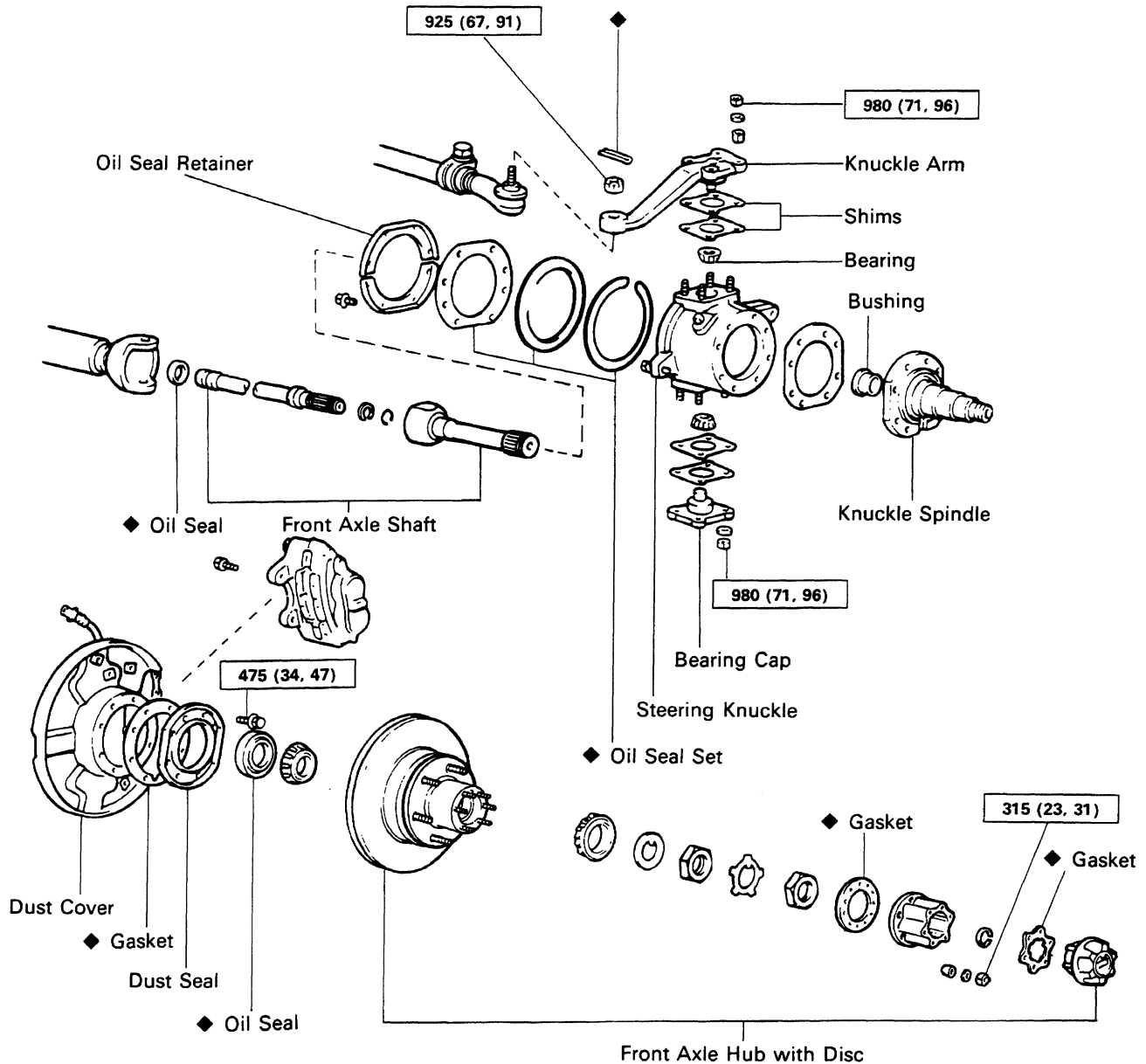
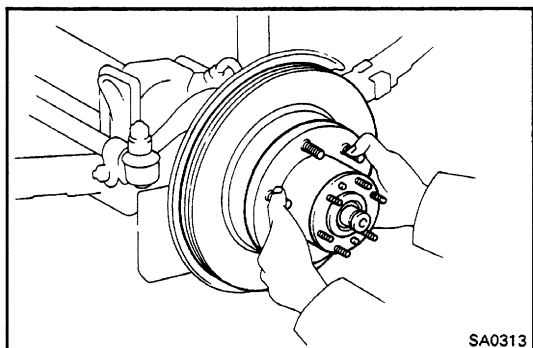


