

SUSPENSION AND AXLE

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SA

TROUBLESHOOTING

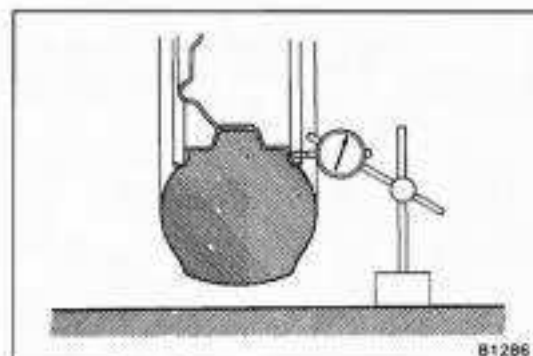
Problem	Possible cause	Remedy	Page	
			Front	Rear
Wanders/pulls	Tire worn or improperly inflated	Replace tire or inflate tires to proper pressure	A-15	A-15
	Alignment incorrect	Check front wheel alignment	SA-3	—
	Front or rear suspension parts loosen or broken	Tighten or replace suspension parts	SA-87, 96	SA-192, 198
	Steering linkage loosen or worn	Tighten or replace steering linkage	SR-72, 76	—
	Steering gear out of adjustment or broken	Adjust or repair steering gear	SR-20, 62	—
Bottoming	Vehicle overloaded	Check loading		
	Shock absorber worn out	Replace shock absorber	SA-87, 96	SA-192, 198
	Spring weak	Replace spring	SA-87, 96	SA-192, 198
Way/pitches	Tires improperly inflated	Inflate tires to proper pressure	A-15	A-15
	Stabilizer bar bent or broken	Inspect stabilizer bar	SA-87, 96	SA-192, 198
	Shock absorber worn out	Replace shock absorber	SA-87, 93	SA-192, 198
Front wheel shimmy	Tires worn or improperly inflated	Replace tire or inflate tires to proper pressure	A-15	—
	Wheels out of balance	Balance wheels		
	Shock absorber worn out	Replace shock absorber	SA-87, 96	—
	Wheel alignment incorrect	Check front wheel alignment	SA-3	—
	Hub bearings worn	Replace hub bearings	SA-29	—
	Steering gear out of adjustment or broken	Adjust or repair steering gear	SR-20, 62	—
Abnormal tire wear	Tires improperly inflated	Inflate tire to proper pressure	A-15	A-15
	Shock absorbers worn out	Replace shock absorber	SA-87, 96	SA-192, 198
	Wheel alignment incorrect	Check wheel alignment	SA-3	—
	Suspension parts worn	Replace suspension parts	SA-87, 96	SA-192, 198
Oil leak from axle	Oil seals worn or damaged	Replace oil seal	SA-38	—
	Bearing retainer loose	Replace retainer	—	SA-108, 116
	Axle housing cracked	Repair as necessary	—	SA-108, 116
Oil leak from pinion shaft	Oil level too high or wrong grade	Drain and replace oil	SA-50	SA-125, 138
	Oil seal worn or damaged	Replace oil seal	SA-50	SA-125, 138
	Companion flange loose or damaged	Tighten or replace bearings	SA-50	SA-125, 138
Noises in axle	Oil level low or wrong grade	Drain and replace oil	SA-50	SA-125, 138
	Excessive backlash between pinion and ring or side gear	Check backlash	SA-60	SA-130, 146
	Ring, pinion or side gears worn or chipped	Inspect gears	SA-60	SA-130, 146
	Pinion shaft bearing worn	Replace bearing	SA-34	SA-130, 146
	Axle shaft bearing worn	Replace bearing	SA-29	SA-108, 116
	Differential bearing loose or worn	Tighten or replace bearings	SA-50	SA-125, 138

WHEEL ALIGNMENT

1. MAKE FOLLOWING CHECKS AND CORRECT ANY PROBLEMS

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

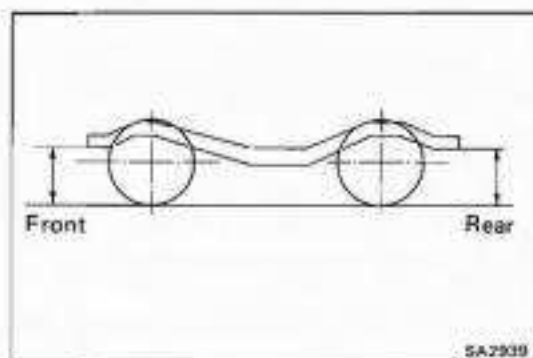
Cold tire inflation pressure: See page A-15



- (b) Check the wheel runout.

Lateral runout: 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.



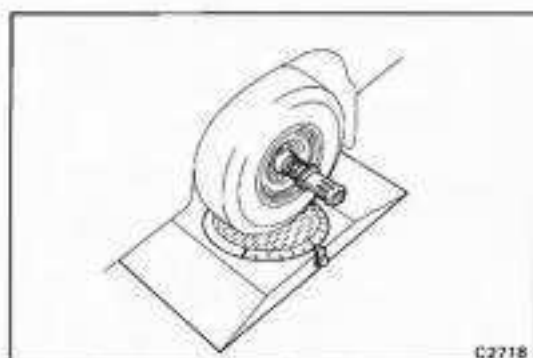
2. MEASURE CHASSIS GROUND CLEARANCE

Chassis ground clearance: See page A-16

If the clearance of the vehicle is not standard, try to level the vehicle by rocking it down.

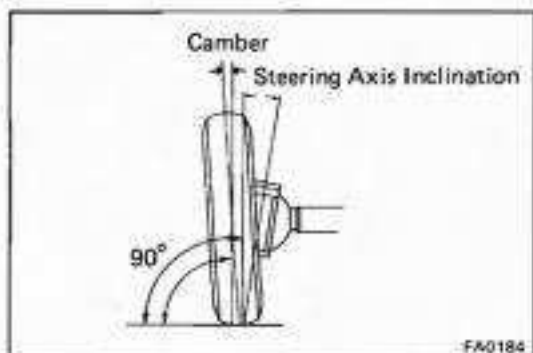
If still not correct, check for bad springs or suspension parts.

HINT: When measuring the chassis ground clearance, measure from the ground to the center of the lower suspension arm front mounting bolt.



3. INSTALL WHEEL ALIGNMENT EQUIPMENT

Follow the specific instructions of the equipment manufacturer.

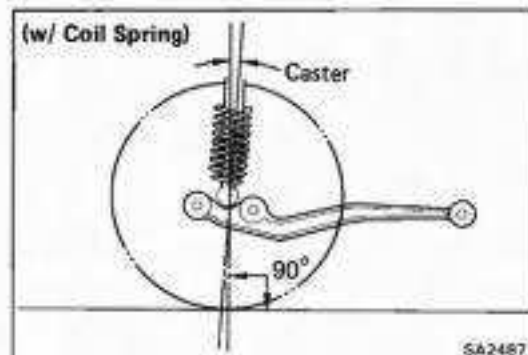


4. CHECK CAMBER AND STEERING AXIS INCLINATION

Camber: $1^{\circ}00' \pm 45'$ ($1^{\circ} \pm 0.75^{\circ}$)

Steering axis inclination: $12^{\circ}00' \pm 45'$ ($12^{\circ} \pm 0.75^{\circ}$)

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

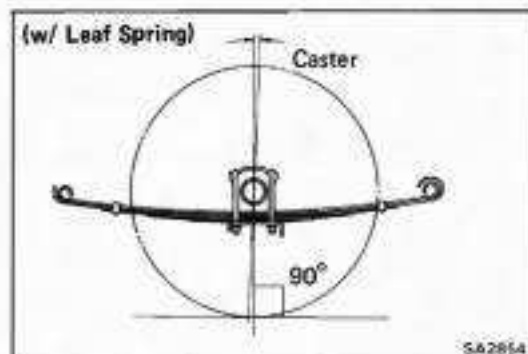


5. (w/ COIL SPRING)

CHECK CASTER

Caster: $4^{\circ}05' \pm 1^{\circ}$ ($4.08^{\circ} \pm 1^{\circ}$)

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



6. (w/ LEAF SPRING)

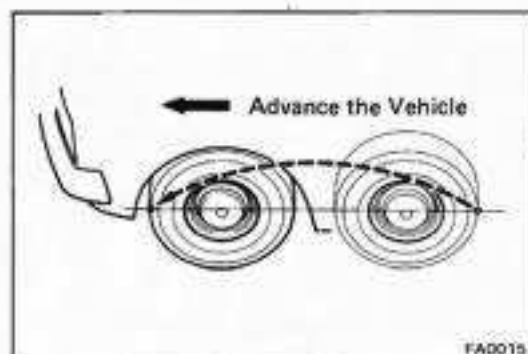
CHECK CASTER

Short Middle series $1^{\circ}15' \pm 1^{\circ}$ ($1.25^{\circ} \pm 1^{\circ}$)

Long (Van) series $0^{\circ}50' \pm 1^{\circ}$ ($0.83^{\circ} \pm 1^{\circ}$)

Long (Pickup) series $0^{\circ}30' \pm 1^{\circ}$ ($0.5^{\circ} \pm 1^{\circ}$)

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



7. ADJUST TOE-IN

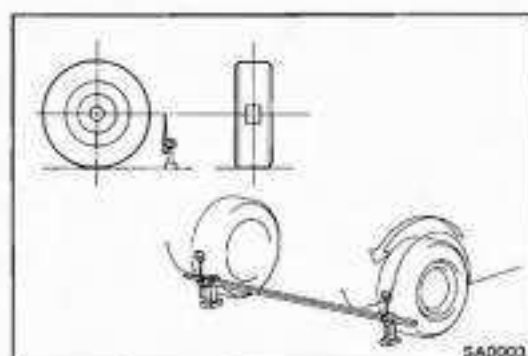
(a) Make sure the wheels are positioned straight ahead.

(b) Mark the center of each rear tread at spindle height and measure the distance between the marks of the right and left tires.

(c) Advance the vehicle until the marks on the rear side of the tires come to the front.

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

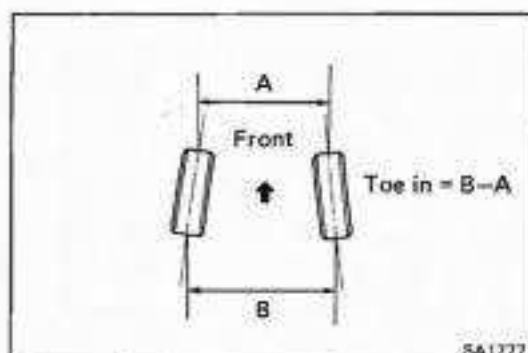
(d) Measure the distance between the marks on the front side of the tires.

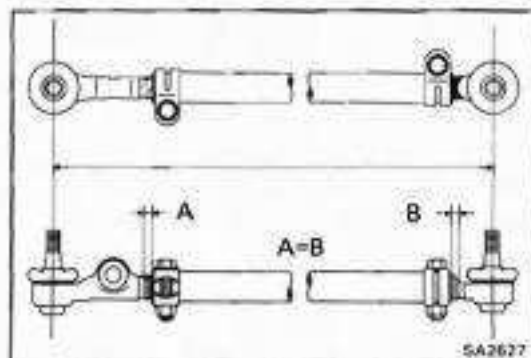


(e) Measure the toe-in.

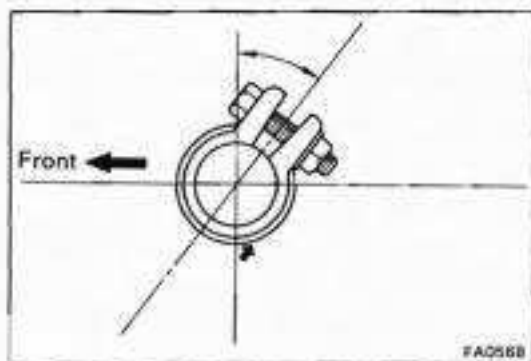
Toe-in = B - A

Inspection STD: See page A-16

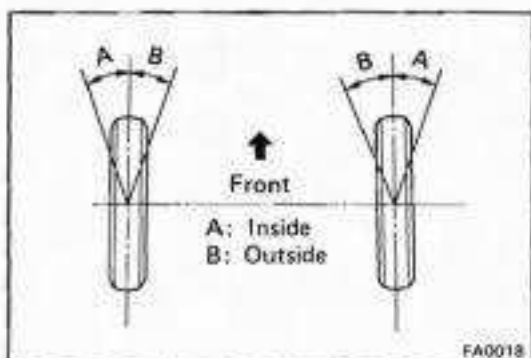




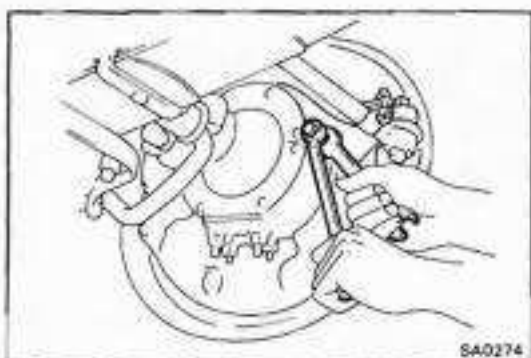
SA2627



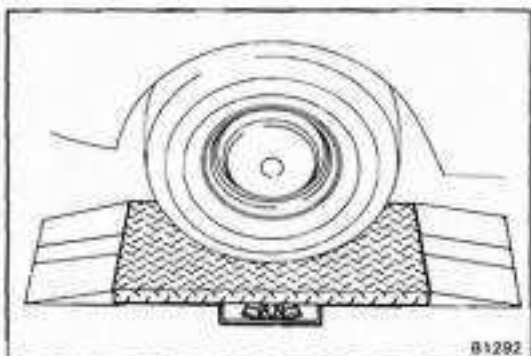
FA0568



FA0018



SA0274



B1292

- (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) Insure that the lengths of the tie rod ends are the same.
- (i) Torque the nuts holding the clamps.

Torque: 375 kg-cm (27 ft-lb, 37 N-m)

HINT: The clamps opening must be positioned at the rear of the tie rod and face within 45° from the verticle axis.

8. ADJUST WHEEL ANGLE

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

Wheel angle: See page A-16

Wheel angle		
Max.	Inside wheel	32° +0° -3°
	Outside wheel	30° (Leaf Spring Type)
		28° (Coil Spring Type)

HINT: 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.

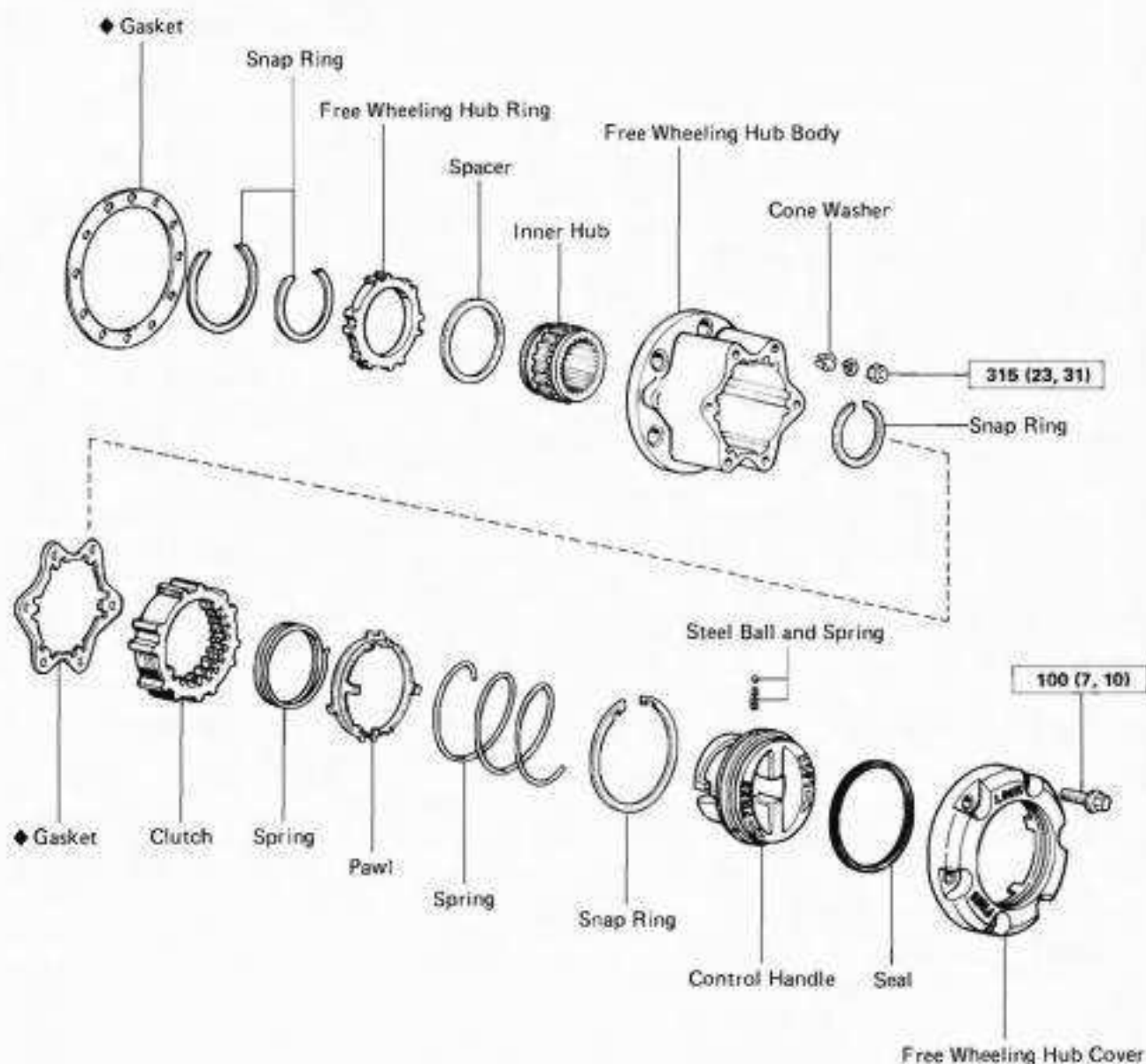
Torque: 450 kg-cm (33 ft-lb, 44 N-m)

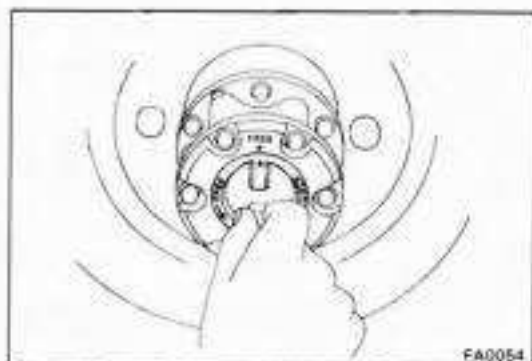
If the wheel angle still cannot be adjusted within limits, inspect and replace damaged or worn steering parts.

