

DAIHATSU
F70,F75,F77

**Service
manual**

FRONT AXLE & SUSPENSION

FS

DAIHATSU MOTOR CO., LTD.

NO.9703-FE

DAIHATSU

F70, F75, F77

FRONT AXLE & SUSPENSION

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WRE91-FS001

OUTLINE OF FRONT AXLE & SUSPENSION

Front Axle

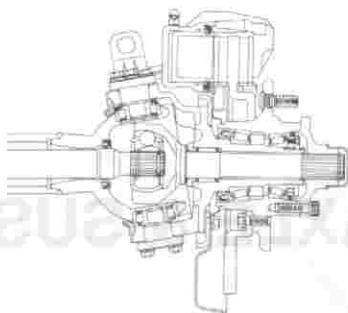
The front axle is of the full floating shaft tube type. It consists of Birfield type constant velocity ball joints, which make possible simultaneous front wheel driving and steering and the steering knuckles, which also serve as the ball joint cases.

The steering knuckle is connected to the front axle housing through the tapered roller bearings at the upper and lower steering knuckle bearing caps.

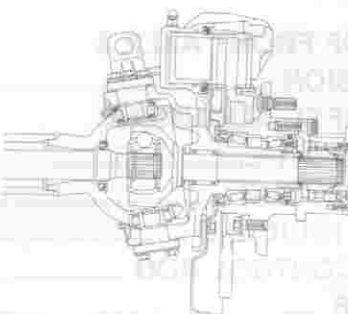
Furthermore, the driving force from the drive shaft is transmitted to the front axle hub by means of the axle outer shaft flange.

Also, instead of the axle outer shaft flange, the manual locking hub and automatic locking hub are available as optional equipment.

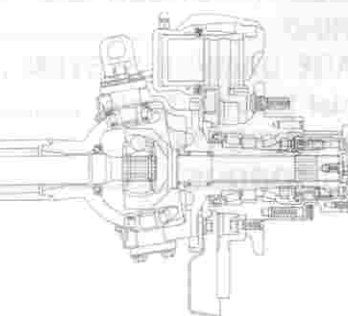
Standard



Manual locking hub



Automatic locking hub



		F70, F75	F77
Toe-in (mm)	other than those listed below	0 - 8 mm	
	215R15, 215/80R15, 255/70R15, H78-15-4	-3 - 5 mm	
Camber	(degree)	1° 00'	
Caster	(degree)	1° 30'	
Kingpin angle	(degree)	9° 30'	
Turning angle (degree)	H78-15-4, 215R15, 215SR-15, 225/70R15, 215/80R-15	Inner 28, Outer 26	Inner 28, outer 26
	other than those listed above	Inner 30, Outer 28	Inner 29, outer 27

1. MANUAL LOCKING HUB

The manual locking hub is a mechanism whereby the switching of power flow is made so that the driving force from the front drive shaft can be transmitted to the front wheel or the torque from the front wheel can not be transmitted to the front drive shaft, etc. and this switching is performed through the operation of the handle provided at the front wheel hub.

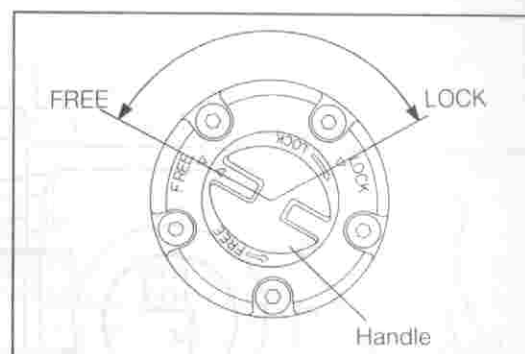
WRE91-FS003

How to operate

- When the transfer shift lever is shifted to the [2H] position, set the locking hub handle to the [FREE] position at both the right and left wheels.
- When the transfer shift lever is shifted to the [4H] or [4L] position, set the locking hub handle to the [LOCK] position at both the right and left wheels.

CAUTION

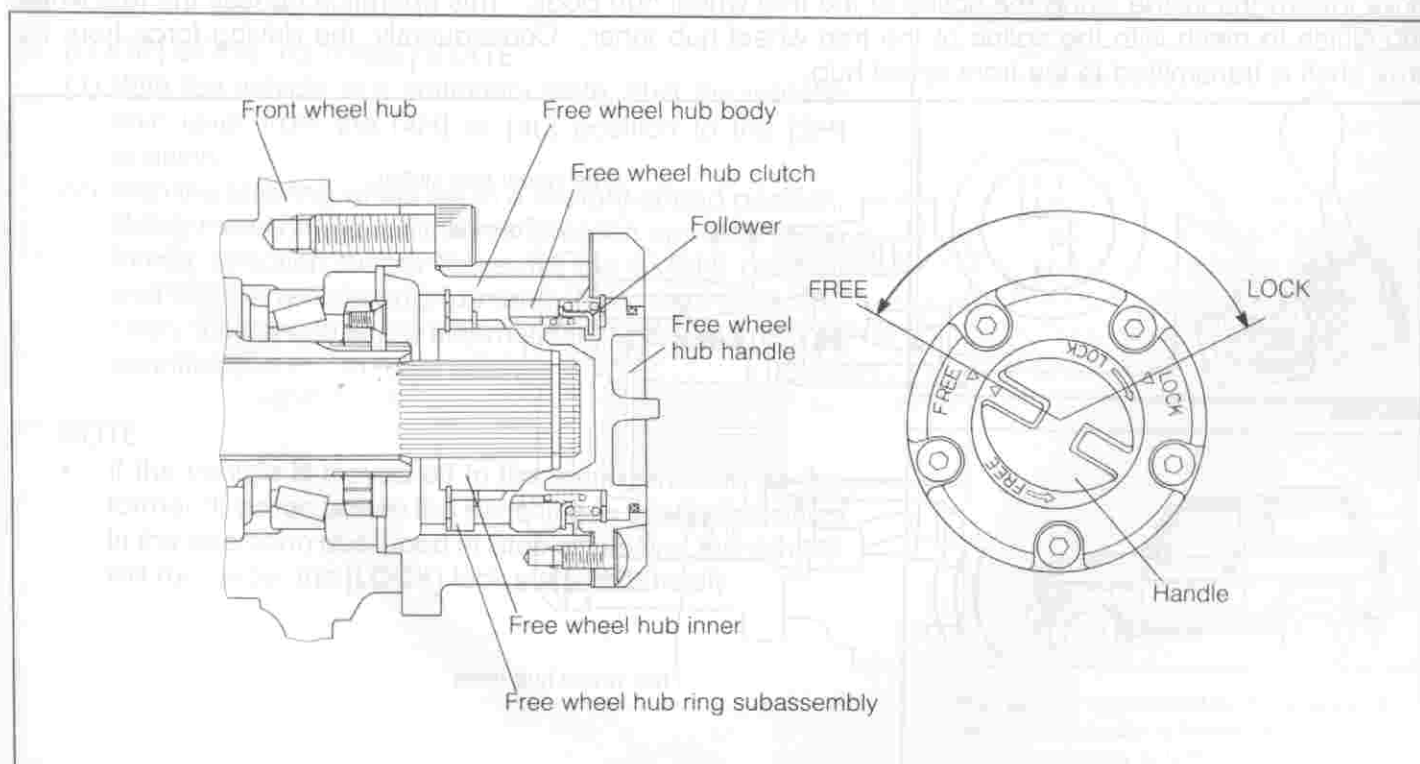
1. Do not move the vehicle if the handle (▽ mark) is not aligned exactly with the mark at the "Free" or "Lock" position on the cover.
2. Do not operate the vehicle in the 4L or 4H position when the hub handle is set to the "Free" position.
3. Make sure to set the handle (▽ mark) on both the right and left wheels at the same position.



