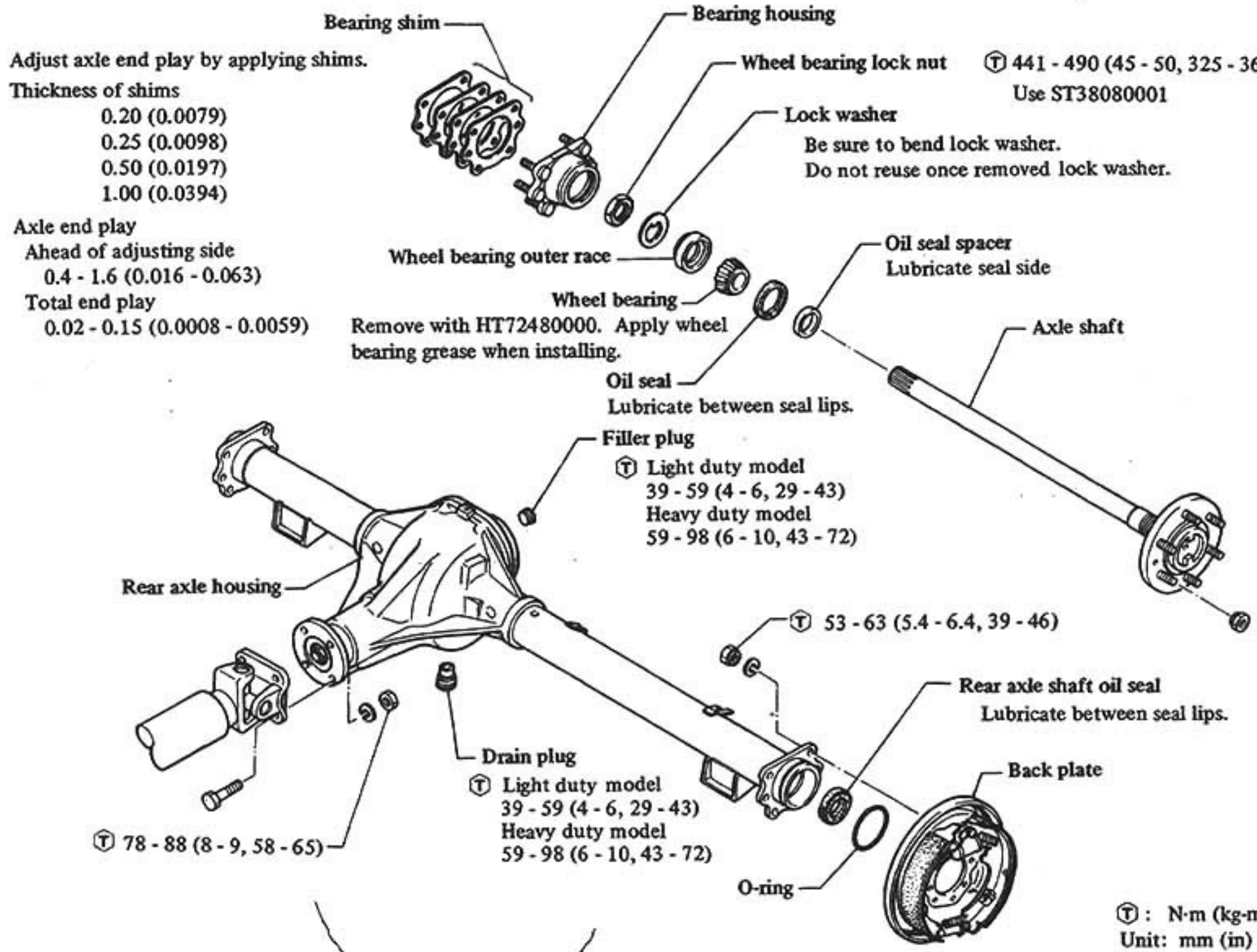
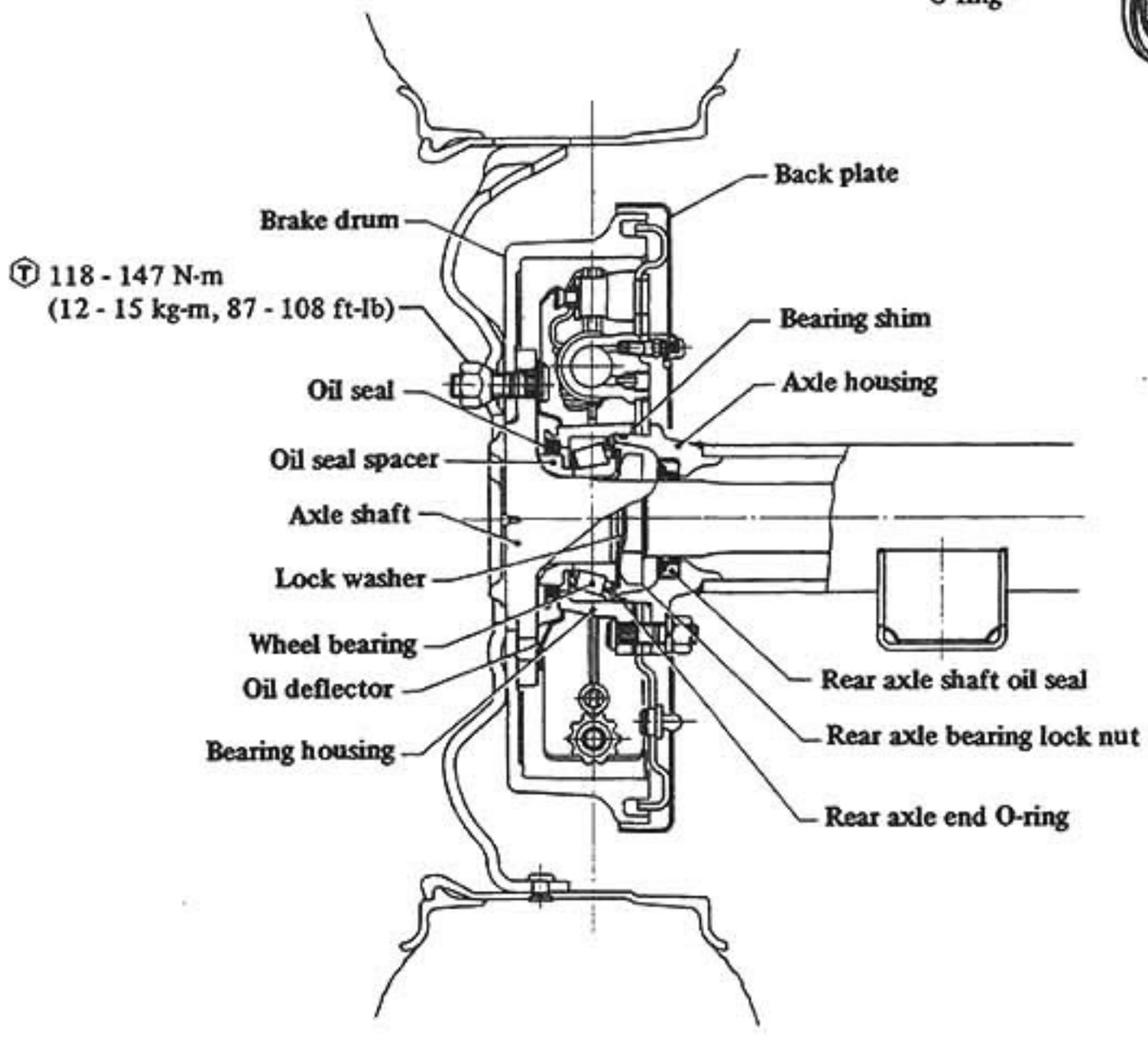
REAR AXLE & REAR SUSPENSION

