

PROPELLER SHAFT & DIFFERENTIAL CARRIER

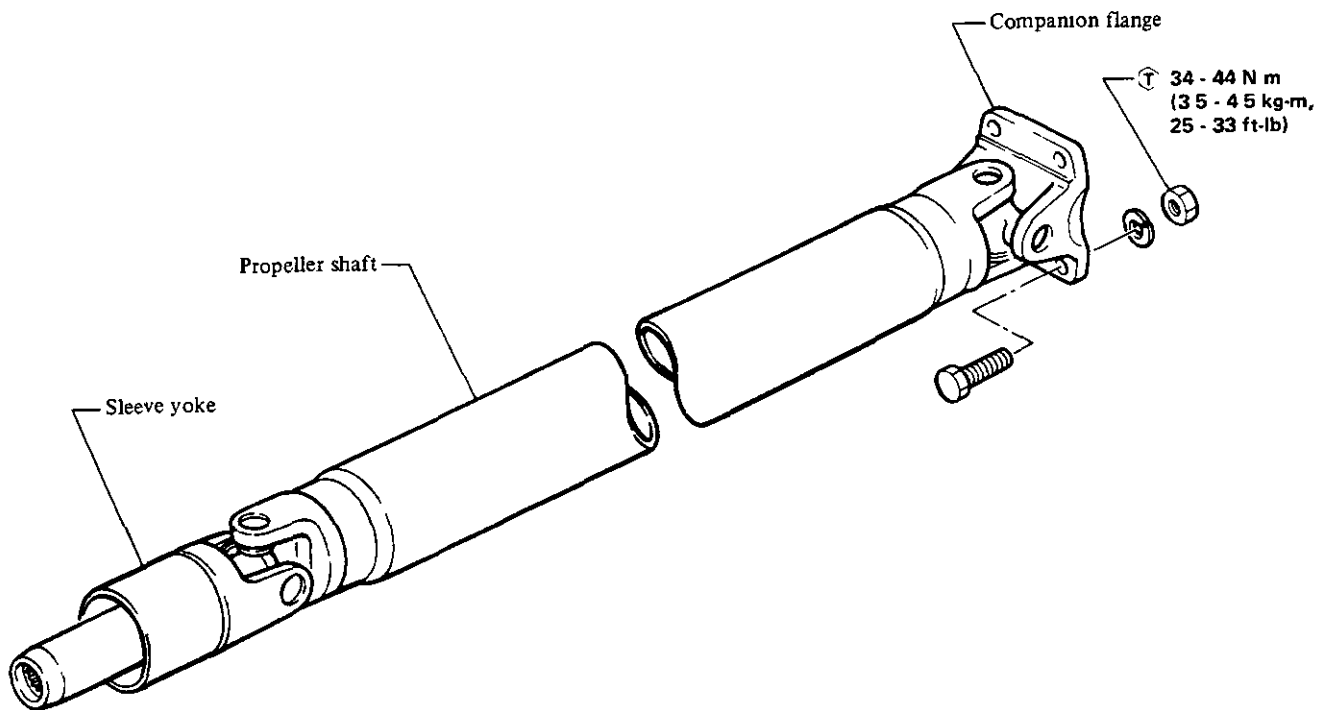
SECTION **PD**

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PROPELLER SHAFT



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INSPECTION

1 Check journal for axial play. If play exists, replace propeller shaft assembly.

Note Journal cannot be disassembled.

2 Check the propeller shaft tube surface for dents or cracks. If necessary, replace propeller shaft assembly.

4 Draw out propeller shaft sleeve yoke from transmission by moving shaft rearward, passing it under rear axle.

Watch for oil leakage from transmission rear end. Take proper action if oil leak is discovered.

Note Remove propeller shaft carefully so as not to damage the spline, sleeve yoke or rear oil seal.

Ⓢ Propeller shaft to companion flange bolts

34 - 44 N·m
(3.5 - 4.5 kg-m,
25 - 33 ft-lb)

REMOVAL

1 Raise car on hoist.

Remove front exhaust tube and heat shield plate to free them from car body.

2 Scribe match marks both on propeller shaft and companion flange so that shaft can be reinstalled in the original position.

3 Remove bolts securing shaft to companion flange.

INSTALLATION

To install, reverse the foregoing removal procedure.

CAUTION:

Align propeller shaft with companion flange using reference marks prescribed in "Removal" procedure and tighten them with bolts. Failure to do so could result in driving vibration.

CHECKING AND CORRECTING UNBALANCED PROPELLER SHAFT

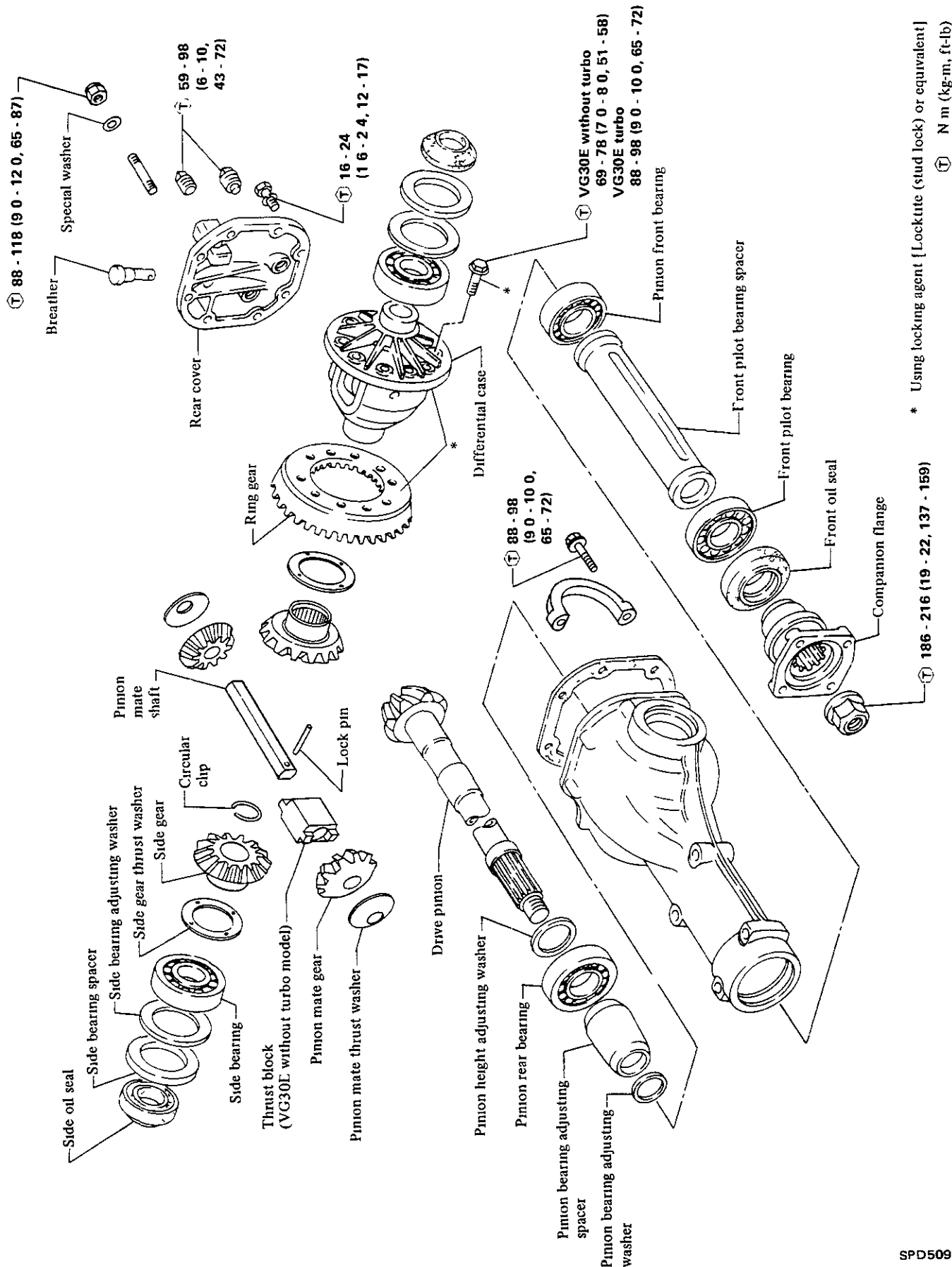
To check and correct an unbalanced propeller shaft, proceed as follows:

