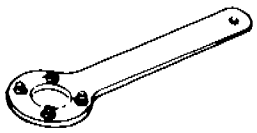
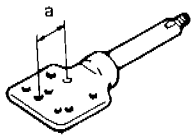
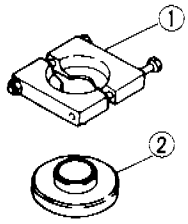
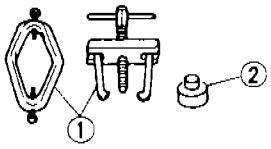
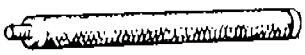
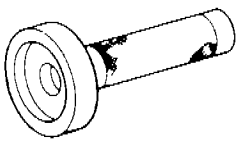
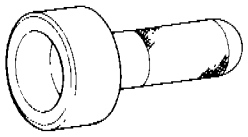
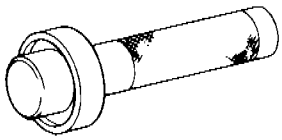
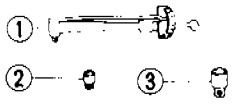
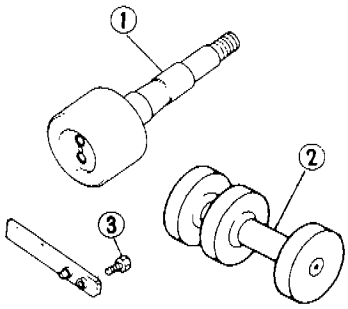
PROPELLER SHAFT & DIFFERENTIAL CARRIER

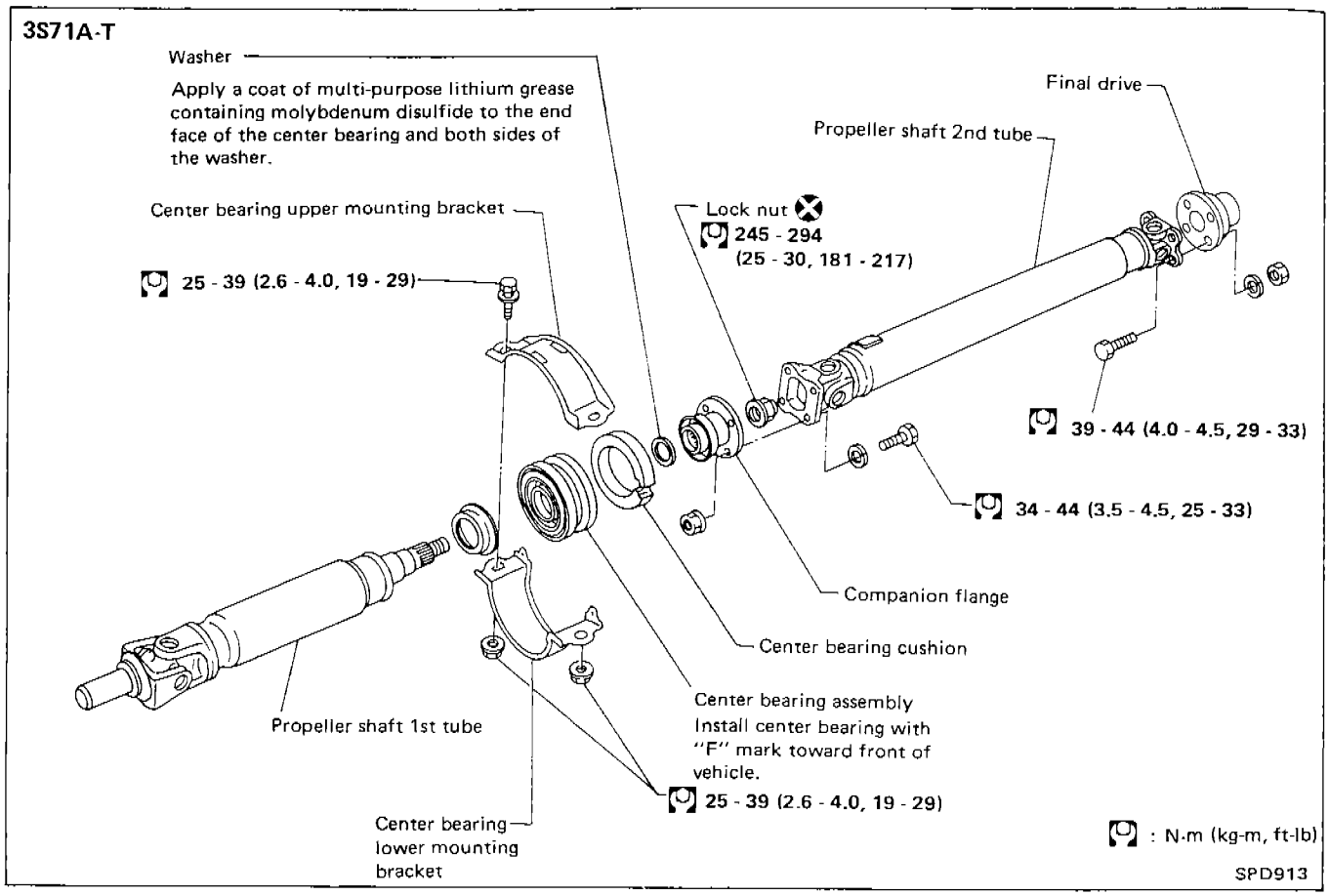
SECTION PD

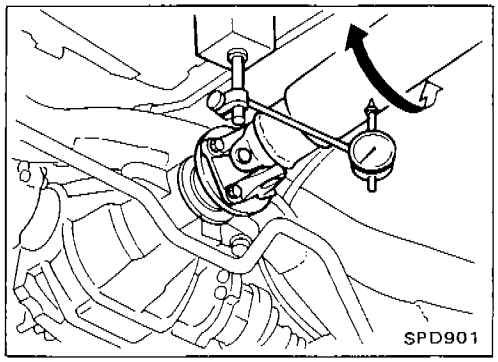
CONTENTS

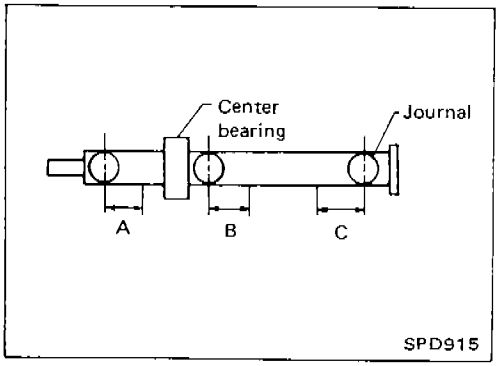
SPECIAL SERVICE TOOLS

Tool number Tool name	Description	
ST38060002 Drive pinion flange wrench		Removing and installing propeller shaft lock nut, and drive pinion lock nut.
KV38100800 Differential attachment	 a: 152 mm (5.98 in)	Mounting final drive (To use, make a new hole.)
ST3090S000 Drive pinion rear inner race puller set ① ST30031000 Puller ② ST30901000 Base		Removing and installing drive pinion rear cone
ST3306S001 Differential side bearing puller set ① ST33051001 Body ② ST33061000 Adapter		Removing and installing differential side bearing inner cone
ST30611000 Drift		Installing pinion rear bearing outer race
ST30613000 Drift		Installing pinion rear bearing outer race
ST30701000 Drift		Installing pinion front bearing outer race
KV38100200 Gear carrier side oil seal drift		Installing side oil seal

Tool number Tool name	Description	
KV38100500 Gear carrier front oil seal drift		Installing front oil seal
KV38100300 Differential side bearing inner cone		Installing side bearing inner cone
KV38100600 Side bearing spacer drift		Installing side bearing spacer
ST3127S000 Preload gauge ① GG91030000 Torque wrench ② HT62940000 Socket adapter ③ HT62900000 Socket adapter		Measuring pinion bearing preload and total preload
HT72400000 Slide hammer		Removing differential case assembly
KV381039S0 Drive pinion setting gauge ① KV38103910 Dummy shaft ② KV38100120 Height gauge ③ KV38100140 Stopper		Selecting pinion height adjusting washer







On-vehicle Service

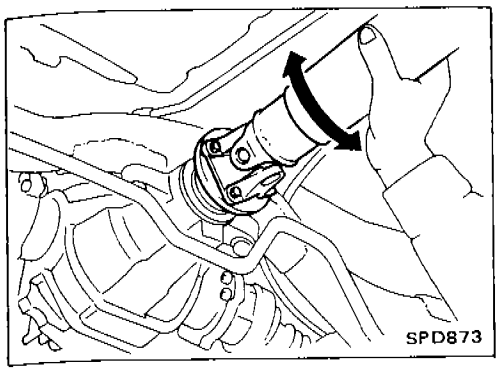
PROPELLER SHAFT VIBRATION

If vibration is present at high speed, inspect propeller shaft runout first.

1. Raise rear wheels.
2. Measure propeller shaft runout at indicated points by rotating final drive companion flange with hands.
   Runout limit: 0.6 mm (0.024 in)

Propeller shaft runout measuring points:
Distance "A"
162 mm (6.38 in)
Distance "B"
172 mm (6.77 in)
Distance "C"
192 mm (7.56 in)

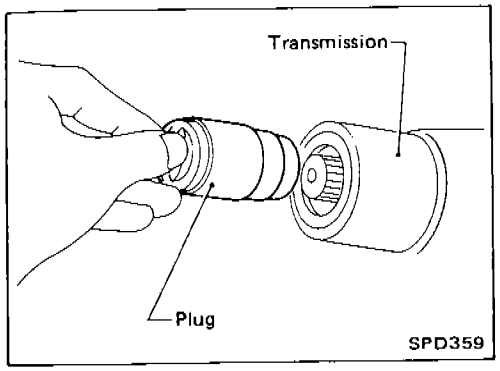
On-vehicle Service (Cont'd)



3. If runout exceeds specifications, disconnect propeller shaft at final drive companion flange; then rotate companion flange 180 degrees and reconnect propeller shaft.
   Runout limit: 0.6 mm (0.024 in)
4. Check runout again. If runout still exceeds specifications, replace propeller shaft assembly.
5. Perform road test.

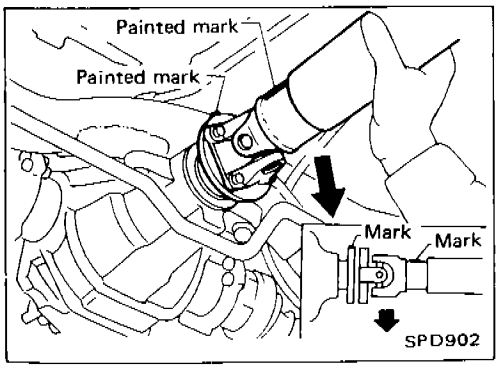
APPEARANCE CHECKING

- Inspect propeller shaft tube surface for dents or cracks. If damaged, replace propeller shaft assembly.
- If center bearing is noisy or damaged, replace center bearing.



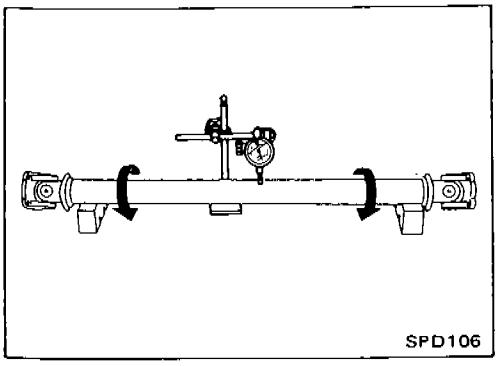
Removal

- Draw out propeller shaft from transmission and plug up rear end of transmission rear extension housing.



Installation

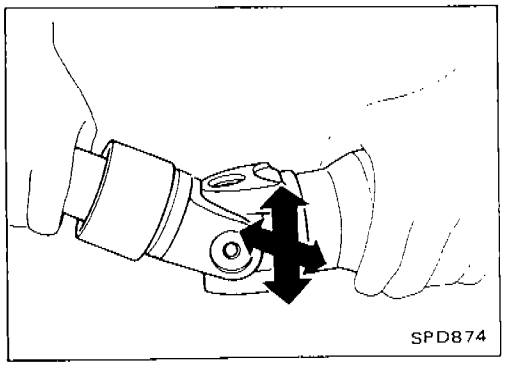
- Temporarily install differential companion flange and flange yoke so that their alignment marks are located as close to each other as possible.
- Turn propeller shaft until alignment marks face straight upward. Securely fasten propeller shaft so that lower side wall of concave flange yoke will touch lower side wall of convex companion flange.



