

FRONT AXLE AND SUSPENSION

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TROUBLESHOOTING

Problem	Possible cause	Remedy	Page
Wanders/pulls	Tires worn or improperly inflated	Replace tire or inflate tires to proper pressure	FA-3
	Alignment incorrect	Check front wheel alignment	FA-3
	Wheel bearing worn	Replace wheel bearing	FA-7
	Front or rear suspension parts loose or broken	Tighten or replace suspension parts	
	Steering gear out of adjustment or broken	Adjust or repair steering gear	SR-59
Bottoming	Vehicle overloaded	Check loading	
	Shock absorber worn out	Replace shock absorber	FA-32
	Springs weak	Replace spring	FA-37
Sways/pitches	Tires improperly inflated	Inflate tires to proper pressure	FA-3
	Stabilizer bar bent or broken	Inspect stabilizer bar	FA-37
	Shock absorber worn out	Replace shock absorber	FA-32
Front wheel shimmy	Tires worn or improperly inflated	Replace tire or inflate tires to proper pressure	FA-3
	Wheels out of balance	Balance wheels	
	Shock absorber worn out	Replace shock absorber	FA-32
	Alignment incorrect	Check front wheel alignment	FA-3
	Wheel bearings worn	Replace wheel bearings	FA-7
	Ball joints or bushings worn	Inspect ball joints and bushings	FA-37
	Tie rod end loosen or worn	Tighten or replace tie rod end	
	Steering gear out of adjustment or broken	Adjust or repair steering gear	SR-59
Abnormal tire wear	Tires improperly inflated	Inflate tires to proper pressure	FA-3
	Shock absorbers worn out	Replace shock absorber	FA-32
	Alignment incorrect	Check wheel alignment	FA-3
	Suspension parts worn	Replace suspension parts	FA-32,37

FRONT WHEEL ALIGNMENT

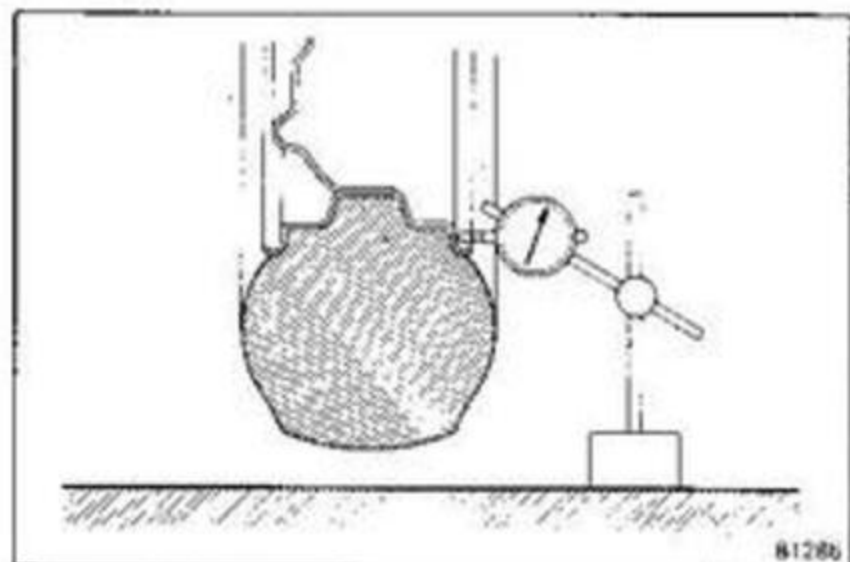
1. MAKE FOLLOWING CHECKS AND CORRECT ANY PROBLEMS

- (a) Check the tires for wear, size and proper inflation.

Cold tire inflation pressure

kg/cm² (psi, kPa)

Tire size	Front	Rear
165 SR 13	2.1 (30, 210)	1.8 (26, 180)
185/70 SR 13	1.9 (28, 190)	1.8 (26, 180)
P185/70 SR 13	1.9 (28, 190)	1.8 (26, 180)
205/60 R14 87H	1.8 (26, 180)	1.8 (26, 180)



- (b) Check the front wheel bearings for looseness.

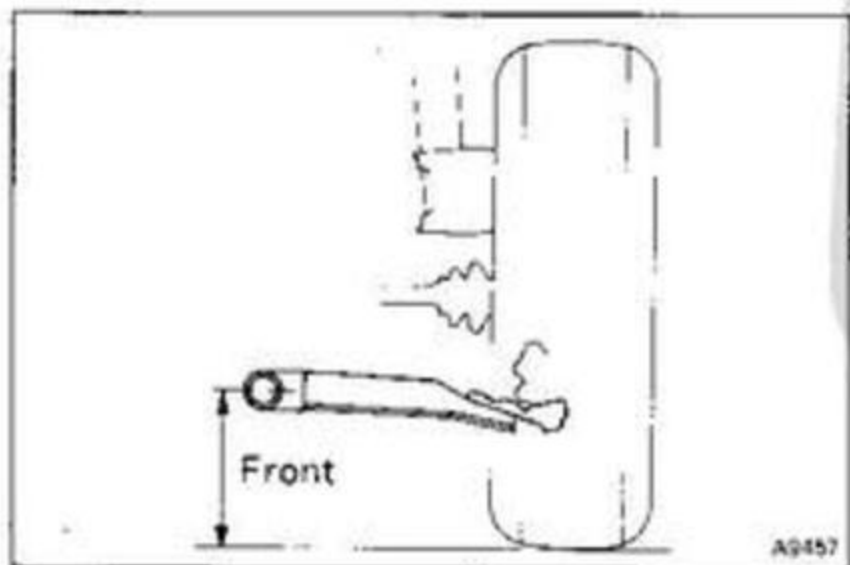
- (c) Check the wheel runout.

Lateral runout: Less than 1.0 mm (0.039 in.)

- (d) Check the front suspension for looseness.

- (e) Check the steering linkage for looseness.

- (f) Check that the front absorbers function properly by using the standard bounce test.



2. MEASURE CHASSIS GROUND CLEARANCE

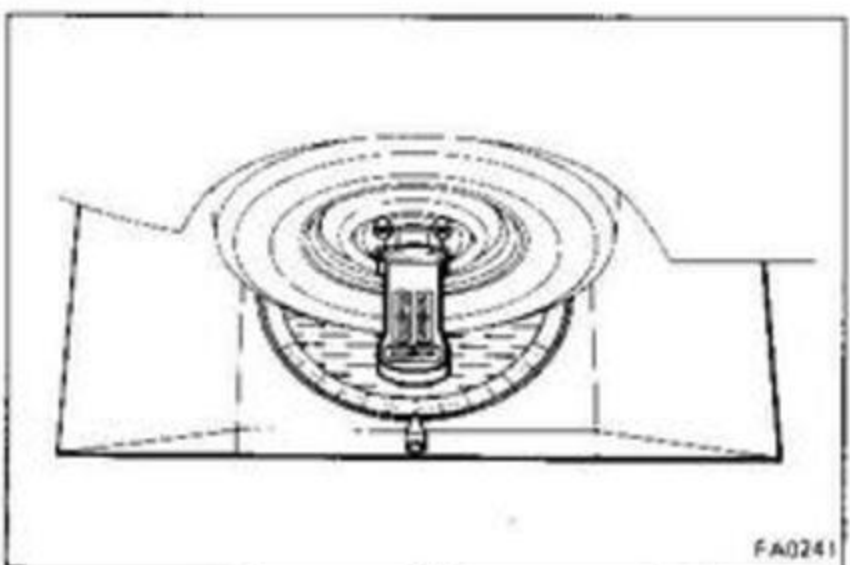
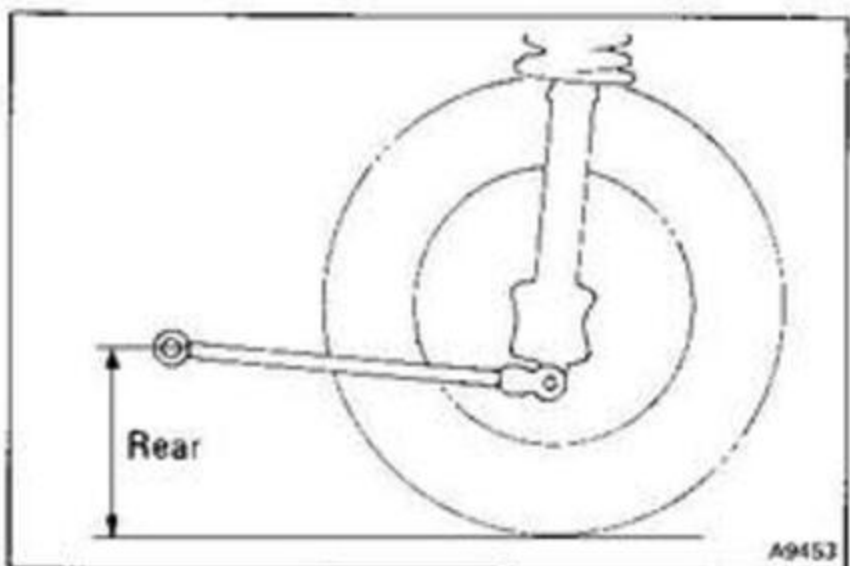
Chassis Ground Clearance

mm (in.)

Tire size	Front	Rear
165 SR 13	189.0 (7.441)	250.5 (9.862)
185/70 SR 13		
P185/70 SR 13		
205/60 R14 87H		

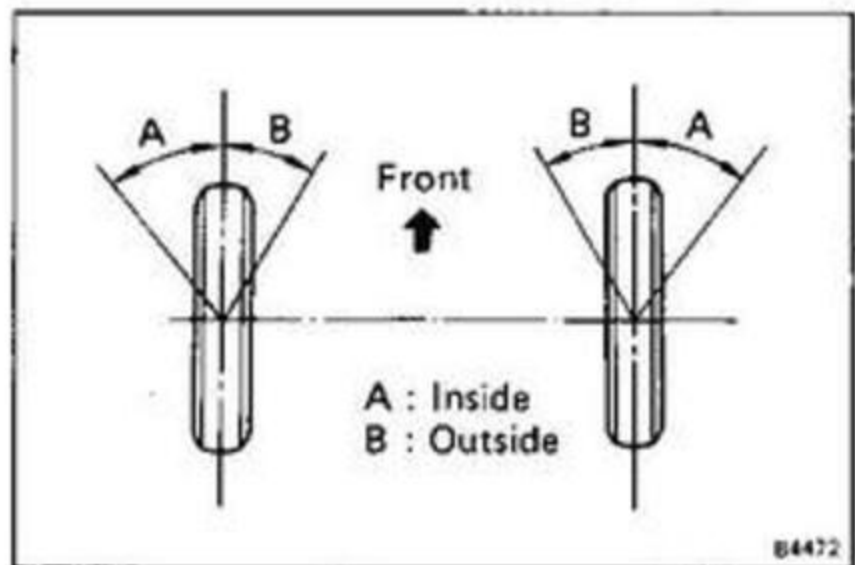
If the clearance of the vehicle is not standard, try to level by locking it down. If still not correct, check for bad springs or suspension parts.

NOTE: Before inspecting wheel alignment, adjust chassis ground clearance to specification.



3. INSTALL WHEEL ALIGNMENT EQUIPMENT

Follow the specific instructions of the equipment manufacturer.



4. CHECK WHEEL ANGLE

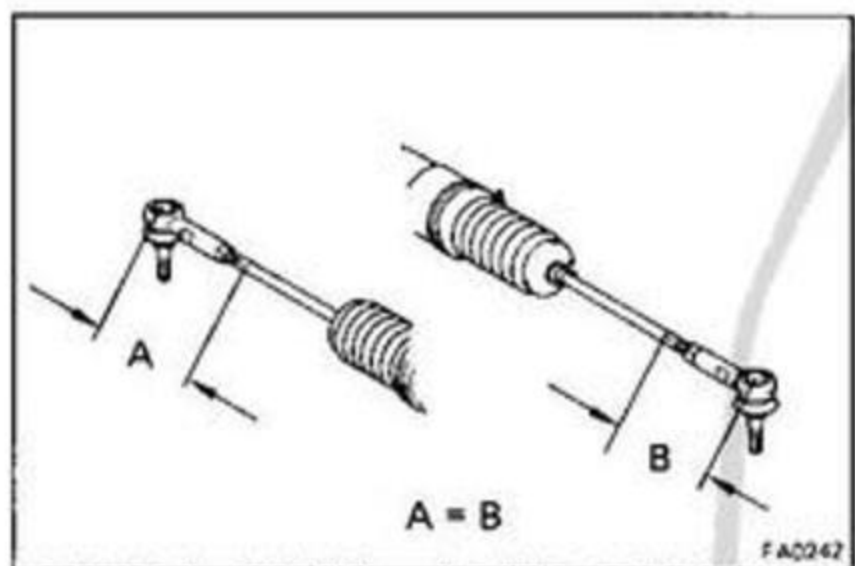
Wheel angle

Max.		at 20° (Outside wheel)
Inside wheel	Outside wheel	Inside wheel
34°	30°	21°30'

If steering angles differ from the standard specifications, check to see if the lengths of the left and right tie rods are the same.

NOTE: If the tie rod lengths are not equal, the steering angle cannot be adjusted properly.

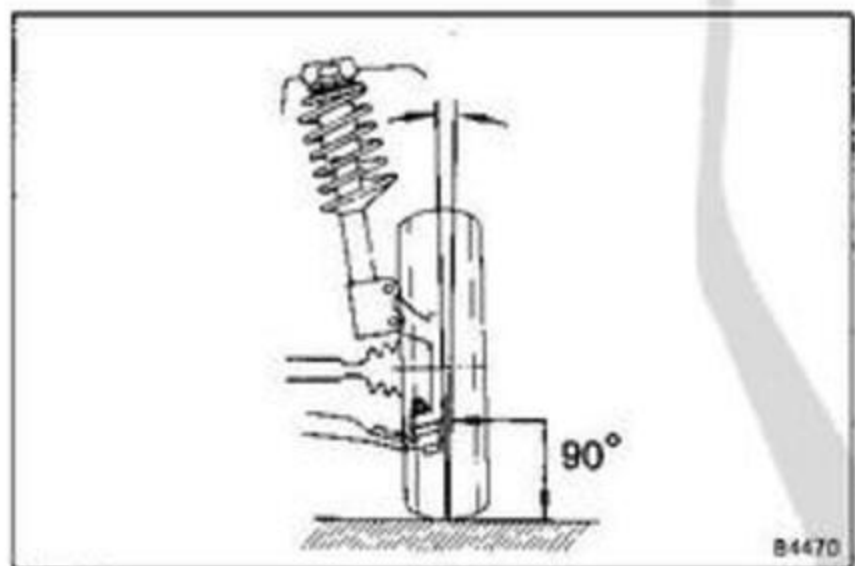
If the tie rod lengths were changed to adjust the steering angle, reinspect the toe-in.



5. CHECK CAMBER

Camber:

Inspection standard	-10' ± 45'
Adjustment standard	-10' ± 30'
Left-right error	30'



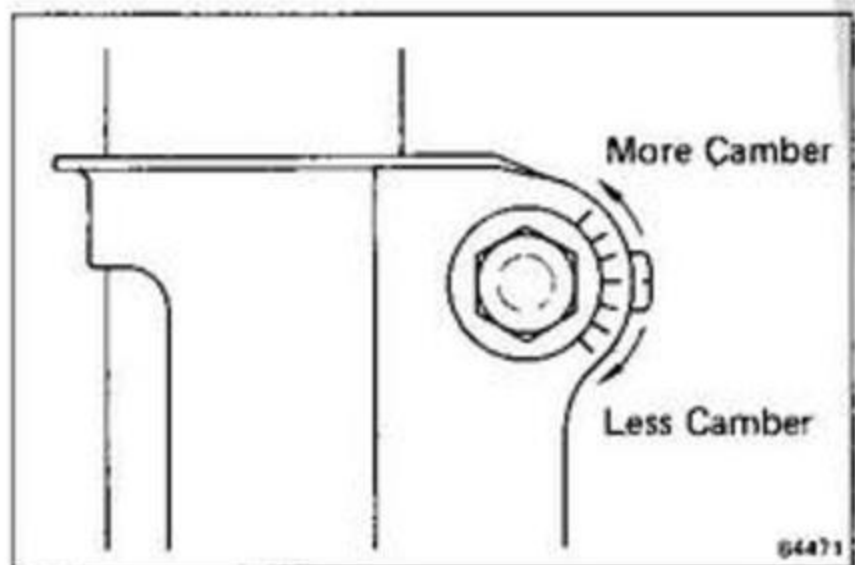
If camber is not within specification, adjust by turning the camber adjust cam.

- Loosen the shock absorber set nut.
- Turn the cam to adjust.

NOTE: Camber changes about 20' with each graduation of the cam.

- Apply engine oil to the threads of the nut.
- Tighten to the specified torque.

Torque: 2,100 kg-cm (152 ft-lb, 206 N·m)

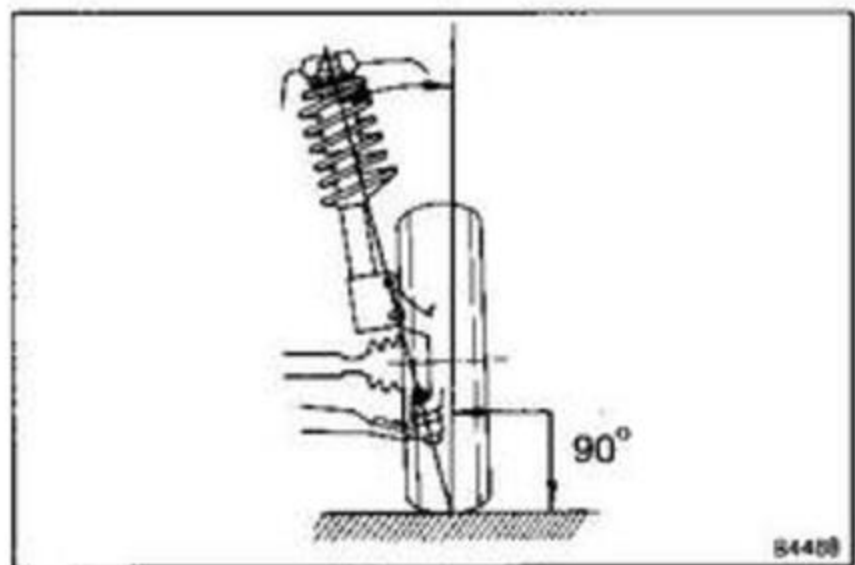


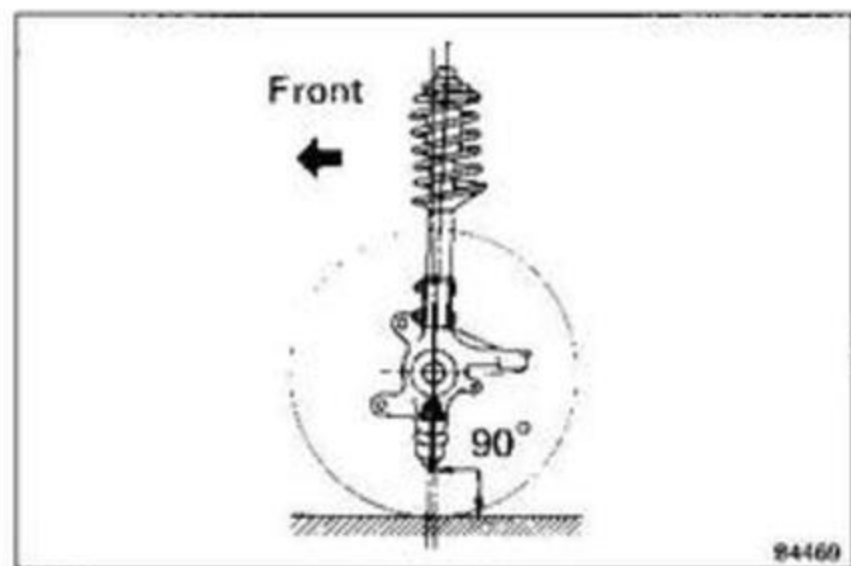
6. CHECK STEERING AXIS INCLINATION

Steering axis inclination:

Inspection standard	13°30' ± 45'
Left-right error	30'

NOTE: Steering axis inclination is not adjustable. If measurement is off standard, inspect suspension parts as necessary, then recheck the front wheel alignment.





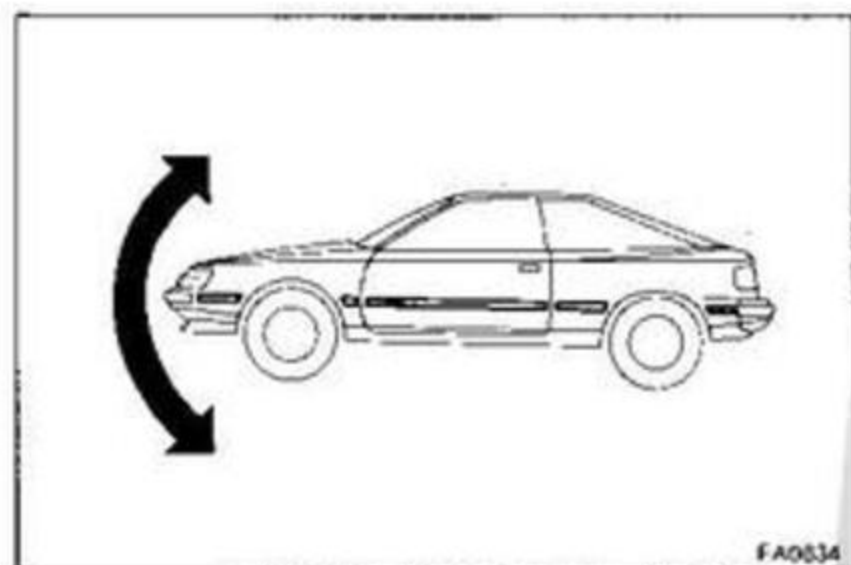
7. CHECK CASTER

Caster:

Inspection standard $1^{\circ} 10' \pm 45'$

Left-right error $30'$

NOTE: Caster is not adjustable. If measurement is off standard, inspect suspension parts as necessary, then recheck the front wheel alignment.



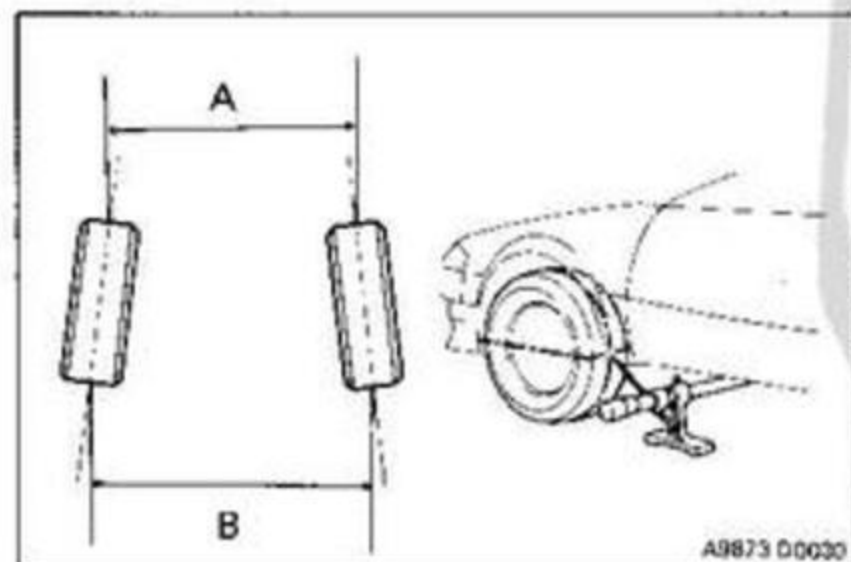
8. CHECK TOE-IN

Adjust toe-in with a toe-in gauge in the following procedure.

(a) Bounce the vehicle up and down to stabilize the suspension.

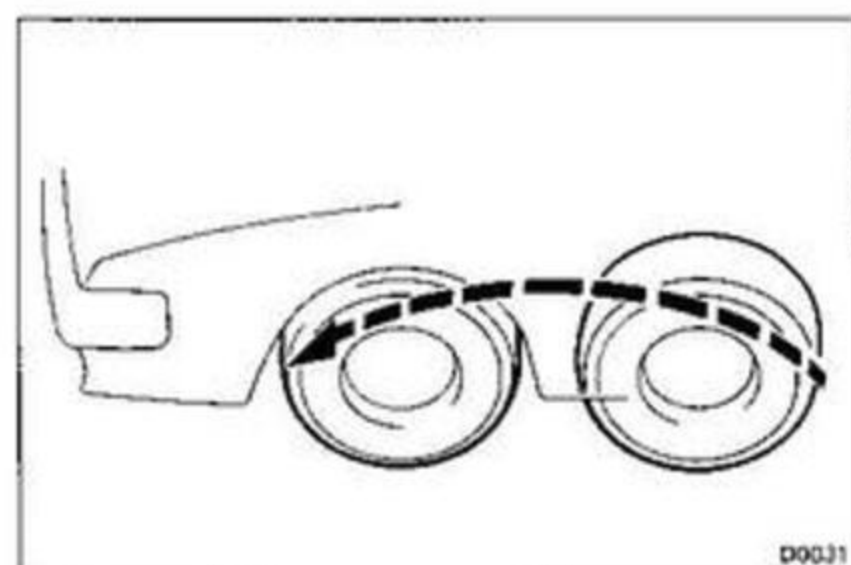
(b) Move the vehicle forward about 5 m (16.4 ft) with the front wheel in the straight-ahead position on a level place.

(c) Mark the center of each rear tread and measure the distance between the marks of the right and left tires.



(d) Advance the vehicle until the marks on the rear sides of the tires come to the measuring heights of the gauge on the front side.

NOTE: If the tire rolls too far, repeat from step (b).



(e) Measure the distance between the marks on the front of the tires.

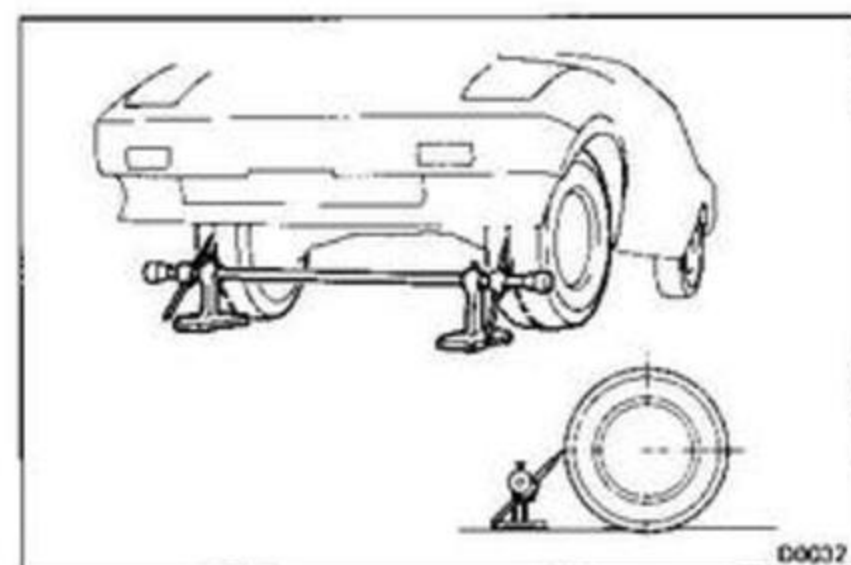
Toe-in:

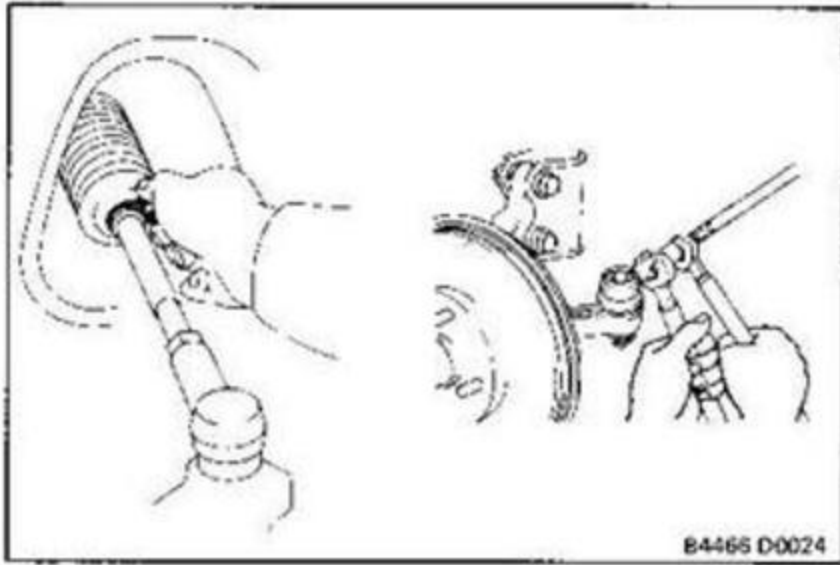
Inspection standard $0 \pm 2 \text{ mm } (0 \pm 0.08 \text{ in.})$

(f) If not within standard, adjust the toe-in.

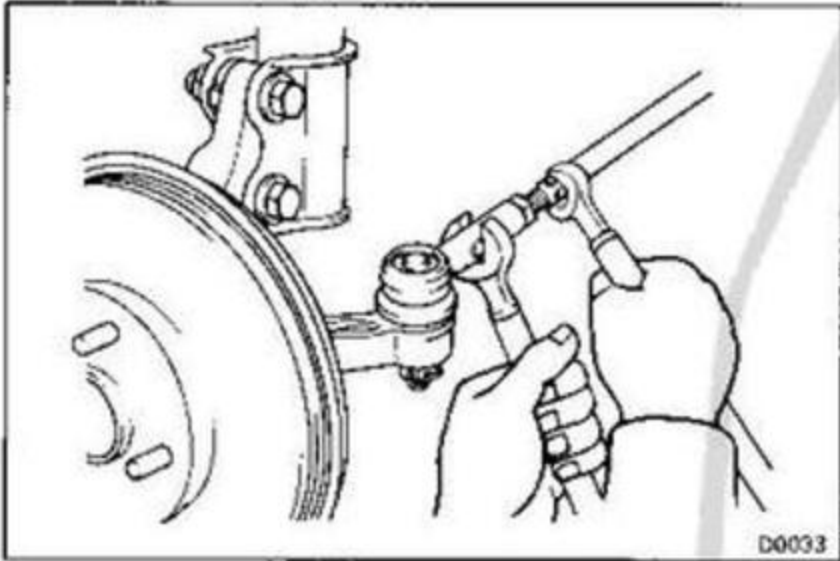
Toe-in:

Adjustment standard $0 \pm 1 \text{ mm } (0 \pm 0.04 \text{ in.})$





- (g) Remove the boot clip.
- (h) Loosen the lock nut.

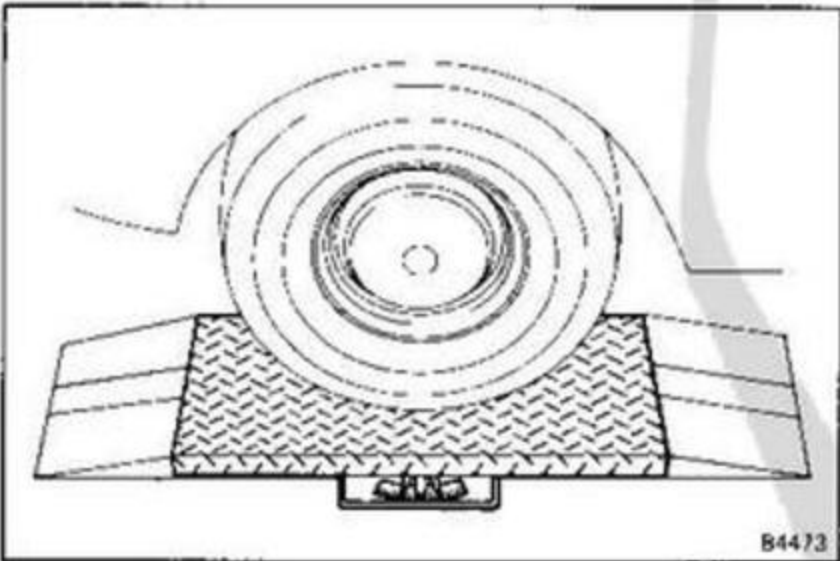


- (i) Turn the left and right rack ends an equal amount to adjust.
- (j) Insure that the lengths of the left and right tie rods are the same.
- (k) Torque the tie rod lock nut.

Torque: 570 kg-cm (41 ft-lb, 56 N·m)

- (l) Place the boot on the seat and clamp it.

NOTE: Insure that the boot is not twisted.



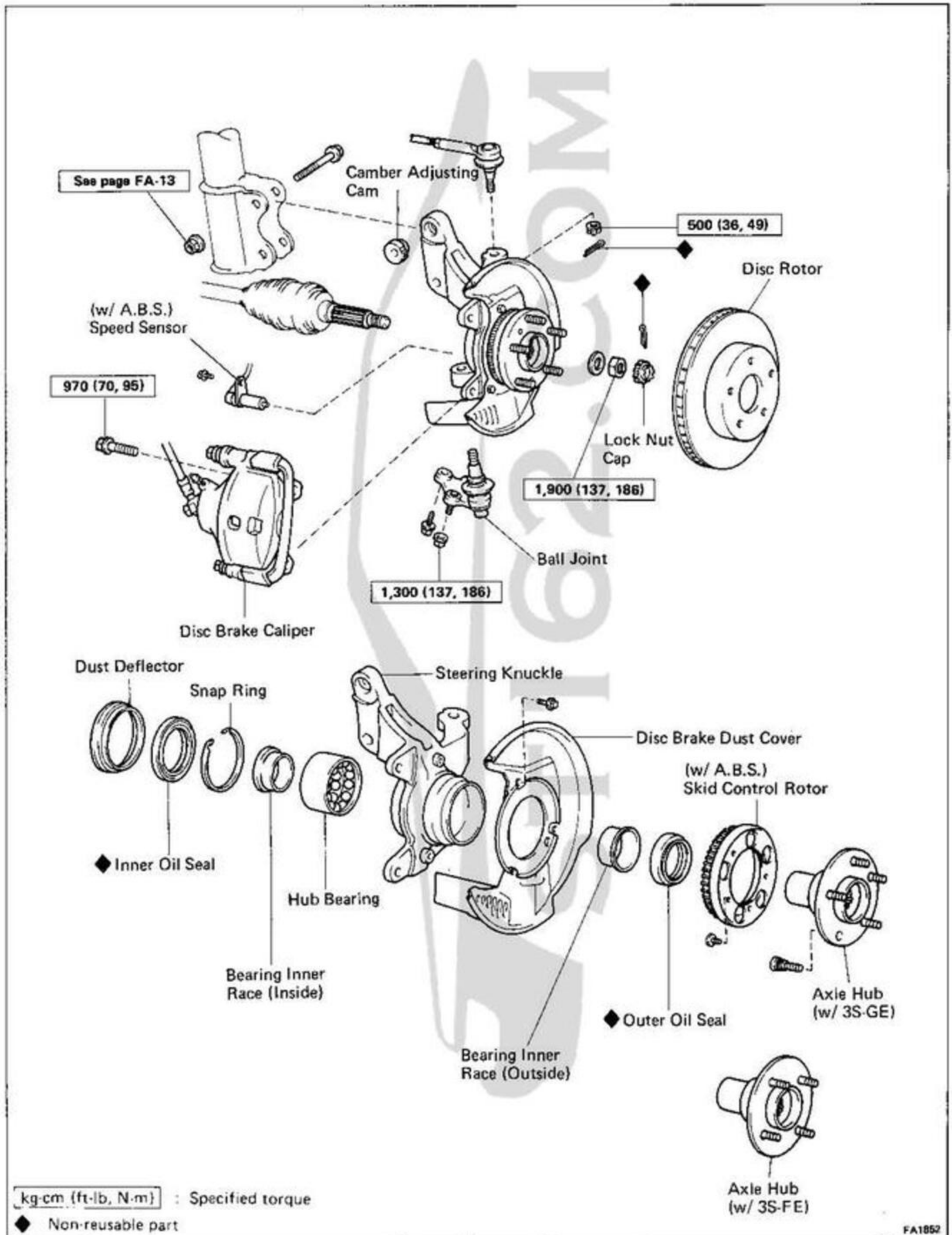
9. INSPECT SIDE SLIP WITH SIDE SLIP TESTER

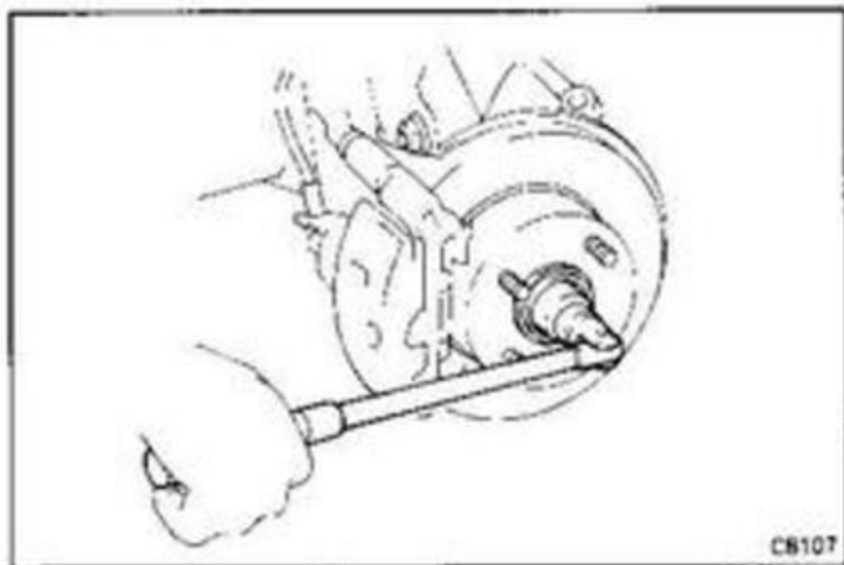
Side slip limit:

Less than 3.0 mm/m (0.118 in./3.3 ft)

If the side slip exceeds the limit, the toe-in or front wheel alignment may not be correct.

FRONT AXLE HUB COMPONENTS

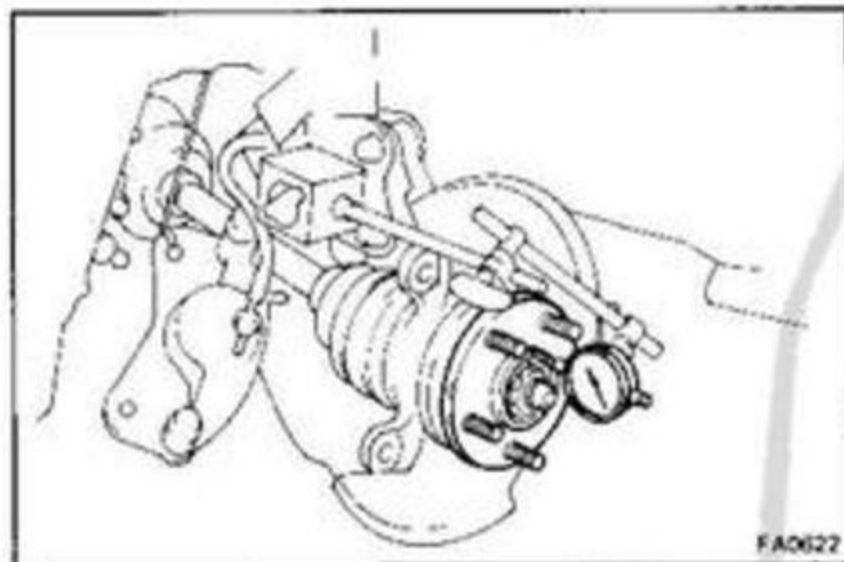


REMOVAL OF FRONT AXLE HUB**1. REMOVE COTTER PIN, LOCK NUT CAP AND BEARING LOCK NUT**

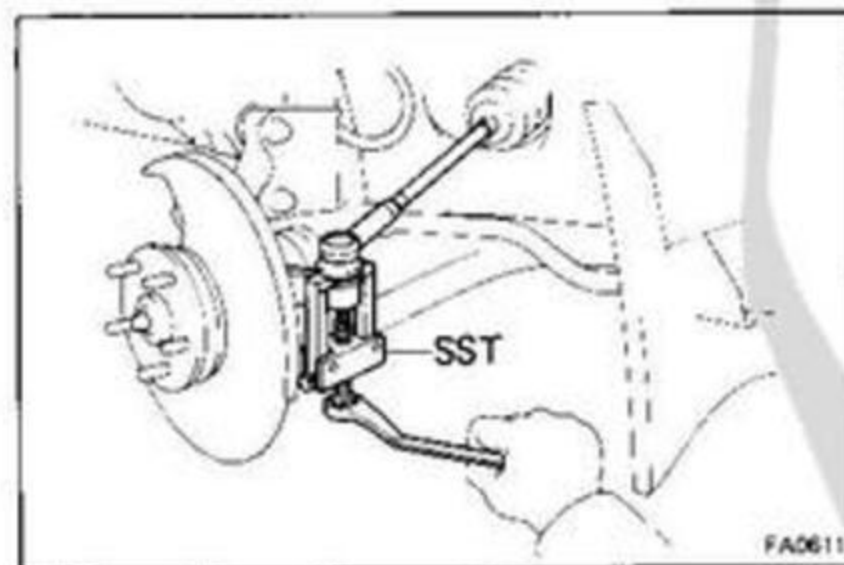
- (a) Remove the cotter pin and lock nut cap.
- (b) Before removing the brake caliper, loosen the bearing lock nut while depressing the brake pedal.