WRE91-FS004

Construction

- The manual locking hub (manual free wheel hub assembly) consists of the free wheel hub body, free wheel hub inner, free wheel hub ring sub assembly, free wheel hub clutch, free wheel hub handle, follower and so forth.
- The free wheel hub inner is spline-connected to the drive shaft. On the other hand, the free wheel hub body is mounted on the front wheel hub. Furthermore, its inside is spline-connected to the free wheel hub clutch.
- The free wheel hub clutch is attached to the free wheel hub handle by means of the follower and two springs.



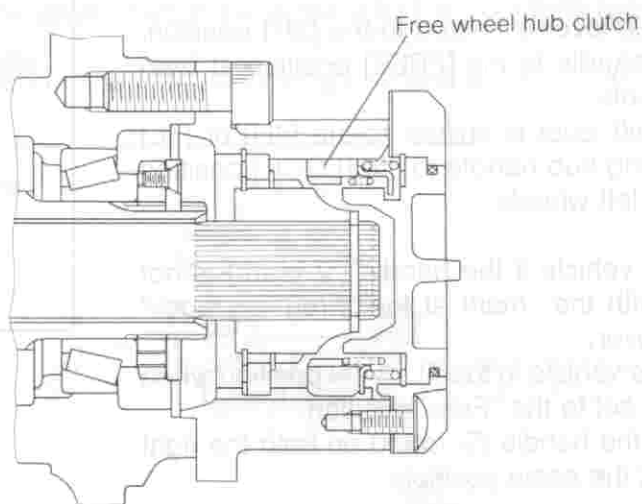
WRE91-FS005

FRONT AXLE & SUSPENSION

Operation

- LOCKING HUB HANDLE (FREE WHEEL HUB HANDLE) WHEN SET TO [FREE] POSITION

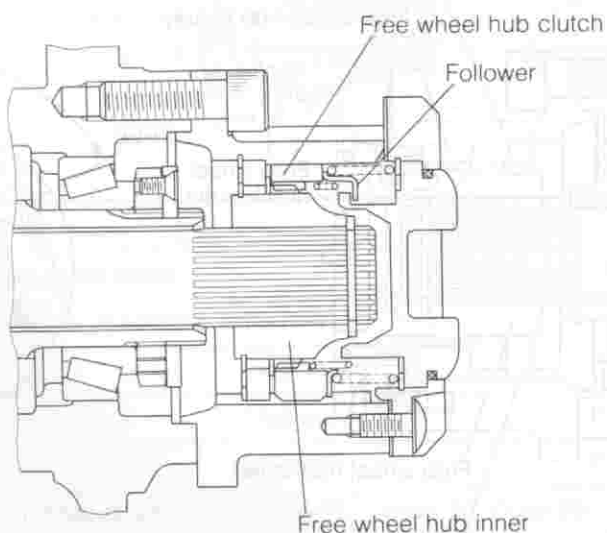
When the free wheel hub handle is set to the [FREE] position, the free wheel hub clutch comes at the outermost position on the spline of the free wheel hub body (at the extremely right position in the figure below), where no driving force from the drive shaft is transmitted to the front wheel hub.



WRE91-FS006

- LOCKING HUB HANDLE (FREE WHEEL HUB HANDLE) WHEN SET TO [LOCK] POSITION

When the free wheel hub handle is turned from the [FREE] position to the [LOCK] position, the follower moves toward the inside (toward the left side in this figure) along the diagonal groove provided inside the free wheel hub handle. As a result, the free wheel hub clutch which is attached to the follower by means of springs will move toward the inside along the spline of the free wheel hub body. This operation causes the free wheel hub clutch to mesh with the spline of the free wheel hub inner. Consequently, the driving force from the drive shaft is transmitted to the front wheel hub.



WRE91-FS007

2. AUTOMATIC LOCKING HUB

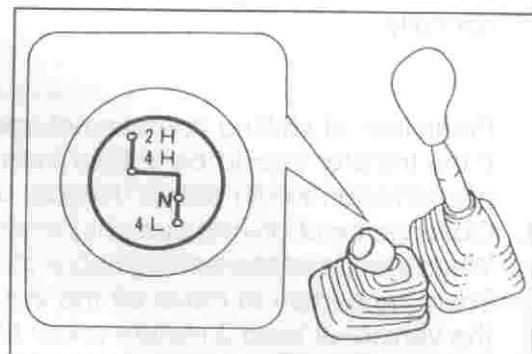
The automatic locking hub is a mechanism whereby the switching of power flow is made automatically so that the driving force from the front drive shaft can be transmitted to the front wheel or no driving force can not be transmitted to the front wheel when the transfer lever is shifted from the [2H] position to the [4H] position or the [4L] position and the vehicle is run.

WRE91-FS008

How to operate

1. [FREE] STATE TO [LOCK] STATE

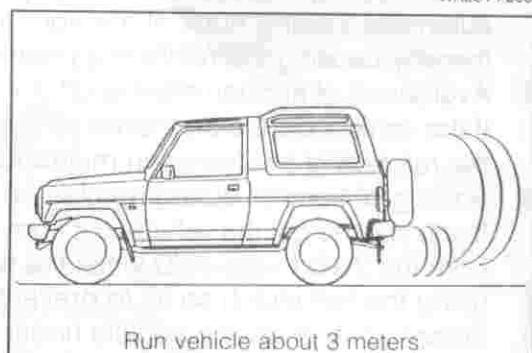
- (1) With the vehicle in a stationary state, shift the transfer shift lever from the [2H] position to the [4H] position or the [4L] position.
- (2) With the steering wheel set to a straight-ahead position, slowly move off the vehicle and run it approximately more than 3 meters. Then, the vehicle is put automatically under the [LOCK] condition.



WRE91-FS009

NOTE:

- When the vehicle runs in a direction opposite to the former direction before stopping (forward movement ↔ backward movement) after the vehicle has been run with the transfer shift lever placed in the [4H] or [4L] position and with the automatic locking hub set to the [LOCK] state and the vehicle has been stopped, the automatic locking hub will be switched from the [LOCK] state to the [FREE] state and will become the [LOCK] state again.

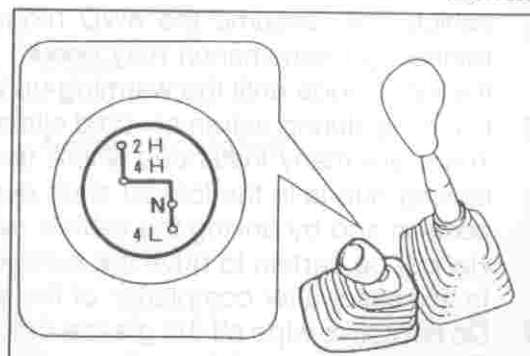


Run vehicle about 3 meters

WRE91-FS010

2. [LOCK] STATE TO [FREE] STATE

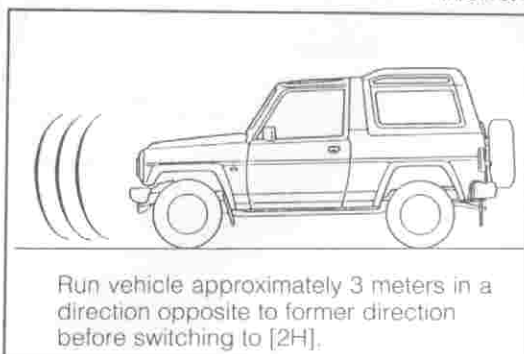
- (1) With the vehicle in a stationary state, shift the transfer shift lever from the [4H] or [4L] position to the [2H] position.
- (2) With the steering wheel set to a straight-ahead position, slowly move off the vehicle in a direction opposite to the former direction before the switching to [2H] position and run the vehicle approximately more than 3 meters. Then, the vehicle is put automatically under the [FREE] condition.