STEERING KNUCKLE AND AXLE SHAFT COMPONENTS



kg-cm (ft-lb, N-m) : Specified torque

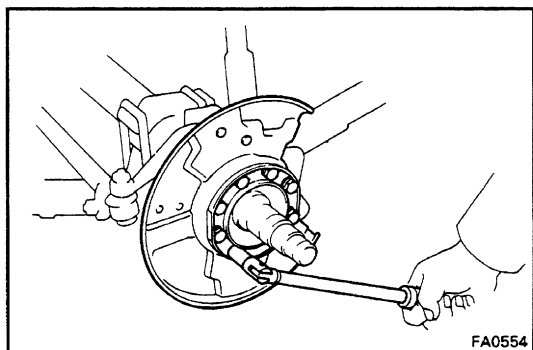
◆ Non-reusable part



DISASSEMBLY OF STEERING KNUCKLE AND AXLE SHAFT

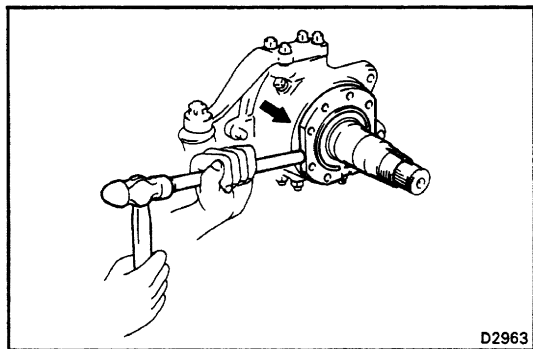
1. REMOVE FRONT AXLE HUB

(See page SA-14)



2. REMOVE KNUCKLE SPINDLE MOUNTING BOLTS

3. REMOVE DUST SEAL AND DUST COVER



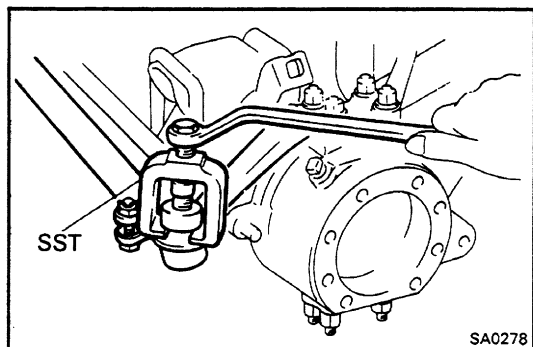
4. REMOVE KNUCKLE SPINDLE

Using a brass bar, tap the knuckle spindle off the steering knuckle.



5. REMOVE AXLE SHAFT

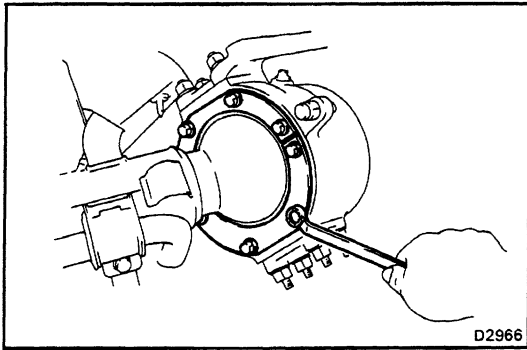
Position one flat part of the outer shaft upward and pull out the axle shaft.



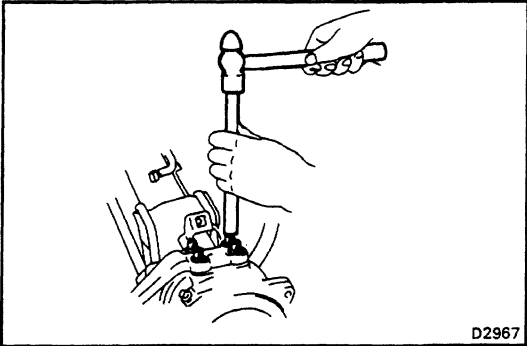
6. DISCONNECT TIE ROD FROM KNUCKLE ARM

Using SST, disconnect the tie rod from the knuckle arm.

SST 09611-22012

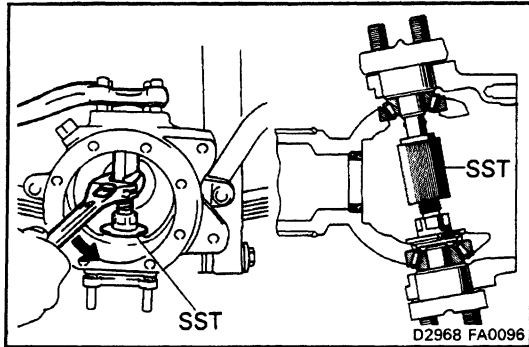


7. REMOVE OIL SEAL SET END RETAINER



8. REMOVE KNUCKLE ARM AND BEARING AND BEARING CAP

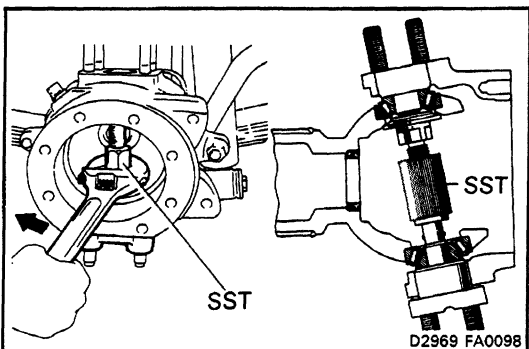
- (a) Remove the knuckle arm and bearing cap mounting nuts.
- (b) Using a brass bar, tap the slits of the cone washers and remove them from the knuckle arm.