1 Remove undercoating and other foreign material which could upset shaft balance, and check shaft vibration by road test.

2 If shaft vibration is noted during road test, disconnect propeller shaft at differential carrier companion flange, rotate companion flange 180 degrees and reinstall propeller shaft.

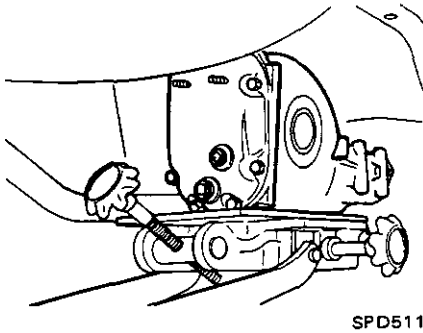
3 Again check shaft vibration. If vibration still persists, replace propeller shaft assembly.

DIFFERENTIAL CARRIER (Type R200)



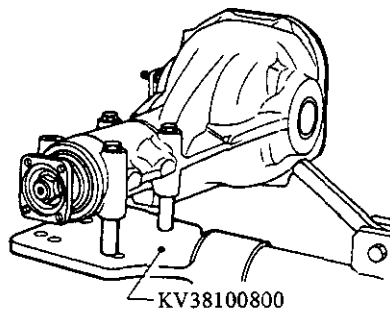
REMOVAL

- 1 Jack up rear of car and support on safety stands Drain gear oil
- 2 Remove exhaust tube
- 3 Disconnect propeller shaft at companion flange
- 4 Remove drive shafts
- 5 With differential carrier jacked up, remove diff mounting insulator nuts
- 6 Loosen off four fitting bolts that hold differential carrier onto suspension member
- 7 Pull off differential carrier backward together with jack



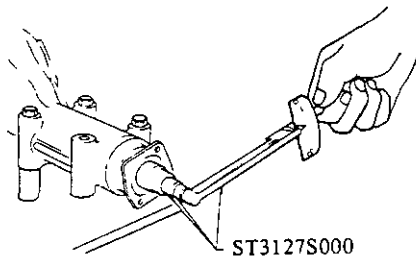
After carrier assembly is removed, support suspension member on a stand to prevent its insulators being twisted or damaged

Note Do not place the center of suspension member on the stand before removal operation Otherwise, it will be difficult to extract the gear carrier assembly



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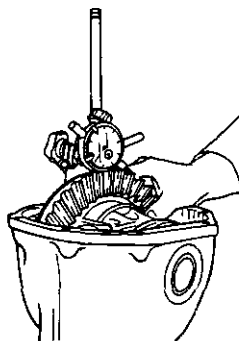
- 2 Remove rear cover
- 3 Visually inspect parts for wear or damage
- 4 Rotate gears checking for any roughness which would indicate damaged bearings or chipped gears Check gear teeth for scoring or signs of abnormal wear Measure preload of drive pinion



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- 5 Set up a dial indicator and check the backlash at several points around ring gear

Ring gear-to-drive pinion backlash-
 0.13 - 0.18 mm
 (0.0051 - 0.0071 in)

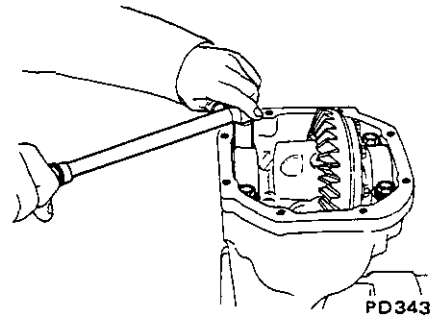


- 6 Check gear tooth contact with a mixture of recommended powder and oil

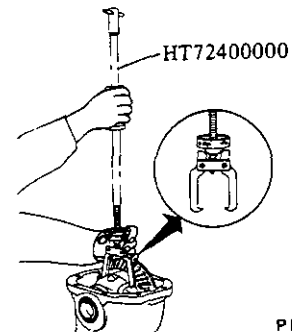
For the tooth contact pattern, see page PD-9

DISASSEMBLY

- 1 Put match marks on side bearing caps and carrier
- 2 Loosen side bearing cap bolts and remove bearing caps

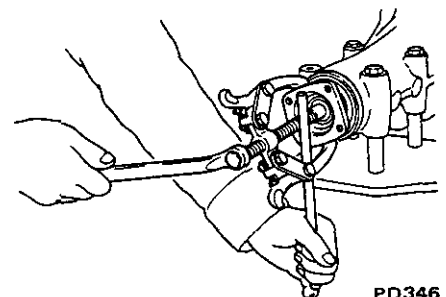
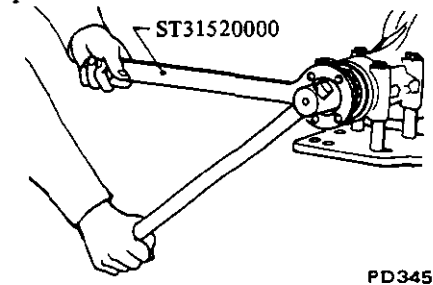