WRE91-FS011

NOTE:

- If the vehicle is moved off in the same direction as the former direction before the switching to the [2H] position in the operation described in Step (2) above, the vehicle will run under the [LOCK] lock state continually.



Run vehicle approximately 3 meters in a direction opposite to former direction before switching to [2H].

WRE91-FS012

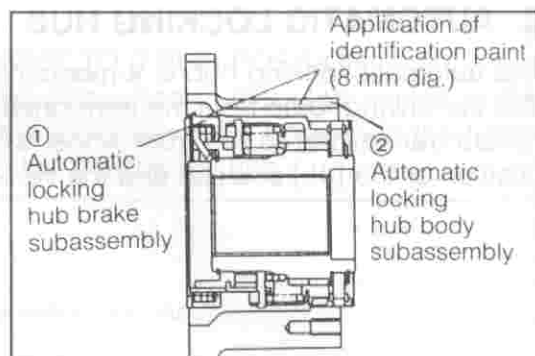
FRONT AXLE & SUSPENSION

HANDLING INSTRUCTIONS ON AUTOMATIC LOCKING HUB

• Avoidance of ratcheting phenomenon

The ratcheting phenomenon means a gear clashing noise which occurs when the automatic locking hub clutch meshes with the automatic locking hub body if there exists a difference in revolutionary speed between these two components.

When such phenomenon occurs, first stop the vehicle. Again place the transfer in the 4WD position. Slowly move off the vehicle straight. Then, proceed to drive the vehicle normally.



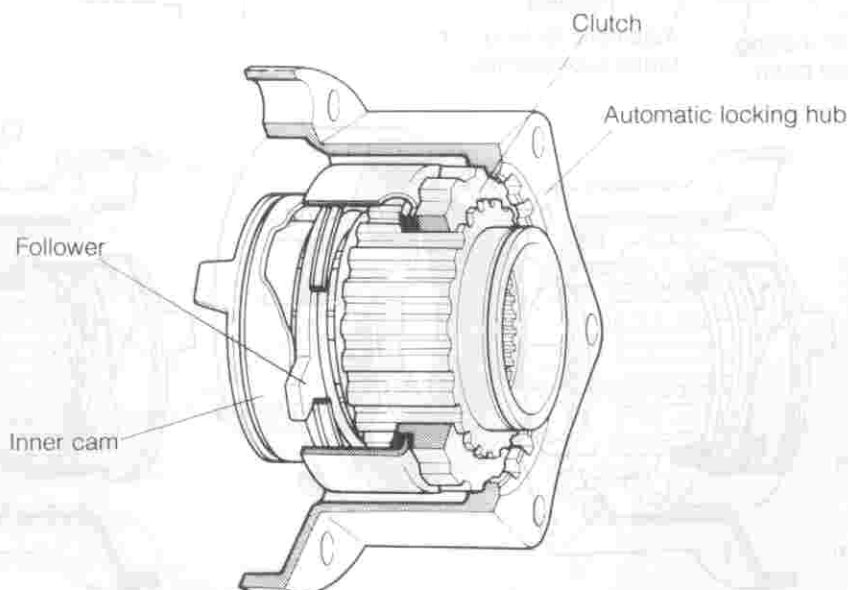
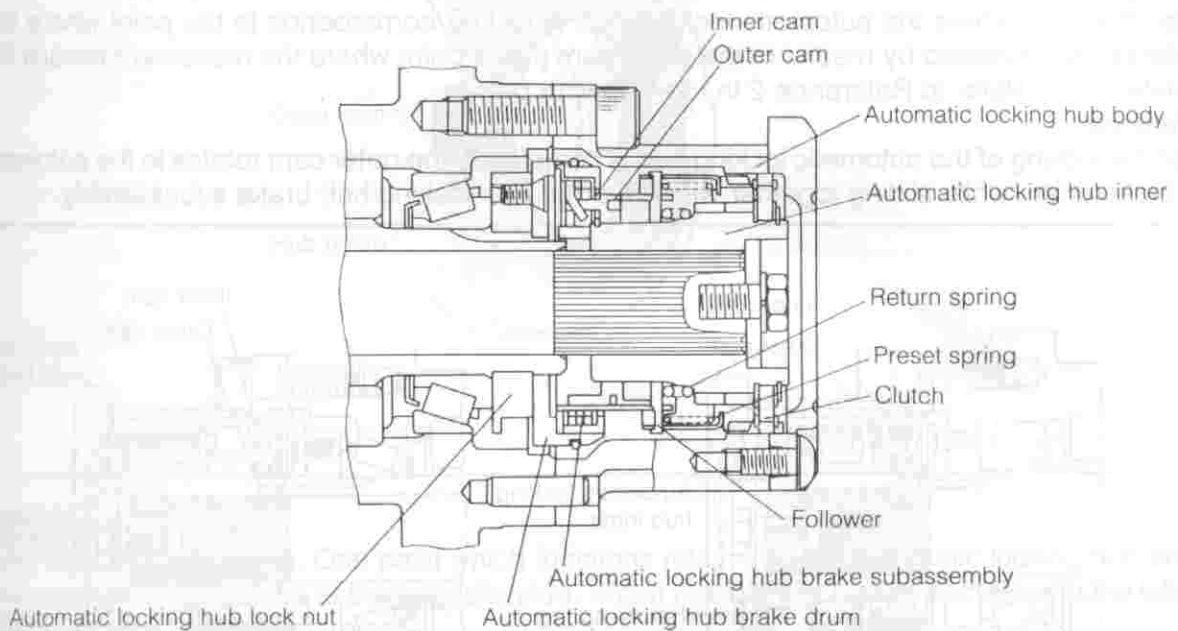
WRE91-FS013

1. Prohibition of shifting operation of transfer during running
If the transfer should be shifted from the 2WD to the 4WD during the running, the aforesaid ratcheting phenomenon would occur. Hence, do not shift the transfer during the running.
2. Observance of driving straight immediately after transfer shifting
When the automatic locking hub is shifted from the Free position to the Lock position, first stop the vehicle. Then, be certain to move off the vehicle with the steering wheel held in a straight-ahead state and run the vehicle at least 3 meters under this state.
If the steering wheel should be turned before the vehicle has been run at least 3 meters, one hub of the automatic locking hubs at the right and left sides may be locked and the other hub may become free, thereby causing the ratcheting phenomenon to occur.
3. Avoidance of sudden moving off
If the vehicle should be moved off suddenly after the transfer has been shifted from the 2WD to the 4WD, the ratcheting phenomenon might occur. Hence, make sure to avoid moving the vehicle suddenly.
4. Shifting of transfer during running on muddy terrain
If you want to get the vehicle out from a muddy terrain or on snowy roads or the like by shifting the transfer from the 2WD to the 4WD while the rear wheels are slipping on these roads, perform the locking slowly, using the half clutch so as to prevent the occurrence of ratcheting phenomenon.
5. Observance of driving vehicle under 4WD mode during extremely cold climate (below -15°C)
If the vehicle should be run under the 2WD mode with the automatic locking hub in the free state, the vehicle may assume the 4WD mode owing to high viscosity of the transfer oil. Consequently, the ratcheting phenomenon may occur. Therefore, during extremely cold climate, drive the vehicle under the 4WD mode until the warming-up is completed.
6. Handling during extremely cold climate (below -15°C)
There are many instances where the automatic locking hub fails to become free when the automatic locking hub is in the locked state and you try to unlock it by shifting the transfer shift lever to the 2WD position and by driving the vehicle reversely. This is because the viscosity of the transfer oil is too high. Hence, be certain to drive the vehicle under the 4WD mode until the warming-up is completed.
In this case, after completion of the warming-up operation, shift the transfer from the 4WD to the 2WD.
7. Do not soil or wipe off the grease that has been applied to the automatic locking hub brake subassembly. Failure to observe this caution makes it impossible to reuse the brake subassembly.

