model		OPZ11VB
Wear limit	mm (in)	2 (0.08)
(Reference) New pad thickness	mm (in)	11.5 (0.453)



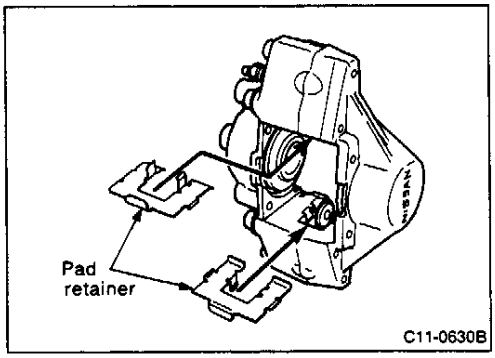
- Install old inner pad as shown in figure to prevent piston from popping out.
- Release air bleeder and use pliers to compress two outer pistons simultaneously. Place wood block on outside to prevent scratching calipers.

CAUTION:
(1) Connect vinyl tube to air bleeder and be careful not to get brake fluid on body.
(2) When pressing piston into calipers, change pressure position of outer pliers so piston does not jam in cylinder.
(3) Temporarily tighten wheel nuts in criss-cross pattern so disc does not incline.



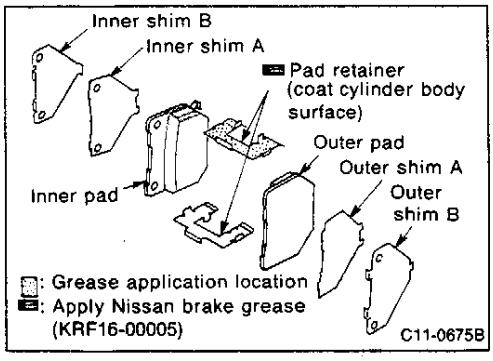
- Remove old inner pad and install new outer pad as shown in figure so outside piston does not pop out.
- Place wood on outer side as described above. Use pliers to compress two inner pistons simultaneously.
- Tighten air bleeder.
- Remove new outer pad to compress inner and outer pistons and complete operation.

CAUTION:
(1) After replacing brake pads, bleed air from system.
(2) Replace pads as a set on both left and right wheels at the same time.



- Remove pad retainer from caliper.

4. Removal and Installation, Assembly and Disassembly (Cont'd)

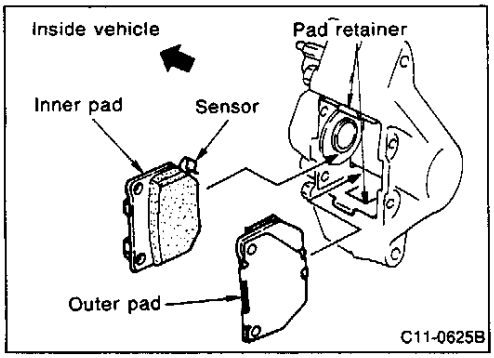


Installation

- Apply a uniform coat of Nissan brake grease to cylinder body side surface of pad retainer.

CAUTION:

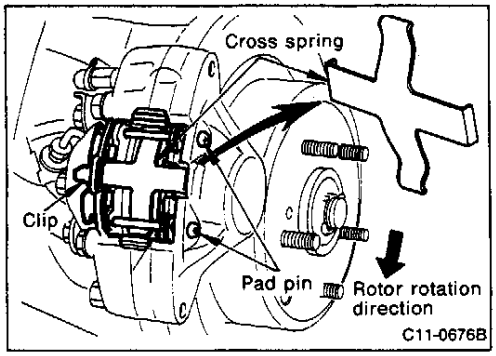
(1) Wipe off excess brake grease so it does not adhere to pad wear surface or caliper installation surface.
(2) Install shims A and B in sequence shown in figure.
(3) Apply grease to contact area between pad retainer and cylinder body because it may rust.



- Install pad retainer in caliper.
- Assemble pad so sensor faces inside of vehicle.

CAUTION:

Omission or incorrect assembly of pad retainer may cause abnormal brake noise.



- Insert lower pad pin securely from outer cylinder side through lower pad hole to inner cylinder side.
- Set cross spring on lower pad pin as shown in figure. Insert upper pad pin from outer cylinder side to inner cylinder side and secure with cross spring.

CAUTION:

If the cross spring installation direction and position are incorrect it may cause squeaking or abnormal noise.

- Using Phillips screwdriver (+), rotate pad pin and insert clip in the small hole in the end of pad pin.

CAUTION:

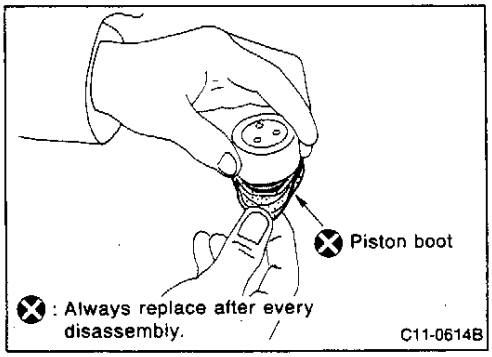
(1) If clip assembly is incorrect, the pad pin or pad itself may fall out during driving causing braking malfunction.
(2) When replacing pads with new parts, bleed air from system.

[Point 2] Caliper removal and installation

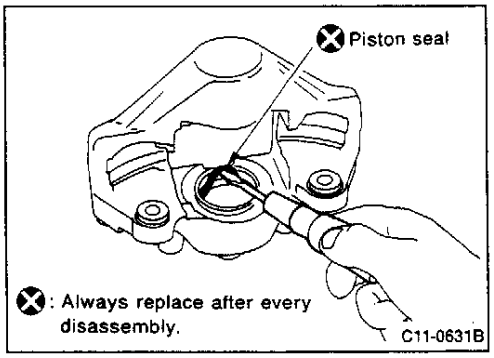
CAUTION:

(1) Do not remove the four caliper inner nuts. Do not tighten these nuts.
(2) The caliper and knuckle housing are manufactured of aluminum alloy and are softer than steel. Be sure to use a half-seat washer for the caliper washer to prevent scratching the installation surface.

4. Removal and Installation, Assembly and Disassembly (Cont'd)



- Remove piston boot from piston.

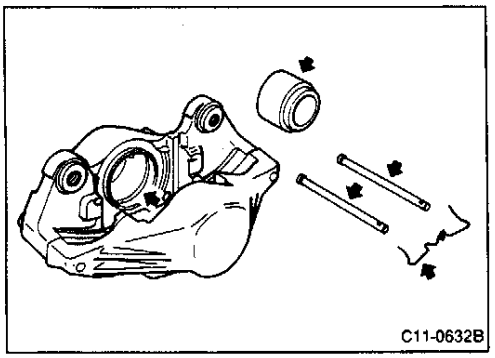


- Remove piston seal with screwdriver.

CAUTION:

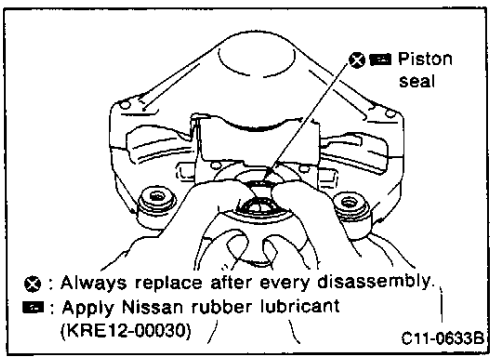
(1) Do not scratch or score inside of cylinder with screwdriver.

(2) Do not loosen four mounting bolts on inner and outer side of caliper. Do not tighten these bolts either.



Disassembly inspection

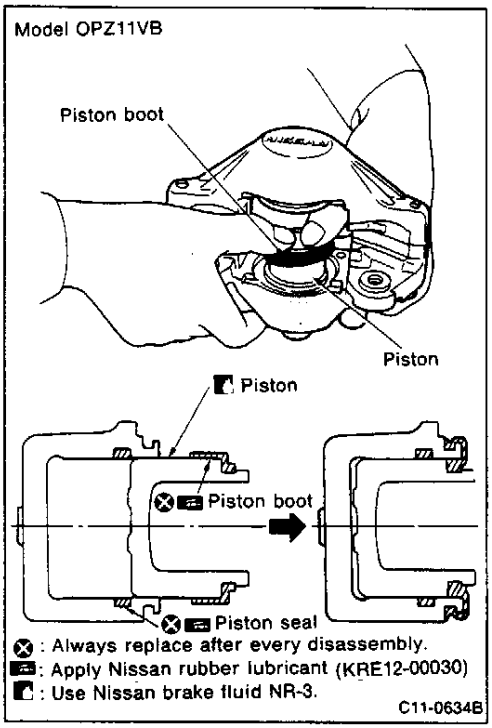
- Check inner surface of cylinder for damage, wear or rust. If any of these conditions are noted, replace parts as necessary.
- If there is leakage from cylinder body mating surface or any other problem, replace caliper assembly.
- Check pad pin, pad retainer, cross spring, clip and shims for damage, deformation or rust. If any of these conditions are noted, replace parts as necessary.



Installation

- Apply a coat of Nissan rubber lubricant to piston seal and install in cylinder.

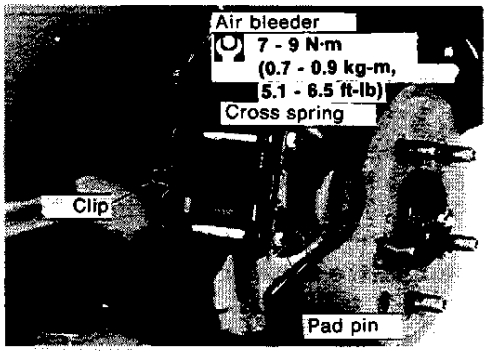
4. Removal and Installation, Assembly and Disassembly (Cont'd)



- Attach piston boot to rear of piston and install correctly in piston groove. (Apply Nissan rubber lubricant to boot before installing piston.)
- Insert piston in cylinder body by hand. Install cylinder lip correctly in piston boot groove.

CAUTION:
When pressing piston, change pressure position on piston to prevent insertion at incorrect angle.

- Secure piston boot with retaining ring.



[Point 4] Misalignment inspection

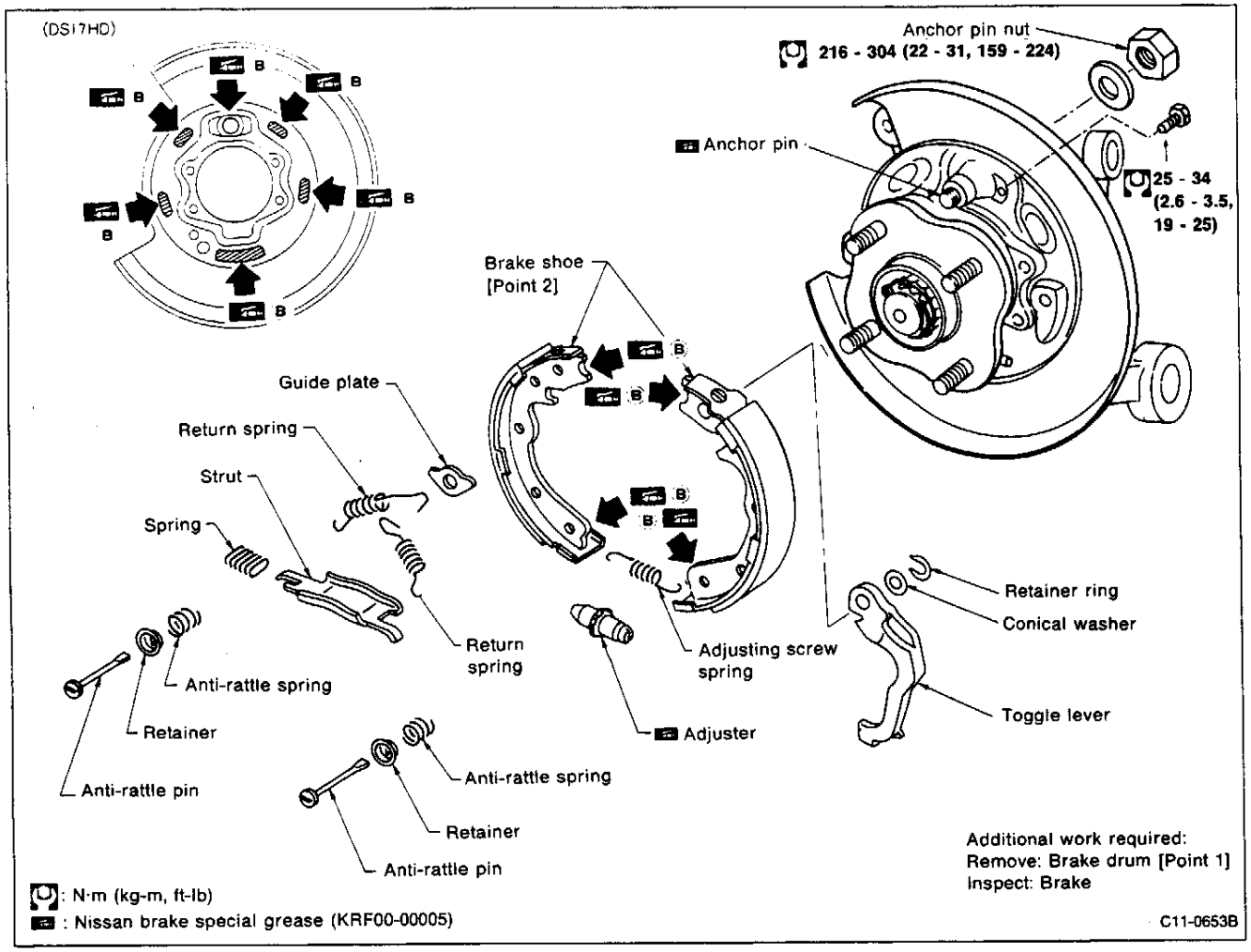
- Install pad and bleed air from brakes. Press on pedal with 196 N (20 kg, 44 lb) for force of 5 sec.
- Release brake pedal and turn disc rotor 10 times. Check for misalignment at this time.

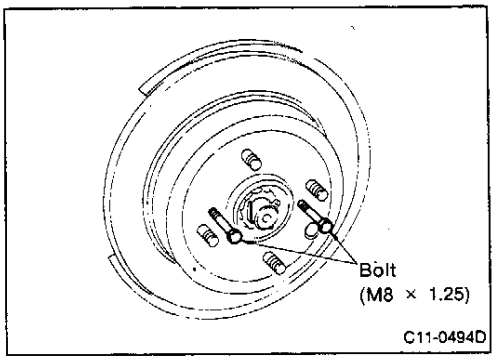
CAUTION:
(1) Pad and disc must be dry.
(2) Wheel bearings must be in normal condition.

4. Removal and Installation, Assembly and Disassembly (Cont'd)

(2) Drum brake removal and installation, assembly and disassembly

Model DS17HD



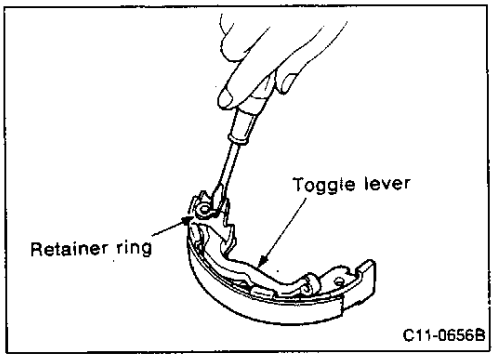


[Point 1] Brake drum removal

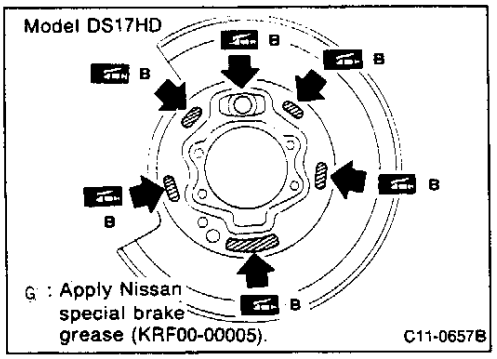
- Remove caliper assembly.
- Make sure parking brake lever and pedal are released completely.
- If drum is hard to remove, tighten two bolts gradually to free drum.

CAUTION:
Drum and baffle plate dust is collected in dust collector. Do not blow off with compressed air.

4. Removal and Installation, Assembly and Disassembly (Cont'd)

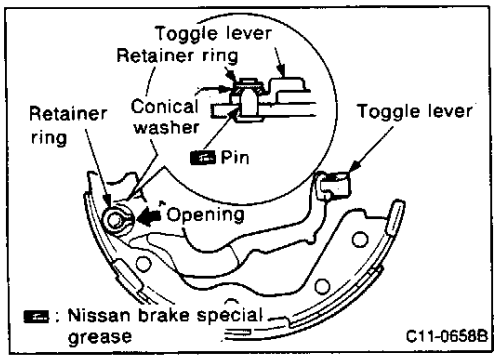


- Use screwdriver and remove retainer ring and toggle lever.



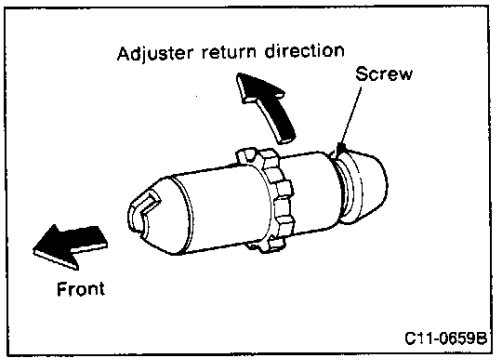
Installation

- Apply Nissan brake special grease to areas indicated by (▩) in figure and then assemble.



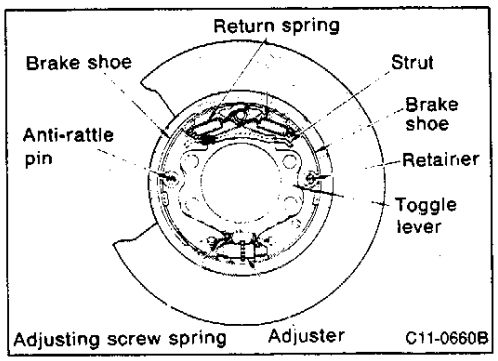
- Apply a coat of Nissan brake special grease to sliding part of toggle lever and install shoe as shown in figure.