- 3 Using Slide Hammer HT72400000 lift differential case assembly out



Note Care should be taken not to confuse the left and right hand bearing caps and bearing outer races so that parts may be installed to the original position

- 4 Loosen drive pinion nut, holding companion flange with Drive Pinion Flange Wrench ST31520000 and pull off companion flange using a suitable puller



PRE-DISASSEMBLY INSPECTION

Differential carrier should be inspected before parts except rear cover are removed from it

These inspections are helpful in finding the cause of the problem and in determining necessary corrections

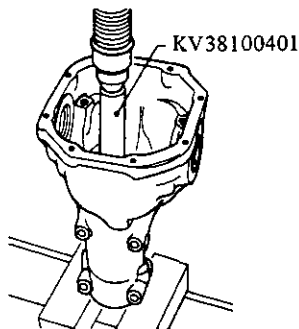
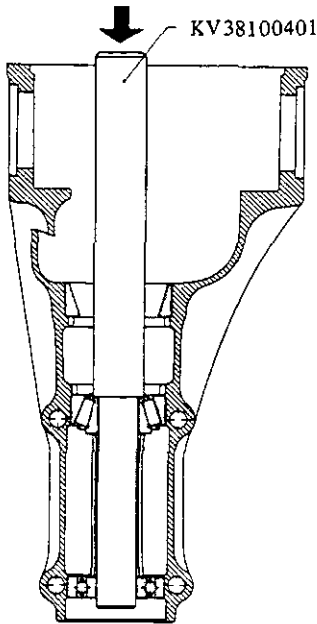
- 1 Using three 45 mm (1.77 in) spacers, mount carrier on Diff Attachment KV38100800

DIFFERENTIAL CARRIER (Type R200)

- 5 Extract drive pinion from carrier using a press Take out drive pinion together with rear bearing inner race, bearing spacer and adjusting washer
- 6 Remove oil seal

Note Oil seal must not be reused

- 7 Remove pilot bearing together with pilot bearing spacer and front bearing inner race using Pilot Bearing Drift KV38100401

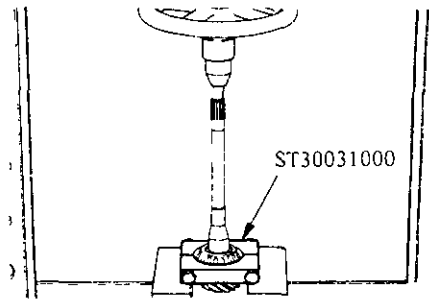


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- 8 Remove side oil seal

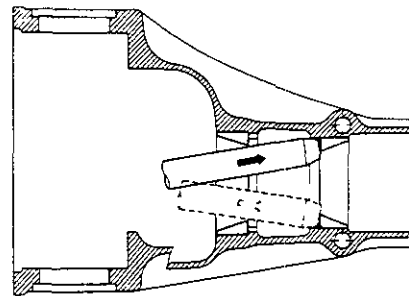
Note Oil seal must not be reused

- 9 Hold rear bearing inner race with Puller ST30031000 and extract from drive pinion with a press



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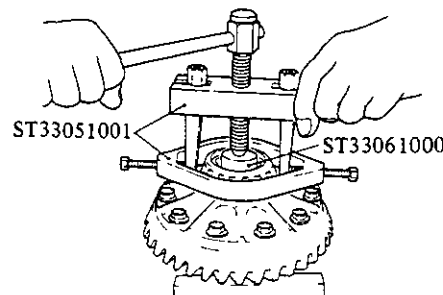
- 10 To remove front and rear bearing outer races, put a drift to race surface, and withdraw them by tapping the top of drift with a hammer



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DIFFERENTIAL CASE

- 1 Extract bearing using Differential Side Bearing Puller ST3306S001 (set of ST33051001 and ST33061000)



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Note

- a Securely attach puller to bearing inner race, utilizing two grooves in differential case
- b Be careful not to confuse the left and right hand parts

- 2 Remove ring gear by loosening ring gear bolts

Note Loosen bolts diagonally

- 3 Punch off pinion mate shaft lock pin from ring gear side using Soid Punch KV31100300

Note Lock pin is caulked at pin hole mouth on differential case Do not punch it off forcibly without checking how it is caulked

- 4 Draw out pinion mate shaft and remove thrust block, pinion mate gears, side gears and thrust washers

Note Put marks on gear and thrust washer so that they can be re-installed in their original positions from which they were removed

INSPECTION

Thoroughly clean all disassembled parts, and examine them to see that they are worn, damaged or otherwise faulty and how they are affected Repair or replace all faulty parts, whichever is necessary

- 1 Check gear teeth for scoring, cracking or chipping, and make sure that tooth contact pattern indicates correct meshing depth If any damaged part is evident, replace parts as required

Note. Drive pinion and drive gear are supplied for replacement as a set, therefore, should either part be damaged, replace as a set

- 2 Check pinion mate shaft, thrust block, and pinion gears for scores and signs of wear, and replace as required

Follow the same procedure for side gears and their seats on differential case

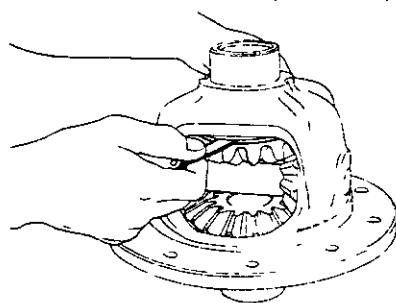
- 3 Inspect all bearing races and rollers for scoring, chipping or evidence of excessive wear They should be in tiptop condition such as not worn and with mirror-like surfaces Replace if there is a shadow of doubt on their efficiency, as an incorrect bearing operation may result in noise and gear seizure

4 Inspect thrust washer faces Small damage can be corrected with sandpaper If pinion mate to side gear backlash (or the clearance between side gear and thrust washer) exceeds the specified value, replace thrust washers

Pinion mate-to-side gear backlash:
Less than 0 15 mm (0 0059 in)

If above procedure is not effective with existing washer, try with other washers

Pinion mate gear-to-side gear backlash
Less than 0 15 mm (0 0059 in)