2. REMOVE BRAKE CALIPER

Remove the brake caliper from the steering knuckle and suspend it with wire.

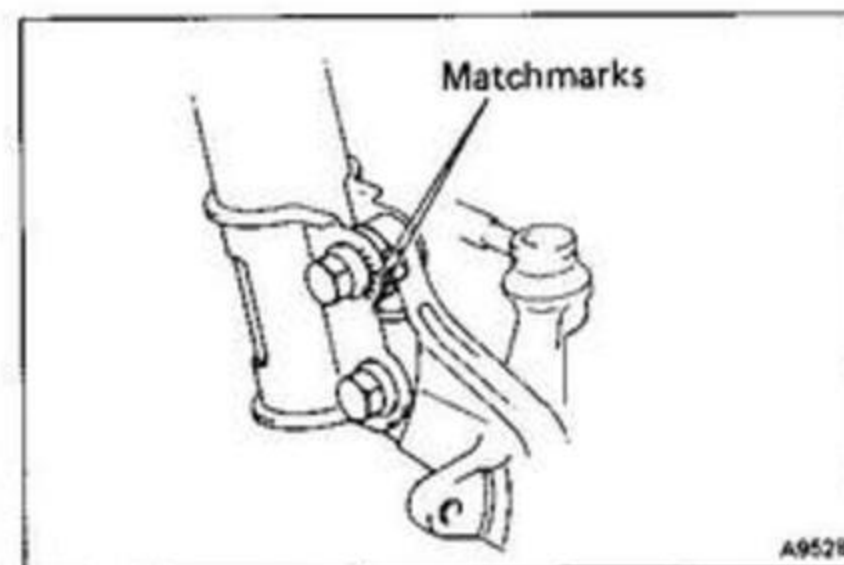
**3. REMOVE DISC ROTOR****4. CHECK BEARING PLAY IN AXIAL DIRECTION**

Limit: 0.05 mm (0.0020 in.)

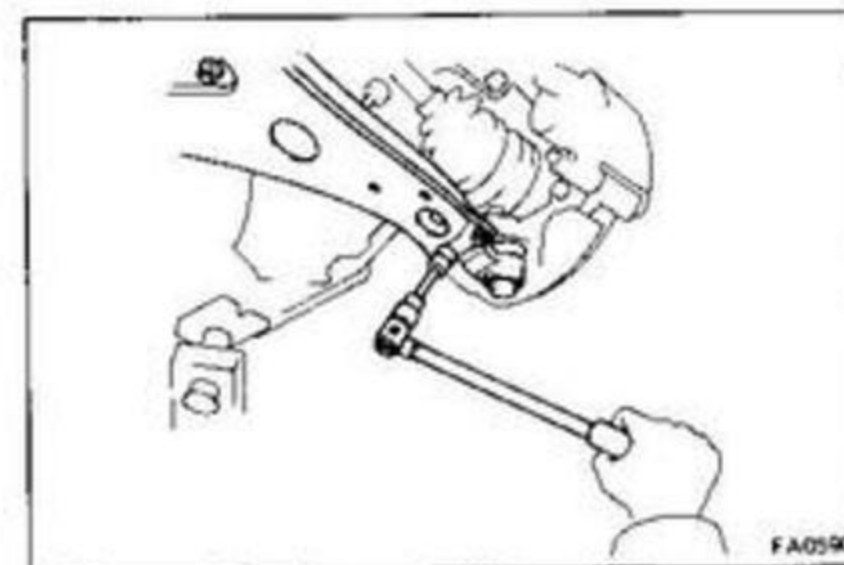
5. (w/ A.B.S.) REMOVE SPEED SENSOR**6. DISCONNECT TIE ROD END**

- (a) Remove the cotter pin and nut from the tie rod end.
- (b) Using SST, disconnect the tie rod end from the steering knuckle.

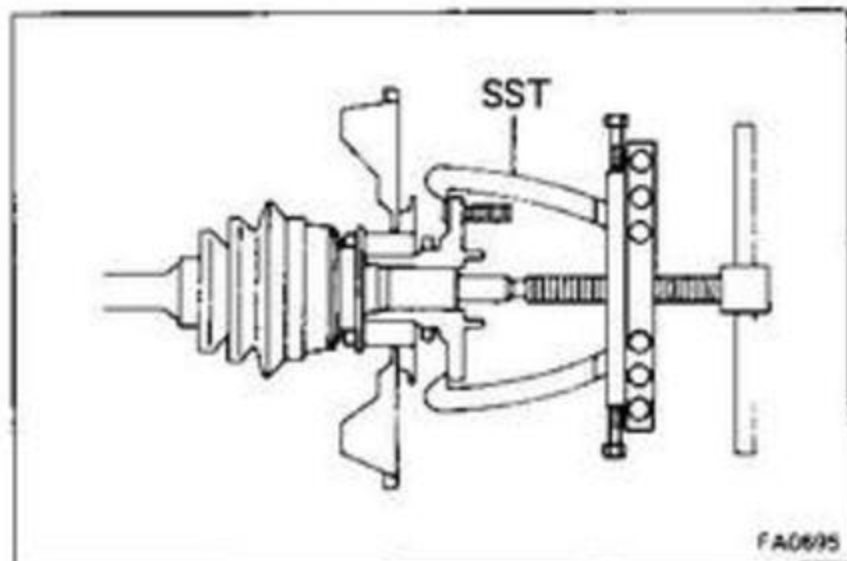
SST 09628-62011

**7. DISCONNECT STEERING KNUCKLE FROM SHOCK ABSORBER**

- (a) Place matchmarks on the shock absorber lower bracket and camber adjust cam.
- (b) Remove the bolt and nut, and then separate the steering knuckle and shock absorber.

**8. DISCONNECT STEERING KNUCKLE FROM LOWER SUSPENSION ARM**

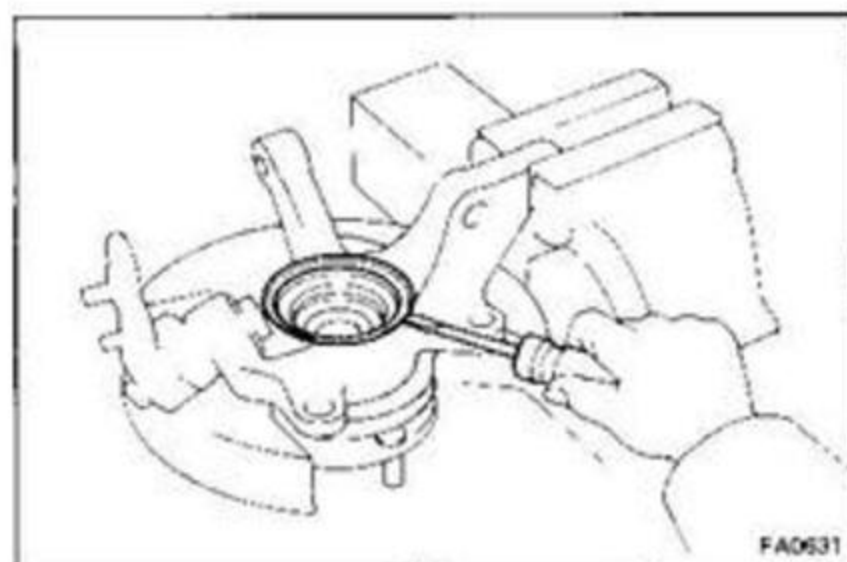
- (a) Remove the bolt and two nuts.
- (b) Disconnect the lower suspension arm from the steering knuckle.

**9. REMOVE AXLE HUB FROM DRIVE SHAFT**

Using SST, disconnect the steering knuckle from the drive shaft and remove the steering knuckle.

SST 09950-20017

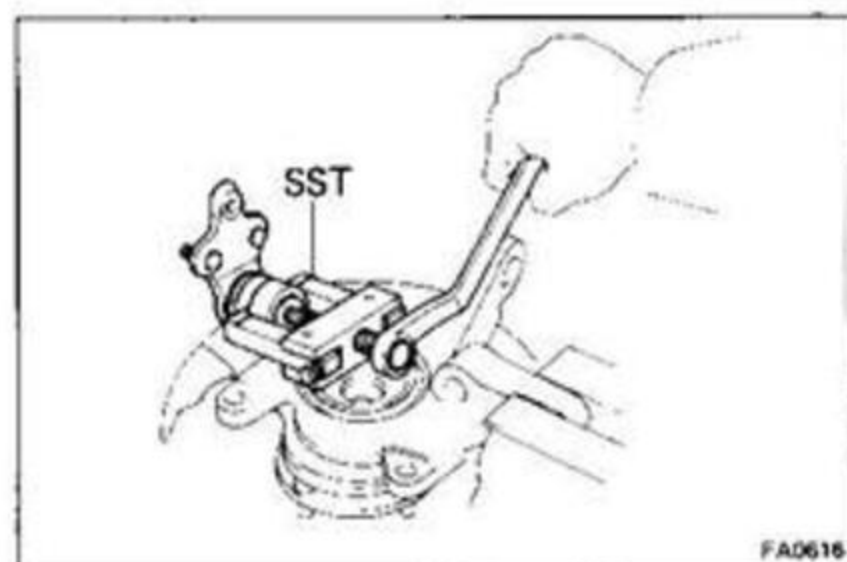
CAUTION: Cover the drive shaft boot with cloth to protect it from damage.

**10. REMOVE BALL JOINT FROM STEERING KNUCKLE**

(a) Clamp the steering knuckle in a vise.

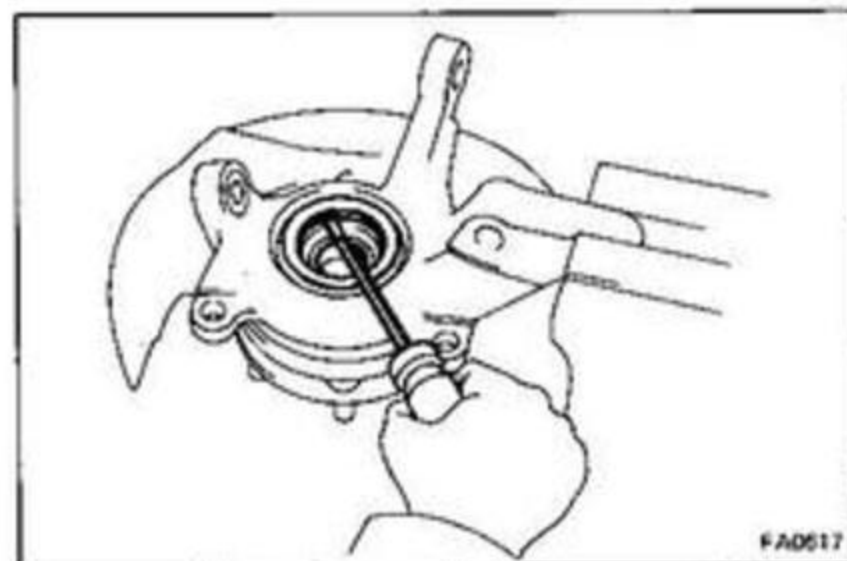
NOTE: Use a set of soft jaws in the vise to protect the steering knuckle.

(b) Using a screwdriver, remove the dust deflector.



(c) Using SST, remove the ball joint from the steering knuckle.

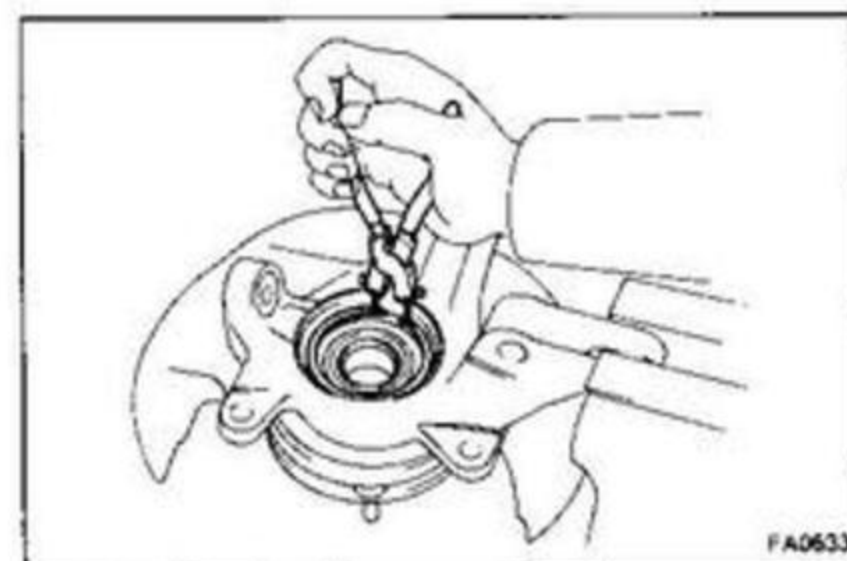
SST 09628-62011

**DISASSEMBLY OF FRONT AXLE HUB**

(See page FA-7)

1. REMOVE INNER OIL SEAL

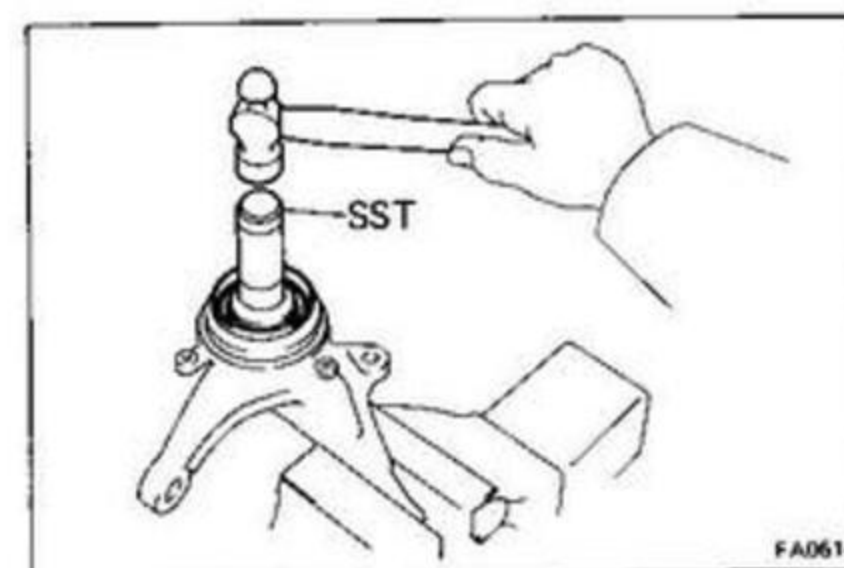
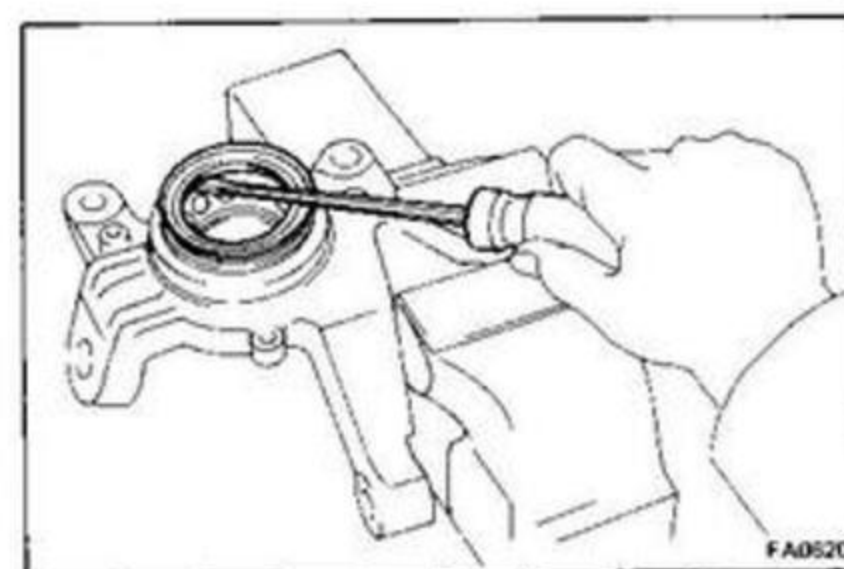
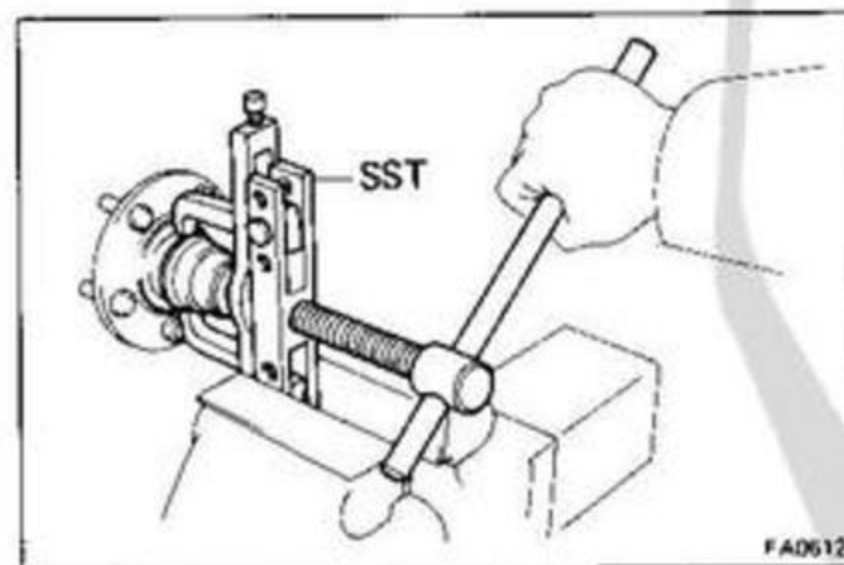
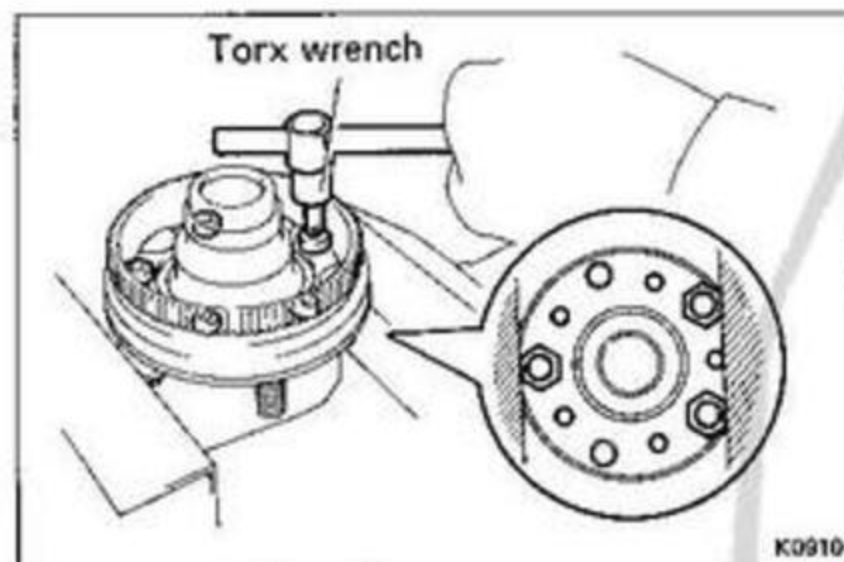
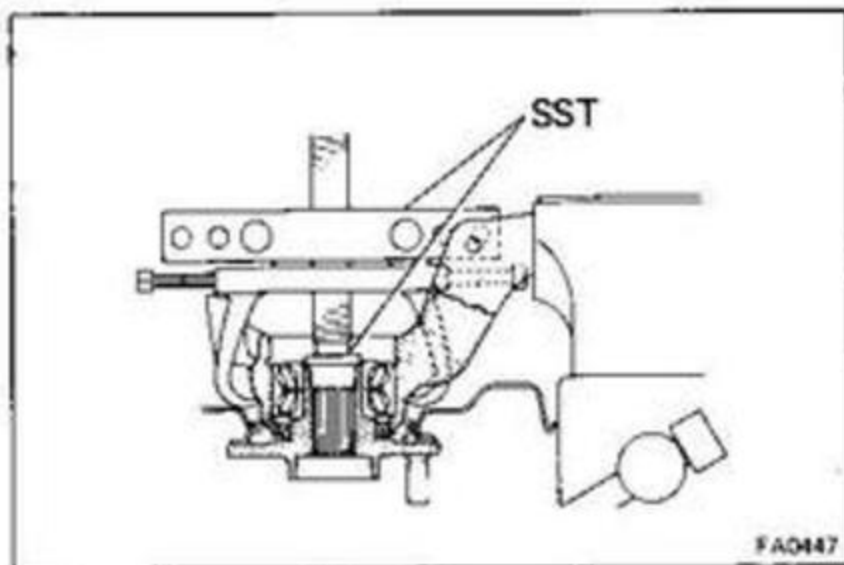
Using screwdriver, remove the oil seal from the steering knuckle.

**2. REMOVE HOLE SNAP RING**

Using snap ring pliers, remove the hole snap ring.

3. REMOVE THREE BOLTS

Remove the three bolts holding the steering knuckle to the disc brake dust cover.



4. REMOVE AXLE HUB FROM STEERING KNUCKLE

- (a) Using SST, push out the axle hub and disc brake dust cover from the steering knuckle.

SST 09950-20016

NOTE: If the axle hub has been removed, be sure to replace the outer oil seal.

- (b) Remove the bearing inner race (inside) from the bearing.

- (c) (w/ A.B.S.)

Using a torx wrench, remove the skid control rotor from the axle hub.

- (d) Using SST, remove the bearing inner race (outside) from the axle hub.

SST 09950-20016

5. REMOVE OUTER OIL SEAL

Using screwdriver, remove the oil seal from the steering knuckle.

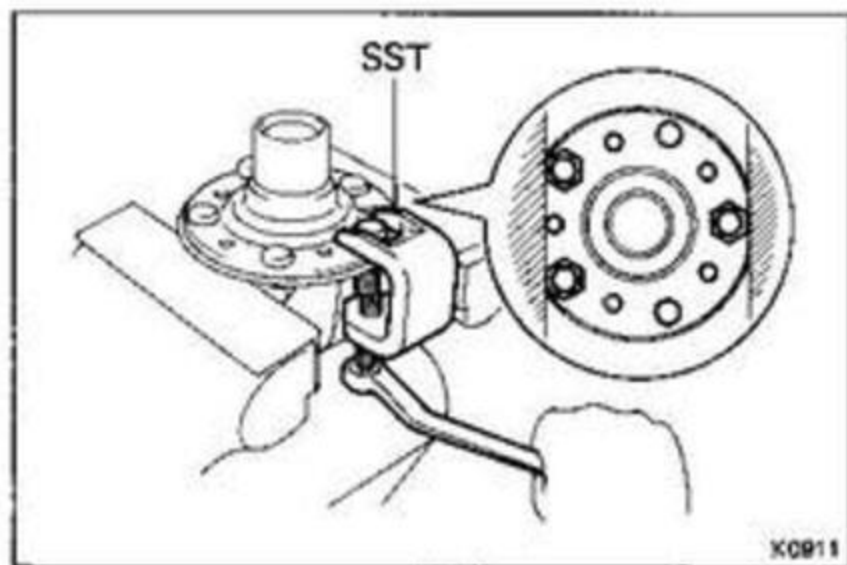
6. REMOVE BEARING

- (a) First install the inner race (outside) of the bearing to be removed.

- (b) Using SST and a hammer, remove the bearing.

SST 09605-60010

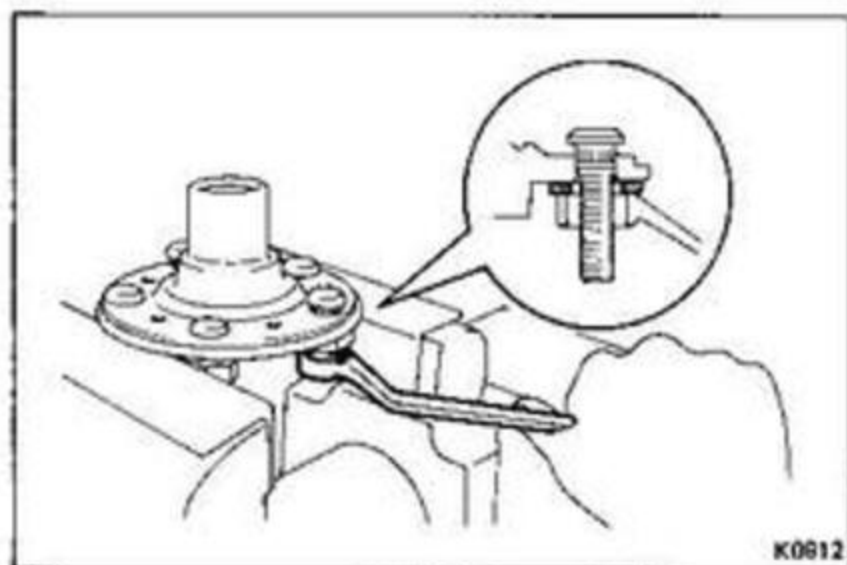
CAUTION: Always replace the bearing as an assembly.



**(w/ A.B.S.)
REPLACEMENT OF FRONT AXLE HUB BOLT**

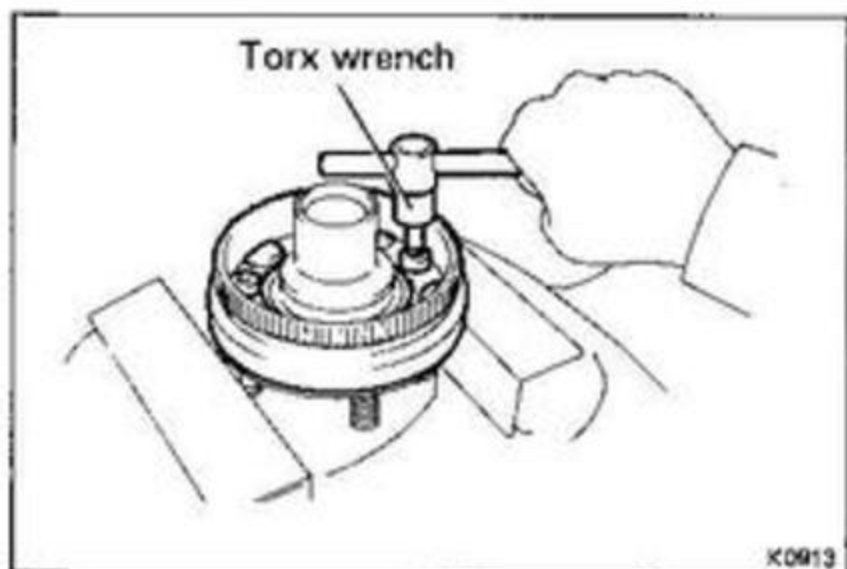
1. REMOVE HUB BOLT

Using SST, remove the hub bolt.
SST 09650-17011



2. INSTALL HUB BOLT

Using a washer and nut, install a new hub bolt.

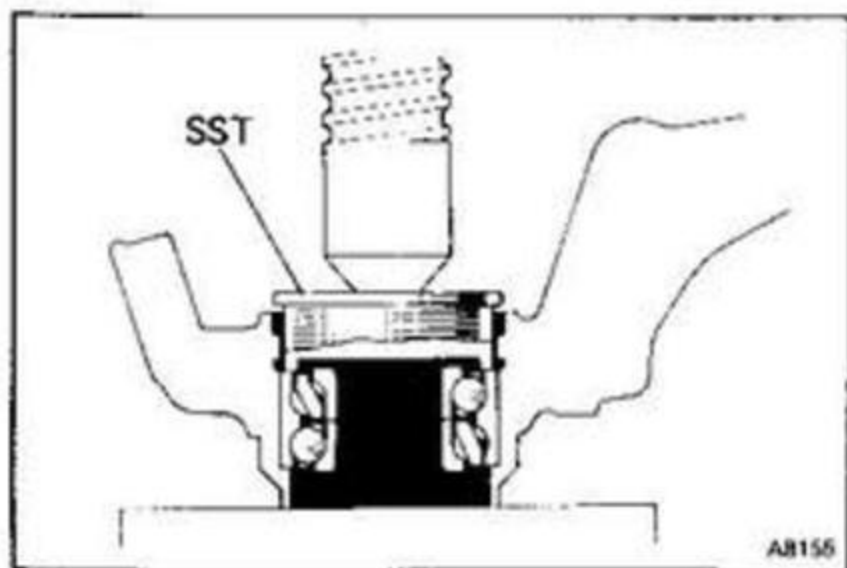


ASSEMBLY OF FRONT AXLE HUB

(See page FA-7)

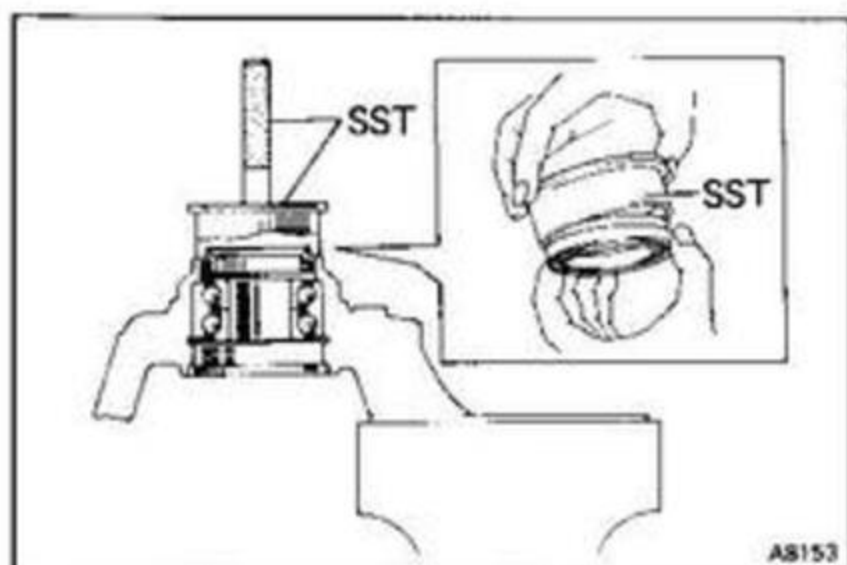
**1. (w/ A.B.S.)
INSTALL SKID CONTROL ROTOR**

Using a torx wrench, install the skid control rotor to the axle hub.



2. INSTALL BEARING

Using SST, press a new bearing into the steering knuckle.
SST 09608-32010



3. INSTALL OUTER OIL SEAL

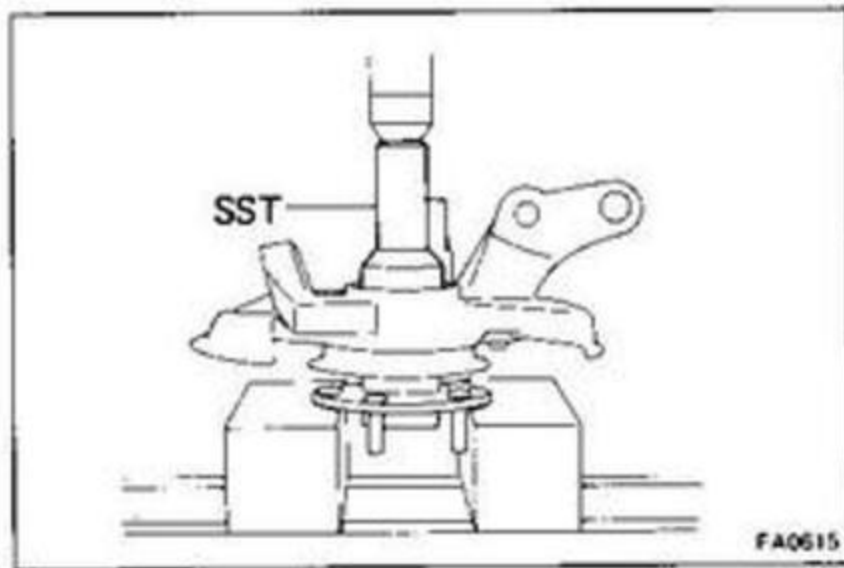
(a) Rotate and insert the side lip of a new oil seal into the SST.

SST 09608-32010

(b) Using SST, drive the oil seal into the steering knuckle.
SST 09608-32010, 09710-14012 (09710-00050)

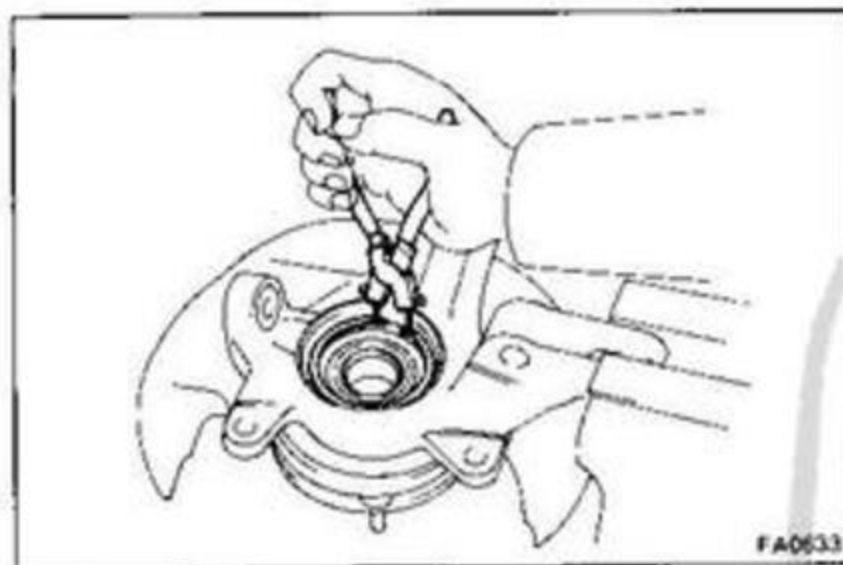
4. INSTALL DISC BRAKE DUST COVER

Apply liquid sealer to the dust cover and steering knuckle connection before assembly.



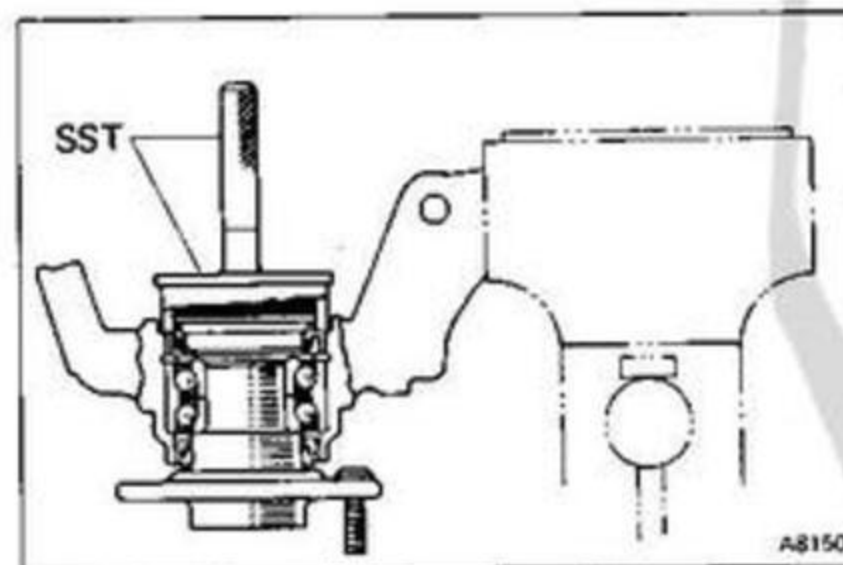
5. INSTALL AXLE HUB

- (a) Apply MP grease between the oil seal lip, oil seal and bearing.
- (b) Using SST, press the hub into the steering knuckle.
SST 09310-35010



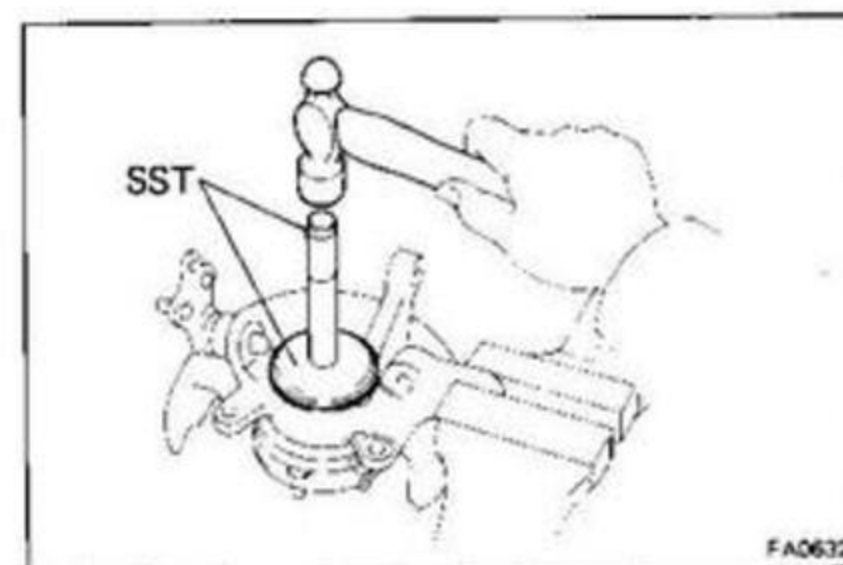
6. INSTALL HOLE SNAP RING

- Using snap ring pliers, install the hole snap ring into the steering knuckle.



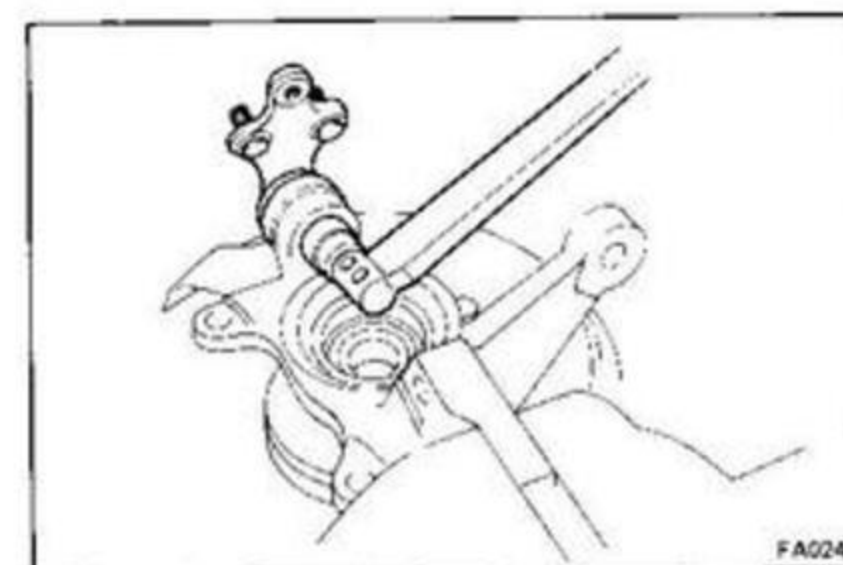
7. INSTALL INNER OIL SEAL

- (a) Using SST, drive in a new oil seal to the steering knuckle surface.
SST 09608-32010, 09710-14012 (09710-00050)
- (b) Apply MP grease to the contact surface of the oil seal lip and drive shaft.