9. INSPECT SIDE SLIP (REFERENCE ONLY)

Side slip or less : 3.0 mm/m (0.018 in/3.3ft)

FREE WHEELING HUB COMPONENTS

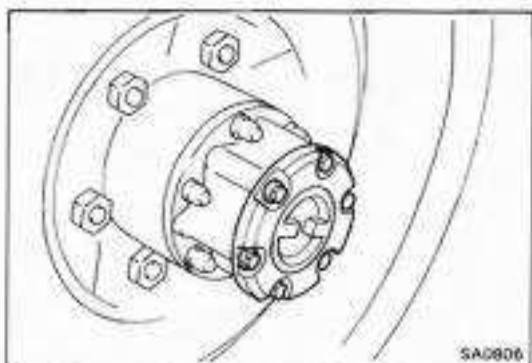


**REMOVAL OF FREE WHEELING HUB**

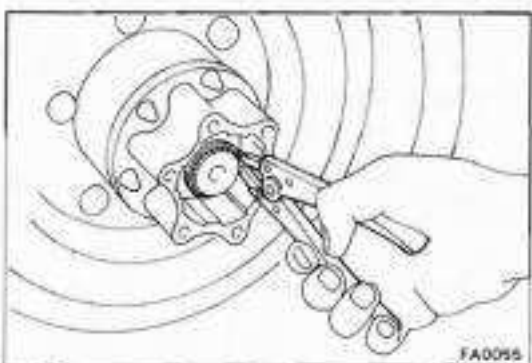
(See page SA-6)

1. REMOVE FREE WHEELING HUB COVER

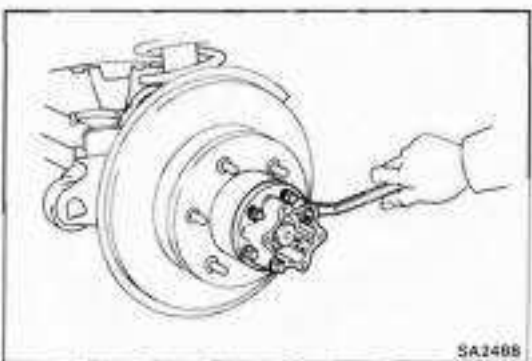
(a) Set the control handle to FREE.



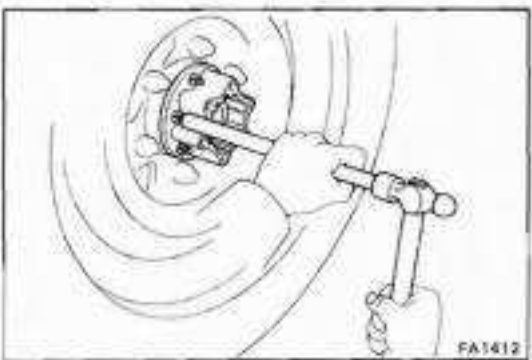
(b) Remove the six cover mounting bolts and pull off the cover.

**2. REMOVE SNAP RING**

Using snap ring pliers, remove the snap ring.

**3. REMOVE FREE WHEELING HUB BODY**

(a) Remove the six mounting nuts and washers.



(b) Using a brass bar and hammer, tap on the bolt heads and remove the cone washers.

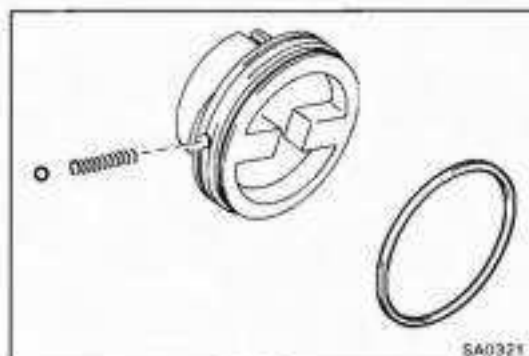
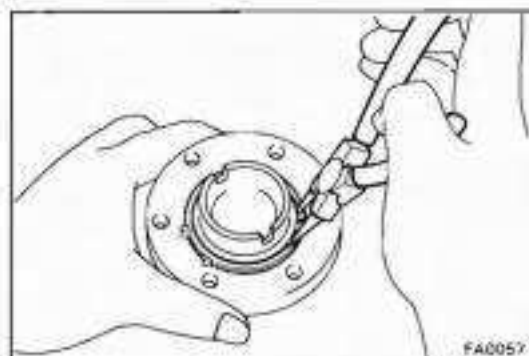
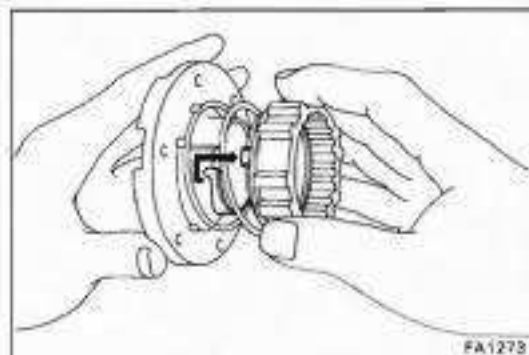
(c) Pull off the free wheeling hub body.

DISASSEMBLY OF FREE WHEELING HUB

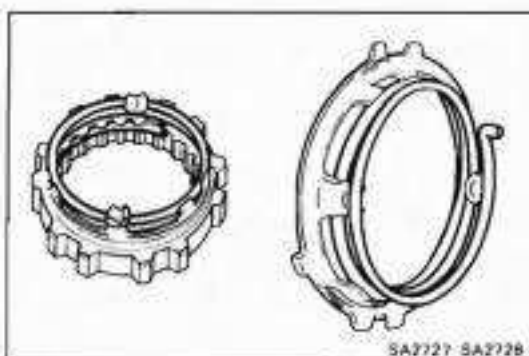
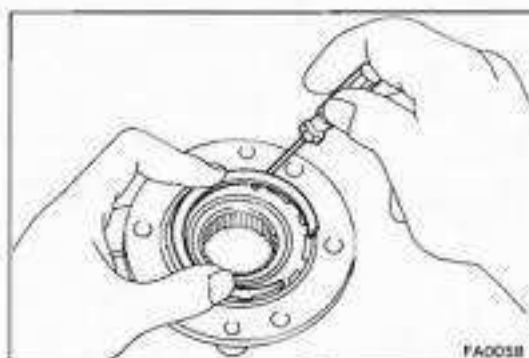
(See page SA-6)

1. REMOVE CONTROL HANDLE FROM FREE WHEELING HUB COVER

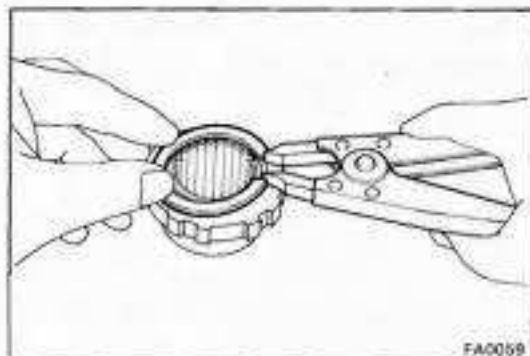
- (a) Compressing the spring, remove the pawl tab from the handle cam, and remove the clutch with the two springs and pawl.
- (b) Using snap ring pliers, remove the snap ring from the free wheeling hub cover.
- (c) Remove the control handle from the free wheeling hub cover.
- (d) Remove the steel ball, spring and seal 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 from the free wheeling hub body.
- (b) Remove the inner hub with spacer, snap ring and free wheeling hub ring.

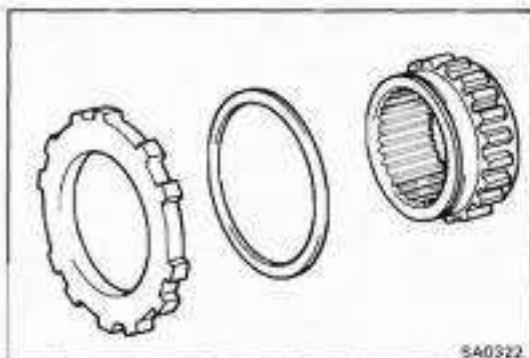
**3. REMOVE PAWL FROM FREE WHEELING HUB CLUTCH**

- (a) Remove the pawl with the spring from the clutch.
- (b) Remove the spring from the pawl.

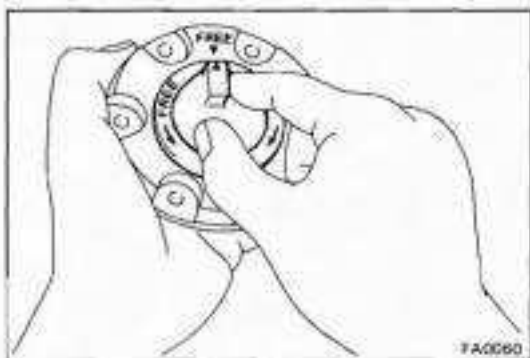


4. REMOVE FREE WHEELING HUB RING FROM INNER HUB

(a) Using snap ring pliers, remove the snap ring from the inner hub.



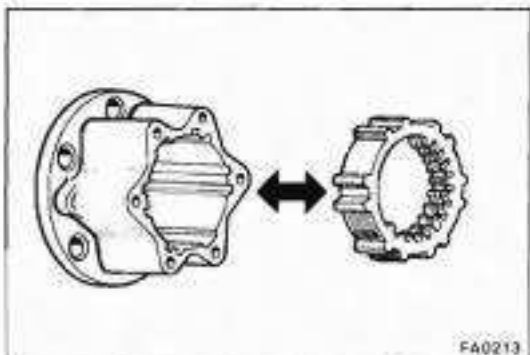
(b) Remove the free wheeling hub ring and spacer from the inner hub.



INSPECTION OF FREE WHEELING HUB

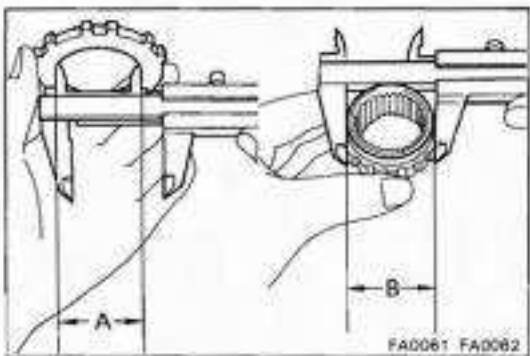
1. INSPECT COVER, HANDLE AND SEAL

Temporarily install the handle with seal in the cover and check that the handle moves smoothly and freely.



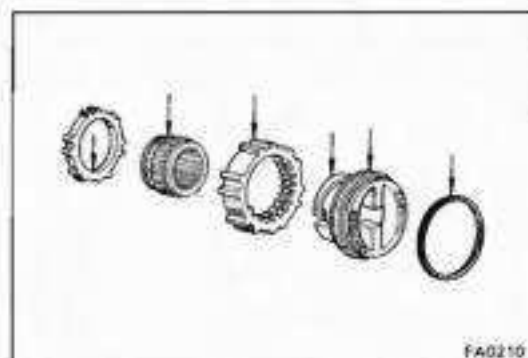
2. INSPECT BODY AND CLUTCH

Check that the clutch moves smoothly in the body.



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

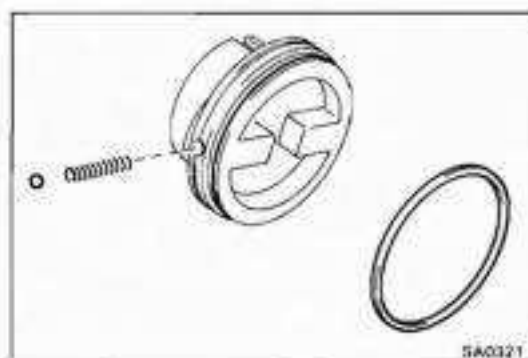
Oil clearance (A — B): 0.3 mm (0.012 in.)



ASSEMBLY OF FREE WHEELING HUB

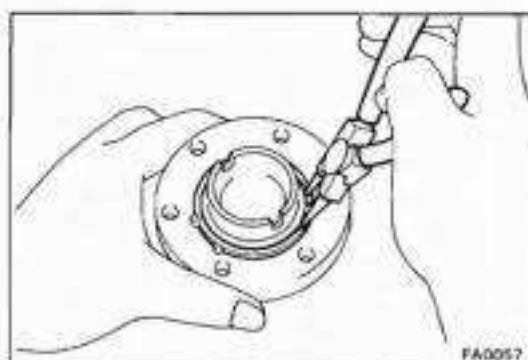
(See page SA-6)

1. APPLY MP GREASE TO SLIDING SURFACE OF PARTS

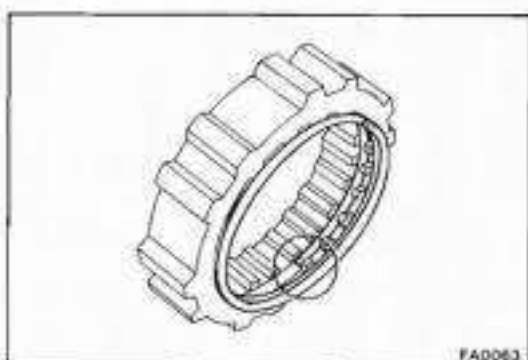


2. INSTALL CONTROL HANDLE TO COVER

- (a) Install the seal, spring and steel ball to the handle.
- (b) Insert the handle in the cover.

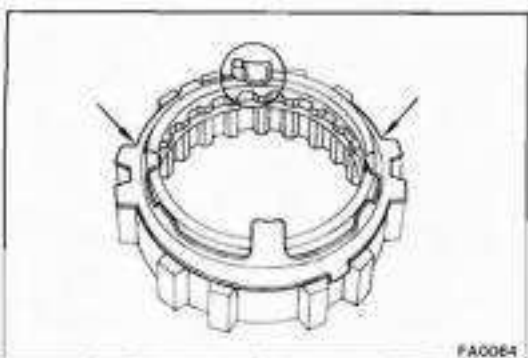


- (c) Using snap ring pliers, install the snap ring to the cover.



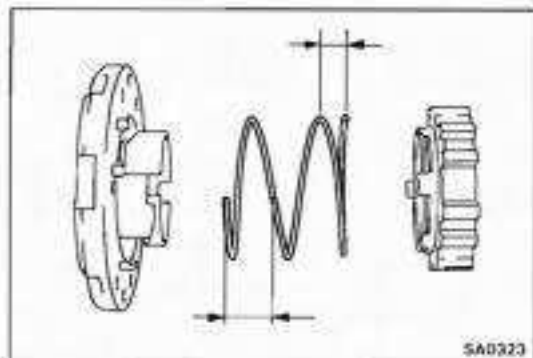
3. INSTALL SPRING ON CLUTCH

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

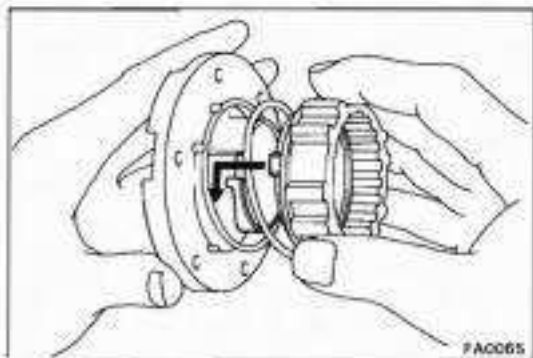


4. INSTALL PAWL TO CLUTCH

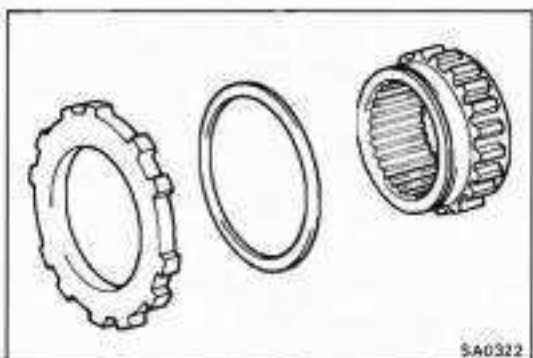
- (a) Place the pawl on the tension spring with one of the large tabs against the bent spring end.
- (b) Place the ring top of the spring on the small tabs.

**5. INSTALL CLUTCH AND SPRING INTO COVER**

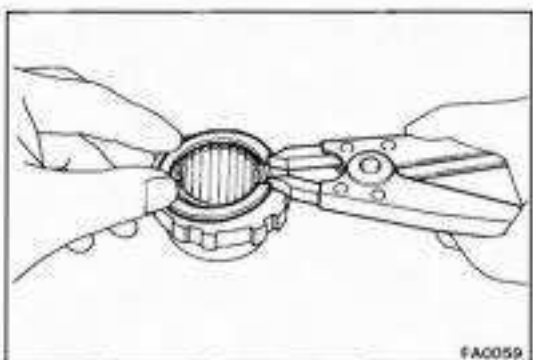
- (a) Place the spring between the cover and clutch with the large spring end toward the cover.



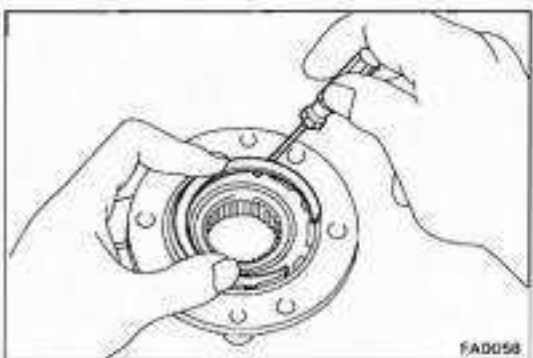
- (b) Compress the spring and install the clutch with the pawl tab fit to the handle cam.

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

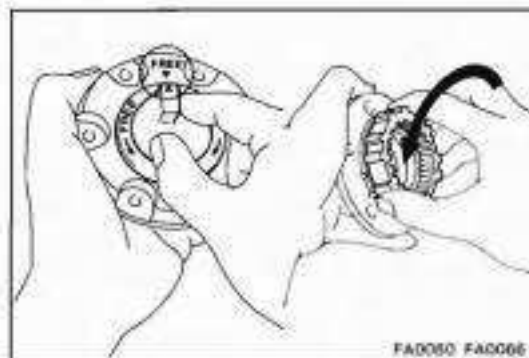
- (a) Install the spacer and free wheeling hub ring to the inner hub.



- (b) Using snap ring pliers, install the snap ring to the free wheeling hub ring.

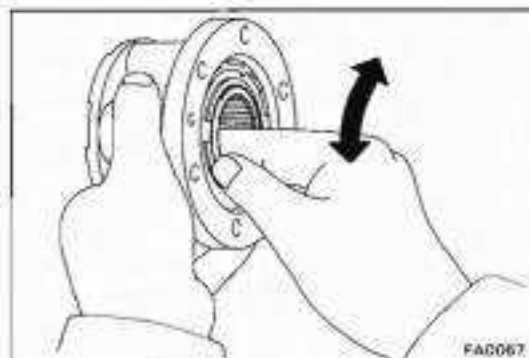
**7. INSTALL INNER HUB AND FREE WHEELING HUB RING TO FREE WHEELING HUB BODY**

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



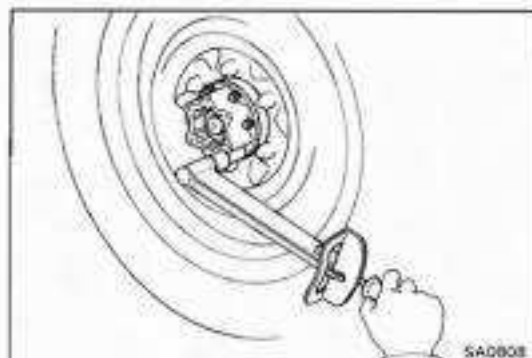
8. TEMPORARILY INSTALL COVER TO BODY AND CHECK FREE WHEELING HUB

(a) Set the control handle and clutch to the "FREE" position.



