

WORKSHOP MANUAL

TF SERIES

STEERING SUSPENSION, WHEELS AND TIRES

SECTION 3

ISUZU

ISUZU



International Service & Parts
Tokyo, Japan

NOTICE

Before using this Workshop Manual to assist you in performing vehicle service and maintenance operations, it is recommended that you carefully read and thoroughly understand the information contained in Section - OA under the headings "GENERAL REPAIR INSTRUCTIONS" and "HOW TO USE THIS MANUAL".

All material contained in this Manual is based on the latest product information available at the time of publication.

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THIS MANUAL INCLUDES FOLLOWING SECTIONS

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3B	Steering
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SECTION 3A

FRONT ALIGNMENT

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- Tire pressure and abnormal wear
- Front hub bearings for axial play
- Ball joints on steering linkage for play
- Suspension ball joint
- Operation of shock absorber
- Tightness of suspension parts

ALIGNMENT



Inspection of Wheel Alignment

The points listed in table at left must be checked prior to inspecting front wheel alignment.



CASTER

	Short wheel base	Long wheel base
4×2 model (except TFR25)	1°35'±45'	1°50'±45'
4×4 model and TFR25	1°55'±45'	2°10'±45'
4×2 Flat Deck	-	1°10'±45'

Note:

Left and right side to be equal within 35'.



[4×2 model (except TFR25)]

The caster angle can be adjusted by varying length of the strut bar (adjust with lock nut) and shims should not be used for adjustment.

Lock Nut Torque	N·m(kgf·m/lb·ft)
127.5±12.8 (13.0±1.3 / 94.0±9.4)	



[4×4 model and TFR25]

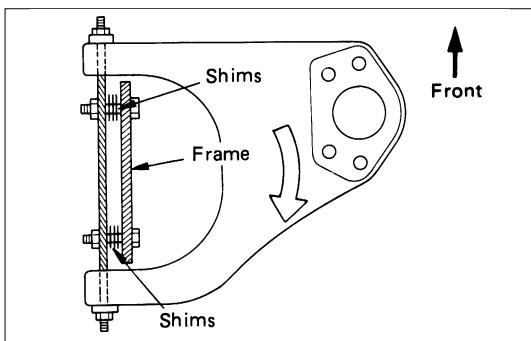
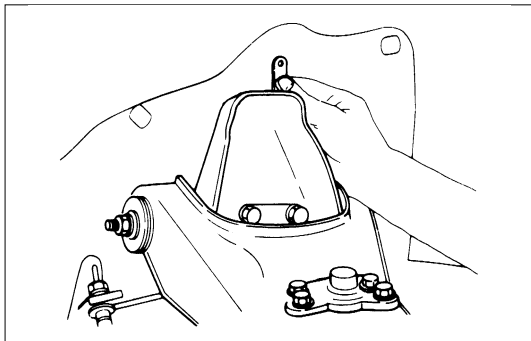
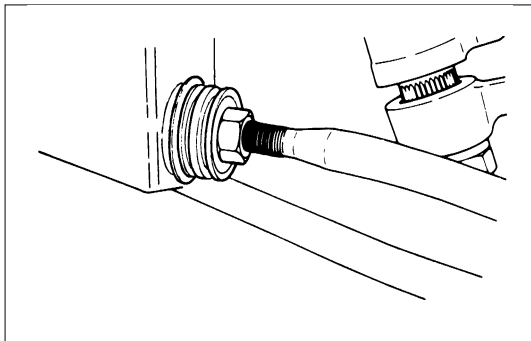
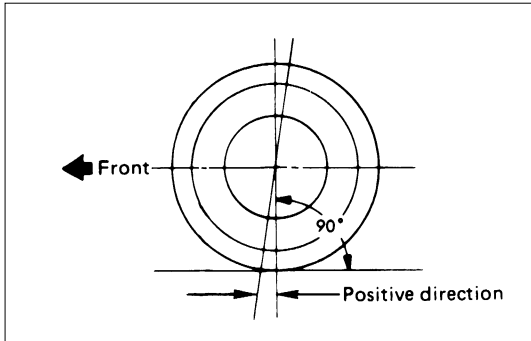
The caster angle can be adjusted by means of the caster shims installed in position between the chassis frame and fulcrum pins.

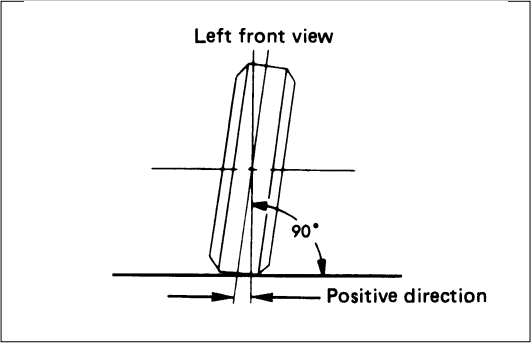
Note:

Difference of the caster shim front/rear thickness shall be 3.2 mm (0.126 in) or less. Overall thickness of caster shim and camber shim shall be 10.8 mm (0.426 in) or less.



Position of shims		Caster angle
Front side	Rear side	
When added	When removed	Decreases
When removed	When added	Increases
Fulcrum Pin Bolt Torque		N·m(kgf·m/lb·ft)
152.0±14.7 (15.5±1.5/112.1±10.8)		





CAMBER

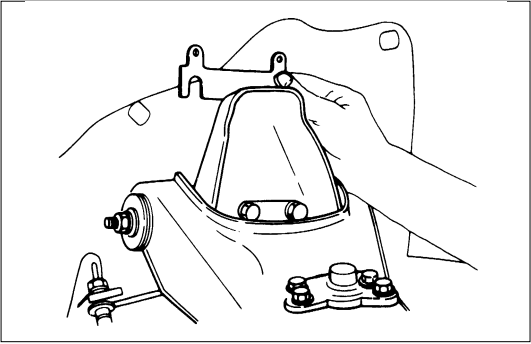
$30' \pm 60'$

Note:

Left and right side to be equal within 45'.

KING PIN INCLINATION

$10^\circ \pm 60'$

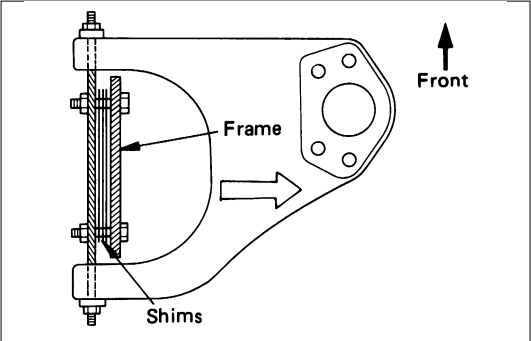


[4x4 model and TFR25 Only]

The camber angle can be adjusted by means of the camber shims installed in position between the chassis frame and fulcrum pins.

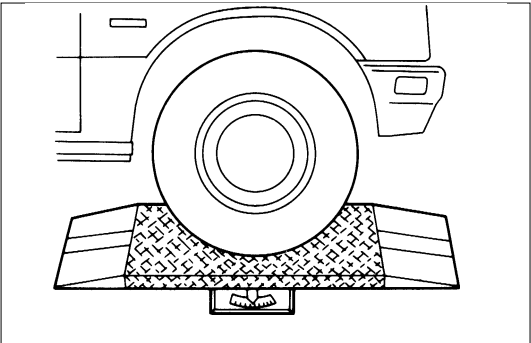
Note:

Overall thickness of caster shim and chamber shim shall be 10.8 mm (0.425 in) or less.



Position of shims	Camber angle
When added	Decreases
When removed	Increases

Fulcrum Pin Bolt Torque	N·m(kgf·m/lb·ft)
152.0 ± 14.7 (15.5 ± 1.5 / 112.1 ± 10.8)	

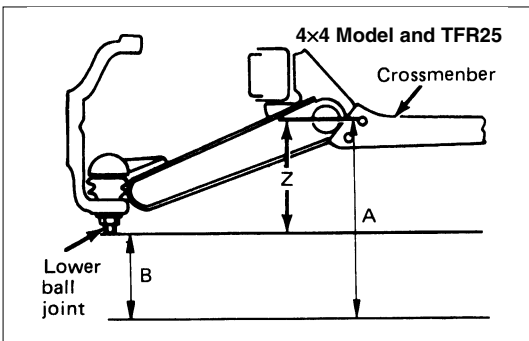
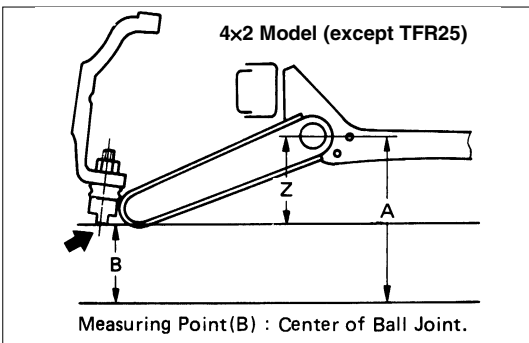
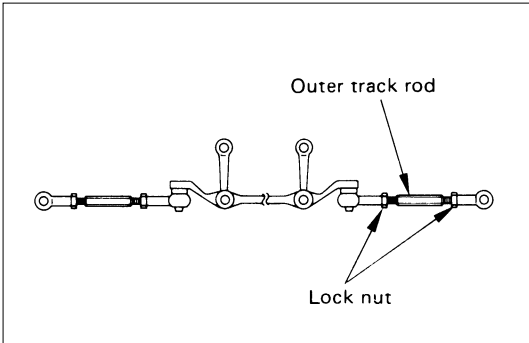
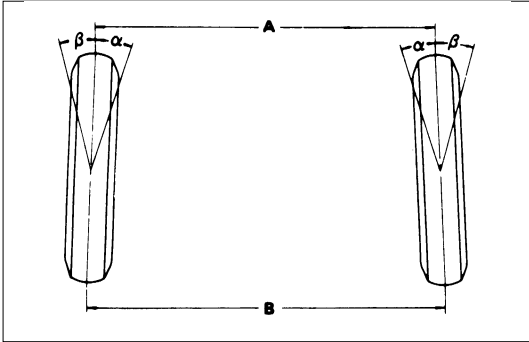
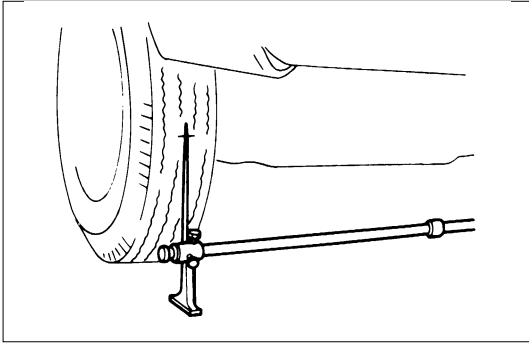


Measurement of Side Slippage

When inspection and adjustments of toe-in, camber, caster and kingpin inclination are completed, check for side slippage using a side slip tester.

Roll the wheels over the side tester as slowly as possible and take reading on the tester. If the amount of side slippage is in excess of 5 mm per 1 m, recheck the wheel alignment.

3A-4 FRONT ALIGNMENT



TOE-IN

Measurement should be taken with the vehicle on a surface plate.

If a surface plate is not available, toe-in should be checked with the vehicle parked on a level floor.

1. Set front wheels to straight ahead position.
2. Align the toe-in gauge with center height of each wheel at front end.
3. Apply center marks to each wheel, then take measurement of distance A between the center marks on each wheel.
4. Slowly move the vehicle rearward until the center marks reach the rear end position.
5. Take measurement of distance B between the center marks at rear end.

The toe-in can be calculated with next formula.

$$\text{Toe-in} = B - A$$

Toe-in	mm (in)
4x2 (except TFR25)	2±2 (0.08±0.08)
4x4 and TFR25	2±2 (0.08±0.08)



To adjust the toe-in angle, loosen the lock nut on the outer track rod and turn the outer track rod with the same degree as right and left.



Lock Nut Torque	N·m (kgf·m/lb·ft)
	98.1±9.8 (10.0±1.0 / 72.3±7.2)



TRIM HEIGHT OR VEHICLE HEIGHT

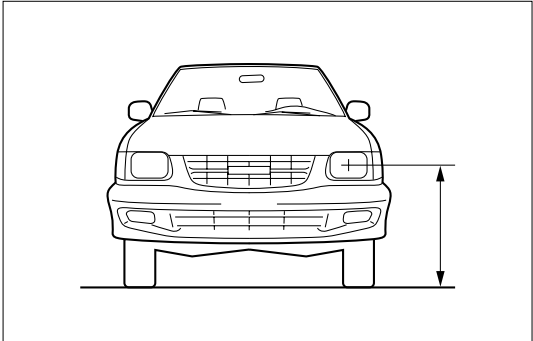
Trim Height : at Curb Weight

$$\text{Trim height (Z)} = A - B$$

Front	mm (in)
Model	Z
4x2 (except TFR25)	56 (2.20)
4x4 and TFR25	130 (5.12)

Note:

Trim height and vehicle height measurements are interchangeable.



Vehicle Height

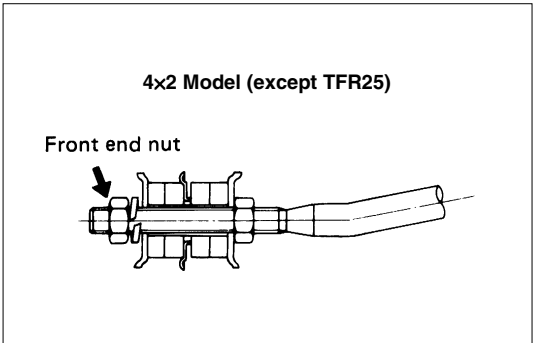
Measure the height from the center of the headlights to the ground. Height should be as specified; there must be no more than 10 mm difference between the left-hand and right-hand measurements.

2WD (except TFR25) mm (in)

185R14	735 (28.9)
6.50-14	760 (29.9)
P205/75R14	740 (29.1)

4WD and TFR25 mm (in)

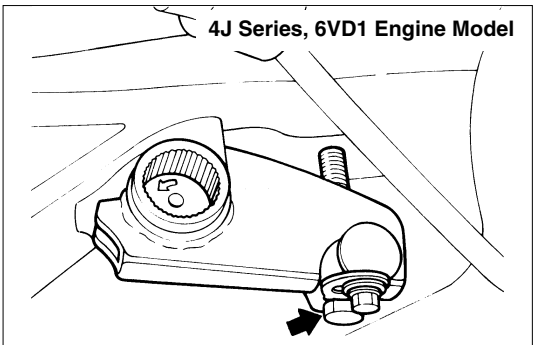
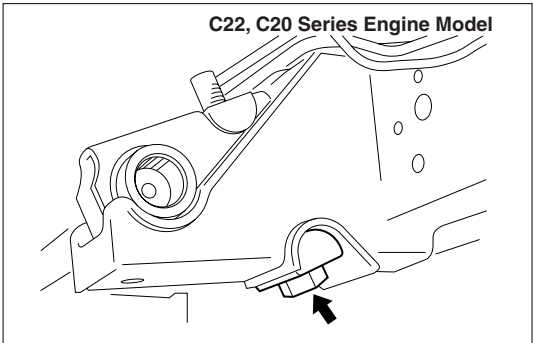
205R16	835 (32.9)
6.50-15	835 (32.9)
215R15	825 (32.5)
P225/75R15	823 (32.5)



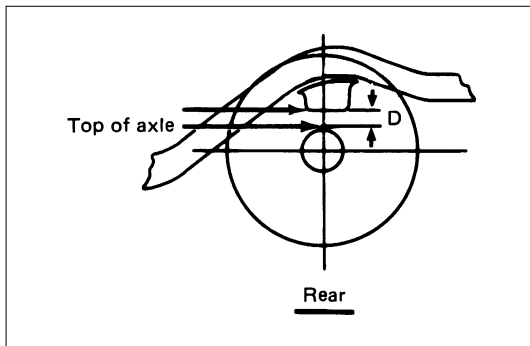
Adjustment

Adjust the trim height by means of the adjusting bolt on the height control arms.

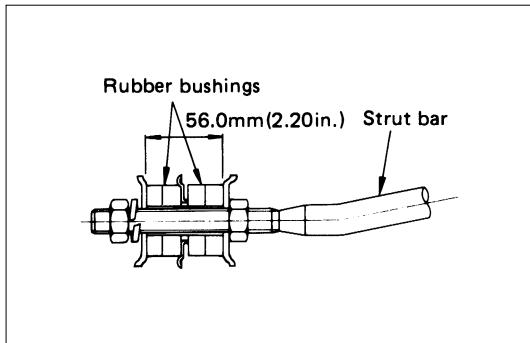
1. Check and adjust the tire inflation pressures.
2. Park the vehicle on a level ground and move the front of the vehicle up and down several times to settle the suspension.
3. Loosen the nuts on the front end of the strut bar. (For 4x2 model (except TFR25) only).
4. Make necessary adjustment with the adjusting bolt on the height control arms.



3A-6 FRONT ALIGNMENT



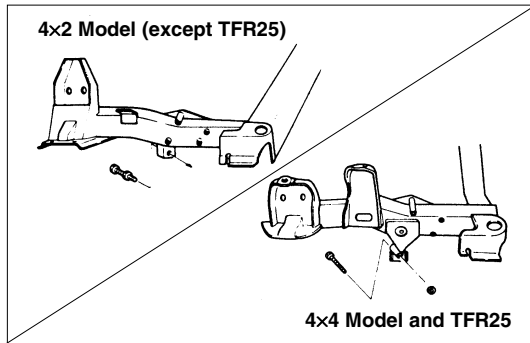
Reference Data		mm(in)	
	4×2 (except TFR25)	4×4 and TFR25	
		Others	Australia (4J Series, 6VD1 Engine model only)
Standard	90 (3.54)	95 (3.74)	95 (3.74)
Heavy Duty Sus.	90 (3.54)	95 (3.74)	-
Flat Deck	65(2.56)	70 (2.76)	-



STRUT BAR

**Securely Tighten the Strut Bar Nuts
(4×2 Model (except TFR25) Only)**

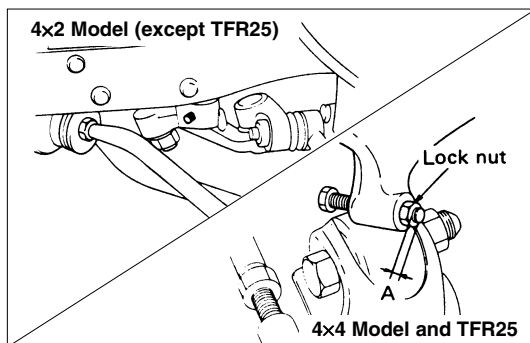
Strut Bar Torque	N·m(kgf·m/lb·ft)
127.5±12.8 (13.0±1.3 / 94.0±9.4)	



MAXIMUM STEERING ANGLE ADJUSTMENT

The maximum steering angle of the front wheels can be adjusted with the stopper bolts under the frame side members.

1. Position each front wheel on the turning radius gauge in a straight-ahead position.
2. Set the parking brake firmly.



3. Adjust the inside wheel angle of each side with the stopper bolts.
4. Similarly adjust the inside wheel angle of the other side with stopper bolt.

	4×2 (except TFR25)	4×4 and TFR25
Outside wheel	33°	33°
Inside wheel	37° ^{+0°} _{-2°}	35° ^{+0°} _{-2°}

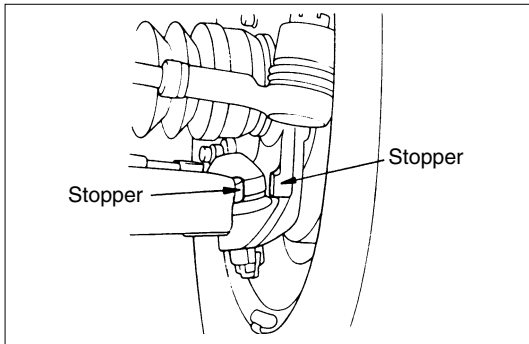
Note:

Maximum steering angles should be set after adjusting front wheel alignment.

4×4 Model and TFR25 Only		mm (in)
A		0 - 8.5 (0 - 0.33)



Stopper Bolt Lock Nut Torque		N·m(kgf·m/lb·ft)
4×2 (except TFR25)	44.1±9.8 (4.5±1.0 / 32.6±7.2)	
4×4 and TFR25	22.5±2.9 (2.3±0.3 / 16.6±2.2)	

**4x4 Model and TFR25 Only**

If the stopper (non-adjustable) between the lower link end and the knuckle comes ahead of the stopper bolt, adjust the stopper bolt so that the inner-side stopper bolt touches the drop arm (relay lever).

SECTION 3B

STEERING

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MAIN DATA AND SPECIFICATIONS

	Manual steering	Power steering
Unit type	Recirculating ball	Integral, ball screw
Gear ratio	20.5 - 23.5	15.8:1, 15.2:1*
Sector shaft operating angle degree	95	94
Starting torque N·m (kgf·m/lb.ft)	0.064 - 1.07 (0.065 - 0.11/0.47 - 0.79)	0.59 - 0.88 (0.06 - 0.09/0.43 - 0.65)
Maximum oil pressure kg/cm ² (psi/kPa)	-	95 (1350 / 9300), 90 (1280/8826)*
Oil pump type	-	Vane
Steering wheel - Diameter mm (in.)	382 (15.04)	
Steering wheel - Free play mm (in.)	10 - 30 (0.394 - 1.181)	10 - 30 (0.394 - 1.181), 10 (0.394)*
Oil capacity liters (US pint / UK pint)	0.4 (0.85 / 0.70) Gear oil GL-5 grade	1.0 (2.13 / 1.75) ATF

* : 4J Series Engine Model

TORQUE SPECIFICATIONS



STANDARD BOLTS

The torque values given in the following table should be applied where a particular torque is not specified.

N-m (kgf-m / lb-ft)

Strength Class Bolt Identification Bolt Diameter x Pitch (mm)		4.8/4T	7T	8.8		9.8/9T
				Refined	Non-Refined	
		No mark	-			
Standard Hex. Head Bolt	M6×1.0	6 (0.6 / 52 lb-in)	7 (0.7 / 61 lb-in)	8 (0.8 / 69 lb-in)		-
	M8×1.25	13 (1.3 / 113)	17 (1.7 / 12)	20 (2.0 / 14)		24 (2.4 / 17)
	M10×1.25	27 (2.8 / 20)	37 (3.8 / 27)	42 (4.3 / 31)		50 (5.1 / 37)
	M12×1.25	61 (6.3 / 45)	76 (7.8 / 56)	87 (8.9 / 64)		95 (9.7 / 70)
	M14×1.5	96 (9.8 / 71)	116 (11.8 / 85)	133 (13.6 / 98)		142 (14.5 / 105)
	M16×1.5	130 (13.3 / 96)	170 (17.3 / 125)	193 (19.7 / 143)		200 (20.4 / 148)
	M18×1.5	188 (19.2 / 139)	244 (24.9 / 180)	278 (28.3 / 205)		287 (29.3 / 212)
	M20×1.5	258 (26.3 / 190)	337 (34.4 / 249)	385 (39.3 / 284)		396 (40.4 / 292)
	M22×1.5	332 (33.9 / 245)	453 (46.3 / 335)	517 (52.7 / 381)		530 (54.1 / 391)
	M24×2.0	449 (45.8 / 331)	570 (58.2 / 421)	651 (66.3 / 480)		692 (70.6 / 511)
	*M10×1.5	26 (2.7 / 20)	36 (3.7 / 27)	41 (4.2 / 30)		48 (4.9 / 35)
	*M12×1.75	57 (5.8 / 42)	71 (7.2 / 52)	80 (8.2 / 59)		89 (9.1 / 66)
	*M14×2.0	89 (9.1 / 66)	110 (11.2 / 81)	125 (12.7 / 92)		133 (13.6 / 98)
	*M16×2.0	124 (12.7 / 92)	162 (16.5 / 119)	185 (18.9 / 137)		191 (19.5 / 141)
Flange Bolt	M6×1.0	7 (0.7 / 61 lb-in)	8 (0.8 / 69 lb-in)	9 (0.9 / 78 lb-in)		-
	M8×1.25	15 (1.5 / 11)	19 (1.9 / 14)	22 (2.2 / 16)		26 (2.7 / 20)
	M10×1.25	31 (3.2 / 23)	41 (4.2 / 30)	47 (4.8 / 35)		56 (5.7 / 41)
	M12×1.25	69 (0.7 / 51)	85 (8.7 / 63)	97 (9.9 / 72)		106 (10.8 / 78)
	M14×1.5	104 (10.6 / 77)	126 (12.8 / 93)	144 (14.6 / 106)		154 (5.7 / 114)
	M16×1.5	145 (14.8 / 127)	188 (.2 / 139)	214 (21.8 / 158)		221 (22.5 / 163)
	M18×1.5	-	-	-		-
	M20×1.5	-	-	-		-
	M22×1.5	-	-	-		-
	M24×2.0	-	-	-		-
	*M10×1.5	30 (3.1 / 22)	40 (4.1 / 30)	46 (4.7 / 34)		54 (5.5 / 40)
	*M12×1.75	64 (6.5 / 47)	78 (8.0 / 58)	89 (9.1 / 66)		99 (10.1 / 73)
	*M14×2.0	97 (9.9 / 72)	119 (12.1 / 88)	135 (13.8 / 99.7)		144 (14.7 / 107)
	*M16×2.0	137 (14.0 / 101)	178 (18.2 / 132)	203 (20.7 / 150)		210 (21.5 / 155)

The asterisk * indicates that the bolts are used for female-threaded parts that are made of soft materials such as casting, etc.



FLARE NUTS

N-m (kgf-m / lb-ft)

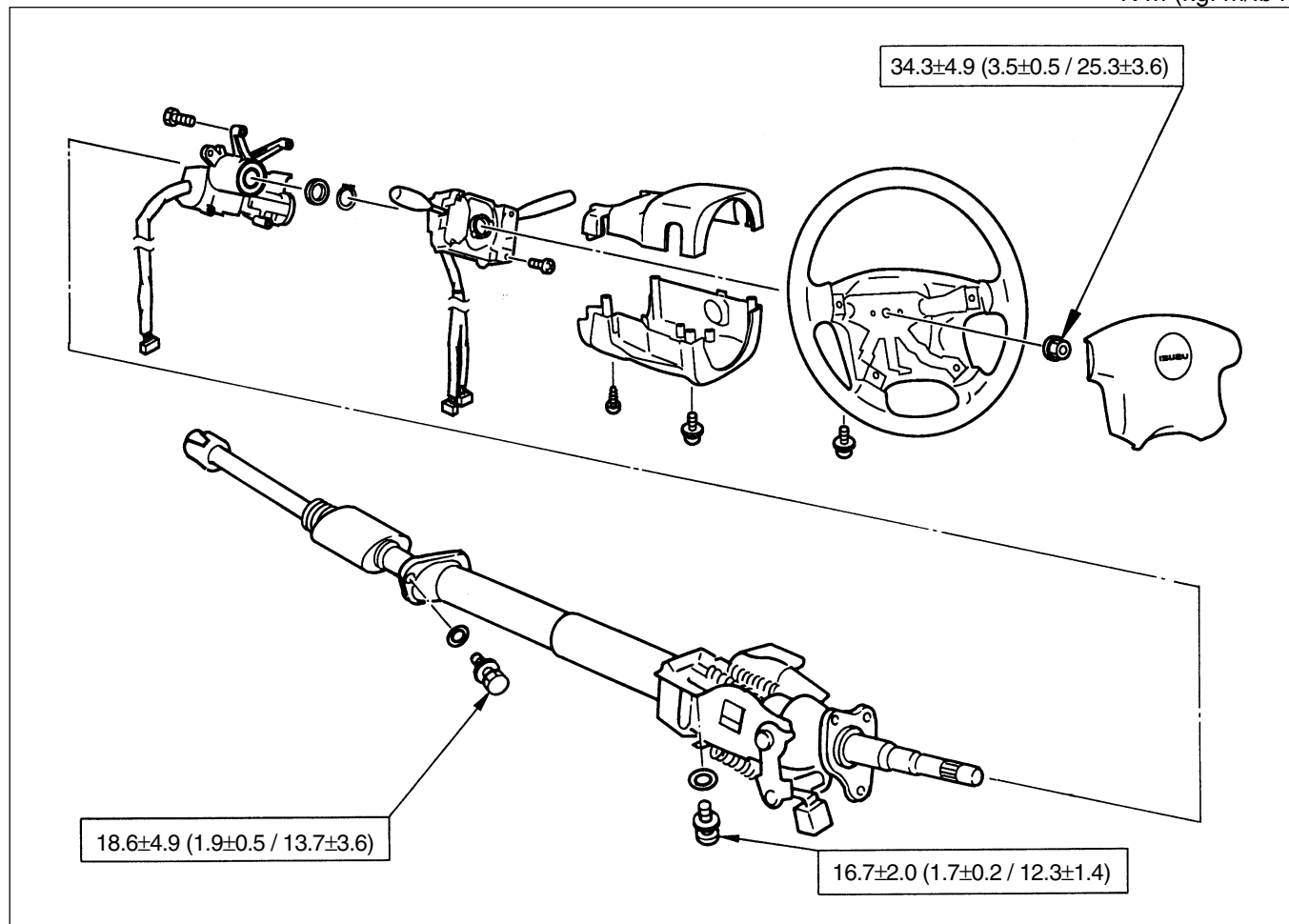
Pipe diameter mm (in)	Torque	Pipe diameter mm (in)	Torque
4.76 (0.187)	16 (1.6 / 12)	10.00 (0.394)	54 (5.5 / 40)
6.35 (0.250)	26 (2.7 / 20)	12.00 (0.472)	88 (9.0 / 65)
8.00 (0.315)	44 (4.5 / 33)	15.00 (0.591)	106 (10.8 / 78)



SPECIAL PARTS FIXING NUTS AND BOLTS

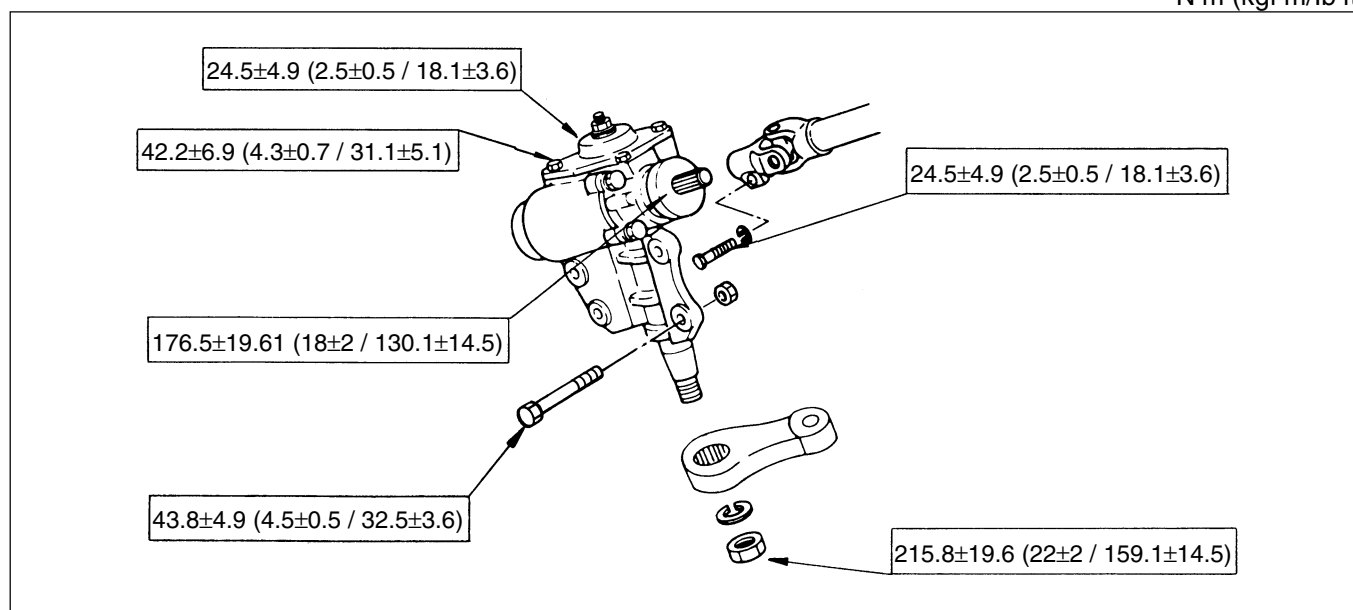
STEERING COLUMN

N·m (kgf·m/lb·ft)

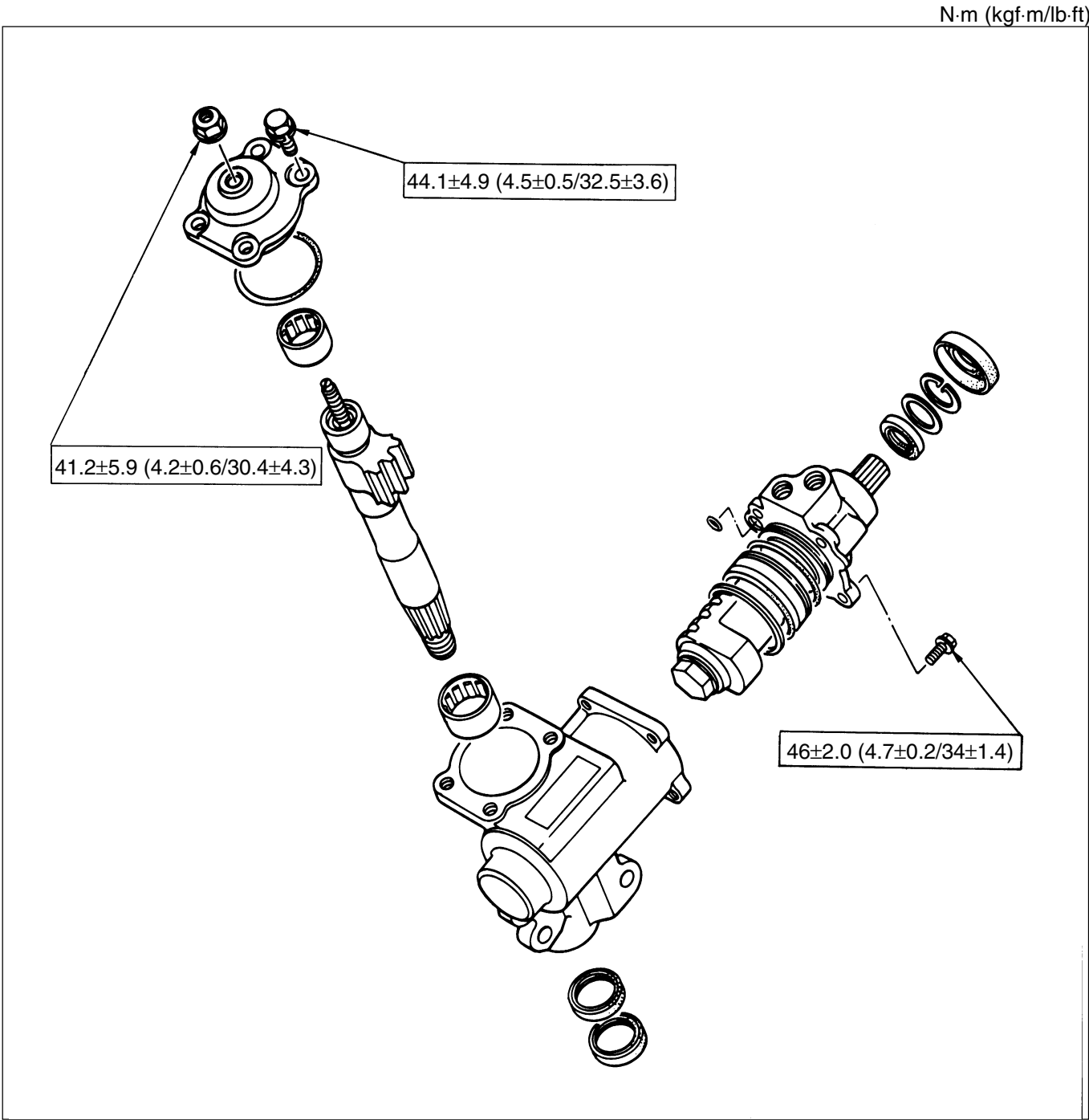


STEERING UNIT

N·m (kgf·m/lb·ft)



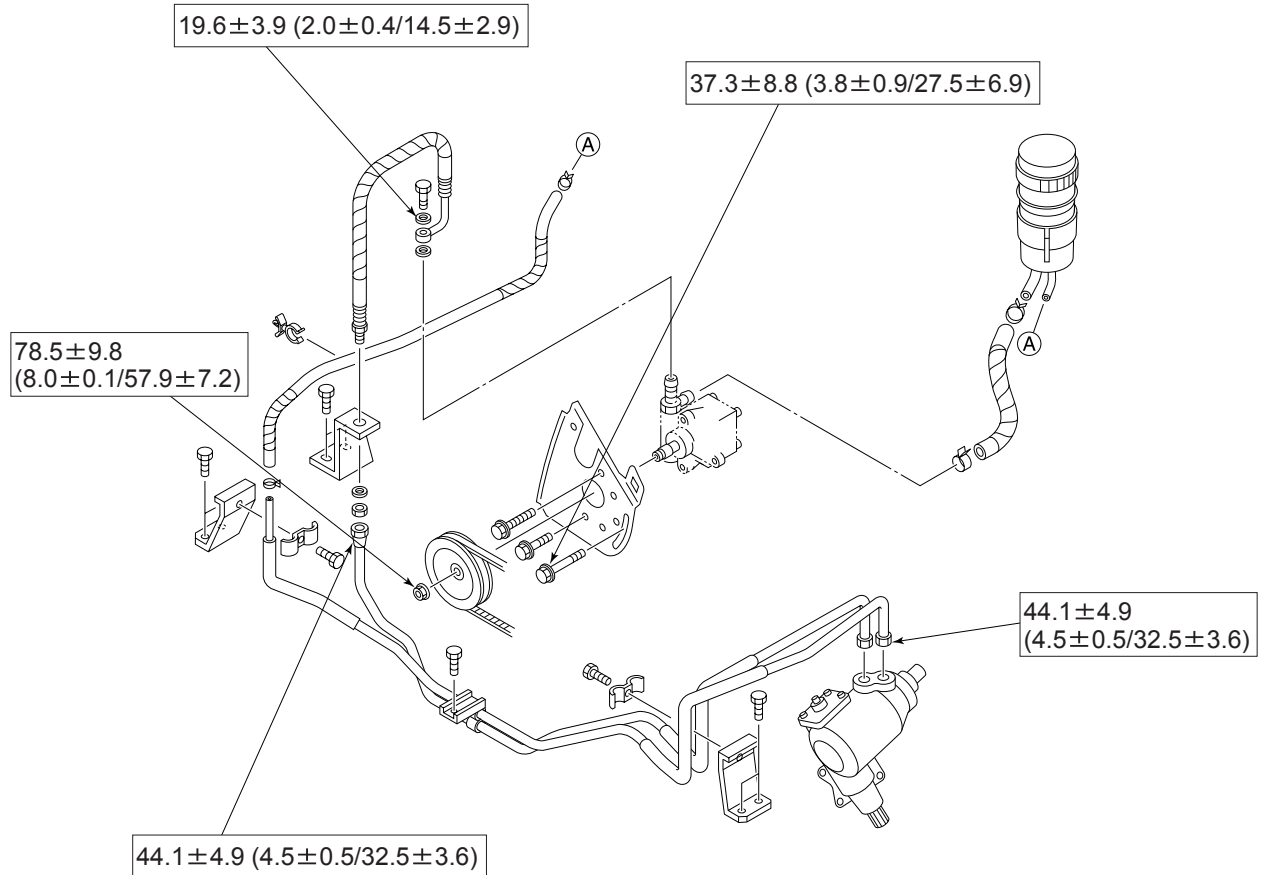
POWER STEERING UNIT



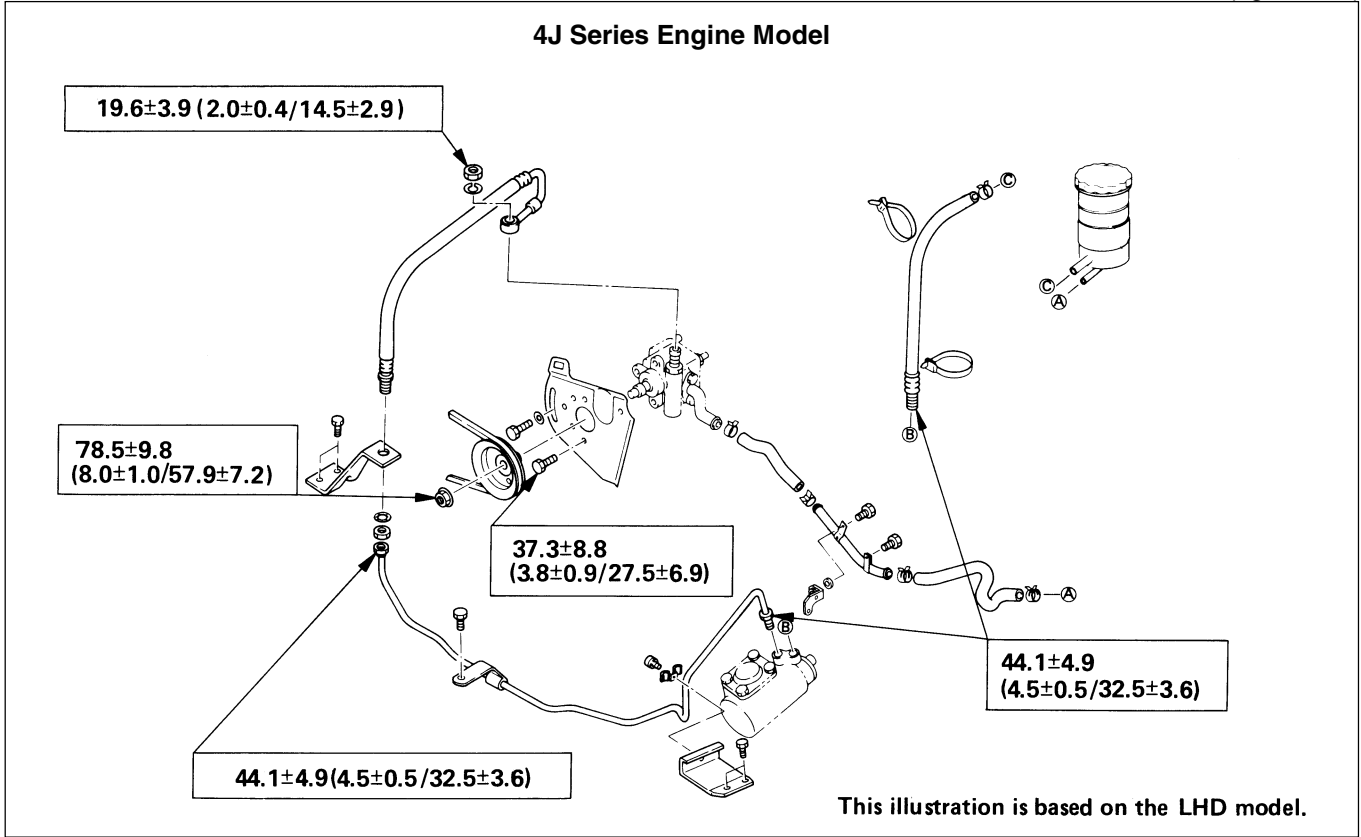
POWER STEERING HYDRAULIC LINE

N·m (kgf·m/lb·ft)

C22, C20 Series Engine Model

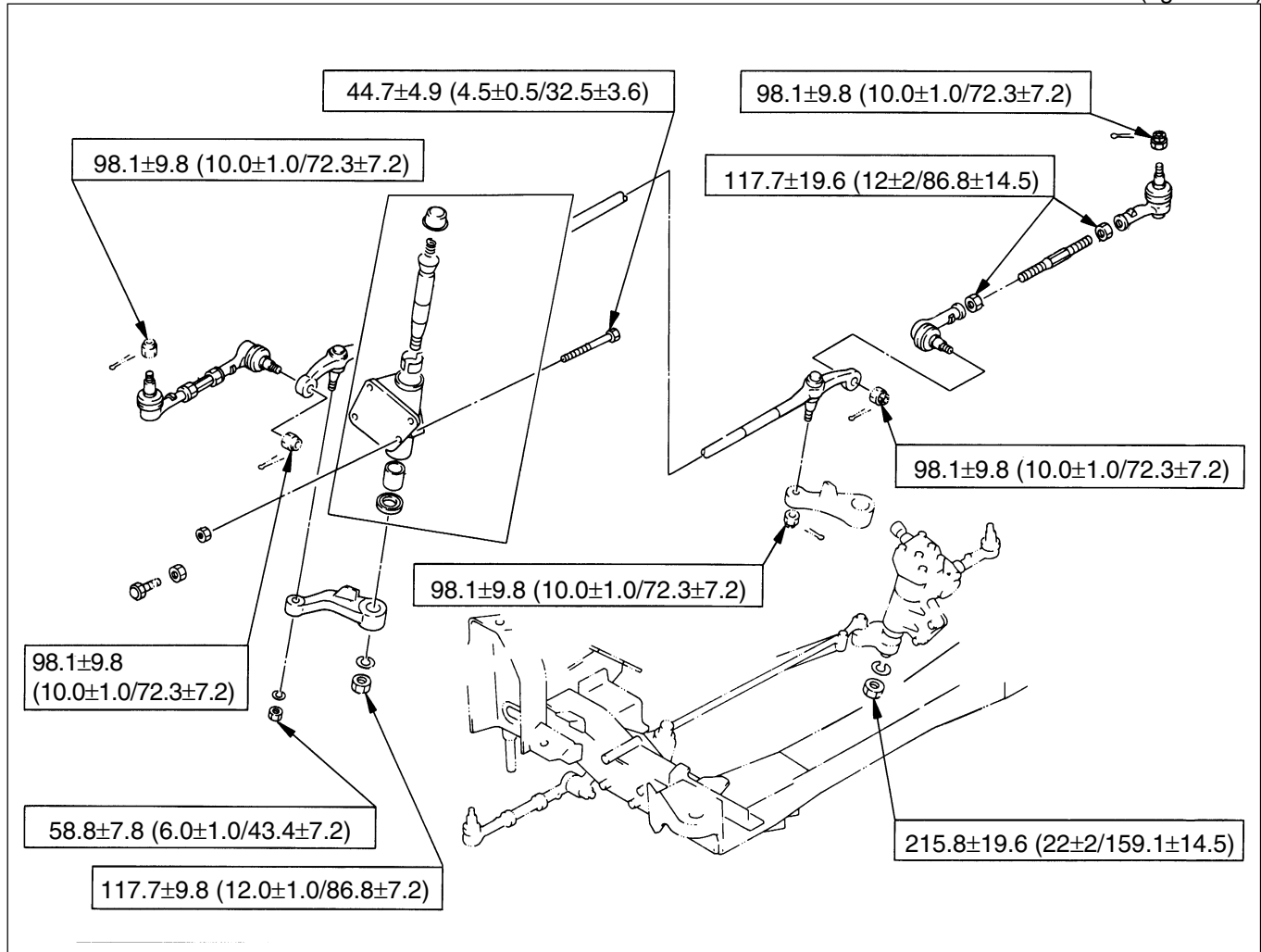


This illustration is based on the LHD model.



STEERING LINKAGE

N·m (kgf·m/lb·ft)



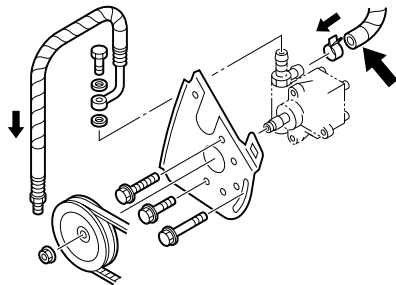
SERVICING

POWER STEERING FLUID

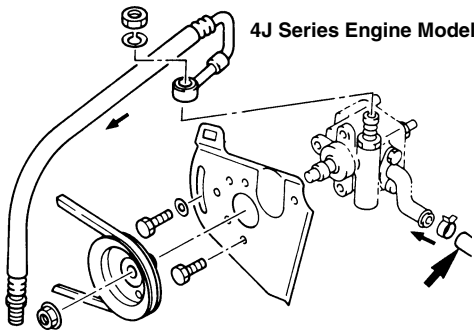
Draining

1. Jack up the front wheels until they are clear of the ground.
2. Disconnect the fluid pipes between the steering unit and the fluid reservoir, and the fluid hose between the pump and the fluid reservoir.
3. When draining is completed, remove remaining fluid within hydraulic system by turning the steering wheel to stop in both directions several times.

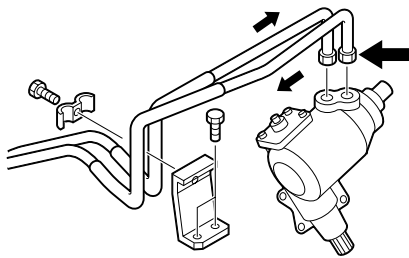
C22, C20 Series Engine Model



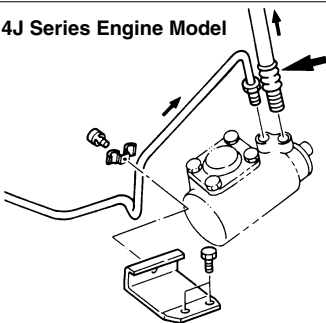
4J Series Engine Model

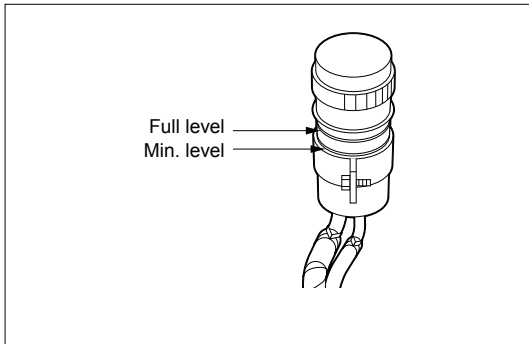


C22, C20 Series Engine Model



4J Series Engine Model



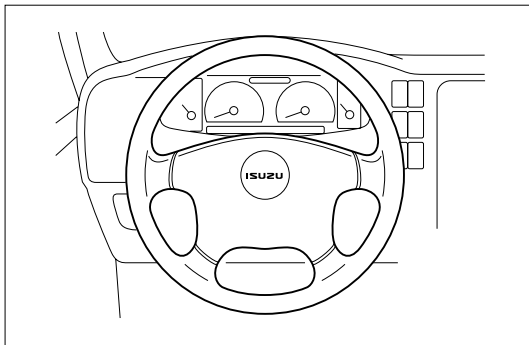


Refilling

1. Connect the fluid lines securely and fill the fluid reservoir with specified automatic transmission fluid.
2. When the fluid reservoir is filled to the specified level, allow 2 or 3 minutes. While refilling, keep fluid reservoir replenished as necessary to prevent air from entering the hydraulic system.
3. Lower the front wheels to the ground. Start and let the engine idle for a few minutes.

Recheck the fluid level and replenish if necessary.

Fluid Capacity	Liter (US pint/UK pint)
Approx. 1.0 (2.13 / 1.75)	



STEERING WHEEL PLAY

Inspection

1. Check the amount of the steering wheel play by turning the wheel in both directions until the tires begin to move with the front wheels properly in the straight-ahead position.

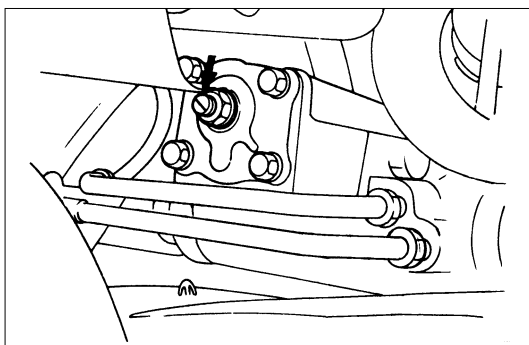


Note:

If the vehicle is equipped with a power steering unit, the wheel free play should be checked with the engine running.

Free Play (Manual/Power Steering)	mm(in)
10 - 30 (0.4 - 1.2)	

2. Also check the steering wheel for play and looseness in mount by moving it back and forth and sideways. While driving check for hard-steering, steering shimmy and tendency of steering to pull to one side.



Adjustment

1. Align the front wheels properly in the straight ahead position.
2. Loosen the lock nut on the adjusting screw of the steering unit.
3. Turn the adjust screw clockwise to decrease free play or counter-clockwise to increase.
4. After check of specified free play, tighten the lock nut to specified torque.

Lock Nut Torque	N-m (kgf-m/lb-ft)
Manual Steering	24.5±4.9 (2.5±0.5/18.1±3.6)
Power Steering	41.2±5.9 (4.2±0.6/30.4±4.3)

AIR BLEEDING

Fill fluid reservoir with specified automatic transmission fluid (DEXRON) and turn the steering wheel to lock in both directions repeatedly, so that level of fluid in the reservoir to the specified level and start the engine.

Perform the following check with the engine running at idle.

Bleeding is considered to be completed if the following conditions apply;

- (1) Turn the steering wheel to lock in both directions 3 or 4 times.

A buzz is not produced in the hydraulic line.

- (2) Stop the engine with steering wheel in a straight ahead position.

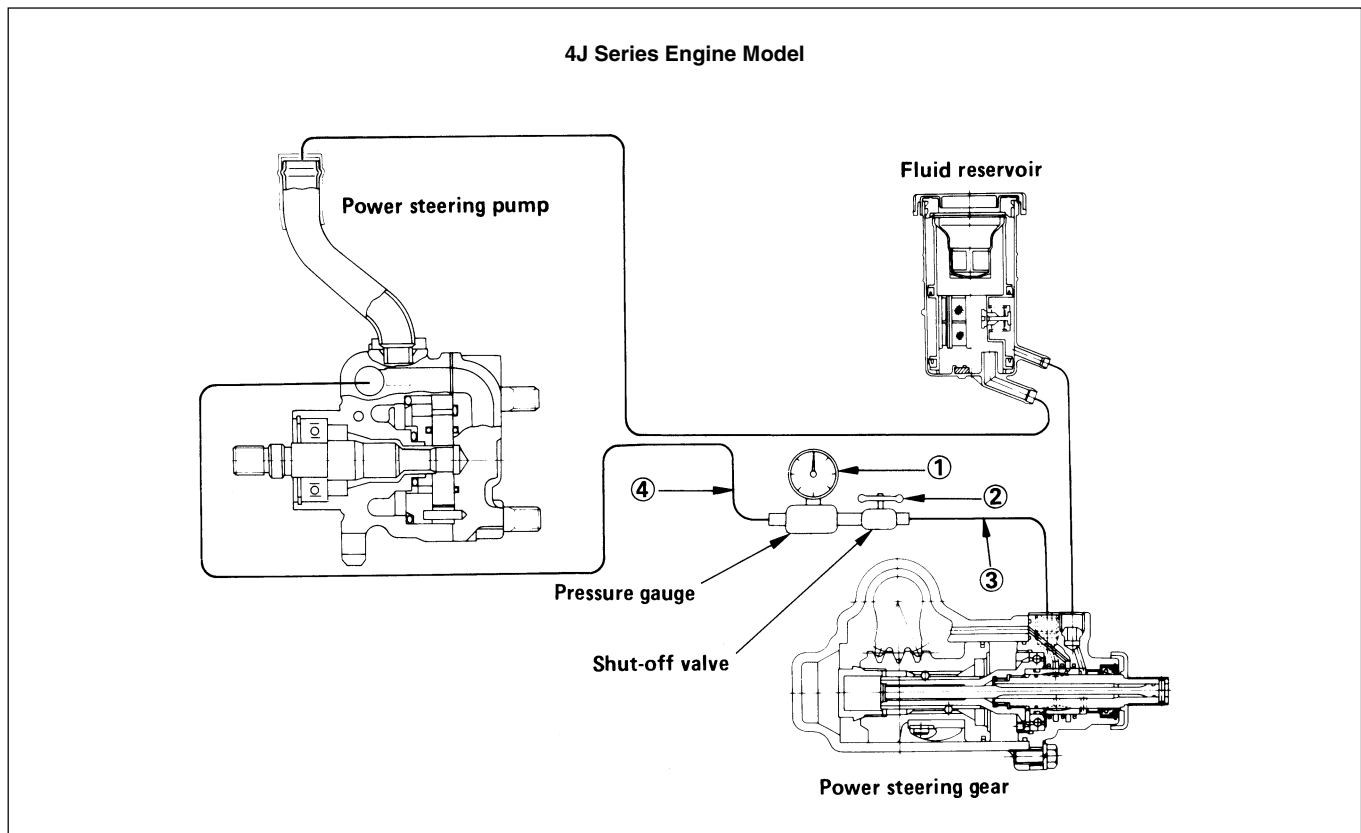
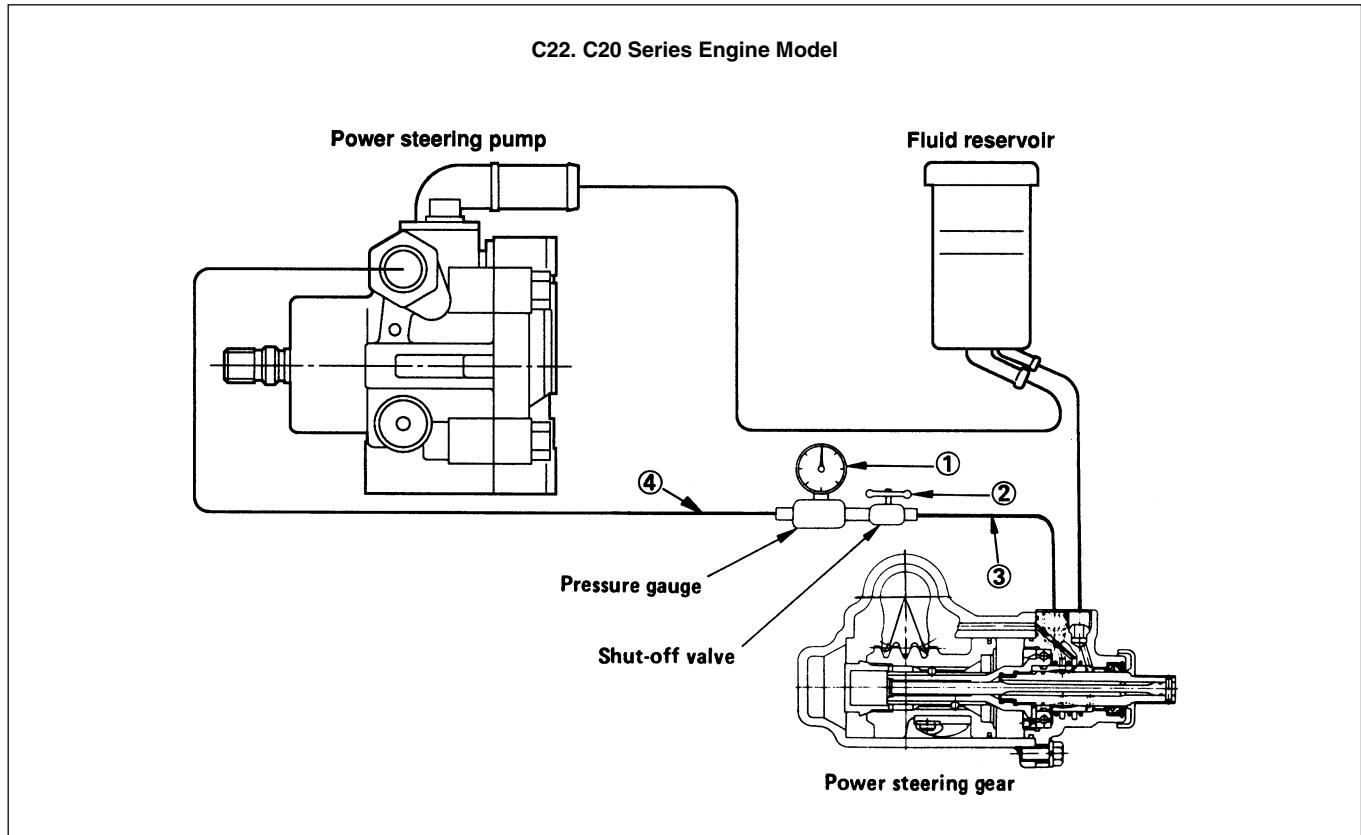
Level of fluid in reservoir does no increase.