CAUTION:
Caulk retainer ring opening unit connection.



- Turn screws of adjuster to rear side because left and right installation direction is different. Assemble adjuster so the screws widen if turned in direction of arrow.

CAUTION:
(1) When adjuster is disassembled, coat screw with Nissan brake special grease.
(2) Assemble adjuster in compressed condition.



- After assembly, check that each part is installed correctly.

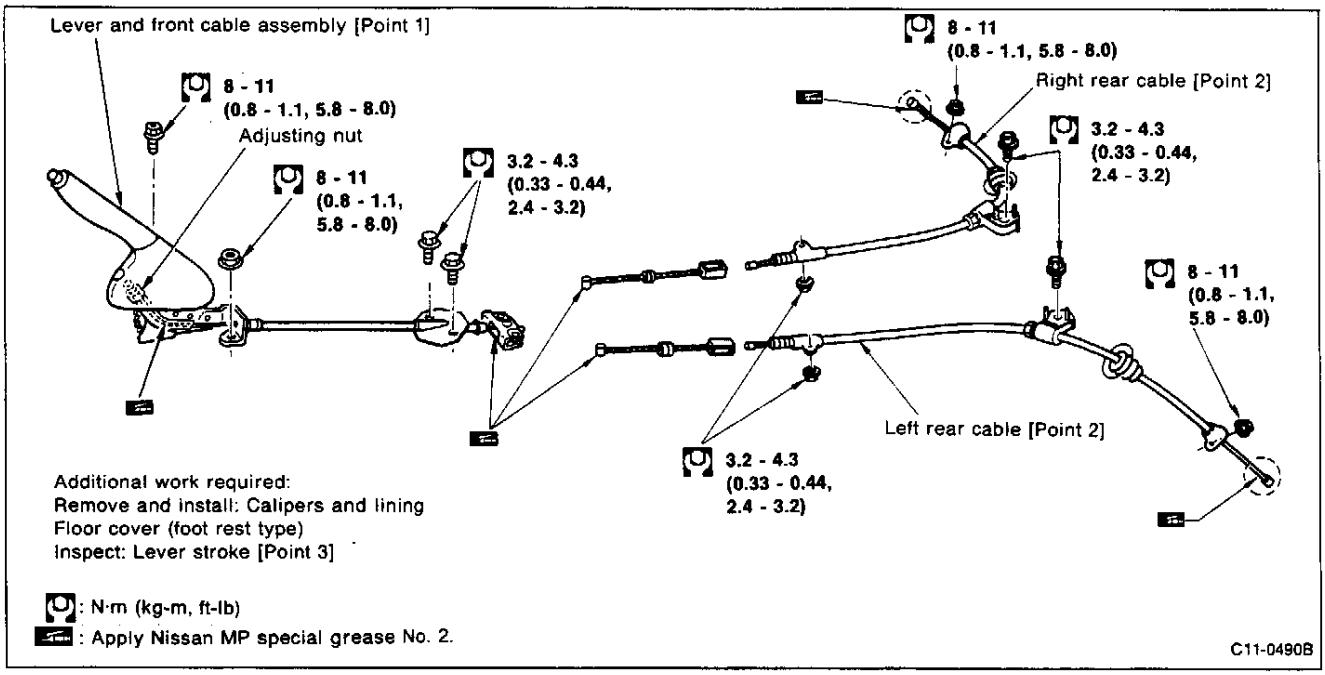
CAUTION:
Return spring is assembled from leading shoe side.

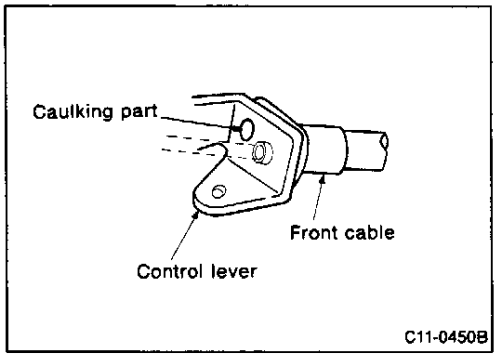
- Measure inside diameter of drum. Widen adjuster so outer diameter from middle of shoe to inner side of drum is less than 0.35 to 0.55 mm (0.0138 to 0.0217 in).
- Adjust disc rotor with wheel nut to adjust shoe clearance. Refer to "2. On-vehicle Inspection, 2-15 PARKING BRAKE INSPECTION AND ADJUSTMENT" for adjustment procedures.

4. Removal and Installation, Assembly and Disassembly (Cont'd)

4-7 PARKING BRAKE

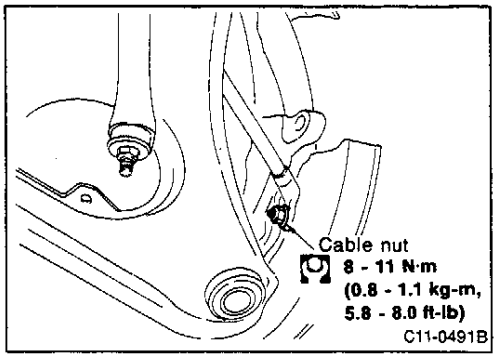
(1) Control lever and cable removal and installation, assembly and disassembly





[Point 1] Lever and front cable assembly

- Knock off caulking from control lever with hammer as shown in figure and replace with new part.

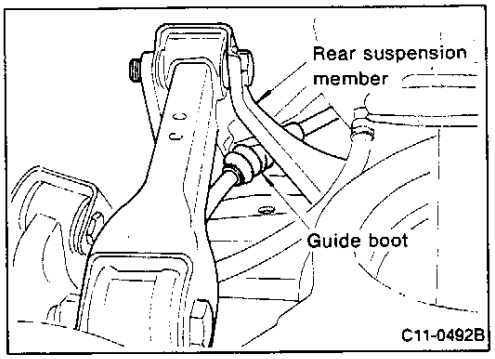


[Point 2] Rear cable removal and installation

Removal

- Remove caliper and disc.
- Remove cable nuts as shown in figure, and separate brake lining.

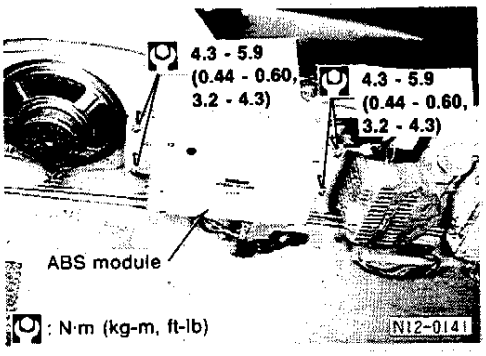
4. Removal and Installation, Assembly and Disassembly (Cont'd)



- Remove rear cable bolt. Pry off guide boot in middle of suspension member so it is free and then remove guide.

Installation

- Assembly is the reverse of disassembly.



4-8 ELECTRICAL CONTROL 4WD ABS MODULE REMOVAL AND INSTALLATION

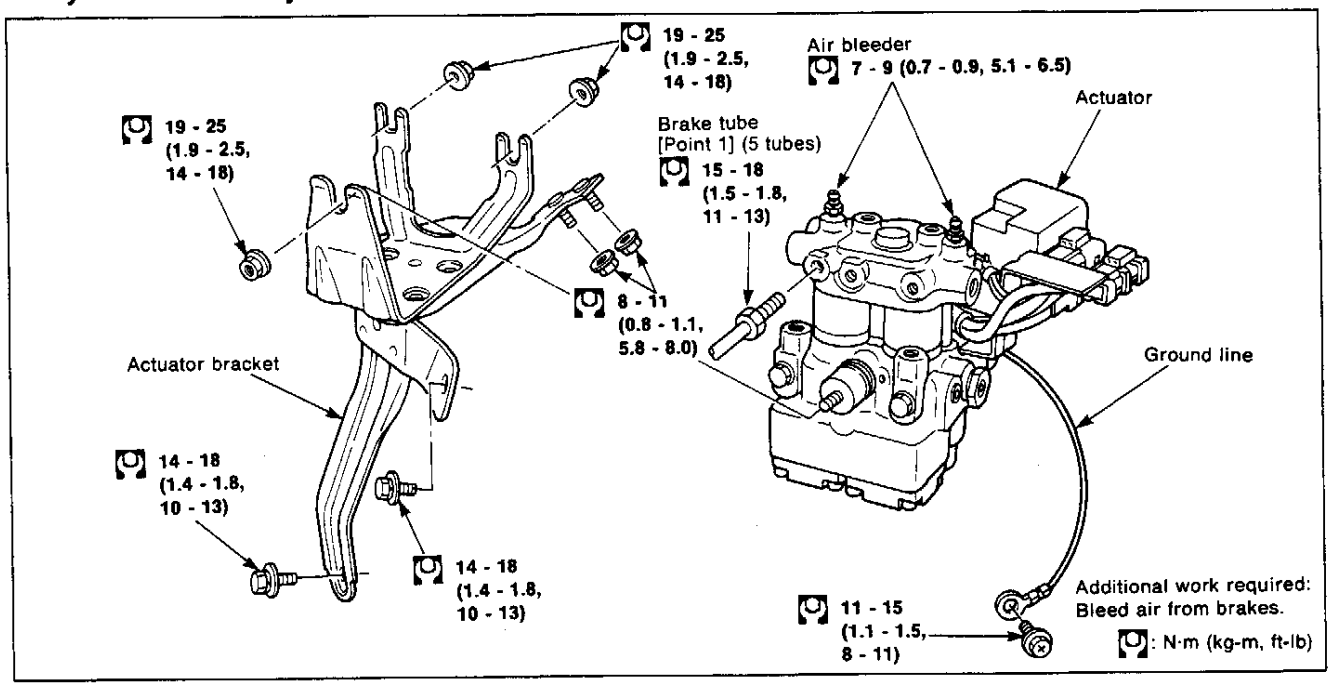
(1) ABS module removal and installation

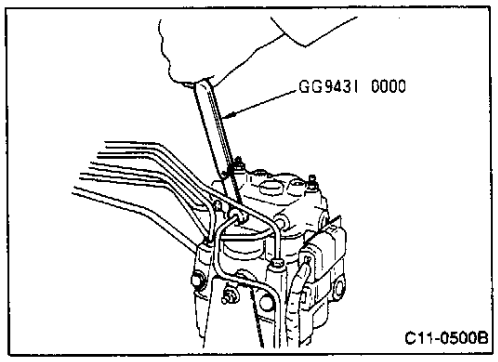
- The module is installed in the bottom of rear parcel shelf in trunk.
- The ground is installed in the top of the rear parcel shelf.

(2) Actuator removal and installation

CAUTION:

Always remove battery terminal before actuator removal and installation.





4. Removal and Installation, Assembly and Disassembly (Cont'd)

[Point 1] Brake tube removal and installation

Removal

- Use brake flare nut wrench and remove brake tube flare nuts.

Installation

- Using brake tube torque wrench (special service tool) as shown in figure, install brake pipes. Be careful not to damage pipes or flare nuts.

CAUTION:
Refer to 2-3 CHANGING BRAKE FLUID AND AIR BLEEDING for air bleeding procedures.

PRECAUTIONS

The disassembly and repair of power steering gear and pump is performed for oil leakage, noise and abnormal steering power.

(1) Part replacement

Oil leak repair is not only the replacement of leak location oil seals and O-rings. The parts specified in this manual are always replaced as kit or entire assembly. Never reuse parts as this may cause fluid leaks.

(2) Protection against foreign matter

Power steering gear and oil pump are precision hydraulic mechanisms and all disassembly should be performed in a clean work area. It is important to prevent the internal parts from becoming contaminated by dirt or other foreign matter.

① Perform assembly and disassembly operations in a vise with copper plates to protect the secured parts. Use nylon cloth or paper towels to clean the parts. Do not use common shop rags because they can leave lint, dust or metallic powder on gears or in the pump housing. Do not wear gloves and perform all operations with clean, bare hands.

② Wash disassembled parts (except rubber parts) with white gasoline and dry off with compressed air or paper towels to remove all oil.

CAUTION:
Never use cloth rags.

Do not wash rubber parts with white gasoline. Clean off with compressed air or paper towels.

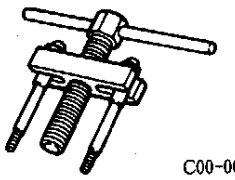
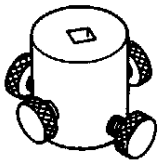
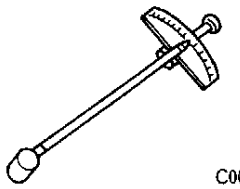
③ Store disassembled parts (including new rubber parts) on a work bench where they will not be scratched or damaged.

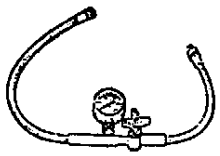
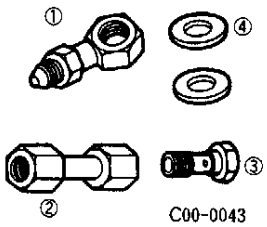
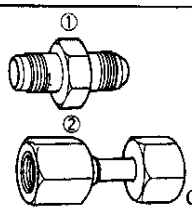
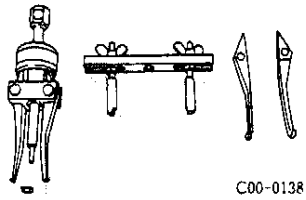
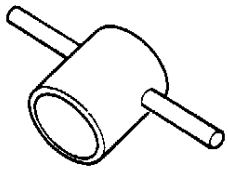
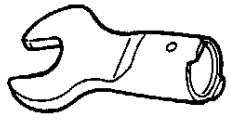
④ Before assembly, wash mating surfaces of each part again (except rubber parts) with white gasoline. Dry with compressed air (or paper towels) and store in a parts rack so they can be reinstalled in their proper positions and sequence.

When an operation must be interrupted, indicate "disassembly" and cover parts with a clean cover.

CAUTION:
A special dust-proof area is not required but all assembly and disassembly should be done in a clean work area. It is important to prevent the internal parts from being contaminated by dirt or other foreign matter.

SPECIAL SERVICE TOOLS

Tool name Tool number	Description	
Steering wheel puller ST2718 0001	 C00-0036	Removing steering wheel
Torque adapter KV481 3400	 C00-0040	Measuring steering gear pinion rotating torque
Preload gauge ST3127 S000	 C00-0039	Measuring steering gear pinion rotation torque and ball joint sliding torque.

Tool name Tool number	Description	
Oil pressure gauge KV481 03500 (former ST2909 1000)	 C00-0042	Measuring oil pump pressure
Pressure gauge adapter KV481 02500 ① KV481 02500-01 (I-joint) ② KV481 02500-02 (flare joint) ③ KV481 02500-03 (bolt) ④ KV481 02500-04 (washer)	 C00-0043	Same as above
Pressure gauge adapter KV481 00410 ① KV481 00400-1 ② KV481 00400-2	 C00-0238	Same as above
Oil seal puller ST3329 0001	 C00-0138	Removing oil seals
Teflon ring correction tool KV481 04400	 C00-0142	Assembling steering gear
Wrench KV481 04300	 C00-0143	Removing electronic control oil pump solenoid

COMMERCIAL SERVICE TOOLS

Tool name Tool number	Description		
Pitman arm puller HT7256 0000	 C00-0231	Removing tie-rod	
Measurement tools	Dial gauge	Gear housing transfer quantity inspection	—
	Spring balance	Checking ball joint swing torque	

1. Summary

Specifications

Description		Engine / Steering control system	RB26DETT / Twin orifice power steering system
Steering wheel	Outer diameter	mm (in)	370 (14.57)
	Number of turns (lock to lock)		2.6
Steering column	Model		Collapsible (steel ball type)
	Tilt distance	mm (in)	30 (1.18)
	Telescope distance	mm (in)	35 (1.38)
Steering gear	Model		Rack and pinion
	Model number		PR26SE (Rotary valve twin-orifice)
	Part number (49001)		05U00
Pump	Model		Fixed injection type
	Part number (49110)		05U00 (RB26DETT)
Maximum steering angle (°)	Inner wheel		$38^{\circ}{}^{+1^{\circ}}_{-3^{\circ}}$
	Outer wheel		31°
Operation oil			Nissan power steering fluid

Inspection specifications

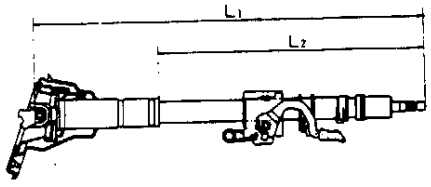
Description		Standard value
Steering wheel play	mm (in)	0 - 35 (0 - 1.38)
Steering wheel standard torque	N·m (kg-m, ft-lb)	10 (1.0, 7) max.
Gear housing movement	mm (in)	±2 (±0.08) max.
Power steering belt tension adjustment value [when 98 N (10 kg, 22 lb) of force is applied]	mm (in)	

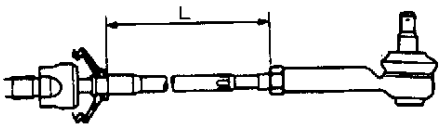
Slack distance / Engine	New value	Adjustment value	Adjustment limit
RB26DETT models	8 - 10 (0.31 - 0.39)	10 - 11 (0.39 - 0.43)	16 (0.63)

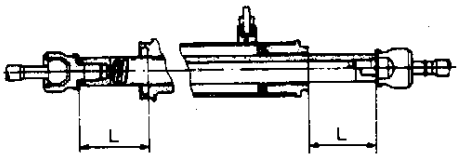
Operation oil: Nissan power steering fluid

Steering gear		PR26SE
Fluid capacity	ℓ (Imp qt)	Approx. 0.9 (3/4)