Inspection

- Inspect propeller shaft runout. If runout exceeds specifications, replace propeller shaft assembly.
  Runout limit: 0.6 mm (0.024 in)

Inspection (Cont'd)

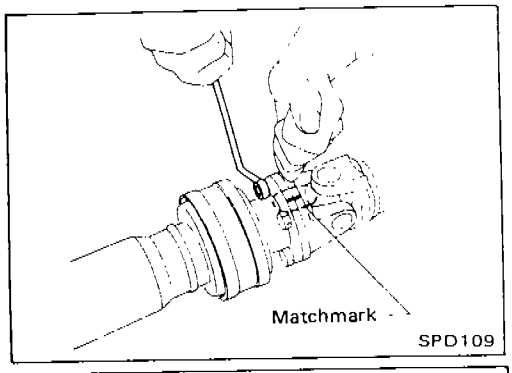


- Inspect journal axial play.
  If the play exceeds specifications, replace propeller shaft assembly.
  Journal axial play:
  0 mm (0 in)

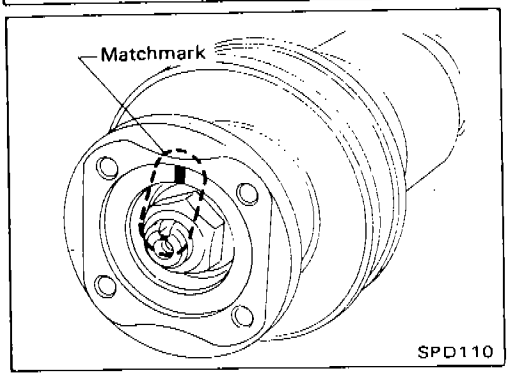
Disassembly

CENTER BEARING

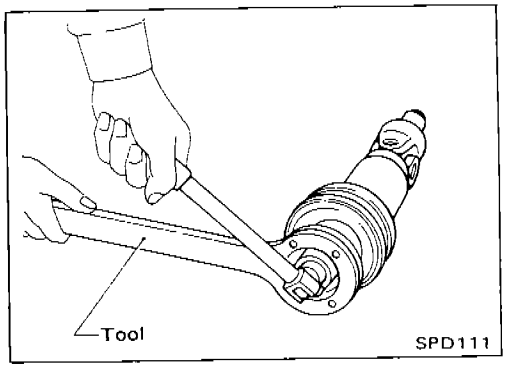
1. Put matchmarks on flanges, and separate 2nd tube from 1st tube.



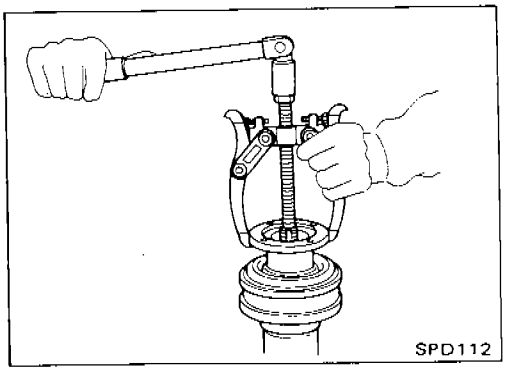
2. Put matchmarks on the flange and shaft.



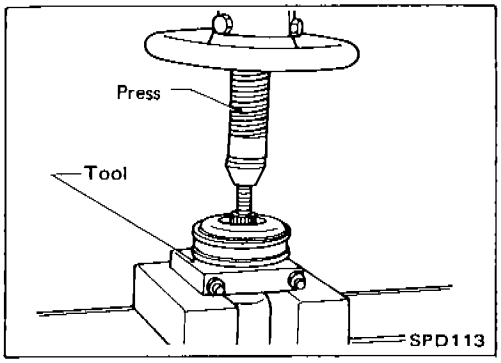
3. Remove locking nut with Tool.
   Tool number:
   ST38060002



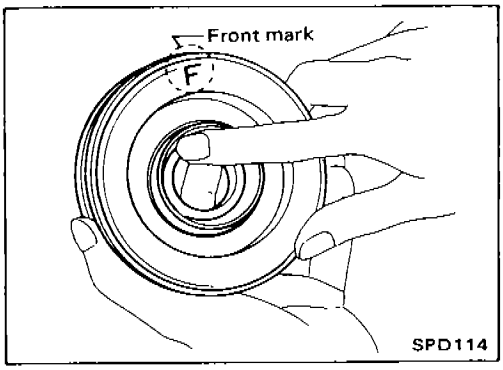
4. Remove companion flange with puller.



Disassembly (Cont'd)



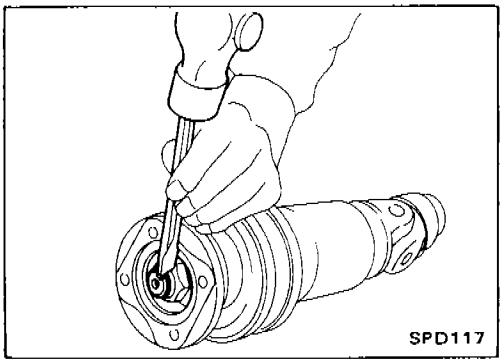
5. Remove center bearing with Tool and press.
   Tool number: ST30031000



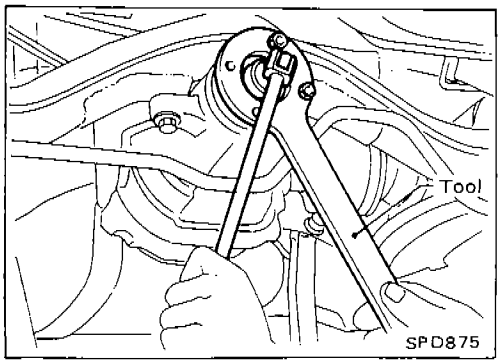
Assembly

CENTER BEARING

- When installing center bearing, position the "F" mark on center bearing toward front of vehicle.
- **Apply a coat of multi-purpose lithium grease containing molybdenum disulfide to the end face of the center bearing and both sides of the washer.**

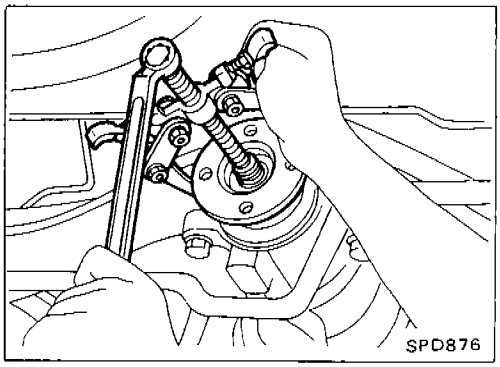


- Stake the nut. Always use new one.
- Align matchmarks when assembling tubes.

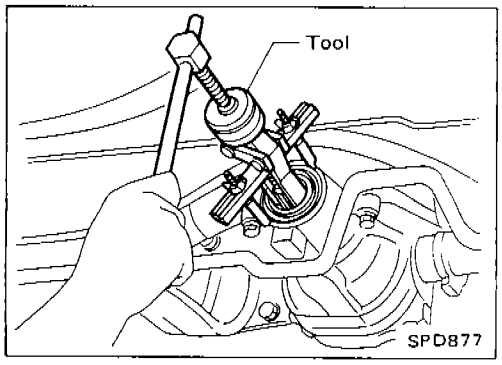


Front Oil Seal Replacement

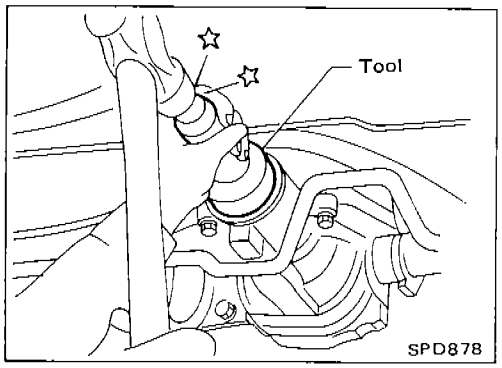
1. Remove propeller shaft.
2. Loosen drive pinion nut with Tool.
   Tool number: ST38060002



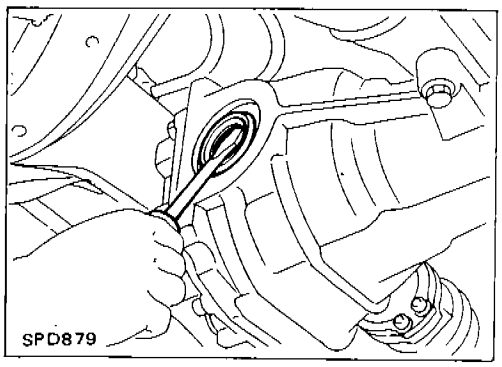
3. Remove companion flange.



4. Remove front oil seal.



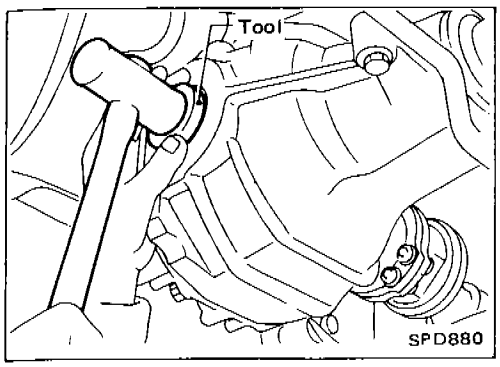
5. Apply multi-purpose grease to sealing lips of oil seal. Press front oil seal into carrier.
6. Install companion flange and drive pinion nut.
7. Install propeller shaft.



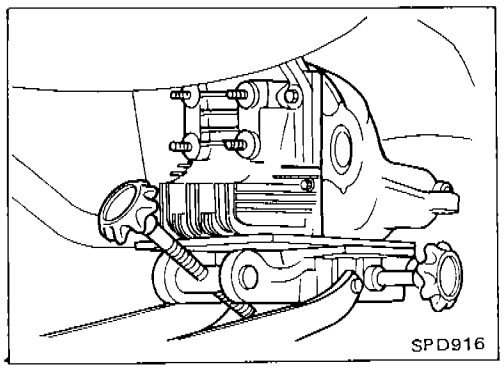
Side Oil Seal Replacement

1. Remove drive shafts.
   Refer to RA section.
2. Remove oil seal.

Side Oil Seal Replacement (Cont'd)



3. Apply multi-purpose grease to sealing lips of oil seal. Press-fit oil seal into carrier with Tool.
   Tool number: KV38100200
4. Install drive shafts.



Removal

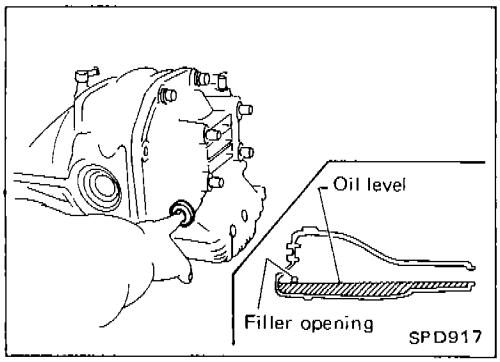
- Remove propeller shaft.

Insert plug into rear oil seal after removing propeller shaft.

- Remove drive shafts.
  Refer to RA section.
- Pull off final drive backward together with jack.