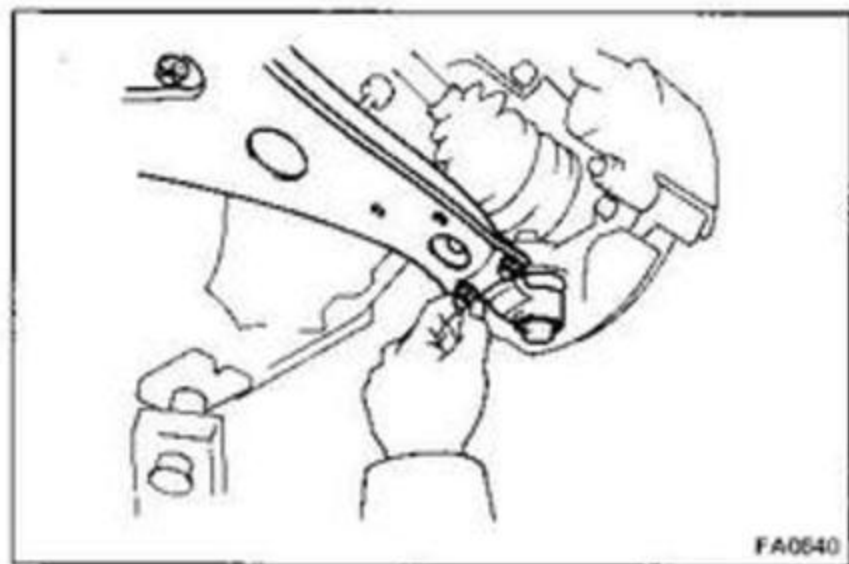
8. INSTALL DUST DEFLECTOR

- Using SST, drive the dust deflector into the steering knuckle.
SST 09608-35014 (09608-06020, 09608-06180)

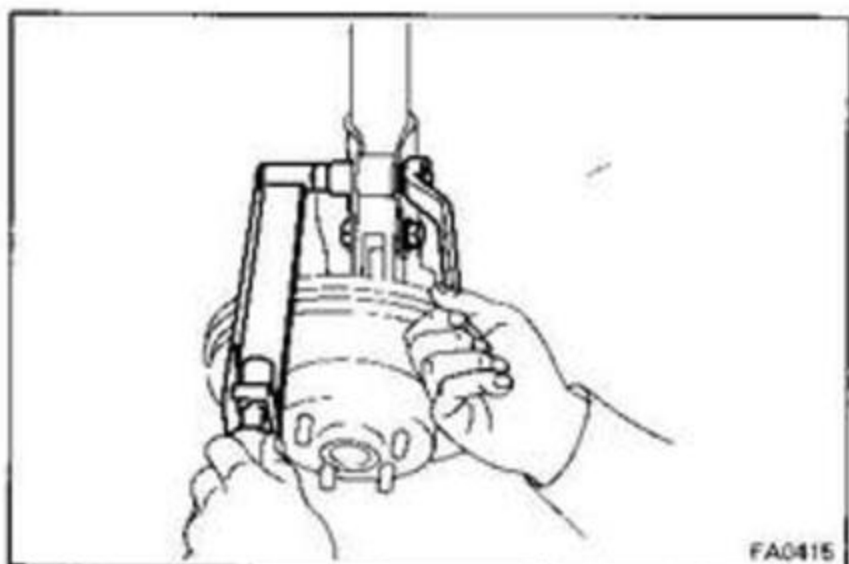


9. INSTALL BALL JOINT TO STEERING KNUCKLE

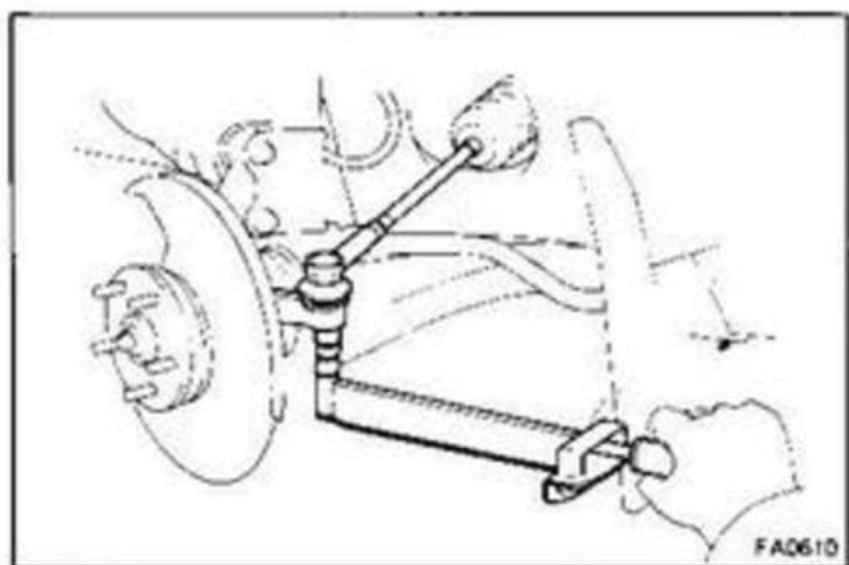
- (a) Temporarily tighten the conventional nut.
Torque: 200 kg-cm (14 ft-lb, 20 N·m)
- (b) Remove the conventional nut.
- (c) Install and tighten the new nut.
Torque: 1,285 kg-cm (93 ft-lb, 126 N·m)



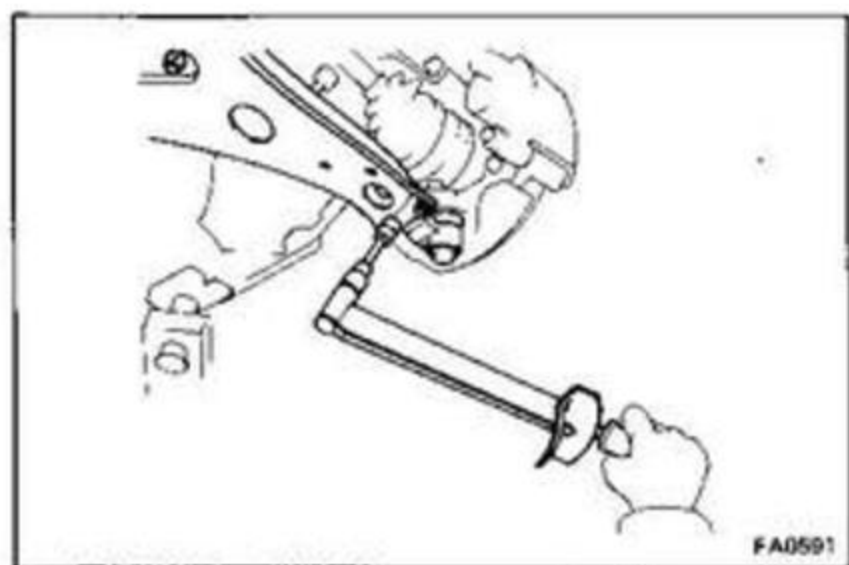
FA0640



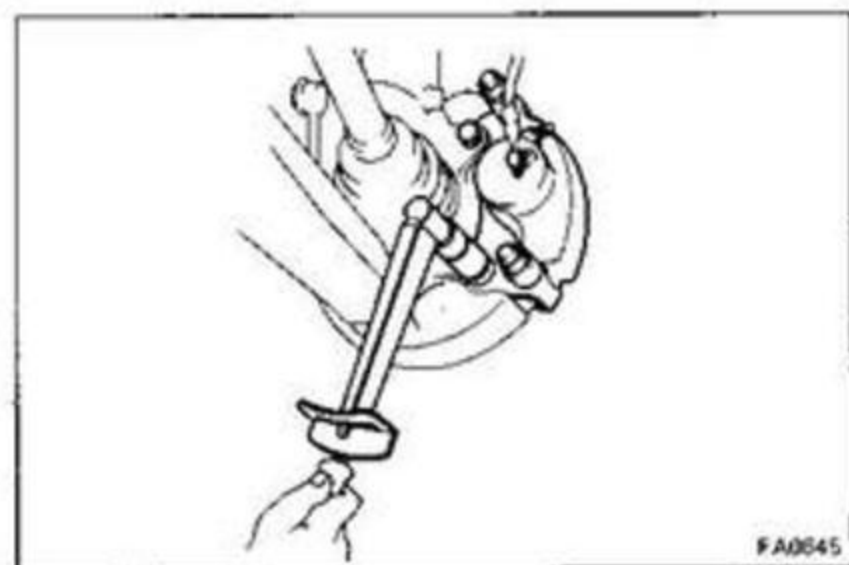
FA0415



FA0610



FA0591



FA0645

INSTALLATION OF FRONT AXLE HUB

(See page FA-7)

1. INSTALL STEERING KNUCKLE WITH AXLE HUB TO LOWER SUSPENSION ARM

Provisionally install the steering knuckle to the lower suspension arm.

2. INSTALL STEERING KNUCKLE TO SHOCK ABSORBER

- Connect the steering knuckle to the shock absorber lower bracket.
- Insert the bolts and align the matchmarks of the camber adjust cam.
- Apply engine oil to the threads of the two nuts.
- Torque the nuts.

Torque: 2,100 kg-cm (152 ft-lb, 206 N·m)

3. CONNECT TIE ROD END TO STEERING KNUCKLE

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

Torque: 500 kg-cm (36 ft-lb, 49 N·m)

4. TORQUE BALL JOINT TO LOWER ARM

Torque: 1,300 kg-cm (94 ft-lb, 127 N·m)

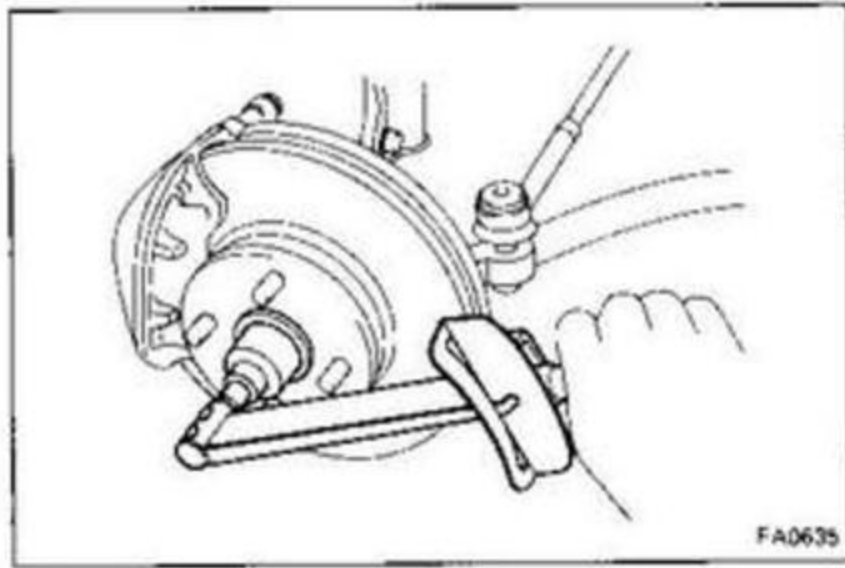
5. INSTALL DISC TO AXLE HUB

6. INSTALL BRAKE CALIPER TO STEERING KNUCKLE

Torque the two bolts.

Torque: 970 kg-cm (70 ft-lb, 95 N·m)

7. (w/ A.B.S.) INSTALL SPEED SENSOR



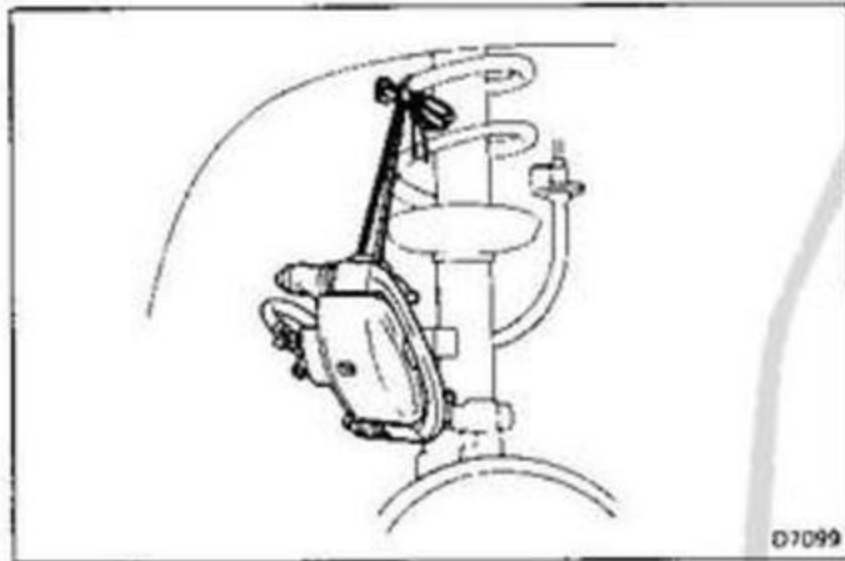
8. INSTALL BEARING LOCK NUT, LOCK NUT CAP AND COTTER PIN

- (a) Torque the bearing lock nut while depressing the brake pedal.

Torque: 1,900 kg-cm (137 ft-lb, 186 N·m)

- (b) Install the lock nut cap and, using pliers, install a new cotter pin.

9. CHECK FRONT WHEEL ALIGNMENT (See page FA-3)

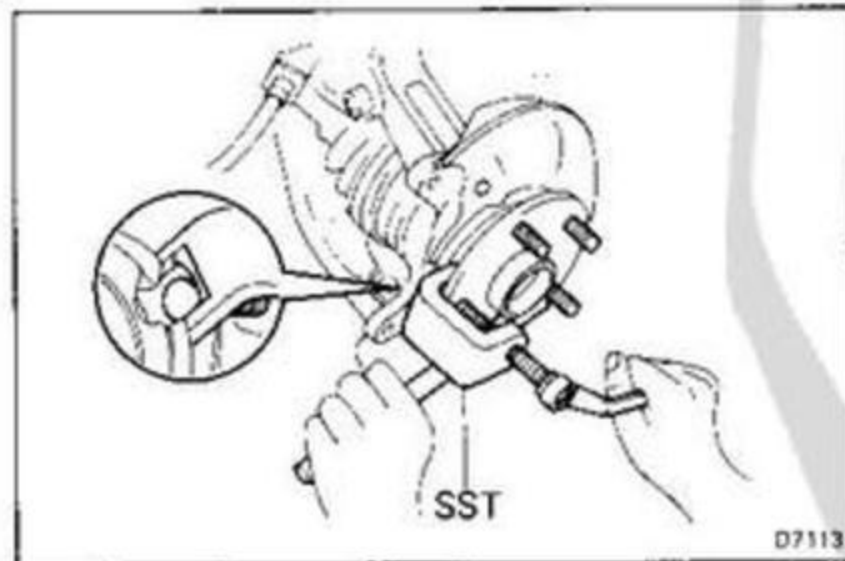


**(w/o A.B.S.)
REPLACEMENT OF FRONT AXLE HUB BOLT**

1. REMOVE BRAKE CALIPER

Remove the brake caliper from the steering knuckle and suspend it with a wire.

2. REMOVE DISC ROTOR



3. REMOVE FRONT AXLE HUB BODY

- (a) Align the disc brake dust cover cutting portion and axle hub bolt.

- (b) Using SST, remove the axle hub bolt.

SST 09650-17011

4. INSTALL FRONT AXLE HUB BOLT

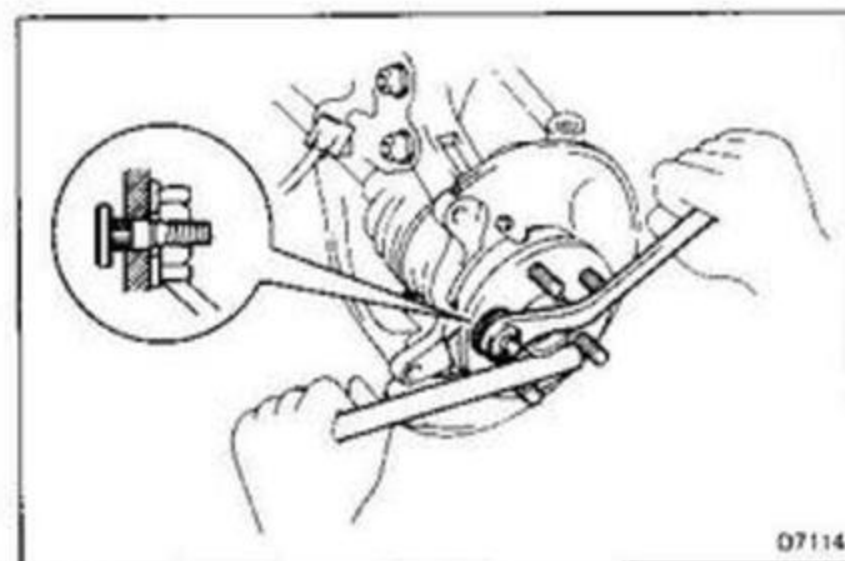
Hold the front axle hub, and install a new hub bolt.

5. INSTALL DISC ROTOR

6. INSTALL DISC BRAKE CALIPER TO STEERING KNUCKLE

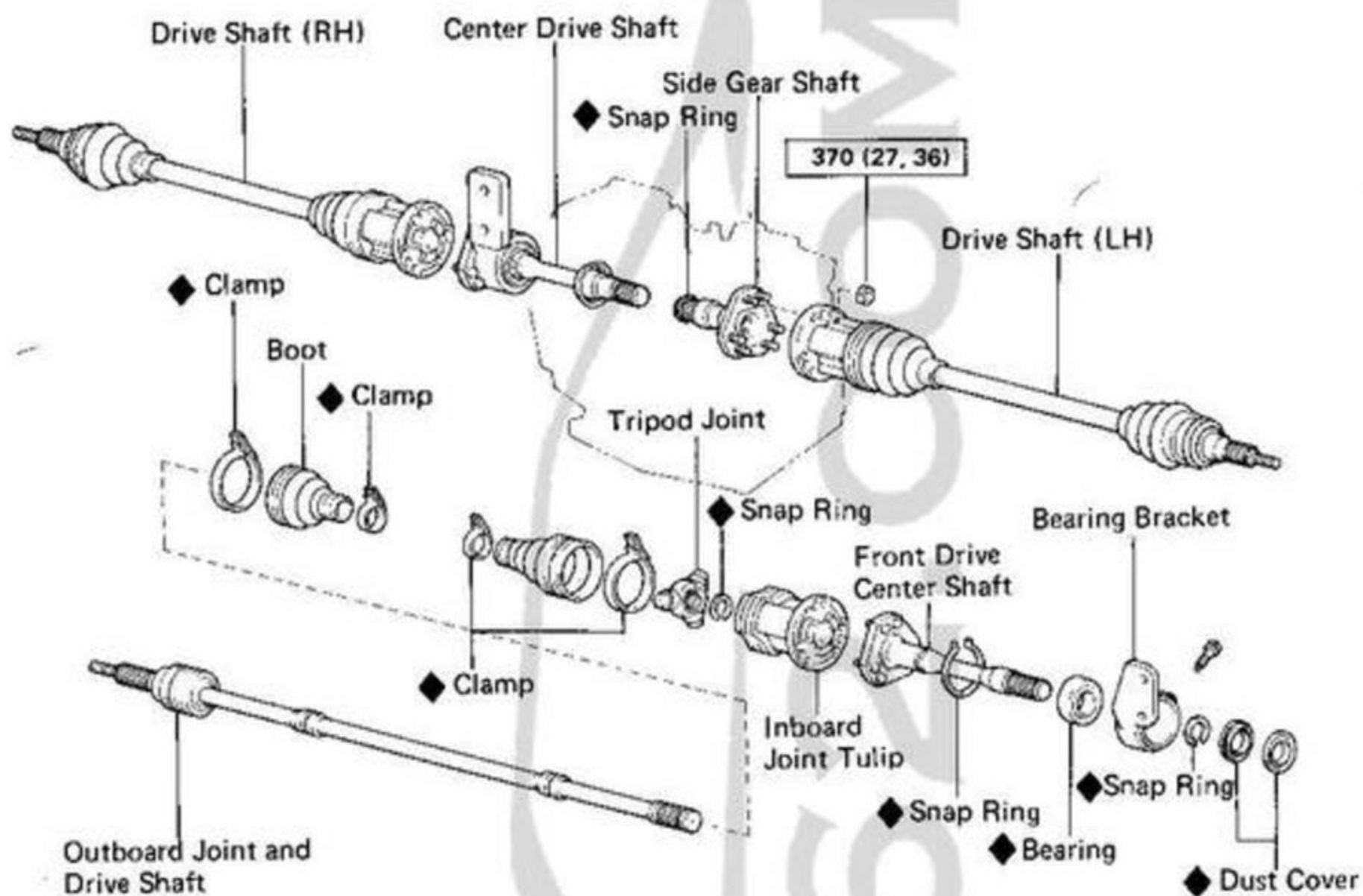
Torque the nut.

Torque: 900 kg-cm (65 ft-lb, 88 N·m)

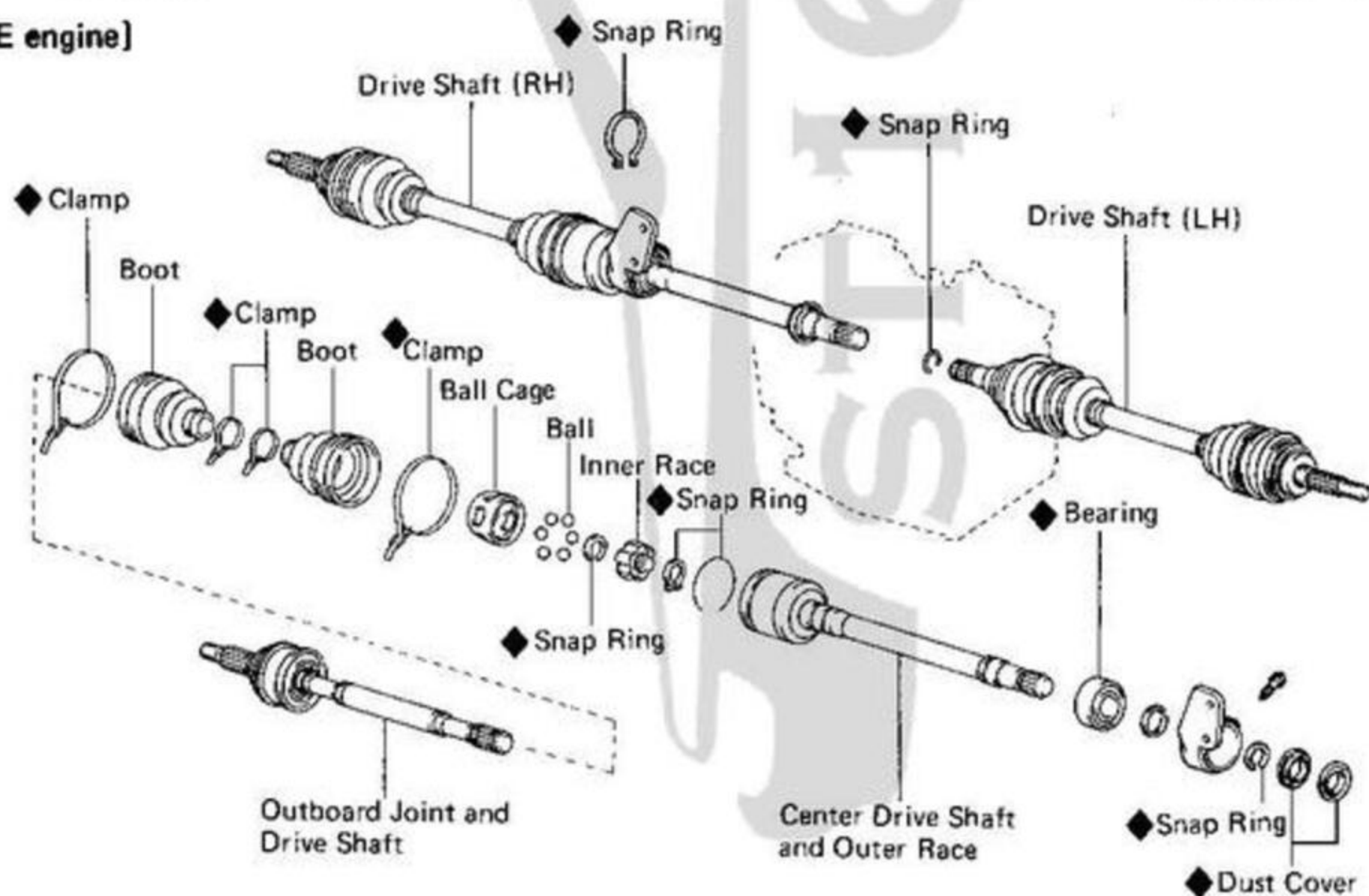


FRONT DRIVE SHAFT COMPONENTS

[3S-FE engine]

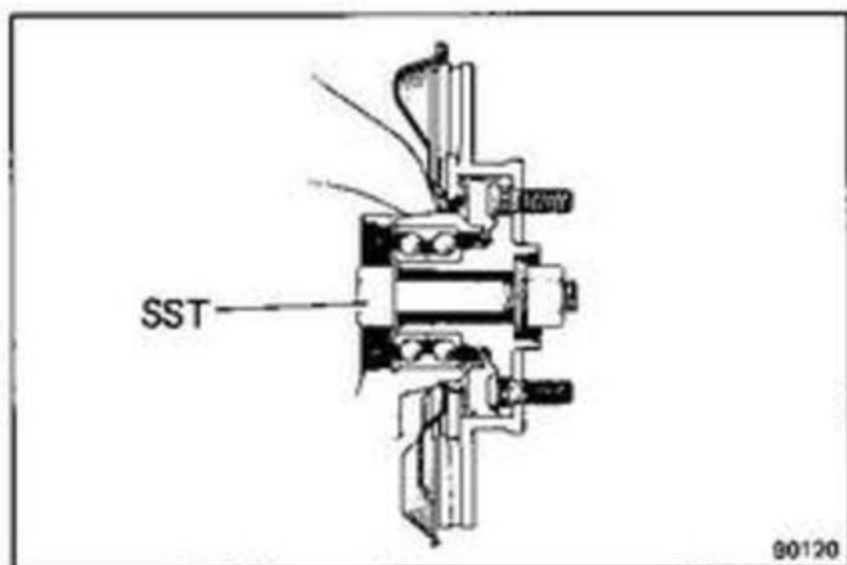


[3S-GE engine]



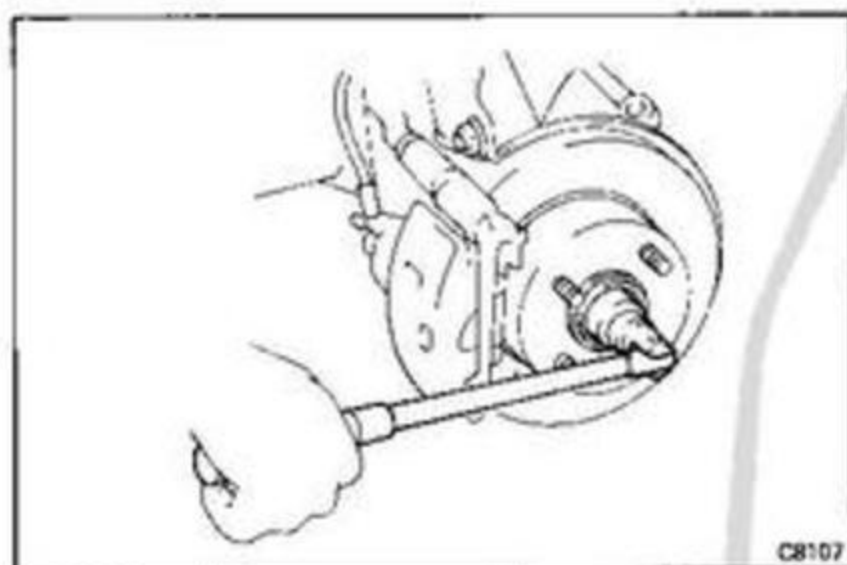
kg-cm (ft-lb, N-m) : Specified torque

◆ Non-reusable part



CAUTION: The hub bearing could be damaged if it is subjected to the vehicle weight, such as when moving the vehicle with the drive shaft removed. Therefore, if it is absolutely necessary to place the vehicle weight on the hub bearing, first support it with SST.

SST 09608-16041 (09608-02020, 09608-02040)



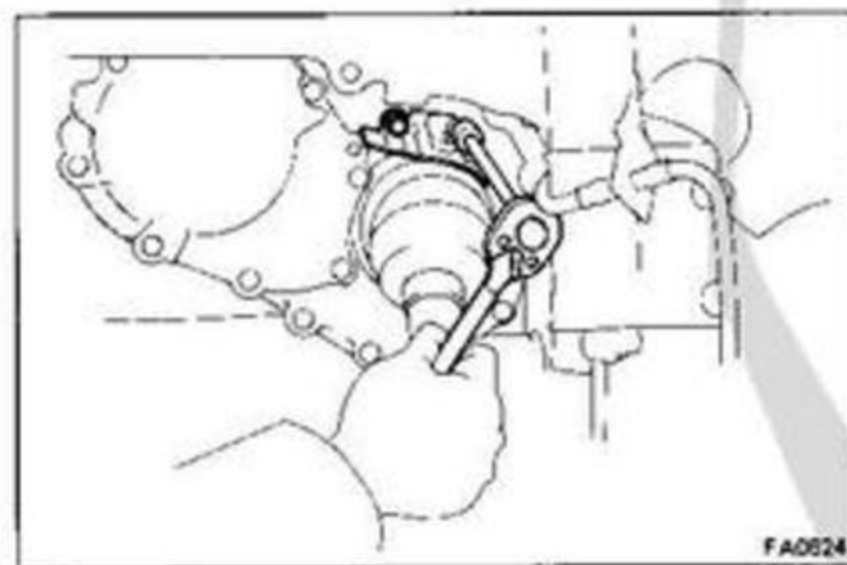
REMOVAL OF FRONT DRIVE SHAFT

1. **REMOVE COTTER PIN, LOCK NUT CAP AND LOCK NUT**
 - (a) Remove the cotter pin and lock nut cap.
 - (b) Loosen the bearing lock nut while depressing the brake pedal.

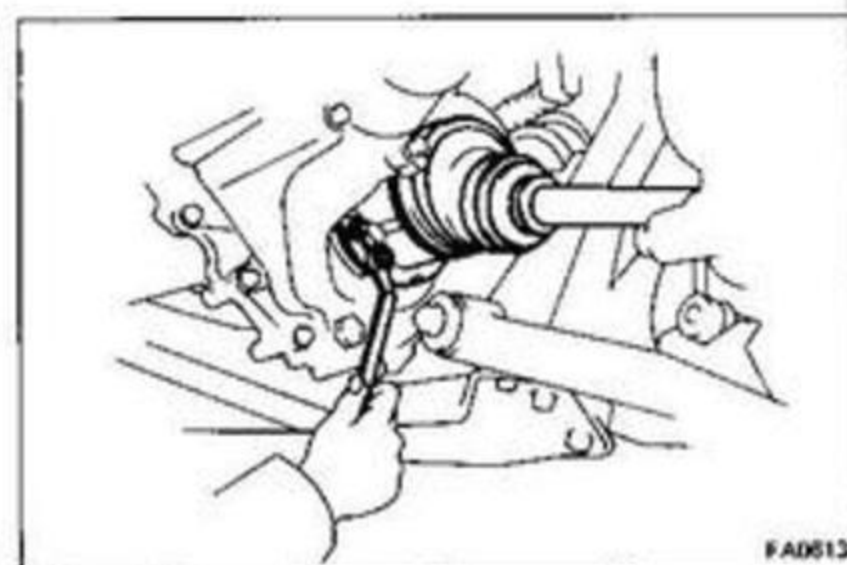
2. **REMOVE ENGINE UNDER COVER**

3. **(3S-GE ENGINE)
DRAIN TRANSAXLE FLUID OR DIFFERENTIAL OIL**

4. **REMOVE TRANSAXLE PROTECTOR**



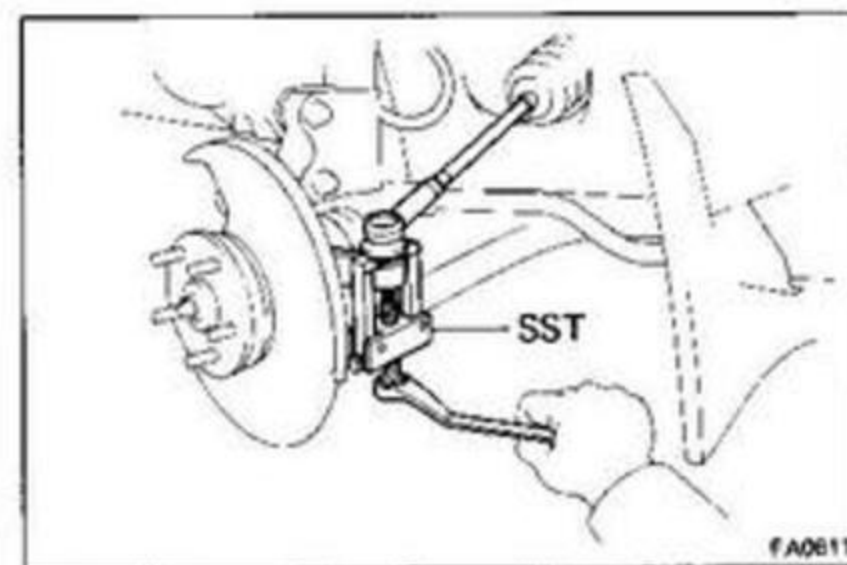
5. **(3S-FE ENGINE)
LOOSEN SIX NUTS HOLDING FRONT DRIVE SHAFT TO
CENTER DRIVE SHAFT OR DIFFERENTIAL SIDE BEARING
SHAFT**

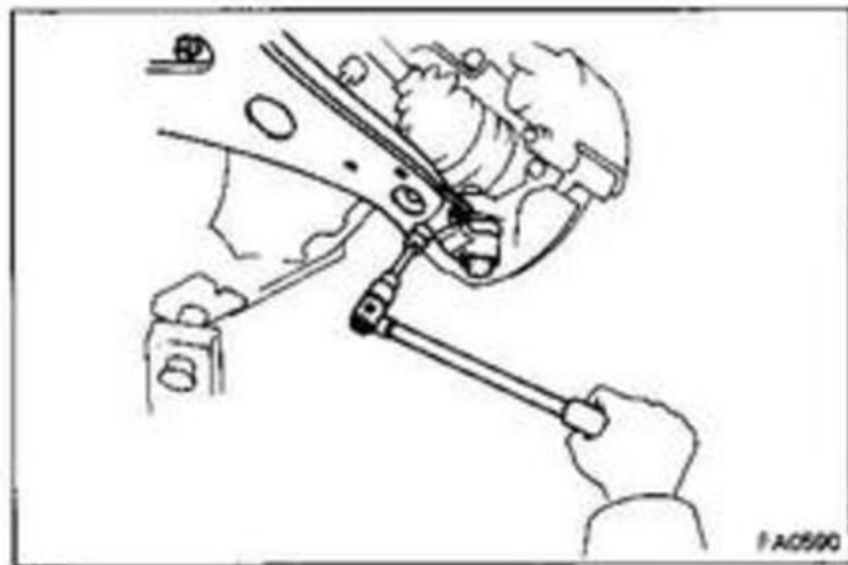


6. **DISCONNECT TIE ROD END**

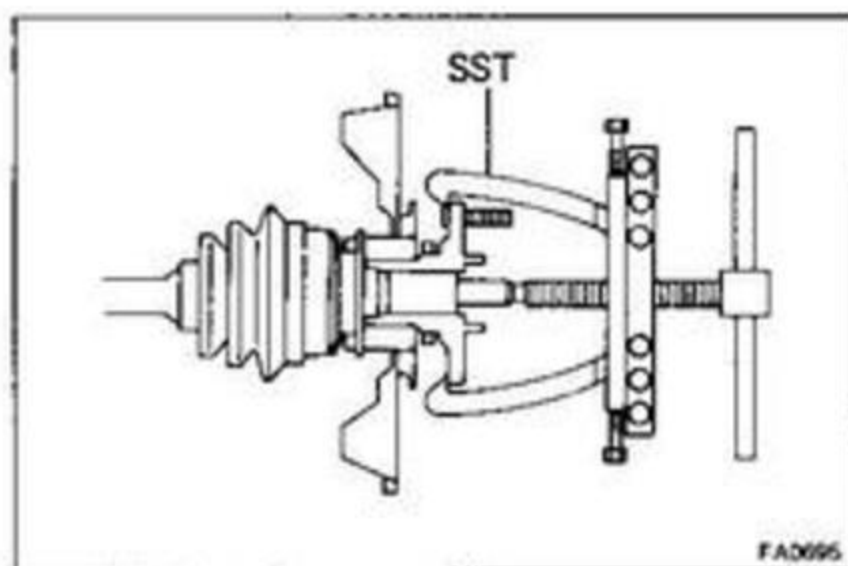
- (a) Remove the cotter pin and nut from the tie rod end.
- (b) Using SST, disconnect the tie rod end from the steering knuckle.

SST 09628-62011



**7. DISCONNECT STEERING KNUCKLE FROM LOWER ARM**

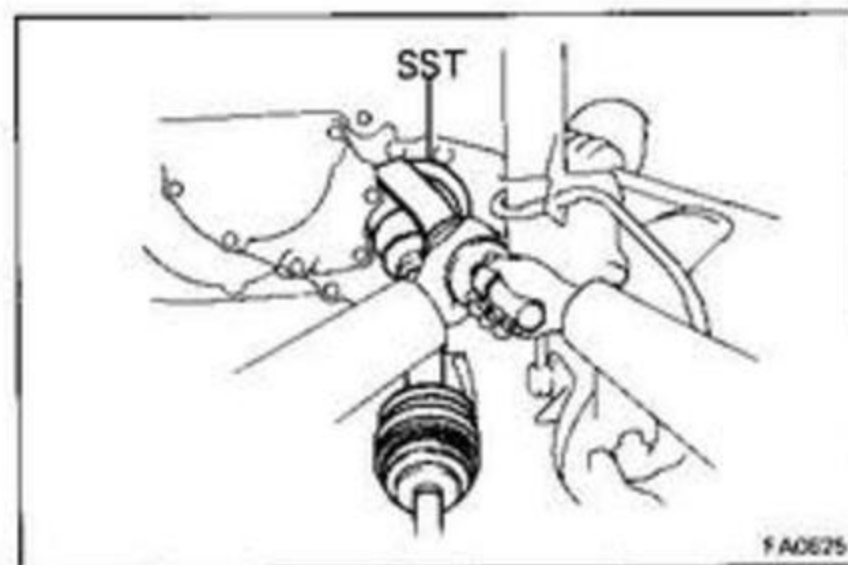
Remove the bolt and two nuts and disconnect the steering knuckle from the lower arm.

**8. (3S-FE ENGINE)
REMOVE DRIVE SHAFT**

Using SST, disconnect the drive shaft from the steering knuckle and remove the drive shaft.

CAUTION: Cover the drive shaft boot with cloth to protect it from damage.

SST 09950-20017

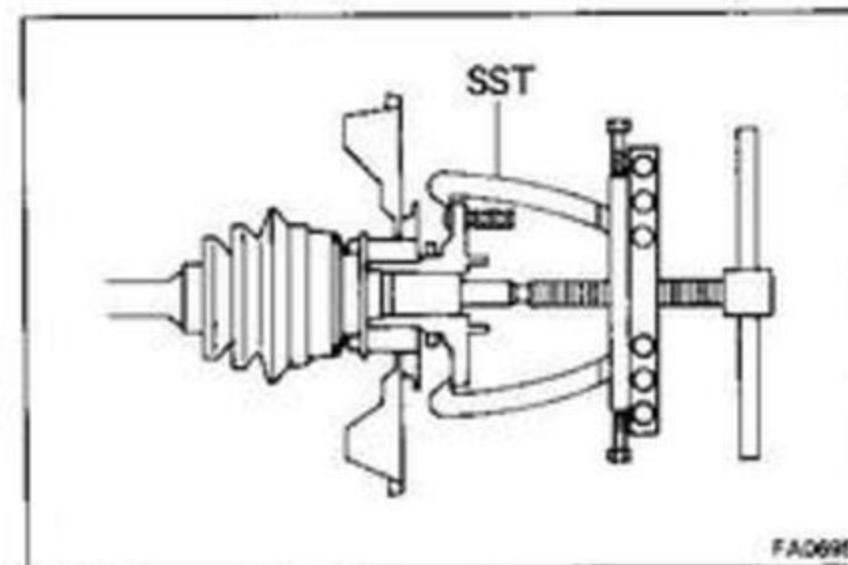
**9. (3S-GE ENGINE)
REMOVE LH DRIVE SHAFT**

(a) Mark a spot somewhere on the drive shaft. Measure and note the distance between the transaxle case and the spot on the drive shaft.

(b) Using SST, pull out the LH drive shaft.

SST 09520-32060

CAUTION: Cover the drive shaft boot with cloth to protect it from damage.

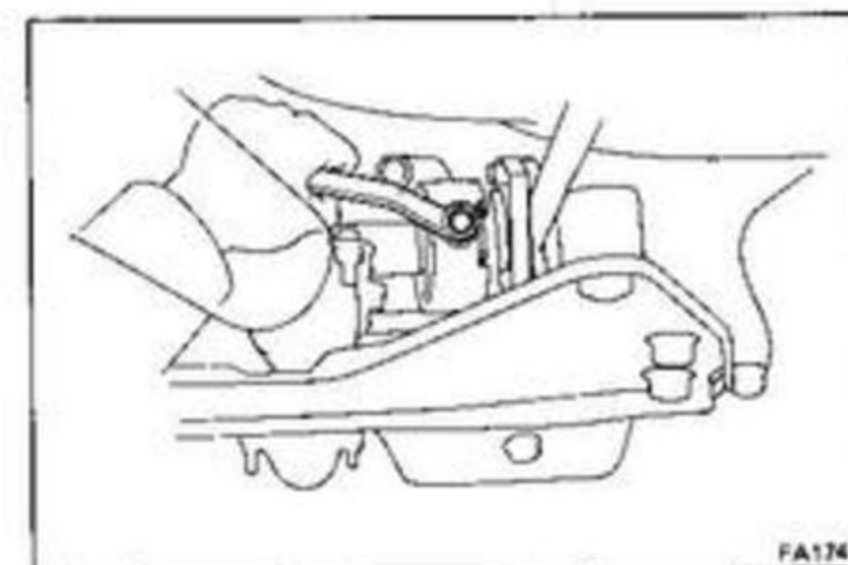
**10. REMOVE RH DRIVE SHAFT WITH CENTER DRIVE SHAFT**

(a) Using SST, disconnect the drive shaft from the steering knuckle.

SST 09950-20017

(b) Loosen the center drive shaft stopper bolt.

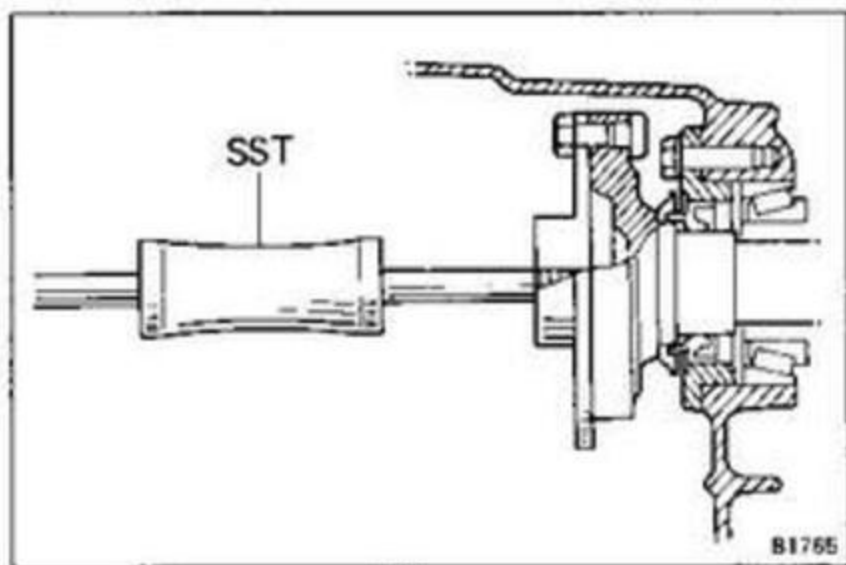
(c) Using pliers, remove the snap ring and pull out the RH drive shaft with center drive shaft.