(b) Insert the cover to the body and check that the inner hub turns smoothly.

(c) Remove the cover from the body.



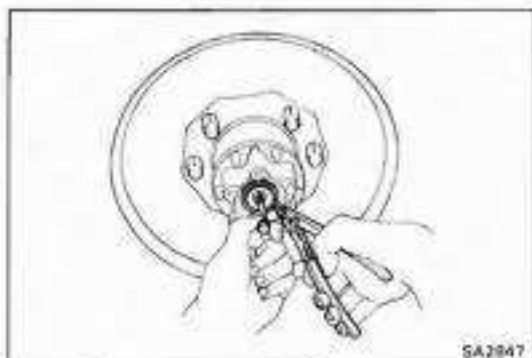
INSTALLATION OF FREE WHEELING HUB

(See page SA-6)

1. INSTALL FREE WHEELING HUB BODY

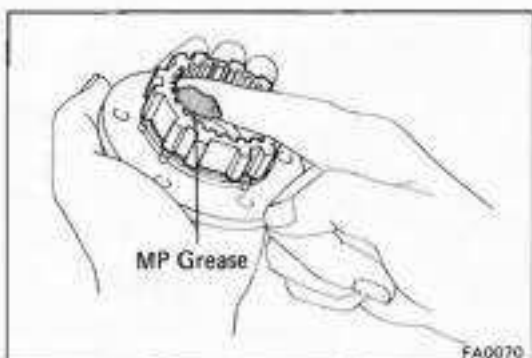
- Place a new gasket on the front axle hub.
- Install the free wheeling hub body with the six cone washers, washers and nuts. Torque the nuts.

Torque: 315 kg-cm (23 ft-lb, 31 N-m)

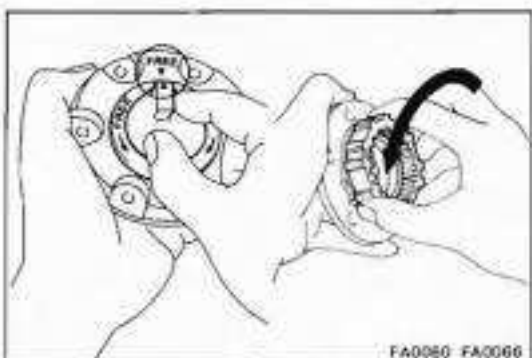


2. INSTALL SNAP RING

- Install a bolt to the axle shaft and pull it out.
- Using snap ring pliers, install the snap ring.
- Remove the bolt.

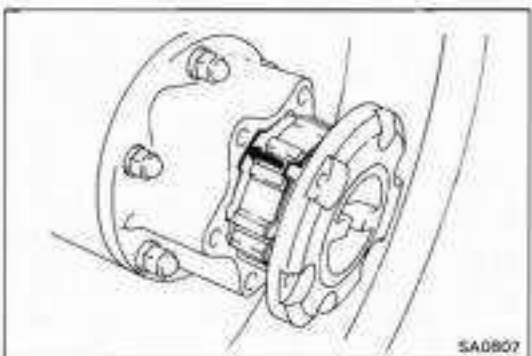


3. APPLY MP GREASE TO INNER HUB SPLINES

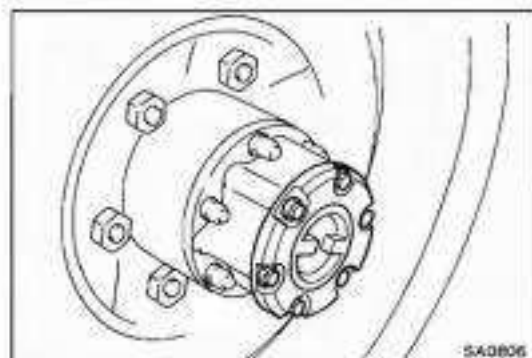


4. INSTALL FREE WHEELING HUB COVER WITH NEW GASKET

- Set the control handle and clutch to the "FREE" position.
- Place a new gasket on the cover.

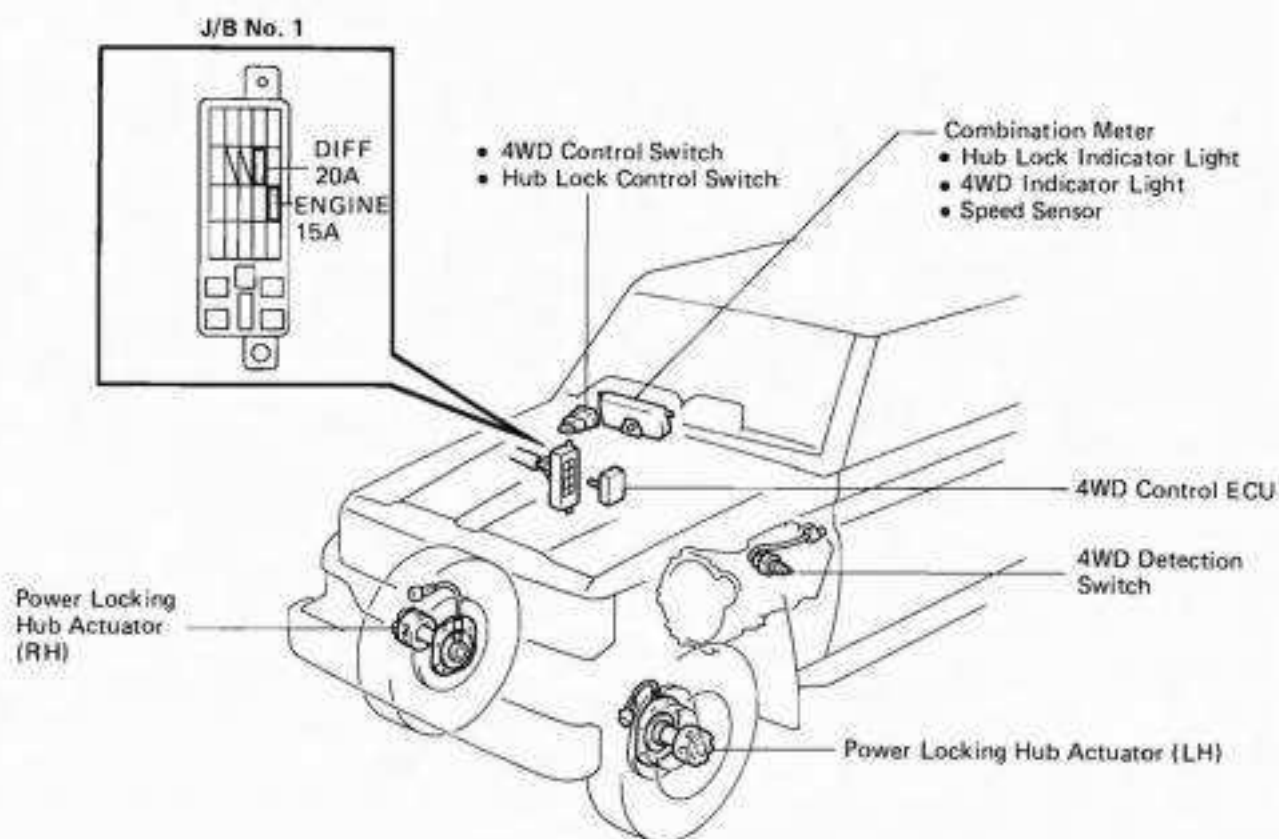


- Install the cover to the body with the follower pawl tabs aligned with the non-toothed portions of the body.



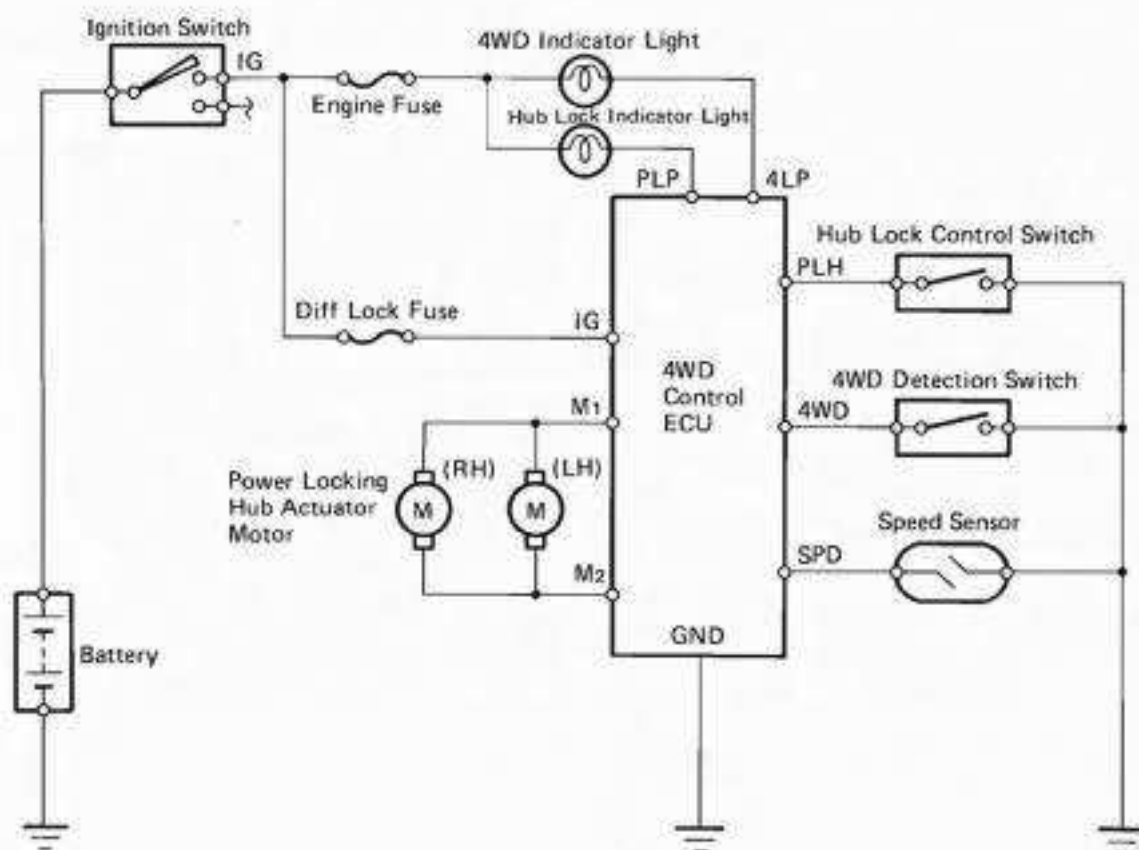
(d) Install and torque the cover mounting bolts.

Torque: 100 kg-cm (7 ft-lb, 10 N·m)

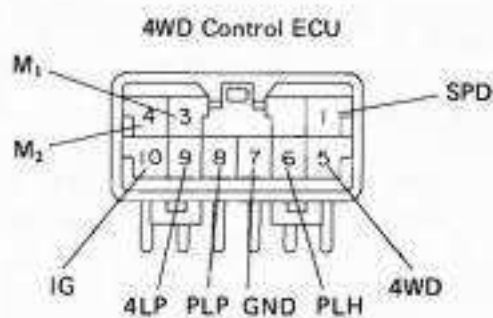
POWER LOCKING HUB**Parts Location**

SA2076

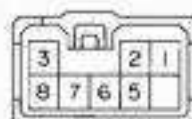
Wiring Diagram



Connectors



4WD Control Switch
• Hub Lock Control Switch



4WD Detection Switch

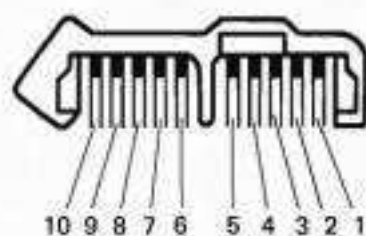


Hub Lock Indicator Light



4WD Indicator Lamp

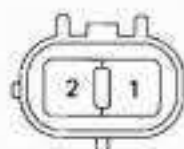
Connector A



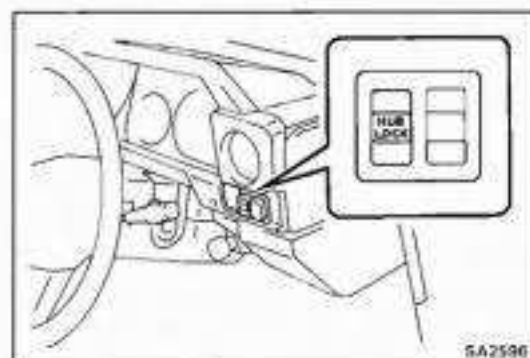
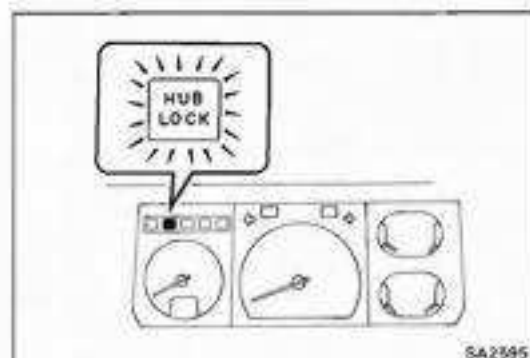
Connector B



Power Locking Hub Actuator



SA2591 SA2592
SA2593 SA2877
SA2878 SA2879
SA2842



Troubleshooting

INSPECTION OF TROUBLES IN SYSTEM

1. INSPECT HUB LOCK INDICATOR LIGHT

- Turn the ignition switch on.
- Turn the hub lock switch on.
- Check that the hub lock indicator light lights on.
- Turn the hub lock switch off.
- Check that the hub lock indicator light lights off.

2. INSPECT HUB LOCK OPERATION

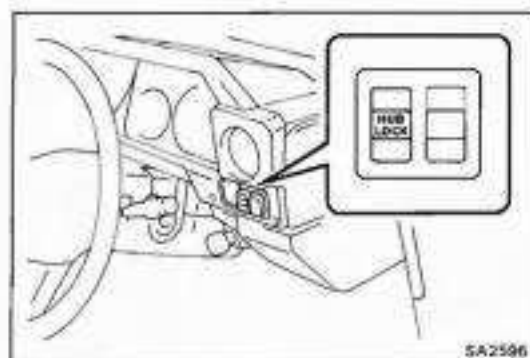
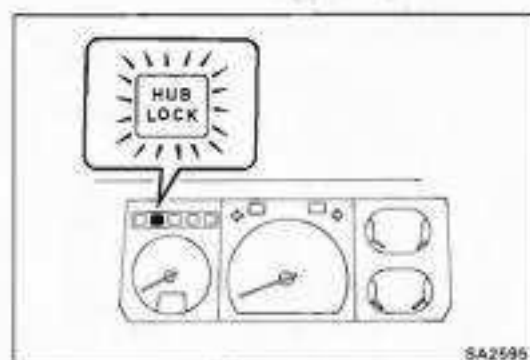
- Jack up the front of the vehicle.
- Turn the ignition switch on.
- Turn the hub lock control switch on.
- Inspect the condition of the hub lock indicator light and hub.

HINT:

- When turn the hub lock control switch on, slowly the front wheels by hand to lock the hub.
- When check that the hub is in lock condition, set the transfer to 2WD condition and turn the front propeller shaft then confirm that the left and right wheels turn.

Hub Lock Control Switch	Indicator Light	Hub
OFF	Light Off	Free
ON	Light On	Lock

- Turn the ignition switch off.
- Jack down vehicle.



3. INSPECT SYSTEM OPERATION

- Jack up the vehicle, and start the engine.
- Keep the vehicle speed at 8 km/h (7.0 mph) or more until the step (e) is completed, and turn the hub lock control switch on.
- Check that the hub lock indicator light blinks.
- (w/ One-touch 2-4 selector switch)
Turn the H4 switch on.
- (w/o One-touch 2-4 selector switch)
Change the selector lever to the H4 mode.
- Check that the hub lock indicator light lights up, then turn the H4 switch off.
- Keep the vehicle speed at 5km/h (3.1 mph) or less.
- Check that the hub lock indicator light lights up.
- Stop the engine, and jack down the vehicle.

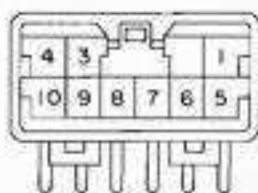
SYSTEM TROUBLESHOOTING

TROUBLESHOOT SYSTEM WITH TABLE BELOW

HINT: Before troubleshoot the system, confirm the troubles by the "INSPECTION OF TROUBLES IN SYSTEM" (See page SA-18), then inspect the trouble according to the following table.

You will find the cause of trouble more easily using the table shown below. In this table, the numbers indicate the order priority of the causes in troubles. Check each part in the order shown. If necessary, replace the parts.

<div>See page</div> <div>Parts name</div> <div>Trouble</div>	SA-21										SA-21	SA-21	SA-20	SA-21	SA-23	-
	Power Locking Hub ECU										Indicator Light	4WD Detection Switch	4wd Control Switch (Hub Lock Switch)	Speed Sensor	Power Locking Hub Actuator	Wire Harness
	Terminal and terminal No.															
	1	3	4	5	6	7	8	9	10							
	SPD	M1	M2	4WD	PLH	GND	PLP	4LP	IG							
Hub lock indicator light dose not turn on					2		3		1	5		4			6	
Hub does not become "FREE" to "LOCK" condition		4	4		3	2			1			5		6	7	
Hub does not become "LOCK" to "FREE" condition		4	4		3	2			1			5		6	7	
System operates abnormally	1			3				4		7	6	5	2		8	



SA2591

Parts Inspection

Power Locking Hub ECU

INSPECT ECU CIRCUIT WITH CONNECTOR CONNECTED

HINT:

- Before inspection, check that the battery voltage is 20 – 28 V.
- Inspect with the ignition switch turning on.