- (c) Using SST, push out the knuckle arm and shims from the steering knuckle.

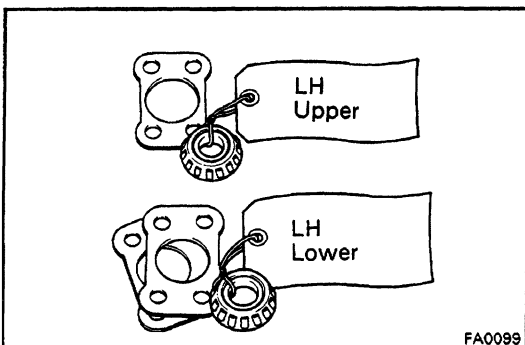
SST 09606-60020

HINT: Use the SST without a collar.



- (d) Using SST, push out the bearing cap and shims from the steering knuckle.

SST 09606-60020



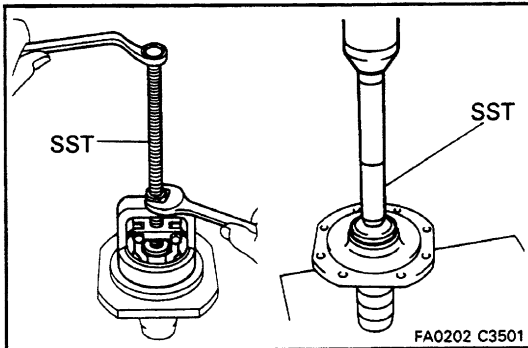
9. REMOVE STEERING KNUCKLE AND BEARING

HINT: Mark the removed adjusting shims and bearings so as to enable reassembling them to their proper positions.

INSPECTION AND REPAIR OF STEERING KNUCKLE AND AXLE SHAFT

1. INSPECT KNUCKLE SPINDLE

Clean the knuckle spindle and inspect the bushing for wear or damage.



2. REPLACE BUSHING

(a) Using SST, remove the bushing.

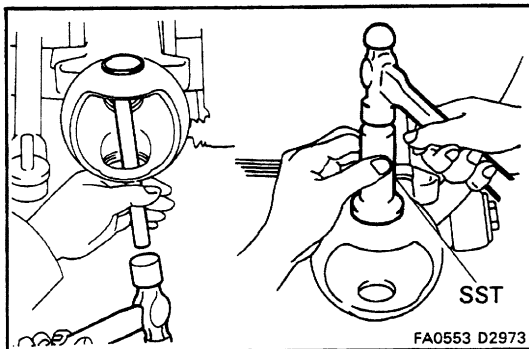
SST 09612-65014

(b) Using SST, press a new bushing into the spindle.

SST 09618-60010

3. INSPECT BEARING

Clean the bearings and outer races and inspect them for wear or damage.

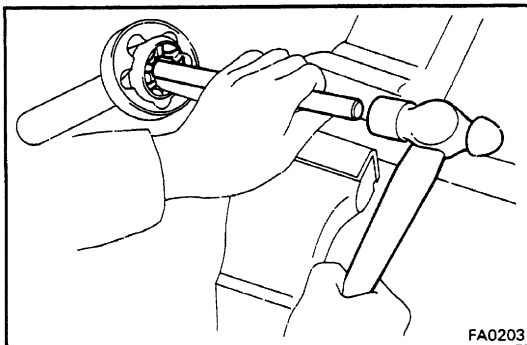


4. IF NECESSARY, REPLACE BEARING OUTER RACE

(a) Using a brass bar, drive out the bearing outer race.

(b) Using SST, carefully drive in a new bearing outer race.

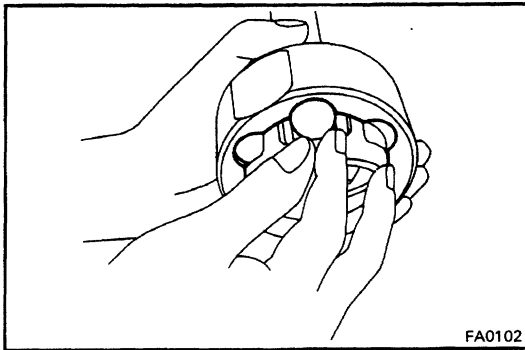
SST 09605-60010



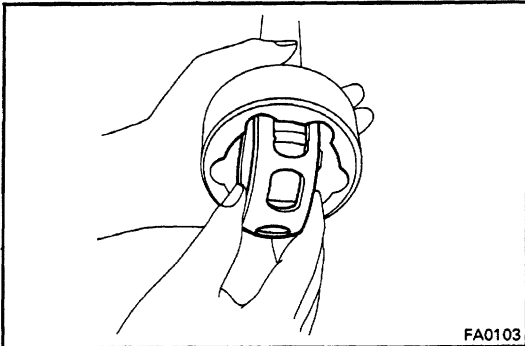
5. INSPECT BIRFIELD JOINT INNER PARTS

(a) Hold the inner shaft in a vise.

