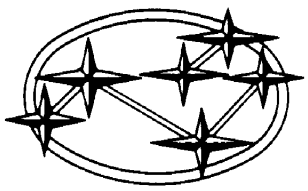
WHEELS AND AXLES

4-2

SUBARU

1988



MECHANISM AND FUNCTION

Front Axle

Because Front Wheel Drive system is adopted on the vehicle, drive shafts are front axle shafts. The inboard end of the axle shaft is connected to the differential via a constant velocity joint (double offset joint: DOJ) which provides flexible capabilities in the longitudinal direction while the outboard end is supported by ball bearings located inside the housing via a bell joint (BJ) which features a large operating angle.

Since the drive shaft employs constant velocity joints, it provides with smooth, even revolution of drive wheel without vibration.

The disc hub is engaged to BJ spindle by means of serration and secured by a castle nut and cotter pin via a center piece and washer spring.

After front axle parts have been repaired, toe-in should be adjusted.

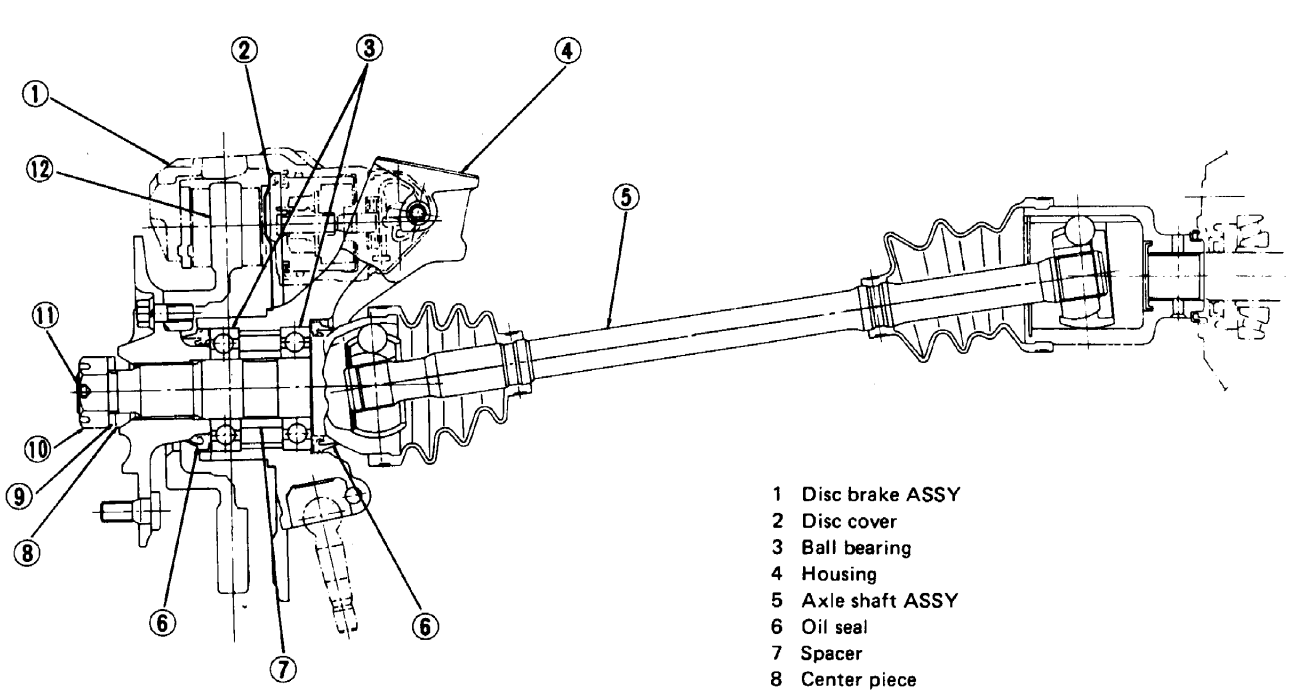


Fig. 1 Except XT6

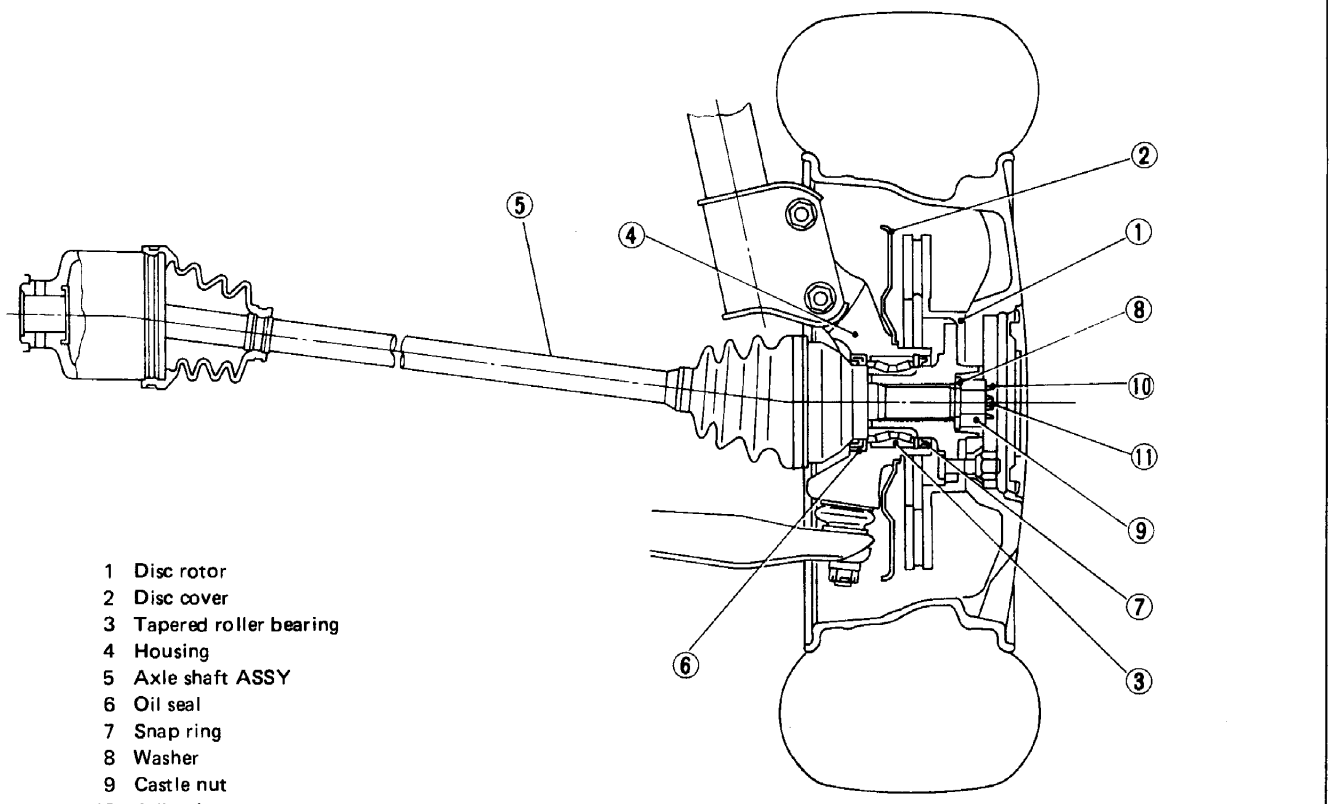

1 Disc rotor
2 Disc cover
3 Tapered roller bearing
4 Housing
5 Axle shaft ASSY
6 Oil seal
7 Snap ring
8 Washer
9 Castle nut
10 Adjusting cap
11 Cotter pin
L4-1321

Fig. 2 XT6

Rear Axle

FWD... The rear axle spindle is welded on the rear trailing arm, and the brake drum (drum brake models)/hub & disc ASSY (disc brake models) is attached to the spindle via the taper roller bearings.

4WD... The rear axle spindle is supported by bearings located inside the housing welded to the rear trailing arm. The brake drum (drum brake models)/hub & disc ASSY (disc brake models) is serrated and held to the spindle with a castle nut and cotter pin.

The brake drum/hub is provided with a fitting section for the disc wheel in order to prevent eccentric installation of the disc wheel and vibration in high-speed operations.

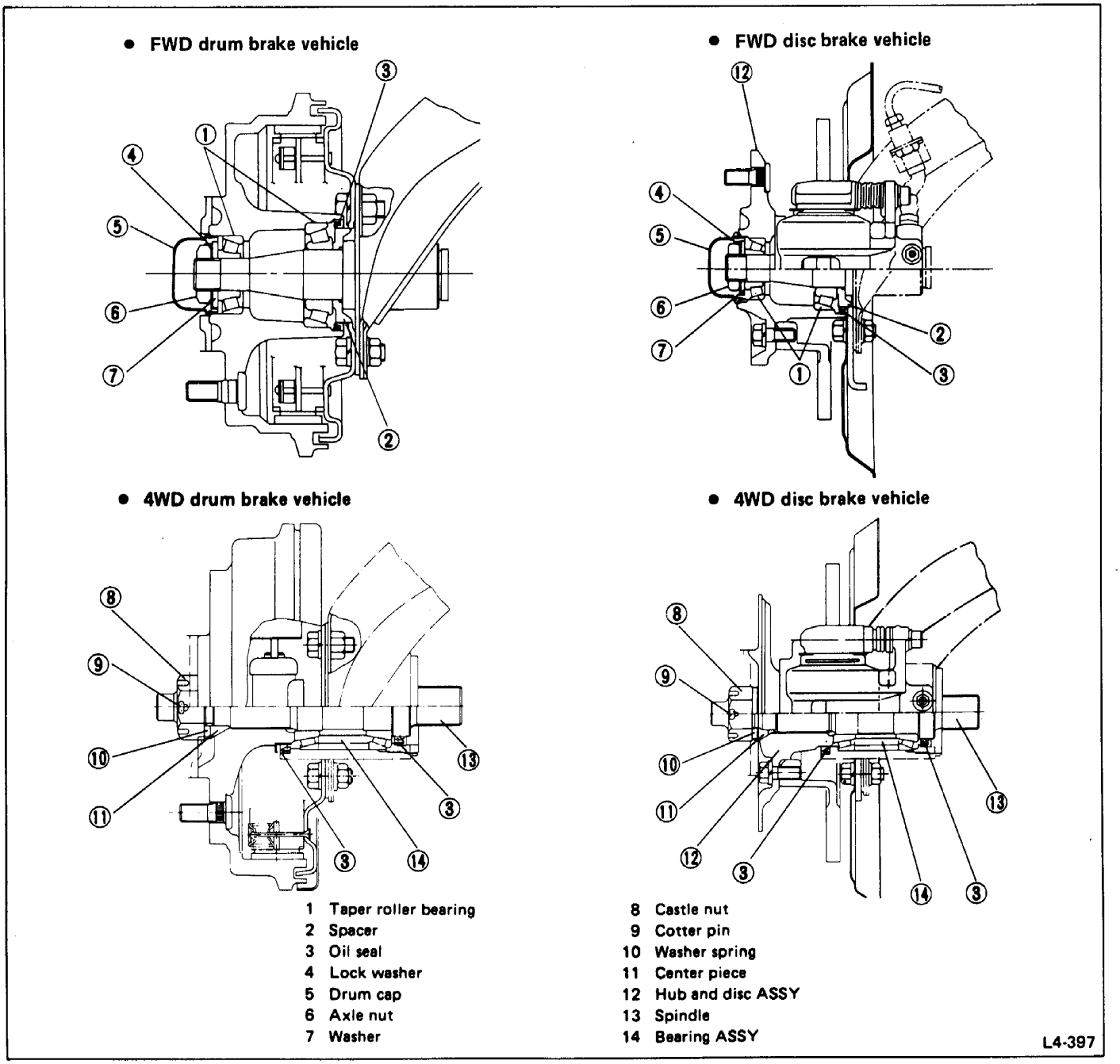
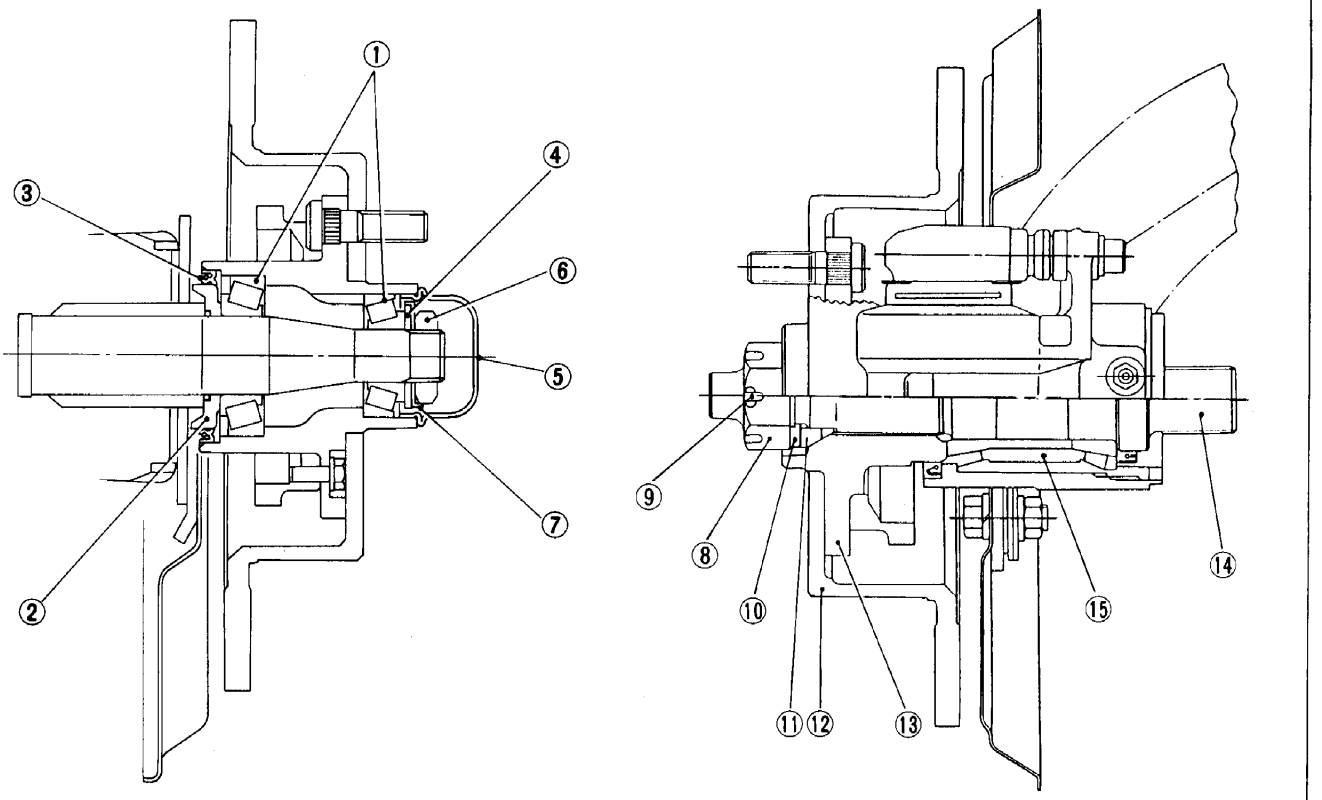


Fig. 3 Except XT6

• FWD disc brake vehicle

• 4WD disc brake vehicle



1 Tapered roller bearing
2 Spacer
3 Oil seal
4 Washer
5 Drum cap
6 Axle nut
7 Lock washer
8 Castle nut
9 Cotter pin
10 Washer spring
11 Center piece
12 Disc rotor
13 Hub
14 Spindle
15 Bearing ASSY

L4-1322

Fig. 4 XT6

SPECIFICATIONS AND SERVICE DATA

SPECIFICATIONS

• TIRE & WHEEL SIZE

Model		Front and Rear				Spare		
		Tire size	Rim size	Rim offset mm (in)	P.C.D. mm (in)	Tire size	Rim size	Rim offset mm (in)
FWD	DL	165SR13	5Jx13	45 (1.77)	140 (5.51)	T125/70D14	4Tx14	50 (1.97)
	GL	185/70HR13						
	XT6	195/60R14 85H	5-1/2JJx14		100 (3.94)	T135/70D15	4Tx15	43 (1.69)
4WD	GL	185/70HR13	5Jx13		140 (5.51)			53 (2.09)
	XT6	205/60R14 87H	5-1/2JJx14		100 (3.94)			46 (1.81)

"T-type" tire for temporary use is used as a spare tire.