CONTENTS

REAR AXLE

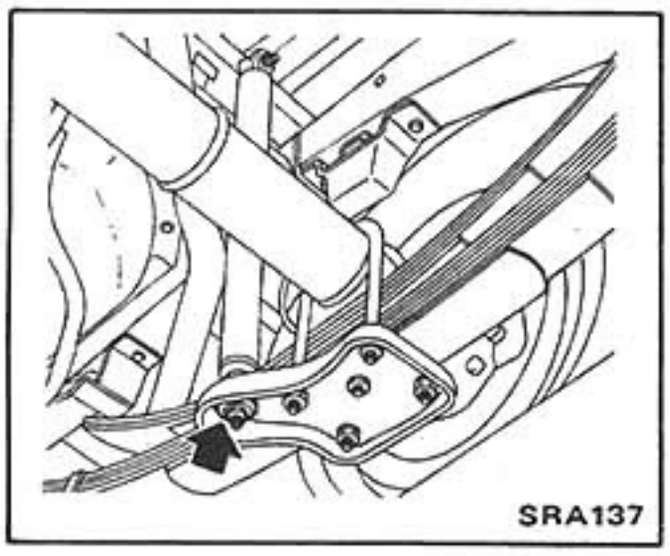

Bearing shim
Bearing housing
Adjust axle end play by applying shims.
Thickness of shims
0.20 (0.0079)
0.25 (0.0098)
0.50 (0.0197)
1.00 (0.0394)
Axle end play
Ahead of adjusting side
0.4 - 1.6 (0.016 - 0.063)
Total end play
0.02 - 0.15 (0.0008 - 0.0059)
Wheel bearing lock nut
T 441 - 490 (45 - 50, 325 - 362)
Use ST38080001
Lock washer
Be sure to bend lock washer.
Do not reuse once removed lock washer.
Wheel bearing outer race
Wheel bearing
Remove with HT72480000. Apply wheel bearing grease when installing.
Oil seal spacer
Lubricate seal side
Axle shaft
Oil seal
Lubricate between seal lips.
Filler plug
T Light duty model
39 - 59 (4 - 6, 29 - 43)
Heavy duty model
59 - 98 (6 - 10, 43 - 72)
Rear axle housing
T 53 - 63 (5.4 - 6.4, 39 - 46)
Rear axle shaft oil seal
Lubricate between seal lips.
Drain plug
T Light duty model
39 - 59 (4 - 6, 29 - 43)
Heavy duty model
59 - 98 (6 - 10, 43 - 72)
Back plate
T 78 - 88 (8 - 9, 58 - 65)
O-ring
T : N·m (kg-m, ft-lb)
Unit: mm (in)
SRA133


Back plate
Brake drum
T 118 - 147 N·m
(12 - 15 kg-m, 87 - 108 ft-lb)
Bearing shim
Oil seal
Axle housing
Oil seal spacer
Axle shaft
Lock washer
Wheel bearing
Oil deflector
Bearing housing
Rear axle shaft oil seal
Rear axle bearing lock nut
Rear axle end O-ring
SRA134

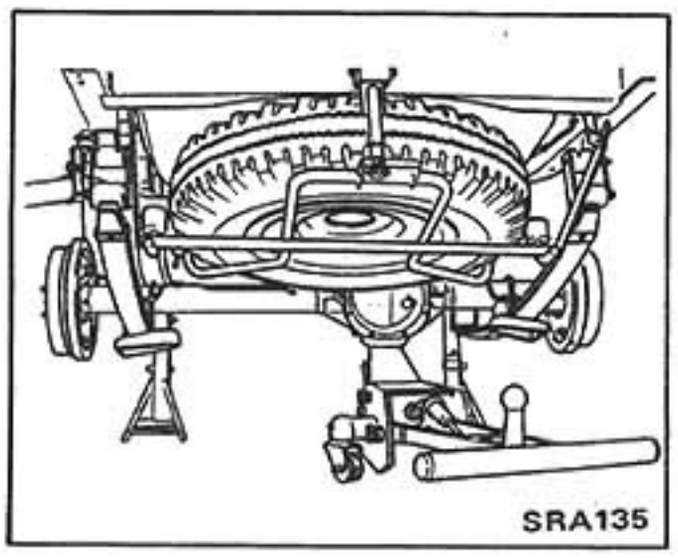
REAR AXLE ASSEMBLY

REMOVAL AND INSTALLATION

1. Disconnect shock absorber lower end on each side.

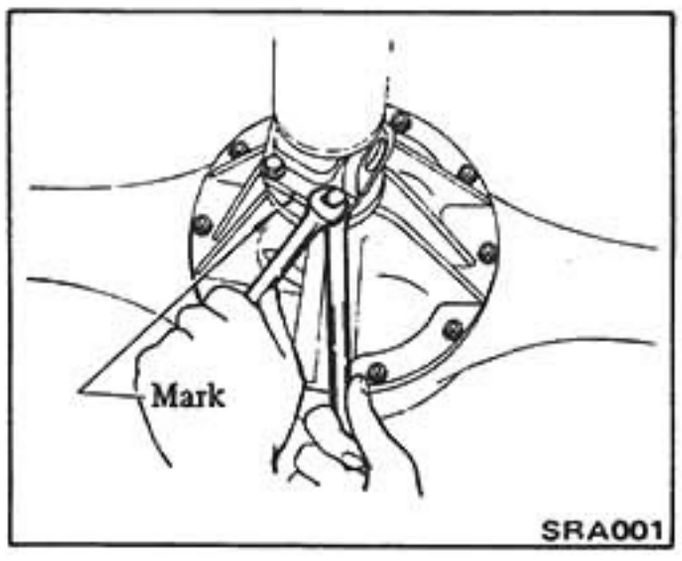

SRA137

2. Block front wheels with chocks and raise rear of vehicle, then **support it with safety stands. Refer to Section GI for lifting points and towing.**


SRA135

3. Remove wheel and tire assembly.
4. Separate propeller shaft and rear axle housing.

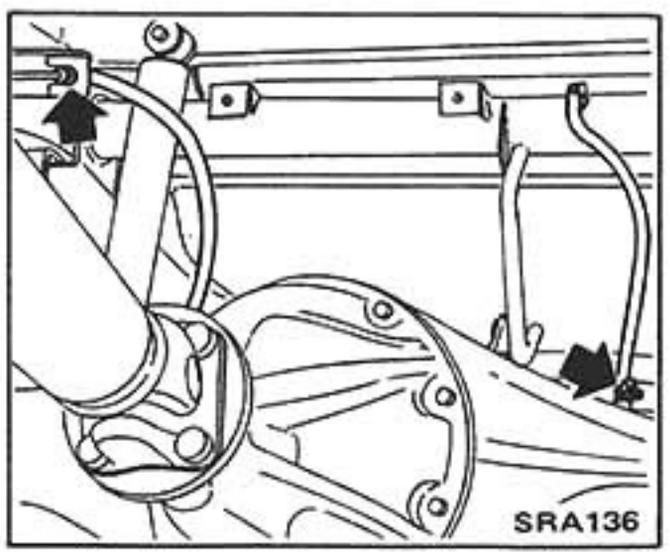
Mark relationship between propeller shaft flange and companion flange.



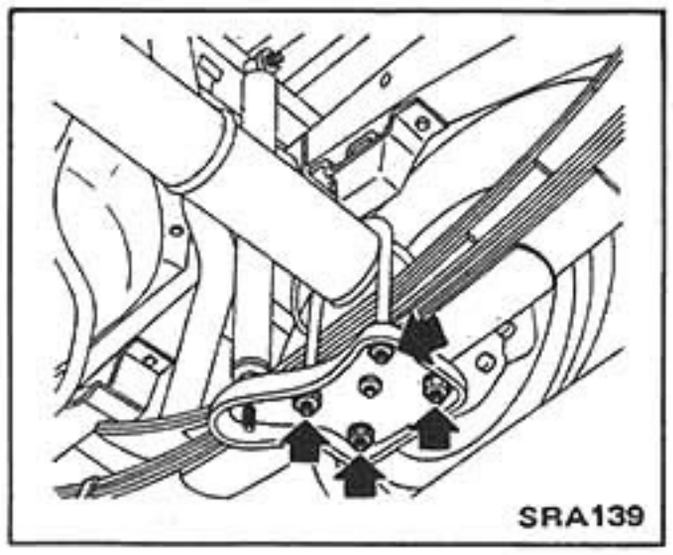
SRA001

5. Disconnect brake tube and breather hose.

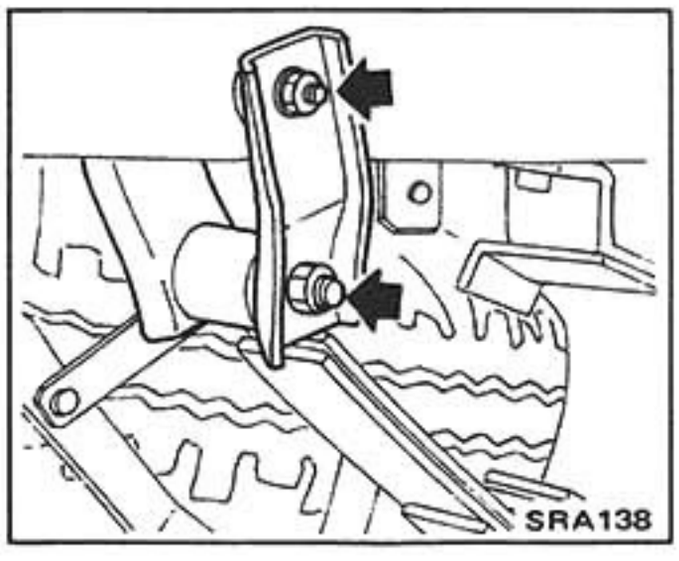
CAUTION:
When removing or installing brake tubes, use Tool GG94310000.