Terminal	Check for	Tester connection	Condition		Specified voltage	Trouble part
			+	-		
1	SPD	Voltage	1	7	0 ↔ 4.5V	Speed Sensor
3	M ₁	Voltage	3	4	Battery voltage (About 3 seconds)	4WD Control ECU
4	M ₂	Voltage	4	3	Battery voltage (About 4 seconds)	
5	4WD	Voltage	5	7	4WD Condition (H4 switch ON or transfer lever in L4 position)	4WD Detection Switch
					2WD Condition (H4 switch OFF and transfer lever in H2 position)	
6	PLH	Voltage	6	7	Hub lock switch OFF	Hub Lock Switch
					Hub lock switch ON	
7	GND	Continuity	7	Body ground	Constant (IG switch OFF)	Wire Harness
8	PLP	Voltage	8	7	Hub lock switch OFF (Hub lock indicator light off)	Hub Lock Indicator Light
					Hub lock switch ON (Hub lock indicator light on)	
9	4LP	Voltage	9	7	2WD Condition (4WD indicator light off)	4WD Indicator Light
					4WD Condition (4WD indicator light on)	
10	IG	Voltage	10	7	Constant	DIFF Fuse

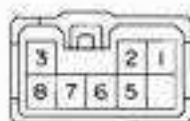
4WD Control Switch

INSPECT 4WD CONTROL SWITCH

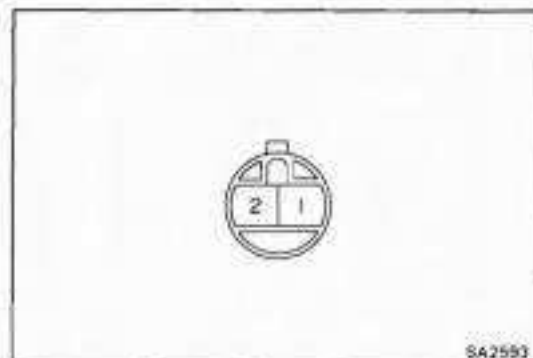
(4WD Control Switch/Continuity)

Switch	Terminal Position	1	6	5	8	3	Illumination	
							7	2
H4 Switch	OFF	○	○					
	ON	○		○			○	○
Hub Lock Switch	OFF							
	ON				○	○		

If continuity is not as specified, replace the switch.



SA2592



4WD Detection Switch

INSPECT 4WD DETECTION SWITCH

- Remove the switch from the transfer.
- Inspect the switch continuity between terminals.

Terminal	1	2
Switch position		
Tip ball is pushed	○	○
Tip ball is free		

If continuity is not as specified, replace the switch.

Speed Sensor

INSPECT SPEED SENSOR

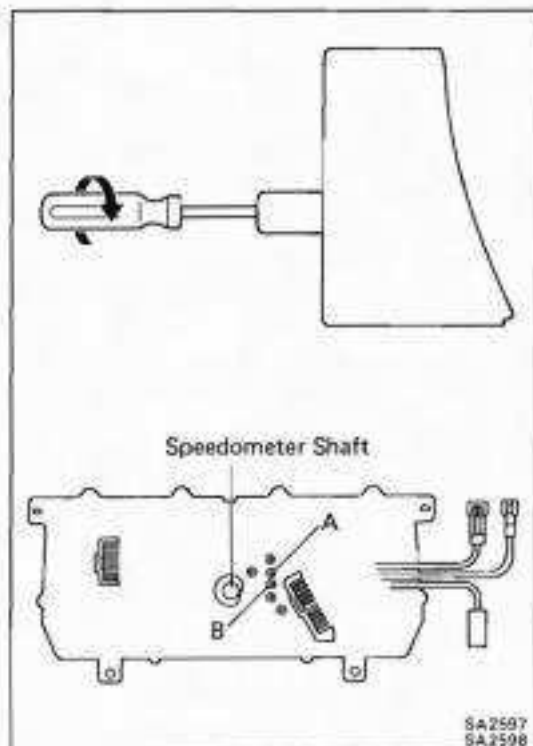
- Remove the combination meter.
(See page BO-50)
- Using a small screwdriver, turn the speedometer shaft.

HINT: Tape the screwdriver tip before use.

- Check that there is continuity between terminals A and B four times per each revolution of the speedometer shaft.

If operation is not as specified, replace the speedometer.

- Install the combination meter.
(See page BO-56)



INDICATOR LIGHTS

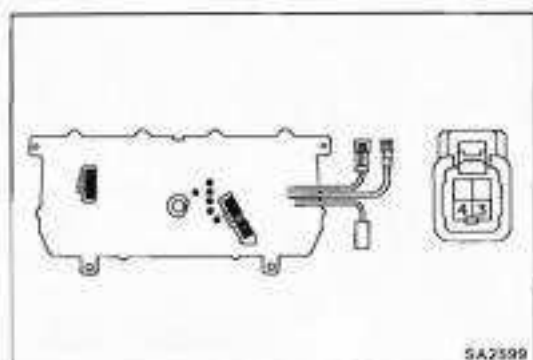
(Hub Lock Indicator Light)

INSPECT HUB LOCK INDICATOR LIGHT

- Remove the combination meter.
(See page BO-50)
- Connect the positive (+) lead from the battery to terminal 3 and negative (-) lead to terminal 4, check the indicator light lights on.

If the indicator light does not light up, test the bulb.

- Install the combination meter.
(See page BO-56)



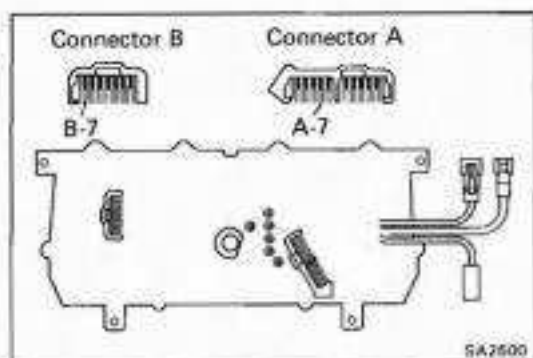
(4WD Indicator Light)

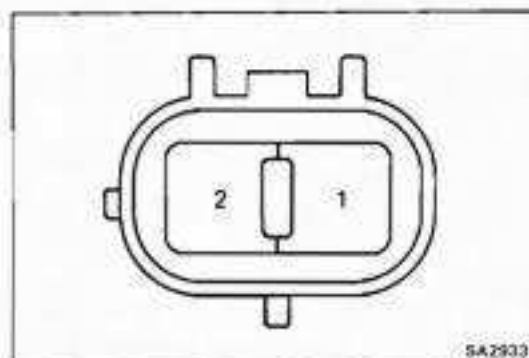
INSPECT INDICATOR LIGHT

- Remove the combination meter.
(See page BO-50)
- Connect the positive (+) lead from the battery to terminal A-7, and the negative (-) battery to terminal B-7 check that the indicator light lights on.

If the indicator light does not light up, test the bulb.

- Install the combination meter.
(See page BO-56)





Power Locking Hub Actuator

1. INSPECT POWER LOCKING HUB ACTUATOR OPERATION

- Set the vehicle in 2WD condition and turn on the hub lock switch.
- Jack up the front of the vehicle and lock the rear wheels.
- Disconnect the connector from the disc brake dust cover.
- Check that the axle hub is in lock condition.
- Connect the positive (+) lead from the battery to terminal 1 and negative (-) lead to terminal 2, check that the motor operates and the hub is in "LOCK" to "FREE" condition.

NOTICE: Do not apply voltage for more than 4 seconds.

HINT: When checking the hub condition, turn the front propeller shaft and check that the right and left tires do not turn.

- Reverse the leads, and check that the motor operates and the hub is in "FREE" to "LOCK" condition.

NOTICE: Do not apply voltage for more than 3 seconds.

HINT:

- When checking the hub condition, turn the front propeller shaft and check that the right and left tires turn.
- If the inner hub did not mesh with the clutch, slowly turn the right and left wheels by hand, and set the hub in lock condition.
- If the one of the right and left hubs did not be in lock condition, both tires do not turn when turn the front propeller shaft.

- Connect the connector.

- Jack down the vehicle.

2. INSPECT ELECTRICAL LOCKING HUB ACTUATOR MOTOR

- Disconnect the connector from the disc brake dust cover.
- Measure the resistance between terminals.

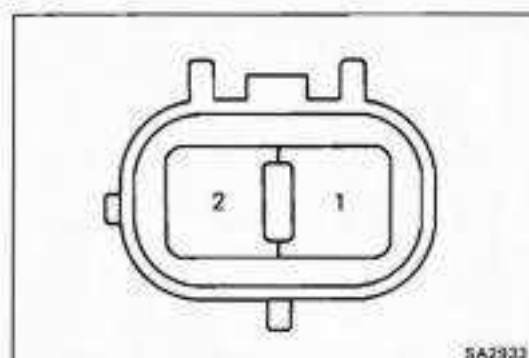
Resistance: 20 — 500 Ω

If resistance value is not as specified, check the power locking hub body sub-assembly and replace if necessary.

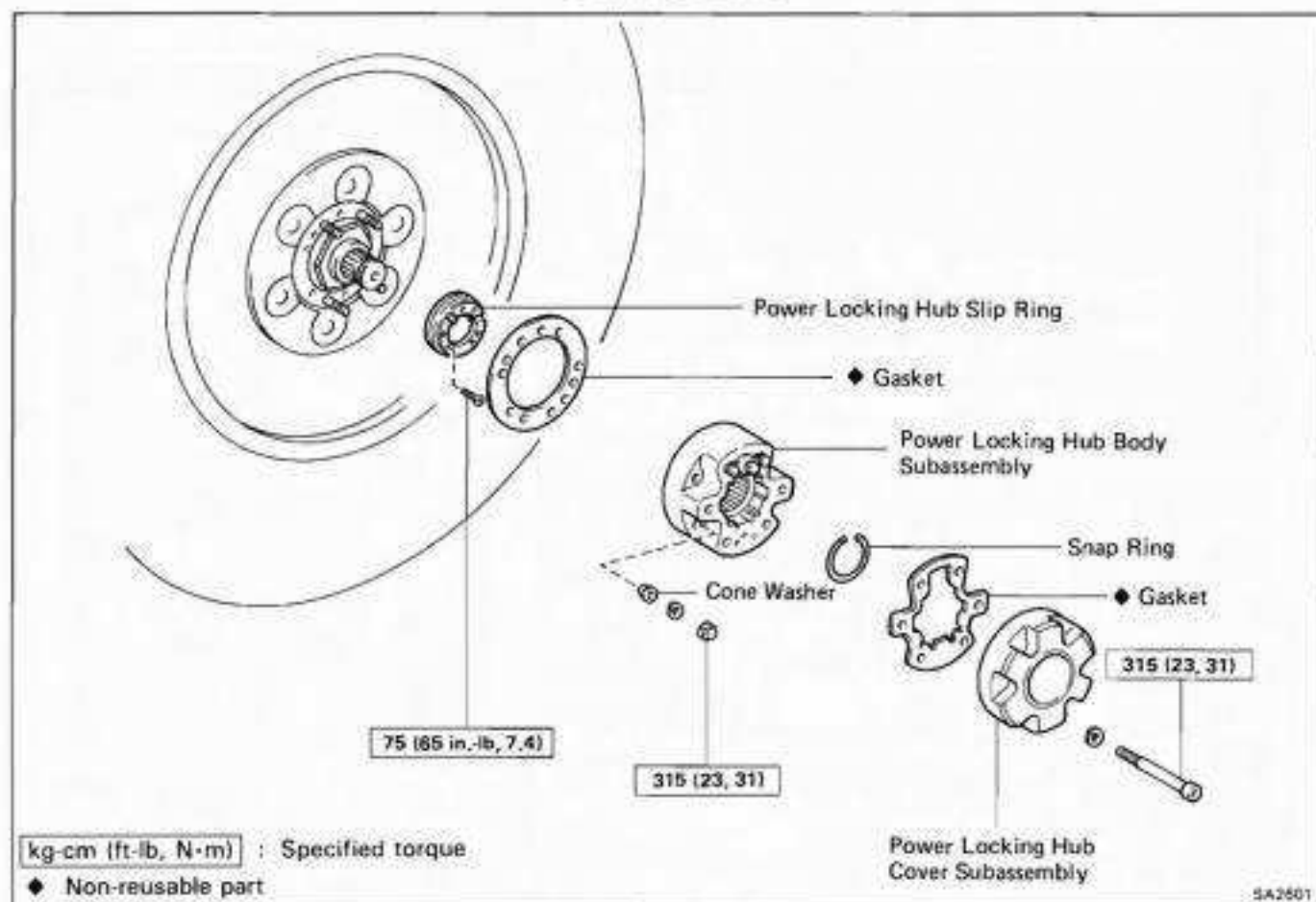
- Check that there is no continuity between each terminal and body ground.

If there is continuity, replace the power locking hub body sub assembly.

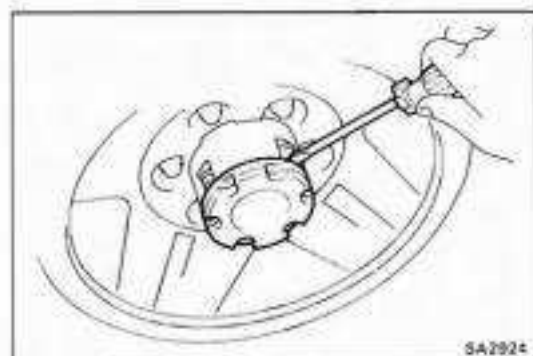
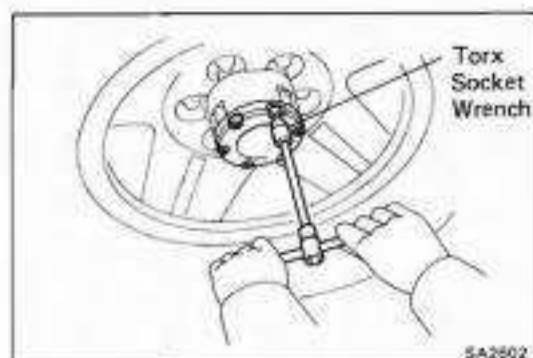
- Connect the connector.



Power Locking Hub Actuator COMPONENTS



REMOVAL OF POWER LOCKING HUB ACTUATOR

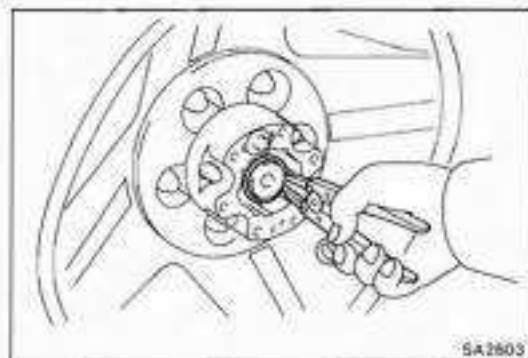


1. REMOVE POWER LOCKING HUB COVER SUB-ASSEMBLY

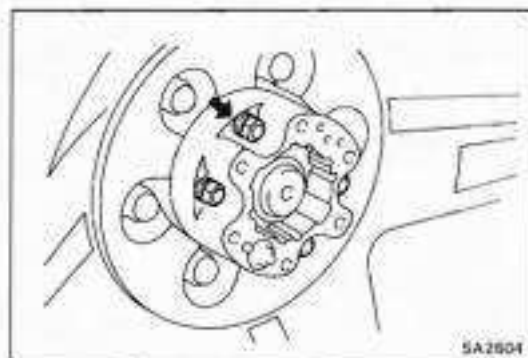
- With the ignition switch to the "ON" position, turn the hub lock switch to off and set the hub in "FREE" condition.
- Using torx socket wrench, remove the six hexagon bolts.
(Torx socket wrench T40 09042-00020)
- Insert a screwdriver between the hub cover sub-assembly and hub body set nut, and pry off the hub cover sub-assembly.

NOTICE:

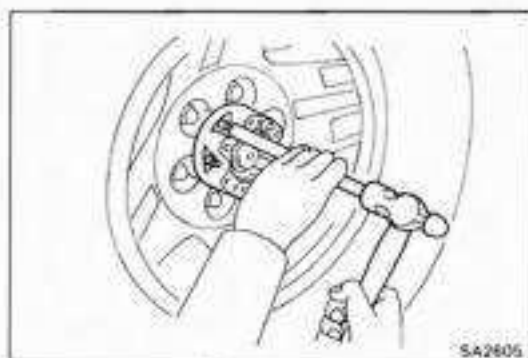
- Apply equal force at the four positions around the set nut.
- Be careful not to scratch or damage the hub cover.
- Do not tap the hub cover subassembly with a hammer or an equivalent so as not to deform the hub cover sub-assembly.
- Remove the gasket from the hub cover sub-assembly.

**2. REMOVE POWER LOCKING HUB BODY SUBASSEMBLY**

- (a) Using snap ring pliers, remove the snap ring.



- (b) Remove the four nuts and plate washers.

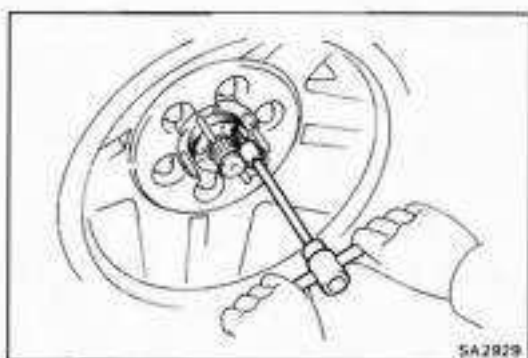


- (c) Using a hammer and brass bar, tap the bolt heads and remove four cone washers.

NOTICE: Do not tap the power locking hub body sub-assembly.

- (d) Remove the power locking hub body subassembly and the gasket.

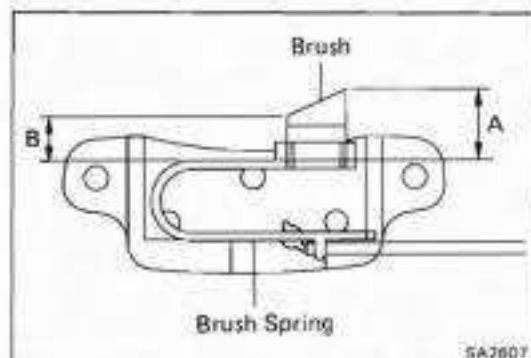
NOTICE: Be careful not to damage the brush.

**3. REMOVE POWER LOCKING HUB SLIP RING**

- (a) Using a torx socket wrench, remove the three set screws.

(Torx socket wrench T20 09041-00010)

- (b) Remove the power locking hub slip ring.



INSPECTION OF ACTUATOR COMPONENTS

1. INSPECT BRUSH

- (a) Measure the brush height.

Standard height:

- A 6.5 mm (0.256 in.)
B 4.7 mm (0.185 in.)

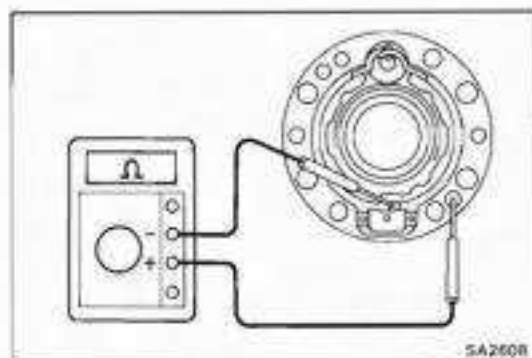
Minimum height:

- A 4.2 mm (0.165 in.)
B 4.2 mm (0.122 in.)

If the height of the brush is out of the specification, replace the power locking hub body subassembly.

NOTICE:

- Do not remove the brush from the brush holder.
- Be careful not to damage the brush spring.



2. INSPECT POWER LOCKING HUB SUBASSEMBLY

Using an ohmmeter, check that there is no continuity between the brush and hub body subassembly.