• TIRE INFLATION PRESSURE

kPa (kg/cm^2, psi)

Front tire	Except XT6	196 (2.0, 28)
	XT6	226 (2.3, 33)
Rear tire		196 (2.0, 28)
Spare tire	T-type	412 (4.2, 60)

• FRONT AXLE SHAFT ASSEMBLY

Model	Type of axle shaft ASSY	Shaft diameter (D) mm (in)	DOJ	
			Cooling groove	No. of spline teeth
Except XT6	87AC-23	23.8 (0.937)	With	23
	87AC-25			25
	95AC-23		With	23
	95AC-25			25
XT6	95AC-25	28 (1.10)	With	25
	100AC-25	25.4 (1.000)		

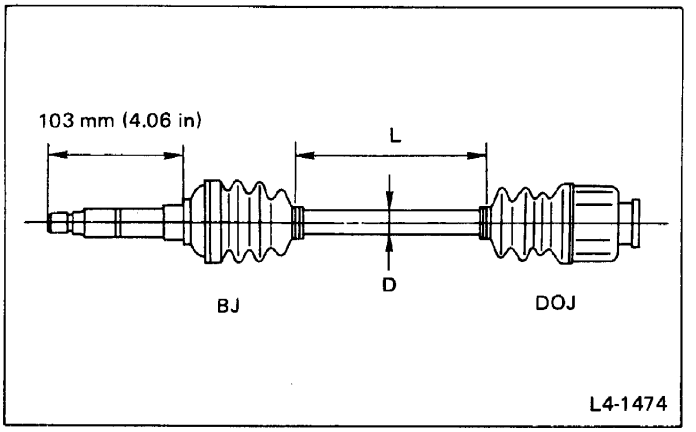


Fig. 5

Application table

Power unit	FWD		4WD	
	MT	AT	MT	AT
Multi-Point Fuel Injection	87AC-23	87AC-25	87AC-23	
XT6	100AC-25		95AC-25	

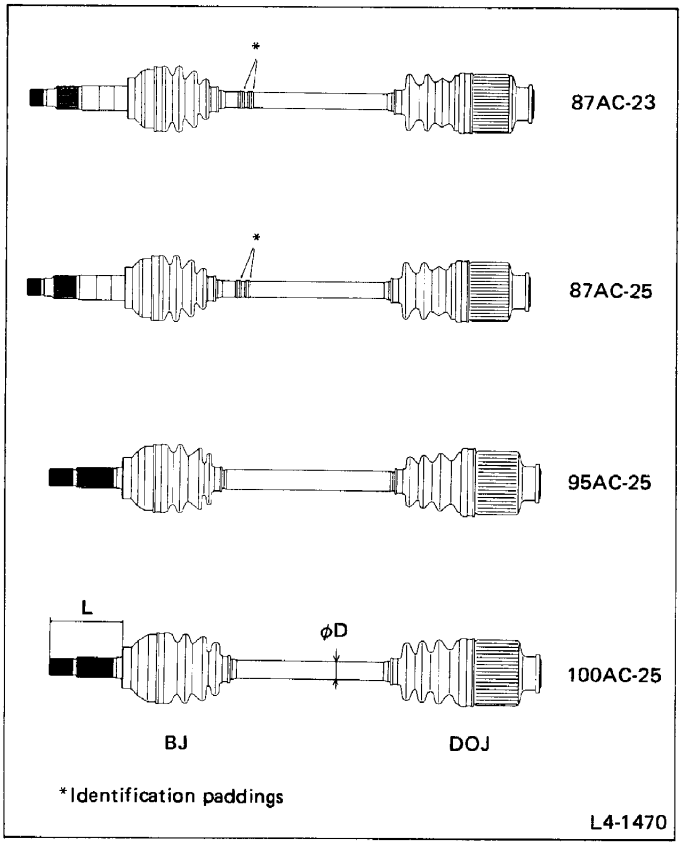


Fig. 6

Proper use of front axle shaft ASSY 95AC-23 and 95AC-25

95AC axle shaft is available in two different sizes to suit the differential spindle in the transmission; DOJ spline 23 teeth type [spline dia. 27 mm (1.06 in) dia.] and DOJ spline 25 teeth type [spline dia. 30 mm (1.18 in) dia.]. These shafts must be used properly according to the "Application Table". When replacing a single DOJ unit or axle shaft ASSY, carefully check the actual vehicle to avoid improper use of axle shaft. The axle shafts 95AC-23 and 95AC-25 can be distinguished by the different shape of the DOJ small end as shown in the figure.

Improper combination of transmission spindle and DOJ spline will result in the following faulty conditions.

a. 87AC-23, 95AC-23 combined with thick spindle [30 mm (1.18 in) dia.]:

The axle shaft cannot be installed because the DOJ spline diameter is small [27 mm (1.06 in) dia.].

b. 87AC-25, 95AC-25 combined with thin spindle [27 mm (1.06 in) dia.]:

A large play will be formed between DOJ and spindle. (Fitting the DOJ to spindle is too loose.) At the time of vehicle's starting the spring pin will break, and a large noise will be generated, then the vehicle will fail to go forward (FWD mode) as the front differential rotates idly.

SERVICE DATA

<table>
<tr><th colspan="2">Item</th><th>Standard</th><th>Service Limit</th></tr>
<tr><td>Rear wheel bearing (FWD only)</td><td>Preload (Starting force when measured at hub bolt)</td><td colspan="2">8.34 – 14.22 N
(0.85 – 1.45 kg, 1.87 – 3.20 lb)</td></tr>
<tr><td>Wheel balancing</td><td>Dynamic unbalance</td><td colspan="2">Less than 6 g (0.21 oz)</td></tr>
<tr><td></td><td colspan="3">Balance weight part number
<table>
<tr><th>For steel wheel</th><th>Weight g (oz)</th><th>For aluminum wheel</th></tr>
<tr><td>723141010</td><td>10 (0.35)</td><td>23141GA470</td></tr>
<tr><td>723141020</td><td>20 (0.71)</td><td>23141GA490</td></tr>
<tr><td>723141030</td><td>30 (1.06)</td><td>23141GA510</td></tr>
<tr><td>723141040</td><td>40 (1.41)</td><td>23141GA530</td></tr>
<tr><td>723141050</td><td>50 (1.76)</td><td>23141GA550</td></tr>
<tr><td>723141060</td><td>60 (2.12)</td><td>23141GA570</td></tr>
<tr><td>723141070</td><td>5 (0.18)</td><td>23141GA460</td></tr>
<tr><td>723141080</td><td>15 (0.53)</td><td>23141GA480</td></tr>
<tr><td>723141090</td><td>25 (0.88)</td><td>23141GA500</td></tr>
<tr><td>723141100</td><td>35 (1.23)</td><td>23141GA520</td></tr>
<tr><td>723141110</td><td>45 (1.59)</td><td>23141GA540</td></tr>
<tr><td>723141220</td><td>55 (1.94)</td><td></td></tr>
</table></td></tr>
</table>

COMPONENT PARTS

Front Axle

1. Except XT6

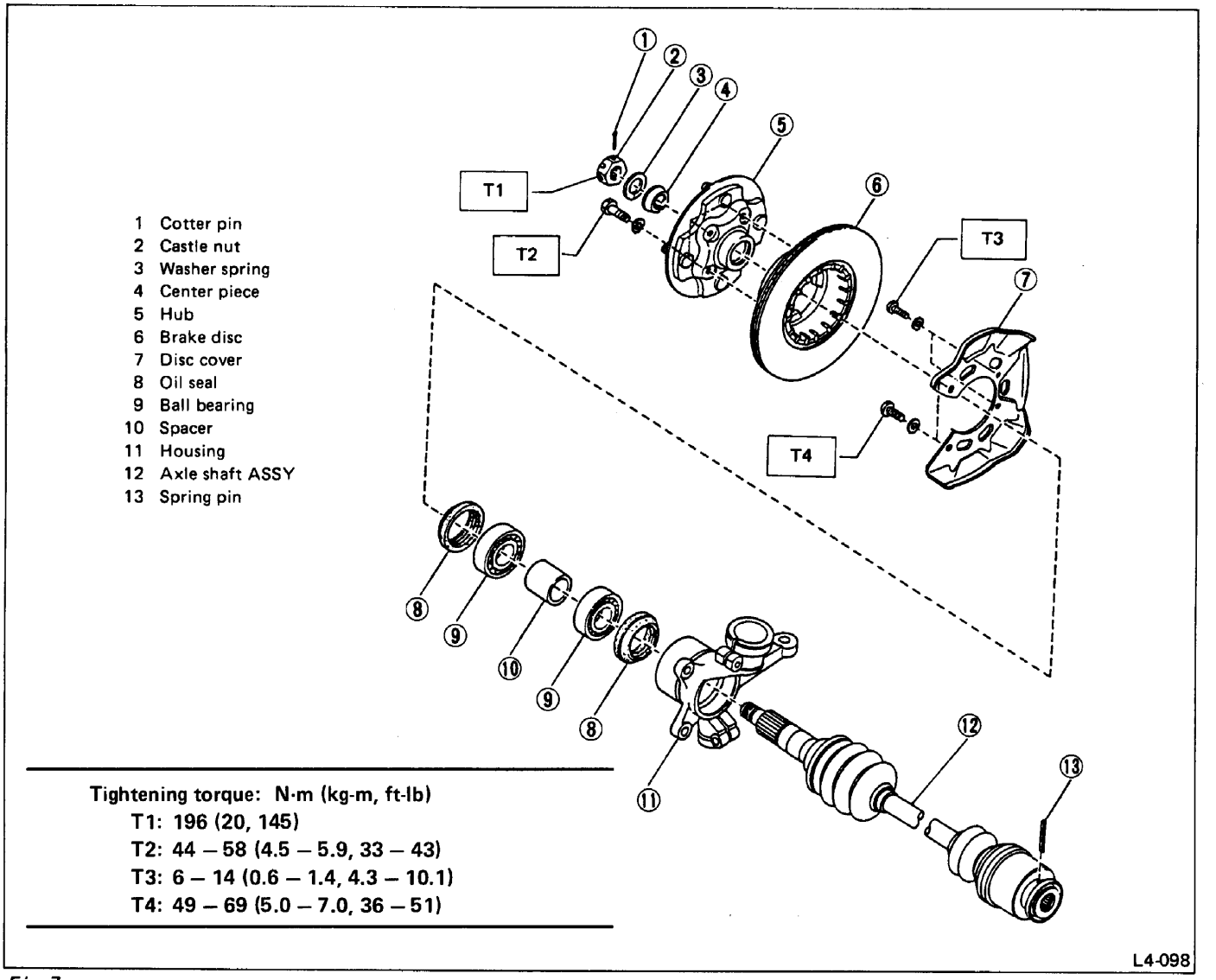


Fig. 7

2. XT6

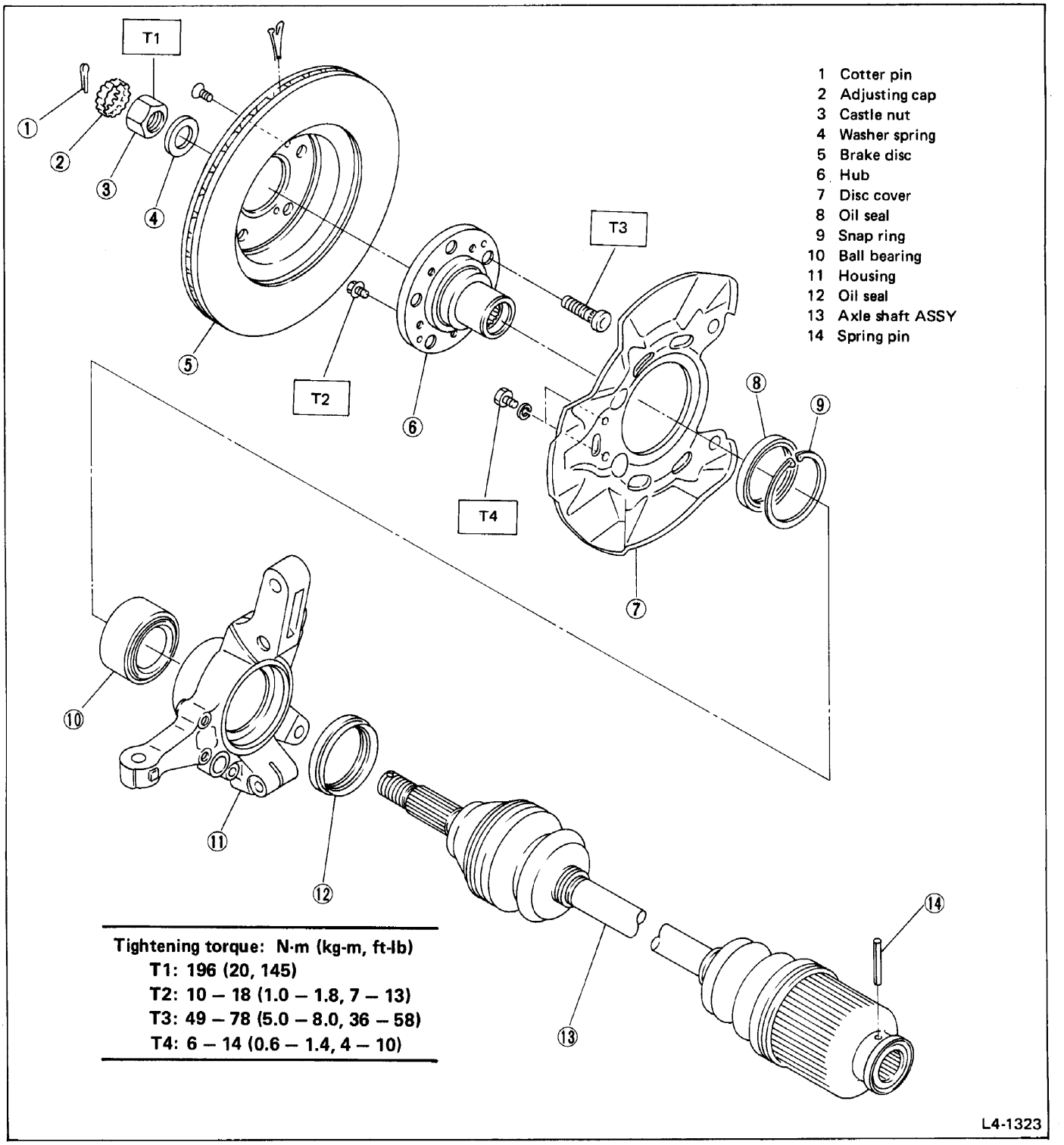
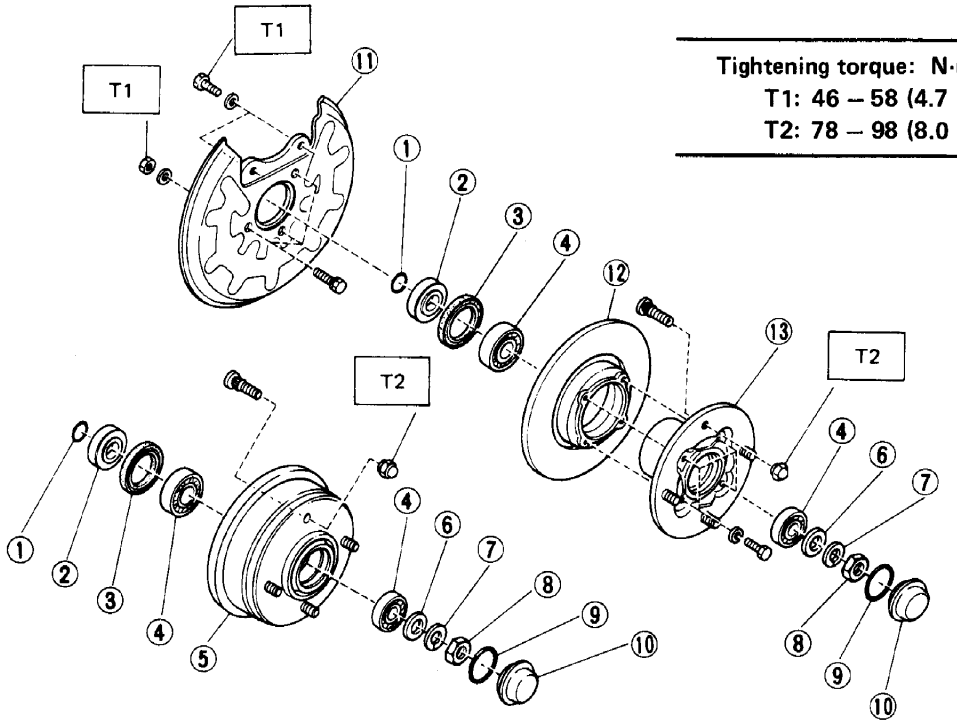