WRE91-FS014

Construction

- The automatic locking hub assembly consists of the automatic locking hub lock nut, automatic locking hub brake drum, automatic locking hub brake subassembly, outer cam, inner cam, automatic locking hub body, clutch and so forth.
- The inside of the automatic locking hub inner is spline- connected to the front drive shaft. On its outside are mounted the clutch and so forth. On the other hand, the automatic locking hub body is mounted on the front wheel hub. Furthermore, the inside of the automatic locking hub body is provided with spline so that it may connected with the clutch.
- On the clutch are attached the follower, two springs, inner cam and outer cam.
- The automatic locking hub brake drum is attached to the hub lock nut with screws.



FRONT AXLE & SUSPENSION

Operation

• AUTOMATIC LOCKING HUB [FREE] STATE TO [LOCK] STATE

When the drive shaft turns after the transfer shift lever has been shifted to the [4H] or [4L] position and the vehicle has been moved off, the automatic locking hub inner and follower which are connected with each other through spline will turn as an integral unit. (The follower is connected by means of the outer spline of the automatic locking hub inner.)

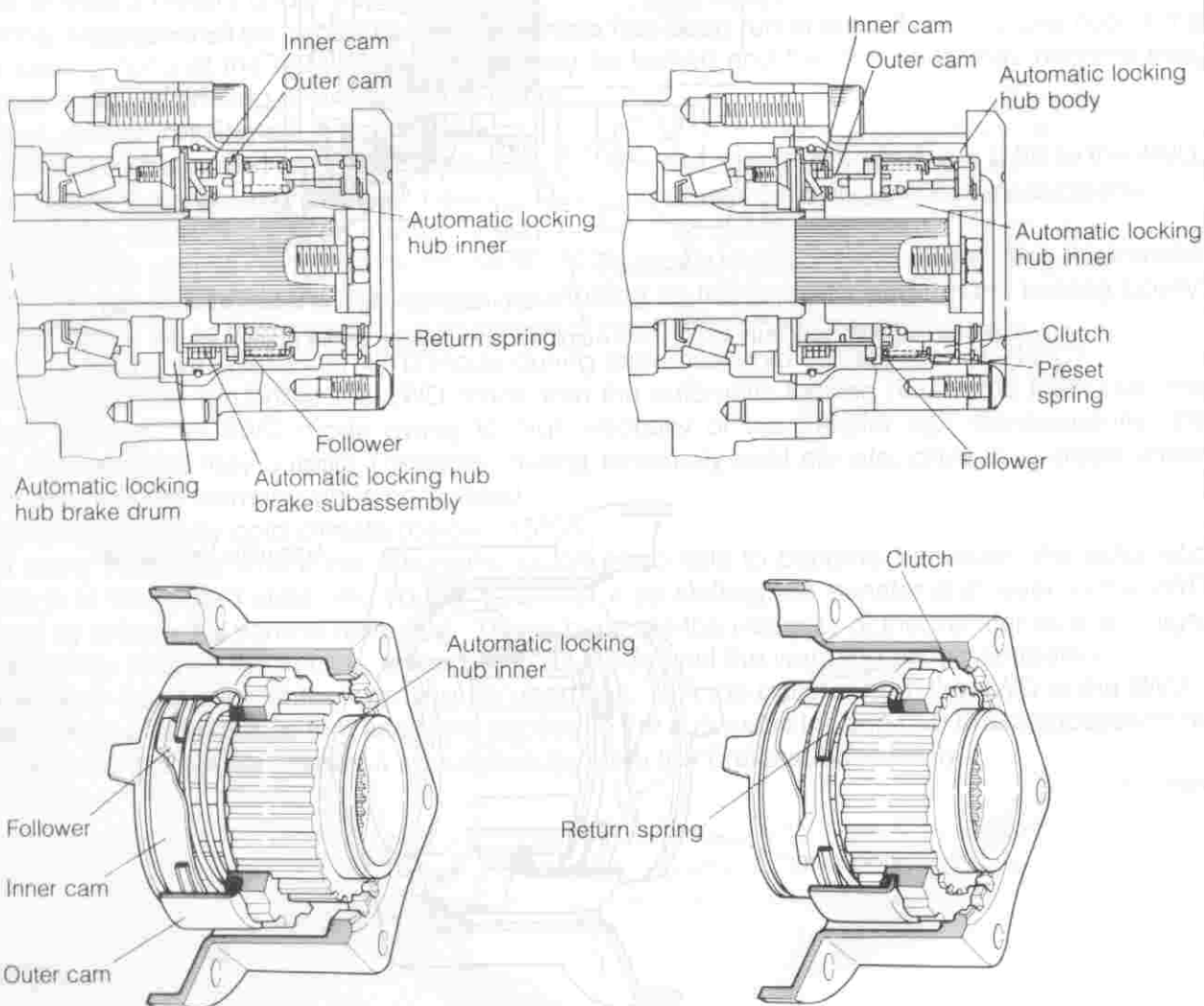
On the other hand, the inner and outer cams tend to remain in their position because of the operation of the automatic locking hub brake subassembly. As a result, the follower moves toward the outside while turning along with the diagonal surface of the inner cam. (The follower moves toward the right side in the figure below.) Refer to Reference 1 in the following pages.

When the follower moves toward the outside, the clutch, too, which is pushed by the spring tension, will move toward the outside. Thus, the clutch meshes with the inner spline of the automatic locking hub body, thereby transmitting the driving force from the drive shaft to the front tire via the front wheel hub.

Moreover, the point where the automatic locking hub is locked corresponds to the point where the rotation of the follower is prevented by means of the outer cam (i.e. a point where the movement toward the outside is completed). Refer to Reference 2 in the following pages.

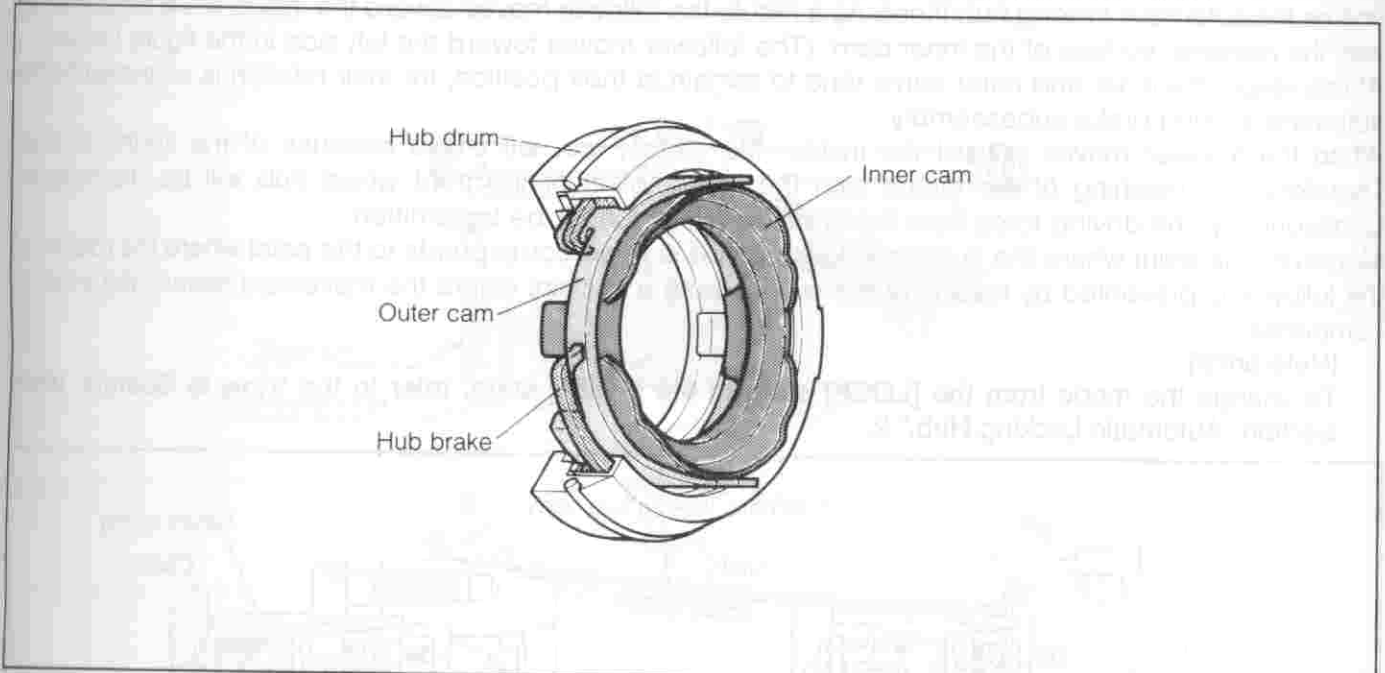
[Reference]

