

FRONT AXLE AND SUSPENSION

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TROUBLESHOOTING (2WD)

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 end alignment	FA-3
	Wheel bearing adjusted too tight	Adjust wheel bearing	FA-8
	Front or rear suspension parts loose or broken	Tighten or replace suspension part	
	Steering linkage loosen or worn	Tighten or replace steering linkage	SR-68
	Steering gear out of adjustment or broken	Adjust or repair steering gear	SR-3
Bottoming	Vehicle overloaded	Check loading	
	Shock absorber worn out	Replace shock absorber	FA-17
	Springs weak	Replace spring	FA-15
Sways/pitches	Tires improperly inflated	Inflate tires to proper pressure	FA-3
	Stabilizer bar bent or broken	Inspect stabilizer bar	FA-23
	Shock absorber worn out	Replace shock absorber	FA-17
Front wheel shimmy	Tires worn or improperly inflated	Replace tire or inflate tires to proper pressure	FA-3
	Wheels out of balance	Balance wheels	
	Shimmy damper worn out	Replace steering damper	SR-77
	Shock absorber worn out	Replace shock absorber	FA-17
	Alignment incorrect	Check front end alignment	FA-3
	Wheel bearings worn or improperly adjusted	Replace or adjust wheel bearings	FA-8
	Ball joints or bushings worn	Inspect ball joints and bushings	FA-13, 18 20
	Steering linkage loosen or worn	Tighten or replace steering linkage	SR-68
	Steering gear out of adjustment or broken	Adjust or repair steering gear	SR-3
Abnormal tire wear	Tires improperly inflated	Inflate tires to proper pressure	FA-3
	Shock absorbers worn out	Replace shock absorber	FA-17
	Alignment incorrect	Check toe-in	FA-5
	Suspension parts worn	Replace suspension part	

FRONT WHEEL ALIGNMENT (2WD)

1. MAKE FOLLOWING CHECKS AND CORRECT ANY PROBLEMS

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

Correct tire pressure: kg/cm² (psi, kPa)

Tire Size	Front	Rear
7.00 — 14 — 6 PR	1.7 (24, 167)	2.5 (36, 245)
P195/75 R 14	2.0 (28, 196)	2.45 (35, 240)
205/70 SR 14	1.9 (27, 186)	2.25 (32, 221)
185 R 14 — LT 8 PR	1.8 (26, 177)	4.5 (64, 441)

(b) Check the wheel runout.

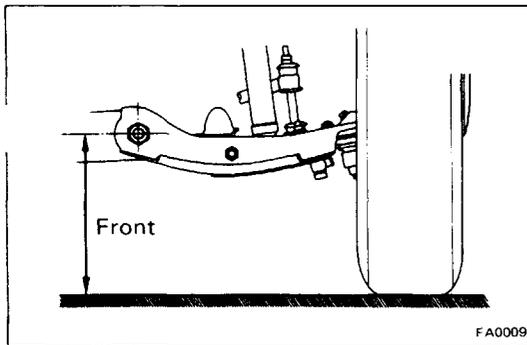
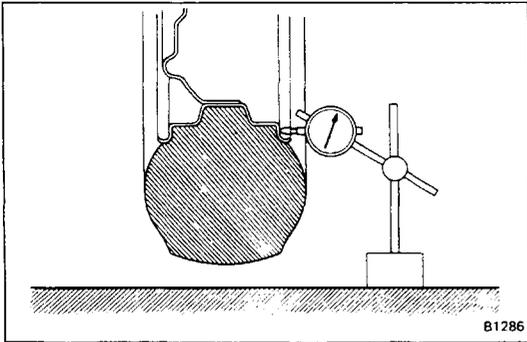
Lateral runout: Less than 1.2 mm (0.047 in.)

(c) Check the front wheel bearings for looseness.

(d) Check the front suspension for looseness.

(e) Check the steering linkage for looseness.

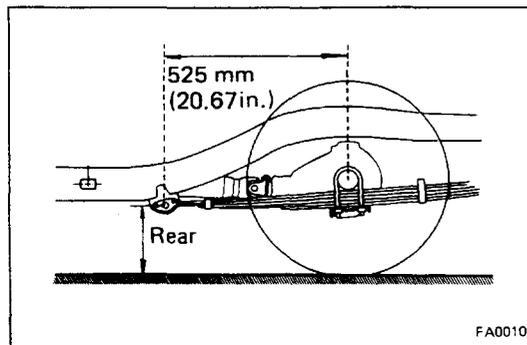
(f) Use the standard bounce test to check that the front absorbers work properly.

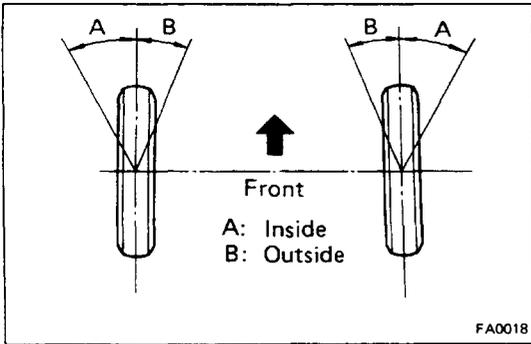


2. MEASURE VEHICLE HEIGHT

If height of the vehicle is not as specified, try to level the vehicle by shaking it down. If it is still not correct, check for bad springs and worn or loose suspensions parts.

Vehicle height: See page A-21





3. ADJUST WHEEL ANGLE

Remove the caps of the knuckle stopper bolts and check the steering angles.

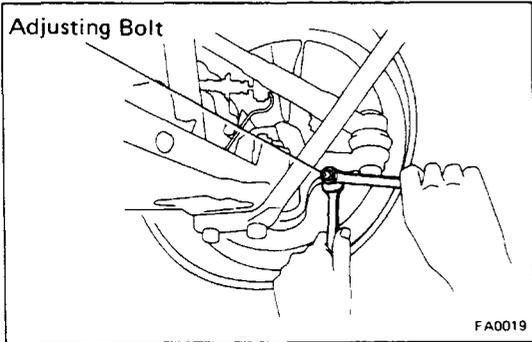
Wheel angle		
Max.	Inside wheel	$34^{\circ} + 1^{\circ}$ $- 2^{\circ}$
	Outside wheel	30°
at 20°	Inside wheel	$22^{\circ} 15'$
	Outside wheel	20°

NOTE: When the steering wheel is fully turned, make sure that the wheel is not touching the body or brake flexible hose.

If maximum steering angles differ from standard value, adjust the wheel angle with the knuckle stopper bolts.

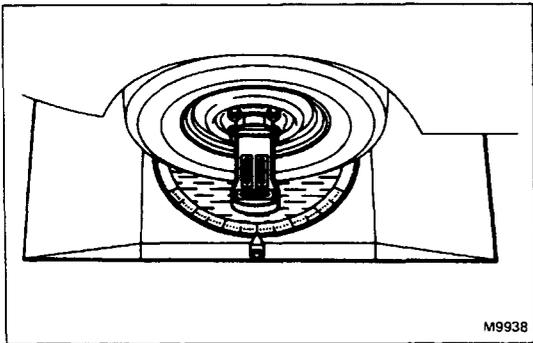
Torque: 350 kg-cm (25 ft-lb, 34 N·m)

If the wheel angle still cannot be adjusted within limits, inspect and replace damaged or worn steering parts.

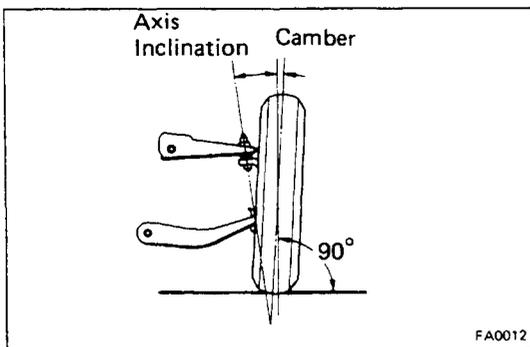


4. INSTALL WHEEL ALIGNMENT EQUIPMENT

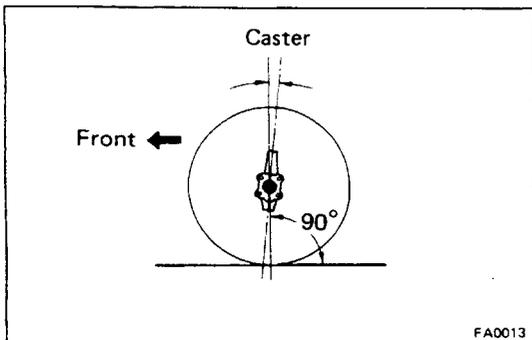
Follow the specific instructions of the equipment manufacturer.

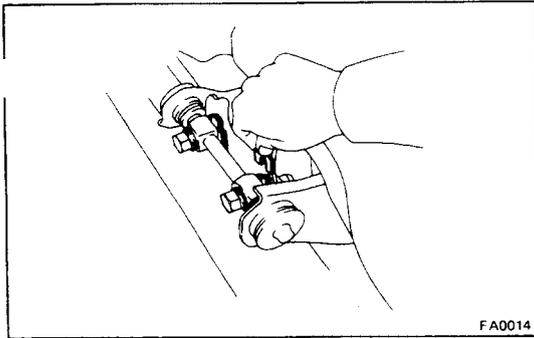


5. ADJUST CAMBER, STEERING AXIS INCLINATION AND CASTER



	Inspection STD	Adjustment STD
Camber	$0^{\circ} 30' \pm 45'$	$0^{\circ} 30' \pm 30'$
Left-right error	30'	30'
Steering axis inclination	10°	
Caster		
1/2 ton short	$0^{\circ} 40' \pm 45'$	$0^{\circ} 40' \pm 30'$
1/2 ton Long	$1^{\circ} 10' \pm 45'$	$1^{\circ} 10' \pm 30'$
1 ton	$0^{\circ} 35' \pm 45'$	$0^{\circ} 35' \pm 30'$
C & C	$0^{\circ} 05' \pm 45'$	$0^{\circ} 05' \pm 30'$
Left-right error	30'	30'





If camber/caster is not within specification, adjust by adding or removing shims on the upper arm.

Shim thickness		mm (in.)
Thickness		
4.0		(0.157)
1.6		(0.063)
1.2		(0.047)

If the steering axis inclination is not as specified after camber and caster have been correctly adjusted, recheck the steering knuckle and front wheel for bending or looseness.

6. ADJUST TOE-IN

- (a) Make sure the wheels are positioned straight ahead.
- (b) Mark the center of each rear tread at spindle height and measure the distance between the marks on the right and left tires.
- (c) Advance the vehicle until the marks on the rear side of the tires come to the front.

NOTE: The toe-in should be measured at the same point on the tire and at the same level.

- (d) Measure the distance between the marks on the front side of the tires.

Toe-in:

mm (in.)

	Tire	Inspection STD	Adjustment STD
1/2 ton Short	Bias	4 ± 4 (0.16 ± 0.16)	4 ± 1 (0.16 ± 0.04)
	Radial	1 ± 4 (0.04 ± 0.16)	1 ± 1 (0.04 ± 0.04)
1/2 ton Long	Bias	6 ± 4 (0.24 ± 0.16)	6 ± 1 (0.12 ± 0.04)
	Radial	3 ± 4 (0.12 ± 0.16)	3 ± 1 (0.12 ± 0.04)
1 ton, C & C	Radial	4 ± 4 (0.16 ± 0.16)	4 ± 1 (0.16 ± 0.04)

- (e) Loosen the clamp bolts.
- (f) Adjust toe-in by turning the left and right tie rod tubes an equal amount.

NOTE: Make sure that the tie rods are the same length.

Left-right error: Less than 3.0 mm (0.118 in.)

- (g) Tighten the clamp bolts and torque them.

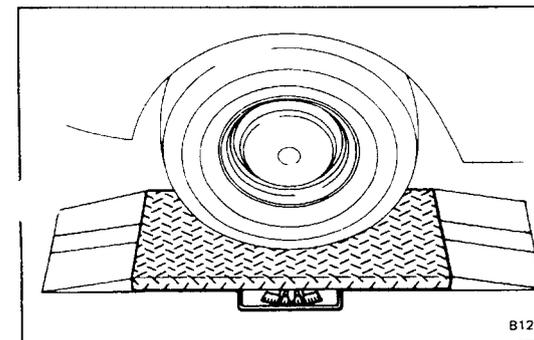
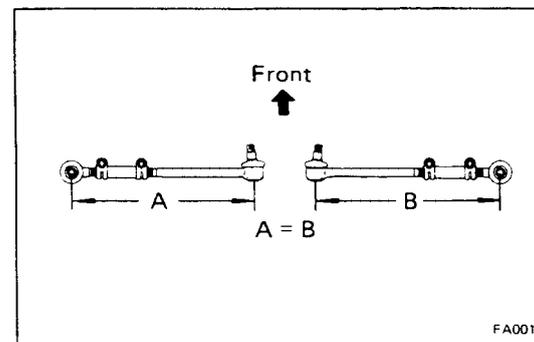
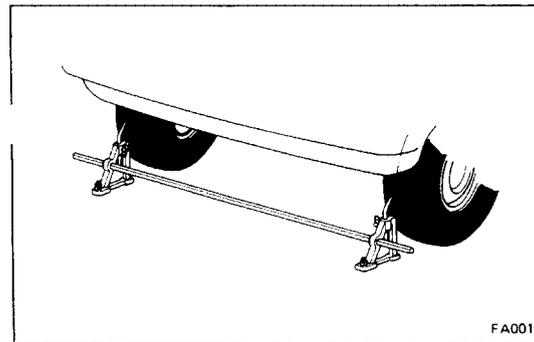
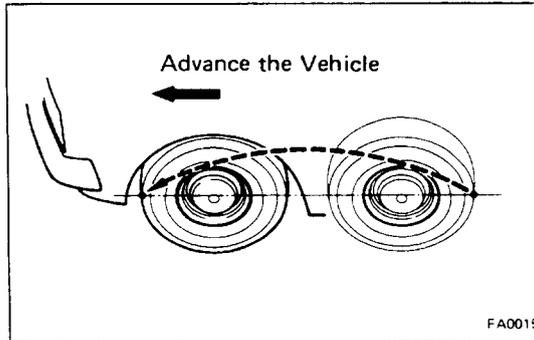
Torque: 260 kg-cm (19 ft-lb, 25 N·m)

7. INSPECT SIDE SLIP WITH SIDE SLIP TESTER

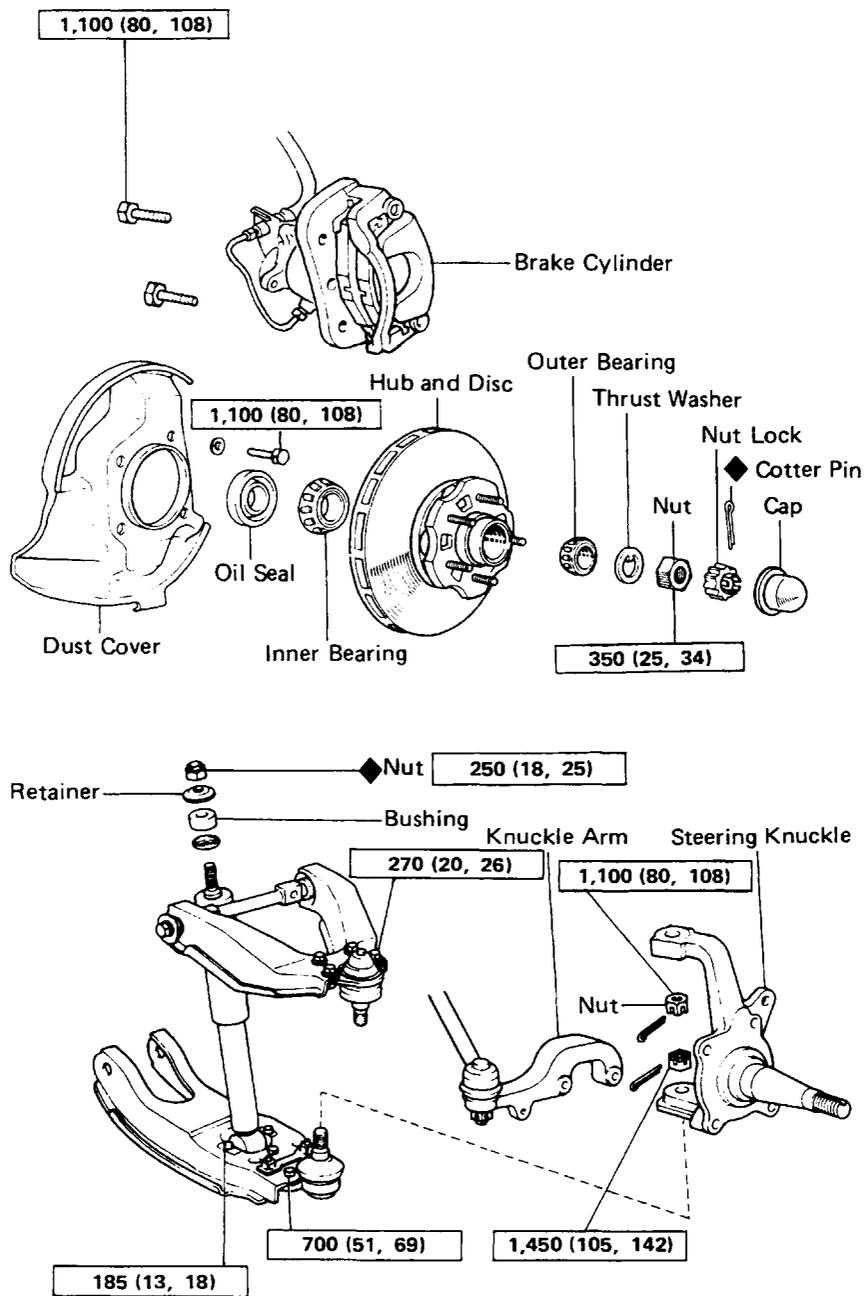
Side slip limit:

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

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



FRONT AXLE HUB AND STEERING KNUCKLE (2WD) COMPONENTS



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

◆ : Non-reusable part

Front Axle Hub

(See page FA-6)

DISASSEMBLY OF FRONT AXLE HUB

1. REMOVE DISC BRAKE CYLINDER AND TORQUE PLATE

- (a) Remove the brake cylinder and suspend it with wire.
- (b) Remove the torque plate.

NOTE: Do not disconnect the brake tube and hose.

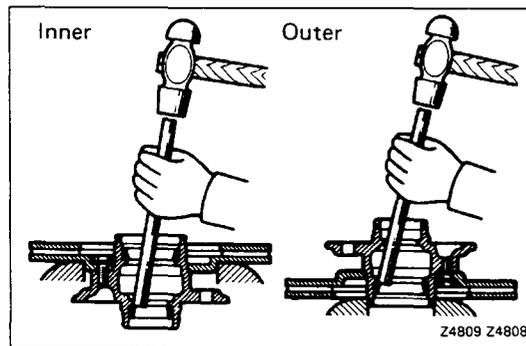
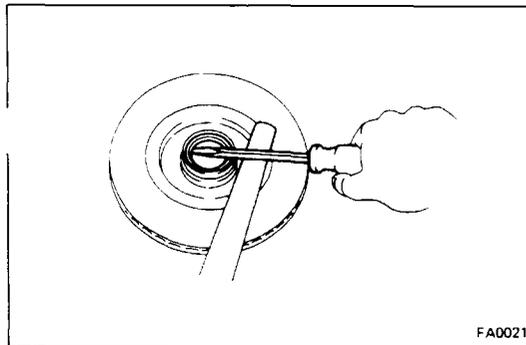
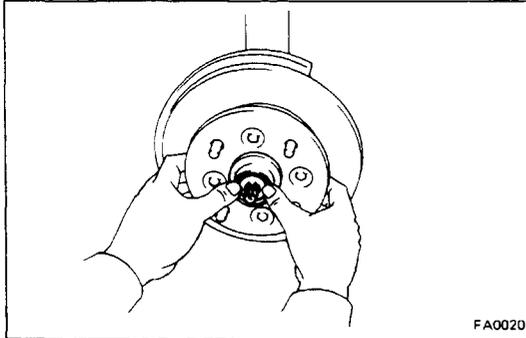
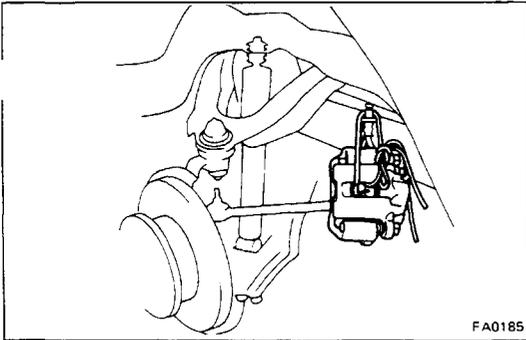
2. REMOVE AXLE HUB WITH DISC

- (a) Remove the cap, cotter pin, nut lock and nut.
- (b) Remove the hub and disc together with the outer bearing and thrust washer.

NOTE: Be careful not to drop the outer bearing.

3. REMOVE INNER BEARING AND OIL SEAL

- (a) Using a screwdriver, pry out the oil seal.
- (b) Remove the inner bearing from the hub.



INSPECTION AND REPAIR OF FRONT AXLE HUB

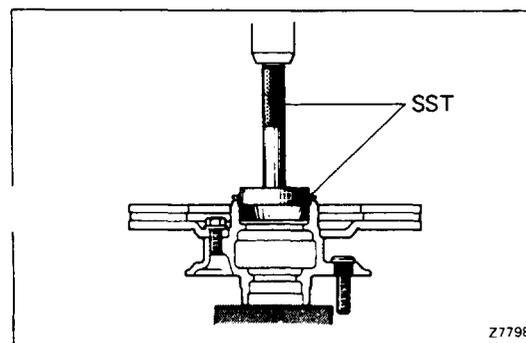
1. INSPECT BEARING

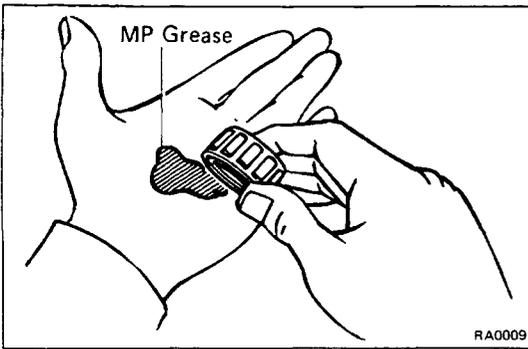
Clean the bearings and outer races and inspect them for wear or damage.

2. REPLACE BEARING OUTER RACE

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

- (b) Using SST, carefully drive in a new bearing outer race.
SST 09608-30011

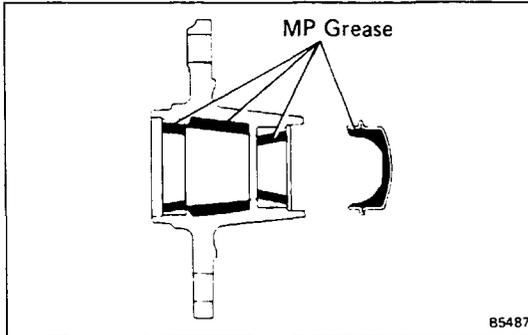




ASSEMBLY OF FRONT AXLE HUB

1. PACK BEARINGS WITH MP GREASE

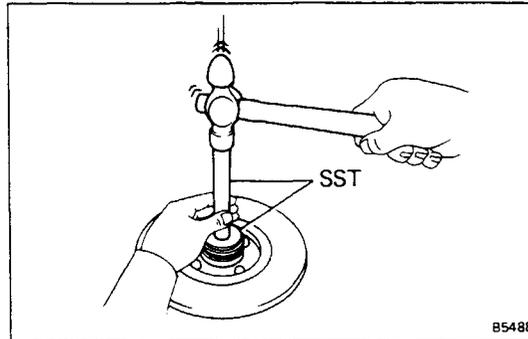
- (a) Place MP grease in the palm of your hand.
- (b) Pack grease into the bearing, continuing until the grease oozes out from the other side.
- (c) Do the same around the bearing circumference.



2. COAT INSIDE OF HUB AND CAP WITH MP GREASE

3. INSTALL INNER BEARING AND OIL SEAL

Place inner bearing into the hub. Using SST, drive the oil seal into the hub. Coat the oil seal with MP grease.
SST 09608-30011



4. INSTALL AXLE HUB ON SPINDLE

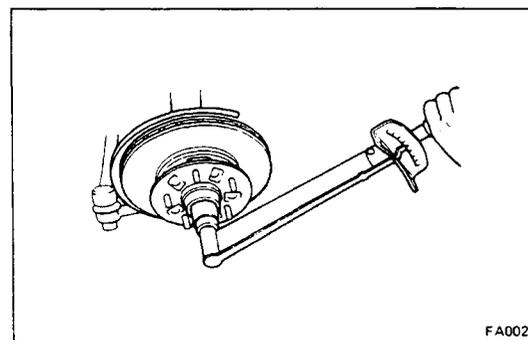
- (a) Place the axle hub on the spindle.
- (b) Install the outer bearing and thrust washer.

5. ADJUST PRELOAD

- (a) Install and torque the nut.

Torque: 350 kg-cm (25 ft-lb, 34 N·m)

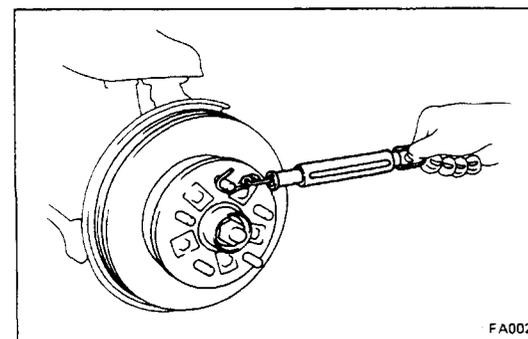
- (b) Turn the hub right and left two or three times to allow the bearings to settle.
- (c) Loosen the nut so there is 0.5 — 1.0 mm (0.020 — 0.039 in.) play in the hub axial direction.

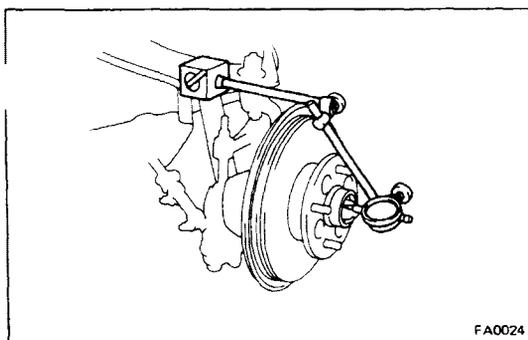


- (d) Using a spring tension gauge, measure the frictional force of the oil seal.
- (e) Adjust the preload by tightening the nut.

Preload (rotating):

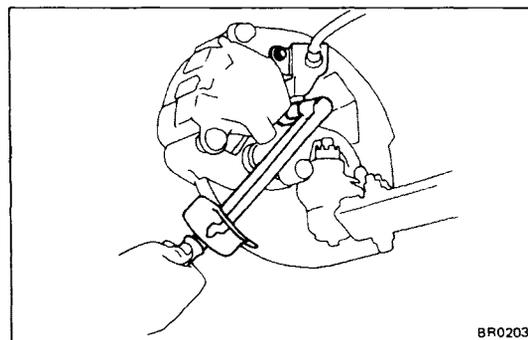
**Frictional force plus 0.6 — 1.8 kg
(1.3 — 4.0 lb, 5.9 — 18 N)**





(f) Measure the hub axial play.

Limit: 0.05 mm (0.0020 in.)



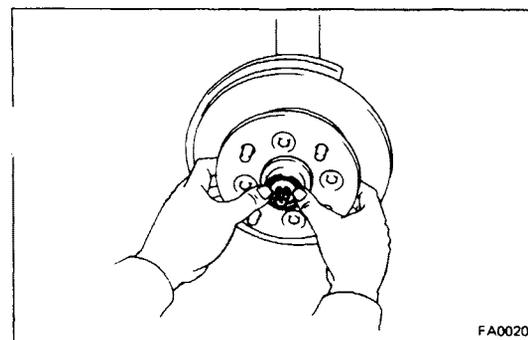
6. INSTALL LOCK NUT, COTTER PIN AND HUB GREASE CAP

7. INSTALL TORQUE PLATE ONTO STEERING KNUCKLE

Torque: 1,100 kg-cm (80 ft-lb, 108 N·m)

8. INSTALL BRAKE CYLINDER ONTO TORQUE PLATE

Torque: 900 kg-cm (65 ft-lb, 88 N·m)



Steering Knuckle

(See page FA-6)

REMOVAL OF STEERING KNUCKLE

1. REMOVE FRONT AXLE HUB AND BRAKE CALIPER
(See page FA-7)

2. REMOVE DUST COVER

(a) Remove the two bolts.