SRA136

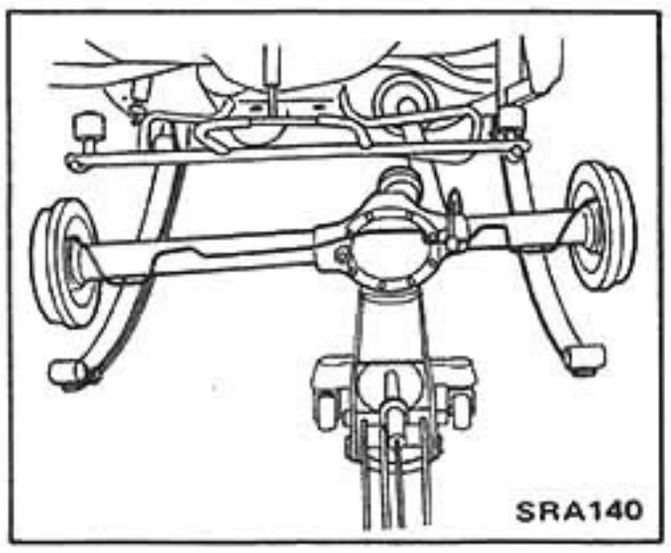
6. Loosen U-bolt.


SRA139

7. Support rear axle by the jack.
8. Disconnect rear spring shackle on each side.


SRA138

9. Lower the jack and remove U-bolts, and take out rear axle case.


SRA140

INSPECTION

Check axle case for yield, deformation or cracks and replace if necessary.

INSTALLATION

Ⓣ : U-bolt (Spring clip)
Light duty models
72 - 97 N·m
(7.3 - 9.9 kg-m,
53 - 72 ft-lb)
Heavy duty models
147 - 177 N·m
(15.0 - 18.0 kg-m,
108 - 130 ft-lb)
Shock absorber lower end
16 - 22 N·m
(1.6 - 2.2 kg-m,
12 - 16 ft-lb)
Brake tube flare nut
15 - 18 N·m
(1.5 - 1.8 kg-m,
11 - 13 ft-lb)
Propeller shaft to companion flange
78 - 88 N·m
(8 - 9 kg-m,
58 - 65 ft-lb)

REAR AXLE SHAFT AND WHEEL BEARING

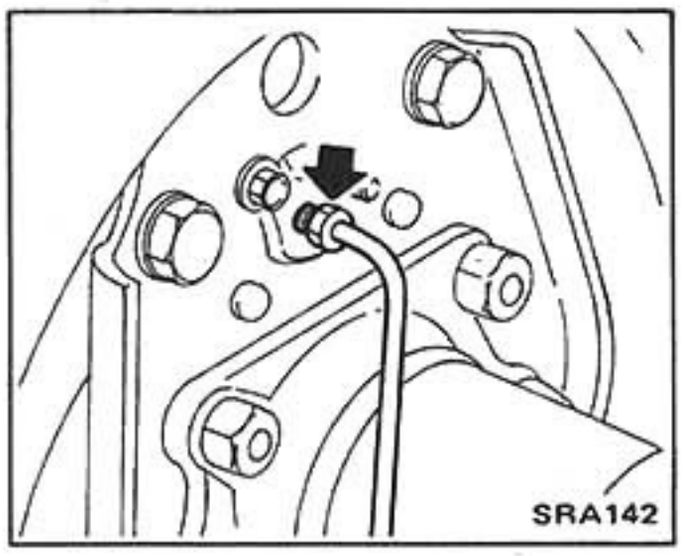
REMOVAL

1. Block front wheels with chocks and raise rear of vehicle, then **support**

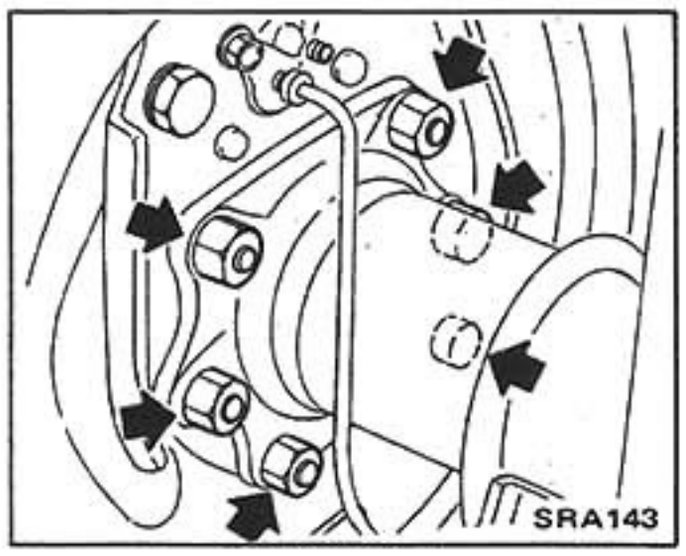
it with safety stands. Refer to Section GI for lifting points and towing.

2. Remove rear wheels and brake drums.
3. Disconnect brake tube.

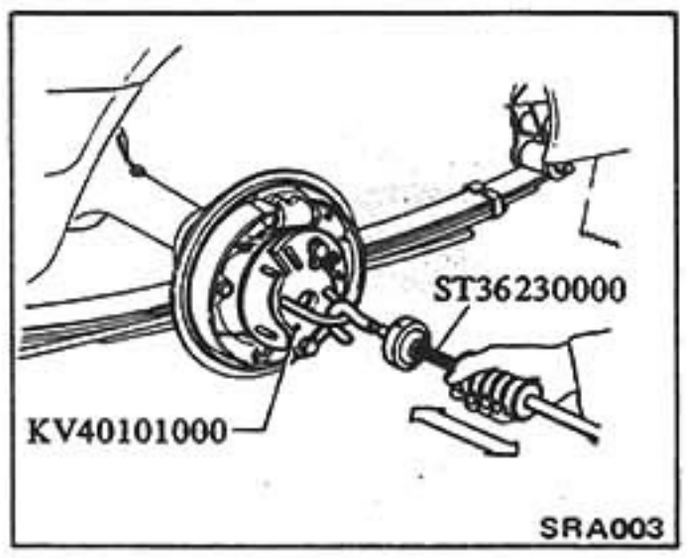
Cover brake tube and back plate openings to prevent entrance of dirt.