**11. (3S-FE ENGINE)
REMOVE CENTER DRIVE SHAFT**

(a) Drain the transmission fluid or differential oil.

(b) Loosen the center drive shaft stopper bolt.

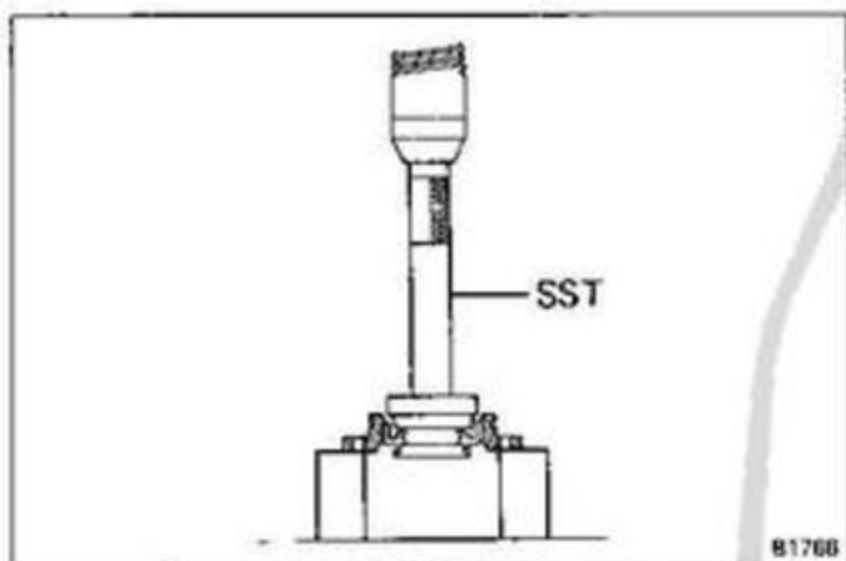
(c) Using pliers, remove the snap ring and pull out the center drive shaft.



REPLACEMENT OF OIL SEAL

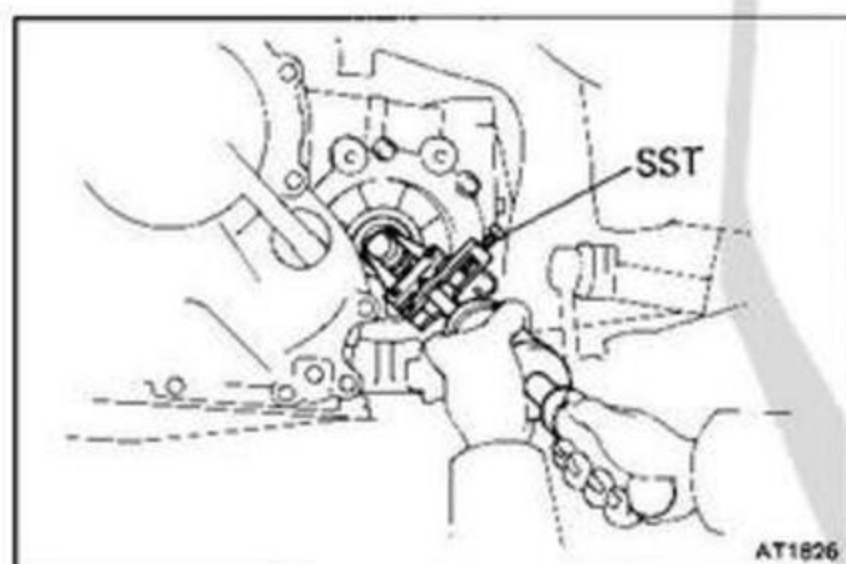
1. (3S-FE ENGINE) REMOVE LH SIDE GEAR SHAFT

- (a) In order to install the side gear shaft, push the side gear shaft to the differential.
Measure and note the distance between the trans-axle case and the side gear shaft.
- (b) Using SST, drive out the side gear shaft.
SST 09520-32012



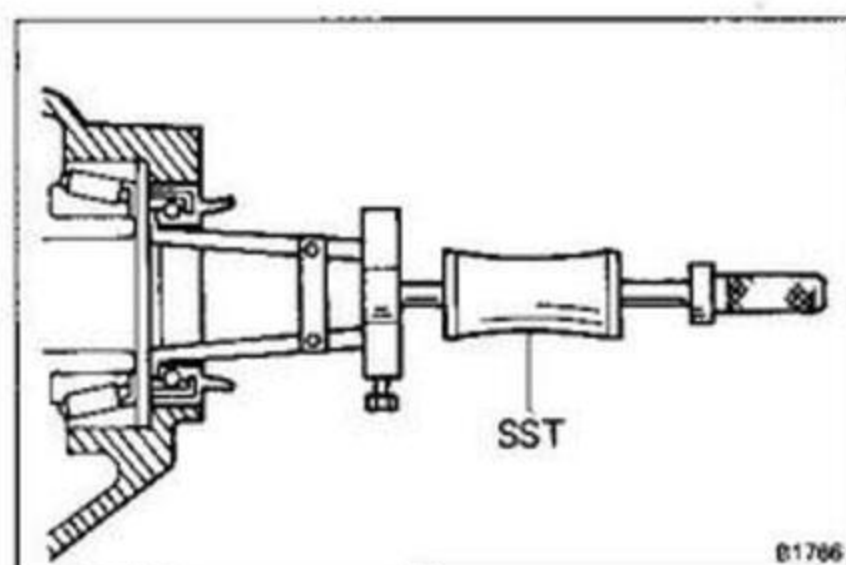
2. REMOVE LH OIL SEAL (Manual transaxle)

- (a) Remove the side bearing retainer.
- (b) Using SST, press out the oil seal from the retainer.
SST 09608-20012 (09608-03020, 09608-00030)



(Automatic transaxle)

Using SST, drive out the oil seal.
SST 09308-00010

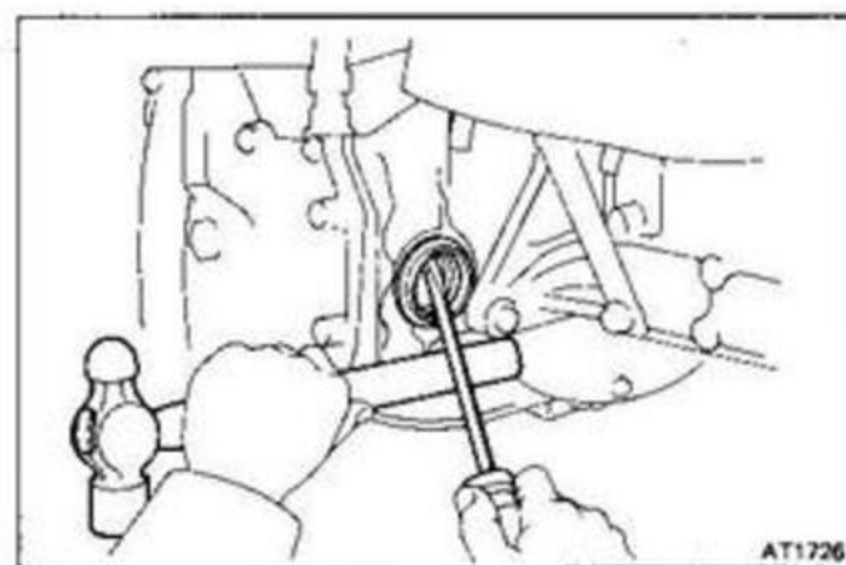


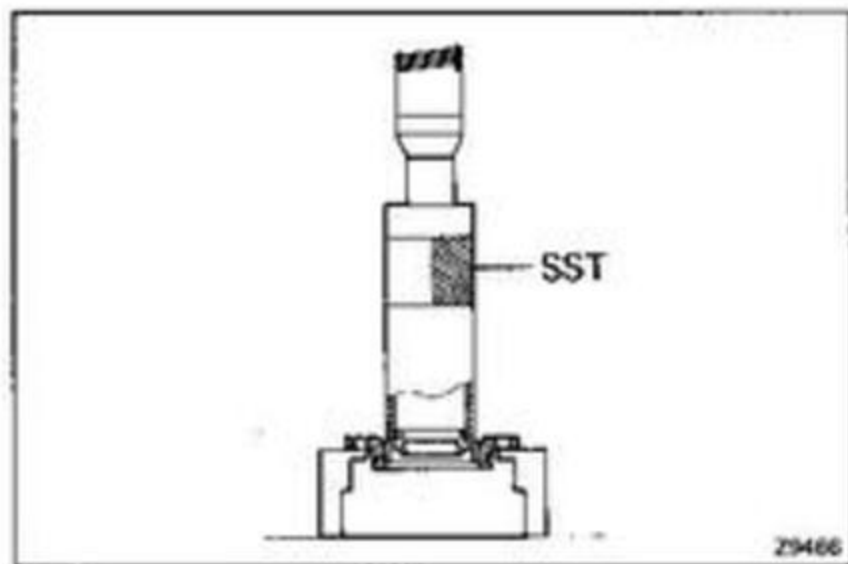
3. REMOVE RH OIL SEAL (Manual transaxle)

- (a) Remove the drive shaft bearing bracket.
- (b) Using SST, drive out the oil seal from the case.
SST 09308-00010

(Automatic transaxle)

Using a screwdriver, remove the oil seal.



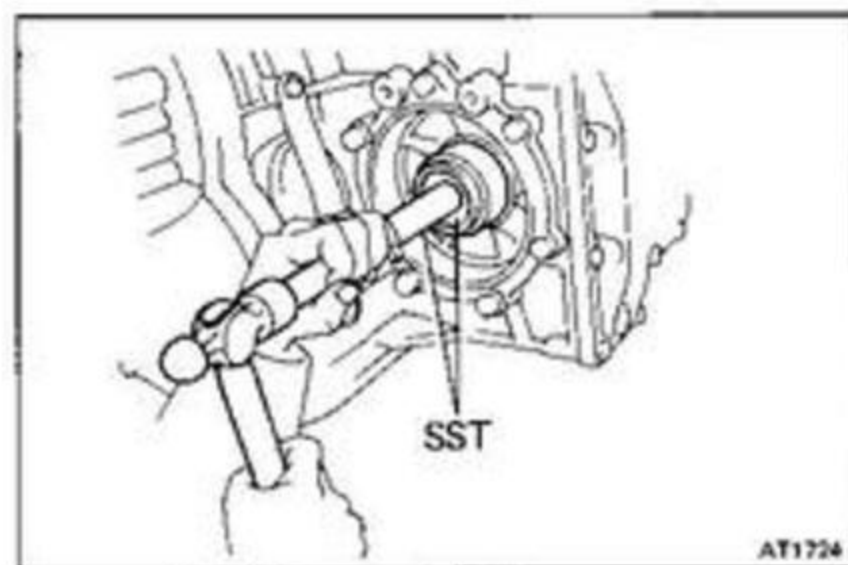


4. INSTALL NEW LH OIL SEAL (Manual transaxle)

- (a) Using SST, press in a new oil seal until its surface is flush with the case surface.

SST 09316-60010 (09316-00010)

- (b) Coat the oil seal lip with MP grease.
(c) Install the side bearing retainer with the six bolts.
Torque: 185 kg-cm (13 ft-lb, 18 N·m)



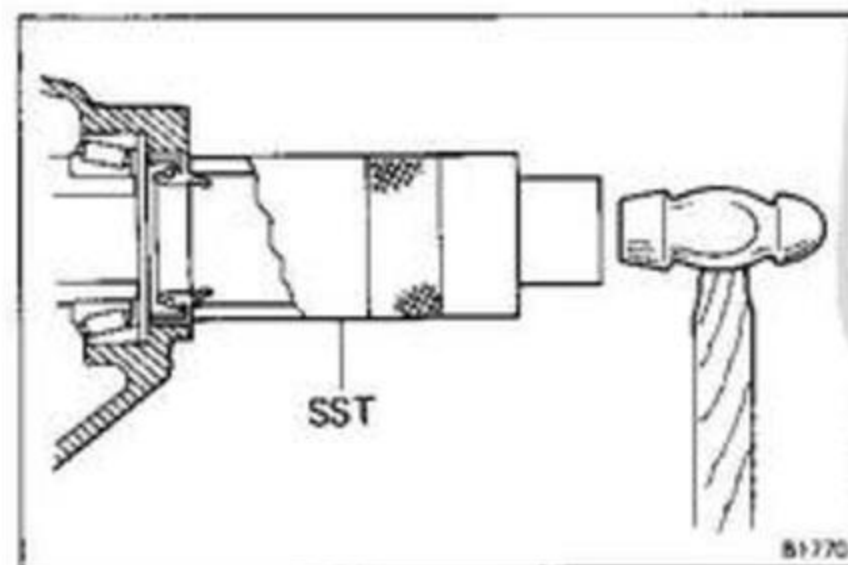
(Automatic transaxle)

- (a) Using SST, press in a new oil seal.

SST 09350-32013 (09351-32150), 09631-12020

Oil seal drive in depth: 2.7 mm (0.106 in.)

- (b) Coat the oil seal lip with MP grease.
(c) Install the drive shaft bearing bracket.

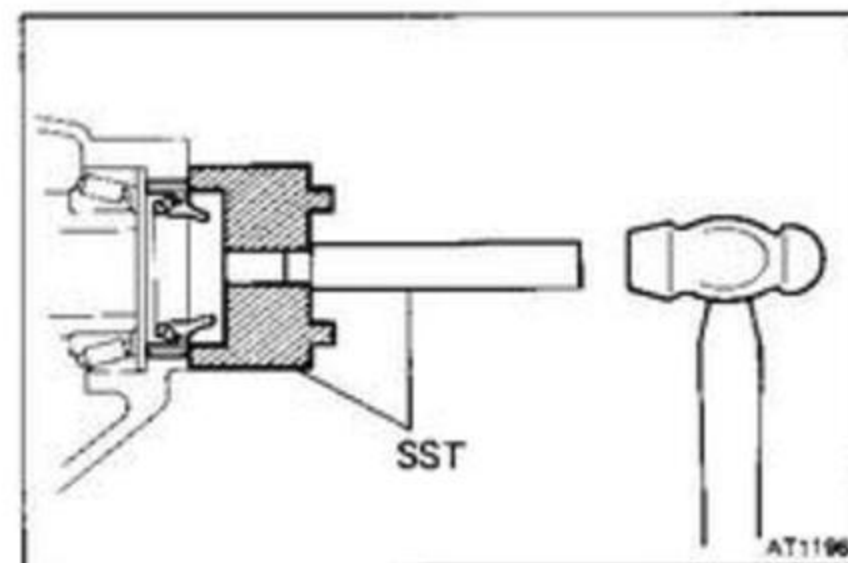


5. INSTALL NEW RH OIL SEAL (Manual transaxle)

- (a) Using SST, drive in a new oil seal until its surface is flush with the case surface.

SST 09316-60010 (09316-00010)

- (b) Coat the oil seal lip with MP grease.
(c) Install the drive shaft bearing bracket.

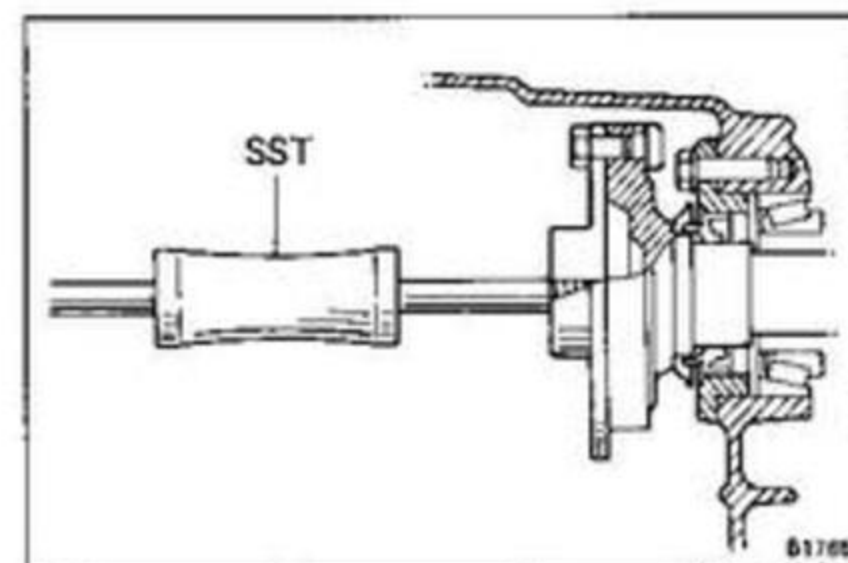


(Automatic transaxle)

- (a) Using SST, press in a new oil seal until its surface is flush with the case surface.

SST 09350-32013 (09351-32150), 09631-12020

- (b) Coat the oil seal lip with MP grease.

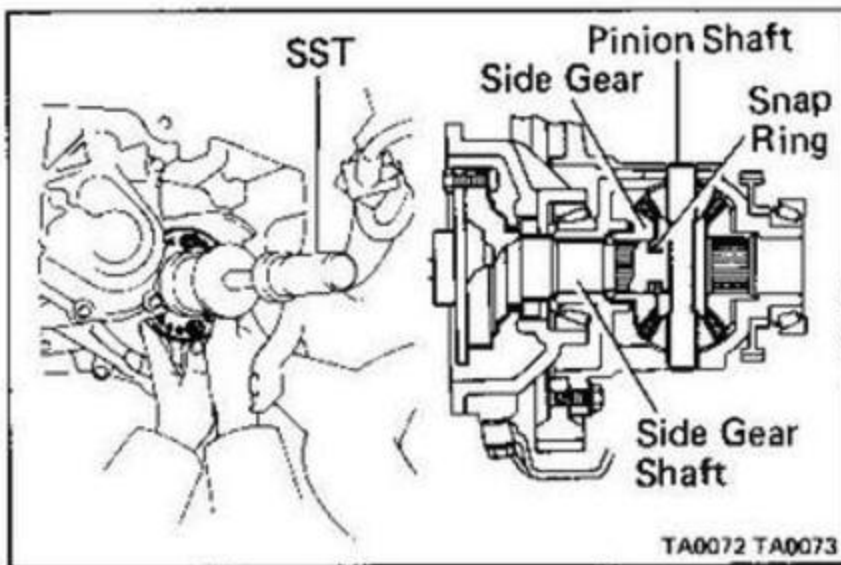


6. (3S-FE ENGINE) INSTALL LH SIDE GEAR SHAFT

- (a) Insure that a new snap ring is positioned securely in the groove of the side gear shaft.
(b) Using SST, drive in the side gear shaft until it marks contact with the pinion shaft.

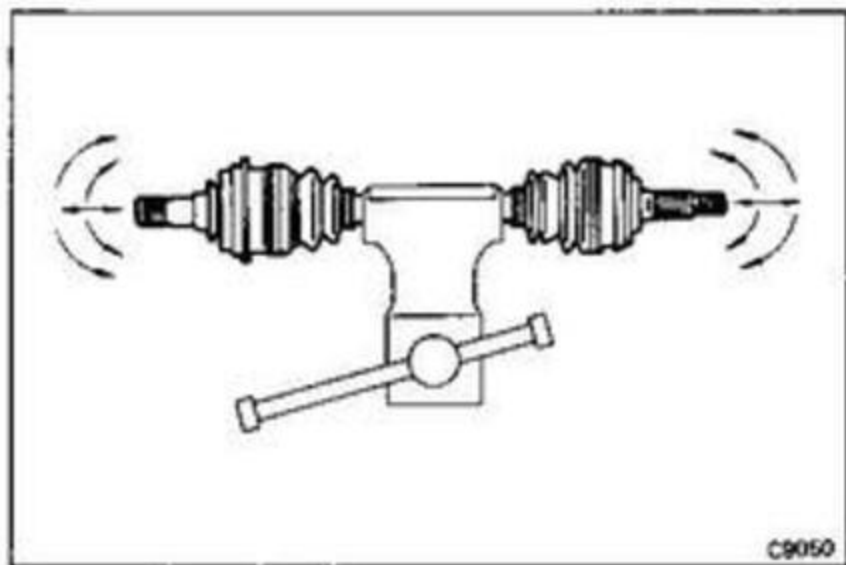
SST 09520-32012

NOTE: Whether or not the side gear shaft is making contact with the pinion shaft can be known by the sound or feeling when drive it in.



7. (3S-FE ENGINE)
CHECK INSTALLATION OF SIDE GEAR SHAFT

- (a) Check that there is 2 — 3 mm (0.08 — 0.12 in.) or play in axial direction.
- (b) Check that the side gear shaft will not come out by trying to pull it completely out by hand.
- (c) Push the side gear shaft to the differential and measure the distance between the side gear shaft and the transaxle case. Check that the distance between the two is the same as the measurement taken before removing the side gear shaft.

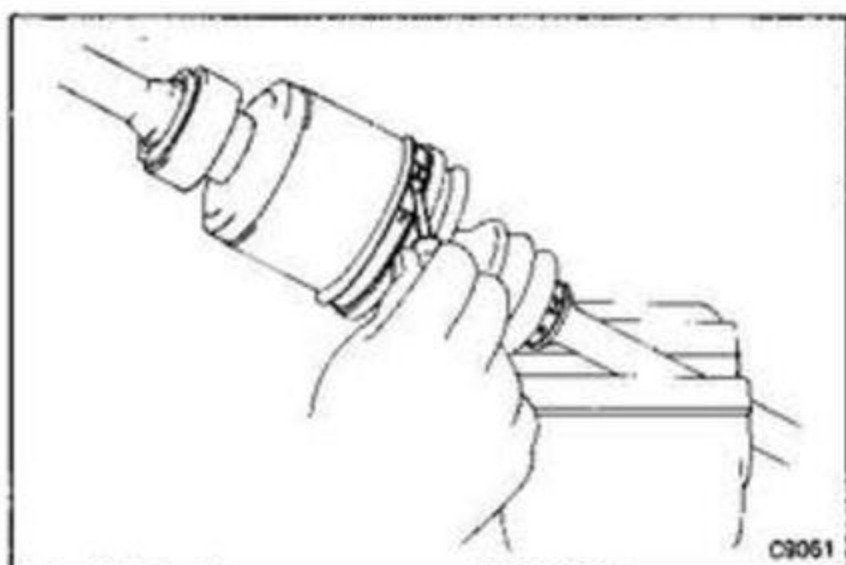


DISASSEMBLY OF FRONT DRIVE SHAFT

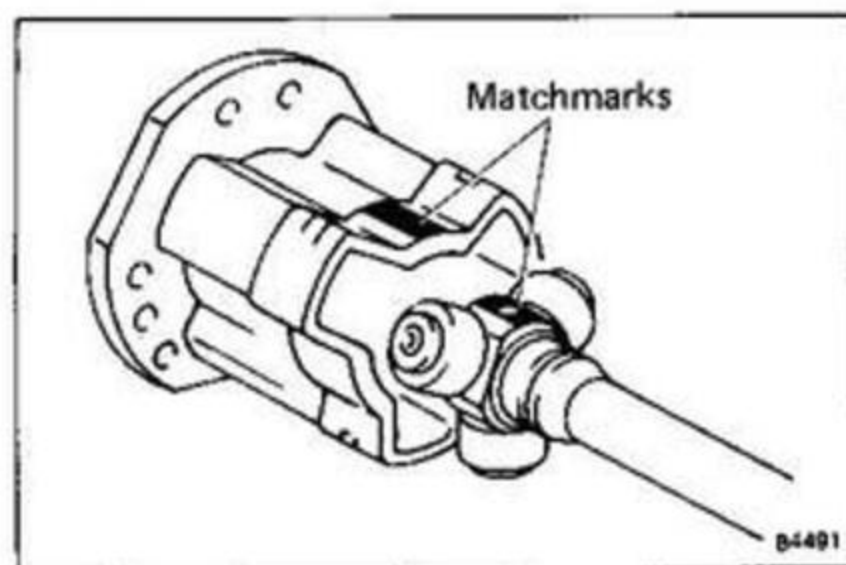
(See page FA-15)

1. CHECK DRIVE SHAFT

- Check to see that there is no play in the inboard and outboard joints.
- Check to see that the inboard joint slide smoothly in the thrust direction.
- Check to see that there is no remarkable play in the radial direction of the inboard joint.
- Check the damage of boot.



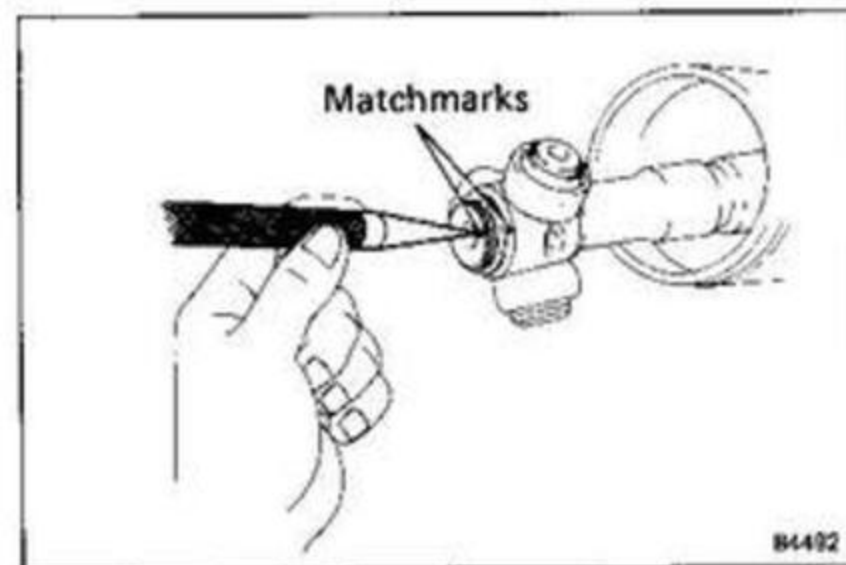
2. REMOVE INBOARD JOINT BOOT CLAMPS



3. (3S-FE ENGINE)

DISASSEMBLE INBOARD JOINT TULIP

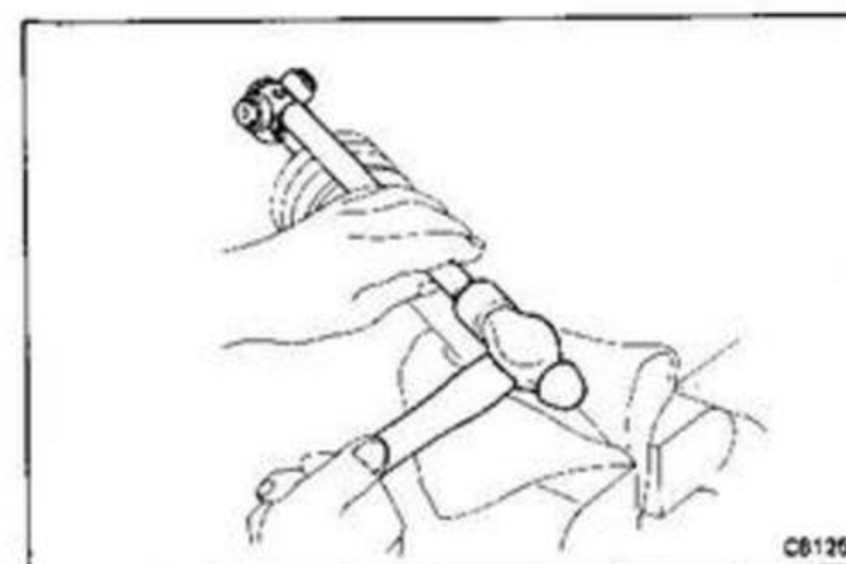
- Place matchmarks on the inboard joint tulip and tripod.
- CAUTION:** Do not punch the marks.
- Remove the inboard joint tulip from the drive shaft.

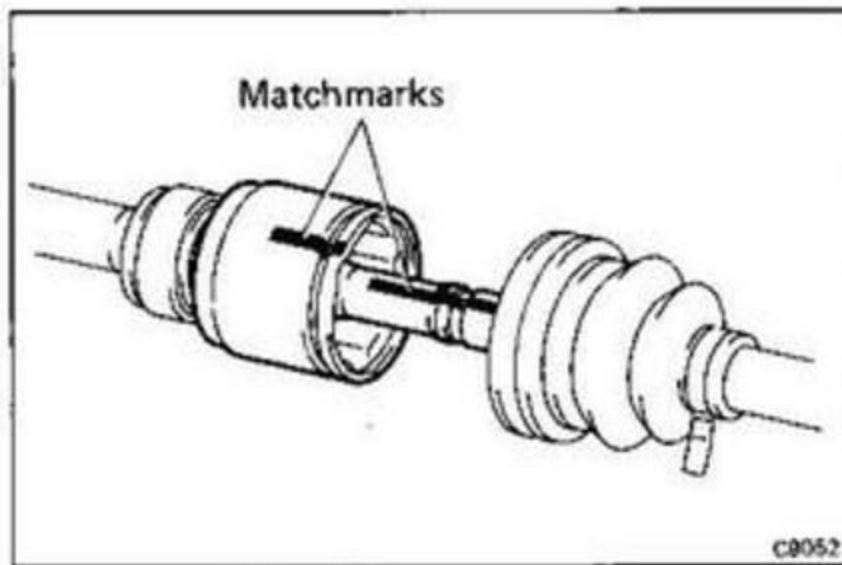


4. (3S-FE ENGINE)

DISASSEMBLE TRIPOD JOINT

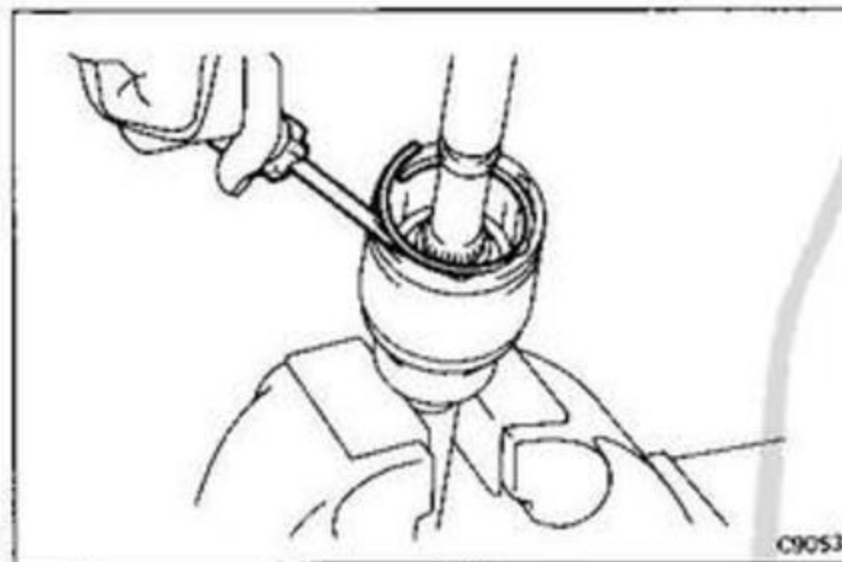
- Using snap ring pliers, remove the snap ring.
 - Using a punch, place matchmarks on the shaft and tripod.
- Using a brass bar and hammer, remove the tripod joint from the drive shaft.





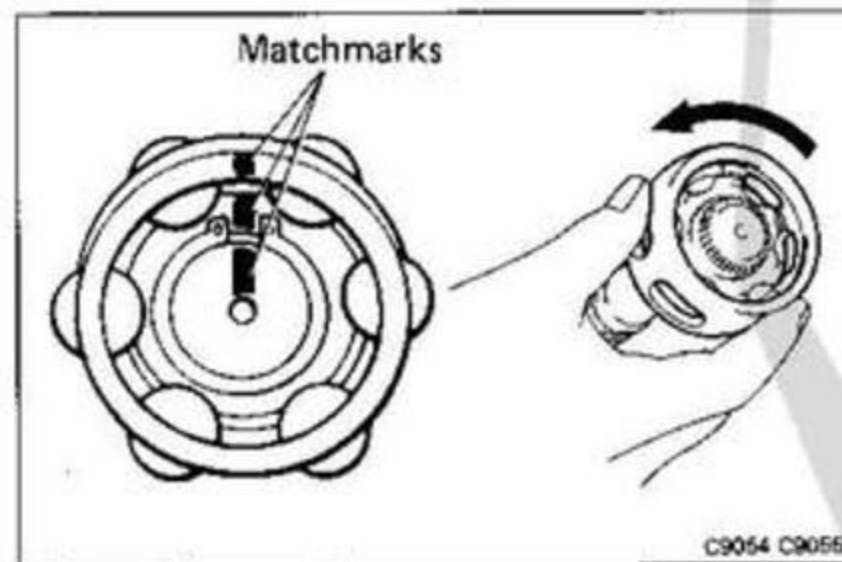
5. (3S-GE ENGINE)
DISASSEMBLE INBOARD JOINT TULIP

(a) Place matchmarks on the inboard joint outer race and drive shaft.



(b) Using a screwdriver, remove the snap ring from the inboard joint outer race.

(c) Remove the inboard joint outer race from the drive shaft.

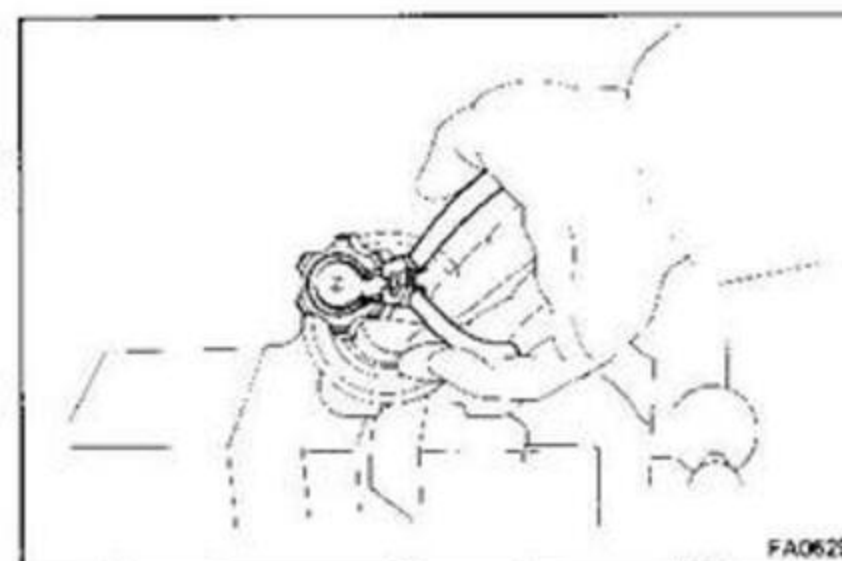


6. (3S-GE ENGINE)
DISASSEMBLE INBOARD JOINT

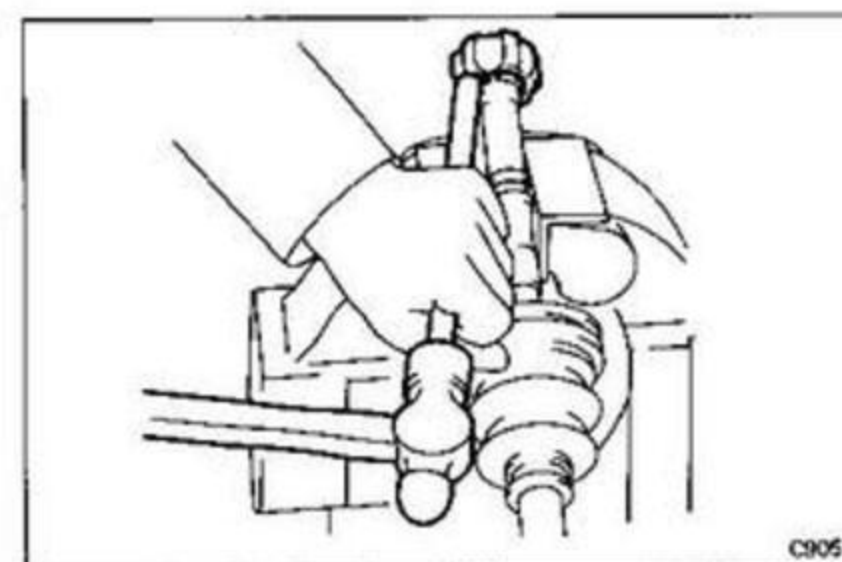
(a) Place matchmarks on the drive shaft, cage and inner race.

(b) Remove the six balls.

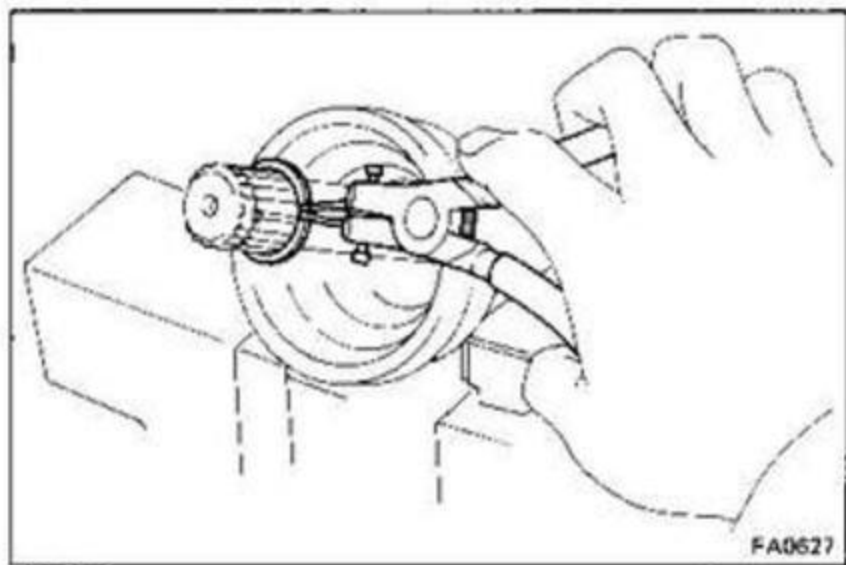
(c) Remove the ball cage from the inner race.



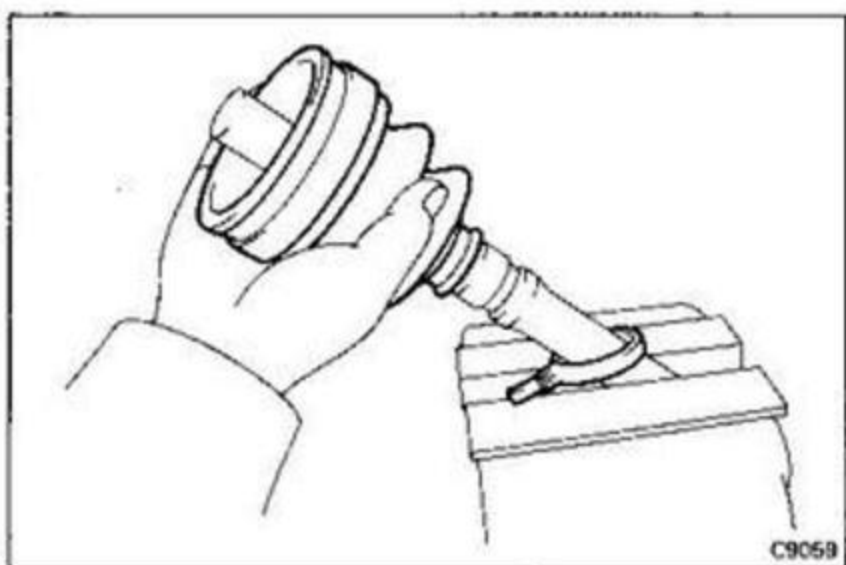
(d) Using snap ring pliers, remove the snap ring.



(e) Using a brass bar and hammer, remove the inner race from the drive shaft.



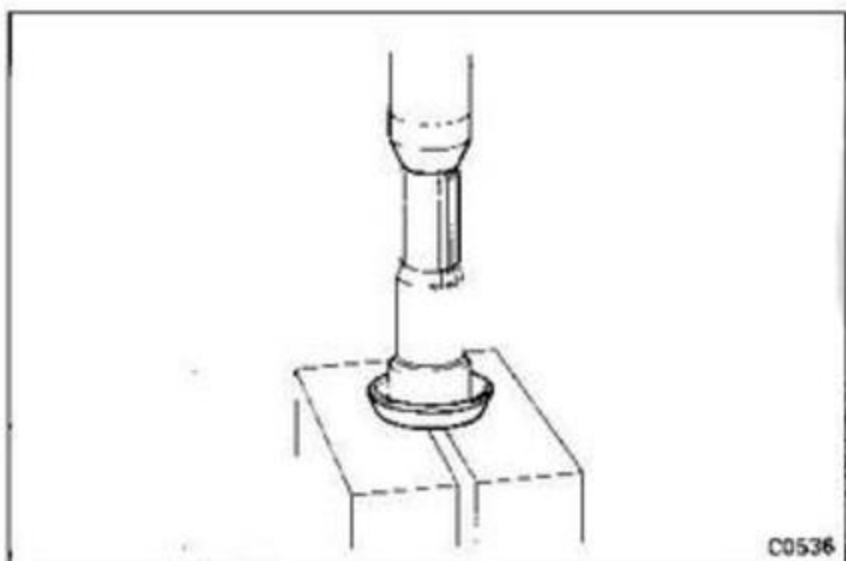
(f) Using snap ring pliers, remove the snap ring.