PD023

4 Lock pinion shaft lock pin using a punch after it is secured in place

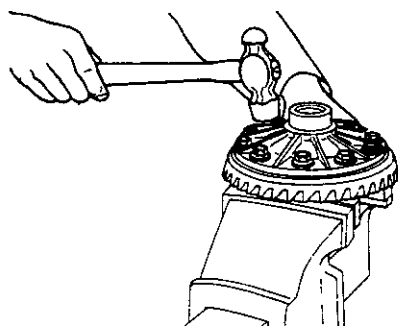
5 Apply oil to gear tooth surfaces and thrust surfaces and check that they turn properly

6 Apply locking agent [Loctite (stud lock) or equivalent] to contacting surfaces of ring gear and differential case, then place differential case on ring gear

7. Apply a small amount of locking agent (described above) to ring gear bolts, and install them

CAUTION:

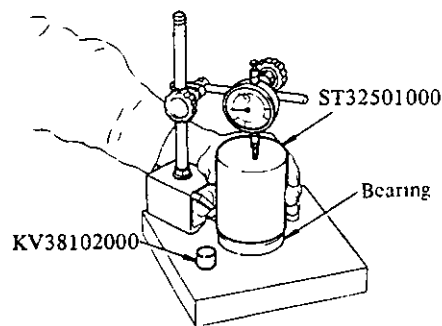
- a. Use only genuine drive gear bolts.
- b. Tighten bolts in criss-cross fashion lightly tapping around bolt heads with a hammer.



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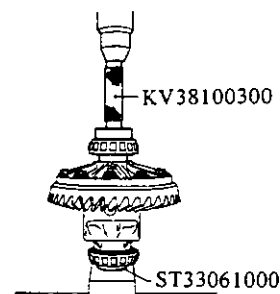
7 When replacing side bearing, measure bearing width using Master Gauge KV38102000 and Weight Block ST32501000 prior to installation

Standard bearing width
21 0 mm (0 827 in)



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8 Press fit side bearing inner race on differential case with Diff Side Bearing Drift KV38100300 and Adapter ST33061000



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ASSEMBLY AND ADJUSTMENT

Assembly can be done in the reverse order of disassembly Adherence to the following directions for adjustment and usage of special tools enable to obtain a perfect differential operation

PRECAUTIONS IN REASSEMBLY

1 Arrange shims, washers and the like to install them correctly

2 Thoroughly clean the surfaces on which shims, washers, bearings and bearing retainers are installed

3 Thoroughly clean oil from ring gear bolt and its hole and contacting surfaces of ring gear and differential case with "Loctite Lacquic Primer" or equivalent

4 Apply gear oil when installing bearings

5 Pack recommended multi-purpose grease into cavity between lips when fitting oil seal

ASSEMBLY OF DIFFERENTIAL GEAR CASE

1 Assemble pinion mates, side gears, thrust washers and thrust block in differential case

2 Fit pinion shaft to differential case so that it meets lock pin holes

3 Adjust side gear-to-pinion mate backlash or adjust the clearance between the rear face of side gear and thrust washer

ADJUSTMENT OF DRIVE PINION PRELOAD

Adjust drive pinion preload with spacer and washer between front and rear bearing inner races, regardless of thickness of pinion height adjusting washer

This adjustment must be carried out without oil seal inserted

1 Press fit front and rear bearing outer races into gear carrier using Drive Pinion Outer Race Drift Set ST30611000, ST30613000 and ST30621000

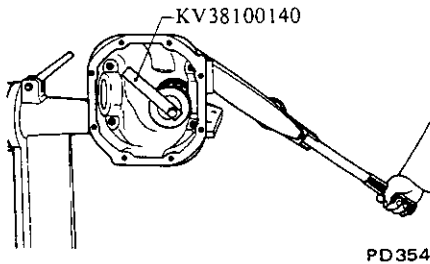
Front ST30611000 and ST30613000

Rear ST30611000 and ST30621000

2 Insert rear bearing inner race into Dummy Shaft KV38100110

3 Fit drive pinion bearing spacer, washer front bearing inner race, Dummy Shaft Collar KV38100130 and companion flange in that order on dummy shaft and tighten drive pinion nut with Stopper KV38100140

Drive pinion nut
 186 - 216 N m
 (19 - 22 kg-m,
 137 - 159 ft-lb)

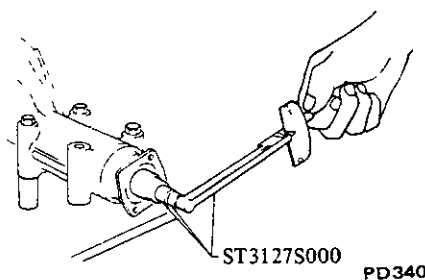


4 Measure pinion bearing preload using Preload Gauge ST3127S000, and select washer and spacer that will provide required preload

Pinion bearing preload
 (without oil seal)
 1.0 - 1.3 N-m
 (10 - 13 kg-cm,
 8.7 - 11.3 in-lb)

Note

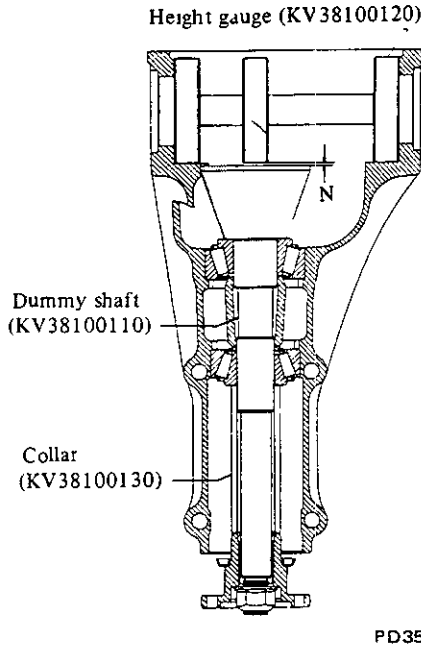
- a Replace bearing washer and spacer with thicker ones if pinion cannot be turned by hand while it is being tightened
- b Preload of old bearing is the same value as that of a new bearing



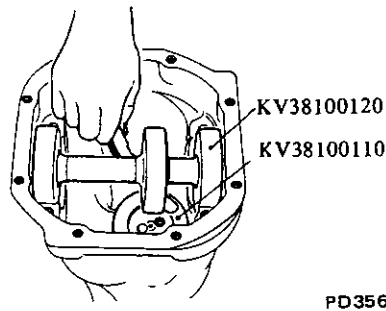
ADJUSTMENT OF DRIVE PINION HEIGHT

Adjust pinion height with washer located between rear bearing inner race and back of pinion gear

1 Install Height Gauge KV38100120 on carrier with dummy shaft mounted



2 Measure the clearance (N) between the tip end of height gauge and the end surface of dummy shaft, using a thickness gauge