When the locking of the automatic locking hub is completed, the outer cam rotates in the automatic locking hub brake drum, while sliding together with the automatic locking hub brake subassembly.



[Reference 1]

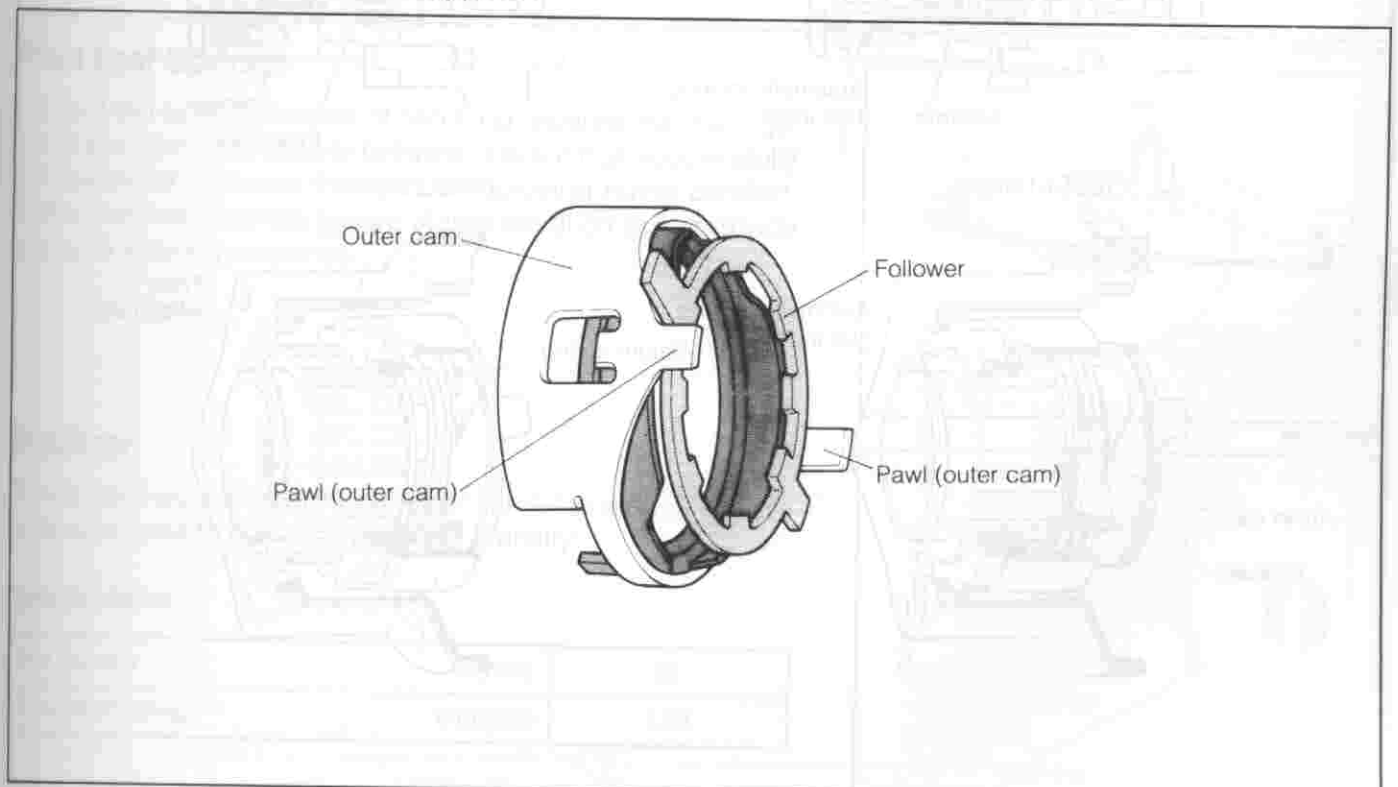
- ① The inner and outer cams have a pawl, respectively. Also, the automatic locking hub brake has an involute-shaped pawl.
- ② In the beginning of the [LOCK] phase, both the inner and outer cams are turning. Thus, their respective pawls are contacting with the pawl of the automatic locking hub brake. At this stage, the hub brake expands because of its involute shape. Consequently, the friction relative to the automatic locking hub brake drum is on the increase, finally stopping the rotation of the inner and outer cams.



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[Reference 2]

The outer cam has two pawls; One pawl which functions relative to the automatic locking hub brake and the other pawl which is located at the opposite side. When the follower makes contact with the latter pawl, the rotation of the follower is stopped.



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FRONT AXLE & SUSPENSION

• AUTOMATIC LOCKING HUB [LOCK] STATE TO [FREE] STATE

When the transfer shift lever is shifted to the [2H] position and the vehicle is run approximately 3 meters in a direction opposite to former direction before switching to [2H], the automatic locking hub body and the automatic locking hub inner as well as the follower start to rotate as a unit, for power is transmitted from the tires. (The drive shaft and clutch, too, rotate as a unit, until the lock is released.)