4. Remove nuts retaining bearing housing and back plate to rear axle housing.

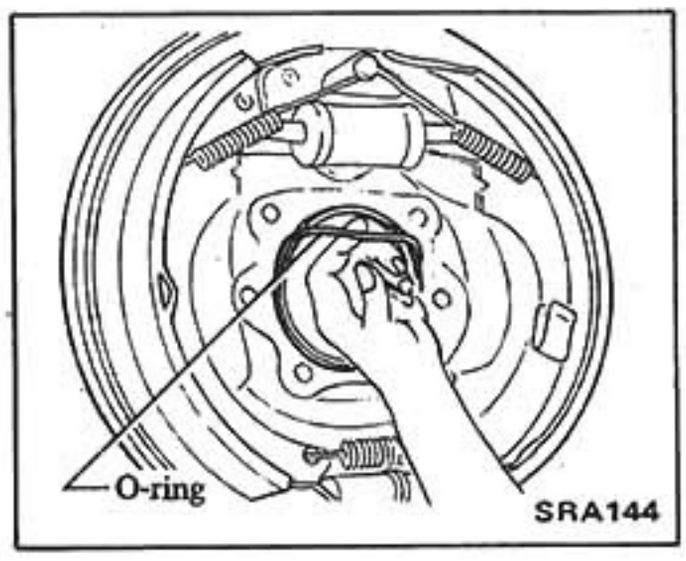


5. Pull out axle shaft assembly together with bearing housing.



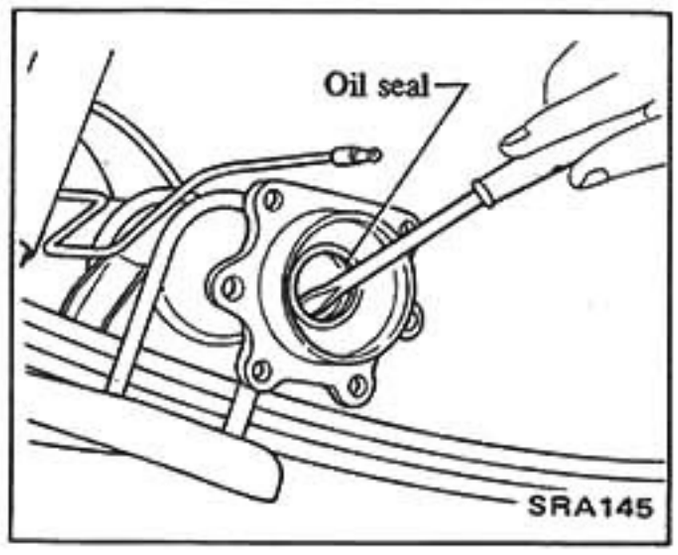
6. Remove O-ring and back plate with brake assembly.

Do not reuse once removed O-ring. Always install new one.



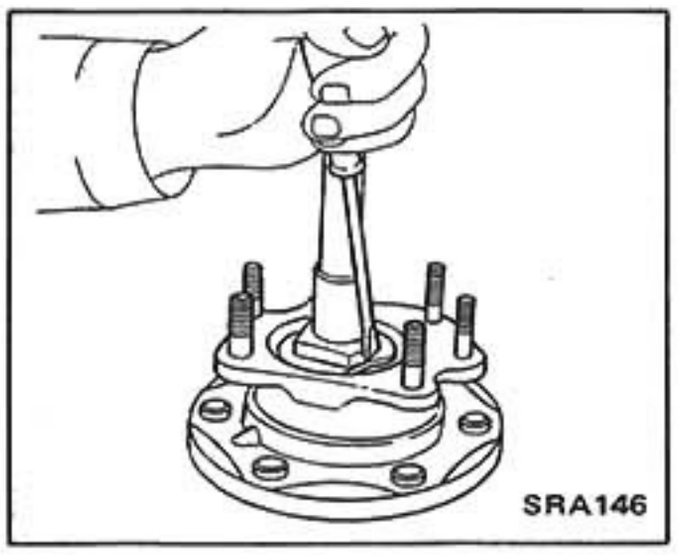
7. Remove oil seal.

Do not reuse once removed oil seal. Always install new one.



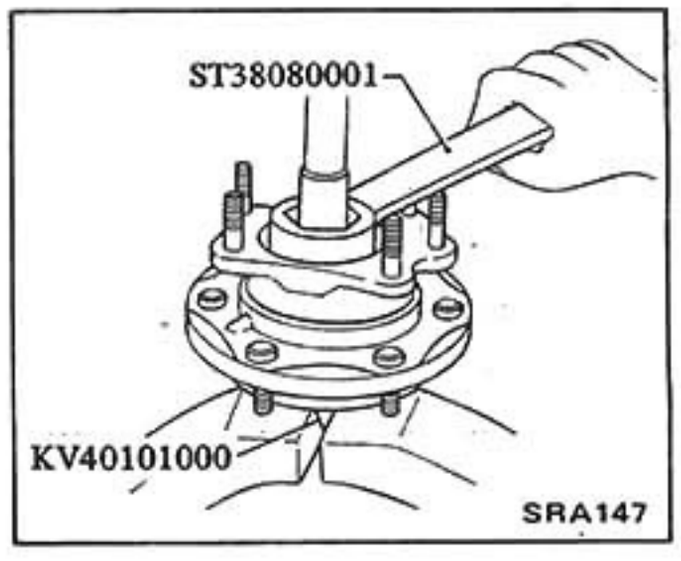
8. Unbend lock washer with a screwdriver.

Do not reuse once removed lock washer. Always install new one.

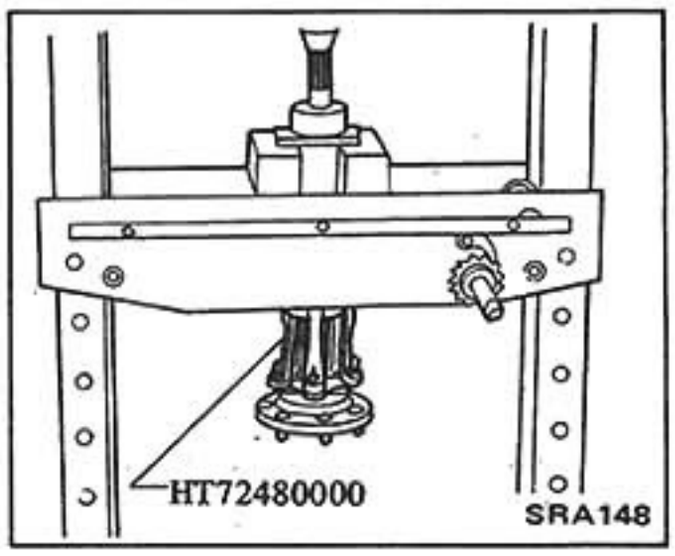


9. Position axle shaft in vise **with KV40101000.**

Remove bearing lock nut, **using Tool.**

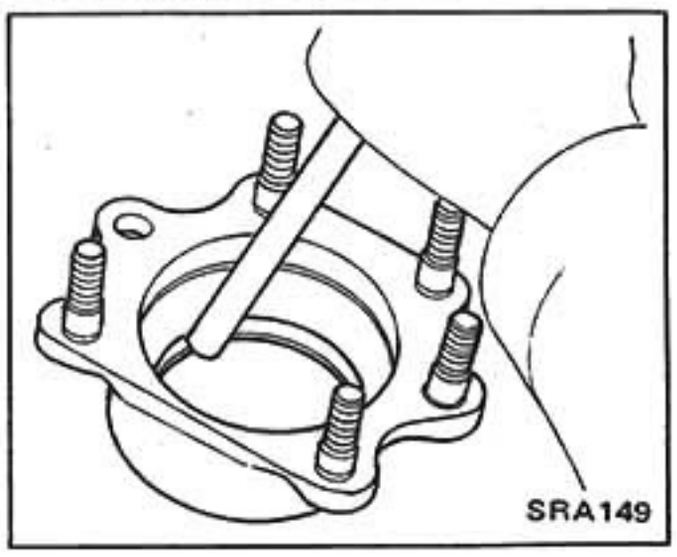


10. Withdraw wheel bearing together with bearing cage.

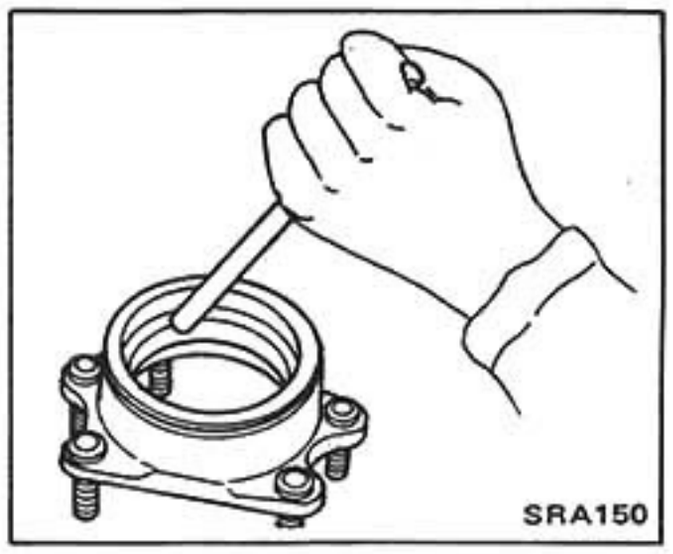


11. Remove oil seal in bearing cage with suitable bar if necessary.

Do not reuse once removed oil seal. Always install new one.