1. Summary (Cont'd)

<table>
<tr><th>Description</th><th>Standard value</th></tr>
<tr><td>Steering gear pinion rotation torque and rack sliding force</td><td>
<table>
<tr><th colspan="3">Description \ Steering gear</th><th>PR26SE</th></tr>
<tr><td rowspan="4">Pinion rotational torque N·m (kg-m, ft-lb)</td><td rowspan="2">Measured one full turn from neutral position</td><td>Average value</td><td>0.8 - 1.3 (0.08 - 0.13, 0.6 - 0.9)</td></tr>
<tr><td>Maximum variation</td><td>0.4 (0.04, 0.3 max.)</td></tr>
<tr><td rowspan="2">Other than above</td><td>Maximum value</td><td>1.9 (0.19, 1.4 max.)</td></tr>
<tr><td>Maximum variation</td><td>0.6 (0.06, 0.4 max.)</td></tr>
<tr><td colspan="2">Rack sliding force N (kg, lb)</td><td>Average value</td><td>167 - 226 (17 - 23, 37 - 51)</td></tr>
</table>
Note: Numeric values indicate performance when unit is not filled with specified fluid.
</td></tr>
<tr><td>Steering column length mm (in)</td><td>L_1 = 685.5 - 720.5 (26.99 - 28.37)
L_2 = 423.4 - 458.4 (16.67 - 18.05)
 

C12—0641C</td></tr>
<tr><td>Tie-rod length mm (in)</td><td>PR26SE model
L = 126.5 (4.98)
 

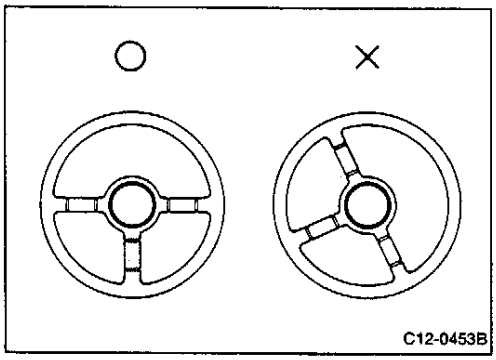
C08-0683B</td></tr>
<tr><td>Rack neutral position mm (in)</td><td>PR26SE model
L = 66.5 (2.618)
 

C12-0423B</td></tr>
<tr><td>Tie-rod ball joint</td><td>
<table>
<tr><th>Description \ Ball joint</th><th>Inner socket</th><th>Outer socket</th></tr>
<tr><td>Sliding torque N·m (kg-m, ft-lb)</td><td>—</td><td rowspan="2">0.3 - 2.9 (0.03 - 0.3, 0.2 - 2.2)</td></tr>
<tr><td>Swinging torque N·m (kg-m, ft-lb)</td><td>1 - 9 (0.1 - 0.9, 0.7 - 6.5)</td></tr>
<tr><td>Axial end play [axial load 490 N (50 kg, 110 lb)] mm (in)</td><td>0 (0)</td><td>0.5 (0.020) max.</td></tr>
</table>
</td></tr>
</table>

2. On-vehicle Inspection and Adjustment

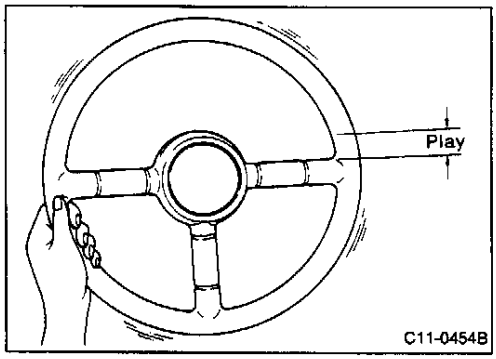
2-1 MAXIMUM STEERING WHEEL PLAY INSPECTION (Inspect with wheels at turning angle.)

- Refer to C7 Front Suspension and Axle.



2-2 STEERING WHEEL NEUTRAL POSITION INSPECTION

- Set wheels straight-ahead and visually check that steering wheel play from neutral position.
- If it is not within specification, remove steering wheel and reinstall it correctly so it is in neutral position.
- If the neutral position is between two serrated teeth loosen tie-rod lock nut and move tie-rod in the opposite direction by the same amount on both left and right sides to compensate for error in the neutral position.

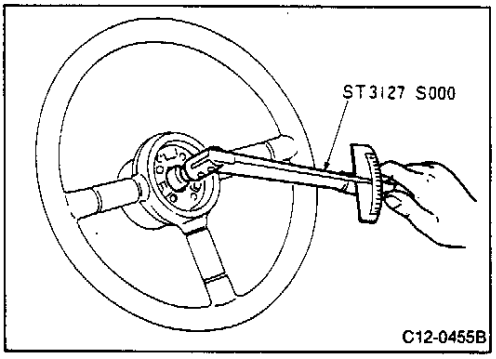


2-3 STEERING WHEEL PLAY INSPECTION

- Set tires in straight-ahead position. Start engine and turn steering wheel lightly. Measure distance until wheels start to move and check if it is within specified range.

Play distance specification value:
0 - 35 mm (0 - 1.38 in)

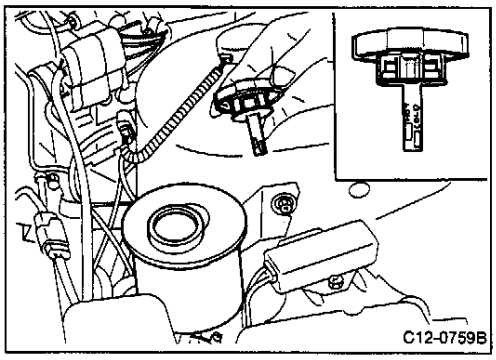
CAUTION:
Measure outside of steering wheel to determine play distance.



2-4 STEERING WHEEL STANDARD TORQUE INSPECTION

- Set vehicle on flat, dry paved road when power steering unit is warm (engine is warmed up). Measure steering wheel rotational torque with preload gauge (special service tool) when engine is running.
- Measure left and right turns.

Standard torque (dry, paved road):
10 N·m (1.0 kg-m, 7 ft-lb) max.



2-5 FLUID LEVEL INSPECTION

- The fluid level should be within the marks in level gauge. Do not overfill because fluid will drip from cap.
- Check that level gauge has HOT and COLD ranges as shown in figure.

HOT	50 - 80°C (122 - 176°F)
COLD	0 - 30°C (32 - 86°F)

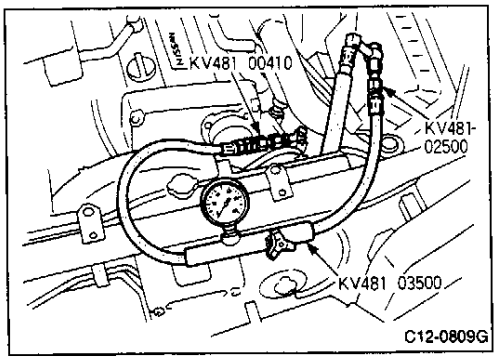
2. On-vehicle Inspection and Adjustment (Cont'd)

CAUTION:

(1) Never reuse steering fluid which has been removed.

(2) Do not mix Nissan Steering Fluid and Nissan Special Steering Fluid.

(3) Never use Nissan matic C or D fluid.



Steering model number	Relief hydraulic specification kPa (kg/cm², psi)
PR26SE models	5,884 - 6,865 (60 - 70, 853 - 995)

2-6 OIL PUMP RELIEF PRESSURE INSPECTION

Attach power steering pressure gauge (special service tool) between oil pump outlet connector and high-pressure hose.

Note 1: Special service tool: KV481 03500, KV481 02500, KV481 00410

Raise front end vehicle until wheels clear ground.

Bleed air from hydraulic system.

Note 2: Refer to "Steering Gear and Linkage" removal and installation.

Open power steering pressure gauge valve and then start engine. Operate steering wheel a few minutes until oil warms up.

Caution 1: If the valve is fully open when the engine starts, the pressure of the oil in the pump rises to the pressure of the relief value. Do not leave the valve closed all the way because oil temperature rises abnormally.

Measure relief pressure when valve is closed. Check that relief pressure is within the specified range.

Caution 2: The valve must not be closed more than 15 seconds. (Leaving valve open for extended periods of time may damage the oil pump.)

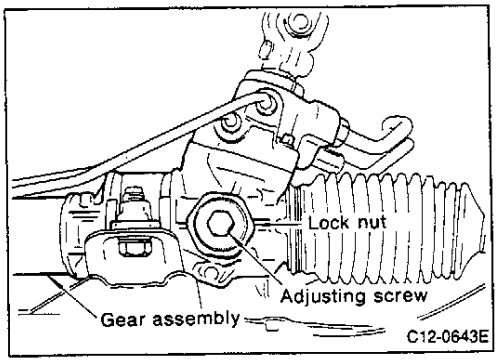
NG → Replace oil pump assembly.

OK

Remove power steering oil pressure gauge and attach high pressure hose to oil pump outlet connector.

Bleed air from hydraulic system.

Relief valve pressure inspection is completed.



2-7 ADJUSTING SCREW INSPECTION

- Perform operation test described below on level road. If any abnormality is noted, check adjusting screw and return it to normal position.

① Linearity

a) Place wheels in straight-ahead position and remove hands from wheel. Check if wheel can maintain straight-ahead position.

b) If wheel cannot be placed in straight-ahead position, loosen adjusting screw.

2. On-vehicle Inspection and Adjustment (Cont'd

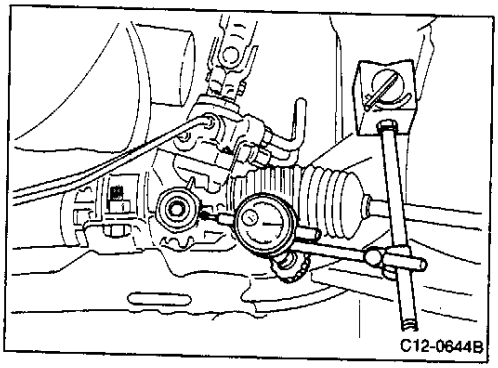
② Restoration

a) Turn the steering wheel slightly (approx. 20° - 30°) ar release wheel. Check that steering wheel returns to neutr position.

b) If return motion is poor, loosen adjusting screw slightly.

CAUTION:

The adjusting screw range is ±90°. After adjustment, remov lock nut again and remove dust and debris from seal materia Coat the lock nut with sealant (silicon bond TB1111B or equi alent) and tighten lock nut to specified torque.



2-8 GEAR HOUSING MOVEMENT INSPECTION

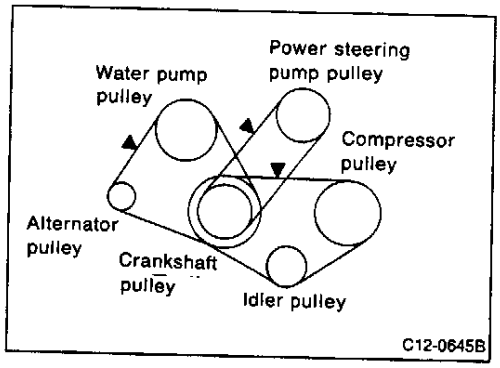
- The steering gear housing operation during stationar turns varies according to the elastic deformation of insula tor. The movement limit is indicated below.

  Gear housing movement limit:

  ±2 mm (±0.08 in) (on dry, paved road)

Note: This movement is the distance the gear housing move when 49 N (5 kg, 11 lb) of force is applied to the end o steering wheel with wheels set in straight-ahead posi tion. (Ignition switch is OFF at this time.)

- If movement is not within specification range, check gea assembly mount bracket and replace mount insulator i necessary.



2-9 BELT TENSION INSPECTION AND ADJUSTMENT

Belt tension inspection

- Inspect belt tension when engine is cold.
- Apply 98 N (10 kg, 22 lb) of force at positions indicated by arrow marks (▲) in figure and measure belt slack distance.

Specification

Unit: mm (in)

Slack distance / Engine	New part	Adjusted	Tension limit
RB26DETT models	8 - 10 (0.31 - 0.39)	10 - 11 (0.39 - 0.43)	16 (0.63)

Belt tension adjustment

- Adjust belt slack if it is less than specification (too tight) or greater than specification (too loose).

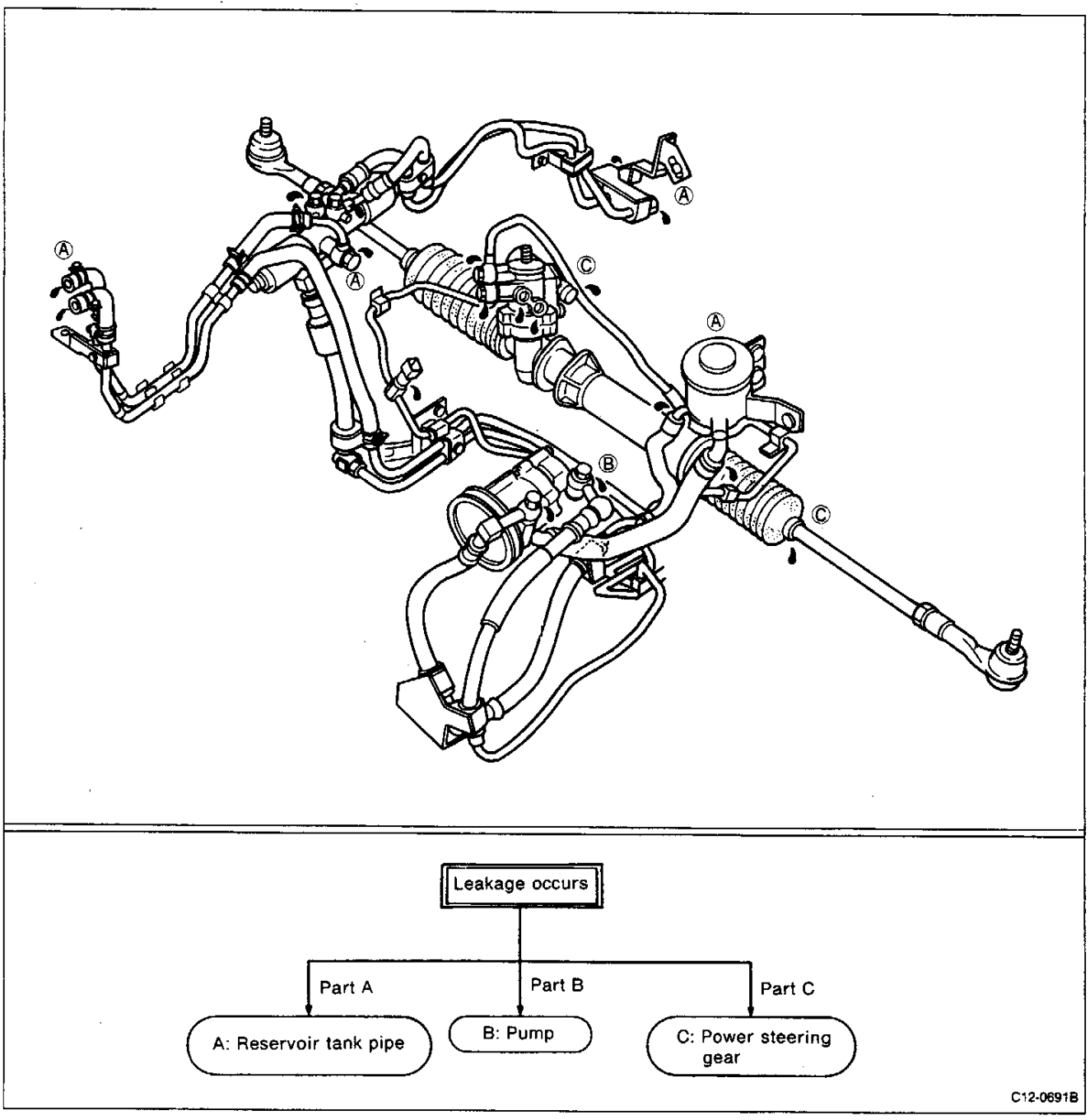
2-10 LEAKAGE INSPECTION

Precautions

① Check type of oil at leakage location. (Power steering fluid is red.)
② When leakage location is not clear, wash area with white gasoline or other solvent. (In vehicles equipped with electrically controlled power steering, do not wash harnesses or connectors directly with white gasoline or solvent. Wipe fluid off with rags immediately if fluid is attached.) Check leak positions again.
③ When repairing parts, check related parts thoroughly and replace defective parts as necessary.

(1) Leakage position inspection

PR26SE model power steering

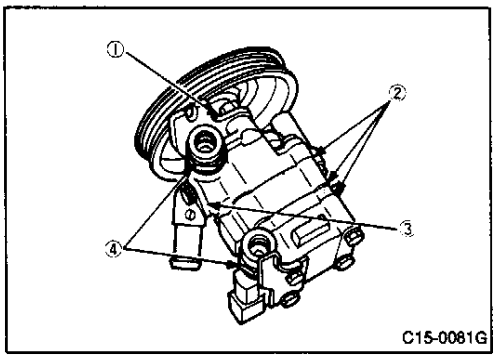


2. On-vehicle Inspection and Adjustment (Cont'd)

(2) Leaks from part Ⓐ (Reservoir tank or pipes)

Leak position	• Reservoir tank cap	• Low-pressure pipe α clamp	• Other
Repair description (replacement parts)	• Reservoir tank cap	• Low-pressure hose • α clamp	• Tube • High pressure hose • Reservoir tank
Related parts requiring inspection	• Reservoir tank	• Tube • Reservoir tank	—
Preparation procedures	Check the seals of related parts for scratches, dents or other damage. (Note) If these conditions exist, replace other parts at same time. Check oil level. If quantity is excessive, reduce it to adequate level. If oil level is correct, replace parts as necessary. If there are no cracks or other damage to low-pressure hose and α clamp positions have shifted and can be retightened, reposition α clamps and tighten again. Otherwise, replace parts as necessary. Replace appropriate parts in leak locations. Bleed air from system, inspect oil level and operational force. Check for leaks.		

Note: The standard for replacing related parts is if a fingernail scrapes or catches in a scratch.



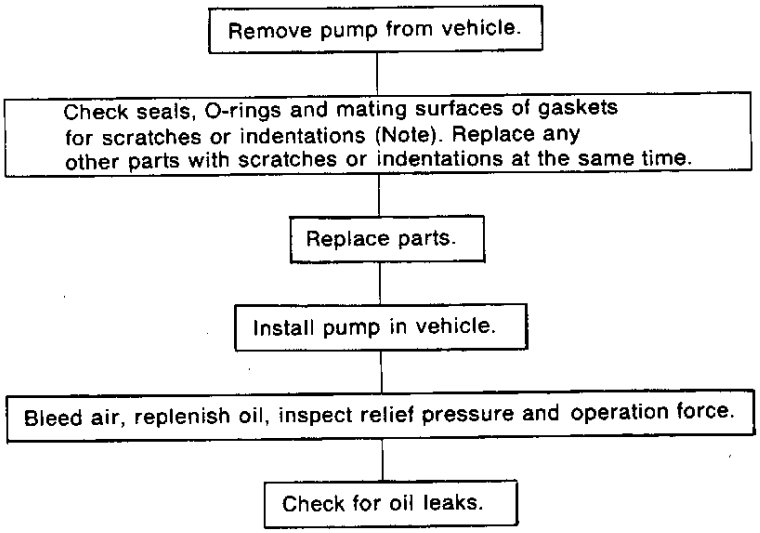
(3) Oil leak from part Ⓑ (pump)

Oil pump leak repair is separated into four types of repair depending on the leak location. Perform the suitable repair procedure for the leak location.