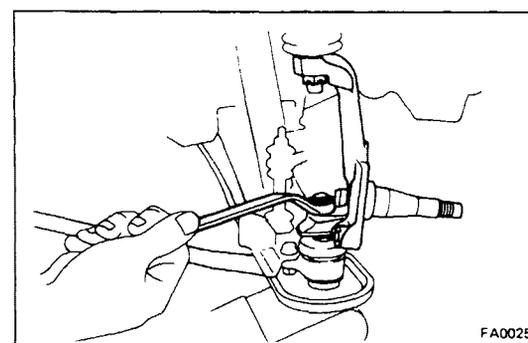
(b) Remove the two cotter pins and bolts and remove the dust cover.

(c) Remove the knuckle arm from the steering knuckle.

3. REMOVE STEERING KNUCKLE

(a) Support the lower arm with a jack.

(b) Remove the two cotter pins and two nuts.

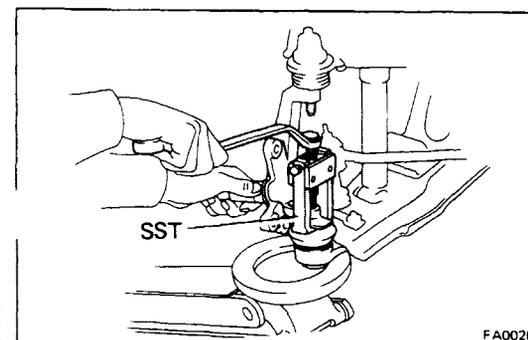


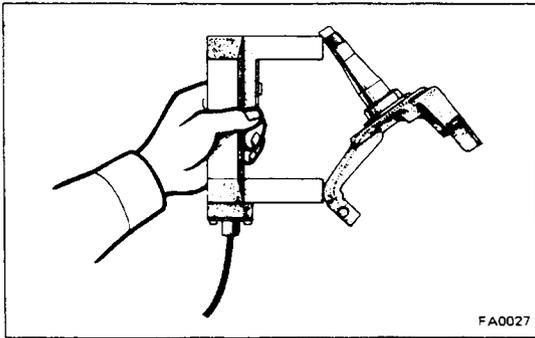
(c) Using SST, disconnect the steering knuckle from the lower ball joint.

(d) Using SST, disconnect the steering knuckle from the upper ball joint.

SST 09628-62011

(e) Remove the steering knuckle.





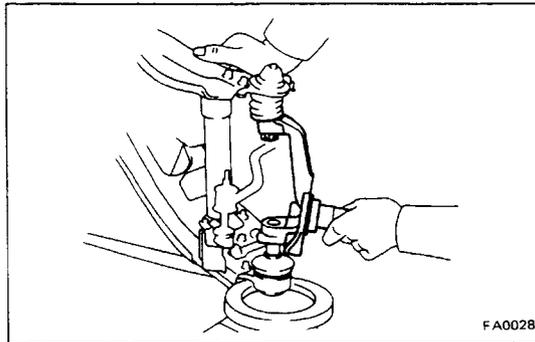
INSPECTION OF STEERING KNUCKLE

INSPECT STEERING KNUCKLE

Inspect the knuckle for damage or cracks.

NOTE: It is recommended that a flaw detector or liquid penetrate be used for this inspection.

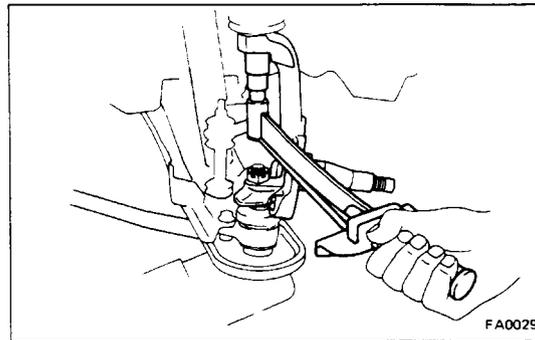
If the steering knuckle is damaged or cracked, replace it.



INSTALLATION OF STEERING KNUCKLE

1. INSTALL STEERING KNUCKLE

- (a) Support the lower arm with a jack.
- (b) Install the steering knuckle to the upper ball joint and install the nut.
- (c) Push the upper arm and steering knuckle down and install the steering knuckle to the lower ball joint and install the nut.



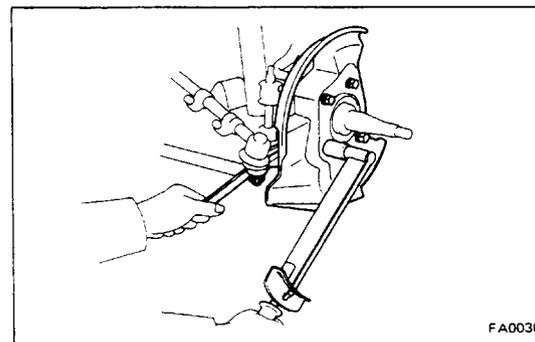
- (d) Torque the upper ball joint nut.

Torque: 1,100 kg-cm (80 ft-lb, 108 N-m)

- (e) Torque the lower ball joint nut.

Torque: 1,450 kg-cm (105 ft-lb, 142 N-m)

- (f) Install the cotter pins.

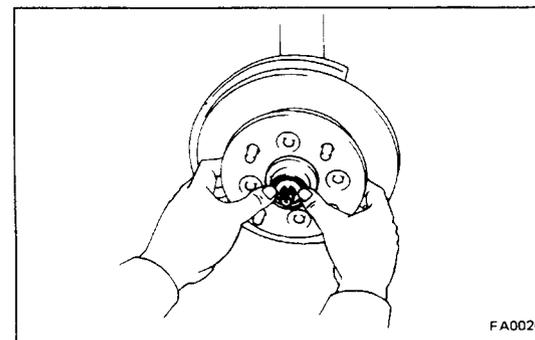


2. INSTALL KNUCKLE ARM AND DUST COVER

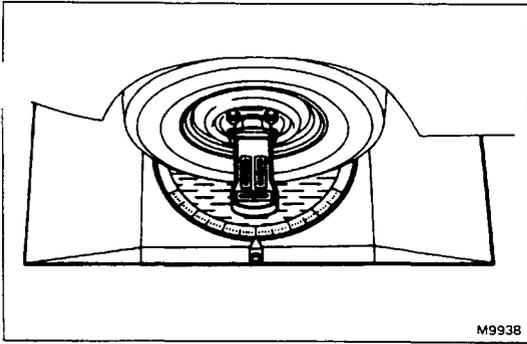
- (a) Install the knuckle arm and the dust cover.
- (b) Torque the bolts.

Torque: 1,100 kg-cm (80 ft-lb, 108 N-m)

- (c) Secure the nuts with the cotter pins.



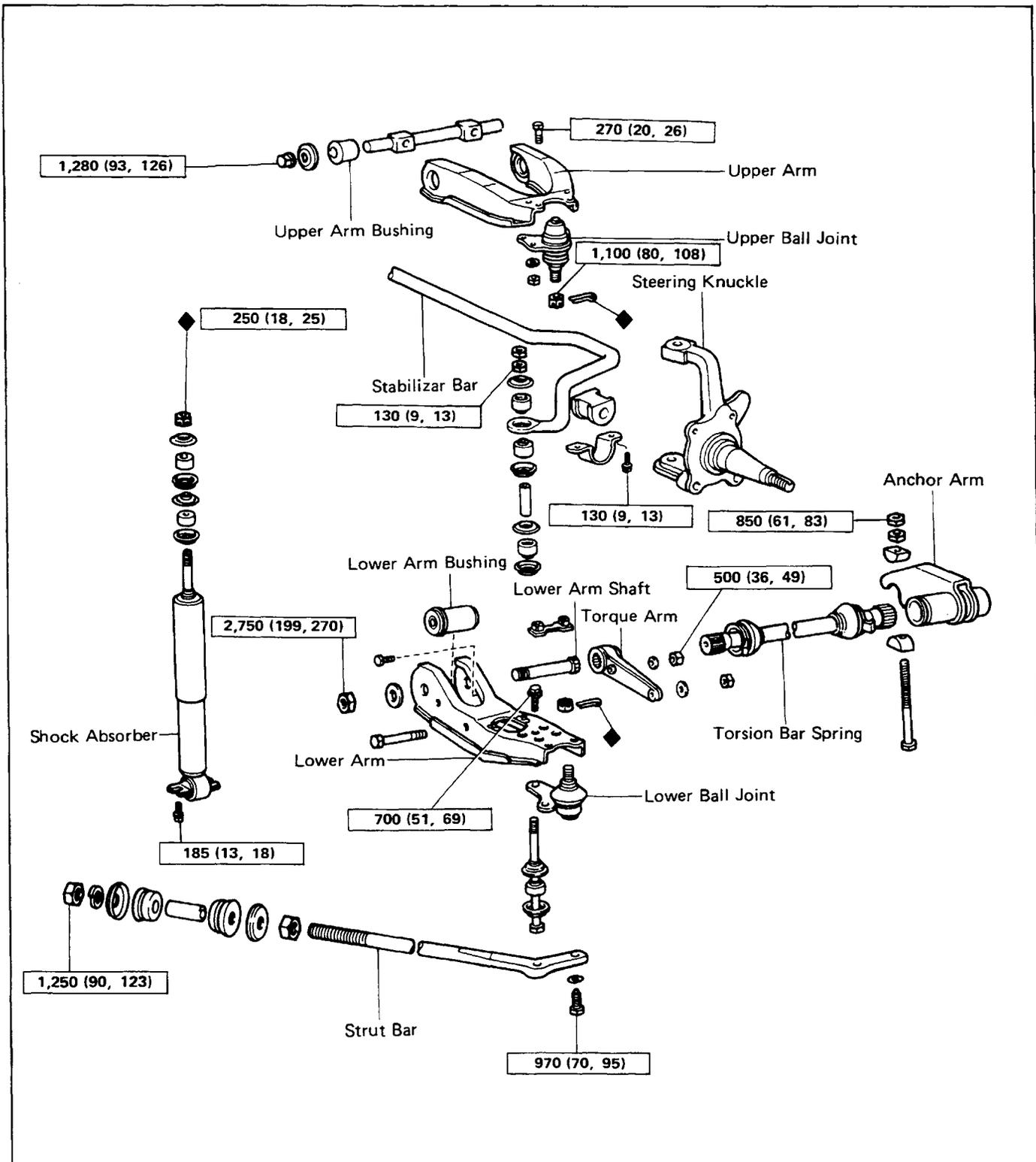
3. INSTALL FRONT AXLE HUB AND BRAKE CALIPER (See pages FA-8, 9)



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

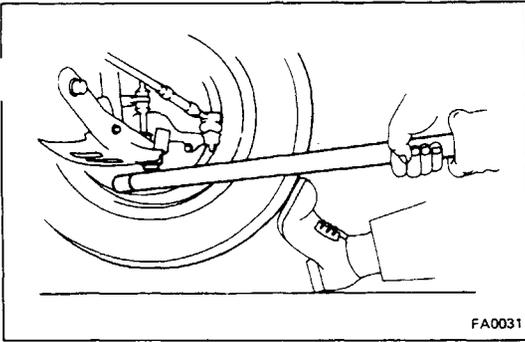
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FRONT SUSPENSION (2WD) COMPONENTS

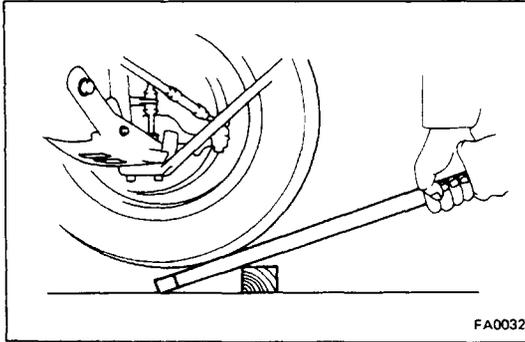


kg-cm (ft-lb, N-m) : Tightening torque

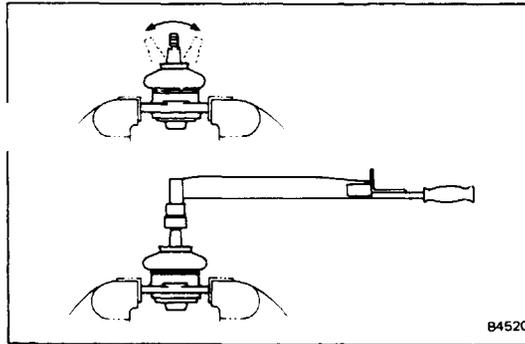
◆ : Non-reusable part



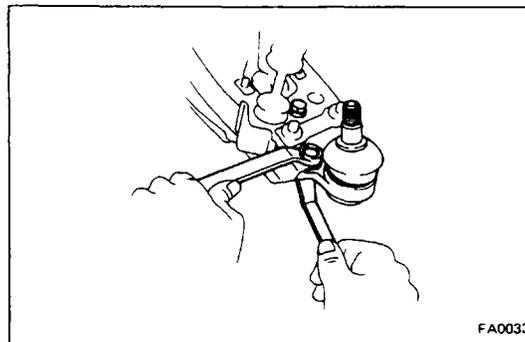
FA0031



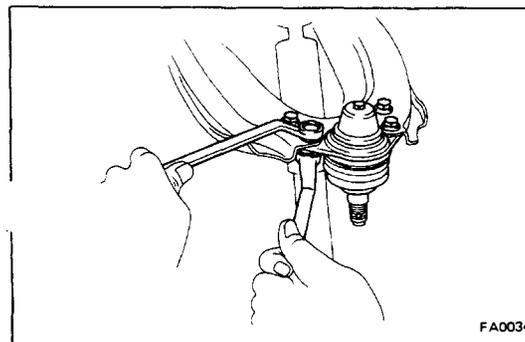
FA0032



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FA0033



FA0034

Ball Joints

INSPECTION OF BALL JOINTS

1. INSPECT LOWER BALL JOINT FOR EXCESSIVE LOOSENESS

- Jack up the front of the vehicle and support it with stands.
- Make sure the front wheels are in a straight forward position, and depress the brake pedal.
- Move the lower arm up and down and check that the lower ball joint has no excessive play.

Maximum vertical play: 2.3 mm (0.091 in.)

2. INSPECT UPPER BALL JOINT FOR EXCESSIVE LOOSENESS

Move the wheel up and down and check that the upper ball joint has no excessive play.

Maximum vertical play: 2.3 mm (0.091 in.)

3. INSPECT BALL JOINT ROTATION CONDITION

- Remove the ball joint. (See pages FA-9,10)
- As shown in the figure, flip the ball joint stud back and forth 5 times before installing the nut.
- Using a torque gauge, turn the nut continuously one turn each 2-4 seconds and take the torque reading on the 5th turn.

Torque (turning):

Lower ball joint 25-50 kg-cm (22-43 in.-lb, 2.5-4.9 N·m)

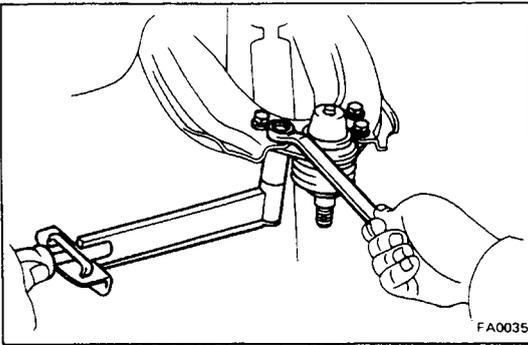
Upper ball joint 20-40 kg-cm (18-34 in.-lb, 2.0-3.9 N·m)

REMOVAL OF BALL JOINTS

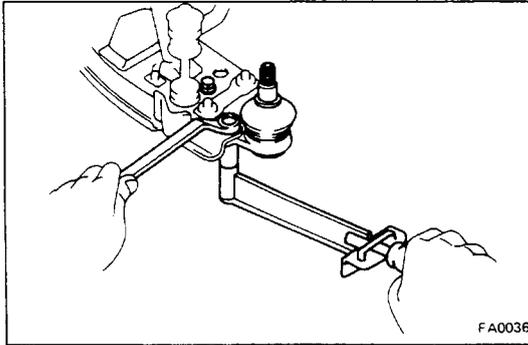
- REMOVE STEERING KNUCKLE
(See page FA-9)
- REMOVE LOWER BALL JOINT FROM LOWER ARM
- REMOVE UPPER BALL JOINT FROM UPPER ARM

INSTALLATION OF BALL JOINTS**1. INSTALL UPPER BALL JOINT TO UPPER ARM**

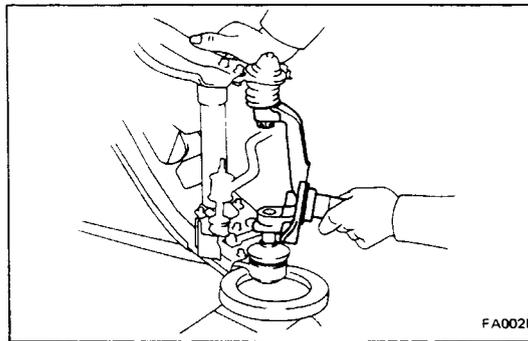
Torque: 270 kg-cm (20 ft-lb, 26 N·m)

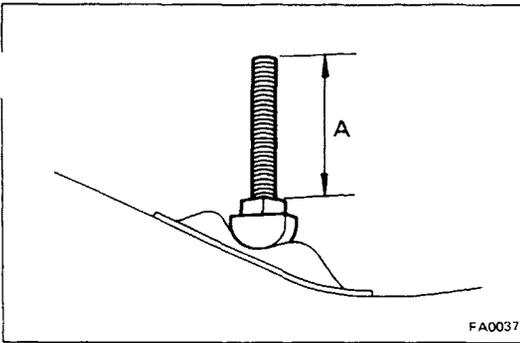
**2. INSTALL LOWER BALL JOINT TO LOWER ARM**

Torque: 700 kg-cm (51 ft-lb, 69 N·m)

**3. INSTALL STEERING KNUCKLE**

(See page FA-10)





Torsion Bar Spring

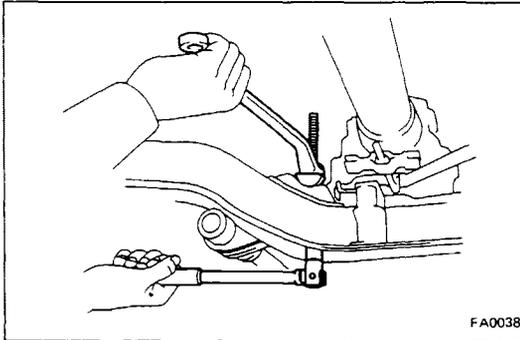
(See page FA-12)

REMOVAL OF TORSION BAR SPRING

1. JACK UP AND SUPPORT FRAME ON STANDS
2. REMOVE LOCK NUT AND MEASURE PROTRUDING BOLT END "A", AS SHOWN

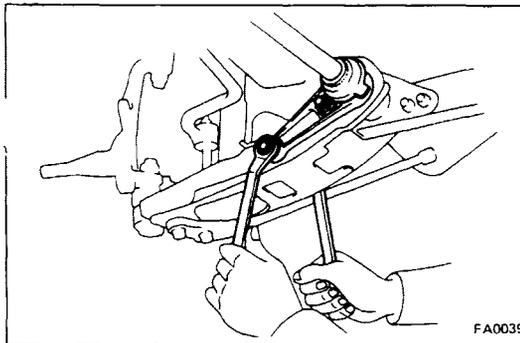
NOTE: Use this measurement for reference when adjusting the vehicle height.

3. REMOVE DUST COVER
4. LOOSEN ADJUSTING NUT UNTIL NO TENSION ON TORSION BAR



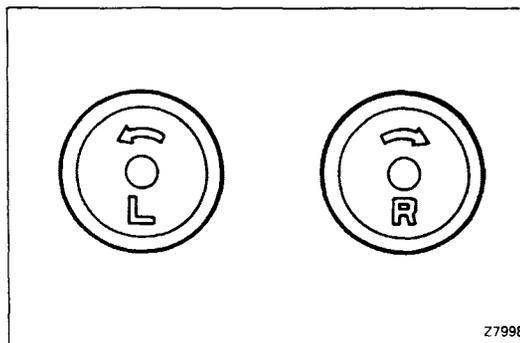
5. REMOVE TORQUE ARM, TORSION BAR SPRING AND ANCHOR ARM

- (a) Remove the torque arm mounting nuts.
- (b) Remove the anchor arm from the adjusting bolt and then remove the torsion bar together with the torque arm and anchor arm.



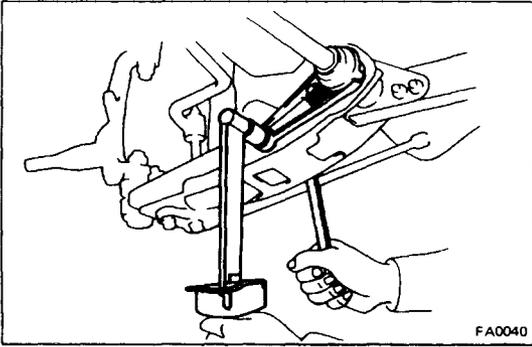
INSTALLATION OF TORSION BAR SPRING

NOTE: There are left and right identification marks on the rear end of the torsion bar springs. Be careful not to interchange them.



1. INSTALL TORSION BAR SPRING AND ANCHOR ARM AND TORQUE ARM

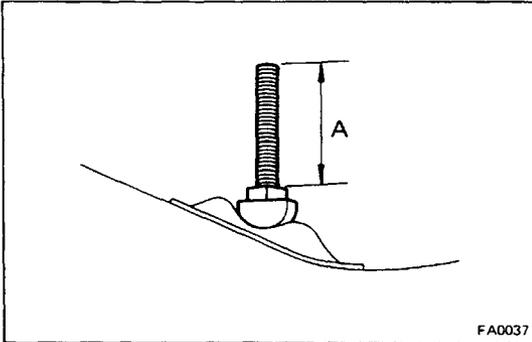
- (a) Apply a light coat of MP grease to the spline of the torsion bar spring.
- (b) Align the toothless portion and install the anchor arm to the torsion bar spring.
- (c) Align the toothless portion and install the torque arm to the torsion bar spring.



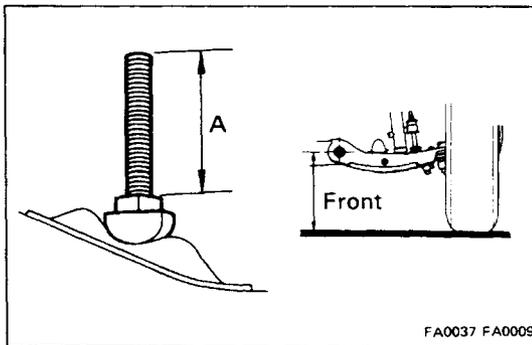
(d) Install the torsion bar spring torque arm side and install the anchor arm to the adjusting bolt.

(e) Torque the torque arm nut.

Torque: 500 kg-cm (36 ft-lb, 49 N·m)



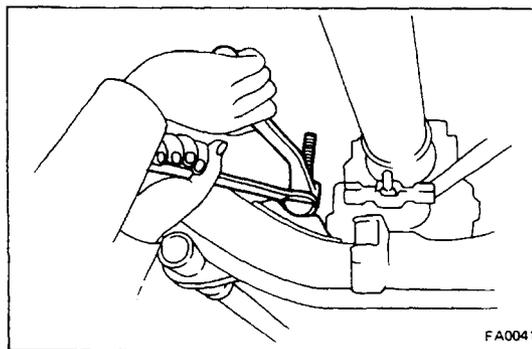
(f) Tighten the adjusting nut so that the bolt protrusion is equal to that before removal.



(g) Install the wheel and remove the stands. Bounce the vehicle to settle the suspension.

(h) Adjust the vehicle height by turning the adjusting nut.

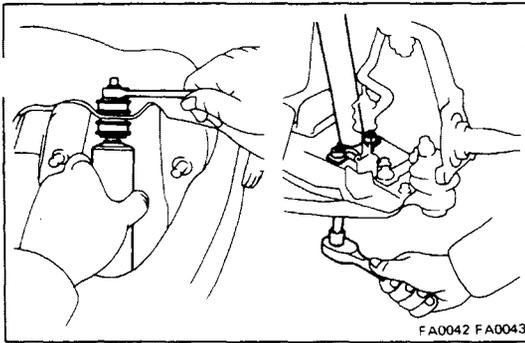
Vehicle hight: See page A-21



2. TORQUE LOCK NUT

Torque: 850 kg-cm (61 ft-lb, 83 N·m)

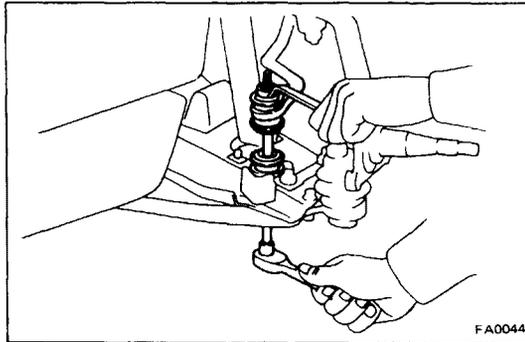
3. INSTALL DUST COVER



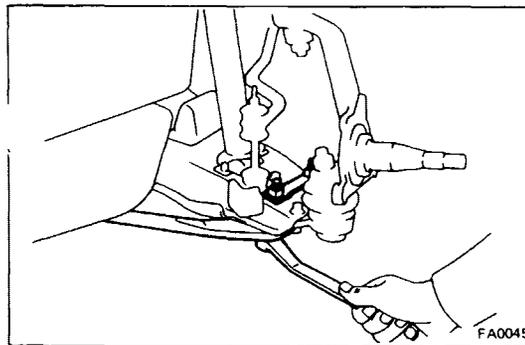
Lower Suspension Arm and Shock Absorber

(See page FA-12)

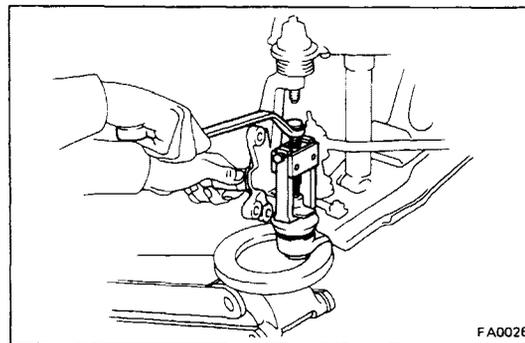
1. REMOVE TORSION BAR SPRING (See page FA-15)
2. REMOVE SHOCK ABSORBER



3. DISCONNECT STABILIZER BAR FROM LOWER ARM



4. DISCONNECT STRUT BAR FROM LOWER ARM

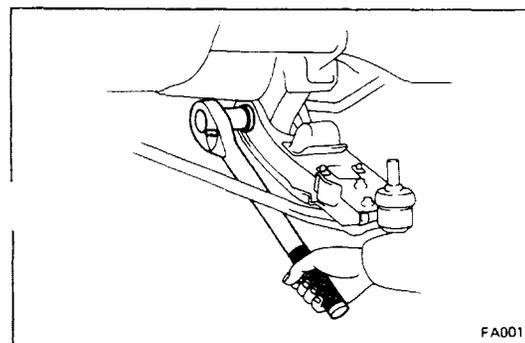


5. REMOVE LOWER BALL JOINT

- (a) Remove the cotter pin and nut.
- (b) Using SST, disconnect the ball joint from the steering knuckle and remove it.

SST 09628-62011

NOTE: Be careful not to damage the ball joint boot.

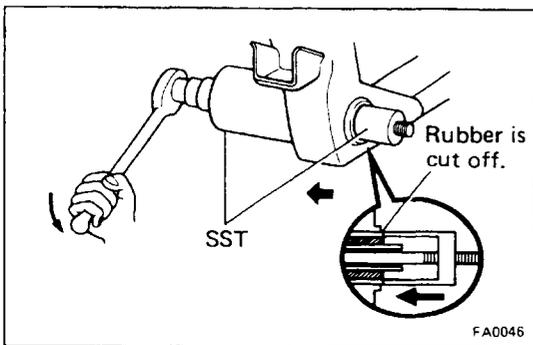


6. REMOVE LOWER SUSPENSION ARM

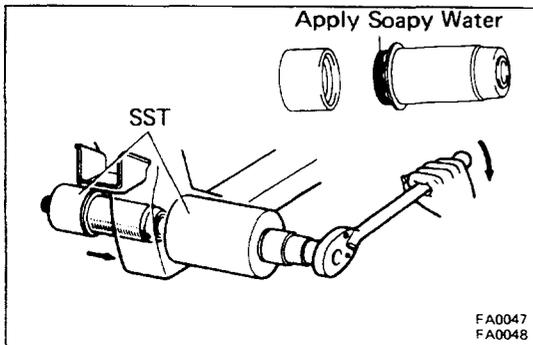
- (a) Remove the lower arm shaft nut and remove the lower arm.