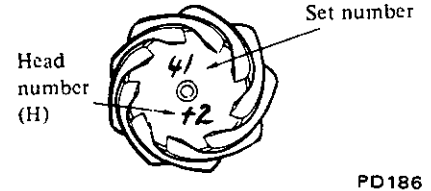
3 The thickness of drive pinion height adjusting washer can be obtained from the following formula

$$T = N - [(H - D') \times 0.01] + 3.00$$

Where,

- T Required thickness of rear bearing adjusting washers (mm)
- N Measured value with thickness gauge (mm)
- H Figure marked on the drive pinion head
- D' Figure marked on the dummy shaft

Note Figures for H and D' are dimensional variations in a unit of 1/100 mm (4/10,000 in) against each standard measurement



Examples of calculation

Ex 1 ---

$$N = 0.23 \text{ mm}$$

$$H = +2, D' = 1$$

$$T = N - [(H - D') \times 0.01] + 3.00$$

$$= 0.23 - [(+2) - 1] \times 0.01 + 3.00$$

$$= 0.23 - [2 - 1] \times 0.01 + 3.00$$

$$= 0.23 - [1 \times 0.01] + 3.00$$

$$= 0.23 - 0.01 + 3.00$$

$$= 3.22 \text{ mm}$$

The correct washer is 3.21 mm thick

Ex 2 ---

$$N = 0.35 \text{ mm}$$

$$H = -1, D' = 2$$

$$T = N - [(H - D') \times 0.01] + 3.00$$

$$= 0.35 - [(-1) - 2] \times 0.01 + 3.00$$

$$= 0.35 - [(-1 - 2) \times 0.01] + 3.00$$

$$= 0.35 - [(-3) \times 0.01] + 3.00$$

$$= 0.35 - [-0.03] + 3.00$$

$$= 0.35 + 0.03 + 3.00$$

$$= 3.38$$

The correct washer is 3.39 mm thick

Ex 3 ---

$$N = 0.27 \text{ mm}$$

$$H = 0, D' = 0$$

$$T = N - [(H - D') \times 0.01] + 3.00$$

$$= 0.27 - [(0 - 0) \times 0.01] + 3.00$$

$$= 0.27 - [0 \times 0.01] + 3.00$$

$$= 0.27 - 0 + 3.00$$

$$= 3.27$$

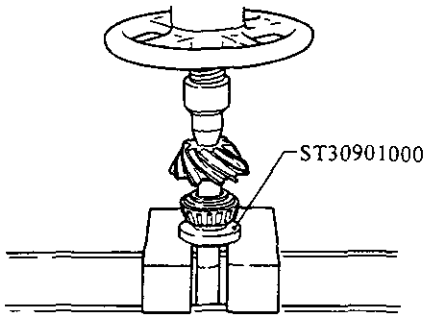
The correct washer is 3.27 mm thick

Note If values signifying H and D' are not given, regard them as zero and compute. After assembly, check to see that tooth contact is correct. If not, readjust.

For the tooth contact pattern, see page PD-9

Note Pinion height adjustment can be made in a unit of 1/100 mm (4/10,000 in) by selecting either 0.05 mm (0.0020 in) or 0.07 mm (0.0028 in) shim in above chart

4 Fit determined pinion height adjusting washer in drive pinion, and press fit rear bearing inner race in it using Base ST30901000



Note Insert washer into pinion with the chamfered side towards gear

5 Lubricate pinion front and rear bearings. Install drive pinion in gear carrier into which drive pinion bearing spacer and washer, front bearing inner race and front pilot bearing spacer, moreover, pilot bearing and front oil seal are fitted. Fit front oil seal using Gear Carrier Front Oil Seal Drift KV38100500

6 Fit companion flange on drive pinion, and secure it in position by tightening nut to specified torque confirming preload

Note If drive pinion lock nut is worn, replace it

- Ⓣ : Drive pinion nut
186 - 216 N·m
(19 - 22 kg·m,
137 - 159 ft·lb)
- Drive pinion preload
(with oil seal)
1.13 - 1.72 N·m
(11.5 - 17.5 kg·cm,
10.0 - 15.2 in·lb)

ADJUSTMENT OF SIDE BEARING WASHERS

1 If the hypoid gear set, carrier, differential case or side bearing has been replaced with new part, adjust the side bearing preload with adjusting washer. The required thicknesses of the left and right washers can be obtained from the following formulas

$$T_1 = (A - C + D - H') \times 0.01 + E + 2.05$$

$$T_2 = (B - D + H') \times 0.01 + F + G + 1.95$$

Where,

T₁ Required thickness of left side washer (mm)

T₂ Required thickness of right side washer (mm)

A & B Figure marked on the gear carrier

C & D Figure marked on the differential case

E & F These are differences in width of left or right side bearing against the standard width (21.00 mm)

If bearing width is 20.82 mm, this figure will be as follows

$$21.00 - 20.82 = 0.18 \text{ (mm)}$$

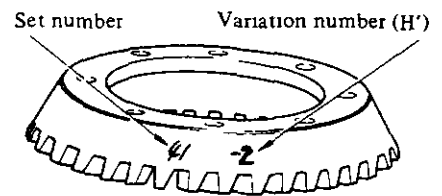
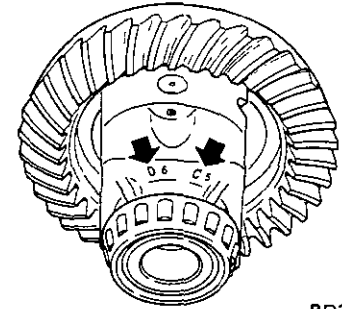
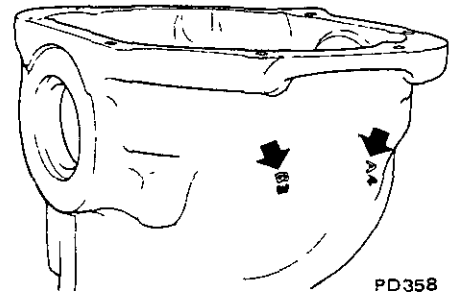
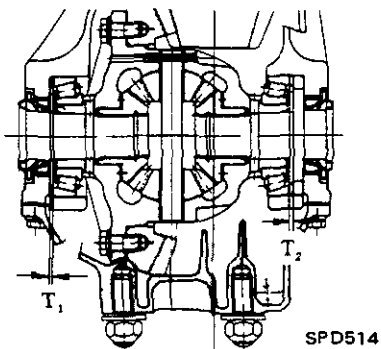
G This is the difference in thickness of side spacer against the standard width (8.10 mm). If spacer width is 8.02 mm, this figure will be as follows