Note:

Do not hold the steering wheel in position of lock for more than 5 seconds, or temperature of fluid increases sharply.

MEASUREMENT OF FLUID PRESSURE

Measurement of fluid pressure in the power steering system is performed to determine whether or not the oil pump and power steering unit are functioning normally.



**1. Installation of Tester**

- Power Steering Tester : 5-8840-0135-0
(J-29877-A)

Adapter; Power Steering Tester :
5-8840-0136-0
(J-33996)

- ① Oil Pressure Gauge with Shut off Valve
- ② Shut off Valve
- ③ Adapter (to steering unit)
- ④ Adapter (to oil pump)
- Installation Procedure;
Disconnect the hose on the outlet side of the pump.
Connect the gauge hose closest to the power steering gauge shut off valve to the hose on the vehicle. Connect the gauge hose furthest from the shut off valve to the outlet side of the power steering pump.

2. Bleeding

- Open stop valve fully.
- Refer to air bleeding procedure.

**3. Measurement of Fluid Pressure**

- Open stop valve fully.
- Increase engine speed to 1500 rpm.
- Measure the fluid pressure when the steering wheel is turned to lock in both directions.

Fluid Pressure	kg/cm ² (psi/kPa)
95 - 100 (1350 - 1420/9300 - 9800) (C22, C20 Series Engine Model)	
85 - 90 (1209 - 1280/8336 - 8826) (4J Series Engine Model)	

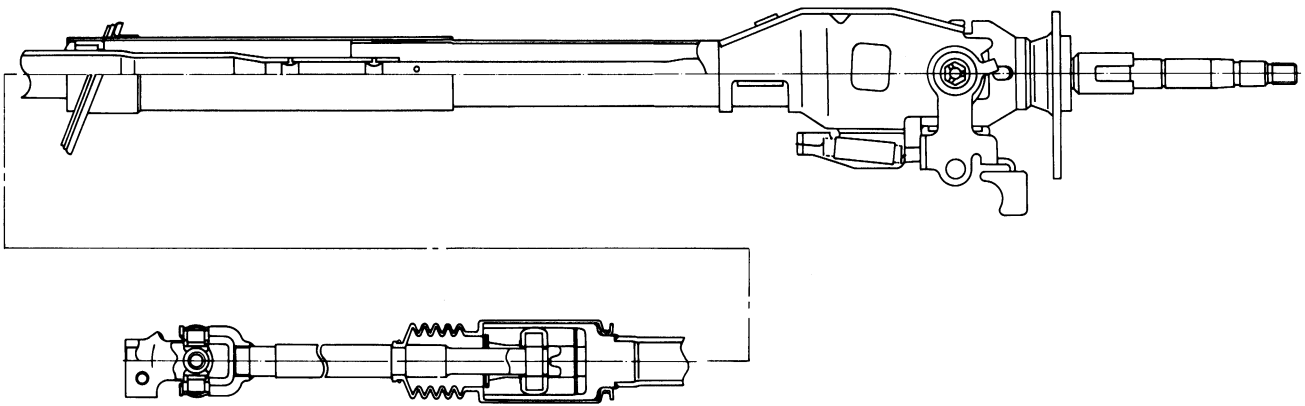
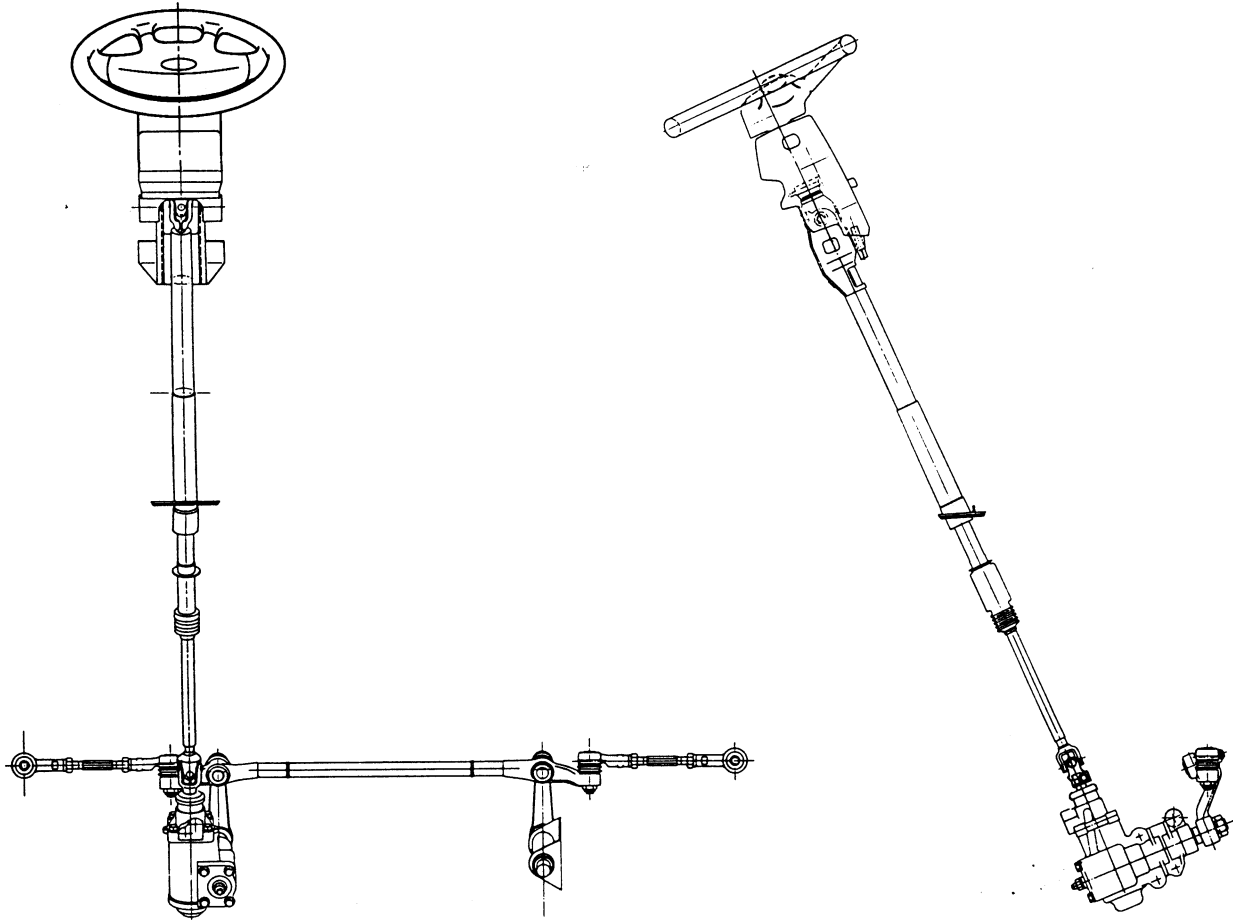
Diagnosis:

- (1) When pressure is higher than Specified pressure, the valve within the oil pump is defective.
- (2) When the pressure is lower than Specified pressure.
- Return steering wheel to straight-ahead position.
 - Close stop valve completely.
 - Hold engine running at 1500 rpm, and take reading of the pressure gauge.

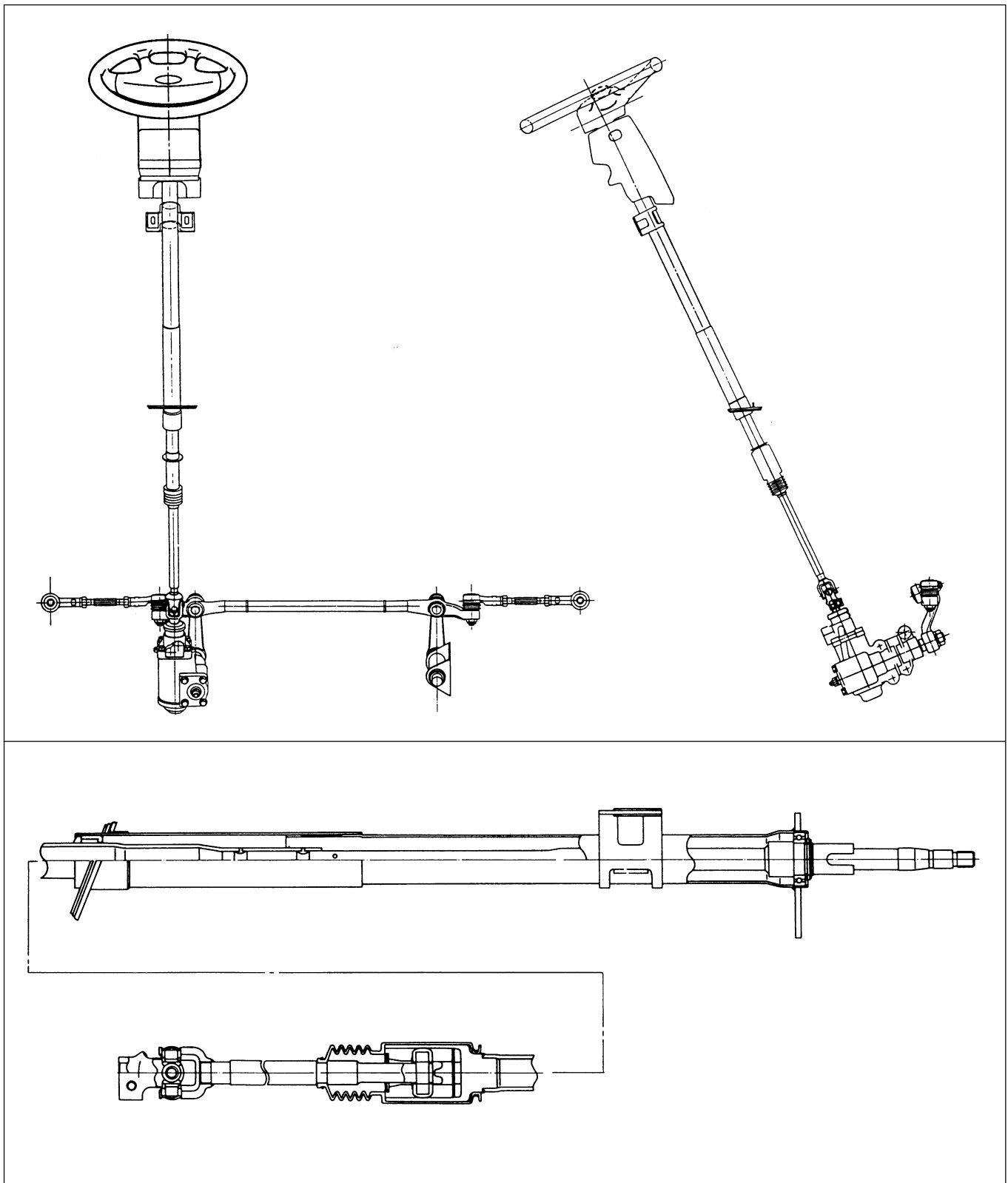
Fluid Pressure	kg/cm ² (psi/kPa)
	Possible trouble
95 - 100 (1350 -1420/9300 - 9800) (C22, C20 Series Engine Model)	Steering unit
85 - 90 (1209 - 1280/8336 - 8826) (4J Series Engine Model)	
Lower than 95 (1350/9300) (C22, C20 Series Engine Model)	Oil pump
Lower than 85 (1209/8336) (4J Series Engine Model)	

STEERING MECHANISM

GENERAL DESCRIPTION STEERING MECHANISM



3B-16 STEERING

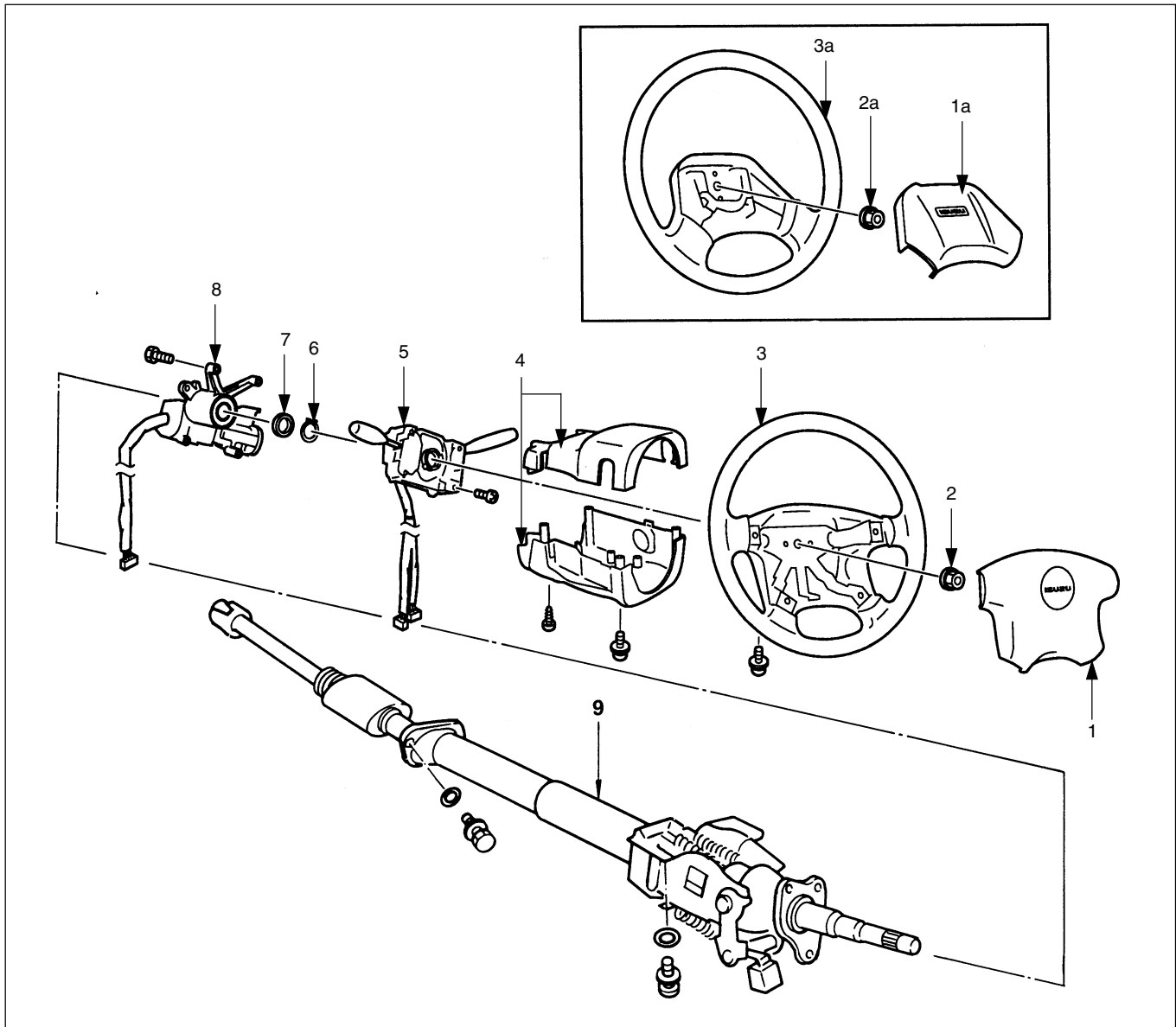


The steering mechanism comprises a steering wheel, steering column, steering shaft, steering unit, and steering linkage.

The steering shaft is equipped with slid joints to prevent vehicle vibration from transferring to the steering wheel.

STEERING COLUMN

REMOVAL AND INSTALLATION

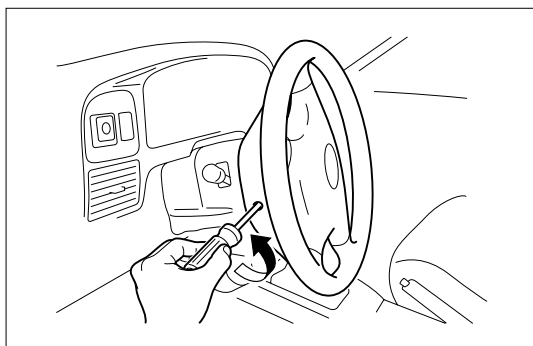


Removal Steps

- ▲ 1., 1a. Horn shroud
- ▲ 2., 2a. Nut
- ▲ 3., 3a. Steering wheel
- ▲ 4. Steering cowl
- ▲ 5. Combination switch
- ▲ 6. Snap ring
- ▲ 7. Bushing
- ▲ 8. Steering lock and bearing
- ▲ 9. Steering column assembly

Installation Steps

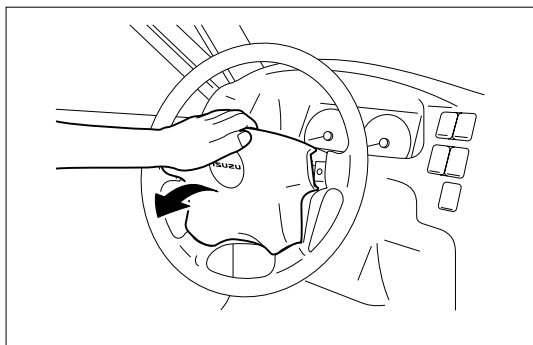
- ▲ 9. Steering column assembly
- ▲ 8. Steering lock and bearing
- ▲ 7. Bushing
- ▲ 6. Snap ring
- ▲ 5. Combination switch
- ▲ 4. Steering cowl
- ▲ 3., 3a. Steering wheel
- ▲ 2., 2a. Nut
- ▲ 1., 1a. Horn shroud



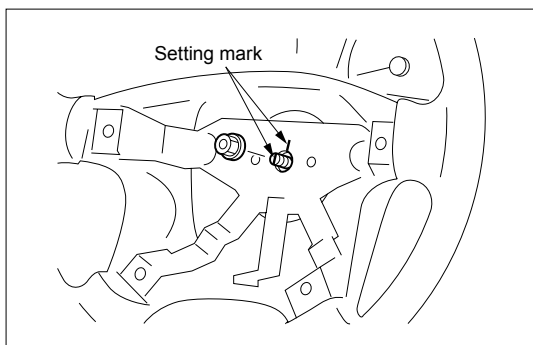
Important Operations - Removal

1., 1a. Horn Shroud

(1) Remove the arrowed screw at the rear side of the steering wheel.

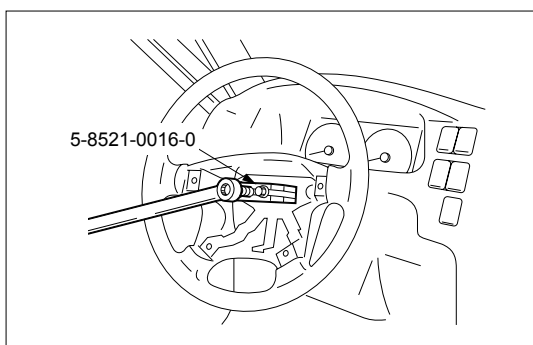


(2) Pull up the pad along the direction shown in the left figure and remove from the steering wheel.



3., 3a. Steering Wheel

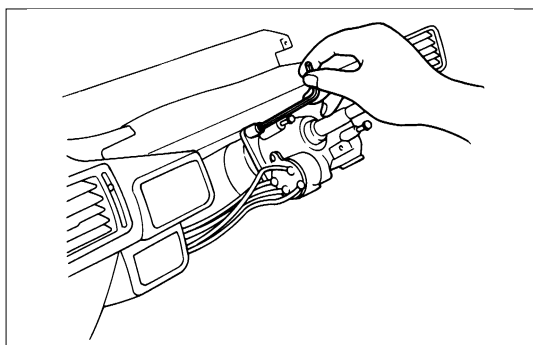
(1) Apply a setting mark across the steering wheel and shaft so parts can be reassembled in their original position.



(2) Steering Wheel Puller : 5-8521-0016-0
(J-29752)

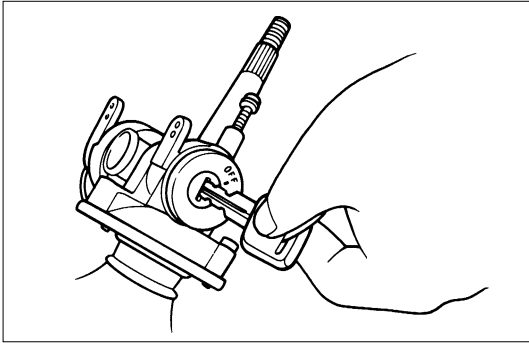
Note :

Never apply blow to the setting wheel in direction of the shaft by using a hammer or other impact tools in an attempt to remove the steering wheel, the setting shaft is designed as an energy absorbing unit.



8. Steering Lock and Bearing

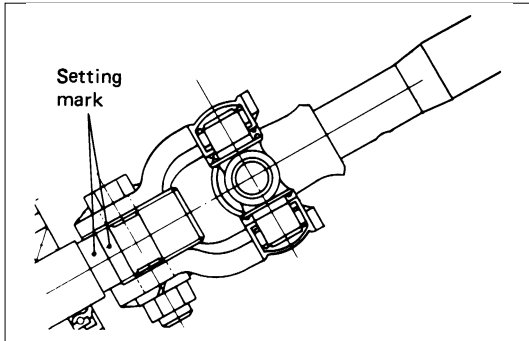
Remove the steering lock assembly using the inner hex wrench.



Turn the ignition/starter key to OFF position.

Note :

With the steering in lock position, the steering lock assembly cannot be removed.

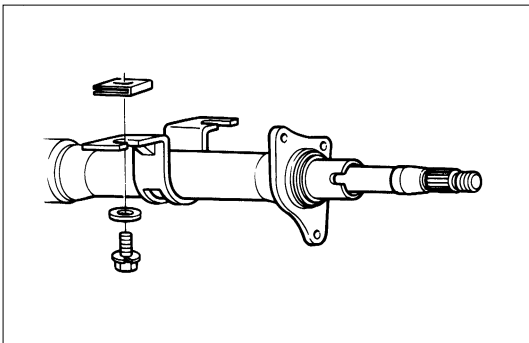


9. Steering Column Assembly

Apply a setting mark across the universal joint and steering shaft to reassemble of the parts in their original position.

Note :

A Setting mark can be easily punched if the shaft is withdrawn a little by loosening the steering shaft universal joint.

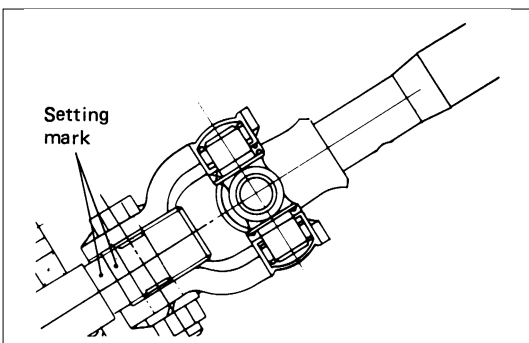


Important Operations - Installation

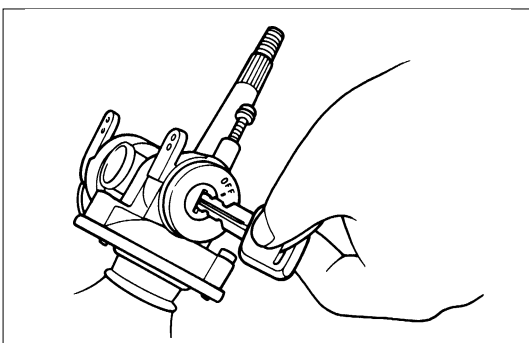


9. Steering Column Assembly

Steering Column Torque	N·m (kgf·m/lb·ft)
16.7 ± 2.0 ($1.7 \pm 0.2 / 12.3 \pm 1.4$)	



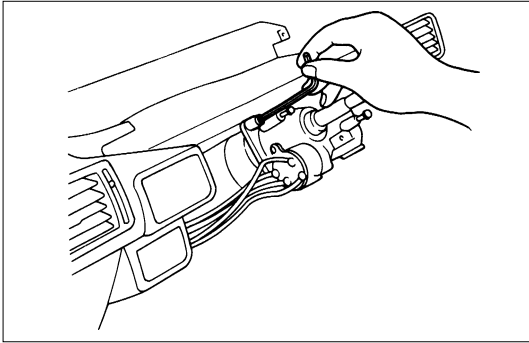
Align the setting marks made when removing.



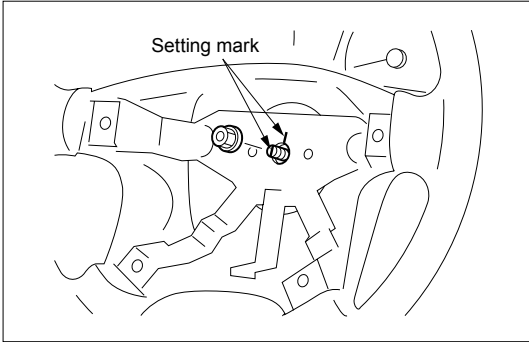
8. Steering Lock and Bearing

Turn the ignition/starter key to OFF position.

With the steering in lock position, the steering lock assembly cannot be installed.



Install the steering lock assembly using the inner hex wrench.

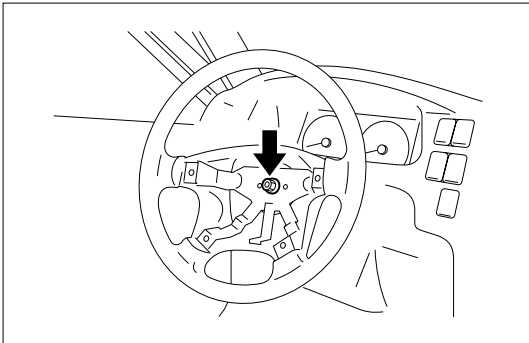


3., 3a. Steering Wheel

- (1) Align the setting marks made when removing.
- (2) Apply grease to contact ring.

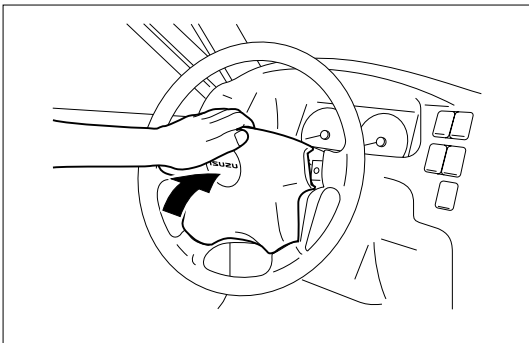
Note :

Never apply blow to the setting wheel in direction of the shaft by using a hammer or other impact tools in an attempt to install the steering wheel, the setting shaft is designed as an energy absorbing unit.



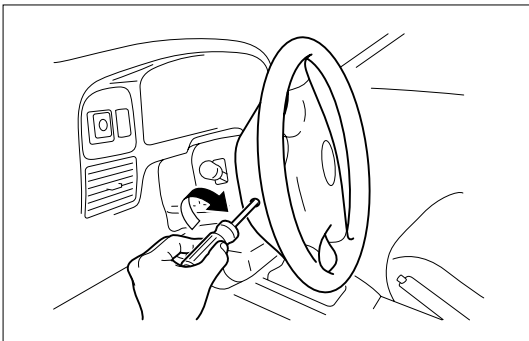
2., 2a. Nut

Steering Wheel Nut Torque	N·m (kgf·m/lb·ft)
34.3±4.9 (3.5±0.5/25.3±3.6)	



1. Horn shroud

- (1) Remove the bracket from the nail at the lower side of pad assembly with a screw driver.

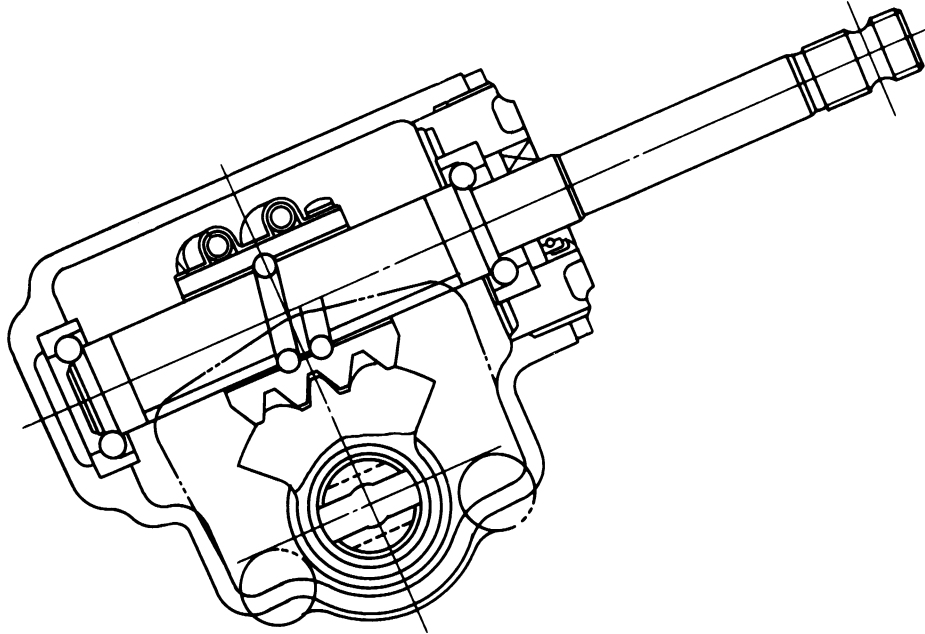


- (2) Install the bracket (removed at procedure 1) onto the steering wheel sub assembly with a screw.
- (3) Connect the harnesses, then, hang the nail of the pad assembly onto the plate of the steering wheel sub assembly, and install the pad carefully so that the nail is not separated from the bracket. (See the lowest figure.)

STEERING UNIT

GENERAL DESCRIPTION

MANUAL STEERING UNIT



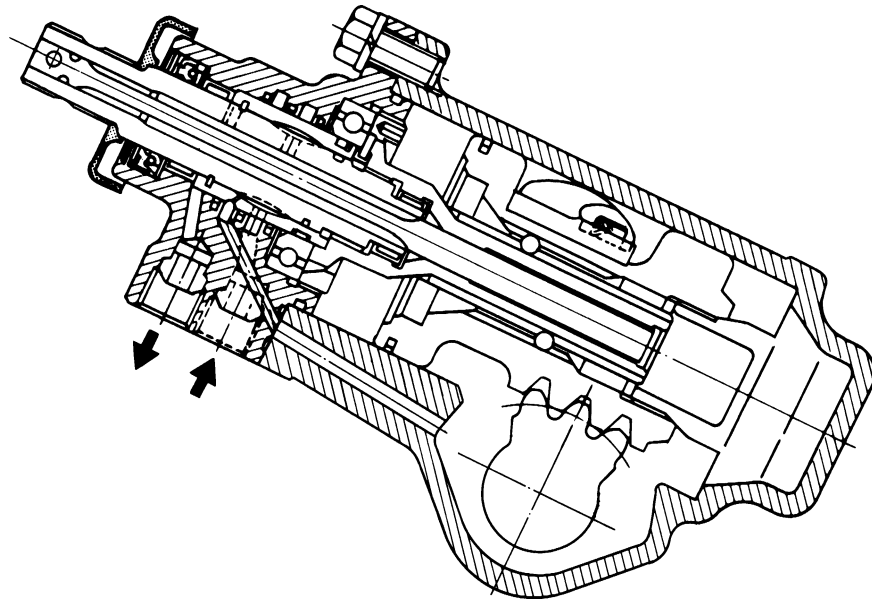
The steering gear is mainly comprised of the sector gear and the worm nut assembly.

There are many recirculating balls installed to the ball groove (way) between the worm nut and the steering worm shaft.

The steering gear's high mechanical efficiency provides very light steering.

Racks machined into the worm nut side face engage the fan shaped sector gear to transfer the steering wheel applied torque to the pitman arm.

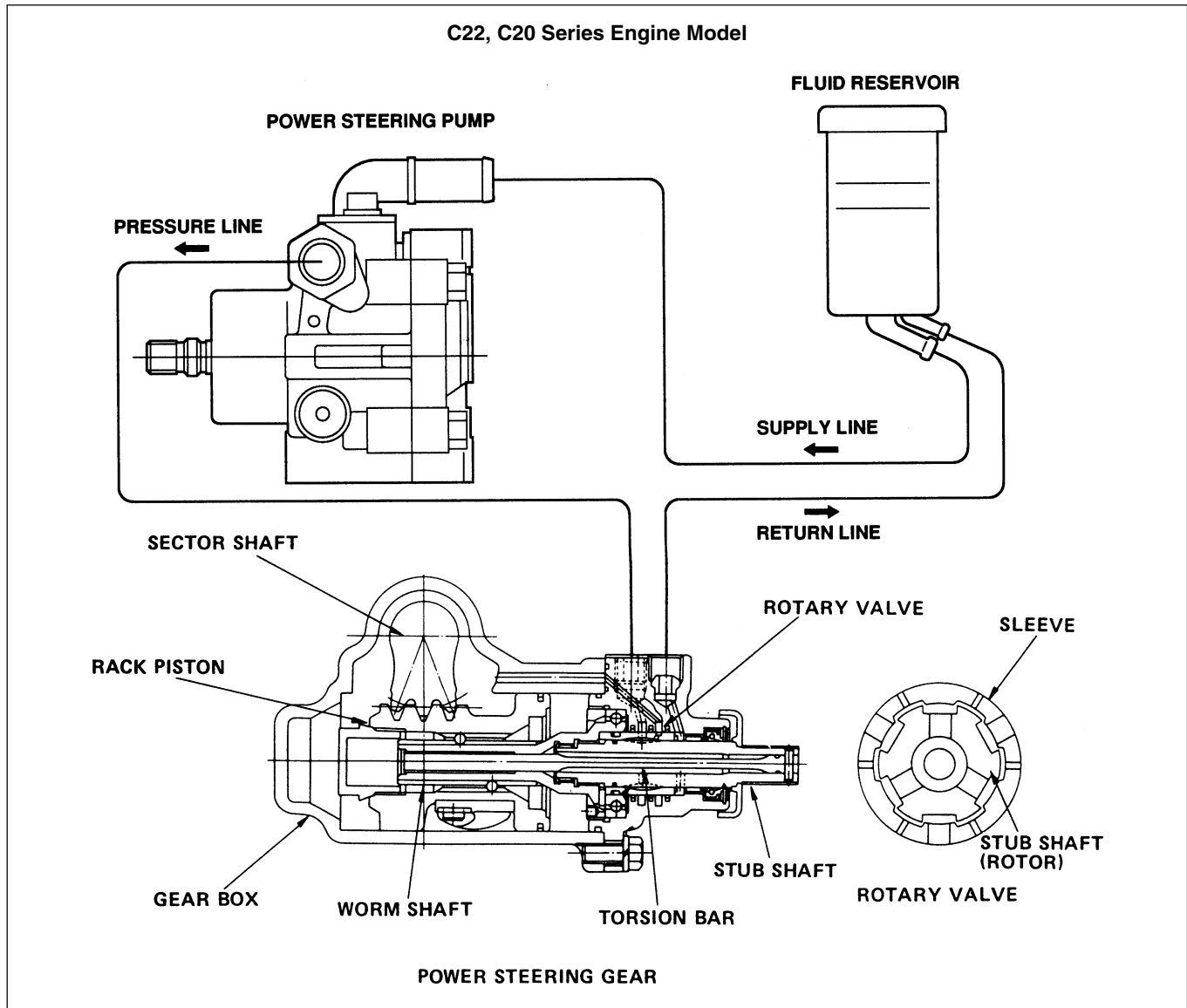
POWER STEERING UNIT

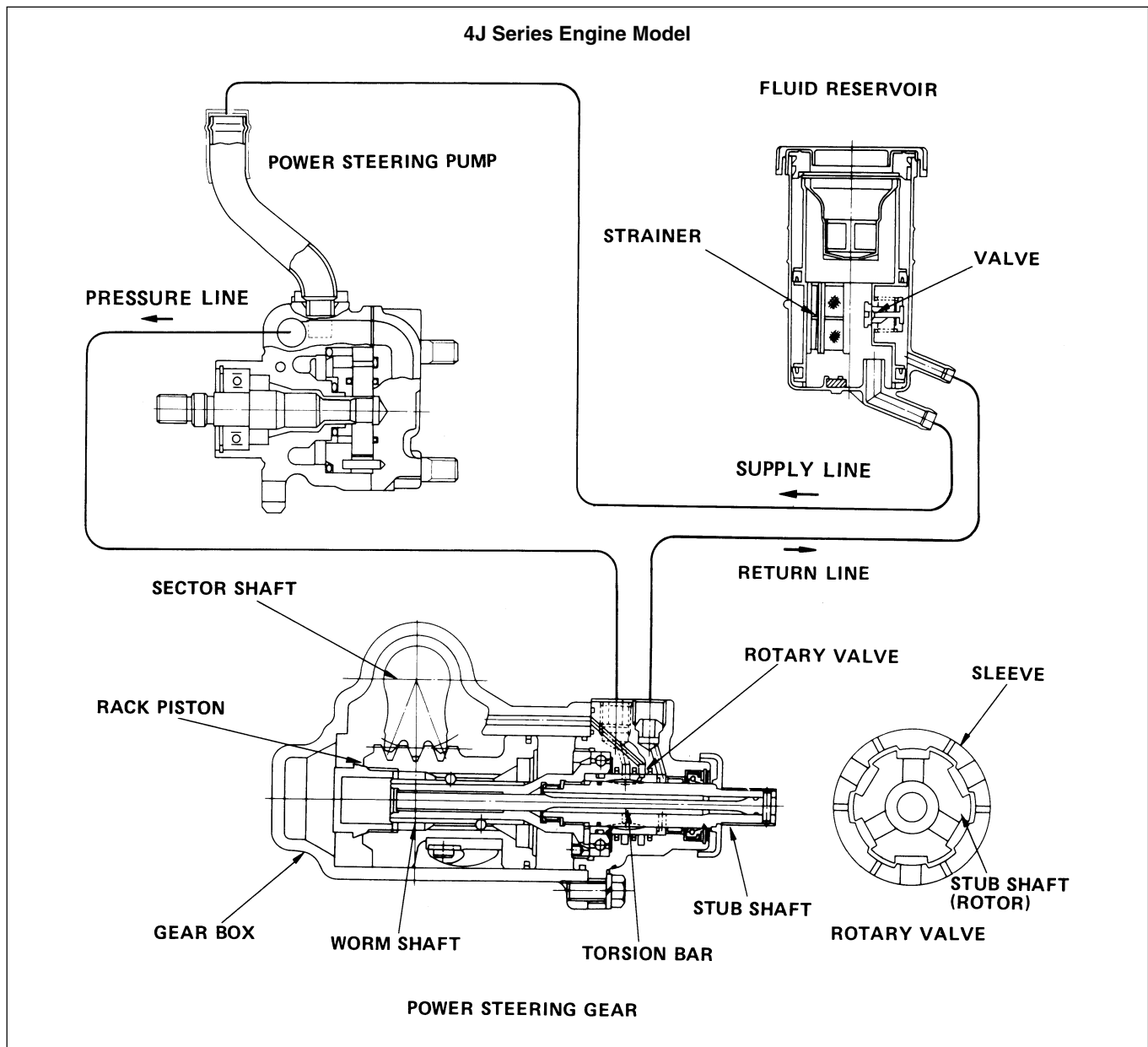


Power steering is designed to reduce the steering wheel turning effort by utilizing hydraulic pressure to bolster the normal torque developed by the steering wheel box.

The power steering unit incorporates a power piston and sector shaft as an integral part of the steering gear. A control valve is built into the steering housing.

Because the tire rolling resistance is constantly applied to the worm shaft, the torsion bar twists with the Steering Wheel. As the torsion bar twists, the relative torque displacement between the worm shaft and the rotor changes. An equivalent oil pressure is applied to the piston to bolster the normal torque.

POWER STEERING HYDRAULIC LINE



The function of each major component is described below:

Power Steering Unit

Refer to the previous page.

Oil Pump

The oil pump uses the power of the engine to send hydraulic fluid to the power steering unit.

An oil pressure relief valve and an oil flow relief valve are installed to the oil pump.

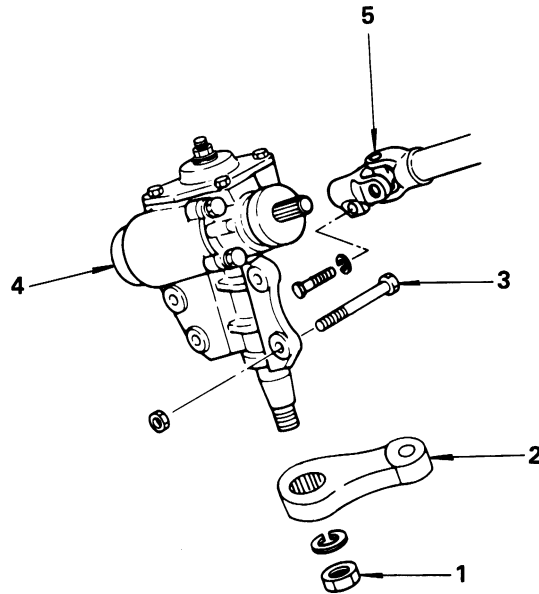
The oil pressure relief valve prevents any excessive oil pressure from reaching the hydraulic circuit.

The oil flow control valve controls the hydraulic fluid volume within the hydraulic system. It prevents too much fluid from entering the system. This, in turn, prevents harmful heat build-up.

Oil Reservoir and Piping

The oil reservoir stores and filters the hydraulic fluid.

REMOVAL AND INSTALLATION

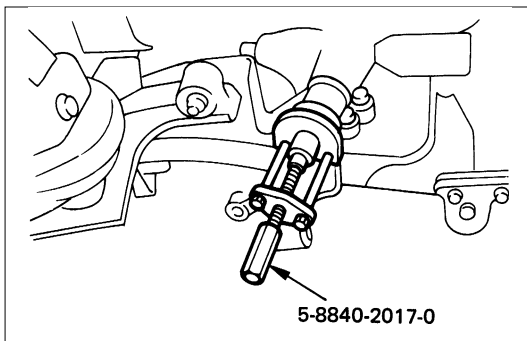


Removal Steps

1. Nut
- ▲ 2. Pitman arm
3. Bolt
4. Unit assembly
- ▲ 5. Coupling assembly

Installation Steps

- ▲ 5. Coupling assembly
4. Unit assembly
- ▲ 3. Bolt
- ▲ 2. Pitman arm
- ▲ 1. Nut

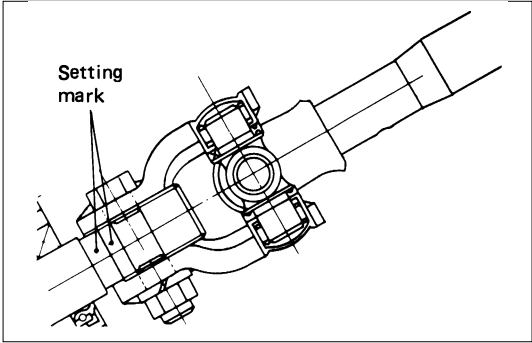


Important Operations - Removal



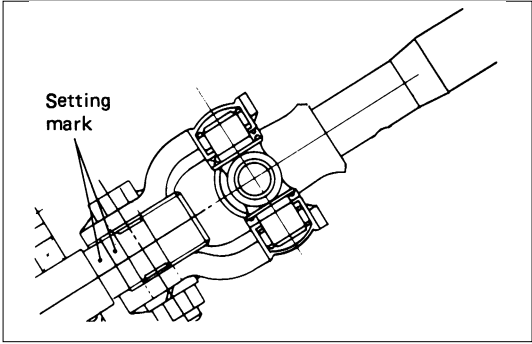
2. Pitman Arm

Pitman Arm Remover : 5-8840-2017-0



5. Coupling Assembly

Make a setting mark across the coupling flange and worm shaft to ensure reassembly of the parts in the original position.

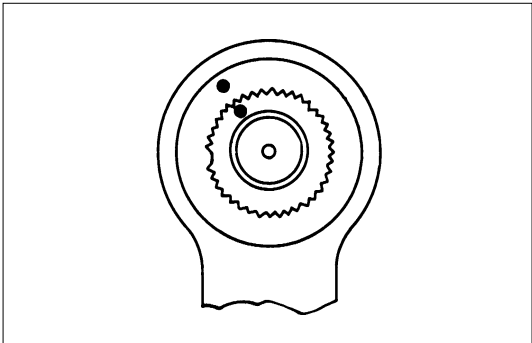


Important Operations - Installation



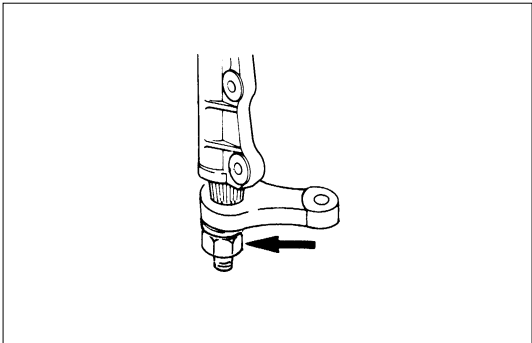
5. Coupling Assembly

Align the Setting mark made at removal



2. Pitman Arm

Align the notched tooth

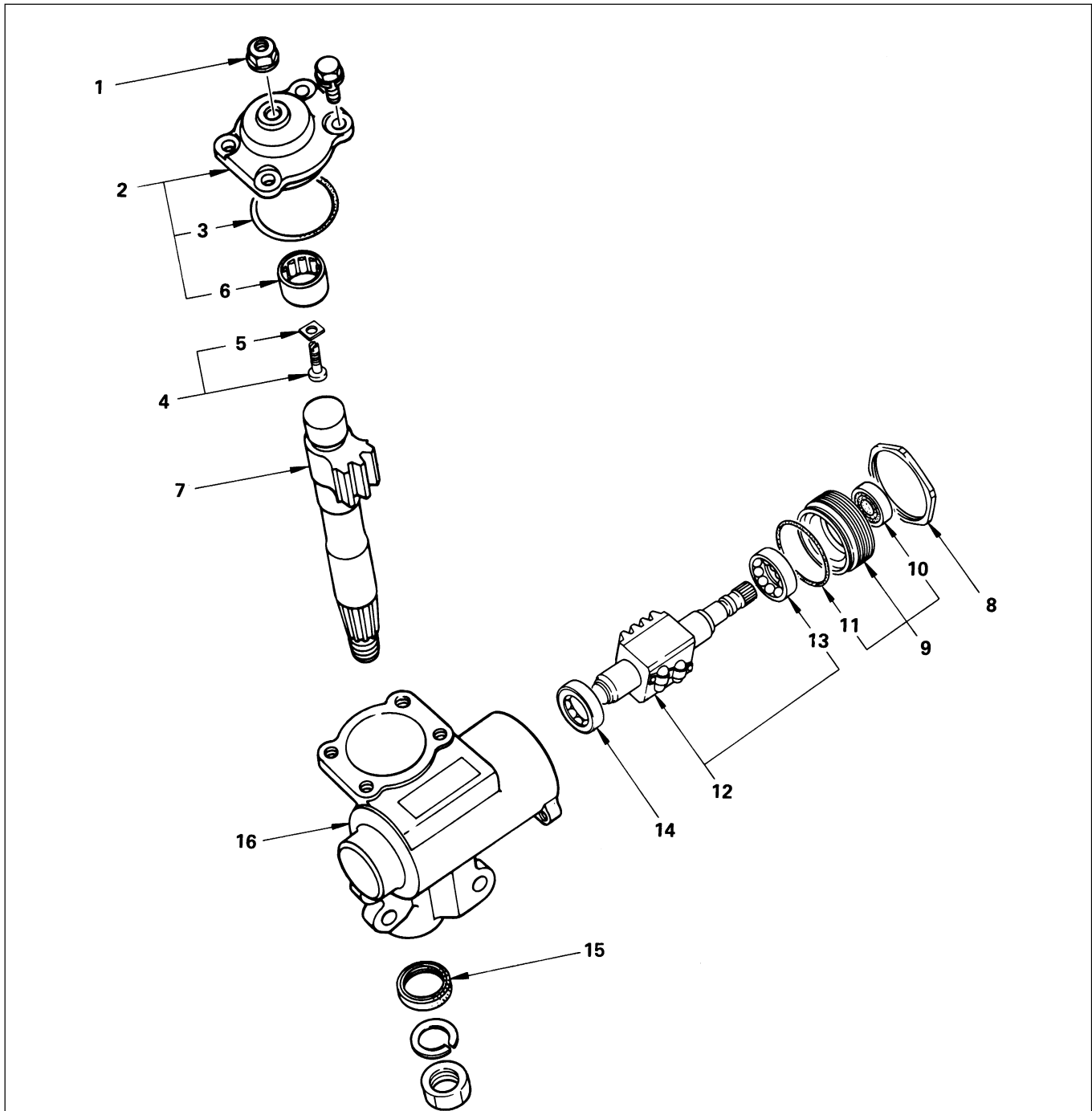


1. Nut

Pitman Arm Nut Torque	N·m (kgf·m/lb·ft)
<u>215.8±19.6 (22.0±2.0/159.0±14.5)</u>	

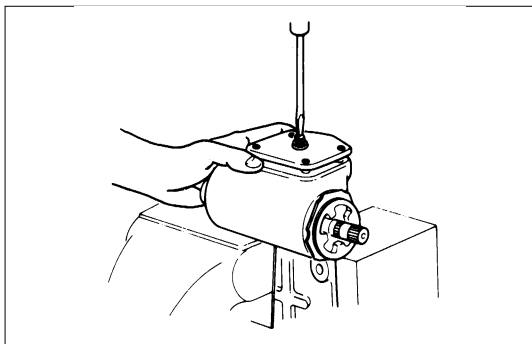
MANUAL STEERING UNIT

DISASSEMBLY



Disassembly Steps

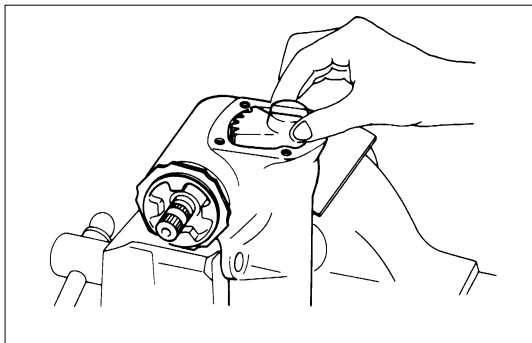
- | | |
|--------------------|-------------------------------|
| 1. Lock nut | ▲ 9. End cover |
| ▲ 2. Side cover | 10. Oil seal |
| 3. Gasket | 11. O-ring |
| 4. Adjusting screw | ▲ 12. Ball nut and worm shaft |
| 5. Adjusting shim | 13. Bearing |
| 6. Needle bearing | 14. Bearing |
| ▲ 7. Sector shaft | 15. Oil seal |
| ▲ 8. Lock nut | 16. Gear box |



Important Operations

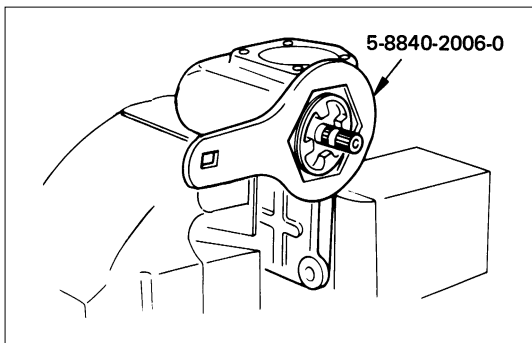
2. Side Cover

- (1) Turn the adjusting screw counter-clockwise slightly, then remove the side cover fixing bolt.
- (2) Turn the adjusting screw clockwise with the side cover held from turning.



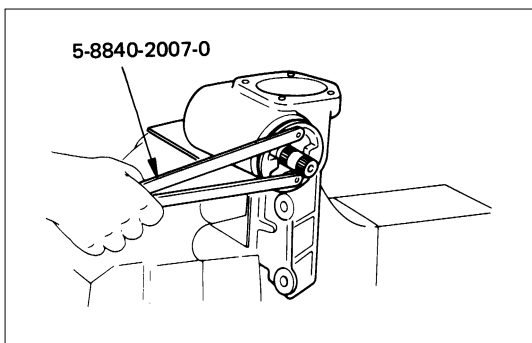
7. Sector Shaft

Hold the sector shaft in straight-ahead position when removing it from the gear box. Do not drive the sector shaft off the gear box with a hammer or other impact tools.



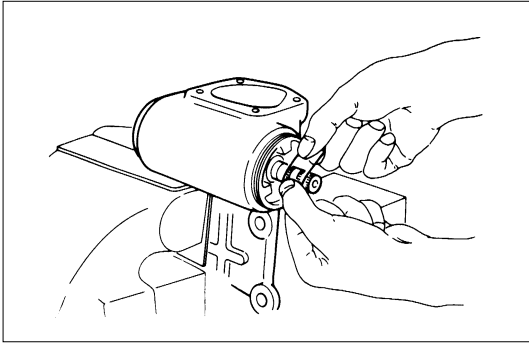
8. Lock Nut

Lock Nut Wrench : 5-8840-2006-0
(J-29753)

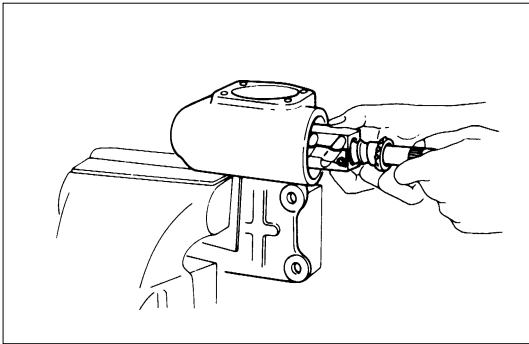


9. End Cover

- (1) End Cover Remover : 5-8840-2007-0
(J-7624)



- (2) When removing, take care so as not to damage the oil seal.
Taping the splines will provide some protection.



12. Ball-Nut and Worm Shaft

Always keep ball-nut assembly in a horizontal position. Do not hold it vertically, or ball-nut will slide out.

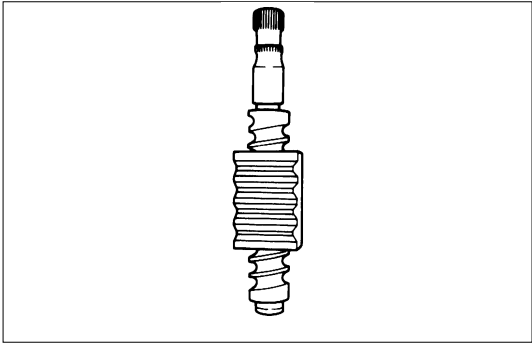
INSPECTION AND REPAIR

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

- Bearing
- Oil seal, bushing
- Ball-nut and worm shaft
- Sector shaft
- Gear box

Visual Check

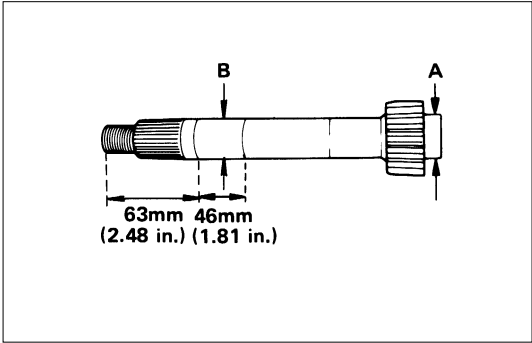
Inspect the following parts for wear, damage or other abnormal conditions.



Ball-Nut Rotation

Hold the worm shaft vertically and check that the ball-nut lowers with a smooth turning motion. If the lowering of the ball-nut by its own weight is not smooth, check the worm shaft for bending and the ball-groove for burrs, dents, and foreign matter.

Note :
When testing the ball-nut assembly, do not let it travel all the way to the end of worm shaft, or damage to the ball tubes will result.