REPLACEMENT OF LOWER ARM BUSHING**1. REMOVE BUSHING**

- (a) Cut off the bushing rubber as shown in the figure.
- (b) Using SST, remove the bushing
SST 09726-35010

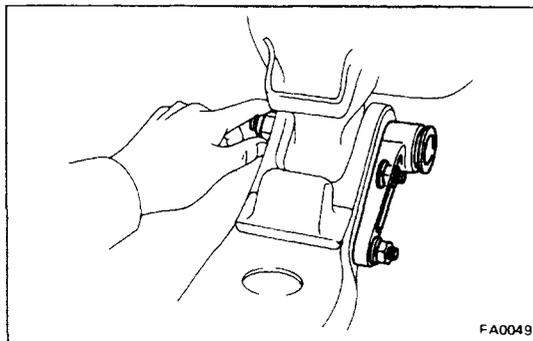


- (c) Apply soapy water on the front rubber part of the bushing and fit SST on the new bushing.
- (d) Using SST, install the new bushing

**INSTALLATION OF LOWER SUSPENSION ARM AND SHOCK ABSORBER****1. INSTALL LOWER SUSPENSION ARM**

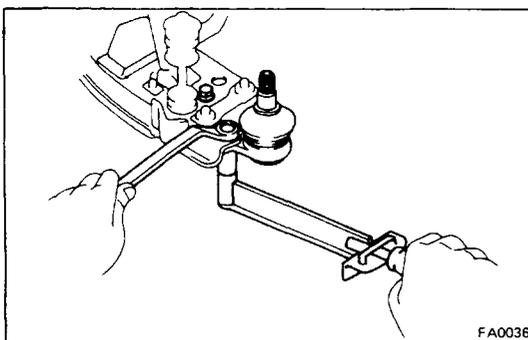
- (a) Install the torque arm mounting bolts to the lower arm.
- (b) Place the torque arm on the lower arm shaft. Set the lower arm in installation position, and insert the lower arm shaft and torque arm.
- (c) Temporarily install the torque arm.
- (d) Finger tighten the lower arm, and remove the torque arm.

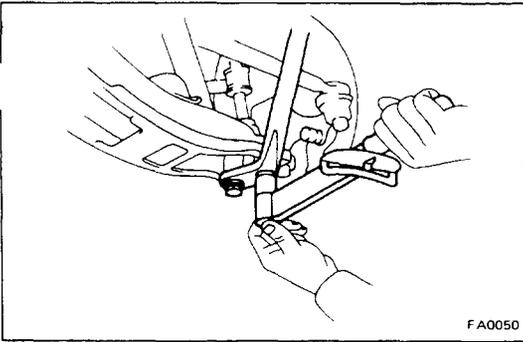
NOTE: Do not torque the nut.

**2. INSTALL LOWER BALL JOINT**

Install the lower ball joint to the lower arm.

Torque: 700 kg-cm (51 ft-lb, 69 N·m)

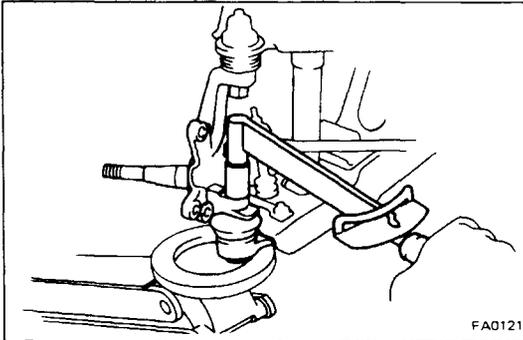


**3. CONNECT STRUT BAR TO LOWER ARM**

Torque: 970 kg-cm (70 ft-lb, 95 N·m)

4. CONNECT STABILIZER BAR TO LOWER ARM

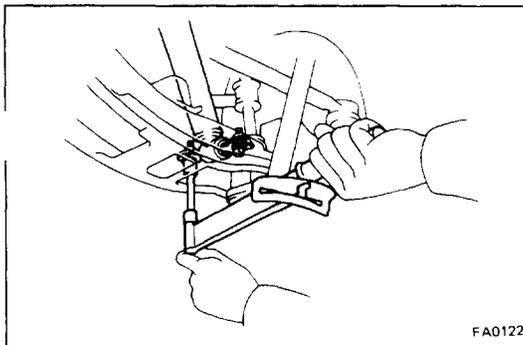
Torque: 130 kg-cm (9 ft-lb, 13 N·m)

**5. CONNECT BALL JOINT TO STEERING KNUCKLE**

- (a) Support the lower arm with a jack.
- (b) Install the ball joint to the steering knuckle.
- (c) Torque the nut.

Torque: 1,450 kg-cm (105 ft-lb, 142 N·m)

- (d) Secure the nut with cotter pin.

**6. INSTALL SHOCK ABSORBER**

- (a) Install the shock absorber to the lower arm.

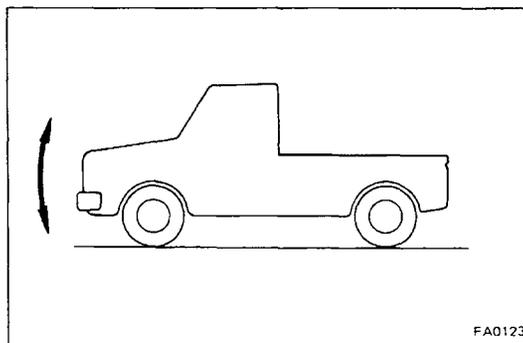
Torque: 185 kg-cm (13 ft-lb, 18 N·m)

- (b) Install the shock absorber to the upper bracket.

Torque: 250 kg-cm (18 ft-lb, 25 N·m)

7. INSTALL KNUCKLE ARM, DUST COVER, AXLE HUB AND BRAKE CALIPER

(See page FA-10)

**8. INSTALL TORSION BAR SPRING**

(See page FA-15)

9. TORQUE LOWER ARM SHAFT NUT

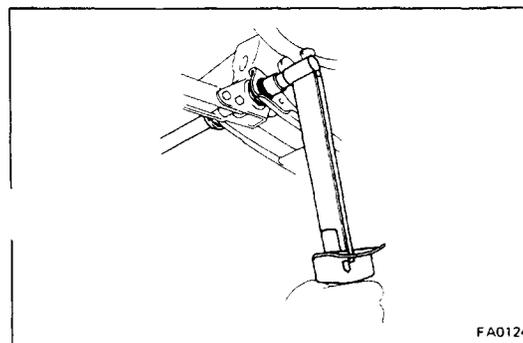
- (a) Remove the stands and bounce the vehicle to stabilize the suspension.

- (b) Torque the nut.

Torque: 2,750 kg-cm (199 ft-lb, 270 N·m)

10. CHECK FRONT WHEEL ALIGNMENT

(See page FA-3)

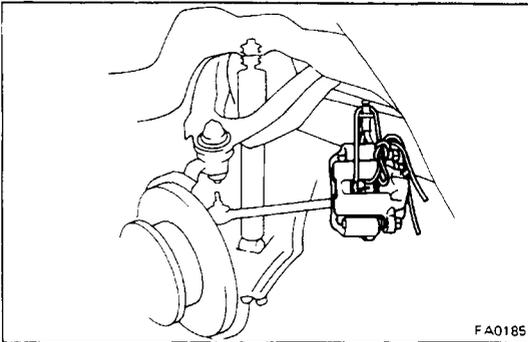


Upper Suspension Arm

(See page FA-12)

REMOVAL OF UPPER SUSPENSION ARM

1. REMOVE DISC BRAKE CYLINDER
(See Page FA-7)

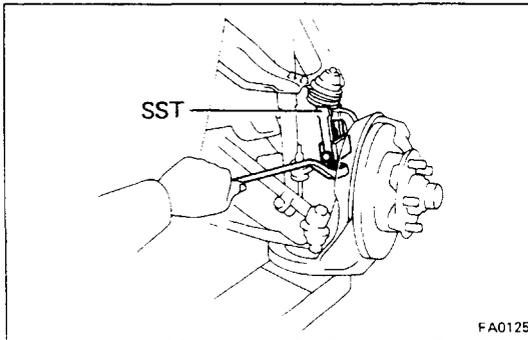


2. DISCONNECT UPPER BALL JOINT FROM STEERING KNUCKLE

- (a) Support the lower arm with a jack.
- (b) Using SST, disconnect the ball joint from the steering knuckle.

SST 09628-62011

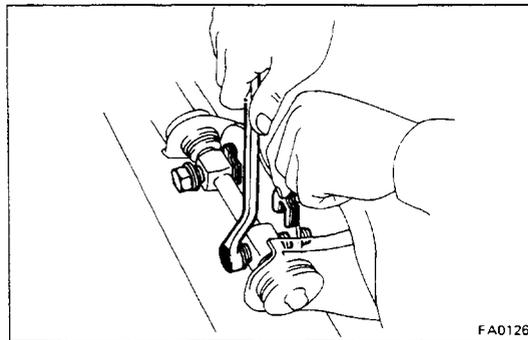
NOTE: Be careful not to damage the ball joint boot.



3. REMOVE UPPER SUSPENSION ARM

- (a) Remove the bolts and camber adjusting shims.
- (b) Remove the upper arm.

NOTE: Do not loose the camber adjusting shims. Recc the position, and the thickness of camber adjusting shims so that these can be reinstalled to their original location.

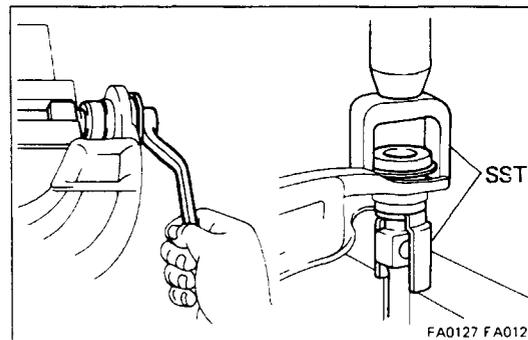


REPLACEMENT OF UPPER ARM BUSHING

1. REMOVE BUSHING

- (a) Remove the bolts and washers.
- (b) Using SST, push out the bushings.

SST 09710-30020



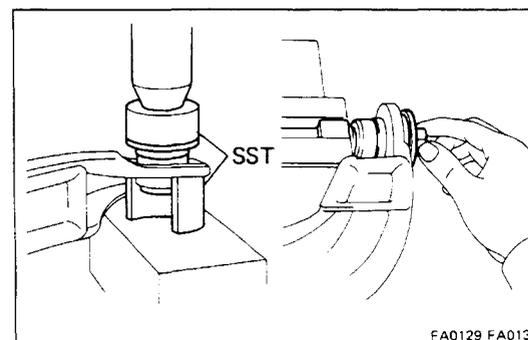
2. INSTALL BUSHING

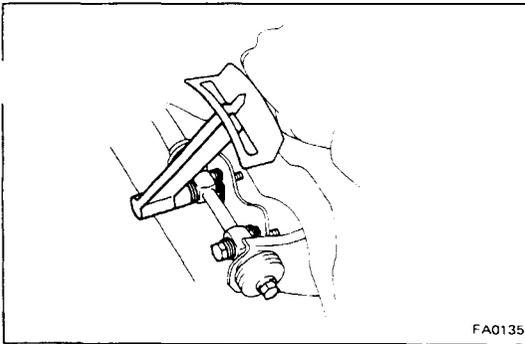
- (a) Using SST, push in the bushings.

SST 09710-30020

- (b) Install the washers, and finger tighten the bolts.

NOTE: Do not torque the bolts.





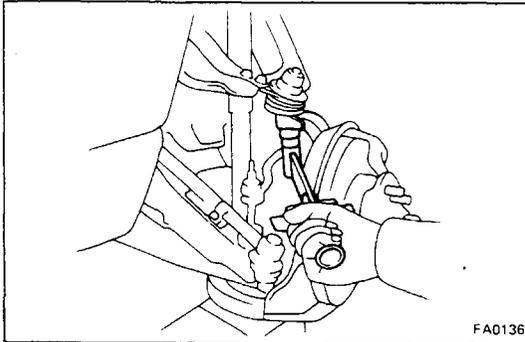
INSTALLATION OF UPPER SUSPENSION ARM

1. INSTALL UPPER ARM

- (a) Install the upper arm together with the camber adjusting shims.
- (b) Torque the bolts.

Torque: 1,000 kg-cm (72 ft-lb, 98 N·m)

NOTE: Install an equal number and thickness of shims in their original position.



2. INSTALL UPPER BALL JOINT

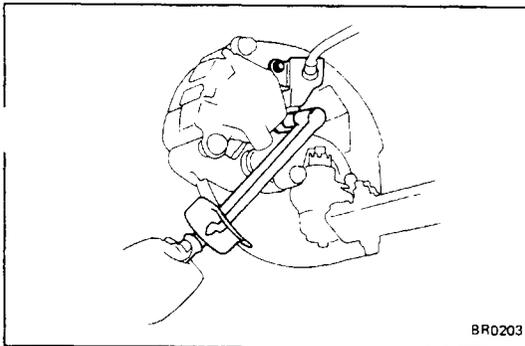
- (a) Install the upper ball joint to the upper arm.

Torque: 270 kg-cm (20 ft-lb, 26 N·m)

- (b) Support the lower arm with a jack and connect the upper ball joint to the steering knuckle.

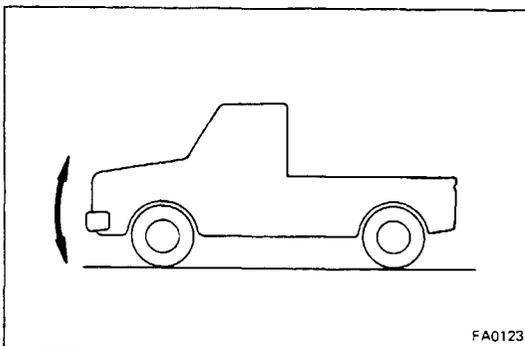
Torque: 1,100 kg-cm (80 ft-lb, 108 N·m)

- (c) Secure the nut with a new cotter pin.



3. CONNECT DISC BRAKE CYLINDER

Torque: 900 kg-cm (65 ft-lb, 88 N·m)



4. TORQUE UPPER ARM SHAFT BOLTS

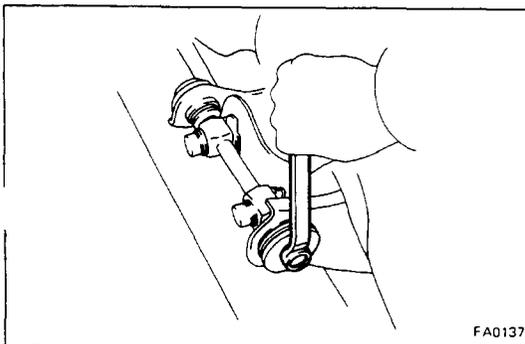
- (a) Remove the stands and bounce the vehicle to stabilize the suspension.

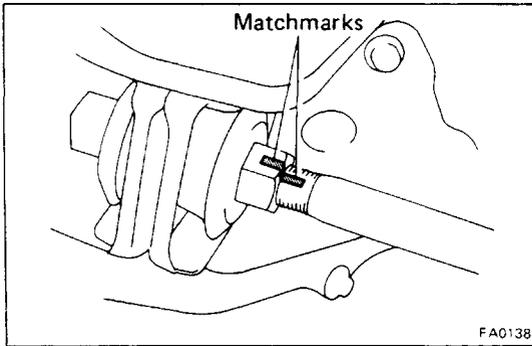
- (b) Torque the upper arm shaft bolts.

Torque: 1,280 kg-cm (93 ft-lb, 126 N·m)

5. CHECK FRONT WHEEL ALIGNMENT

(See page FA-3)





Strut Bar

(See page FA-12)

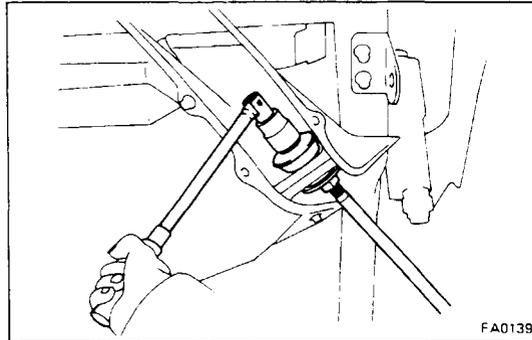
REMOVAL OF STRUT BAR

1. PLACE MATCHMARKS ON STRUT BAR

2. REMOVE FRONT NUT FROM STRUT BAR

3. REMOVE STRUT BAR FROM LOWER ARM

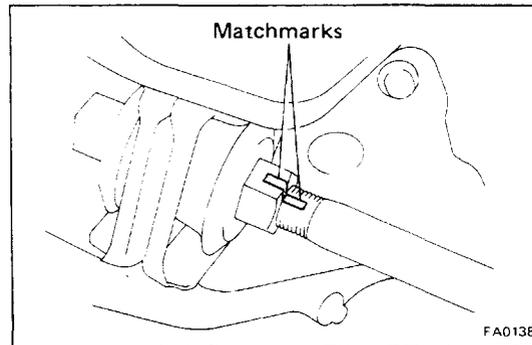
Remove the nuts holding the strut bar to the lower arm, and remove the strut bar.



INSTALLATION OF STRUT BAR

1. INSTALL FRONT NUT

Install the front nut and align the matchmarks on the strut bar.



2. INSTALL STRUT BAR TO BRACKET

- (a) Install the washer and bushing to the strut bar and install it to the bracket.
- (b) Install the collar, bushing and washer to the strut bar.
- (c) Finger tighten the front nut.

3. CONNECT STRUT BAR TO LOWER ARM

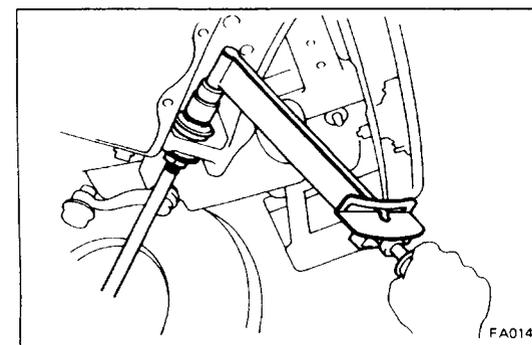
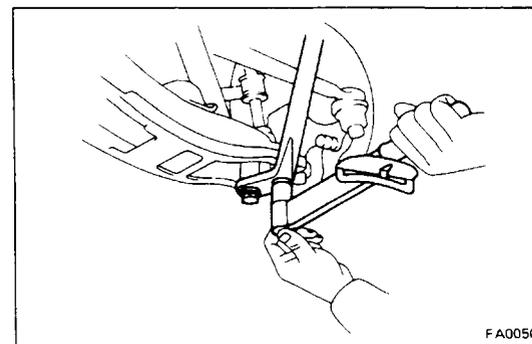
Torque: 970 kg-cm (70 ft-lb, 95 N·m)

4. TORQUE FRONT NUT

- (a) Remove the stands and the vehicle to stabilize the suspension.
- (b) Torque the front nut.

Torque: 1,250 kg-cm (90 ft-lb, 123 N·m)

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

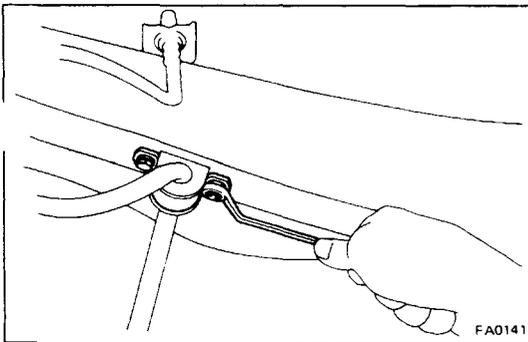
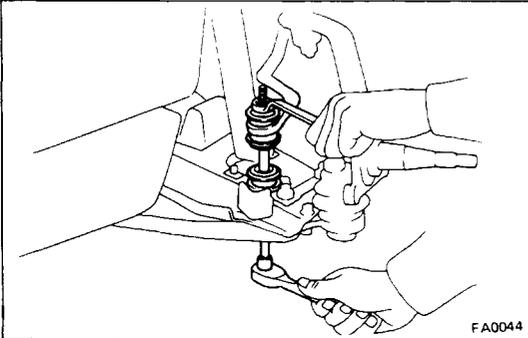


Stabilizer Bar

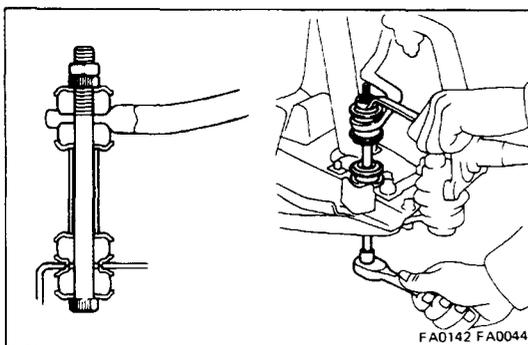
(See page FA-12)

REMOVAL OF STABILIZER BAR

1. REMOVE ONE TORSION BAR SPRING
(See page FA-15)
2. REMOVE STABILIZER BAR FROM LOWER ARMS
 - (a) Remove the nuts and cushions holding both sides of the stabilizer bar from the lower arms, and disconnect the stabilizer bar.

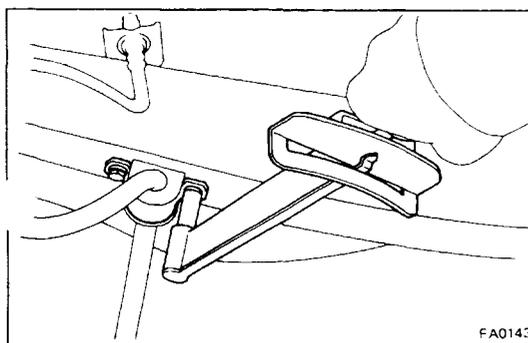


- (b) Remove both stabilizer bar bushings and brackets, and remove the stabilizer bar.



INSTALLATION OF STABILIZER BAR

1. PLACE STABILIZER BAR TO FRAME
Place the stabilizer bar in position and install both stabilizer bar bushings and brackets to the frame. Finger tighten the bolts.
2. CONNECT STABILIZER BAR TO LOWER ARMS
Connect the stabilizer bar on both sides to the lower arms with bolts, cushions and new nuts as shown. Torque the nuts.
Torque: 130 kg-cm (9 ft-lb, 13 N·m)
3. TORQUE BRACKET SET BOLTS
Torque: 130 kg-cm (9 ft-lb, 13 N·m)
4. INSTALL TORSION BAR SPRING
(See page FA-15)



TROUBLESHOOTING (4WD)

Problem	Possible cause	Remedy	Page
Oil leak at front axle	Oil seals damaged or worn Front axle housing cracked	Replace oil seal Repair as necessary	FA-49
Oil leak at pinion shaft	Oil level too high or wrong grade Oil seal worn or damaged Companion flange loose or damaged	Drain and replace oil Replace oil seal Tighten or replace flange	A-34 RA-6 RA-9
Noises in front axle	Oil level low or wrong grade Excessive backlash between pinion and ring or side gear Ring, pinion or side gears worn or chipped Pinion shaft bearing worn Wheel bearing worn Differential bearing loose or worn	Drain and replace oil Check backlash Inspect gears Replace bearing Replace bearing Tighten or replace bearings	A-34 RA-8 RA-10 RA-10 FA-45 RA-10
Wanders/pulls	Tires worn or improperly inflated Alignment incorrect Wheel bearing adjusted too tight Front or rear suspension parts loose or broken Steering linkage loosen or worn Steering gear out of adjustment or broken	Replace tire or inflate tires to proper pressure Check front end alignment Adjust wheel bearing Tighten or replace suspension part Tighten or replace steering linkage Adjust or repair steering gear	FA-25 FA-25 FA-46 FA-60 SR-75 SR-3
Bottoming	Vehicle overloaded Shock absorber worn out Springs weak	Check loading Replace shock absorber Replace spring	FA-60 FA-61
Sways/pitches	Tires improperly inflated Stabilizer bar bent or broken Shock absorber worn out	Inflate tires to proper pressure Inspect stabilizer bar Replace shock absorber	FA-25 FA-65 FA-60
Front wheel shimmy	Tires worn or improperly inflated Wheels out of balance Steering damper worn out Shock absorber worn out Alignment incorrect Wheel bearings worn or improperly adjusted Steering knuckle bearing worn Steering linkage loosen or worn Steering gear out of adjustment or broken	Replace tire or inflate tires to proper pressure Balance wheels Replace steering damper Replace shock absorber Check front end alignment Replace or adjust wheel bearings Replace bearing Tighten or replace steering linkage Adjust or repair steering gear	FA-25 SR-77 FA-60 FA-25 FA-45 FA-45 SR-75 SR-3
Abnormal tire wear	Tires improperly inflated Shock absorbers worn out Alignment incorrect	Inflate tire to proper pressure Replace shock absorber Check toe-in	FA-25 FA-60 FA-26

FRONT WHEEL ALIGNMENT (4WD)

1. MAKE FOLLOWING CHECKS AND CORRECT ANY PROBLEMS

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

Correct tire pressure:

Tire size	kg/cm ² (psi, kPa)	
	Front	Rear
P225 / 75R15	1.8 (26,177)	2.0 (28,196)

(b) Check the wheel runout.

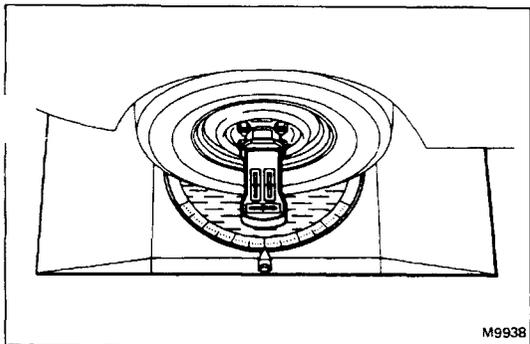
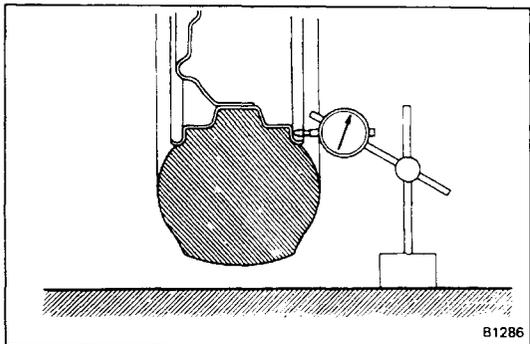
Lateral runout: Less than 1.2 mm (0.047 in.)

(c) Check the front wheel bearings for looseness.

(d) Check the front suspension for looseness.

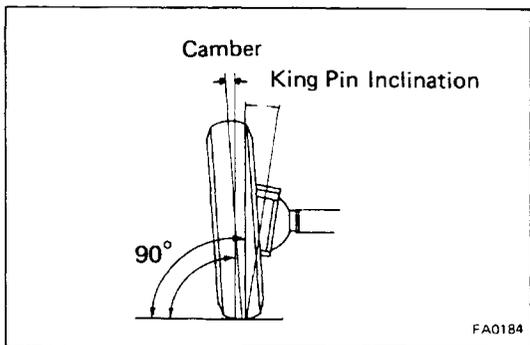
(e) Check the steering linkage for looseness.

(f) Use the standard bounce test to check that the front absorbers work properly.



2. INSTALL WHEEL ALIGNMENT EQUIPMENT

Follow the specific instructions of the equipment manufacturer.

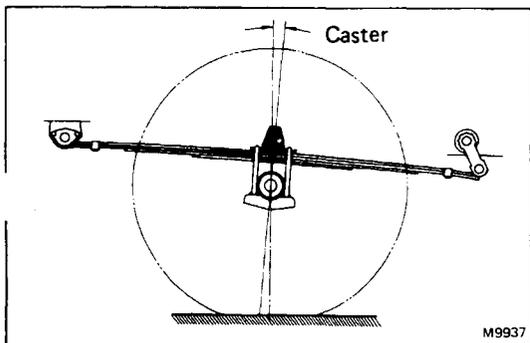


3. CHECK CAMBER AND KING PIN INCLINATION

Camber: $1^\circ \pm 45'$

King pin inclination: $9^\circ 30' \pm 45'$

If camber or king pin inclination checks are not within specification, rechecks the steering knuckle parts and the front wheel for bending or looseness.