H' Figure marked on ring gear
8.10 - 8.02 = 0.08 (mm)

Figures for A, B, C and D are dimensional variations in a unit of 1/100 mm against each standard measurement

To measure width of side bearing, see differential case assembly procedure

Before calculation, determine "G" value by measuring spacer thickness. If spacer is deformed or scratched, replace



Example of calculation

Ex 1 --

- A = 4, B = 3, C = 5, D = 6
- E = 0.18 mm, F = 0.15 mm
- G = 0.08 mm, H' = -2

Left side

$$T_1 = (A - C + D - H') \times 0.01 + E + 2.05$$

$$= [4 - 5 + 6 - (-2)] \times 0.01 + 0.18 + 2.05$$

$$= 7 \times 0.01 + 0.18 + 2.05$$

$$= 0.07 + 0.18 + 2.05$$

$$= 2.30$$

The correct washer is 2.30 mm thick

Right side

$$T_2 = (B - D + H') \times 0.01 + F + G + 1.95$$

$$= [3 - 6 + (-2)] \times 0.01 + 0.15 + 0.08 + 1.95$$

$$= (-5) \times 0.01 + 0.15 + 0.08 + 1.95$$

$$= -0.05 + 0.15 + 0.08 + 1.95$$

$$= 2.13$$

The correct washer is 2.15 mm thick

Ex 2 ---

A = 6, B = 6, C = 5, D = 3
 E = 0 17 mm, F = 0 22 mm
 G = 0 10 mm, H' = 2

Left side

$$\begin{aligned} T_1 &= (A - C + D - H') \times 0 01 + E \\ &\quad + 2 05 \\ &= (6 - 5 + 3 - 2) \times 0 01 + 0 17 \\ &\quad + 2 05 \\ &= 2 \times 0 01 + 0 17 + 2 05 \\ &= 0 02 + 0 17 + 2 05 \\ &= 2 24 \end{aligned}$$

The correct washer is 2 25 mm thick

Right side

$$\begin{aligned} T_2 &= (B - D + H') \times 0 01 + F + G \\ &\quad + 1 95 \\ &= (6 - 3 + 2) \times 0 01 + 0 22 \\ &\quad + 0 10 + 1 95 \\ &= 5 \times 0 01 + 0 22 + 0 10 \\ &\quad + 1 95 \\ &= 0 05 + 0 22 + 0 10 + 1 95 \\ &= 2 32 \end{aligned}$$

The correct washer is 2 30 mm thick

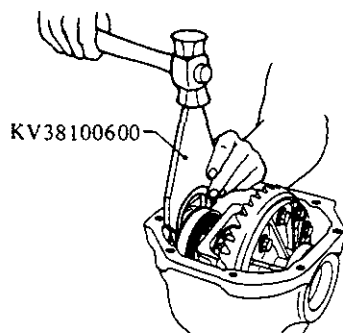
Note If values signifying A, B C and D are not given, regard them as zero and compute

After assembly, check to see that preload and backlash are correct If not, readjust

2 Install differential case assembly with side bearing outer races into carrier

3 Insert left and right side bearing preload adjusting washers in place between side bearings and housing

4 Drive in side bearing spacer between RH washer and housing with Side Bearing Spacer Drift KV38100600 If too great or too small a driving force is required, check to be sure that calculation and side bearing width are correct

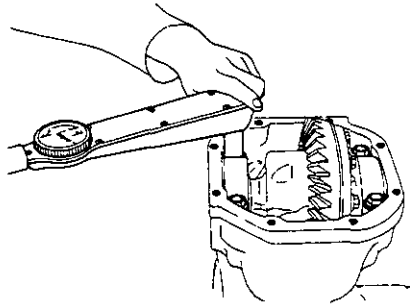


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Note When driving spacer into place, be careful not to tilt side bearing outer race to either side

5 Align mark on bearing cap with that on carrier and install bearing cap on carrier And tighten bolts to specified torque

Ⓣ **Side bearing cap bolts**
 88 - 98 N m
 (9 0 - 10 0 kg-m,
 65 - 72 ft-lb)



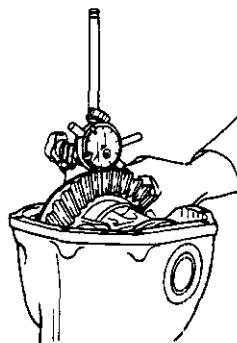
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6 Measure ring gear-to-drive pinion backlash with a dial indicator

If it is below the specified value, replace left washer with a thinner one and right washer with a thicker one If it is over it, replace left washer with a thicker one and right washer with a thinner one

Note To maintain correct preload at all times, do not change total thickness of washers

Ring gear-to-drive pinion backlash
 0.13 - 0.18 mm
 (0.0051 - 0.0071 in)



SPD513

Incidentally a decrease or increase in thickness of washers causes change in ring gear-to-pinion backlash

Thus, check for proper backlash

7 Check and adjust the tooth contact pattern of ring gear and drive pinion

(1) Thoroughly clean ring and drive pinion gear teeth

(2) Paint ring gear teeth lightly and evenly with a mixture of powdered ferric oxide and oil of a suitable consistency to produce a contact pattern

(3) Rotate pinion through several revolutions in the forward and reverse direction until a definite contact pattern is developed on ring gear

(4) If contact pattern is incorrect, readjust thickness of adjusting washer

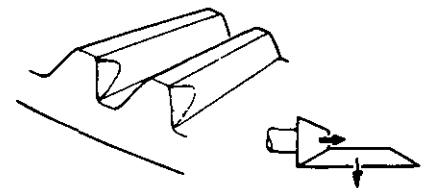
Be sure to completely wipe off red lead upon completion of adjustment

(5) Incorrect teeth contact pattern can be adjusted in the following manner

Contact pattern

a Heel contact

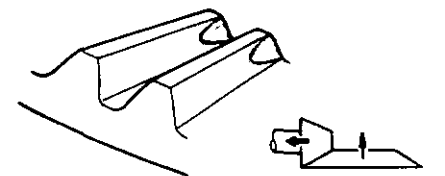
To correct, increase thickness of pinion height adjusting washer in order to bring drive pinion close to ring gear



PD193

b Toe contact

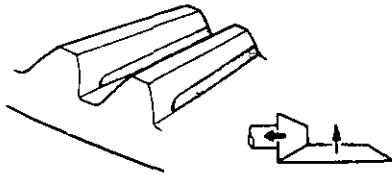
To correct, reduce thickness of pinion height adjusting washer in order to make drive pinion move away from ring gear



PD194

c Flank contact

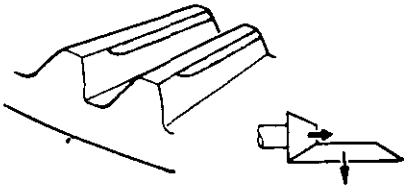
Adjust in the same manner as in b



PD195

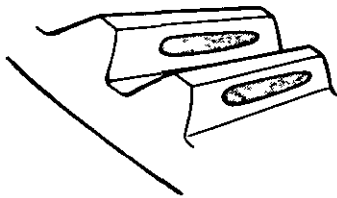
d Face contact

Adjust in the same manner as in a



PD196

e Correct tooth contact



PD197

Note Change in thickness of adjusting washer is accompanied by change in backlash. Check it when installing gear.