2. On-vehicle Inspection and Adjustment (Cont'd)

Leak location	① Drive shaft oil seal	② Housing	③ Inlet connector	④ Outlet connector
Preparation description (replacement parts)	[Kit] • Oil seal • Snap ring • Inner O-ring • Outer O-ring • Gasket • O-ring (inlet connector)	• O-ring (inlet connector)	• O-ring (inlet connector)	• O-ring (2) (flow control valve)
Related parts requiring inspection	• Drive shaft	• Front housing • Rear housing	• Inlet connector • Front housing	• Outlet connector • Front housing • Rear housing

Preparation procedures



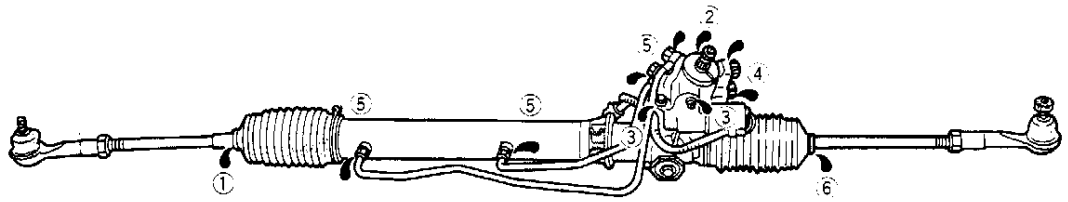
Note: The standard for replacing related parts is if a fingernail scrapes or catches in a scratch.

2. On-vehicle Inspection and Adjustment (Cont'd)

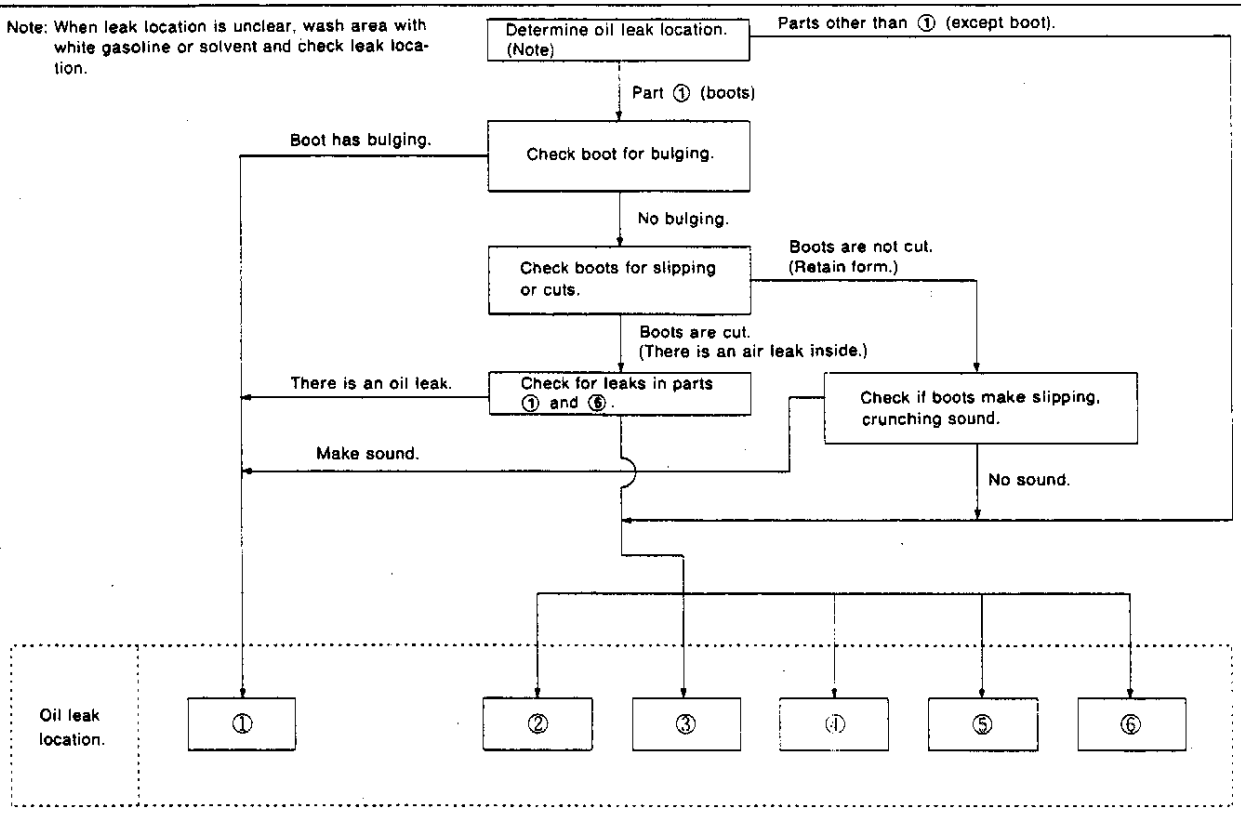
(4) Oil leak from part Ⓒ (steering gear)

Model PR26SE power steering

(Model PR26SE)



Note: Adjusting screw is included in ⑥.



C15-0043E

2. On-vehicle Inspection and Adjustment (Cont'd)

Oil leak location	① Dust boot	② Upper rear housing	③ Rear housing and gear housing mating surfaces	④ Power steering high- and low-pressure and HICAS low-pressure side connections.	⑤ Cylinder tube connections (rear housing side and gear housing side)	⑥ Dust boot
Installation check items on vehicle	—		Bolt tightening torque 20 - 24 N·m (2.0 - 2.4 kg-m, 14 - 17 ft-lb)	Pipe tightening torque Power steering side PR26SE High-pressure side: 30 - 35 N·m (3.1 - 3.6 kg-m, 22 - 26 ft-lb) Low-pressure side: 36 - 40 N·m (3.7 - 4.1 kg-m, 27 - 30 ft-lb) HICAS High-pressure side: 29 - 39 N·m (3.0 - 4.0 kg-m, 22 - 29 ft-lb) Low-pressure side: 29 - 39 N·m (3.0 - 4.0 kg-m, 22 - 29 ft-lb)	Cylinder tube tightening torque: 29 - 39 N·m (3.0 - 4.0 kg-m, 22 - 29 ft-lb) Cylinder tube union bolt tightening torque: 20 - 29 N·m (2.0 - 3.0 kg-m, 14 - 22 ft-lb)	—
Preparation description (replacement parts)	• Rack oil seal (Note 1) • O-ring (cylinder end assembly)	Gear housing assembly		• Pipes (tube sheet in port)		Gear housing assembly
Related parts requiring replacement	Gear housing assembly	—		Gear housing assembly		—
Preparation procedures	Remove pump from vehicle. ↓ Check seals, O-rings, gaskets and mating surfaces of related parts for scratches or indentations (Note). Replace any parts with scratches or indentations at same time. ↓ Replace parts. ↓ Install pump in vehicle. ↓ Bleed air, replenish oil, inspect relief pressure and operation force. ↓ Check for oil leaks.					

Note:

(1) Make sure there is no peeling around rack oil seal. If there is peeling, also replace gear housing.

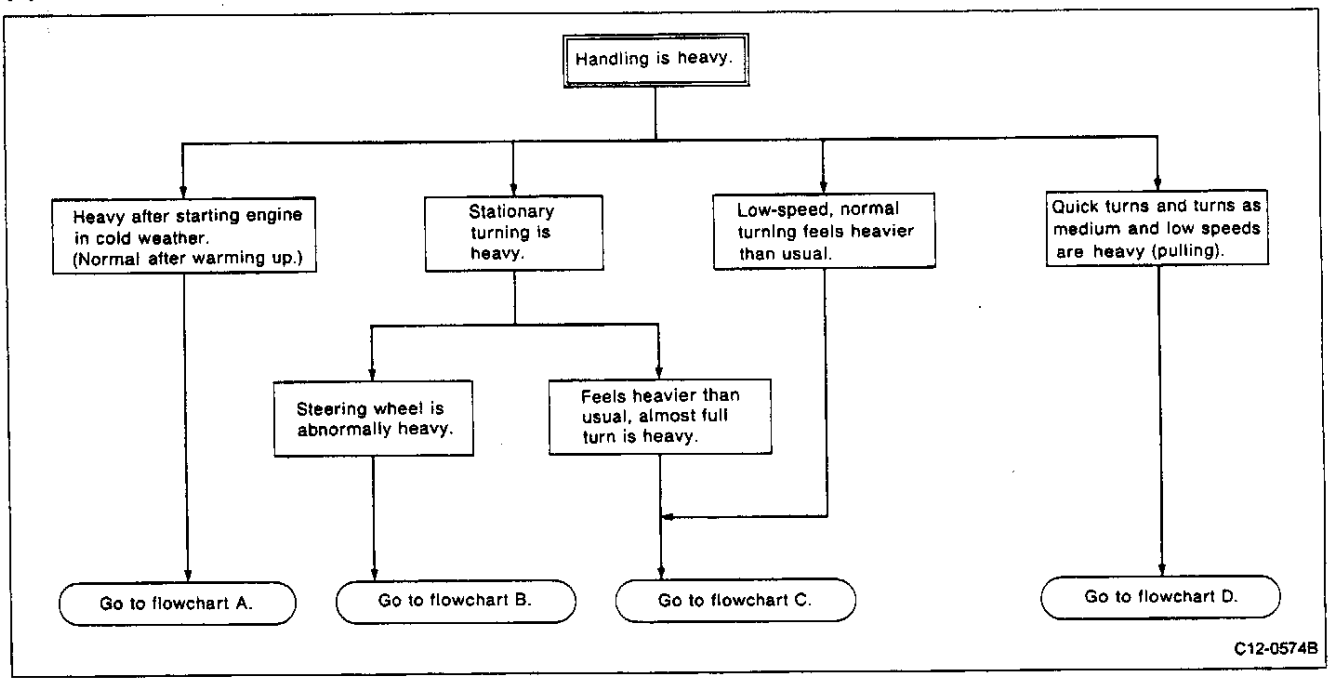
(2) The standard for replacing related parts is if a fingernail scrapes or catches in a scratch.

2-11 STEERING FORCE INSPECTION

(1) Precautions before inspection

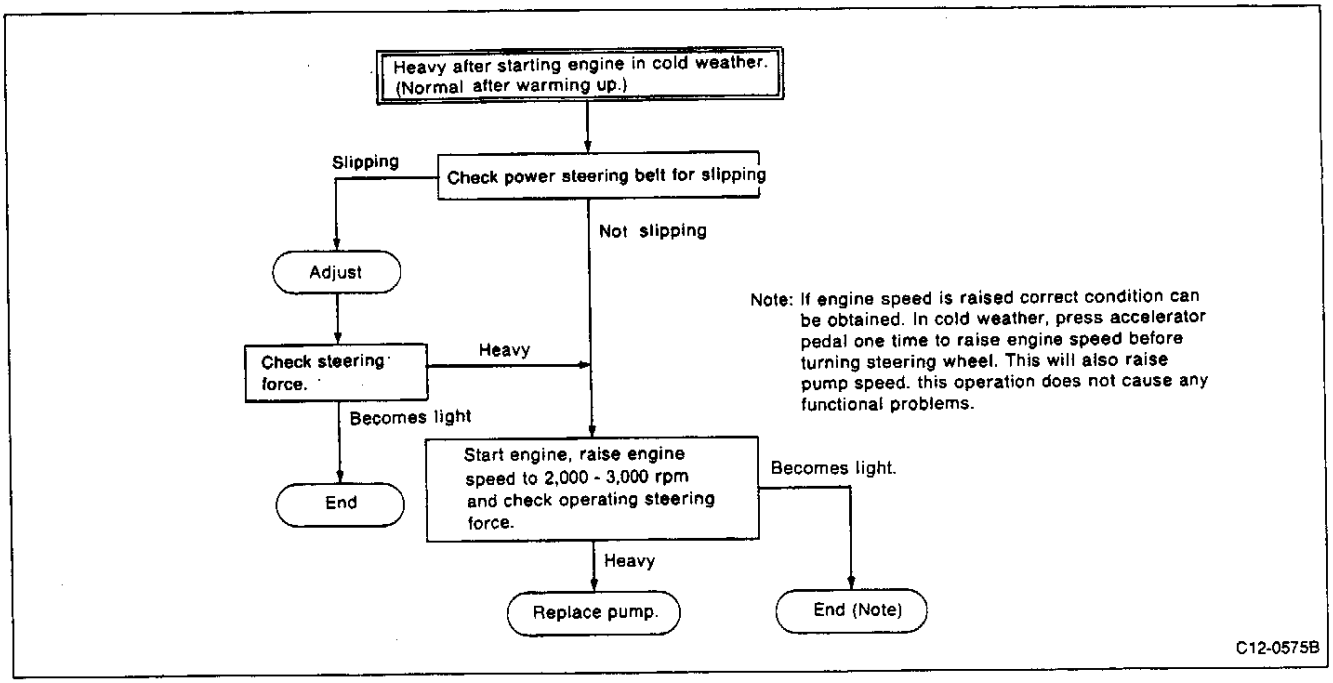
① Are the tire air pressure and size correct? Is the steering wheel a genuine part?
② Is the wheel offset correct? (Check if wheel spacers are present.)
③ Is wheel alignment correct?
④ Has the suspension been modified? Has the vehicle weight been increased?

(2) Problem classification



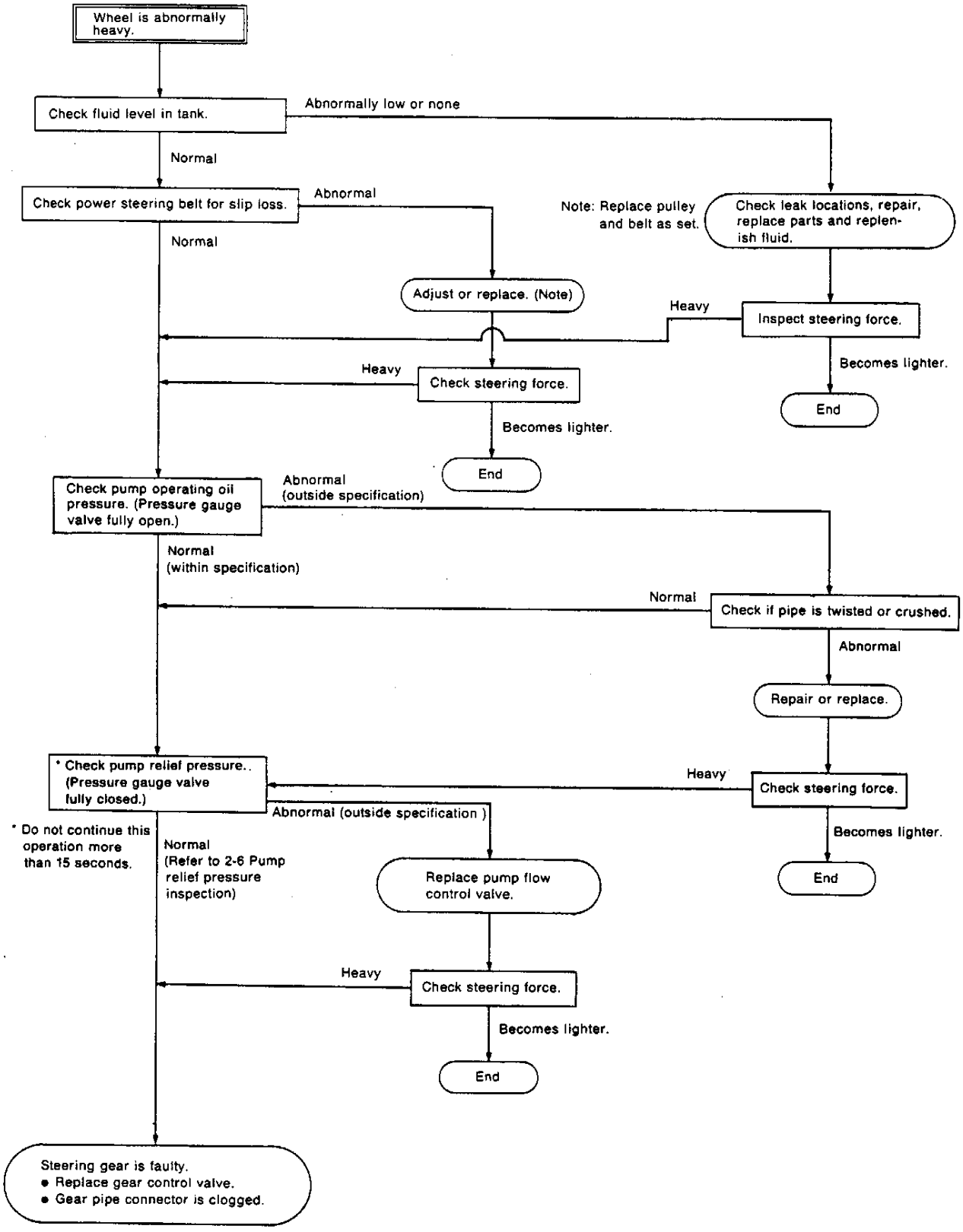
(3) Damage diagnosis flowchart (entire vehicle)