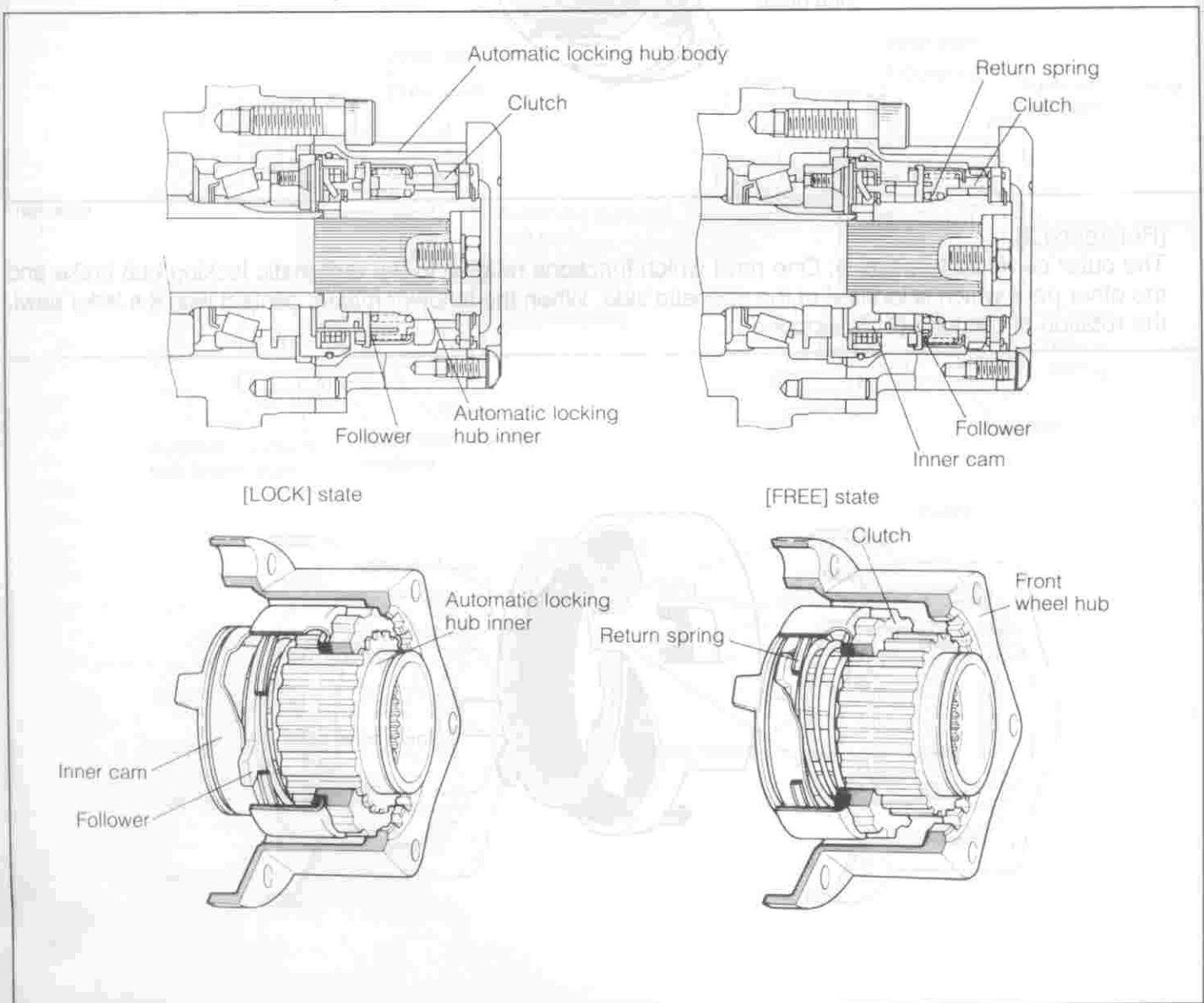
Since the follower is connected by means of the outer spline of the automatic locking hub inner and it is pushed against the diagonal surface of the inner cam by the spring tension, the follower rotates as an integral unit as the automatic locking hub inner. As a result, the follower moves toward the inside while turning along with the diagonal surface of the inner cam. (The follower moves toward the left side in the figure below.) At this stage, the inner and outer cams tend to remain at their position, for their rotation is restricted by the automatic locking brake subassembly.

When the follower moves toward the inside, the clutch, too, will move because of the spring tension. Therefore, the meshing of the clutch with the inner spline of the front wheel hub will be disengaged. Consequently, the driving force from the tire side will no longer be transmitted.

Moreover, the point where the automatic locking hub is freed corresponds to the point where the rotation of the follower is prevented by means of the outer cam (i.e. a point where the movement toward the inside is completed).

[Reference]

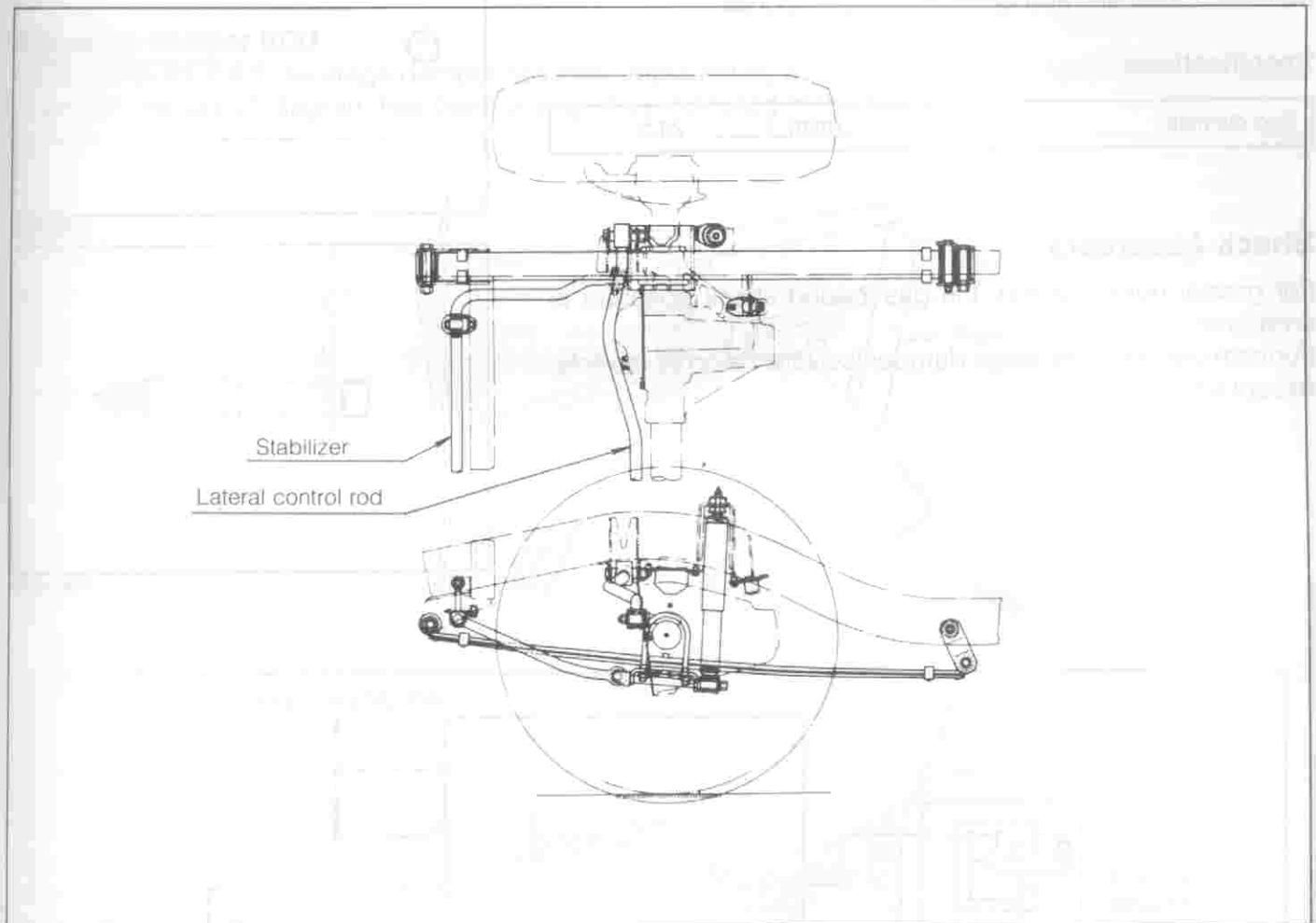
To change the mode from the [LOCK] state to the [FREE] state, refer to the "How to Operate" under Section "Automatic Locking Hub," 2.



WRE91-FS019

FRONT SUSPENSION

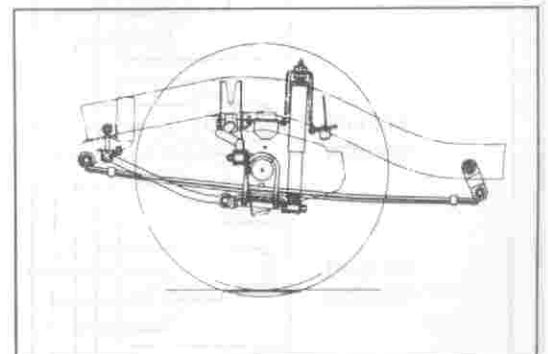
For greater riding comfort and operational safety, the front suspension features stabilizer, lateral control rods, gas-loaded shock absorbers and rear shackles.