7. REMOVE INBOARD JOINT BOOT

8. REMOVE OUTBOARD JOINT BOOT CLAMPS AND BOOT

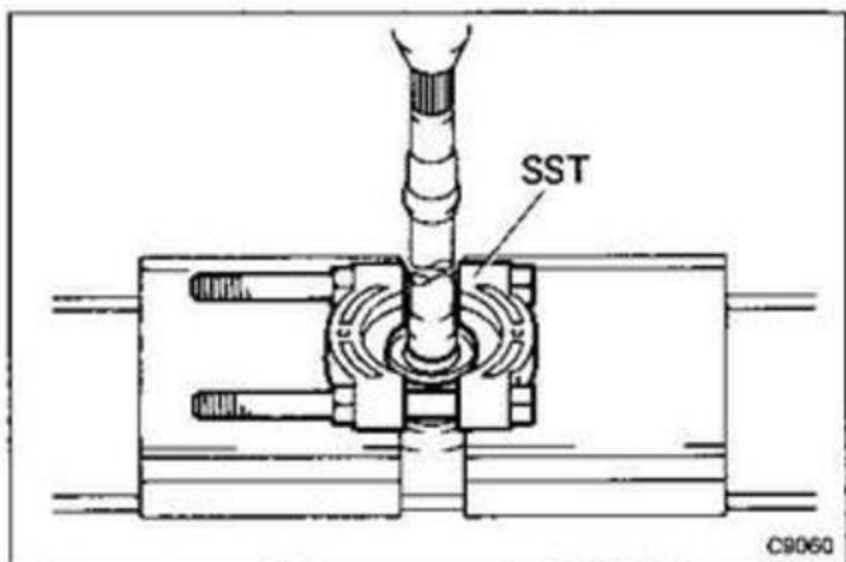
CAUTION: Do not disassemble the outboard joint.



9. REMOVE TWO DUST COVERS

(a) (Transaxle side)

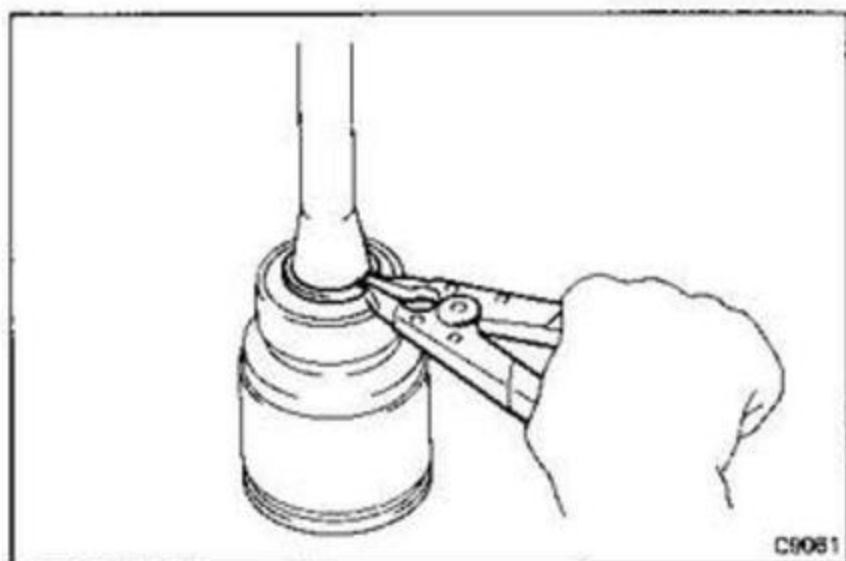
Using a press, press out the dust cover.



(b) (Drive shaft side)

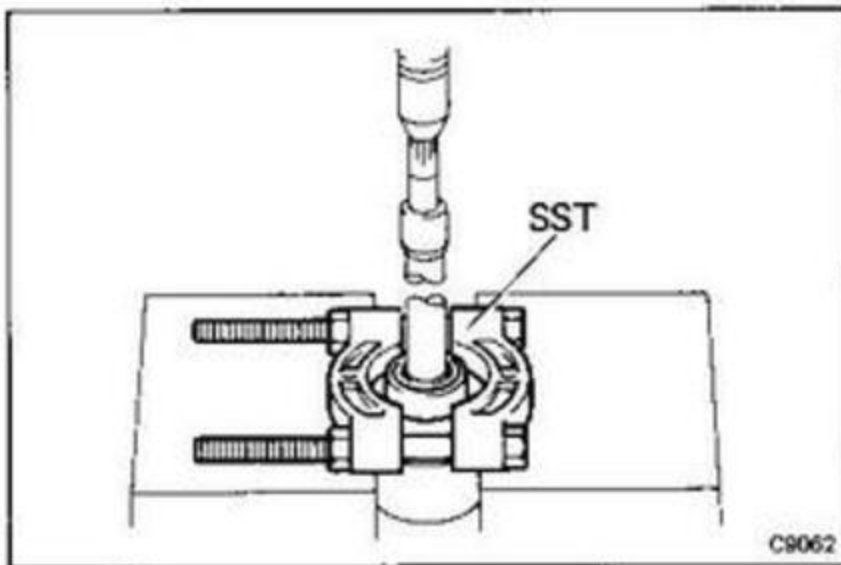
Using SST and a press, press out the dust cover.

SST 09950-00020

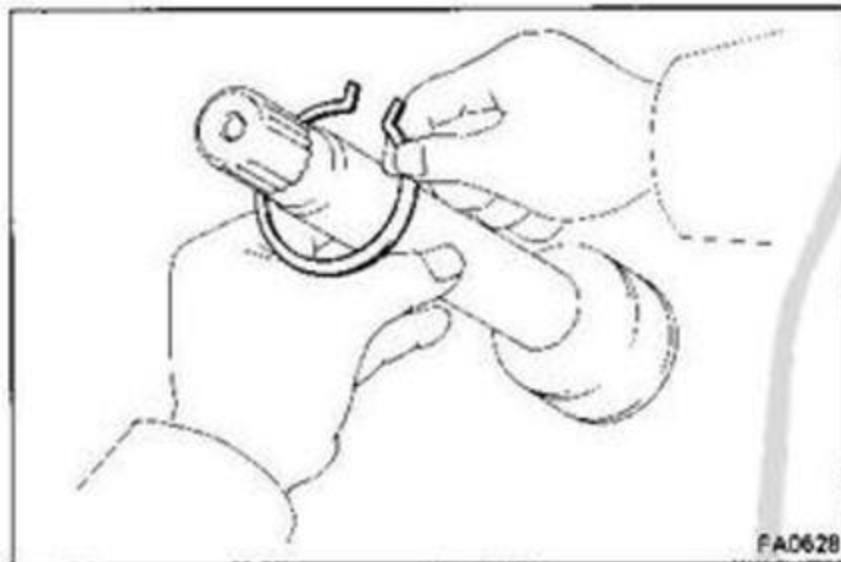


10. REMOVE SNAP RING

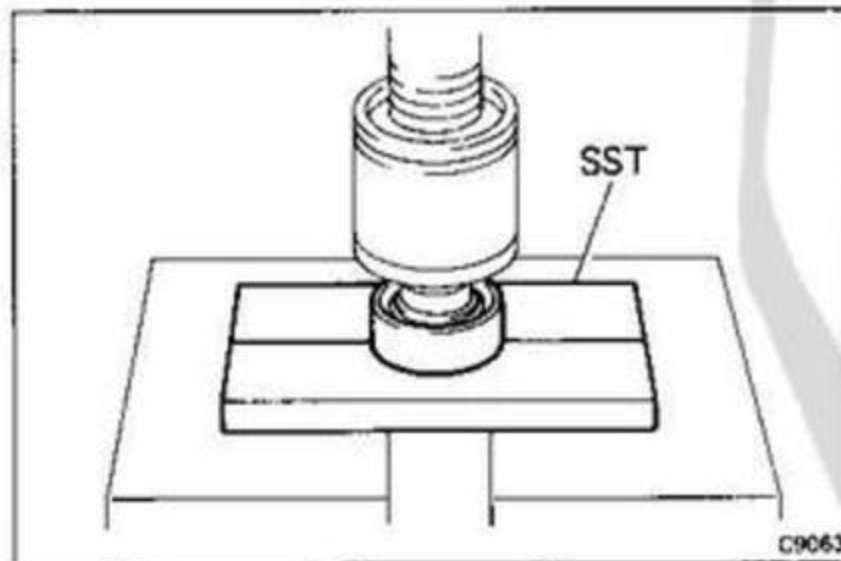
Using snap ring pliers, remove the snap ring.

**11. REMOVE BEARING**

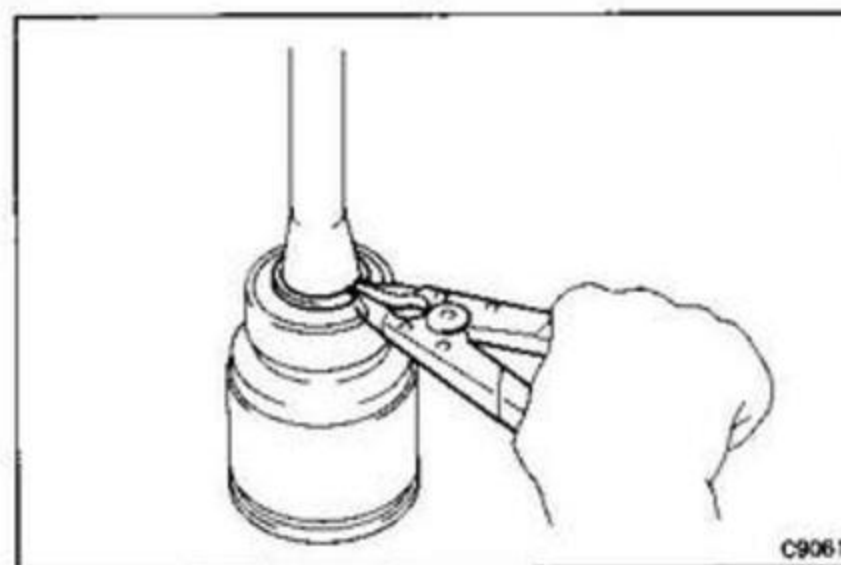
- (a) Using SST and a press, press out the bearing.
SST 09950-00020
- (b) Remove the snap ring.

**ASSEMBLY OF FRONT DRIVE SHAFT**

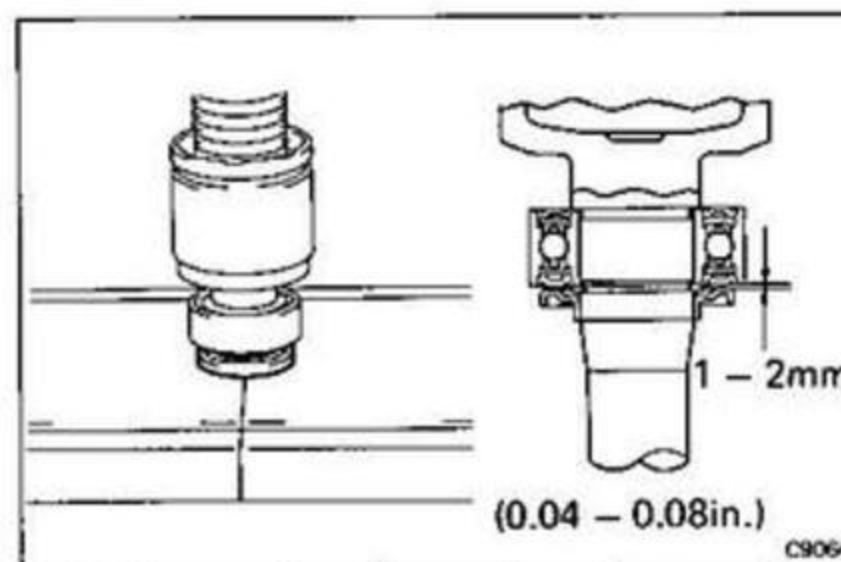
(See page FA-15)

1. INSTALL SNAP RING TO CENTER DRIVE SHAFT**2. INSTALL BEARING AND SNAP RING**

- (a) Using SST and a press, press in the bearing.
SST 09527-20011

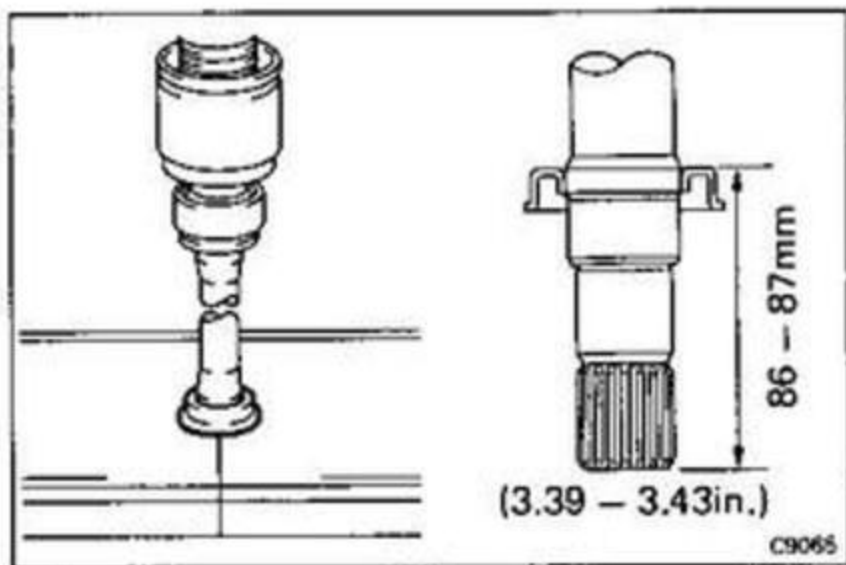


- (b) Using snap ring pliers, install a new snap ring.

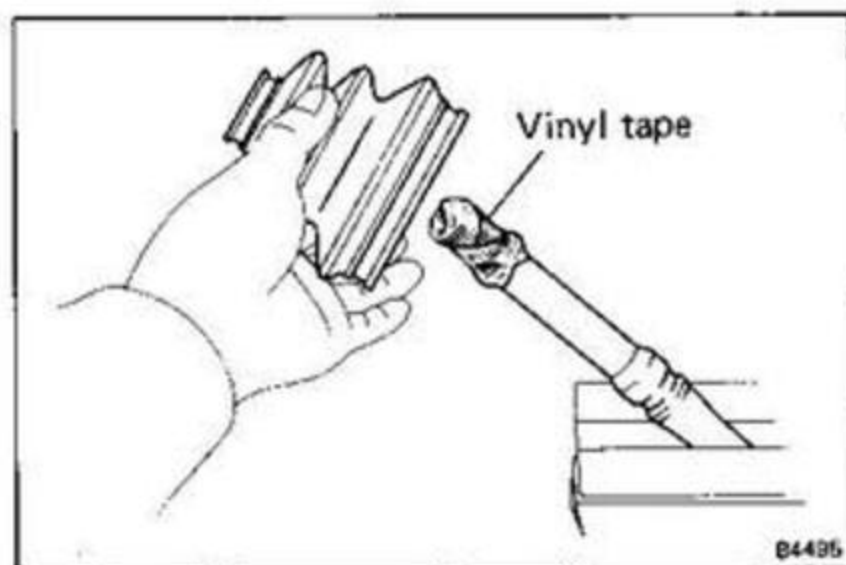
**3. INSTALL DUST COVERS**

- (a) (Transaxle side)
Using a press, press in the dust cover.

NOTE: The clearance between the dust cover and the bearing should be kept in the range shown in the figure.

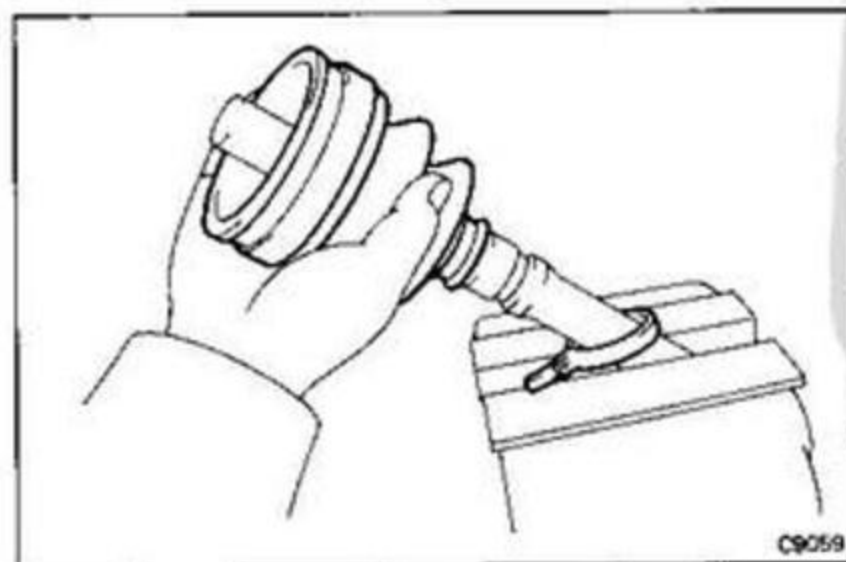


- (b) (Drive shaft side)
Using a press, press in the dust cover.



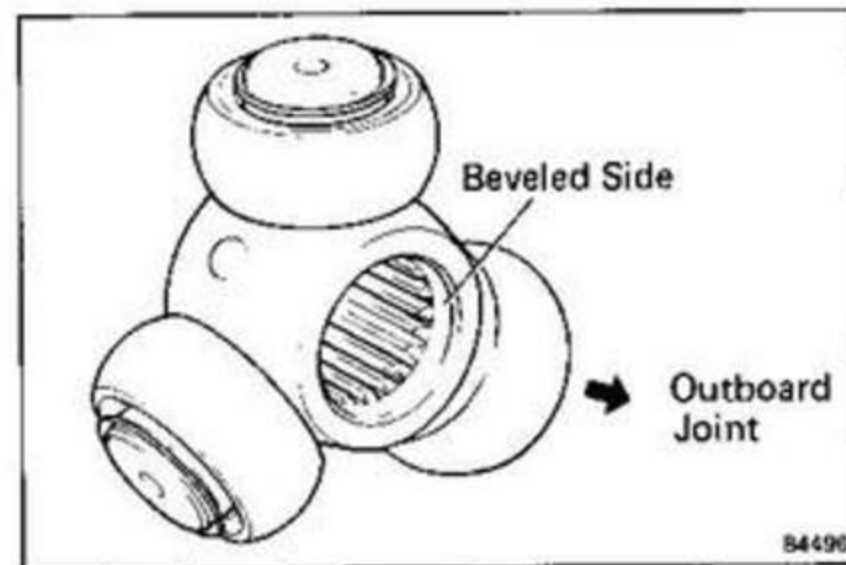
4. PROVISIONALLY INSTALL BOOT AND NEW BOOT CLAMPS TO OUTBOARD JOINT

NOTE: Before installing the boot, wrap vinyl tape around the spline of the shaft to prevent damage the boot.



5. PROVISIONALLY INSTALL BOOT AND NEW BOOT CLAMPS TO DRIVE SHAFT

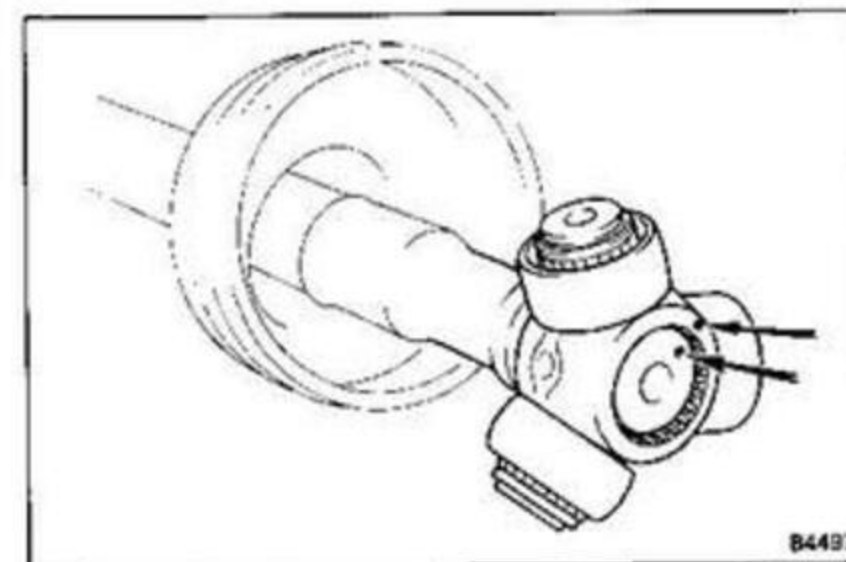
NOTE: Before installing the boot, wrap vinyl tape around the spline of the shaft to prevent damage the boot.

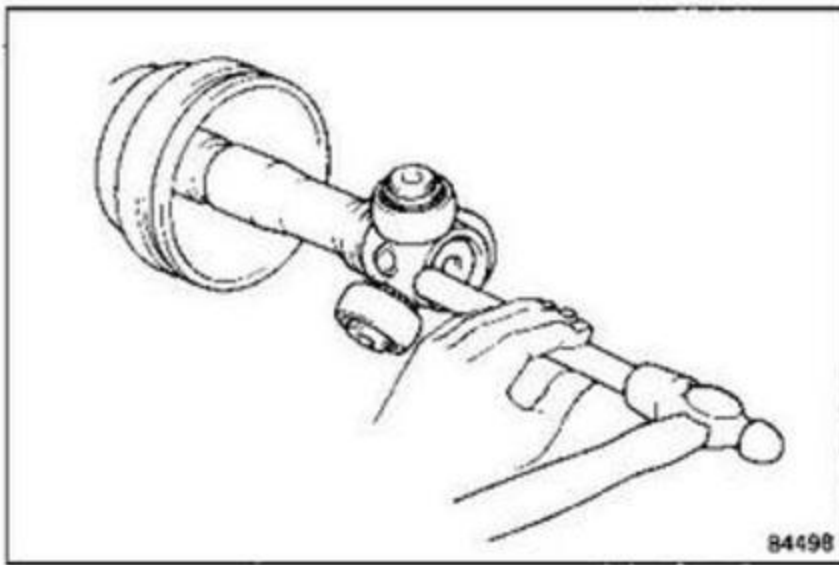


6. (3S-FE ENGINE)
ASSEMBLE TRIPOD JOINT

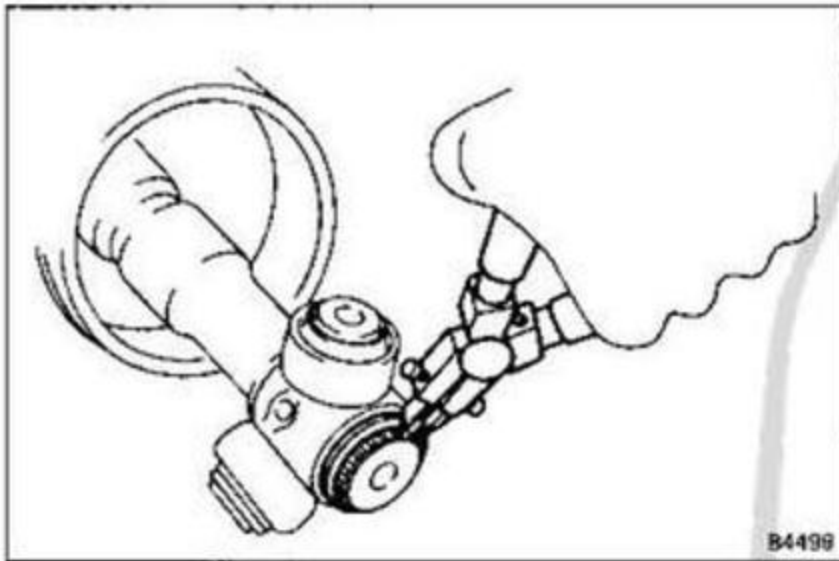
- (a) Place the beveled side of the tripod axial spline toward outboard joint.

- (b) Align the matchmarks placed before disassembly.

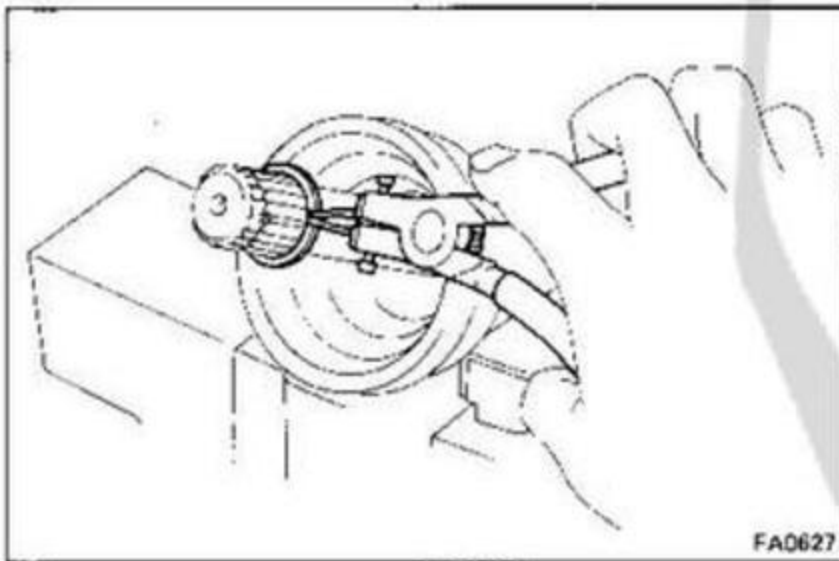




- (c) Using a brass bar and hammer, tap in the tripod joint to the drive shaft.

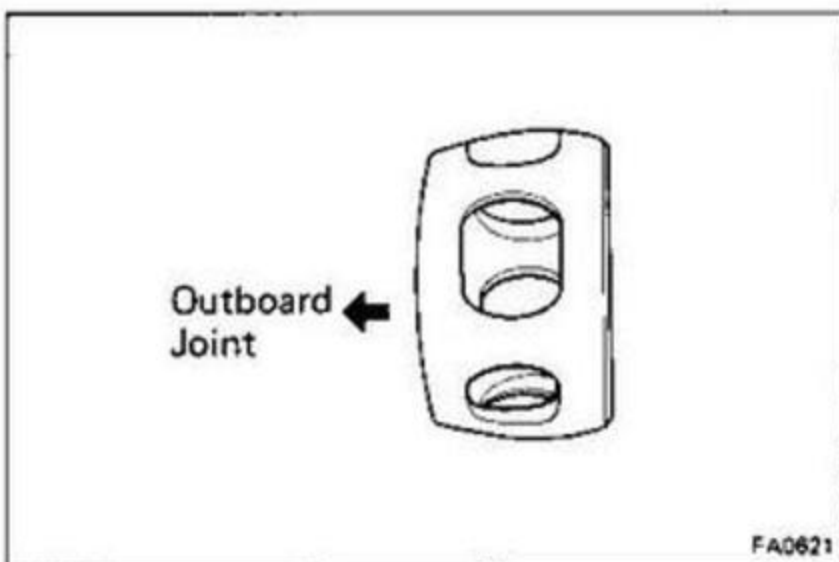


- (d) Using snap ring pliers, install a new snap ring.



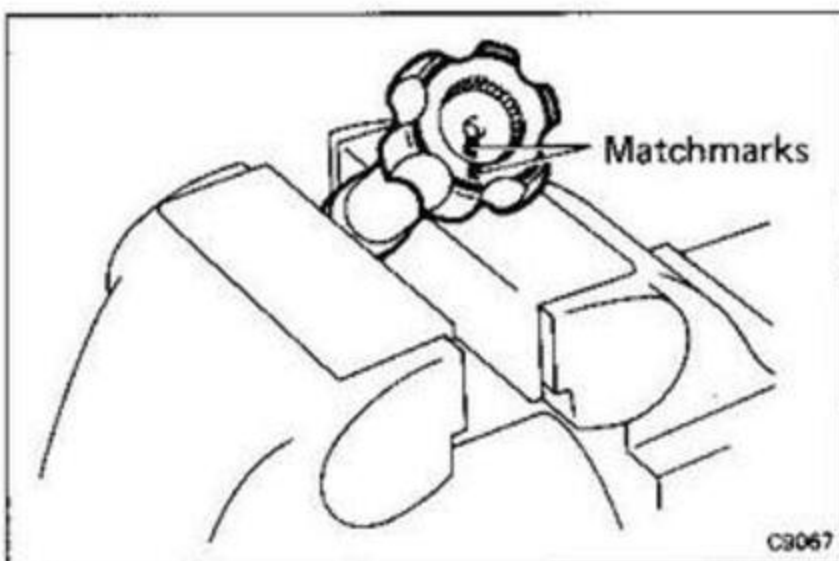
7. (3S-GE ENGINE) ASSEMBLE INBOARD JOINT

- (a) Using snap ring pliers, install a new snap ring.

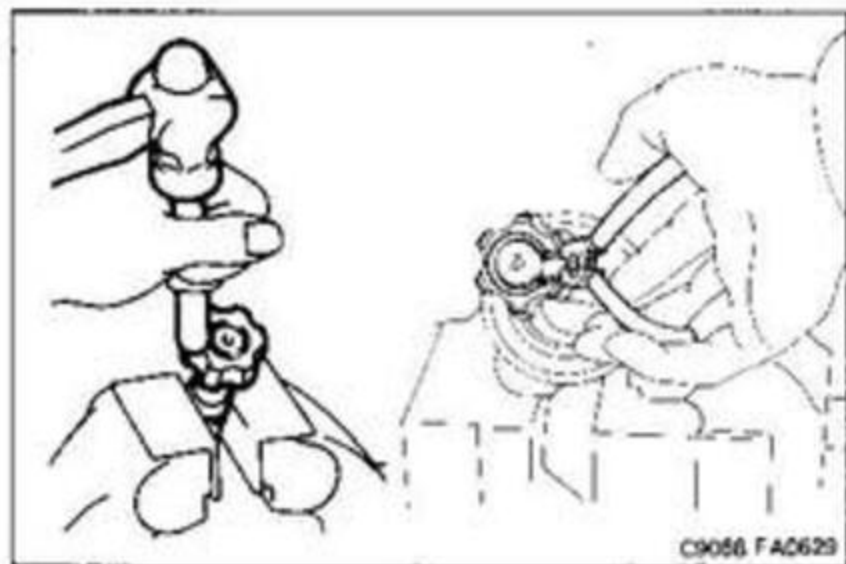


- (b) Install the ball cage to the drive shaft.

NOTE: Install the large end of the ball cage to the inboard joint side.

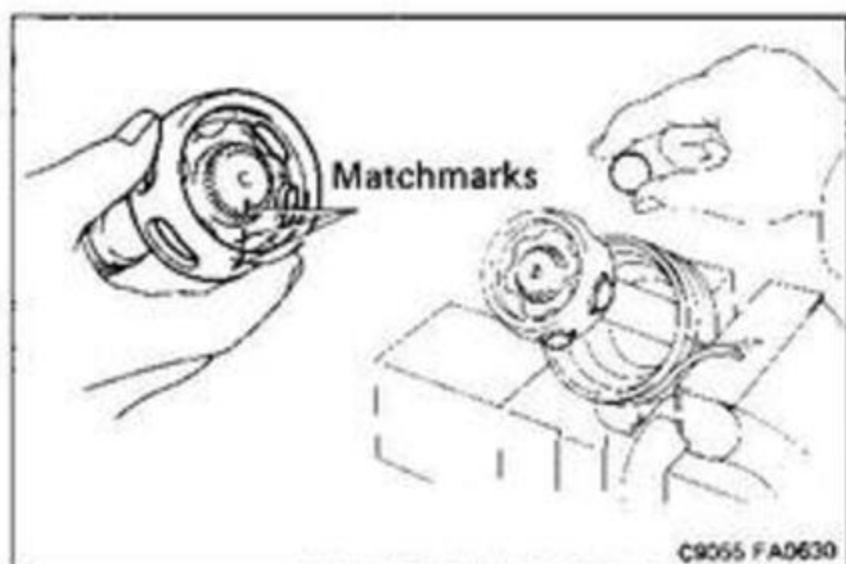


- (c) Align the matchmarks placed before disassembly.



(d) Using a brass bar and hammer, tap in the race to the drive shaft.

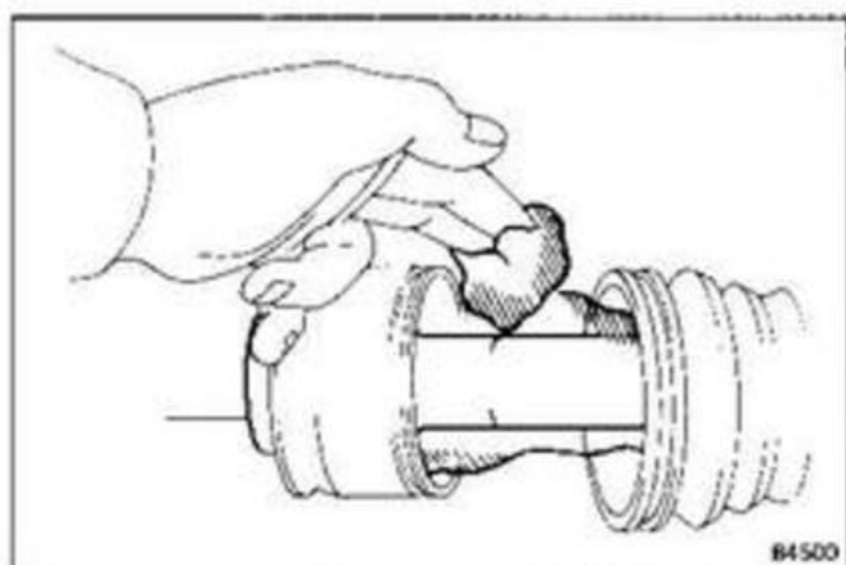
(e) Using snap ring pliers, install a new snap ring.



(f) Install the ball cage to the inner race so that they mesh. Then, align the inner race and ball cage, matchmarks by the rotating the ball cage.

(g) Install the six balls into the cage.

NOTE: Use the grease supplied in the boot kit to do not drop the balls.



8. ASSEMBLE BOOT TO OUTBOARD JOINT

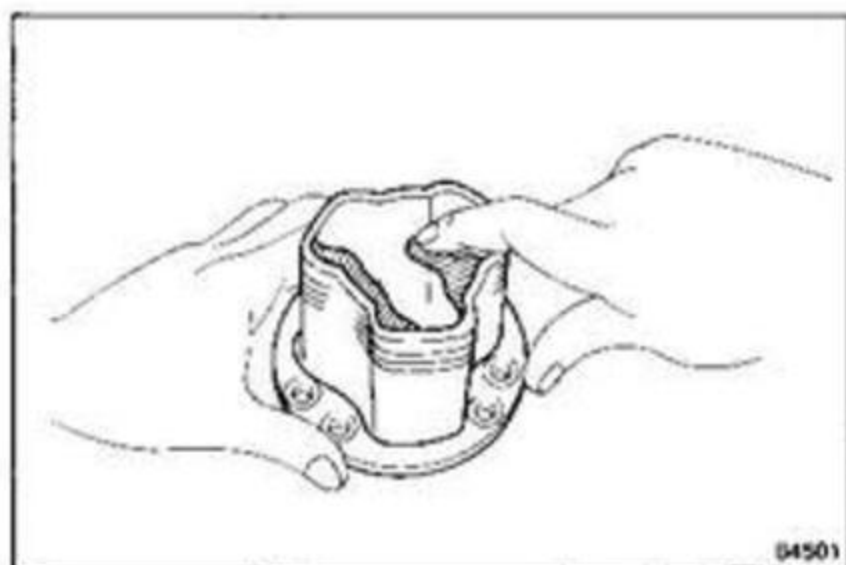
Before assembling the boots, pack in grease.

NOTE: Use the grease supplied in the boot kit.

Grease capacity:

3S-FE engine 120 — 130 g (0.26 — 0.29 lb)

3S-GE engine 100 — 150 g (0.22 — 0.33 lb)



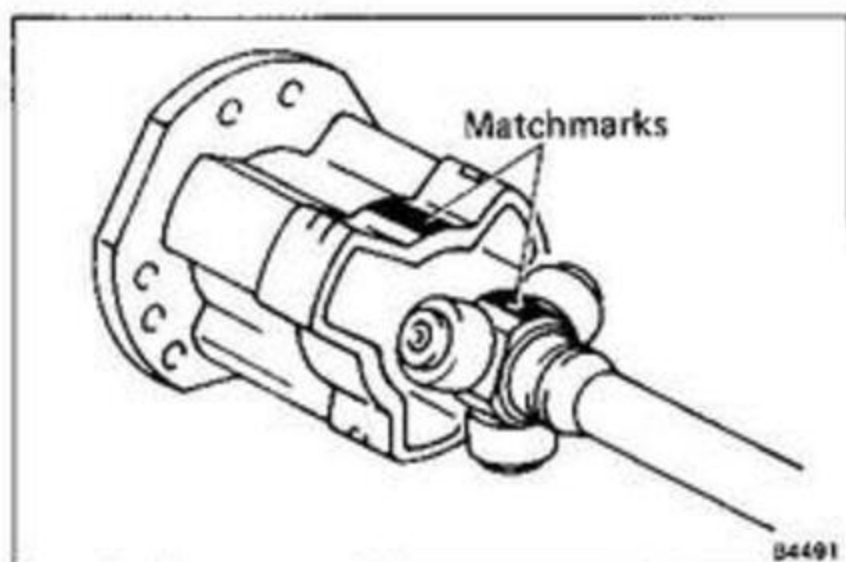
9. (3S-FE ENGINE)

ASSEMBLE INBOARD JOINT TO INBOARD TULIP

(a) Pack in grease to the inboard tulip and boot.

NOTE: Use the grease supplied in the boot kit.

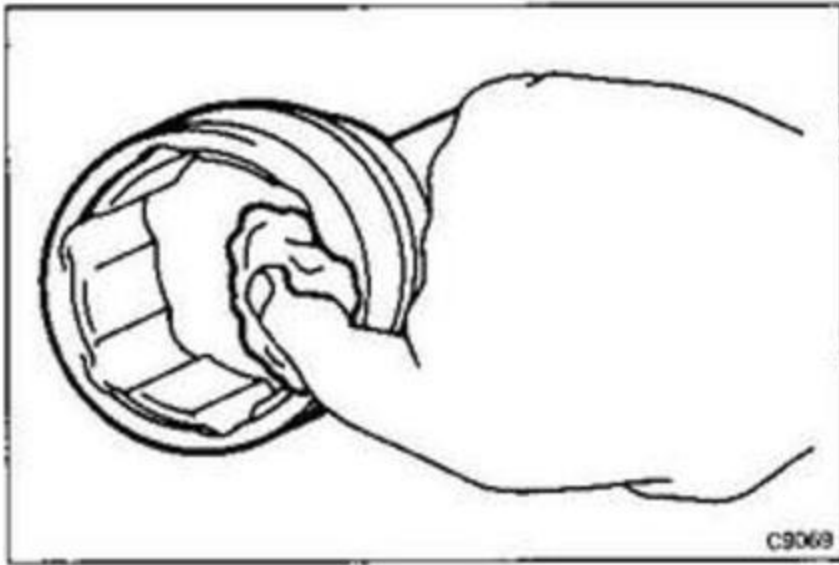
Grease capacity: 212 - 222 g (0.47 - 0.49 lb)



(b) Align the matchmarks placed before disassembly.

(c) Install the inboard tulip to the drive shaft.

(d) Temporarily install the boot to the inboard tulip.

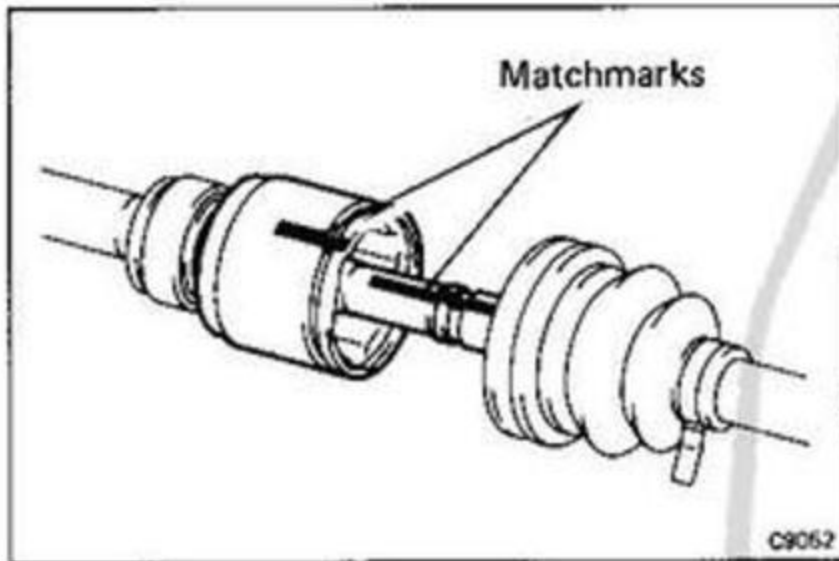


**10. (3S-GE ENGINE)
ASSEMBLE INBOARD JOINT TO INBOARD OUTER RACE**

(a) Pack in grease to the inboard outer race and boot.