T1
T2
T3
T4
1 Cotter pin
2 Adjusting cap
3 Castle nut
4 Washer spring
5 Brake disc
6 Hub
7 Disc cover
8 Oil seal
9 Snap ring
10 Ball bearing
11 Housing
12 Oil seal
13 Axle shaft ASSY
14 Spring pin
Tightening torque: N·m (kg-m, ft-lb)
T1: 196 (20, 145)
T2: 10 – 18 (1.0 – 1.8, 7 – 13)
T3: 49 – 78 (5.0 – 8.0, 36 – 58)
T4: 6 – 14 (0.6 – 1.4, 4 – 10)
L4-1323

Fig. 8

Rear Axle

1. FWD (Except XT6)



Tightening torque: N·m (kg-m, ft-lb)
T1: 46 – 58 (4.7 – 5.9, 34 – 43)
T2: 78 – 98 (8.0 – 10.0, 58 – 72)

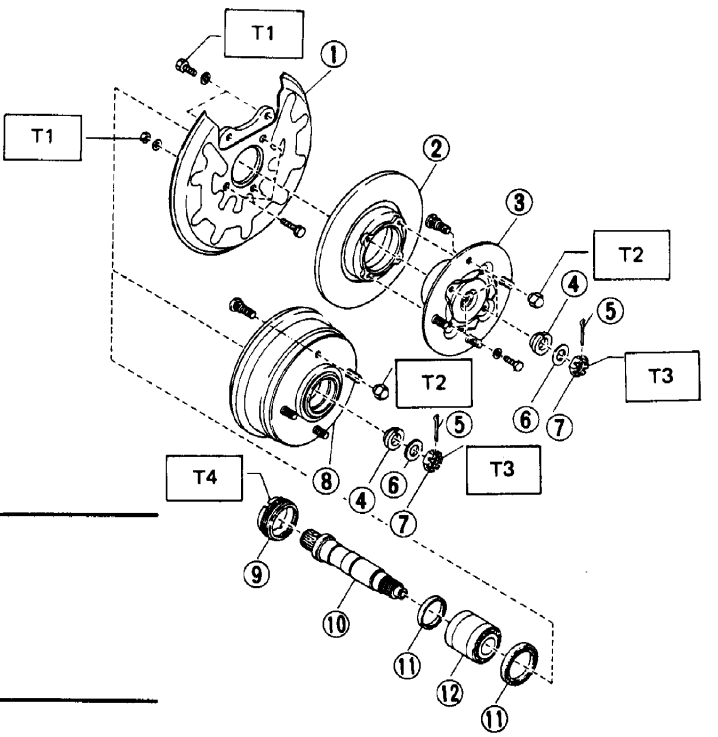
1 O-ring
2 Spacer
3 Oil seal
4 Taper roller bearing
5 Brake drum
6 Washer
7 Lock washer
8 Axle nut
9 O-ring
10 Drum cap
11 Disc cover
12 Brake disc
13 Hub

L4-398

Fig. 9

2. 4WD (Except XT6)

1 Disc cover
2 Brake disc
3 Hub
4 Center piece
5 Cotter pin
6 Washer spring
7 Castle nut
8 Brake drum
9 Ring nut
10 Spindle
11 Oil seal
12 Bearing ASSY



Tightening torque: N·m (kg-m, ft-lb)
T1: 46 – 58 (4.7 – 5.9, 34 – 43)
T2: 78 – 98 (8.0 – 10.0, 58 – 72)
T3: 196 (20, 145)
T4: 172 – 221 (17.5 – 22.5, 127 – 163)

L4-399

Fig. 10

3. FWD (XT6)

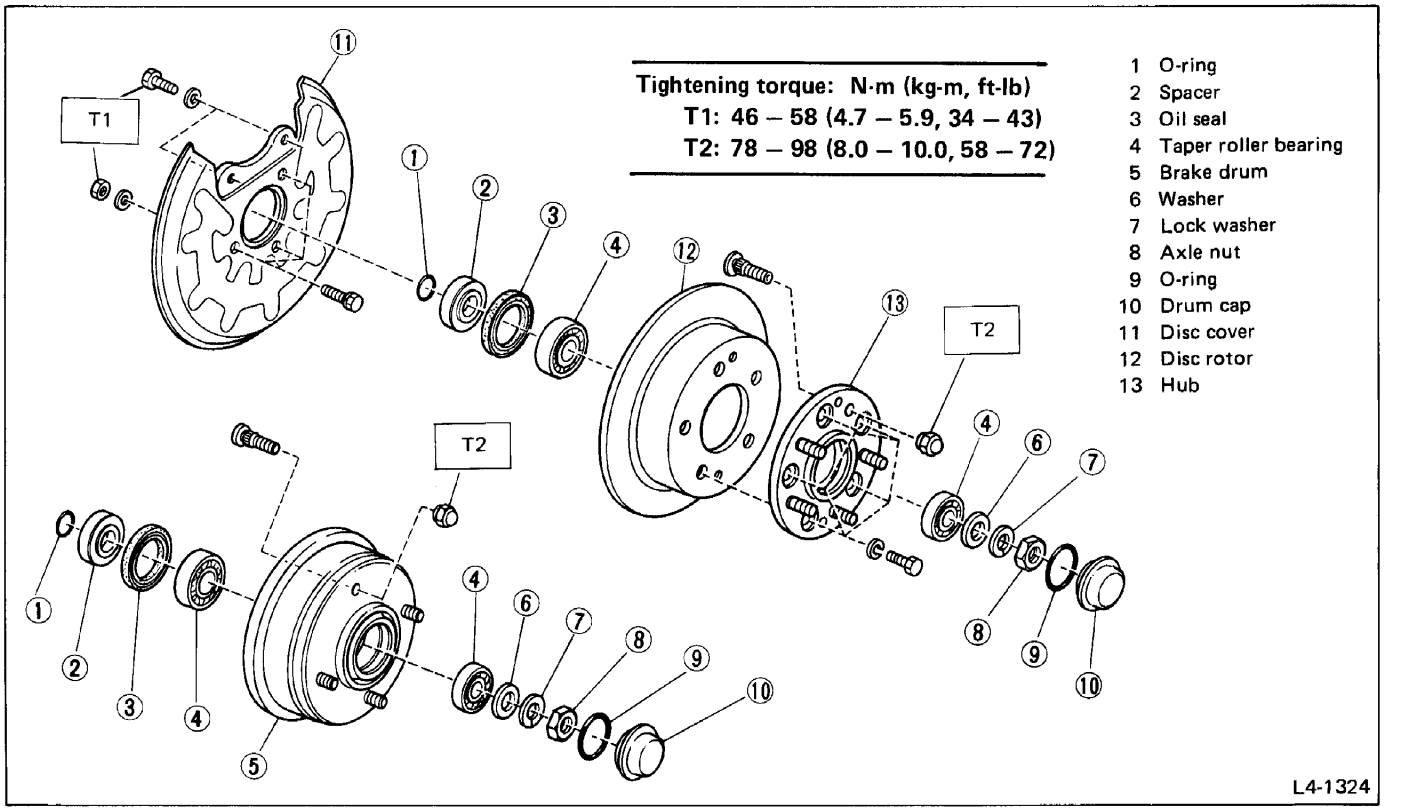


Fig. 11-1

4. 4WD (XT6)

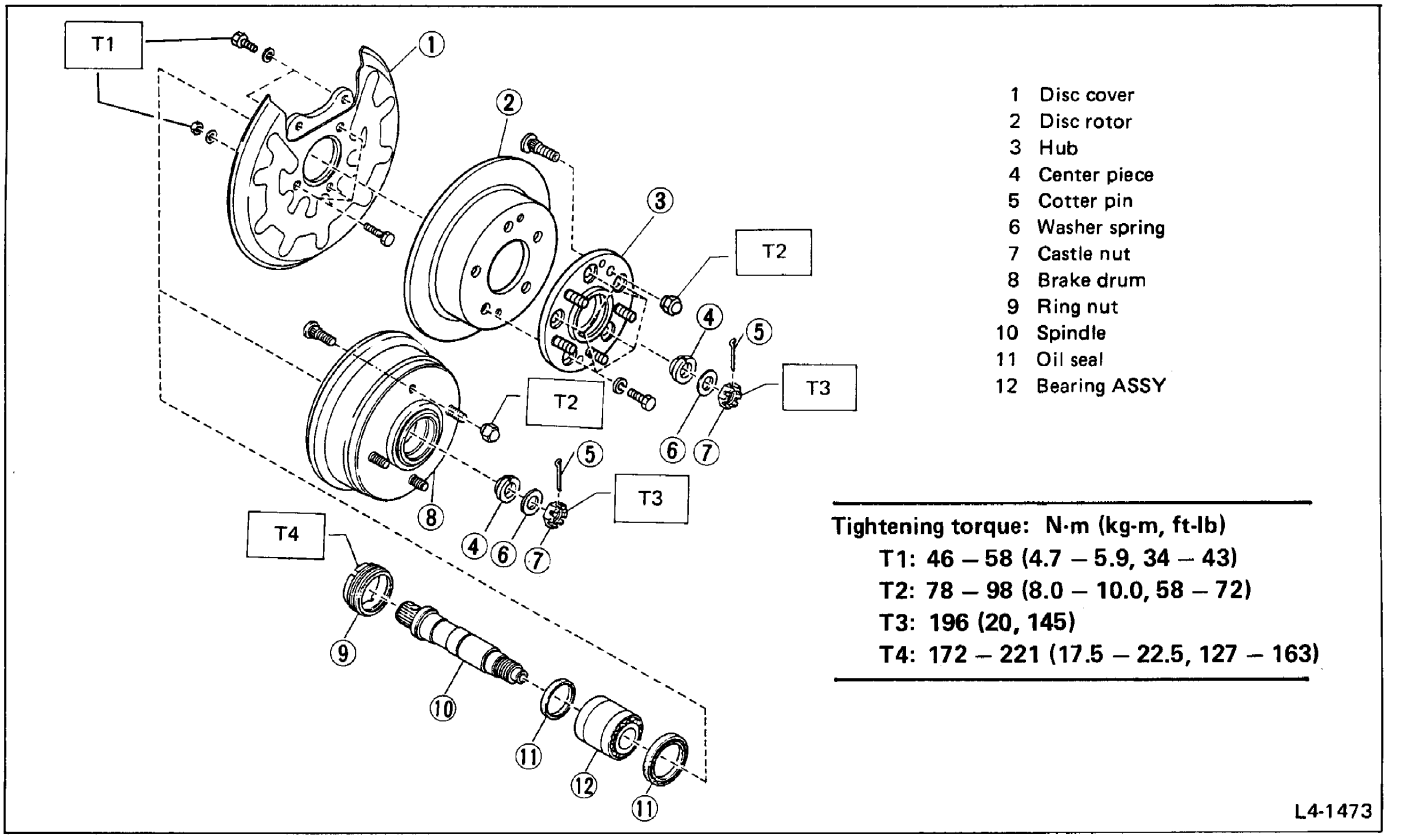


Fig. 11-2

SERVICE PROCEDURE

Front Axle

Housing (Except XT6)

REMOVAL

1) Disconnect ground cable from battery.
2) Apply parking brake.
3) Remove front wheel cap and cotter pin, and loosen castle nut and wheel nuts.
4) Jack up vehicle, support it with safety stands (rigid racks), and remove front tires and wheels.
5) Release parking brake.
6) Pull out parking brake cable outer clip from caliper.
7) Disconnect the parking brake cable end from caliper lever.
8) Loosen two bolts, and remove the disc brake ASSY from housing.

Keep the removed disc brake ASSY suspended from strut with string.

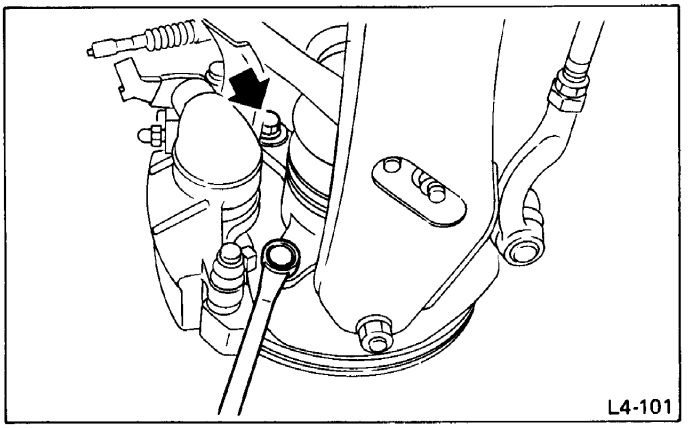


Fig. 12

9) Remove two bolts which connect housing and damper strut.
10) Remove cotter pin and castle nut, and disconnect tie-rod end ball joint from the housing knuckle arm by using a puller.
11) Disconnect strut from housing by opening slit of housing and by lowering housing gradually with care of not damaging BJ boot.

a. Do not expand the slit of housing more than 4 mm (0.16 in).
b. If housing is hard to remove from strut, lightly tap hub & disc with spare tire.

12) Remove castle nut, washer spring and center piece on axle shaft, and take out hub & disc ASSY.
13) Remove disc cover.
14) Attach PULLER (926470000) to housing and drive axle shaft out of housing toward engine at the bearing location.

When inner bearing and/or inner oil seal are/is left on axle shaft, remove them/it with a puller.

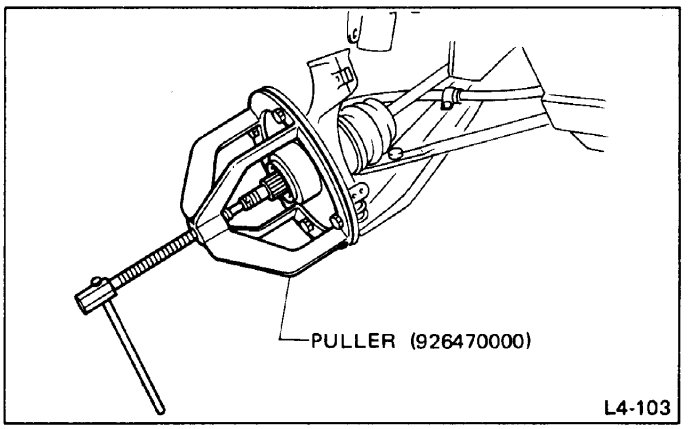


Fig. 13

15) Disengage transverse link ball joint from housing and detach housing.

DISASSEMBLY

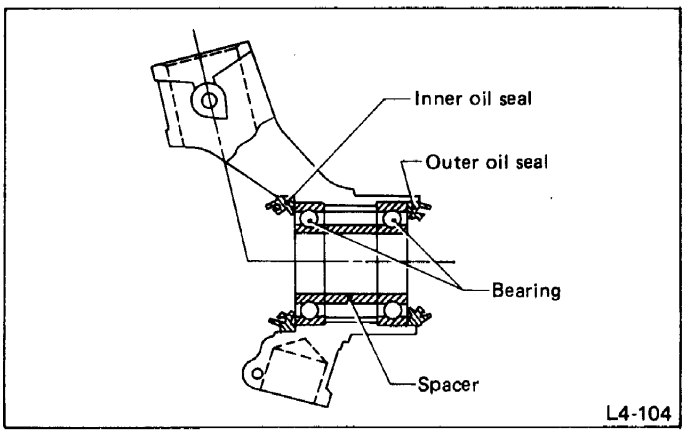


Fig. 14

1) Move spacer in radial direction with a finger.
2) Hold an aluminum or brass bar against inner race of bearing.
Lightly tap the bar with a plastic hammer to drive bearing out of housing together with oil seal.

a. Do not tap bearing with a steel hammer, otherwise the bearing will be damaged.
b. Tap evenly along entire periphery of bearing inner race.