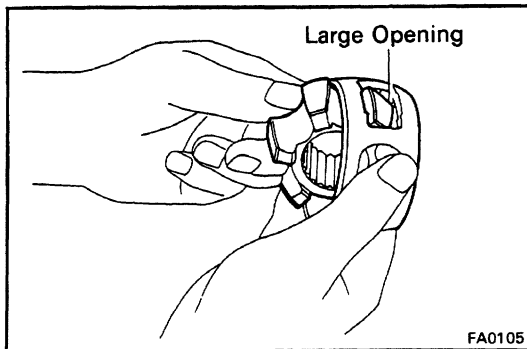
(b) Place a brass bar against the joint inner race and drive out the outer shaft.



- (c) Tilt the inner race and cage and take out the bearing balls one by one.

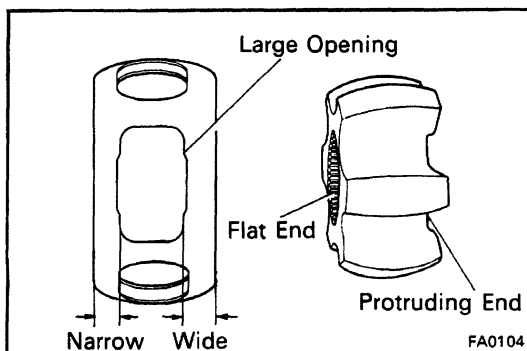


- (d) Fit the two large openings in the cage against the protruding parts of the outer shaft. Pull out the cage and inner race.



- (e) Take out the inner race from the cage through the large opening.

- (f) Clean and inspect the joint inner parts for wear or damage.



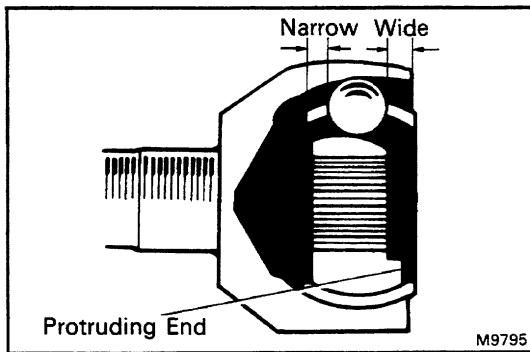
- (g) Coat the joint inner parts and inside of the outer shaft with Molybdenum disulphide lithium base grease.

- (h) Insert the inner race in the cage through the large opening.

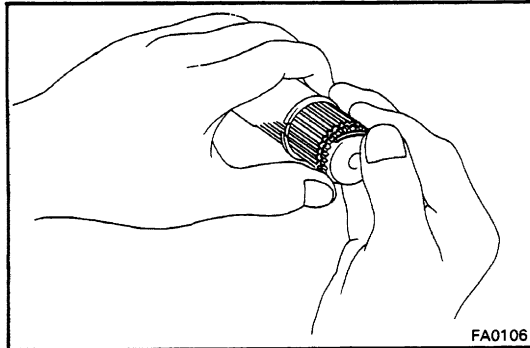
- (i) Position the protruding end and the inner race toward the wide side of the cage.



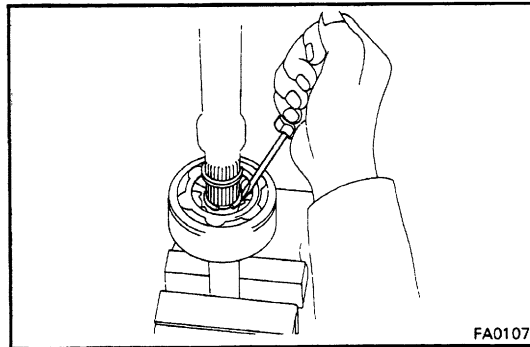
- (j) Assemble the cage and inner race to the outer shaft by fitting the two large openings in the cage against the protruding parts of the outer shaft.