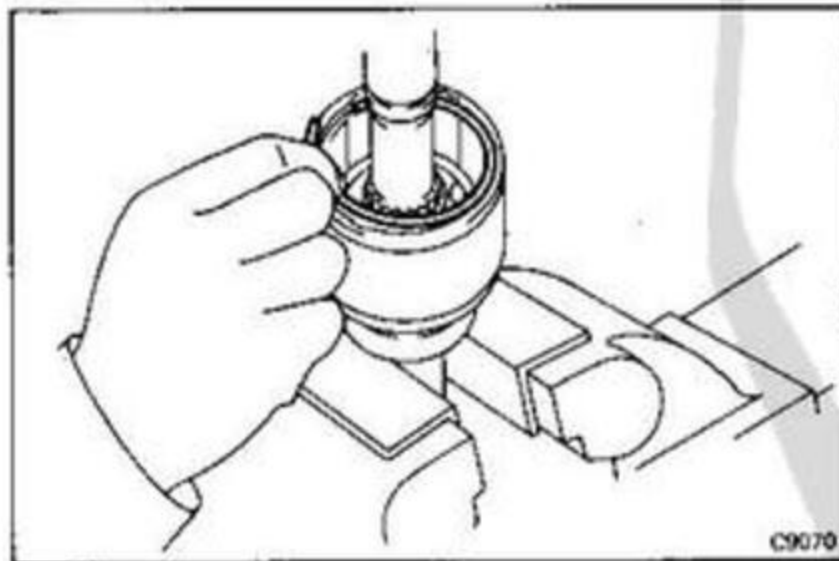
NOTE: Use the grease supplied in the boot kit.

Grease capacity: 100 – 120 g (0.22 – 0.26 lb)



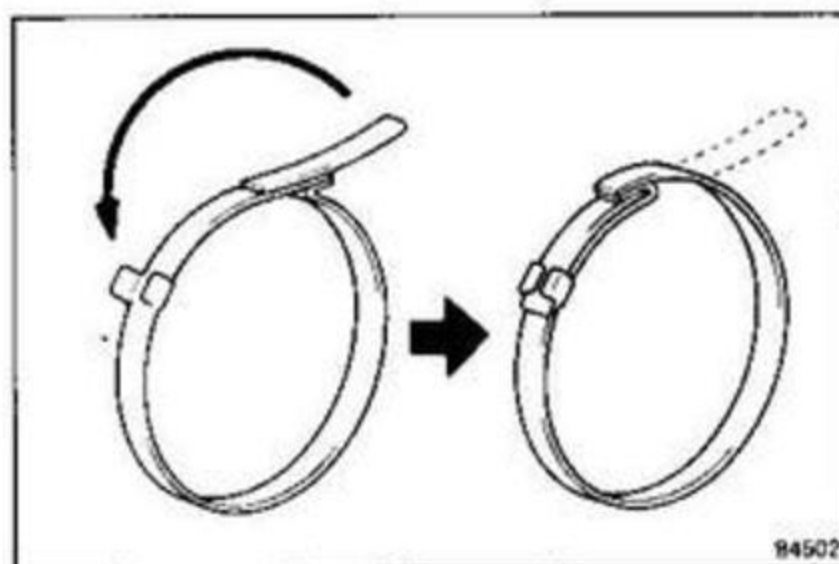
(b) Align the matchmarks placed before disassembly.

(c) Install the inboard outer race to the drive shaft.



(d) Install a new snap ring to the inboard outer race as shown.

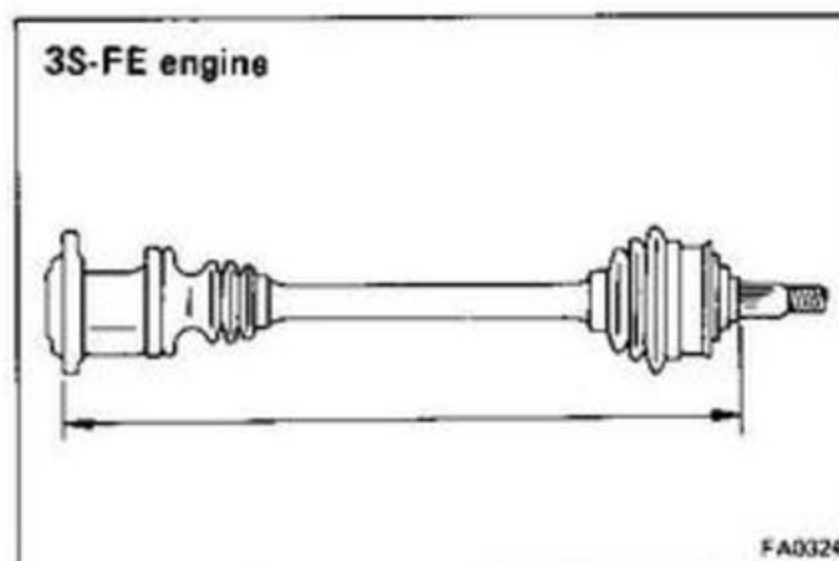
(e) Install the boot to the inboard outer race.



11. ASSEMBLE BOOT CLAMPS TO BOTH BOOTS

(a) Be sure the boot is on the shaft groove.

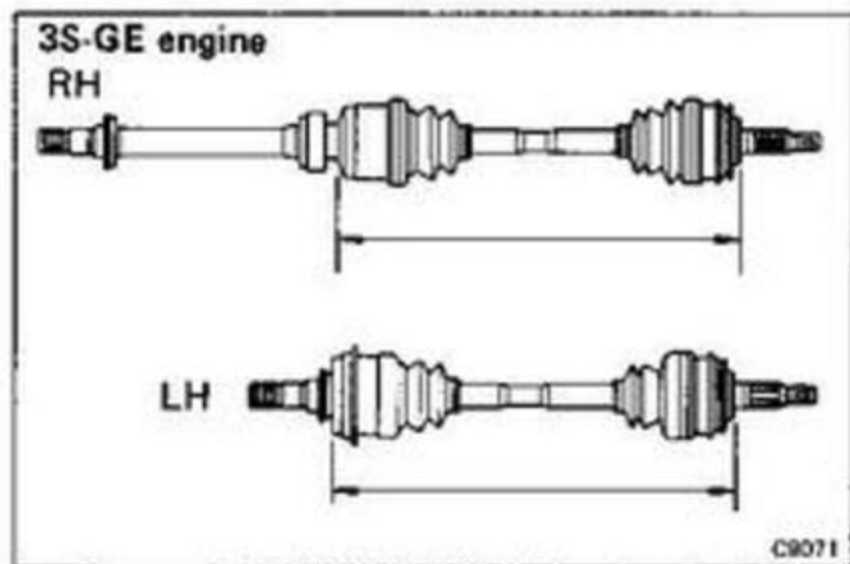
(b) Bend the band and lock it as shown in the figure.



(c) In sure that the boot is not stretched or contracted when the drive shaft is at standard length.

Drive shaft length:

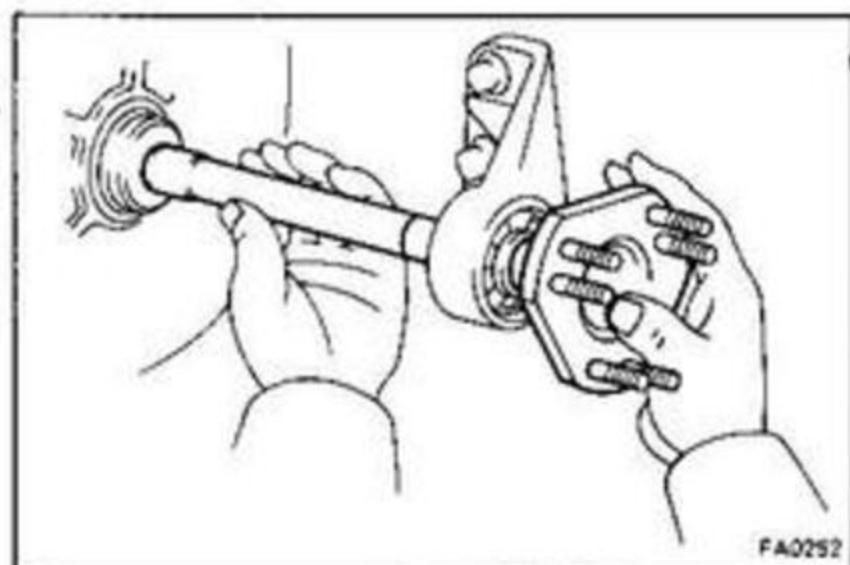
3S-FE engine 445.3 mm (17.531 in.)



Drive shaft length:

3S-GE engine LH 459.3 mm (18.083 in.)

RH 461.8 mm (18.181 in.)



INSTALLATION OF FRONT DRIVE SHAFT

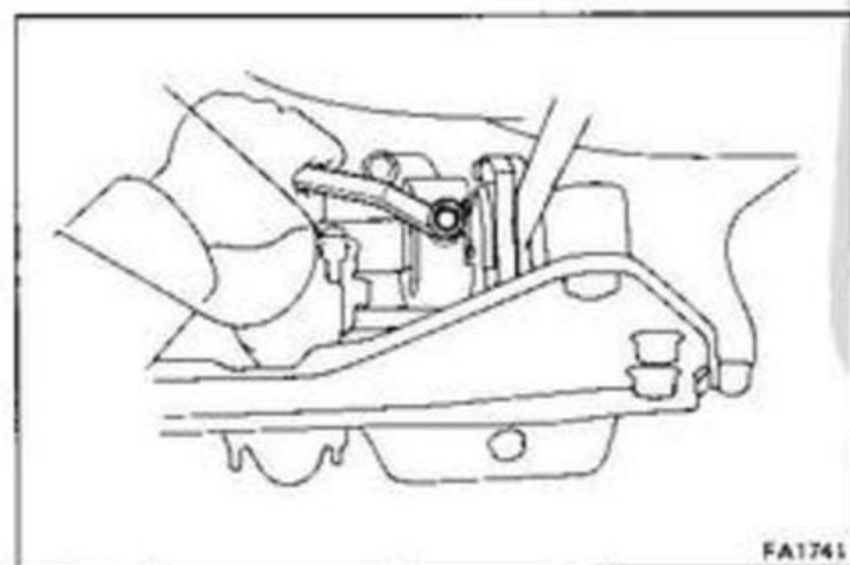
(See page FA-15)

1. (3S-FE ENGINE) INSTALL CENTER DRIVE SHAFT

- (a) Apply MP grease to the transaxle oil seal lip.
- (b) Insert the center drive shaft to the transaxle through the bearing bracket.

- (c) Secure the center drive shaft with a new snap ring.
- (d) Torque a new center drive shaft stopper bolt.

Torque: 330 kg-cm (24 ft-lb, 32 N·m)

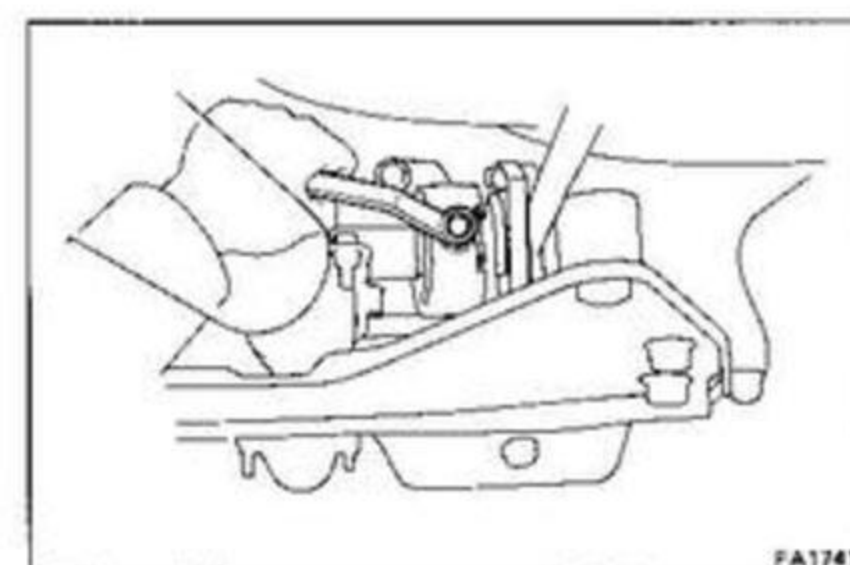
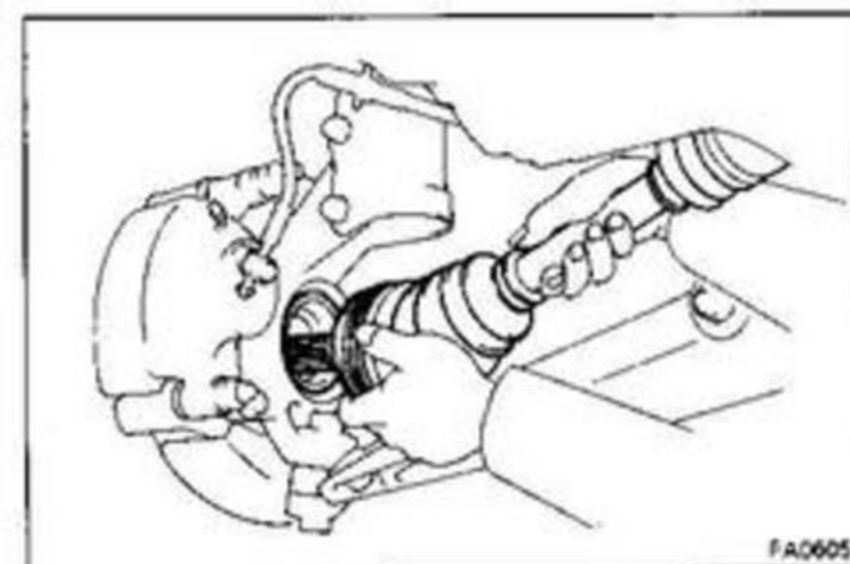


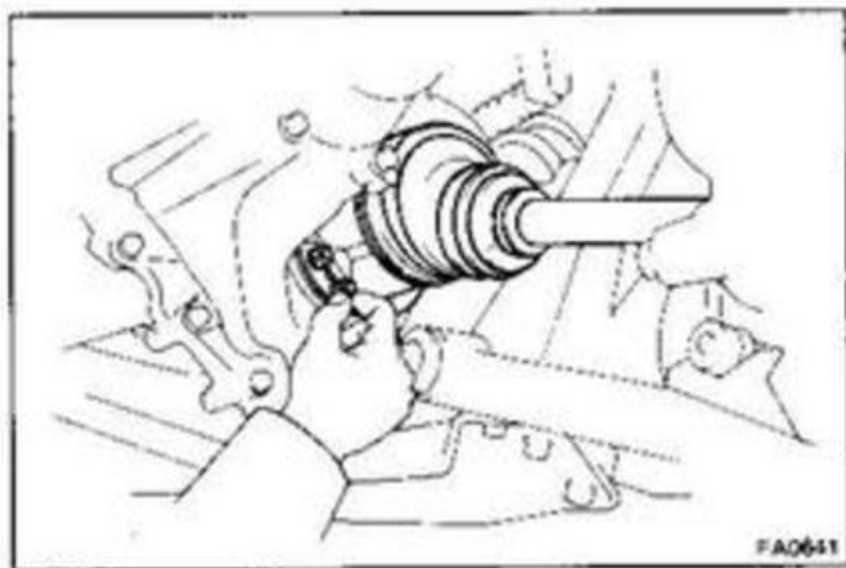
2. (3S-GE ENGINE) INSTALL RH DRIVE SHAFT WITH CENTER DRIVE SHAFT

- (a) Apply MP grease to the transaxle oil seal lip.
- (b) Insert the RH drive shaft with center drive shaft to the transaxle through the bearing bracket.

- (c) Secure the center drive shaft with a new snap ring.
- (d) Torque a new center drive shaft stopper bolt.

Torque: 330 kg-cm (24 ft-lb, 32 N·m)



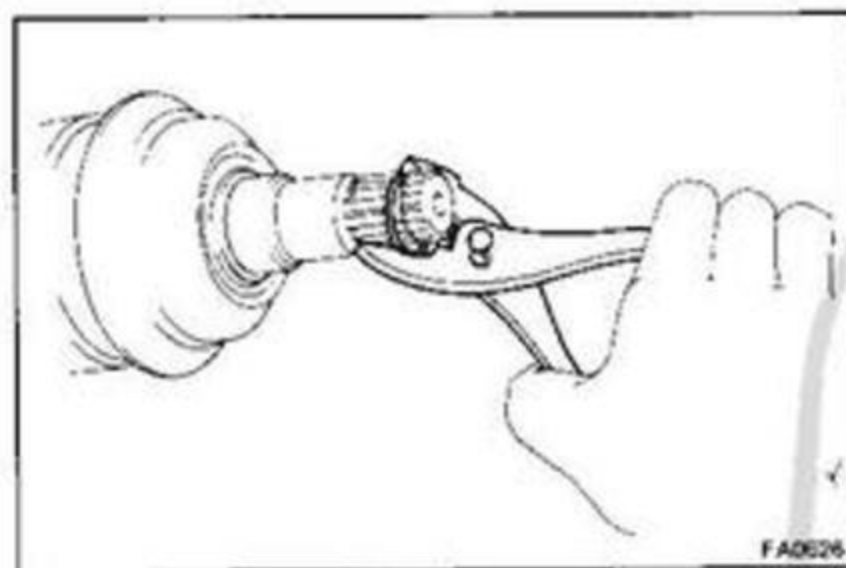


3. (3S-FE ENGINE)
INSTALL FRONT DRIVE SHAFT

- (a) Install the outboard joint side of the drive shaft to the axle hub.

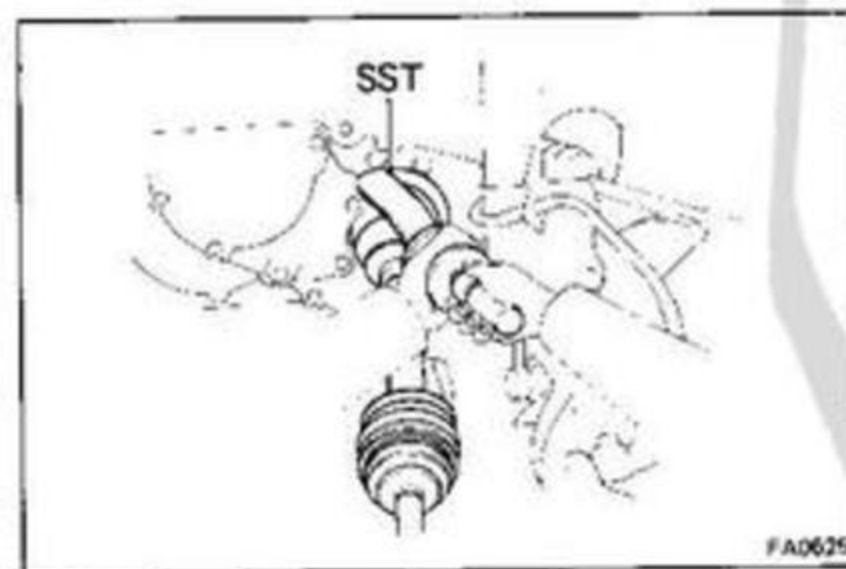
CAUTION: Be careful not to damage the boot.

- (b) Finger tighten the six nuts holding the drive shaft to the center drive shaft or differential side gear shaft.



4. (3S-GE ENGINE)
INSTALL FRONT DRIVE SHAFT

- (a) Install a new snap ring to inboard joint shaft.
(b) Apply MP grease to the transaxle oil seal lip.
(c) Install the LH drive shaft to the transaxle.

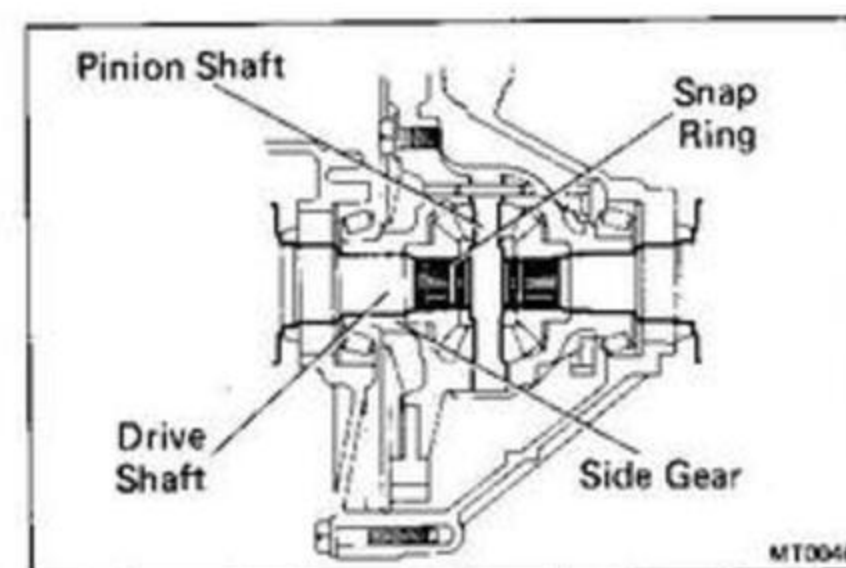


- (d) Using SST, drive in the LH drive shaft.

SST 09520-32060

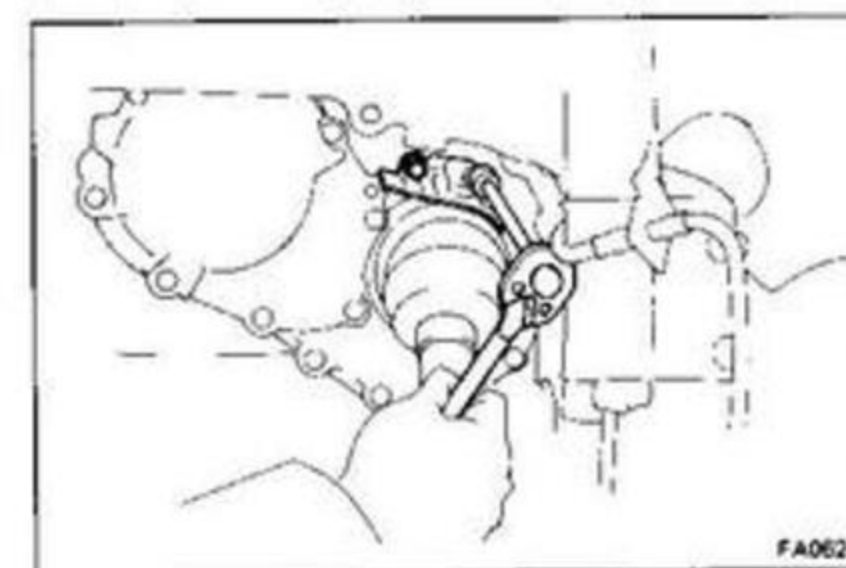
- (e) Push the drive shaft to the differential and measure the distance between the transaxle case and the mark on the drive shaft in step 9 on page FA-16.

Check that the measurements is the same as the measurement recorded in step 9 on page FA-16.

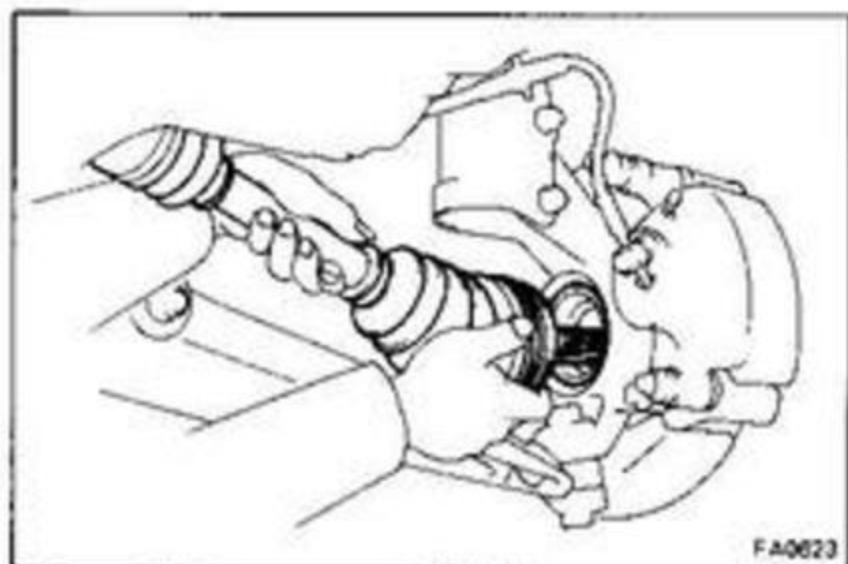


5. (3S-GE ENGINE)
CHECK INSTALLATION OF LH FRONT DRIVE SHAFT

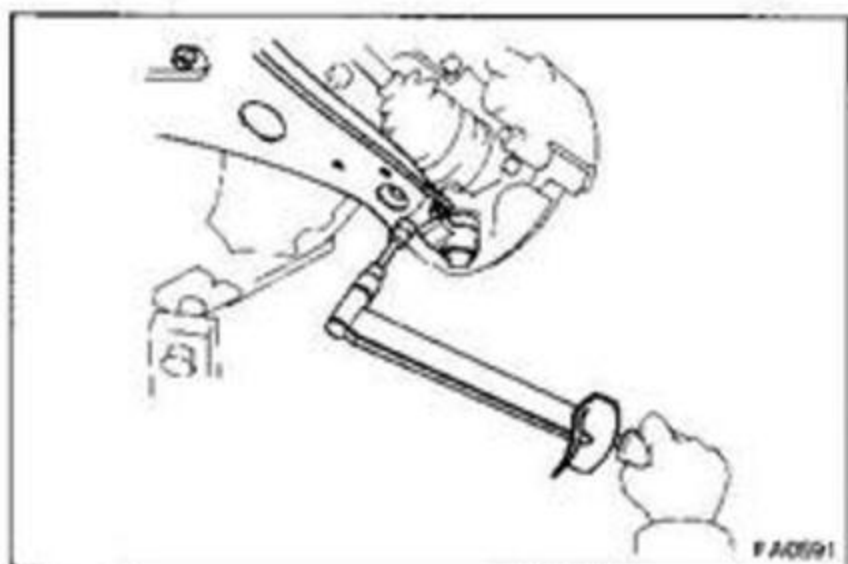
- (a) Check that there is 2 – 3 mm (0.08 – 0.12 in.) of play in axial direction.
(b) Check that the drive shaft will not come out by trying to pull it completely out by hand.



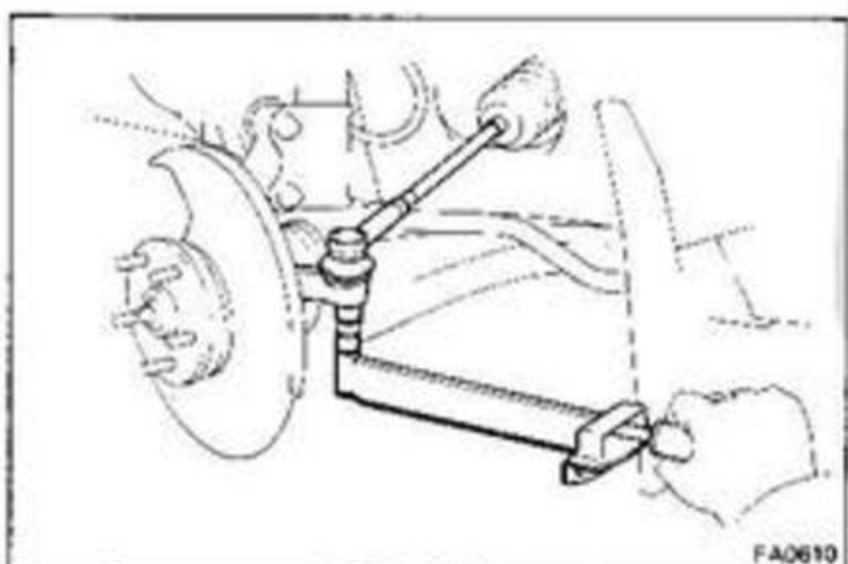
6. (3S-GE ENGINE)
INSTALL TRANSAXLE PROTECTOR



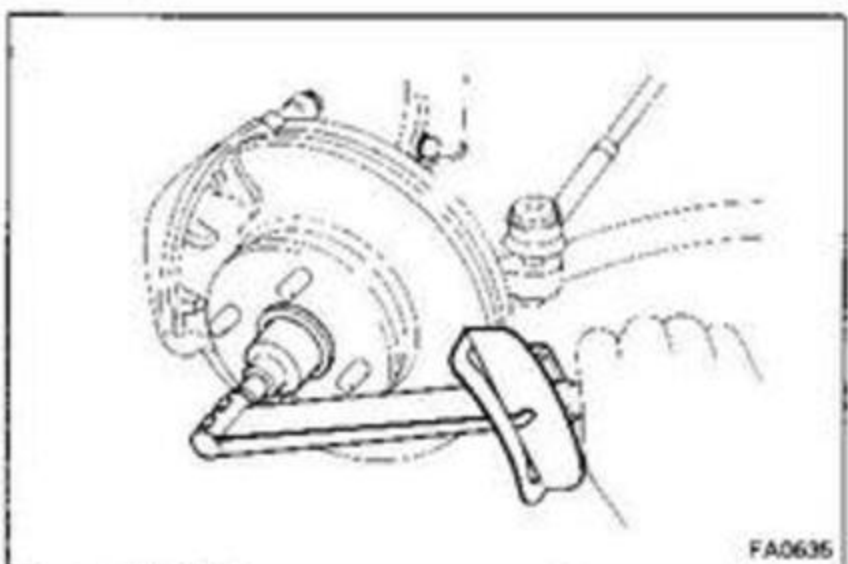
7. (3S-GE ENGINE)
INSTALL RH FRONT DRIVE SHAFT TO AXLE HUB
CAUTION: Be careful not to damage the drive shaft boot and oil seal lip.



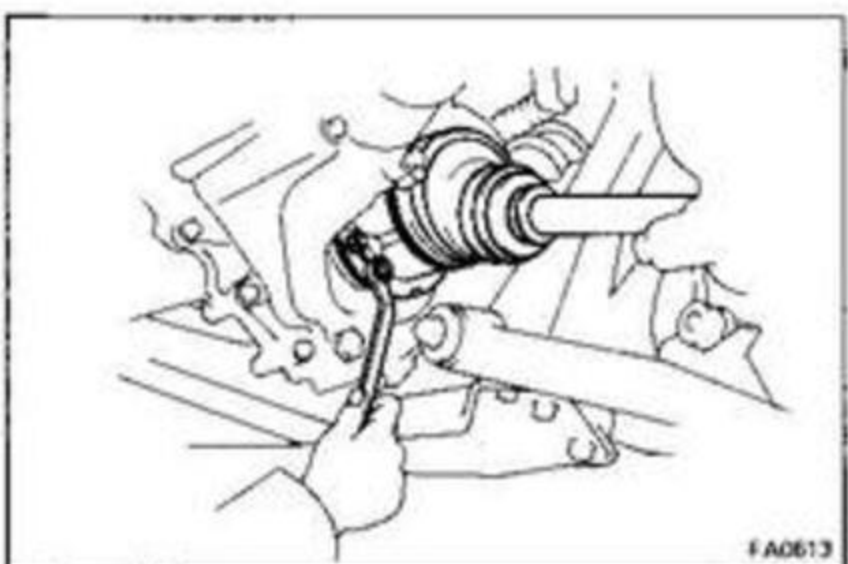
8. **CONNECT STEERING KNUCKLE TO LOWER ARM**
 Connect the steering knuckle to lower arm and torque the bolt and two nuts.
 Torque: 1,300 kg-cm (94 ft-lb, 127 N·m)



9. **CONNECT TIE ROD END TO STEERING KNUCKLE**
 Torque the nut and secure it with a new cotter pin.
 Torque: 500 kg-cm (36 ft-lb, 49 N·m)

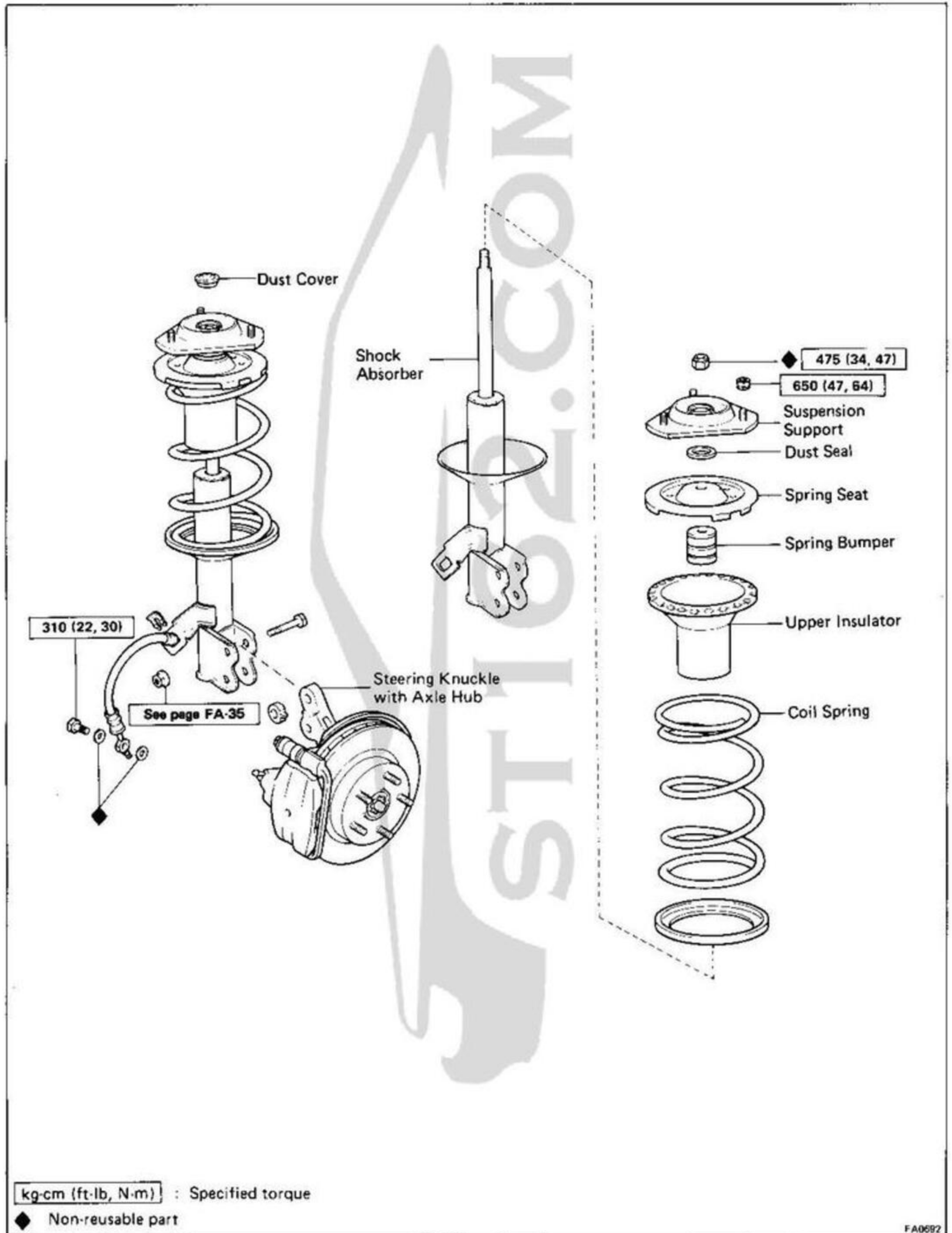


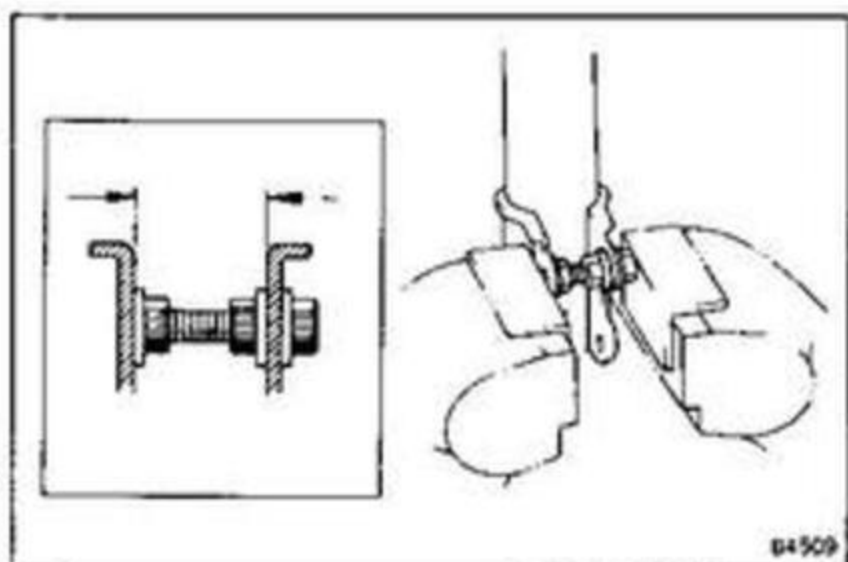
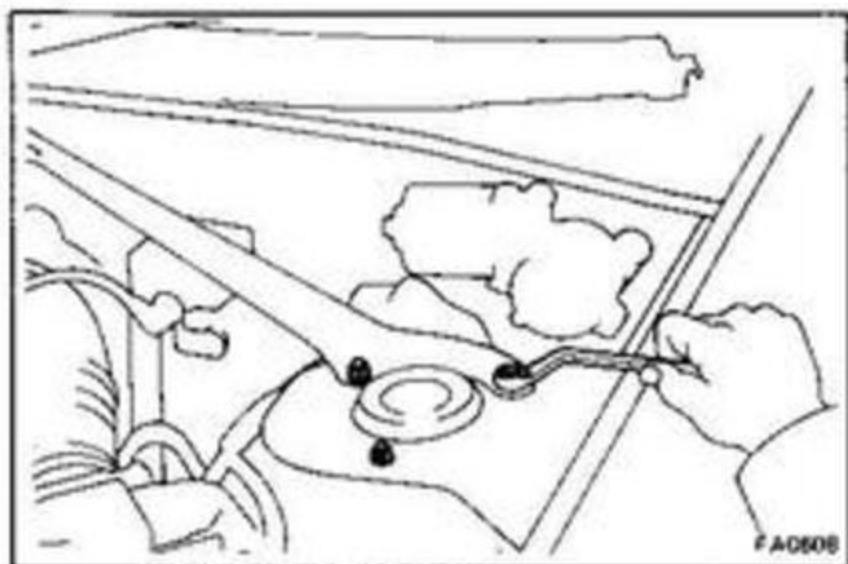
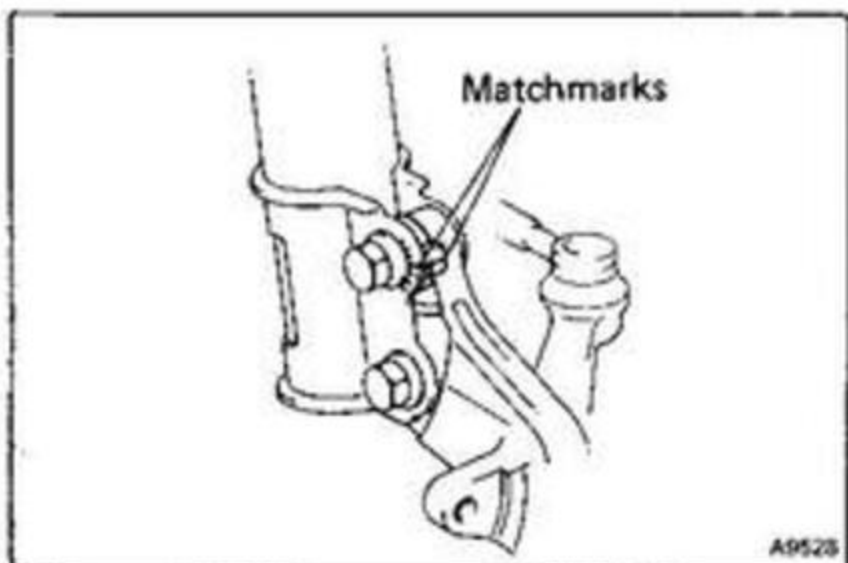
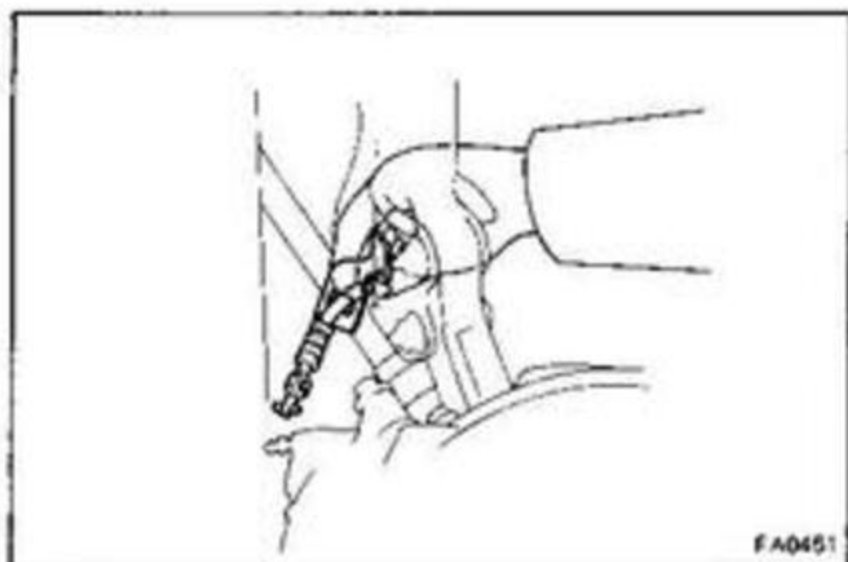
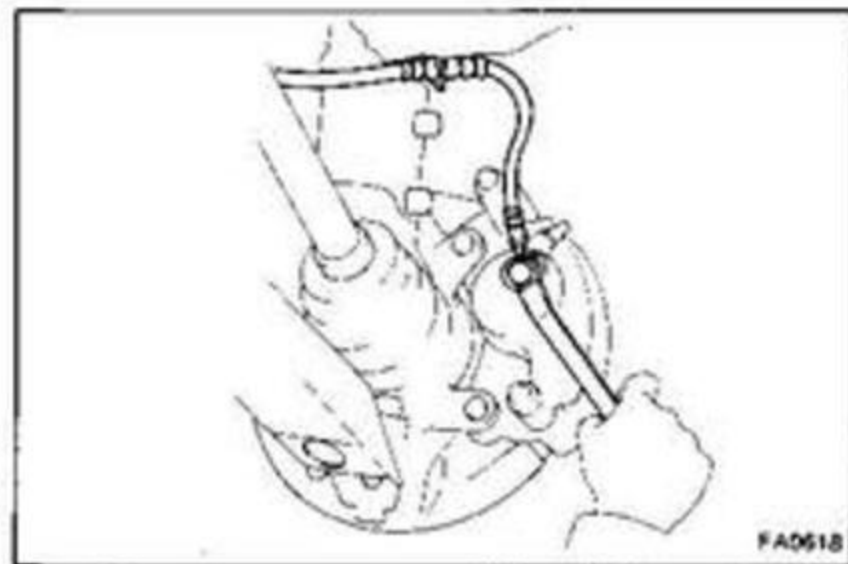
10. **INSTALL BEARING LOCK NUT, LOCK NUT CAP AND COTTER PIN**
 (a) Torque the bearing lock nut while depressing the brake pedal.
 Torque: 1,900 kg-cm (137 ft-lb, 186 N·m)
 (b) Install the lock nut cap and a new cotter pin.