① Flowchart A



2. On-vehicle Inspection and Adjustment (Cont'd)

② Flowchart B

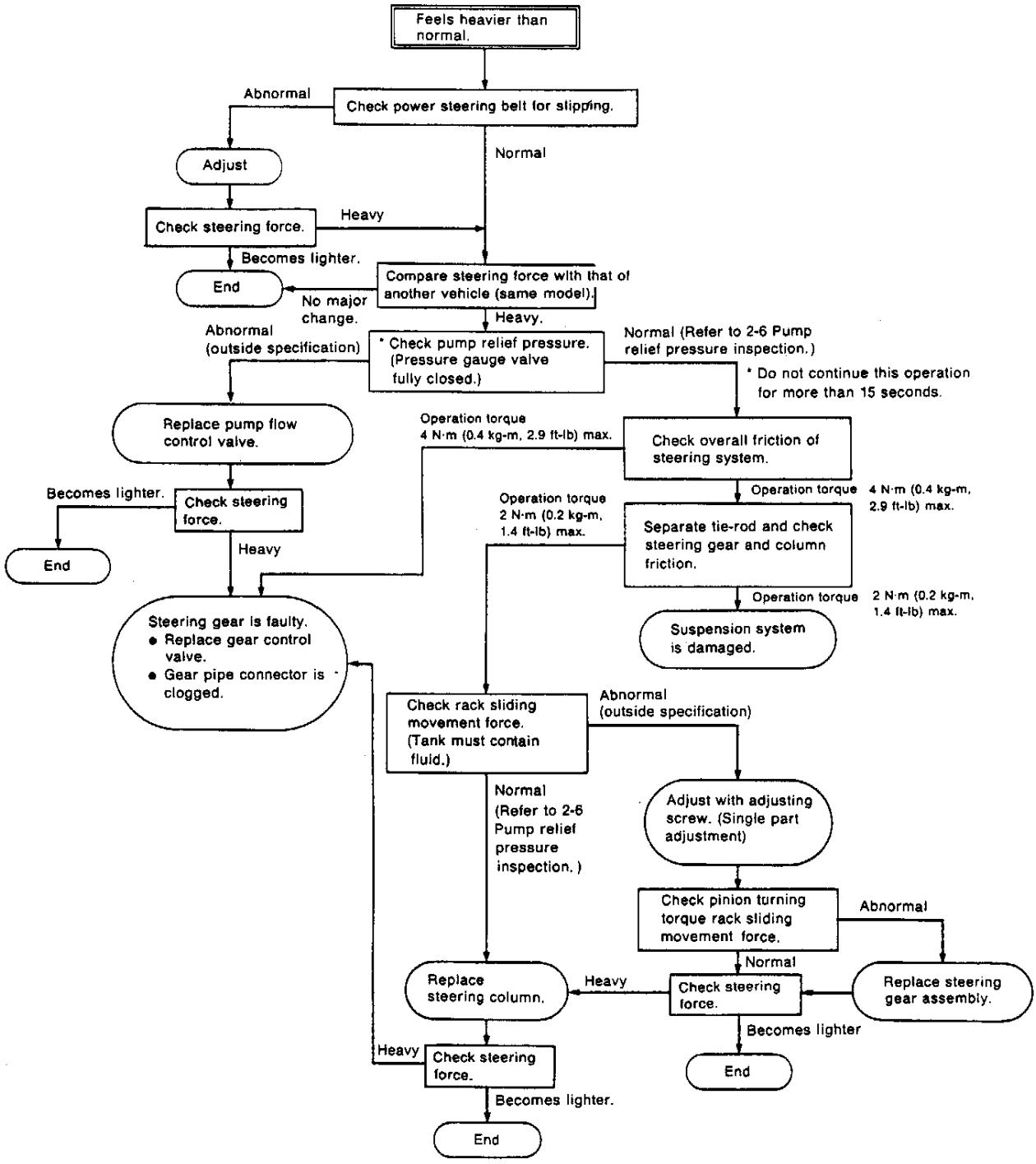


2. On-vehicle Inspection and Adjustment (Cont'd)

③ Flowchart C

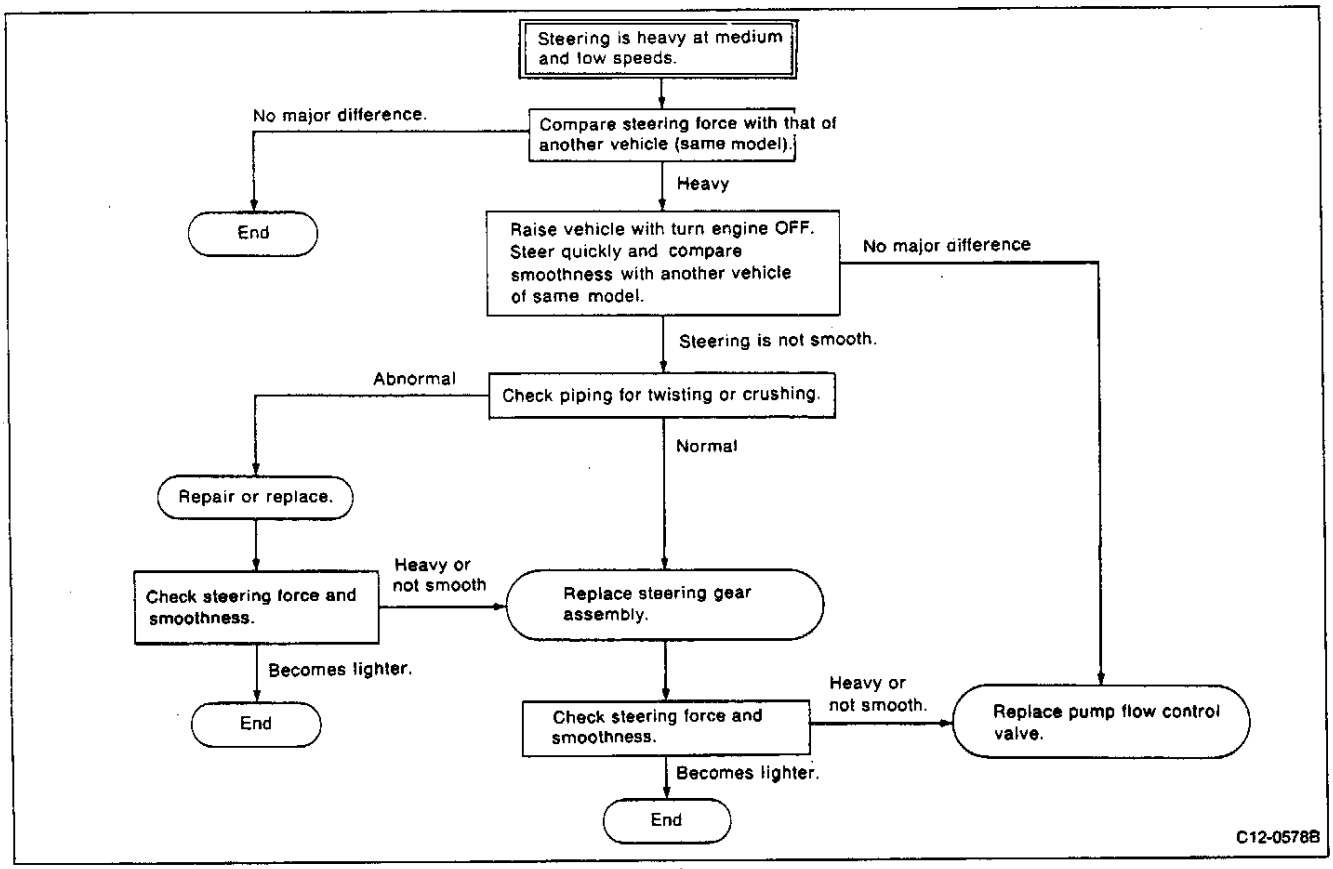
Verification items

- **Is the tire air pressure and size correct? Is the steering wheel a genuine part?**
- **Is the wheel offset correct? (Check if wheel spacers are present.)**
- **Is wheel alignment correct?**
- **Has the suspension been modified? Has the vehicle weight been increased?**
- **Steering column wheel cover and rubber coupling do not grip.**

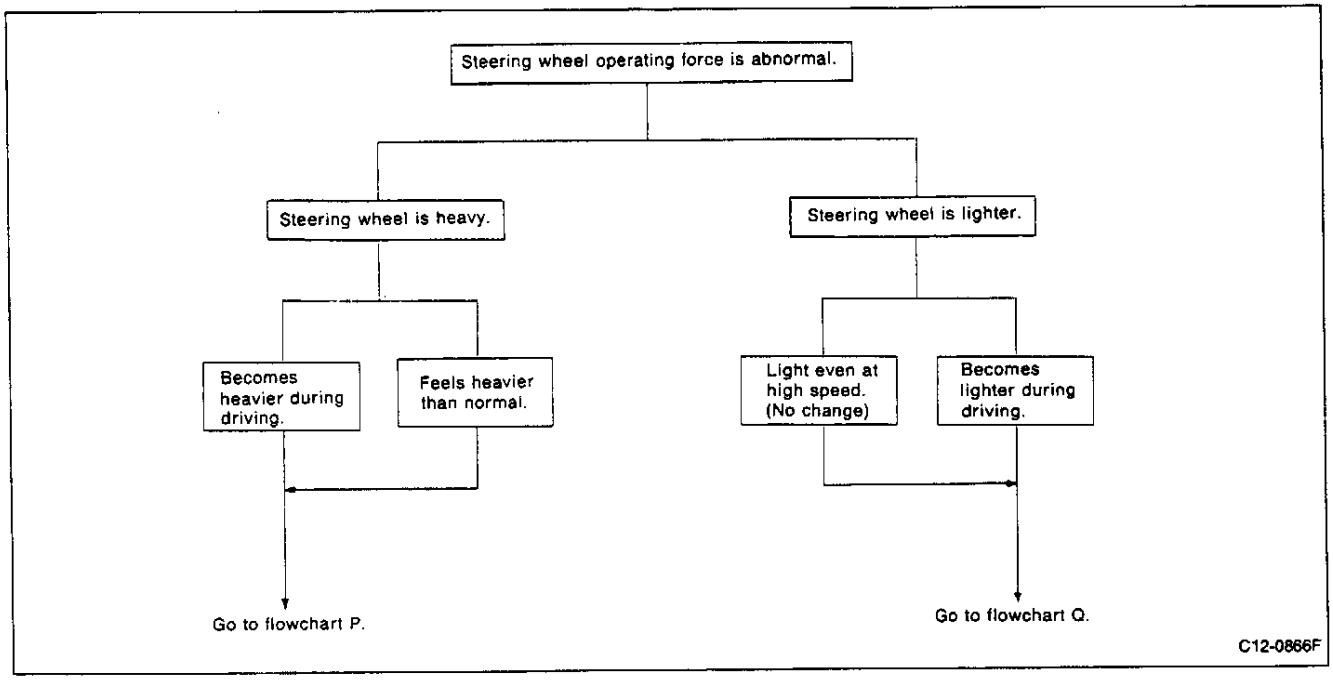


2. On-vehicle Inspection and Adjustment (Cont'd)

④ Flowchart D

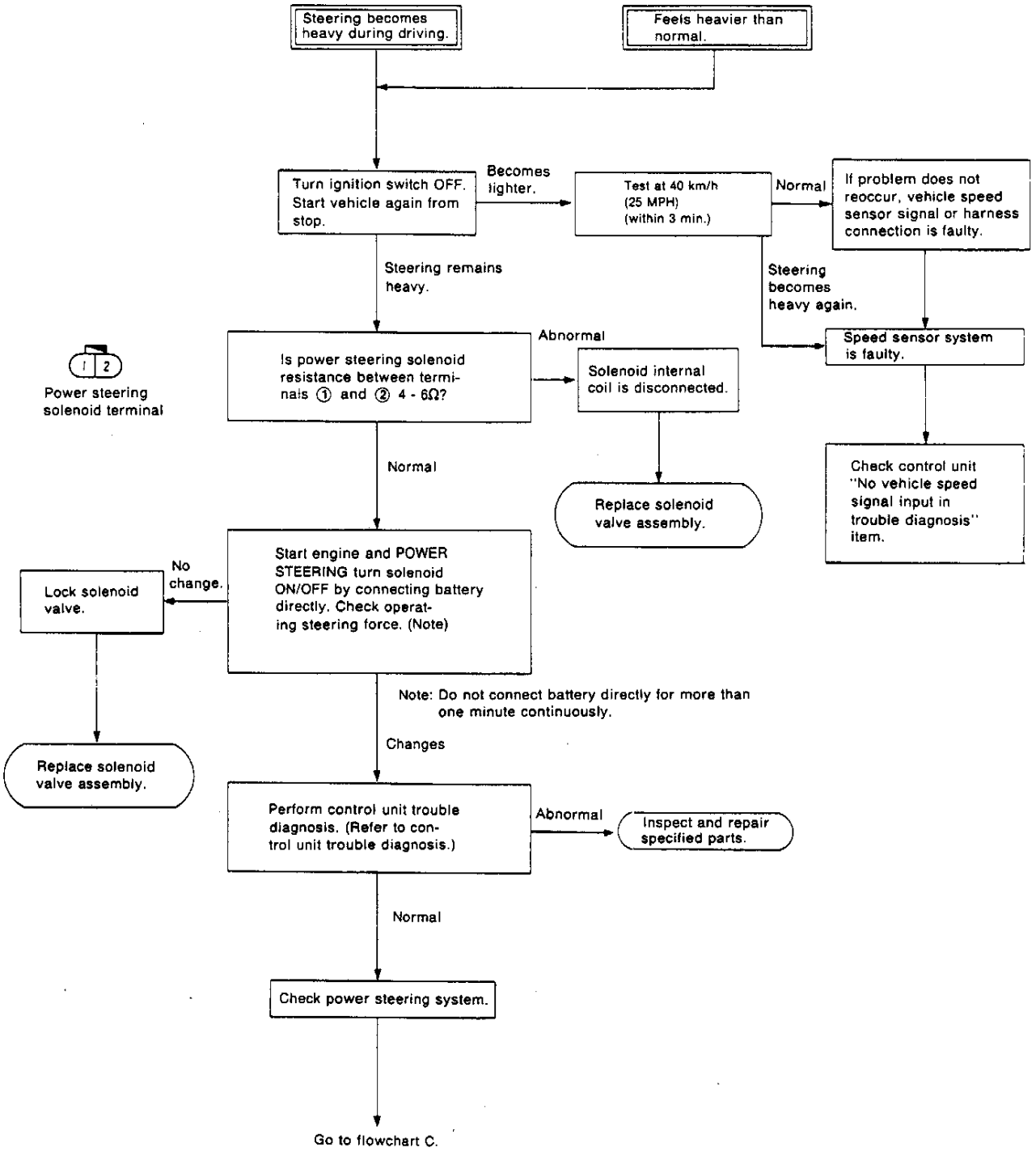


(4) Flowchart (Electrical control power steering)



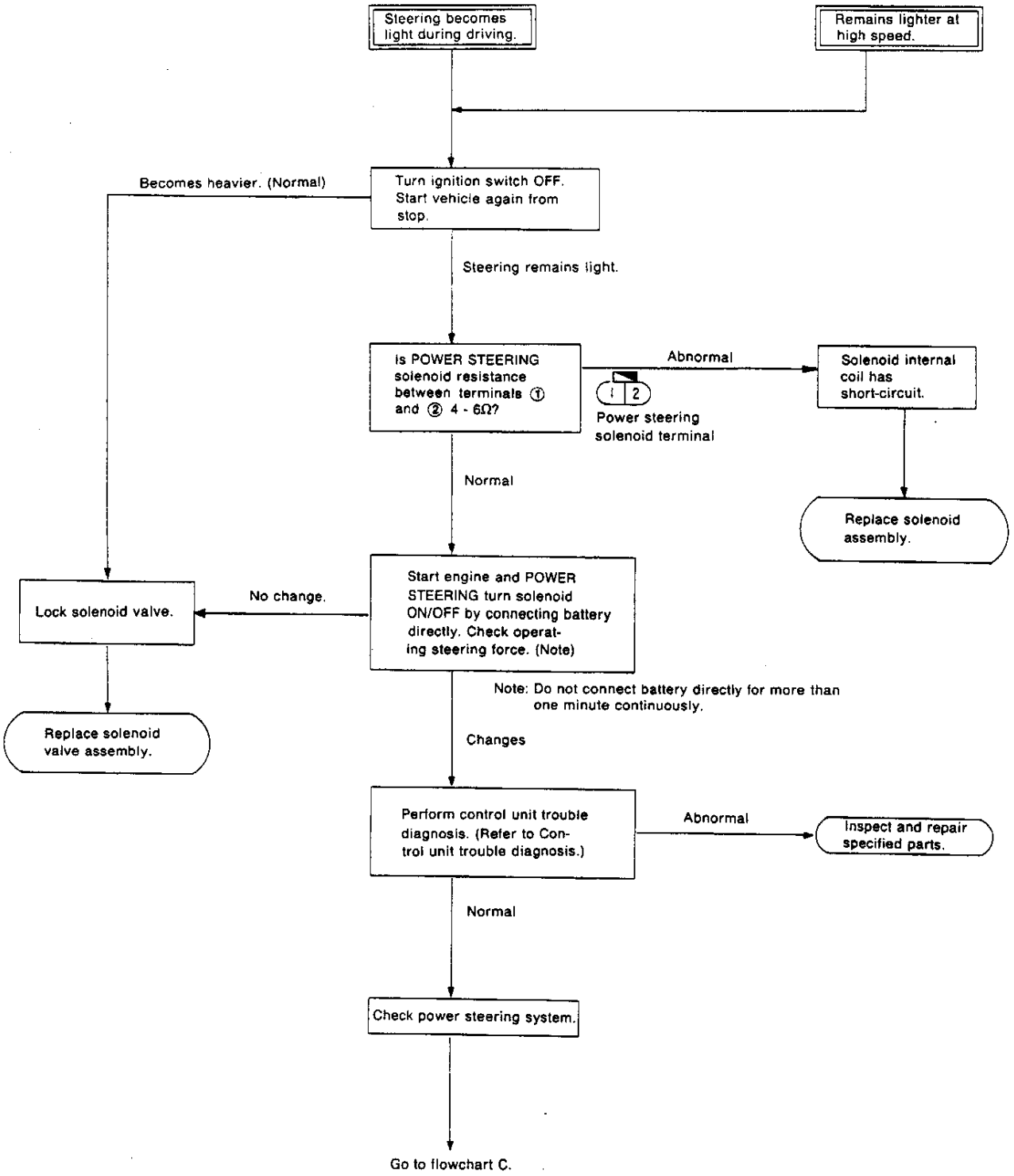
2. On-vehicle Inspection and Adjustment (Cont'd