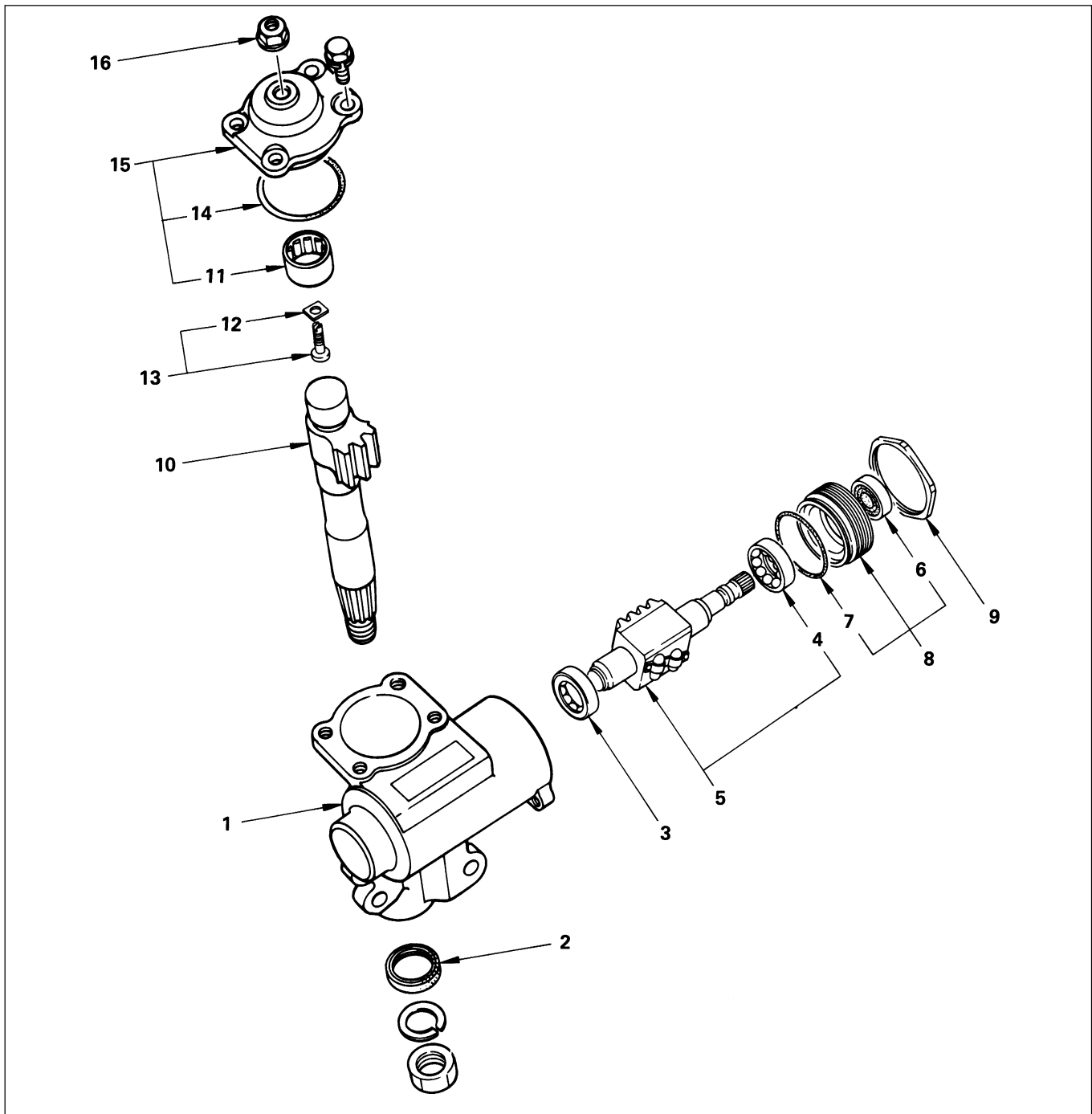




Sector Shaft Outside Diameter		mm(in)
	Standard	Limit
A	28.6 (1.13)	28.3 (1.12)
B	31.8 (1.25)	31.5 (1.24)

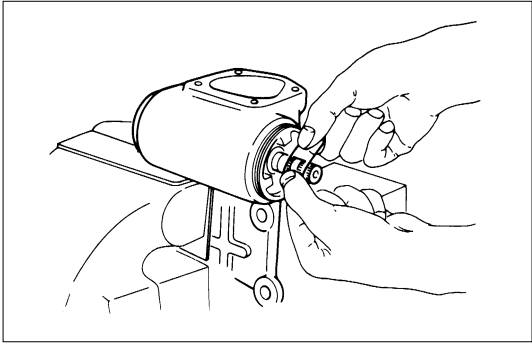


REASSEMBLY



Reassembly Steps

- | | |
|----------------------------|--------------------|
| 1. Gear box | ▲ 9. Lock nut |
| 2. Oil seal | ▲ 10. Sector shaft |
| 3. Bearing | 11. Needle bearing |
| 4. Bearing | ▲ 12. Adjust shim |
| 5. Ball nut and worm shaft | 13. Adjust screw |
| 6. Oil seal | ▲ 14. Gasket |
| 7. O-ring | ▲ 15. Side cover |
| ▲ 8. End cover | ▲ 16. Lock nut |

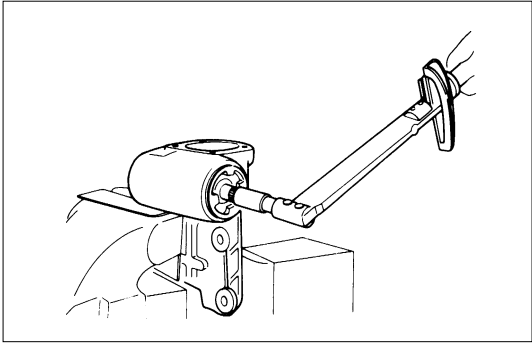


Important Operations

8. End Cover

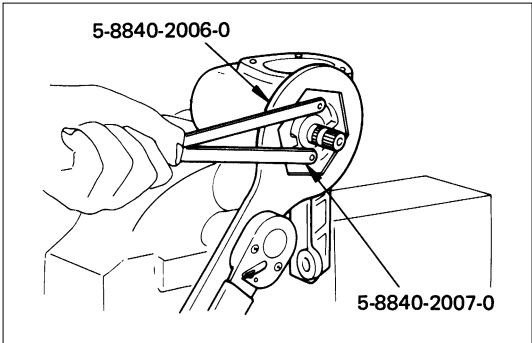
(1) When installing, take care so as not to cause damage to the oil seal.

Taping the splines will provide some protection.



(2) Adjust the bearing preload by using socket.

Bearing Preload	N·m (kgf·m/lb·ft)
0.29 - 0.59 (0.03 - 0.06/0.22 - 0.43)	



9. Lock Nut

Lock Nut Torque	N·m (kgf·m/lb·ft)
176.5±49.0 (18.0±2.0/130.2±14.5)	

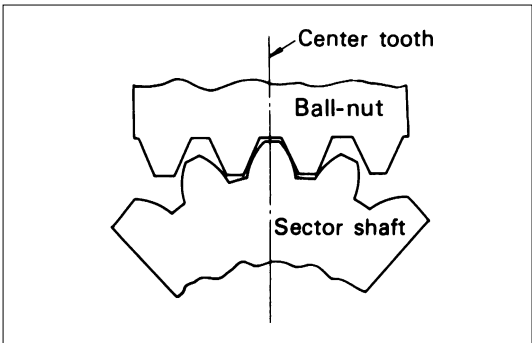


Lock Nut Wrench : 5-8840-2006-0
(J-29753)

End Cover Installer : 5-8840-2007-0
(J-7624)

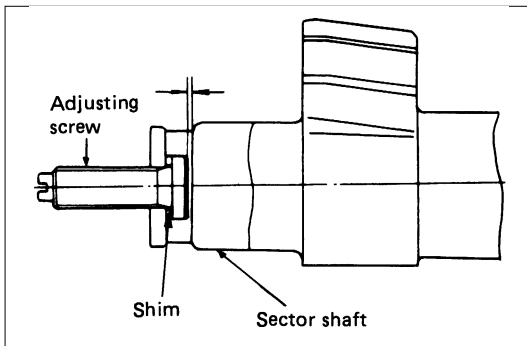
Note:

After tightening, check the bearing preload.



10. Sector Shaft

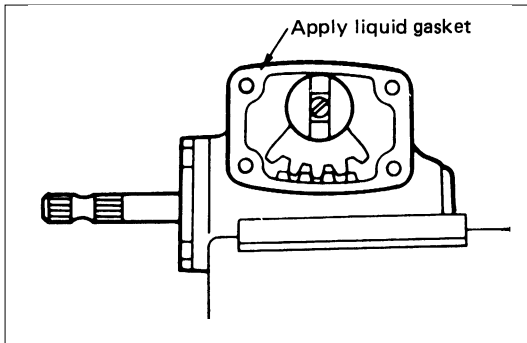
Align the center tooth of the ball-nut with that of the sector shaft.

**12.Adjust Shim**

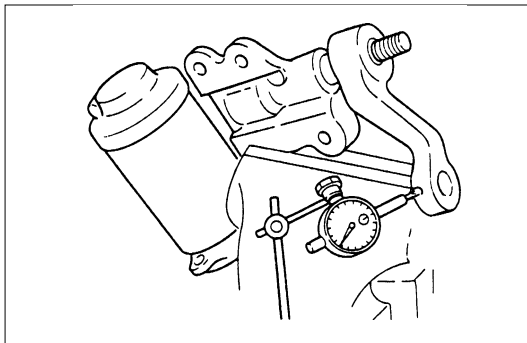
Adjust the clearance and check that the adjusting screw turns freely.

Clearance	mm (in)
0.1 (0.004)	

Adjusting shims available	mm (in)
1.524 (0.0600)	
1.554 (0.0612)	
1.585 (0.0624)	
1.615 (0.0636)	
1.646 (0.0648)	

**14.Gasket****15.Side Cover**

Apply liquid gasket to the joining surface of each parts.

**16.Lock Nut**

Adjust the backlash between the sector gear and ball-nut.

- (1) Install the pitman arm.
- (2) Check that the sector shaft moves smoothly in the correct working angle range, then semi-tighten the lock nut.



- (3) Measure preload of worm gear.

Preload	N·m (kgf·m/lb·ft)
less than 1.079 (0.11/0.795)	

Note:

Obtain the specified backlash by turning the adjust screw.

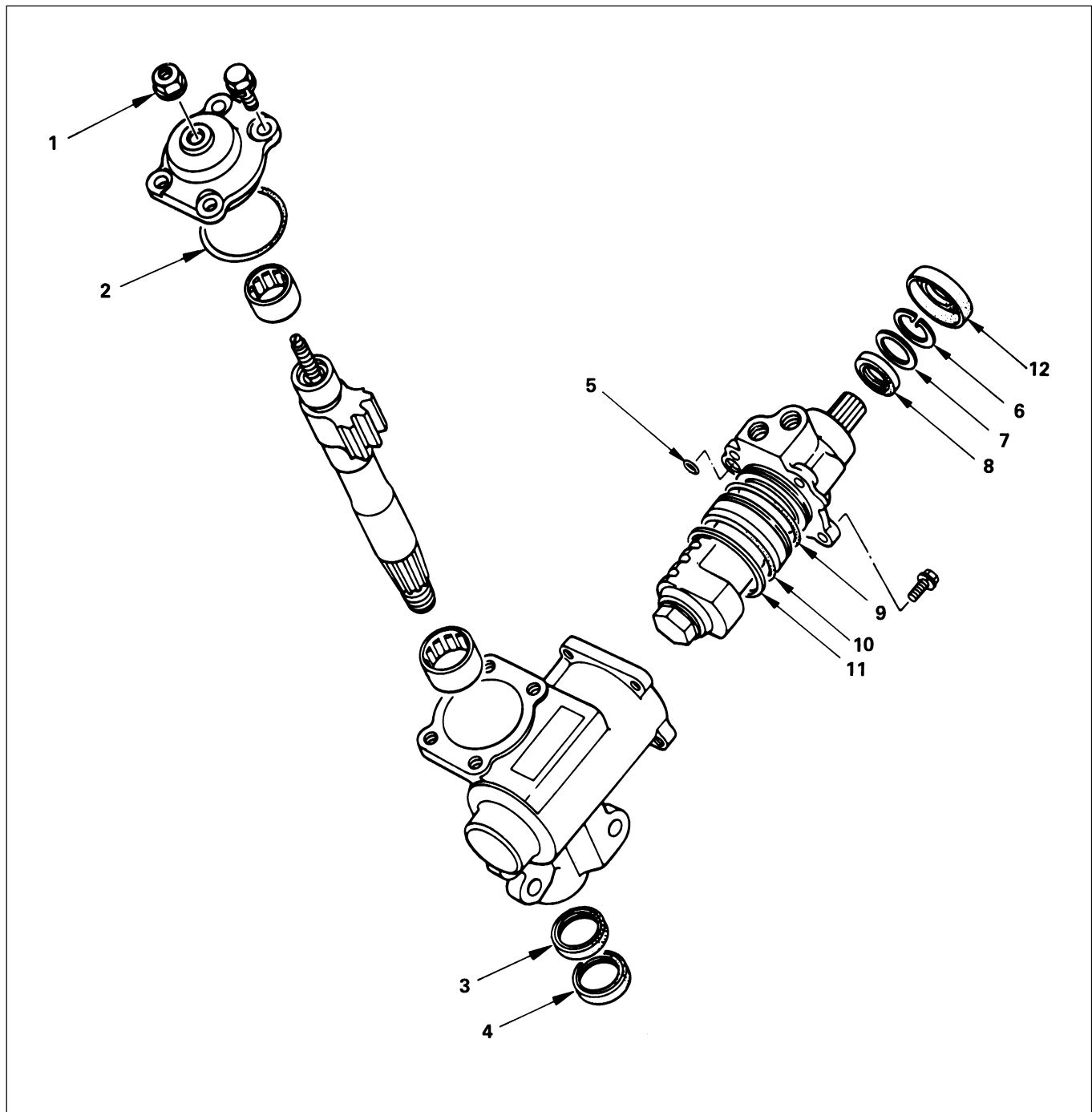


The backlash should be measured at the drop arm end.

Backlash	mm (in)
0.2 (0.008)	

POWER STEERING UNIT

REPAIR KIT

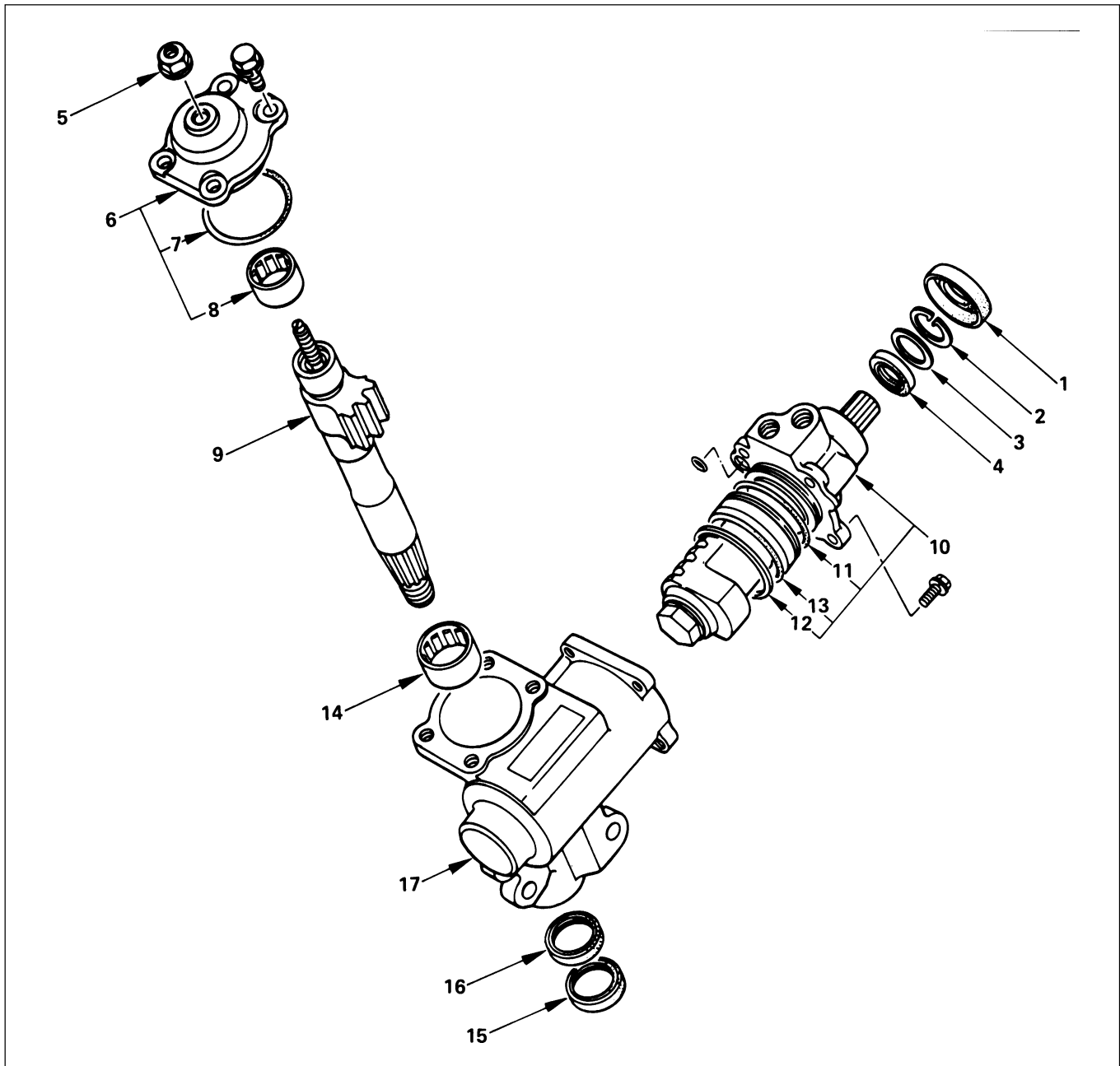


1. Nut : adjust screw
2. Gasket : cover
3. Gasket : sector shaft
4. Seal : sector shaft
5. Gasket : housing
6. Ring : retaining

7. Ring : back up
8. Seal: oil
9. Gasket : housing
10. Gasket : housing
11. Seal ring : housing
12. Dust Cover

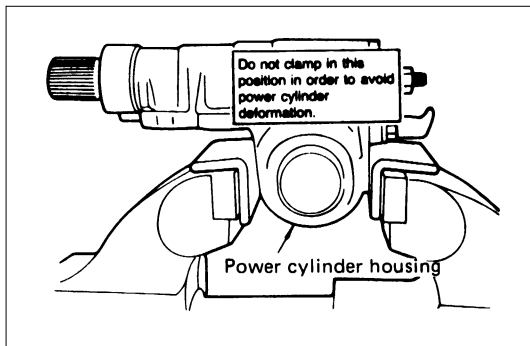


DISASSEMBLY



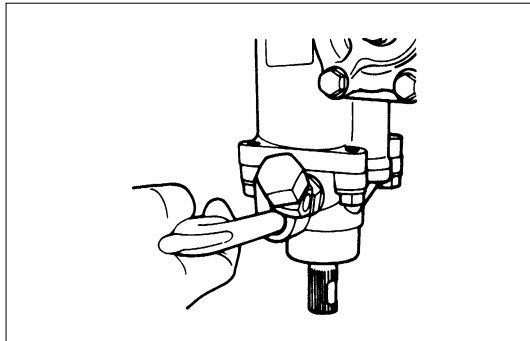
Disassembly Steps

- | | |
|------------------------|--|
| 1. Dust cover | ▲10. Ball nut and valve housing assembly |
| 2. Retaining ring | 11. Gasket |
| 3. Back up ring | 12. Seal ring |
| ▲4. Oil seal | 13. Gasket |
| ▲5. Lock nut | 14. Needle bearing |
| ▲6. Top cover assembly | 15. Sector shaft seal |
| 7. O-ring | 16. Sector shaft gasket |
| 8. Needle bearing | 17. Gear box |
| ▲9. Sector shaft | |



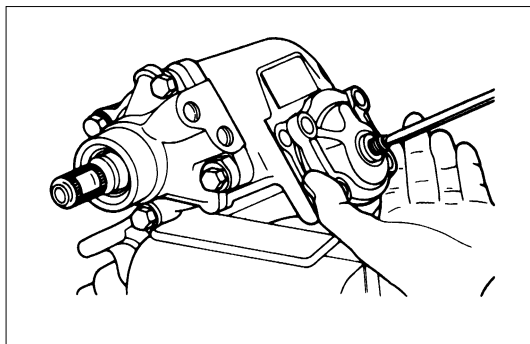
Important Operations

Avoid clamping the steering gear assembly in a vise by the power cylinder housing.



4. Oil Seal

- (1) Clean the faces of the extended stub shaft.
- (2) Plug the hose fitting on the inlet side.
- (3) Remove the oil seal by blowing compressed air through the hole in the outlet side.

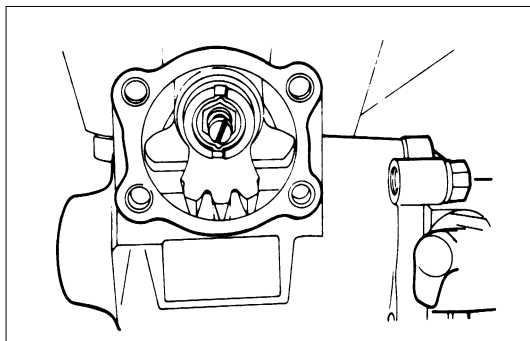


5. Lock Nut

Remove the adjusting screw lock nut and turn the adjusting screw counter-clockwise to remove the preload between the sector gear and the rack piston, then remove the top cover bolts.

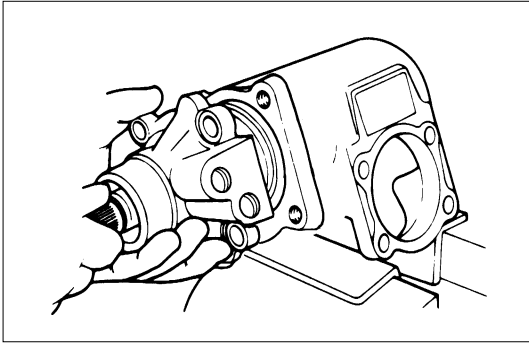
6. Top Cover

Hold the top cover stationary, turn the adjusting screw clockwise to raise and free the cover, then remove the cover.



9. Sector Shaft

Bring the stub shaft into straight-ahead position. Do not force the sector shaft off the gear box with a hammer or other impact tools.



10. Ball Screw and Valve Housing Assembly

It is strongly advisable to keep the ball nut and valve housing assembly always in a horizontal position, or the rack piston will fall off onto the end of the worm, causing the rack piston to slip out of the worm shaft and the balls to fall out.



INSPECTION AND REPAIR

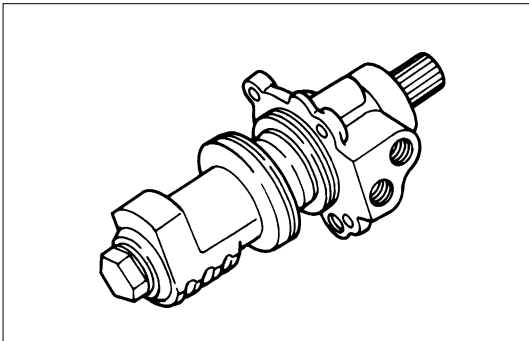
Make necessary correction or parts replacement if wear, damage or any other abnormal conditions are found through inspection.

- Bearing
- Oil seal, Dust seal, Dust cover
- O-Ring, seal ring
- Ball nut and valve housing
- Sector shaft
- Gear box



Visual Check

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

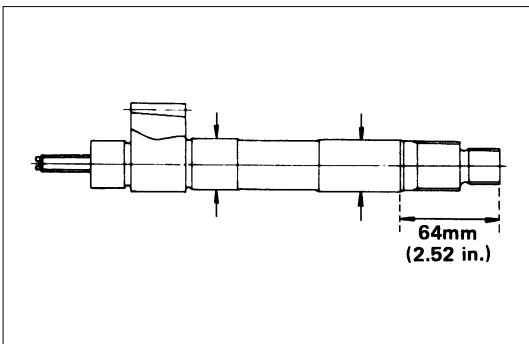


Ball-Nut Rotation

Hold the ball nut and valve housing assembly vertically and see if the ball-nut lowers by turning smoothly. If the lowering of the ball-nut by its own weight is not smooth, check the worm shaft for bending and the ball-groove for burrs, dents and foreign matter.

Note :

When testing the ball nut and valve housing assembly, do not let it travel all the way to the end of worm shaft, or damage to the ball tubes will result.



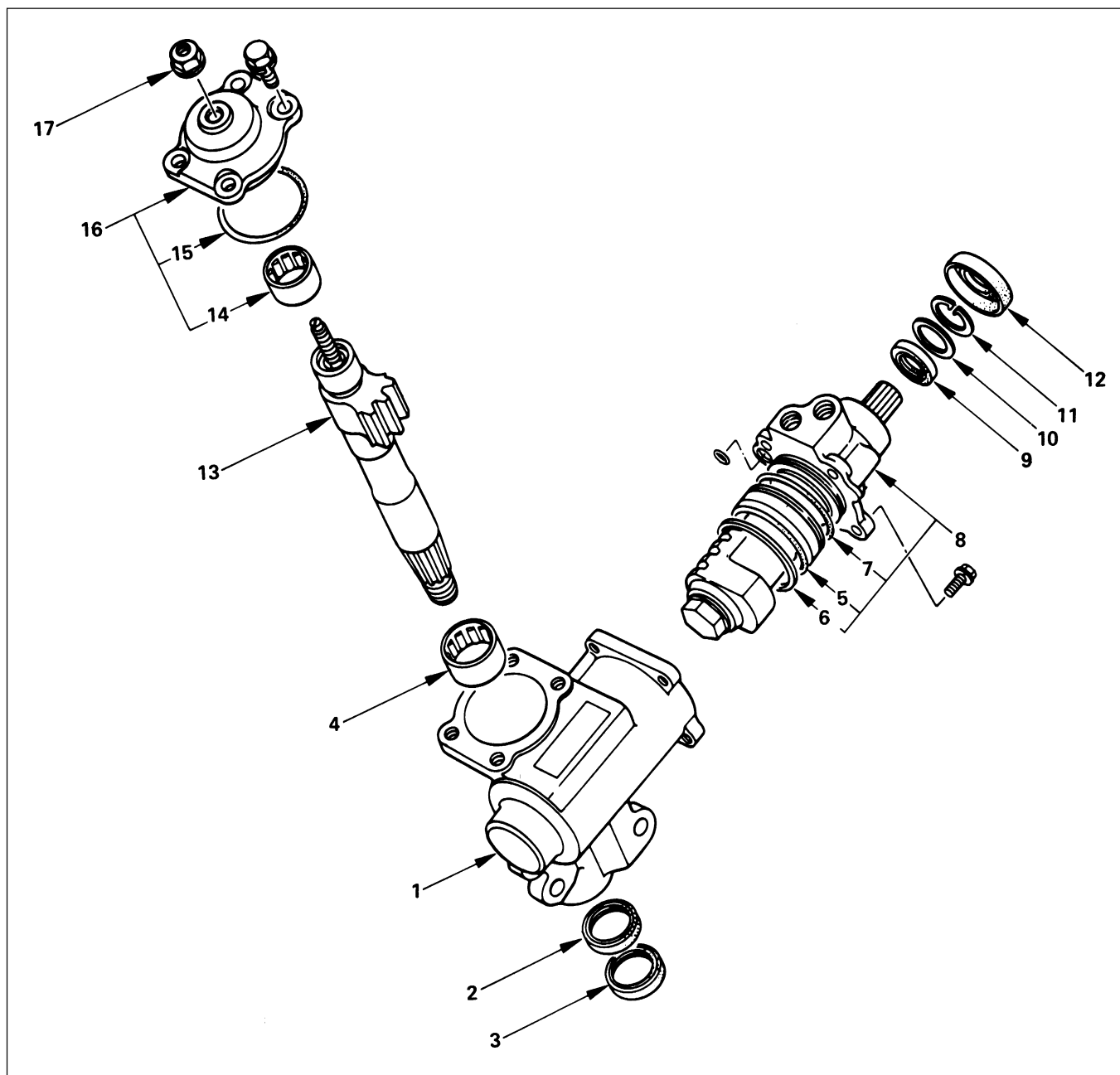
Sector shaft outside diameter

mm (in)

Standard	Limit
32.0 (1.260)	31.97 (1.258)

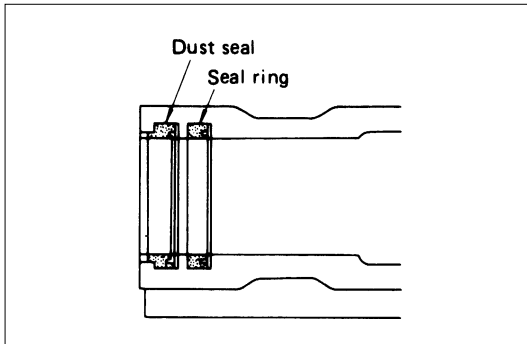


REASSEMBLY



Reassembly Steps

- | | |
|---|-------------------------|
| 1. Gear box | ▲10. Back up ring |
| ▲2. Gasket | ▲11. Retaining ring |
| ▲3. Seal | 12. Dust cover |
| 4. Needle bearing | ▲13. Sector shaft |
| ▲5. Gasket | 14. Needle bearing |
| ▲6. Seal ring | 15. O-ring |
| ▲7. Gasket | ▲16. Top cover assembly |
| ▲8. Ball nut and valve housing assembly | ▲17. Lock nut |
| ▲9. Oil seal | |



Important Operations



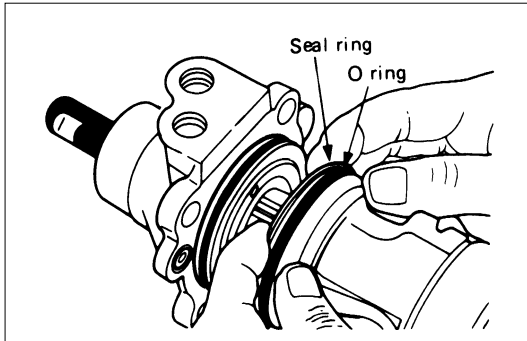
2. Seal Ring

3. Dust Seal



Note the setting direction.

Apply a thin coat of grease to lip of each part.

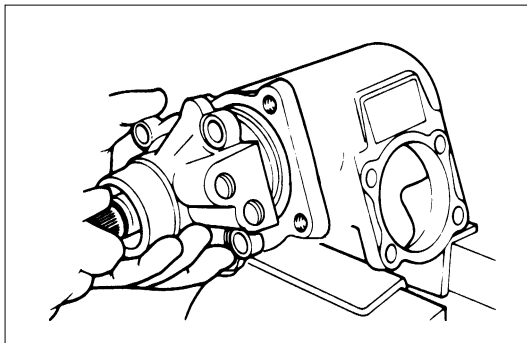


5. O-Ring

6. Seal Ring

7. O-Ring

Apply a thin coat of grease.



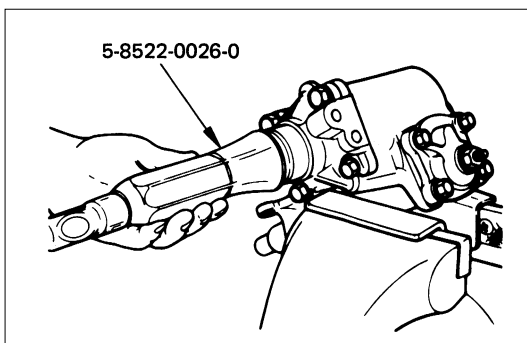
8. Ball Nut and Valve Housing Assembly

(1) It is strongly advisable to keep the ball screw and valve housing assembly always in a horizontal position and avoid holding it vertically, or the rack piston will fall off onto the end of the worm, causing the rack piston to slip out of the worm shaft and balls to fall out.

(2) Be careful so as not to drop the O-ring fitted to oil passage in the valve housing.

(3) Tighten the valve housing retaining bolts to the specified torque.

Valve Housing Bolt Torque	N·m (kgf·m/lb·ft)
46.7 ± 7.8 ($4.7 \pm 0.7/34 \pm 5.1$)	



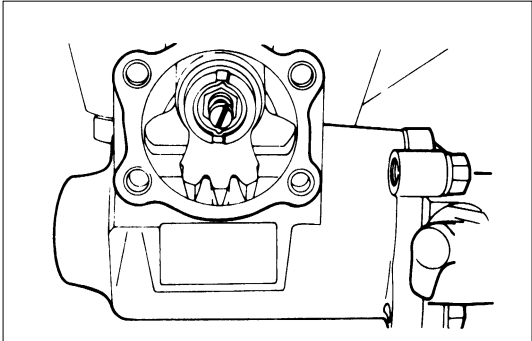
9. Oil Seal

Oil Seal Installer : 5-8522-0026-0
(J-26508)

10.Back Up Ring

11.Retaining Ring

Turn the face with rounded edge (outer circumference) to the oil seal.



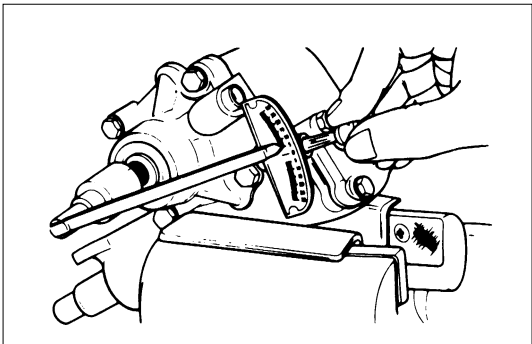
13.Sector Shaft

- (1) Tape the sector shaft serrations to protect the seal ring from damage.
- (2) Align the center tooth of ball nut with that of the sector shaft.



16.Top Cover Assembly

Top Cover Bolt Torque	N·m (kgf·m/lb·ft)
44.1±4 (4.5±0.5/32.5 ±3.6)	



17.Lock Nut

Adjust the backlash between the worm gear and the ball nut.

- (1) With the worm gear rotating, set it to the straight ahead position.
- (2) Set the worm shaft preload to below 0.98 N·m (10 kgf·cm/ 8.7 lb·in) with the sector shaft adjusting screw.
- (3) Measure the worm shaft backlash with the worm gear turned 450° both to the right and to the left.

The worm gear preload in these positions should be 0.3 ± 0.1 N·m (3 ± 1 kgf·cm / 2.6 ± 0.9 lb·in) lower than in the straight ahead position.

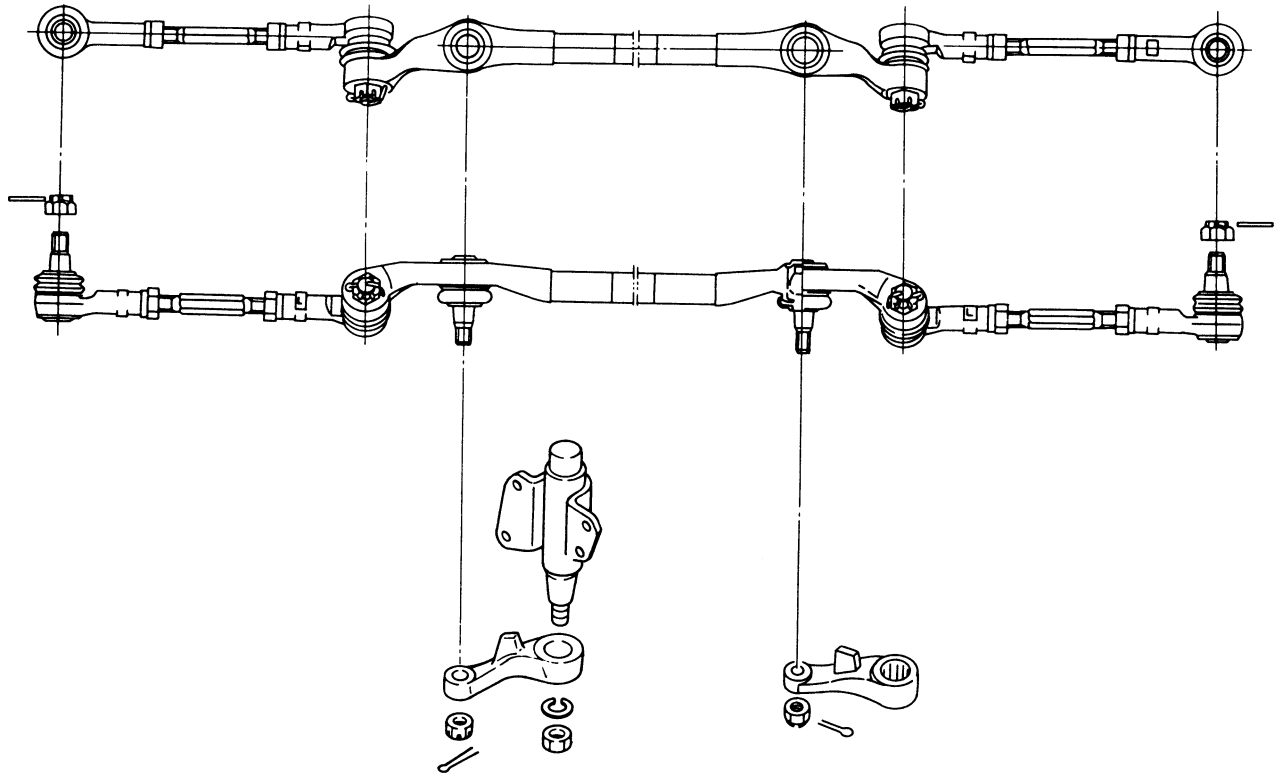


- (4) Lock the sector shaft adjusting screw with the lock nut.

Lock Nut Torque	N·m (kgf·m/lb·ft)
41.2±5.9 (4.2±0.6/30.4±4.3)	

STEERING LINKAGE

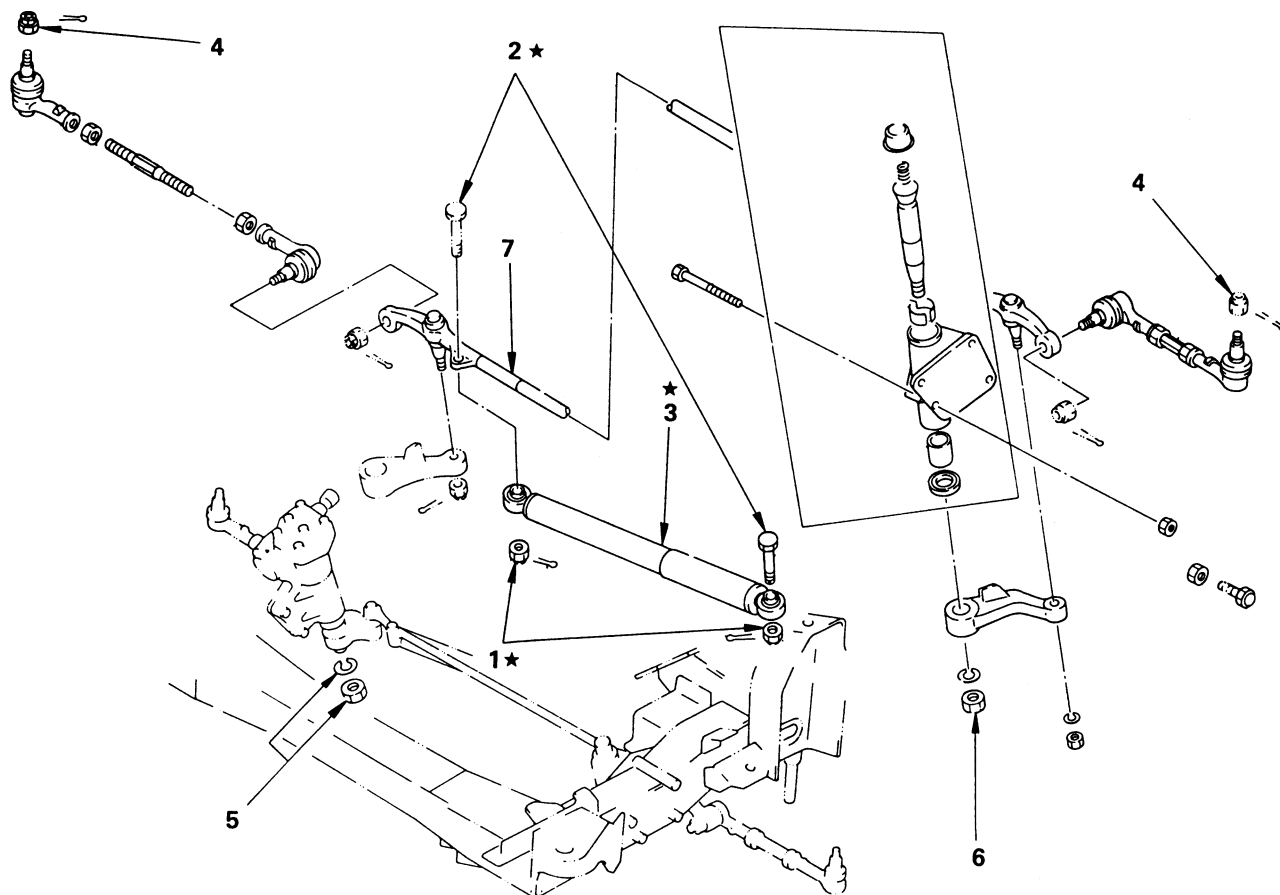
GENERAL DESCRIPTION



↔

↔

REMOVAL AND INSTALLATION



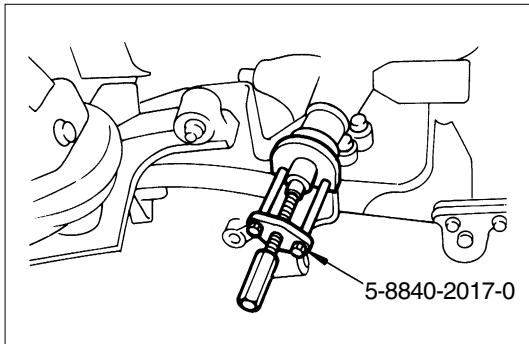
★ Except Europe and Thailand for 4J series and 6VD1 engine model

Removal Steps

1. Nut
2. Bolt
3. Steering damper
4. Nut
- ▲ 5. Nut ; pitman arm
- ▲ 6. Nut ; relay lever
- ▲ 7. Intermediate rod

Installation Steps

7. Intermediate rod
- ▲ 6. Nut ; relay lever
- ▲ 5. Nut ; pitman arm
4. Nut
3. Steering damper
2. Bolt
- ▲ 1. Nut



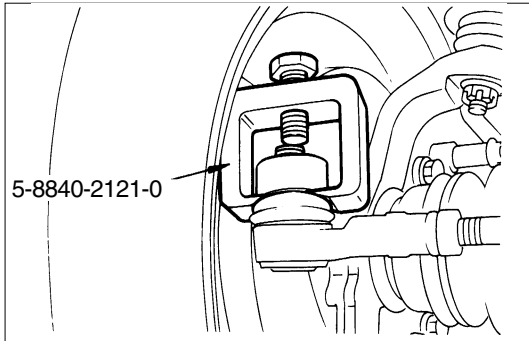
Important Operations - Removal



5., 6. Pitman Arm Nut and Relay Lever Nut

Remove relay lever or pitman arm to shafts nut and lock washer. Remove the relay lever or pitman arm from the shaft using remover.

Remover : 5-8840-2017-0



7. Outer Track Rod

Remove split pin from the ball stud connecting outer track rod end. Remove the castellated nuts and disconnect the parts using remover.

Tie Rod Remover : 5-8840-2121-0



Important Operations - Installation



6. Nut ; Relay Lever

Relay Lever Nut Torque	N·m (kgf·m/lb·ft)
117.7±9.8 (12.0±1.0/86.8±7.2)	



5. Nut ; Pitman Arm

Pitman Arm Nut Torque	N·m (kgf·m/lb·ft)
215.8±19.6 (22.0±2.0/159.1±14.5)	

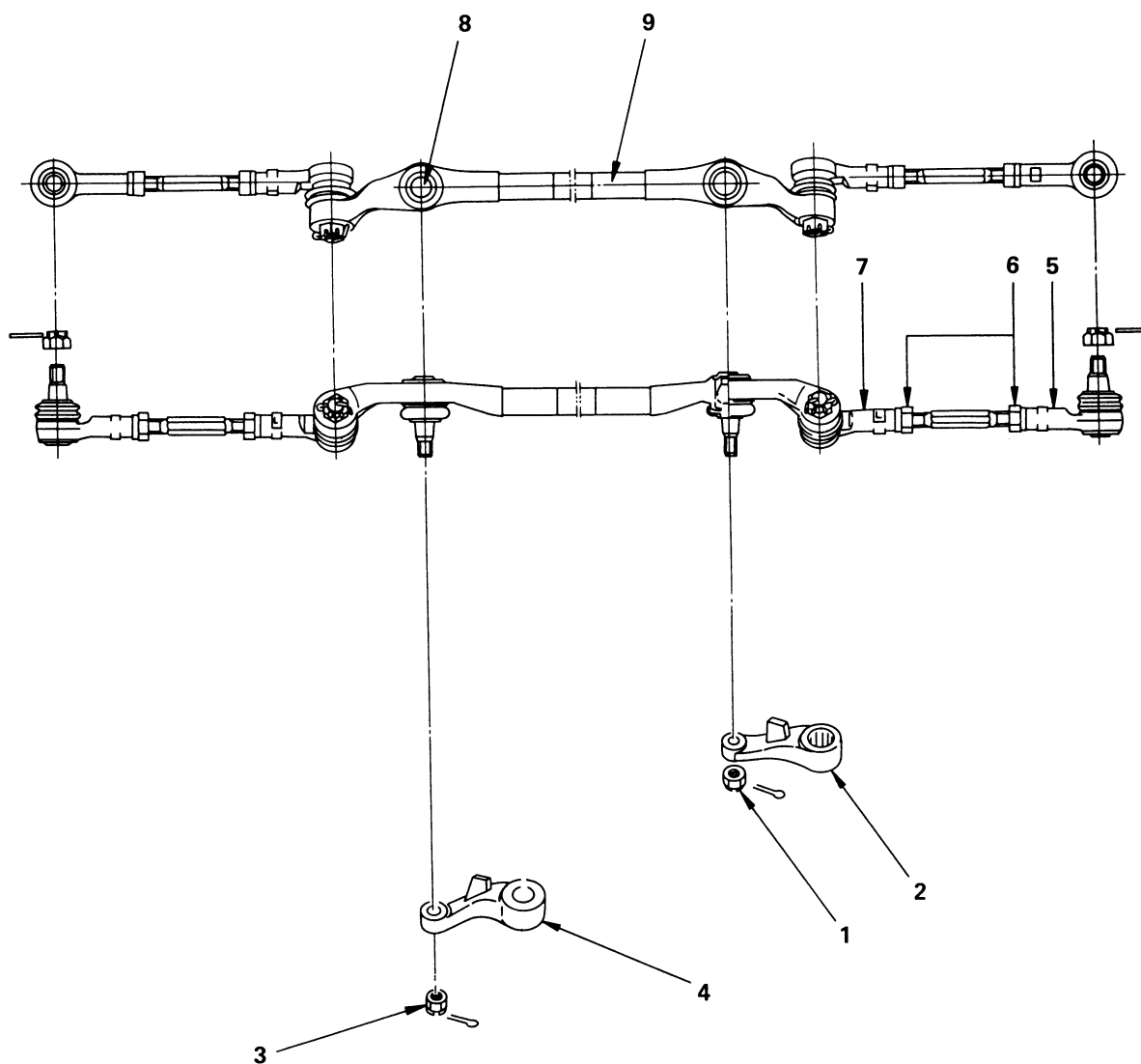


1. Nut

Steering Damper Torque	N·m (kgf·m/lb·ft)
39.2±4.9 (4.0±0.5/28.9±3.6)	



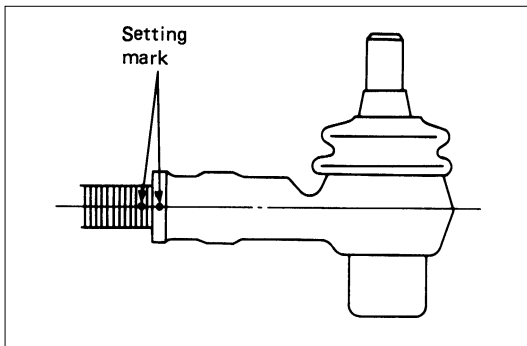
DISASSEMBLY



This illustration is based on the LHD model.

Disassembly Steps

1. Nut
2. Pitman arm
3. Nut
4. Relay lever
- ▲ 5. End assembly (outer)
6. Nut
- ▲ 7. End assembly (inner)
8. Pin assembly
9. Center track rod assembly

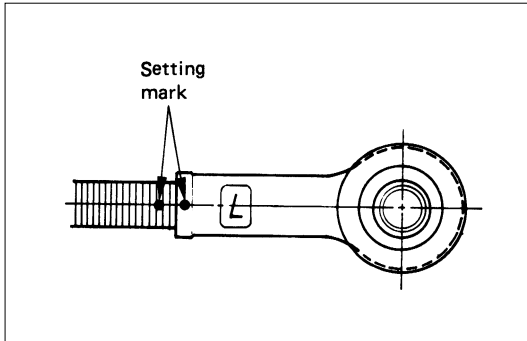


Important Operations



5. End Assembly (Outer)

Apply the setting mark to reassemble the parts in their original position.



7. End Assembly (Inner)

Apply the setting mark to reassemble the parts in their original position.



INSPECTION AND REPAIR

Make all necessary adjustments, repairs, and part replacements if wear, damage, or other problems are discovered during inspection.

- Pitman arm, relay lever
- End assembly, pin assembly
- Center track rod assembly
- Boot



Visual Check

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



Ball Joints (Center Track Rod Assembly and Outer Track Rod Track Rod Assembly)

Inspect the following.

If one or more of the abnormal conditions listed in parenthesis is discovered during inspection, the entire track rod assembly(s) must be replaced.

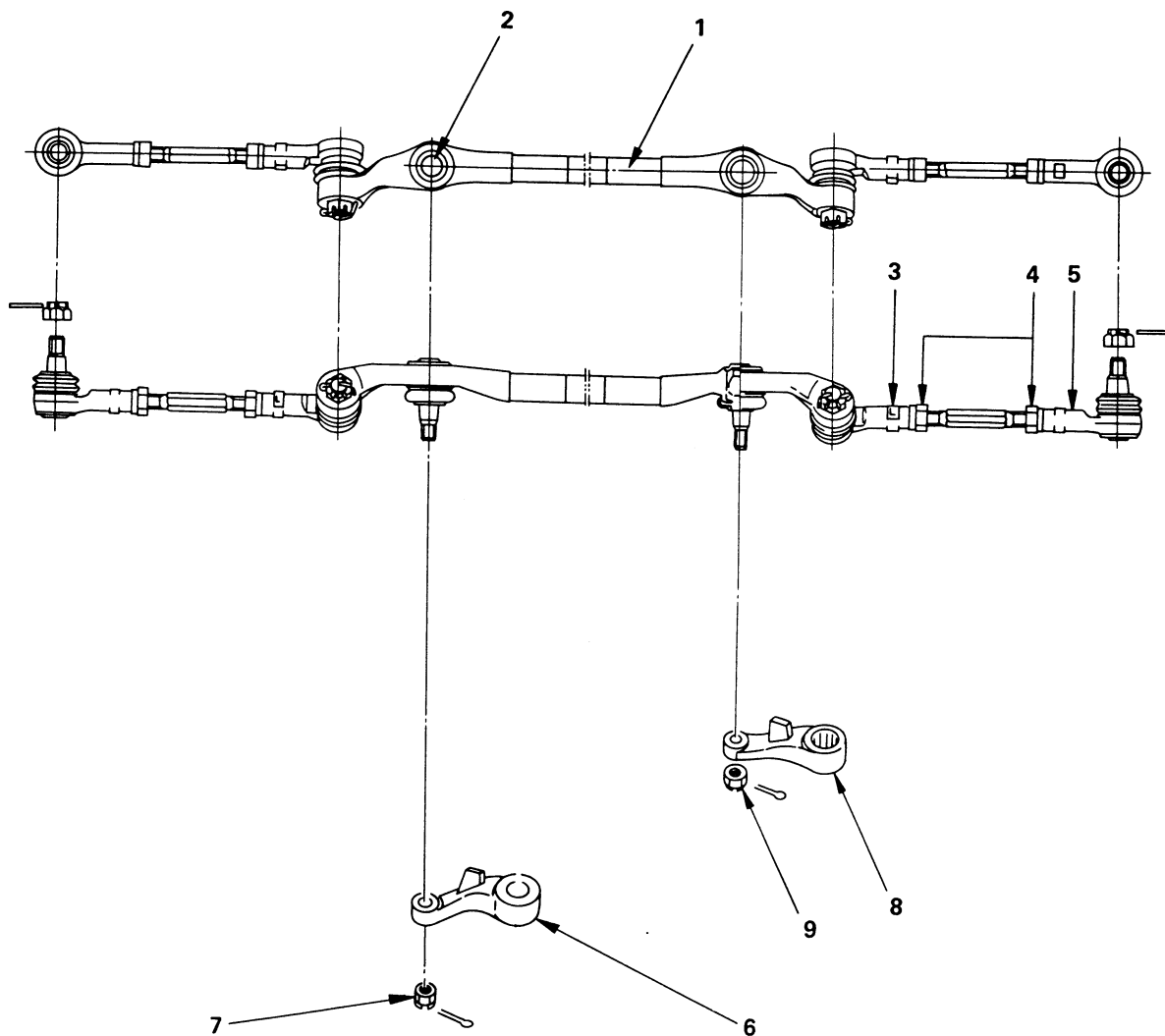
1. Ball joint boot (Tearing and grease leakage)
2. Ball joint (Rough movement)

The ball joint must move smoothly with no snagging.

3. Ball joint screws (Excessive damage)
4. Ball joint tapered surfaces (Excessive wear and damage)



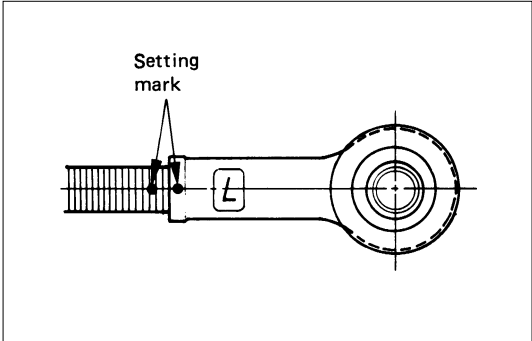
REASSEMBLY



This illustration is based on the LHD model.

Reassembly Steps

- | | |
|------------------------------|----------------|
| 1. Center track rod assembly | 6. Relay lever |
| 2. Pin assembly | ▲ 7. Nut |
| ▲ 3. End assembly (inner) | 8. Pitman arm |
| ▲ 4. Nut | ▲ 9. Nut |
| ▲ 5. End assembly (outer) | |



Important operations



3. End Asseembly (Inner)

Align the setting marks applied at the disassembly.



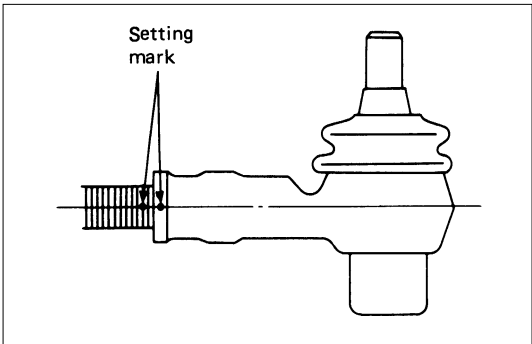
End Assembly Torque	N·m (kgf·m/lb·ft)
117.7 ± 19.6 ($12.0\pm2.0/86.8\pm14.5$)	

After tightening, stake the two portions securely.



4. Nut

End Assembly Nut Torque	N·m (kgf·m/lb·ft)
98.1 ± 9.8 ($10.0\pm1.0/72.3\pm7.2$)	



5. End Assembly (Outer)

Align the setting marks applied during disassembly.



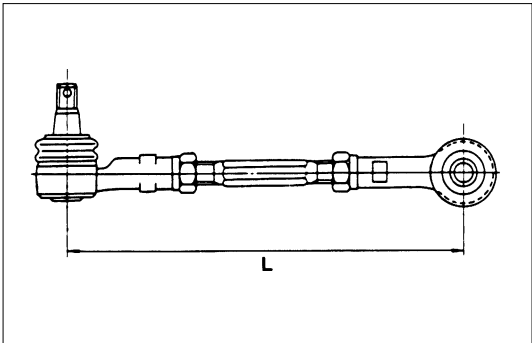
7. Nut

Relay Lever Nut Torque	N·m (kgf·m/lb·ft)
58.8 ± 4.9 ($6.0\pm0.5/43.4\pm3.6$)	



9. Nut

Pitman Arm Nut Torque	N·m (kgf·m/lb·ft)
98.1 ± 9.8 ($10.0\pm1.0/72.3\pm7.2$)	



Note :

When change the track rod, adjust the track rod length.

	mm (in)
4×2 (except TFR25)	306.9 ± 1.5 (12.08 ± 0.059)
4×4 and TFR25	262 ± 1.5 (10.31 ± 0.059)



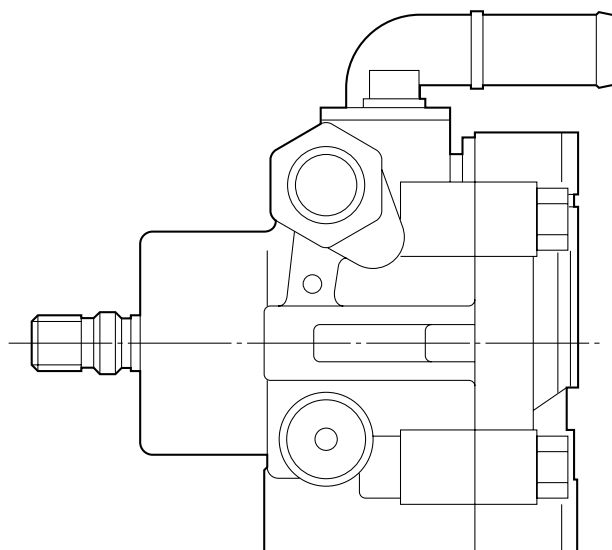
ADJUSTMENT

Adjust the toe-in angle.