11. **TORQUE SIX NUTS HOLDING FRONT DRIVE SHAFT TO DIFFERENTIAL SIDE SHAFT OR CENTER DRIVE SHAFT**
 Torque the six nuts while depressing the brake pedal.
 Torque: 370 kg-cm (27 ft-lb, 36 N·m)
12. **INSTALL TRANSAXLE PROTECTOR**
13. **FILL TRANSAXLE WITH GEAR OIL OR FLUID**
14. **INSTALL ENGINE UNDER COVER**

FRONT SHOCK ABSORBER COMPONENTS





REMOVAL OF FRONT SHOCK ABSORBER ASSEMBLY

1. DISCONNECT BRAKE HOSE

- Remove the union bolt and two washers and disconnect the brake hose from the disc brake caliper.
- Drain the brake fluid into a container.
- Remove the clip from the brake hose.
- Pull off the brake hose from the brake hose bracket.

2. DISCONNECT STEERING KNUCKLE FROM SHOCK ABSORBER

- Place matchmarks on the shock absorber lower bracket and camber adjust cam.
- Remove the bolts and nuts and disconnect the steering knuckle and shock absorber.

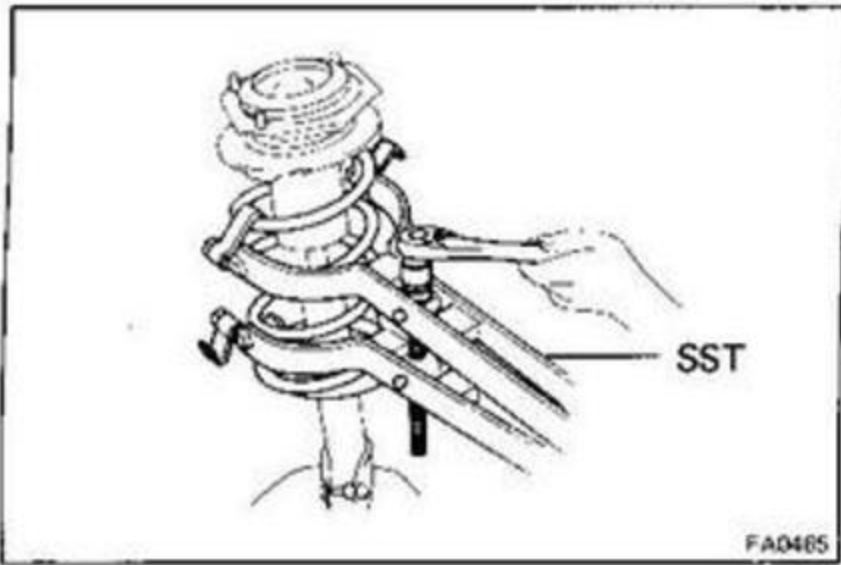
3. REMOVE SHOCK ABSORBER FROM BODY

- Remove the three bolts holding the top of the suspension support.
- Remove the shock absorber from the body.

CAUTION: Cover the drive shaft boot with cloth to avoid damaging it.

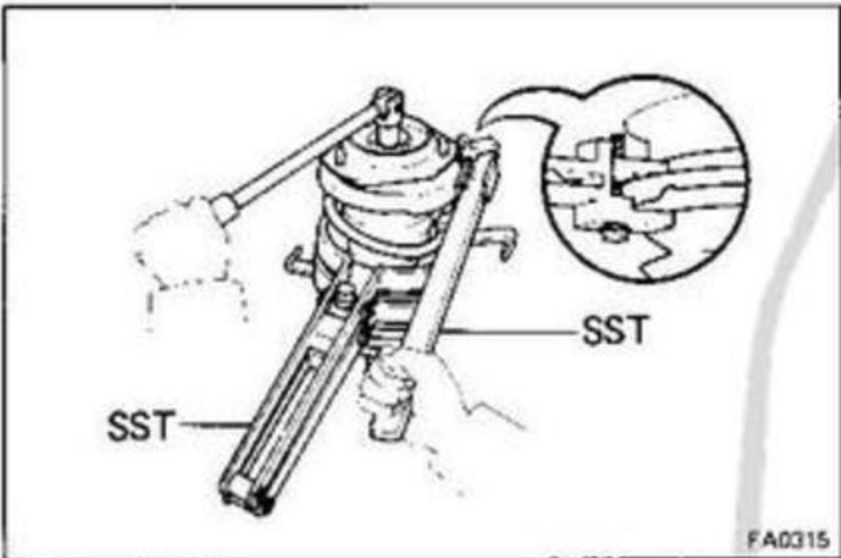
4. CLAMP SHOCK ABSORBER IN VISE

Install a bolt and two nuts to the bracket at the lower portion of the shock absorber shell and secure it in a vise.



5. REMOVE COIL SPRING

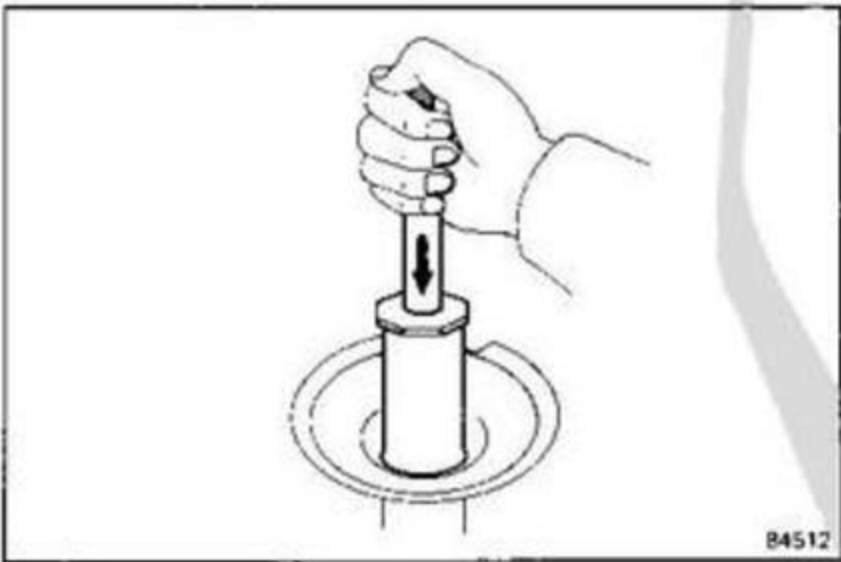
- (a) Using SST, compress the coil spring.
SST 09727-22032



- (b) Using SST, hold the spring seat so that it will not turn, and remove the nut.

SST 09729-22031

- (c) Remove the suspension support, spring seat, spring, insulators and bumper.



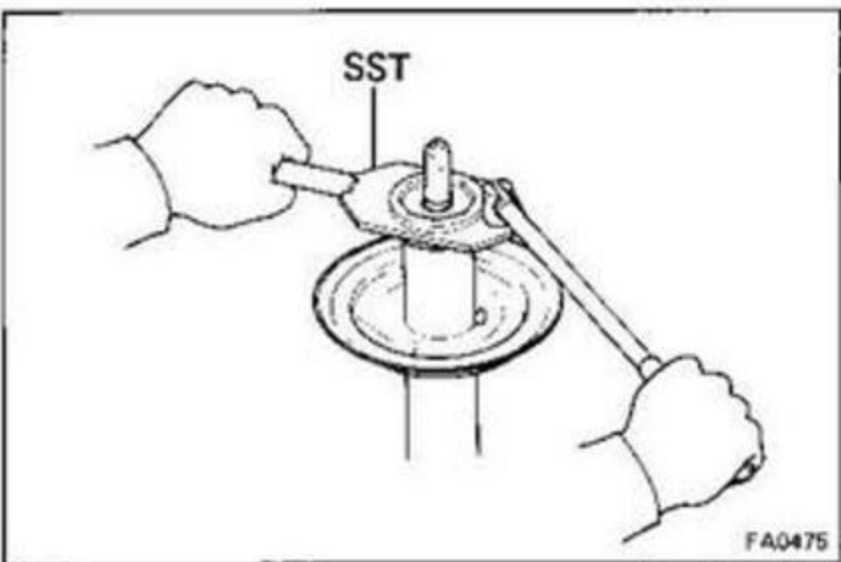
INSPECTION OF FRONT SHOCK ABSORBER ASSEMBLY

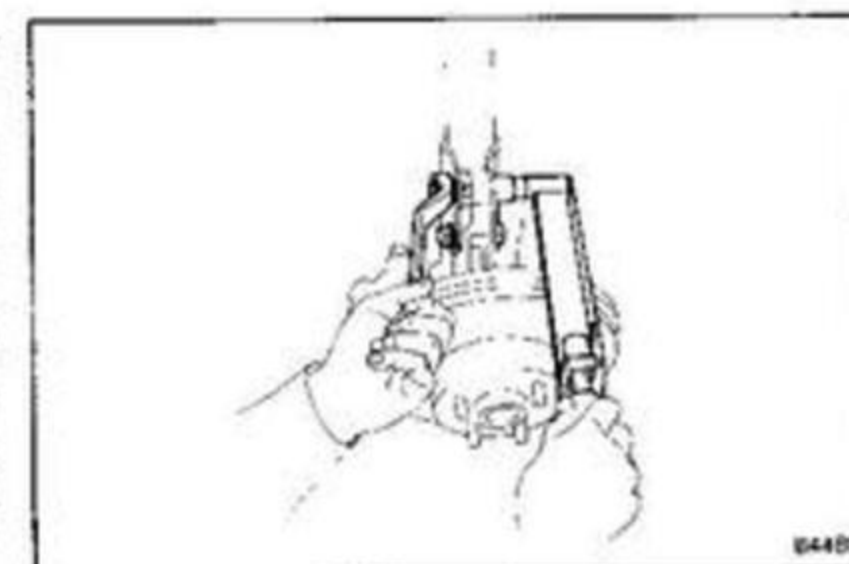
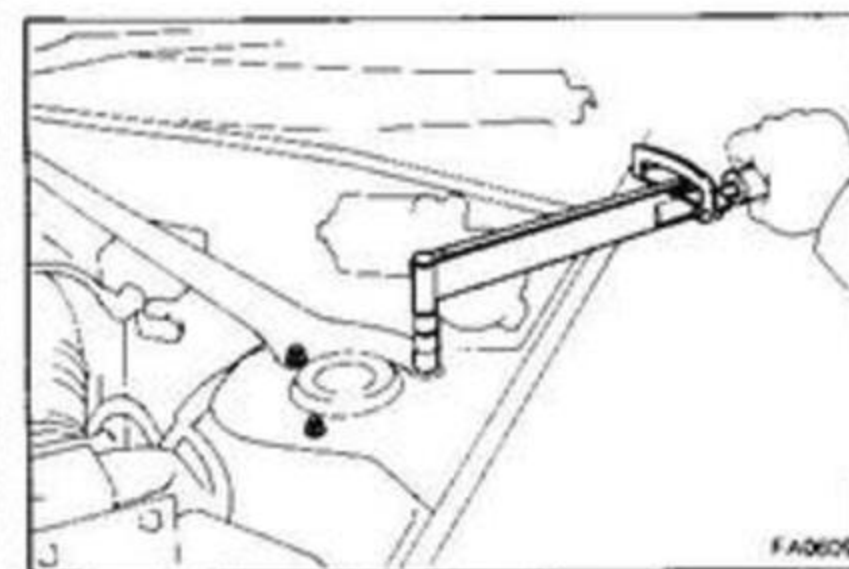
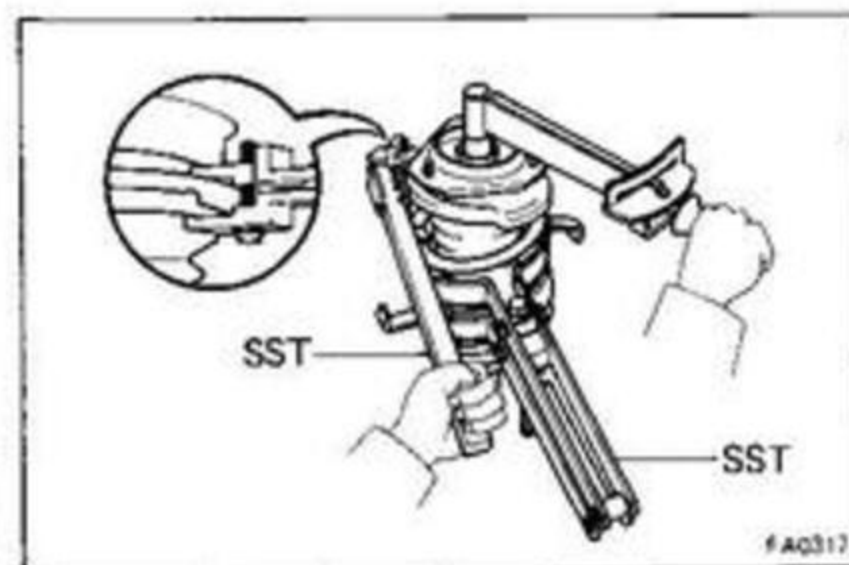
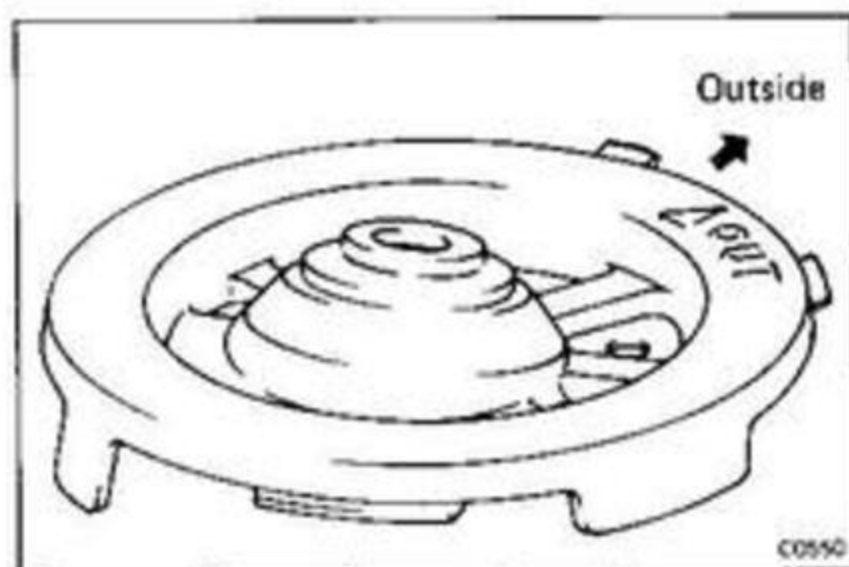
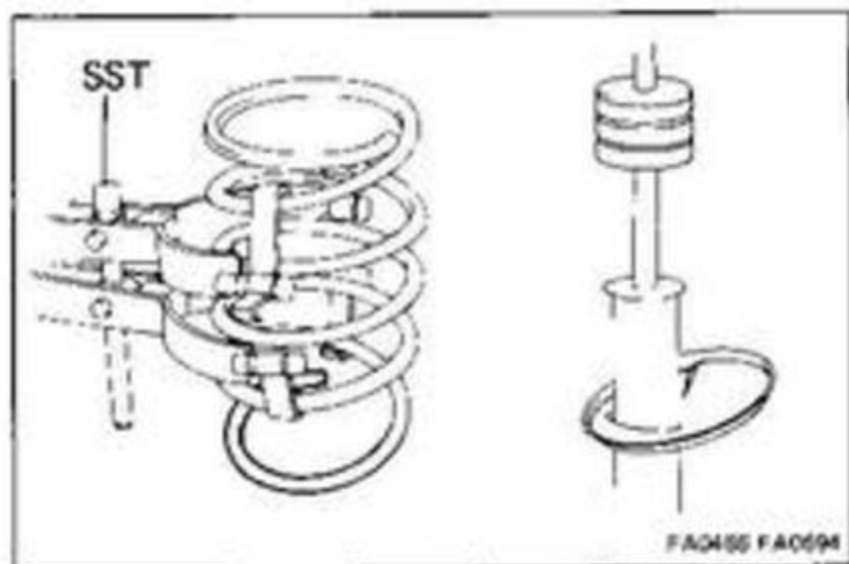
- (a) While pushing the piston rod, check that the pull through out the stroke is even, and there is no abnormal resistance or noise.
- (b) Push the piston rod in fully and release it. Check that it returns at a constant speed throughout.

If the absorber operations is defective, replace the absorber, as an assembly.

CAUTION: Before discarding the shock absorber, first loosen the ring nut 2 or 3 turns with SST to release the gas completely.

SST 09720-00011 (09721-00071)





INSTALLATION OF FRONT SHOCK ABSORBER ASSEMBLY

(See page FA-32)

1. INSTALL BUMPER, COIL SPRING, INSULATOR, SPRING SEAT AND DUST SEAL

- (a) Install the bumper to piston rod.
- (b) Using SST, compress the coil spring.
SST 09727-22032
- (c) Install the lower insulator.
- (d) Align the coil spring end with the lower seat hollow and install.
- (e) Install the upper insulator.
- (f) Face the "OUT" mark of the spring seat toward the outside of the vehicle.
- (g) Install the dust seal on the spring seat.
- (h) Install the suspension support.

- (i) Using SST, install and torque a new suspension support nut.

Torque: 475 kg-cm (34 ft-lb, 47 N·m)

SST 09729-22031

2. INSTALL SHOCK ABSORBER TO BODY

Install the three bolts holding the shock absorber to the body. Torque the nuts.

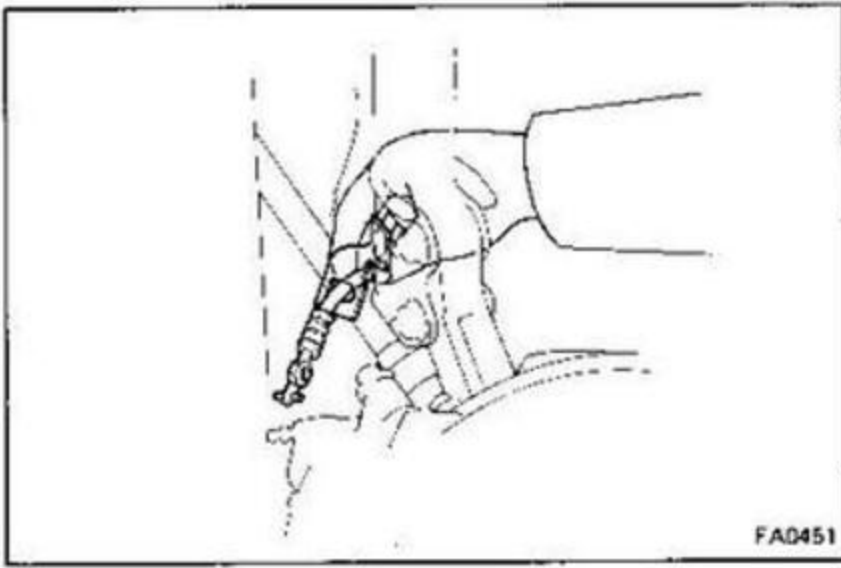
Torque: 650 kg-cm (47 ft-lb, 64 N·m)

CAUTION: Be careful not to damage the drive shaft boot.

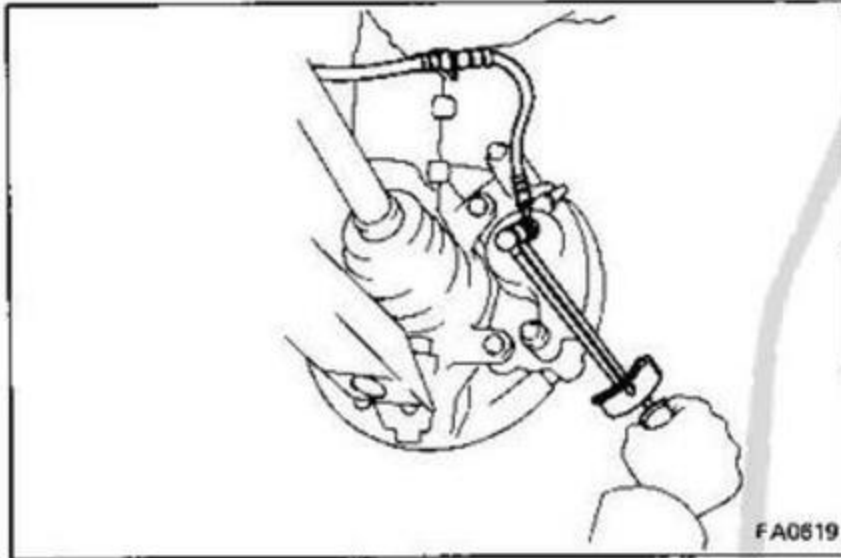
3. INSTALL STEERING KNUCKLE TO SHOCK ABSORBER

- (a) Connect the steering knuckle to the shock absorber lower bracket.
- (b) Insert the bolts from the rear side and align the match-marks of the camber adjust cam.
- (c) Apply engine oil to the threads of the two nuts.
- (d) Torque the nuts.

Torque: 2,100 kg-cm (152 ft-lb, 206 N·m)

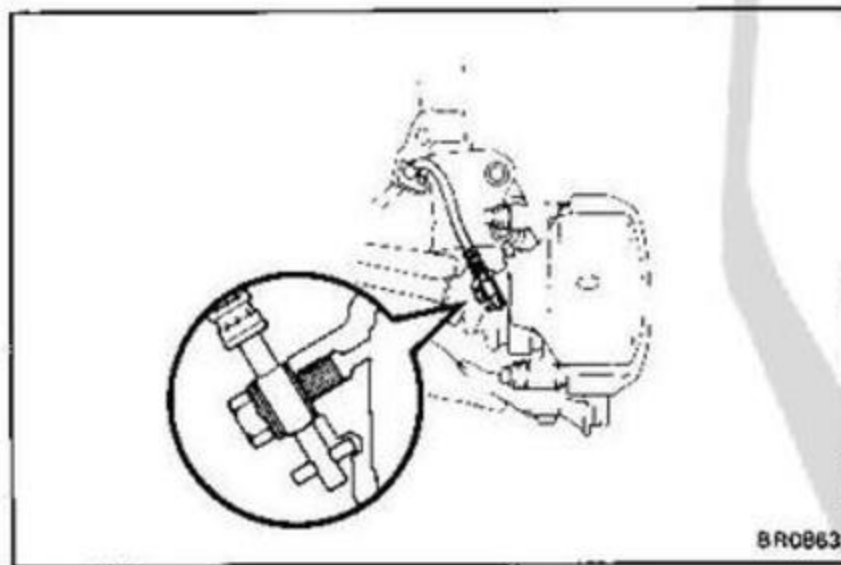
**4. CONNECT FLEXIBLE HOSE**

- (a) Run the flexible hose through the brake hose bracket.



- (b) Connect the flexible hose through the disc brake caliper with the union bolt and new gaskets.

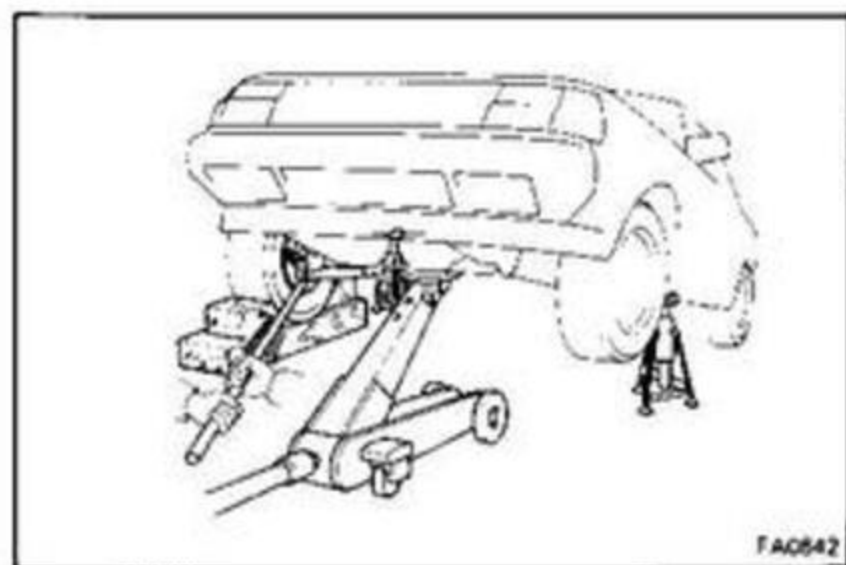
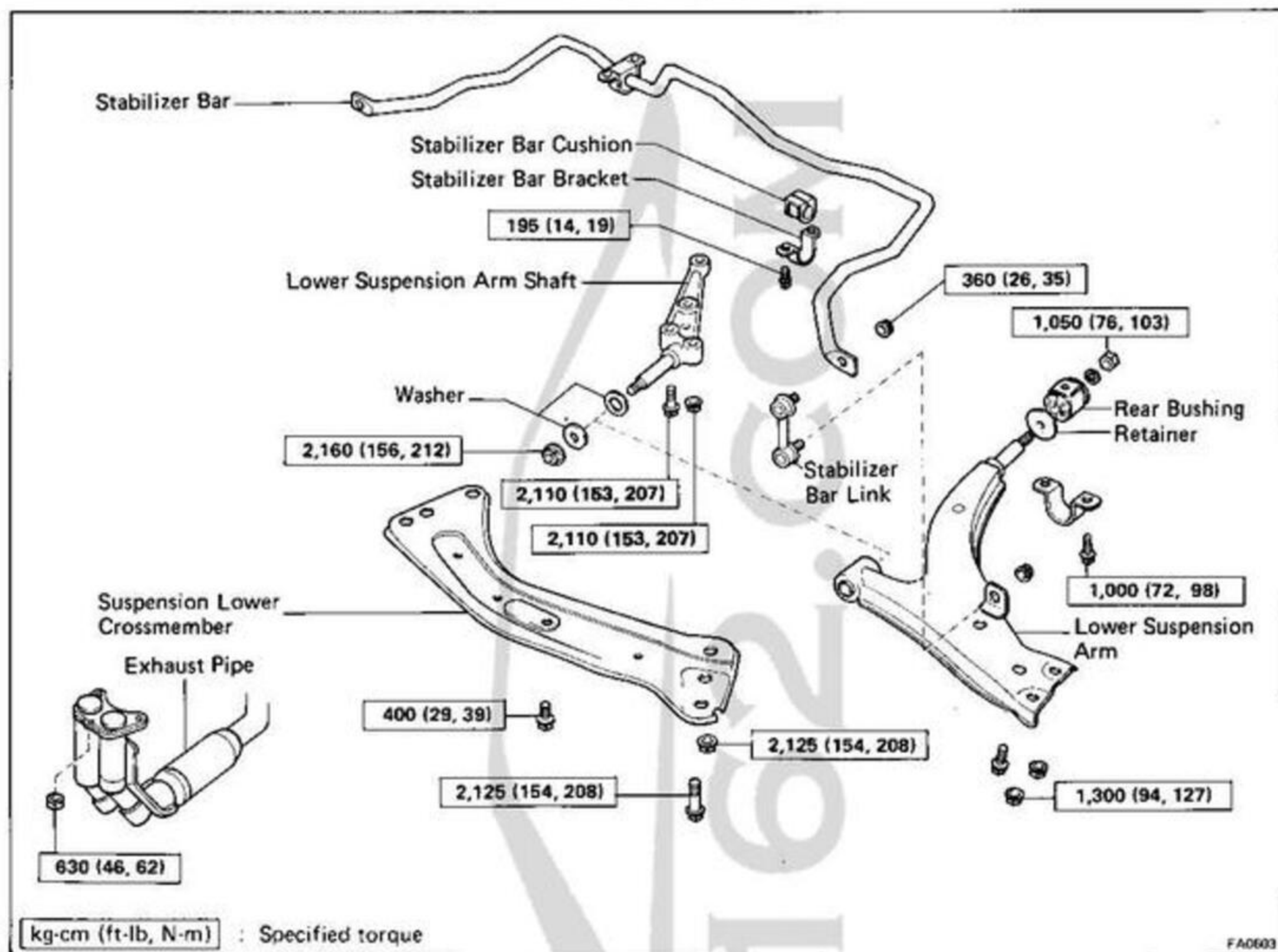
Torque: 310 kg-cm (22 ft-lb, 30 N·m)



NOTE: When connecting the flexible hose to the caliper, connect so the peg aligns with the hole.

5. INSTALL CLIP**6. BLEED BRAKE LINE (See page BR-3)****7. INSPECT CAMBER (See page FA-3)**

FRONT SUSPENSION COMPONENTS



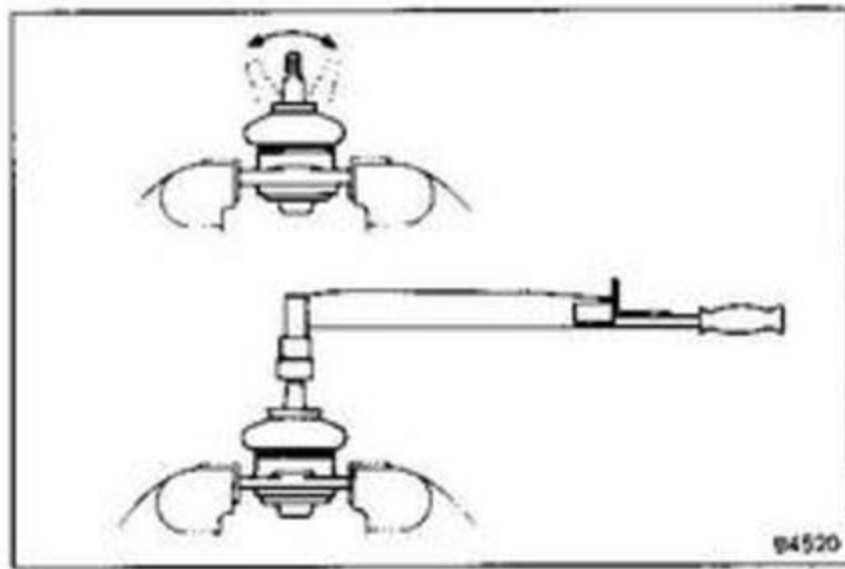
Ball Joints

INSPECTION OF BALL JOINTS

1. INSPECT BALL JOINTS FOR EXCESSIVE LOOSENESS

- Jack up the front of the vehicle and place a wooden block with a height of 180 - 200 mm (7.09 - 7.87 in.) under one front tire.
- Lower the jack until there is about half a load on one front coil spring. Place stands under the vehicle for safety.
- Make sure the front wheels are in a straightforward position and block the wheel with chocks.
- Move the lower arm up and down and check that the ball joint has no excessive play.

Ball joint vertical play: 0 mm (0 in.)



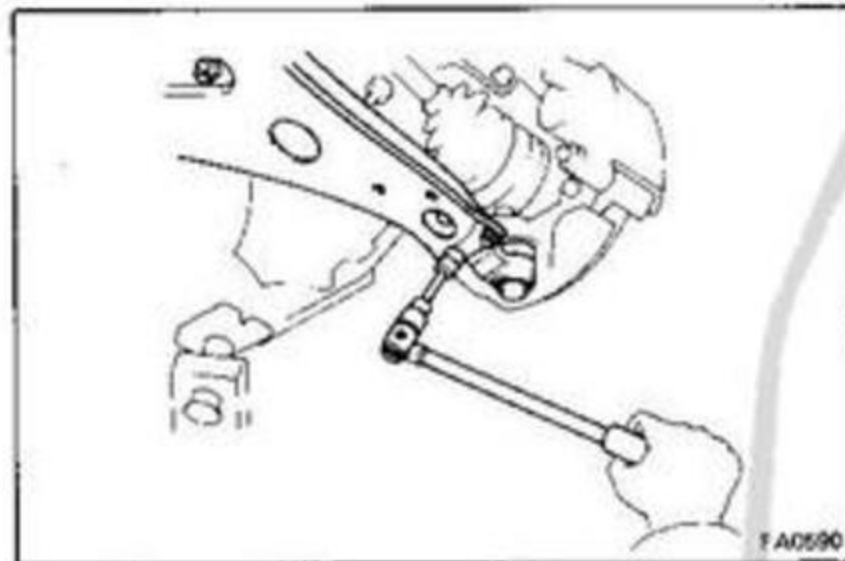
2. INSPECT BALL JOINT FOR ROTATION CONDITION

- (a) Remove the ball joint (See page FA-8).
- (b) Flip the ball joint stud back and forth 5 times as shown in the figure, before installing the nut.
- (c) Using a torque gauge, turn the nut continuously one turn each 2-4 seconds and take the torque reading on the fifth turn.

Torque (turning): 10 – 30 kg-cm
(9 – 26 in.-lb, 1.0 – 2.9 N·m)

If not within specification, replace the ball joint.

- (d) Install the ball joint.
(See page FA-9)



Lower Arm

(See page FA-37)

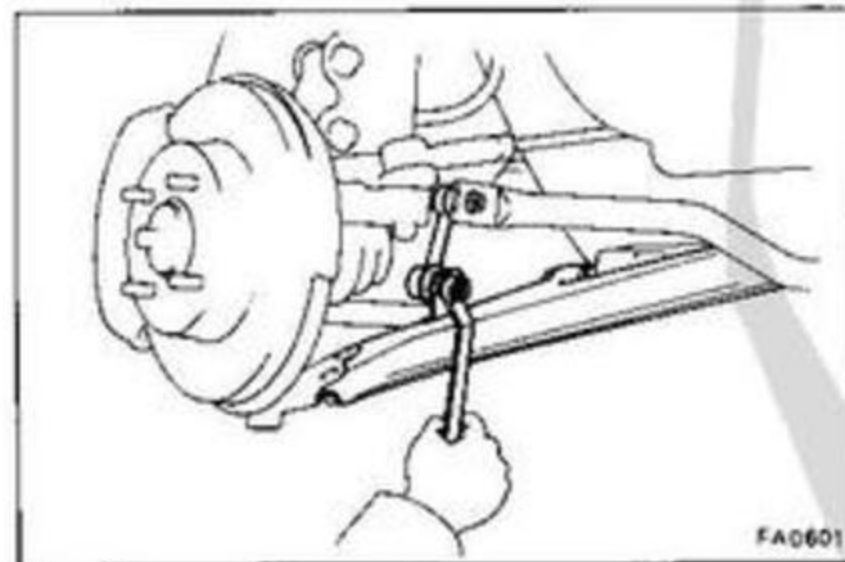
REMOVAL OF LOWER SUSPENSION ARM

1. DISCONNECT LOWER SUSPENSION ARM FROM STEERING KNUCKLE

Remove the bolt and two nuts holding the steering knuckle to the lower suspension arm.

2. DISCONNECT STABILIZER LINK FROM LOWER SUSPENSION ARM

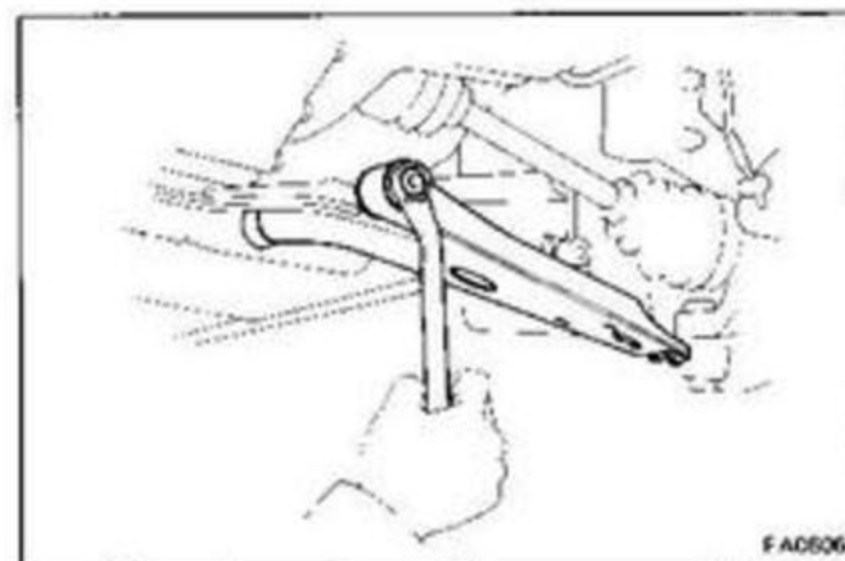
Remove the nut and disconnect the stabilizer link from the lower suspension arm.



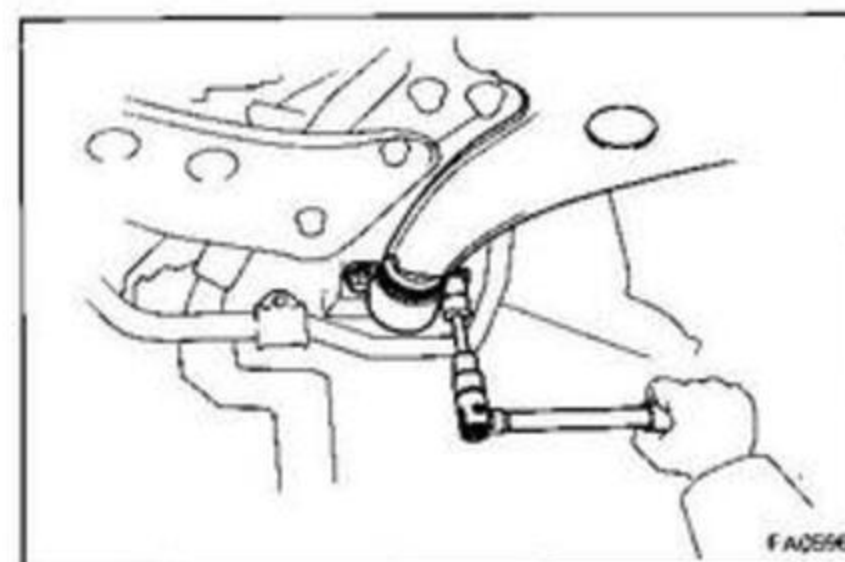
3. REMOVE LOWER SUSPENSION ARM

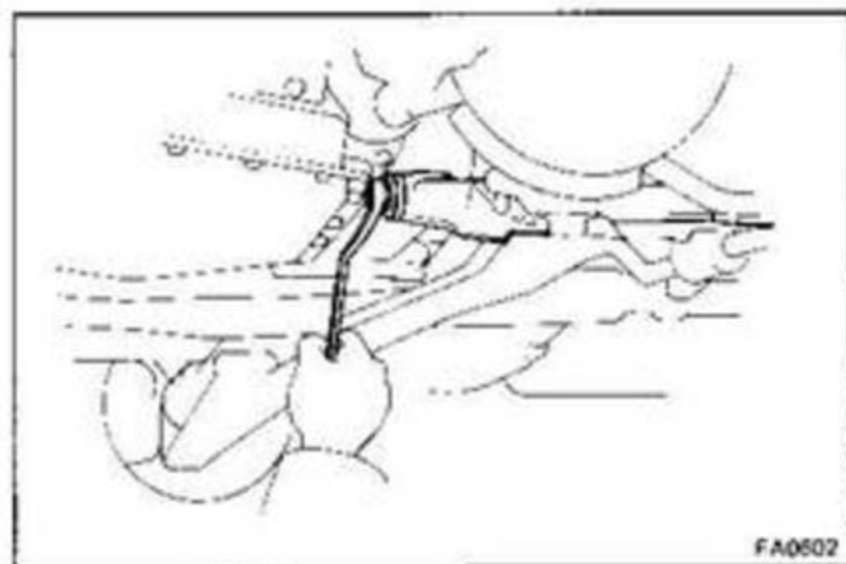
(Ex. A/T LH arm)

- (a) Remove the lower suspension arm front setting nut and washer.