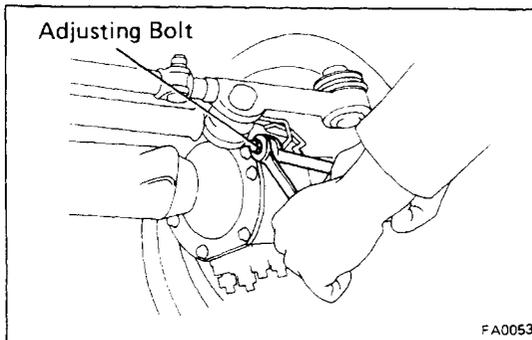
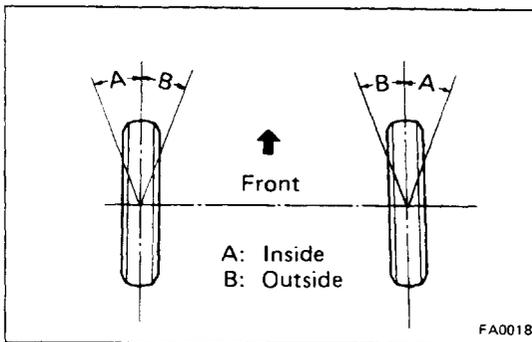
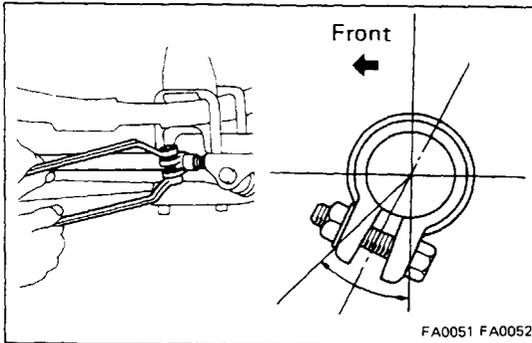
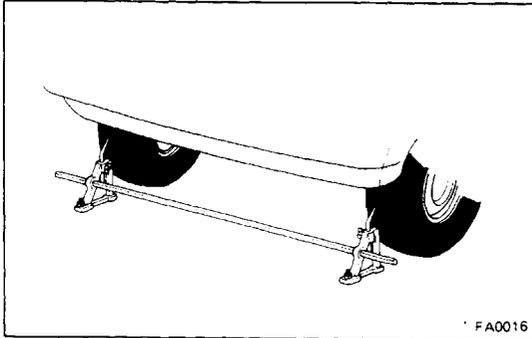
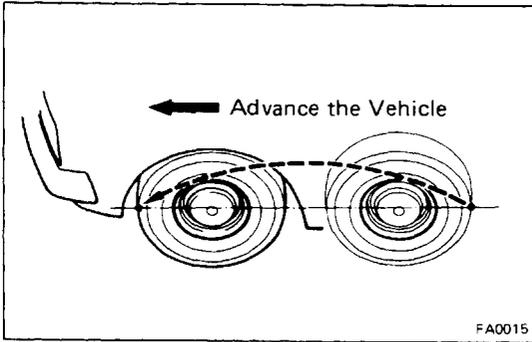
4. CHECK CASTER

Caster (at unloaded):

TRUCK $2^\circ 15' \pm 1^\circ$

4-RUNNER $3^\circ 00' \pm 1^\circ$

If caster is not as specified, inspect and replace damaged or worn leaf spring parts.



5. ADJUST TOE-IN

- (a) Make sure the wheels are positioned straight ahead.
- (b) Mark the center of each rear tread at spindle height and measure the distance between the marks of right and left tires.
- (c) Advance the vehicle until the marks on the rear side of the tires come to the front.

NOTE: The toe-in should be measured at the same point on the tire and at the same level.

- (d) Measure the distance between the marks on the front side of the tires.

Tire	Toe-in mm (in.)	
	Inspection STD	Adjustment STD
Radial	1 ± 4 (0.04 ± 0.16)	1 ± 1 (0.04 ± 0.04)

- (e) Make sure the steering gear is centered.
- (f) Loosen the nuts holding the clamps to the tie rod.
- (g) Adjust toe-in to the correct value by turning the tie rod.
- (h) Torque the nuts holding the clamps.

Torque: 375 kg-cm (27 ft-lb, 37 N·m)

NOTE: The steering damper side clamp opening must be positioned at the front of the tie rod, and face within 45° from straight down as shown in the figure.

6. ADJUST WHEEL ANGLE

Remove the caps of the knuckle stopper bolts and check the steering angles.

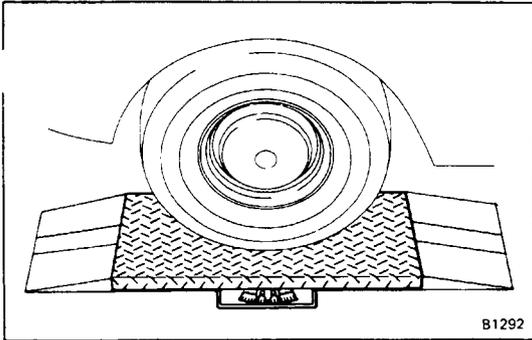
Wheel angle		
Max.	Inside wheel	30°30' +1° -2°
	Outside wheel	29°
at 20°	Inside wheel	20°30'
	Outside wheel	20°

NOTE: When the steering wheel is fully turned, make sure that the wheel is not touching the body or brake flexible hose.

If maximum steering angles differ from the standard value, adjust the wheel angle with the knuckle stopper bolts.

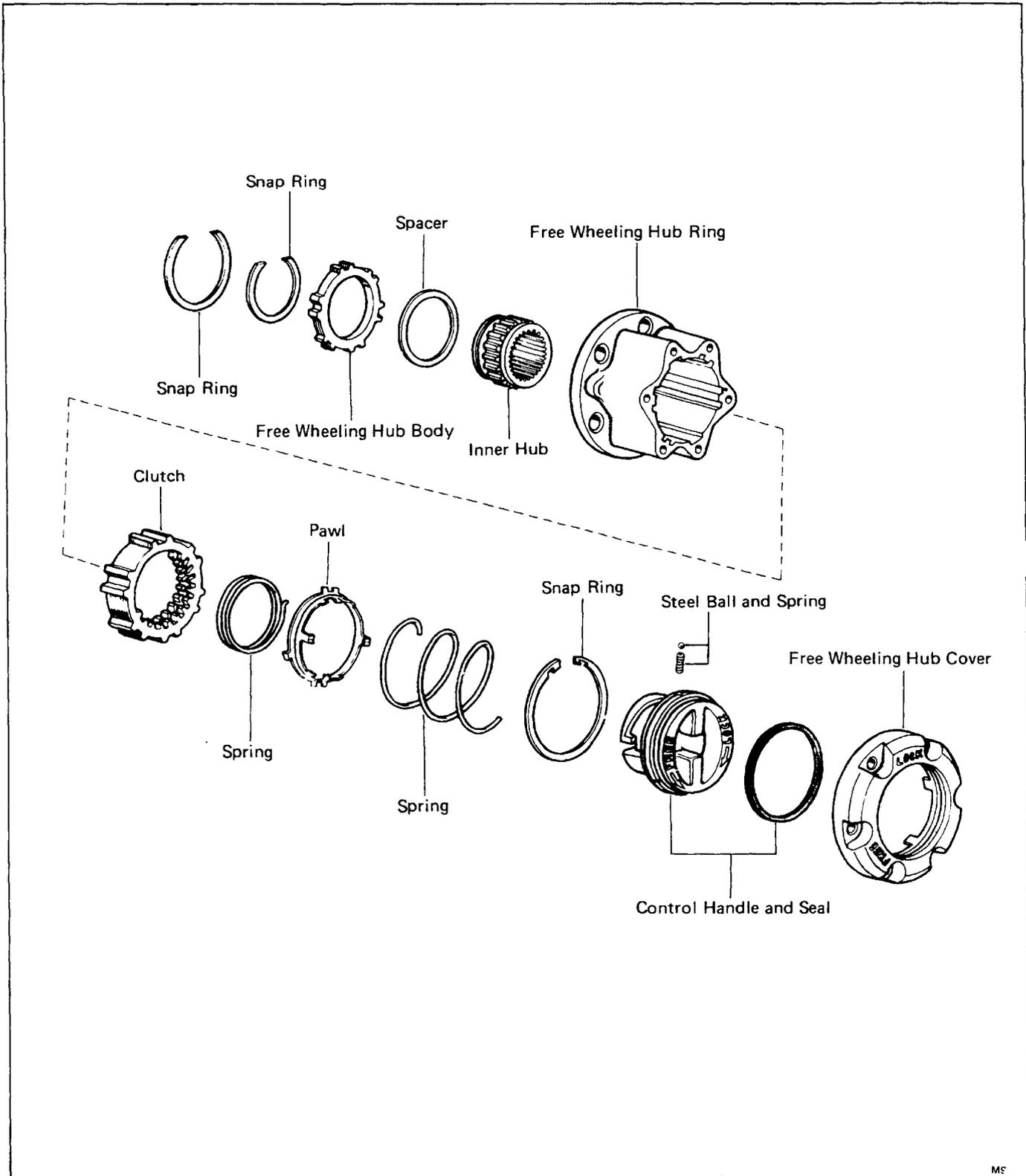
Torque: 480 kg-cm (35 ft-lb, 47 N·m)

If the wheel angle still cannot be adjusted within limits, inspect and replace damaged or worn steering parts.

**7. INSPECT SIDE SLIP WITH SIDE SLIP TESTER****Side slip limit:****Less than 3.0 mm/m (0.118 in./3.3 ft)**

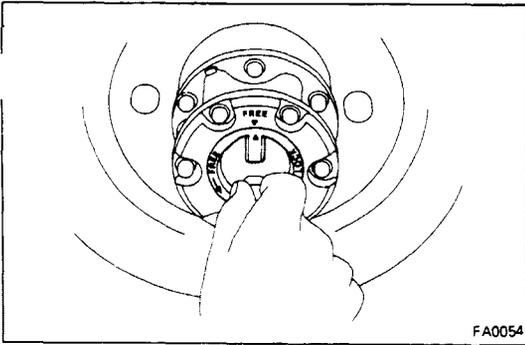
If the side slip exceeds the limit, the toe-in or other front wheel alignment may not be correct.

FREE WHEELING HUB (4WD) COMPONENTS

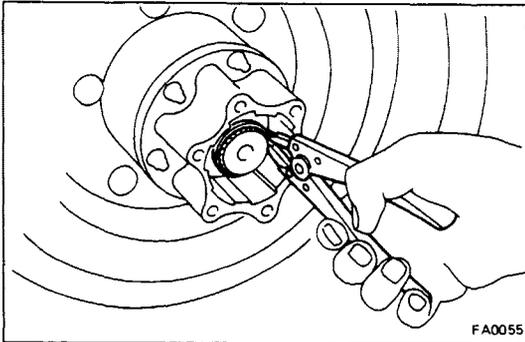


REMOVAL OF FREE WHEELING HUB**1. REMOVE FREE WHEELING HUB COVER**

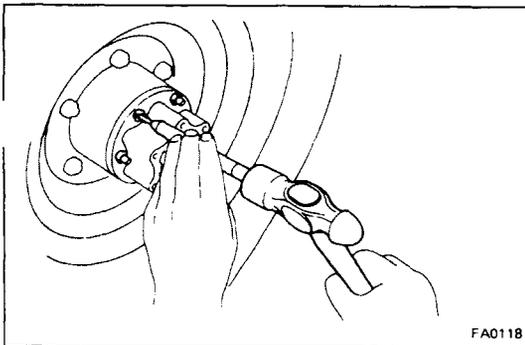
- (a) Set the control handle to FREE.
- (b) Remove the cover mounting bolts and pull off the cover.

**2. REMOVE SNAP RING**

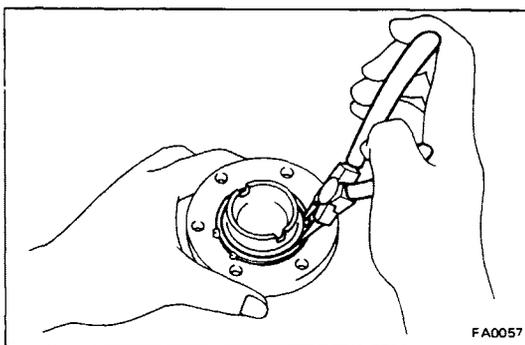
Using snap ring pliers, remove the snap ring.

**3. REMOVE FREE WHEELING HUB BODY**

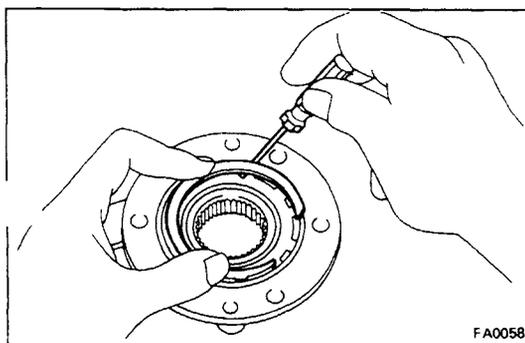
- (a) Remove the mounting nuts.
- (b) Using a tapered punch, tap on the slits of the cone washers and remove them.
- (c) Pull off the free wheeling hub body.

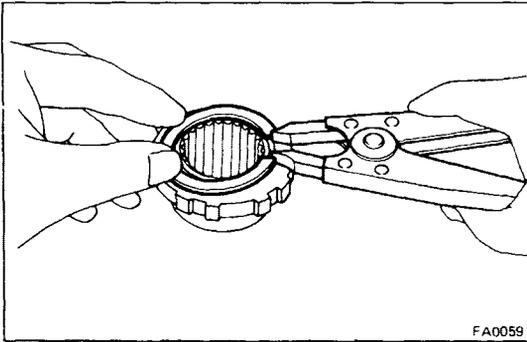
**DISASSEMBLY OF FREE WHEELING HUB****1. REMOVE CONTROL HANDLE FROM FREE WHEELING HUB COVER**

- (a) Using snap ring pliers, remove the snap ring.
- (b) Remove the control handle.
- (c) Remove the steel ball and spring from the control handle.

**2. REMOVE INNER HUB AND FREE WHEELING HUB RING FROM FREE WHEELING HUB BODY**

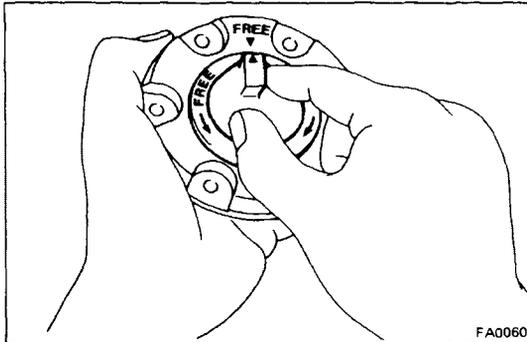
- (a) Using a screwdriver, remove the snap ring.
- (b) Remove the inner hub and free wheeling hub ring.





3. REMOVE FREE WHEELING HUB RING FROM INNER HUB

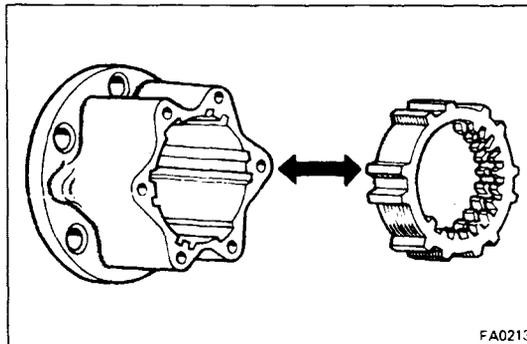
- (a) Using snap ring pliers, remove the snap ring.
- (b) Remove the free wheeling hub ring and spacer.



INSPECTION OF FREE WHEELING HUB

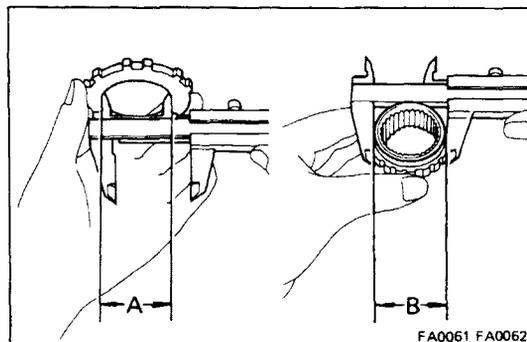
1. INSPECT COVER, HANDLE AND SEAL

- (a) Temporarily install the handle in the cover and check that the handle moves smoothly and freely.



2. INSPECT BODY AND CLUTCH

- (a) Check that the clutch moves smoothly in the body.

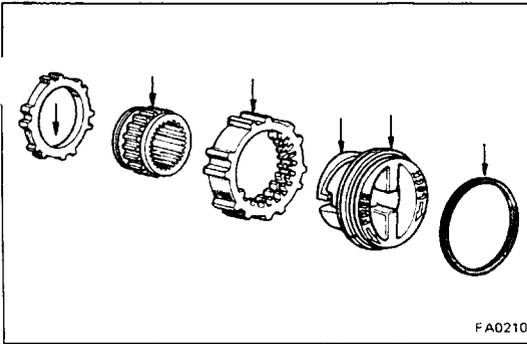


3. MEASURE THE OIL CLEARANCE BETWEEN THE INNER HUB AND FREE WHEELING HUB RING

Oil clearance (A – B): 0.3 mm (0.012 in.)

ASSEMBLY OF FREE WHEELING HUB

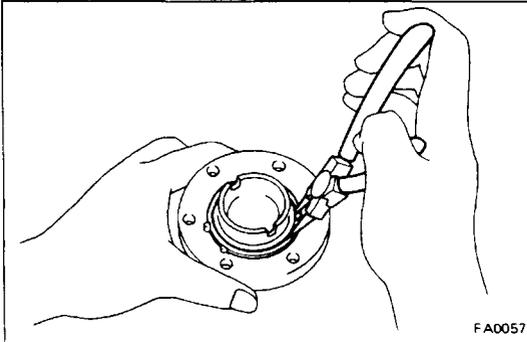
(See page FA-28)

1. APPLY MP GREASE TO SLIDING SURFACE OF PARTS

FA0210

2. INSTALL CONTROL HANDLE TO COVER

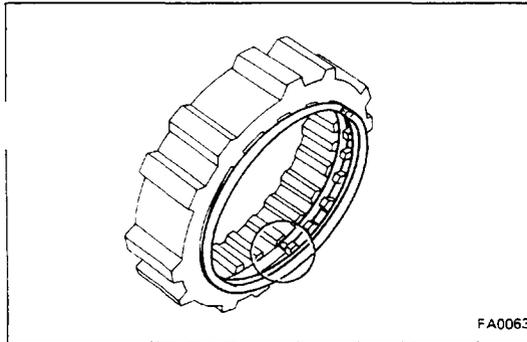
- (a) Install the seal, spring and steel ball to the handle.
- (b) Insert the handle in the cover and install the snap ring with snap ring pliers.



FA0057

3. INSTALL TENSION SPRING IN CLUTCH

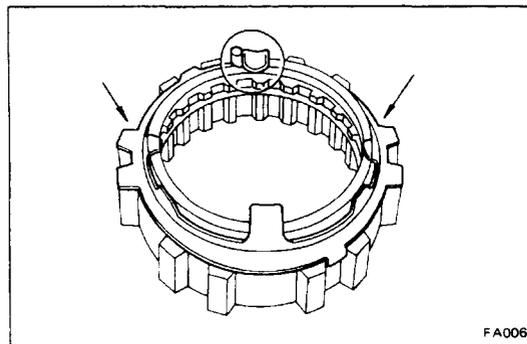
Install the tension spring in the clutch with the spring end aligned with the initial groove.



FA0063

4. INSTALL FOLLOWER PAWL TO CLUTCH

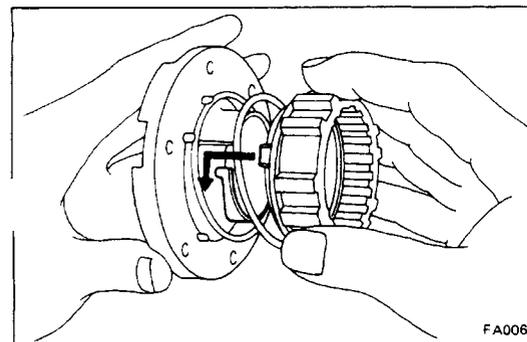
- (a) Place the follower pawl on the tension spring with one of the large tabs against the bent spring end.
- (b) Place the top ring of the spring on the small tabs.



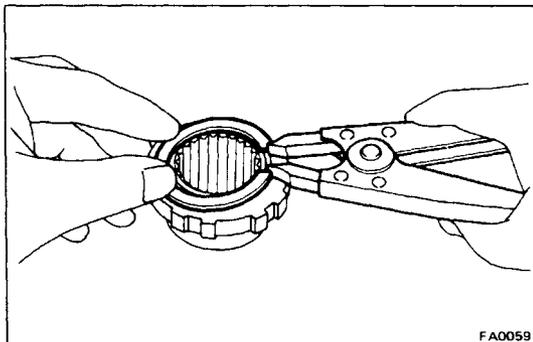
FA0064

5. INSTALL CLUTCH AND SPRING INTO COVER

- (a) Place the spring between the cover and clutch with the large spring end toward the cover.
- (b) Compress the spring and install the clutch with the pawl tab fit to the handle cam.



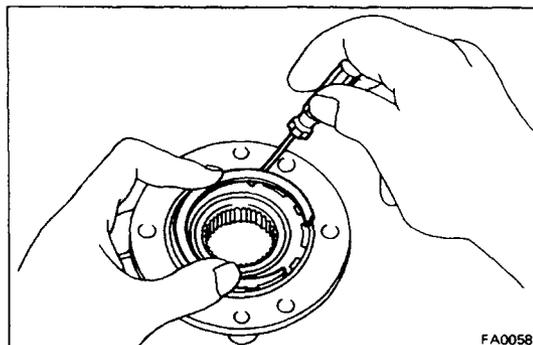
FA0065



FA0059

6. INSTALL SPACER AND FREE WHEELING HUB RING TO INNER HUB

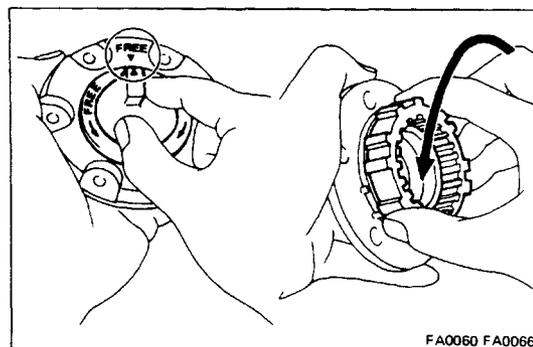
- (a) Install the spacer and free wheeling hub ring to inner hub.
- (b) Using snap ring pliers, install the snap ring.



FA0058

7. INSTALL INNER HUB AND FREE WHEELING HUB RING IN FREE WHEELING HUB BODY

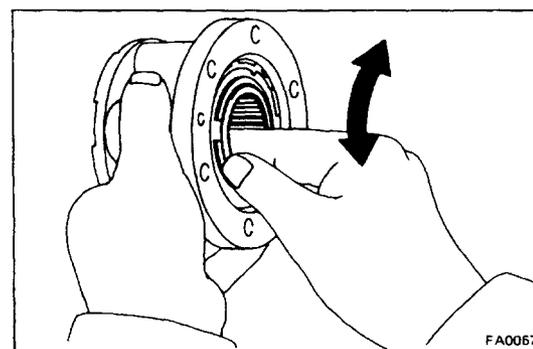
- (a) Insert the inner hub and free wheeling hub ring in the body.
- (b) Using a screwdriver, install the snap ring.



FA0060 FA0066

8. TEMPORARILY INSTALL COVER TO BODY AND CHECK FREE WHEELING HUB

- (a) Set the control handle and clutch to the free position.



FA0067

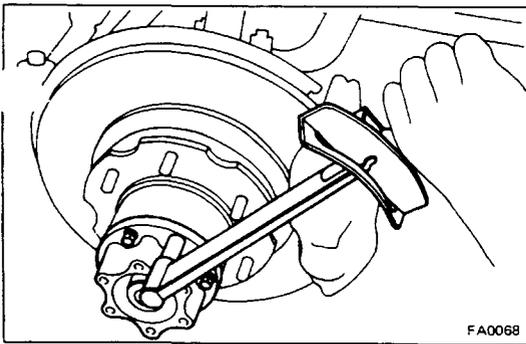
- (b) Insert the cover in the body and verify that the inner hub turns smoothly.
- (c) Remove the cover from the body.

INSTALLATION OF FREE WHEELING HUB

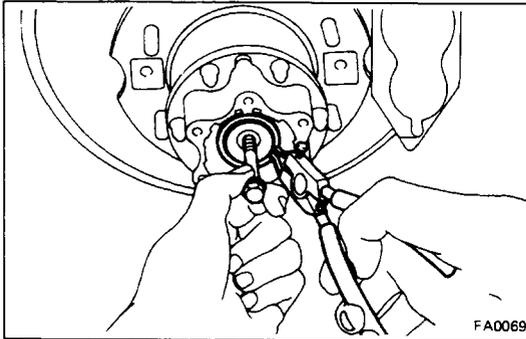
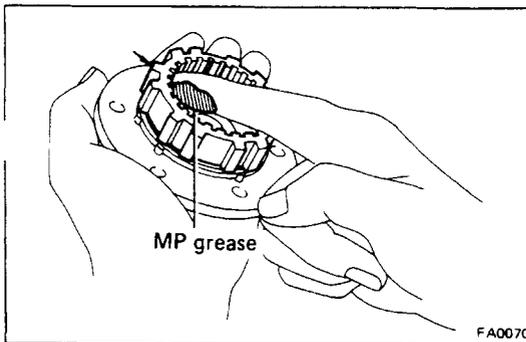
(See page FA-28)

1. INSTALL FREE WHEELING HUB BODY

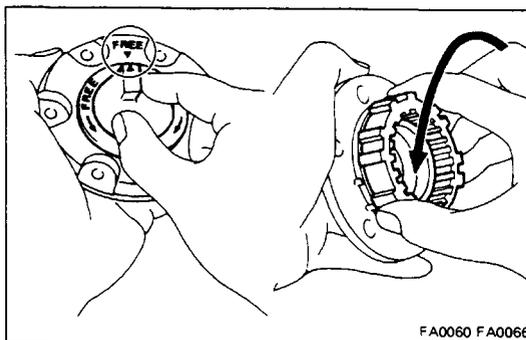
- (a) Place the gasket in position on the front axle hub.
- (b) Install the free wheeling hub body with six cone washers and nuts. Tighten the nuts.

Torque: 315 kg-cm (23 ft-lb, 31 N·m)**2. INSTALL SNAP RING**

- (a) Install a bolt in the axle shaft and pull it out.
- (b) Using snap ring pliers, install the snap ring.
- (c) Remove the bolt.

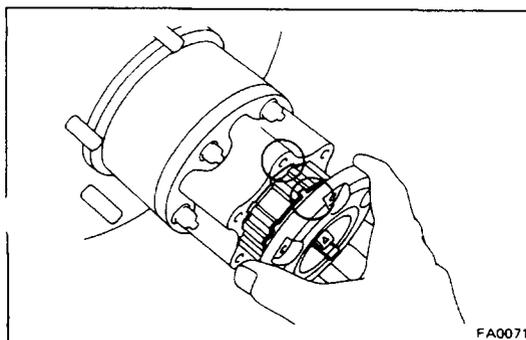
**3. APPLY MP GREASE TO INNER HUB SPLINES****4. INSTALL FREE WHEELING HUB COVER WITH NEW GASKET**

- (a) Set the control handle and clutch to the free position.
- (b) Place a new gasket in position on the cover.



- (c) Install the cover to the body with the follower pawl tabs aligned with the non-toothed portions of the body.