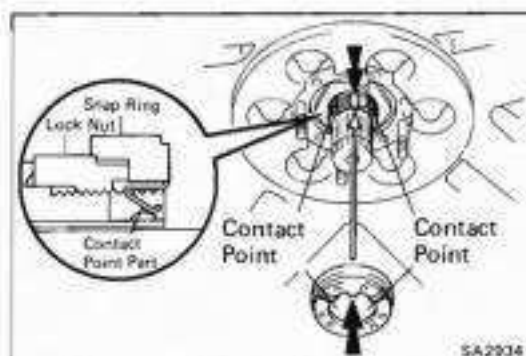
If there is continuity, replace the power locking hub body subassembly.

INSTALLATION OF POWER LOCKING HUB ACTUATOR

(See page SA-23)

1. CLEAN POWER LOCKING HUB COVER SET BOLT AND BOLT HOLE

Using the cleaning solvent, clean the set bolt and bolt hole.



2. INSTALL POWER LOCKING HUB SLIP RING

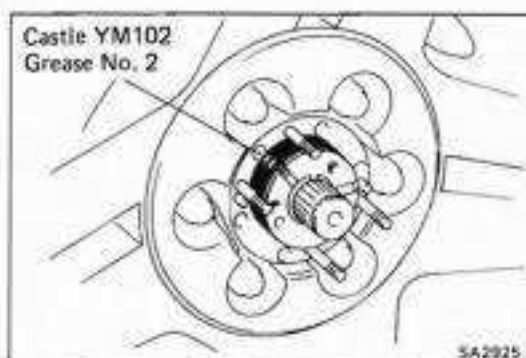
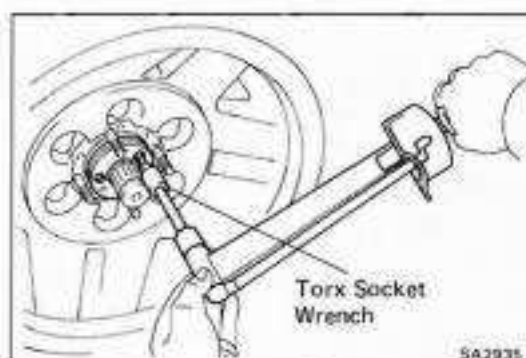
- Clean the slip ring, locking nut, drive shaft, and spindle of the tip.
- Match the slip ring protrusion with the knuckle spindle cut-out and install the slip ring to the lock nut.
- Check that the two contact points between the slip ring and knuckle spindle are actually in contact.

NOTICE: Make sure there is no grease or oil, etc. on the parts at the contact point.

- Using a torx socket wrench, install the three set screws.

(Torx socket wrench T20 09042-00030)

Torque: 75 kg-cm (65 in.-lb, 7.4 N·m)



3. APPLY CASTLE BODY GREASE W TO HUB BODY SUBASSEMBLY AND HUB COVER SUBASSEMBLY

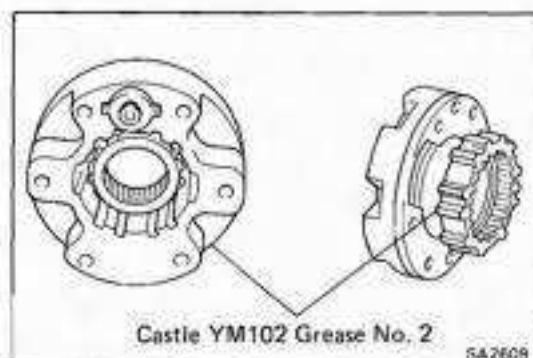
- After cleaning the slip ring again, thinly and evenly spread castle body grease w around the circumference of the slip ring.

Grease: Part No. 08887-02007, CASTLE BODY GREASE W

NOTICE: Do not apply any grease other than castle YM102 No.2 to the slip ring.

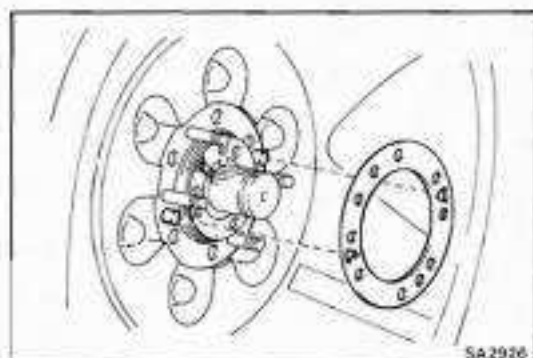
HINT:

- Apply approx. 2 – 3 g (0.04 – 0.07 lb) of the grease.
- If grease is not applied, or grease other than castle body grease W is applied, non-continuity at low temperatures and premature wearing of the flange will occur.



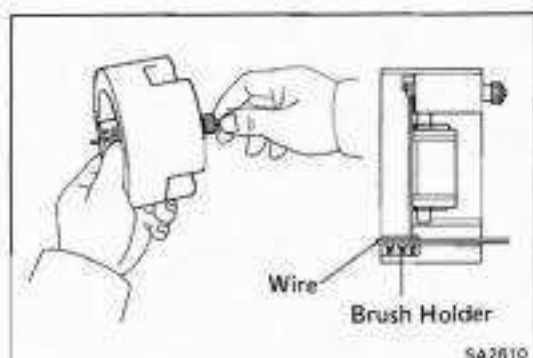
- (b) Thinly and evenly apply castle body grease W to the sliding parts of the hub body subassembly and hub cover assembly.

Grease: Part No. 08887-02007, CASTLE BODY GREASE W



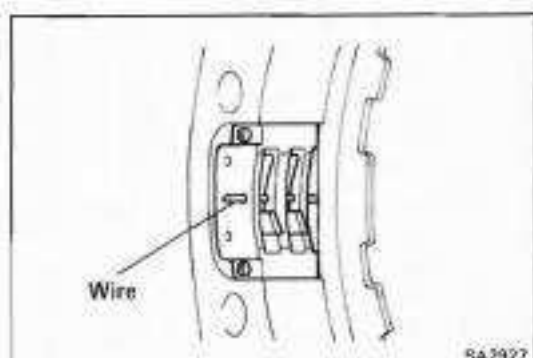
4. INSTALL POWER LOCKING HUB BODY SUBASSEMBLY

- (a) Align the knock-pin of the axle hub and a new gasket's triangular hole, and install a gasket to the axle hub.

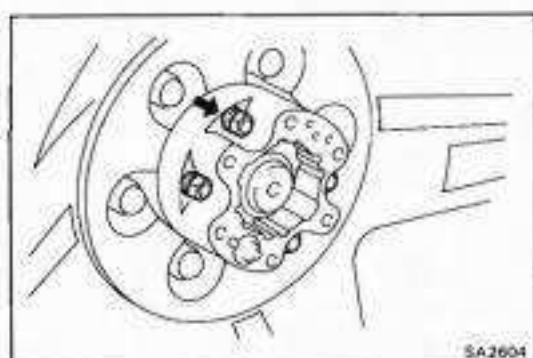


- (b) Using a wire or an equivalent, fix the brush as shown.

NOTICE: Do not allow oil or grease to get on the brush.



- (c) Check that the brush is hold in the brush holder.

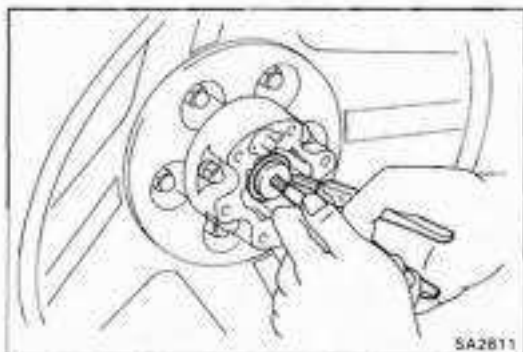


- (d) Install the hub body subassembly to the axle hub with the four cone washers, washers and nuts.

Torque: 315 kg-cm (23 ft-lb, 31 N·m)

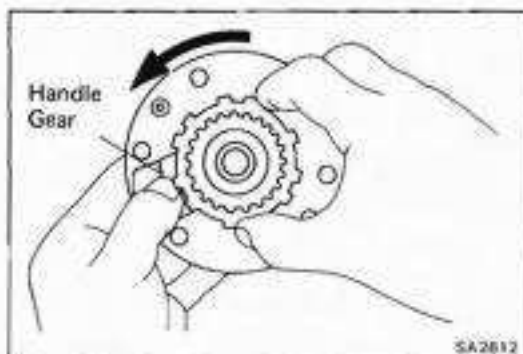
HINT: Before installing the hub body subassembly, check that the brush fixed.

- (e) Remove the wire or and equivalent from the power locking hub body subassembly.



5. INSTALL SNAP RING

- Install a bolt to the drive shaft and pull it out.
- Using snap ring pliers, install the snap ring.
- Remove the bolt.

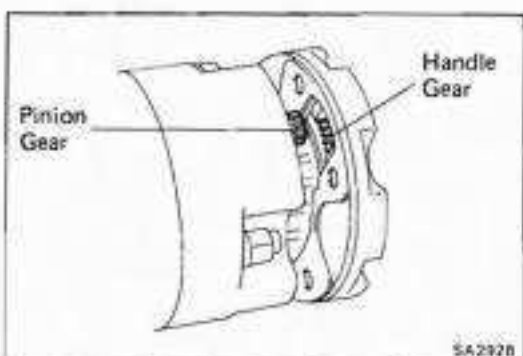
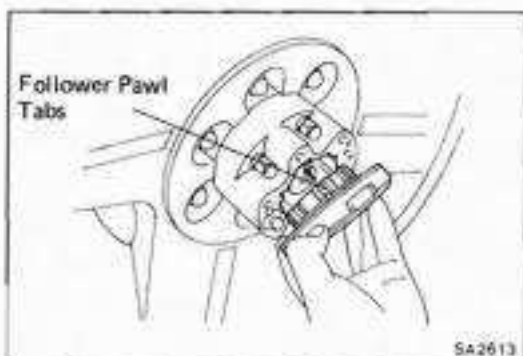


6. INSTALL POWER LOCKING HUB COVER SUB-ASSEMBLY

- Hold the handle gear, turn the clutch counterclockwise and set the hub cover subassembly to "FREE" condition.
- Remove the backing paper from the new gasket and install the gasket to the hub cover subassembly.

NOTICE:

- Install the sealant-covered surface of the gasket (from which the backing paper was removed) to the hub cover subassembly.
- Check that the gasket is properly aligned and that there is no unevenness.
- Install the hub cover subassembly to the hub body assembly with the follower pawl tabs aligned with the non-toothed portions of the body.



- Align the installation position of the 4WD control motor's pinion gear with that of the hub cover's handle gear, and install the hub cover subassembly.

NOTICE: With the hub cover subassembly lightly held down by hand onto the hub body subassembly, check that there is no space between the hub body subassembly and hub cover subassembly.

HINT: If there is a gap between the hub body subassembly and hub cover subassembly when the set bolt is tightened, the motor, the gasket etc. will be damaged, so again check steps (1) — (4) above and check that there is no gap between the hub body subassembly and hub cover subassembly.

- Apply sealant to the threads of the set bolts.

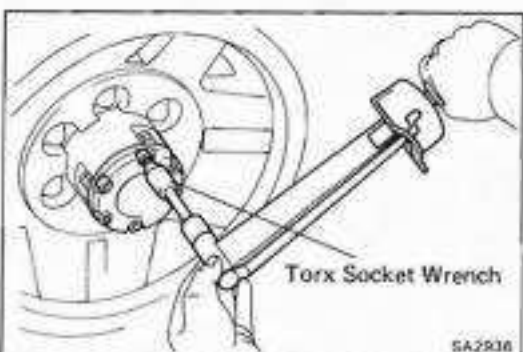
Sealant: Part No. 08833-00080, THREE BOND 1344, LOCTITE 242 or equivalent

- Using torx socket wrench, install and torque the six set bolts.

(Torx socket wrench T40 09042-00020)

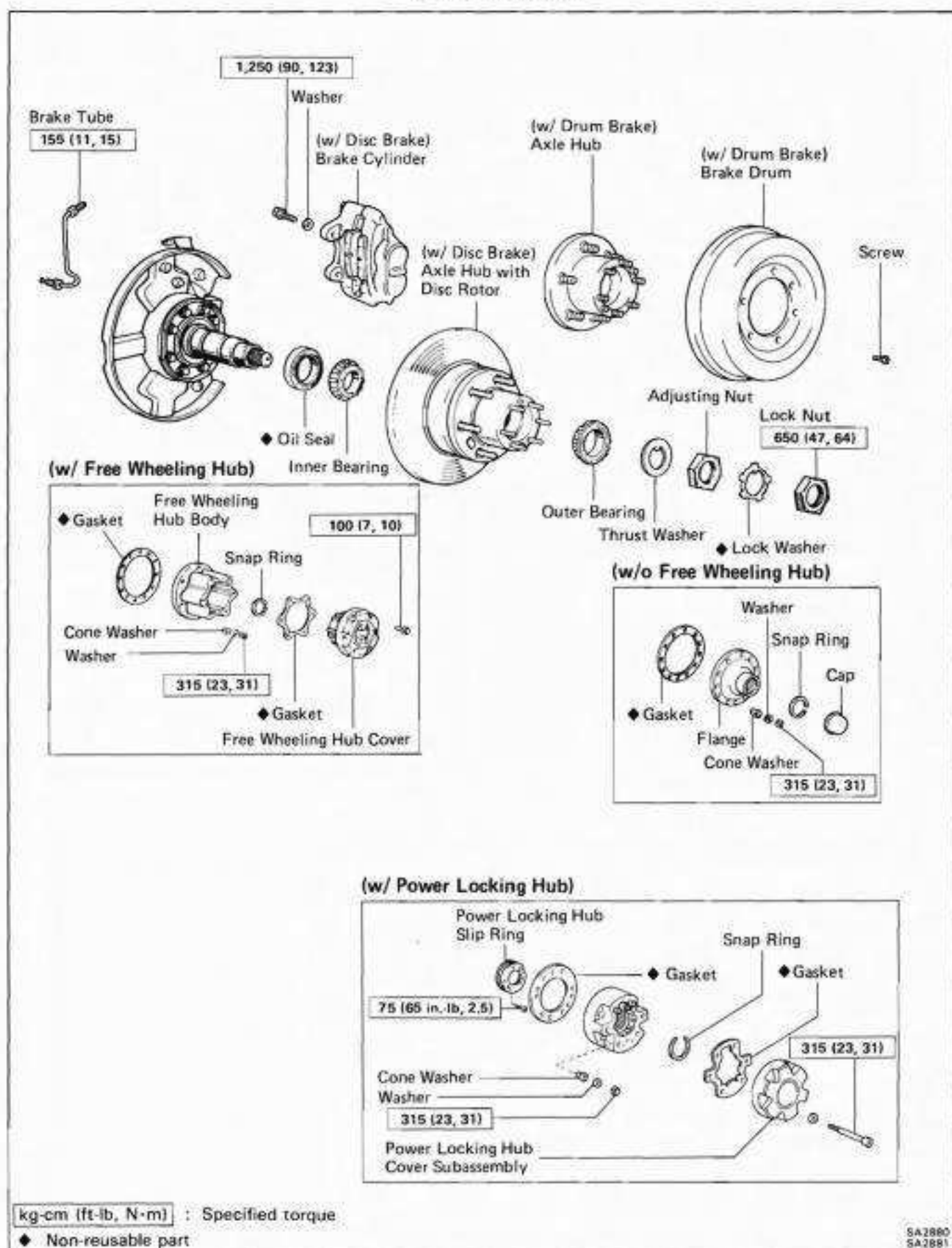
Torque: 315 kg-cm (23 ft-lb, 31 N-m)

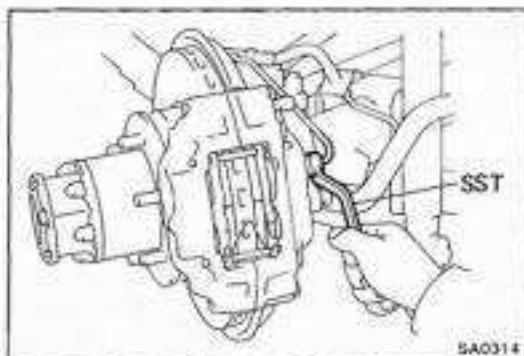
NOTICE: After temporarily tightening diagonally opposite hub cover bolts to 200 kg-cm (14 ft-lb, 20 N-m), tighten them to the specified torque.



7. CHECK OPERATION

FRONT AXLE HUB COMPONENTS



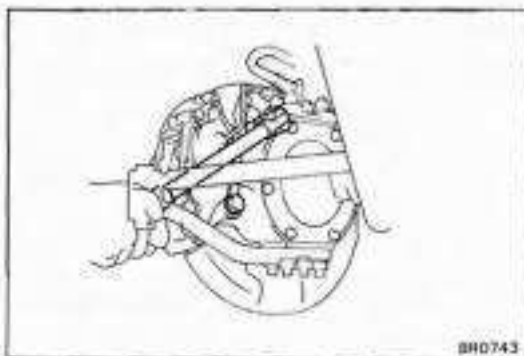


DISASSEMBLY OF FRONT AXLE HUB

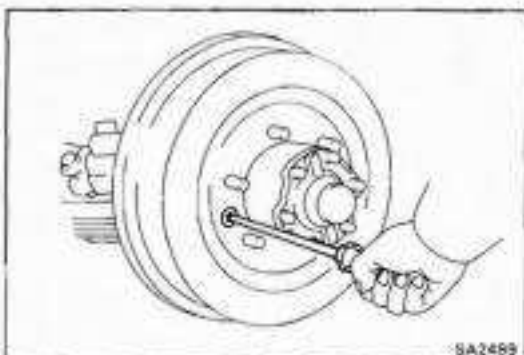
(See page SA-29)

1. (w/ DISC BRAKE) REMOVE DISC BRAKE CYLINDER

- (a) Using SST, disconnect the brake tube.
SST 09751-36011

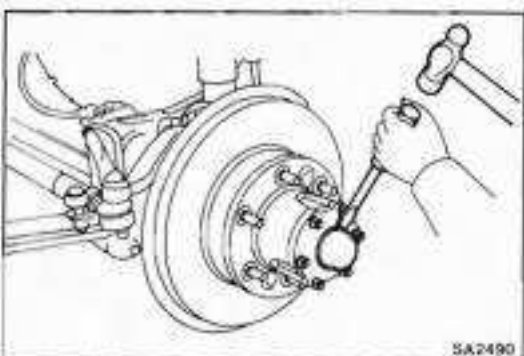


- (b) Remove the two bolts and brake cylinder.



2. (w/ DRUM BRAKE) REMOVE BRAKE DRUM

- (a) Remove the screw from the drum.
(b) Pull out the brake drum.