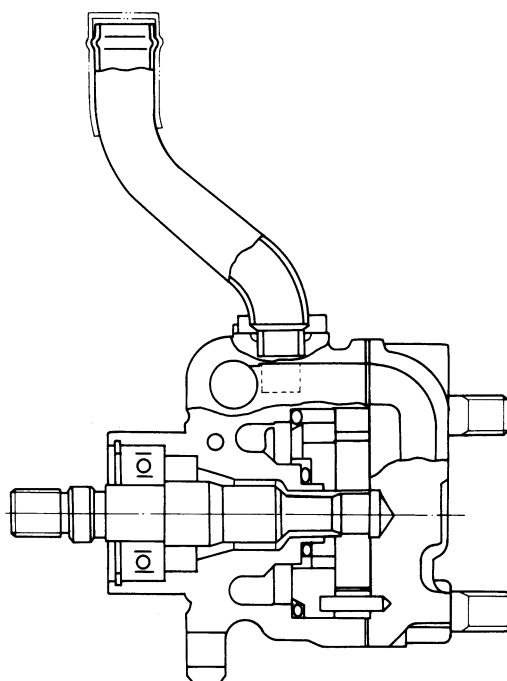
POWER STEERING OIL PUMP

GENERAL DESCRIPTION

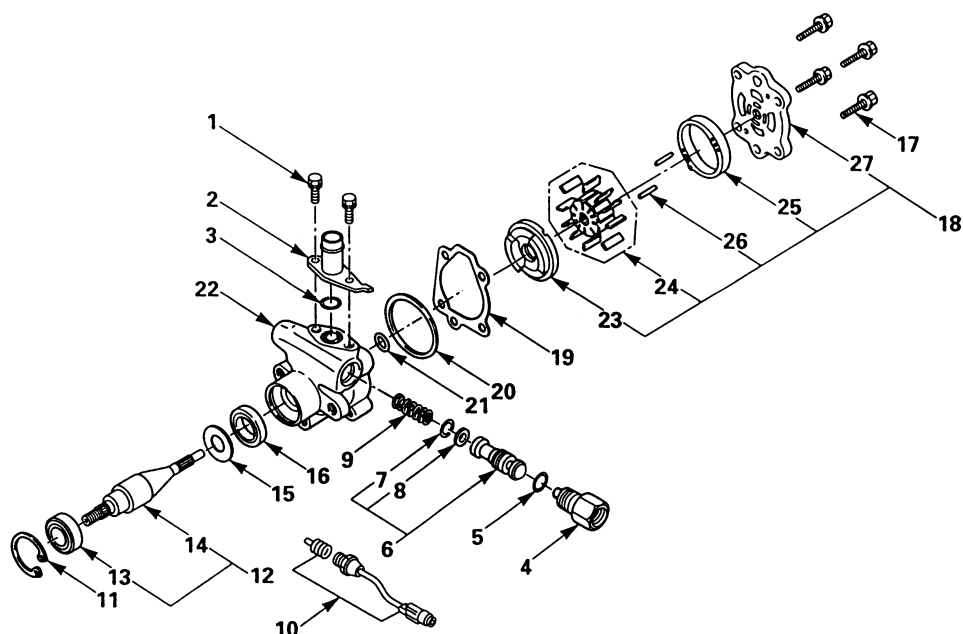
C22, C20 Series Engine Model



4J Series Engine Model



REPAIR KIT (C22, C20 Series Engine Model)

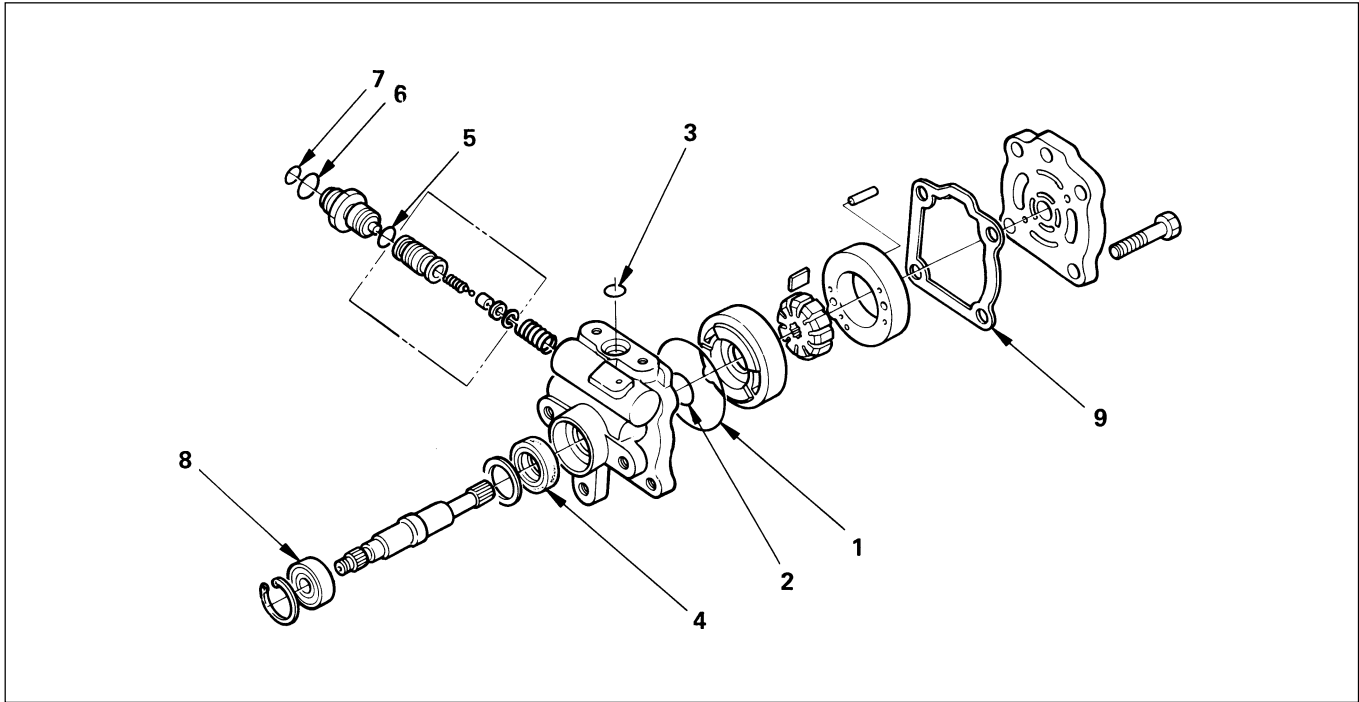


Legend

- | | |
|---------------------|--|
| 1. Bolt | 15. Retaining Ring |
| 2. Suction Pipe | 16. Oil Seal |
| 3. O-ring | 17. Bolt |
| 4. Connector | 18. Rear Housing Assembly and Pump Cartridge |
| 5. O-ring | 19. Gasket |
| 6. Valve | 20. O-ring |
| 7. Retaining Ring | 21. O-ring |
| 8. Filter | 22. Front Housing |
| 9. Spring | 23. Pressure Plate |
| 10. Pressure Switch | 24. Rotor and Vane |
| 11. Retaining Ring | 25. Cam |
| 12. Shaft assembly | 26. Pin |
| 13. Bearing | 27. Rear Housing |
| 14. Shaft | |

Repair Kit

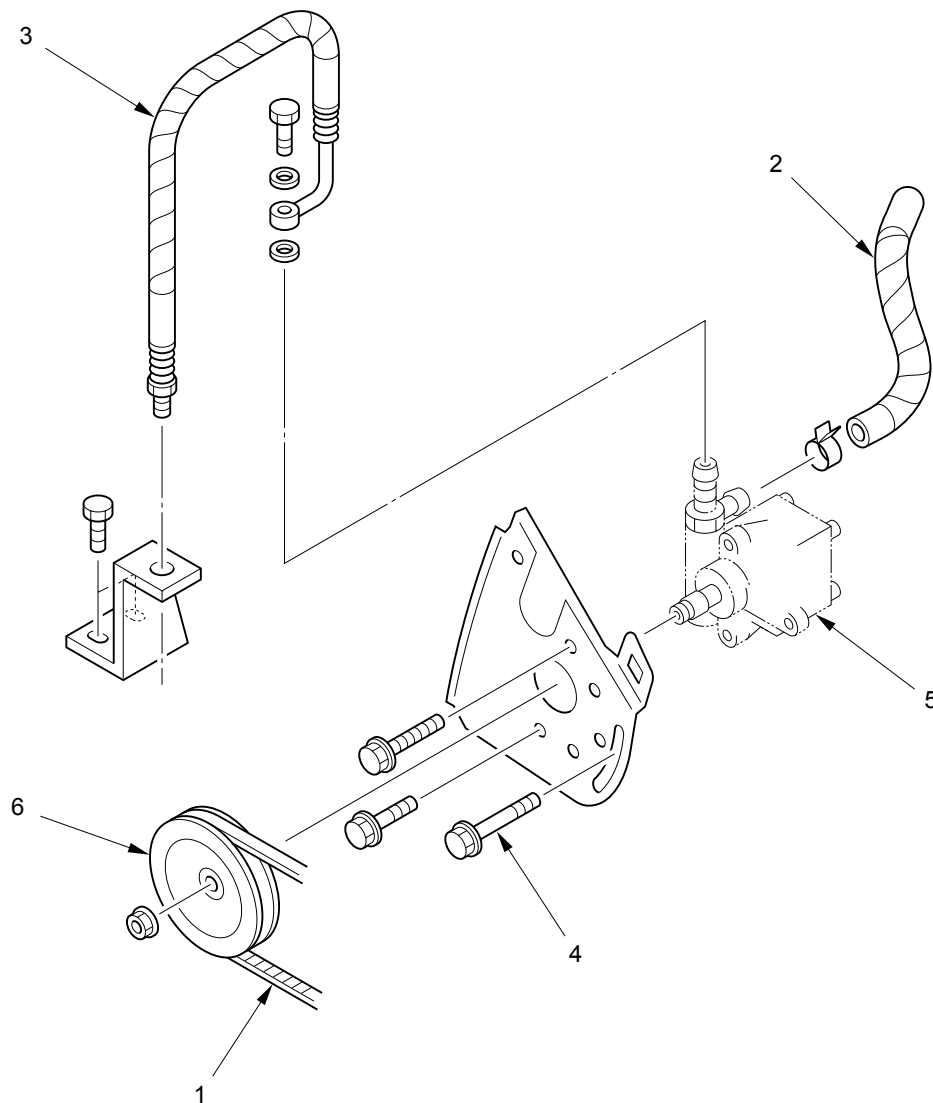
- | | |
|--------------|------------|
| 3. O-ring | 19. Gasket |
| 5. O-ring | 20. O-ring |
| 13. Bearing | 21. O-ring |
| 16. Oil Seal | |

REPAIR KIT (4J Series Engine Model)

- 1. O-ring
- 2. O-ring
- 3. O-ring
- 4. Oil seal
- 5. O-ring

- 6. O-ring
- 7. O-ring
- 8. Bearing
- 9. Gasket

↔ ↔ REMOVAL AND INSTALLATION (C22, C20 Series Engine Model)



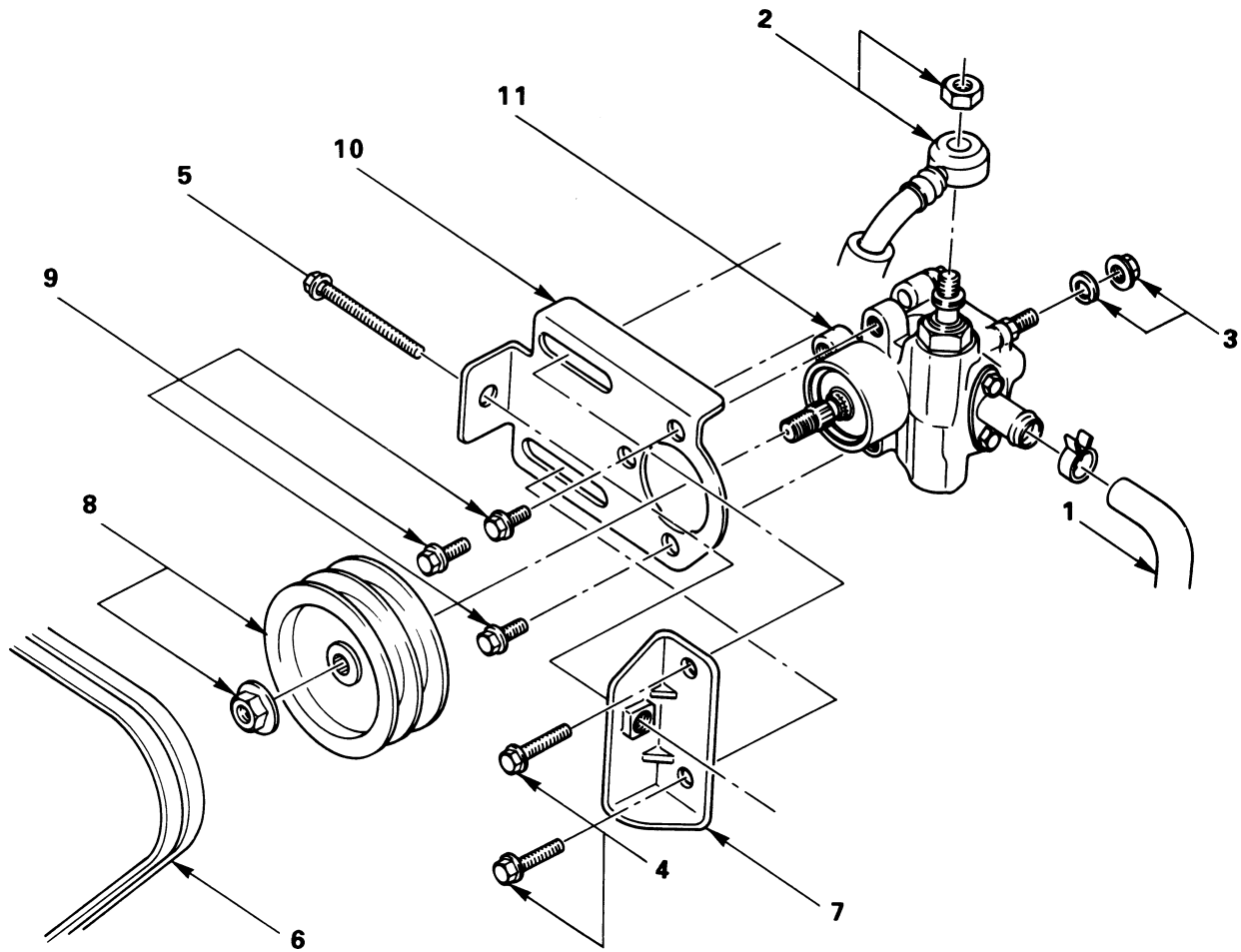
Removal Steps

1. Belt : oil pump
2. Hose : rubber, suction
3. Hose : flexible
4. Bolts
5. Pump assembly : oil
6. Pulley : oil pump

Installation Steps

To install follow the removal procedure in reverse order

REMOVAL AND INSTALLATION (4J Series Engine Model)



Removal Steps

1. Hose, suction
2. Hose, flexible
3. Adjust nut
4. Bolt
5. Adjust bolt
6. Belt
7. Bracket
8. Pulley
9. Bolt
10. Bracket
11. Pump assembly

Installation Steps

11. Pump assembly
10. Bracket
9. Bolt
8. Pulley
7. Bracket
6. Belt
5. Adjust bolt
4. Bolt
3. Adjust nut
2. Hose, flexible
1. Hose, suction



REMOVAL

Preparation:

- Place a drain pan below the pump.
- Hose, Suction
 - Hose, Flexible
 - Adjust Nut
 - Bolt
 - Adjust Bolt
 - Belt
 - Bracket
 - Pulley
 - Bolt
 - Bracket
 - Pump Assembly



INSTALLATION

- Pump Assembly
- Bracket



9. Bolt

Bolt Torque	N·m (kgf·m / lb·ft)
37 (3.8 / 27)	



8. Pulley

Pulley Nut Torque	N·m (kgf·m / lb·ft)
78 (8.0 / 58)	

7. Bracket

6. Belt

5. Adjust Bolt



4. Bolt

After adjusting drive belt tension, tighten bolt to specified torque.

Bracket Bolt Torque	N·m (kgf·m / lb·ft)
37 (3.8 / 27)	



3. Adjust Nut

After adjusting drive belt tension, tighten bolt to specified torque.

Adjust Nut Torque	N·m (kgf·m / lb·ft)
37 (3.8 / 27)	

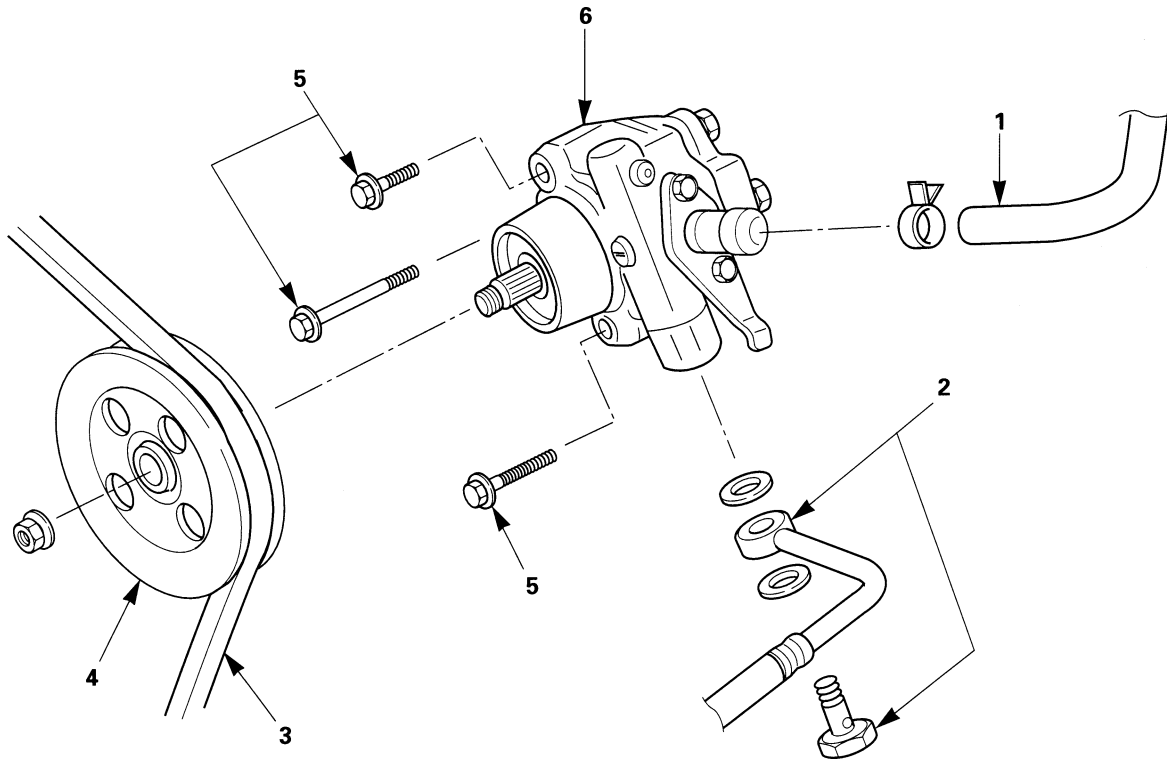


2. Hose Flexible

Hose, Nut Torque	N·m (kgf·m / lb·ft)
20 (2.0/14)	

1. Hose, Suction

Fill and bleed the system. Refer to "Bleeding the Power Steering System" in this section.

↔ ↔ REMOVAL AND INSTALLATION (6VD1 Engine Model)**Removal Steps**

1. Hose, suction
2. Hose, flexible
3. Belt
4. Pulley
5. Bolt
6. Pump assembly

Installation Steps

6. Pump assembly
5. Bolt
4. Pulley
3. Belt
2. Hose, flexible
1. Hose, suction



REMOVAL

Preparation:

- Place a drain pan below the pump.
1. Hose, Suction
 2. Hose, Flexible
 3. Belt
 4. Pulley
 5. Bolt
 6. Pump Assembly



INSTALLATION

6. Pump Assembly



5. Bolt

Bolt Torque	N·m (kgf·m / lb·ft)
46 (4.7 / 34)	



4. Pulley

Pulley Nut Torque	N·m (kgf·m / lb·ft)
78 (8.0 / 58)	

3. Belt



2. Hose, Flexible

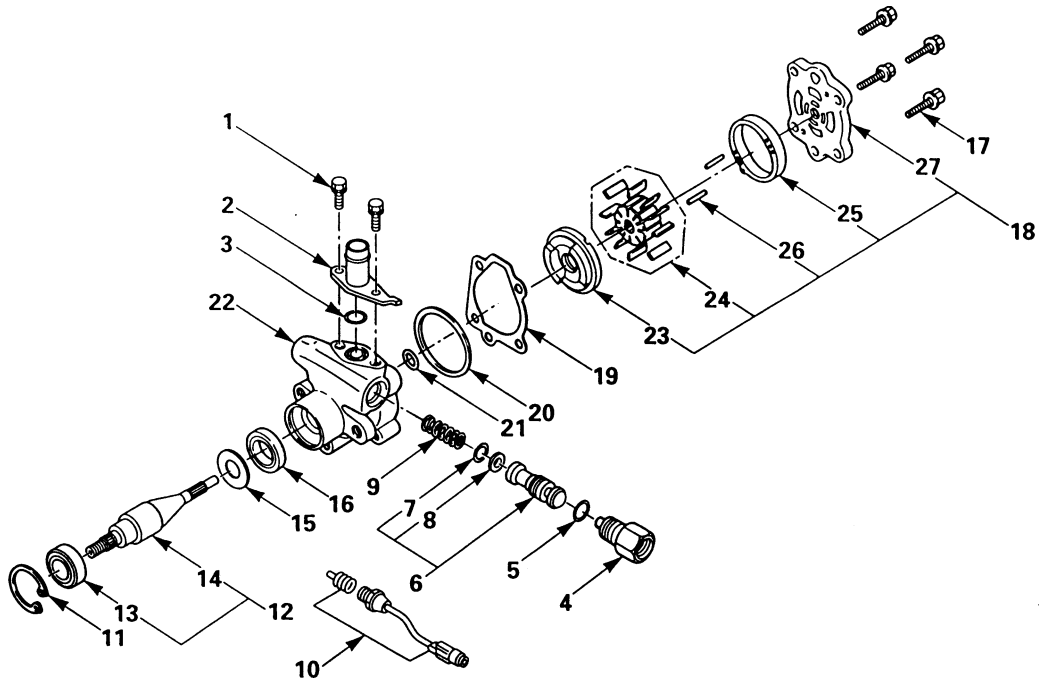
Hose, Bolt Torque	N·m (kgf·m / lb·ft)
54 (5.5 / 40)	

1. Hose, Suction

Fill and bleed the system. Refer to "Bleeding the Power Steering System" in this section.

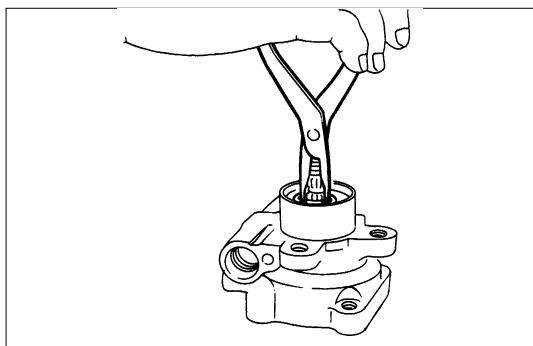


DISASSEMBLY (C22, C20 Series Engine Model)



Disassembly Steps

- | | |
|---------------------|--|
| 1. Bolt | 15. Retaining ring |
| 2. Suction Pipe | ▲16. Oil seal |
| 3. O-ring | 17. Bolt |
| 4. Connector | 18. Rear housing assembly and pump cartridge |
| 5. O-ring | 19. Gasket |
| 6. Valve | 20. O-ring |
| 7. Retaining ring | 21. O-ring |
| 8. Filter | 22. Front housing |
| 9. Spring | 23. Pressure plate |
| 10. Pressure switch | 24. Rotor and vane |
| ▲11. Retaining ring | 25. Cam |
| ▲12. Shaft assembly | 26. Pin |
| ▲13. Bearing | 27. Rear housing |
| 14. Shaft | |

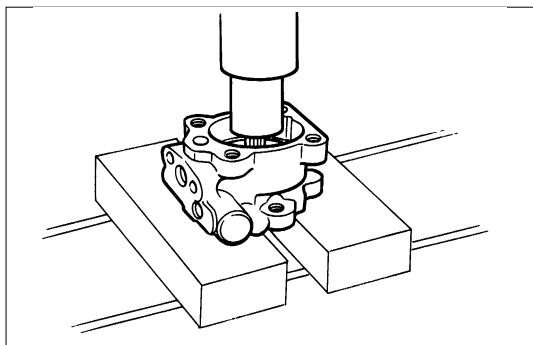


Important Operations



11.Snap Ring

Use a pair of snap ring pliers to remove the snap ring.

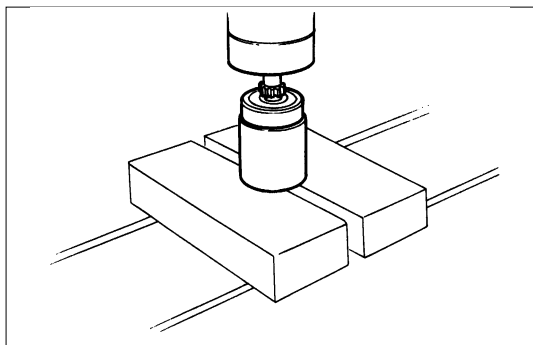


12.Shaft

Use a bench press to slowly force the shaft from the rear cover side.

Note :

Take care not to damage the end of the shaft when removing the shaft.

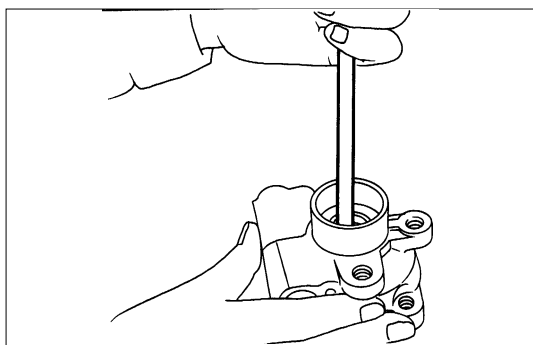


13.Bearing

Use the bench press and bearing remover.
Bearing Remover : 5-8840-2206-0

Note :

Take care not to damage the shaft when removing the shaft.



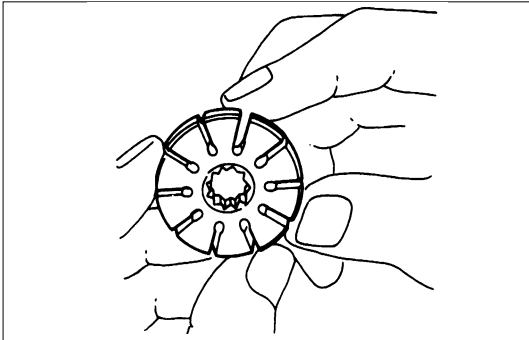
16.Oil Seal

Use a suitable bar.



INSPECTION AND REPAIR (C22, C20 Series Engine Model)

Make all necessary adjustments, repairs, and part replacements if wear, damage, or other problems are discovered during inspection.



Rotor

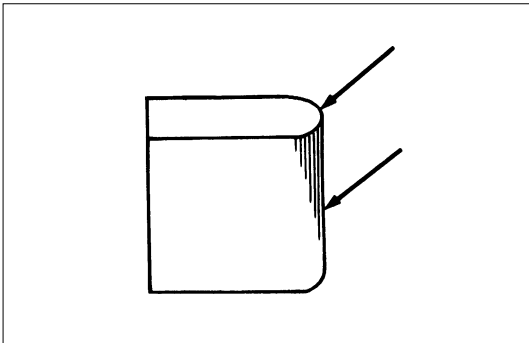
Check that the groove in the vane is free from excessive wear and that the vane slides smoothly.

When part replacement becomes necessary, the pump cartridge should preferably be replaced as a sub assembly.

Vane

Sliding faces of the vane should be free from wear. (particularly the curved face at the tip in contact with the cam should be free from wear and distortion.)

When part replacement becomes necessary, the pump cartridge should preferably be replaced as a sub assembly.



Cam

The inner face of the cam should have a trace of uniform contact without a sign of step wear.

When part replacement becomes necessary, the pump cartridge should preferably be replaced as a sub assembly.

Pressure Plate and Thrust Plate

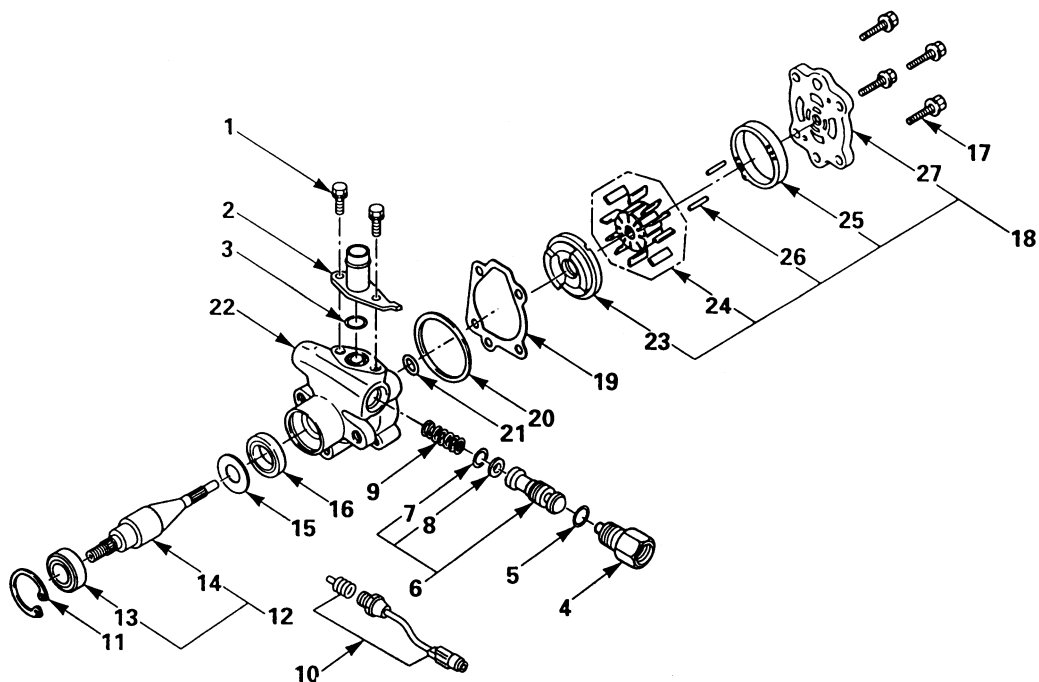
The sliding faces of the parts must be free from step wear (more than 0.01 mm) which can be felt by the finger nail. The parts with minor scores may be reused after lapping the face.

Shaft

Oil seal sliding faces must be free from a step wear which can be felt by the finger nail.

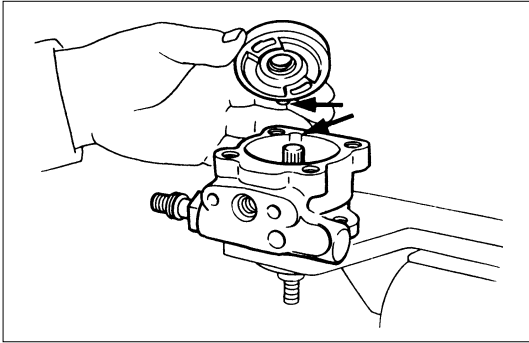


REASSEMBLY (C22, C20 Series Engine Model)



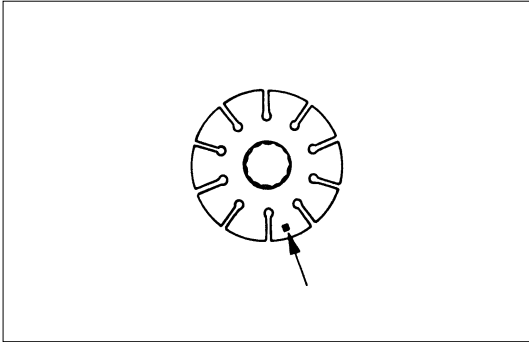
Reassembly Steps

- | | |
|--|---------------------|
| 1. Rear housing | 14. Shaft |
| 2. Pin | 15. Bearing |
| 3. Cam | ▲16. Shaft assembly |
| 4. Rotor and vane | ▲17. Retaining ring |
| ▲5. Pressure plate | 18. Pressure switch |
| 6. Front housing | 19. Spring |
| 7. O-ring | 20. Filter |
| 8. O-ring | 21. Retaining ring |
| 9. Gasket | 22. Valve |
| 10. Rear housing assembly and pump cartridge | 23. O-ring |
| ▲11. Bolt | ▲24. Connector |
| ▲12. Oil seal | 25. O-ring |
| 13. Retaining ring | 26. Pipe, suction |
| | 27. Bolt |



5. Pressure Plate

When installing the pressure plate, align the projection of pressure plate with the groove of oil pump body.

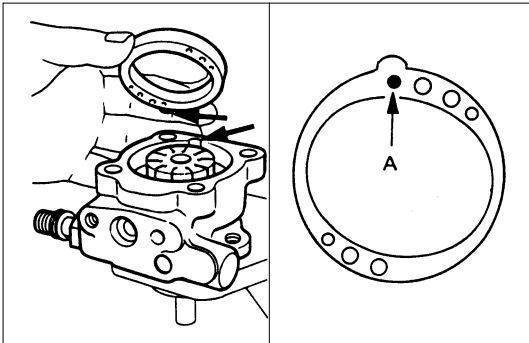


Rotor

Place the rotor so that specified mark ■ turns down.

Note :

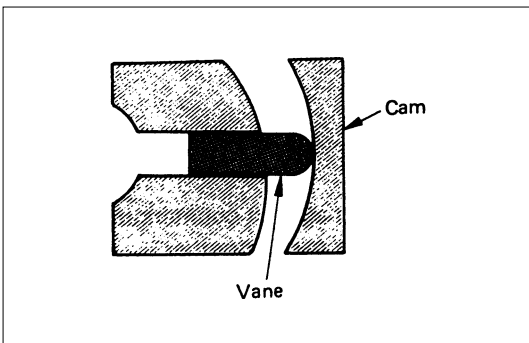
When part replacement becomes necessary, the pump cartridge should be replaced as a sub assembly.



Cam

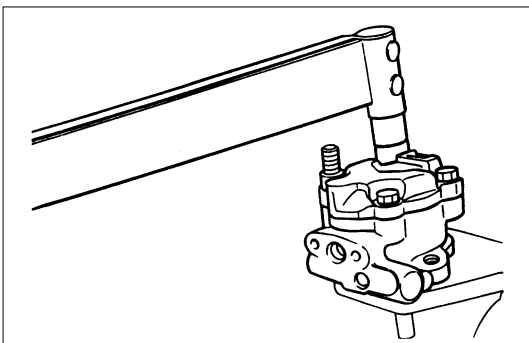
When installing the cam, align the projection of cam with the groove of oil pump body.

Install the cam with the pin "A" side turn down.



Vane

The round end of the vane should be matched to the inner surface of the cam ring.

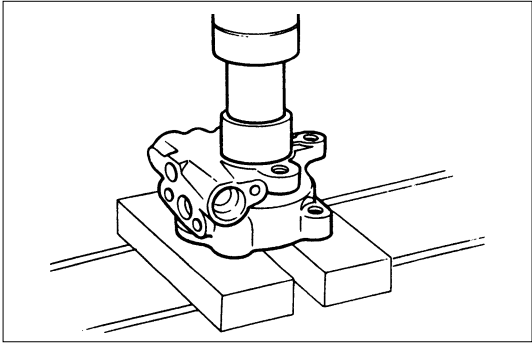


11. Cover and Bolt

Torque

N·m (kgf·m/lb·ft)

53.9±4.9 (5.5±0.5 / 39.8±3.6)



Important Operations



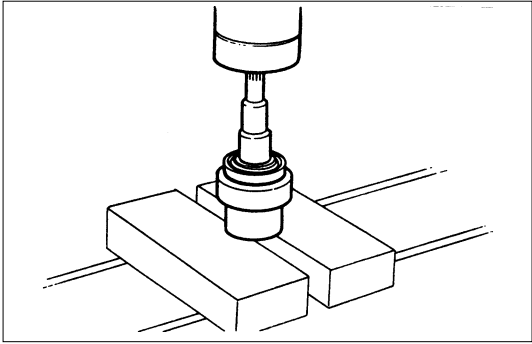
12.Oil Seal

Apply compressed air to the inside of the oil pump body.



Use the bench press and oil seal installer.

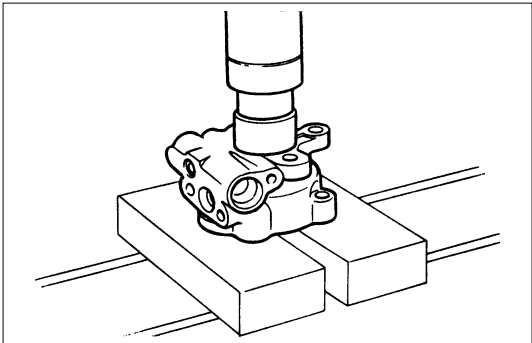
Oil Seal Installer : 5-8840-2205-0



16.Shaft and Bearing

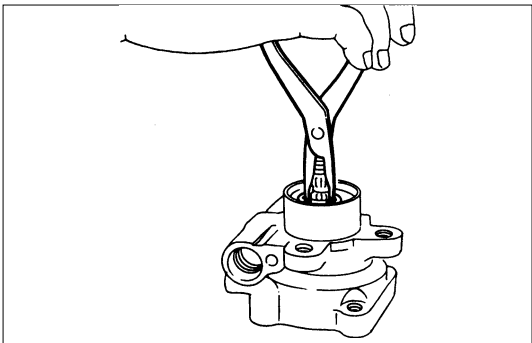
Install the bearing to the shaft with a bench press and bearing installer.

Bearing installer : 5-8840-2206-0



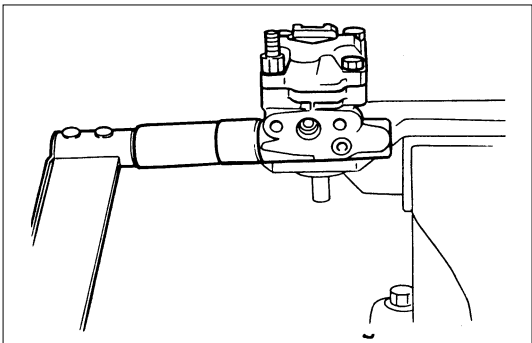
Use a bench press and bearing installer to slowly force the shaft from front side of the oil pump body.

Bearing Installer : 5-8840-2206-0



17.Snap Ring

Use a pair of snap ring pliers to install the snap ring.

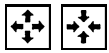


24.Connector

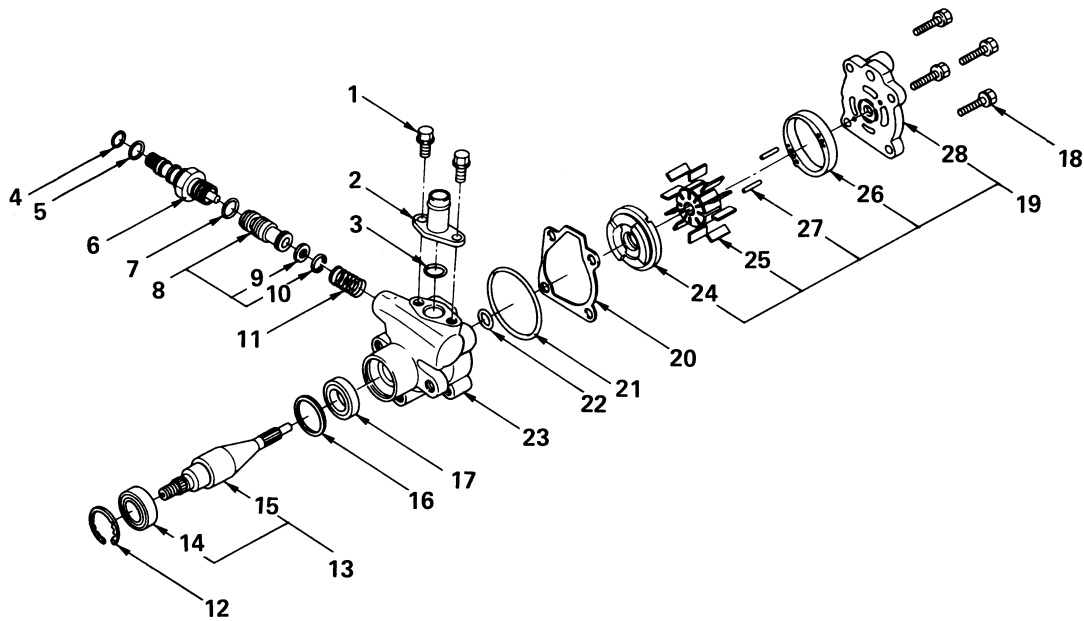
Torque

N·m(kgf·m/lb·ft)

53.9±4.9 (5.5±0.5 / 39.8±3.6)



DISASSEMBLY AND REASSEMBLY (4J Series Engine Model)



Disassembly Steps

- | | |
|--------------------|--|
| 1. Bolt | 16. Retaining ring |
| 2. Pipe, suction | 17. Oil seal |
| 3. O-ring | 18. Bolt |
| 4. O-ring | 19. Rear housing assembly and pump cartridge |
| 5. O-ring | 20. Gasket |
| 6. Connector | 21. O-ring |
| 7. O-ring | 22. O-ring |
| 8. Valve | 23. Front housing |
| 9. Retaining ring | 24. Pressure plate |
| 10. Filter | 25. Rotor and vane |
| 11. Spring | 26. Cam |
| 12. Retaining ring | 27. Pin |
| 13. Shaft assembly | 28. Rear housing |
| 14. Bearing | |
| 15. Shaft | |

Reassembly Steps

- | | |
|--|--------------------|
| 28. Rear housing | 14. Bearing |
| 27. Pin | 13. Shaft assembly |
| 26. Cam | 12. Retaining ring |
| 25. Rotor and vane | 11. Spring |
| 24. Pressure plate | 10. Filter |
| 23. Front housing | 9. Retaining ring |
| 22. O-ring | 8. Valve |
| 21. O-ring | 7. O-ring |
| 20. Gasket | 6. Connector |
| 19. Rear housing assembly and pump cartridge | 5. O-ring |
| 18. Bolt | 4. O-ring |
| 17. Oil seal | 3. O-ring |
| 16. Retaining ring | 2. Pipe |
| 15. Shaft | 1. Bolt |



DISASSEMBLY

Preparation:

Clean oil pump with solvent (its plug discharge and suction port to prevent the entry of solvent). Be careful not to expose the oil seal of shaft assembly to solvent.

1. Bolt
2. Pipe, Suction
3. O-ring
4. O-ring
5. O-ring
6. Connector
7. O-ring
8. Valve
9. Retaining Ring
10. Filter
11. Spring
12. Retaining Ring
13. Shaft Assembly
14. Bearing
15. Shaft
16. Retaining Ring
17. Oil Seal



CAUTION:

When removing the oil seal, be careful not to damage the housing.

18. Bolt
19. Rear Housing Assembly and Pump Cartridge
20. Gasket
21. O-ring
22. O-ring
23. Front Housing
24. Pressure Plate
25. Rotor and Vane
26. Cam
27. Pin
28. Rear Housing



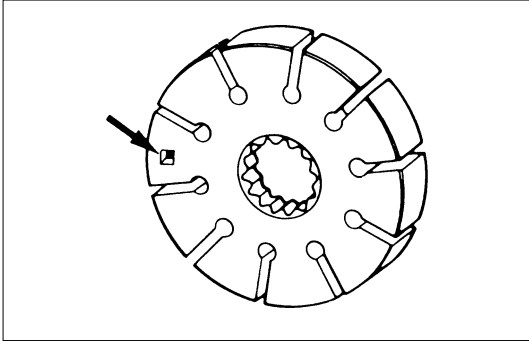
REASSEMBLY

28. Rear Housing

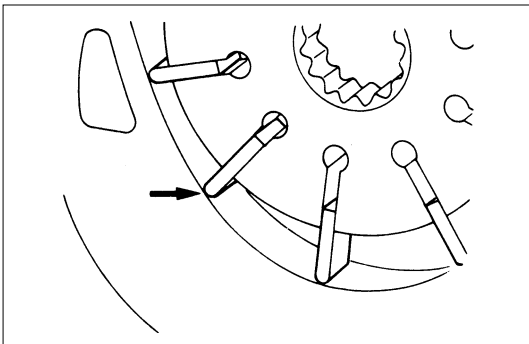
27. Pin

26. Cam

25. Rotor and Vane



Install the rotor with its punch mark facing the front housing.



Install the vane with curved face in contact with the inner wall of the cam.

24. Pressure Plate



CAUTION:

When install pressure plate, be careful not to damage its inner surface. Damaged pressure plate may cause poor pump performance, pump seizure or oil leakage.

23. Front Housing

22. O-ring

Be sure to discard used parts, and always used new parts for installation.

21. O-ring

Be sure to discard used parts, and always used new parts for installation.

20. Gasket

Be sure to discard used parts, and always used new parts for installation.

19. Rear Housing Assembly and Pump Cartridge



18. Bolt

Rear Housing Bolt Torque	N·m (kgf·m / lb·ft)
54 (5.5 / 40)	

17. Oil Seal

Be sure to discard used parts, and always used new parts for installation.



CAUTION:
When installing the oil seal, be careful not to damage the oil seal contacting surface of the housing.

- 16. Retaining Ring
- 15. Shaft
- 14. Bearing
- 13. Shaft Assembly
- 12. Retaining Ring
- 11. Spring
- 10. Filter
- 9. Retaining Ring
- 8. Valve
- 7. O-ring

Be sure to discard used parts, and always used new parts for installation.



6. Connector	
Connector Torque	N·m (kgf·m / lb·ft)
54 (5.5 / 40)	

5. O-ring

Be sure to discard used parts, and always used new parts for installation.

4. O-ring

Be sure to discard used parts, and always used new parts for installation.

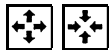
3. O-ring

Be sure to discard used parts, and always used new parts for installation.

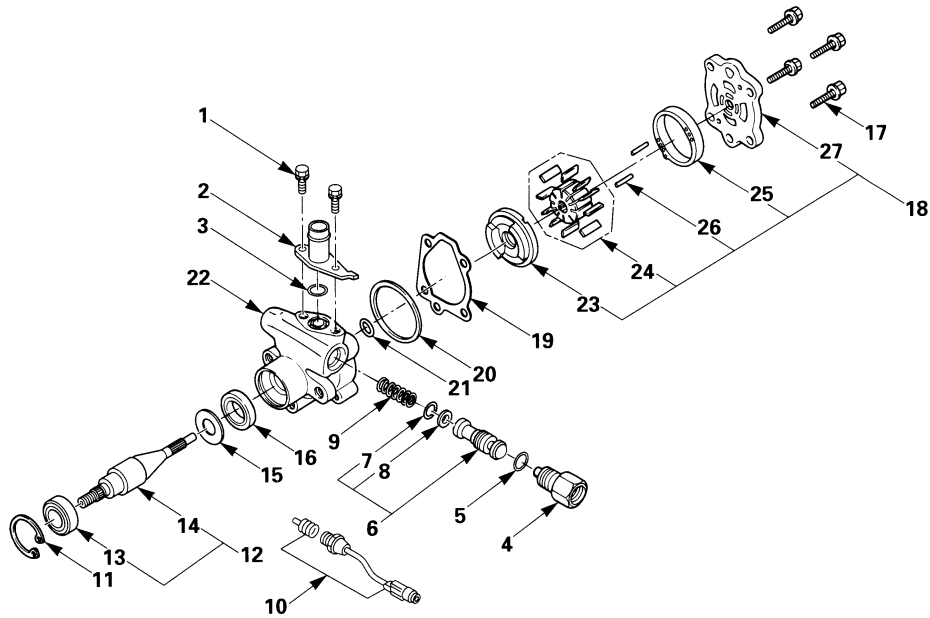
2. Pipe, Suction



1. Bolt	
Suction Pipe Bolt Torque	N·m (kgf·m / lb·ft)
21 (2.1 / 15)	



DISASSEMBLY AND REASSEMBLY (6VD1 Engine Model)



Disassembly Steps

- | | |
|---------------------|--|
| 1. Bolt | 15. Retaining ring |
| 2. Pipe, suction | 16. Oil seal |
| 3. O-ring | 17. Bolt |
| 4. Connector | 18. Rear housing assembly and pump cartridge |
| 5. O-ring | 19. Gasket |
| 6. Valve | 20. O-ring |
| 7. Retaining ring | 21. O-ring |
| 8. Filter | 22. Front housing |
| 9. Spring | 23. Pressure plate |
| 10. Pressure switch | 24. Rotor and vane |
| 11. Retaining ring | 25. Cam |
| 12. Shaft assembly | 26. Pin |
| 13. Bearing | 27. Rear housing |
| 14. Shaft | |

Reassembly Steps

- | | |
|--|---------------------|
| 27. Rear housing | 14. Shaft |
| 26. Pin | 13. Bearing |
| 25. Cam | 12. Shaft assembly |
| 24. Rotor and vane | 11. Retaining ring |
| 23. Pressure plate | 10. Pressure switch |
| 22. Front housing | 9. Spring |
| 21. O-ring | 8. Filter |
| 20. O-ring | 7. Retaining ring |
| 19. Gasket | 6. Valve |
| 18. Rear housing assembly and pump cartridge | 5. O-ring |
| 17. Bolt | 4. Connector |
| 16. Oil seal | 3. O-ring |
| 15. Retaining ring | 2. Pipe, suction |
| | 1. Bolt |



DISASSEMBLY

Preparation:

Clean oil pump with solvent (its plug discharge and suction port to prevent the entry of solvent). Be careful not to expose the oil seal of shaft assembly to solvent.

1. Bolt
2. Pipe, Suction
3. O-ring
4. Connector
5. O-ring
6. Valve
7. Retaining Ring
8. Filter
9. Spring
10. Pressure Switch
11. Retaining Ring
12. Shaft Assembly
13. Bearing
14. Shaft
15. Retaining Ring
16. Oil Seal



CAUTION:

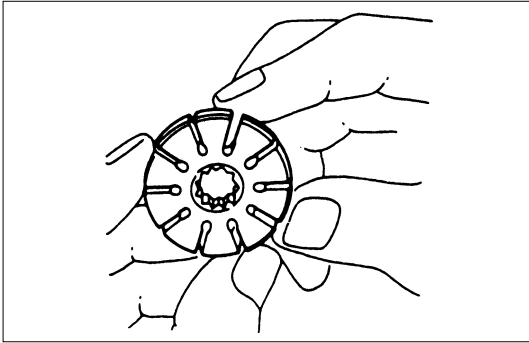
When removing the oil seal, be careful not to damage the housing.

17. Bolt
18. Rear Housing Assembly and Pump Cartridge
19. Gasket
20. O-ring
21. O-ring
22. Front Housing
23. Pressure Plate
24. Rotor and Vane
25. Cam
26. Pin
27. Rear Housing



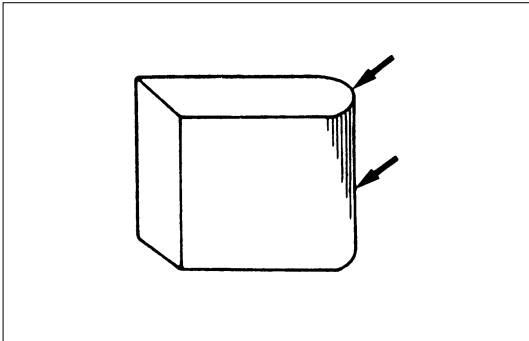
INSPECTION AND REPAIR

Make all necessary adjustments, repairs, and part replacements if wear, damage, or other problems are discovered during inspection.



Rotor

Check that the groove in the vane is free from excessive wear and that the vane slides smoothly.
When part replacement becomes necessary, the pump cartridge should be replaced as a subassembly.



Vane

Sliding faces of the vane should be free from wear. (Particularly the curved face at the tip in contact with the cam should be free from wear and distortion.)
When part replacement becomes necessary, the pump cartridge should be replaced as a subassembly.

Cam

The inner face of the cam should have a trace of uniform contact without a sign of step wear.
When part replacement becomes necessary, the pump cartridge should be replaced as a subassembly.

Side plate

The sliding faces of parts must be free from step wear (more than 0.01 mm), which can be felt by the finger nail.
The parts with minor scores may be reused after lapping the face.

Valve

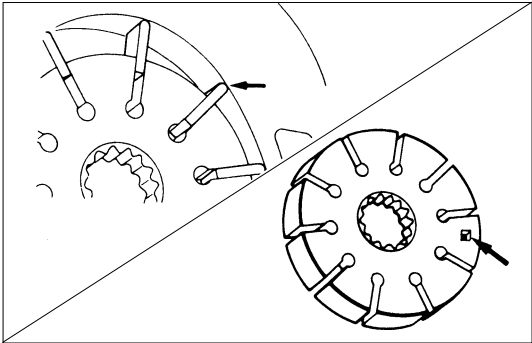
The sliding face of the valve must be free from burrs and damage.
The parts with minor scores may be reused after smoothing with emery cloth (#800 or finer).

Shaft

Oil seal sliding faces must be free from a step wear which can be felt by the finger nail.
Needle bearing fitting face must be free from disintegration and wear.

O-ring, oil seal retaining ring

Be sure to discard used parts, and always use new parts for installation. Prior to installation, lubricate all seals and rings with power steering fluid.



REASSEMBLY

27. Rear Housing

26. Pin

25. Cam



24. Rotor and Vane

1. Install the rotor with its punch mark facing the front housing.
2. Install the vanes with curved face in contact with the inner wall of the cam.

23. Pressure plate



CAUTION:

When install pressure plate, be careful not to damage its inner surface. Damaged pressure plate may cause poor pump performance, pump seizure or oil leakage.

22. Front Housing

21. O-ring

Be sure to discard used parts, and always used new parts for installation.

20. O-ring

Be sure to discard used parts, and always used new parts for installation.

19. Gasket

Be sure to discard used parts, and always used new parts for installation.

18. Rear Housing Assembly and Pump Cartridge



17. Bolt

Rear Housing Bolt Torque	N·m (kgf·m / lb·ft)
17.6 (1.8 / 12.8)	

16. Oil Seal

Be sure to discard used parts, and always used new parts for installation.



CAUTION:

When installing the oil seal, be careful not to damage the oil seal contacting surface of the housing.

15. Retaining Ring

14. Shaft

13. Bearing

12. Shaft Assembly

11. Retaining Ring

10. Pressure Switch

Pressure Switch Torque	N·m (kgf·m / lb·ft)
20 (2.0 / 14)	

9. Spring

8. Filter**7. Retaining ring****6. Valve****5. O-ring**

Be sure to discard used parts, and always use new parts for installation.

**4. Connector**

Connector Torque	N·m (kgf·m / lb·ft)
74 (7.5 / 54)	

3. O-ring

Be sure to discard used parts, and always use new parts for installation.

2. Pipe, Suction**1. Bolt**

Suction Pipe Bolt Torque	N·m (kgf·m / lb·ft)
16 (1.6 / 12)	

TROUBLESHOOTING

INSPECTION PROCEDURES FOR STEERING SYSTEM

COMPONENT AND TEST		PROCEDURE
HANDLE	Check for play and slack	1. Place the steering wheel in the straight forward position. Gently move the wheel to the right and to the left. About ten millimeters of play in either direction should be present before the front tires begin to move. If the vehicle is equipped with power steering, the engine should be running when these tests are made. 2. Grasp the steering wheel firmly with both hands. Exert force in an up and down direction on the steering column. There should be no play. 3. Move the steering wheel to the right and to the left. Check to see the steering shaft. Make sure that there is no slack in those areas where parts are joined together.
	Check the operating condition of the system	1. Make the following checks while actually driving the vehicle. a. Check the position of the steering wheel when the vehicle is traveling straight ahead. b. Make sure that the vehicle does not have a tendency to steer to the right or the left. c. There should be no excessive vibration present at the steering wheel. d. Turn the vehicle as sharply as possible to both the right and the left. When the steering wheel is turned fully in either direction, check for abnormal noise. Neither should the wheel feel overly heavy when it is fully turned to either the left or the right. Loosen your grip on the steering wheel. It should return to its center position.
GEAR BOX	Check for oil leakage	1. Check all parts of the steering unit (the oil seals of the front cover, side cover, sector shaft, etc.) to make sure that there is no oil leakage.
	Check for looseness in the assembly	1. With the wheels of the vehicle on the ground (the vehicle should not be jacked up), have an assistant or helper turn the steering wheel to the right and to the left. As he does this, you should carefully check all areas where the steering unit is attached to the frame for looseness and other possible problems.
	Check for bearing backlash	1. Check the condition of the connections between the steering shaft and the bearings. Move the steering shaft in the direction of the axle and make sure that there is no backlash present. 2. Rotate the steering shaft. There should be no abnormal noise. It should rotate smoothly and there should be no feeling of roughness. Check to make sure that there is no abnormal or excessive bearing wear.
	Check for gear backlash	1. The front wheels should be facing straight ahead. Have an assistant or helper grasp the drop arm so as to immobilize it. Now try to turn the steering wheel. Backlash should not exceed one millimeter.
	Inspect the sector shaft for cracks	1. Remove the steering unit from the vehicle and break it down into its component parts. Carefully inspect the sector shaft for cracks or other damage.