① Flowchart P



C12-0867F

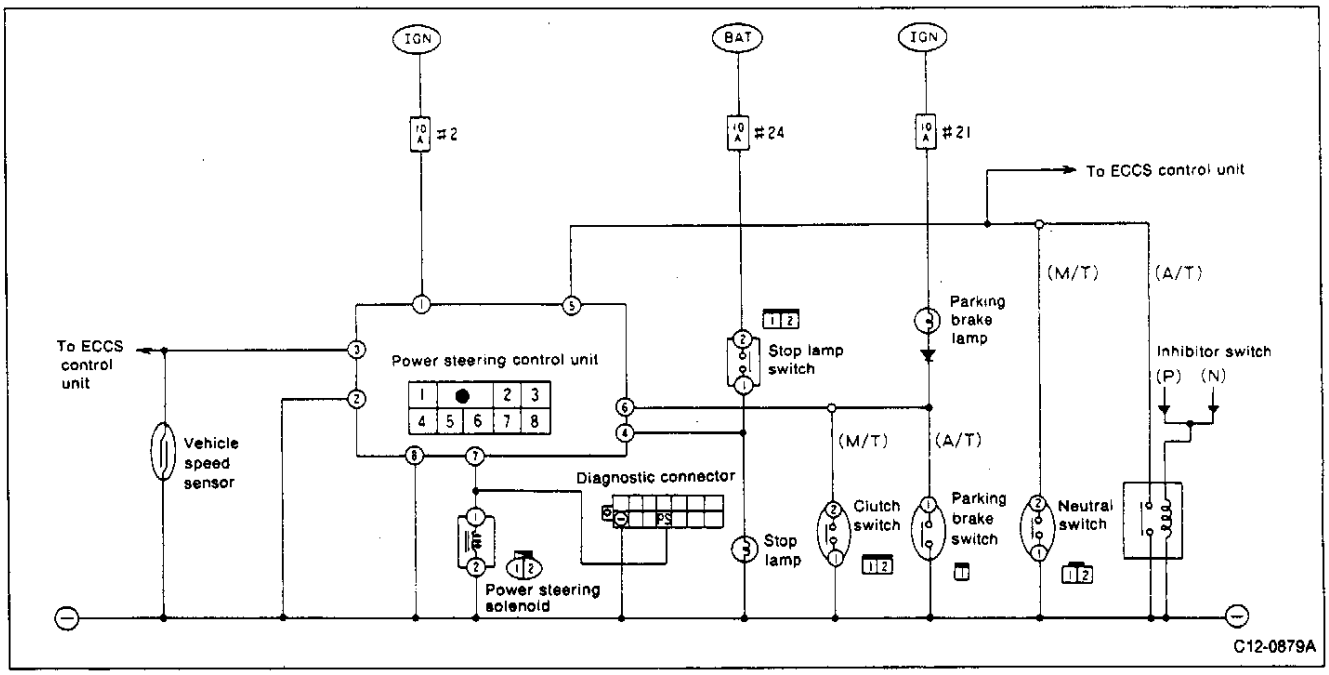
② Flowchart Q



C12-0868F

3. Control Unit Trouble Diagnosis

3-1 CIRCUIT DIAGRAM (Refer to Super HICAS system circuit diagram.)



3-2 DAMAGE DIAGNOSIS

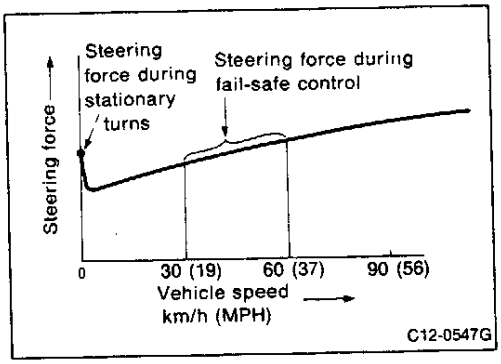
Precautions

Before starting to diagnose the power steering system ensure that:

<Vehicle stopped>
1. Power steering components (gears, oil pump, pipes, etc.) are free from leakage and that oil level is correct.
2. Tires are inflated to specified pressure and are of specified size, and that steering wheel is a genuine part.
3. Wheel size is adjusted properly.
4. Suspension utilizes the original design and is free of modifications which increase vehicle weight.

<Vehicle in operation>
1. Understand the trouble symptoms. (5W1H)
2. Engine is operating properly.

3. Control Unit Trouble Diagnosis (Cont'd)



(1) Steering is heavy during stationary turning.

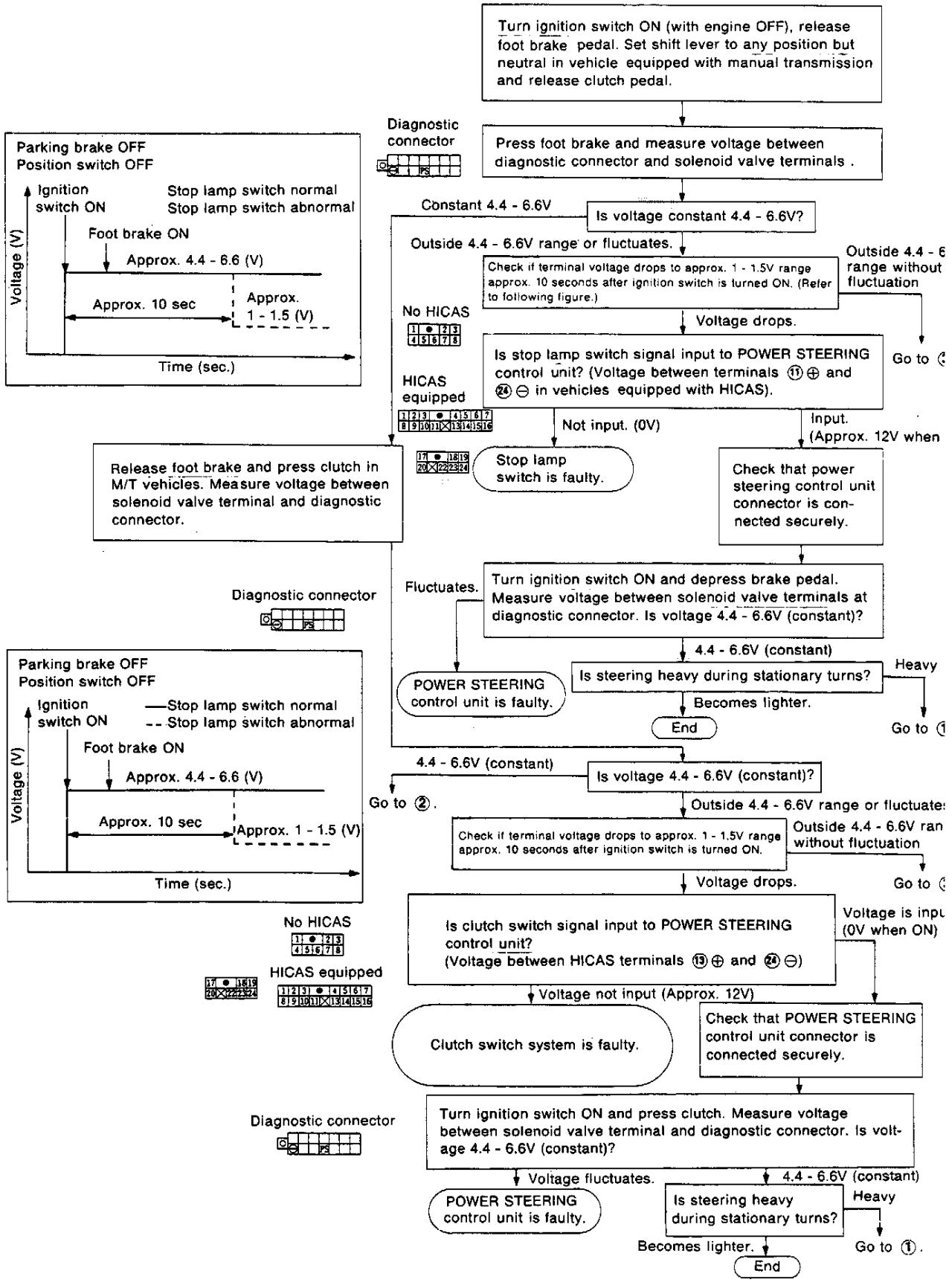
① Preliminary knowledge helpful in conducting diagnoses

The power steering system is a twin-orifice type, which uses a vehicle-speed sensing, electronic control design. Valve sensitivity is controlled in response to vehicle speed to achieve optimum steering effort. When a vehicle-speed signal is not input to the power steering control unit for more than approximately 10 seconds, a fail-safe system activates to maintain the steering effort at a level similar to that experienced during operation at a vehicle speed of 30 to 60 km/h (19 to 37 MPH).
Consequently, if a foot-brake signal, parking brake or transmission position signal, or neutral in signal a vehicle equipped with manual transmission are not input to the POWER STEERING control unit, the steering system is maintained in a "fail-safe" control state. When this happens, a symptom referred to a "heavy steering during stationary turns" sometimes occurs.

Note: Normal operation refers to a driving condition in which the foot brake pedal and parking brake lever are released, and the shift lever is any position other than neutral or clutch pedal is released in a vehicle equipped with manual transmission.

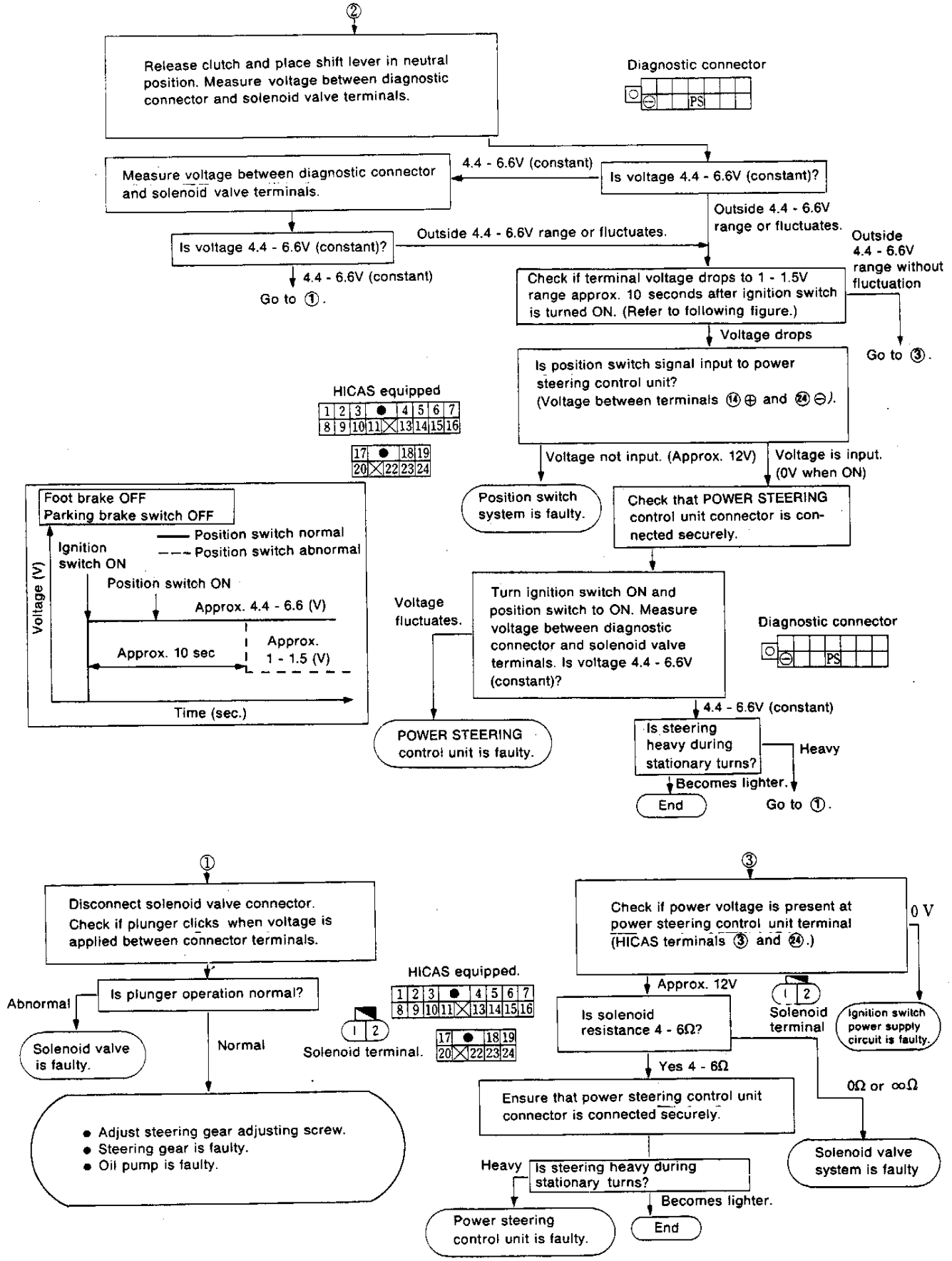
3. Control Unit Trouble Diagnosis (Cont'd)

② Flow chart ("Heavy steering during stationary turns")