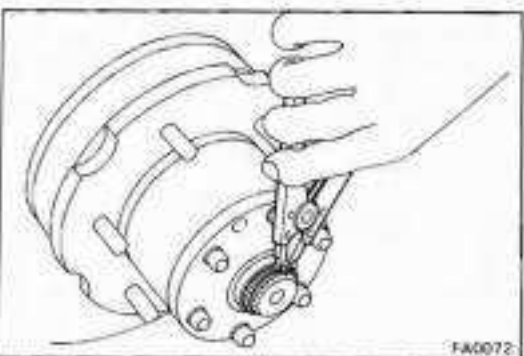


3. REMOVE FLANGE, FREE WHEELING HUB OR POWER LOCKING HUB

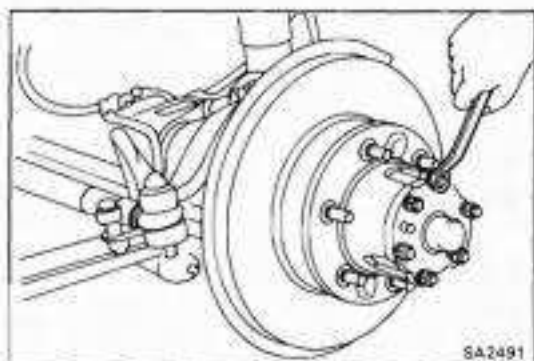
HINT:

- If the vehicle has the free wheeling hub, see page SA-6.
- If the vehicle has the power locking hub, see page SA-23.

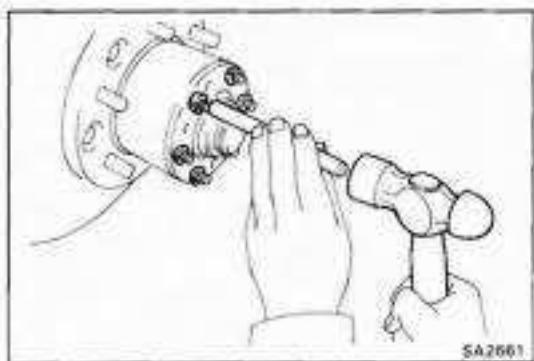
- (a) Using a screwdriver and hammer, remove the cap from the flange.



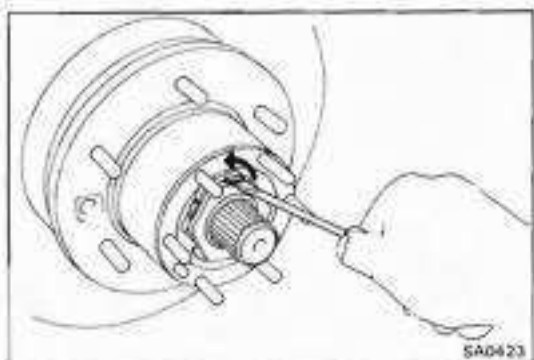
- (b) Using snap ring pliers, remove the snap ring.



- (c) Remove the six mounting nuts and washers.

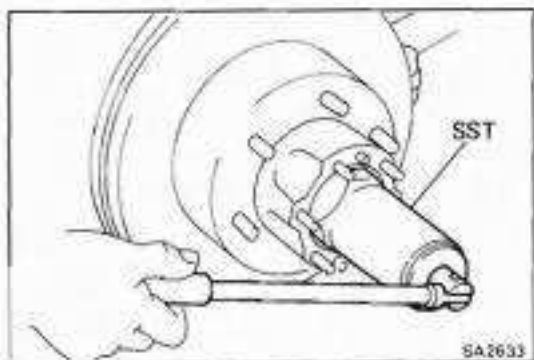


- (d) Using a brass bar and hammer, tap the bolt heads and remove the cone washers.
(e) Pull out the flange.



4. REMOVE AXLE HUB

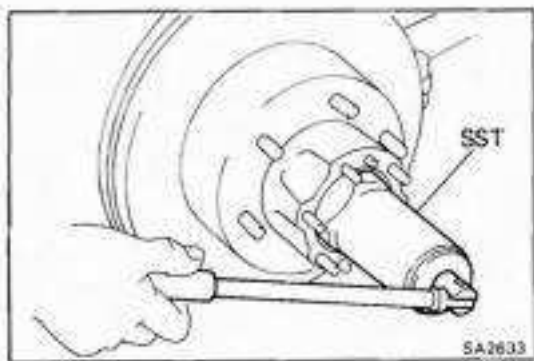
- (a) Using a screwdriver, loosen the staked part of the lock washer.



- (b) Using SST, remove the lock nut.

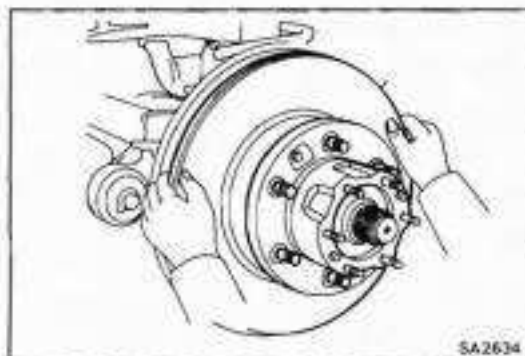
SST 09607-60020

- (c) Remove the lock washer.



- (d) Using SST, remove the adjusting nut.

SST 09607-60020

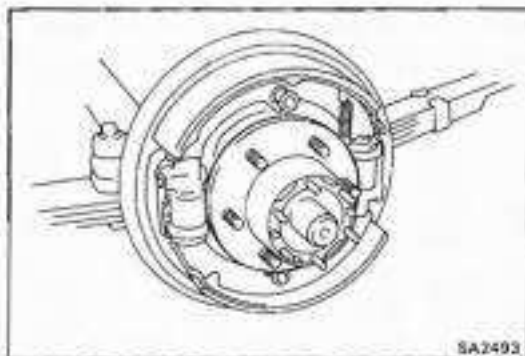


(e) (w/ Disc Brake)

Remove the axle hub with the disc rotor.

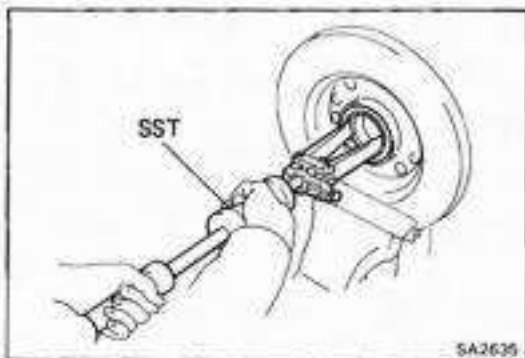
HINT: (w/ Power Locking Hub)

Before removing the boot, wrap vinyl tape around the tip of the spindle.



(f) (w/ Drum Brake)

Remove the axle hub.

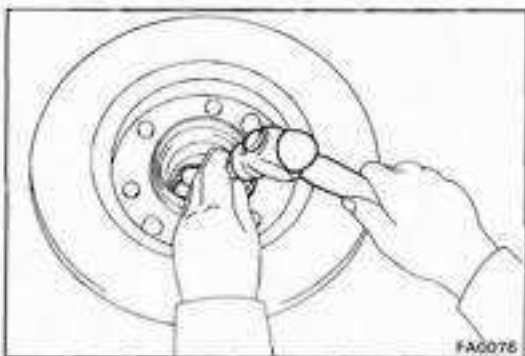


5. REMOVE INNER BEARING AND OIL SEAL

(a) Using SST, remove the oil seal.

SST 09308-00010

(b) Remove the inner bearing from the axle 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

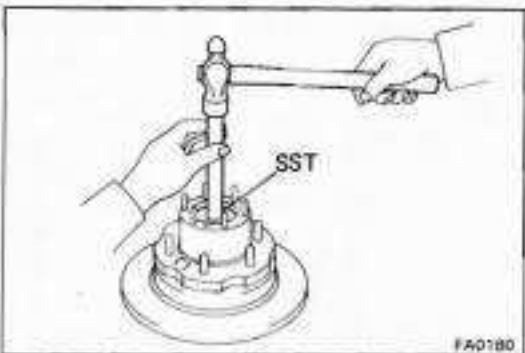
(a) Using a brass bar and hammer, drive out the bearing outer race.

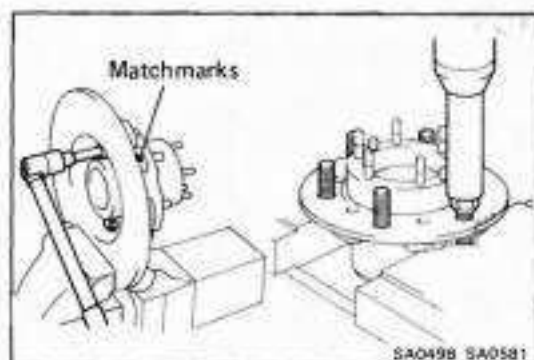
(b) Using SST, carefully drive in a new bearing outer race.

SST 09608-35014

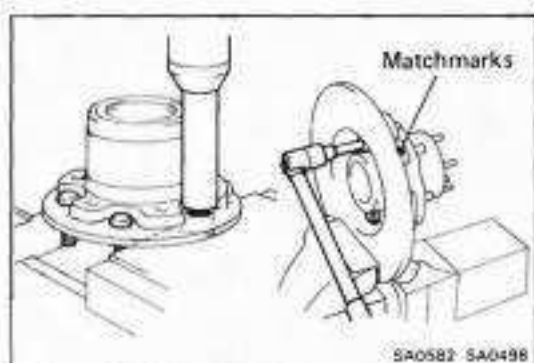
Inner Bearing (09608-06020, 09608-06210)

Outer Bearing (09608-06020, 09608-06200)

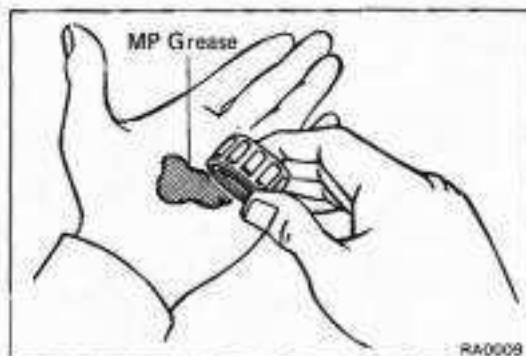


**3. REPLACE HUB BOLTS**

- (a) Place matchmarks on the axle hub and rotor disc.
- (b) Remove the six bolts and rotor disc from the axle hub.
- (c) Install the nut to the hub bolts.
- (d) Using an extension bar and press, press out the hub bolts.



- (e) Using an extension bar and press, press in the hub bolts.
- (f) Align the matchmarks install the axle hub to the rotor disc.

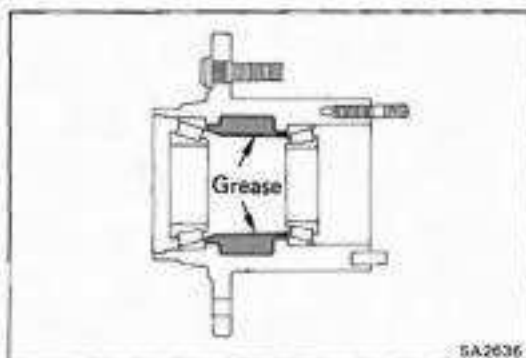


ASSEMBLY OF FRONT AXLE HUB

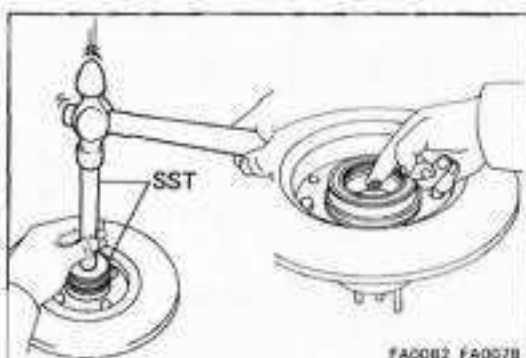
(See page SA-29)

1. PACK BEARINGS WITH MP GREASE

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

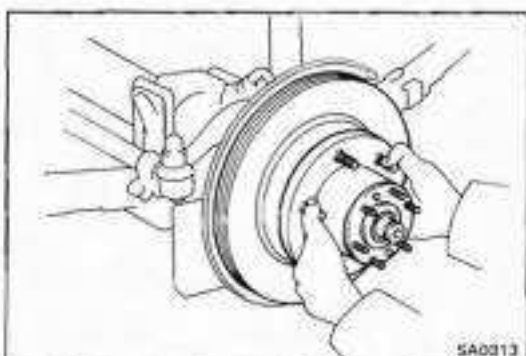


2. PACK INSIDE OF HUB WITH MP GREASE



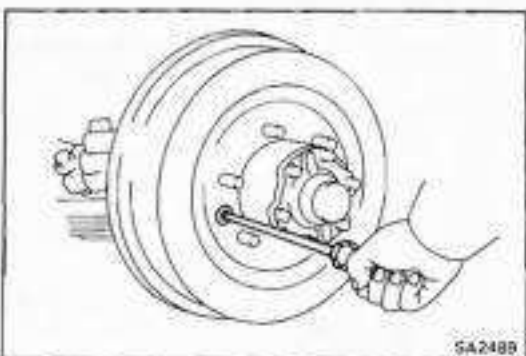
3. INSTALL INNER BEARING AND OIL SEAL

- Place inner bearing into the hub.
- Using SST, drive in the oil seal into the hub.
SST 09608-35014 (09608-06020, 09608-06150)
- Coat the oil seal with MP grease.



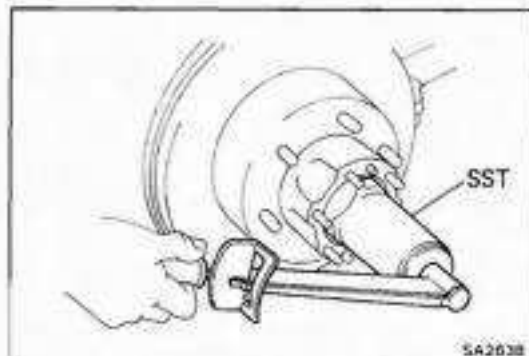
4. INSTALL AXLE HUB ON SPINDLE

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



5. (w/ DRUM BRAKE) INSTALL BRAKE DRUM

- Install the brake drum to the axle hub.
- Install the screw to the brake drum.



6. ADJUST PRELOAD

(a) (w/ Power Locking Hub)

Remove the vinyl tape from the tip of spindle.

(b) Using SST, torque the bearing adjusting nut.

SST 09607-60020

Torque: 600 kg-cm (43 ft-lb, 59 N·m)

HINT: Be careful not to damage the oil seal.

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

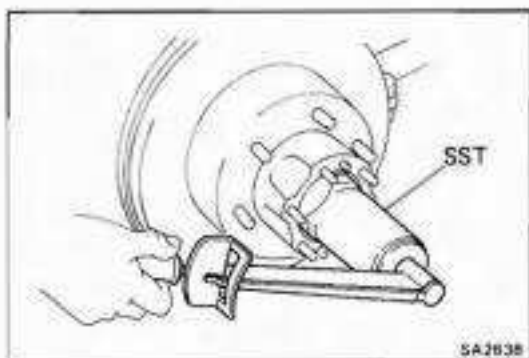
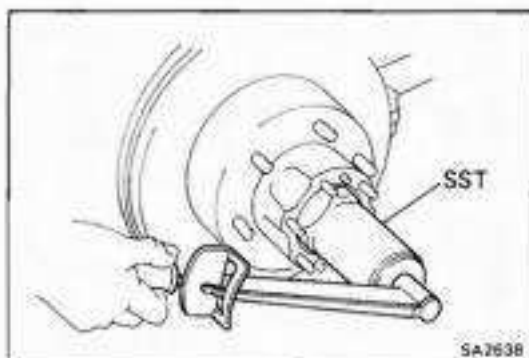
(d) Loosen the nut until it can be turned by hand.

(e) Using SST, retorque the bearing adjusting nut.

SST 09607-60020

Torque: 600 kg-cm (43 ft-lb, 59 N·m)

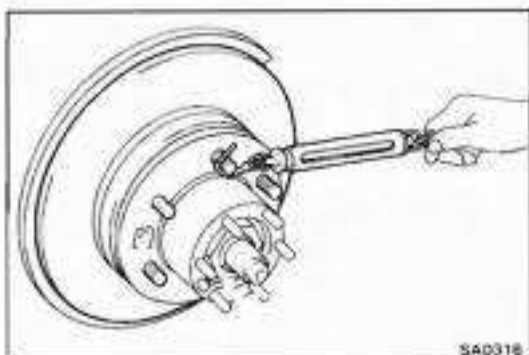
(f) Loosen the nut until it can be turned by hand.



(g) Retorque the adjusting nut.

SST 09607-60020

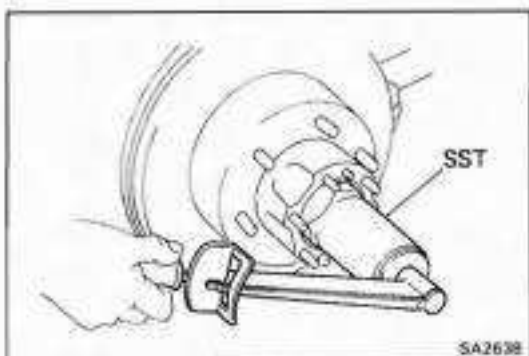
Torque: 55 kg-cm (48 in.-lb, 5.4 N·m)



(h) Using a spring tension gauge, measure the preload.

Preload (starting):

Preload 2.8 – 5.7 kg
(6.2 – 12.6 lb, 27 – 56 N)



7. INSTALL LOCK WASHER AND LOCK NUT

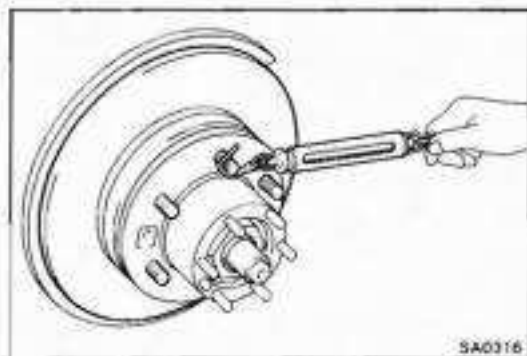
(a) Install the lock washer and lock nut.

(b) Using SST, torque the lock nut.

SST 09607-60020

Torque: 650 kg-cm (47 ft-lb, 64 N·m)

(c) Check that the bearing has no play.

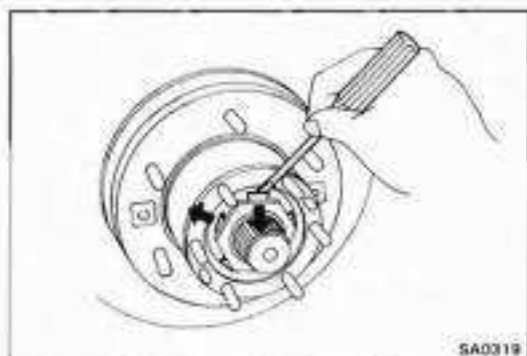


(d) Using a spring tension gauge, check the preload.