COMPONENT AND TEST		PROCEDURE
RODS AND ARMS	Check for play, backlash, and damage	1. With the wheels of the vehicle on the ground (the vehicle should not be jacked up), have an assistant or helper turn the steering wheel to the right and to the left. As he does this, you should carefully check the connecting points of all the parts for play, slack, or damage. a. Specifically check the pitman arm, the intermediate rod, the tie rods, the tie rod ends, the knuckle arms and the relay lever. 2. Carefully check all of the pins for cracks and other damage. 3. Make sure that the rod end boots and related areas are not cracked or otherwise damaged.
	Check the coupling parts for abrasion and other abnormal conditions	1. The ball joints and the rubber bushings should be free from abrasion or any other damage. 2. Pay careful attention to the coupling areas. Make sure that everything is properly connected.
	Check for cracks in the knuckle arms and also for poor knuckle attachment	1. Make sure that both the knuckle arms and the tie rod arms are free from cracks. The fit between the knuckles and the tapers should be secure. Look for any abnormal coloring which may indicate trouble.
KNUCKLES	Check for loose and damaged joints	1. Jack up the front axle and the front crosspiece. By hand, rotate the two front tires in either direction. Check that the king pins and the ball joints are free of play or slack. If play or slack is present, have an assistant or helper, hold down the brake pedal. Using a dial gauge, once again check the wheels for play and vibration. It is possible that the problem lies not with the steering system but with the wheel bearings.
	Check the gap between the steering knuckles and the front axle	1. Use a thickness gauge or other appropriate tool to measure the width of the gap between the steering knuckles and the front axle. Measure in the direction of the king pin. After measurement, thrust washers may be inserted to alter the gap.

1. HARD STEERING WITH POOR STEERING WHEEL RETURN

Checkpoint		Trouble Cause	Countermeasure
Tire inflation pressure	NG	Low tire inflation pressure	Correct the tire inflation pressure
OK			
Oil level in the reservoir (Power steering only)	NG	Insufficient oil	Replenish the oil
OK			
Steering wheel play	NG	Insufficient play	Adjust the play
OK			
Front wheel alignment	NG	Front wheels out of alignment	Correct the front wheel alignment
OK			
Steering linkage	NG	Joint ball sticking or rusted	Repair or replace the joint ball and/or the ball seat
OK			
Steering shaft bearings	NG	Bearings sticking or rusted	Replace the bearings
OK			

Continued on the next page

Checkpoint		Trouble Cause	Countermeasure
Continued from the previous page			
Joints and sleeve yoke	NG	Joints and sleeve yoke sticking or rusted	Repair or replace
OK			
Hydraulic system (Power steering only)	NG	Air in the hydraulic system	Air bleeding
OK			
Control valve lock nut (Power steering only)	NG	Control valve lock nut overtightened	Retighten the lock nut to the specified torque
OK			
Worm shaft bearing preload	NG	Preload too heavy	Adjust the preload
OK			
Steering unit internal parts	NG	Part damage	Replace the damaged parts

2. STEERING VIBRATION AND SHIMMY

Checkpoint		Trouble Cause	Countermeasure
Wheel nuts	NG	Wheel nuts unevenly torqued	Retighten the wheel nuts to the specified torque
OK			
Wheel pins	NG	Broken or loose wheel pin(s)	Retighten or replace the wheel pin(s)
OK			
Tires and disc wheels	NG	Unbalanced tires Deformed disc wheel(s)	Correct the tire balance Replace the disc wheel
OK			
Steering wheel play	NG	Excessive play	Adjust the play
OK			
Front wheel alignment	NG	Front wheels out of alignment	Correct the front wheel alignment
OK			
Steering link joint ball play	NG	Joint ball excessively worn	Replace the joint ball and the ball seat
OK			

Continued on the next page

Checkpoint		Trouble Cause	Countermeasure
Continued from the previous page			
Shock absorbers	NG	Faulty shock absorbers	Replace the shock absorbers
OK			
Wheel bearings	NG	Play in bearings excessive or bearings disintegrated	Replace the bearings
OK			
Adjust screw and sector shaft clearance	NG	Excessive clearance	Adjust the clearance
OK			
Sector shaft needle bearing	NG	Needle bearing excessively worn	Replace the needle bearing
OK			
Steering unit internal parts	NG	Part damage	Replace the damaged parts

3. STEERING PULLS TO ONE SIDE OR THE OTHER

Checkpoint		Trouble Cause	Countermeasure
Tire inflation pressure	NG	Tires unevenly inflated	Inflate all the tires to the specified pressure
OK			
Tires and disc wheels	NG	Unbalanced tires Deformed disc wheel(s)	Correct the tire balance Replace the disc wheel
OK			
Wheel bearings	NG	Incorrect preload or damage	Correct or replace
OK			
Shock absorbers	NG	Faulty shock absorbers	Replace the shock absorbers
OK			
Front wheel alignment	NG	Front wheels out of alignment	Correct the front wheel alignment
OK			
Brakes	NG	One wheel dragging	Refer to Section 05A "BRAKE VACUUM ASSISTED HYDRAULIC TYPE"
OK			
Steering shaft end play	NG	Excessive end play	Adjust the end play

4. STEERING WANDER (EXCESSIVE PLAY OR LOOSENESS)

Checkpoint		Trouble Cause	Countermeasure
Tires	NG	Tires badly worn Rounded tire edges	Replace the tires and check the wheel alignment
OK			
Oil level in the reservoir (Power steering only)	NG	Insufficient oil	Replenish the oil
OK			
Manual or power steering unit	NG	Steering unit mounting loose	Tighten the steering unit bolts to the specified torque
OK			
Front wheel alignment (Toe-in)	NG	Front wheels out of alignment (Toe-in out of adjustment)	Correct the front wheel alignment (Adjust the toe-in)
OK			
Steering wheel and shaft	NG	Steering wheel lock nut loose	Tighten the lock nut to the specified torque
OK			
Steering shaft universal joint	NG	Universal joint bolts loose	Tighten the bolts to the specified torque
OK			
Steering linkage joint ball nut	NG	Joint ball nut loose	Tighten the nut to the specified torque
OK			

Continued on the next page

Checkpoint		Trouble Cause	Countermeasure
Continued from the previous page			
Pitman arm and sector shaft	NG	Pitman arm nut loose	Tighten the nut to the specified torque
OK			
Front wheel bearings	NG	Bearings excessively worn or preload incorrectly adjusted	Replace the bearings or adjust the preload
OK			
Hydraulic system (Power steering only)	NG	Air in the hydraulic system	Air bleeding
OK			
Worm shaft bearing preload	NG	Preload improperly adjusted	Adjust the preload

5. MOMENTARY INCREASE IN STEERING EFFORT WHEN THE STEERING WHEEL IS TURNED QUICKLY TO ONE SIDE OR THE OTHER (POWER STEERING ONLY)

Checkpoint		Trouble Cause	Countermeasure
Oil level in the reservoir (Power steering only)	NG	Insufficient oil	Replenish the oil
OK			
Oil pump (Power steering only)	NG	Oil pump internal leakage	Repair or replace the oil pump

6. STEERING WHEEL SURGE OR JERK WHEN PARKING THE VEHICLE (POWER STEERING ONLY)

Checkpoint		Trouble Cause	Countermeasure
Oil level in the reservoir (Power steering only)	NG	Insufficient oil	Replenish the oil
OK			
Oil pump pressure	NG	Pressure too low	Adjust the pressure and/or replace the relief valve

7. EXCESSIVE ROAD SHOCK

Checkpoint		Trouble Cause	Countermeasure
Tire inflation pressure	NG	Tires overinflated	Inflate all the tires to the specified pressure
OK			
Suspension	NG	Loose suspension	Repair or replace the applicable parts
OK			
Shock absorbers	NG	Faulty shock absorbers	Replace the shock absorbers
OK			
Camber angle (4×2)	NG	Camber angle incorrectly adjusted	Adjust the camber angle
OK			
Hub bearing preload	NG	Preload out of adjustment	Adjust the preload

8. ABNORMAL NOISE

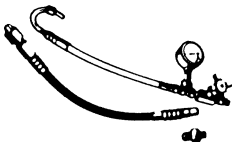
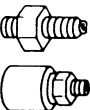
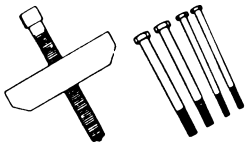
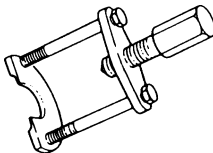
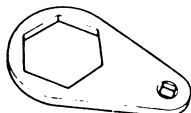
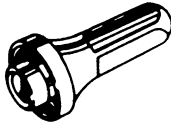
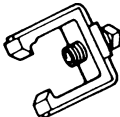
(1) RATTLING OR CLICKING NOISE IN THE STEERING GEAR

Checkpoint		Trouble Cause	Countermeasure
Manual or power steering unit	NG	Steering unit mounting bolts loose	Tighten the steering unit bolts to the specified torque
OK			
Hydraulic pressure hose (Power steering only)	NG	Hose touching another part of the vehicle	Reposition the hose
OK			
Pitman arm	NG	Pitman arm loose	Tighten the pitman arm nut to the specified torque
OK			
Steering linkage	NG	Steering linkage loose or worn	Repair or replace the steering linkage parts

9. OIL PUMP NOISY

Checkpoint		Trouble Cause	Countermeasure
Oil level	NG	Insufficient	Replenish
OK			
Pressure of air in hydraulic circuit	NG	Air in circuit	Bleed circuit
OK			
Suction tube and filter for restrictions	NG	Restrictions in tubing or filter	Clean or replace
OK			
Oil pump NG	NG	Defective	Overhaul or replace
OK			
Steering gear box	NG	Defective	Overhaul or replace

SPECIAL SERVICE TOOL (C22, C20 Series Engine Model)

ITEM NO.	ILLUSTRATION	PART NO.	PART NAME
STL-19		5-8840-0135-0 (J-29877-A)	Power steering tester
STL-21		5-8840-0136-0 (J-33996)	Power steering tester adapter
STL-1		5-8521-0016-0 (J-29752)	Steering wheel puller
STL-13		5-8840-2017-0 (J-35707)	Pitman arm remover
STL-2		5-8840-2006-0 (J-29753)	Input cover lock nut wrench
STL-5		5-8840-2007-0 (J-7624)	End cover remover
STL-8		5-8522-0026-0 (J-26508)	Extension housing oil seal installer
STL-12		5-8840-2121-0 (J-21677-2)	Tie-rod remover
STL-10		5-8840-2206-0	Power steering pump bearing remover and installer

3B-86 STEERING

ITEM NO.	ILLUSTRATION	PART NO.	PART NAME
STL-9		5-8840-2205-0	Power steering pump oil seal installer

SECTION 3C

FRONT SUSPENSION

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MAIN DATA AND SPECIFICATIONS

C22, C20 Series Engine Model 4x2 MODEL

Front Suspension Type	Independent wishbone arms. torsion bar springs with stabilizer bar		
	Short wheel base	Long wheel base	
		Except Flat Deck	Flat Deck
Front wheel alignment When not loaded Tread mm(in) Camber Caster Toe-in mm(in) Kingpin inclination	1445 (56.88) 0°30'±60' (Left and right side to be equal within 45') *1°35'±45' *1°50'±45' *1°10'±45' * Left and right side to be equal within 35' 2±2 (0.08±0.08) 10°±60'		
Torsion Bar Spring Data Gasoline Engine Model (Except for Australia) Length×diameter mm(in) Wheel Rate/Side N/mm (kg/mm/lb/in) Spring Constant N·m/deg (kg·m /deg/lb·ft/deg) Spring Capacity N (kg/lb) Diesel Engine Model and Gasoline engine Model for Australia Length×diameter mm(in) Wheel Rate/Side N/mm (kg/mm/lb/in) Spring Constant N·m/deg (kg·m /deg/lb·ft/deg) Spring Capacity N (kg/lb)	1006×23.8 (39.61 ×0.937) 23.14 (2.36/132) 43.64 (4.45/32.18) 4217 (430/948) 1006×24.4 (39.61×0.961) 25.0 (2.55/143) 48.06 (4.90/35.44) 4658 (475/1047), For Australia 5148 (525/1157)		
Shock Absorber Data Maximum Length mm(in) Minimum Length mm(in) Stroke mm(in) Damping Force Rebound Side Compression Side	325 (12.80) 210 (8.27) 115 (4.53) 135 kg at 0.3 m/sec. (1324 N at 0.3 m/sec./297 lb. at 11.8 in/sec.) 34 kg at 0.3 m/sec. (333 N at 0.3 m/sec./74.9 lb. at 11.8 in/sec.)		
Shock Absorber Data (For Australia) Maximum Length mm(in) Minimum Length mm(in) Stroke mm(in) Damping Force Rebound Side Compression Side	328(12.91) 213 (8.39) 115 (4.53) 215 kg at 0.3 m/sec. (2108 N at 0.3 m/sec./474 lb. at 11.8 in/sec.) 118 kg at 0.3 m/sec. (1157 N at 0.3 m/sec./26.0 lb. at 11.8 in/sec.)		- - - - -

4J Series Engine Model
4x2 MODEL (except TFR25)

Front Suspension Type	Independent wishbone arms. torsion bar springs with stabilizer bar		
	Short wheel base	Long wheel base	
		Except Flat Deck	Flat Deck
Front wheel alignment When not loaded Tread mm (in) Camber Caster Toe-in mm (in) Kingpin inclination	1445 (56.88) 0°30'±60' (Left and right side to be equal within 45') *1°35'±45' *1°50'±45' *1°10'±45' *Left and right side to be equal within 35' 2±2 (0.08±0.08) 10°±60'		
Torsion Bar Spring Data Gasoline Engine Model (Except for Australia, Chile and Kenya) Length x Diameter mm (in) Wheel Rate/Side kg/mm (lb/in/N/mm) Spring Constant kg-m/deg (lb.ft/deg/N-m/deg) Diesel Engine Model (except for Chile and Kenya) and Gasoline Engine Model for Australia, Chile and Kenya Length x Diameter mm (in) Wheel Rate/Side kg/mm (lb/in/N/mm) Spring Constant kg-m/deg (lb.ft/deg/N-m/deg) Diesel Engine Model for Chile and Kenya Length x Diameter mm (in) Wheel Rate/Side kg/mm (lb/in/N/mm) Spring Constant kg-m/deg (lb.ft/deg/N-m/deg)	1006 x 23.8 (39.61 x 0.937) 2.36 (132 / 23.14) 4.45 (32.18 / 43.64) 1006 x 24.4 (39.61 x 0.961) 2.55 (143/25.0) 4.90 (35.44 / 48.06) 1006 x 24.9 (39.61 x 0.980) 2.73 (153 / 26.8) 5.31 (38.4 / 52.1)		
Shock Absorber Data Maximum Length mm (in) Minimum Length mm (in) Stroke mm (in) Damping Force Rebound Side Compression Side	325 (12.80) 210 (8.27) 115 (4.53) 135 kg at 0.3 m/sec. (297 lb. at 11.8 in/sec./ 1324 N at 0.3 m/sec.) 34 kg at 0.3 m/sec. (74.9 lb. at 11.8 in/sec./333 N at 0.3 m/sec.)		
Shock Absorber Data (Gas-sealed) Maximum Length mm (in) Minimum Length mm (in) Stroke mm (in) Damping Force Rebound Side Compression Side	328 (12.91) 213 (8.39) 115 (4.53) 215 kg at 0.3 m/sec. (474 lb. at 11.8 in/sec./ 2108 N at 0.3 m/sec.) 118 kg at 0.3 m/sec. (260 lb. at 11.8 in/sec./ 1157 N at 0.3 m/sec.)		

3C-4 FRONT SUSPENSION

6VD1 Engine Model

Front Suspension Type	Independent wishbone arms. torsion bar springs with stabilizer bar	
Front wheel alignment When not loaded		
Tread	mm (in)	1438 (56.61)
Camber		0°30'±60'
		(Left and right side to be equal within 45')
Caster		*2°10'±45'
		*Left and right side to be equal within 35'
Toe-in	mm (in)	2±2 (0.08±0.08)
Kingpin inclination		10°±60'
Torsion Bar Spring Data		
Length x Diameter	mm (in)	998 x 22.8 (39.29 x 0.898)
Wheel Rate/Side	kg/mm (lb/in/N/mm)	3.08 (172 / 30.2)
Spring Constant	kg·m/deg (lb.ft/deg/N·m/deg)	3.79 (27.5 / 37.2)
Shock Absorber Data (Gas-sealed)		
Type	Gas-sealed, hydraulic double acting telescopic	
Maximum Length	mm (in)	377 (14.84)
Minimum Length	mm (in)	237 (9.33)
Stroke	mm (in)	140 (5.51)
Damping Force		
Rebound Side	139 kg at 0.3 m/sec. (306 lb. at 11.8 in/sec./ 1363 N at 0.3 m/sec.)	
Compression Side	110 kg at 0.3 m/sec. (243 lb. at 11.8 in/sec./ 1079 N at 0.3 m/sec.)	

4x4 MODEL

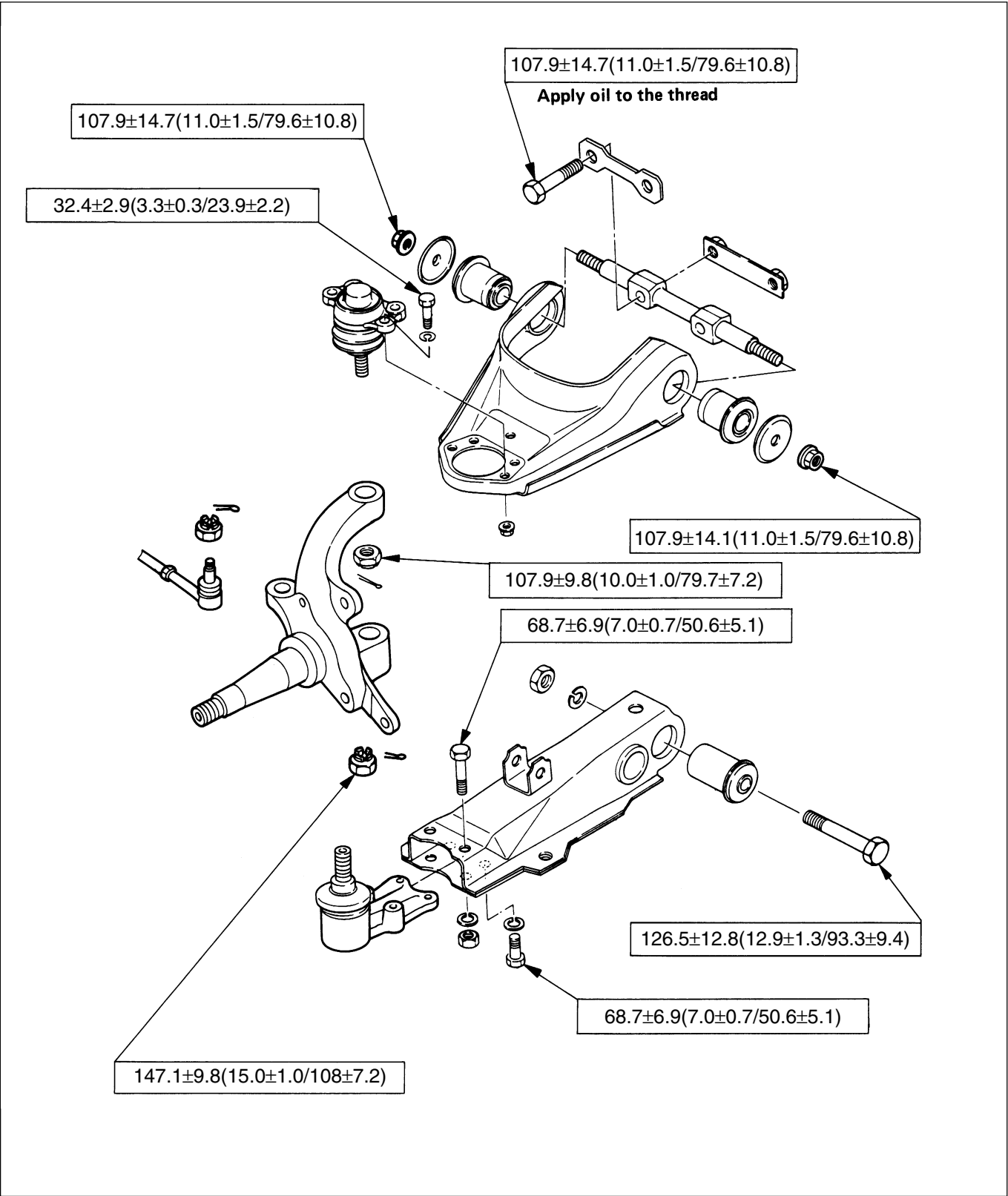
Front Suspension Type	Independent wishbone arms. torsion bar springs with stabilizer bar	
	Short wheel base	Long wheel base
Front wheel alignment When not loaded Tread mm(in) Camber Caster Toe-in mm(in) Kingpin inclination	1438 (56.61) 0°30' ± 60' (Left and right side to be equal within 45') *1°55' ± 45' *2°10' ± 45' * Left and right side to be equal within 35' 2 ± 2 (0.08±0.08) 10° ± 60'	
Torsion Bar Spring Data Length × diameter mm(in) Wheel Rate/Side N/mm (kg/mm/lb/in) Spring Constant N·m/deg (kg·m/deg/lb·ft) Spring Capacity N (kg/lb)	998×23.4 (39.29×0.321) 32.6 (3.33/186) 41.2 (4.20/30.4) Gasoline engine 490 (500/1102)	
Shock Absorber Data Type Maximum Length mm(in) Minimum Length mm(in) Stroke mm(in) Damping Force Rebound Side Compression Side	Hydraulic double acting, telescopic 375 (14.76) 235 (9.25) 140 (5.51) 110 kg at 0.3 m/sec. (1079 N at 0.3 m/sec./243 lb. at 11.8 in/sec.) 32 kg at 0.3 m/sec. (313 N at 0.3 m/sec./70.5 lb. at 11.8 in/sec.)	
Shock Absorber Data (For Australia) Type Maximum Length mm(in) Minimum Length mm(in) Stroke mm(in) Damping Force Rebound Side Compression Side	Gas-sealed, hydraulic double acting telescopic 377 (14.84) 237 (9.33) 140(5.51) 200 kg at 0.3 m/sec. (1961 N at 0.3 m/sec./441 lb. at 11.8 in/sec.) 138 kg at 0.3 m/sec. (1353 N at 0.3 m/sec./304 lb. at 11.8 in/sec.)	
Shock Absorber Data (TFS25) Type Maximum Length mm(in) Minimum Length mm(in) Stroke mm(in) Damping Force Rebound Side Compression Side	Gas-sealed, hydraulic double acting telescopic 377 (14.84) 237 (9.33) 140(5.51) 199 kg at 0.3 m/sec. (439 lb. at 11.8 in/sec./1952 N at 0.3 m/sec.) 126 kg at 0.3 m/sec. (278 lb. at 11.8 in/sec./1236 N at 0.3 m/sec.)	

TORQUE SPECIFICATIONS

SPECIAL PARTS FIXING NUTS AND BOLTS

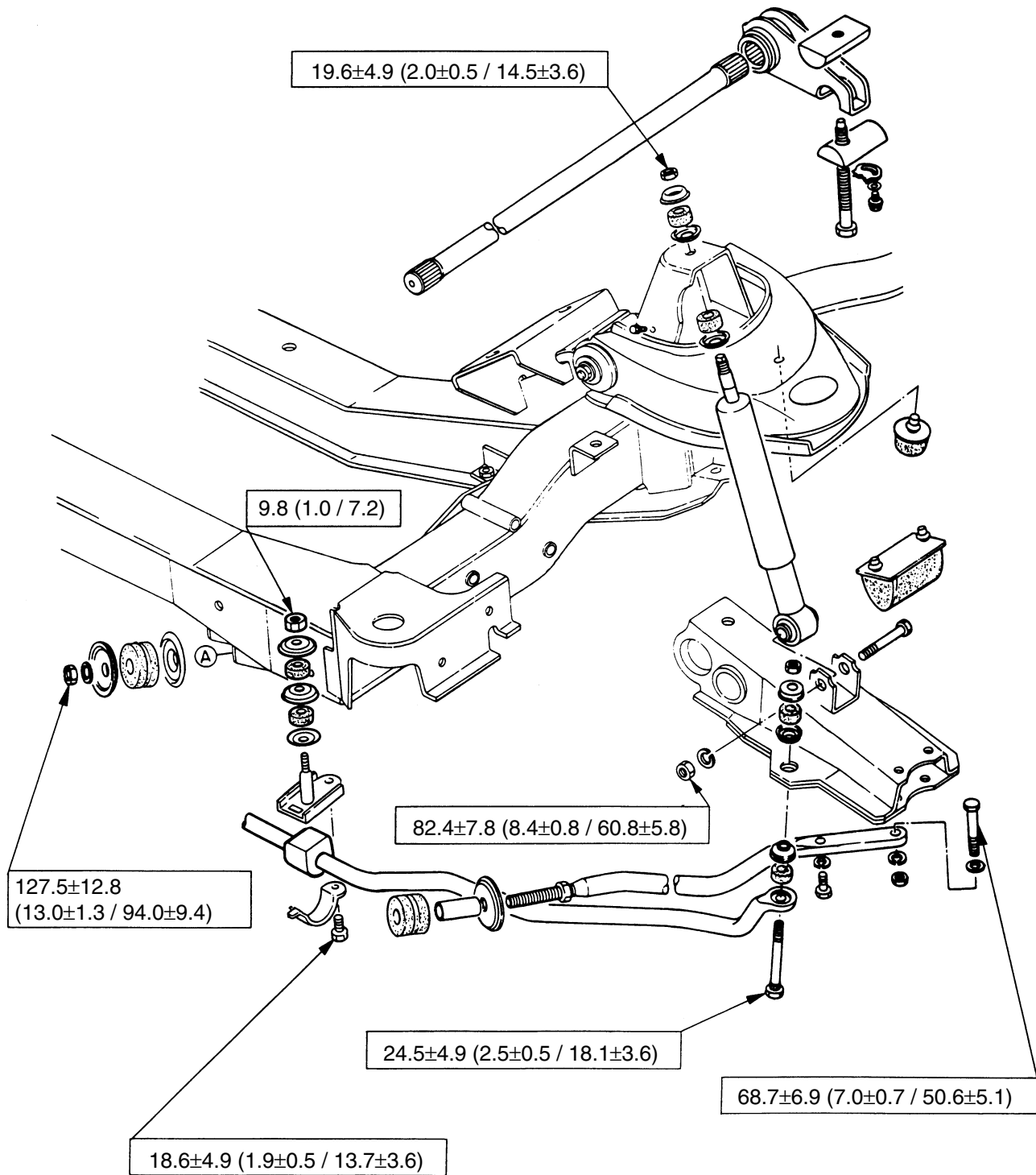
4x2 Model (except TFR25)

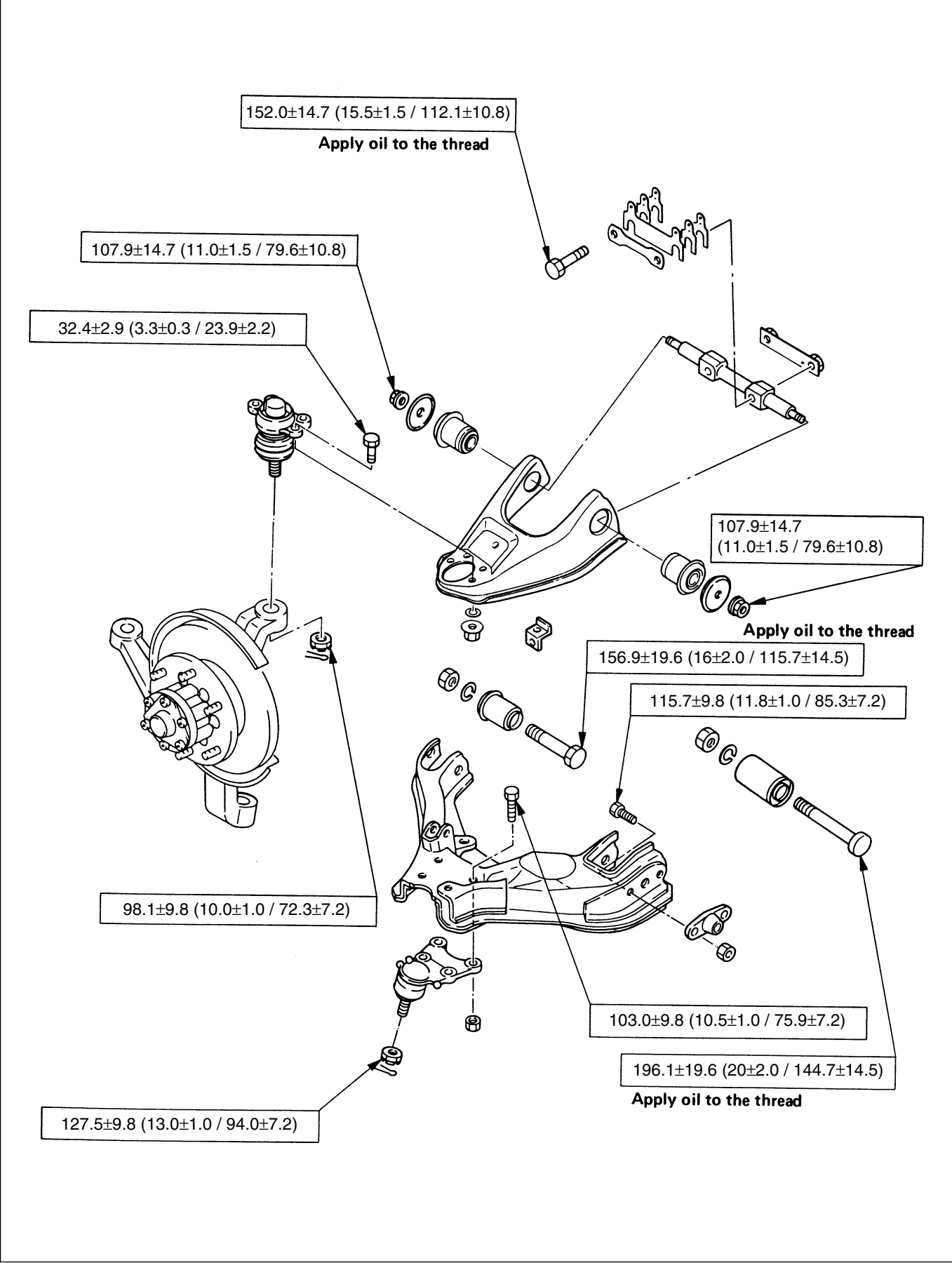
N·m (kgf·m/lb·ft)



4x2 Model (except TFR25)

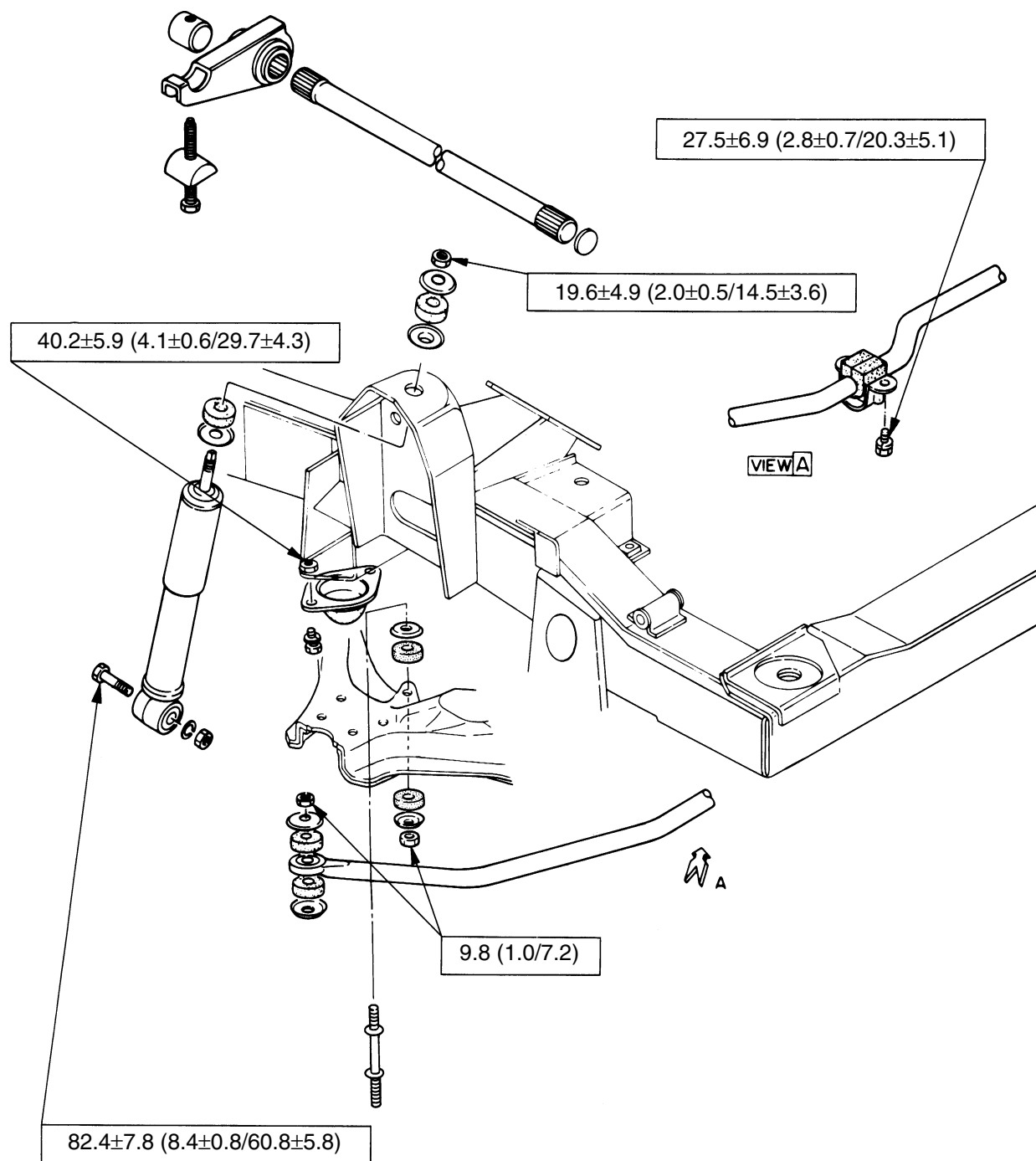
N·m (kgf·m/lb·ft)





4x4 Model and TFR25

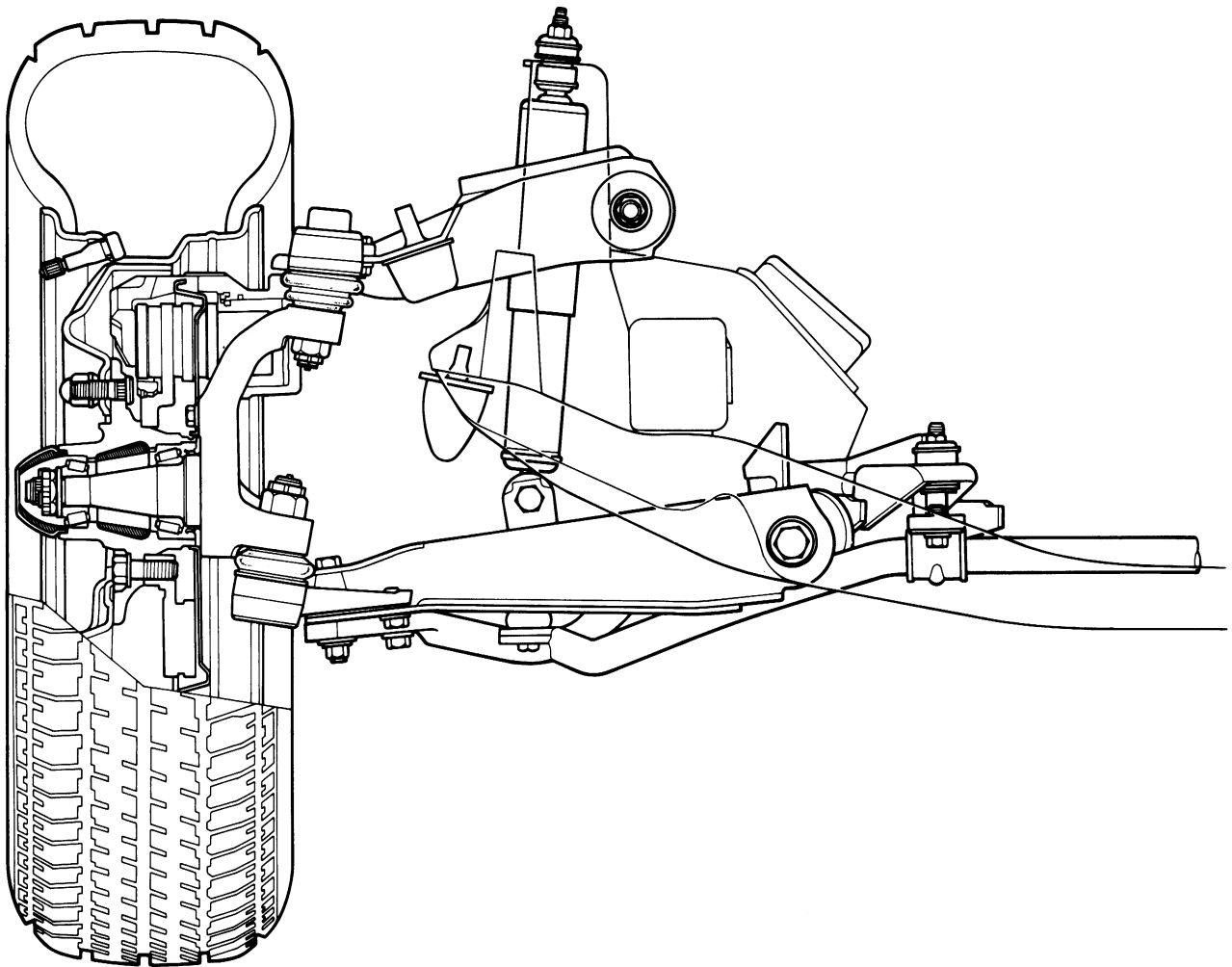
N·m (kgf·m/lb·ft)

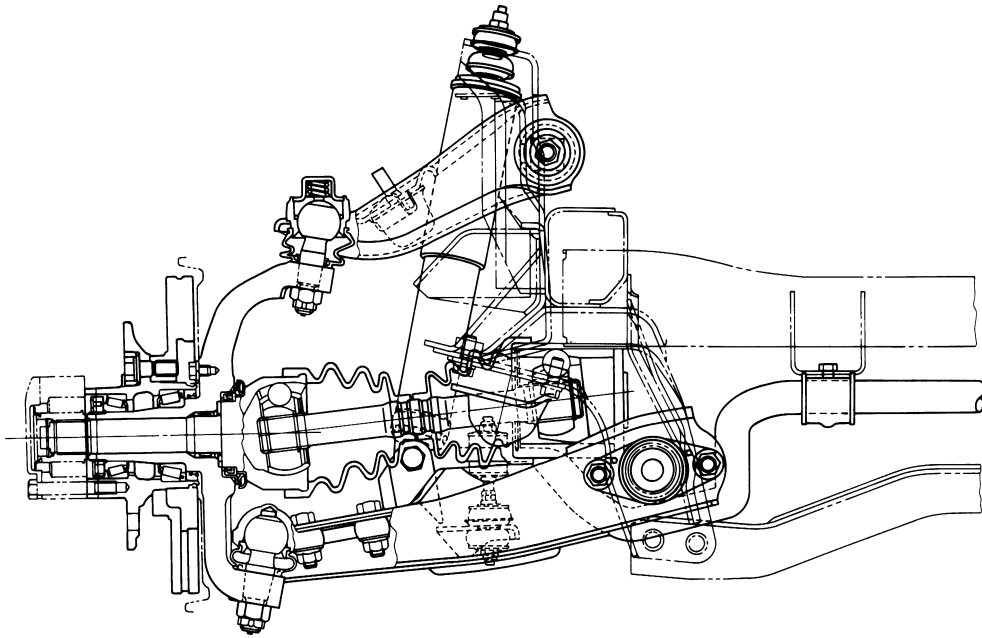
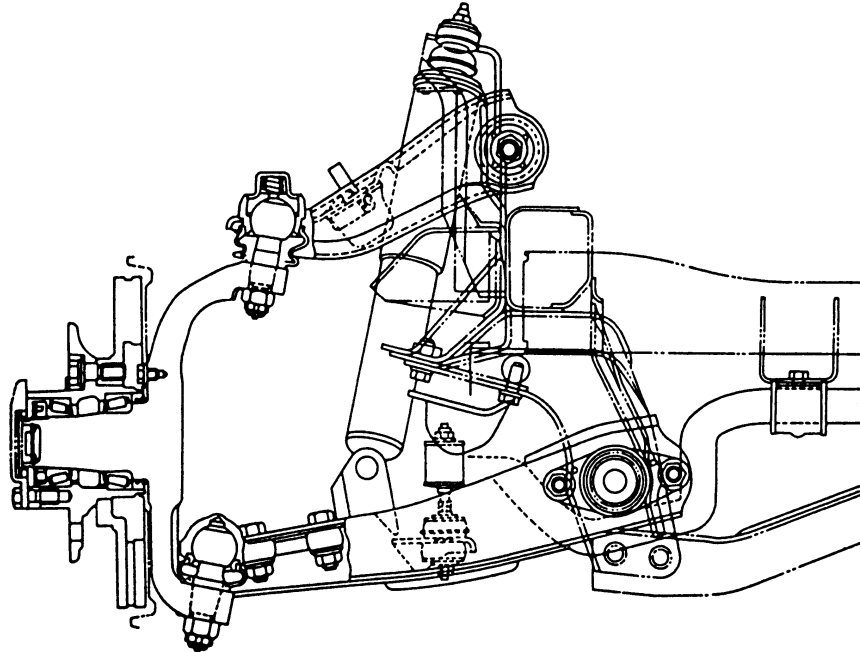


FRONT SUSPENSION

GENERAL DESCRIPTION

4×2 Model (except TFR25)



4x4 Model and TFR25**4x4 Model****TFR25**

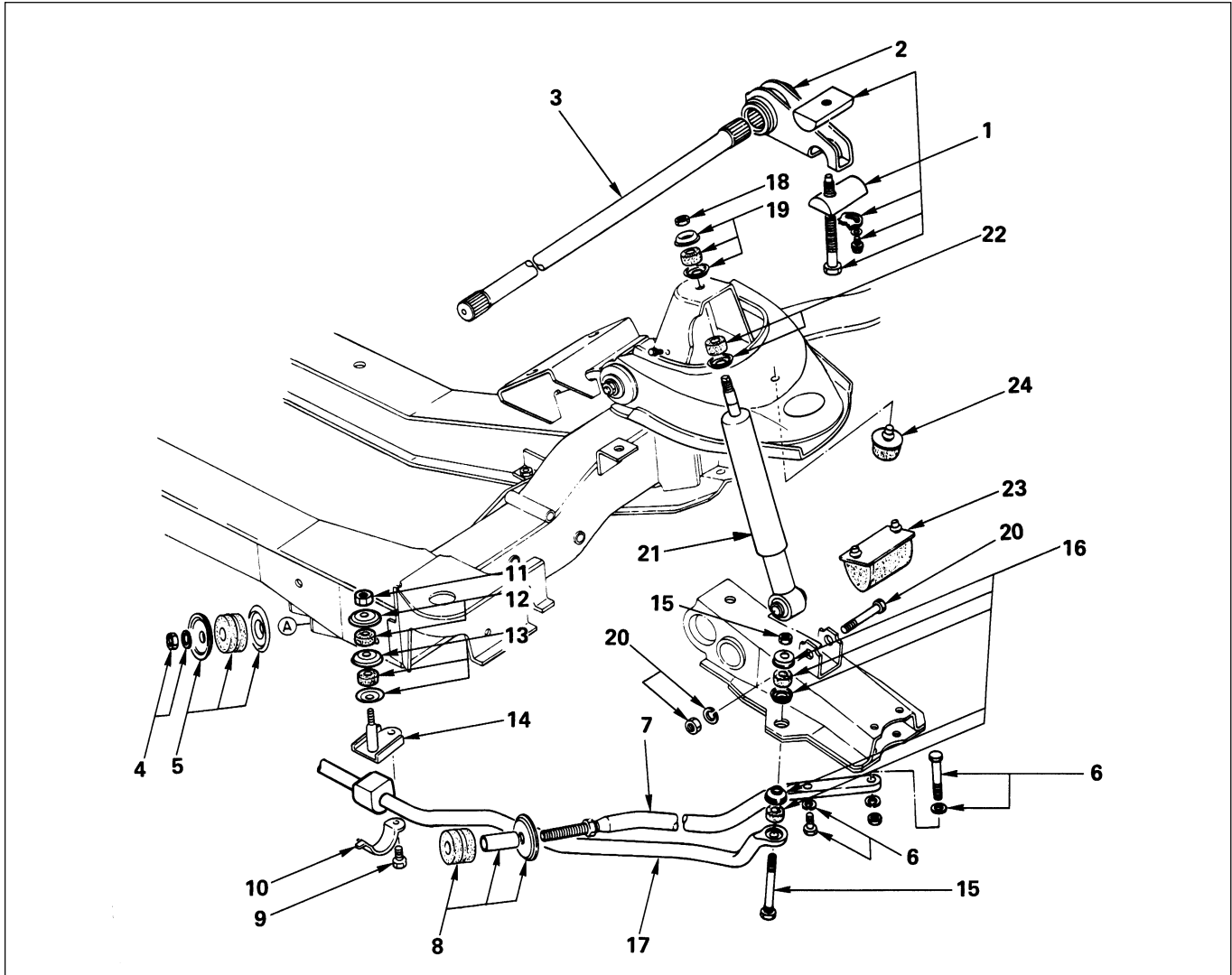
The links attach to the vehicle with bolts and bushings at their inner pivot points and to the steering knuckle, which is part of the front wheel spindle, at their outer points.

The knuckle is mounted to the upper and lower links each of which has a ball joint to permit pivoting of the knuckle for steering operations. The hub is supported in position on the knuckle spindle by means of the two bearings and the rotor is mounted to the hub.

The front suspension is an independent type utilizing torsion bar springs. The torsion bar spring has splines on each end. Height control is provided on the third crossmember. Both the upper and lower links are pressed steel and the torsion bar is supported at the ends by lower link in front and by height control arm in rear.

TORSION BAR, STRUT BAR, STABILIZER BAR AND SHOCK ABSORBER (4×2 MODEL EXCEPT TFR25)

DISASSEMBLY



Disassembly Steps

Torsion Bar

- ▲ 1. Adjust bolt, seat, lock plate and bolt
- ▲ 2. Height control arm
- ▲ 3. Torsion bar

Strut Bar

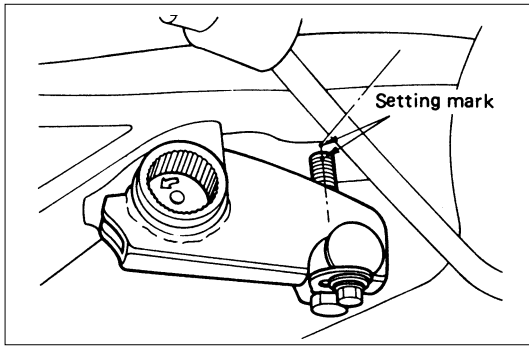
- 4. Nut and washer
- 5. Rubber bushing and washer
- 6. Bolt and washer
- 7. Strut bar
- 8. Rubber bushing, washer and tube

Stabilizer Bar

- 9. Bolt
- 10. Bracket
- 11. Nut
- 12. Rubber bushing and washer
- 13. Rubber bushing and washer
- 14. Bracket
- 15. Bolt and nut
- 16. Rubber bushing and washer
- 17. Stabilizer bar

Shock Absorber

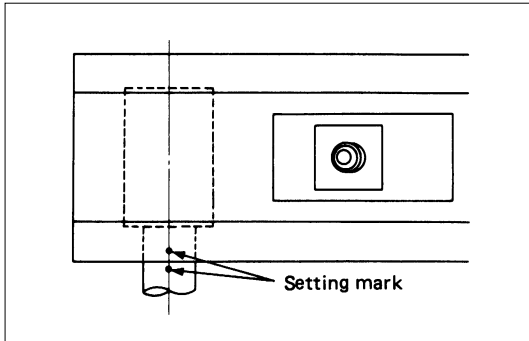
- 18. Nut
- 19. Rubber bushing and washer
- 20. Bolt, nut, and washer
- ▲ 21. Shock absorber
- 22. Rubber bushing and washer
- 23. Lower link bumper
- 24. Upper link bumper



Important Operations

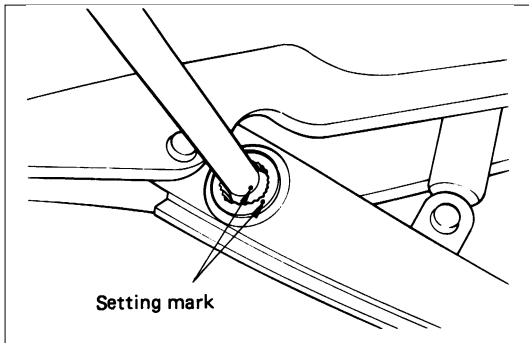
1. Adjust Bolt

Apply the setting marks to the adjust bolt and height control arm.



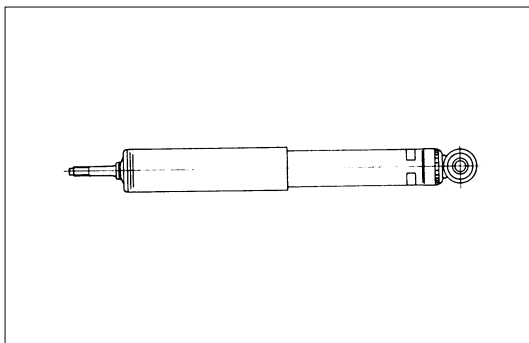
2. Height Control Arm

Apply the setting marks to the height control arm and torsion bar.



3. Torsion Bar

Apply the setting marks to the torsion bar and lower link.



21.Shock Absorber (Gas-sealed type)

CAUTION :

The shock absorbers have been charged with gas at the factory. Exposure to high temperatures or an open flame can result in a dangerous explosion.

Keep the shock absorbers away from high temperatures and open flames.



INSPECTION AND REPAIR

Make all necessary adjustments, repairs, and part replacements if wear, damage, or other problems are discovered during inspections.

- Torsion bar, height control arm
- Strut bar
- Stabilizer bar
- Shock absorber
- Rubber bushing

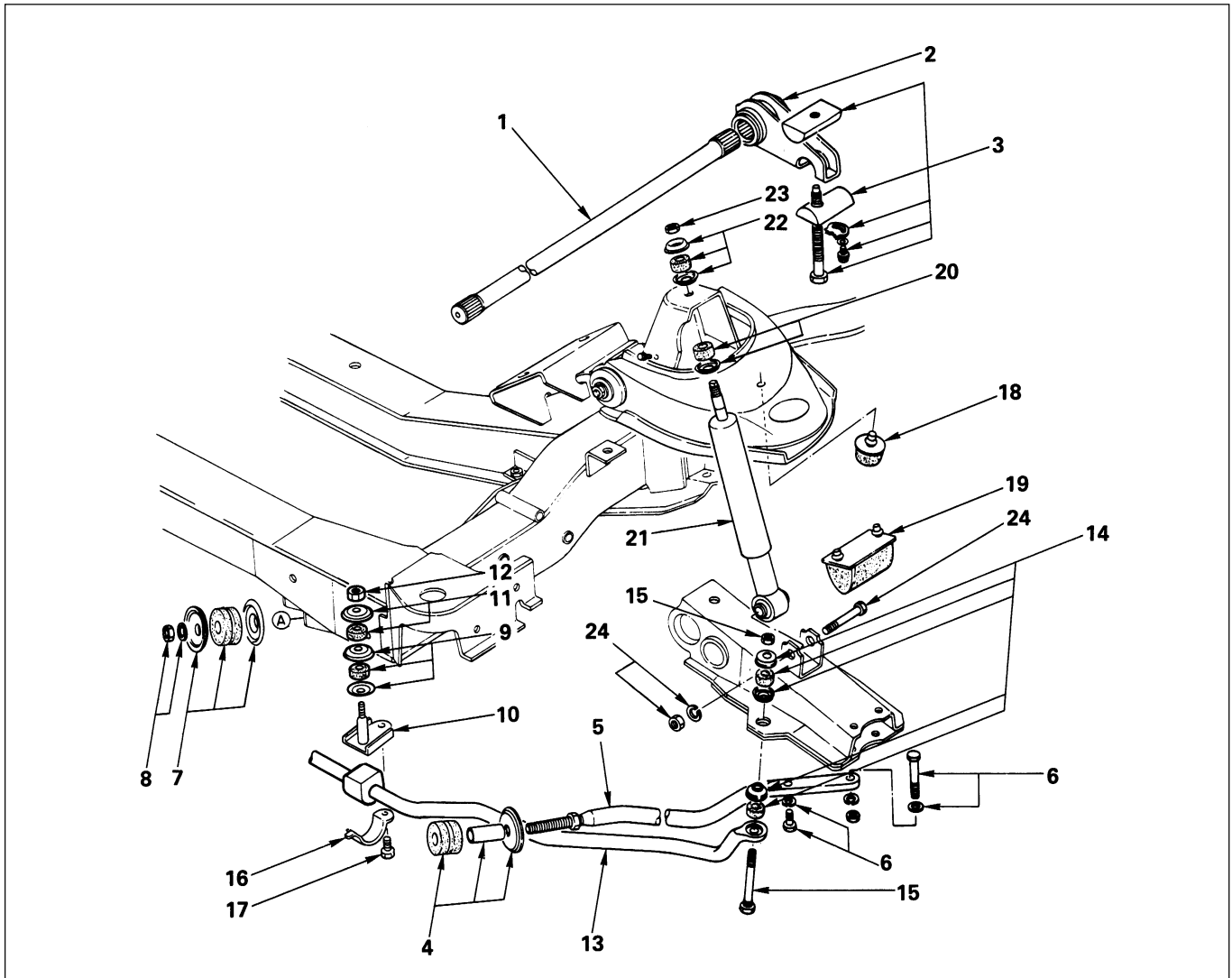


Visual Check

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



REASSEMBLY



Reassembly Steps

Torsion Bar

- ▲ 1. Torsion Bar
- ▲ 2. Height control arm
- ▲ 3. Adjust bolt, seat, lock plate and bolt

Strut Bar

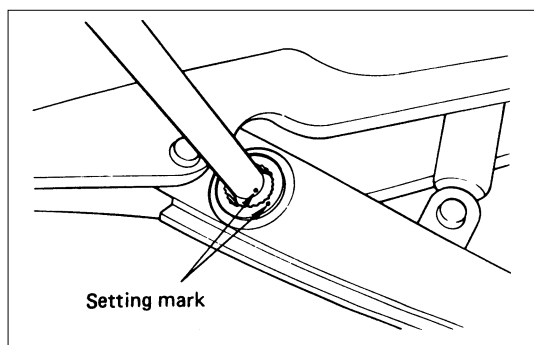
- 4. Rubber bushing and washer
- ▲ 5. Strut bar
- ▲ 6. Bolt and washer
- 7. Rubber bushing, washer and tube
- ▲ 8. Nut and washer

Stabilizer Bar

- 9. Rubber bushing and washer
- 10. Bracket
- 11. Rubber bushing and washer
- 12. Nut
- 13. Stabilizer bar
- 14. Rubber bushing and washer
- ▲ 15. Bolt and nut
- 16. Bracket
- 17. Bolt

Shock Absorber

- 18. Upper link bumper
- 19. Lower link bumper
- 20. Rubber bushing and washer
- 21. Shock absorber
- 22. Rubber bushing and washer
- ▲ 23. Nut
- ▲ 24. Bolt, nut, and washer



Important Operations

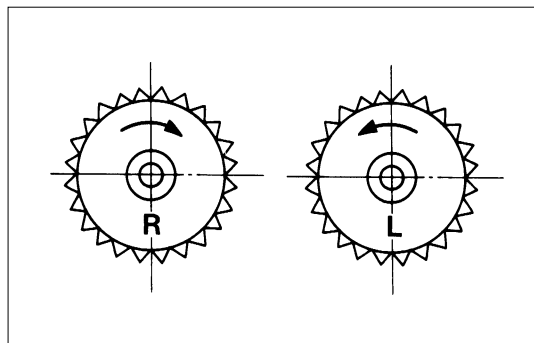


1. Torsion Bar

(1) Apply grease to the serrated portions.



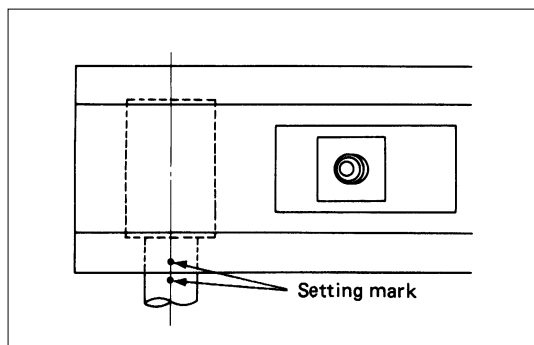
(2) Align the scribe marks.



(3) Note the embossed mark on the end of the torsion bar.

R : Right side

L : Left side

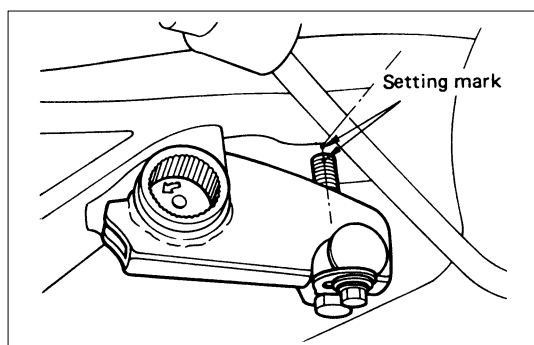


2. Height Control Arm

(1) Apply grease to the portion that fits into the bracket.

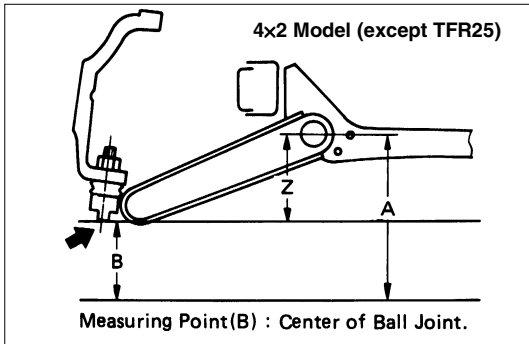


(2) Align the scribe marks.