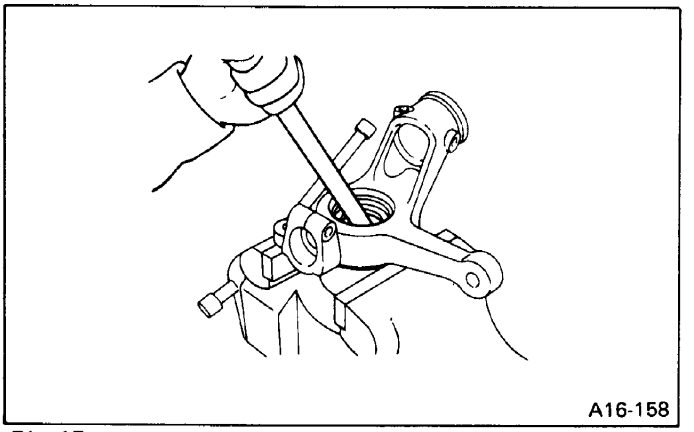

A16-158

Fig. 15

3) Pull out spacer.
4) Hold an aluminum or brass bar against outer race or inner race of bearing.
Lightly tap the bar with a plastic hammer to drive bearing out of housing together with oil seal.

a. Tap evenly along entire periphery of bearing outer race or inner race.
b. Do not reuse the oil seal.

ASSEMBLY

Press is necessary in assembling.
1) Set housing on DIE (INSTALLER: 926490000).
2) Set bearing onto PUNCH (INSTALLER: 926490000) and gradually press it into housing till outer race of bearing comes to contact with housing stopper.

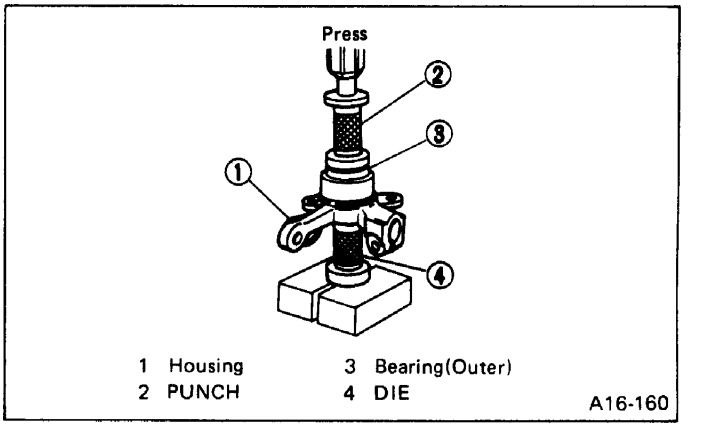


Fig. 16

3) Turn upside down housing, and apply about 10 to 13 g (0.35 to 0.46 oz) of bearing grease into inside of housing.
4) Insert spacer.

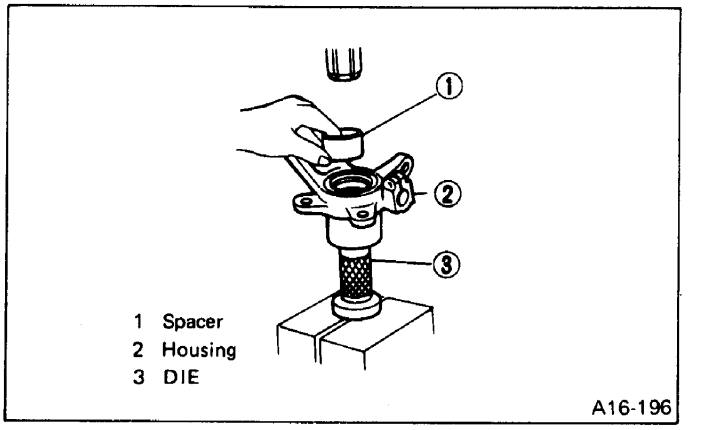


Fig. 17

5) The other bearing is pressed in as shown in figure.

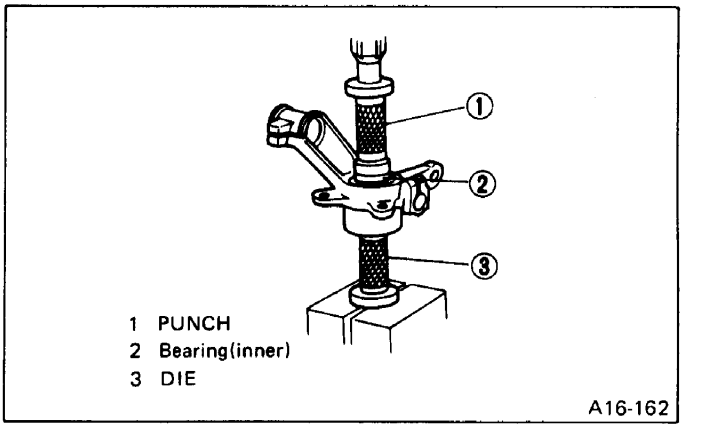


Fig. 18

6) Set housing on DIE.
Apply sufficient grease to oil seal lip.
7) Insert outer oil seal into the groove of PUNCH so that the oil seal lip faces the groove, and gradually press it into housing till the face of PUNCH comes to contact with bearing outer race.

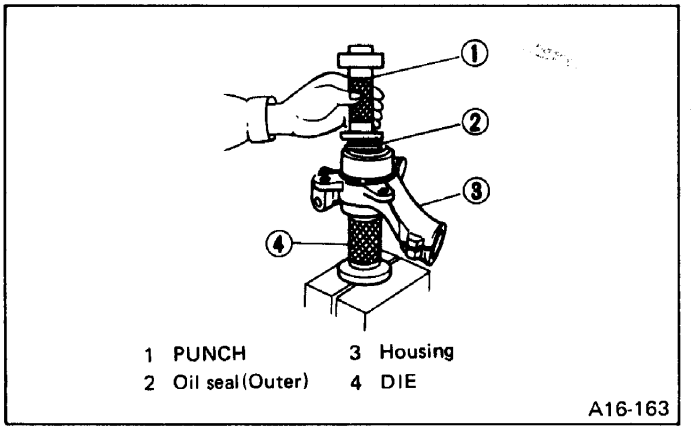


Fig. 19

Do not confuse outer oil seal with the inner since their outside diameters differ as follows:
Outer oil seal..... 72 mm (2.83 in) dia.
Inner oil seal..... 76 mm (2.99 in) dia.

8) Turn upside down housing and set it on PUNCH.
9) Insert inner oil seal into the groove of DIE so that the oil seal lip faces the groove, and gradually press it into housing.

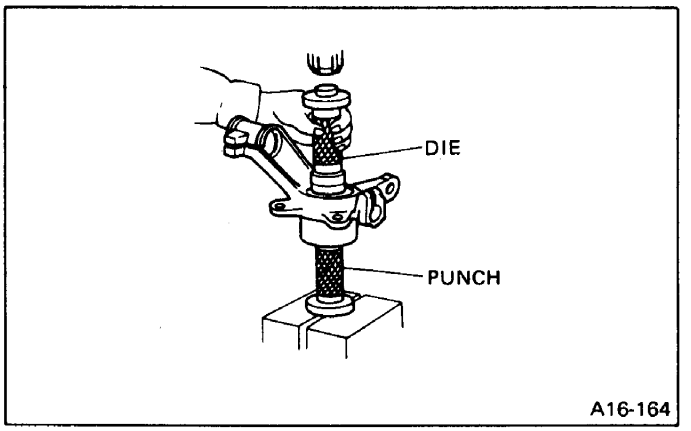


Fig. 20

INSTALLATION

1) Fit housing onto axle shaft and attach spacer of INSTALLER (925130000 or 922430000) on outer bearing inner race taking care not to damage the oil seal lip.
Then, connect the rod of INSTALLER to the thread of axle shaft so that housing does not drop off from axle shaft.
2) Install transverse link ball joint to housing.

Tightening torque:
29 – 39 N·m (3.0 – 4.0 kg-m, 22 – 29 ft-lb)

3) Turn the handle while holding the rod end by means of spanner, thus housing is pushed in.

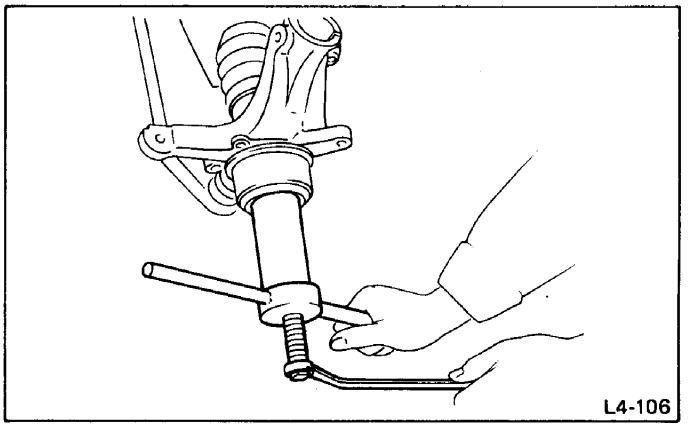


Fig. 21

4) Connect damper strut and housing by installing two bolts.

Tightening torque:
29 – 39 N·m (3.0 – 4.0 kg-m, 22 – 29 ft-lb)

5) Connect tie-rod end ball joint and housing knuckle arm.

Tightening torque (Castle nut):
25 – 29 N·m (2.5 – 3.0 kg-m, 18 – 22 ft-lb)

After tightening to the specified torque, further tighten castle nut within 60° to align holes of castle nut and ball stud.
Then insert cotter pin into ball stud and bend it around castle nut.
6) Install disc cover to housing.

Tightening torque:
6 – 14 N·m (0.6 – 1.4 kg-m, 4.3 – 10.1 ft-lb)

7) Install hub & disc ASSY onto axle shaft.

Be sure to insert (press) hub & disc ASSY onto axle shaft until the end surface of hub contacts ball bearing.
If the ASSY is hard to press, rotate it to locate the point where it is easily pressed.

8) Install disc brake ASSY to housing by two bolts.

Tightening torque:
49 – 69 N·m (5.0 – 7.0 kg-m, 36 – 51 ft-lb)

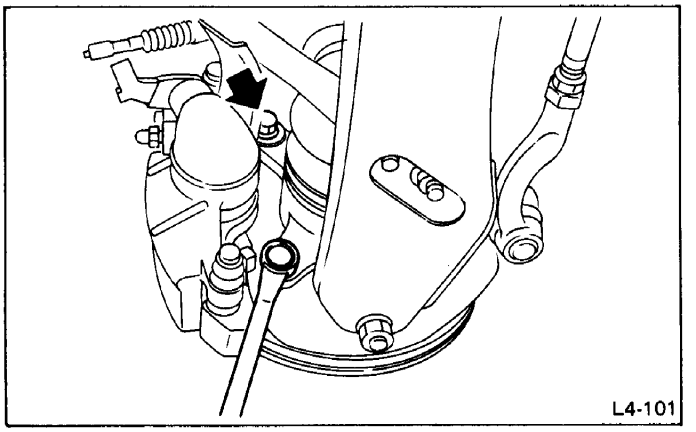


Fig. 22

9) Connect parking brake cable to brake ASSY.

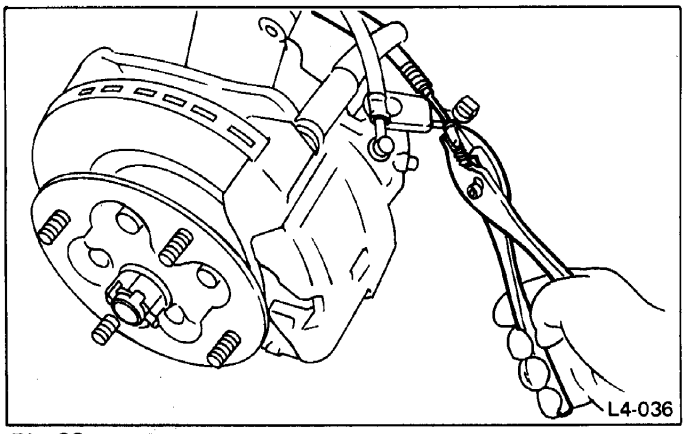


Fig. 23

10) Apply parking brake.
11) Fit center piece, washer spring and castle nut in this order onto axle shaft and tighten castle nut to the specified torque, then insert a new cotter pin and bend it around castle nut.

After tightening the nut to the specified torque, retighten further within 30° until a slot of the castle nut is aligned to the hole in the axle shaft.

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

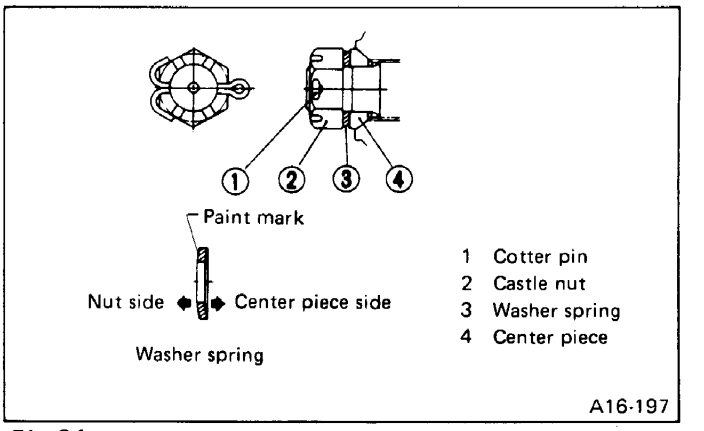


Fig. 24

12) Install wheels and wheel caps.
13) Put down vehicle from rigid racks.
14) Connect ground cable with negative terminal of battery.

Housing (XT6)

REMOVAL

1) Remove cotter pin and castle nut which secure tie-rod end ball joint to housing knuckle arm.
2) Using a puller, disconnect tie rod end ball joint from housing knuckle arm.
3) Remove 10-mm bolt. Extract trasverse link ball joint from houisng.
4) Remove two bolts which connect housing and damper strut, and disconnect strut from housing.

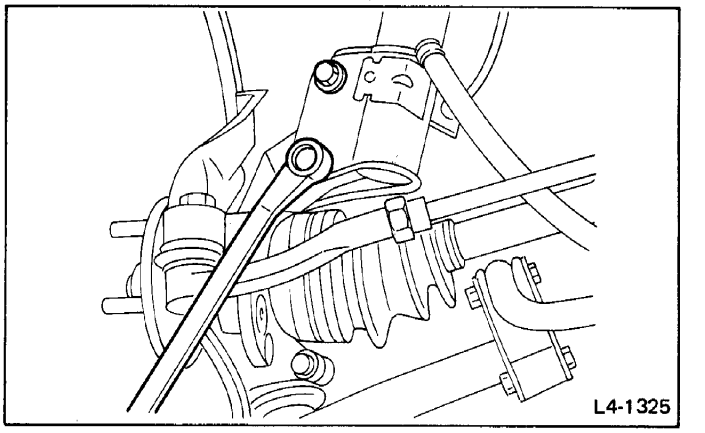


Fig. 25

DISASSEMBLY

1) Using HUB STAND (927080000), support housing & hub ASSY securely.
2) Attach HUB PULLER (927060000) to housing and drive hub bearing out.

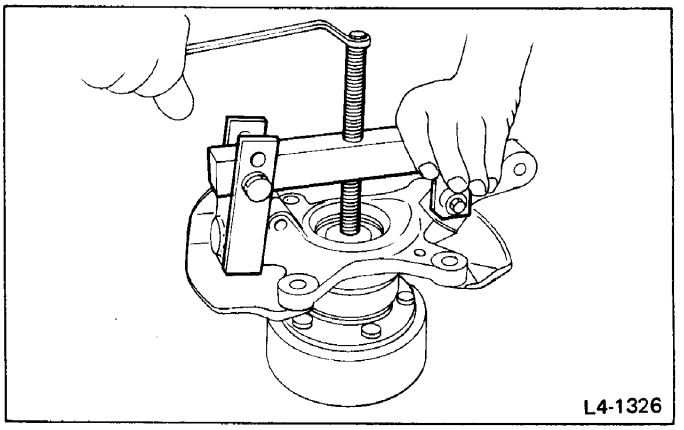


Fig. 26

3) If bearing inner race remains in the hub, remove it a suitable tool (commercially available).