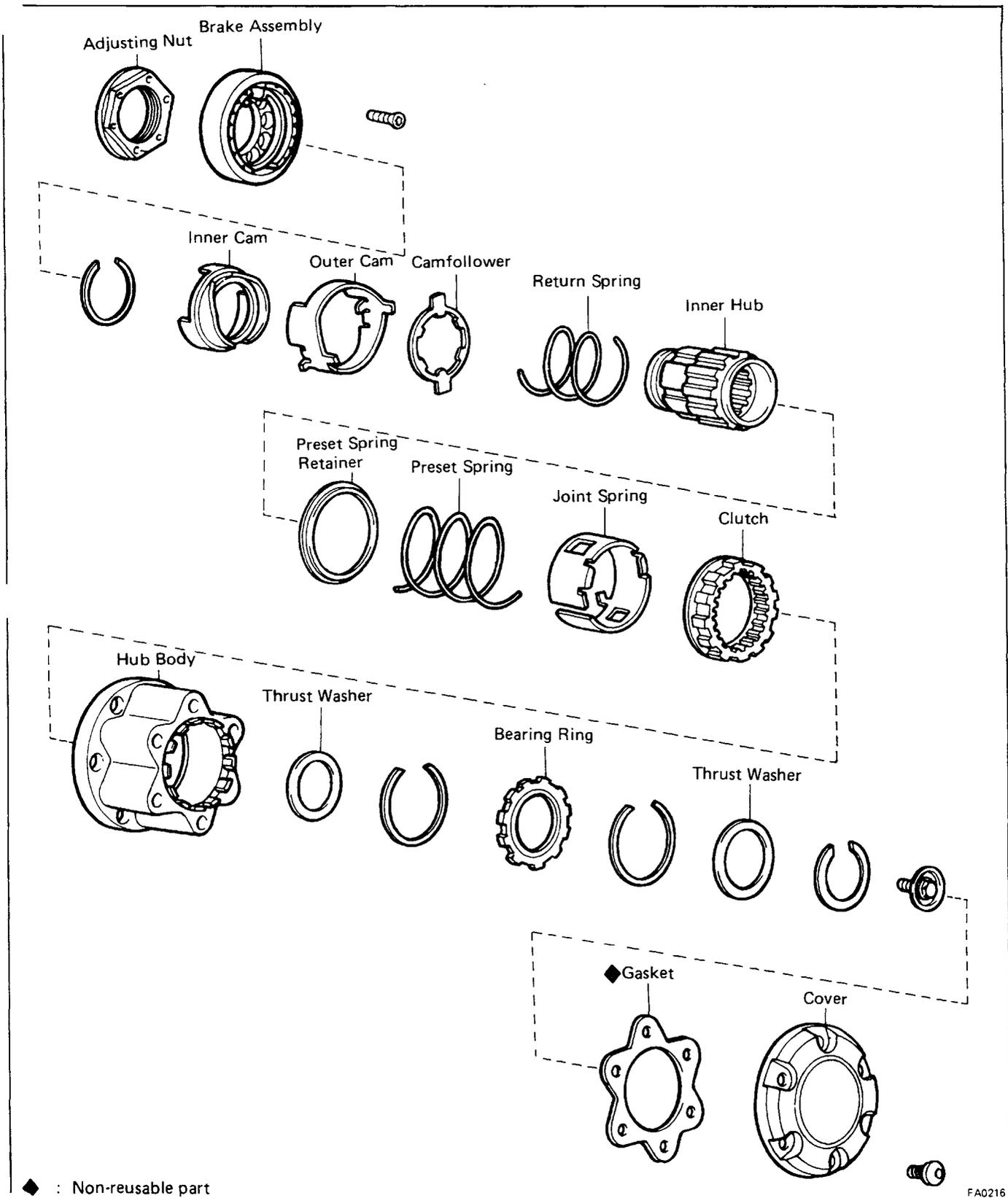
- (d) Tighten the cover mounting bolts.

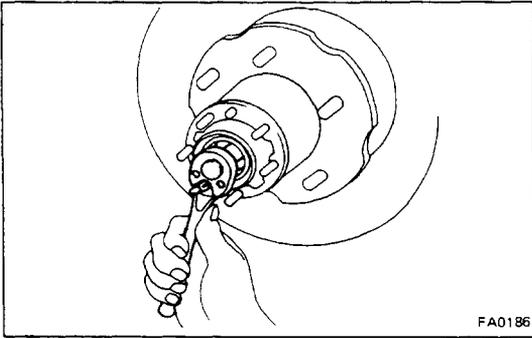
Torque: 100 kg-cm (7 ft-lb, 10 N·m)

AUTOMATIC LOCKING HUB (4WD) TROUBLESHOOTING

Problem	Possible cause	Remedy	Page
Will not lock	Brake shoe worn or damaged	Replace brake assembly	FA-36
Will not unlock	Brake spring weak	Replace brake assembly	FA-36
	Bad rubbing between the inner hub and clutch	Replace hub assembly	FA-36
	Engage and disengage between the clutch and hub body did not go smoothly	Replace hub assembly	FA-36
Abnormal noise	Body and clutch looseness or damage	Replace hub assembly	FA-36
	Looseness of set bolt for axle shaft and inner hub	Tighten or replace hub assembly	FA-36
	Looseness of brake assembly set screw	Replace brake assembly	FA-36
	Needs grease	Apply grease or replace hub assembly	FA-36
Brake drag (ALH)	Outer cam worn or damaged	Replace hub assembly	FA-36
	Front brake dragged	Replace hub assembly	FA-36

COMPONENTS

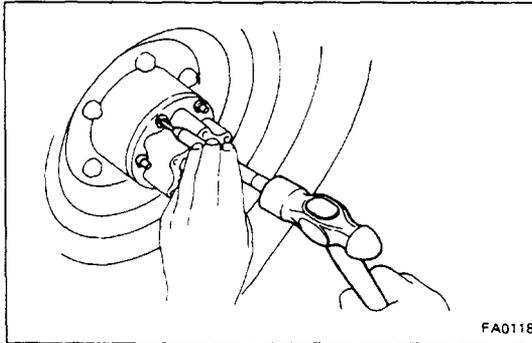




FA0186

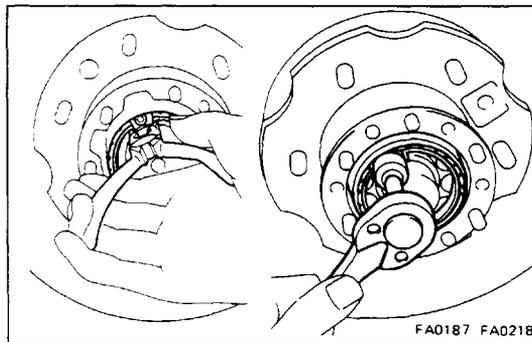
REMOVAL OF AUTOMATIC LOCKING HUB

1. REMOVE HUB COVER
2. REMOVE AXLE BOLT WITH WASHER



FA0118

3. REMOVE HUB BODY
(See step 3 of page FA-29)



FA0187 FA0218

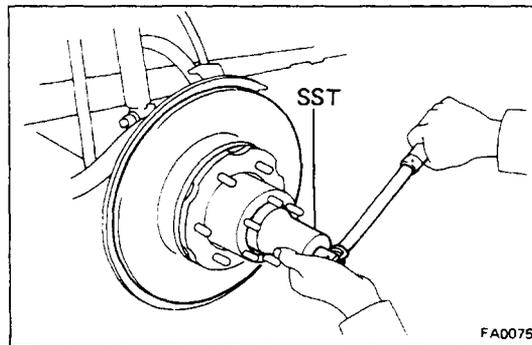
4. REMOVE BRAKE ASSEMBLY

(a) Using needle-nose pliers, compress and turn the brake spring to the position of the screw.

NOTE: To prevent the spring tension from weakening, not overly compress the spring. Also, do not remove the shoe from the drum.

(b) Using a torx socket, remove the screw, and also the other two screws in the same manner.

(c) Remove the brake assembly.

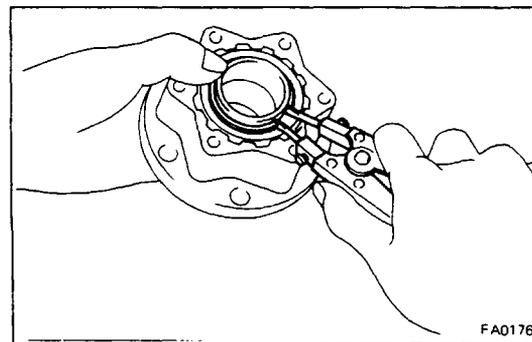


FA0075

5. IF NECESSARY REMOVE ADJUSTING NUT

(a) Using SST, remove the adjusting nut.

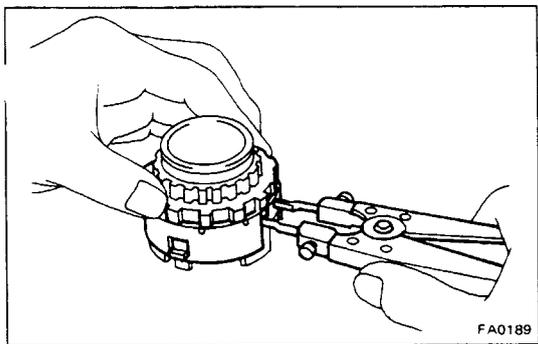
SST 09607-60020



FA0176

DISASSEMBLY OF AUTOMATIC LOCKING HUB

1. REMOVE INNER HUB SUBASSEMBLY FROM HUB BODY
 - (a) Using snap ring pliers, remove the snap ring.
 - (b) Remove the inner hub subassembly from the hub.

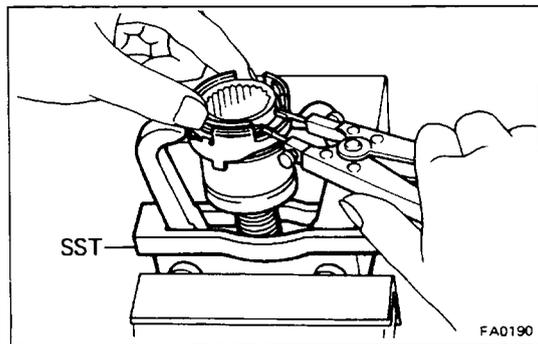


2. REMOVE CLUTCH WITH JOINT SPRING, PRESET SPRING AND SPRING RETAINER

- (a) Using snap ring pliers, extend the joint spring and release it from the cam follower claw.

NOTE: Be careful not to stretch the spring too much.

- (b) Remove the clutch with the joint spring, preset spring and spring retainer.



3. REMOVE OUTER CAM WITH INNER CAM, CAM FOLLOWER AND RETURN SPRING

- (a) Using SST, attach it to the cam follower claw and then compress the return spring.

SST 09950-20015

- (b) Using snap ring pliers, remove the snap ring.
 (c) Remove the outer cam with the inner cam, cam follower and return spring.

INSPECTION OF AUTOMATIC LOCKING HUB

1. MEASURE BRAKE SHOE THICKNESS

- (a) Using pliers, compress the brake spring and slightly draw it out from the drum.

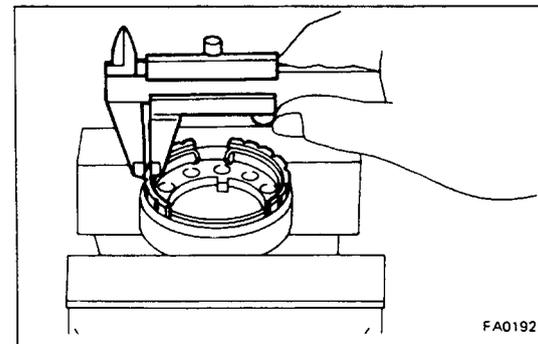
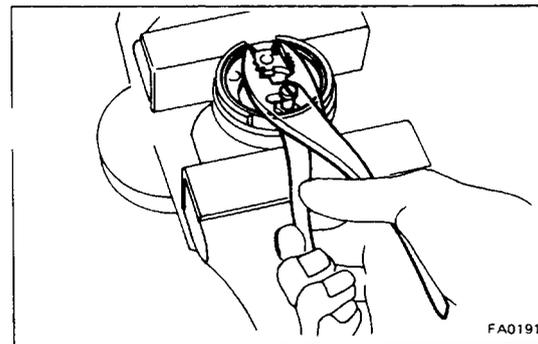
NOTE: To prevent the spring tension from weakening, do not overly compress the spring. Also, do not remove the shoe from the drum.

- (b) Measure the shoe thickness.

Minimum thickness: 1.0 mm (0.039 in.)

If the shoe thickness is less than minimum, replace the brake assembly.

- (c) Using pliers, install the brake shoe all the way back.

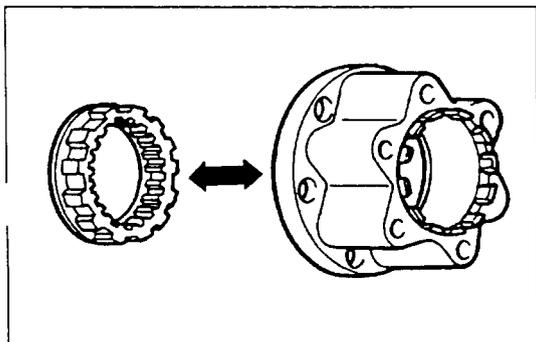


2. INSPECT HUB BODY AND CLUTCH

- (a) Check to see that the hub body and clutch engage and disengage smoothly.
 (b) If engage or disengage are not smooth, replace the hub assembly.

3. INSPECT OTHER PARTS

- (a) Check for abnormal wear or scratches on each part.
 (b) If there are abnormal wear or scratches, replace the hub assembly.

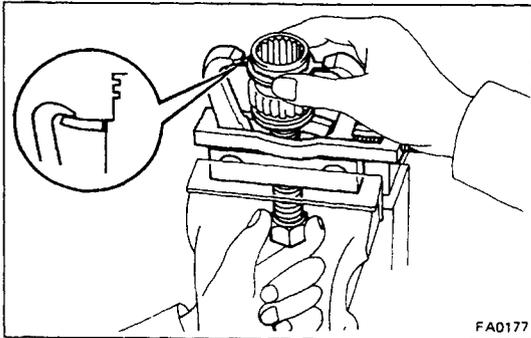


ASSEMBLY OF AUTOMATIC LOCKING HUB

(See page FA-35)

NOTE: The automatic locking hub is maintenance free, and requires no grease except when foreign matter becomes attached or cleaning becomes necessary.

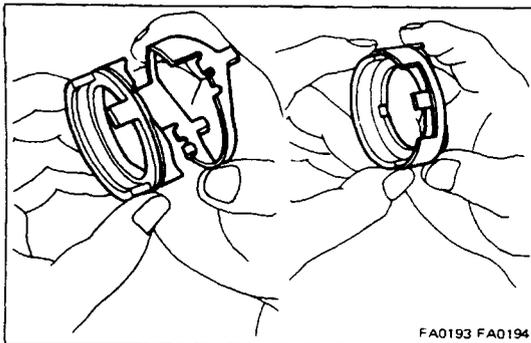
When greasing, use the grease listed below:
 BENTON TYPE GREASE "PLUSGUARD SG"
 ARCO CALDRON EP2
 CASTROL WB or Equivalent

**1. ADJUST HEIGHT OF SST**

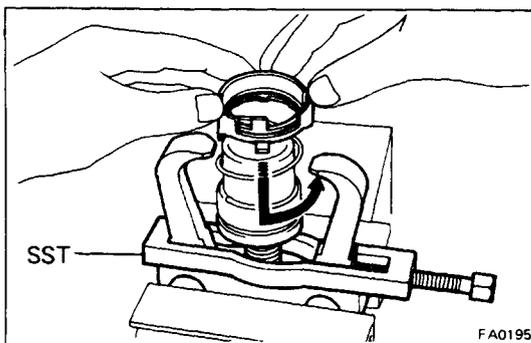
- (a) Position SST. Place the clutch hub above it and insert the cam follower.

SST 09950-20015

- (b) Adjust the height of SST so the cam follower meshes with the inner hub spline and also so the cam follower claw aligns with the claw of SST.
- (c) Remove the cam follower.

**2. ASSEMBLE OUTER CAM, INNER CAM**

- (a) Align the inner cam notch with the outer cam claw and insert it.
- (b) Align the positions of the inner and outer cam.

**3. ASSEMBLE RETURN SPRING, CAM FOLLOWER, OUTER CAM WITH INNER CAM TO INNER HUB**

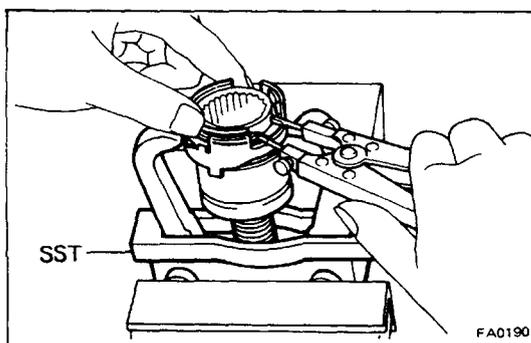
- (a) Install the return spring.

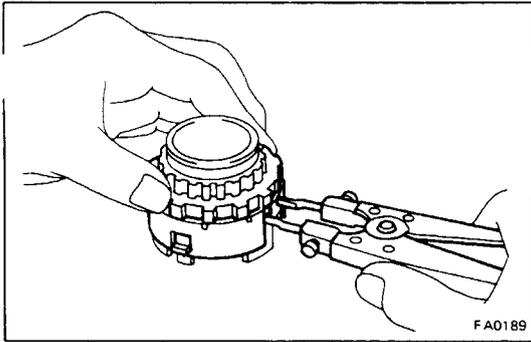
NOTE: Set the follower claw to the spring end of the return spring.

- (b) Align the cam follower with the outer cam with inner cam and install it to the inner hub.
- (c) Compress the return spring and attach the cam follower claw to SST.

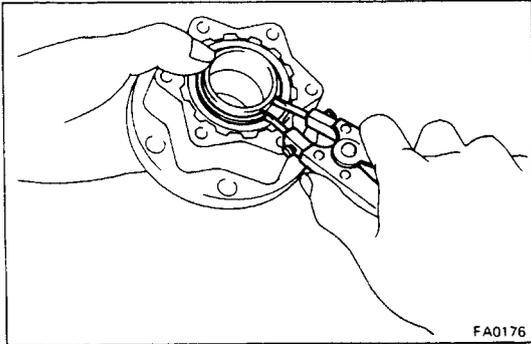
SST 09950-20015

- (d) Using snap ring pliers, secure the snap ring.





- 4. INSTALL CLUTCH, JOINT SPRING, PRESET SPRING, SPRING RETAINER TO INNER HUB**
- (a) Install the joint spring to the clutch.
 - (b) Install the spring retainer and preset spring to the clutch.
 - (c) Install the joint spring with the clutch to the inner hub. Using snap ring pliers, expand the spring and attach it to the cam follower.



- 5. INSTALL INNER HUB ASSEMBLY TO HUB BODY**
- (a) Install the thrust washer to the inner hub.
 - (b) Install the hub body to the inner hub.
 - (c) Install the thrust washer.
 - (d) Using snap ring pliers, secure the snap ring.

INSTALLATION OF AUTOMATIC LOCKING HUB

(See page FA-35)

1. IF NECESSARY, INSTALL ADJUSTING NUT

CAUTION: When converting to an automatic locking type from a type without free wheeling hubs or a manual locking type, a thrust washer must not be installed.

2. ADJUST PRELOAD

(a) Using SST, torque the adjusting nut.

SST 09607-60020

Torque: 600 kg-cm (43 ft-lb, 59 N·m)

(b) Turn the hub right and left two or three times.

(c) Loosen the nut until it can be turned by hand.

(d) Using a spring tension gauge, measure the frictional force of the oil seal.

(e) Retighten the adjusting nut.

Torque: 250 kg-cm (18 ft-lb, 25 N·m)

3. INSTALL BRAKE ASSEMBLY

(a) Tighten the adjusting nut by the smallest amount possible and align it in either position shown at left.

(b) Align the brake hub with the spindle groove and fully insert it to where it is up against the adjusting nut. Then confirm that the holes of the brake hub and adjusting nut coincide.

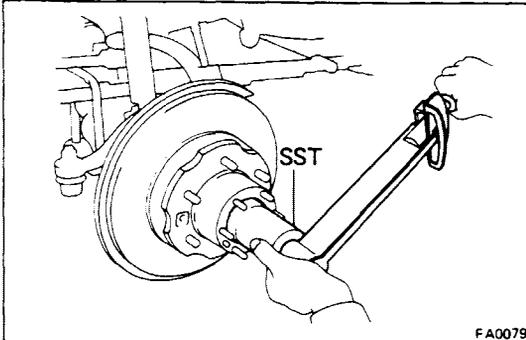
(c) Using a spring tension gauge, check the preload.

Preload (rotating):

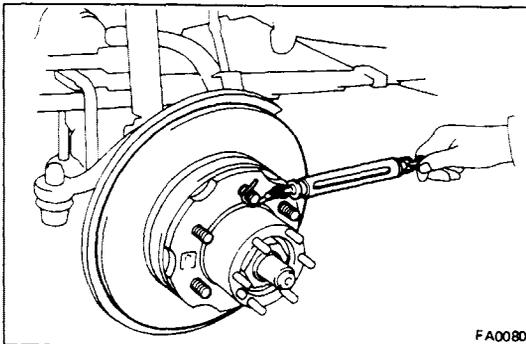
**Frictional force plus 1.0 — 3.9 kg
(2.2 — 8.6 lb, 10 — 38 N)**

If not within specification, adjust with the adjusting nut.

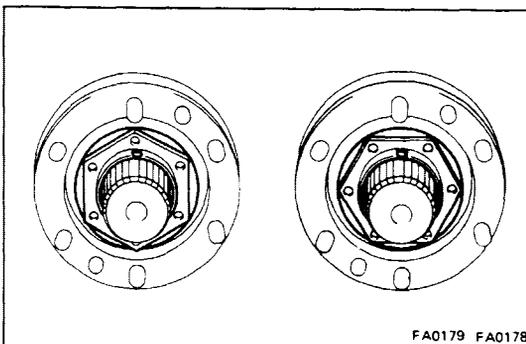
(d) Using needle-nose pliers, compress the brake spr by the smallest amount possible and turn it to where the holes of the brake assembly and adjusting nut are aligned.



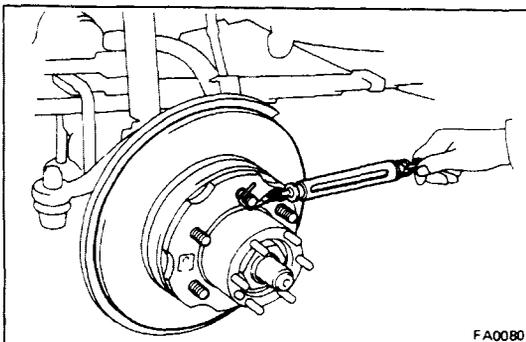
FA0079



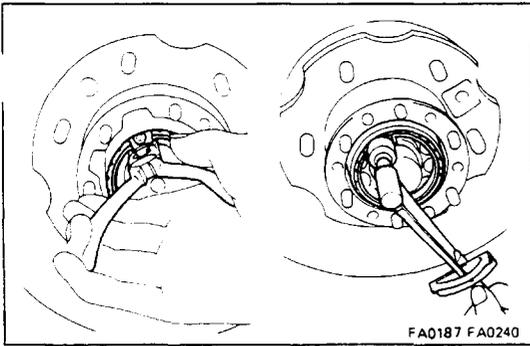
FA0080



FA0179 FA0178



FA0080

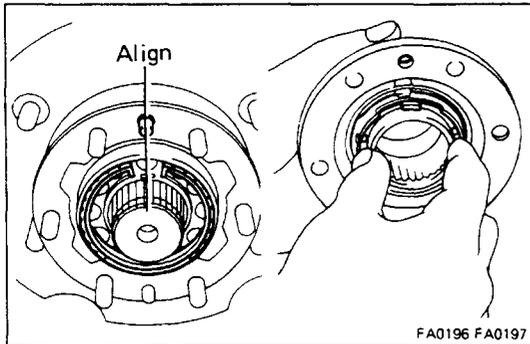


- (e) Using a torx socket, install the screw, and also the other two screws in the same manner and equal distance apart. Torque the screw.

Torque: 70 kg-cm (61 in.-lb, 6.9 N·m)

CAUTION:

1. Tighten as close to specifications possible.
2. Insure that the brake shoe is as far back into the drum as it will go.



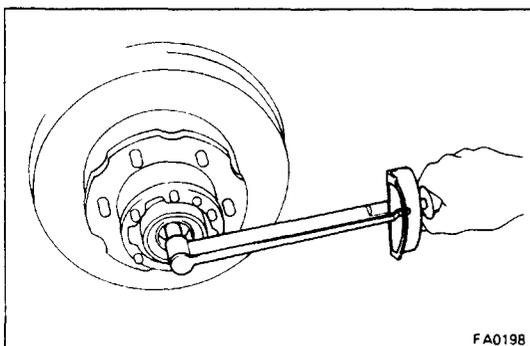
4. INSTALL AUTOMATIC LOCKING HUB

- (a) Align the spring claw of the brake assembly with the knock pin.
- (b) Align the inner cam protrusion with the hub body knock pin hole.
- (c) Install the hub body. Confirm that the hub body fits perfectly on the axle hub, and then install the six cone washers and nuts.

Torque: 315 kg-cm (23 ft-lb, 31 N·m)

NOTE: If the hub body and axle hub do not fit perfectly, reinstall them.

Spline are not aligned, turn the propeller shaft to align them.



5. INSTALL PLATE WASHER WITH NUT

Torque the nut.

Torque: 185 kg-cm (13 ft-lb, 18 N·m)

6. INSTALL COVER

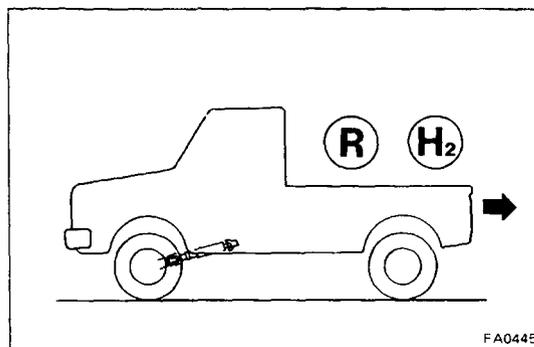
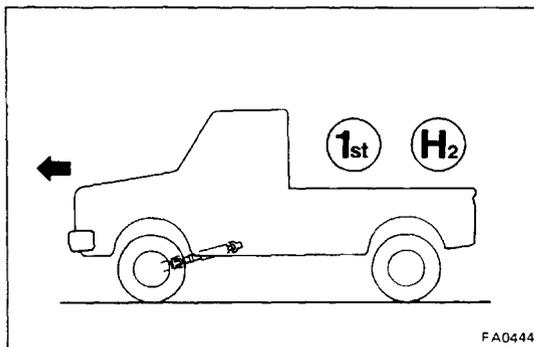
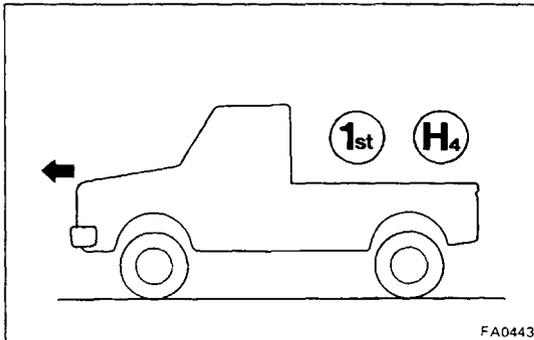
Torque the bolt.

Torque: 100 kg-cm (7 ft-lb, 10 N·m)

CAUTION: When assembling the automatic locking hub, the locking of the left and right hubs may not be identical. So, in the first run after assembly, shift to H4.

OPERATION CHECK

Perform this check with 2 persons.



CONFIRMATION OF FORWARD MOTION

1. CHECK LOCK OPERATION

- (a) Shift to H4 and 1st position and slowly proceed for several meters.
- (b) Stop the vehicle.

- (c) For transfer, shift to H2 and proceed slowly. During this, one person should check under the vehicle to see that the propeller shaft is turning. If turning this means that the automatic locking hub is locked.

2. CHECK-FREE OPERATION

- (a) Transfer is done in H2, shifting to reverse position and backing up several meters.