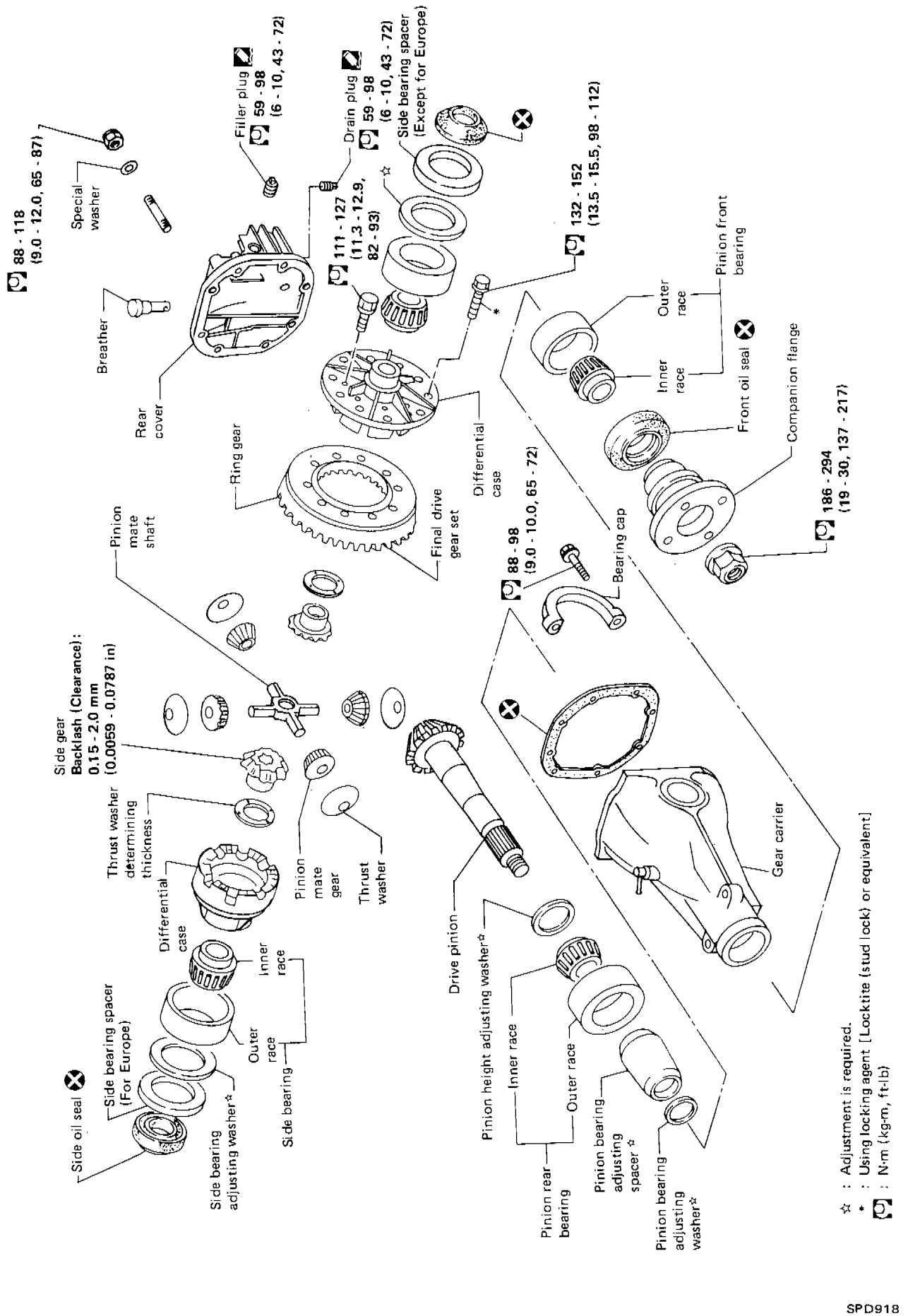
CAUTION:

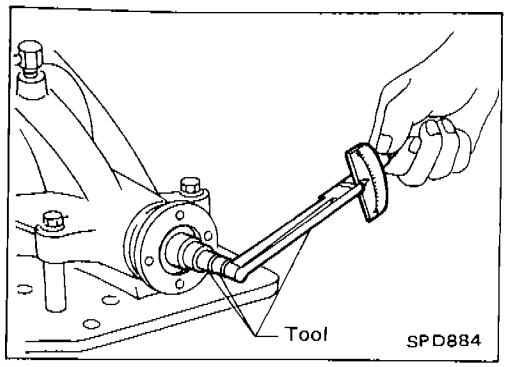
- **Be careful not to damage spline, sleeve yoke and front oil seal, when removing propeller shaft.**
- **After final drive is removed, support suspension member on a stand to prevent its insulators from being twisted or damaged.**



Installation

- Fill final drive with recommended gear oil.


88 - 118 (9.0 - 12.0, 65 - 87)
Special washer
Breather
Rear cover
Filler plug 59 - 98 (6 - 10, 43 - 72)
Drain plug 59 - 98 (6 - 10, 43 - 72)
111 - 127 (11.3 - 12.9, 82 - 93)
Side bearing spacer (Except for Europe)
132 - 152 (13.5 - 15.5, 98 - 112)
Pinion front bearing
Outer race
Inner race
Front oil seal
Companion flange
186 - 294 (19 - 30, 137 - 217)
Ring gear
Pinion mate shaft
Final drive gear set
Differential case
88 - 98 (9.0 - 10.0, 65 - 72)
Bearing cap
Side gear Backlash (Clearance): 0.15 - 2.0 mm (0.0059 - 0.0787 in)
Thrust washer determining thickness
Differential case
Pinion mate gear
Thrust washer
Drive pinion
Gear carrier
Side oil seal
Side bearing spacer (For Europe)
Side bearing adjusting washer☆
Outer race
Inner race
Side bearing
Pinion height adjusting washer☆
Inner race
Outer race
Pinion rear bearing
Pinion bearing adjusting spacer ☆
Pinion bearing adjusting washer☆
☆ : Adjustment is required.
* : Using locking agent [Locktite (stud lock) or equivalent]
: N·m (kg-m, ft-lb)
SPD918

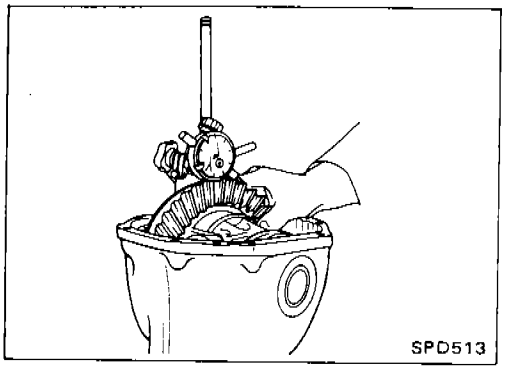


Pre-inspection

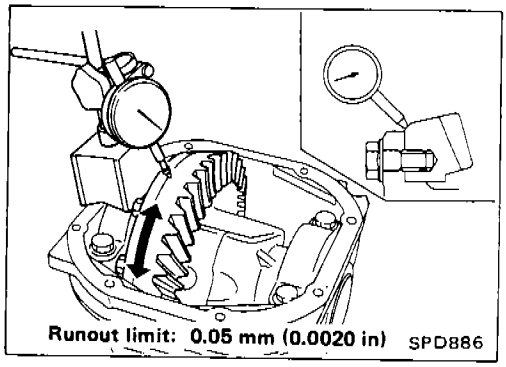
Before disassembling final drive, perform the following inspection.

- Total preload

1) Turn drive pinion in both directions several times to set bearing rollers.
2) Check total preload with Tool.
   Tool number: ST3127S000
   Total preload:
   1.4 - 1.7 N·m
   (14 - 17 kg-cm, 12 - 15 in-lb)



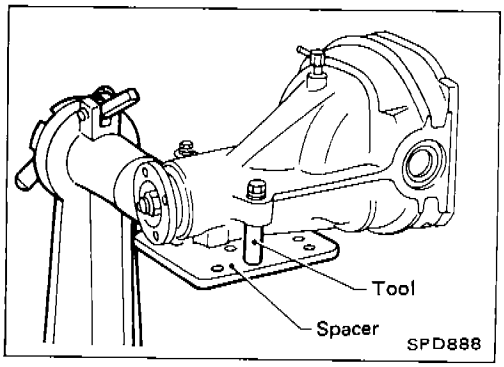
- Ring gear to drive pinion backlash
  Check ring gear-to-drive pinion backlash with a dial indicator at several points.
  Ring gear-to-drive pinion backlash:
  0.10 - 0.15 mm (0.0039 - 0.0059 in)

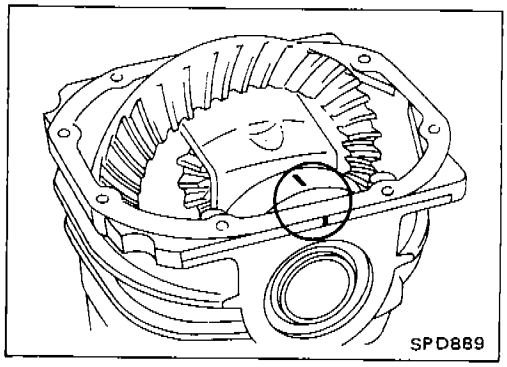


- Ring gear runout
  Check runout of ring gear with a dial indicator.
  Runout limit:
  0.05 mm (0.0020 in)
- Tooth contact
  Check tooth contact. (Refer to Adjustment.)

Differential Carrier

1. Using two 45 mm (1.77 in) spacers, mount carrier on Tool.
   Tool number: KV38100800

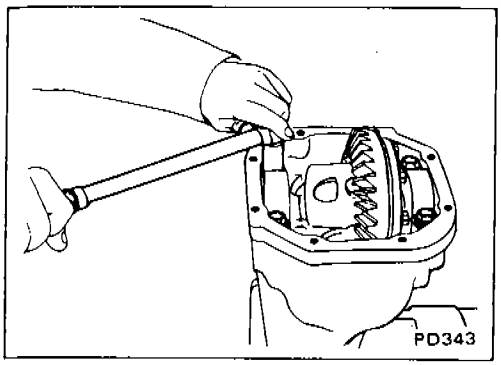




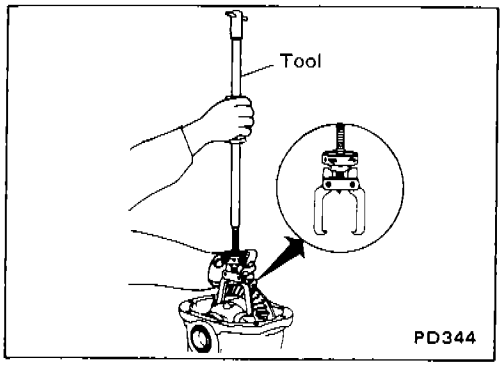
2. Paint or punch matchmarks on one side of the side bearing cap so it can be properly reinstalled.

Bearing caps are line-board during manufacture. Replace them in their proper positions.

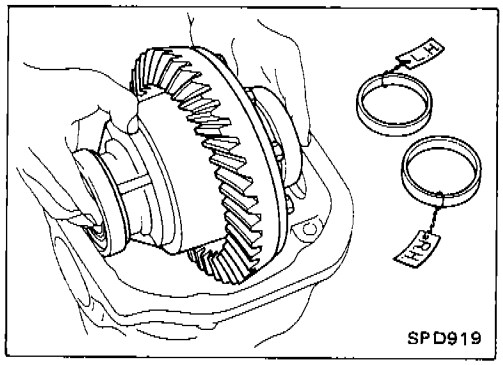
Differential Carrier (Cont'd)



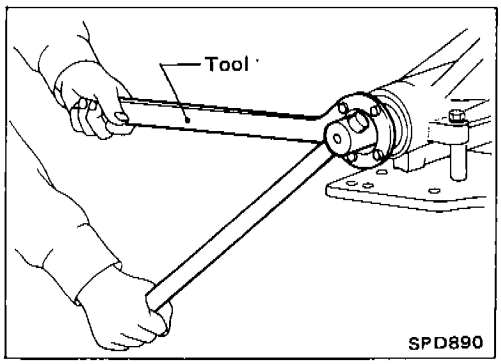
3. Remove side bearing caps.