WRE91-FS020

Front Leaf Springs

The front leaf spring consists of two long tapered leaf springs. Use of a polyethylene spacer between the springs successfully reduces friction between them, thus improving riding comfort. Further, the rear shackles assure stable travel on bumpy roads and quick steering response.



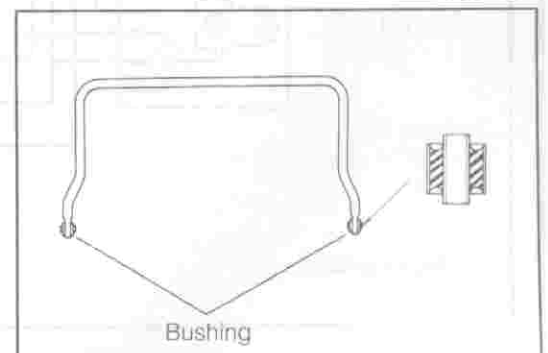
WRE91-FS021

Stabilizer

The standard-equipped front stabilizer serves to reduce vehicle body rolling and to enhance traveling stability.

Specifications

Rod diameter	(mm)	22
Constant of spring	(kgf/mm)	1.83



WRE91-FS022

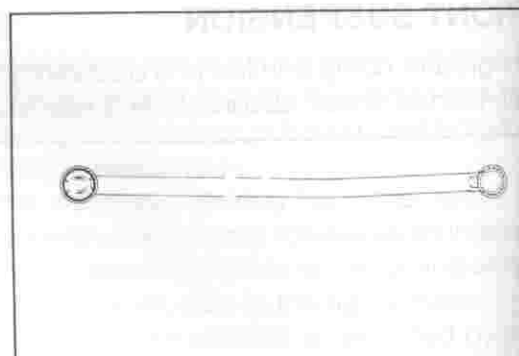
FRONT AXLE & SUSPENSION

Lateral Control Rod

The lateral control rod is newly installed to increase lateral stiffness, which contributes greatly to highly stable straight traveling capability and quick steering response.

Specifications

Rod diameter	(mm)	24.5
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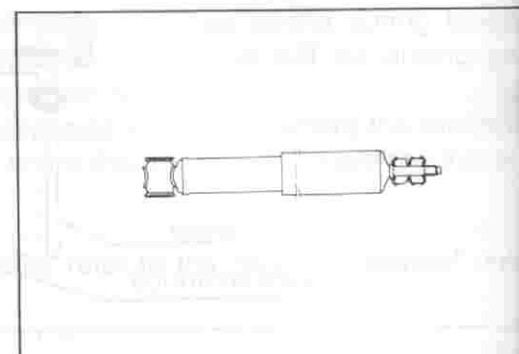


WRE91-FS02

Shock Absorbers

For greater riding comfort, the gas-loaded shock absorber is employed.

Furthermore, the three-stage damper is available on all models, except for F77.



WRE91-FS03



mm	mm	mm
25	25	25

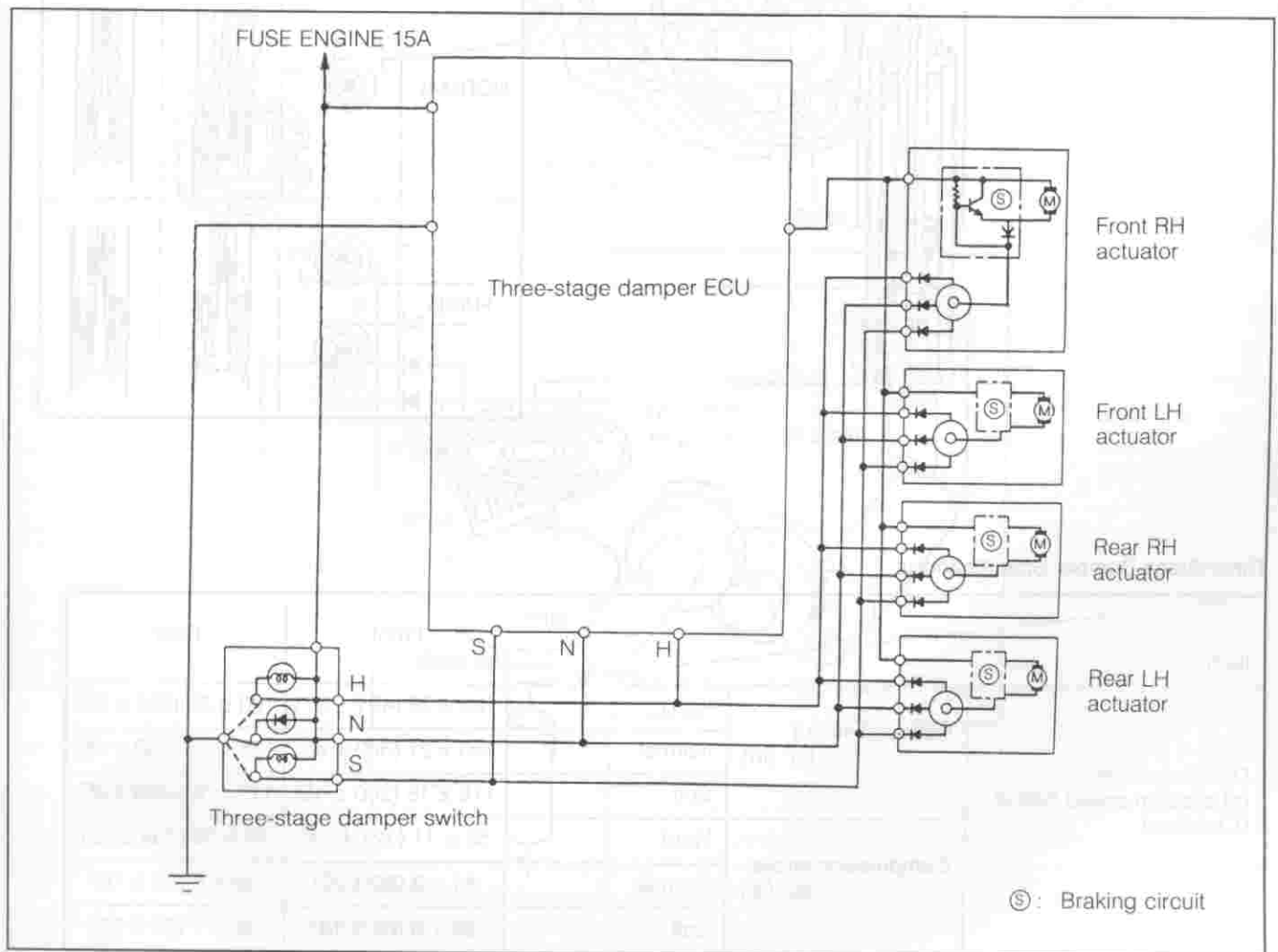
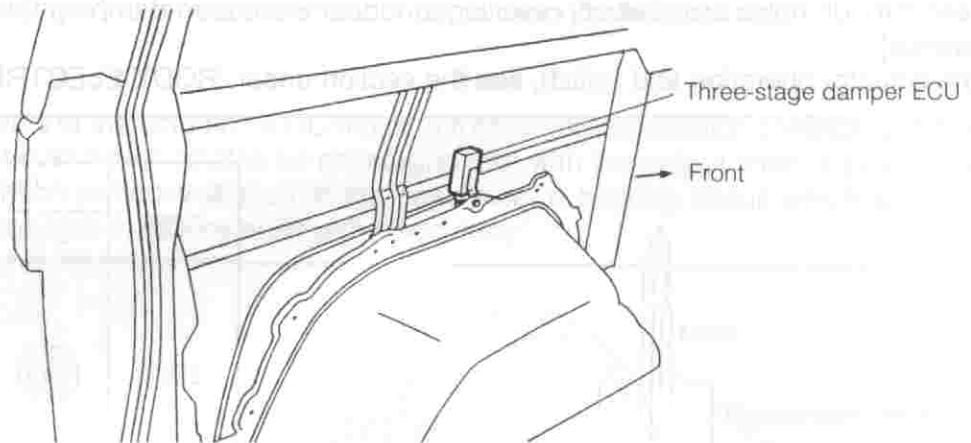
THREE-STAGE DAMPER SYSTEM

The actuator, computer and shock absorber of the three-stage damper have been modified.