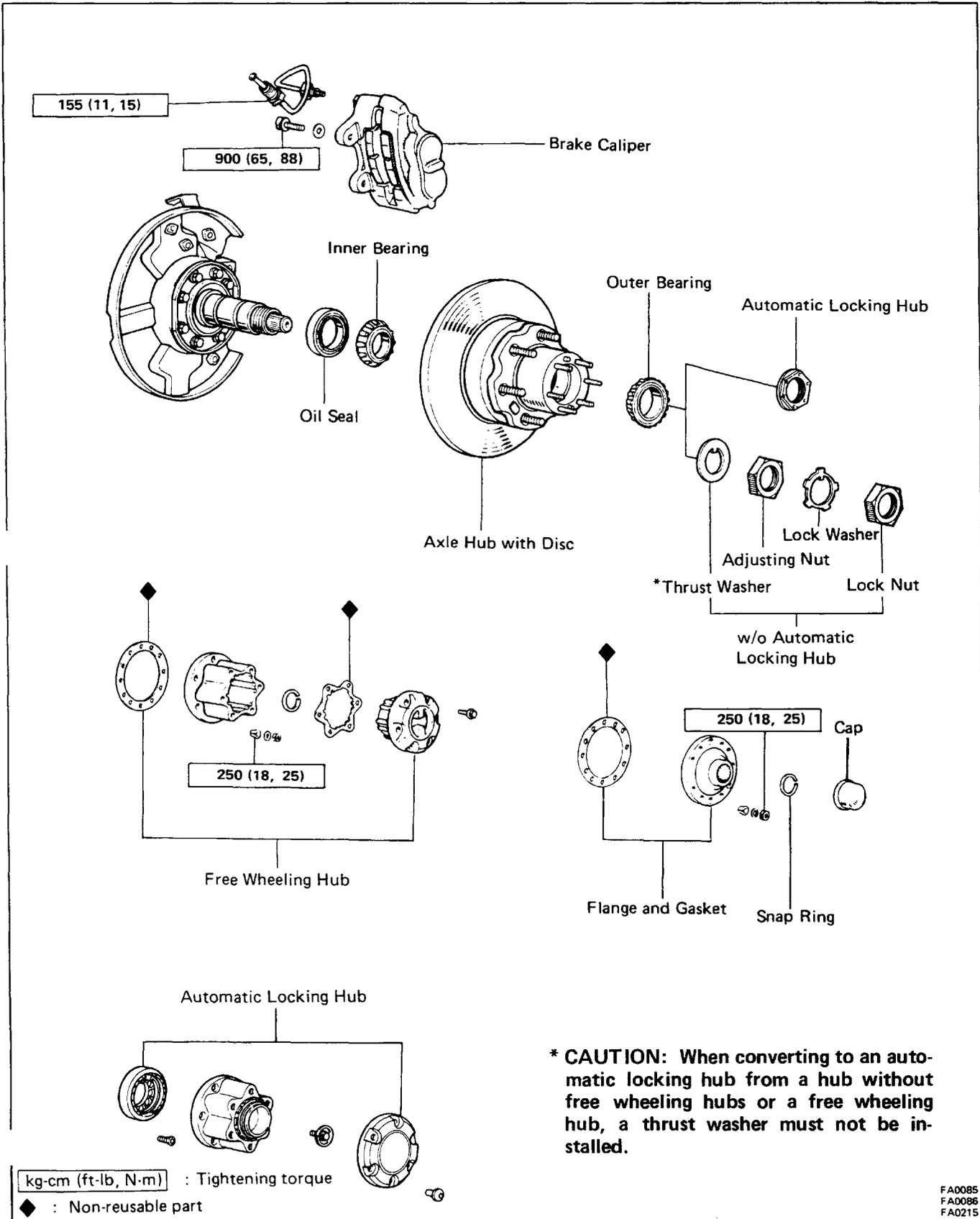
During this one person should check under the vehicle to see that the propeller shaft is not turning.

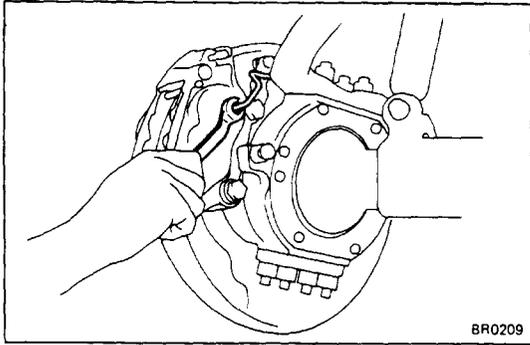
CONFIRMATION OF REVERSE MOTION

Reverse is checked in the same manner.

If the event that checking reveals abnormalities, re-confirm the assembly and/or installation.

FRONT AXLE HUB (4WD) COMPONENTS



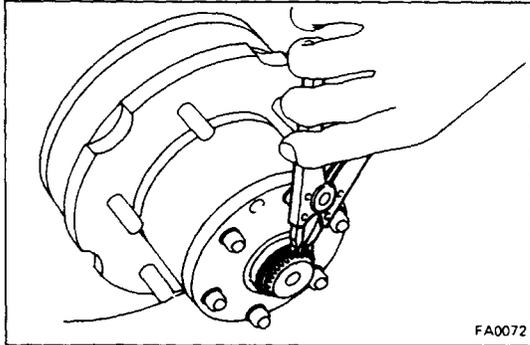


Front Axle Hub

DISASSEMBLY OF FRONT AXLE HUB

1. REMOVE DISC BRAKE CYLINDER

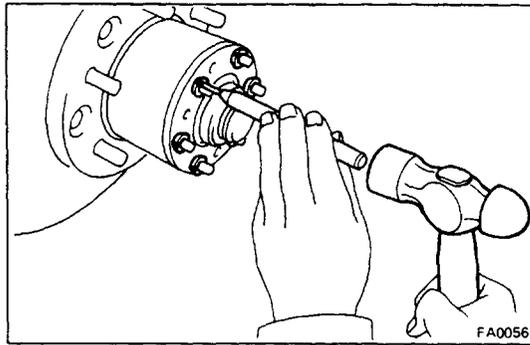
- (a) Using SST, disconnect the brake tube.
SST 09751-36011
- (b) Remove the disc brake cylinder.



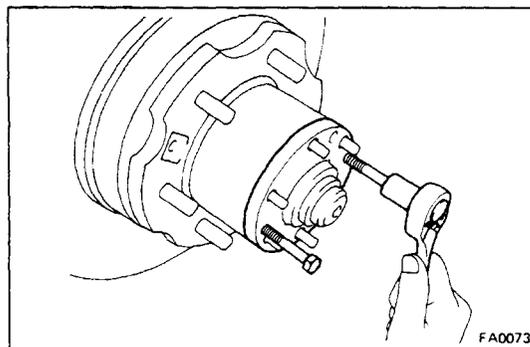
2. REMOVE FLANGE, FREE WHEELING HUB OR AUTOMATIC LOCKING HUB

NOTE: For the free wheeling hub. (See page FA-29)
For the automatic locking hub. (See page FA-36)

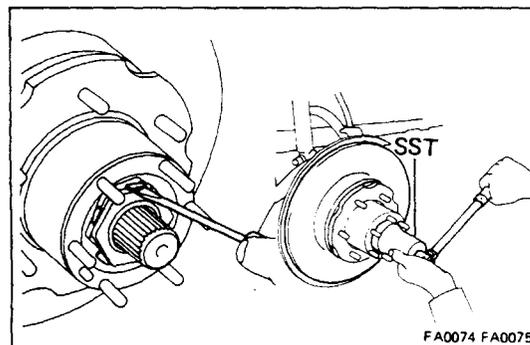
- (a) Remove the cap from the flange.
- (b) Using snap ring pliers, remove the snap ring.
- (c) Remove the mounting nuts.



- (d) Using a tapered punch, tap the slits of the cone washers and remove them.

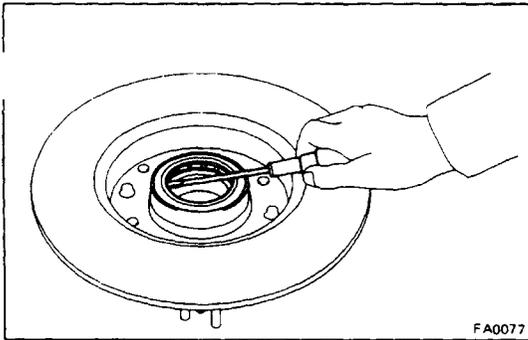


- (e) Install and tighten the two bolts, and remove the flange.



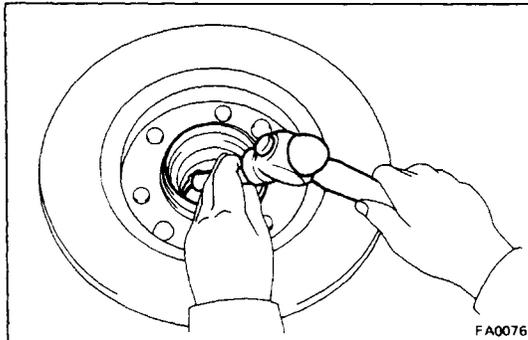
3. REMOVE AXLE HUB WITH DISC

- (a) Using a screwdriver, release the lock washer.
- (b) Using SST, remove the lock nut.
SST 09607-60020
- (c) Remove the lock washer and adjusting nut.
- (d) Remove the axle hub with the disc.



4. REMOVE INNER BEARING AND OIL SEAL

- (a) Using a screwdriver, pry out the oil seal.
- (b) Remove the inner bearing from the hub.



INSPECTION AND REPAIR OF FRONT AXLE HUB

1. INSPECT BEARING

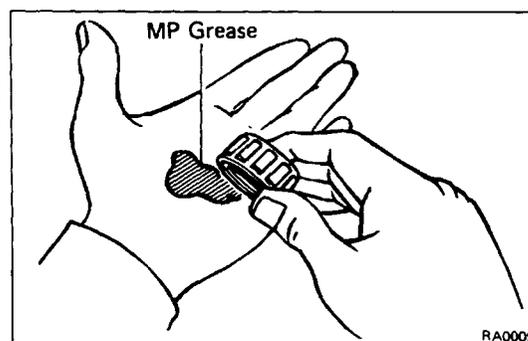
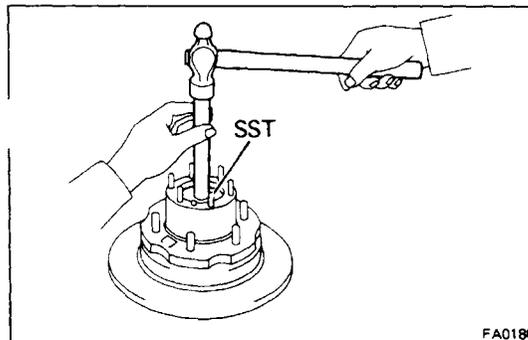
Clean the bearings and outer races and inspect them for wear or damage.

2. REPLACE BEARING OUTER RACE

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

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

SST 09608-35013

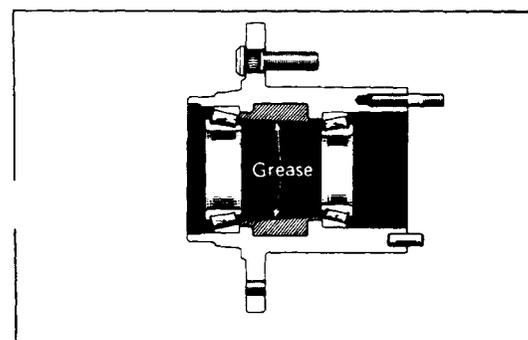


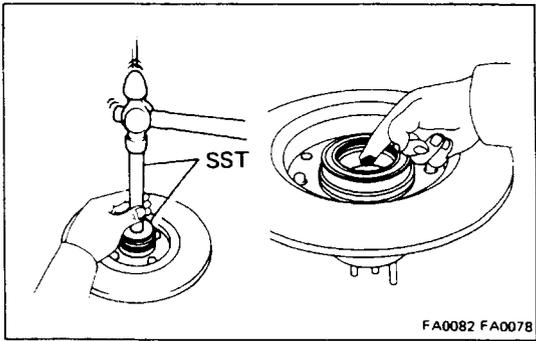
ASSEMBLY OF FRONT AXLE HUB

1. PACK BEARINGS WITH MP GREASE

- (a) Place MP grease in the palm of your hand.
- (b) Pack grease into the bearing, continuing until the grease oozes out from the other side.
- (c) Do the same around the bearing circumference.

2. COAT INSIDE OF HUB AND CAP WITH MP GREASE





FA0082 FA0078

3. INSTALL INNER BEARING AND OIL SEAL

Place inner bearing into the hub. Using SST, drive the oil seal into the hub. Coat the oil seal with MP grease.

SST 09608-35013

4. INSTALL AXLE HUB ON SPINDLE

- Place the axle hub on the spindle.
- Install the outer bearing and thrust washer.

CAUTION: When converting to an automatic locking hub from a hub without free wheeling hubs or a free wheeling hub, a thrust washer must not be installed.

5. ADJUST PRELOAD

- Using SST, install and torque the nut.

SST 09607-60020

Torque: 600 kg-cm (43 ft-lb, 59 N·m)

- Turn the hub right and left two or three times.
- Loosen the nut until it can be turned by hand.

- Using a spring tension gauge, measure the frictional force of the oil seal.

- Retighten the adjusting nut.

Torque: 250 kg-cm (18 ft-lb, 25 N·m)

6. INSTALL LOCK WASHER AND LOCK NUT (Ex. AUTOMATIC LOCKING HUB)

- Install the lock washer and lock nut.

- Using SST, torque the lock nut.

SST 09607-60020

Torque: 450 kg-cm (33 ft-lb, 44 N·m)

- Check that the bearing has no play.

- Using a spring tension gauge, check the preload.

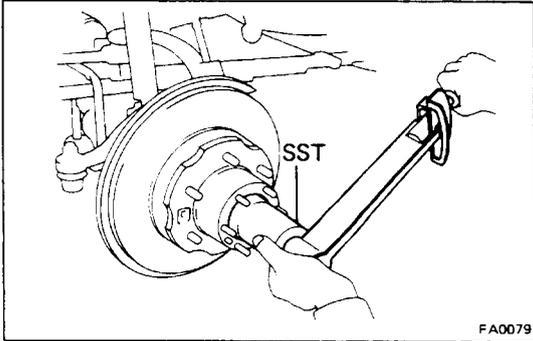
Preload (rotating):

Frictional force plus 2.8 – 5.6 kg

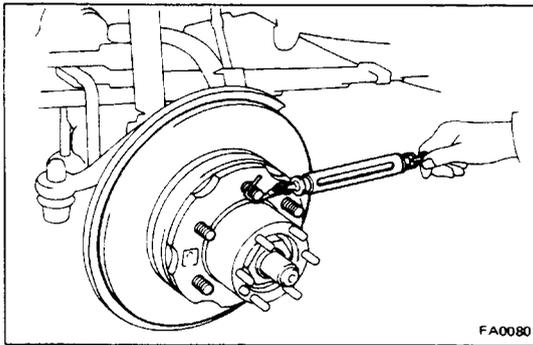
(6.2 – 12.3 lb, 27 – 55 N·m)

If not within specification, adjust with the adjusting nut.

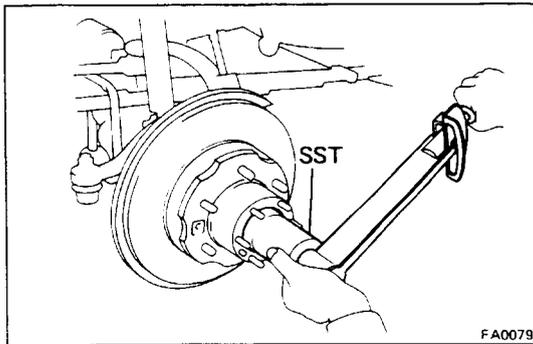
- Secure the lock nut by bending one of the lock washer teeth inward and another lock washer teeth outward.



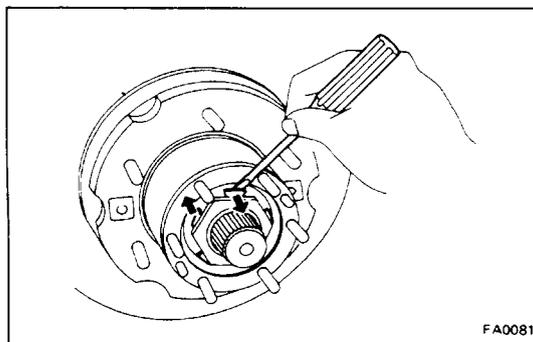
FA0079



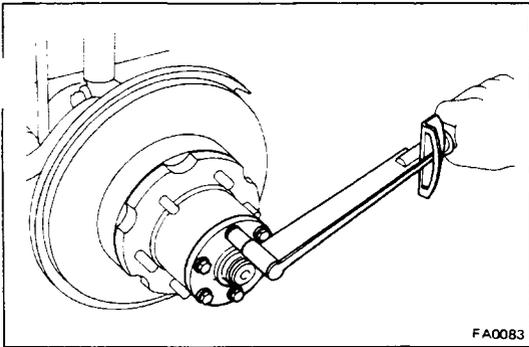
FA0080



FA0079



FA0081

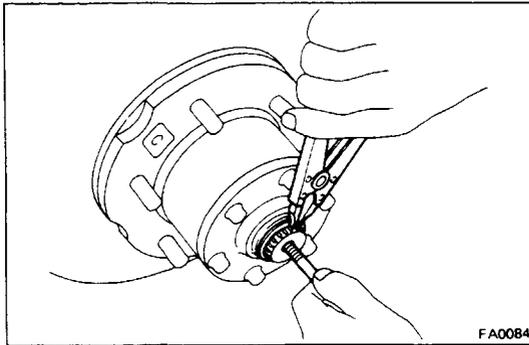


7. INSTALL FLANGE, FREE WHEELING HUB OR AUTOMATIC LOCKING HUB

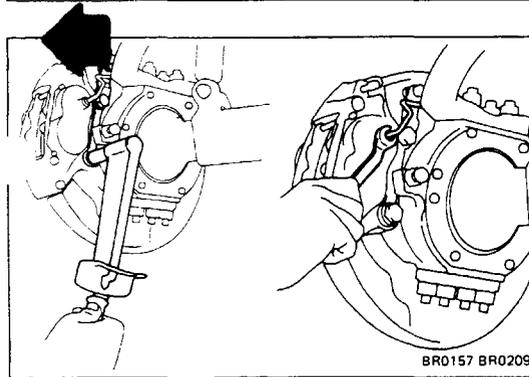
NOTE: In case of the free wheeling hub. (See page FA-33)
In case of the automatic locking hub. (See page FA-40)

- (a) Place the gasket in position on the axle hub.
- (b) Install the flange to the axle hub.
- (c) Install six cone washers and nuts.
Torque the nuts.

Torque: 315 kg-cm (23 ft-lb, 31 N·m)



- (d) Install a bolt in the axle shaft and pull it out.
- (e) Using snap ring pliers, install the snap ring.
- (f) Remove the bolt.
- (g) Install the cap to the flange.



8. INSTALL BRAKE CALIPER

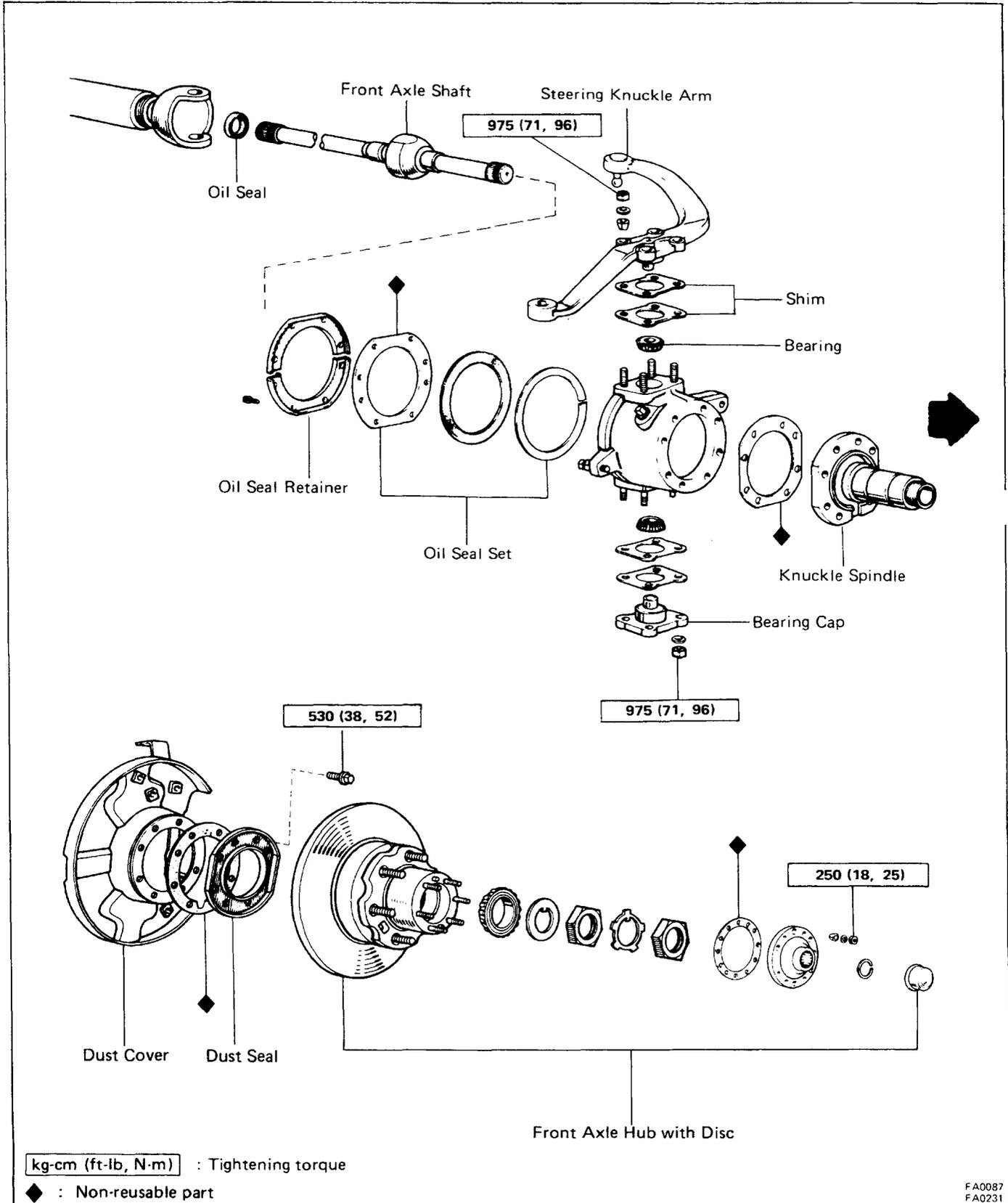
- (a) Install the brake caliper to the steering knuckle.
Torque the mounting bolts.

Torque: 900 kg-cm (65 ft-lb, 88 N·m)

- (b) Using SST, connect the brake tube.
SST 09751-36011

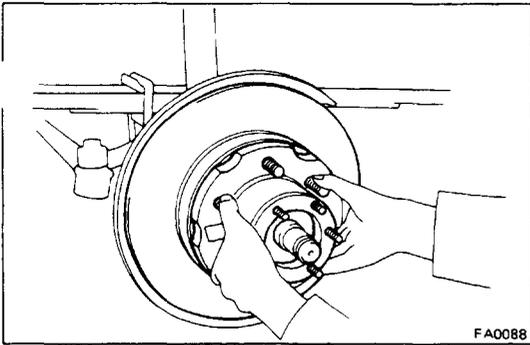
Torque: 155 kg-cm (11 ft-lb, 15 N·m)

STEERING KNUCKLE AND AXLE SHAFT (4WD) COMPONENTS

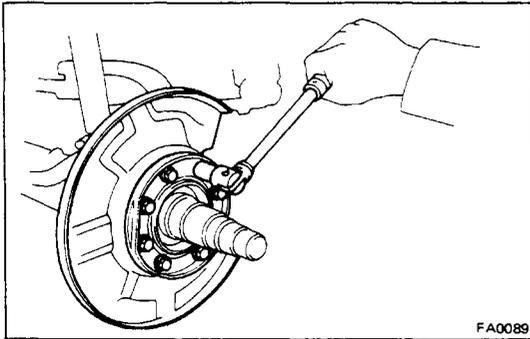


DISASSEMBLY OF STEERING KNUCKLE AND AXLE SHAFT

1. REMOVE FRONT AXLE HUB
(See page FA-44)

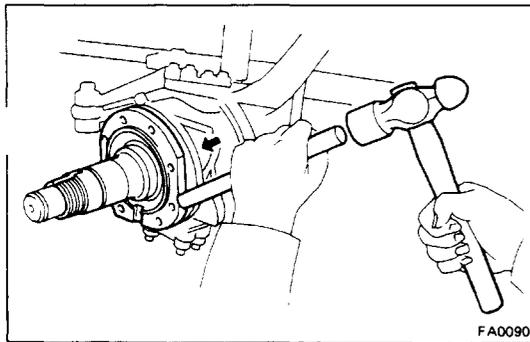


2. REMOVE KNUCKLE SPINDLE MOUNTING BOLTS
3. REMOVE DUST SEAL AND DUST COVER



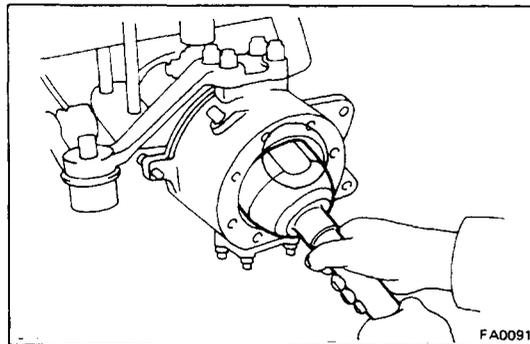
4. REMOVE KNUCKLE SPINDLE

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



5. REMOVE AXLE SHAFT

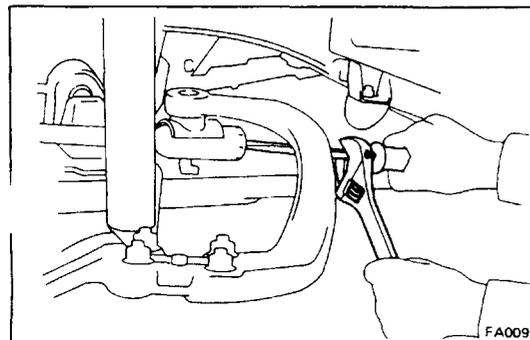
Position one flat part of the outer shaft upward and pull out the axle shaft.

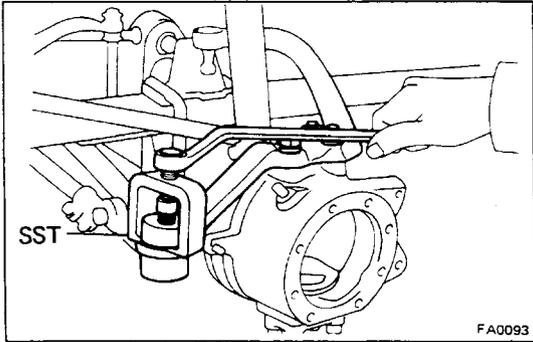


6. REMOVE OIL SEAL SET RETAINER

7. DISCONNECT DRAG LINK FROM KNUCKLE ARM

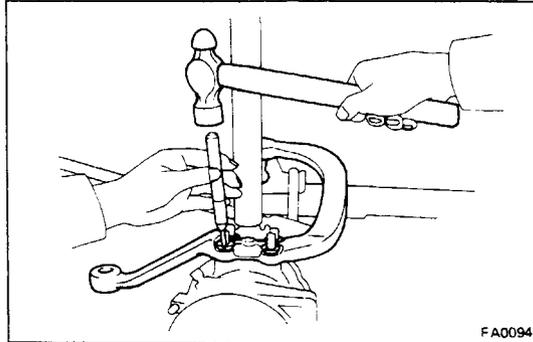
- (a) Remove the cotter pin from the drag link end.
- (b) Using a screwdriver, remove the plug.
- (c) Disconnect the drag link from the knuckle arm.





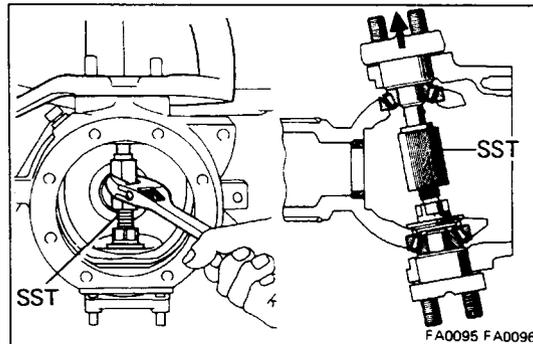
8. DISCONNECT TIE ROD FROM KNUCKLE ARM

Using SST, disconnect the tie rod from the knuckle arm
SST 09611-22012



9. REMOVE KNUCKLE ARM AND BEARING CAP

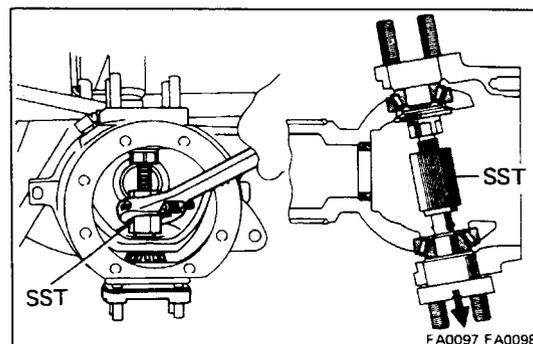
- (a) Remove the knuckle arm and bearing cap mounting nuts.
- (b) Using a tapered punch, tap the slits of the cone washers and remove them from the knuckle arm.