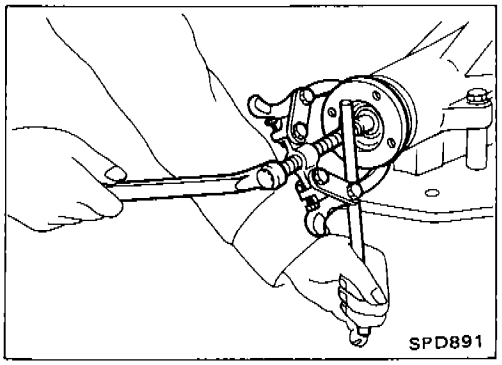
4. Lift differential case assembly out with Tool.
   Tool number: HT72400000



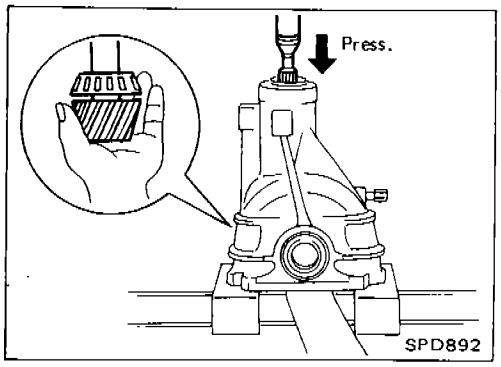
Keep the side bearing outer races together with inner cone — do not mix them up.



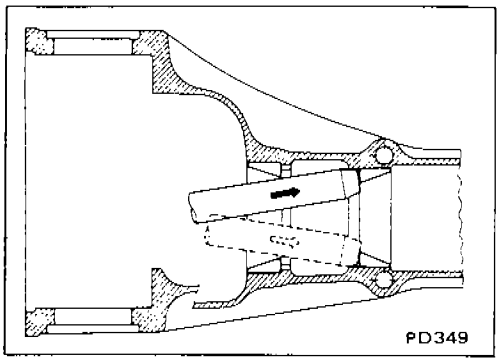
5. Loosen drive pinion nut and pull off companion flange.



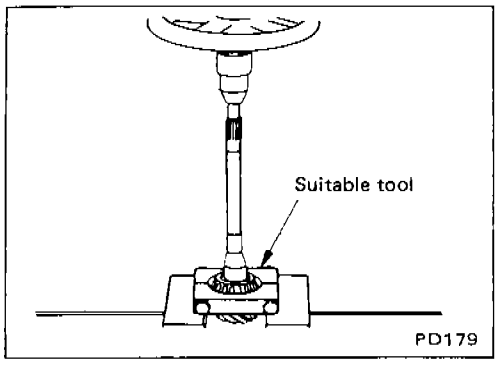
Differential Carrier (Cont'd)



6. Take out drive pinion (together with rear bearing inner race, bearing spacer and adjusting washer).
7. Remove oil seal.
8. Remove front bearing inner race.
9. Remove side oil seal.

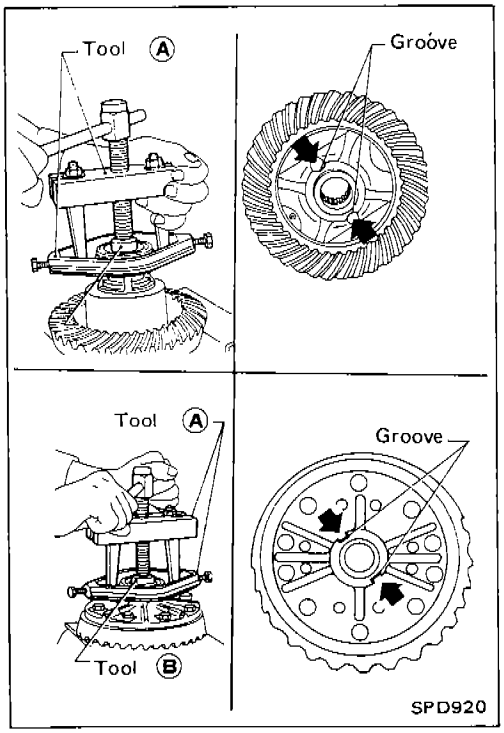


10. Remove pinion bearing outer races with a brass drift.



11. Remove pinion rear bearing inner race and drive pinion height adjusting washer with suitable tool.

Differential Case



1. Remove side bearing inner cones.

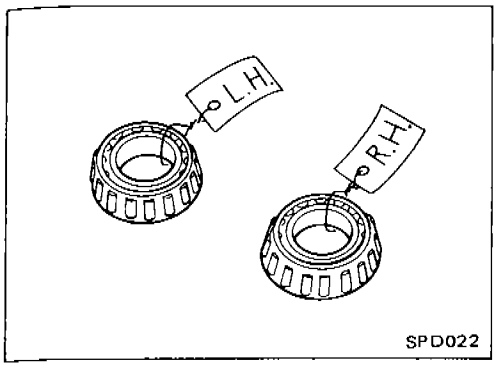
To prevent damage to bearing, engage puller jaws in groove.

Tool number:

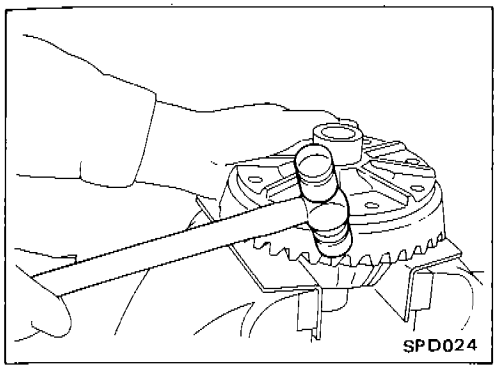
Ⓐ ST33051001

Ⓑ ST33061000

Differential Case (Cont'd)

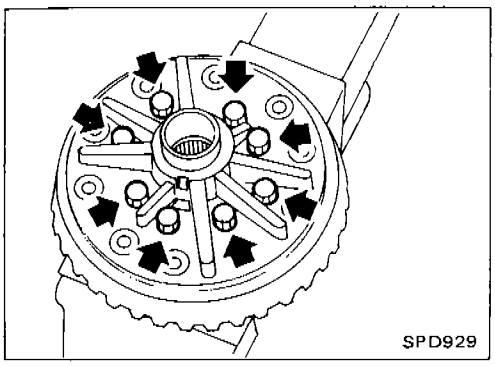


Be careful not to confuse left- and right-hand parts.



2. Loosen ring gear bolts in a criss-cross fashion.
3. Tap ring gear off the differential case with a soft hammer.

Tap evenly all around to keep ring gear from binding.

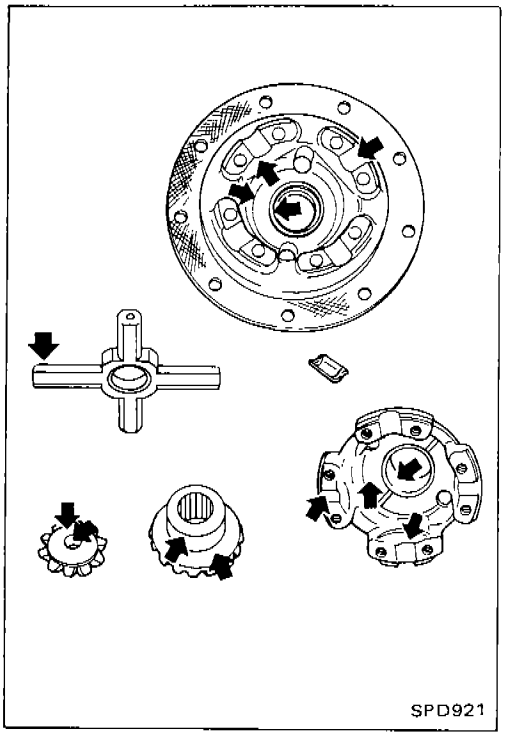


4. Separate differential case L.H. and R.H. (4-pinion type differential case).

Put matchmarks on both differential case L.H. and R.H. sides prior to separating them.

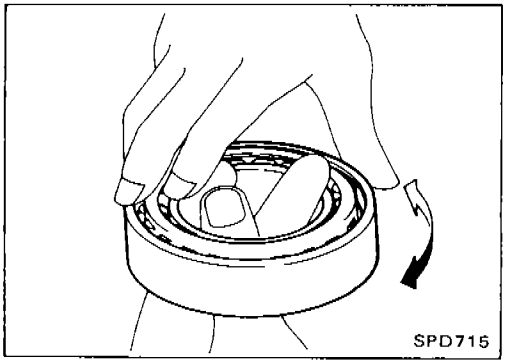
Ring Gear and Drive Pinion

Check gear teeth for scoring, cracking or chipping. If any part is damaged, replace ring gear and drive pinion as a set (hypoid gear set).


SPD921

Differential Case Assembly

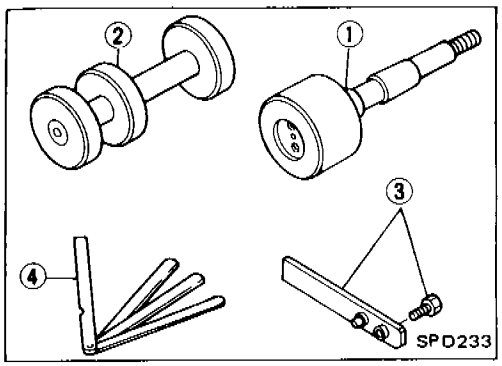
Check mating surfaces of differential case, side gears, pinion mate gears, pinion mate shaft and thrust washers.


SPD715

Bearing

1. Thoroughly clean bearing.
2. Check bearings for wear, scratches, pitting or flaking. Check tapered roller bearing for smooth rotation. If damaged, replace outer race and inner cone as a set.

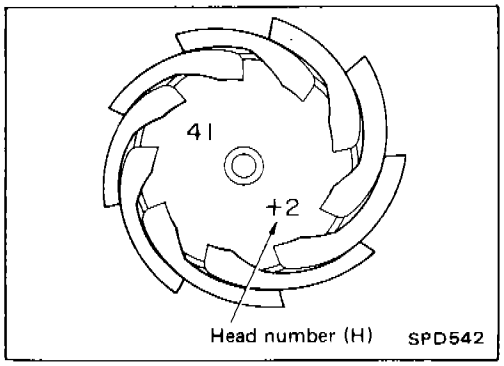
To avoid confusion while calculating bearing shims, it is absolutely necessary to stay with the metric system. If you measure anything in inches, **the results must be converted to the metric system.**



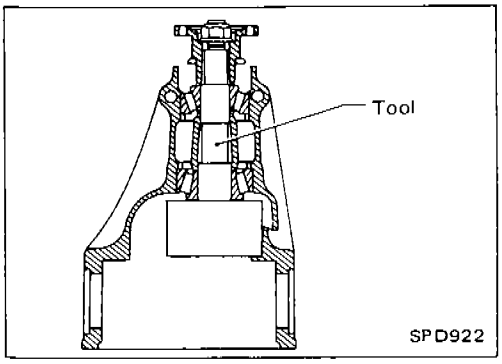
Drive Pinion Height

1. First prepare Tools for pinion height adjustment.
   ① Dummy Shaft (KV38103910)
   ② Height Gauge (KV38100120)
   ③ Stopper (KV38100140)
   ④ Feeler Gauge
2. To simplify the job, make a chart, like the one below, to organize your calculations.

LETTERS	HUNDREDTHS OF A MILLIMETER
H: Head number	
N: Measureing clearance	

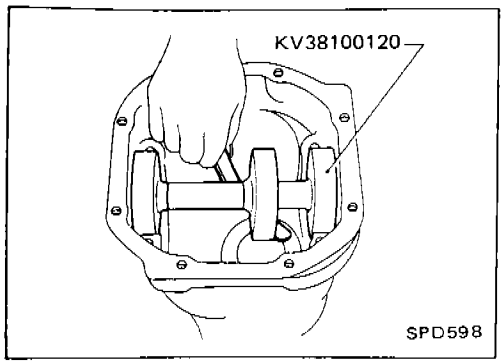


3. Write the following numbers down the chart.
   H: Head number



4. Set Tool (Dummy shaft) as shown below and tighten drive pinion nut carefully to corret preload of 1.0 to 1.3 N·m (10 to 13 kg-cm, 8.7 to 11.3 in-lb).
   Tool: Dummy shaft (KV38103910)

Drive Pinion Height (Cont'd)



5. Attach Tool (Height gauge) to gear carrier, and measure the clearance between the height gauge and the dummy shaft face.
6. Substitute these values into the equation to calculate the thickness of the washer.

If value signifying H is not given, regard it as zero and calculate.