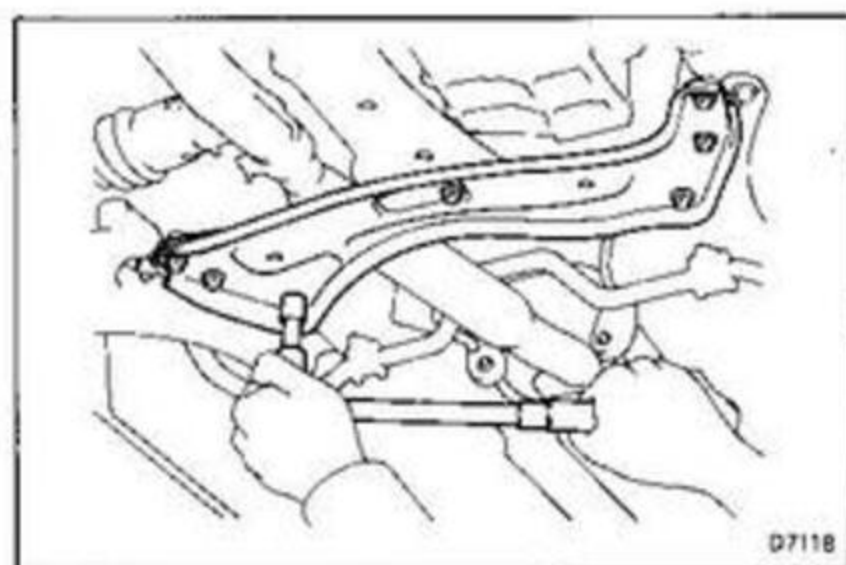


- (b) Remove the lower suspension arm rear bracket bolts.
- (c) Remove the lower suspension arm.

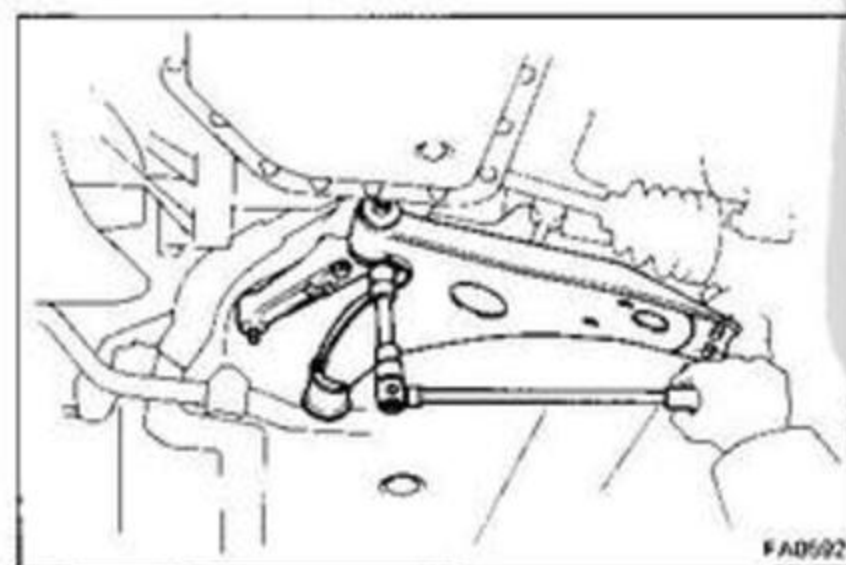


**(A/T LH arm)**

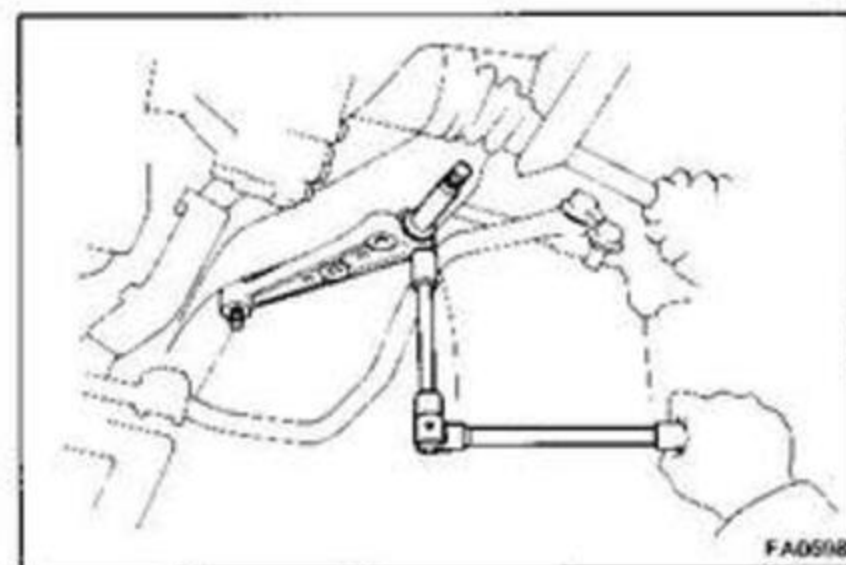
- (a) Remove lower suspension arm front setting nut and washer.



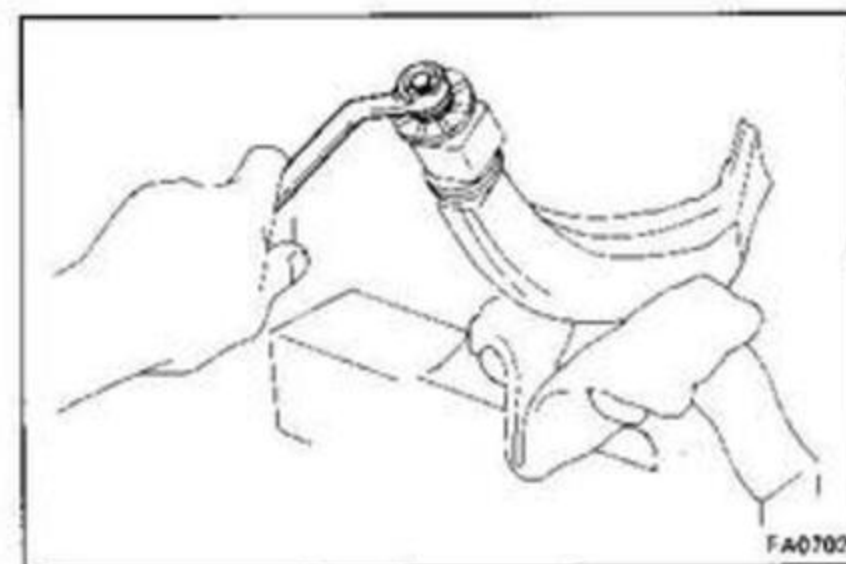
- (b) Remove the four bolts and two nuts and the suspension lower crossmember.



- (c) Remove the bolt and nut and the lower suspension arm with the lower arm shaft.

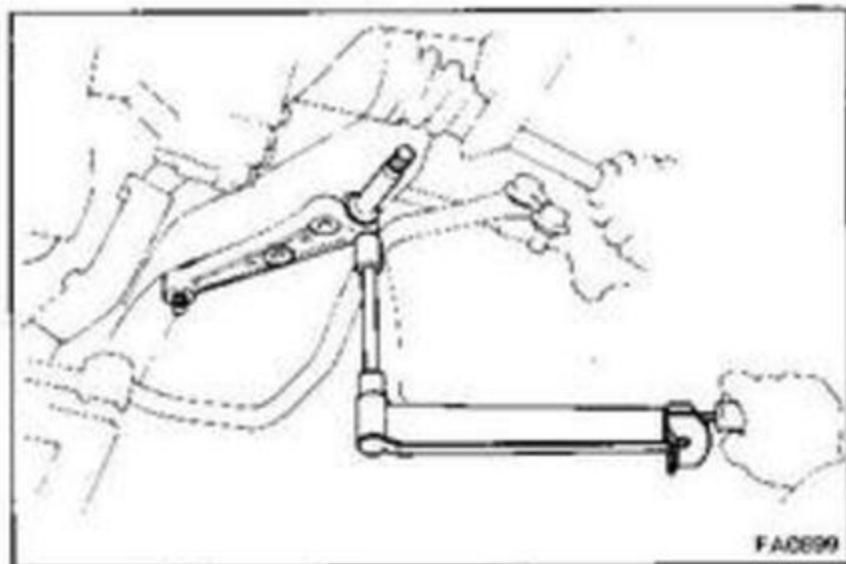
**4. (Ex. A/T LH SHAFT)****REMOVE LOWER SUSPENSION ARM SHAFT**

- (a) Remove the four bolts and two nuts, and remove the suspension lower crossmember.
- (b) Remove the bolt and nut, and remove the lower suspension arm shaft.

**REPLACEMENT OF LOWER SUSPENSION ARM REAR BUSHING**

1. REMOVE NUT AND BUSHING
2. INSTALL NEW BUSHING
3. INSTALL AND TORQUE NUT

Torque: 1,050 kg-cm (76 ft-lb, 103 N·m)



INSTALLATION OF LOWER SUSPENSION ARM

(See page FA-37)

1. (Ex. A/T LH SHAFT)

INSTALL LOWER SUSPENSION ARM SHAFT

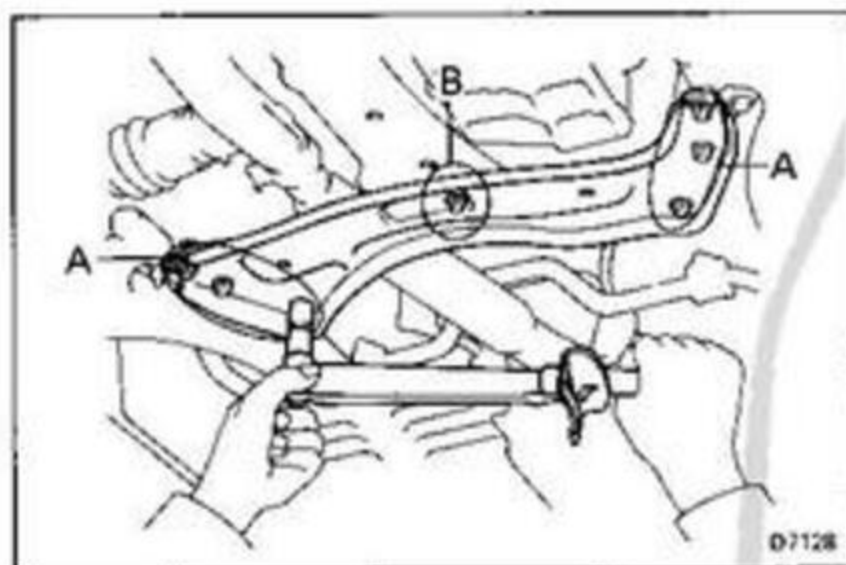
- (a) Install the lower suspension arm shaft and torque the nut and bolt (LH shaft) or bolt (RH shaft).

Torque: 2,110 kg-cm (153 ft-lb, 207 N·m)

- (b) Install the suspension lower crossmember and torque the four bolts and two nuts.

Torque: A 2,110 kg-cm (153 ft-lb, 207 N·m)

B 400 kg-cm (29 ft-lb, 39 N·m)

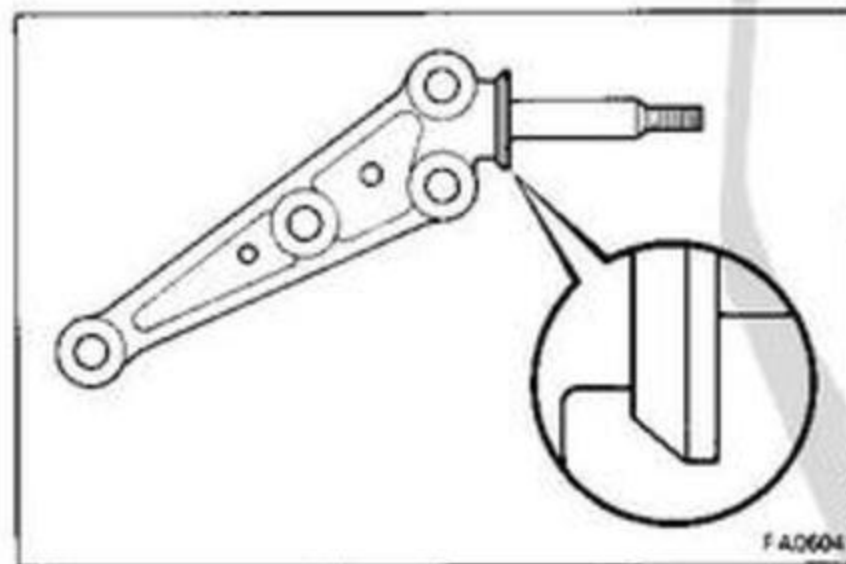


2. INSTALL LOWER SUSPENSION ARM

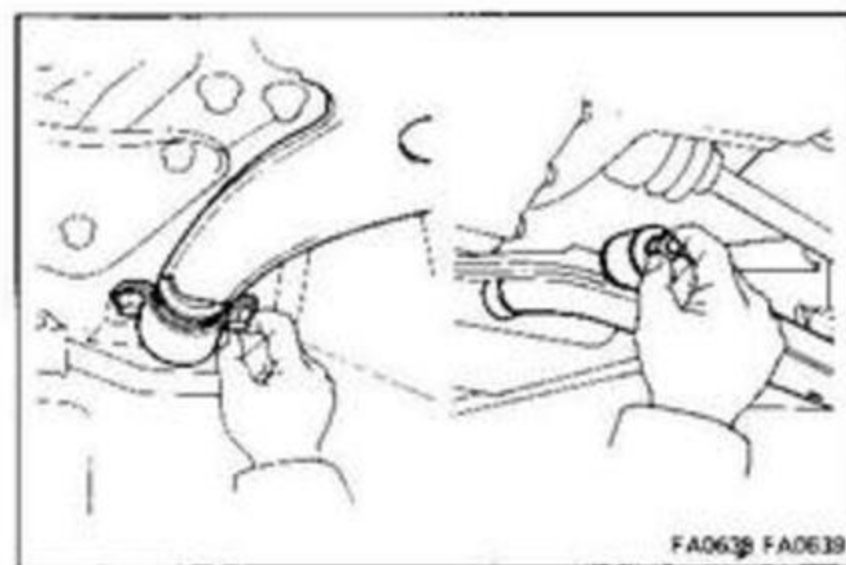
(Ex. A/T LH arm)

- (a) Install the washer to the lower suspension arm shaft.

NOTE: Install the washer with the tapered side towards the body.



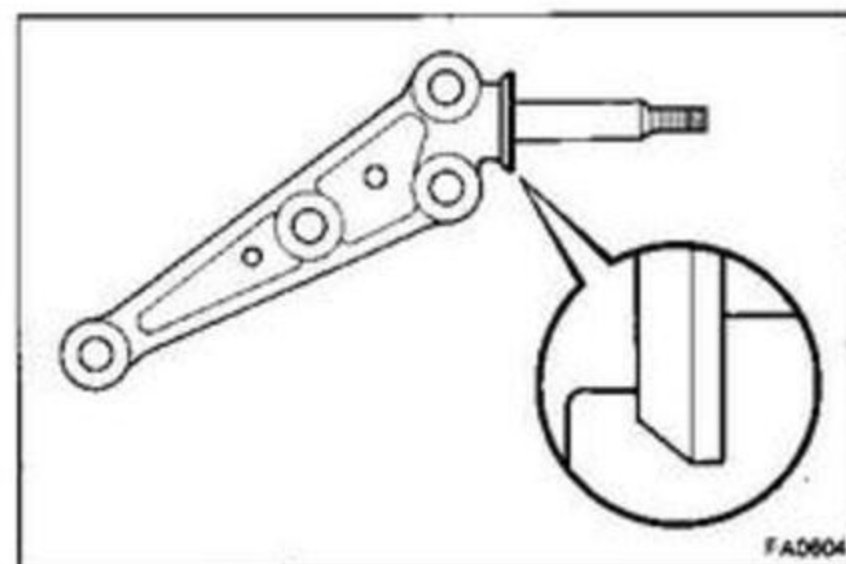
- (b) Install the lower suspension arm with the lower suspension arm rear bracket and temporarily install the washer and nut to the lower suspension arm shaft and rear bracket bolts.

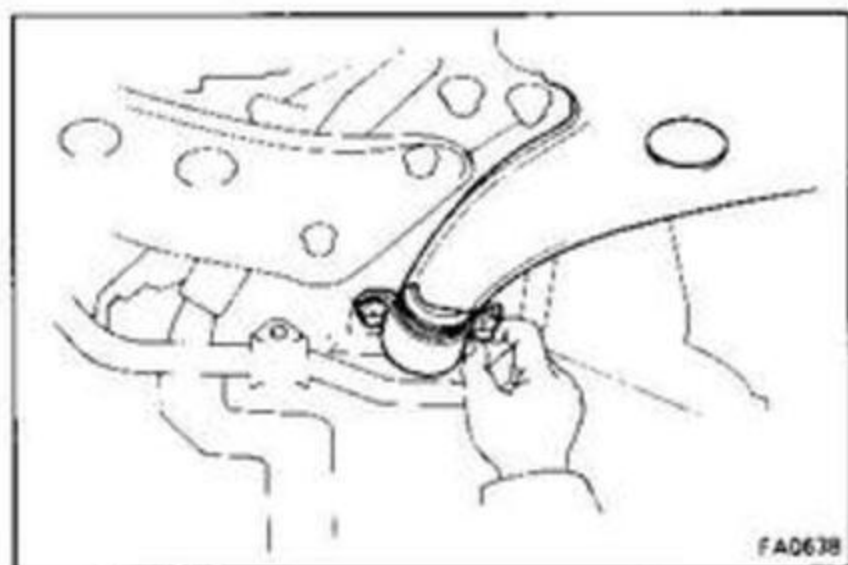


(A/T LH arm)

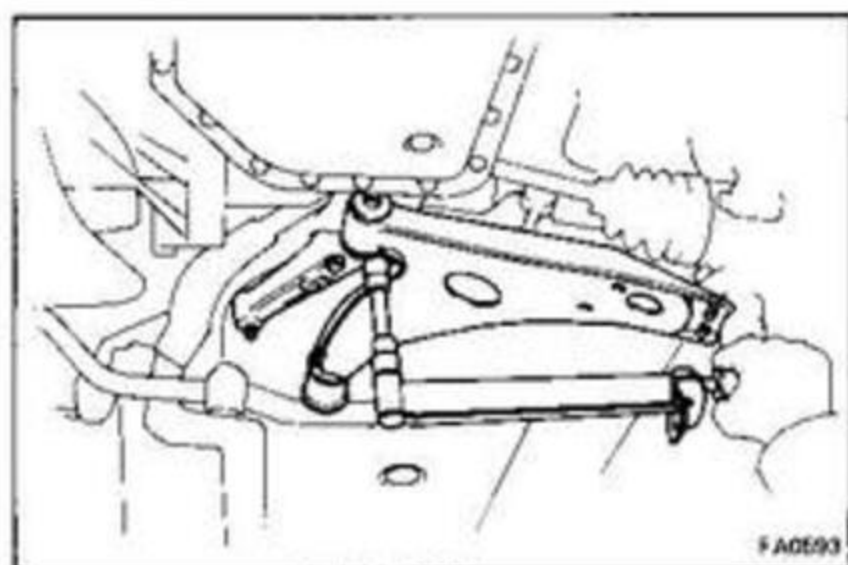
- (a) Install the washer to the lower suspension arm shaft and install them to the lower suspension arm and temporarily install the washer and nut to the lower suspension arm shaft.

NOTE: Install the washer with the tapered side towards the body.



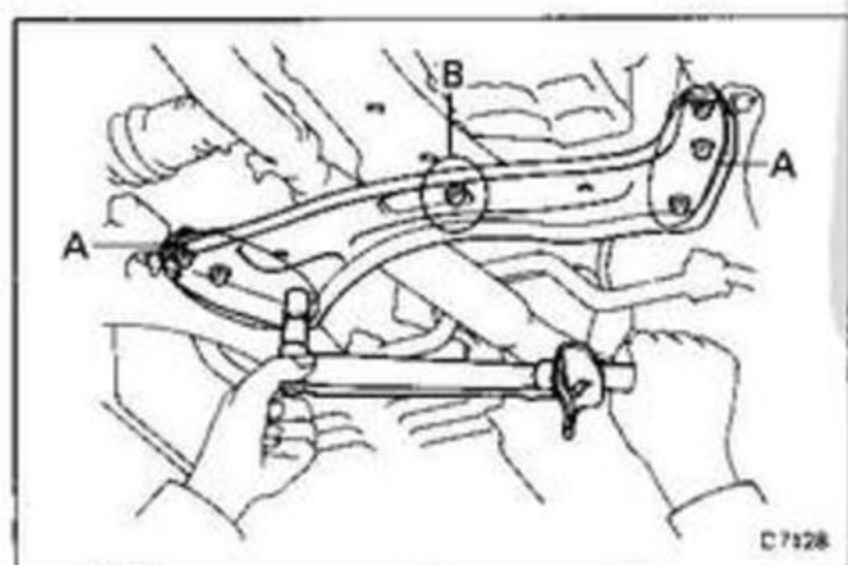


- (b) Install the lower suspension arm with the lower suspension arm shaft to the body and temporarily install the rear arm bracket bolts.



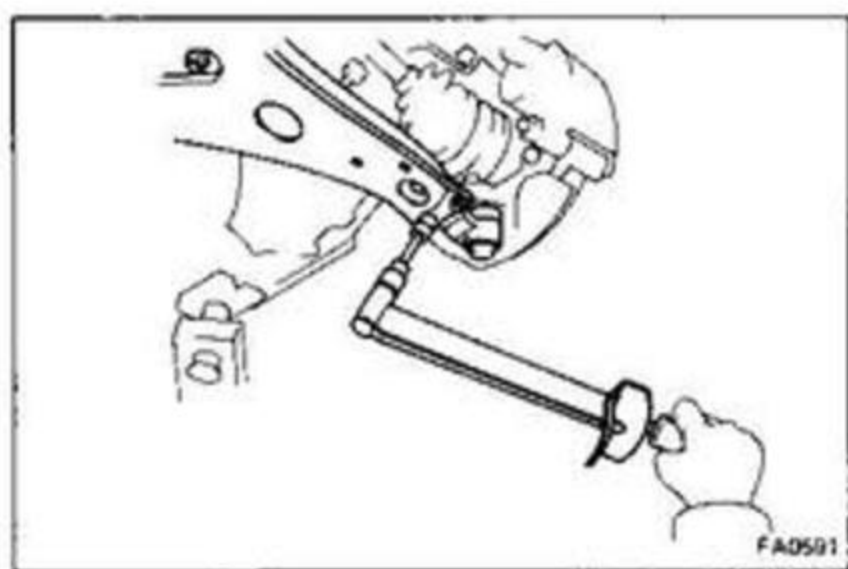
- (c) Install and torque the bolt and nut to the lower suspension arm shaft.

Torque: 2,110 kg-cm (153 ft-lb, 207 N·m)



- (d) Install the suspension lower crossmember to the body and torque the four bolts and two nuts.

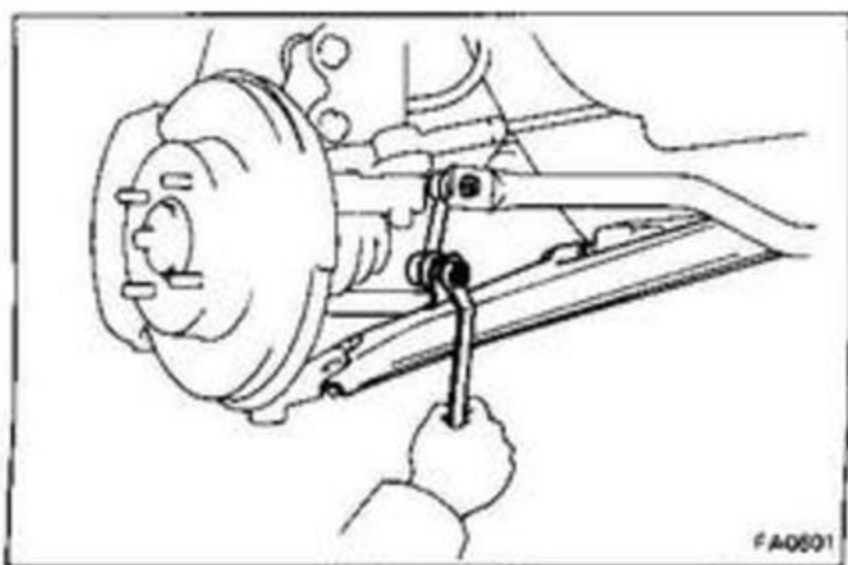
Torque: A 2,110 kg-cm (153 ft-lb, 207 N·m)
B 400 kg-cm (29 ft-lb, 39 N·m)



3. CONNECT LOWER SUSPENSION ARM TO STEERING KNUCKLE

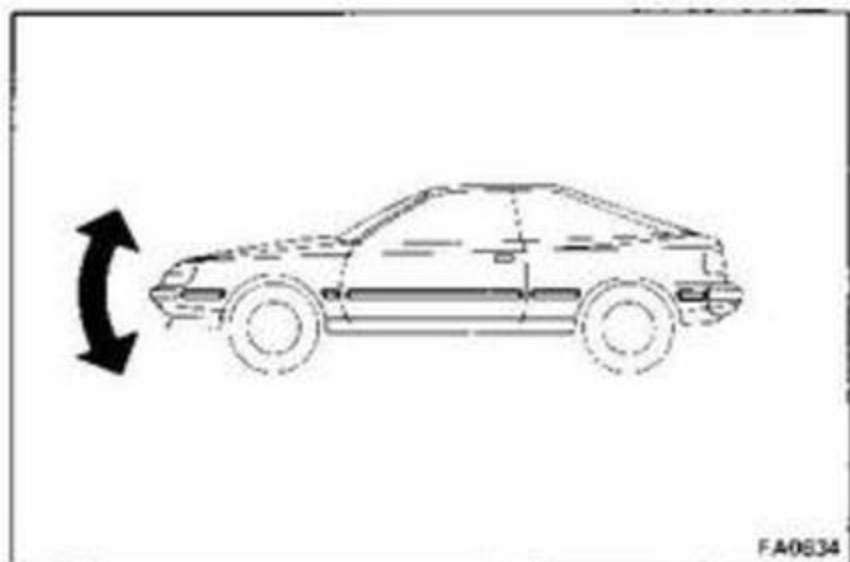
Connect the lower suspension arm to the steering knuckle and torque the bolt and two nuts.

Torque: 1,300 kg-cm (94 ft-lb, 127 N·m)



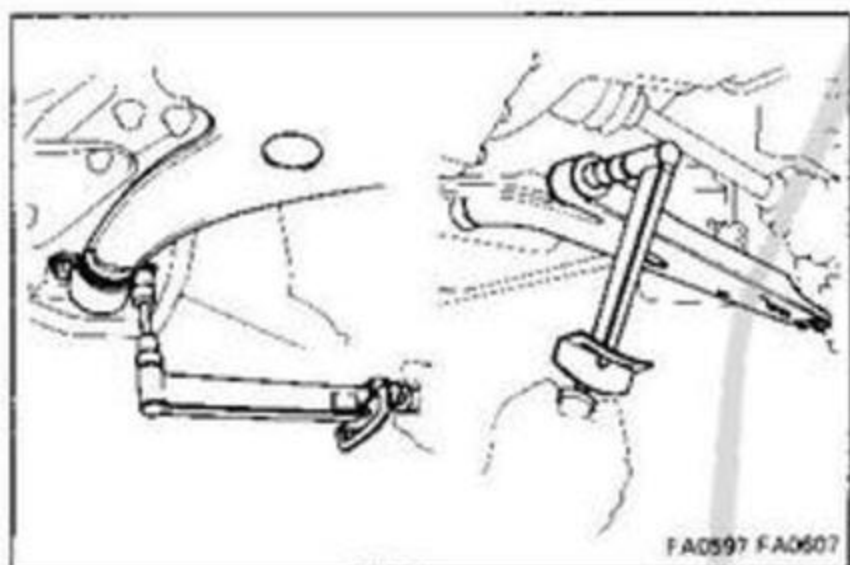
4. CONNECT STABILIZER LINK

Connect the stabilizer link to the lower suspension arm and torque the nut.



5. INSTALL WHEEL AND LOWER VEHICLE

Bounce the vehicle up and down to stabilize the suspension.



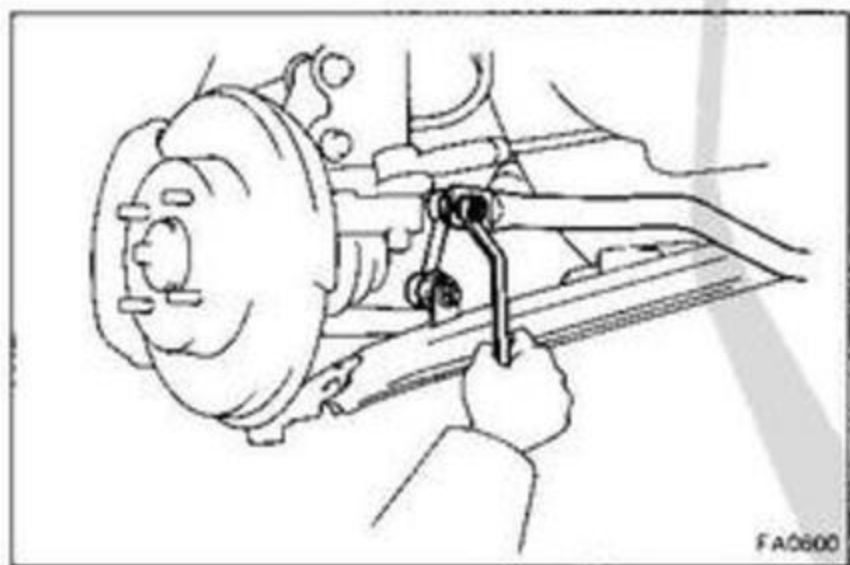
6. TORQUE FRONT SETTING NUT AND REAR BRACKET BOLTS

Torque:

Front setting nut 2,160 kg-cm (156 ft-lb, 212 N·m)

Rear bracket bolts 1,000 kg-cm (72 ft-lb, 98 N·m)

7. CHECK FRONT WHEEL ALIGNMENT (See page FA-3)

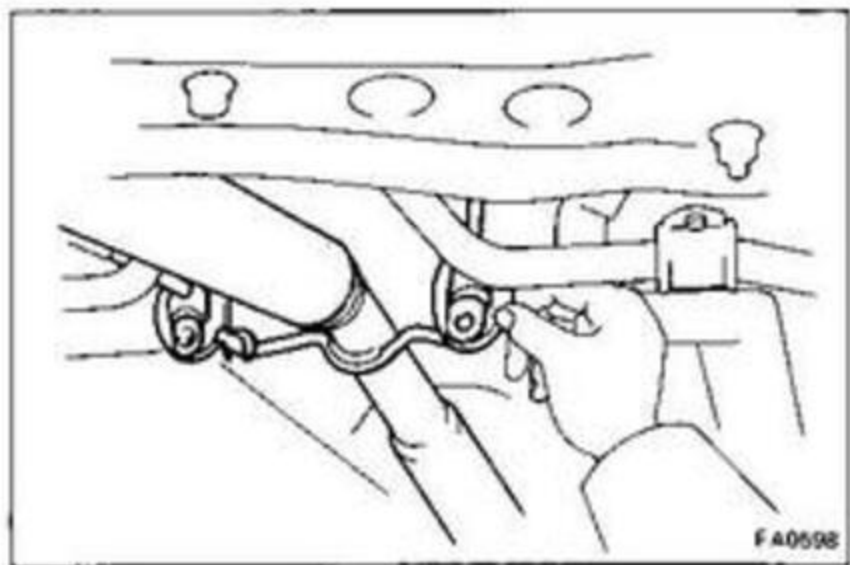
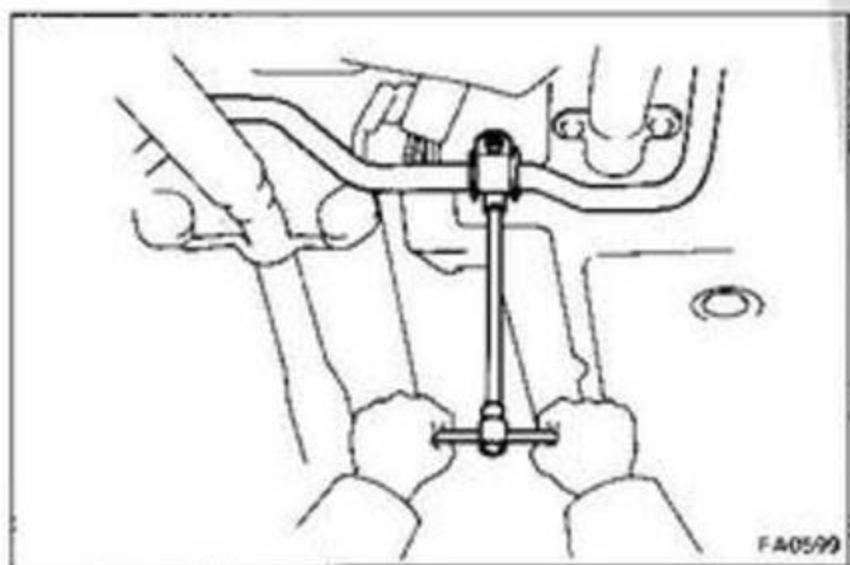


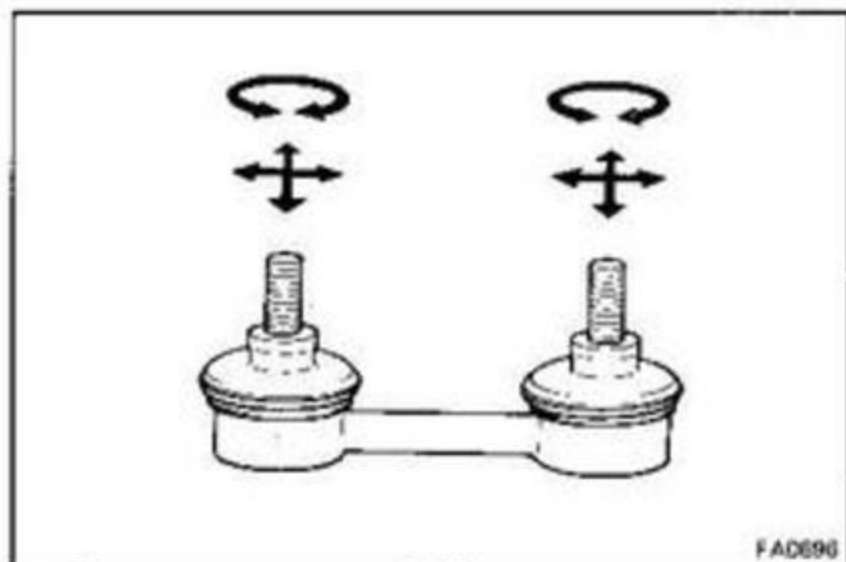
Stabilizer Bar and Link

(See page FA-36)

REMOVAL OF STABILIZER BAR AND LINK

1. DISCONNECT STABILIZER LINK FROM LOWER SUSPENSION ARM AND STABILIZER BAR
2. REMOVE BOTH STABILIZER BAR BRACKETS FROM BODY
3. DISCONNECT EXHAUST PIPE FROM EXHAUST MANIFOLD
4. DISCONNECT EXHAUST PIPE FROM TAIL PIPE RING
5. REMOVE STABILIZER BAR

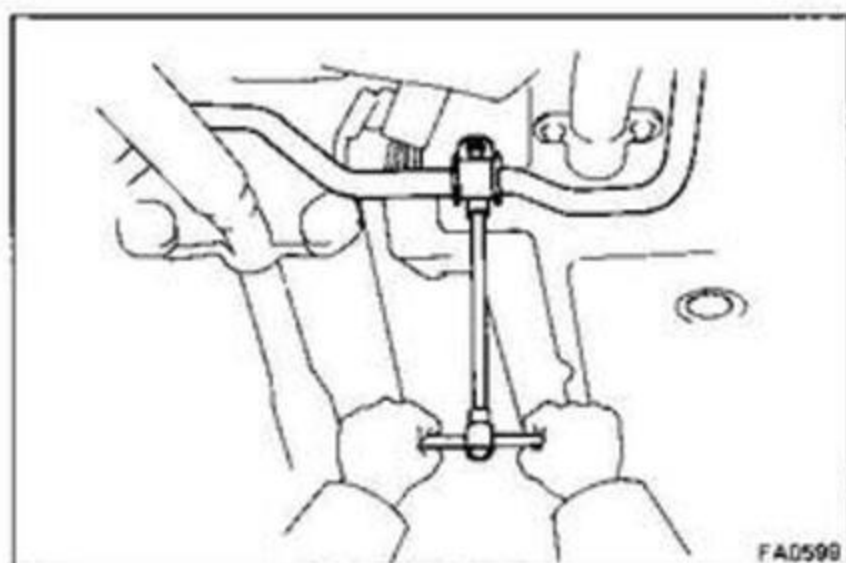




INSPECTION OF STABILIZER LINK

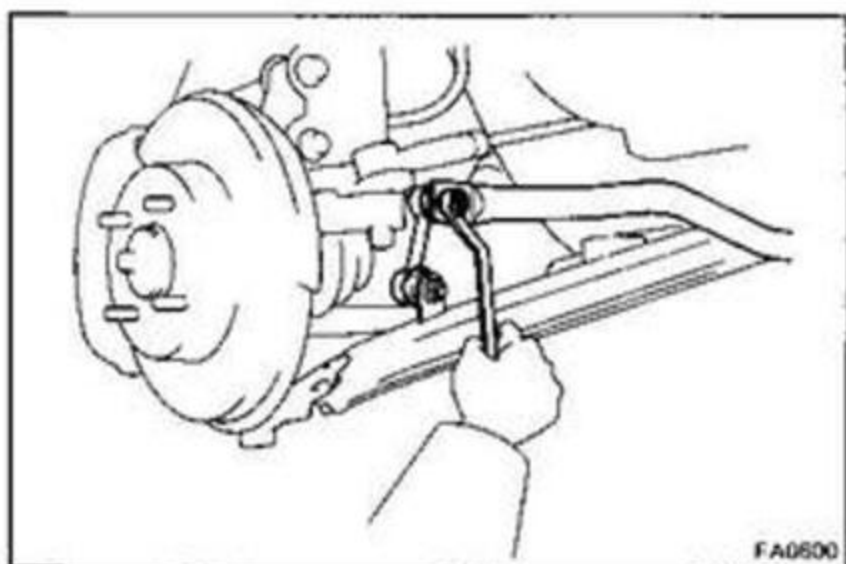
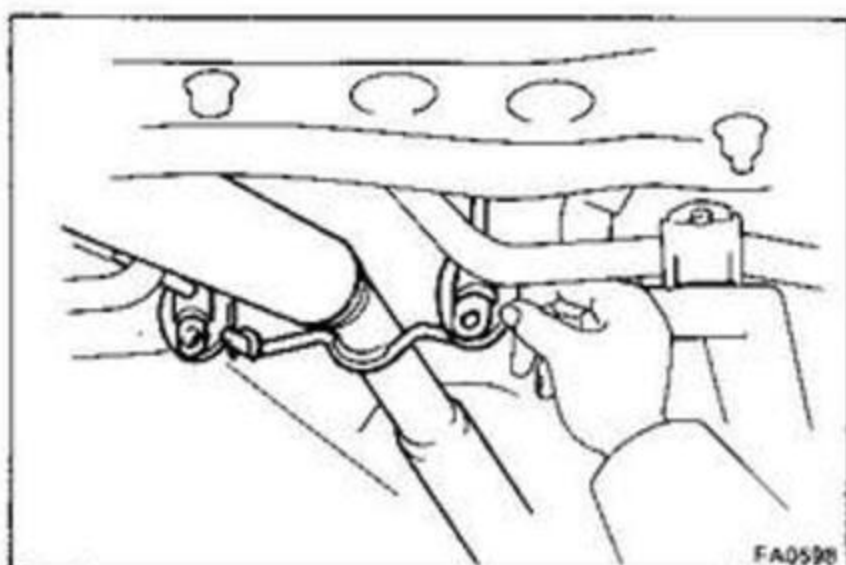
INSPECT STABILIZER LINK

Rotate ball joint arm in all directions. If the movement is not smooth and free, replace the stabilizer link.



INSTALLATION OF STABILIZER BAR AND LINK

1. INSTALL STABILIZER BAR TO BODY
2. INSTALL STABILIZER CUSHION AND STABILIZER BAR BRACKET
3. TORQUE STABILIZER BAR BRACKET BOLTS
Torque: 195 kg-cm (14 ft-lb, 19 N·m)
4. CONNECT EXHAUST PIPE TO EXHAUST MANIFOLD
Torque: 630 kg-cm (46 ft-lb, 62 N·m)
5. CONNECT EXHAUST PIPE TO TAIL PIPE RING



6. INSTALL AND TORQUE STABILIZER LINK TO LOWER SUSPENSION ARM AND STABILIZER BAR
Torque: 360 kg-cm (26 ft-lb, 35 N·m)