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

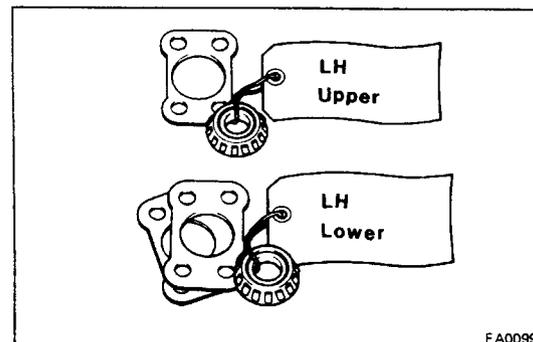
SST 09606-60020

NOTE: Use the SST without a collar.



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

SST 09606-60020



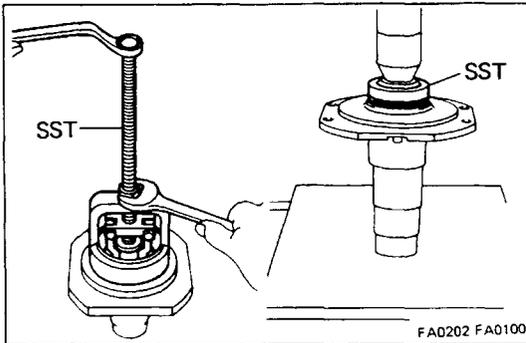
10. REMOVE STEERING KNUCKLE AND BEARINGS

NOTE: 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.

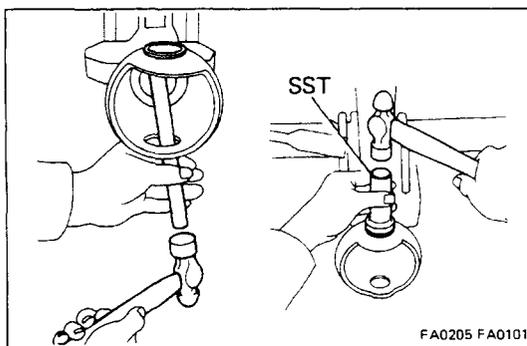
SST 09612-65013

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

SST 09608-35013

3. INSPECT BEARING

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

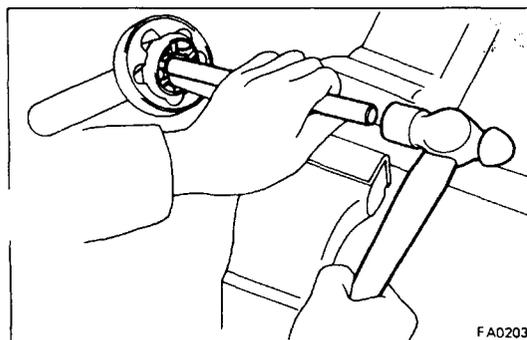


4. IF NECESSARY, REPLACE BEARING OUTER RACE

(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

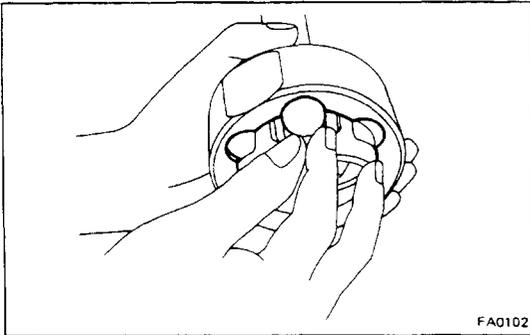


5. INSPECT BIRFIELD JOINT INNER PARTS

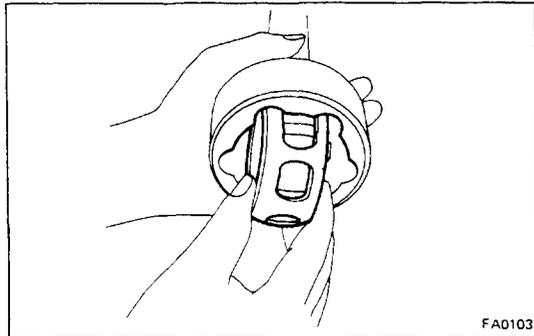
(a) Hold the inner shaft in a vise.

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

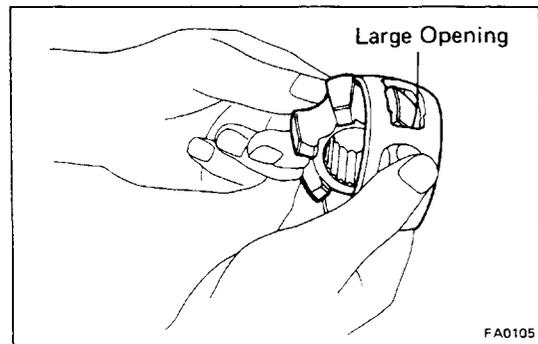
B02217



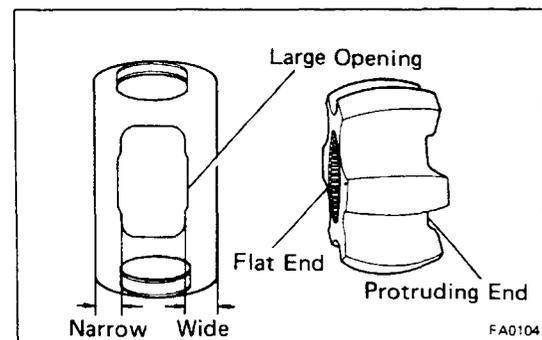
- (c) Tilt the inner race and cage and take out the bearing balls one by one.



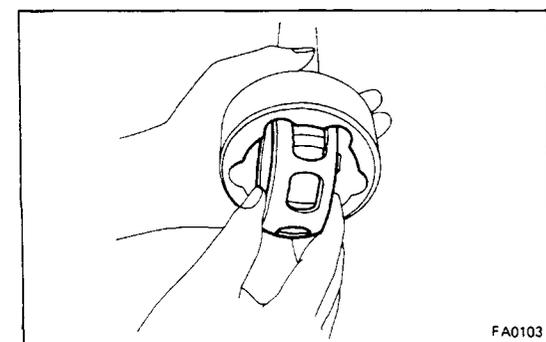
- (d) Fit the two large openings in the cage against the protruding parts of the outer shaft, and pull out the cage and inner race.



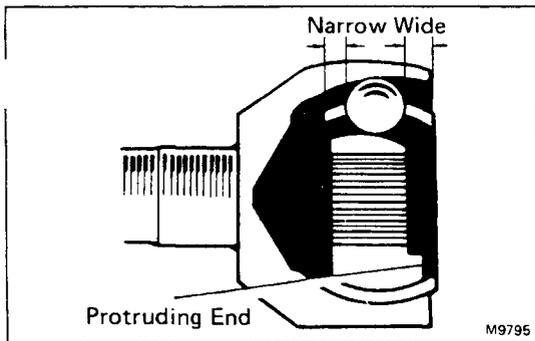
- (e) Take out the inner race from the cage through the large opening.
 (f) Clean and inspect the joint inner parts for wear or damage.



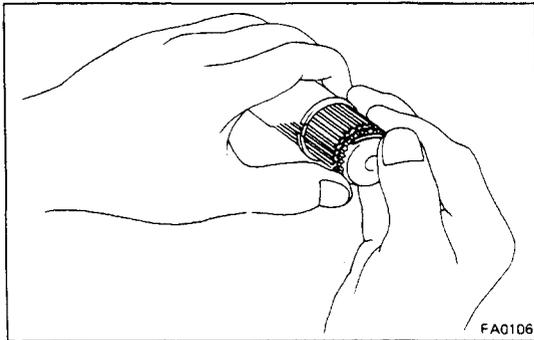
- (g) Coat the joint inner parts and outer shaft inside with molybdenum disulphide lithium base grease.
 (h) Insert the inner race in the cage through the large opening.
 (i) Position the protruding end the inner race toward the wide side of the cage.



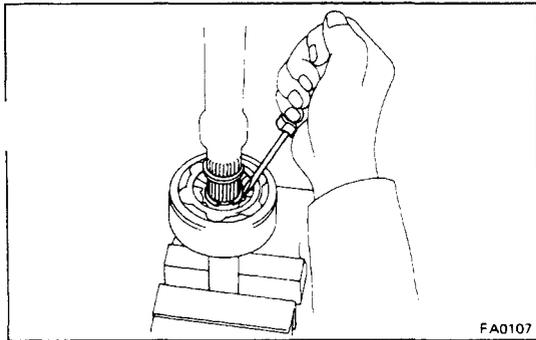
- (j) Assemble the cage and inner race to the outer shaft by fitting the two large openings in the cage against the protruding parts of the outer shaft.



- (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

NOTE: 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.

SST 09634-60013

1. ADJUST BEARING PRELOAD

(a) Using SST, remove the oil seal.

SST 09308-00010

(b) Coat the knuckle bearings lightly with MP grease.

(c) Mount the SST on the housing with the bearings.

SST 09634-60013

(d) Add preload to the bearings by tightening nut F.

Using a spring tension gauge, measure the preload.

Preload (rotating): 3.0 – 6.0 kg

(6.6 – 13.2 lb, 29 – 59 N)

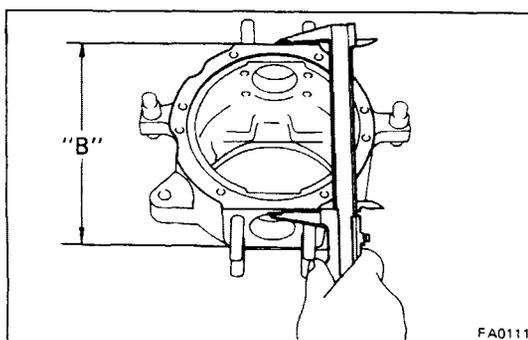
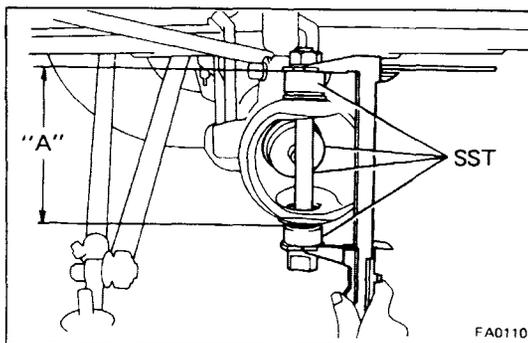
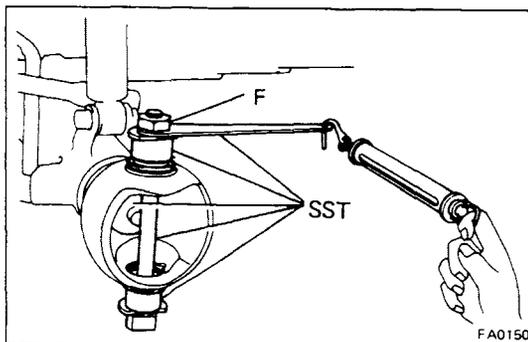
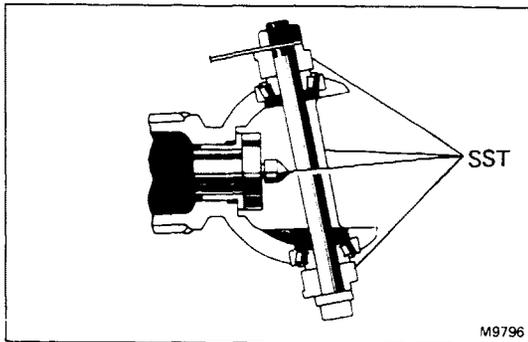
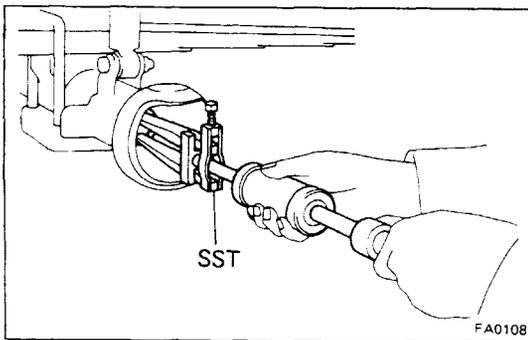
(e) Measure distance "A".

(f) Measure distance "B".

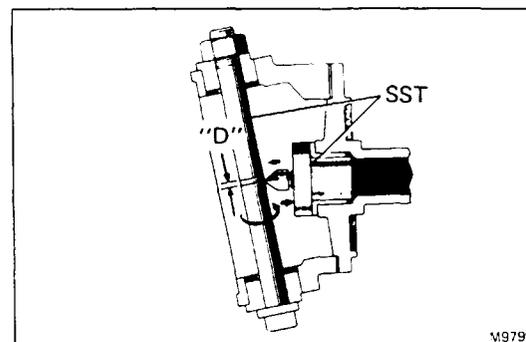
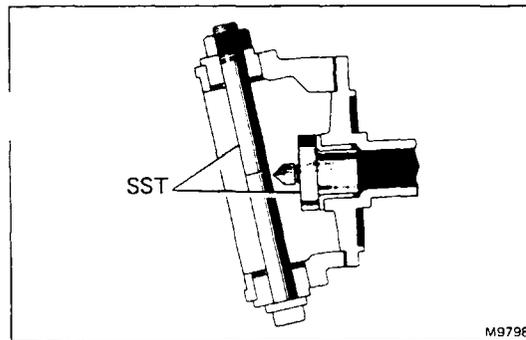
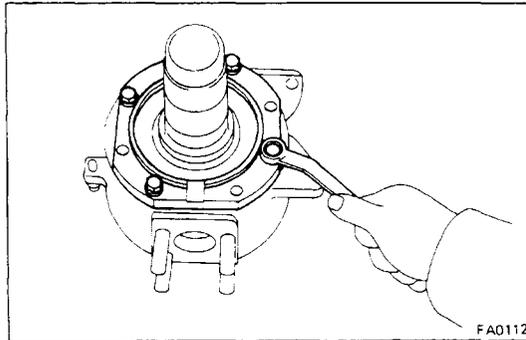
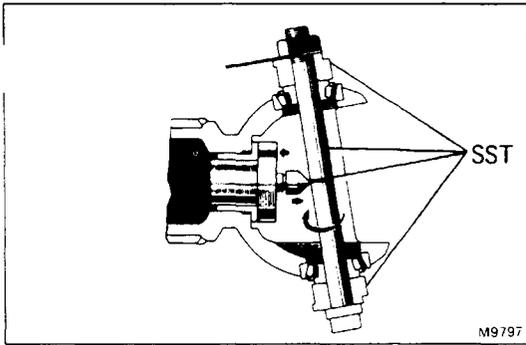
The difference between "A" and "B" is the total adjusting shim thickness that is required to maintain the correct bearing preload.

TOTAL SHIM THICKNESS "C"

$$"C" = "A" - "B"$$



B02220



2. ADJUST STEERING KNUCKLE ALIGNMENT

- (a) Apply a light coat of red lead on the center part 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 scribed 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

NOTE: Use care not to erase the scribed 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 scribe another line on it. Measure distance "D" between the two scribed lines.

The thickness of the steering knuckle lower bearing shim "E" will be the distance "D" less 3 mm (0.12 in.).

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".

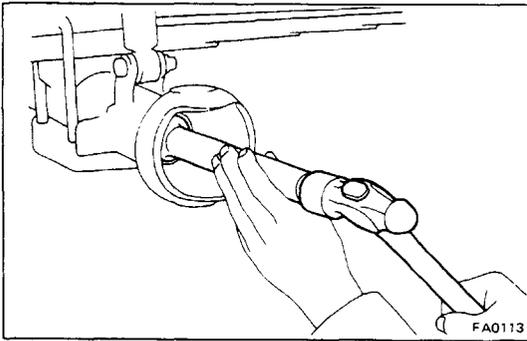
UPPER SHIM THICKNESS "F"

$$"F" = "C" - "E"$$

NOTE: Compare "E" and "F" with the thicknesses of the shims removed at disassembly. If there is considerable difference, remeasure "E" and "F".

Adjusting shim thickness mm (in.)

Thickness
0.1 (0.004)
0.2 (0.008)
0.5 (0.020)
1.0 (0.039)

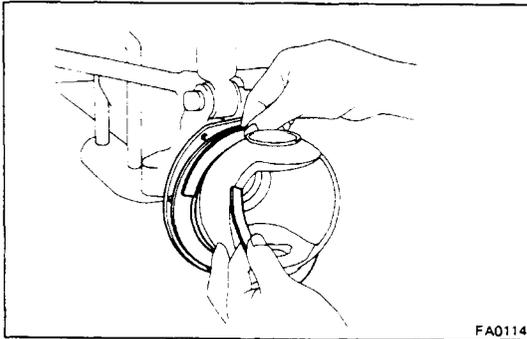


ASSEMBLY OF STEERING KNUCKLE AND AXLE SHAFT

(See page FA-48)

1. INSTALL OIL SEAL TO AXLE HOUSING

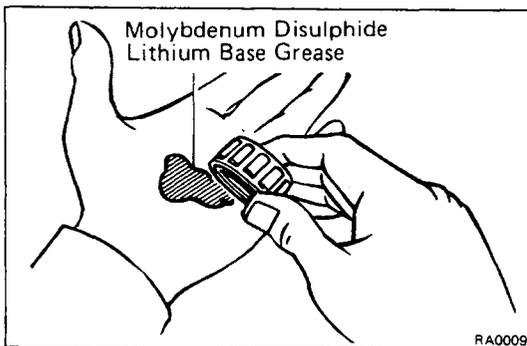
Using SST, drive the oil seal into the axle housing.
SST 09618-60010



2. INSTALL OIL SEAL SET

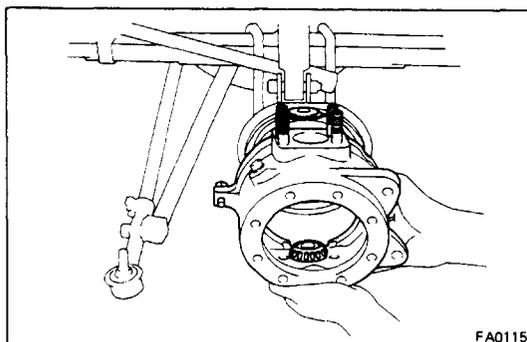
Install the parts in the following order:

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



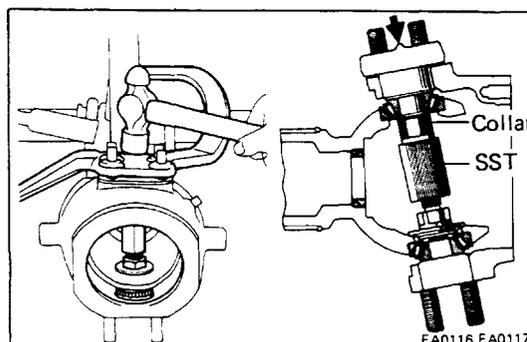
3. PACK BEARINGS WITH MP GREASE

- (a) Place Molybdenum disulphide lithium base grease in the palm of your hand.
- (b) Pack grease into the bearing, continuing 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 positions on the knuckle and axle housing.
- (b) Insert the knuckle on the axle housing.



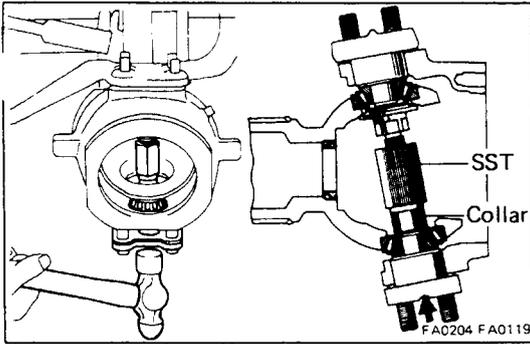
5. INSTALL KNUCKLE ARM AND BEARING CAP

(a) Using SST, support the upper bearing inner race.
SST 09606-60020

NOTE: Use SST with a collar.

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

B02222



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

NOTE: Use SST with a collar.

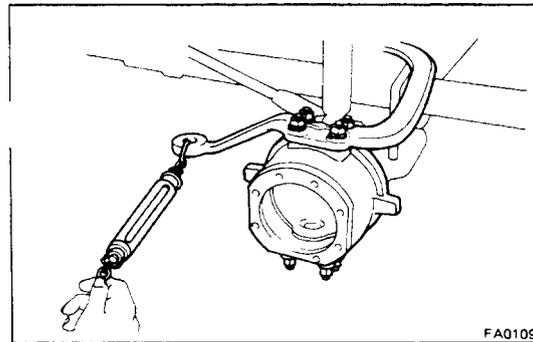
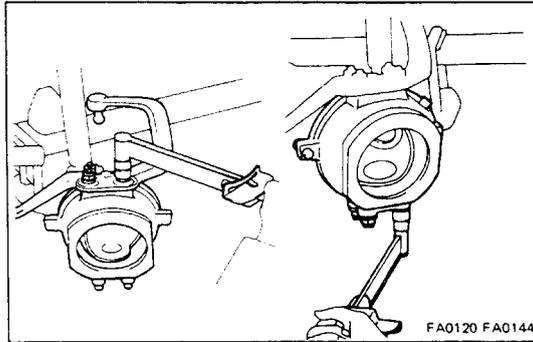
- (e) Install the bearing cap over the shims that were originally used or were selected as described in adjustment operations.
(f) Using a hammer, tap the bearing cap into the bearing inner race.
(g) Remove SST from the knuckle.

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

Torque: 975 kg-cm (71 ft-lb, 96 N·m)

- (i) Install and torque the bearing cap mounting nuts.

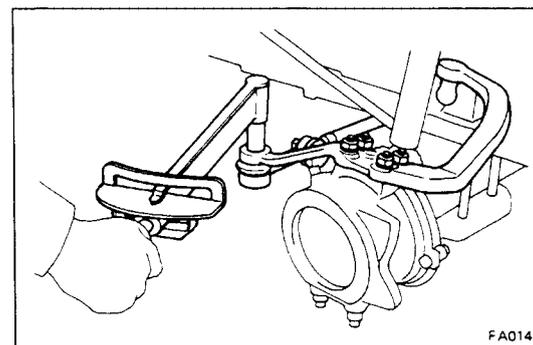
Torque: 975 kg-cm (71 ft-lb, 96 N·m)



6. MEASURE BEARING PRELOAD

Using a spring tension gauge, measure the preload.

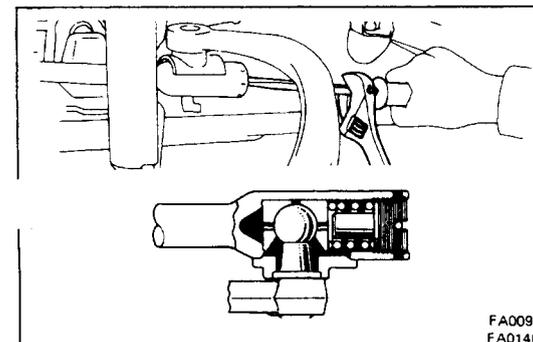
**Preload (rotating): 3.0 — 6.0 kg
(6.6 — 13.2 lb, 29 — 59N)**



7. CONNECT TIE ROD TO KNUCKLE ARM

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

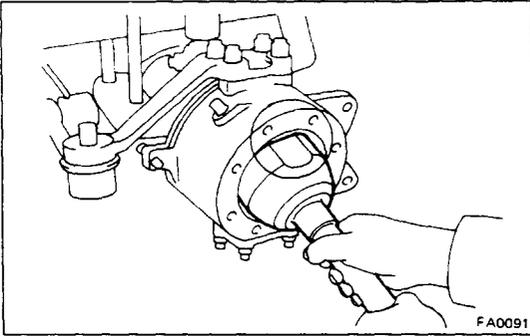
Torque: 930 kg-cm (67 ft-lb, 91 N·m)



8. CONNECT DRAG LINK TO KNUCKLE ARM

- (a) Insert the drag link on the knuckle arm.
(b) Install the ball stud seat, spring, spring seat and plug in the drag link end.
(c) Torque the plug completely and then loosen 1-1/3 turns.
(d) Secure the plug with a cotter pin.

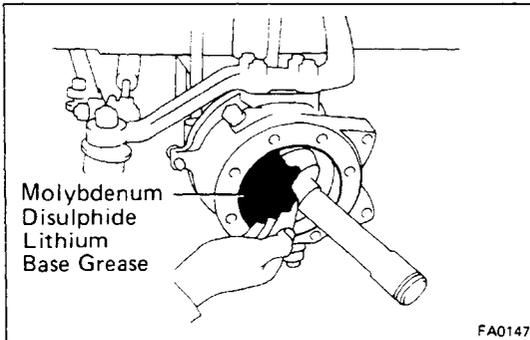
B02223



9. INSTALL OIL SEAL SET RETAINER TO KNUCKLE

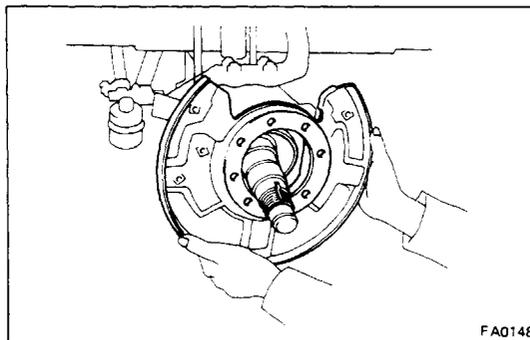
10. INSTALL AXLE SHAFT

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



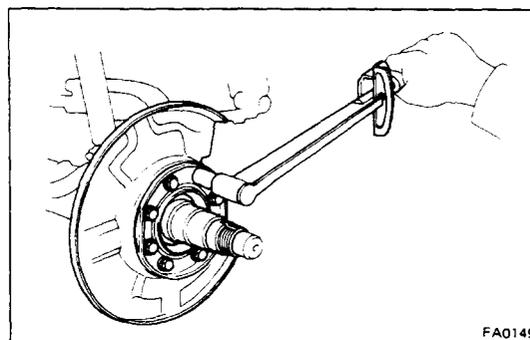
11. PACK MOLYBDENUM DISULPHIDE LITHIUM BASE GREASE IN KNUCKLE

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



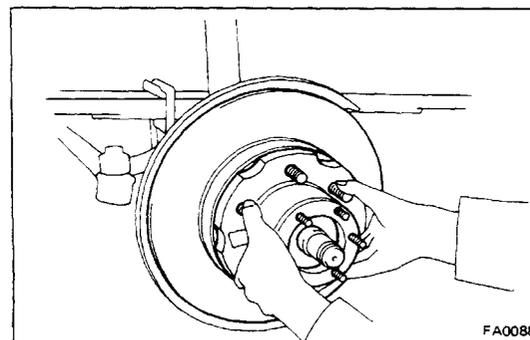
12. INSTALL KNUCKLE SPINDLE, DUST COVER AND DUST SEAL WITH NEW GASKETS

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



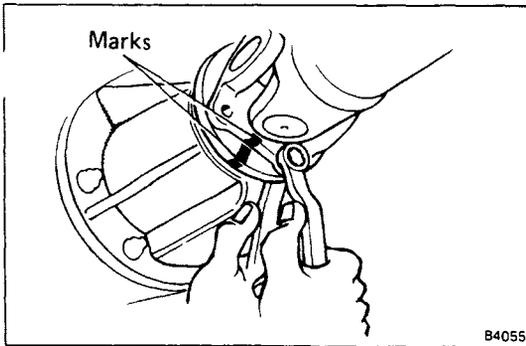
- (c) Torque the spindle mounting bolts.