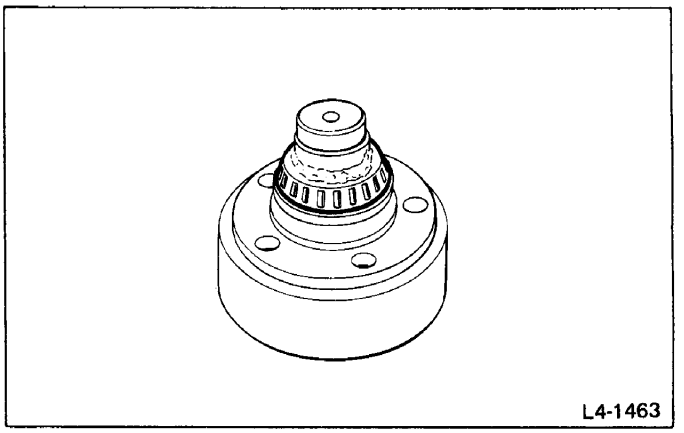


Fig. 27

a. Remove oil seal. Cut it off with shears to facilitate removal.
b. Be careful not to scratch polished area of hub.
c. Be sure to install inner race on the side of outer race from which it was removed.

4) Remove two bolts which secure disc cover. Remove disc cover.
5) Using a standard screwdriver, remove outer and inner oil seals.

Do not use old oil seals.

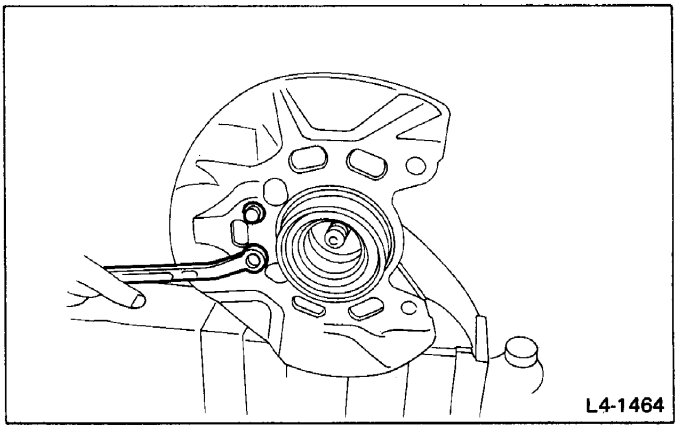


Fig. 28

6) Using pliers, remove snap ring.
7) Using HOUSING STAND (927090000), support housing securely.
8) Using BEARING PULLER (927100000), press inner race to drive out outer bearing.

a. Do not remove outer race unless it is faulty.
b. Discard outer race after removal.
c. Do not replace inner or outer race separately; always replace as a unit.

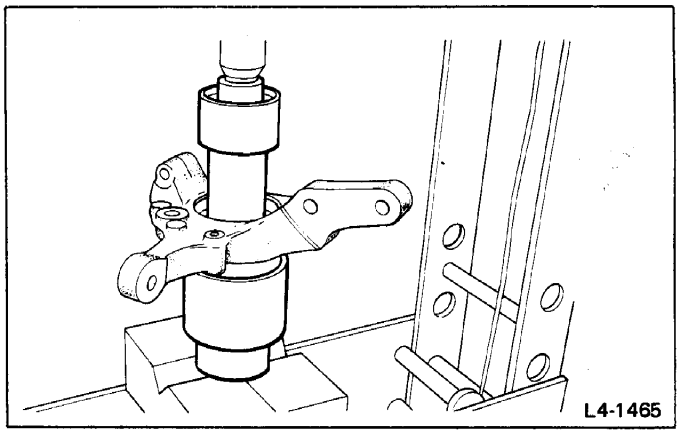


Fig. 29

9) Loosen bolts which secure tone wheel to hub. Remove tone wheel.

10) Using HUB STAND (927080000) and a hydraulic press, drive hub bolts out.

Be careful not to hammer hub bolts. This may deform hub.

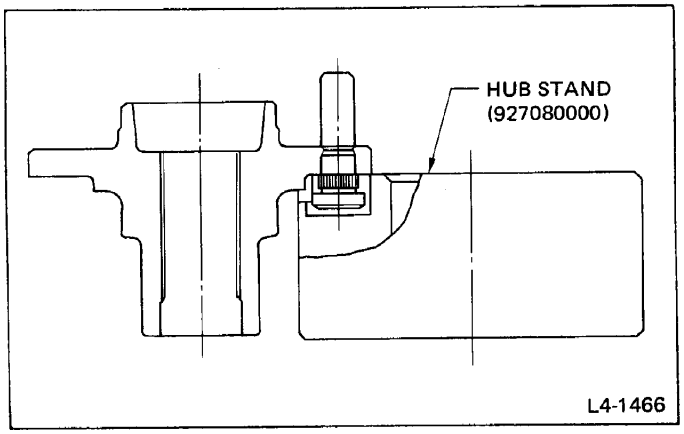


Fig. 30

ASSEMBLY

1) Attach hub COMPL to HUB STAND (927080000) securely.
2) Using a hydraulic press, press new hub bolts into place.

a. Use 12 mm (0.47 in) dia. holes in HUB STAND to prevent bolts from tilting.
b. Be sure to press hub bolts until their seating surfaces contact the hub.

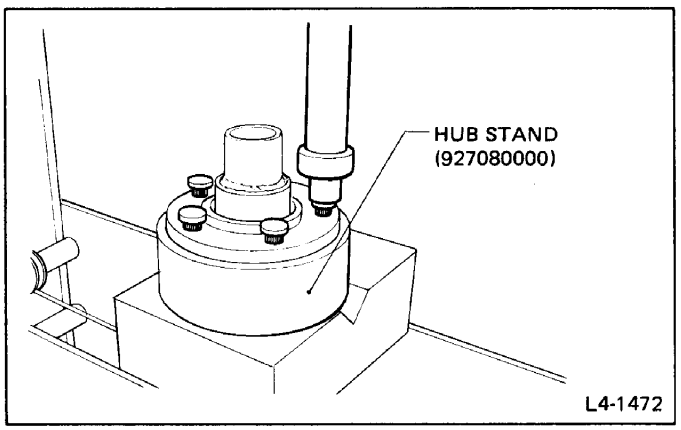


Fig. 31

3) Clean dust or foreign particles from inside the housing.
4) Using HOUSING STAND (927090000) and BEARING PULLER (927100000), press a new bearing into place.

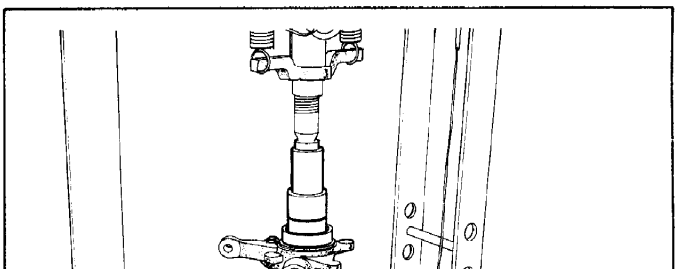


Fig. 32

a. Always press outer race when installing bearing.
b. Be careful not to remove plastic lock from inner race when installing bearing.
c. Charge bearing with new grease when outer race is not removed.

5) Install snap ring in its groove.

Make sure to install it firmly to groove.

6) Using OIL SEAL INSTALLER (927110000), press outer oil seal until it contacts circlip.

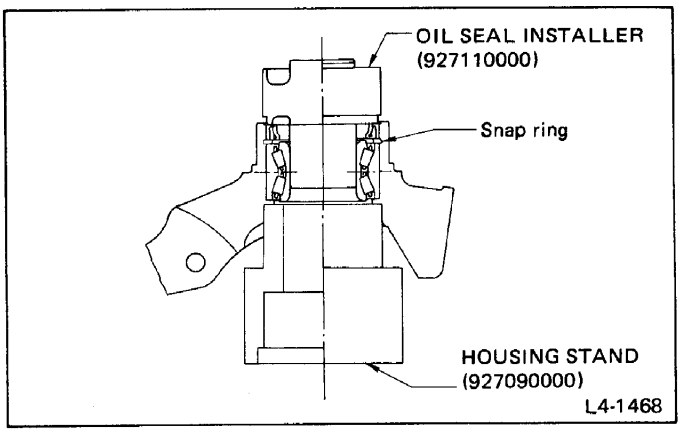


Fig. 33

7) Invert HOUSING STAND and housing.
8) Using OIL SEAL INSTALLER (927110000), press inner oil seal until it contacts the bottom of housing.
9) Apply sufficient grease to oil seal lip.

Specified grease
SHELL XSG-6459

a. If specified grease is not available, remove bearing grease and apply AutoRex A instead.
b. Do not mix different types of grease.

10) Install disc cover to housing using two bolts.

Tightening torque:
10 – 18 N·m (1.0 – 1.8 kg-m, 7 – 13 ft-lb)

11) Attach hub COMPL to HUB STAND (927080000) securely.
12) Clean dust or foreign particles from the polished surface of hub.
13) Using HUB INSTALLER (927120000), press bearing into hub by driving inner race.

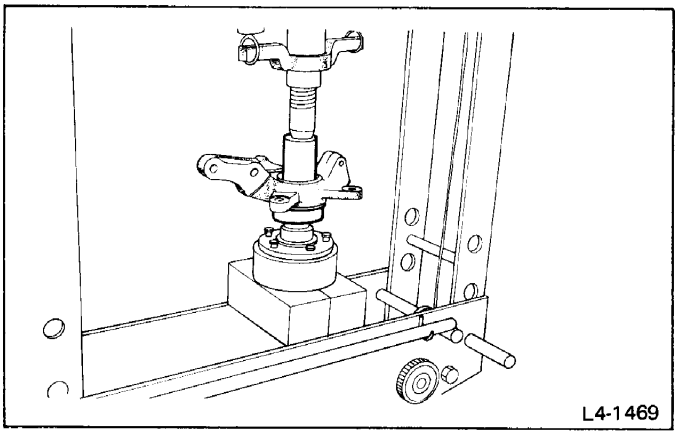


Fig. 34

14) Install transverse link ball joint to housing.

Tightening torque:
38 – 50 N·m (3.9 – 5.1 kg-m, 28 – 37 ft-lb)

15) Connect damper strut and housing using two bolts.

Tightening torque:
64 – 83 N·m (6.5 – 8.5 kg-m, 47 – 61 ft-lb)

Front Axle Shaft

Several kinds of front axle shaft ASSY are available. When replacing a single DOJ unit or axle shaft ASSY, select the correct one according to "SPECIFICATIONS AND SERVICE DATA".

REMOVAL

1) Disconnect ground cable from battery.
2) Apply parking brake.
3) Remove front wheel cap and cotter pin, and loosen castle nut and wheel nuts.
4) Jack up vehicle, support it with safety stands (rigid racks), and remove front tires and wheels.
5) Release parking brake.
6) Remove parking brake cable bracket from transverse link.
7) Drive out spring pin of DOJ.

Do not reuse spring pin.

8) Remove disc brake ASSY, and disconnect damper strut, tie-rod end and transverse link from housing. (Refer to "REMOVAL" of "Housing".)
9) Remove axle shaft from differential spindle along with housing.
10) Remove housing from axle shaft by using PULLER (926470000).

a. Be sure not to scratch boot when removing axle shaft ASSY.
b. Do not apply excessive force to differential case when removing axle shaft.

DISASSEMBLY

1) Straighten bent claw of larger end of DOJ boot.
2) Loosen band by means of screwdriver or pliers with care of not damaging boot.

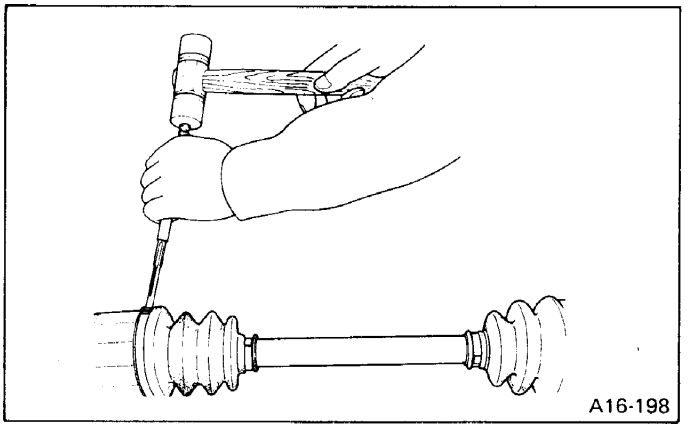


Fig. 35

3) Remove boot band on the small end of DOJ boot in the same manner.
4) Remove the larger end of DOJ boot from DOJ outer race.

5) Pry and remove round circlip located at the neck of DOJ outer race with a screwdriver.

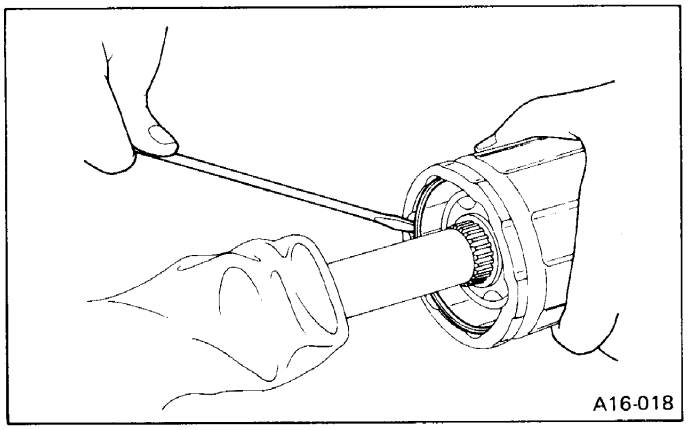


Fig. 36

6) Take out DOJ outer race from shaft ASSY.
7) Wipe off grease and take out balls and move cage to the boot side.

a. To remove the cage from the inner race, turn the cage by a half pitch to the track groove of the inner race and shift the cage.
b. Disassemble exercising care not to lose balls (6 pcs).
c. The grease is a special grease (grease for constant-velocity joint). Do not confuse with other greases.

8) Remove C-type snap ring, which fixes inner race to shaft, by using special pliers.
9) Take out DOJ inner race.
10) Take off DOJ cage from shaft and remove DOJ boot.

Be sure to wrap shaft splines with vinyl tape to prevent boot from scratches.

11) Remove BJ boot in the same procedure as steps 1) to 3).
12) Thus, disassembly of axle is completed, but BJ is unable to be disassembled.

INSPECTION

Check the removed parts for damage, wear, corrosion and etc. If faulty, repair or replace.
1) DOJ (Double Offset Joint)
Check seizure, corrosion, damage, wear and excessive play.
2) Shaft
Check excessive bending, twisting, damage and wear.
3) BJ (Bell Joint)
Check seizure, corrosion, damage and excessive play.
4) Boot
Check for wear, warping, breakage or scratches.
5) Grease
Check for discoloration or fluidity.

ASSEMBLY

Use specified grease.

Specified grease for constant velocity joint:
Molylex No. 2 (P/N 623029980)

1) Install BJ boot in specified position, and fill it with 60 to 70 g (2.12 to 2.47 oz) of specified grease.
2) Place DOJ boot at the center of shaft.

Be sure to wrap shaft splines with vinyl tape to prevent boot from scratches.

3) Insert DOJ cage onto shaft.

Insert the cage with the cut-out side facing the shaft end, since the cage has an orientation.

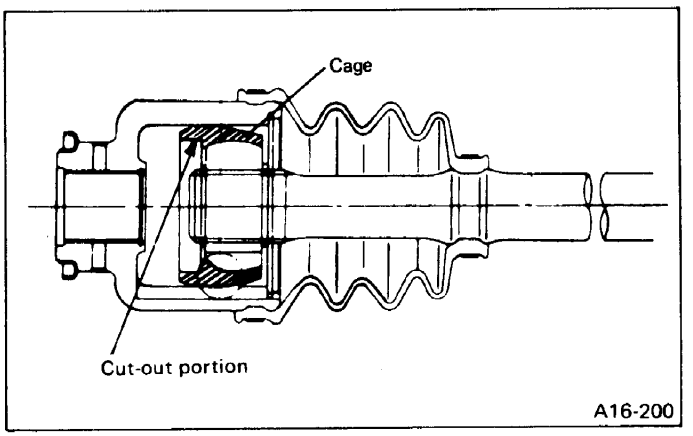


Fig. 37

4) Install DOJ inner race on shaft and fit C-type snap ring with special pliers.