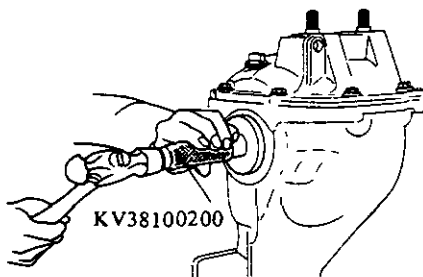
8 Install rear cover

Ⓣ Rear cover attaching bolts

16 - 24 N·m
(1.6 - 2.4 kg·m,
12 - 17 ft·lb)

9 Apply grease to cavity at sealing lips of oil seal

Press side oil seal into carrier with Gear Carrier Side Oil Seal Drift KV38100200



PD363

INSTALLATION

Install in the reverse order of removal

1 Position differential carrier onto suspension member, and temporarily tighten it with four bolts

2 Fit rear cover to mounting insulator nuts

Ⓣ Rear cover to mounting insulator nuts

98 - 118 N·m
(10.0 - 12.0 kg·m,
72 - 87 ft·lb)

Mounting insulator to body

Bolt
29 - 39 N·m
(3 - 4 kg·m,
22 - 29 ft·lb)

Nut
59 - 78 N·m
(6 - 8 kg·m,
43 - 58 ft·lb)

3 Secure differential carrier onto rear suspension member with four bolts

Ⓣ Differential carrier to suspension member bolts

59 - 78 N·m
(6.0 - 8.0 kg·m,
43 - 58 ft·lb)

4 Install drive shaft

5 Join drive shafts with companion flanges of rear axle shafts and tighten connecting bolts

Ⓣ Drive shaft to axle shaft bolts

27 - 37 N·m
(2.8 - 3.8 kg·m,
20 - 27 ft·lb)

6 Install other parts in the reverse manner of removal

7 Fill with correct gear oil

Note Gear oil capacity

1.3 liter (2-3/4 US pt, 2-1/4 Imp pt)

REPLACEMENT OF OIL SEALS

Replacement of oil seals with differential gear carrier assembly installed on the vehicle

FRONT OIL SEAL

Procedures are as follows

- 1 Drain gear oil
- 2 Raise vehicle on hoist
- 3 Remove insulator, exhaust tube and main muffler mounting bolt to free them from car body
- 4 Detach propeller shaft
- 5 Remove drive pinion nut
- 6 Extract companion flange with a suitable puller
- 7 Remove oil seal
- 8 Set new oil seal in position with Gear Carrier Front Oil Seal Drift KV38100500. Apply grease to cavity between seal lips
- 9 Fit companion flange on drive pinion, and secure it in position by tightening nut to specified torque confirming the following preload, with Drive Pinion Flange Wrench

Ⓣ Drive pinion nut

186 - 216 N·m
(19 - 22 kg·m,
137 - 159 ft·lb)

Total preload

123 - 230 N·m
(12.5 - 23.5 kg·m,
90 - 170 in·lb)

10 Reinstall propeller shaft in reverse order of removal, and fill up with gear oil

SIDE OIL SEAL

Side oil seal is replaced as follows

- 1 Disconnect drive shafts
- 2 Remove oil seal
- 3 Set in new oil seal with Gear Carrier Side Oil Seal Drift KV38100200

Note Apply grease to cavity between oil seal lips

4 Install drive shafts

Note Be careful not to scratch oil seal lips with spline of drive shaft.

Ⓣ Drive shaft to axle shaft bolts

VG30E without turbo
39 - 49 N·m
(4 - 5 kg·m,
29 - 36 ft·lb)

VG30E turbo
59 - 69 N·m
(6 - 7 kg·m,
43 - 51 ft·lb)

SERVICE DATA AND SPECIFICATIONS (S.D.S.)

Propeller Shaft

GENERAL SPECIFICATIONS

Unit mm (in)

Applied model	2 seater				2+2 seater			
	VG30E without turbo		VG30E turbo		VG30E without turbo		VG30E turbo	
	M/T	A/T	M/T	A/T	M/T	A/T	M/T	A/T
Propeller shaft model	2S71A							
Number of joints	2							
Coupling method with transmission	Sleeve type							
Distance between yokes	71 (2 80)							
Type of journal bearing	Shell type (non-disassembly type)							
Shaft length (Spider to spider)	665 (26 18)	685 (26 97)	650 (25 59)	715 (28 15)	865 (34 06)	885 (34 84)	850 (33 46)	915 (36 02)
Shaft outer diameter	75 (2 95)							

SERVICE DATA

Unit mm (in)

Model	2S71A
Propeller shaft runout limit	0.6 (0.024)
Journal axial play	0 (0)

TIGHTENING TORQUE

Unit	N m	kg-m	ft-lb
Shaft to companion flange bolts	39 - 44	4.0 - 4.5	29 - 33

Differential Carrier

GENERAL SPECIFICATIONS

Applied model	VG30E without turbo	VG30E turbo
Final drive model	R200	
Ring gear pitch diameter mm (in)	200 (7 87)	
Gear ratio	3.700	3.545
Number of teeth (Ring gear/Drive pinion)	37/10	39/11
Oil capacity (approx) ℓ (US pt, Imp qt)	1.3 (2-3/4, 2-1/4)	

SERVICE DATA

Final drive model	R200
Drive pinion bearing preload adjusting method	Adjusting spacer and washer
Drive pinion preload (With front oil seal) N m (kg-cm, in-lb)	1.13 - 1.72 (11.5 - 17.5, 10.0 - 15.2)
Drive pinion preload (Without front oil seal) N m (kg-cm, in-lb)	1.0 - 1.3 (10 - 13, 8.7 - 11.3)
Total preload N m (kg-cm, in-lb)	1.23 - 2.30 (12.5 - 23.5, 10.9 - 20.4)
Side bearing adjusting method	Shim
Backlash Drive pinion to ring gear mm (in)	0.13 - 0.18 (0.0051 - 0.0071)
Side gear to pinion mate gear (Clearance between side gear to differential case) mm (in)	Less than 0.15 (0.0059)
Ring gear runout limit mm (in)	Less than 0.08 (0.0031)

SERVICE DATA AND SPECIFICATIONS (S.D.S.)