T (Thickness of washer) = N − (H x 0.01) + 3.00

Example:

N = 0.23

H = 1

T = N − (H x 0.01) + 3.00

= 0.23 − (1 x 0.01) + 3.00

(1) H 1

+1

(2) +1 x 0.01

+0.01

(3) N ..... 0.23 − (+0.01)

0.22

(4) 0.22 +3.00

3.22

∴T = 3.22

7. Select the proper washer. (Refer to S.D.S.)

If you cannot find the desired thickness of washer, use washer with thickness closest to the calculated value.

Example:

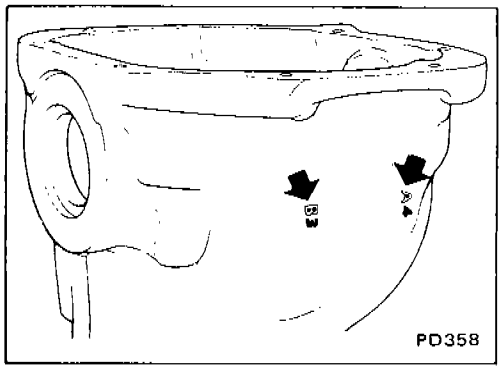
Calculated value ... T = 3.22 mm

Used washer ... T = 3.21 mm

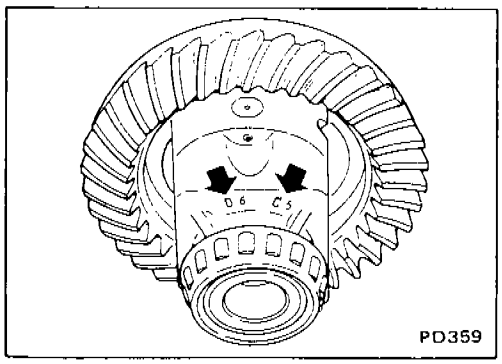
Side Bearing Preload

1. To simplify the job, make a chart like the one below to organize your calculations.

LETTERS	HUNDREDTHS OF A MILLIMETER
A - Left housing	
B - Right housing	
C - Differential case	
D - Differential case	
E - Left side bearing	
F - Right side bearing	
H - (+) or (–): ring gear	
G - Spacer measurement	

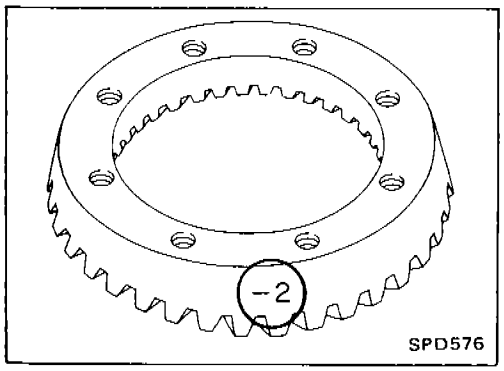

PD358

2. Write the following numbers down in the chart.
   A & B: Figures marked on gear carrier



PD359

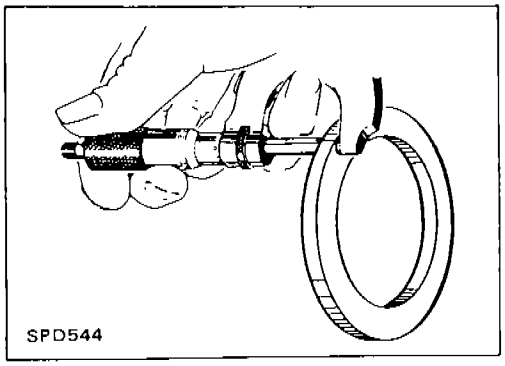
C & D: Figures marked on differential case



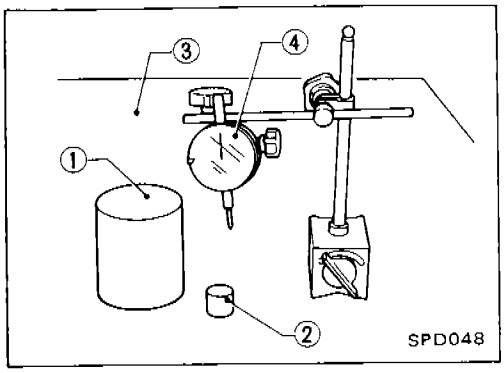
SPD576

H: Figure marked on ring gear

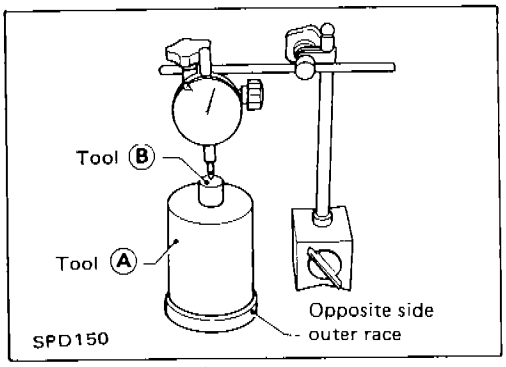
Side Bearing Preload (Cont'd)



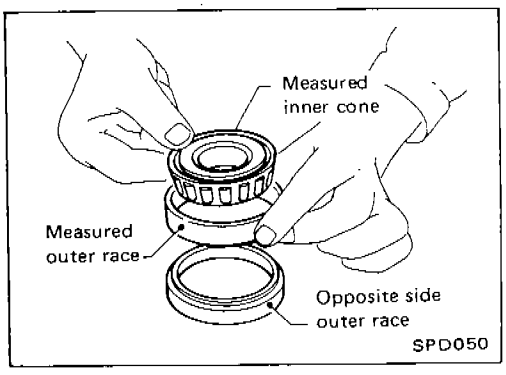
G: This is the difference in thickness of side spacer against standard width [8.10 mm (0.3189 in)].
(G = Standard spacer – Measured spacer)



3. Measure how far under the standard thickness [21 mm (0.83 in)] the side bearings are.
   It will require tools shown to the left.
   ① Weight Block (ST32501000)
   ② Master Gauge (KV38102000)
   ③ Base Plate
   ④ Dial Indicator

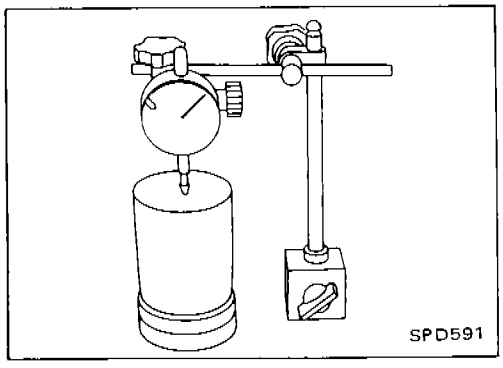


4. Place the outer race of the opposite side bearing to be measured.
5. Place a weight block on that outer race, and a master gauge on that block.
   Tool number:
   Ⓐ **ST32501000**
   Ⓑ **KV38102000**
6. Adjust dial indicator scale to zero.
7. Carefully slide master gauge block and weight block out from under dial indicator.



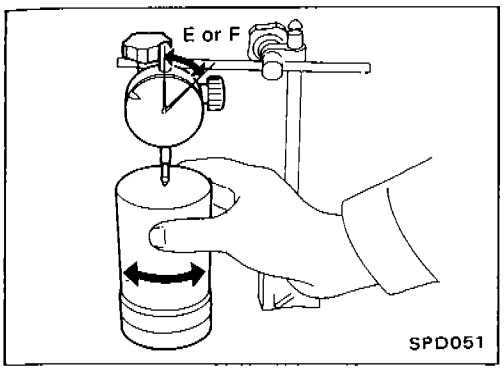
8. Lubricate side bearing and place the bearing outer race and inner cone to be measured on the opposite side outer race.

If the bearing assembly is placed on the base plate, the bearing width cannot be accurately determined due to its cage being in contact with the base plate.



9. Place weight block on side bearing.
10. Slide dial indicator on weight block.

Side Bearing Preload (Cont'd)



11. Turn weight block a few times to ensure that bearing is properly seated.
12. Read dial indicator.
- Normal indication:
  0.10 - 0.30 mm (0.0039 - 0.0018 in)
- If the needle fluctuated erratically then bearing is either dirty or damaged and should be cleaned or replaced.

13. Measure both bearings in the same way and write the left side bearing measurement next to "E" and the right side bearing measurement next to "F".
14. Substitute these values into the equation to calculate the thickness of the shim.

If values signifying A, B, C, D and H are not given, regard them as zero and calculate.

Europe model:

Left side

$$T_1 = (A - C + D - H) \times 0.01 + 2.07 + E$$

Right side

$$T_2 = (B - D + H) \times 0.01 + 1.97 + F + G$$

Except Europe model:

Left side

$$T_2 = (B - D + H) \times 0.01 + 1.97 + F + G$$

Right side

$$T_1 = (A - C + D - H) \times 0.01 + 2.07 + E$$

Side Bearing Preload (Cont'd)

Example:

A = 4	H = –2
B = 3	E = 0.18
C = 5	F = 0.15
D = 6	G = 0.08

Left side: Europe
Right side: Except Europe

T_1 = (A – C + D – H) x 0.01 + 2.07 + E
= [4 – 5 + 6 – (–2)] x 0.01 + 2.07 + 0.18

(1) A 4
–C ..... –5
–1
+D ..... +6
5
–H ..... –(–2)
7

(2) 7
x 0.01
0.07

(3) 0.07
+2.07
2.14

(4) 2.14
+E ..... +0.18
2.32

$\therefore T_1$ = 2.32 mm

Right side: Europe
Left side: Except Europe

T_2 = (B – D + H) x 0.01 + 1.97 + F + G
= [3 – 6 + (–2)] x 0.01 + 1.97 + 0.15 + 0.08

(1) B 3
–D ..... –6
–3
+H ..... +(–2)
–5

(2) –5
x 0.01
–0.05

(3) –0.05
+1.97
1.92

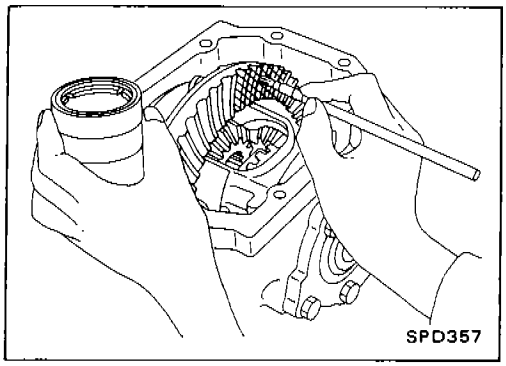
(4) 1.92
+F ..... +0.15
2.07
2.07
+G ..... +0.08
2.15

$\therefore T_2$ = 2.15 mm

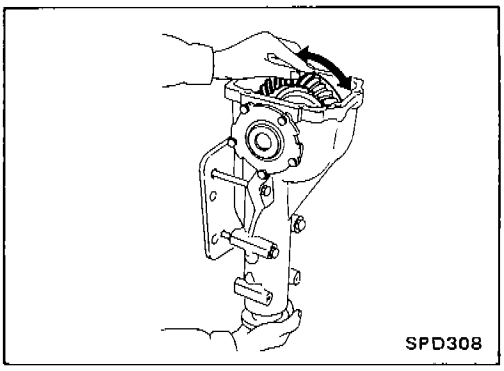
15. Select the proper shims. (Refer to S.D.S.)
If you cannot find the desired thickness of shims, use shims with the total thickness closest to the calculated value.

Tooth Contact

Checking gear tooth contact pattern is necessary to verify correct relationship between ring gear and drive pinion.
Hypoid gear set which is not positioned properly in relation to one another may be noisy, or have short life or both. With the checking of gear tooth contact pattern, the most desirable contact for low noise level and long life can be assured.