3. Adjust Bolt, Seat, Lock Plate and Bolt

(1) Turn in the adjustment bolt to location marked upon disassembly.



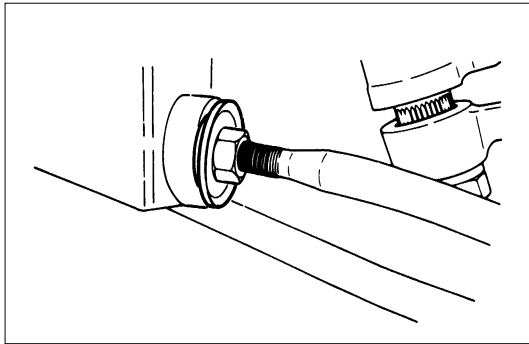
(2) Check the vehicle trim height.

Trim Height (Z) = A - B

Trim Height

mm(in)

56 (2.20)



5. Strut Bar

Adjust the caster angle by varying length of the strut bar (adjust with lock nut).

Caster

Short Wheel Base	$1^{\circ}35' \pm 45'$
Long (Except Flat Deck)	$1^{\circ}50' \pm 45'$
Long (Flat Deck)	$1^{\circ}10' \pm 45'$

Note :

No more than 35' side to side variation.

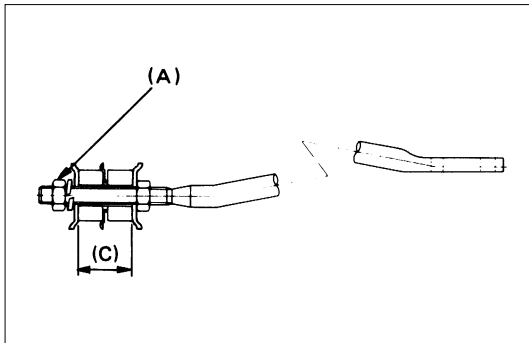


6. Bolt, Nut and Washer

Strut Bar Bolt Torque

N·m (kgf·m/lb·ft)

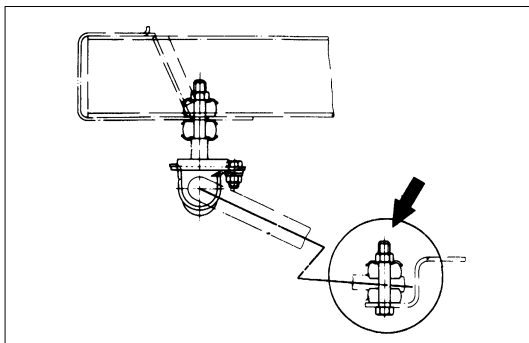
68.7 ± 6.9 ($7.0 \pm 0.7/50.6 \pm 5.1$)



8. Nut and Washer

Strut Bar Nut Torque

Model	N·m (kgf·m/lb·ft)	Distance (C) mm(in)
4 × 2	127.5 ± 12.8	56.0
(except TFR25)	($13.0 \pm 1.3/94.0 \pm 9.4$)	(63.3)



15. Bolt and Nut

Stabilizer Bar Bolt Torque

N·m (kgf·m/lb·ft)

24.5 ± 4.9 ($2.5 \pm 0.5/18.1 \pm 3.6$)



23.Nut

Shock Absorber Nut Torque	N·m (kgf·m/lb·ft)
19.6 ± 4.9 ($2.0 \pm 0.5/14.5 \pm 3.6$)	

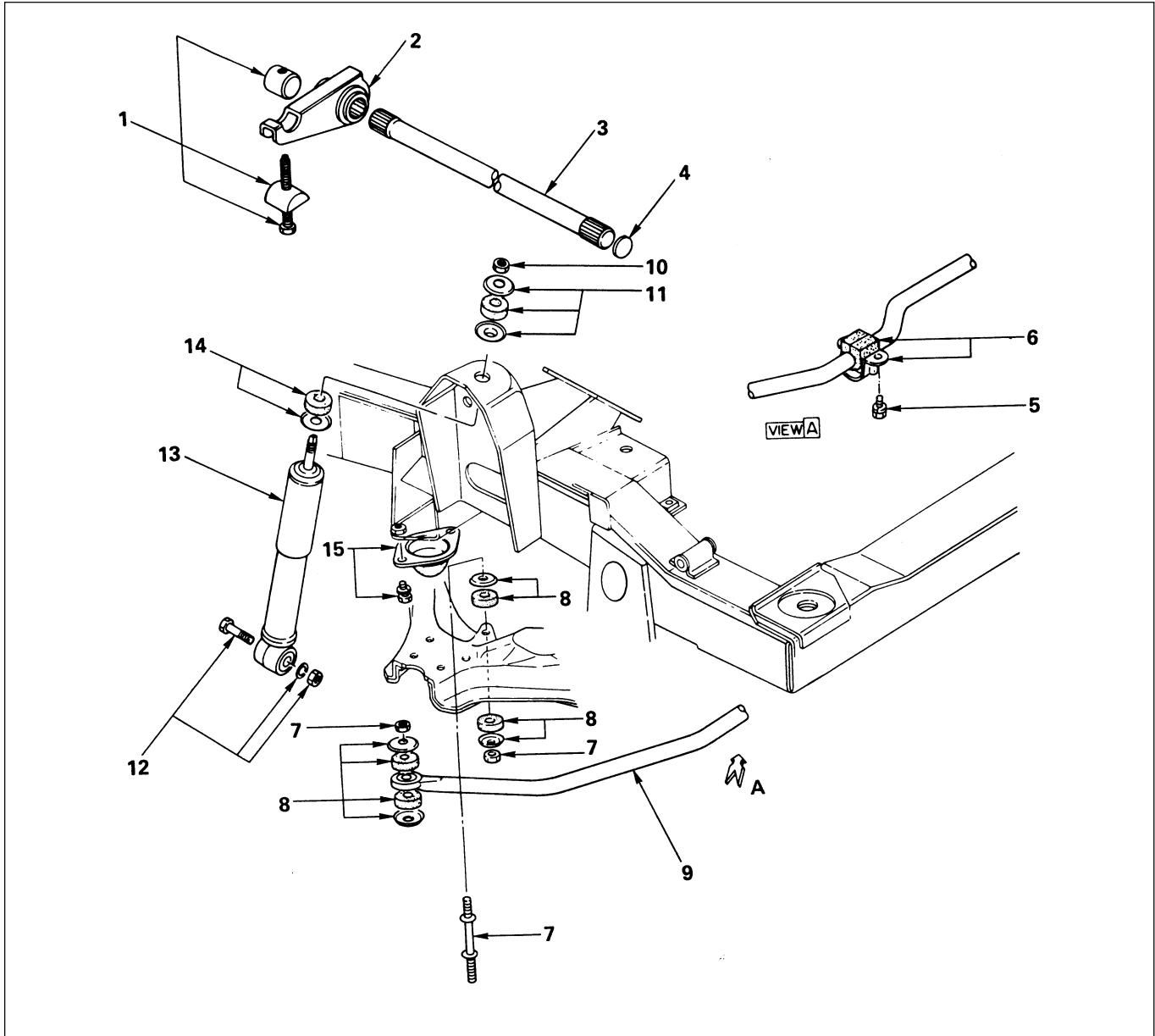


24.Bolt, Nut and Washer

Shock Absorber Bolt Torque	N·m (kgf·m/lb·ft)
82.4 ± 7.8 ($8.4 \pm 0.8/60.8 \pm 5.8$)	

TORSION BAR, STABILIZER BAR AND SHOCK ABSORBER (4×4 MODEL AND TFR25)

DISASSEMBLY



Disassembly Steps

Torsion Bar

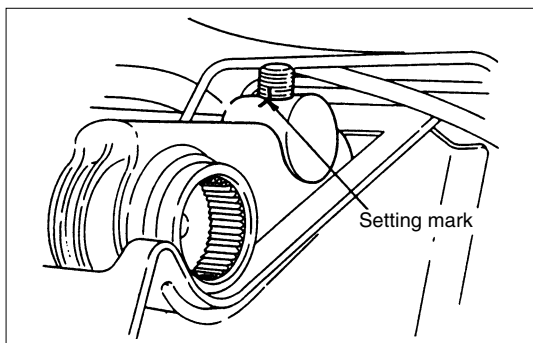
- ▲ 1. Adjust bolt, seat
- ▲ 2. Height control arm
- ▲ 3. Torsion Bar
- 4. Rubber seat

Stabilizer Bar

- 5. Bolt
- 6. Bracket and rubber bushing
- 7. Bolt, nut, and washer
- 8. Rubber bushing and washer
- 9. Stabilizer bar

Shock Absorber

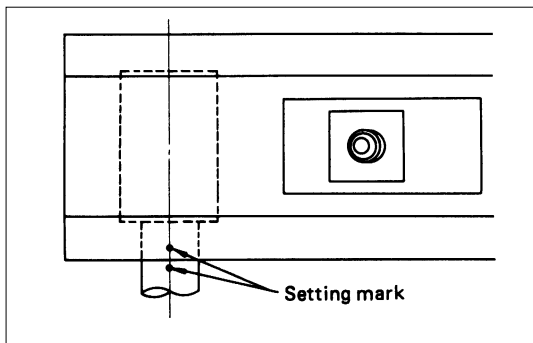
- 10. Nut
- 11. Rubber bushing and washer
- 12. Bolt, nut, and washer
- 13. Shock absorber
- 14. Rubber bushing and washer
- 15. Lower link bumper



Important Operations

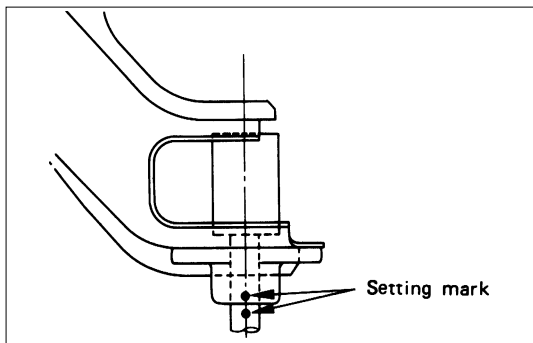
1. Adjust Bolt

Apply the setting marks to the adjust bolt and height control arm.



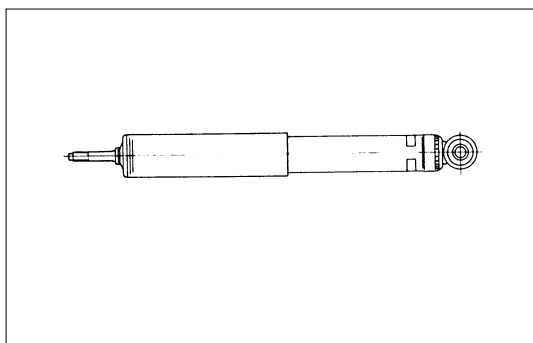
2. Height Control Arm

Apply the setting marks to the height control arm and torsion bar.



3. Torsion Bar

Apply the setting marks to the torsion bar and lower link.



13.Shock Absorber (For Australia)

CAUTION :

The shock absorbers have been charged with gas at the factory. Exposure to high temperatures or an open flame can result in a dangerous explosion.

Keep the shock absorbers away from high temperatures and open flames.



INSPECTION AND REPAIR

Make all necessary adjustments, repairs, and part replacements if wear, damage, or other problems are discovered during inspection.

- Torsion bar, height control arm
- Strut bar
- Stabilizer bar
- Shock absorber
- Rubber bushing

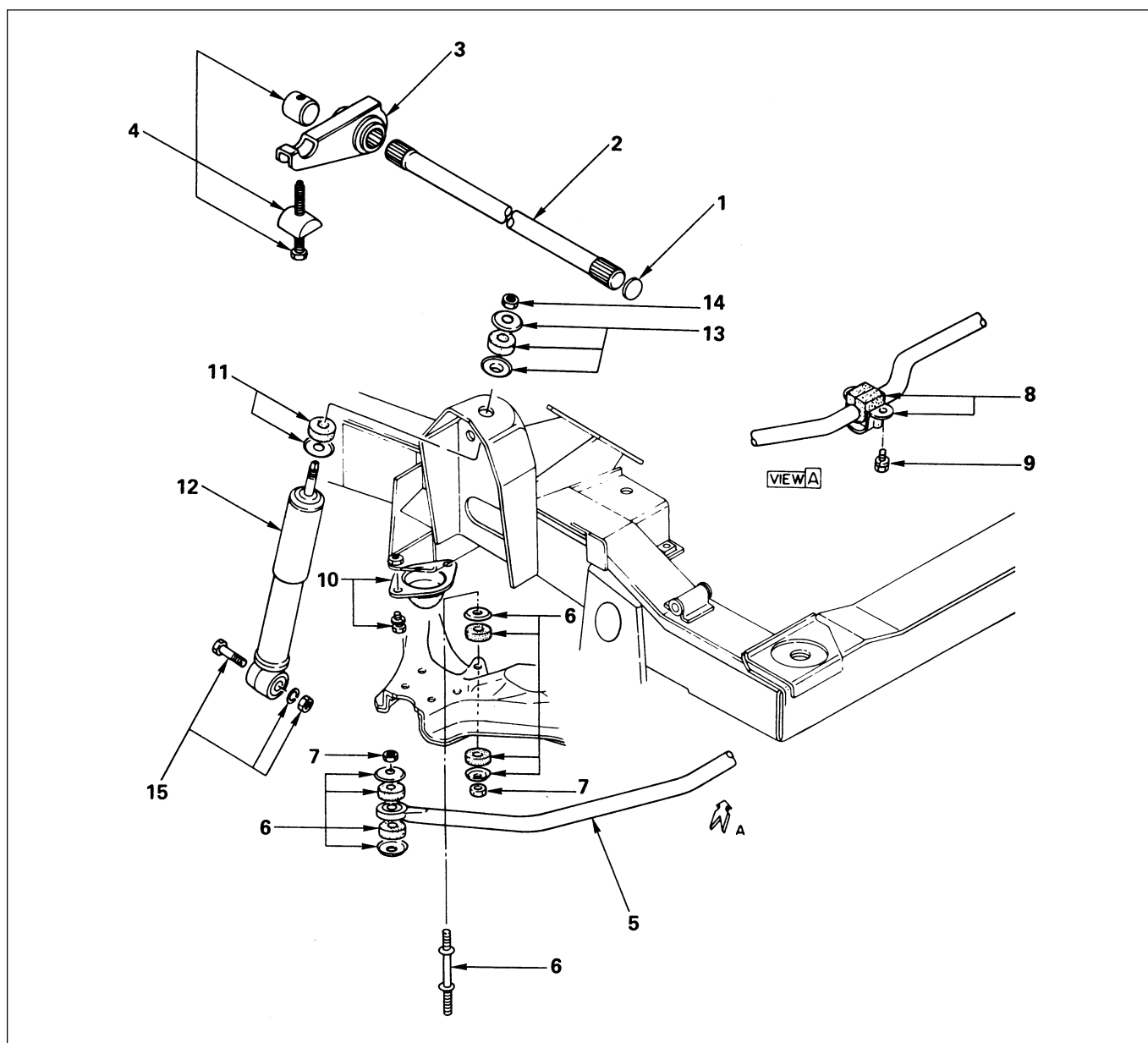


Visual Check

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



REASSEMBLY



Reassembly Steps

Torsion Bar

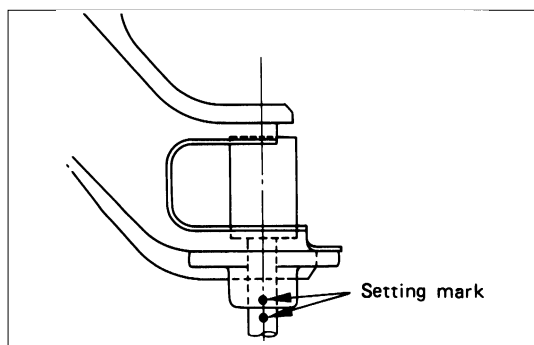
- 1. Rubber seat
- ▲ 2. Torsion Bar
- ▲ 3. Height control arm
- ▲ 4. Adjust bolt, seat

Stabilizer Bar

- 5. Stabilizer bar
- 6. Rubber bushing and washer
- ▲ 7. Nut
- 8. Bracket
- 9. Bolt

Shock Absorber

- 10. Lower link bumper
- 11. Rubber bushing and washer
- 12. Shock absorber
- 13. Rubber bushing and washer
- ▲ 14. Nut
- ▲ 15. Bolt, nut, and washer



Important Operations

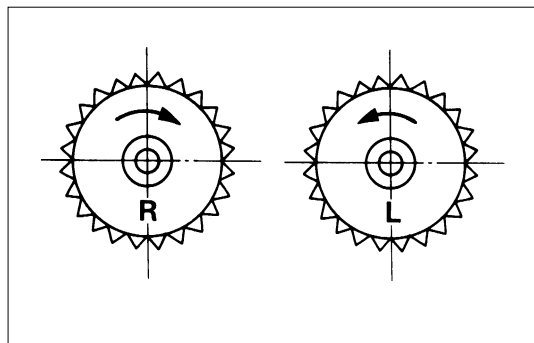


2. Torsion Bar

(1) Apply grease to the serrated portions.



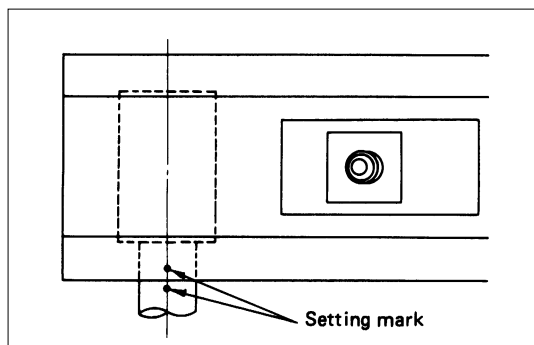
(2) Align the setting marks.



(3) Note the emboss mark on its side face.

R : Right side

L : Left side



3. Height Control Arm

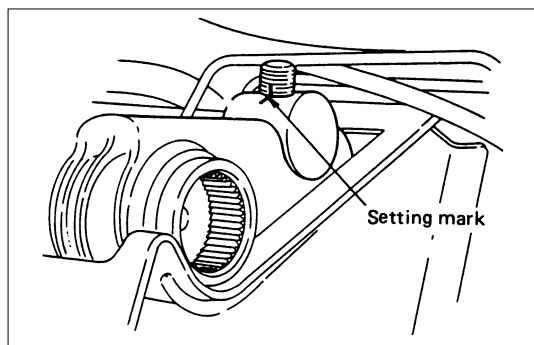
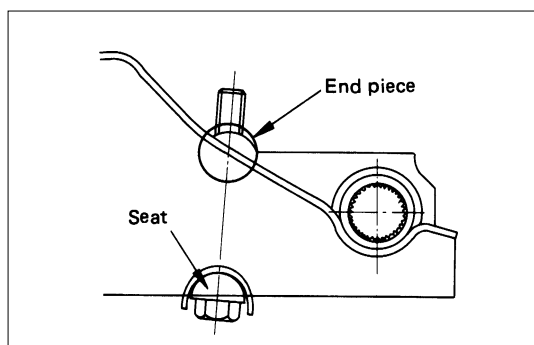
(1) Apply grease to the portion that fits into the bracket.

(2) Align the setting marks.



(3) Apply grease to the bolt portion of the end piece.

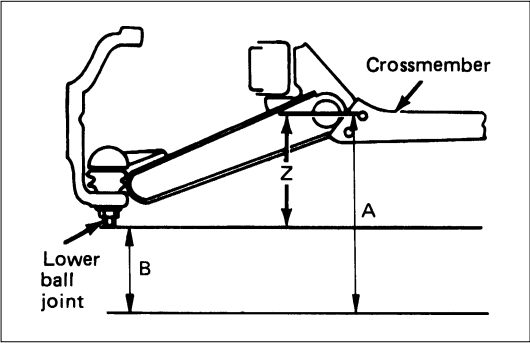
(4) Apply grease to the portion of the seat that fits in to the bracket.



4. Adjust Bolt

(1) Turn in the adjust bolt to location marked during disassembly.

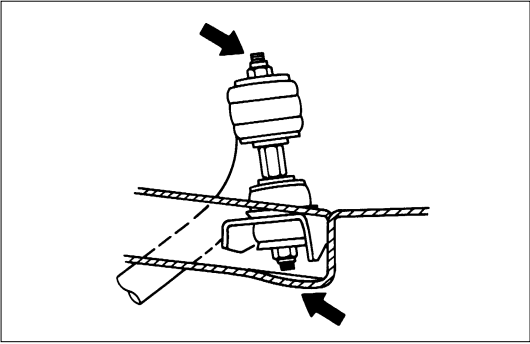
3C-24 FRONT SUSPENSION



(2) Check the vehicle trim height.

Trim height (Z) = A - B

Trim Height	mm(in)
130 (5.12)	



7. Bolt

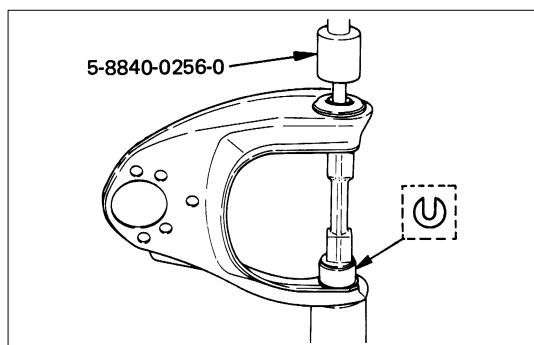
Stabilizer bar Bolt Torque	N·m (kgf·m/lb·ft)
9.8 (1.0/7.2)	

14.Nut

Shock Absorber Nut Torque	N·m (kgf·m/lb·ft)
19.6 ± 4.9 (2.0 ± 0.5/14.5 ± 3.6)	

15.Bolt

Shock Absorber Bolt Torque	N·m (kgf·m/lb·ft)
82.4 ± 7.8 (8.4 ± 0.8/60.8 ± 5.8)	

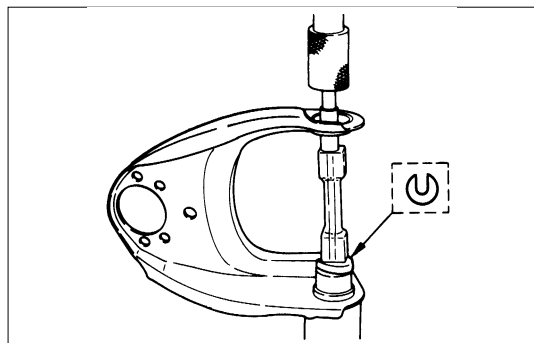


Important Operations



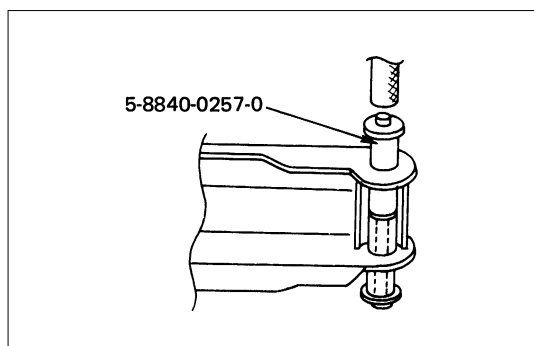
11. Bushing

Remover and installer : 5-8840-0256-0
(J-29755)



15. Lower Link Assembly

Before removal, remove the torsion bar, strut bar, stabilizer bar and shock absorber.



16. Bushing

Remover and installer : 5-8840-0257-0
(J-29756)

INSPECTION AND REPAIR

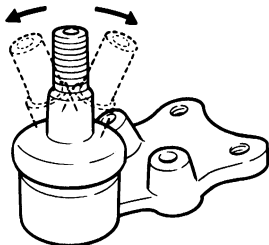
Make necessary correction or parts replacement if wear, damage or any other abnormal conditions are found through inspection.

- Knuckle, Knuckle arm
- Upper link, lower link, bushing
- Upper end, lower end, boot
- Fulcrum pin



Visual Check

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



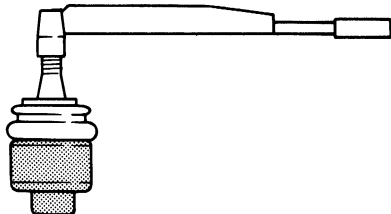
Upper Link End and Lower Link End

Inspect the upper and lower link end boot for damage or grease leak.

Move the Ball Joint as shown in the illustration, then confirm its normal movement.

Inspect screw/taper area of Ball Joint for defects.

If any defects are found by the above inspections, replace the end assembly with new one.



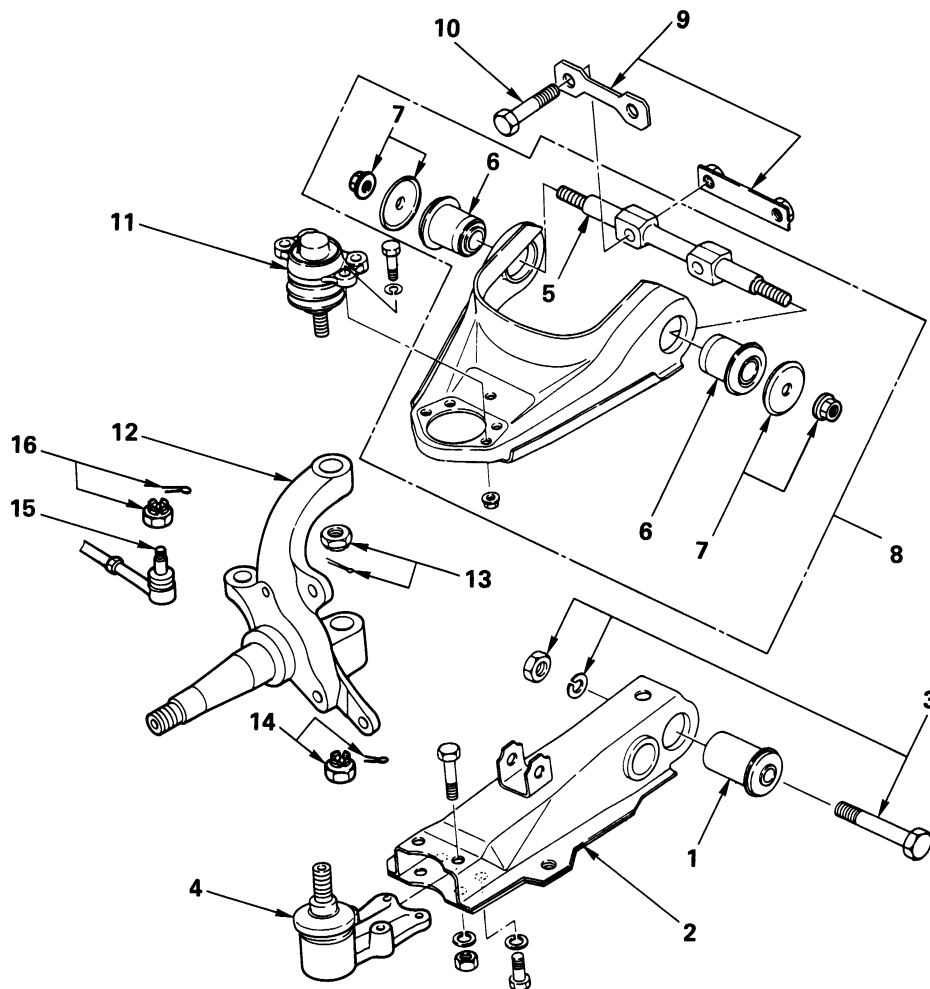
After moving the Ball Joint 4 or 5 times, attach nuts then measure the preload.

Preload		N·m (kgf·m/lb·ft)
Upper link end		0.9 - 3.2 (0.1 - 0.33/0.7 - 2.4)
Lower link end		0.5 - 3.4 (0.05 - 0.35/0.35 - 2.5)

If above limits specified are exceeded, replace the end assembly.



REASSEMBLY



Reassembly Steps

Lower Link

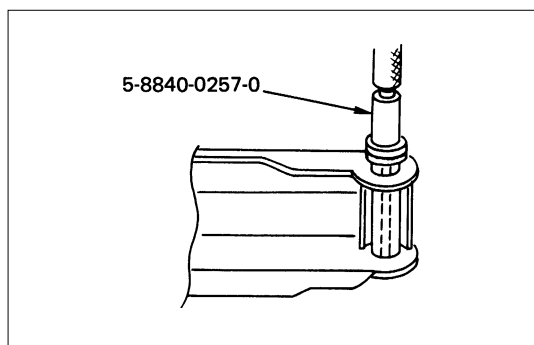
- ▲ 1. Bushing
- ▲ 2. Lower link assembly
- ▲ 3. Bolt, nut, and washer
- ▲ 4. Lower end

Upper Link

- ▲ 5. Fulcrum pin
- ▲ 6. Bushing
- ▲ 7. Plate and nut
- 8. Upper link assembly
- 9. Nut Assembly
- ▲ 10. Bolt and washer
- ▲ 11. Upper end

Knuckle

- 12. Knuckle
- ▲ 13. Nut and cotter pin
- ▲ 14. Nut and cotter pin
- 15. Steering link end
- ▲ 16. Nut and cotter pin



Important Operations



1. Bushing

Remover and Installer : 5-8840-0257-0
(J-29756)

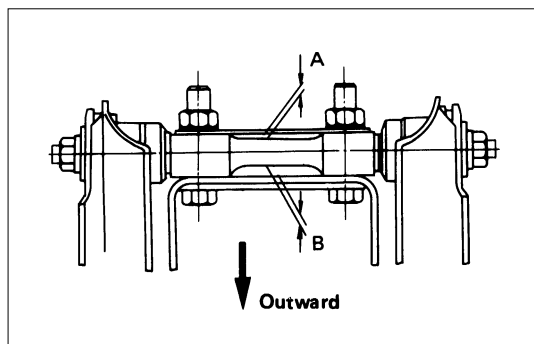
3. Bolt, Nut and Washer

Tighten lower link nut finger-tight.
Perform the secure tightening after adjusting buffer clearance.



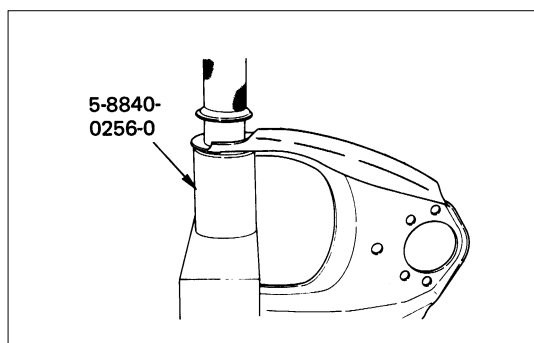
4. Lower End

Lower End Bolt Torque	N·m (kgf·m/lb·ft)
68.7 ± 6.9 ($7.0 \pm 0.7/50.6 \pm 5.1$)	



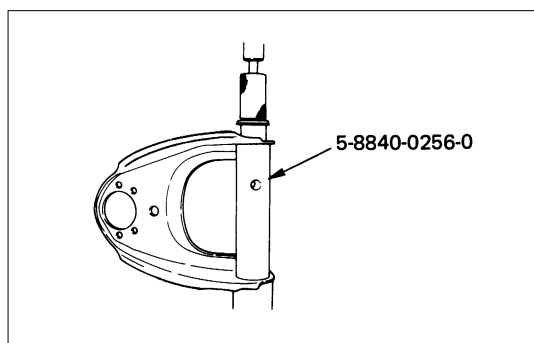
5. Fulcrum Pin

Install the smaller clearance A to be inside and larger clearance B outside of vehicle.



6 Bushing

Remover and Installer : 5-8840-0256-0
(J-29755)



7. Plate and Nut

Tighten fulcrum pin nut finger-tight.
Perform the secure tightening after adjusting buffer clearance.



10.Bolt

Fulcrum Pin Bolt Torque	N·m (kgf·m/lb·ft)
152.0 ± 14.7 ($15.5 \pm 1.5/112.1 \pm 10.8$)	



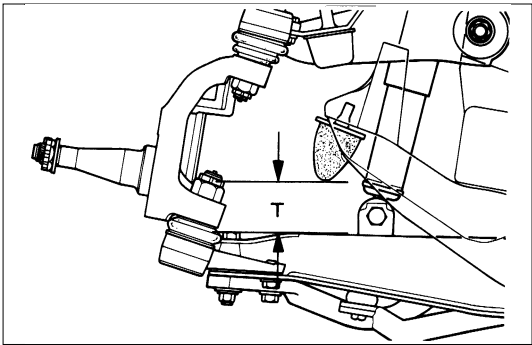
11.Upper End

Upper End Torque	N·m (kgf·m/lb·ft)
32.4 ± 2.9 ($3.3 \pm 0.3/23.9 \pm 2.2$)	



13.14. 16. Nut

Knuckle Nut Torque		N·m (kgf·m/lb·ft)
Lower End	147.1 ± 9.8 ($15.0 \pm 1.0/108.5 \pm 7.2$)	
Upper End	107.9 ± 9.8 ($10.0 \pm 1.0/79.7 \pm 7.2$)	
Steering Link End	107.9 ± 9.8 ($10.0 \pm 1.0/79.7 \pm 7.2$)	



Fasten the bushing nut, and keep the buffer clearance as shown on the left diagram.
 $T = 53 \text{ mm}$ (2.09 in)



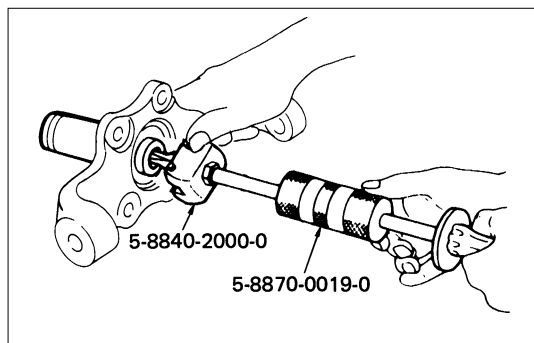
Lower Link Nut

Lower Link Nut Torque	N·m (kgf·m/lb·ft)
126.5 ± 12.8 ($12.9 \pm 1.3/93.3 \pm 9.4$)	



Upper Link Nut

Upper Link Nut Torque	N·m (kgf·m/lb·ft)
107.9 ± 14.7 ($11.0 \pm 1.5/79.6 \pm 10.8$)	



Important Operations



7. Needle Bearing (4x4 model)

Remover : 5-8840-2000-0

(J-5822)

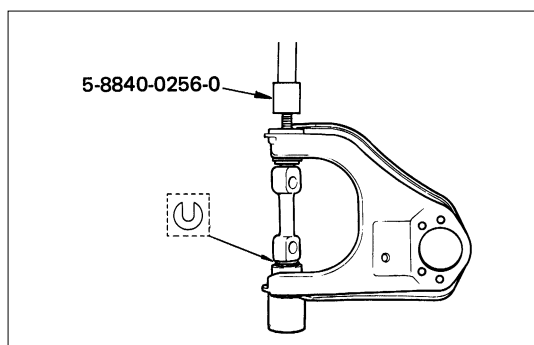
Sliding hammer : 5-8840-0019-0

(J-23907)

11.Camber Shims

12.Caster Shims

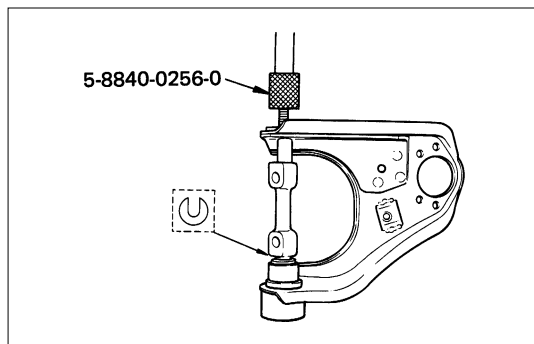
Note the positions and number of shims.



16.Bushing

Remover and installer : 5-8840-0256-0

(J-29755)

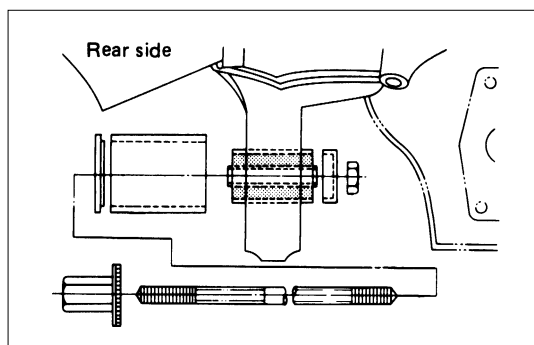


23.Lower Link Assembly

Before removal, remove the torsion bar, stabilizer bar and shock absorber.

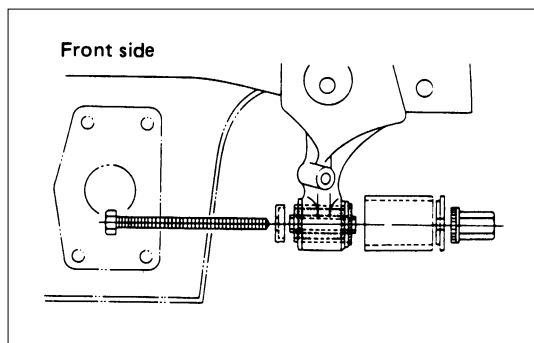
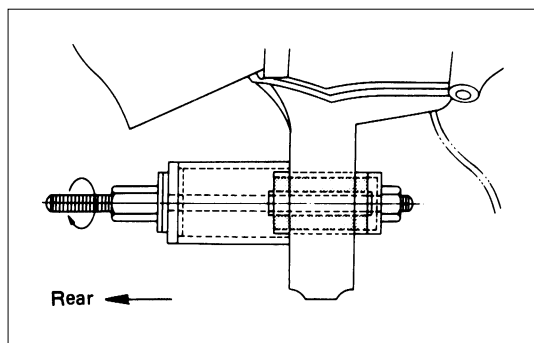


Brake hoses should be removed before disassembly and installed after reassembly to avoid serious damage.



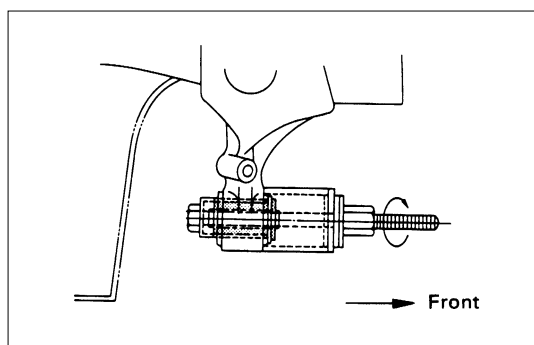
25. Bushing : Rear Side

Remover and Installer : 5-8840-2124-0
(J-36834)



26. Bushing : Front Side

Remover and Installer : 5-8840-2123-0
(J-36833)





INSPECTION AND REPAIR

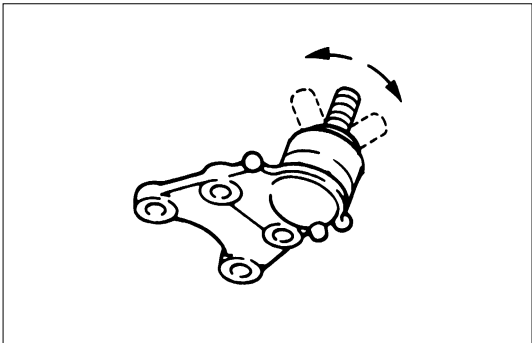
Make necessary correction or parts replacement if wear, damage or any other abnormal conditions are found through inspection.

- Knuckle, Knuckle arm
- Needle bearing, oil seal (4×4 model)
- Upper link, lower link, bushing
- Upper end, lower end, boot
- Fulcrum pin
- Thrust washer



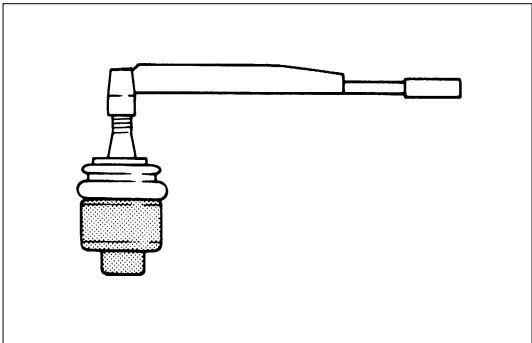
Visual Check

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



Upper Link End and Lower Link End

Inspect the upper and lower link end boot for damage or grease leak.
Move the Ball Joint as shown in the illustration, then confirm its normal movement.
Inspect screw/taper area of Ball Joint for defects.
If any defects are found by the above inspections, replace the end assembly with new one.



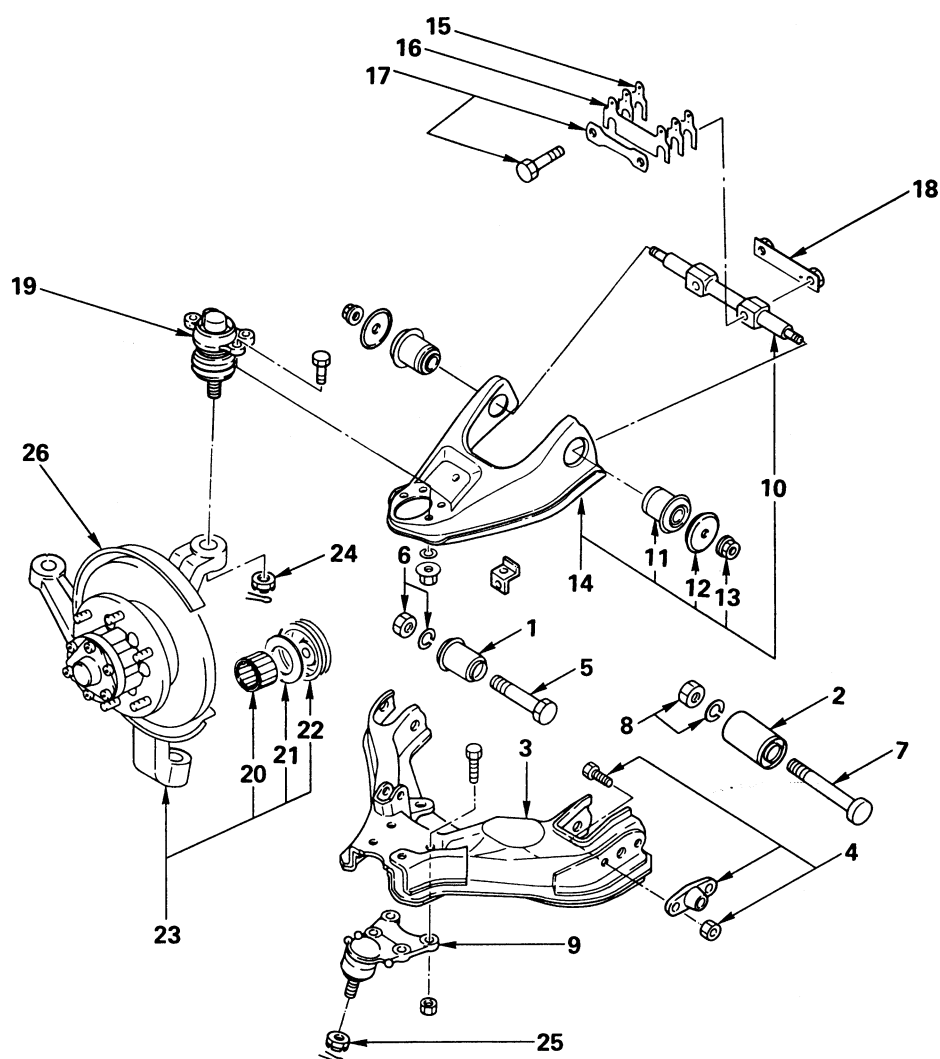
After moving the Ball Joint 4 or 5 times, attach nuts then measure the preload.

Preload		N·m (kgf·m/lb·ft)
Upper link end		0.9 - 3.2 (0.1 - 0.33/0.7 - 2.4)
Lower link end		0.06 - 0.64 (0.07 - 0.65/0.15 - 1.43)

If above limits specified are exceeded, replace the end assembly.



REASSEMBLY



Reassembly Steps

Lower Link

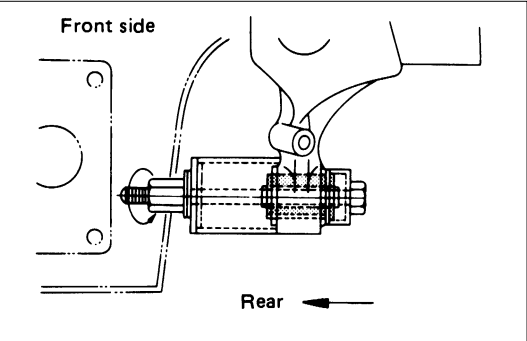
- ▲ 1. Bushing ; front
- ▲ 2. Bushing ; rear
- ▲ 3. Lower link assembly
- ▲ 4. Torsion bar arm
- ▲ 5. Bolt
- ▲ 6. Nut and washer
- ▲ 7. Bolt
- ▲ 8. Nut and washer
- ▲ 9. Lower End

Upper Link

- 10. Fulcrum pin
- ▲ 11. Bushing
- 12. Plate
- ▲ 13. Nut
- ▲ 14. Upper link assembly
- ▲ 15. Caster shims
- ▲ 16. Caster shims
- ▲ 17. Bolt and plate
- 18. Nut assembly
- ▲ 19. Upper end

Knuckle

- ▲ 20. Needle bearing (4×4 model)
- 21. Washer (4×4 model)
- ▲ 22. Oil seal (4×4 model)
- 23. Knuckle
- ▲ 24. Nut and cotter pin
- ▲ 25. Nut and cotter pin
- 26. Back plate

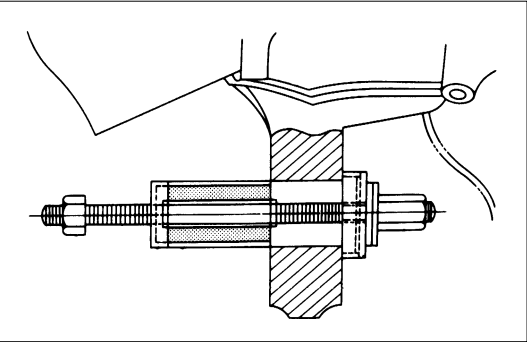


Important Operations



1. Bushing ; Front Side

Remover and Installer : 5-8840-2123-0
(J-36833)



2. Bushing ; Rear Side

Remove and Installer : 5-8840-2124-0
(J-36834)



4. Torsion Bar Arm

Torsion Bar Arm Torque	N·m (kgf·m/lb·ft)
115.7 ± 9.8 ($11.8 \pm 1.0/85.3 \pm 7.2$)	

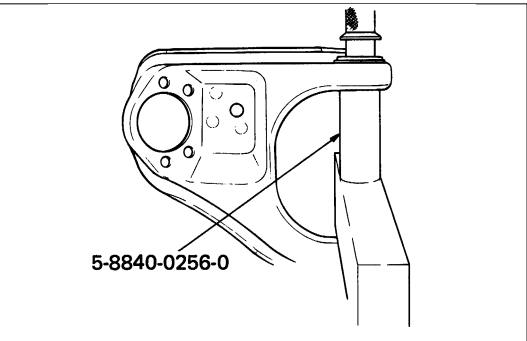
6. 8. Nut and Washer

Tighten Lower Link Nut finger-tight.
Perform the secure tightening after adjusting buffer clearance.



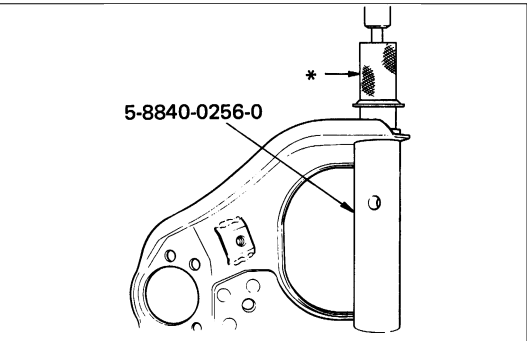
9. Lower End

Lower End Bolt Torque	N·m (kgf·m/lb·ft)
103.0 ± 9.8 ($10.5 \pm 1.0/75.9 \pm 7.2$)	



11. Bushing

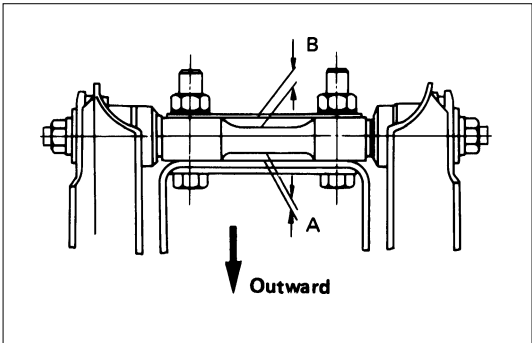
Remover and Installer : 5-8840-0256-0
(J-29755)



Apply a suitable socket to (*) portion.

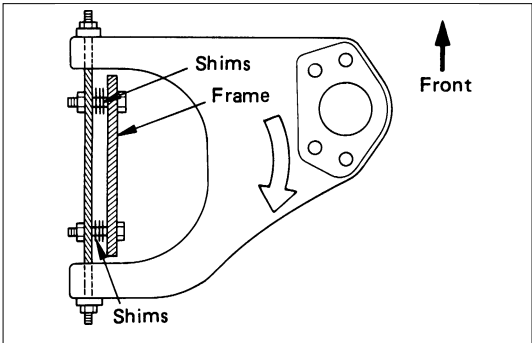
13.Nut

Tighten fulcrum pin nut finger-tight.
Perform the secure tightening after adjusting buffer clearance.



14.Upper Link Assembly

Install the smaller clearance A outside and larger clearance B inside of vehicle.



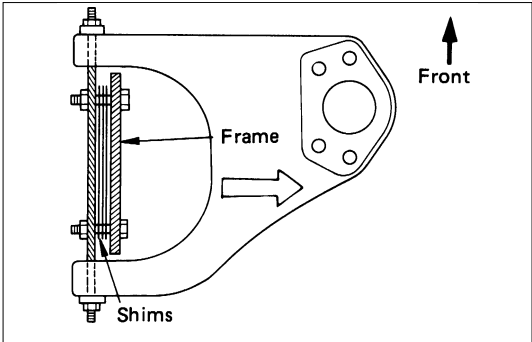
15.Caster Shims

Caster angle

Short Wheel Base	Long Wheel Base
$1^{\circ}55' \pm 45'$	$2^{\circ}10' \pm 45'$

Note :

No more than 35' side to side variation.



16.Camber Shims

Camber angle

$30' \pm 60'$

Note :

No more than 45' side to side variation.



17.Bolt and Plate

Fulcrum Pin Bolt Torque N·m (kgf·m/lb·ft)



152.0 ± 14.7 ($15.5 \pm 1.5/112.1 \pm 10.8$)

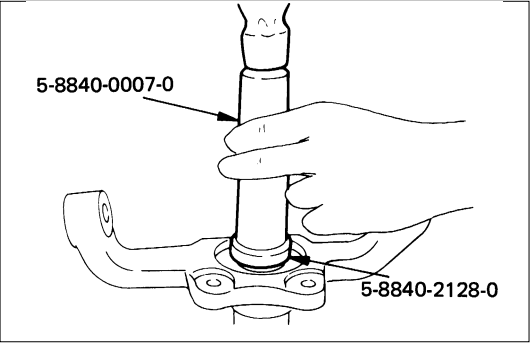
Apply oil to the thread.



19.Upper End

Upper End Bolt Torque N·m (kgf·m/lb·ft)

32.4 ± 2.9 ($3.3 \pm 0.3/23.9 \pm 2.2$)



20.Needle Bearing (4×4 model)

Installer : 5-8840-2128-0

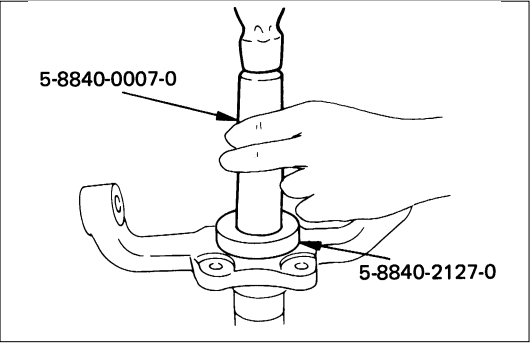
(J-36838)

Grip : 5-8840-0007-0

(J-8092)



Before installation, apply the appropriate amount of specified grease (Besco L2 or equivalent) to the bearing (Approx. 15g).



22.Oil Seal (4×4 model)

Installer : 5-8840-2127-0

(J-36837)

Grip : 5-8840-0007-0

(J-8092)

- Insert the thrust washer into the knuckle.
- After fitting the oil seal to the setting tool; installer, drive it to the knuckle using a hammer or bench press until the tool front face contacts with the thrust washer.
- Apply the specified grease to the thrust washer, and install after turning the place where there is a chamfer to the spindle.



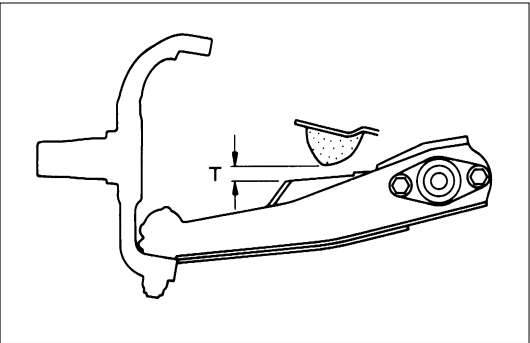
- Use a new oil seal, and apply the specified grease (Besco L2 or equivalent) to the place surrounded by the lip (Approx. 15g).



24.25. Nut and Cotter Pin

Torque N·m (kgf·m/lb·ft)

Upper Link End	98.1 ± 9.8 ($10.0 \pm 1.0/72.3 \pm 7.2$)
Lower Link End	127.5 ± 9.8 ($13.0 \pm 1.0/94.0 \pm 7.2$)
Track Rod End	107.9 ± 9.8 ($11.0 \pm 1.0/79.6 \pm 7.2$)



Fasten the bushing nut and keep the buffer clearance as shown on the left diagram.

T = 15 mm (0.59 in)



Nut and Washer

Front Lower Link Nut Torque N·m (kgf·m/lb·ft)



156.9 ± 19.6 (16.0 ± 2.0/115.7 ± 14.5)

Apply oil to the thread.



Nut and Washer

Rear Lower Link Nut Torque N·m (kgf·m/lb·ft)



196.1 ± 19.6 (20.0 ± 2.0/144.7 ± 14.5)

Apply oil to the thread.



Nut

Fulcrum Pin Nut Torque N·m (kgf·m/lb·ft)

152.0 ± 14.7 (11.0 ± 1.5/112.1 ± 10.8)

Apply oil to the thread.