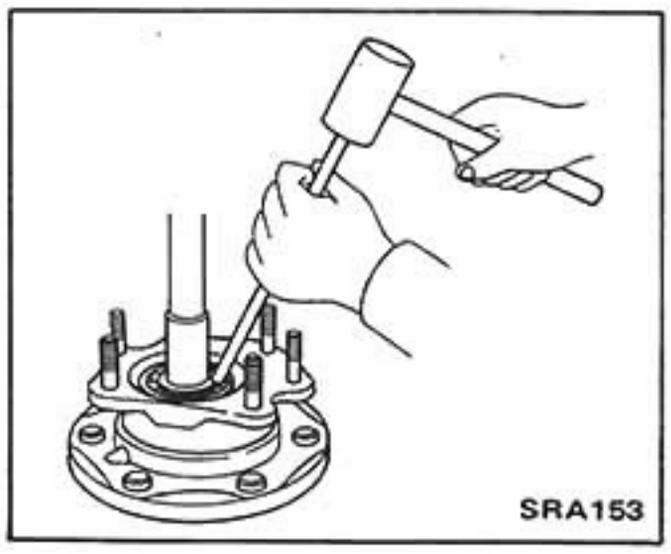
12. Remove wheel bearing outer race using a brass drift.

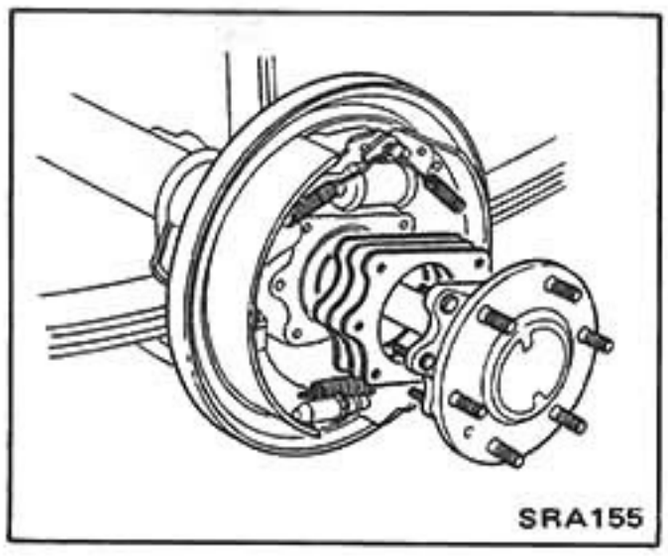


INSPECTION

Inspect the following parts and replace as required.

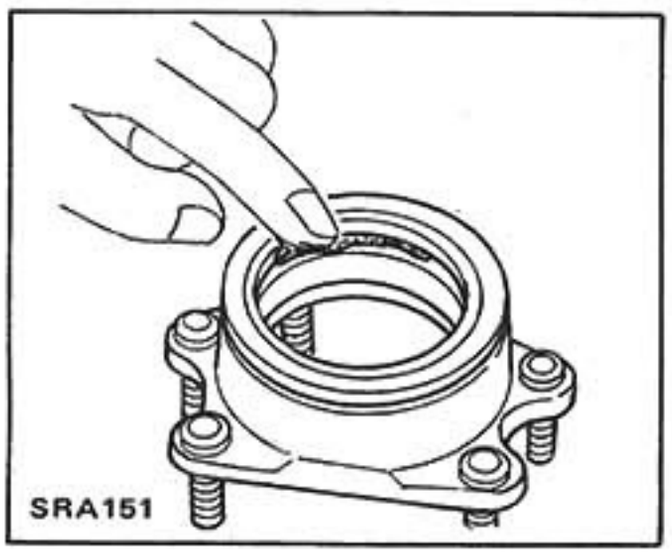
1. Check axle shaft for straightness, cracks, damage, wear or distortion.
2. Check bearing for wear or damage and axial end play.


SRA153

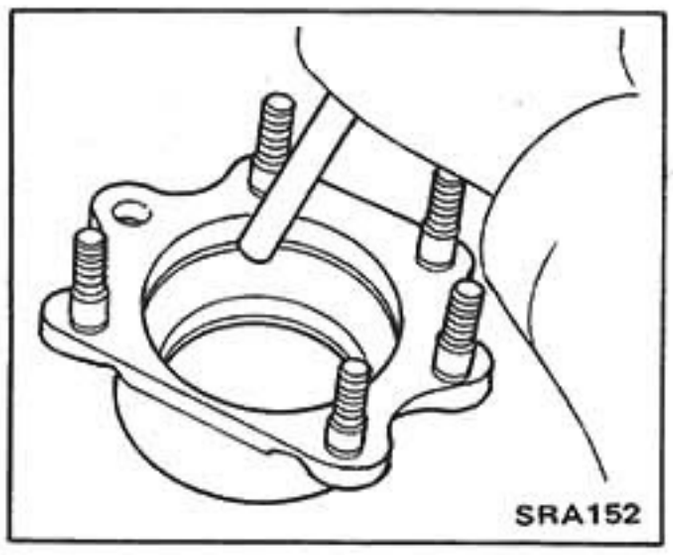

SRA155

INSTALLATION

a. Install a new oil seal in bearing cage. Lubricate cavity between seal lips after fitting seal.


SRA151

b. Install wheel bearing outer race, using a brass drift.


SRA152

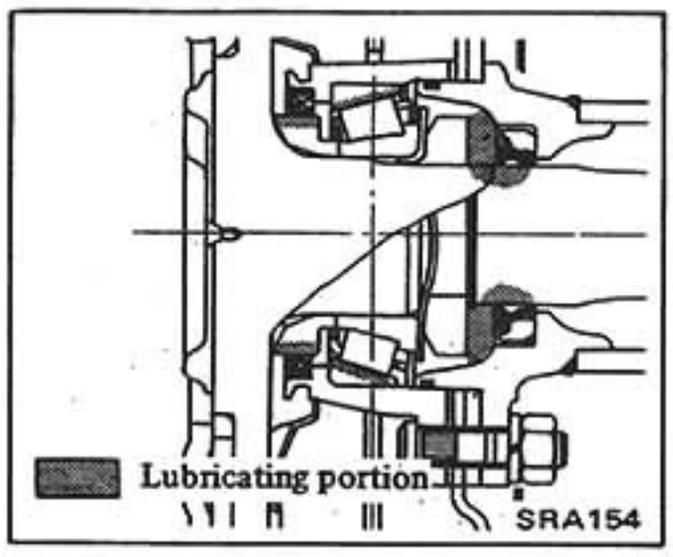
c. Install wheel bearing inner race, using a brass drift.

d. Be careful to place the faced side of nut on washer side.

e. Fit washer lip in axle shaft groove correctly.

f. Use a new bearing lock washer. Be sure to bend it up.

g. Apply wheel bearing grease to wheel bearing and recess of axle case end.

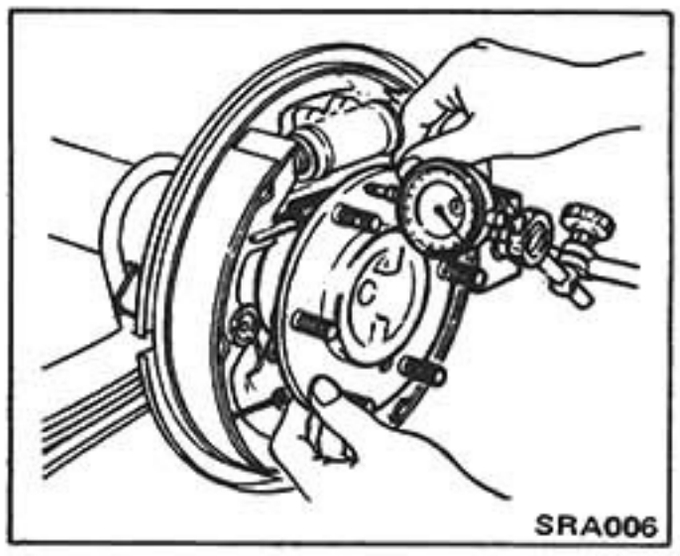


SRA154

h. Apply gear oil to the spline and apply a coat of wheel bearing grease to seal surface before installing axle shaft.

i. When installing axle shaft, adjust axial end play by applying case end shims.