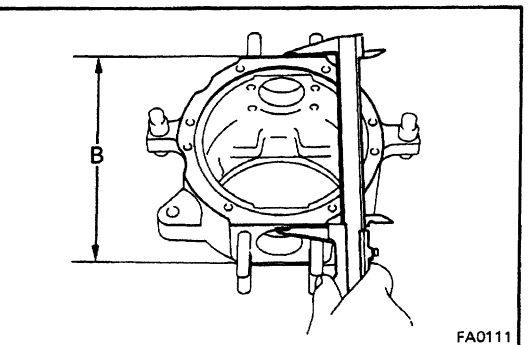
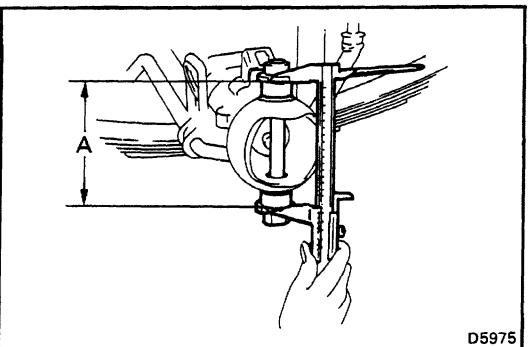
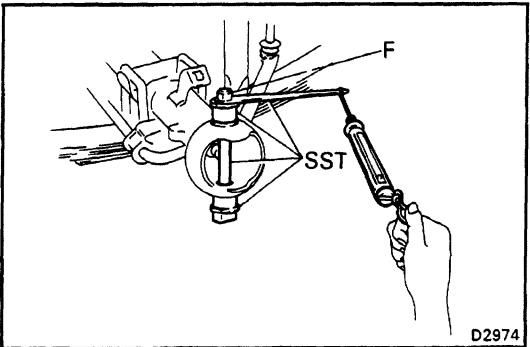
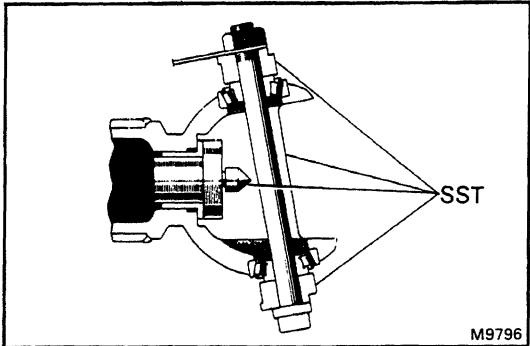
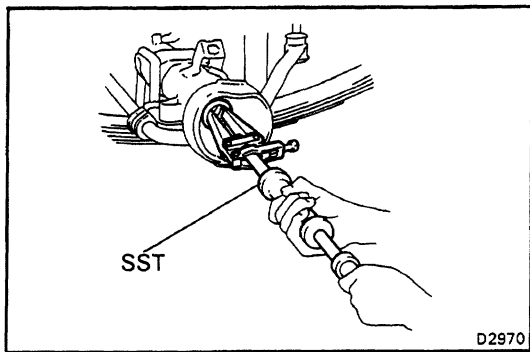
- (k) Make sure to position the wide side of the cage and the inner race protruding end outward.
- (l) Fit in the inner race and cage, and install the six bearing balls in the outer shaft. (See step (c))
- (m) Pack Molybdenum disulphide lithium base grease in the outer shaft.



- (n) Install the new snap rings on the inner shaft.



- (o) Hold the outer shaft in a vise, and, while compressing the snap inner ring, install the inner shaft to the outer shaft.
- (p) Verify that the inner shaft cannot be pulled out.



ADJUSTMENT OF STEERING KNUCKLE ALIGNMENT AND BEARING PRELOAD

HINT: Whenever the axle housing or the steering knuckle is replaced, the steering knuckle alignment and knuckle bearing preload are to be adjusted with the SST.

1. ADJUST BEARING PRELOAD

- Using SST, remove the oil seal.
SST 09308-00010
- Coat the knuckle bearings lightly with Molybdenum disulfide lithium base grease. .
- Mount the SST on the housing with the bearings.
SST 09634-60013

- Add preload to the bearings by tightening nut F.
Using a spring tension gauge, measure the preload.

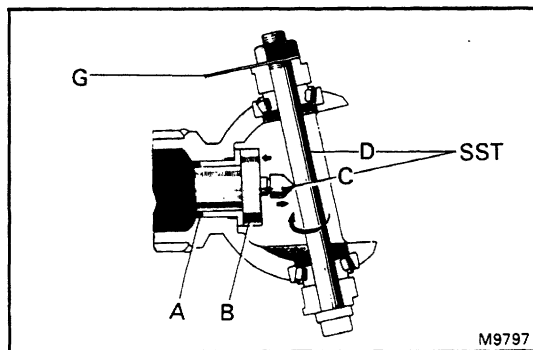
Preload (starting): 3.0 – 6.0 kg
(6.6–13.2 lb, 29–59 N)

- Measure distance A.

- Measure distance B.

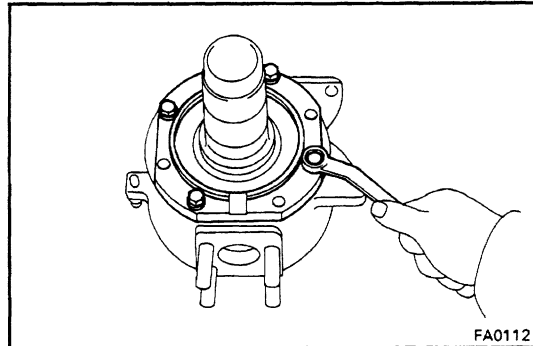
The difference between A and B is the total adjusting shim thickness that is required to maintain the correct bearing preload.