TROUBLESHOOTING

1. VIBRATION, SHOCK, AND SHIMMY OF STEERING WHEEL

Checkpoint		Trouble Cause	Countermeasure
Check vehicle trim height	NG	Incorrect	Adjust
OK			
Check shock absorber or attaching nut and bolt	NG	Malfunction or loose	Replace or retighten
OK			
Check upper and lower link bushings	NG	Worn	Replace
OK			
Check suspension ball joint	NG	Worn	Replace
OK			
Check wheel alignment	NG	Faulty	Adjust
OK			
Check front axle	NG	Check steering unit and linkage	Check tires and wheels

- Improperly adjusted or worn front wheel bearing.
 - Worn or incorrectly adjusted wheel bearing.
- Replace; refer to Section 4C "Front Wheel Drive"**

- Insufficiently tightened steering gear housing.
 - Wear of steering linkage.
 - Excessive backlash due to improper adjustment of the steering gear box.
 - Worn column bearing weakened column bearing spring, or loose clamp.
- Replace; refer to Section 3B "Steering"**

- Improper tire pressure.
 - Imbalance and deformation of frond wheel.
 - Unevenly worn tire or insufficient tightening of wheel nuts.
- Replace; refer to Section 3E "Wheel and Tires"**

2. VEHICLE PULLS TO RIGHT OR LEFT

Checkpoint		Trouble Cause	Countermeasure
Torsion bar	NG	Collapsed or twisted	Replace
OK			
Vehicle trim height	NG	Incorrect	Adjust
OK			
Brake adjustment (binding)	NG	Incorrect	Adjust
OK			
Wheel alignment	NG	Incorrect	Adjust
OK			
Rubber bushing for upper and lower link, and strut bar	NG	Worn	Replace
OK			
Steering linkage, and upper and lower link and strut bar	NG	Deformed Replace	Front wheel bearing
OK			
Front wheel bearing	NG	Incorrect adjustment or abrasion	Adjust or replace

Continued on the next page

Checkpoint		Trouble Cause	Countermeasure
Continued from the previous page			
Tire pressure or wheel nuts	NG	Improper or instufficient tightening	Adjust or tighten
OK			
Tire tread (right and left)	NG	Difference in wear and tear	Replace (tire)

3. INSTABILITY OF VEHICLE

Checkpoint		Trouble Cause	Countermeasure
Vehicle trim height	NG	Incorrect	Adjust
OK			
Rubber bushings for upper and lower links, and strut bar (4 × 2)	NG	Worn	Replace
OK			
Steering linkage and upper and lower links	NG	Worn or deformed	Replace
OK			
Wheel alignment	NG	Incorrect	Adjust
OK			
Steering gear (back lash and worm bearing preload)	NG	Incorrect	Adjust
OK			
Tire pressure	NG	Incorrect	Adjust
OK			
Road wheel	NG	Deformed or unbalanced	Adjust

4. STIFF STEERING WHEEL

Checkpoint		Trouble Cause	Countermeasure
Upper and ball joint	NG	Stiff or damaged or lack of grease	Replace
OK			
Wheel alignment	NG	Incorrect	Adjust
OK			
Steering gear (Back lash)	NG	Incorrect	Adjust
OK			
Steering gear	NG	Worn or damaged	Replace
OK			
Steering linkage	NG	Deformed	Replace
OK			
Steering gear box or steering linkage	NG	Insufficient lubricants or impurities present; or excessively worn	Replace the part
OK			
Steering column with turn signal switch	NG	Interference abrasion	Replace
OK			
Tire pressure	NG	Improper	Adjust

5. NOISES

Checkpoint		Trouble Cause	Countermeasure
Strut bar (4 × 2)	NG	Broken	Replace
OK			
Upper and lower links and strut bar bushings	NG	Worn	Replace
OK			
Shock absorber fixing nut and bolt	NG	Loose	Retighten
OK			
Stabilizer fixing nuts and bolts	NG	Loose	Retighten
OK			
Shock absorber	NG	Faulty	Replace
OK			
Lubricating oil and grease for upper and lower ball joint	NG	Insufficient	Replace
OK			
Upper and lower ball joint	NG	Damaged	Replace

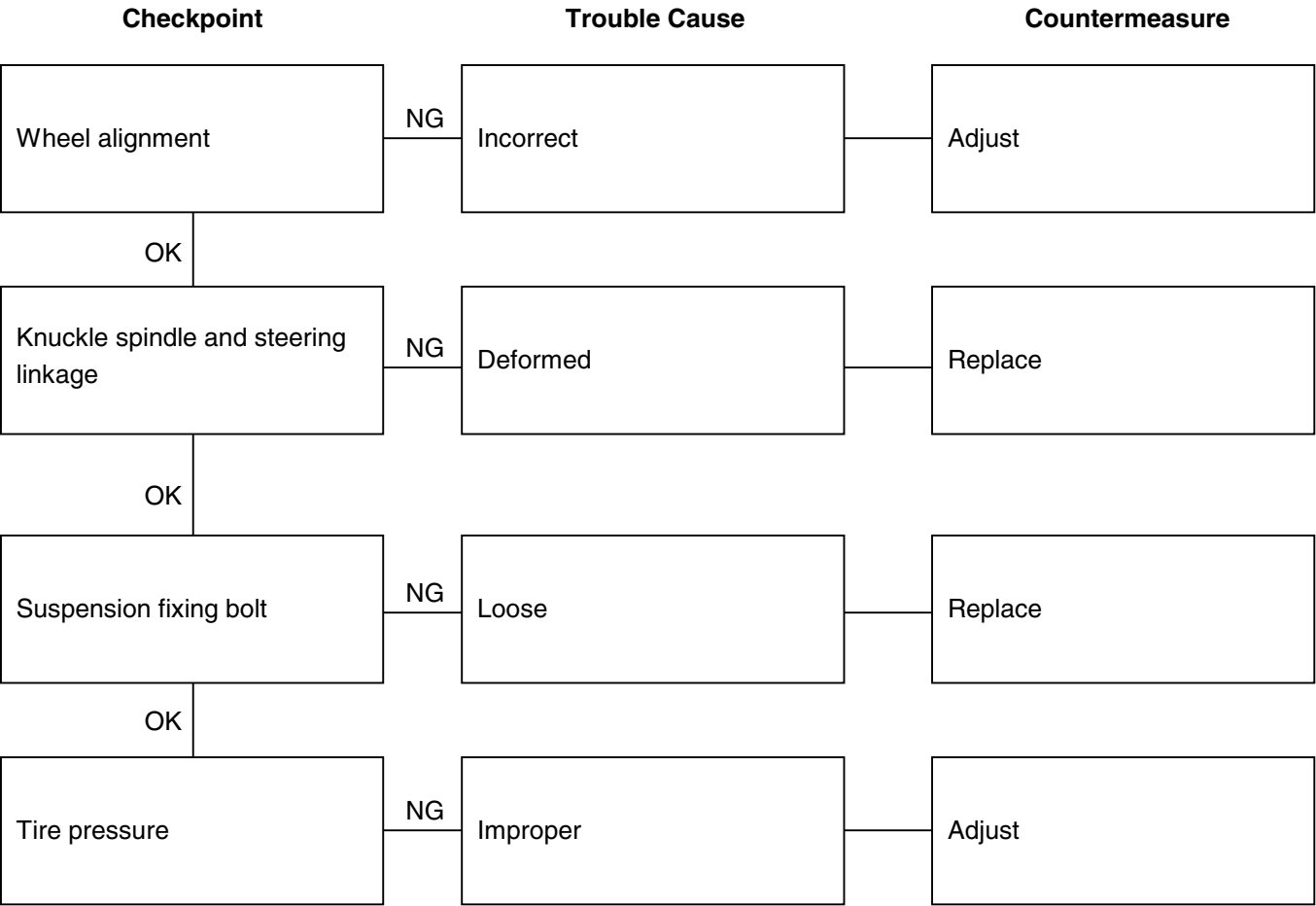
Continued on the next page

Checkpoint		Trouble Cause	Countermeasure
Continued from the previous page			
OK			
Tire pressure	NG	Improper	Adjust
OK			
Steering linkage and steering gear	NG	Worn	Replace
OK			
Front wheel bearing	NG	Incorrect adjustment or abrasion	Adjust or replace
OK			
Steering unit fixing bolts and linkage	NG	Loose	Retighten
OK			
Lubricating oil and grease to steering linkage	NG	Insufficient	Replace

6. EXCESSIVE STEERING WHEEL PLAY

Checkpoint		Trouble Cause	Countermeasure
Upper, and lower links, and strut bar bushing (4 × 2)	NG	Worn	Replace
OK			
Steering linkage	NG	Worn	Replace
OK			
Adjusted gear housing	NG	Incorrectly	Adjust
OK			
Front wheel bearing	NG	Incorrect adjustment or abrasion	Adjust or replace

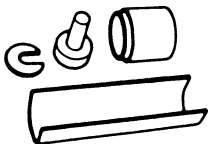
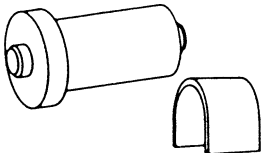
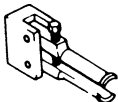
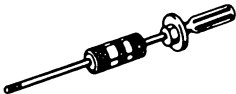
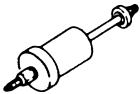
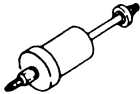
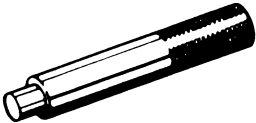
7. GRATING TIRE NOISE



8. EXCESSIVELY OR PARTIALLY WORN TIRE

Checkpoint		Trouble Cause	Countermeasure
Tire pressure	NG	Improper	Adjust
OK			
Wheel alignment	NG	Incorrect	Adjust
OK			
Front wheel bearing	NG	Faulty	Replace
OK			
Brake adjustment	NG	Incorrect	Adjust
OK			
Tire rotation	NG	Not rotated	Rotate tires at recommended intervals

SPECIAL SERVICE TOOL (C22, C20 Series Engine Model)

ITEM NO.	ILLUSTRATION	PART NO.	PART NAME
SUL-1		5-8840-0256-0 (J-29755)	Upper link bushing remover & installer
SUL-6		5-8840-0257-0 (J-29756)	Lower link bushing remover & installer
SUL-3		5-8840-2000-0 (J-5822)	Knuckle needle bearing remover
OTL-2		5-8840-0019-0 (J-23907)	Sliding hammer (small)
SUL-5		5-8840-2124-0 (J-36384)	Rear lower link bushing remover & installer kit
SUL-4		5-8840-2123-0 (J-36833)	Front lower link bushing remover & installer kit
SUL-10		5-8840-2128-0 (J-36838)	knuckle needle bearing installer
OTL-1		5-8840-0007-0 (J-8092)	Driver handle
SUL-9		5-8840-2127-0 (J-36838)	Knuckle oil seal installer

SECTION 3D

REAR SUSPENSION

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Rear Suspension	3D- 4
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Inspection and Repair	3D- 7
Reassembly	3D- 9
Troubleshooting	3D- 12

MAIN DATA AND SPECIFICATIONS

Items		Models	Standard			Have-duty Suspension		Flat Deck	
		4 × 2 (except TFR25)	4 × 4	TFR25	4 × 2 (except TFR25)	4 × 4 and TFR25	4 × 2	4 × 4	
Type			Semi-elliptic, rubber bushed, leaf type springs and direct double acting shock absorbers.						
Main spring									
No. of leaves			4		6		4		
Leaf thickness - Numbered			7(0.276); No.1-2		7(0.276) ; No.1		7(0.276); No.1-4		
(Top to bottom)			6 (0.236); No. 3		6(0.236) ;No.2-3		8(0.315); No.1-2		
			15(0.591); No.4		12(0.472); No.5-6		7 (0.709); No. 3		
							18(0.709); No.4		
Spring eye type			Berlin eye type						
Bushing outside dia.			Front; 40 (1.575), Rear; 30 (1.181)						
Length			1200 (47.244)						
Width			60 (2.362)						
Rate - Unclamped			2.61/7.96		2.23/ 8.13		3.91/8.34		
			(146.0/445.4)		(124.8/ 454.9)		3.95/12.8		
							(218.8/466.7)		
							(221.0/716.2)		
Clamped			2.87/8.75		2.47/8.72		4.30/9.17		
			(160.6/489.6)		(138.3/487.9)		4.37/14.2		
							(240.6/513.1)		
							(244.5/794.6)		
Rear spring capacity			768	763	701	760	755	715	720
			(7532/1693)	(7483/1682)	(1545/6877)	(7423/1676)	(7404/1664)	(7012/1576)	(7061/1587)
Weight			153 (15.6/34.4)		16.2 (35.7/ 158.9)		196 (20.0/44.1)		
							180 (18.4/40.6)		
Rear shock absorbers									
Type			Hydraulic, double acting, telescopic						
			Gas-sealed Hydraulic, double acting telescopic						
			(For Australia)						
Mean stroke			245 (9.65)						
Compressed length			353 (13.90)						
Extended length			598 (23.54)						
Bump rubber									
Height			69 (2.72)	84 (3.31)	69 (2.72)	84 (3.31)	84 (3.31)	84 (3.31)	
For Australia			69 (2.72)	99 (3.90)	69 (2.72)	99 (3.90)	-	-	

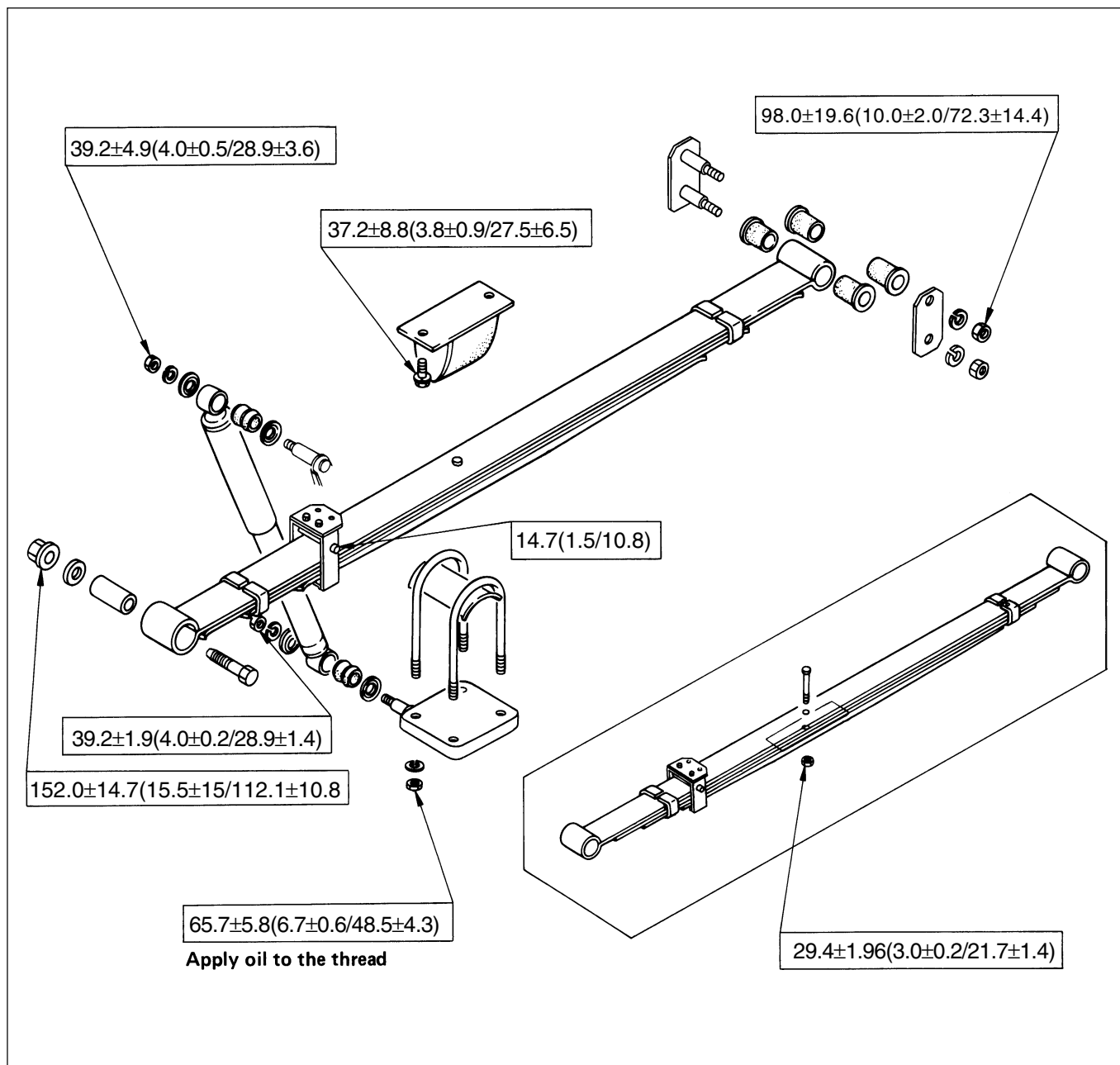
TORQUE SPECIFICATIONS



SPECIAL PARTS FIXING NUTS AND BOLTS

Rear suspension

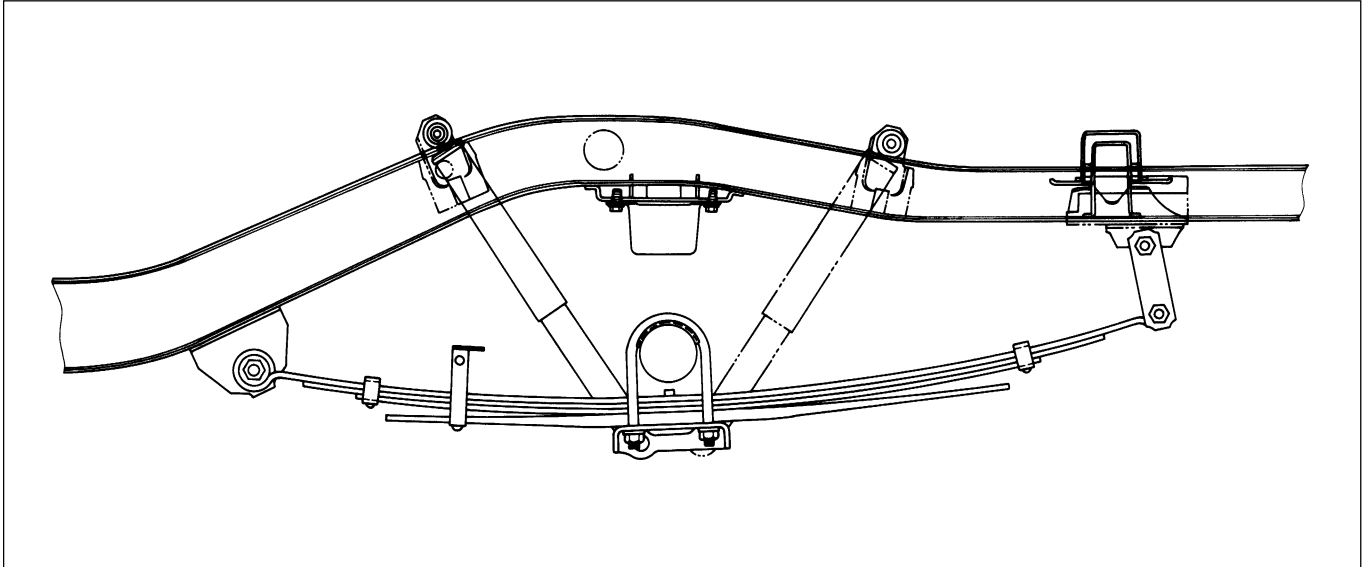
N·m(kgf·m/lb·ft)



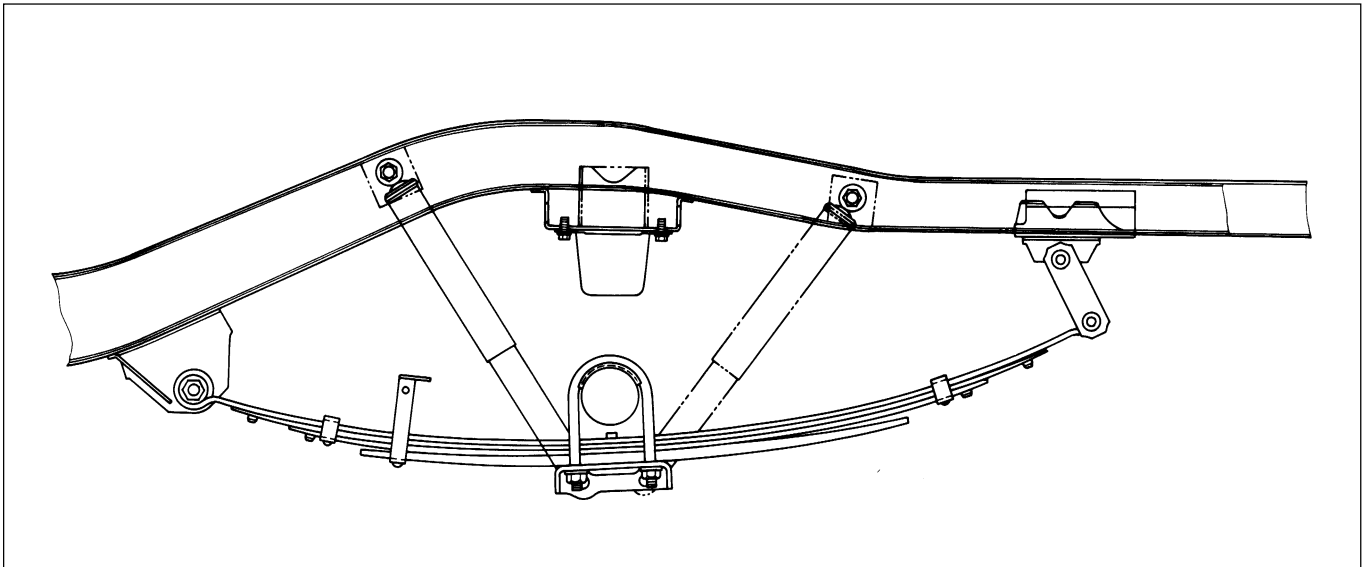
REAR SUSPENSION

GENERAL DESCRIPTION

4×2 Model (except TFR25)



4×4 Model and TFR25

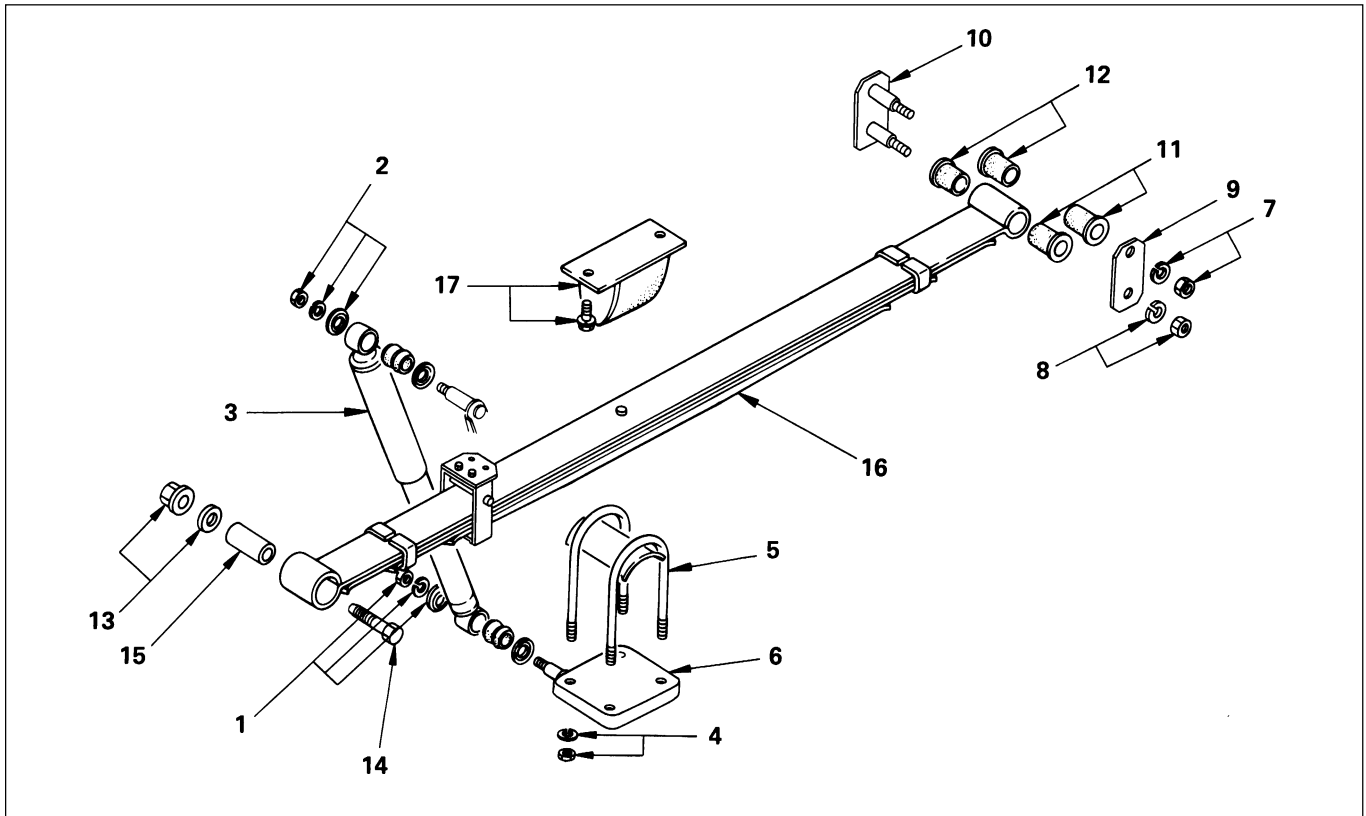


Rear suspension absorbs vibration from the road surface thus preventing vehicle damage, as well as providing a good ride.

Components parts

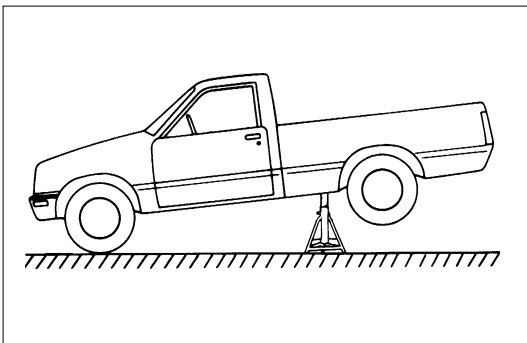
- Spring between the body and the axle case
- Spring shackle connecting the spring to the body
- Clamp and U-bolt fixing the axle case to the spring
- Shock absorber as a countermeasure for vibration

DISASSEMBLY



Disassembly Steps

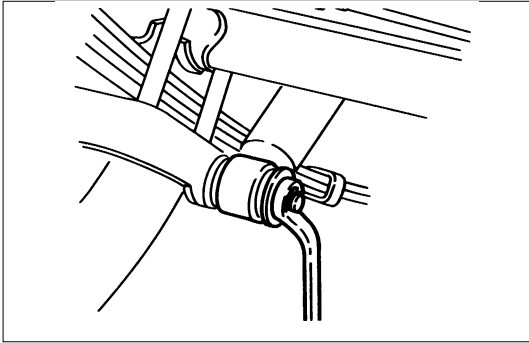
- ▲ 1. Nut and washer
- ▲ 2. Nut and washer
- 3. Shock absorber
- ▲ 4. Nut and washer
- ▲ 5. U-bolt
- 6. Lower clamp
- ▲ 7. Nut and washer
- ▲ 8. Nut and washer
- ▲ 9. Shackle plate
- ▲ 10. Shackle
- 11. Rubber bushing
- 12. Rubber bushing
- ▲ 13. Nut and washer
- ▲ 14. Bolt, washer and spring pin
- ▲ 15. Bushing
- 16. Leaf spring assembly
- 17. Bolt and dump rubber



Important Operations

Jack up the rear axle and place chassis stands under the frame near the front end of the rear spring brackets.

3D-6 REAR SUSPENSION

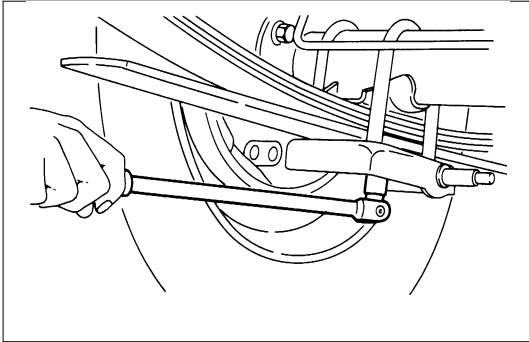


1. 2. Nut and Washer

Caution (Australia only):

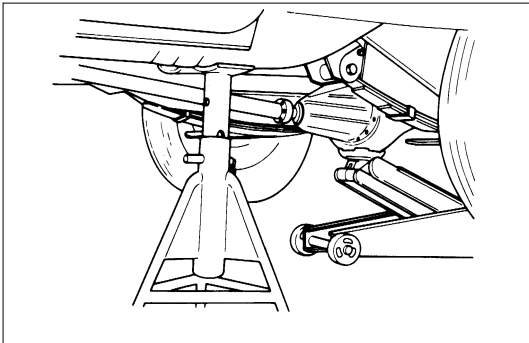
The shock absorbers have been charged with gas at the factory. Exposure to high temperatures or an open flame can result in a dangerous explosion.

Keep the shock absorbers away from high temperatures and open flames.

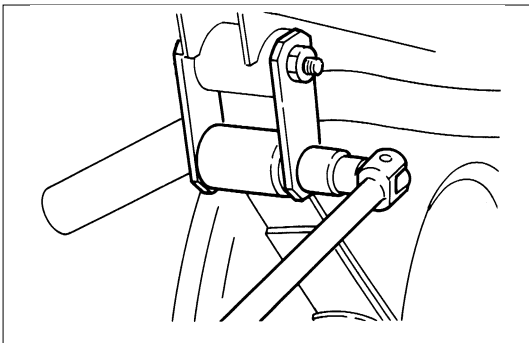


4. Nut and Washer

5. U-bolt



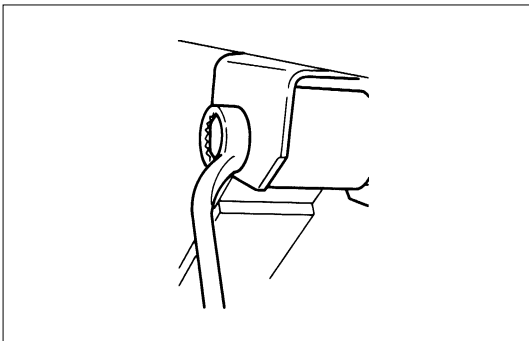
Jack up the rear axle case slightly to separate it from the leaf spring assemblies.



7. 8. Nut and Washer

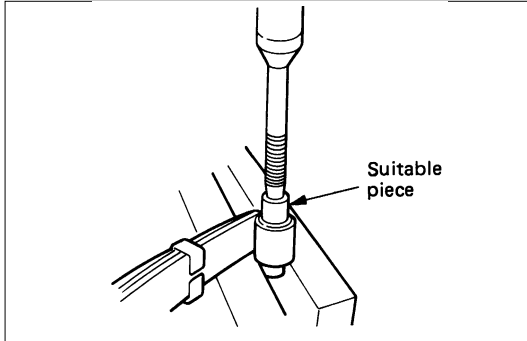
9. 10. Shackle

Remove the nut and drive out the shackle with a hammer using a brass bar.



13.14. Nut, Washer, Bolt and Spring Pin

Remove the nut and drive out the spring pin with a hammer using a brass drift.



15. Bushing

Remove the bushing using a bench press.



INSPECTION AND REPAIR

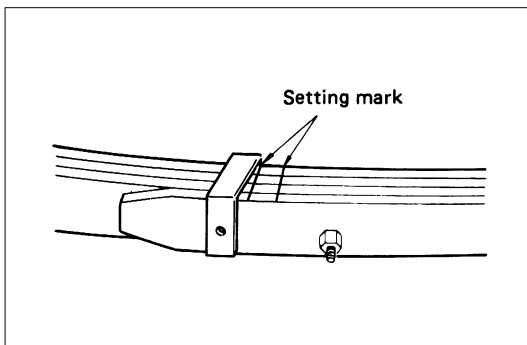
Make correction or parts replacement if wear, damage or their abnormal conditions are found through inspection.

- Leaf spring assembly
- Clip
- Center bolt
- U-bolt
- Spring pin
- Shackle pin
- Shock absorber
- Bump rubber
- Rubber bushing
- Bump rubber seat



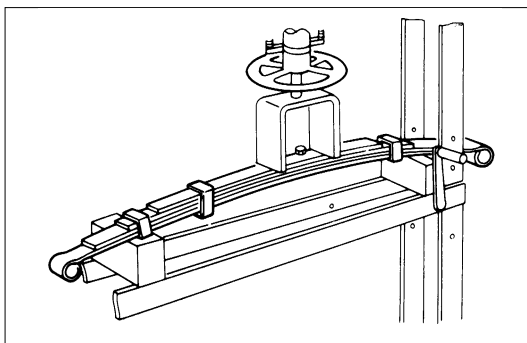
Visual Check

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



Leaf Spring Assembly Replacement

- Apply a setting mark across the springs before disassembling the leaf spring assembly.
- Apply grease to both faces of each leaf spring at assembly.
- Use a bench press for disassembly and reassembly.
- Discard center bolt and install a new one.

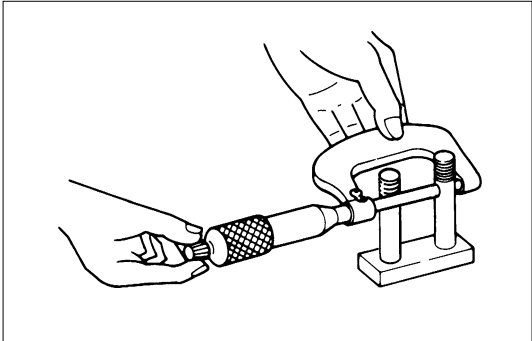


Center bolt

Center Bolt Torque

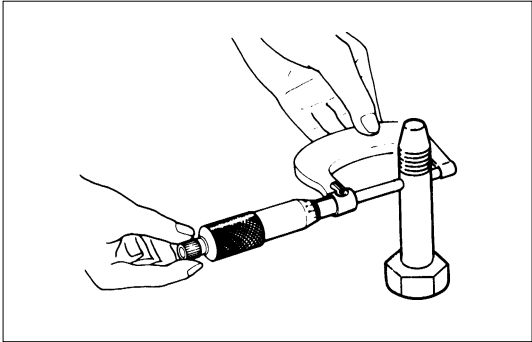
N·m(kgf·m/lb·ft)

29.4 ± 19.6 (3.0 ± 0.2 / 21.7 ± 1.4)



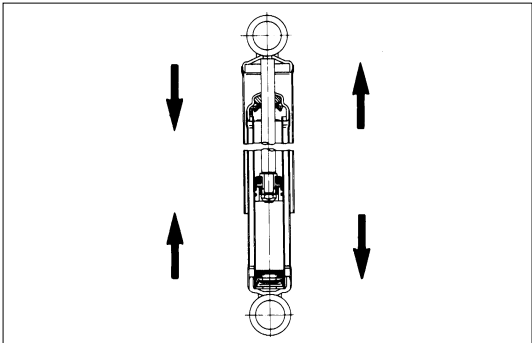
Shackle Pin

Shackle Pin diameter	mm(in)
17.93 - 18.00 (0.706 - 0.709)	



Spring Pin

Spring Pin Diameter	mm(in)
13.8 - 14.0 (0.543 - 0.551)	

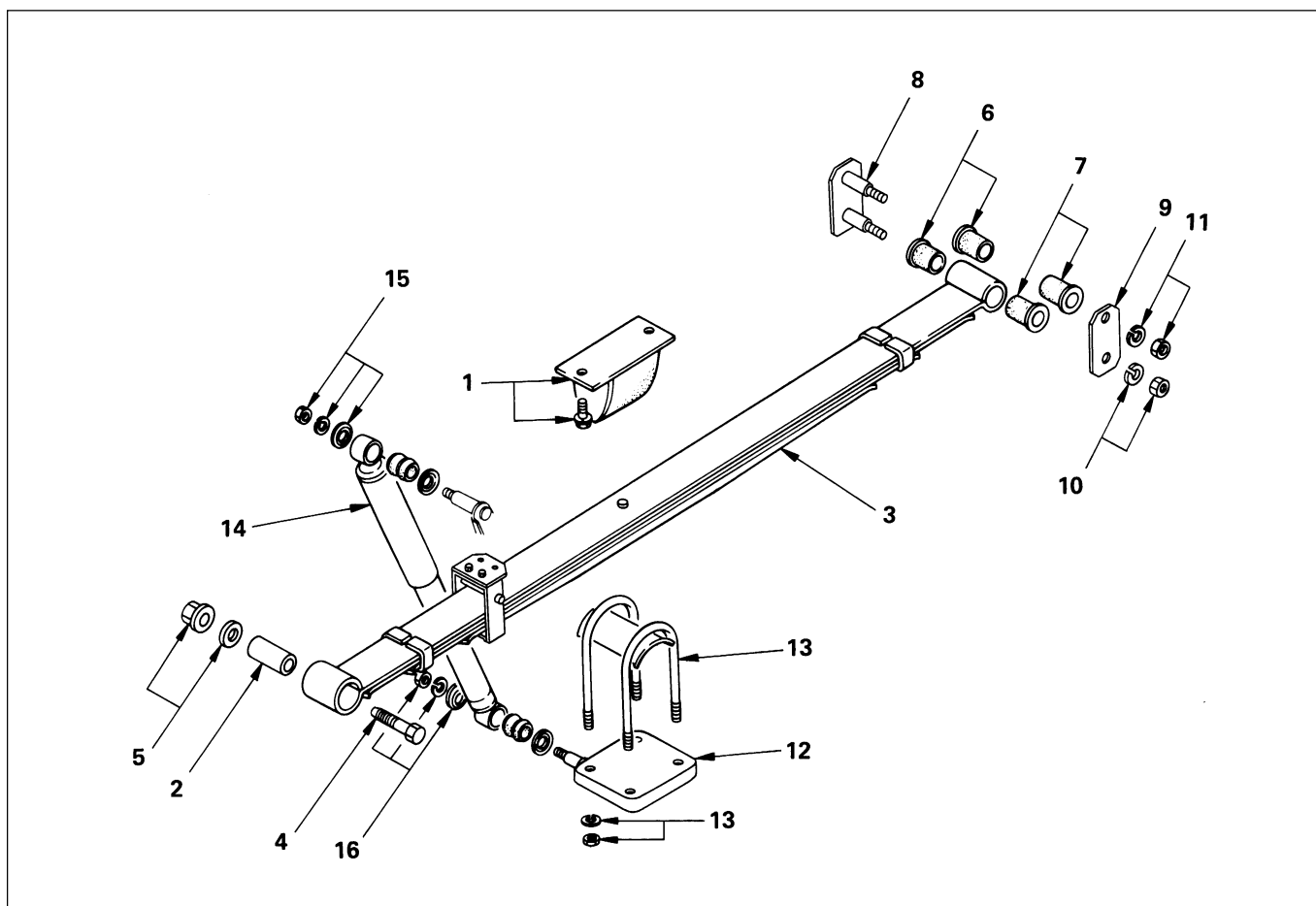


Shock Absorber

Inspection operation of shock absorber

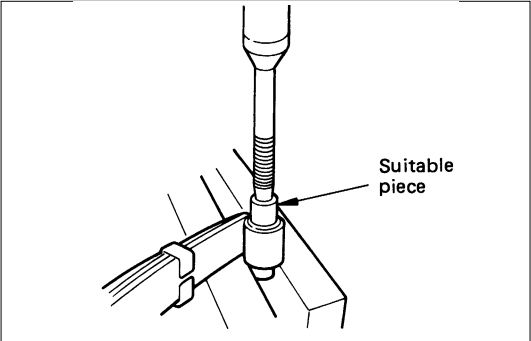
If no resistance is felt while expanding the shock absorber, that indicates the absorber is faulty.

REASSEMBLY



Reassembly Steps

- | | |
|--------------------------------|----------------------|
| 1. Bump rubber | ▲ 9. Shackle plate |
| ▲ 2. Bushing | ▲ 10. Nut and washer |
| ▲ 3. Leaf spring assembly | ▲ 11. Nut and washer |
| 4. Spring pin, bolt and washer | 12. Lower clamp |
| ▲ 5. Nut and washer | ▲ 13. U-bolt and nut |
| ▲ 6. Rubber bushing | ▲ 14. Shock absorber |
| ▲ 7. Rubber bushing | ▲ 15. Nut and washer |
| ▲ 8. Shackle | ▲ 16. Nut and washer |

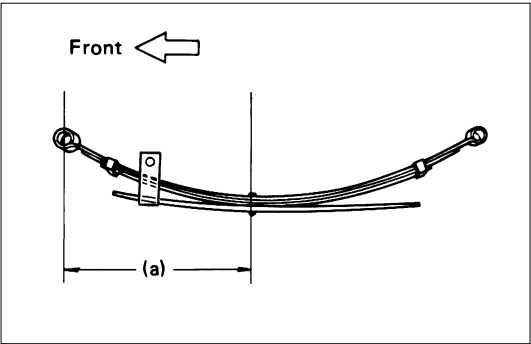


Important Operations



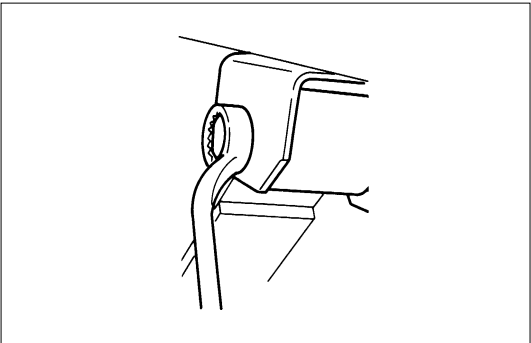
2. Bushing

Install the bushing using a bench press.



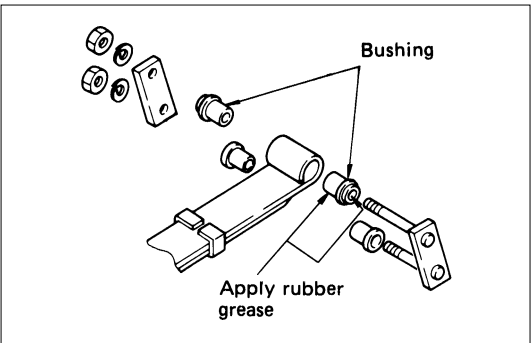
3. Leaf Spring Assembly

The leaf spring assembly should be installed so that the shorter length (a) (distance between center bolt and center of spring eye) is toward the front.



5. Nut and Washer

Spring Pin Torque	N·m(kgf·m/lb·ft)
152.0 ± 14.7 (15.5 ± 1.5 / 112.1 ± 10.8)	



6. 7. Rubber Bushing

Apply rubber grease to inside and outside of the rubber bushing.

8. 9. Shackle



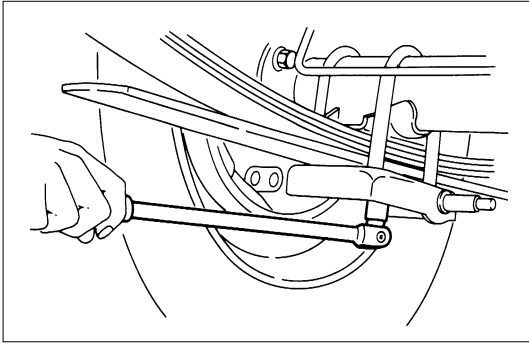
10.11. Nut and Washer

Install bushing with collar on the leaf spring, then install and tighten the nut.

Note :

Tighten the nuts to the specified torque with the vehicle empty.

Shackle Nut Torque	N·m(kgf·m/lb·ft)
98.0 ± 19.6 (10.0 ± 2.0 / 72.3 ± 14.4)	



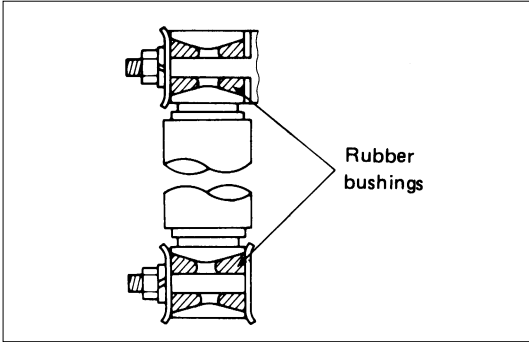
13.U-bolt and Nut

When tightening the nuts apply oil as necessary to prevent damaging the threads.

U-bolt Nut Torque

N·m(kgf·m/lb·ft)

65.7 ± 5.8 (6.7 ± 0.6 / 48.5 ± 4.3)



14.Shock Absorber

15.16. Nut and Washer

Refer to the drawing for parts installation.

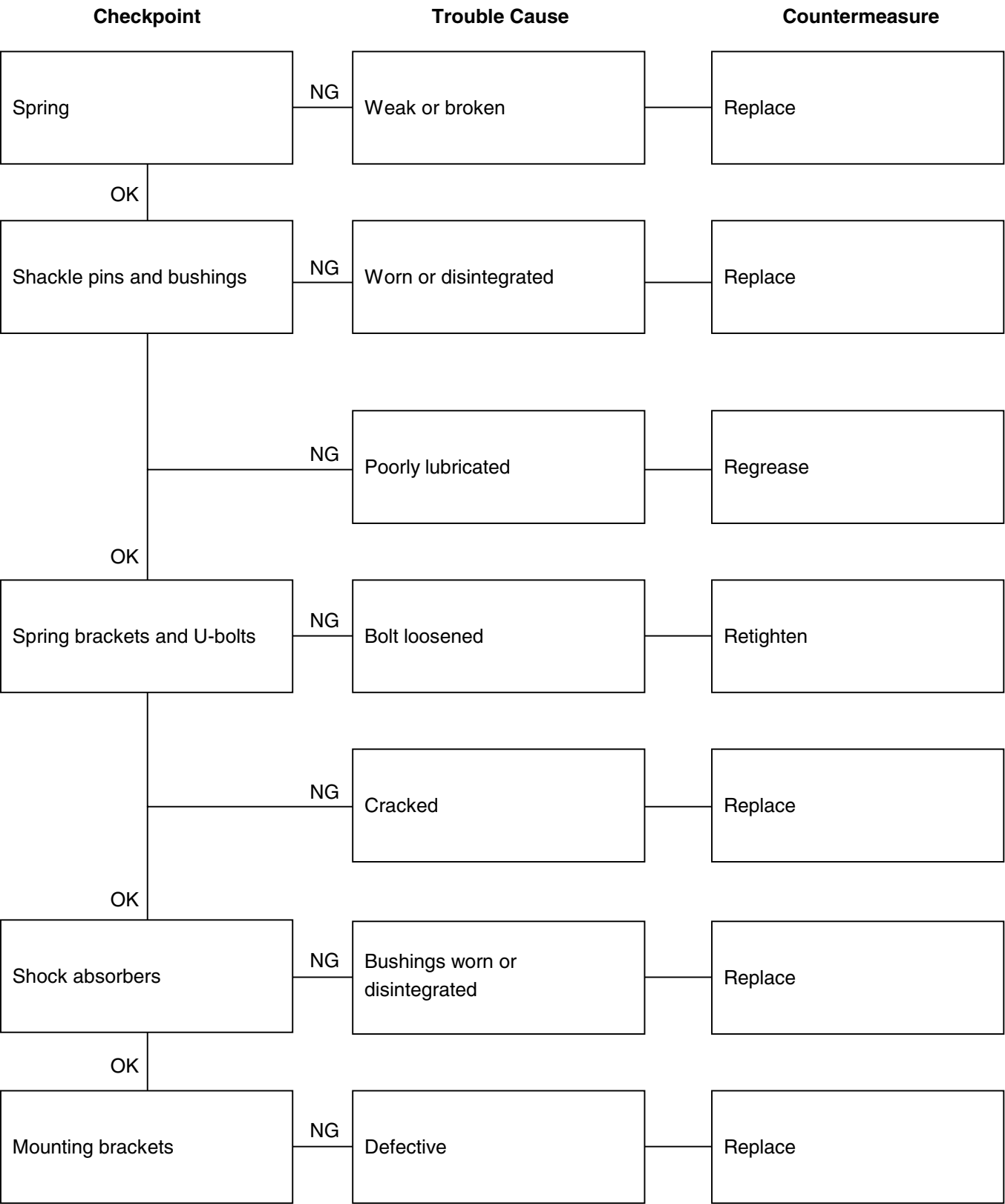
Shock Absorber Nut Torque

N·m(kgf·m/lb·ft)

39.2 ± 4.9 (4.0 ± 0.5 / 28.9 ± 3.6)

TROUBLESHOOTING

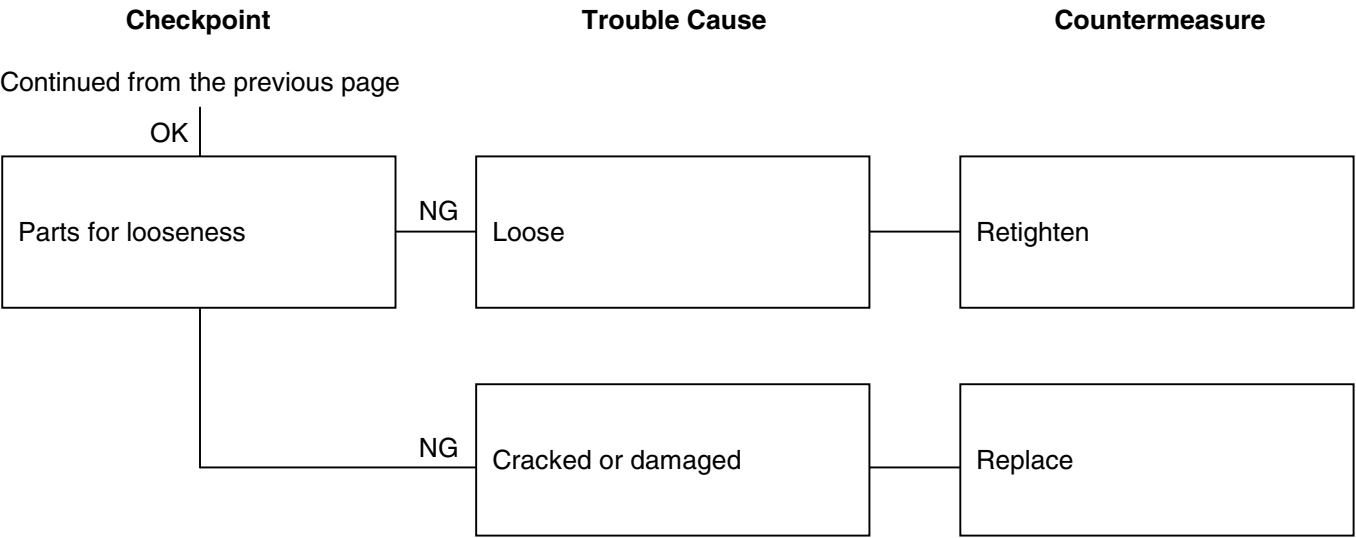
1. BODY INCLINATION



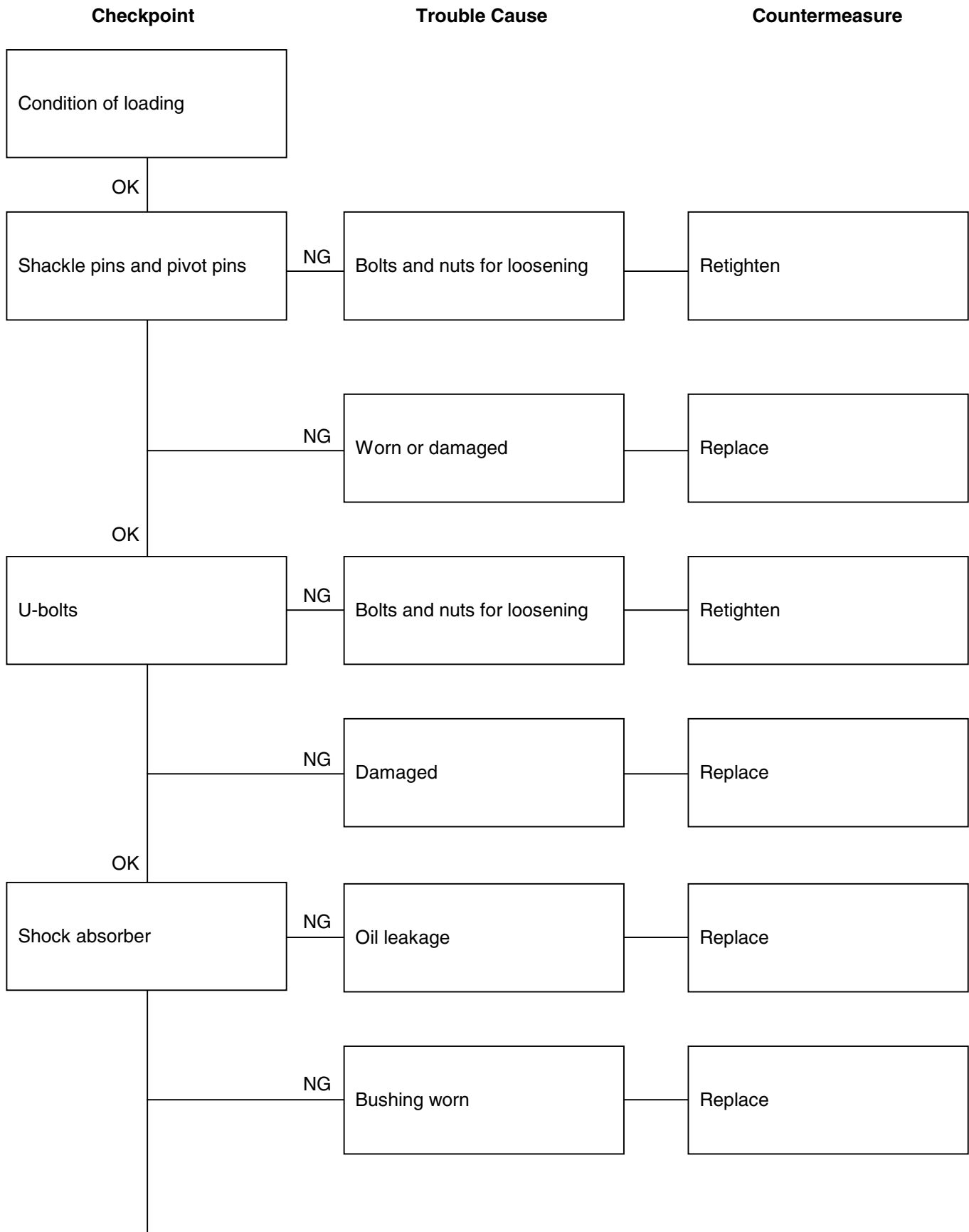
2. REDUCTION GROUND CLEARANCE

Checkpoint		Trouble Cause	Countermeasure
Condition of load	OK		
Leaf springs	NG	Broken	Replace
Springs clip bands	NG	Worn or broken	Replace
	NG	Loosened	Retighten
Bushings	NG	Deteriorated or disintegrated	Replace
	NG	Poorly lubricated	Regrease
	NG	Over lubricated	Wipe off excess grease

Continued on the next page



3. SPRING BREAKAGE



Continued on the next page

Checkpoint		Trouble Cause	Countermeasure
Continued from the previous page			
	NG	Brackets cracked	Replace
	NG	Defective	Replace
OK			
Spring bushing	NG	Worn or disintegrated	Replace
OK			
Center bolts	NG	Loosened	Retighten
	NG	Damaged	Replace

4. HARSHNESS

Checkpoint		Trouble Cause	Countermeasure
Road test vehicle(Noise has a certain pattern)	NG	Noise does not have any specific pattern	Replace tires
OK			
Tire inflation pressure	NG	Incorrect	Adjust
OK			
Tires for out of balance	NG	Incorrect	Adjust or replace
OK			
Bushings in suspension System	NG	Defective	Replace
OK			
Bushings in suspension system	NG	Loosen or broken	Retighten or replace

[illegible]

SECTION 3E

WHEELS AND TIRES

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Troubleshooting	3E- 19

MAIN DATA AND SPECIFICATIONS

2WD (except TFR25)

Front Tire			Rear Tire		
Tire size	Wheel size	Tire pressure kg/cm ² (psi/kPa)	Tire size	Wheel size	Tire pressure kg/cm ² (psi/kPa)
6.00-14-6	14 × 5J	2.0 (28/196)	6.50-14-8	14 × 5J	4.25 (60/416)
6.50-14-8	14 × 5J	1.8 (26/176)	6.50-14-8	14 × 5J	4.25 (60/416)
185R14-6	14 × 5.5JJ	1.8 (26/176)	185R14-8	14 × 5.5JJ	4.5 (64/441)
185R14-8	14 × 5.5JJ	1.8 (26/176)	185R14-8	14 × 5.5JJ	4.5 (64/441)
195R14C8	14 × 5.5JJ	2.5 (36/245)	195R14C8	14 × 5.5JJ	4.5 (64/441)

4WD (C22, C20 Series Engine Model)

Front Tire			Rear Tire		
Tire size	Wheel size	Tire pressure kg/cm ² (psi/kPa)	Tire size	Wheel size	Tire pressure kg/cm ² (psi/kPa)
6.50-15-8	15 × 5.5K	2.0 (28/196)	6.50-15-8	15 × 5.5K	4.25 (60/416)
6.50-15-6	15 × 5.5K	2.0 (28/196)	6.50-15-8	15 × 5.5K	4.25 (60/416)
205R16104Q	16 × 6JJ	2.0 (28/196)	205R16104Q	16 × 6JJ	2.7 (38/264)
215R15-6	15 × 5.5K	1.8 (26/176)	215R15-6	15 × 5.5K	2.8 (40/274)

4WD and TFR25 (4J Series, 6VD1 Engine Model)

Front Tire			Rear Tire		
Tire size	Wheel size	Tire pressure kg/cm ² (psi/kPa)	Tire size	Wheel size	Tire pressure kg/cm ² (psi/kPa)
6.50-15-8PR LT	15 × 5.5K	2.0 (28/200)	6.50-15-8PR LT	15 × 5.5K	4.25 (60/425)
6.50-15-6PR LT	15 × 5.5K	2.0 (28/200)	6.50-15-8PR LT	15 × 5.5K	4.25 (60/425)
P225/75R15	15 × 6JJ	1.8 (26/186)	P225/75R15	15 × 6JJ	1.8 (26/180)
215R15-6PR	15 × 5.5K	1.8 (26/180)	215R15-6PR	15 × 5.5	2.8 (40/280)
215R15 105S	15 × 6JJ	2.0 (28/200)	215R15 105S	15 × 6JJ	2.9 (41/290)
205/80R16 104T and Q	16 × 6JJ	2.0 (28/200)	205/80R16 104T and Q	16 × 6JJ	2.7 (38/270)
205R16 104S and Q	16 × 6JJ	2.0 (28/200)	205R16 104S and Q	16 × 6JJ	2.7 (38/270)

TORQUE SPECIFICATIONS

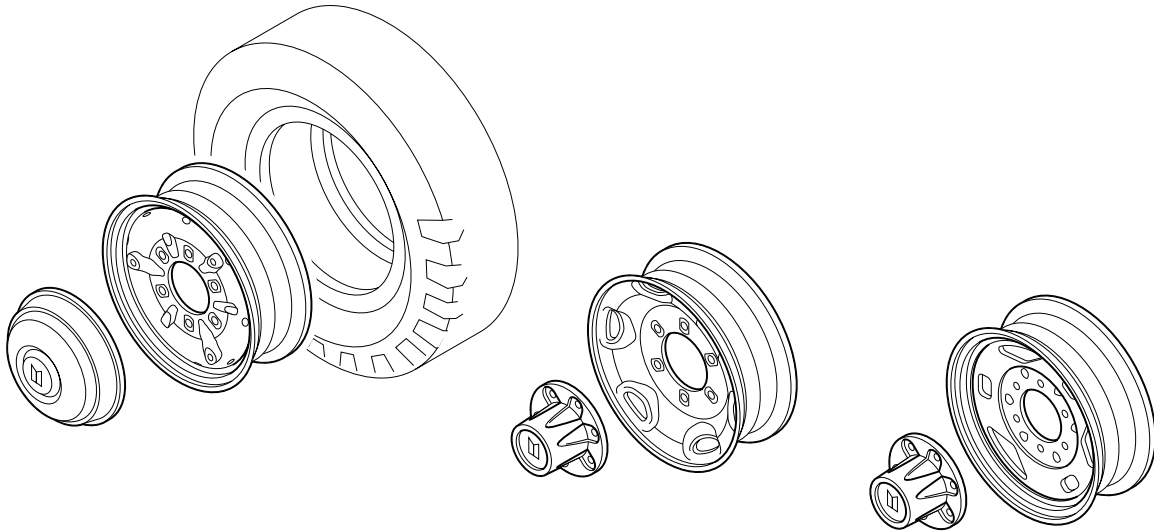


SPECIAL PARTS FIXING NUTS AND BOLTS WHEELS AND TIRES

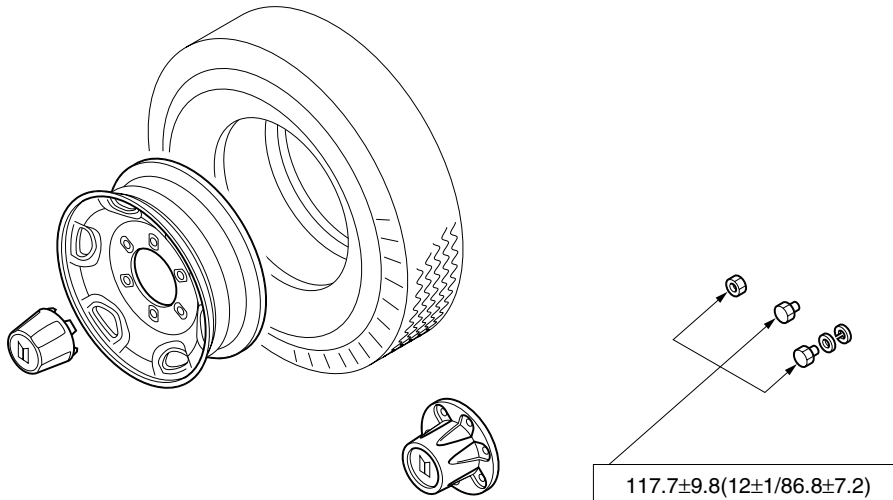
N·m(kgf·m/lb·ft)