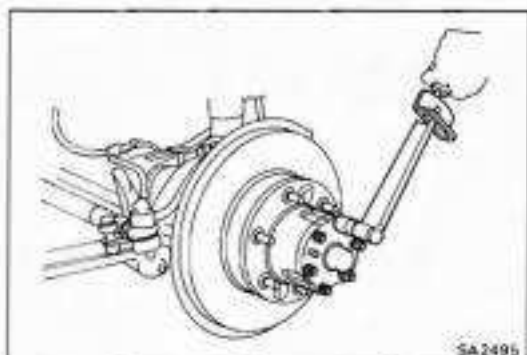
Preload (starting):

**Preload 2.8 – 5.7 kg
(6.2 – 12.6 lb, 27 – 56 N)**

If not within specification, adjust with the adjusting nut.



(e) Secure the lock nut by bending one of the lock washer tooth inward and another lock washer tooth outward.



8. INSTALL FLANGE, FREE WHEELING HUB OR POWER LOCKING HUB

HINT:

- If the vehicle has the free wheeling hub, see page SA-13.
- If the vehicle has the power locking hub, see page SA-26.

(a) Place a new gasket in position on the axle hub.

(b) Install the flange to the axle hub.

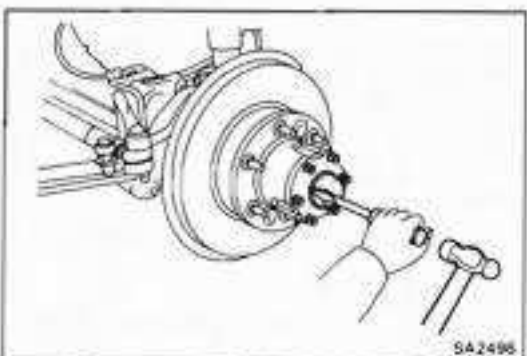
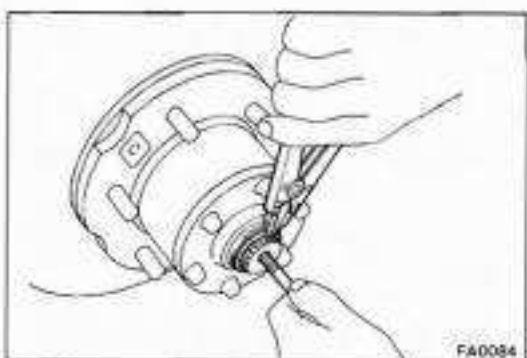
(c) Install the six cone washers, washers and nuts. Torque the nuts.

Torque: 315 kg-cm (23 ft-lb, 31 N·m)

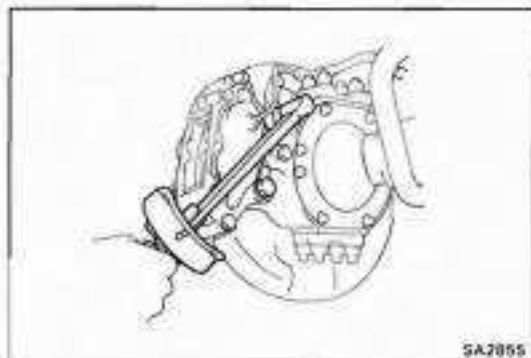
(d) Install a bolt to the axle shaft and pull it out.

(e) Using snap ring pliers, install the snap ring.

(f) Remove the bolt from the axle shaft.



(g) Using a hammer and screwdriver, install the cap to the flange.

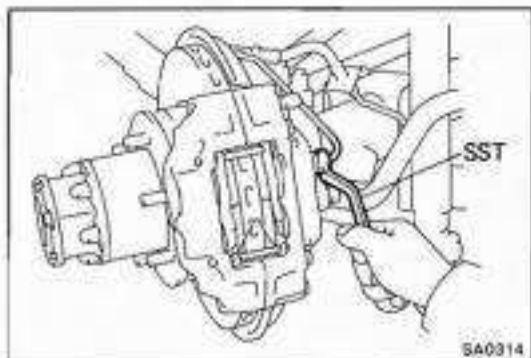


**9. (w/ DISC BRAKE)
INSTALL BRAKE CYLINDER**

- (a) Install the brake cylinder to the steering knuckle with the two bolts.

Torque the mounting bolts.

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



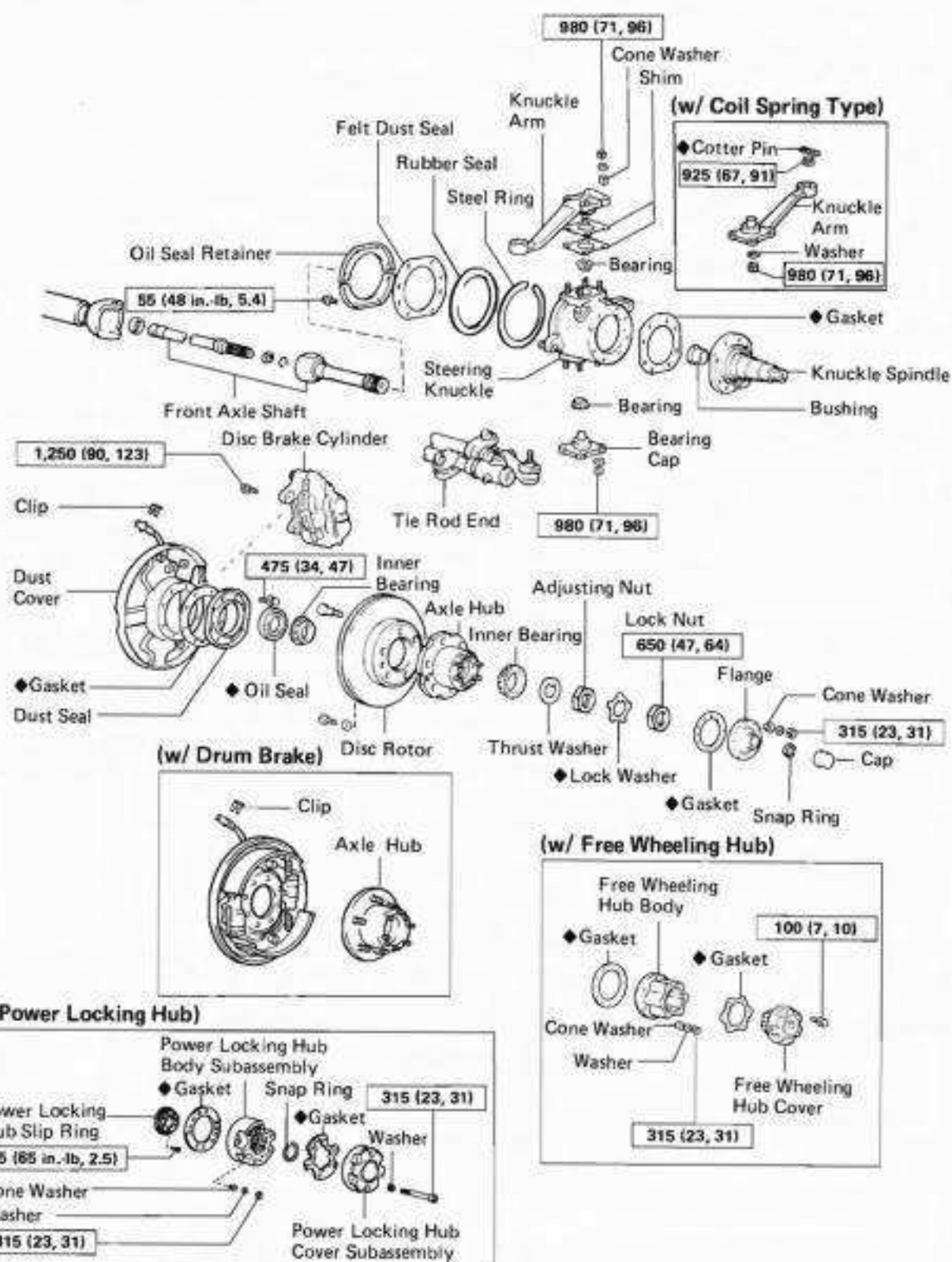
- (b) Using SST, connect the brake tube.

SST 09751-36011

Torque: 155 kg-cm (11 ft-lb, 15 N·m)

**10. BLEED BRAKE LINE
(See page BR-7)**

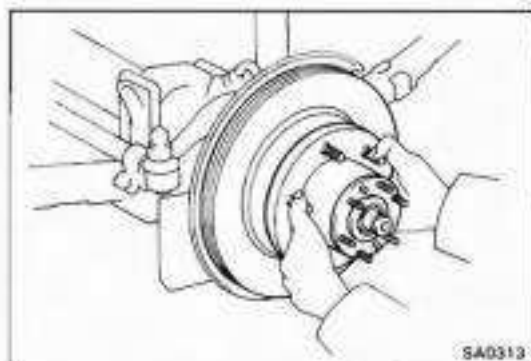
STEERING KNUCKLE AND AXLE SHAFT COMPONENTS



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

◆ Non-reusable part

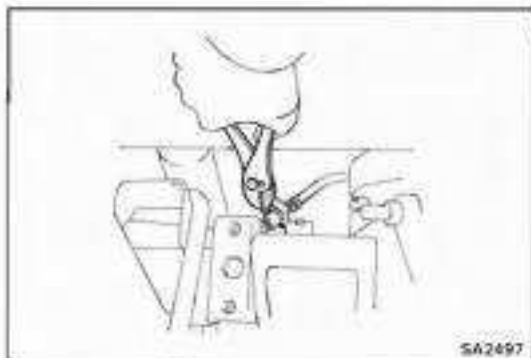
SA2931



DISASSEMBLY OF STEERING KNUCKLE AND AXLE SHAFT

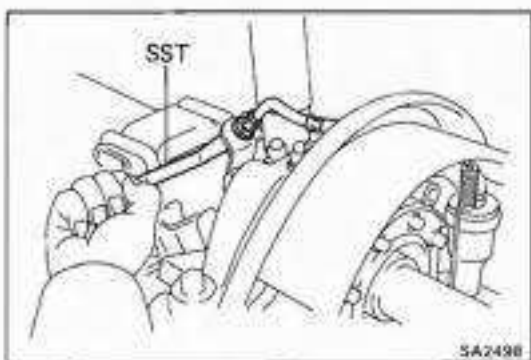
(See page SA-38)

1. REMOVE FRONT AXLE HUB
(See page SA-29)

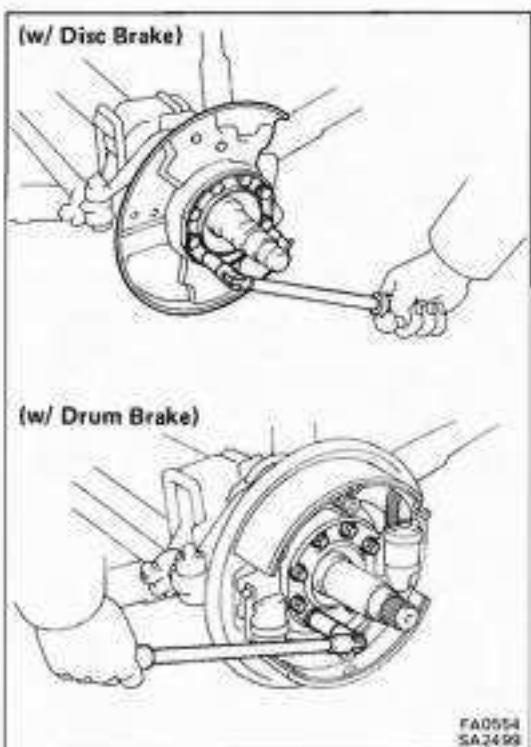


2. DISCONNECT BRAKE HOSE

(a) Using pliers, remove the clip.



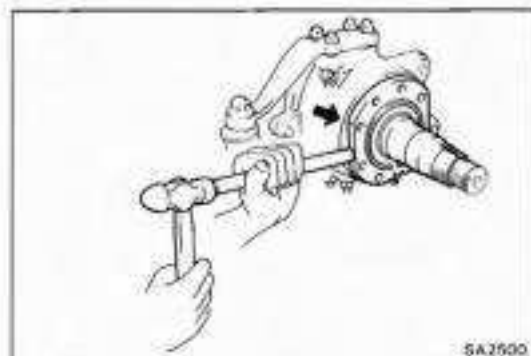
(b) Using SST, disconnect the brake tube.
SST 09751-36011



3. REMOVE KNUCKLE SPINDLE MOUNTING BOLTS

4. REMOVE DUST SEAL AND DUST COVER

Remove the eight bolts, dust seal, dust cover and gasket.



SA2500

5. REMOVE KNUCKLE SPINDLE

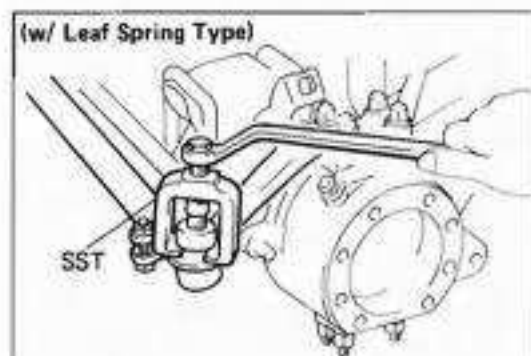
- (a) (w/ Power Locking Hub)
Disconnect the connector.
- (b) Using a brass bar and hammer, drive out the knuckle spindle from the steering knuckle.



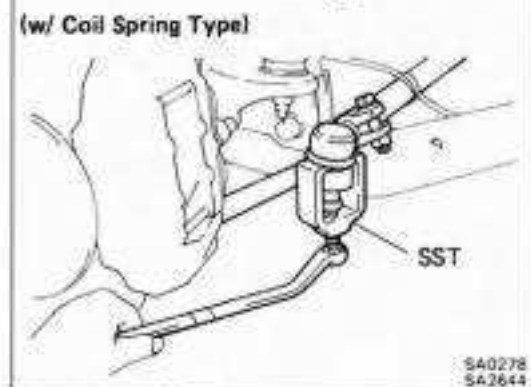
SA2501

6. REMOVE AXLE SHAFT

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



SST

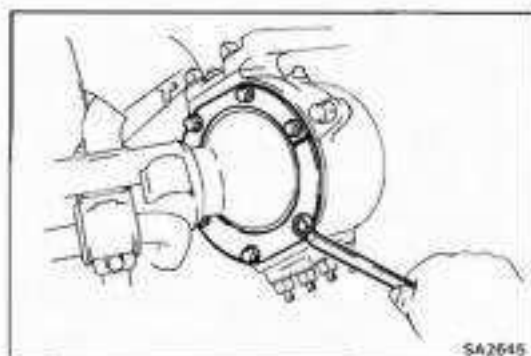


SST

SA0278
SA2644**7. DISCONNECT TIE ROD END FROM KNUCKLE ARM**

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

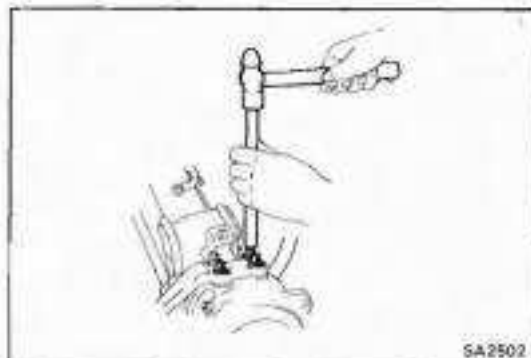
SST 09611-22012



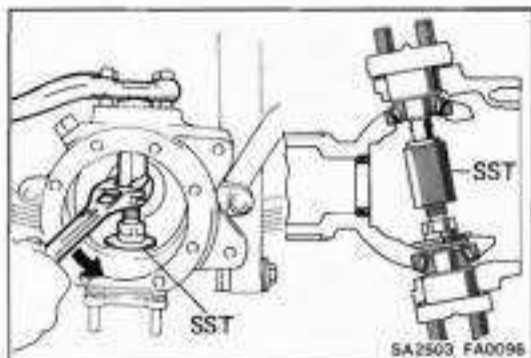
SA2645

8. REMOVE OIL SEAL RETAINER, STEEL RING, RUBBER SEAL AND FELT DUST SEAL

Remove the six bolts and the oil seal retainer, steel ring, rubber seal and felt dust seal.

**9. REMOVE KNUCKLE ARM AND BEARING CAP**

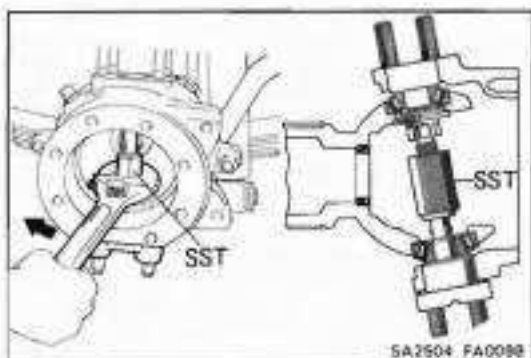
- (a) Remove the knuckle arm and bearing cap mounting nuts.
- (b) Using a brass bar, tap the slits of the cone washers and remove them from the knuckle arm.



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

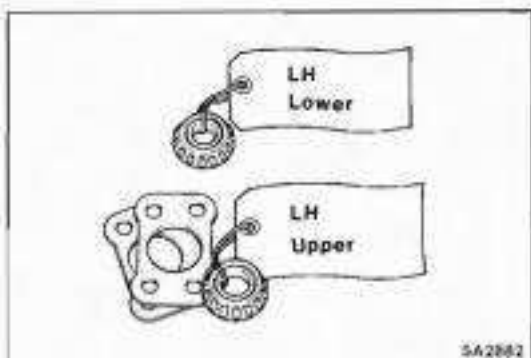
SST 09606-60020

HINT: Use the SST without a collar.



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

SST 09606-60020

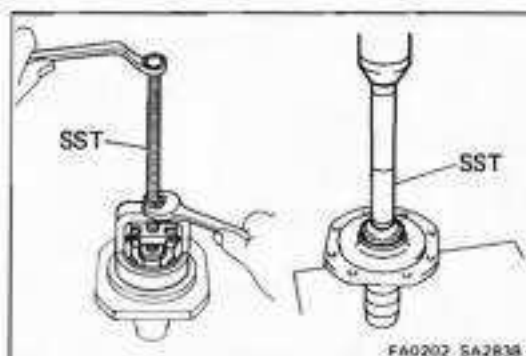
**10. REMOVE STEERING KNUCKLE AND BEARING**

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

INSPECTION AND REPAIR OF STEERING KNUCKLE AND AXLE SHAFT

1. INSPECT KNUCKLE SPINDLE

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



2. REPLACE BUSHING

(a) Using SST, remove the bushing.