TOTAL SHIM THICKNESS C
C = A-B

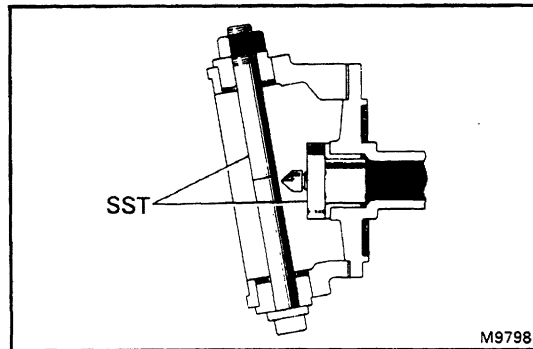


2. ADJUST STEERING KNUCKLE ALIGNMENT

- (a) Apply a light coat of red lead to the center-of rod D.
- (b) Press adapters A and B against the housing, press plug C against the rod D and turn lever G so that a line will be marked on rod D.



- (c) Temporarily install the spindle to the knuckle. Tighten the bolt with two washers.

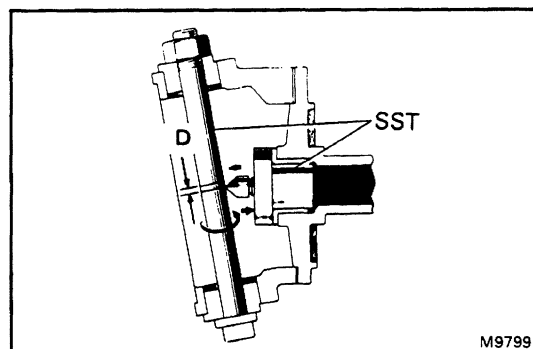


- (d) Dismount the SST from the housing, and mount it on the knuckle.

SST 09634-60013

HINT: Use care not to erase the line when dismounting and remounting the SST.

Make sure that rod D is in the same vertical direction that it was when mounted on the housing.



- (e) Turn rod D and mark another line on it. Measure distance D between the two lines. The thickness of the steering knuckle lower bearing shim E will be the distance D less 3 mm (0.12 in.).

$$\text{LOWER SHIM THICKNESS E} \\ E = D - 3 \text{ mm}$$

The thickness of the steering knuckle upper bearing shim F will be the difference between the total adjusting shim thickness C and shim thickness E.

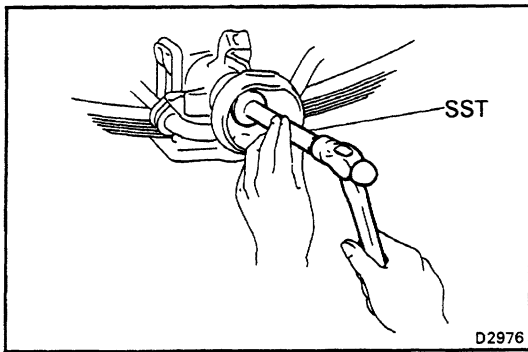
$$\text{UPPER SHIM THICKNESS F} \\ F = C - E$$

Adjusting shim thickness

Thickness	mm (in.)
0.1	(0.004)
0.2	(0.008)
0.3	(0.012)
0.5	(0.020)
1.0	(0.039)

HINT: Compare E and F with the thickness of the shims removed at disassembly. If there is a considerable difference, remeasure E and F.

- (f) Apply Molybdenum disulphide lithium base grease to the front axle shaft bushing.

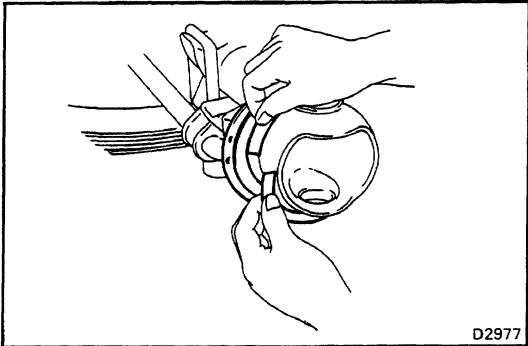


ASSEMBLY OF STEERING KNUCKLE AND AXLE SHAFT

(See page SA-17)

1. INSTALL OIL SEAL TO AXLE HOUSING

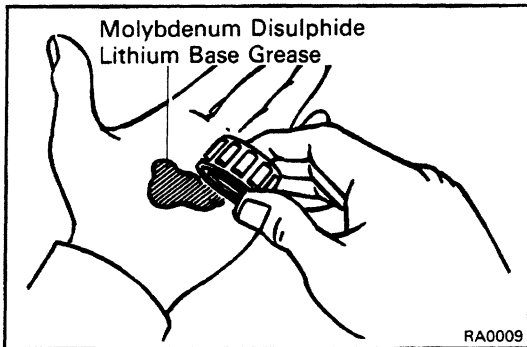
Using SST, drive a new oil seal into the axle housing.
SST 09618-60010