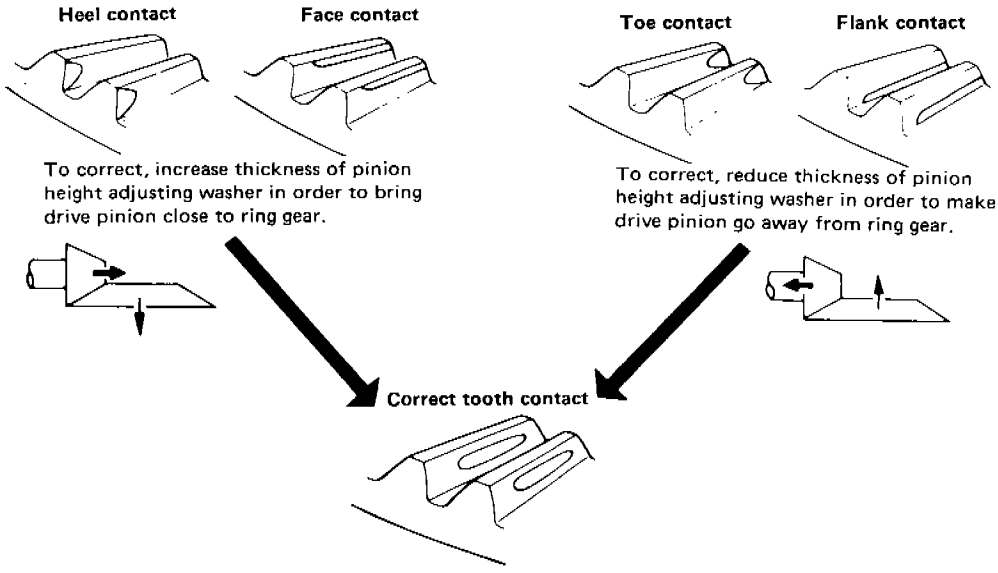

SPD357

1. Thoroughly clean ring gear and drive pinion teeth.
2. Sparingly apply a mixture of powdered ferric oxide and oil or equivalent to 3 or 4 teeth of ring gear drive side.

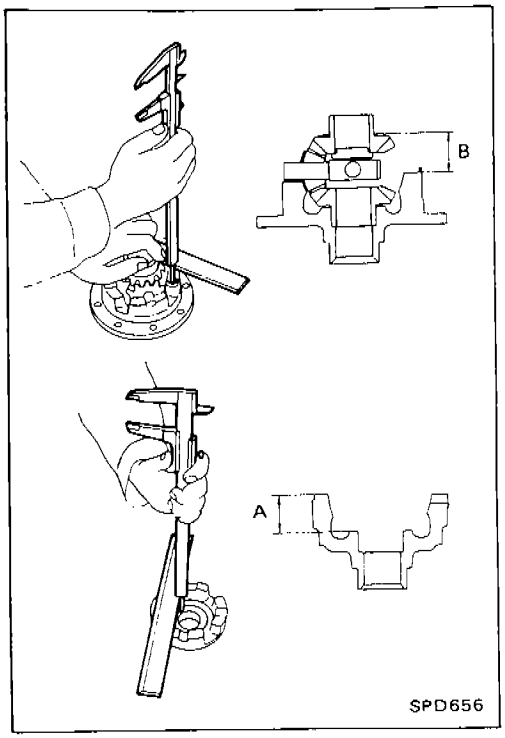

SPD308

3. Hold companion flange steady by hand and rotate the ring gear in both directions.

Usually the pattern will be correct if you have calculated the shims correctly and the backlash is correct.
However, in rare cases you may have to use trial-and-error processes until you get a good tooth contact pattern.
The tooth pattern is the best indication of how well the final drive has been set up.



SPD007



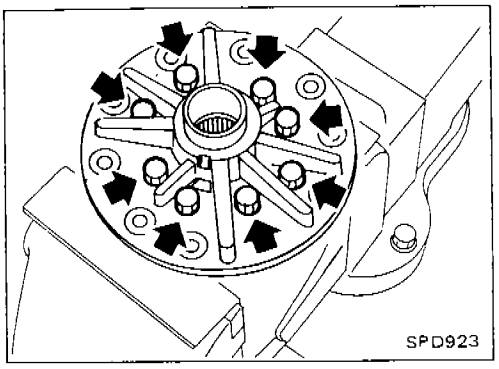
Differential Case

1. Measure clearance between side gear thrust washer and differential case.

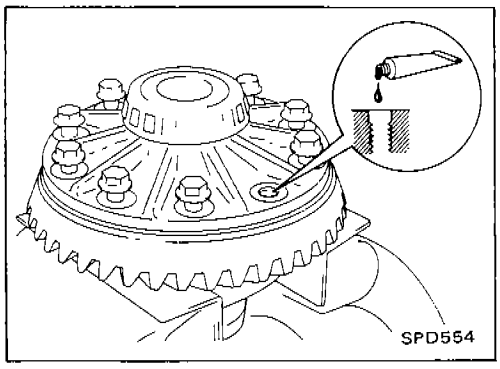
   Clearance between side gear thrust washer and differential case (A – B):

   0.15 - 0.20 mm (0.0059 - 0.0079 in)

   The clearance can be adjusted with side gear thrust washer. Refer to S.D.S.
2. Apply oil to gear tooth surfaces and thrust surfaces and check that they turn properly.

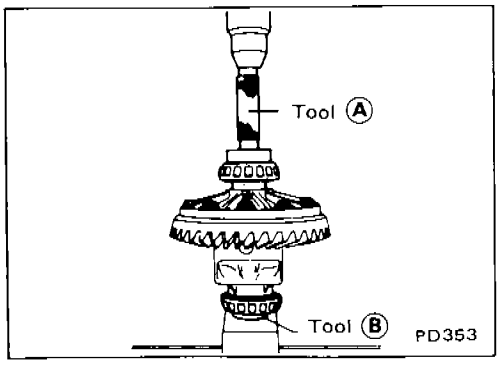


3. Install differential case L.H. and R.H.



4. Place differential case on ring gear.
5. Apply locking sealant to ring gear bolts, and install them.

Tighten bolts in a criss-cross fashion, lightly tapping bolt head with a hammer.

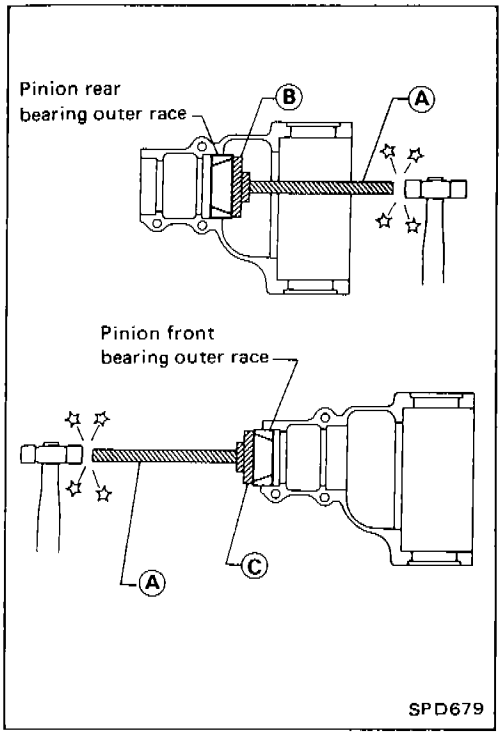


6. Press-fit side bearing inner cones on differential case with Tool.

   Tool number:

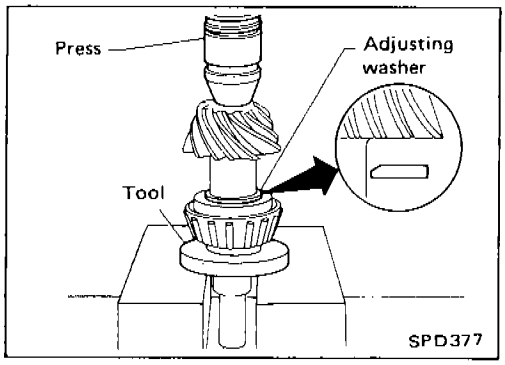
   Ⓐ KV38100300

   Ⓑ ST33061000

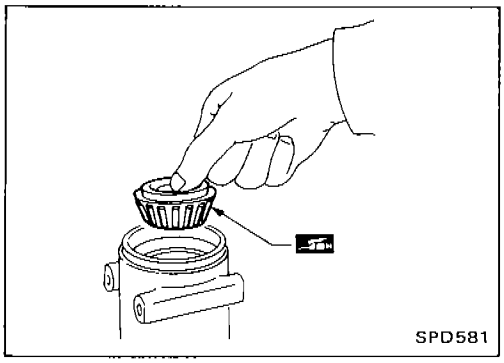


Differential Carrier

1. Press-fit front and rear bearing outer races with Tools.
   Tool number:
   - Ⓐ **ST30611000**
   - Ⓑ **ST30613000**
   - Ⓒ **ST30701000**
2. Select pinion bearing adjusting washer and drive pinion bearing spacer, referring to ADJUSTMENT.

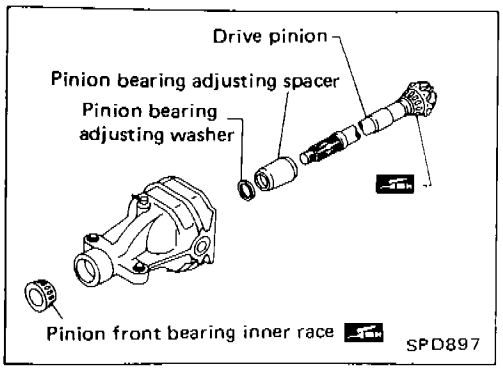


3. Install drive pinion height adjusting washer in drive pinion, and press-fit pinion rear bearing inner cone in it, using press and Tool.
   Tool number: ST30901000



4. Place pinion front bearing inner cone in final drive housing.

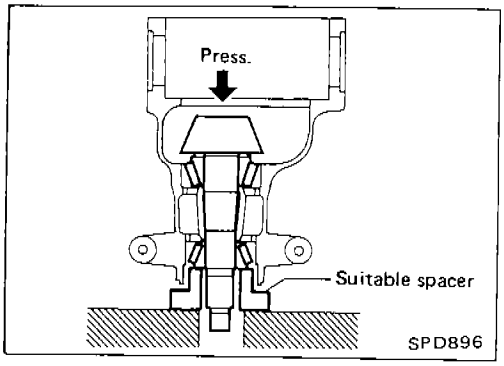
Differential Carrier (Cont'd)



5. Set drive pinion assembly (as shown in figure at left) in differential carrier and install drive pinion, with press and suitable tool.

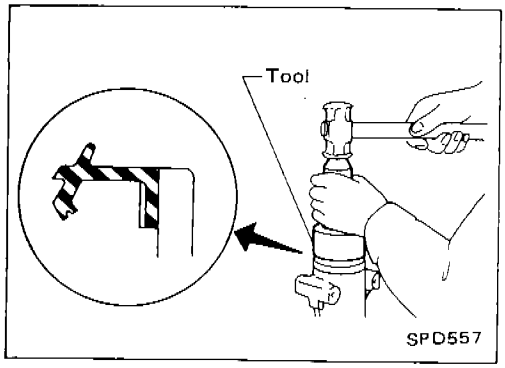
Stop when drive pinion touches bearing.

Apply multi-purpose grease to pinion rear bearing inner race, pinion front bearing inner race and front pilot bearing.



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

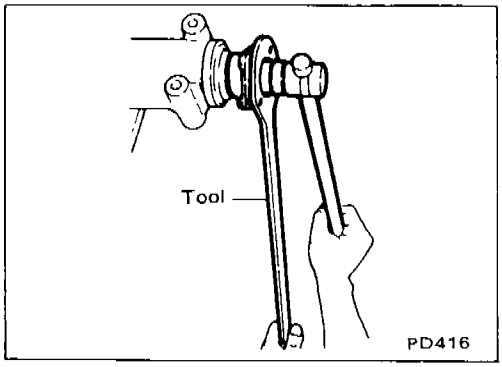
Tool number: KV38100500



7. Install companion flange, and tighten pinion nut to specified torque with Tool.

Ascertain that threaded portion of drive pinion and pinion nut are free from oil or grease.

Tool number: ST38060002



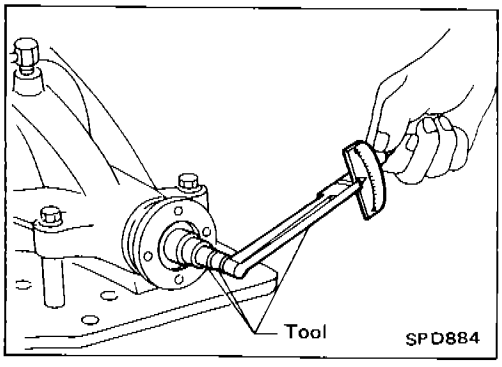
8. Turn drive pinion in both directions several times, and measure pinion bearing preload.