C22, C20 Series Engine Model

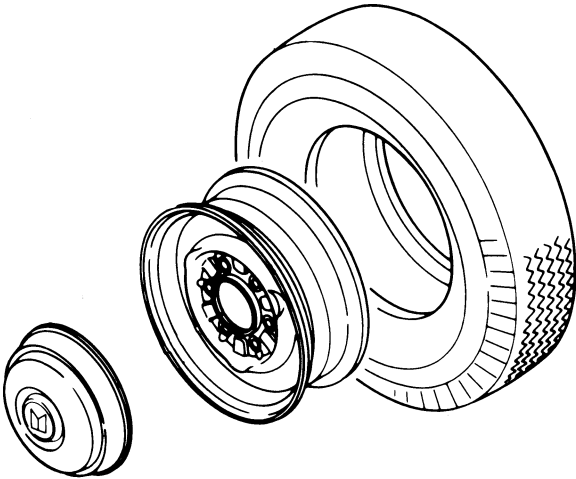
4 x 4 model



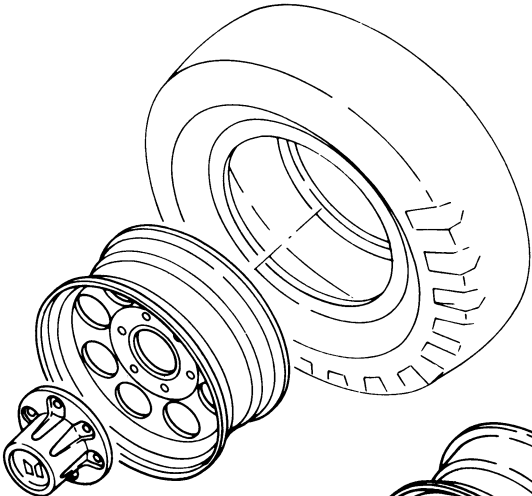
4 x 2 model



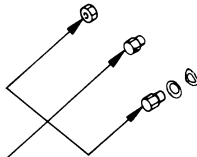
4J Series, 6VD1 Engine Model



4 x 2 model



4 x 4 model

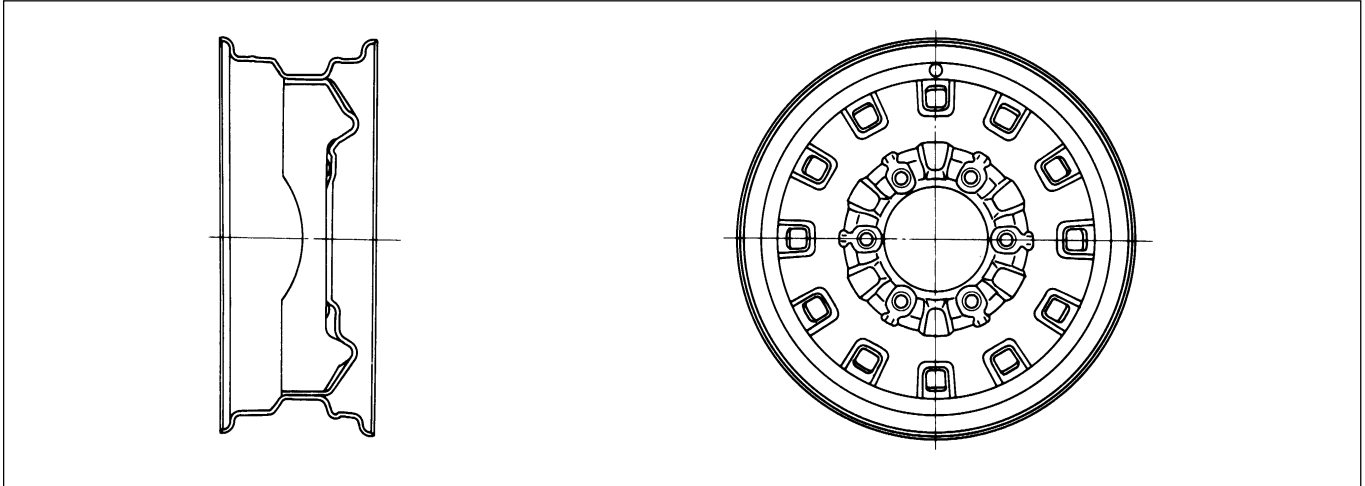


117.7±9.8(12±1/86.8±7.2)

WHEELS AND TIRES

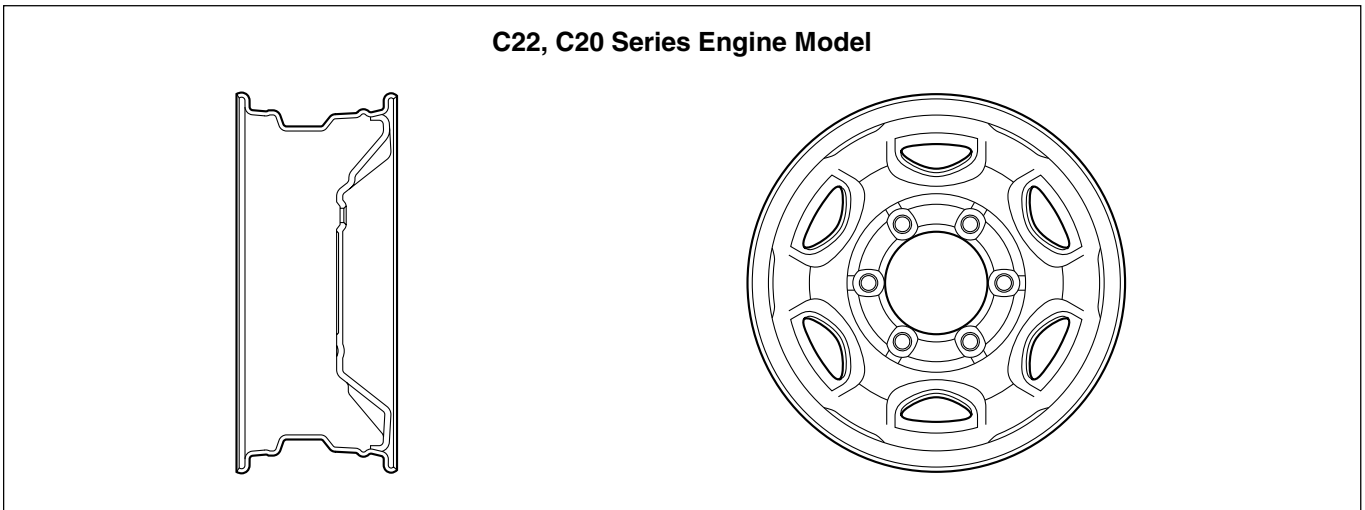
GENERAL DESCRIPTION

4 × 2 Model Steel Wheel



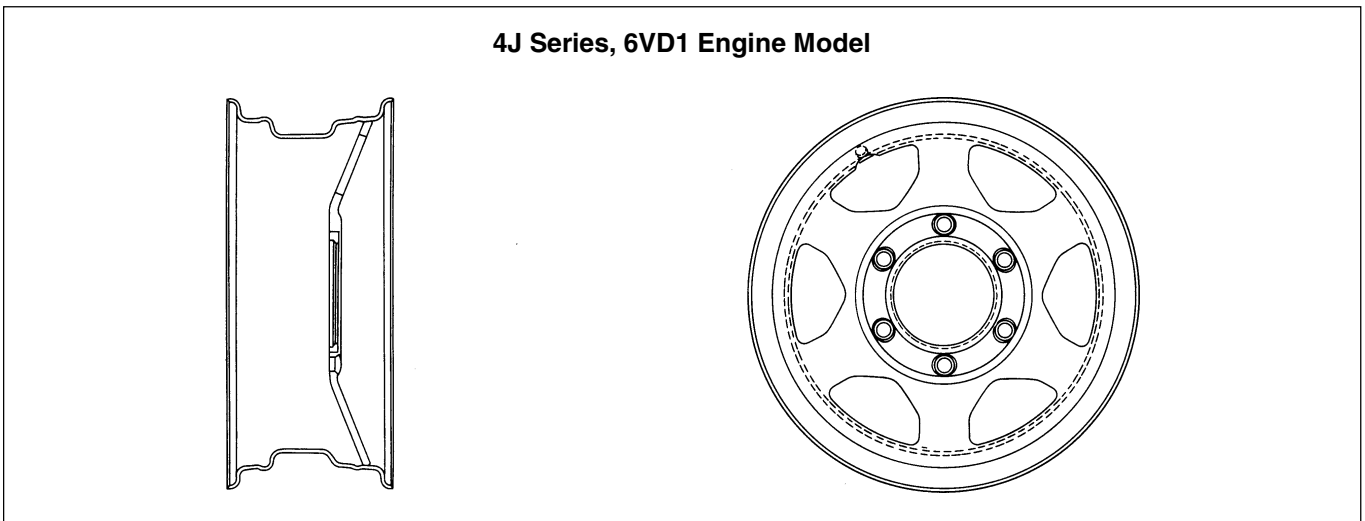
4 × 2 Model Styled Wheel

C22, C20 Series Engine Model

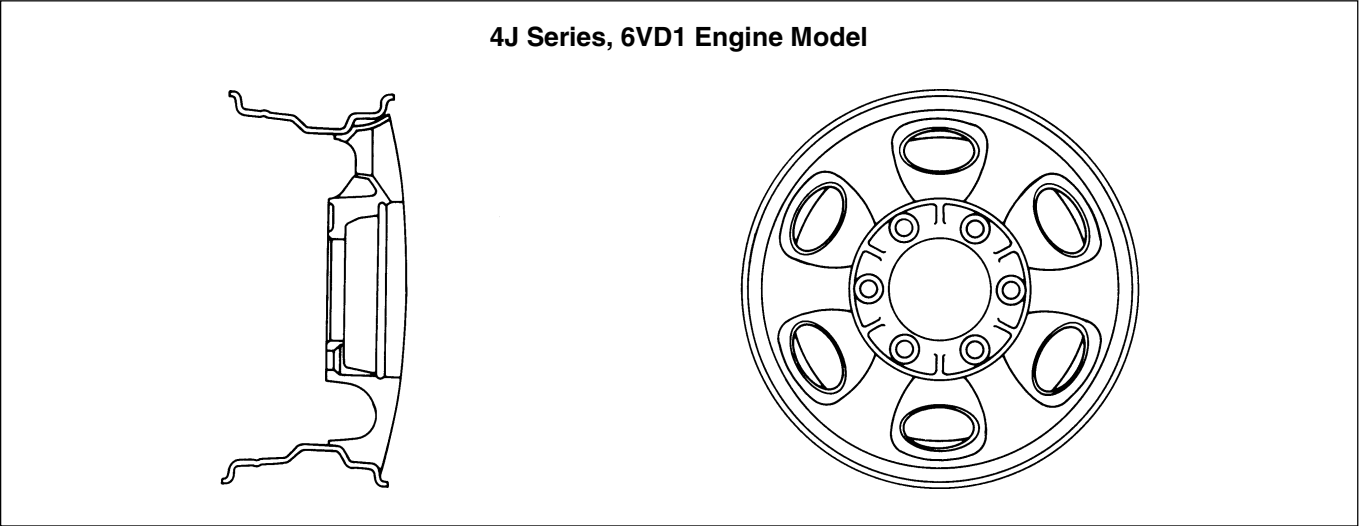


4 × 2 Model Styled Wheel

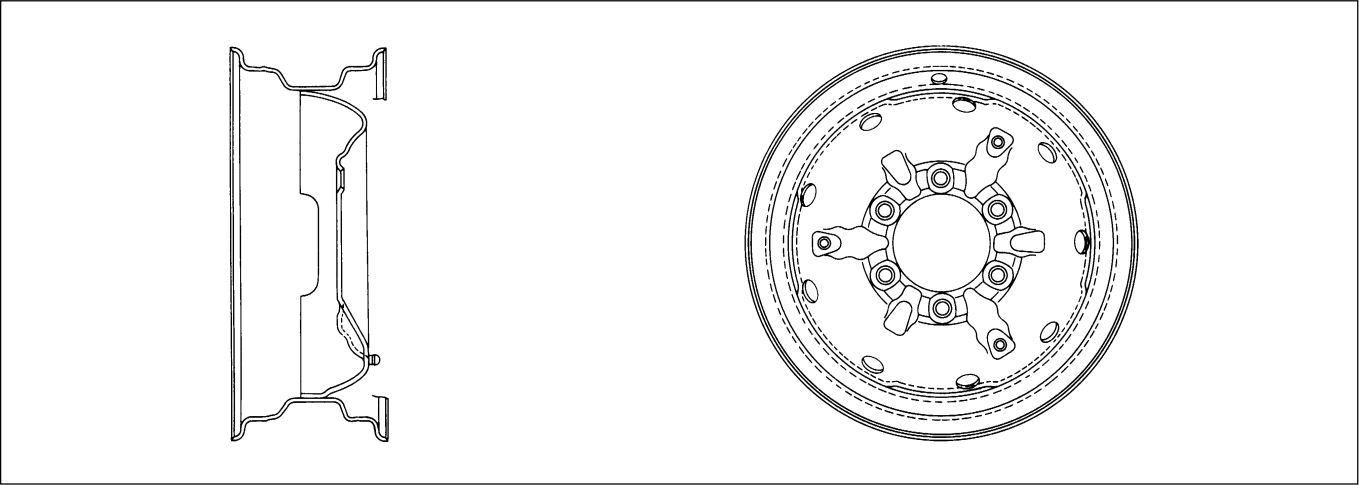
4J Series, 6VD1 Engine Model



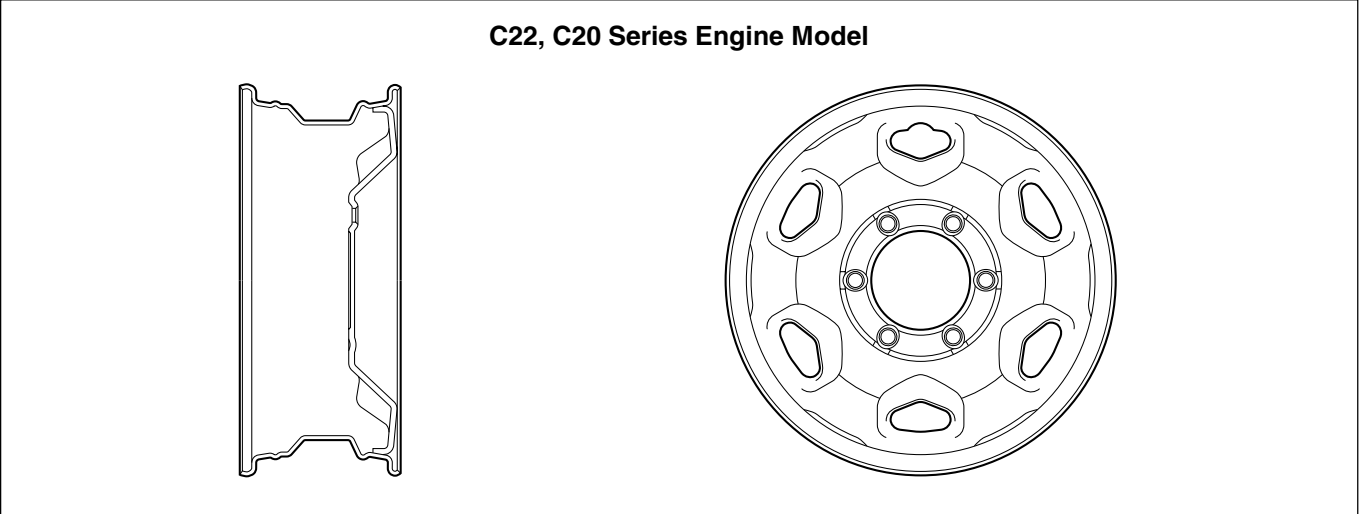
4 × 2 Model Alumi. Wheel



4 × 4 Model Steel Wheel

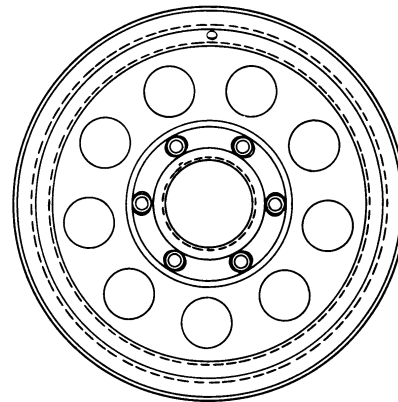
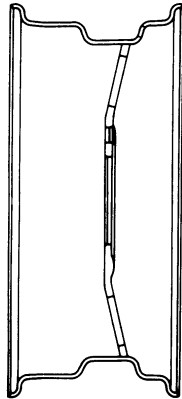


4 × 4 Model Styled Wheel



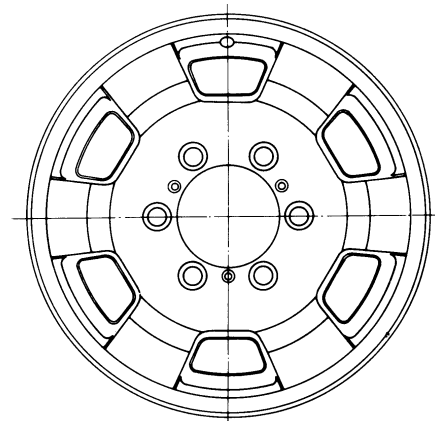
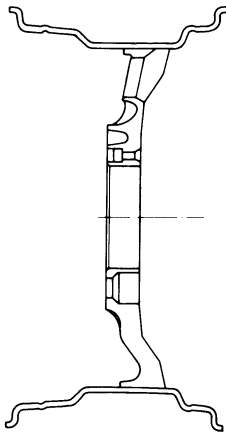
4 × 4 Model Styled Wheel

4J Series, 6VD1 Engine Model

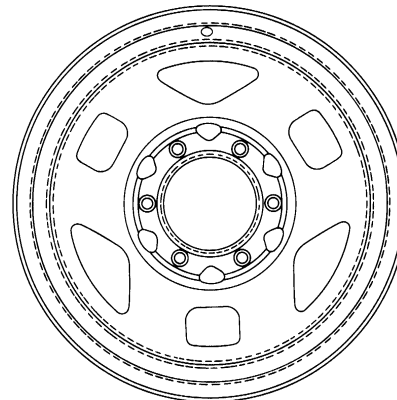
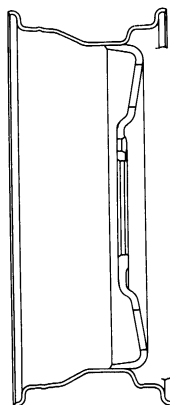


4 × 4 Model Alumi. Wheel

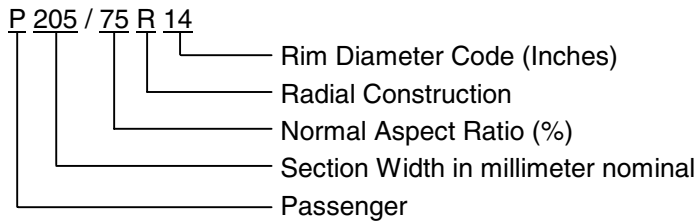
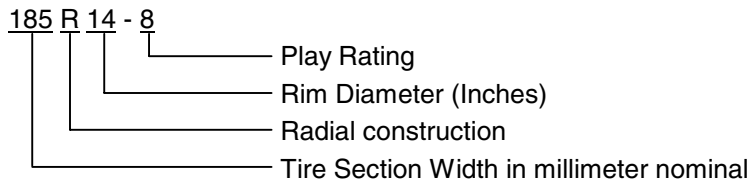
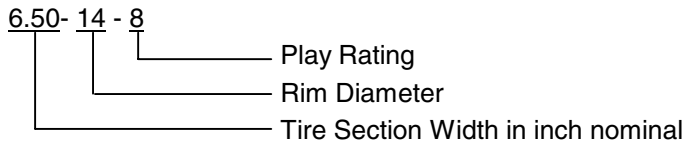
4J Series, 6VD1 Engine Model



4 × 4 Model 16 × 6JJ



TIRE DESIGNATION



TIRE PRESSURE LABEL (LOCATION : DRIVERS DOOR OR FRAME OF DRIVERS DOOR) C22, C20 Series Engine Model

2WD

 SEE OWNER'S AND DRIVERS MANUAL FOR ADDITIONAL INFORMATION.				
TIRE PRESSURE : kg/cm ² (PSI)				
TIRE	UNLOADED		LOADED	
	FRONT	REAR	FRONT	REAR
6.00-14-6	2.0(28)		2.0(28)	
6.50-14-8	1.8(26)	4.25(60)	1.8(26)	4.25(60)
185R14 - 6	1.8(26)		1.8(26)	
185R14 - 8	1.8(26)	4.5(64)	1.8(26)	4.5(64)
195R14C8	2.5(36)	4.5(64)	2.5(36)	4.5(64)

4WD

 SEE OWNER'S AND DRIVERS MANUAL FOR ADDITIONAL INFORMATION.				
TIRE PRESSURE : kg/cm ² (PSI)				
TIRE	UNLOADED		LOADED	
	FRONT	REAR	FRONT	REAR
6.50 - 15 - 6	2.0(28)		2.0(28)	
6.50 - 15 - 8	2.0(28)	4.25(60)	2.0(28)	4.25(60)
215R15 - 6	1.8(26)	2.8(40)	1.8(26)	2.8(40)
205R-16 104Q	2.0(28)	2.7(38)	2.0(28)	2.7(38)

Note :

- The air pressure of the tire should be maintained as indicated in the label instruction on the driver's door or frame of driver's door.

Lower pressure can cause burst and adverse vehicle handling.

On the other hand, higher pressure can cause shock-burst and reduce gripping effect.

4J Series, 6VD1 Engine Model

2WD (except TFR25)



SEE OWNER'S AND
DRIVERS MANUAL FOR
ADDITIONAL INFORMATION.

TIRE PRESSURE : kg/cm ² (PSI)				
TIRE	UNLOADED		LOADED	
	FRONT	REAR	FRONT	REAR
6.00 - 14 - 6	2.0(28)		2.0(28)	
6.50 - 14 - 6	1.8(26)	4.25(60)	1.8(26)	4.25(60)
185R14 - 6	1.8(26)		1.8(26)	
185R14 - 8	1.8(26)	4.5(64)	1.8(26)	4.5(64)
195R14 - 8	2.5(36)	4.5(64)	2.5(36)	4.5(64)
195R14C8	2.5(36)	4.5(64)	2.5(36)	4.5(64)
P205/75R14	2.0(28)	2.45(35)	2.0(28)	2.45(35)

4WD and TFR25



SEE OWNER'S AND
DRIVERS MANUAL FOR
ADDITIONAL INFORMATION.

TIRE PRESSURE : kg/cm ² (PSI)				
TIRE	UNLOADED		LOADED	
	FRONT	REAR	FRONT	REAR
6.50 - 15 - 6	2.0(28)		2.0(28)	
6.50 - 15 - 8	2.0(28)	4.25(60)	2.0(28)	4.25(60)
215R15 - 6	1.8(26)	2.8(40)	1.8(26)	2.8(40)
P225/75R15	1.8(26)	1.8(26)	1.8(26)	1.8(26)
205R16 1040 or S 205/80R16 1040 or T	2.0(28)	2.7(38)	2.0(28)	2.7(38)

For Australia (2WD)

TYRE PLACARD	
NOMINATED RIM SIZE FRONT : 14 x 5 1/2 JJ REAR : 14 x 5 1/2 JJ	
TYRE SIZE DESIGNATION FRONT : 185R14-8PR LT REAR : 185R14-8PR LT	
RECOMMENDED COLD INFLATION PRESSURE UP TO MAX. LOAD FRONT : 220 (KPa) REAR : 450 (KPa)	
WARNING The sum of the load carrying capacities of the tyres fitted to any axle of this vehicles shall not be less than 1050kg(FRONT) and 1680kg(REAR). The tyres fitted to this vehicle shall have a speed category not less than L(120km/h).	

TYRE PLACARD				
NOMINATED RIM SIZE AND TYRE SIZE DESIGNATION	RECOMMENDED COLD INFLATION PRESSURE(kPa) UP TO MAX. LOAD			
	NORMAL SPEED		HIGH SPEED (ABOVE 140km/h)	
	FRONT	REAR	FRONT	REAR
	15 x 6JJ 215R15 105S	200	290	200

WARNING

The tyres fitted to this vehicle shall have a maximum load rating not less than 925kg on a load index of 105 and a speed category symbol not less than S.

When fitted with winter tread tyres, this vehicle should not be driven at speeds in excess of the tyre speed category symbol as moulded on the tyre or, in absence thereof, at high speeds.

For Australia (4WD)

TYRE PLACARD				
NOMINATED RIM SIZE AND TYRE SIZE DESIGNATION	RECOMMENDED COLD INFLATION PRESSURE(kPa) UP TO MAX. LOAD			
	NORMAL SPEED		HIGH SPEED (ABOVE 140km/h)	
	FRONT	REAR	FRONT	REAR
16 x 6JJ 205R16 104Q	240	270	240	290
16 x 5.50F 205R16LT 6PR	240	300		

WARNING

205R16 104Q

The tyres fitted to this vehicle shall have a maximum load rating not less than 900kg on a load index of 104 and a speed category symbol not less than Q.

When fitted with winter tread tyres, this vehicle should not be driven at speeds in excess of tyre speed category symbol as moulded on the tyre or in absence thereof at high speeds.

205R16 LT 6PR

The sum of the load carrying capacities of the tyres fitted to any axle of this vehicle shall not be less than 1100kg(FRONT) and 1680kg(REAR).

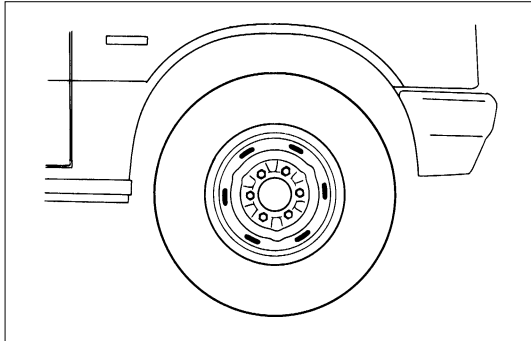
The tyres fitted to this vehicle shall have a speed category not less than "L"(120km/h).

Note :

- The air pressure of the tire should be maintained as indicated in the label instruction on the driver's door or frame of driver's door.
Lower pressure can cause burst and adverse vehicle handling.
On the other hand, higher pressure can cause shock-burst and reduce gripping effect.

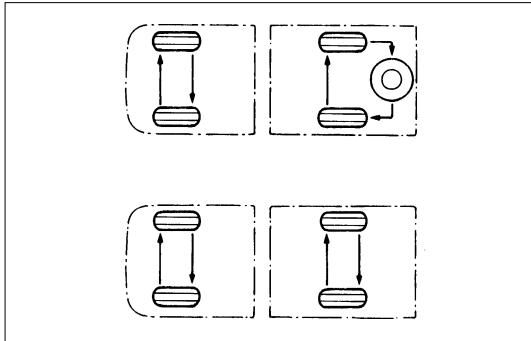
SERVICING

Servicing refers to general maintenance procedures to be performed by qualified service personnel.



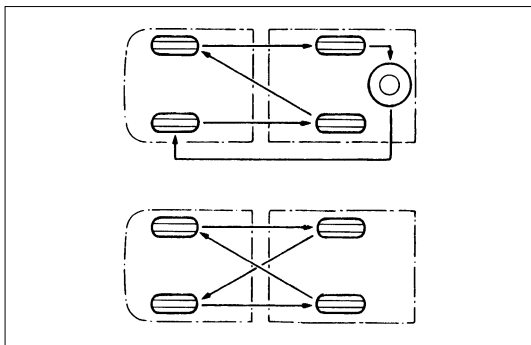
WHEEL NUT TORQUES

Wheel Nut Torque	N·m(kgf·m/lb·ft)
117.7 ± 9.8 (12.0 ± 1.0 / 86.8 ± 7.2)	

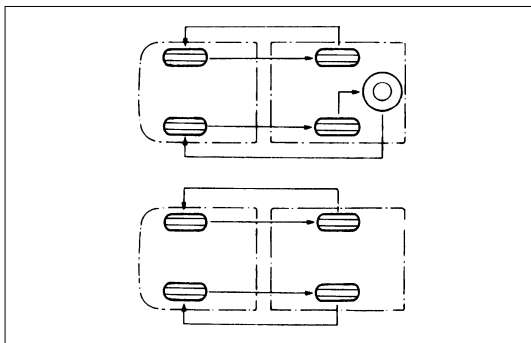


TIRE ROTATION

When the front tire size and the rear size are different, interchange front wheels and rotate the rear wheels as shown in the figure.

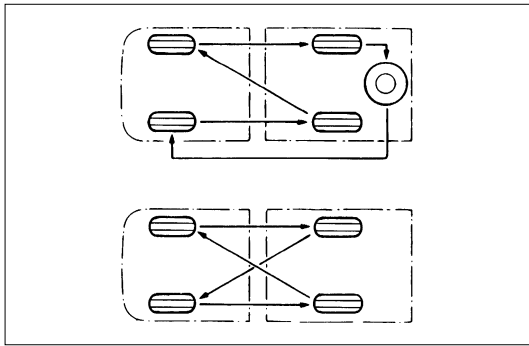


When the front and rear tires are the same size, rotate the wheels as shown in the figure.



For of radial tires, interchange the front and the rear wheels on the same side as shown in the figure.

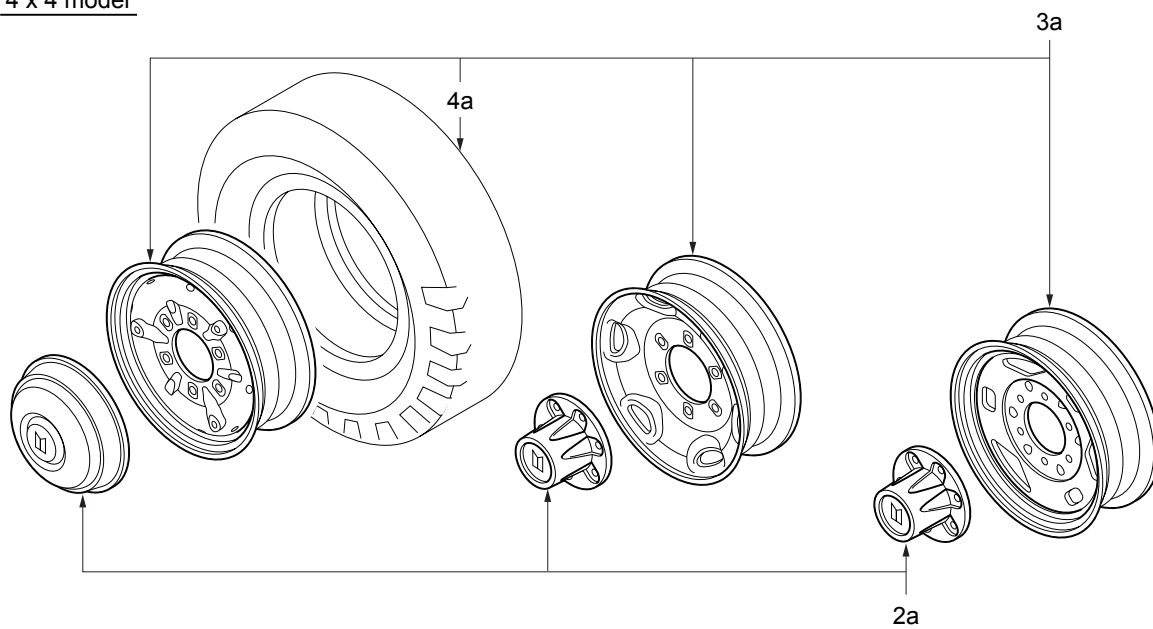
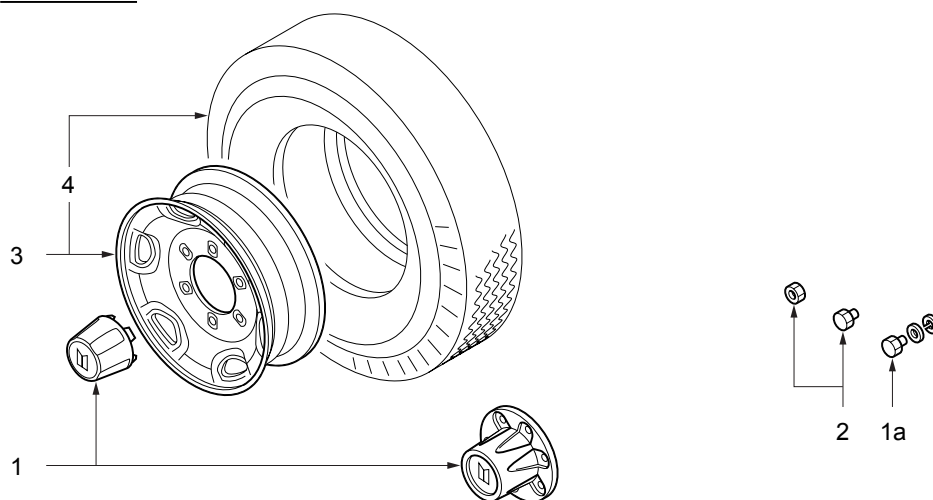
3E-12 WHEELS AND TIRES



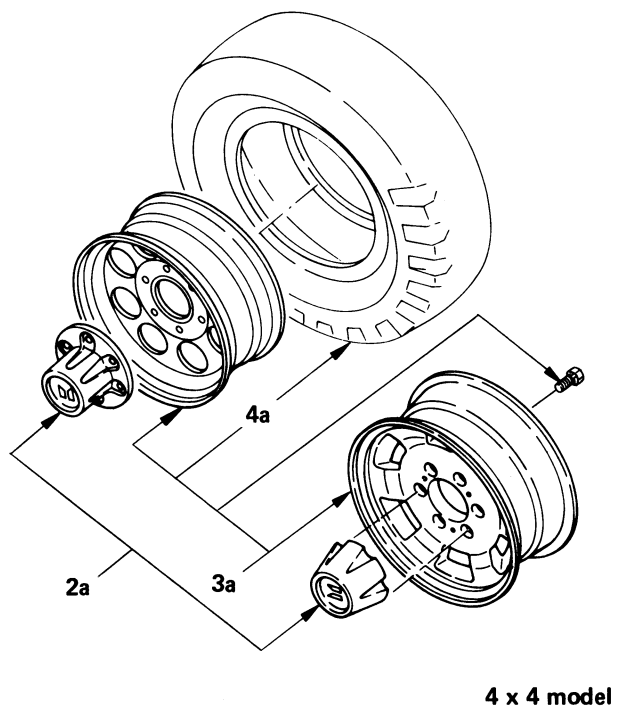
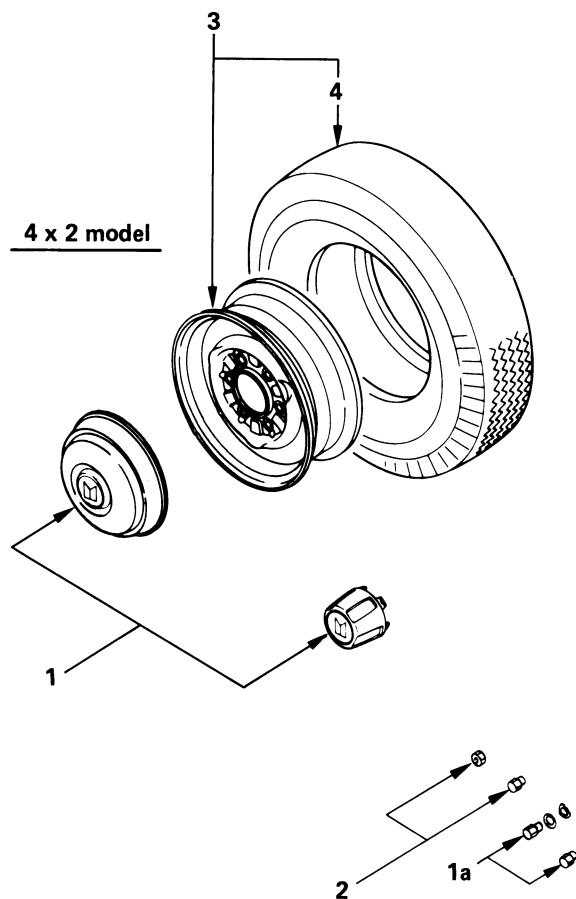
If one-sided tire wear appears on radial tires, rotate the wheels as shown in the figure.

Note:

After rotation, adjust the front and rear tire pressure and be sure to check wheel nut tightness.

**DISASSEMBLY****C22, C20 Series Engine Model**4 x 4 model4 x 2 model

4J Series, 6VD1 Engine Model



**Disassembly Steps
(for 4 × 2 model)**

1. Wheel cap
2. Wheel nut
3. Wheel and tire assembly
4. Tire assembly

(for 4 × 4 model)

- 1a. Wheel nut
- 2a. Center cap
- 3a. Wheel and tire assembly
- 4a. Tire assembly



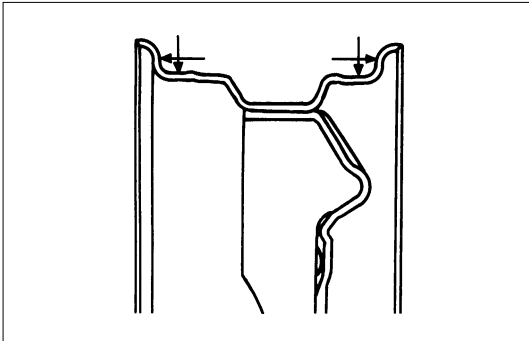
INSPECTION AND REPAIR

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



Visual Check

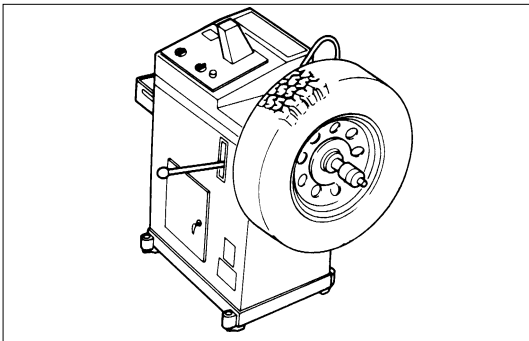
Inspect all disassembled parts for wear, damage or other abnormal conditions.



Measure Wheel Runout

	mm(in)
14 inch	Less than 1.2 (0.047)
15 inch, 16inch	Less than 1.5 (0.059)

If the measured value exceed the specified limit, the wheel must be replaced.



Measure Wheel Unbalance

Using a wheel balancing equipment.

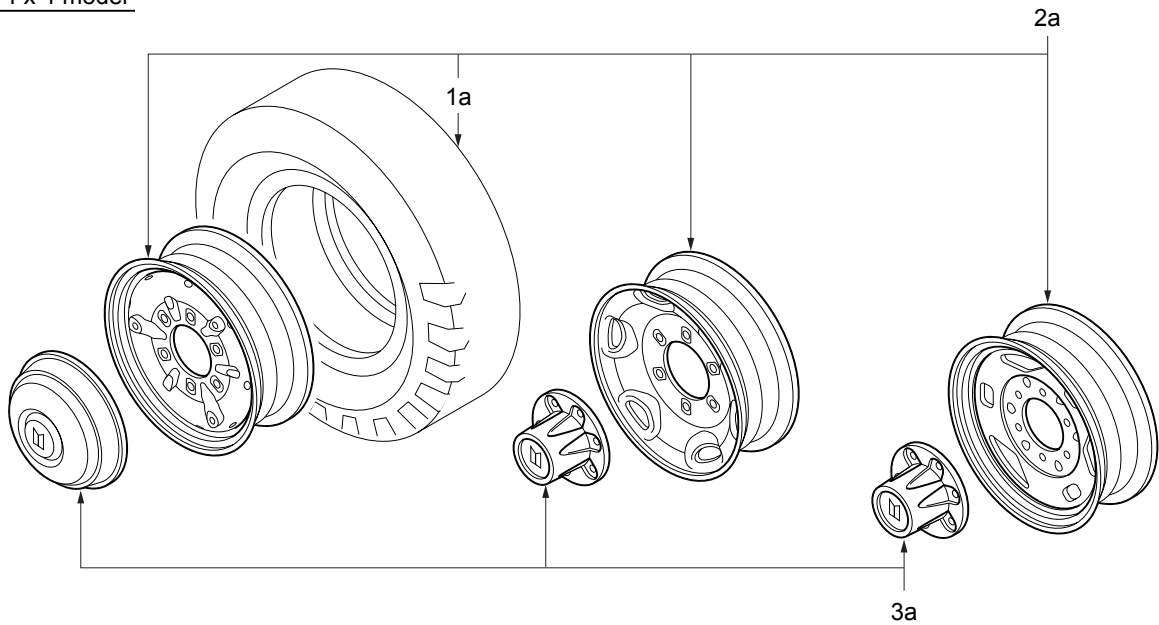
Install on the side rim of the wheel a balance weight to offset unbalance.

Balance weight for the wheel should not exceed 170g in total, and 140g is the maximum amount for either side.

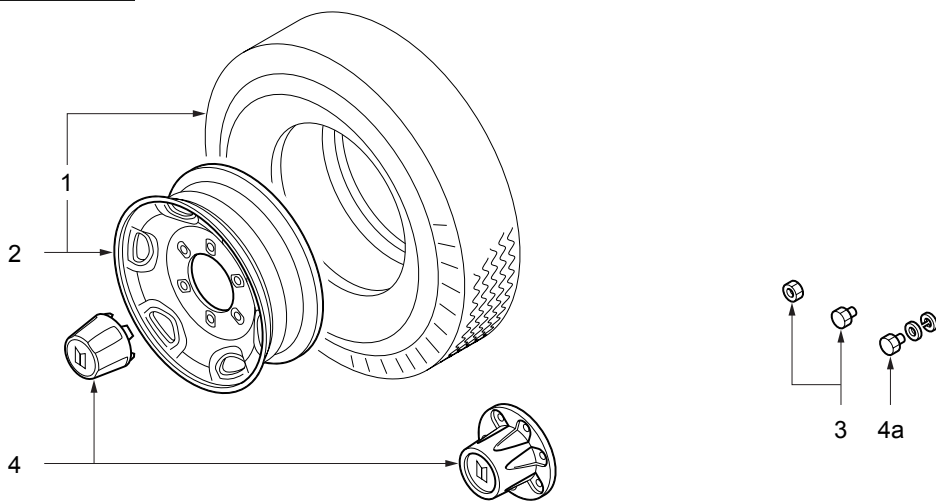
 REASSEMBLY

C22, C20 Series Engine Model

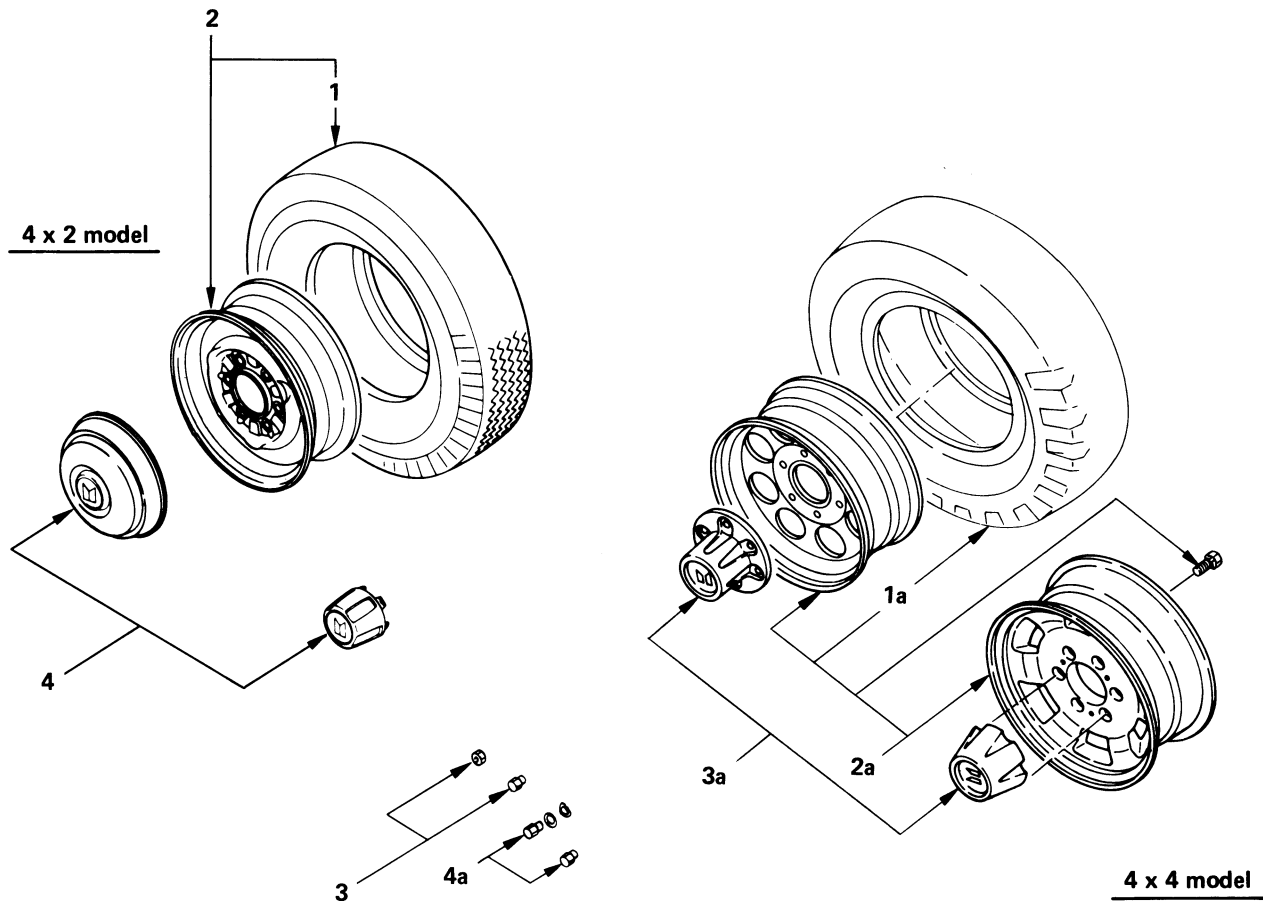
4 x 4 model



4 x 2 model



4J Series, 6VD1 Engine Model

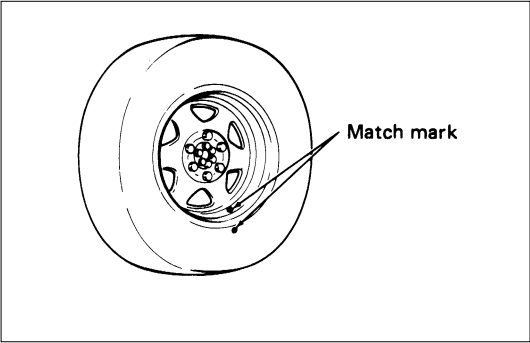


Reassembly Steps (for 4 × 2 model)

- ▲ 1. Tire assembly
- ▲ 2. Wheel and tire assembly
- ▲ 3. Wheel nut
- 4. Wheel cap

(for 4 × 4 model)

- ▲ 1a. Tire assembly
- ▲ 2a. Wheel and tire assembly
- 3a. Center cap
- ▲ 4a. Wheel nut

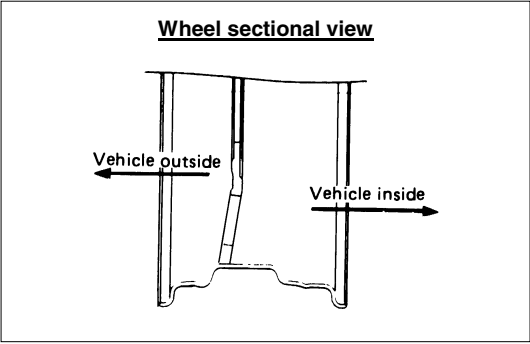


Important Operations

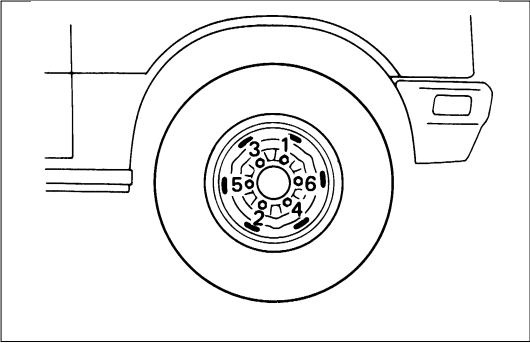
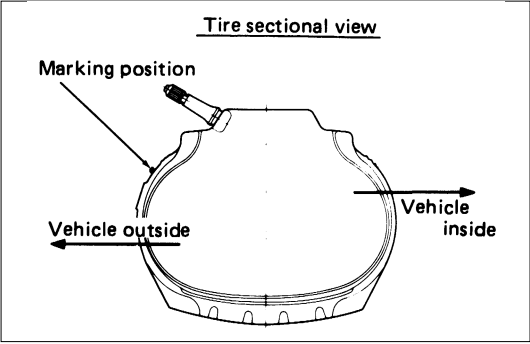


1., 1a. Tire Assembly

Align air valve - tire balancing match marks (About 8 mm diameter paint mark).



2., 2a. Wheel and Tire Assembly



3., 4a. Wheel Nut

Tighten wheel nuts in numerical order.

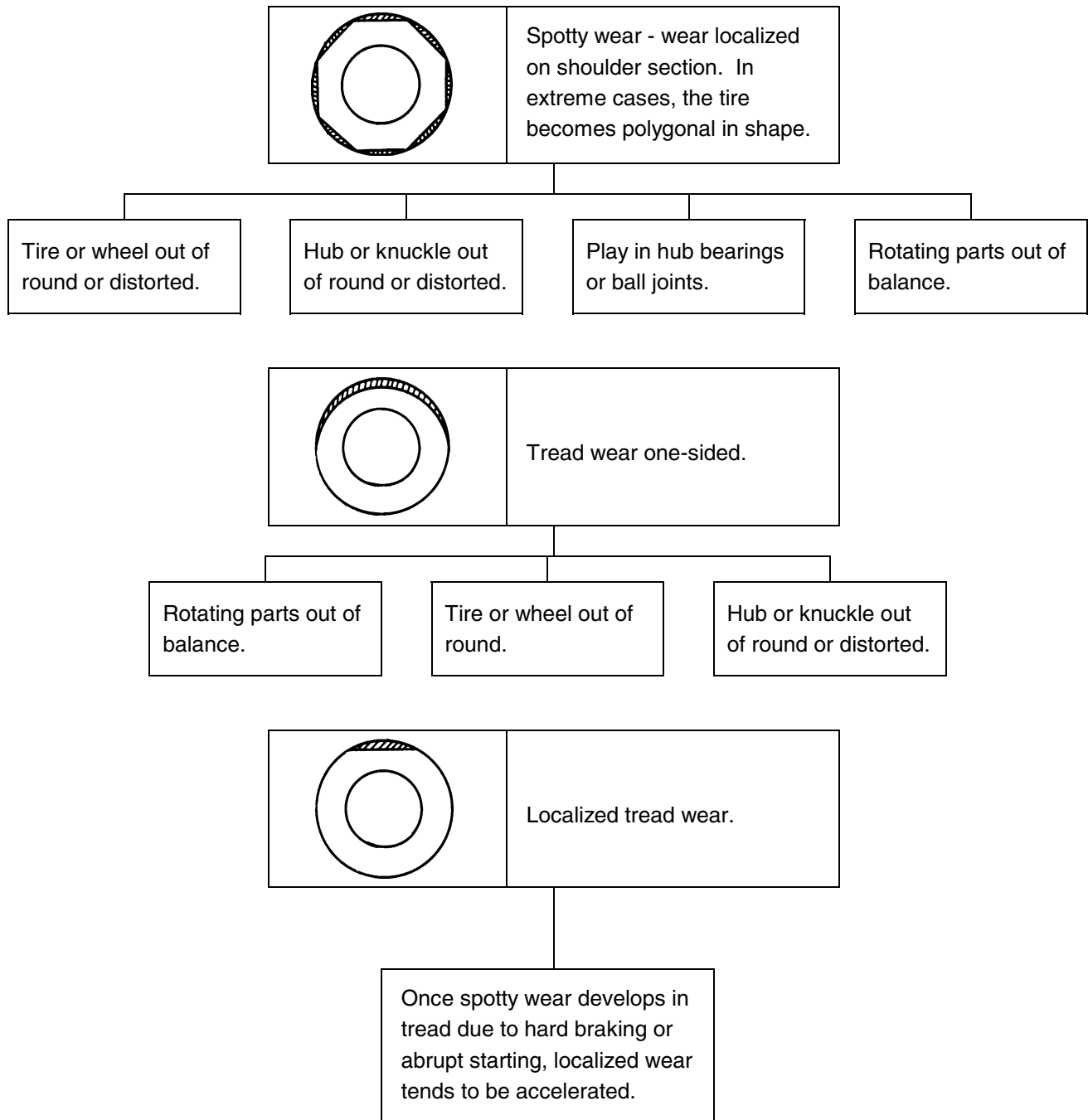
Wheel Nut Torque	N·m(kgf·m/lb·ft)
117.7 ± 9.8 (12.0 ± 1.0 / 86.8 ± 7.2)	

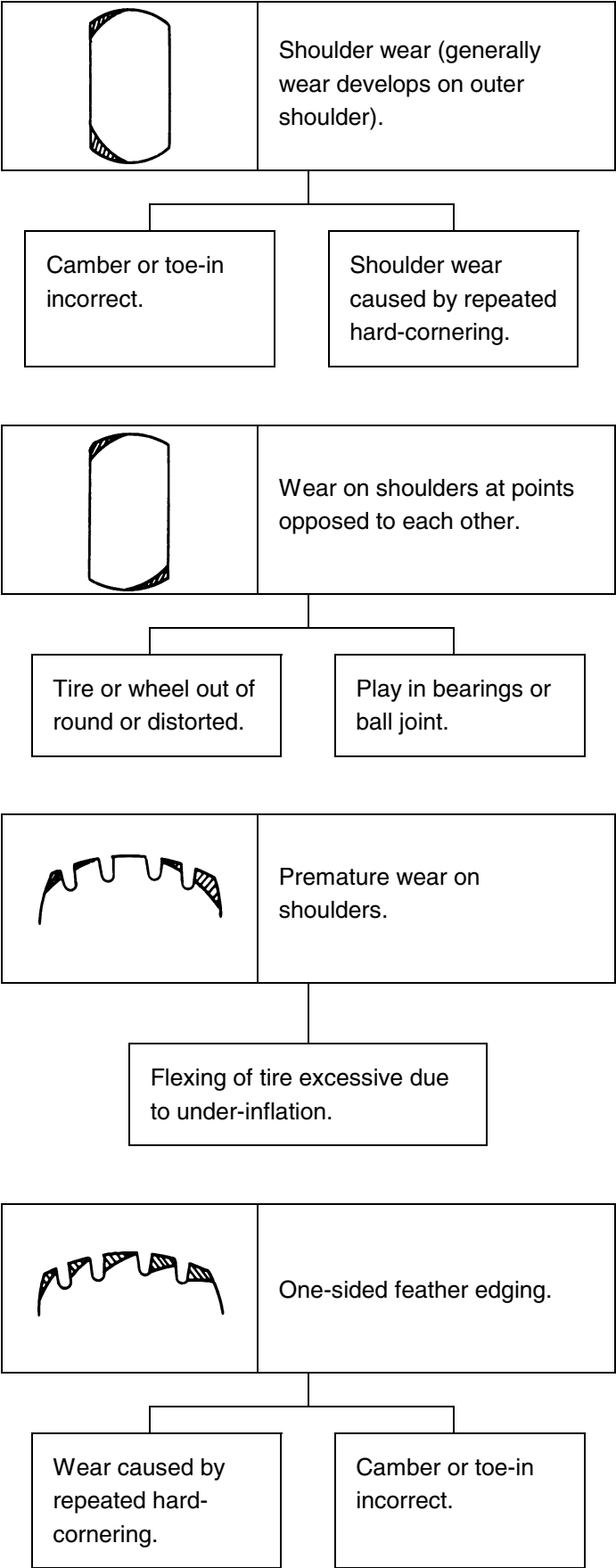
TROUBLESHOOTING

Typical examples of abnormal tire tread wear and major causes :

CAUTION:

Similar wear patterns can be caused by worn suspension parts, misalignment of wheels and tires, and other suspension related problems.





This image shows a blank sheet of white paper designed for writing. It features horizontal ruling lines spaced evenly down the page. A single vertical margin line runs parallel to the left edge, creating a narrow column for notes or a header. The word "MEMO" is printed in a bold, black, sans-serif font in the upper right corner.

[illegible]

This image shows a full page of a blank sheet of white paper designed for writing. It features horizontal blue or grey ruling lines spaced evenly down the page. A single vertical line runs parallel to the left edge, creating a narrow margin. The word "MEMO" is printed in a bold, black, sans-serif font in the upper right corner. The rest of the page is empty, ready for notes.

TFSSW-WE-0001A

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