2. INSTALL OIL SEAL SET

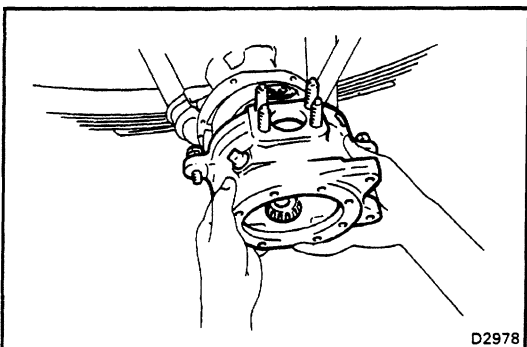
Install the parts in the following order:

- (a) Felt dust seal
- (b) Rubber seal
- (c) Steel ring



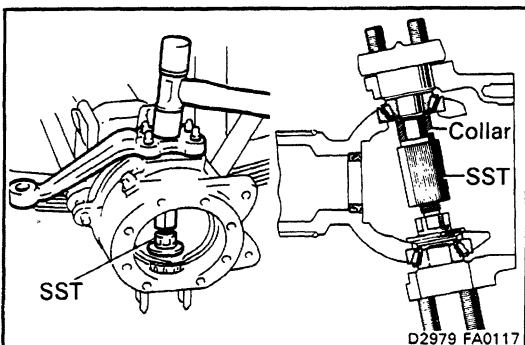
3. PACK BEARINGS WITH MOLYBDENUM DISULPHIDE LITHIUM BASE GREASE

- (a) Place Molybdenum disulphide lithium base.
- (b) Pack grease into the bearing and continue until the grease oozes out from the other side.
- (c) Do the same around the bearing circumference.



4. INSTALL STEERING KNUCKLE AND BEARINGS

- (a) Place the bearings in position on the knuckle and axle housing.
- (b) Insert the knuckle on the axle housing.



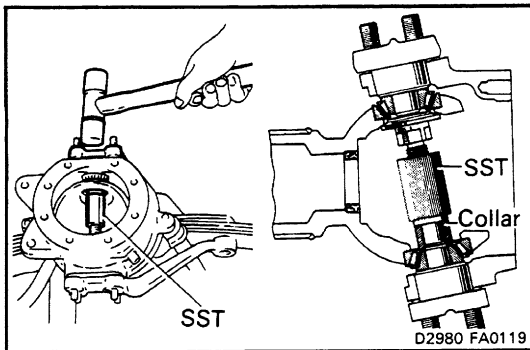
6. INSTALL KNUCKLE ARM AND BEARING CAP

- (a) Using SST, support the upper bearing inner race.

SST 09606-60020

HINT: Use SST with a collar.

- (b) Install the knuckle arm over the shims that were originally used or were selected in the adjustment operations.
- (c) Using a hammer, tap the knuckle arm into the bearing inner race.



(d) Using SST, support the lower bearing inner race.
SST 09606-60020

HINT: Use SST with a collar

(e) Install the bearing cap over the shims that were originally used or were selected as described in adjustment operations.

(f) Using a hammer, tap the bearing cap into the bearing inner race.

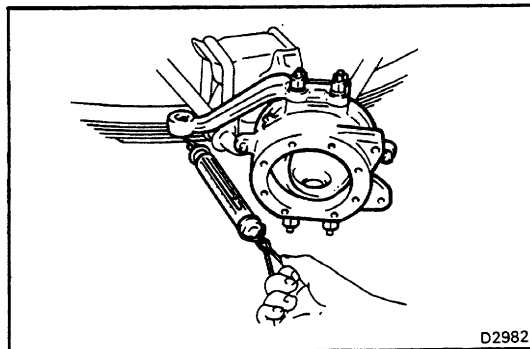
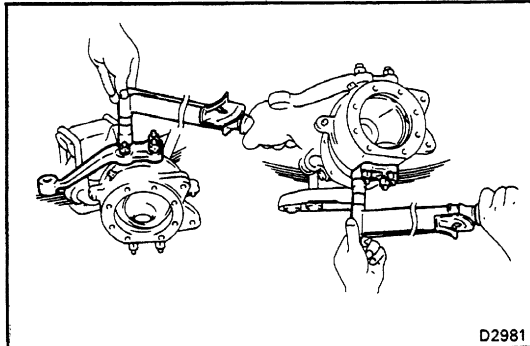
(g) Remove SST from the knuckle. .

(h) Install the cone washers to the third arm and torque the nuts.

Torque: 980 kg-cm (71 ft-lb, 96 N-m)

(i) Install the cone washers to the knuckle arm and torque the nuts.

Torque: 980 kg-cm (71 ft-lb, 96 N-m)

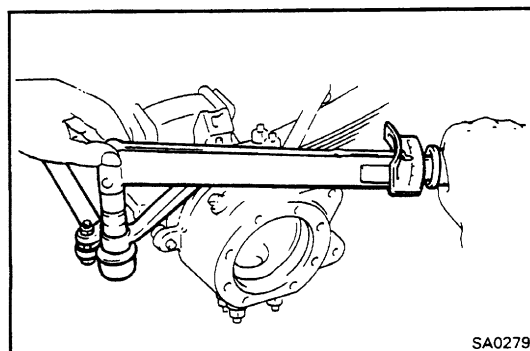


6. MEASURE BEARING PRELOAD

Using a spring tension gauge, measure the preload.