Confirm that the C-type snap ring is completely fitted in the shaft groove.

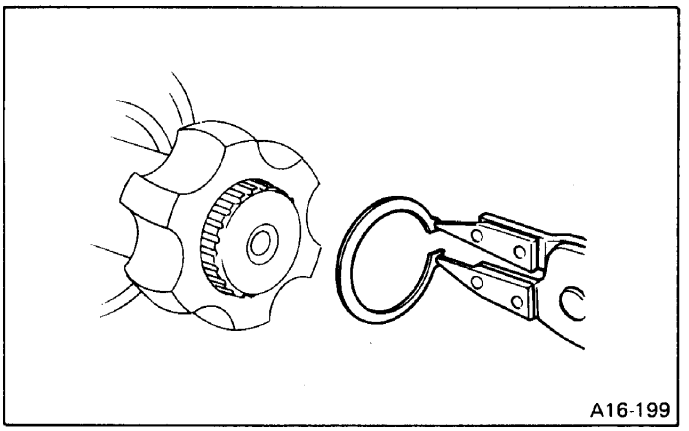


Fig. 38

5) Install cage, which was previously fitted, to inner race fixed upon shaft.

Fit the cage with the protruded part aligned with the track on the inner race and then turn by a half pitch.

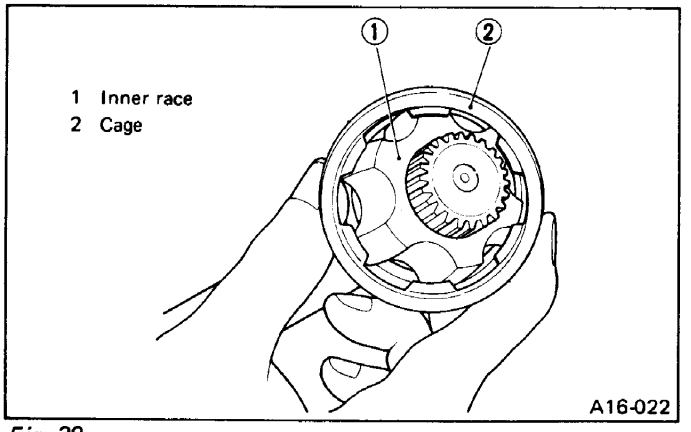


Fig. 39

6) Apply the specified grease 20 to 30 g (0.71 to 1.06 oz) on the cage pocket.

7) Insert six balls into the cage pocket.

8) Fill 20 to 30 g (0.71 to 1.06 oz) of specified grease into the interior of DOJ outer race.

9) Align the outer race track and ball positions and place in the part where shaft, inner race, cage and balls are previously installed, and then fit outer race.

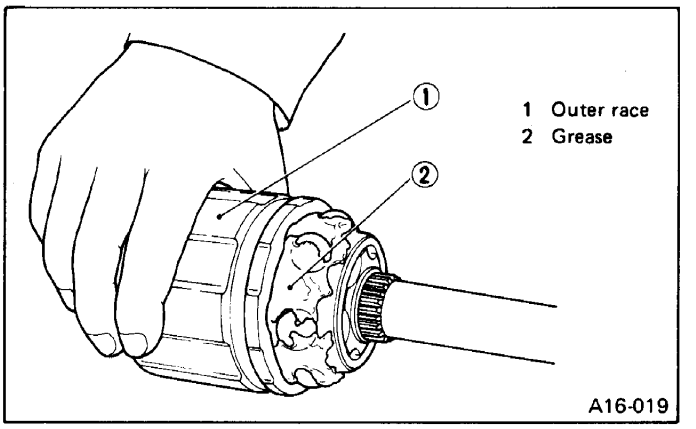


Fig. 40

10) Install circlip in the groove on DOJ outer race.

a. Assure that the balls, cage and inner race are completely fitted in the outer race of DOJ.
b. Exercise care not to place the matched position of circlip in the ball groove of outer race.
c. Pull the shaft lightly and assure that the circlip is completely fitted in the groove.

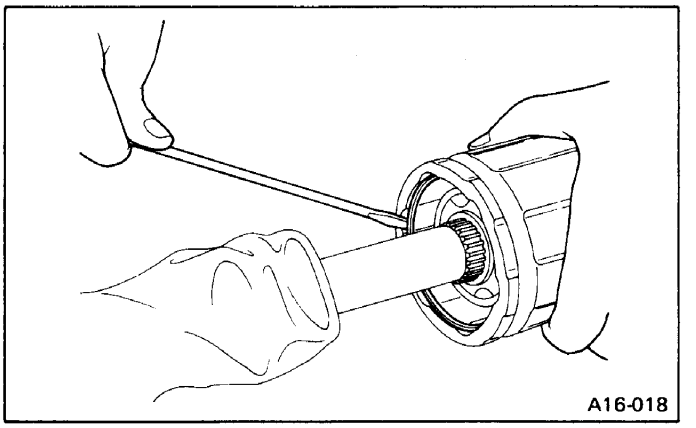


Fig. 41

11) Add 20 to 30 g (0.71 to 1.06 oz) of specified grease to the DOJ's interior.

12) Apply an even coat of the specified grease [20 to 30 g (0.71 to 1.06 oz)] to the entire inner surface of boot. Also apply grease to shaft.

13) Install DOJ boot taking care not to twist it.

a. The inside of the larger end of DOJ boot and the boot groove shall be cleaned so as to be free from grease and other substances.
b. When installing DOJ boot, position outer race of DOJ at center of its travel.

14) Put a band through the clip and wind twice in alignment with band groove of boot.

Use a new band.

15) Pinch the end of band with pliers. Hold the clip and tighten securely.

When tightening boot, exercise care so that the air within the boot is appropriate.

16) Tighten band by using BAND TIGHTENING TOOL (925091000).

a. Tighten band until it cannot be moved by hand.
b. Former BAND TIGHTENING TOOL (925090000) is interchangeable with this 925091000.

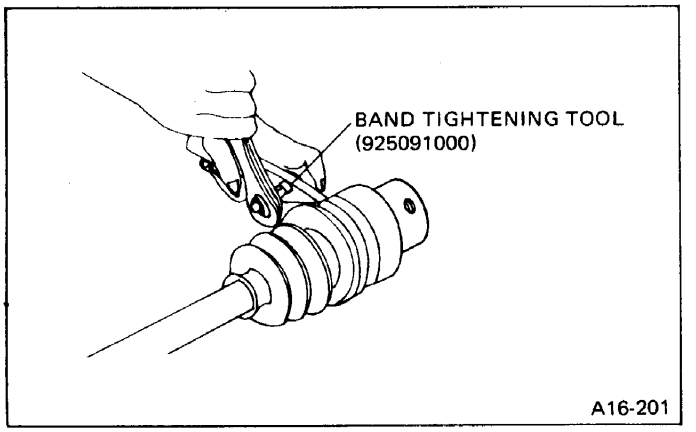


Fig. 42

17) Tap on the clip with the punch provided at the end of BAND TIGHTENING TOOL.

Tap to an extent that the boot underneath is not damaged.

18) Cut off band with an allowance of about 10 mm (0.39 in) left from the clip and bend this allowance over the clip.
19) Fix up boot on BJ in the same manner.

INSTALLATION (Except XT6)

1) Insert axle shaft into housing and attach spacer of INSTALLER (925130000 or 922431000) on outer bearing inner race taking care not to damage the oil seal lip.

2) Install transverse link ball joint to housing.

Tightening torque:
29 – 39 N·m (3.0 – 4.0 kg-m, 22 – 29 ft-lb)

3) Connect the rod of INSTALLER to the thread of axle shaft and turn the handle while holding the rod end by means of a spanner, thus axle shaft is pulled in.
4) Align the spring pin holes of DOJ and differential spindle.
5) Connect DOJ and differential spindle by driving spring pin in.

a. Make sure that the holes are aligned before driving the spring pin in.
b. When driving the spring pin, always use new one.

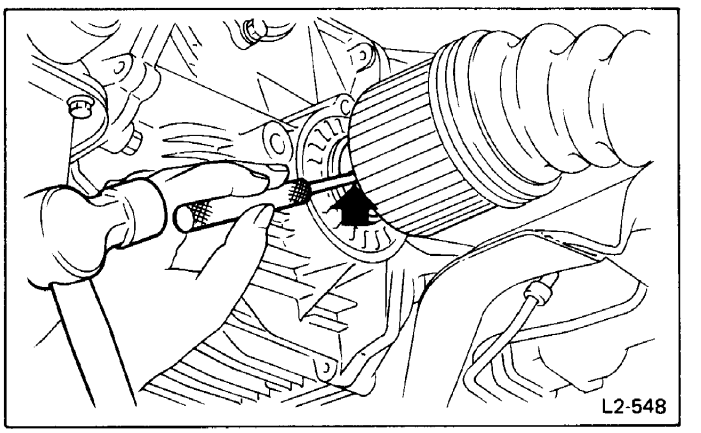


Fig. 43

6) Connect damper strut to housing, and tighten two bolts.

Tightening torque:
29 – 39 N·m (3.0 – 4.0 kg-m, 22 – 29 ft-lb)

7) Install disc cover on housing.

Tightening torque:
6 – 14 N·m (0.6 – 1.4 kg-m, 4.3 – 10.1 ft-lb)

8) Install hub & disc ASSY to axle shaft.

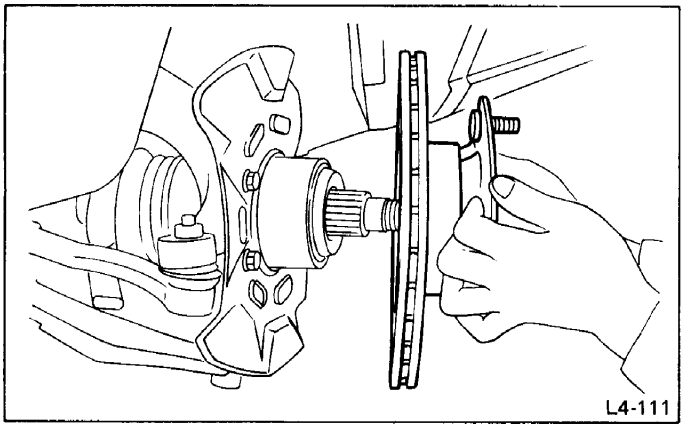


Fig. 44

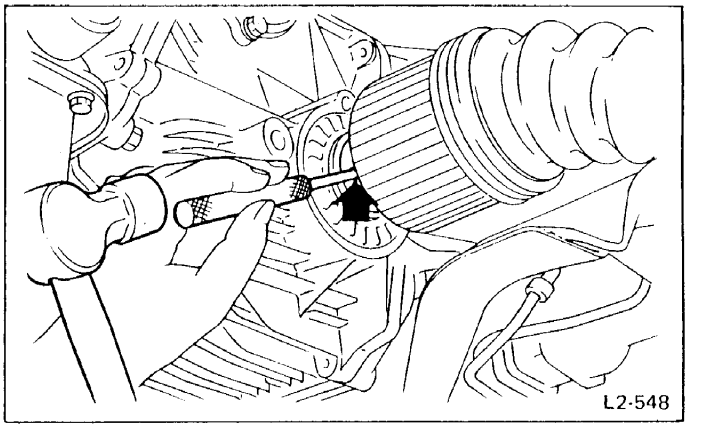


Fig. 45

9) Install or connect disc brake ASSY, parking brake cable, center piece, washer spring, axle nut, cotter pin, brake hose and tie rod end referring to "INSTALLATION" of "Housing".
10) Install wheels and tighten wheel nuts.
11) Install wheel caps in position.
12) Put down vehicle from rigid racks.
13) Connect ground cable with negative terminal of battery.

INSTALLATION (XT6)

1) Insert BJ (bell joint) into hub splines.

Be careful not to damage inner oil seal lip.

2) Using AXLE SHAFT INSTALLER (922431000) and EXTENSION (927130000), pull bell joint into place.

Do not hammer axle shaft when installing bell joint.

3) Install a washer on the threaded portion of BJ (bell joint) and temporarily tighten axle nut.
4) Align the spring pin holes of DOJ and differential spindle, then insert DOJ into differential spindle.

a. Make sure that the holes are aligned before driving the spring pin in.
b. When driving the spring pin, always use new one.

5) Install transverse link temporarily to crossmember by using a bolt and self-locking nut; then tighten self-locking nut which installs transverse link to cross member.

Torque (self-locking nut):
93 – 113 N·m (9.5 – 11.5 kg-m, 69 – 83 ft-lb)

Self-locking nut should be replaced with a new one whenever it is removed.

6) Install tie-rod end ball joint to the housing knuckle arm.

Torque (Castle nut):
25 – 29 N·m (2.5 – 3.0 kg-m, 28 – 22 ft-lb)

After tightening the nut to the specified torque, adjust groove on the nut and hole on the ball joint by retightening the nut from 0 to 60 degrees.

7) After then, install new cotter pin into the hole, and bend it firmly.
8) Engage brake caliper lever with parking brake cable.
9) Install the outer parking brake cable.
10) Install parking brake cable bracket to transverse link.
11) Pull parking brake lever.
12) Tighten axle nut.

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

Before tightening axle nut, raise vehicle with a jack, remove wheel and apply parking brake. Do not tighten axle nut with wheels on the ground. Otherwise, bearing may be damaged.

13) After tightening axle nut, locate adjusting cap so that cotter pin can be driven into place while turning axle nut within 15°.
14) Drive cotter pin into place.
15) Spread cotter pin to lock axle nut.

Rear Axle (FWD)

The text describes the procedures for drum brake equipped vehicle. Take similar procedures as the above for disc brake equipped vehicle.

REMOVAL AND DISASSEMBLY

1) Apply parking brake, and loosen rear wheel nuts.
2) Jack up vehicle, support it with safety stands (rigid racks) and remove rear tires and wheels.
3) Pry brake drum cap by screwdriver off drum.
4) Flatten lock washer and loosen axle nut, then remove lock washer, washer and brake drum so as not to drop inner race of outer bearing.
Outer races of outer bearing and inner bearing, and oil seal can be removed together with drum.
5) Pry up spacer with a screwdriver and remove spacer and inner bearing inner race with a gear puller.

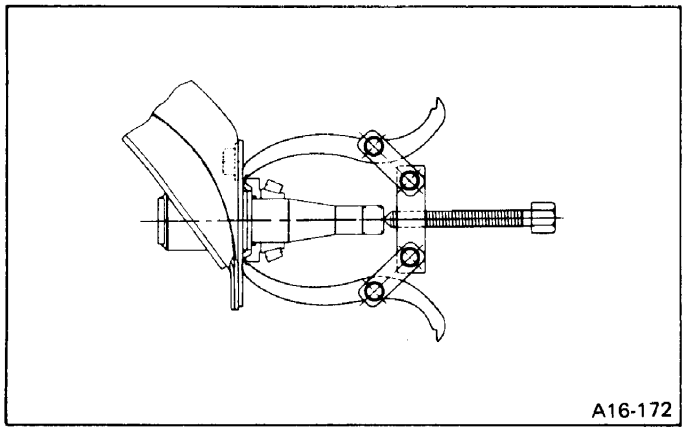


Fig. 46

6) Remove outer race of inner bearing from drum. Remove oil seal at this time.

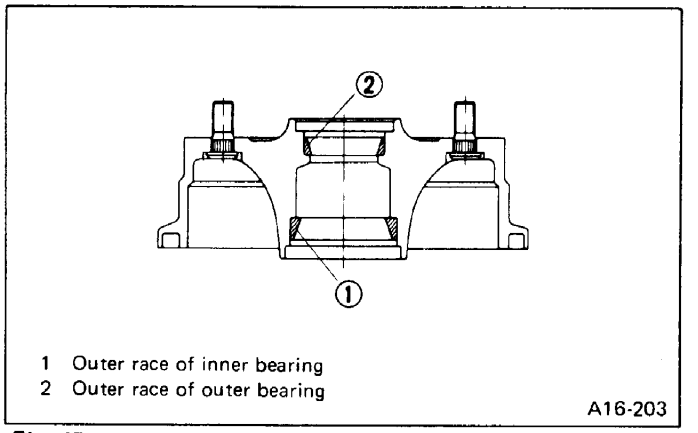


Fig. 47

7) Remove outer race of outer bearing from drum.