C12-087C

3. Control Unit Trouble Diagnosis (Cont'd)

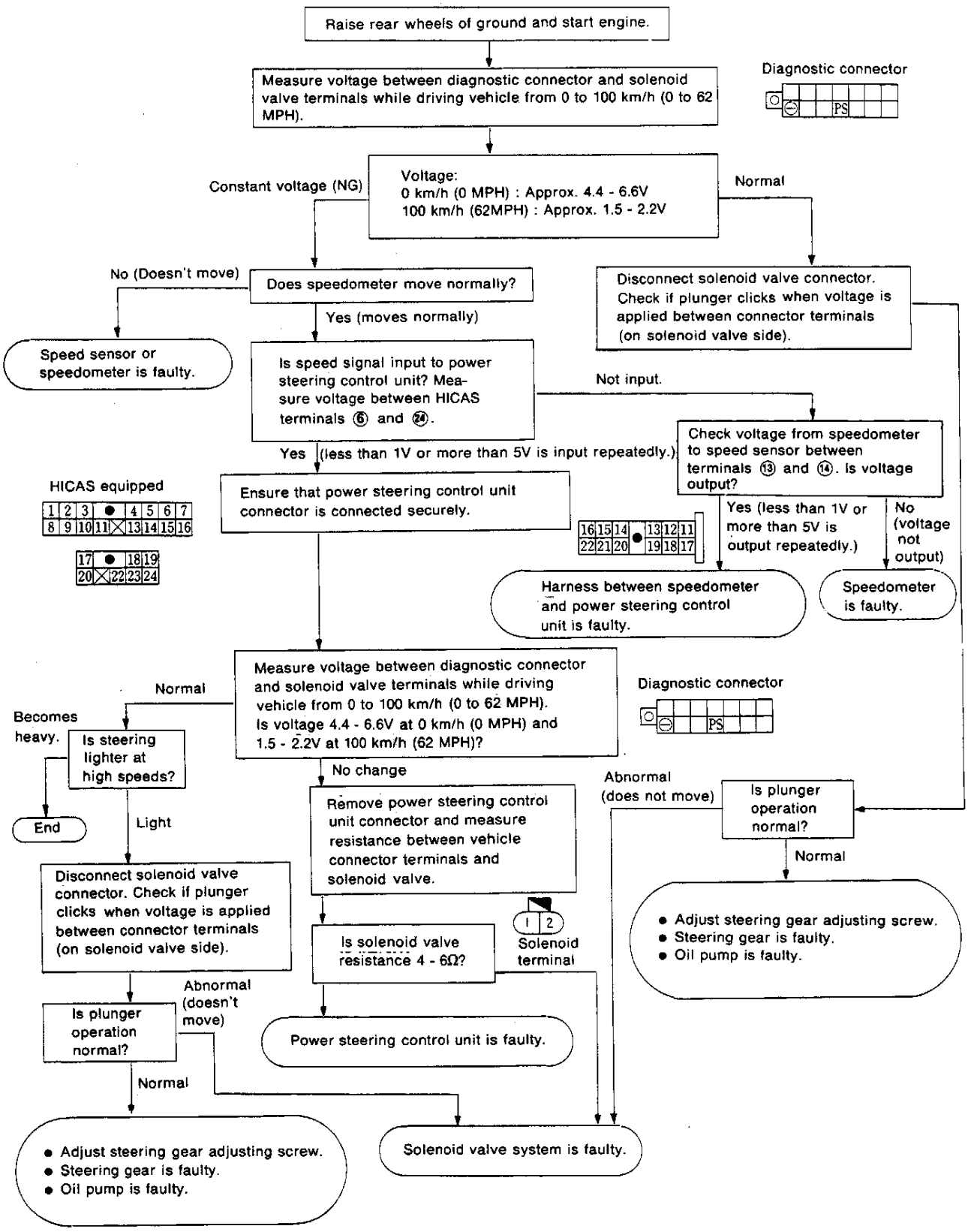


C12-0871F

3. Control Unit Trouble Diagnosis (Cont'd)

(2) Light steering operation during high-speed driving

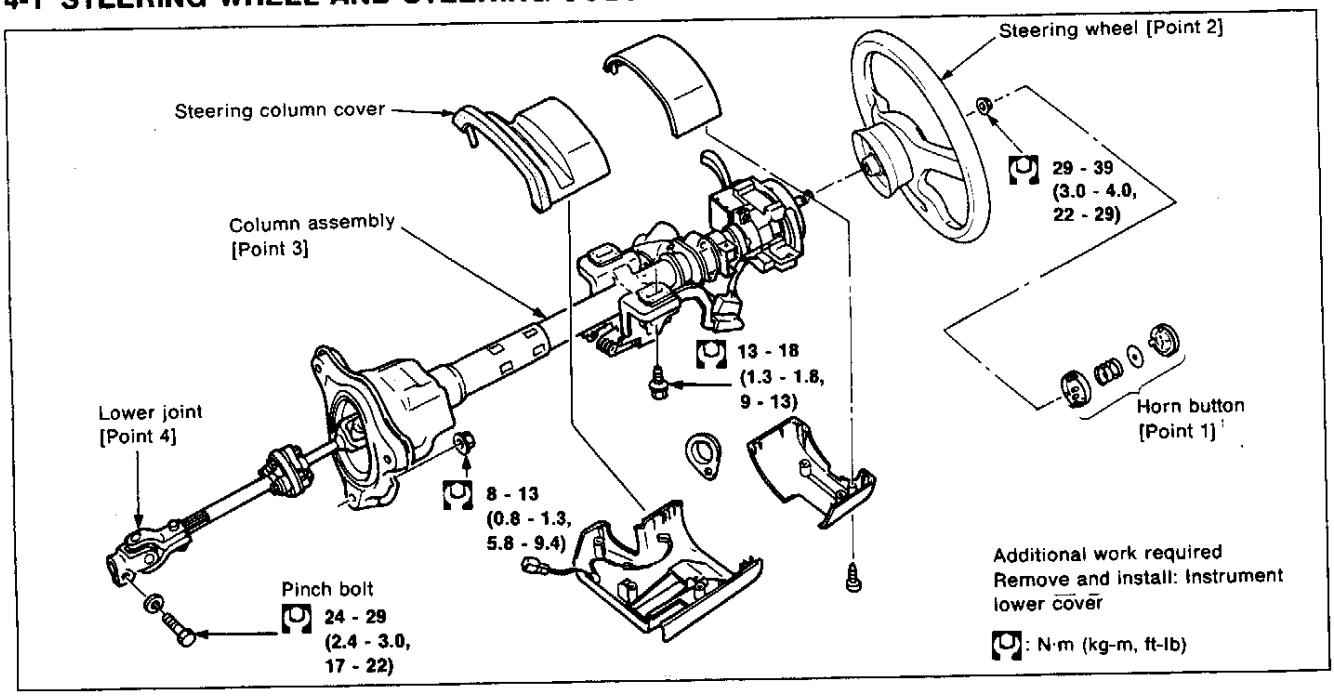
① Flowchart

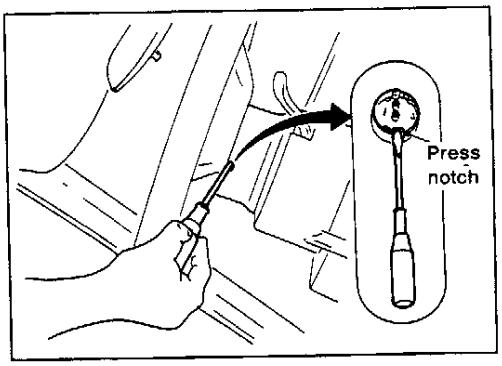


C12-0872F

4. Removal and Installation, Assembly and Disassembly

4-1 STEERING WHEEL AND STEERING COLUMN ASSEMBLY REMOVAL AND INSTALLATION

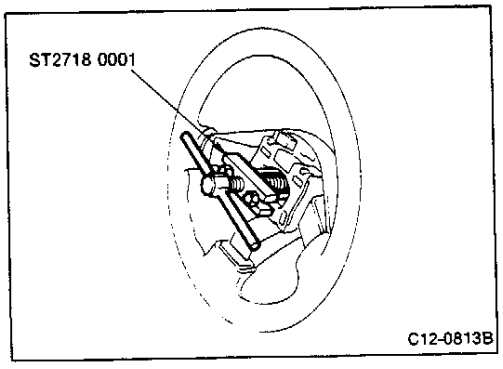




[Point 1] Horn button removal

- Press horn button notch from hole under steering wheel with screwdriver and remove horn button as shown in figure.

CAUTION:
(1) Pay attention not to scratch steering wheel and horn pad.
(2) Remove horn without placing unnecessary tension on wiring.



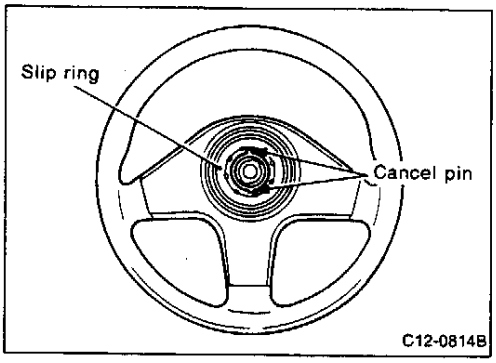
[Point 2] Steering wheel removal and installation

Removal

- Always use steering wheel puller (special service tool) to remove steering wheel.

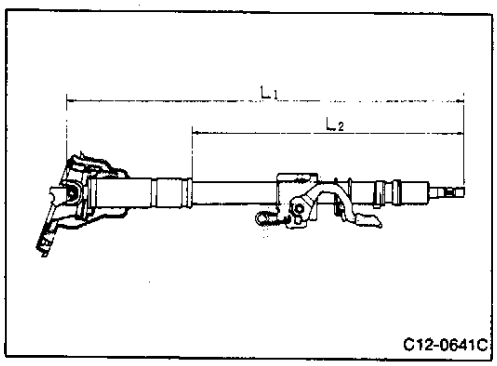
CAUTION:
Do not tap steering wheel or apply undue stress to steering column shaft (especially in axial direction).

4. Removal and Installation, Assembly and Disassembly (Cont'd)



Installation

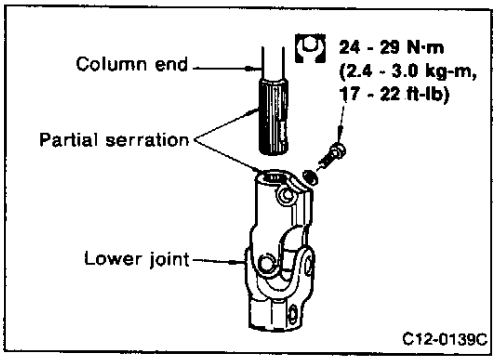
- When installing steering wheel, apply multi-purpose bod grease (spray type: KRH05-00030) to entire surface of tur signal cancel pin and horn contact slip ring.



[Point 3] Column standard dimension measurement

- Measure dimension L_1 (standard value). Replace colum assembly if measurement is outside specification range.
- Refer to the following specification values for vehicle equipped with telescopic wheels.

Description		Telescopic wheel
L_1	mm (in)	685.5 - 720.5 (26.99 - 28.37)
L_2	mm (in)	423.4 - 458.4 (16.67 - 18.05)



[Point 4] Lower joint assembly

- Align position where serration is incomplete (Note) in lowe joint and steering column and install shaft.

Note: Lower joint has a projecting portion in serration. Steer ing column fits into serration indentation.

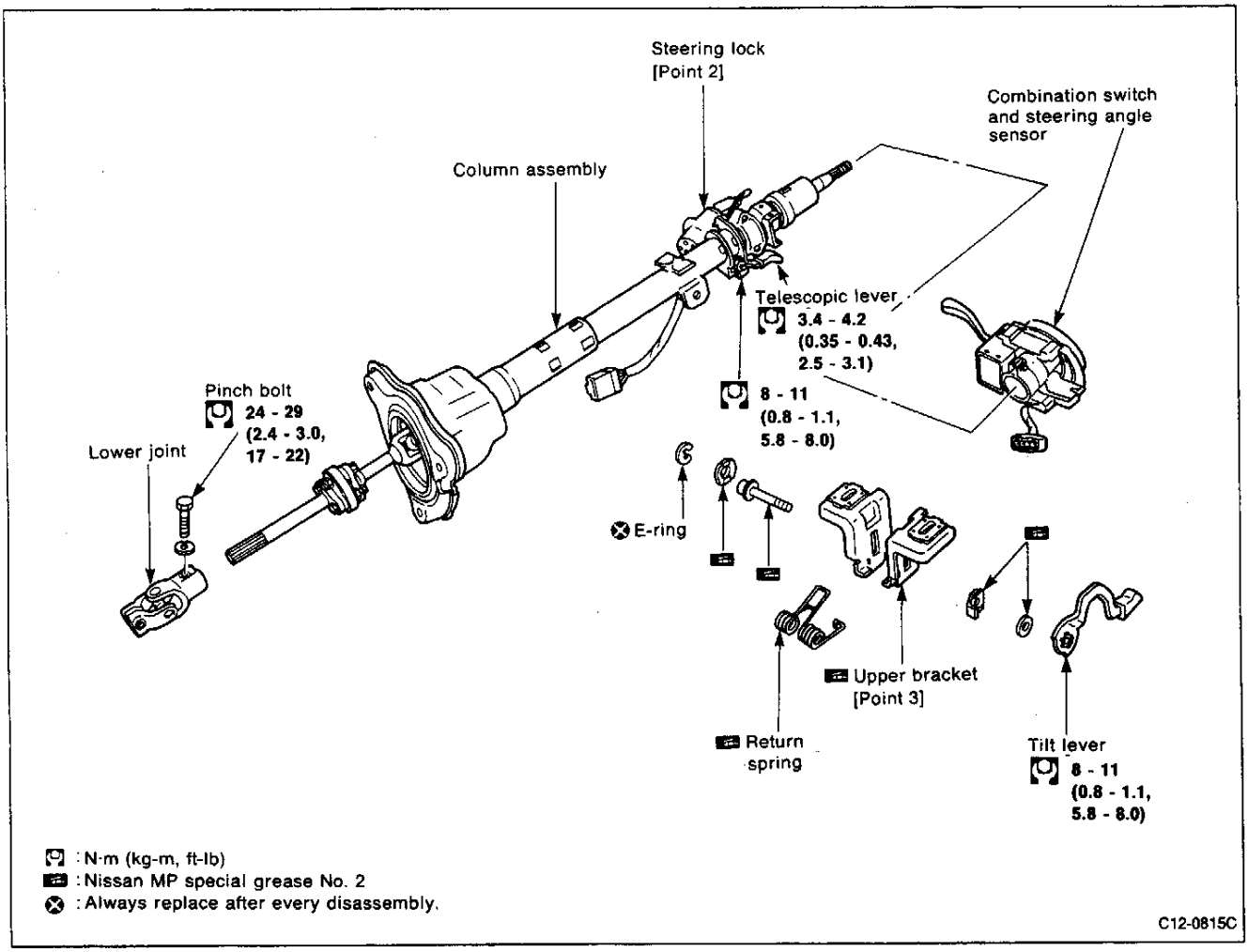
- Align pinch bolt to shaft notch part on gear side and colum side correctly and insert securely. After fingertightening tighten to specified torque.

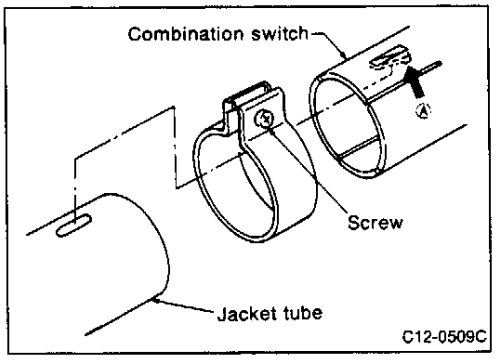
[Point 5] Installation inspection

- After installing steering column, turn steering wheel t make sure it moves smoothly, without any noise or exces force. Also check that the number of turns from the straight ahead position to left and right locking points are equal. B sure that the steering wheel is in a neutral position whe driving straight ahead.

4. Removal and Installation, Assembly and Disassembly (Cont'd)

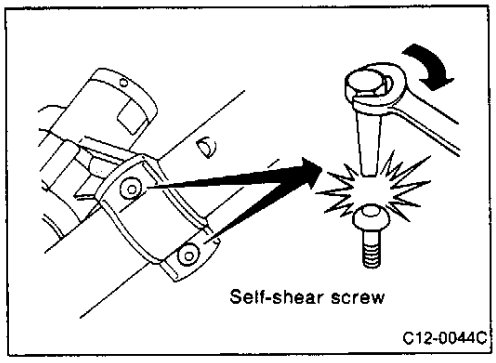
(2) Assembly and disassembly





[Point 1] Combination switch removal

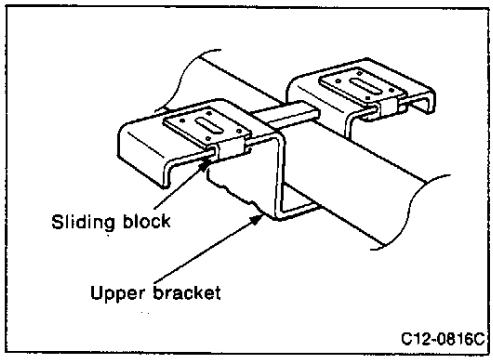
- To remove combination switch from jacket tube, first loosen screw. While prying notch Ⓐ on inside of switch with screwdriver, remove switch.



[Point 2] Steering lock installation

- Align positioning boss on steering lock with hole in jacket tube and tap bracket with self-shear screw to secure.
- Tighten self-shear screw and then cut off screw heads.

4. Removal and Installation, Assembly and Disassembly (Cont'd)

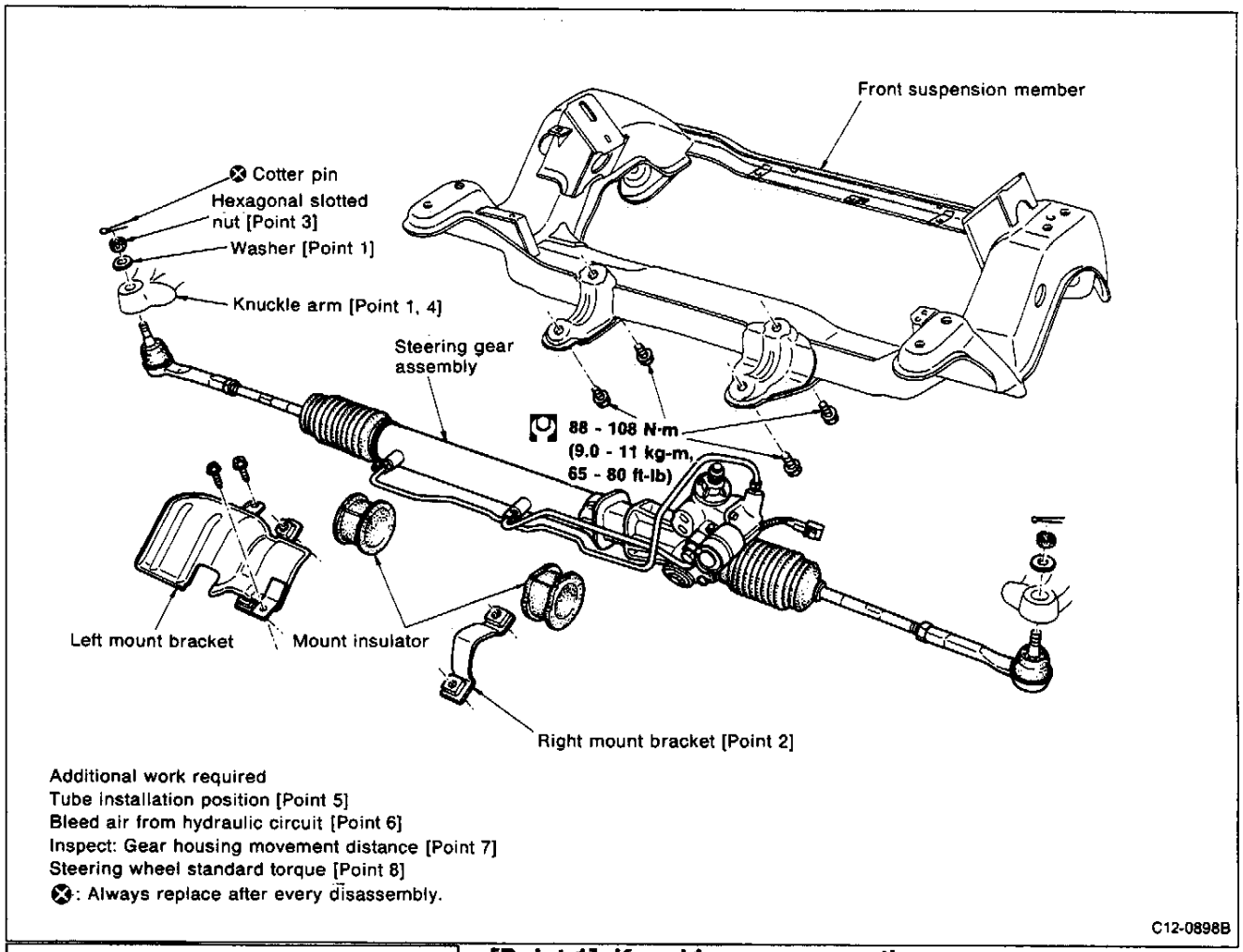


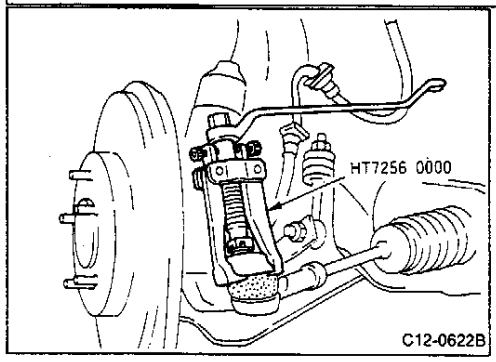
[Point 3] Upper bracket inspection

- Upper bracket and sliding block are set in plastic molding as shown in figure.
- If sliding block is falling off, replace upper bracket assembly.

4-2 STEERING GEAR AND LINKAGE

(1) Removal and installation



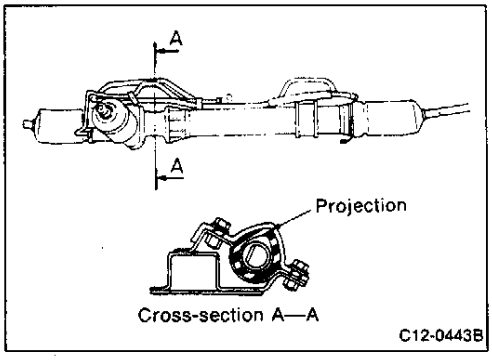


[Point 1] Knuckle arm separation

- Use Pitman arm puller (commercial service tool) to remove knuckle arm.

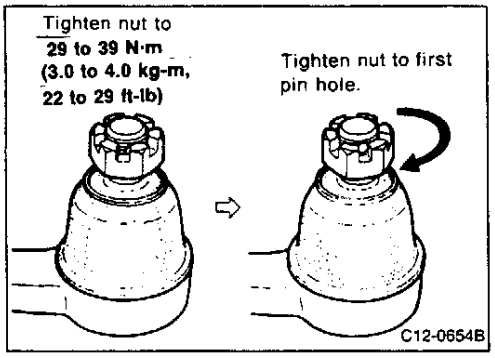
CAUTION:
Do not scratch dust boot of tie-rod ball joint.