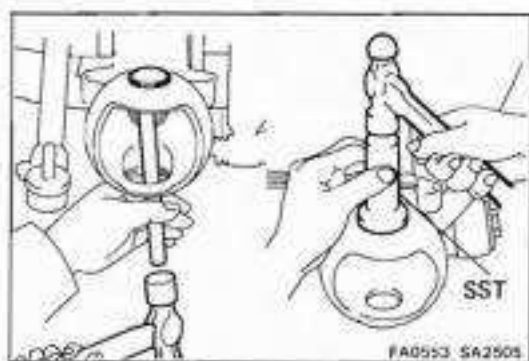
SST 09612-65014 (09612-01020, 09612-01050)

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

SST 09618-60010

3. INSPECT BEARINGS AND OUTER RACES

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

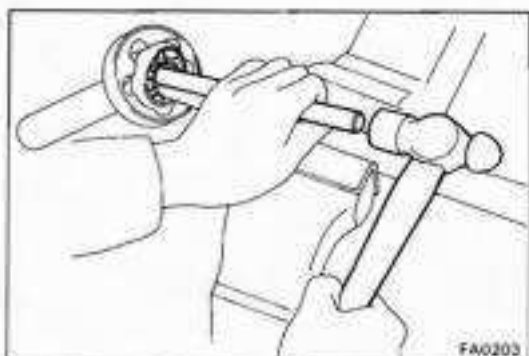


4. IF NECESSARY, REPLACE BEARING OUTER RACE

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

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

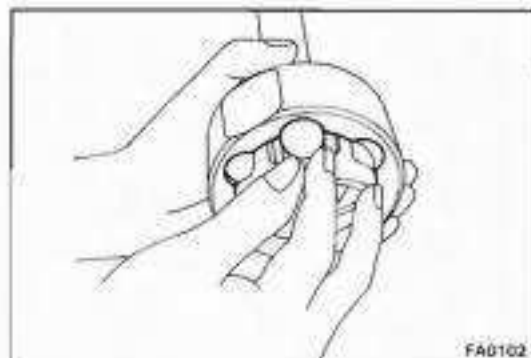
SST 09605-60010



5. INSPECT BIRFIELD JOINT INNER PARTS

(a) Hold the inner shaft in a vise.

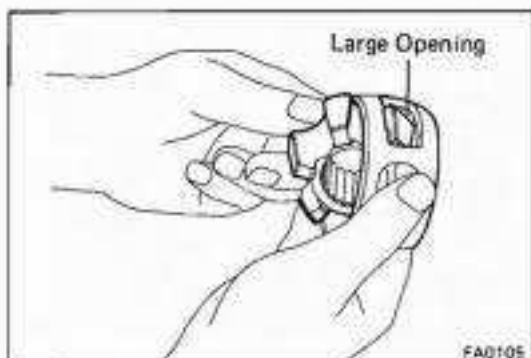
(b) Place a brass bar against the joint inner race and drive out the outer shaft.



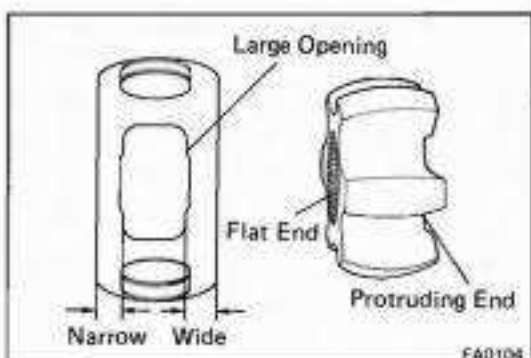
- (c) Tilt the inner race and cage, then take out the bearing balls one by one.



- (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.



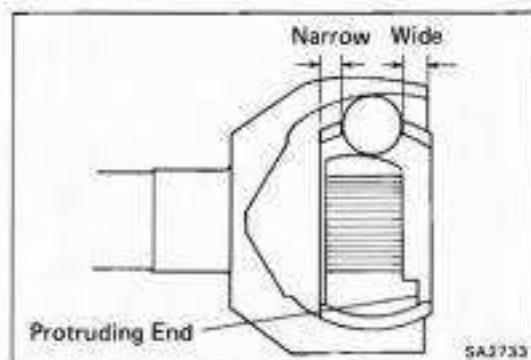
- (e) Take out the inner race from the cage through the large opening.
(f) Clean and inspect the joint inner parts for wear or damage.



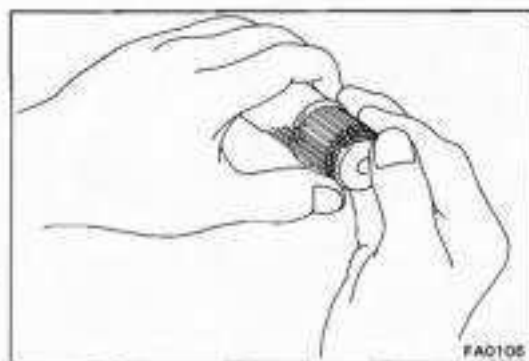
- (g) Coat the joint inner parts and outer shaft inside with molybdenum disulphide lithium base grease.
(h) Insert the inner race in the cage through the large opening.
(i) Position the protruding end of the inner race toward the wide side of the cage.



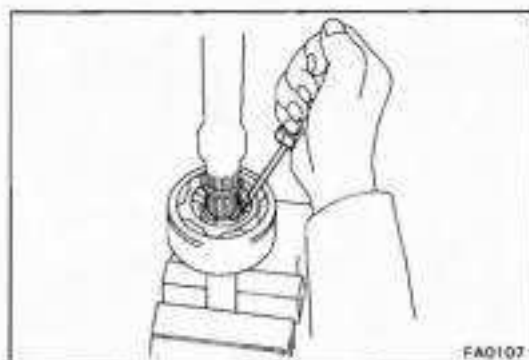
- (j) Assemble the cage and inner race to the outer shaft by fitting the two large openings in the cage against the protruding parts of the outer shaft.



- (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 a new snap rings to the inner shaft.



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

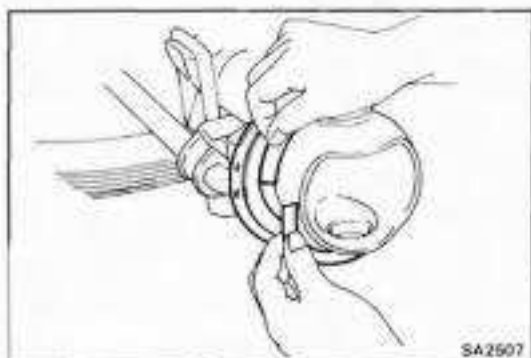


ASSEMBLY OF STEERING KNUCKLE AND AXLE SHAFT

(See page SA-38)

1. INSTALL OIL SEAL TO AXLE HOUSING

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



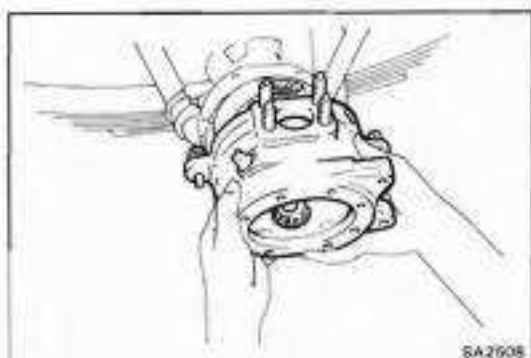
2. INSTALL FELT DUST SEAL, RUBBER SEAL, STEEL RING AND OIL SEAL RETAINER

- Install the felt dust seal, rubber seal, steel ring and oil seal retainer to the axle housing.



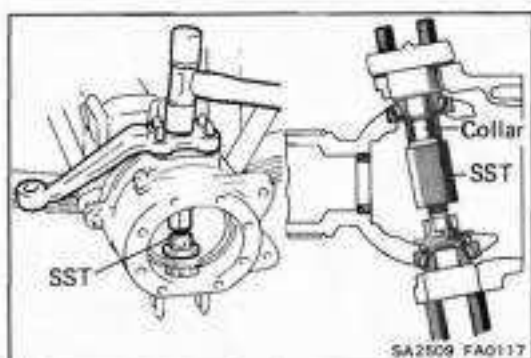
3. PACK BEARINGS WITH MOLYBDENUM DISULPHIDE LITHIUM BASE GREASE

- (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 to the knuckle and axle housing.
- (b) Insert the knuckle to the axle housing.

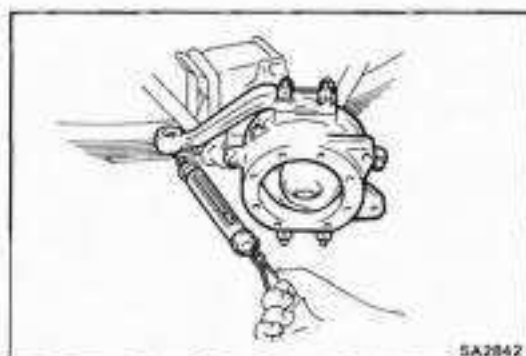
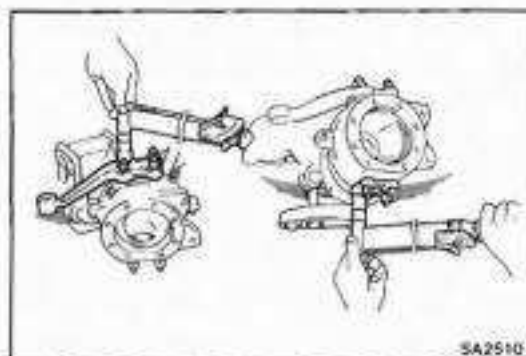
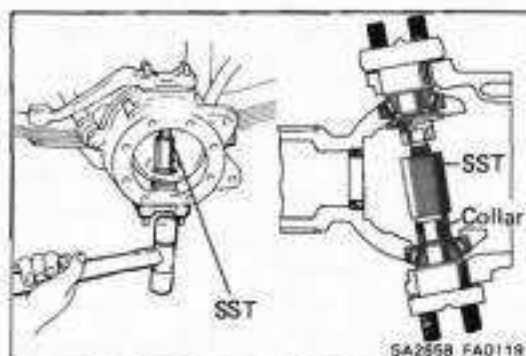


5. INSTALL KNUCKLE AND BEARING CAP

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

HINT: Use SST with collar.

- (b) Install the bearing cap or the knuckle arm over the shims that were originally used.
- (c) Using a hammer, drive the bearing cap or the third arm into the bearing inner race.



Adjusting shim thickness

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

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

SST 09606-60020

HINT: Use SST with collar.

(e) Install the bearing cap or the knuckle arm.

(f) Using a hammer, drive the knuckle arm into the bearing inner race.

(g) Remove SST from the knuckle.

SST 09606-60020

(h) Install and torque the nuts.

(Knuckle Arm)

Install the cone washers, spring washers, nut and the four nuts and torque the nuts.

Torque: 980 kg-cm (71 ft-lb, 96 N·m)

(Third Arm)

Install the cone washers, spring washers, nut and four nuts and torque the nuts.

Torque: 980 kg-cm (71 ft-lb, 96 N·m)

(Bearing Cap)

Install the spring washers and four nuts and torque the nuts.

Torque: 980 kg-cm (71 ft-lb, 96 N·m)

6. CHECK BEARINGS PRELOAD

Using a spring tension gauge, measure the preload.

Preload (starting):

RJ, LJ

2.5 – 4.5 kg (5.5 – 9.9 lb, 25 – 44 N)

FJ, PZJ, HZJ

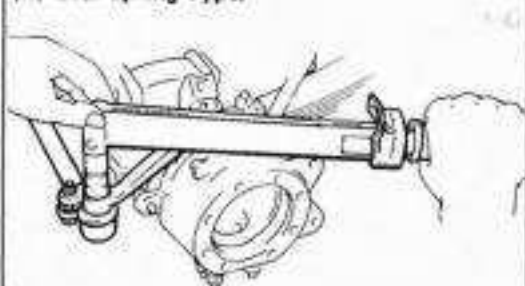
3.0 – 6.5 kg (6.6 – 14.3 lb, 29 – 64 N)

If the bearing preload is not within specification, adjust it by replacing the adjusting shims.

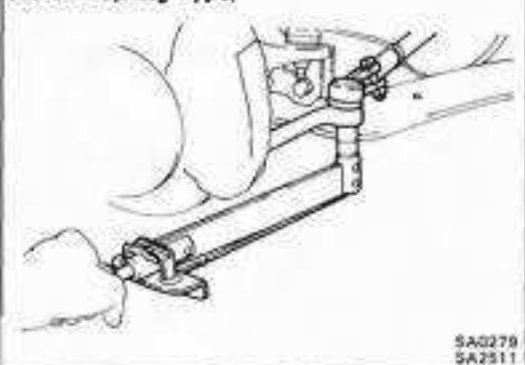
HINT:

- If the bearing preload is excessive, use thicker shims.
- If the bearing preload is insufficient, use thinner shims.
- The preload will change about 0.1 – 0.2 kg (0.2 – 0.4 lb, 1.0 – 2.0 N) with each 0.1 mm (0.004 in.) alteration of the adjusting shim thickness.

(w/ Leaf Spring Type)

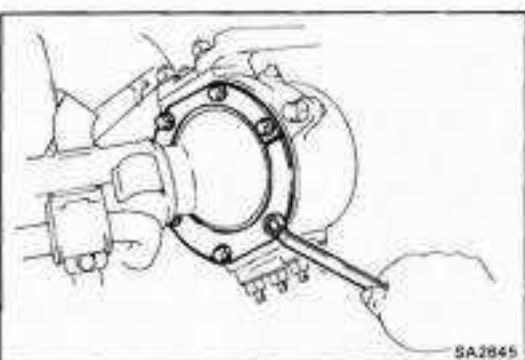


(w/ Coil Spring Type)

SA0279
SA2511**7. CONNECT TIE ROD TO KNUCKLE ARM**

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

Torque: 925 kg-cm (67 ft-lb, 91 N·m)



SA2845

8. INSTALL FELT DUST SEAL, RUBBER SEAL, STEEL RING AND OIL SEAL RETAINER

Install the felt dust seal, rubber seal, steel ring and oil seal retainer to steering knuckle with the six bolts.

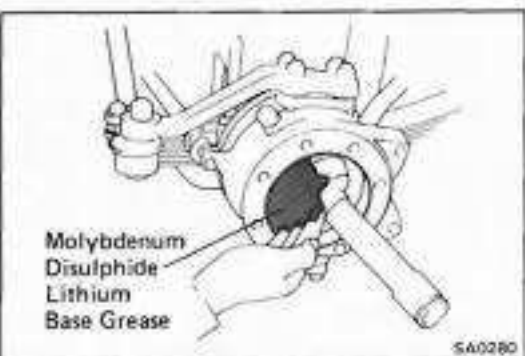
Torque: 55 kg-cm (48 in.-lb, 5.4 N·m)



SA2501

9. INSTALL AXLE SHAFT

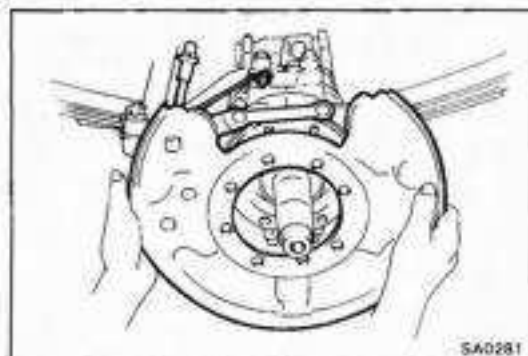
Position one flat part of the outer shaft upward, and install the shaft.

Molybdenum
Disulphide
Lithium
Base Grease

SA0280

10. PACK MOLYBDENUM DISULPHIDE LITHIUM BASE GREASE

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



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

- (a) Place a new gasket in position on the knuckle and install the spindle.

NOTICE: (w/ Power Locking Hub)

- Be careful not to get the wire harness and gum grommet between the spindle and the knuckle.
- Check that the vinyl tape come off the spindle.

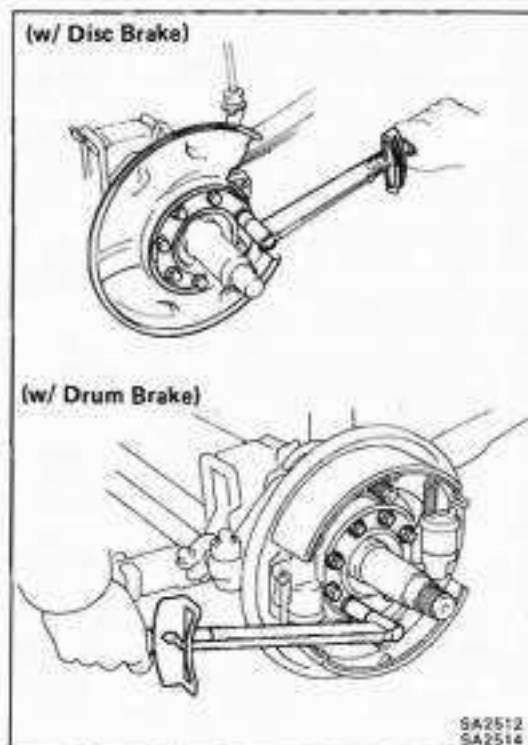
- (b) Place the gasket, dust cover and dust seal on the spindle.

- (c) Torque the spindle mounting bolts.

Torque: 475 kg-cm (34 ft-lb, 47 N·m)

- (d) (w/ Power Locking Hub)

Connect the connector.

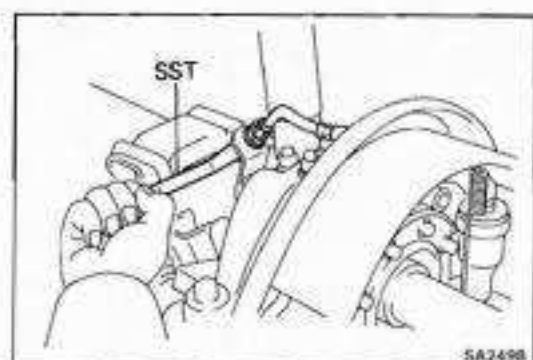


12. CONNECT BRAKE HOSE

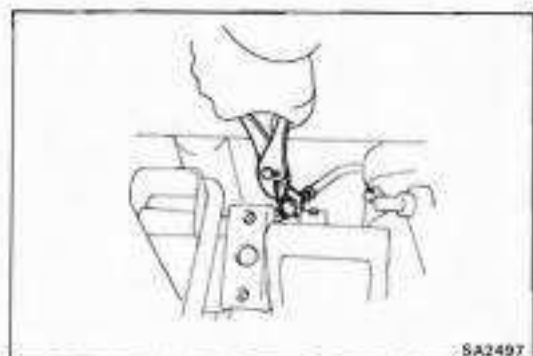
- (a) Using SST, connect the brake tube.

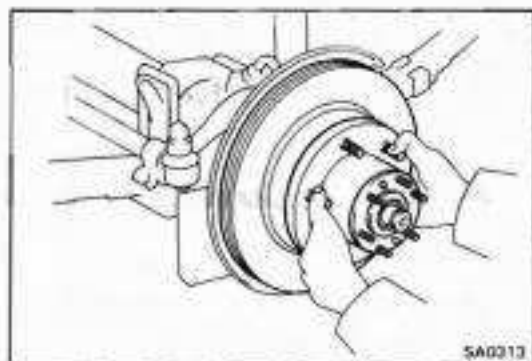
SST 09751-36011

Torque: 155 kg-cm (11 ft-lb, 15 N·m)



- (b) Using pliers, install the clip.



**13. INSTALL AXLE HUB (See page SA-34)**