Preload (starting): 3.0 – 6.0 kg

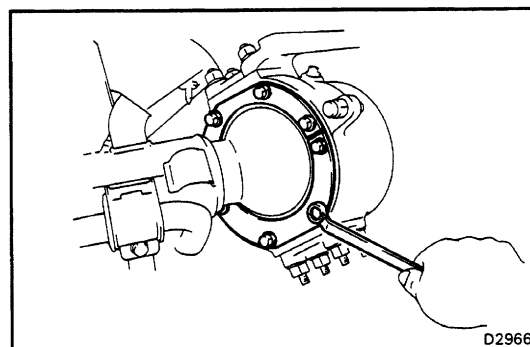
(6.6–13.2 lb, 29–59 N)



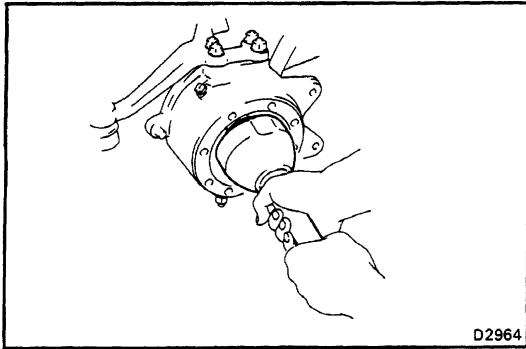
7. CONNECT TIE ROD TO KNUCKLE ARM

Torque the castle nut and secure it with a new cotter pin.

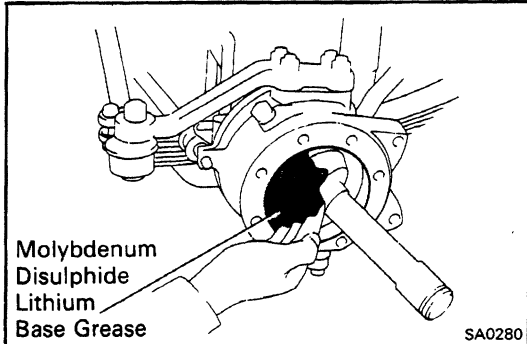
Torque: 925 kg-cm (67 ft-lb, 91 N-m)



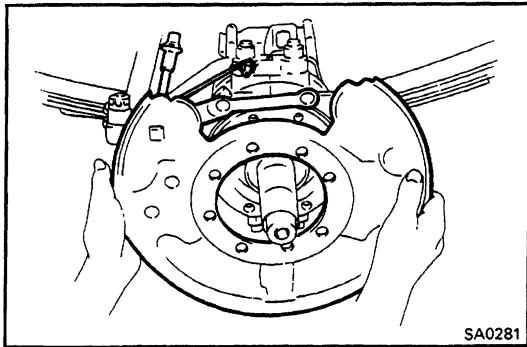
8. INSTALL OIL SEAL SET TO KNUCKLE

**9. INSTALL AXLE SHAFT**

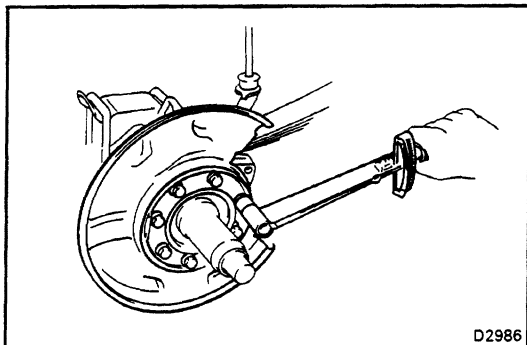
Position one flat part of the outer shaft upward, and install the shaft.

**10. PACK MOLYBDENUM DISULPHIDE LITHIUM BASE – GREASE**

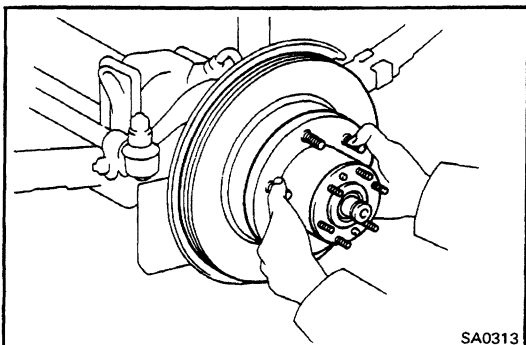
Pack Molybdenum disulphide lithium base grease into the knuckle to about three fourths of the knuckle.

**11. INSTALL KNUCKLE SPINDLE, DUST COVER WITH NEW GASKETS AND DUST SEAL**

- (a) Place a new gasket in position on the knuckle and install the spindle.
- (b) Place the gasket, dust cover and dust seal on the spindle.



- (c) Torque the spindle mounting bolts.
Torque: 475 kg-cm (34 ft-lb, 47 ft-lb)

**12. INSTALL AXLE HUB**
(See page [SA-15](#))