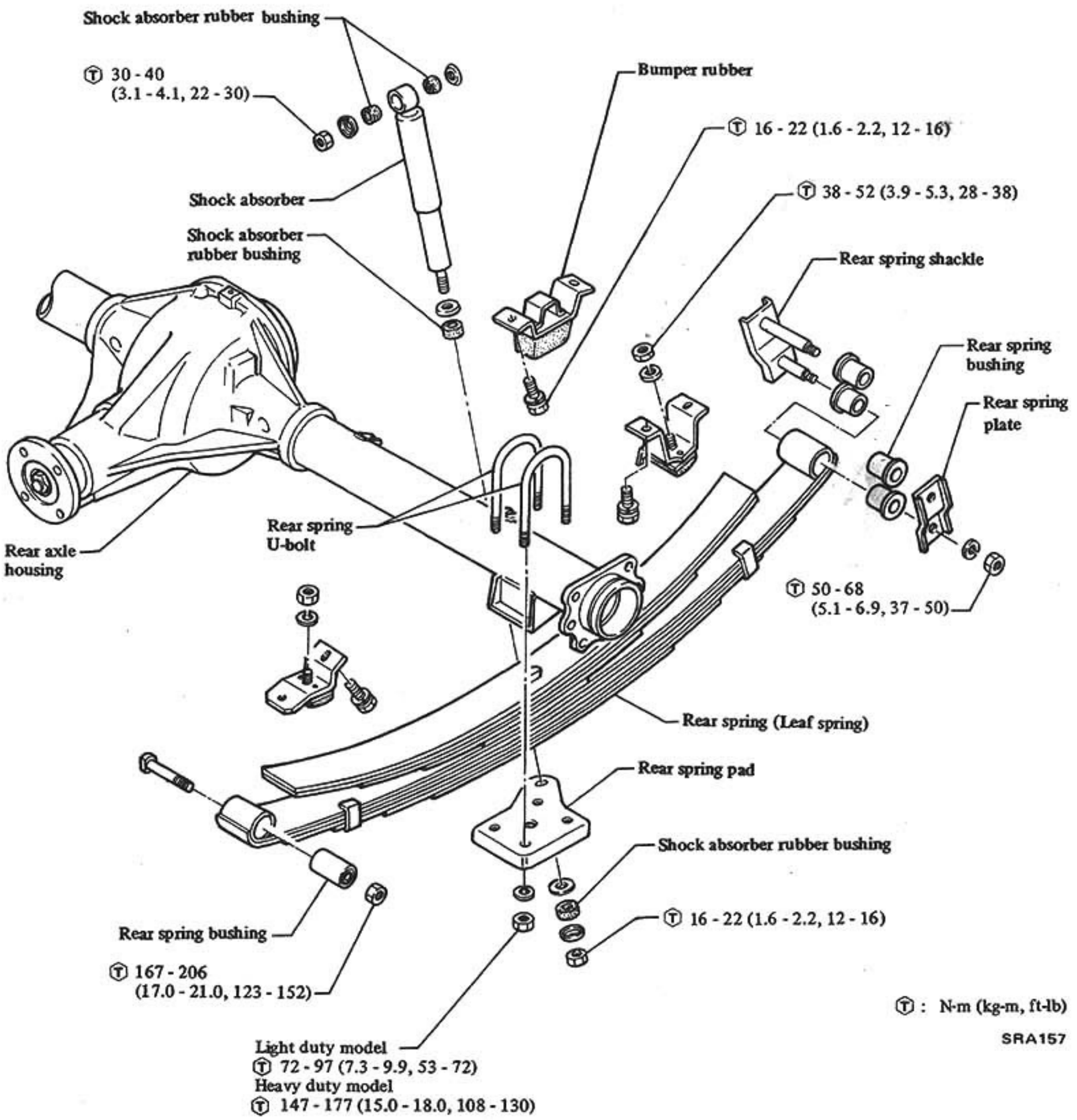
Rear axle case end shim:
Rear to S.D.S.
Axial end play:
Total end play
0.02 - 0.15 mm
(0.0008 - 0.0059 in)


SRA006

j. When installing axle shaft, be careful not to damage oil seal in axle housing.

Ⓣ : Wheel bearing lock nut
441 - 490 N·m
(45 - 50 kg-m,
325 - 362 ft-lb)
Back plate fixing nut
53 - 63 N·m
(5.4 - 6.4 kg-m,
39 - 46 ft-lb)
Brake tube flare nut
15 - 18 N·m
(1.5 - 1.8 kg-m,
11 - 13 ft-lb)
Wheel nut
118 - 147 N·m
(12 - 15 kg-m,
87 - 108 ft-lb)

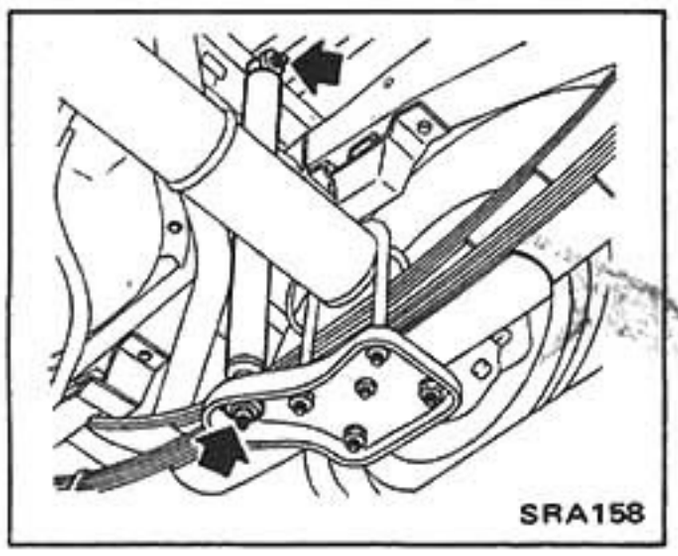
REAR SUSPENSION



REAR SHOCK ABSORBER

REMOVAL AND INSTALLATION

1. Remove shock absorber by disconnecting upper and lower ends.


SRA158

2. Install shock absorber, observing the following note.

Vehicle weight must be on rear wheels when tightening shock absorber upper and lower ends in order to clamp rubber bushings in neutral or unloaded position.

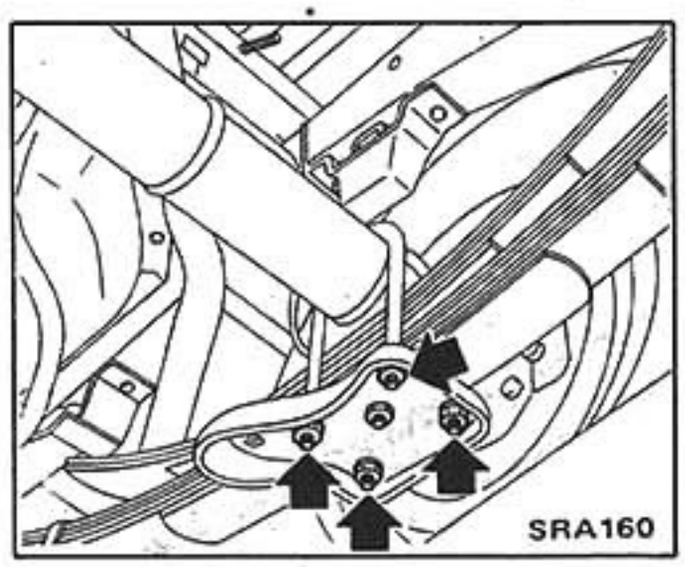
INSPECTION

1. Test shock absorber and compare with specifications given **in S.D.S. Replace if necessary.**
2. Check for oil leakage and cracks. Also, check shaft for bending.
3. Inspect rubber bushings for damage, cracks and deformation. Replace parts if necessary.