INSPECTION

Clean the removed parts and check them for wear, damage and corrosion. If faulty, repair or replace.

ASSEMBLY AND INSTALLATION

1) Press outer race of inner bearing into drum using TAPER ROLLER BEARING INSTALLER (925220000) and a press.

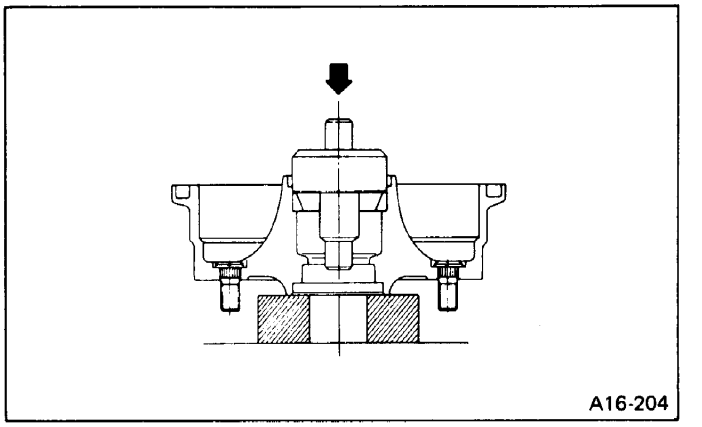


Fig. 48

2) Apply sufficient grease to oil seal lip. Install oil seal into drum until its outer end is flush with the drum surface.
3) Press outer race of outer bearing into drum using TAPER ROLLER BEARING INSTALLER (921130000) and a press.

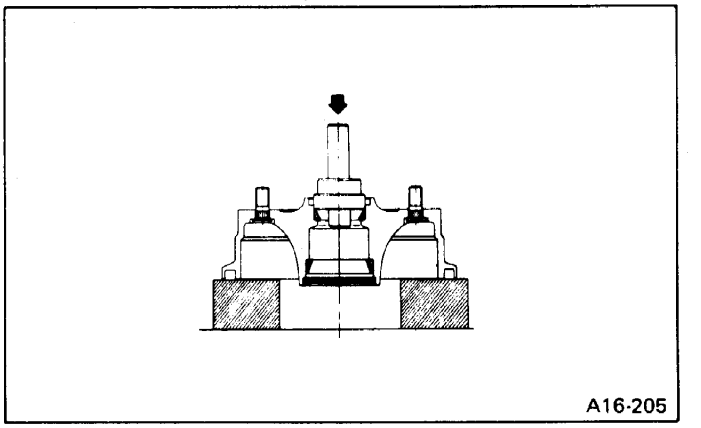


Fig. 49

4) Apply approximately 4 g (0.14 oz) of grease to inner bearing and 3 g (0.11 oz) to outer bearing.
Fill the boss of drum with approximately 30 g (1.06 oz) of grease.

5) Install spacer and inner race of inner bearing onto the spindle of trailing arm.

Stepped surface of the spacer must be faced toward the bearing.

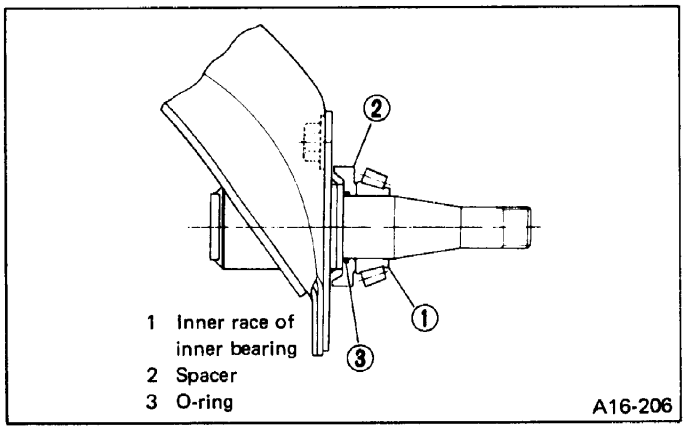


Fig. 50

6) Install drum, inner race of outer bearing, washer, lock washer and axle nut in this order onto the spindle.

Be sure to use new lock washer without fail.

ADJUSTING REAR WHEEL BEARING

1) Temporarily tighten axle nut with tightening torque of 49 N·m (5 kg-m, 36 ft-lb), and then turn drum back and forth alternately several times to properly seat bearing and ascertain bearing stability.

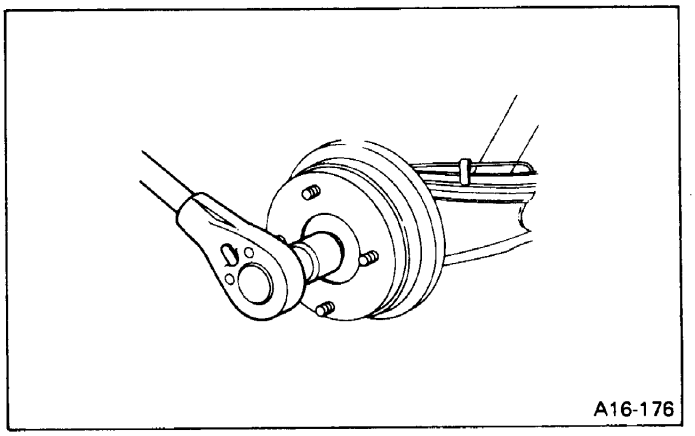


Fig. 51

2) Turn back nut 1/8 to 1/10 in order to obtain correct starting torque. Measure the starting force as shown.

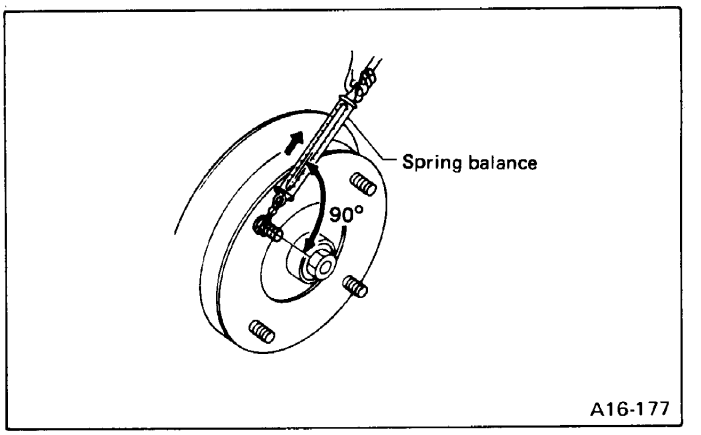


Fig. 52

Starting force when measured at hub bolt:
8.34 – 14.22 N (0.85 – 1.45 kg, 1.87 – 3.20 lb)

Make sure there is no free play in the bearing.

3) Bend lock washer.

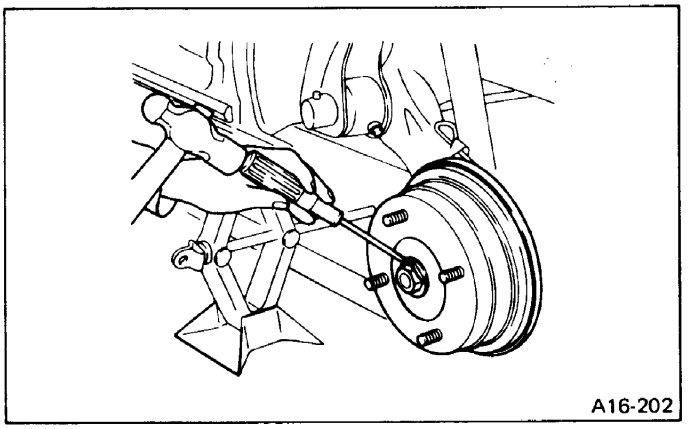


Fig. 53

4) After installing O-ring to drum cap, install cap to brake drum by lightly tapping with plastic hammer.

a. Do not use steel hammer etc.
b. Be sure to use new O-ring.

Rear Axle (4WD)

For 4WD model, dismount inner arm of trailing arm from vehicle body before removing and installing rear axle.

The text describes the procedures for disc brake equipped vehicle.

REMOVAL

1) Apply parking brake.
2) Remove rear wheel cap and cotter pin, and loosen castle nut and wheel nuts.
3) Detach shock absorber from inner arm.
4) Loosen lock bolts of crossmember outer bush.
5) Jack up vehicle, support it with safety stand (rigid racks).
6) Remove rear wheels.
7) Drive out spring pins of DOJ and BJ by using a steel rod of 6 mm (0.24 in) diameter.
8) Remove BJ from spindle of trailing arm with trailing arm lowered fully, then remove DOJ from differential spindle.

Disassembly and reassembly procedure of rear drive shaft is the same as that of front drive shaft.

9) Remove castle nut loosened previously and brake disc.
10) Disconnect brake pipe from brake hose at inner arm bracket.

Fit air breather cap onto end of brake hose to prevent brake fluid from pouring out.

11) Remove brake ASSY from trailing arm.
12) Remove bolt holding inner bush of inner arm.
13) Remove three bolts which connect inner arm and outer arm, and take out inner arm.
14) Vise inner arm, and straighten staked portion of ring nut, then remove ring nut by using special tool WRENCH (925550000).
15) Extract spindle inwardly by lightly tapping it from outside with a plastic hammer.
16) Remove outer oil seal from inner arm housing.
17) Insert spindle from out side of housing, and extract outer race of inner bearing, spacer and outer bearing by pushing inner race of outer bearing through the spindle by a press.
18) Remove inner race of inner bearing from spindle by using a press.

INSPECTION

Check the removed parts for wear and damage.
If defective, replace with a new one.

a. If a bearing is faulty, replace it as the bearing set.
b. Be sure to replace oil seal at every overhaul.

INSTALLATION

1) Install inner race of inner bearing onto the spindle, and install outer races of inner bearing and outer bearing and spacer by using press.

Don't confuse orientation of bearing outer races.

2) Apply grease of 20 to 30 g (0.71 to 1.06 oz) to bearing outer race in housing.
3) Insert spindle from inside, and press inner race of outer bearing from outside by using a pipe of 35 mm (1.38 in) in inner diameter while tapping it with a hammer.

Apply grease sufficiently on the inner and outer bearing area.

4) Install ring nut to housing by using WRENCH (925550000).

Tightening torque:
172 – 221 N·m (17.5 – 22.5 kg-m, 127 – 163 ft-lb)

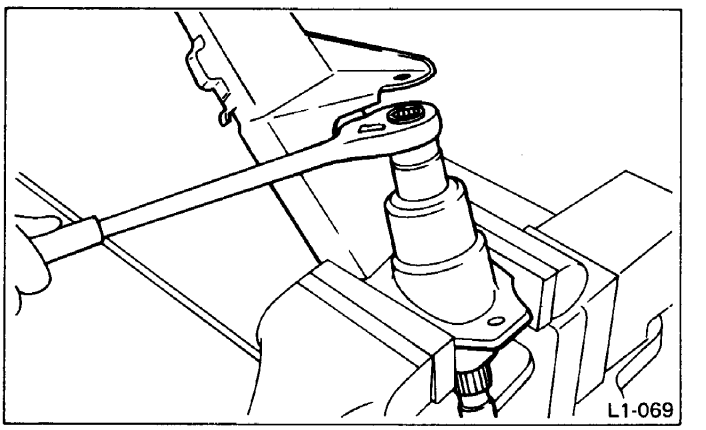


Fig. 54

5) Lock the ring nut by staking a point on the housing surface facing the ring nut groove.

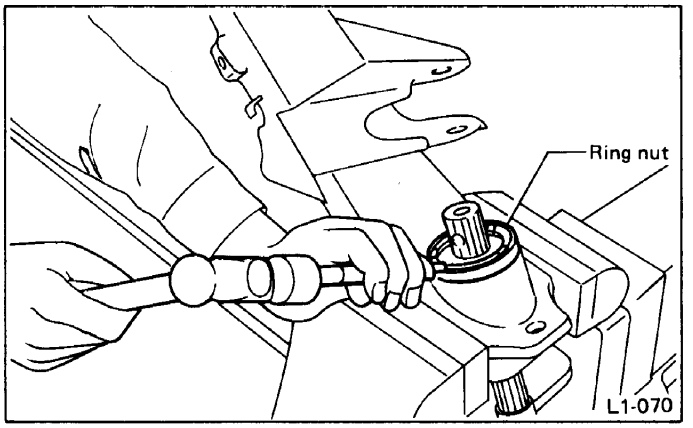


Fig. 55

6) Install outer oil seal by using special tool INSTALLER (925530000).

Be sure to renew the oil seal.

7) Install inner oil seal by using special tool INSTALLER (925530000).

Be sure to renew the oil seal.

8) Mount inner arm to vehicle body.
9) Install rear brake ASSY to inner arm, and connect brake pipes etc.

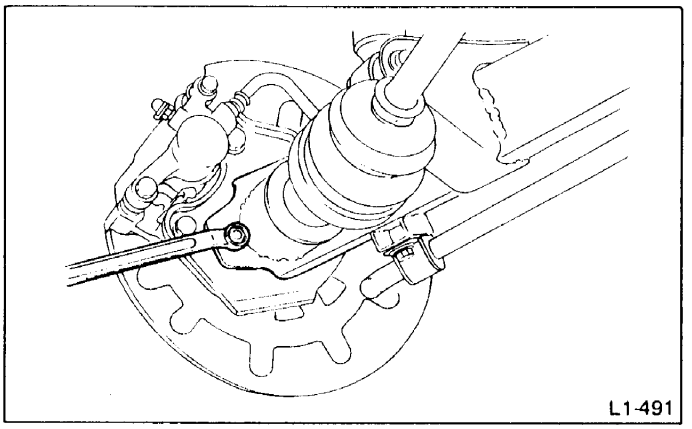


Fig. 56

Tightening torque (Back plate):
46 – 58 N·m (4.7 – 5.9 kg-m, 34 – 43 ft-lb)

10) Connect brake hose and brake pipe.

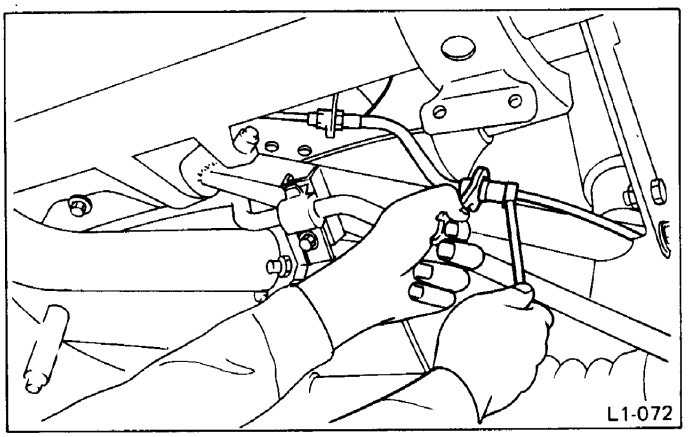


Fig. 57

11) Temporarily fit brake disc, center piece, washer spring and castle nut to spindle, in this order.

a. Play on spindle experienced, when mounting brake disc is not a fault.
b. Don't confuse orientation of washer spring.

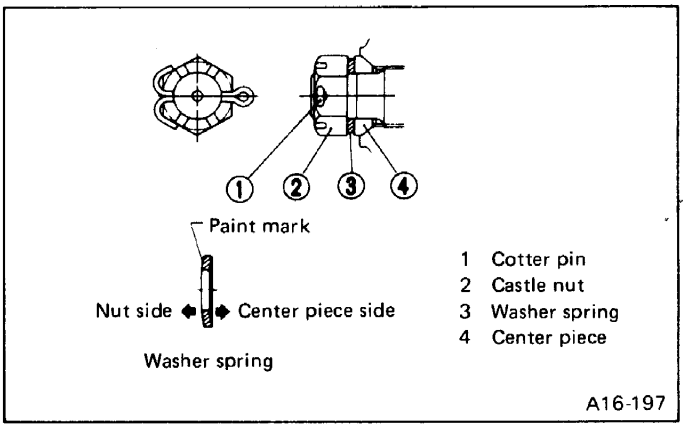


Fig. 58

12) Bleed brake system.

a. Before bleeding brake system, check pedal play and brake fluid level in reserve tank.
b. Bleed air from four wheels without fail.

13) Tighten castle nut, insert cotter pin and bend it firmly with foot brake applied to lock the wheel and axle.