4. Removal and Installation, Assembly and Disassembly (Cont'd)



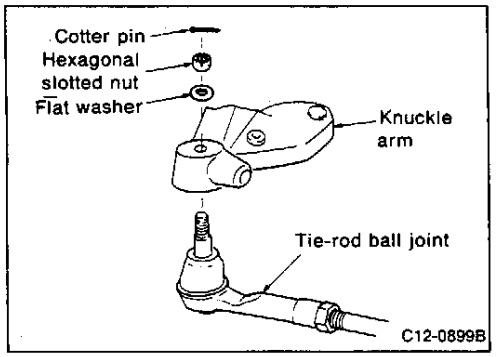
[Point 2] Gear mount bracket and mount insulator installation

- Perform alignment securely since right side bracket and insulator have projection as shown in figure.
- Coat mount bolt with machine oil or equivalent.
- To install bracket, initially tighten nuts to 78 N·m (8.0 kg-m, 58 ft-lb) and then tighten to specified torque.



[Point 3] Hexagonal slotted nut tightening

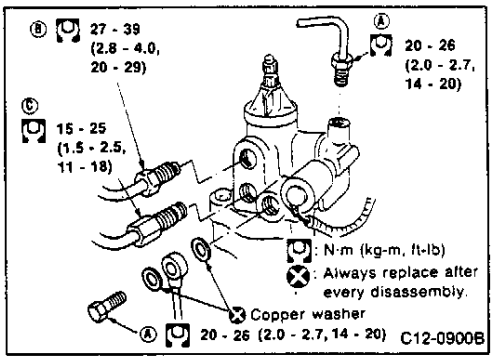
- Tighten nut to specified torque [29 to 39 N·m (3.0 to 4.0 kg-m, 22 to 29 ft-lb)]. Then tighten further to align nut groove with first pin hole so cotter pin can be installed. Tightening torque must not exceed 49 N·m (5.0 kg-m, 36 ft-lb).
- After tightening, check that knuckle arm and ball joint socket are parallel.



[Point 4] Knuckle arm installation

- When assembling tie-rod ball joint in knuckle arm, insert flat washer before hexagonal slotted nut because knuckle arm is made of aluminum.

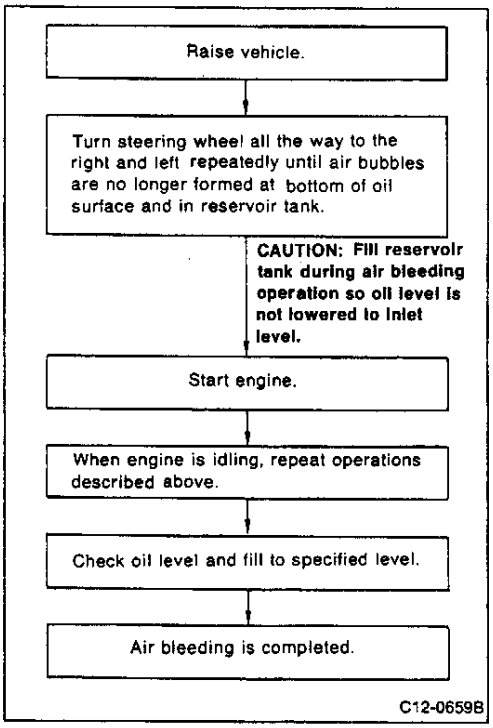
CAUTION:
Do not tap knuckle arm to assemble because it is made of aluminum. Be careful not to scratch knuckle arm during assembly.

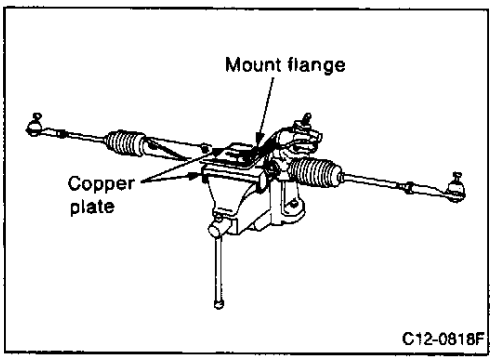


[Point 5] Tube installation position

- Assemble tubes carefully in correct installation positions shown in figure.

Ⓐ Cylinder pipe (rear housing to gear housing)
Ⓑ Power steering low-pressure pipe (rear housing to reservoir tank)
Ⓒ Power steering high-pressure pipe (power steering to rear housing)





4. Removal and Installation, Assembly and Disassembly (Cont'd)

[Point 6] Hydraulic circuit air bleeding

- Perform the procedures described on the left to bleed th air from the hydraulic system.
- The presence of any of the following conditions indicate that air bleeding is not completed. Bleed the system agair

① Air bubbles are formed in the reservoir tank.
② The pump makes a sound like bouncing gravel.
③ The pump makes loud growling noises.

Note: The sound of fluid flow from gear valve and pump can b heard during heavy steering during stationary turns o slow steering. This sound does not affect steering pe form or durability.

CAUTION:
Perform air bleeding of power steering system before startin engine.

[Point 7] Gear housing movement inspection

- Refer to "2. On-vehicle Inspection and Adjustment".

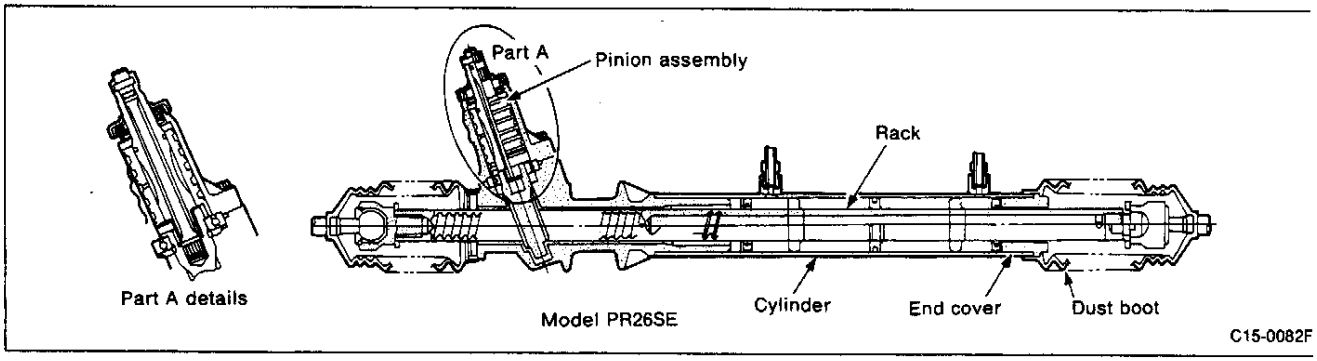
[Point 8] Steering wheel standard torque inspection

- Refer to "2. On-vehicle Inspection and Adjustment."

(2) Assembly and disassembly precaution

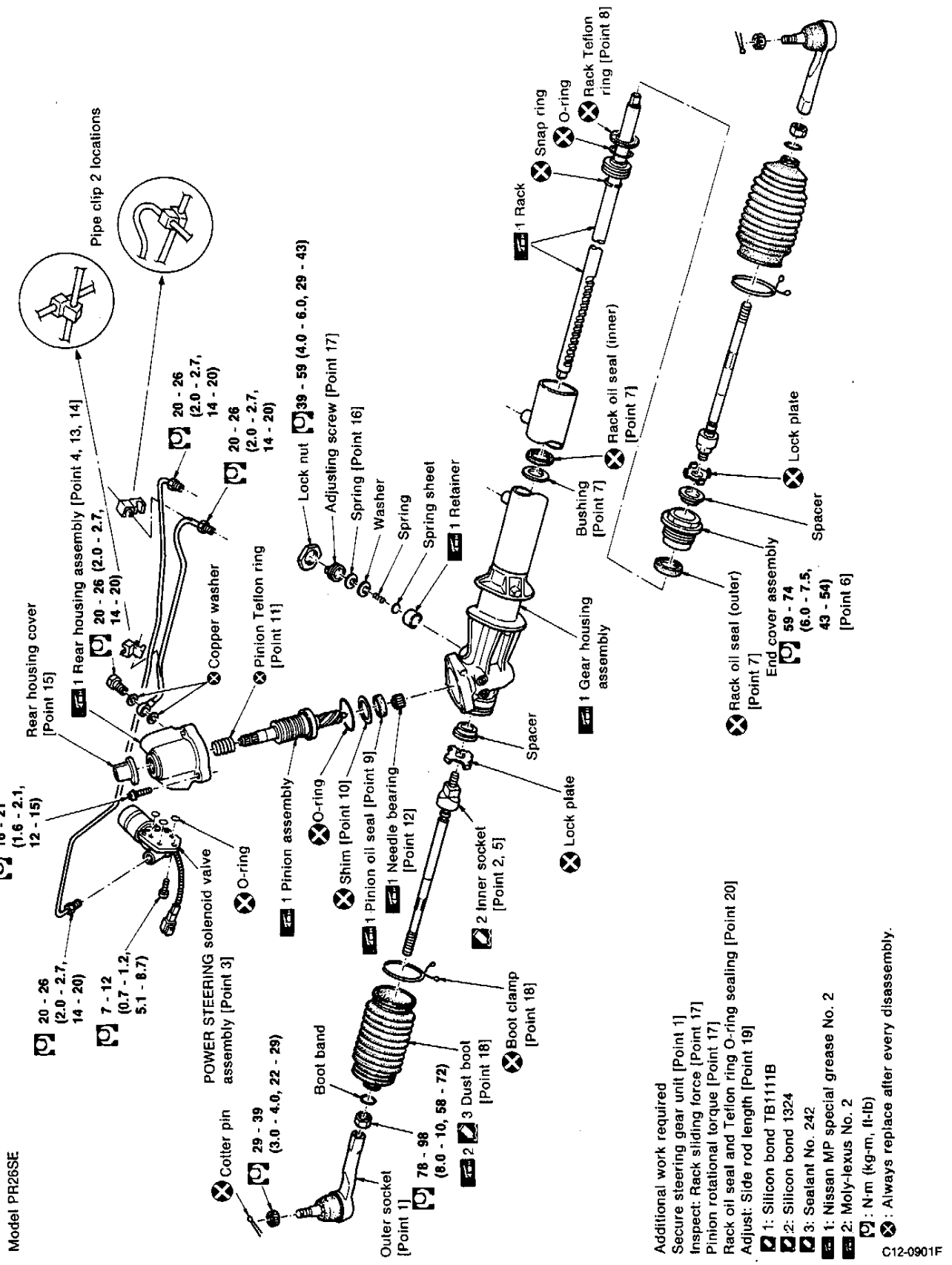
- Secure mounting flange in vice (use copper plates) t assemble and disassemble steering gear.
- Wash dirt on steering gear off with white gasoline or sol vent. Be careful not to get the white gasoline or solvent o the ports, harness or connectors for outlet and return.
- Do not reuse O-ring, oil seal (universal joint packing) o copper washer. Always replace with new parts after ever disassembly.
- If inner surface of rear housing assembly or gear housin assembly and rack is scratched or damaged, replace gea housing assembly.

(3) PR26SE power steering gear cross-section



4. Removal and Installation, Assembly and Disassembly (Cont'd)

(4) Power steering gear assembly and disassembly (model PR26SE)

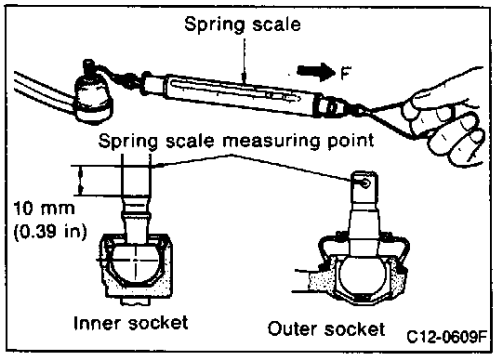


4. Removal and Installation, Assembly and Disassembly (Cont'd)

[Point 1] Securing steering gear main unit

- Secure gear housing mount in vise for steering gear assembly and disassembly.

CAUTION:
Insert copper plates in sides of vise to avoid scratching housing.



[Point 2] Tie-rod ball joint inspection

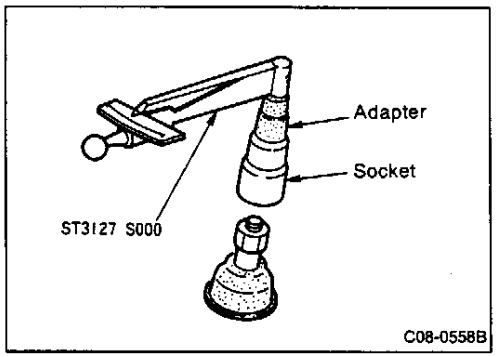
Swinging force inspection

- Place spring scale on measurement points indicated in figure. Check that value when ball stand starts moving is within specification indicated below. If value is outside specification range, replace outer socket and inner socket.
- Make sure dust boot of inner and outer socket is not twisted.

Specification values at measurement points shown in figure:

Inner socket
16.7 - 147.1 N (1.7 - 15 kg, 3.7 - 33.1 lb)

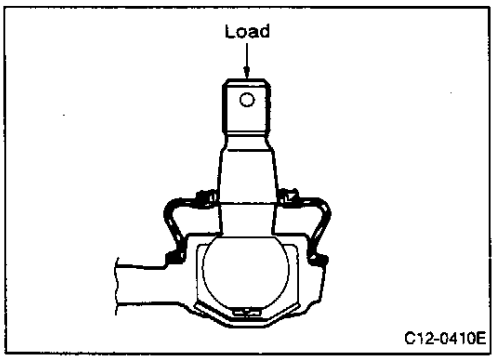
Outer socket
4.9 - 46.1 N (0.5 - 4.7 kg, 1.1 - 10.4 lb)



Sliding torque inspection

- Using preload gauge (special service tool), check that torque is within specification limit indicated below. If torque is outside specification, replace outer socket.

Outer socket sliding torque:
0.3 - 2.9 N·m (0.03 - 0.3 kg-m, 0.2 - 2.2 ft-lb)



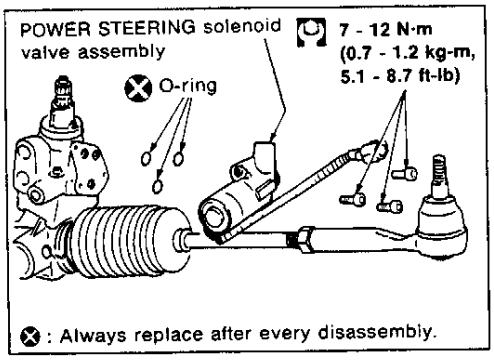
Axial end play inspection

- Apply load of 490 N (50 kg, 110 lb) to axis of ball stud and measure stud play with dial gauge. If play is outside specification indicated below, replace inner and outer socket.

Inner socket:
0 mm (0 in)

Outer socket:
0.5 mm (0.020 in) max.

4. Removal and Installation, Assembly and Disassembly (Cont'd)



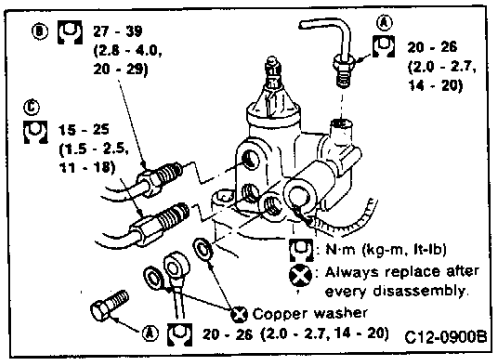
[Point 3] Power steering solenoid valve replacement

- The power steering solenoid valve is an integral unit and cannot be disassembled. If replacement is necessary, replace entire assembly.
- Replace O-rings (3) at assembly. (Non-reusable part)

CAUTION:

(1) Do not remove the power steering solenoid valve screw because it cannot be disassembled. (It does not adjust the steering force.)

(2) When replacing assembly, be careful not to allow dirt, debris or foreign matter to adhere to assembly.



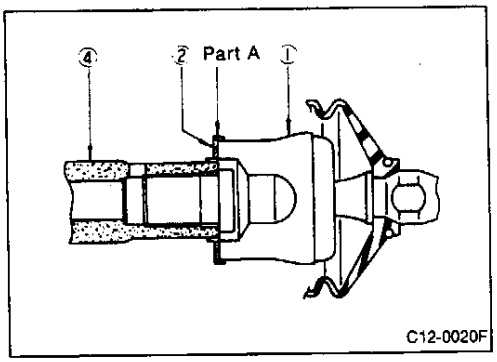
[Point 4] Rear housing pipe installation position

- Assemble pipes carefully in correct installation positions shown in figure.

CAUTION:

Pay close attention because certain parts vary in the 2WD model.

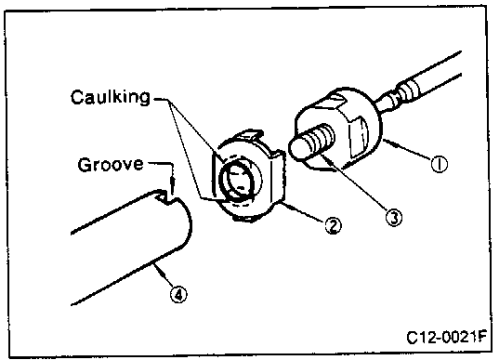
Ⓐ Cylinder pipe (rear housing to gear housing)
Ⓑ Power steering low-pressure pipe (rear housing to reservoir tank)
Ⓒ Power steering high-pressure pipe (power steering to rear housing)



[Point 5] Inner socket assembly and disassembly

Disassembly

- Move the caulking (Ⓐ 4 locations) of the lock plate ②, loosen socket and separate from rack ④.
- Remove lock plate ②.



Assembly

- Set lock plate ② on tie-rod inner socket ①.
- Apply sealant (Three Bond 1324) to threads of inner socket ③. Screw into socket ① into rack ④ and tighten to specified torque.
- Caulk lock plate at two locations on groove side of rack.

CAUTION:

Wipe off any debris on lock plate so it will not adhere to the boot.