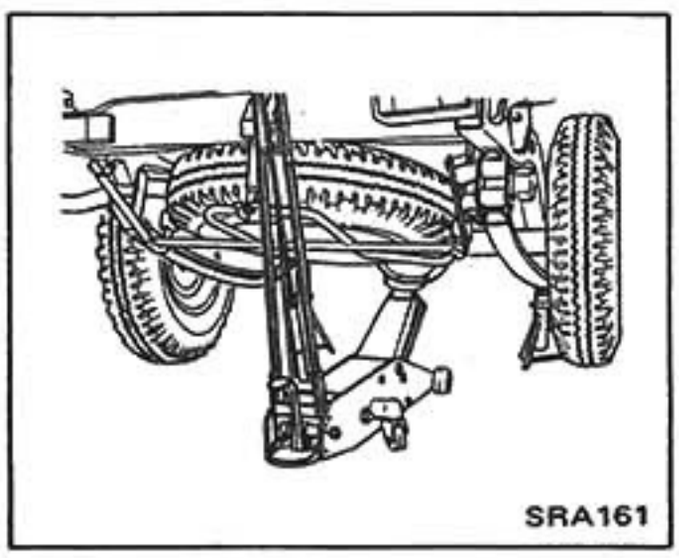
LEAF SPRING

REMOVAL

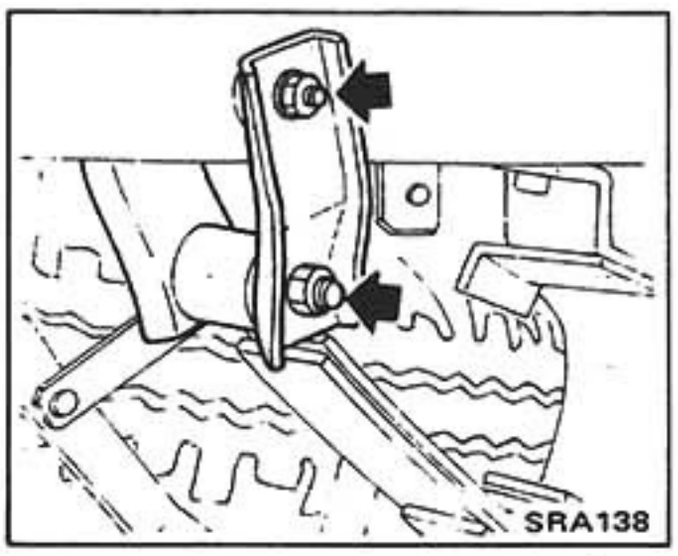
1. Disconnect shock absorber lower end.
2. Block front wheels with chocks and raise rear of vehicle, then **support it with safety stands. Refer to Section GI for lifting points and towing.**
3. Remove U-bolts.

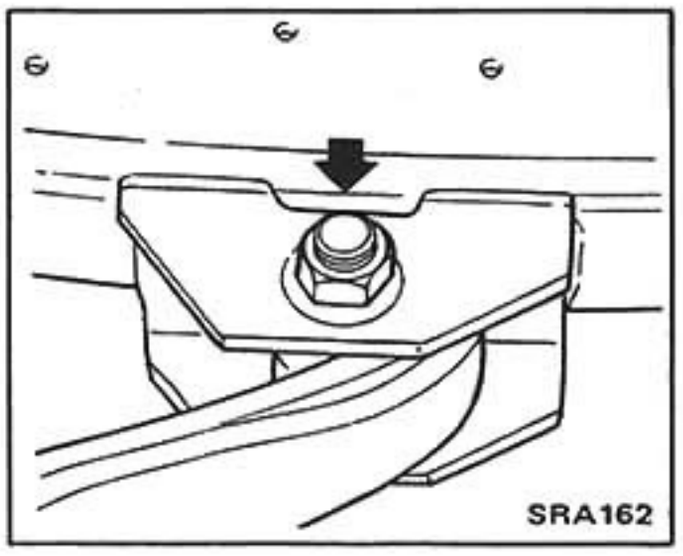

SRA160

4. Raise jack positioned under differential carrier and float axle case from spring.


SRA161

5. Disconnect rear spring shackle and front pin.


SRA138


SRA162

6. Remove rubber bushing if necessary.

INSPECTION

Clean all rust and dirt from spring leaves, using a wire brush if necessary.

1. Examine spring leaves for fractures or cracks.
2. Check front bracket and pin, shackle, U-bolts and spring seat for wear, cracks, straightness or damaged threads. If faulty parts are found, replace with new ones.
3. Inspect all rubber parts for wear, damage, separation or deformation. Replace them if necessary.

INSTALLATION

Vehicle weight must be on rear wheels when tightening front pin, shackle and shock absorber in order to clamp rubber bushings in neutral or unloaded position.

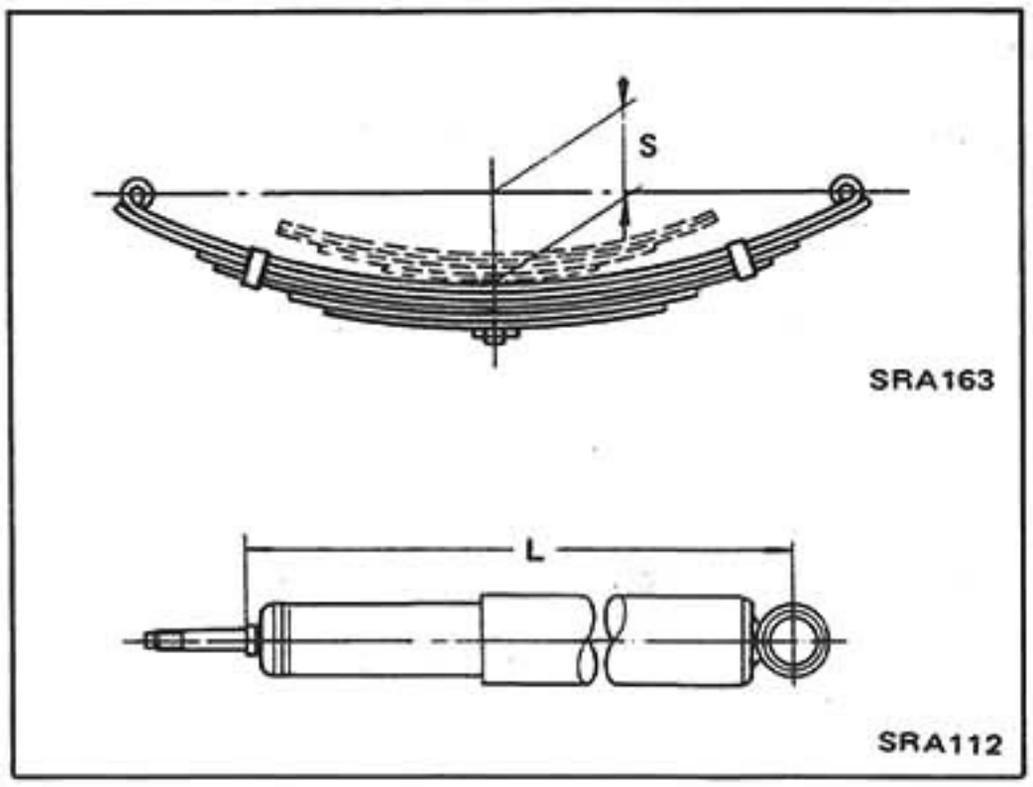
Ⓣ : Spring front pin nut
167 - 206 N·m
(17.0 - 21.0 kg-m,
123 - 152 ft-lb)
Spring shackle nut
50 - 68 N·m
(5.1 - 6.9 kg-m,
37 - 50 ft-lb)
U-bolt nut
Light duty models
72 - 97 N·m
(7.3 - 9.9 kg-m,
53 - 72 ft-lb)
Heavy duty models
147 - 177 N·m
(15.0 - 18.0 kg-m,
108 - 130)
Wheel nut
118 - 147 N·m
(12 - 15 kg-m,
87 - 108 ft-lb)