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

After tightening castle nut to the specified torque, tighten further within 30° to align holes on nut and spindle.

14) Install packing to differential spindle.
15) Engage DOJ of rear drive shaft to differential spindle.

a. When mounting, mate the spline teeth properly so that the spring pin holes of DOJ and spindle will align.
b. When mounting the rear drive shaft ASSY, take care not to mount the DOJ and BJ oppositely.

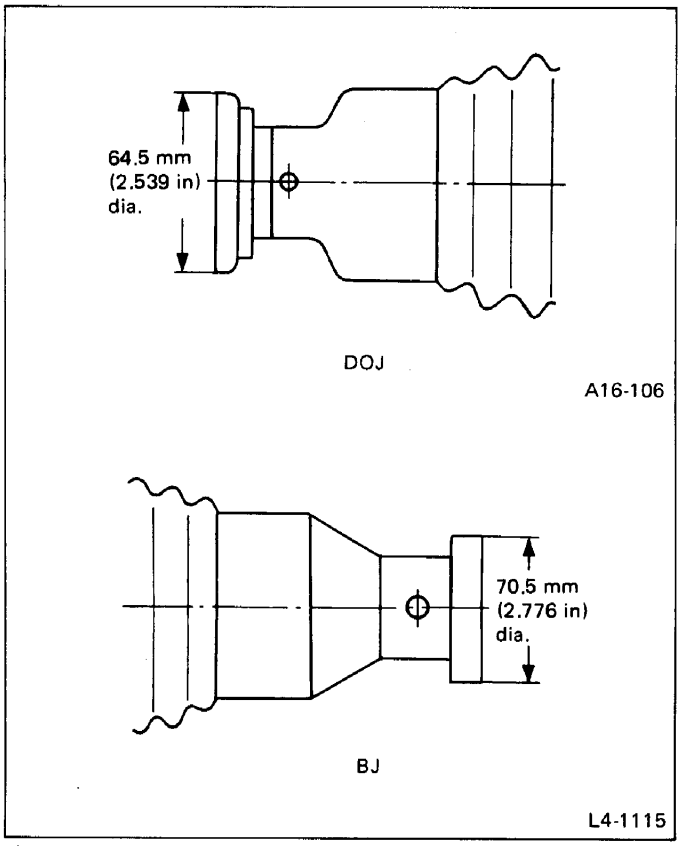


Fig. 59

16) Install packing to rear spindle, and mount BJ of rear drive shaft onto rear spindle with trailing arm lowered all the way.

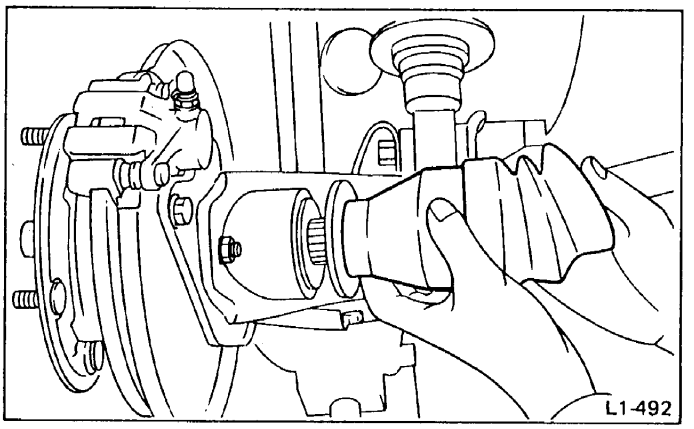


Fig. 60

17) Drive spring pins into DOJ and BJ respectively.

a. Before driving in the spring pin, confirm alignment of the holes.
b. Be sure to use new spring pin.

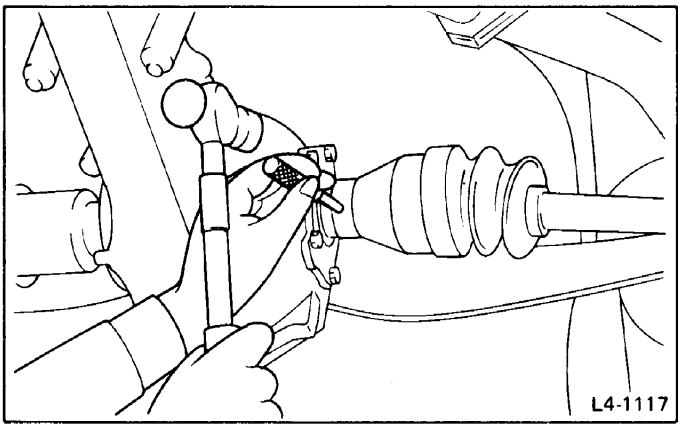


Fig. 61

18) Install wheels, outer arms, etc.
19) Lower vehicle to the ground, and install lower end of shock absorber to inner arm.

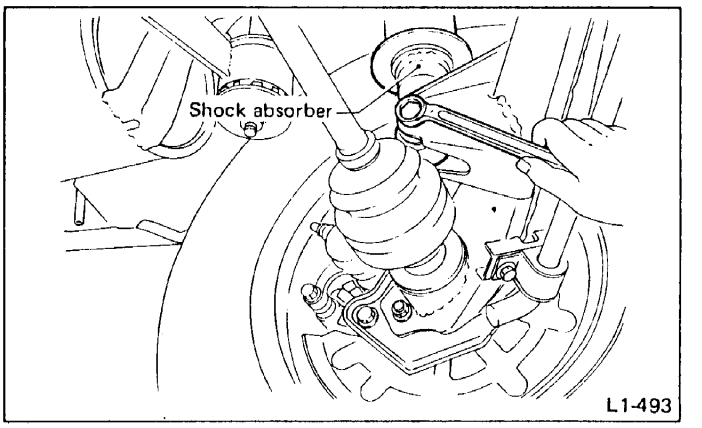


Fig. 62

Tightening torque:
88 – 118 N·m (9 – 12 kg-m, 65 – 87 ft-lb)

20) Check and adjust rear vehicle hight and rear wheel alignment.

Wheel and Tire

See "SPECIFICATIONS AND SERVICE DATA" for:
- Combination of tire and wheel
- Tire inflation pressure

Wheel Cap

HALF CAP

Removal

Pry off the half cap with a screwdriver inserted into openings in the cap.

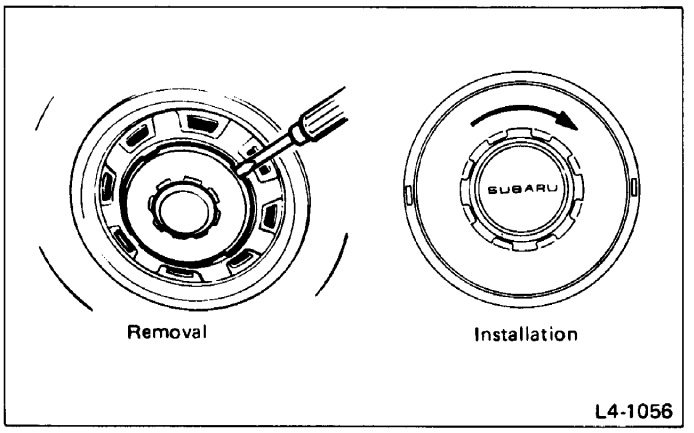


Fig. 63

Installation

Attach the half cap to the disc wheel. Using the palm of your hand, turn it clockwise until it stops. (The cap will stop when turned approximately 20° after the pawl engages the nut.)

FULL CAP

Removal

Pry off the full cap with a screwdriver inserted between openings in the cap.

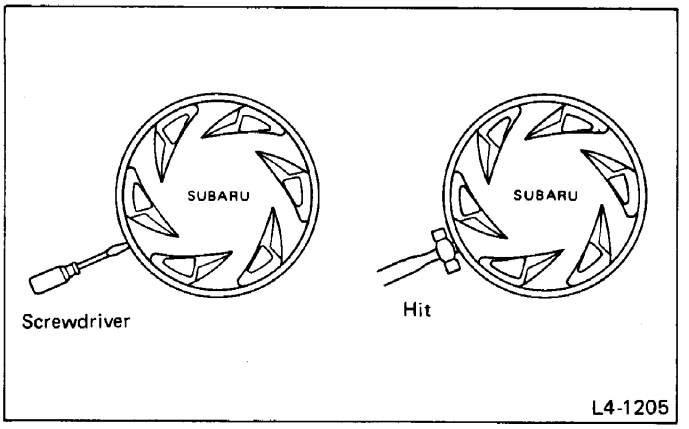


Fig. 64

Installation

Align the valve hole in the wheel cap with the valve on the wheel and secure the wheel cap by tapping four points (shown in Figure) by hand.

CENTER CAP (XT6)

Removal

Insert a screwdriver into access hole and pry center cap.

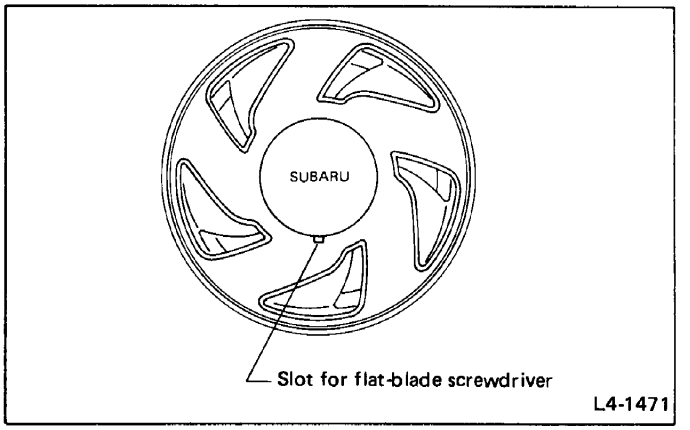


Fig. 65

Installation

After aligning notch in center cap with that of aluminum wheel, push center cap into place. When not properly aligned, center cap cannot be installed properly because its protrusion rides over the wheel.

Wheel and Tire

1) Deformation or damage on the rim can cause air leakage. Check the rim flange for deformation, crack, or damage, and repair or replace as necessary.
2) Take stone, glass, nail etc. off the tread groove.
3) Replace tire:
   - when large crack on side wall, damage or crack on tread is found.
   - when the "tread wear indicator" appears as a solid band across the tread.

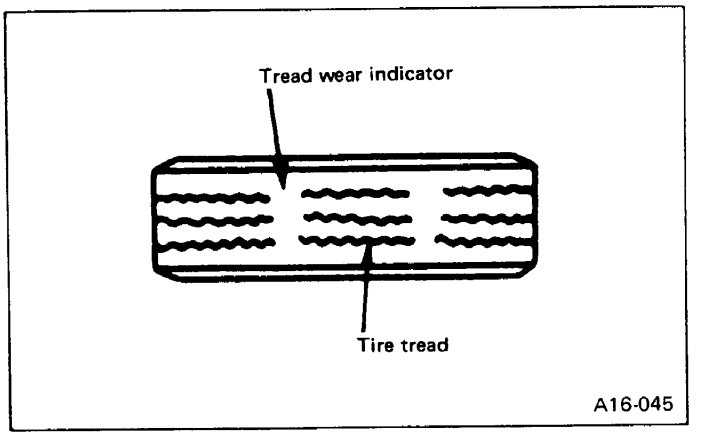


Fig. 66

When replacing a tire, make sure to use only the same size, construction and load range as originally installed. Avoid mixing radial, belted bias or bias tires on the vehicle.

Aluminum Wheel

INSPECTION

Inspection for aluminum wheels is basically the same as the one for steel wheels. However, check the rim flange for cracks or damage, and replace (not repair) aluminum wheel if air leakage is found.

PRECAUTIONS

Aluminum wheels are easily scratched. To maintain their appearance and safety, observe the following:

1) Do not damage aluminum wheels during removal, disassembly, installation, wheel balancing, etc. After removing aluminum wheels, place them on a rubber mat, etc.

2) While vehicle is being driven, be careful not to ride over sharp obstacles or allow aluminum wheels to contact the shoulder of the road.

3) When installing tire chain, be sure to install it properly not to have a slack; otherwise it may hit wheel while driving.

4) When washing aluminum wheel, use neutral synthetic detergent and water. Avoid using the cleanser including abrasive, hard brushes or an automatic car washer.

Wheel Balancing

1) Proper wheel balance may be lost if the tire is repaired or if it wears. Check the tire for dynamic balance, and repair as necessary.

2) To check for dynamic balance, use a dynamic balancer. Drive in the balance weight on both the top and rear sides of the rim.

3) Some types of balancer can cause damage to the wheel. Use an appropriate balancer when adjusting the wheel balance.

4) Use genuine balance weights.

Parts No. for steel wheel	Weight g (oz)	Parts No. for aluminum wheel
723141010	10 (0.35)	23141GA470
723141020	20 (0.71)	23141GA490
723141030	30 (1.06)	23141GA510
723141040	40 (1.41)	23141GA530
723141050	50 (1.76)	23141GA550
723141060	60 (2.12)	23141GA570
723141070	5 (0.18)	23141GA460
723141080	15 (0.53)	23141GA480
723141090	25 (0.88)	23141GA500
723141100	35 (1.23)	23141GA520
723141110	45 (1.59)	23141GA540
723141220	55 (1.94)	

Allowable dynamic unbalance:
6 g (0.21 oz) at rim flange

Installation of Wheel Assembly to vehicle

1) Attach the wheel to the hub by aligning the wheel bolt hole with the hub bolt.

2) Temporarily attach the wheel nuts to the hub bolts.
(In the case of aluminum wheel, use SUBARU genuine wheel nut for aluminum wheel.)

3) Manually tighten the nuts making sure the wheel hub hole is aligned correctly to the guide portion of hub.

4) Tighten the wheel nuts in a diagonal selection to the specified torque. Use a wheel nut wrench.

Wheel nut tightening torque:
78 – 98 N·m (8 – 10 kg-m, 58 – 72 ft-lb)

a. Tighten the wheel nuts in two or three steps by gradually increasing the torque and working diagonally, until the specified torque is reached. For drum brake models, excess tightening of wheel nuts may cause wheels to "judder".
b. Do not depress the wrench with a foot; Always use both hands when tightening.
c. Make sure the bolt, nut and the nut seating surface of the wheel are free from oils.

5) If a wheel was removed for replacement or for repair of a puncture, retighten the wheel nuts to the specified torque after running 1,000 km (600 miles).

Tire Rotation

If tires are maintained at the same positions for a long period of time, uneven wear results. Therefore, they should be pediodically rotated.
This lengthens service life of tires.

a. When rotating tires, replace unevenly worn or damaged tires with new ones.
b. Since "T-type" tire for temporary use is prepared as a spare tire, tire rotation is as follows.

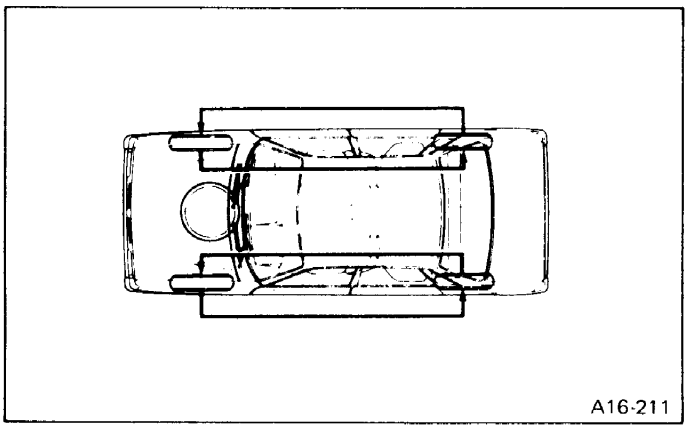


Fig. 67

"T-type" Tire

"T-type" tire for temporary use is prepared as a spare tire.

a. Keep the inflation pressure at 412 kPa (4.2 kg/cm^2, 60 psi) at all times.
b. When the wear indicator appears on the tread surface, replace the tire with a new one.
c. Do not use a tire chain with the "T-type" tire. Because of the smaller tire size, a tire chain will not fit properly and will result in damage to the vehicle and the tire.
d. When using a T-type tire:
- **Do not drive at a speed greater than 80 km/h (50 MPH).**
- **Drive as slowly as possible and avoid running over bumps.**
- **Do not drive with 4WD engaged.**
- **Replace it with a conventional tire as soon as possible since this "T-type" tire is only for temporary use.**