Pinion bearing preload:

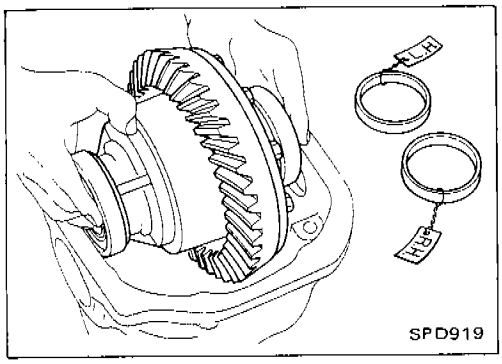
1.1 - 1.4 N·m

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

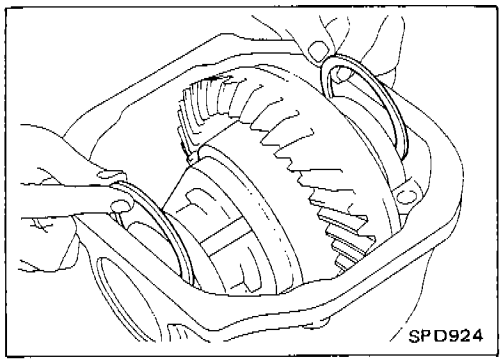
When pinion bearing preload is outside the specifications, replace pinion bearing adjusting washer and spacer with a different thickness.



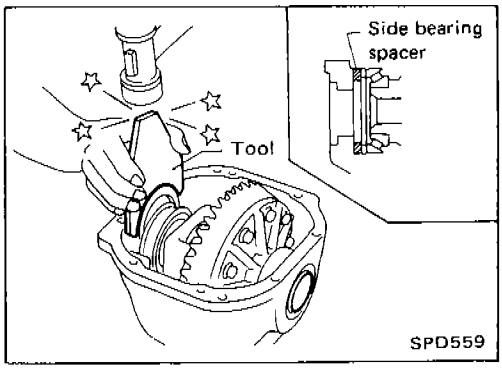
Differential Carrier (Cont'd)



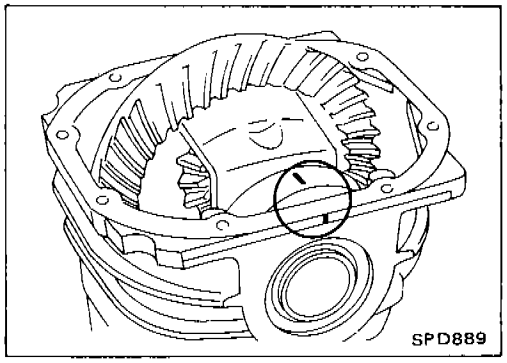
9. Select side bearing adjusting washer.
   Refer to ADJUSTMENT.
10. Install differential case assembly with side bearing outer races into gear carrier.



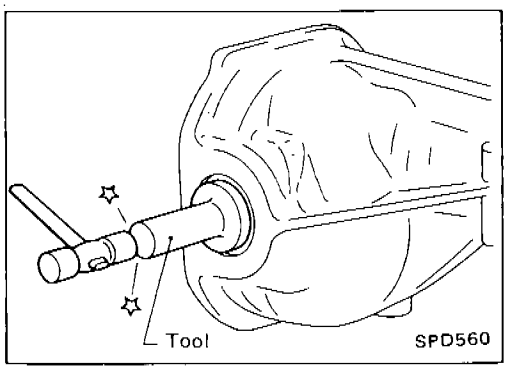
11. Insert left and right side bearing adjusting washers in place between side bearings and carrier.



12. Drive in side bearing spacer with Tool.
    Tool number: KV38100600

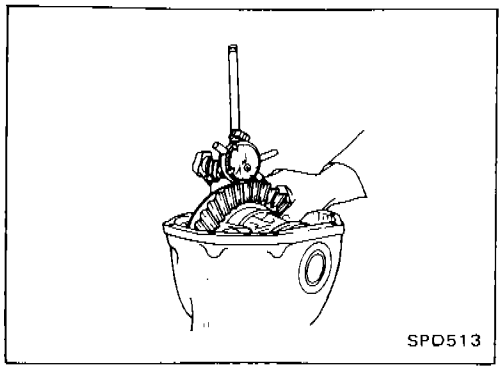


13. Align mark on bearing cap with that on gear carrier and install bearing cap on gear carrier.



14. Apply multi-purpose grease to cavity at sealing lips of oil seal. Install side oil seal.
    Tool number: KV38100200

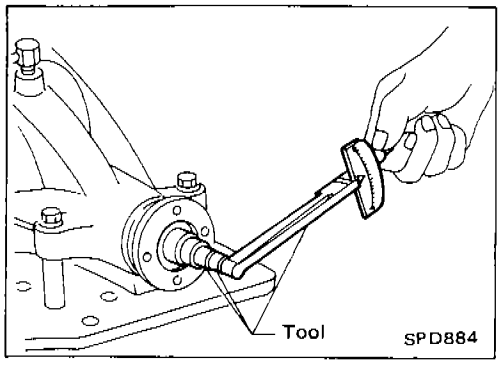
Differential Carrier (Cont'd)


SPD513

15. Measure ring gear-to-drive pinion backlash with a dial indicator.
    Ring gear-to-drive pinion backlash:
    0.10 - 0.15 mm
    (0.0039 - 0.0059 in)
- If backlash is too small, decrease thickness of left shim and increase thickness of right shim by the same amount.

If backlash is too great, reverse the above procedure.

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



SPD884

16. Check total preload with Tool.

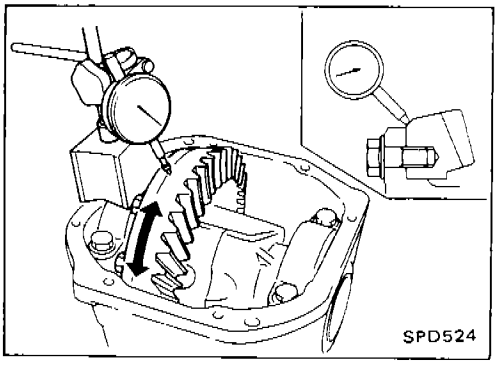
When checking preload, turn drive pinion in both directions several times to seat bearing rollers correctly.

Total preload:
Value more than 0.29 N·m (3.0 kg-cm, 2.6 in-lb) added on measured value of drive pinion preload

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

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

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


SPD524

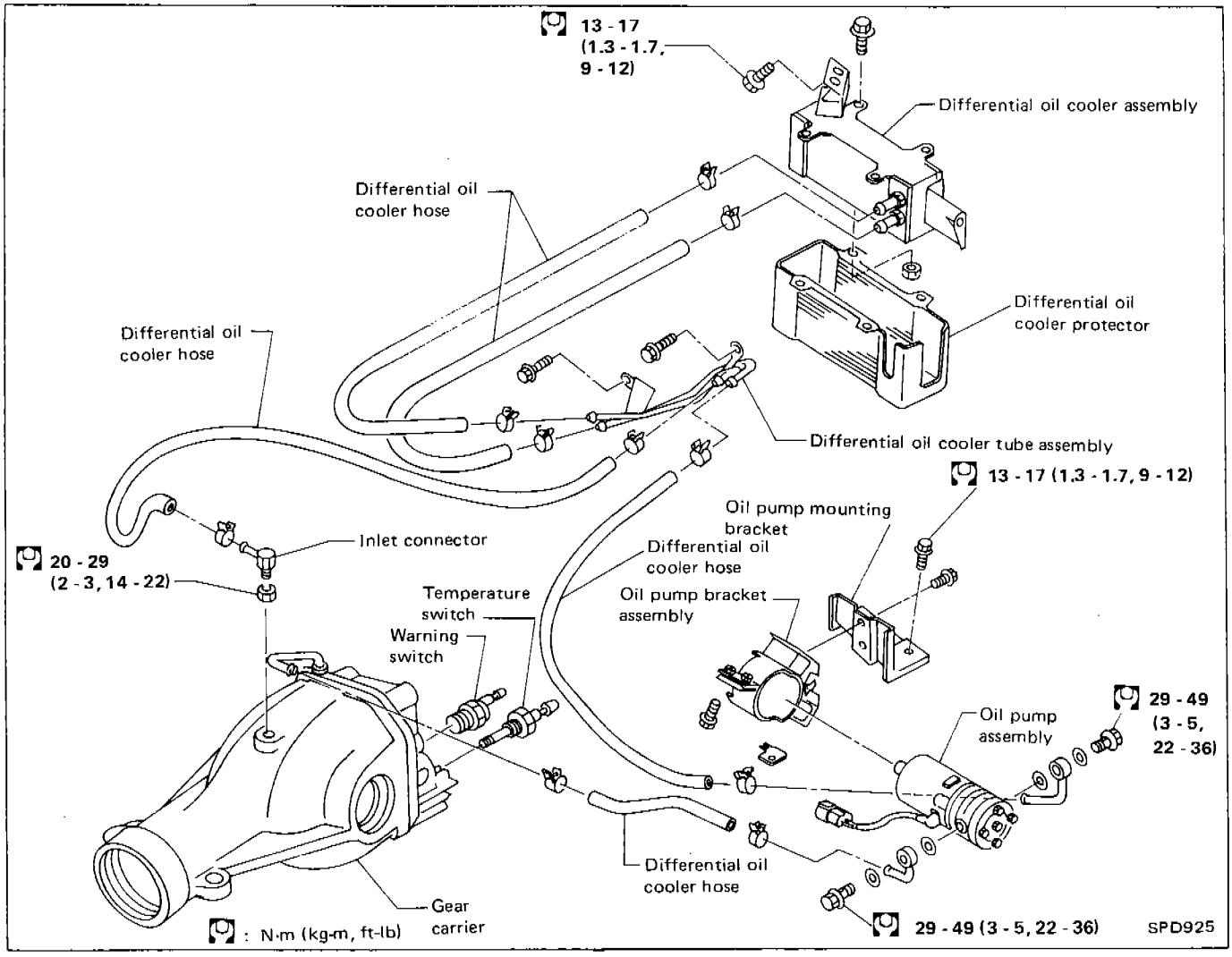
18. Check runout of ring gear with a dial indicator.
    Runout limit:
    0.05 mm (0.0020 in)
- If backlash varies excessively in different places, foreign matter may be caught between the ring gear and the differential case.
- If the backlash varies greatly when the ring gear runout is within a specified range, replace the hypoid gear set or differential case.