SERVICE DATA AND SPECIFICATIONS

GENERAL SPECIFICATIONS

Item \ Model			Model 160 series				Model 61 series	
			Light duty model		Heavy duty model		Light duty model	Heavy duty model
			*	For Middle East	*	For Middle East		
Suspension type			Semi-elliptic leaf spring					
Leaf spring	Length x width x thickness – number of leaves mm (in)		1,420 x 60 x 11 - 3 (55.91 x 2.36 x 0.43 - 3)	1,420 x 60 x 8 - 6 (55.91 x 2.36 x 0.31 - 6)	(Main) 1,435 x 60 x 11 - 3 (56.50 x 2.36 x 0.43 - 3) (Helper) 1,051 x 60 x 10 - 2 (41.38 x 2.36 x 0.39 - 2)	(Main) 1,435 x 60 x 8 - 6 (56.50 x 2.36 x 0.31 - 6) (Helper) 1,051 x 60 x 7 - 4 (41.38 x 2.36 x 0.28 - 4)	1,300 x 70 x 7.5 - 5 (51.18 x 2.76 x 0.295 - 5)	1,300 x 70 x 8 - 1 7 - 7 (51.18 x 2.76 x 0.31 - 1, 0.28 - 8)
	Free camber "S" mm (in)		173.3 (6.82)	165 (6.50)	206 (8.11)	215.7 (8.49)	145 (5.71)	168 (6.61)
	Laden camber "S" mm/N (mm/kg, in/lb)		40.5 - 52.5/ 5,982 (40.5 - 52.5/ 610, 1.594 - 2.067/ 1,345)	30.5 - 42.5/ 5,982 (30.5 - 42.5/ 610, 1.201 - 1.673/ 1,345)	64 - 76/ 8,238 (64 - 76/ 840, 2.52 - 2.99/ 1,852)	80 - 92/ 8,238 (80 - 92/ 840, 3.15 - 3.62/ 1,852)	17 - 27/ 5,247 (17 - 27/ 535, 0.67 - 1.06/ 1,180)	45.5 - 56.5/ 7,257 (45.5 - 56.5/740, 1.791 - 2.224/ 1,632)
	Spring constant N/mm (kg/mm, lb/in)		47.2 (4.81, 269.4)	46.6 (4.75, 266.0)	46.9 - 115.5 (4.78 - 11.78, 267.7 - 659.7)	46.4 - 118.9 (4.73 - 12.12, 264.9 - 678.7)	39.6 - 45.7 (4.035 - 4.655, 225.96 - 260.68)	66.3 - 76.3 (6.76 - 7.78, 378.6 - 435.7)
Shock absorber	Maximum length "L" mm (in)		458 (18.03)	498 (19.61)	518 (20.39)	538 (21.18)	482 (18.98)	
	Stroke mm (in)		180 (7.09)	200 (7.87)	210 (8.27)	220 (8.66)	200 (7.87)	
	Damping force [0.3 m/sec (1.0 ft/sec)] N (kg, lb)	Expansion	1,128 (115,254)				1,863 (190, 419)	
		Compression	451 (46,101)				785 (80, 176)	

* Except Middle East: Standard
For Middle East: Option



INSPECTION AND ADJUSTMENT

REAR AXLE

Unit: mm (in)

Total end play	0.02 - 0.15 (0.0008 - 0.0059)	
Bearing housing shim	Thickness	Part No.
	1.00 (0.0394)	43086 T0400
	0.50 (0.0197)	43087 T0400
	0.25 (0.0098)	43088 T0400
	0.20 (0.0079)	43089 T0400

TIGHTENING TORQUE

Unit	N·m	kg-m	ft-lb
Shock absorber upper end nut	30 - 40	3.1 - 4.1	22 - 30
Shock absorber lower end nut	16 - 22	1.6 - 2.2	12 - 16
Leaf spring U-bolt nut	72 - 97 147 - 177*	7.3 - 9.9 15.0 - 18.0*	53 - 72 108 - 130*
Spring front pin nut	167 - 206	17.0 - 21.0	123 - 152
Spring shackle	50 - 68	5.1 - 6.9	37 - 50
Back plate and bearing housing fixing nut	53 - 63	5.4 - 6.4	39 - 46
Wheel bearing lock nut	441 - 490	45 - 50	325 - 362
Differential gear carrier to axle case nut	11 - 14 27 - 36*	1.1 - 1.4 2.8 - 3.7*	8 - 10 20 - 27*
Drain plug	39 - 59 59 - 98*	4 - 6 6 - 10*	29 - 43 43 - 72*
Filler plug	39 - 59 59 - 98*	4 - 6 6 - 10*	29 - 43 43 - 72*
Bumper rubber fixing bolt	16 - 22	1.6 - 2.2	12 - 16
Wheel nut	118 - 147	12 - 15	87 - 108
Propeller shaft to companion flange	78 - 88	8 - 9	58 - 65
Brake tube flare nut	15 - 18	1.5 - 1.8	11 - 13
Bumper rubber fixing nut	38 - 52*	3.9 - 5.3*	28 - 38*

* Heavy duty models

TROUBLE DIAGNOSES AND CORRECTIONS

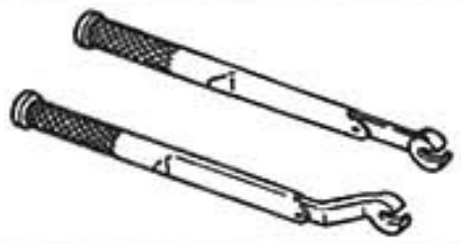
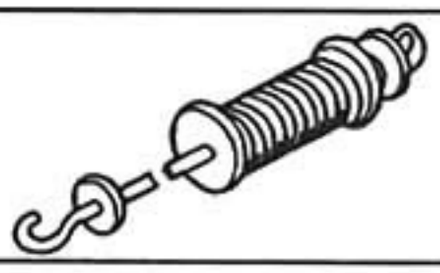
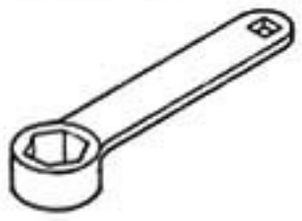
When rear axle and suspension is suspected of being noisy it is advisable to make a thorough test to determine whether the noise originates in the tires, road surface, exhaust, propeller shaft, engine, transmission, wheel bearings or suspension.

Noise which originates in other places can not be corrected by adjustment or replacement of parts in the rear axle and rear suspension.

In case of oil leak, first check if there is any damage or restriction in breather.

Condition	Probable cause	Corrective action
Noise	Loose wheel nuts.	Tighten the wheel nuts.
	Loose one or more securing bolts.	Tighten the bolts to the specified torque.
	Lack of lubricating oil or grease.	Lubricate as required.
	Faulty shock absorber.	Replace the shock absorber.
	Incorrect adjustment of rear axle shaft end play.	Adjust the rear axle shaft end play.
	Damaged or worn wheel bearing.	Replace wheel bearing.
	Worn spline portion of rear axle shaft.	Replace if necessary.
	Broken leaf spring.	Replace leaf spring.
	Loose journal, connections and so on.	Tighten to the given torque.
	Wheel and tire unbalance.	Balance wheel and tire.
	Damaged rubber parts such as leaf spring bushing and shock absorber mounting bushing.	Replace the required parts.
	Faulty propeller shaft journal.	Correct or replace.
Instability in driving	Loose wheel nuts.	Tighten to the given torque.
	Worn shock absorber.	Replace faulty shock absorber.
	Worn or broken leaf spring.	Replace leaf spring.
Oil leakage	Damaged or restricted air breather.	Clean or replace air breather.
	Damaged oil seal in rear axle case or differential carrier.	Replace the damaged oil seal.
	Oil leakage from between the differential carrier and axle case.	Tighten to the specified torque, or replace gasket.

SPECIAL SERVICE TOOLS

Tool number	Tool name	
GG94310000	Flare nut torque wrench	
KV40101000	Rear axle stand	
ST36230000	Sliding hammer	
ST38080001	Bearing lock nut wrench	
HT72480000	Rear axle shaft bearing puller