Differential Carrier (Cont'd)

Pinion height adjusting washer

Thickness mm (in)	Part No
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
0 05 (0 0020)	38453-28500
0 07 (0 0028)	38454-28500

Side bearing adjusting washer

Thickness mm (in)	Part No
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

Side gear thrust washer

Thickness mm (in)	Part No
0 75 - 0 80 (0 0295 - 0 0315)	38424-N3100
0 80 - 0 85 (0 0315 - 0 0335)	38424-N3101
0 85 - 0 90 (0 0335 - 0 0354)	38424-N3102
0 90 - 0 95 (0 0354 - 0 0374)	38424-N3103

TIGHTENING TORQUE

Type	R200		
	N m	kg-m	ft-lb
Final drive installation			
Drive shaft to rear axle			
VG30E without turbo	39 - 49	4 - 5	29 - 36
VG30E turbo	59 - 69	6 - 7	43 - 51
Rear cover to mounting insulator	88 - 118	9 0 - 12 0	65 - 87
Mounting insulator to body			
Bolt	29 - 39	3 4	22 - 29
Nut	59 - 78	6 - 8	43 - 58
Differential carrier to suspension member	59 78	6 - 8	43 - 58
Final drive assembly			
Drive pinion nut	186 - 216	19 - 22	137 - 159
Ring gear bolt [using Locktite (stud lock) or equivalent]			
VG30E without turbo	69 - 78	7 0 - 8 0	51 - 58
VG30E turbo	88 - 98	9 0 - 10 0	65 - 72
Side bearing cap bolt	88 - 98	9 0 - 10 0	65 - 72
Rear cover fixing bolt	16 - 24	1 6 - 2 4	12 - 17
Companion flange to propeller shaft fixing bolt	39 - 44	4 0 - 4 5	29 - 33
Filler and drain plug	59 - 98	6 - 10	43 - 72

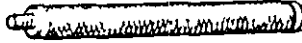


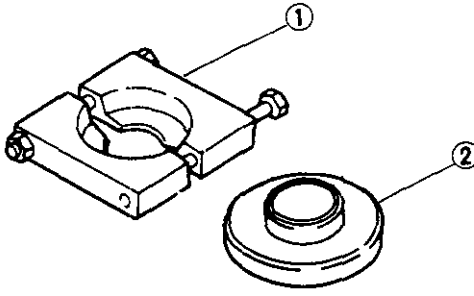
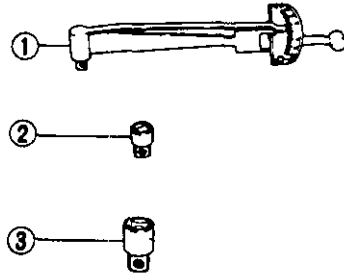
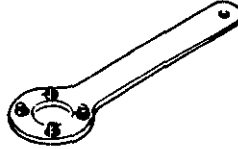
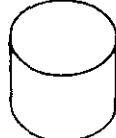
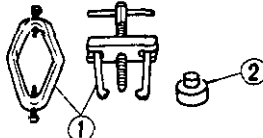
Drive pinion bearing preload adjusting washer

Thickness mm (in)	Part No
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

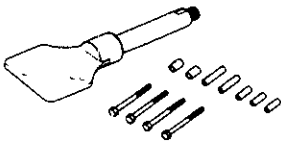
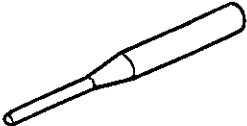
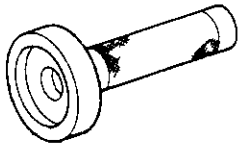
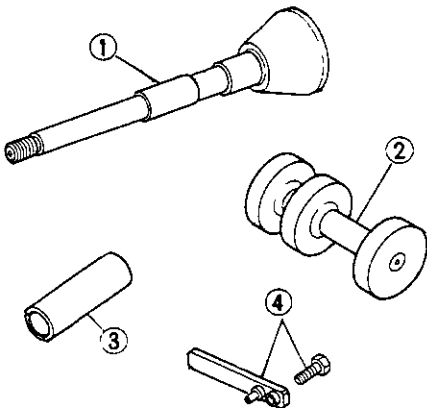
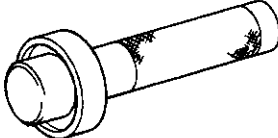
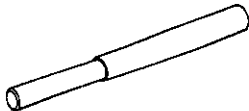
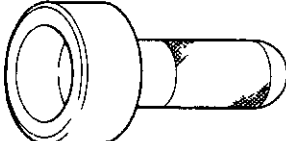

Drive pinion bearing preload adjusting spacer

Length mm (in)	Part No
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


SPECIAL SERVICE TOOLS

Tool number (Kent-Moore No)	Tool name
ST30611000 (J25742-1)	Drift 
ST30613000 (J25742-3)	Drift 
ST30621000 (-)	Drift 
ST3090S000 ① ST30031000 (J22912-01) ② ST30901000 (-)	Drive pinion rear bearing inner race puller set Puller Base 
ST3127S000 (J25765-A) ① GG91030000 (J25765-A) ② HT62940000 (-) ③ HT62900000 (-)	Preload gauge Torque wrench Socket adapter Socket adapter 
ST31520000 (-)	Drive pinion flange wrench 
ST32501000 (J25407-3)	Weight block 
ST3306S001 ① ST33051001 (-) ② ST33061000 (J8107-2)	Diff side bearing puller set Body Adapter 

SPECIAL SERVICE TOOLS

Tool number (Kent-Moore No)	Tool name
KV38100800 (-)	Diff attachment 
KV31100300 (J25689-A)	Solid punch 
KV38100200 (-)	Gear carrier side oil seal drift 
KV381001S0 ① KV38100110 (-) ② KV38100120 (-) ③ KV38100130 (-) ④ KV38100140 (-)	Drive pinion setting gauge set (R200) Dummy shaft Height gauge Collar Stopper 
KV38100300 (J25523)	Diff side bearing drift 
KV38100401 (-)	Pilot bearing drift 
KV38100500 (-)	Gear carrier front oil seal drift 
KV38100600 (J25267)	Side bearing spacer drift 

SPECIAL SERVICE TOOLS

Tool number (Kent-Moore No)	Tool name
KV38102000 (-)	Master gauge [21 0 mm (0 827 in)] 
HT72400000 (-)	Slide hammer 