19. Check tooth contact.
    Refer to ADJUSTMENT.
20. Install rear cover and gasket.

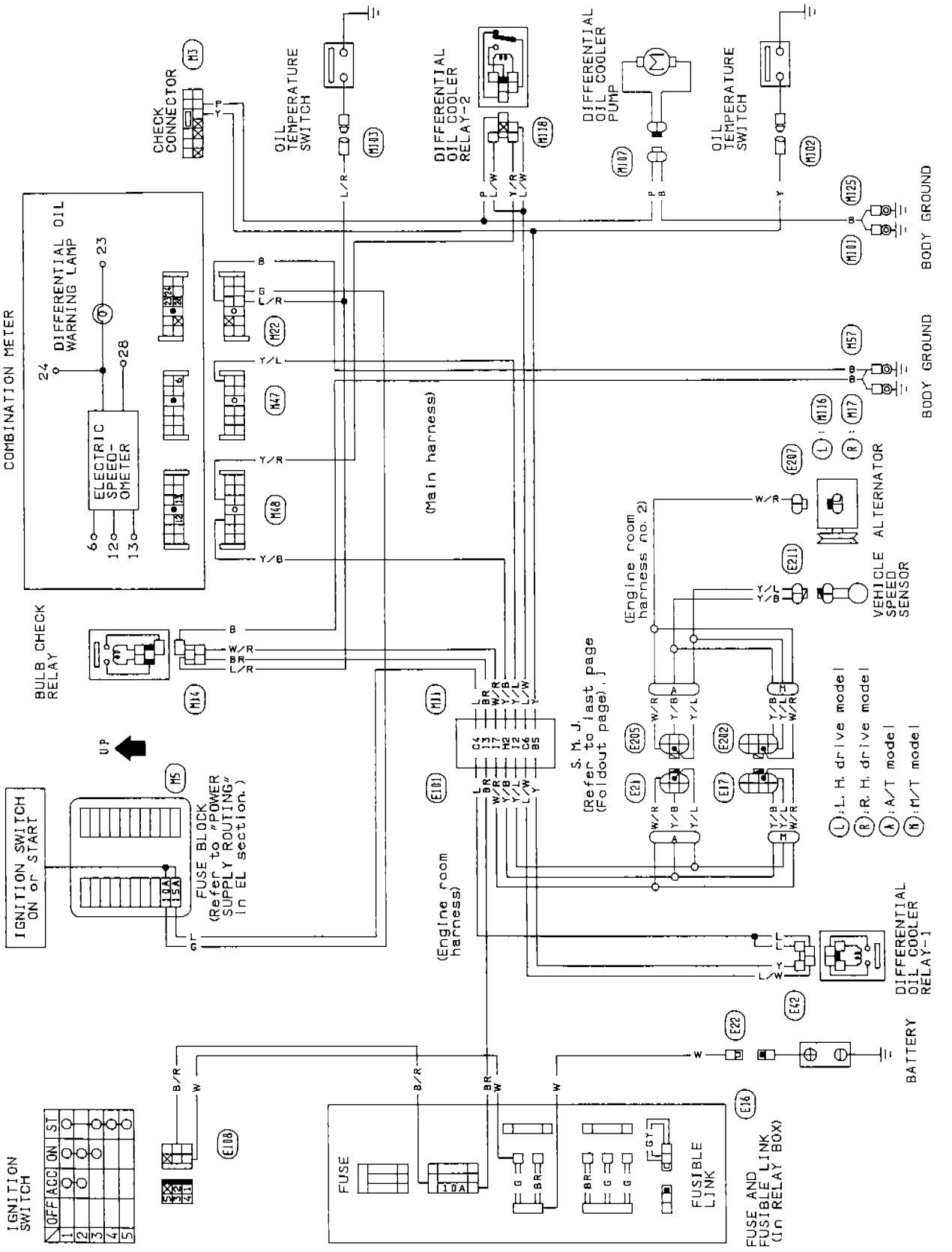
Description

- In this system, when the differential gear oil temperature exceeds the specified value, the temperature switch which is installed in the rear cover senses the temperature of the gear oil and activates the magnetic pump. The magnetic pump circulates differential gear oil which is cooled by the cooler located in the rear of the vehicle.
- The pump automatically repeats ON-OFF operation according to the temperature of the differential gear oil.
  OFF → ON 132 - 138°C (270 - 280°F)
  ON → OFF 124 - 130°C (255 - 266°F)
  However, the pump will not operate when the vehicle speed is less than 10 km/h (6 MPH).
- When the oil temperature becomes excessively high, the warning lamp in the combination meter will illuminate.
  OFF → ON 180°C (356°F)
  ON → OFF 155°C (311°F)

Removal and Installation

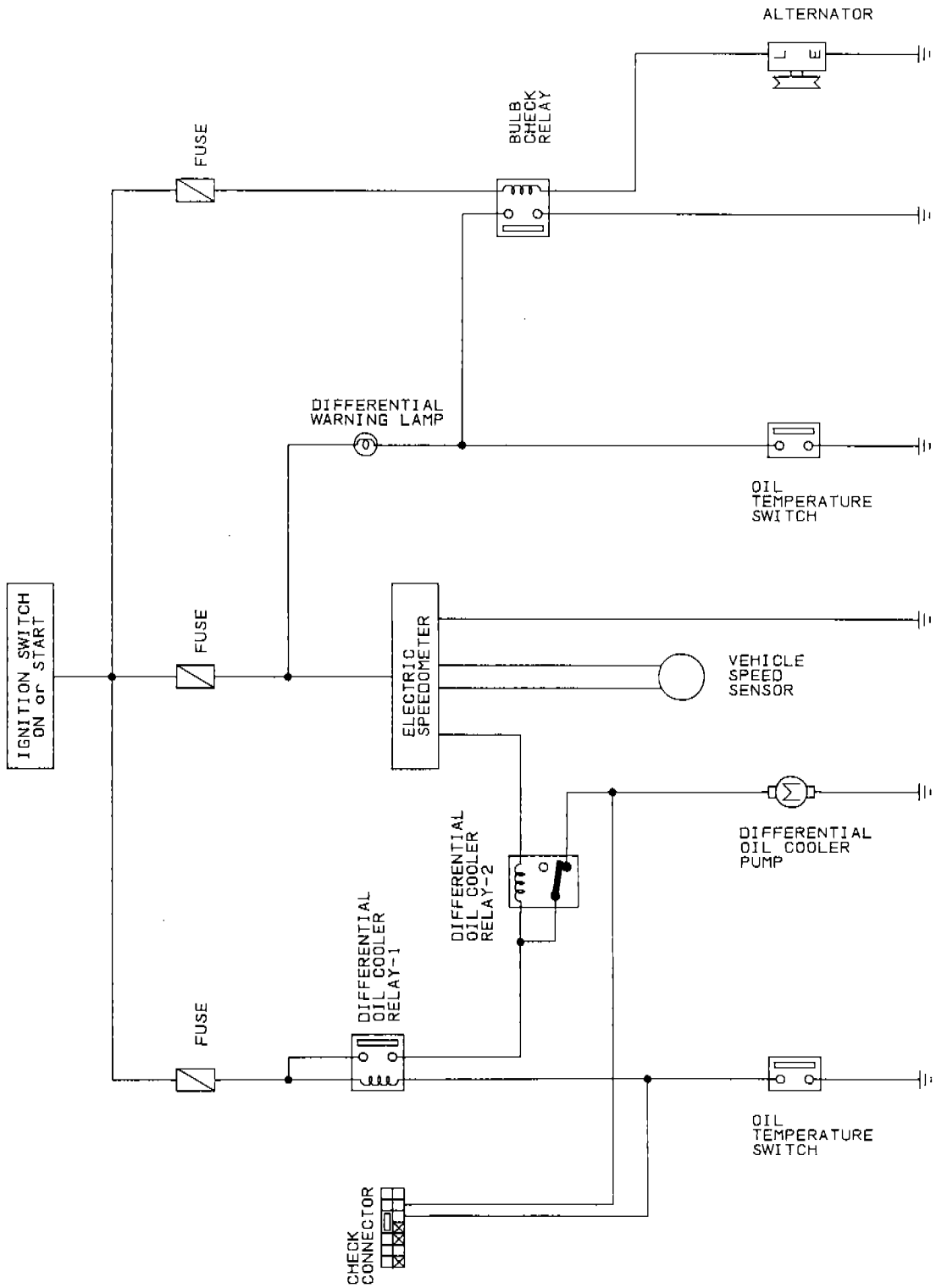


Wiring Diagram/Differential Oil Cooler System



SPD926

Schematic/Differential Oil Cooler System



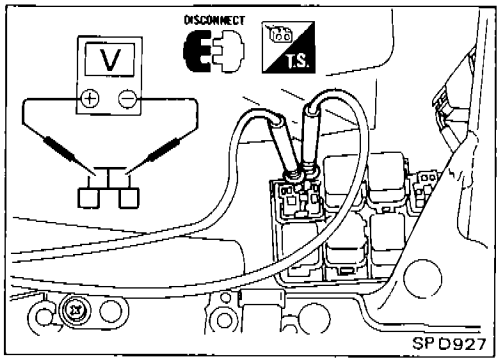
SPD928

Inspection

Thoroughly clean all parts in cleaning solvent and blow dry with compressed air, if available.

OIL PUMP ASSEMBLY

Replace oil pump assembly when motor does not rotate because of motor seizure or other damage.



SPEEDOMETER AMPLIFIER

Check speedometer amplifier operation as follows:

1. Disconnect differential oil cooler relay-1 from relay box and connect circuit tester to connector for relay-1 in relay box as shown.
2. Raise rear wheels.
3. Drive vehicle slowly and check the voltage.
   Less than 10 km/h (6 MPH) ... Approx. 12V
   More than 10 km/h (6 MPH) ... 0V

OIL COOLER ASSEMBLY, OIL TUBE ASSEMBLY, OIL HOSE

If oil leakage is detected during removal, replace oil cooler assembly or oil tube.

Propeller Shaft

GENERAL SPECIFICATIONS

Unit: mm (in)

Transmission type	M/T		A/T	
Anti-skid brake system	Yes	No	Yes	No
Propeller shaft model	3S71A-T			
Number of joints	3			
Coupling method with transmission	Sleeve type			
Type of journal bearings	Shell type (Non-disassembly type)			
Distance between yokes	75.0 (2.953)			
Shaft length (Spider to spider) 1st	410.0 (16.14)		430.0 (16.93)	
2nd	585.0 (23.03)	600.0 (23.62)	585.0 (23.03)	600.0 (23.62)
Shaft outer diameter 1st	75.0 (2.953)			
2nd	75.0 (2.953) ... Large side 63.5 (2.500) ... Small side			

SPECIFICATIONS AND ADJUSTMENT

Unit: mm (in)

Propeller shaft model	3S71A-T
Propeller shaft runout limit	0.6 (0.024)
Journal axial play	0 (0)

Final Drive

GENERAL SPECIFICATIONS

Final drive model	R200	
	Europe	Except Europe
Ring gear pitch diameter mm (in)	205 (8.07)	
Gear ratio	3.916	4.363
Number of teeth (Ring gear/ Drive pinion)	47/12	48/11
Oil capacity (approx.) ℓ (Imp pt)	1.8 (3-1/8)	

SPECIFICATIONS AND ADJUSTMENT

Drive pinion adjustment

Drive pinion bearing adjusting method	Pinion bearing adjusting washer
Drive pinion to ring gear backlash mm (in)	0.10 - 0.15 (0.0039 - 0.0059)

Available pinion height adjusting washer

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

Drive pinion preload adjustment

Drive pinion preload N-m (kg-cm, in-lb)	
With front oil seal	1.1 - 1.4 (11 - 14, 9.5 - 12.2)

Available drive pinion bearing preload adjusting washer

Thickness mm (in)	Part number
3.80 - 3.82 (0.1496 - 0.1504)	38125-61001
3.82 - 3.84 (0.1504 - 0.1512)	38126-61001
3.84 - 3.86 (0.1512 - 0.1520)	38127-61001
3.86 - 3.88 (0.1520 - 0.1528)	38128-61001
3.88 - 3.90 (0.1528 - 0.1535)	38129-61001
3.90 - 3.92 (0.1535 - 0.1543)	38130-61001
3.92 - 3.94 (0.1543 - 0.1551)	38131-61001
3.94 - 3.96 (0.1551 - 0.1559)	38132-61001
3.96 - 3.98 (0.1559 - 0.1567)	38133-61001
3.98 - 4.00 (0.1567 - 0.1575)	38134-61001
4.00 - 4.02 (0.1575 - 0.1583)	38135-61001
4.02 - 4.04 (0.1583 - 0.1591)	38136-61001
4.04 - 4.06 (0.1591 - 0.1598)	38137-61001
4.06 - 4.08 (0.1598 - 0.1606)	38138-61001
4.08 - 4.10 (0.1606 - 0.1614)	38139-61001

Available drive pinion bearing preload adjusting spacer

Length mm (in)	Part number
55.10 (2.1693)	38165-B4002
55.40 (2.1811)	38165-B4003
55.70 (2.1929)	38165-B4004
56.00 (2.2047)	38165-61001
56.25 (2.2146)	38166-61001

Final Drive (Cont'd)

Total preload adjustment

Total preload	Value more than 0.29 N·m (3.0 kg-cm, 2.6 in-lb) added on measured value of drive pinion preload

Side bearing adjustment

Side bearing adjusting method	Adjusting shim
Side gear to pinion mate gear backlash (Clearance between side gear to differential case) mm (in)	0.03 - 0.09 (0.0012 - 0.0035)

Available side bearing adjusting washer

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

Available side gear thrust washer

Thickness mm (in)	Part number
0.75 - 0.80 (0.0295 - 0.0315)	38424-E3000
0.80 - 0.85 (0.0315 - 0.0335)	38424-E3001
0.85 - 0.90 (0.0335 - 0.0354)	38424-E3002
0.90 - 0.95 (0.0354 - 0.0374)	38424-E3003

Ring gear runout

Ring gear runout limit	mm (in)	0.05 (0.0020)