Torque: 530 kg-cm (38 ft-lb, 52 N·m)



13. INSTALL AXLE HUB (See page FA-45)

B02224



FRONT DIFFERENTIAL (4WD)

REMOVAL OF DIFFERENTIAL

(See page RA-7)

1. REMOVE DRAIN PLUG AND DRAIN DIFFERENTIAL OIL
2. REMOVE FRONT AXLE SHAFT (See page FA-49)
3. DISCONNECT PROPELLER SHAFT FROM DIFFERENTIAL (See page RA-6)
4. REMOVE DIFFERENTIAL CARRIER ASSEMBLY

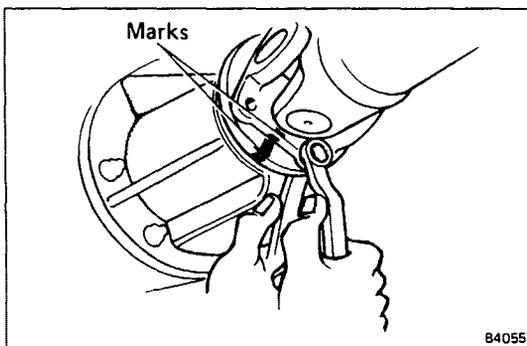
DISASSEMBLY OF DIFFERENTIAL

(See page RA-8)

INSTALLATION OF DIFFERENTIAL

(See page RA-19)

1. INSTALL A NEW GASKET
2. INSTALL DIFFERENTIAL CARRIER ASSEMBLY
Install the differential carrier assembly in the axle and install the ten nuts.



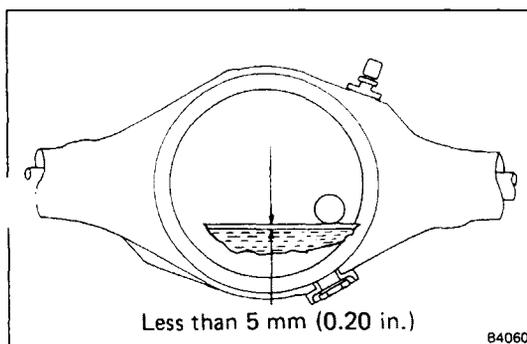
3. CONNECT PROPELLER SHAFT FLANGE TO COMPANION FLANGE

(a) Align the marks on the flanges and connect the flanges with four bolts and nuts.

(b) Torque the bolts and nuts.

Torque: 750 Kg-cm (54 ft-lb, 74 N·m)

4. INSTALL FRONT AXLE SHAFT (See page FA-56)



5. INSTALL DRAIN PLUG AND FILL DIFFERENTIAL WITH GEAR OIL

Differential oil:

API GL-5 hypoid gear oil

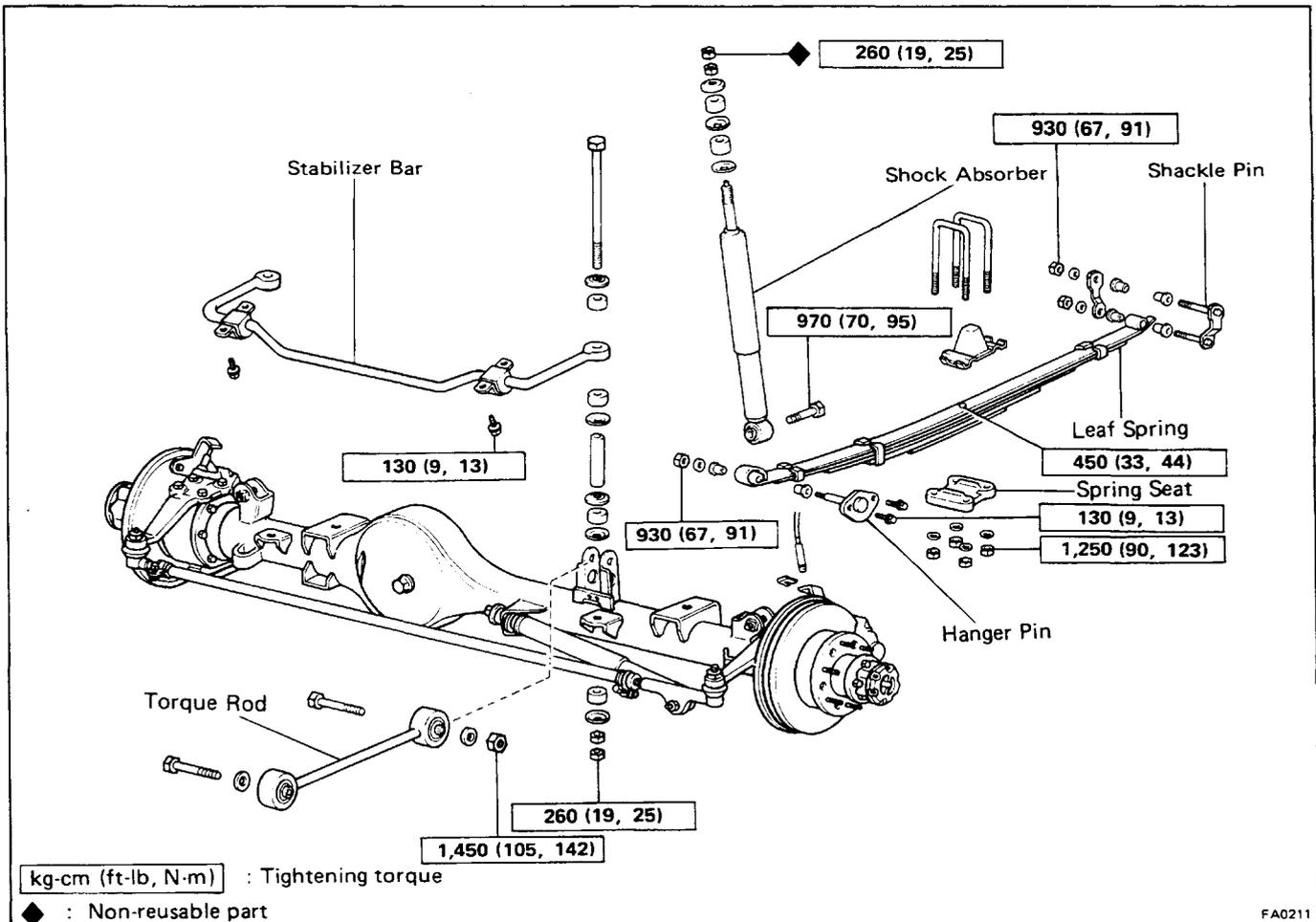
SAE 90 above — 18°C (0°F)

SAE 80W or 80W-90 below — 18°C (0°F)

Capacity: 2.3 liters (2.4 US qts, 2.0 Imp. qts)

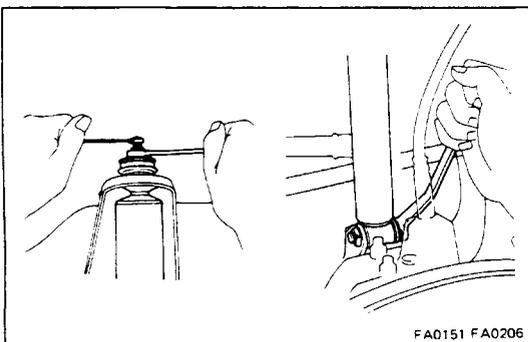
Install a filler plug.

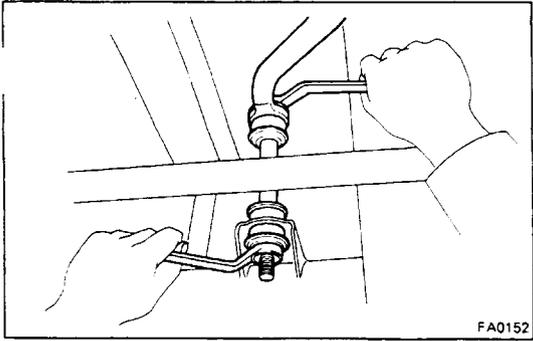
FRONT SUSPENSION (4WD) COMPONENTS



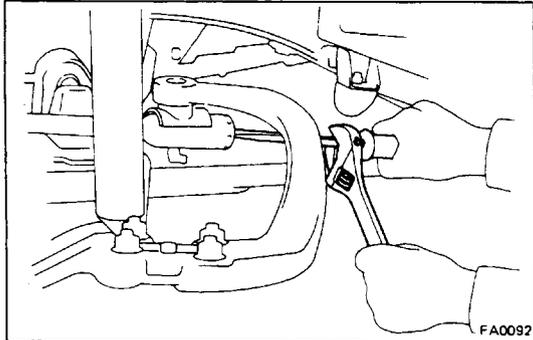
Leaf Spring and Shock Absorber REMOVAL OF LEAF SPRING AND SHOCK ABSORBER

1. **JACK UP AND SUPPORT BODY**
 - (a) Jack up and support the body on the stands.
 - (b) Lower the axle housing until the leaf spring tension is free, and keep it at this position.
2. **REMOVE SHOCK ABSORBER**



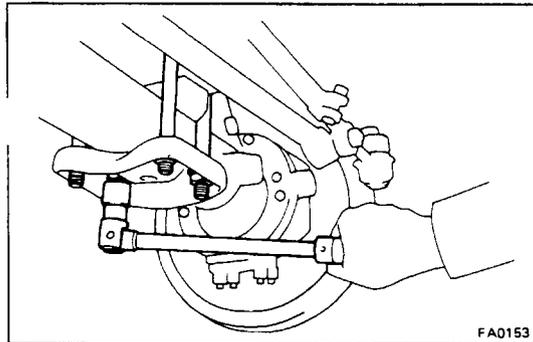


3. DISCONNECT STABILIZER BAR FROM AXLE HOUSING



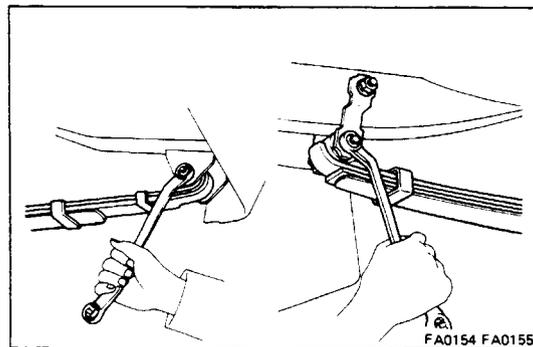
4. DISCONNECT DRAG LINK FROM KNUCKLE ARM

- (a) Remove the cotter pin.
- (b) Using a screwdriver, remove the plug.
- (c) Disconnect the drag link from the knuckle arm.



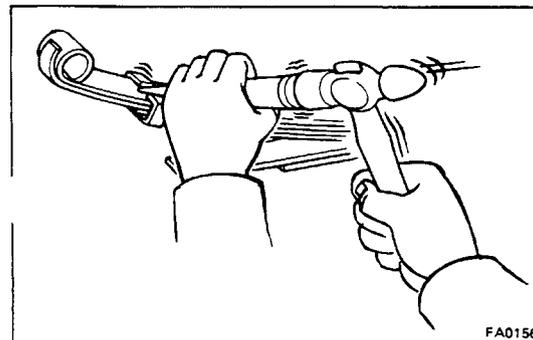
5. REMOVE U-BOLTS

- (a) Remove the U-bolt mounting nuts.
- (b) Remove the spring lower seat.
- (c) Remove the U-bolt.
- (d) Remove the spring bumper.



6. REMOVE LEAF SPRING

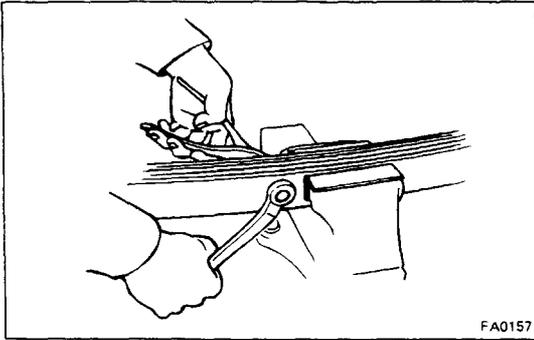
- (a) Remove the hanger pin mounting nut.
- (b) Remove the shackle pin mounting nut.
- (c) Remove the hanger pin.
- (d) Remove the shackle pin.
- (e) Remove the leaf spring.



REPLACEMENT OF LEAF SPRING

1. BEND OPEN SPRING CLIP

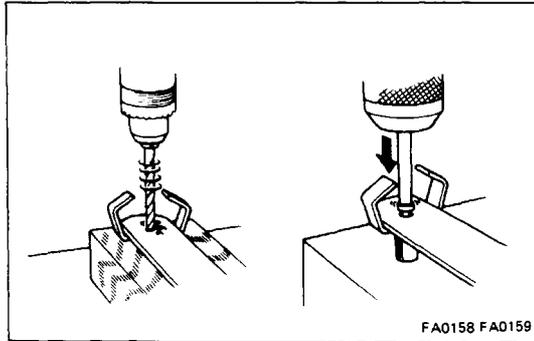
Using a chisel, pry up the spring clip.



FA0157

2. REMOVE CENTER BOLT

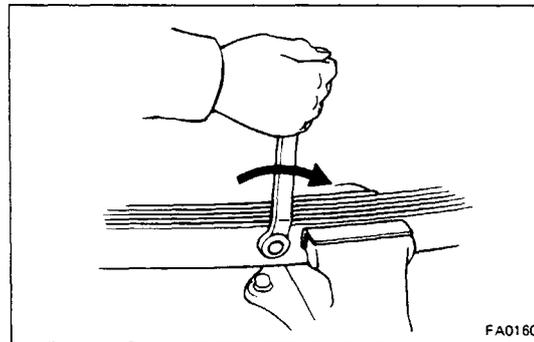
Hold the spring near the center bolt in a vise and remove the center bolt.



FA0158 FA0159

3. IF NECESSARY, REPLACE SPRING CLIP

- (a) Drill off the head of the rivet, and drive it out.
- (b) Install a new rivet into the holes of the spring leaf and clip. Then rivet with a press.

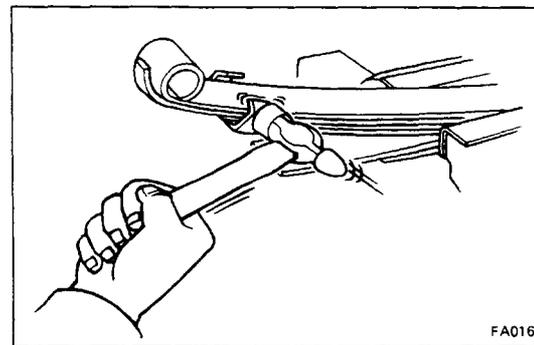


FA0160

4. INSTALL SPRING CENTER BOLT

- (a) Attach the spring silencer.
- (b) Align the leaf holes and secure the leaves with a vise.
- (c) Install and tighten the spring center bolt.

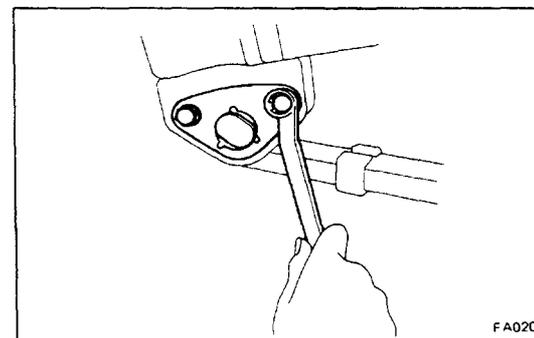
Torque: 450 kg-cm (33 ft-lb, 44 N·m)



FA0161

5. BEND SPRING CLIP

Using a hammer, bend the spring clip into position.



FA0209

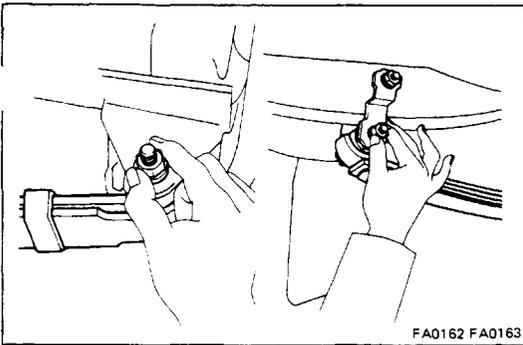
INSTALLATION OF LEAF SPRING

(See page FA-60)

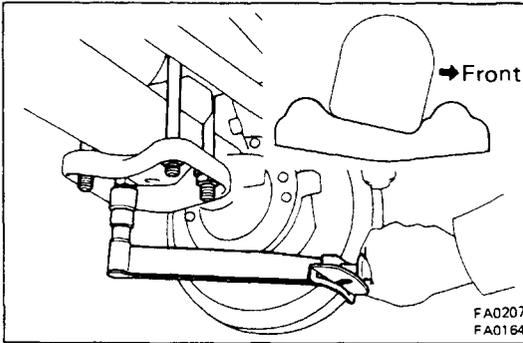
1. INSTALL LEAF SPRING

- (a) Insert the bushings into the frame and into both ends of the leaf spring.
- (b) Place the leaf spring in position.
- (c) Install the hanger pin and tighten the bolt.

Torque: 130 kg-cm (9 ft-lb, 13 N·m)



- (d) Finger tighten the hanger pin nut.
- (e) Install the shackle pin.
- (f) Install the plate and finger tighten the nuts.



2. INSTALL U-BOLTS

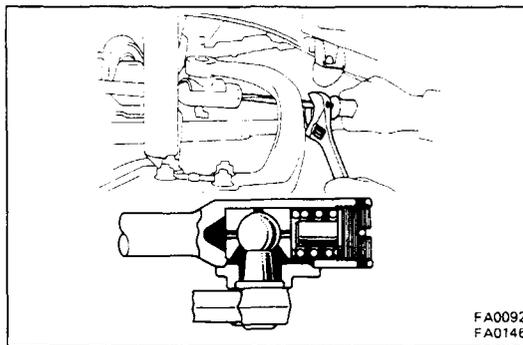
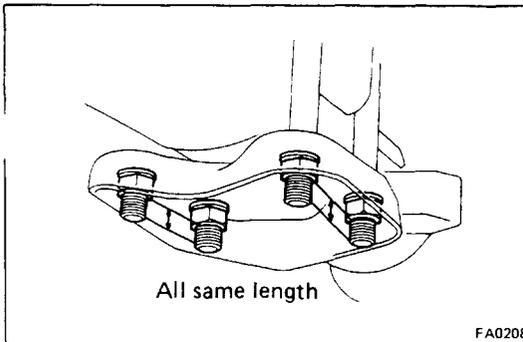
- (a) Install the spring bumper and U-bolts onto the leaf spring.
- (b) Install the spring seat and nuts.

NOTE: Be careful of the installation direction of the LH spring seat.

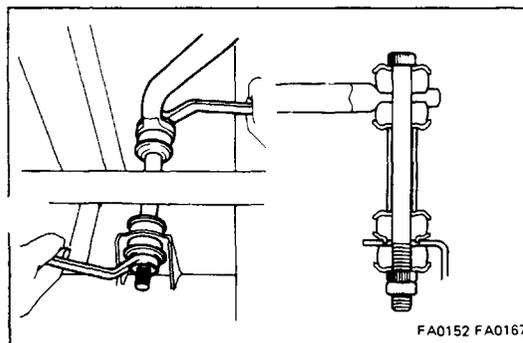
- (c) Tighten the U-bolt mounting nuts.

Torque: 1,250 kg-cm (90 ft-lb, 123 N·m)

NOTE: Tighten the U-bolts, so that the length of all the U-bolts under the spring seat are the same.



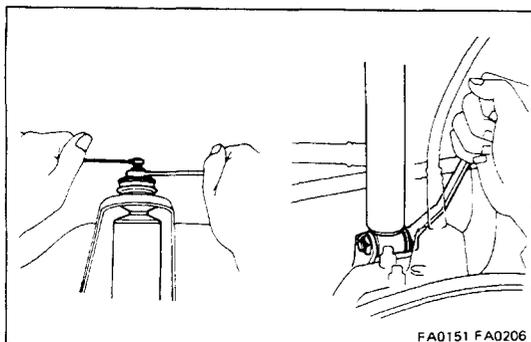
3. CONNECT DRAG LINK TO KNUCKLE ARM
(See page SR-78)



4. CONNECT STABILIZER BAR TO AXLE HOUSING

Tighten the mounting nuts.

Torque: 260 kg-cm (19 ft-lb, 25 N·m)



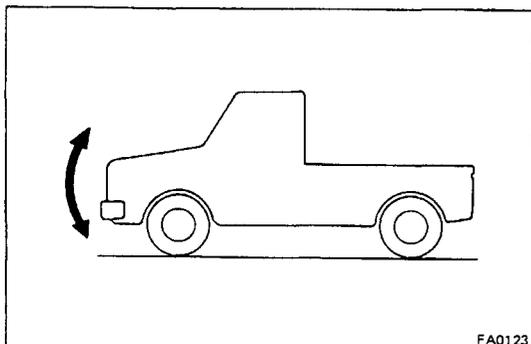
5. INSTALL SHOCK ABSORBER

- (a) Position the shock absorber and install the bushings retainers and nut.

Torque: 260 kg-cm (19 ft-lb, 25 N·m)

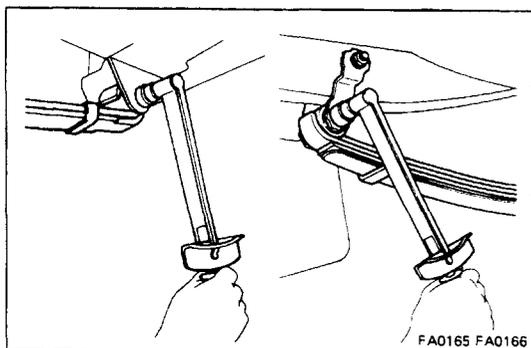
- (b) Install the lower mounting bolt.

Torque: 970 kg-cm (70 ft-lb, 95 N·m)



6. STABILIZE SUSPENSION

- Remove the stands and bounce the car to stabilize the suspension.



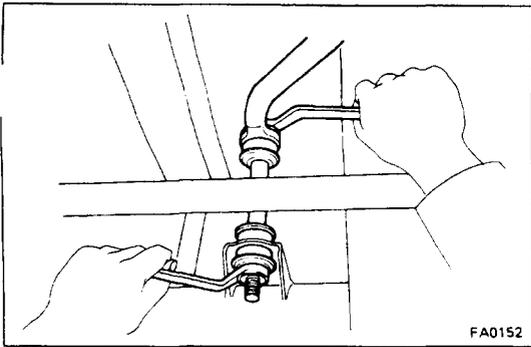
7. TIGHTEN HANGER PIN AND SHACKLE PIN

- Tighten the hanger pin nut.

Torque: 930 kg-cm (67 ft-lb, 91 N·m)

- Tighten the shackle pin nut.

Torque: 930 kg-cm (67 ft-lb, 91 N·m)



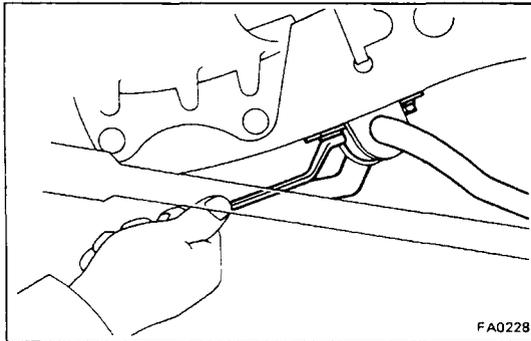
Stabilizer Bar

REMOVAL OF STABILIZER BAR

(See page FA-60)

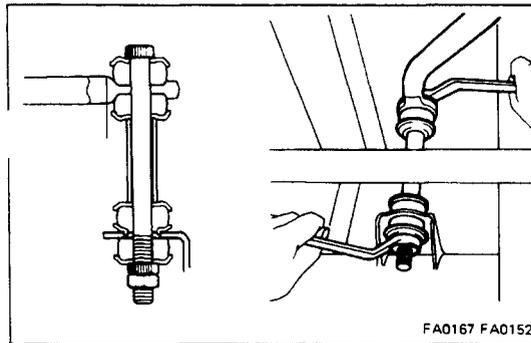
1. DISCONNECT STABILIZER BAR FROM FRONT AXLE HOUSING

Remove the nuts, cushions and bolts holding both sides of the stabilizer bar to the axle housing.



2. DISCONNECT STABILIZER BAR FROM FRAME

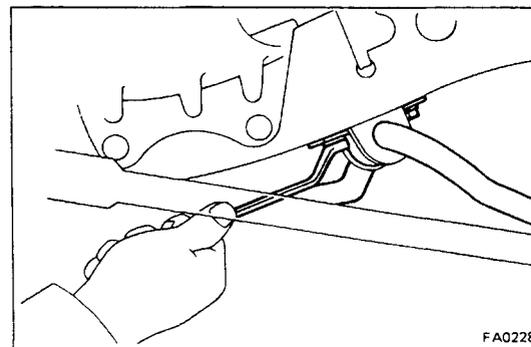
Remove both stabilizer bar brackets from the frame, and remove the stabilizer bar.



INSTALLATION OF STABILIZER BAR

1. PLACE STABILIZER BAR

Place the stabilizer bar in position and install both stabilizer bar bushings and brackets to the frame. Finger tighten the bolts.



2. CONNECT STABILIZER BAR TO AXLE HOUSING

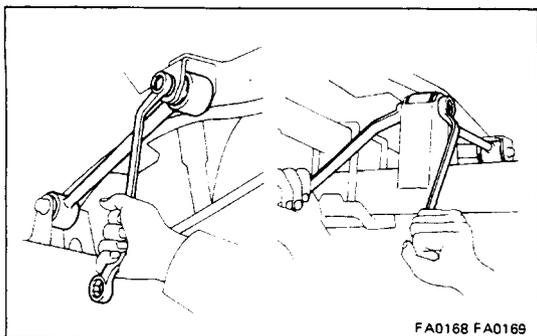
Connect the stabilizer bar on both sides to the axle housing with bolts.

Cushions and nuts as shown.

Torque: 260 kg-cm (19 ft-lb, 25 N·m)

3. TORQUE BRACKET SET BOLTS

Torque: 130 kg-cm (9 ft-lb, 13 N·m)

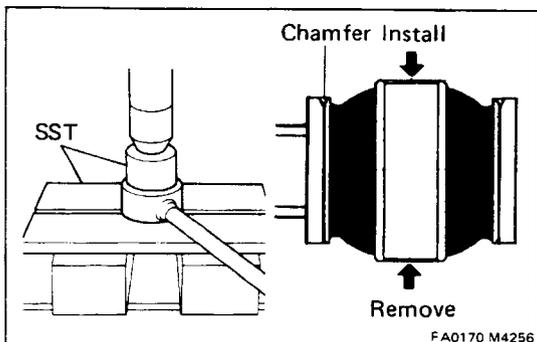


Torque Rod

REMOVAL OF TORQUE ROD

(See page FA-60)

1. DISCONNECT TORQUE ROD FROM AXLE HOUSING
2. DISCONNECT TORQUE ROD FROM FRAME



REPLACEMENT OF TORQUE ROD BUSHING

1. REMOVE BUSHING

Using SST, press out the bushing

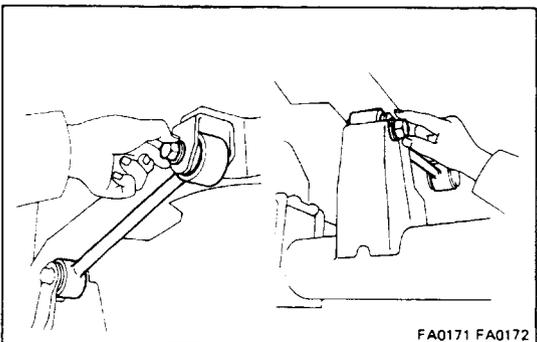
SST 09726-35010 and 09527-10010

NOTE: When inserting and removing the bushing, press or pull from the chamfered side as shown in the figure.

2. INSTALL BUSHING

Using SST, press in the new bushing

NOTE: Do not use a lubricant when pressing in the bushing.



INSTALLATION OF TORQUE ROD

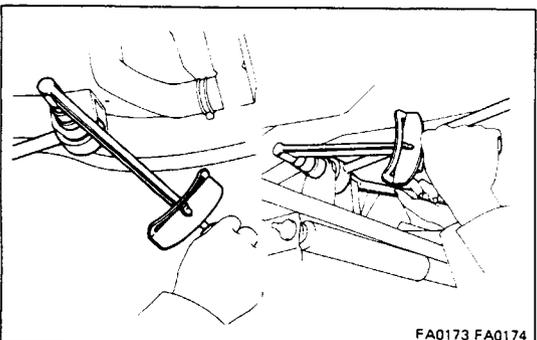
(See page FA-60)

1. INSTALL TORQUE ROD

Finger tighten the mounting bolts.

2. STABILIZE SUSPENSION

Bounce the car to stabilize the suspension.



3. TIGHTEN TORQUE ROD MOUNTING BOLTS

Torque: 1,450 kg-cm (105 ft-lb, 142 N·m)