WRE91-FS025

Three-stage damper ECU

The computer for the three-stage damper has been replaced by a more compact and lighter type computer. As a result, the circuit diagram has been changed as indicated in the figure below.



WRE91-FS026

FRONT AXLE & SUSPENSION

Damping operation of three-stag damper

The amount of the oil passing through pass-through hole provided at the control rod and shaft varies depending upon the rotation position of the control rod, thus switching the damping force.

(1) Soft

The pass-through holes of the control rod and shaft are aligned with each other at two points. As a result, the oil flow rate increases, thereby weakening the damping force.

(2) Normal

The pass-through hole is formed at one point. The damping force increases slightly.

(3) Hard

All pass-through holes are shut off, resulting in further increased damping force.

[Reference]

For the actuator operation and switch, see the section under "BODY ELECTRICAL SYSTEM".



Selection mode	Condition of gas holes		
	Shaft	Expand	Contract
SOFT			
NORMAL			
HARD			

Three-Stage Damper Specifications

Item.		kind	Front	Rear
Damping force (at a piston speed Soft of 0.3 m/sec)	Rebound stroke kg (lb)	Hard	182 ± 26 (401 ± 57)	180 ± 25 (397 ± 55)
		Normal	140 ± 21 (309 ± 46)	135 ± 21 (298 ± 46)
		Soft	118 ± 18 (260 ± 40)	117 ± 18 (258 ± 40)
	Compression stroke kg (lb)	Hard	55 ± 11 (121 ± 24)	47 ± 10 (104 ± 22)
		Normal	41 ± 9 (90 ± 20)	40 ± 8 (88 ± 18)
		Soft	28 ± 6 (62 ± 13)	30 ± 7 (66 ± 15)

Control operation of three-stage damper

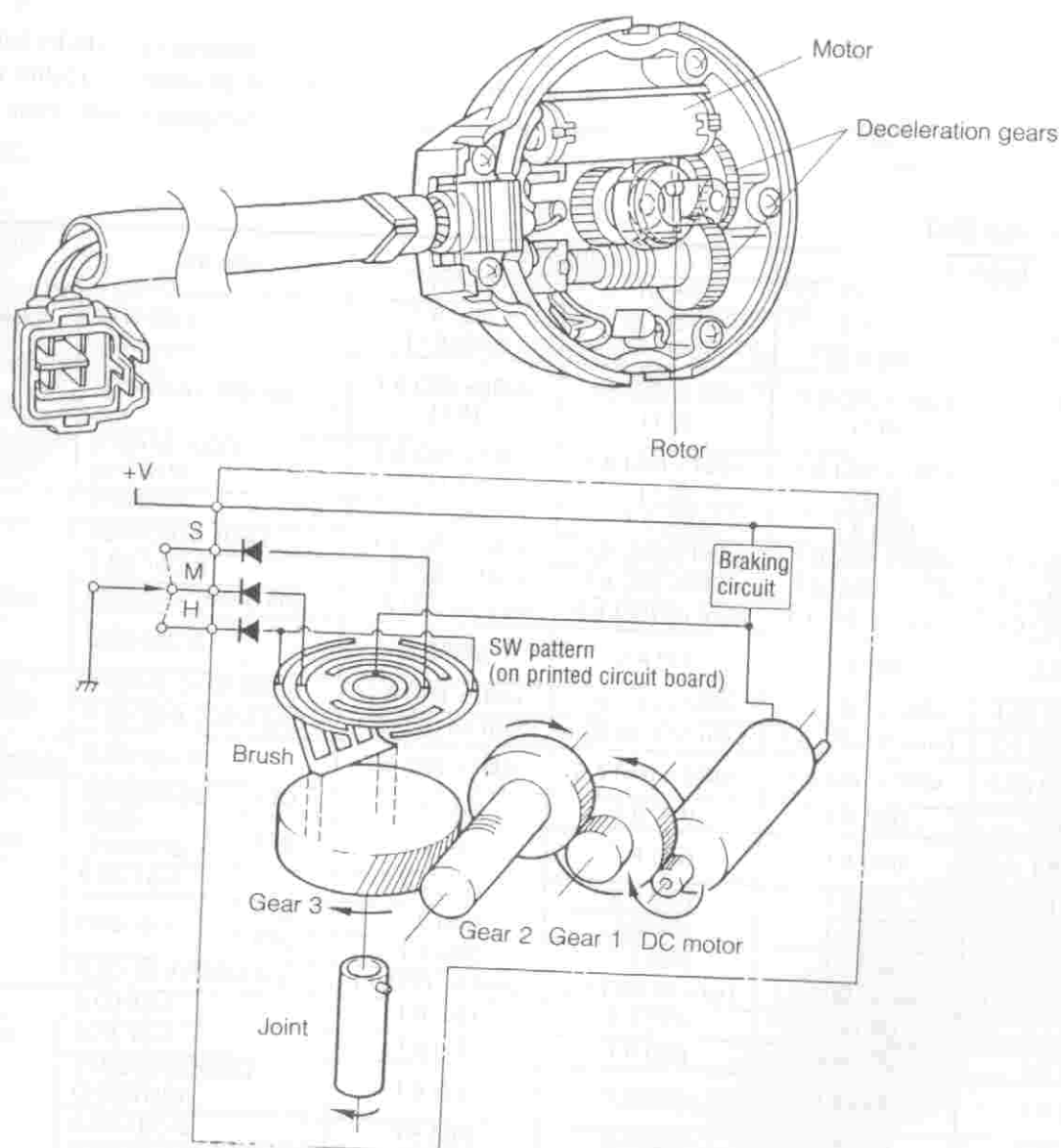
1. When the three-stage selection switch is operated, the actuator motor is energized. Then, the rotor begins its rotation, for it is interlocked with the motor by means of the gear.
2. When the rotor rotates to the specified position, the switch (contact points consisting of the pattern on the printed circuit board and the brush) is turned OFF. Consequently, the braking circuit operates and the rotation stops.
3. The rotor rotates the control rod located inside the shock absorber proper, thus switching the damping force.

If the actuator should be encountered with abnormal operation or continuous rotation, etc. should occur, the actuator energizing time is limited to four to seven seconds so as to protect the motor.

ACTUATOR

WRE91-FS028

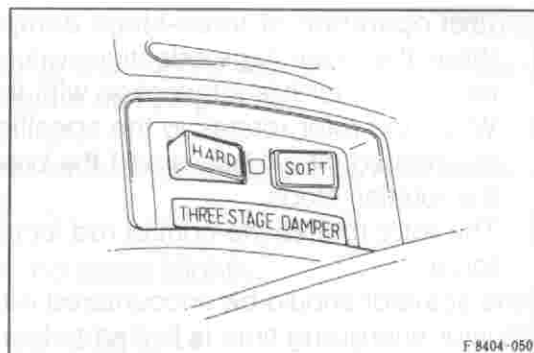
The following are components of the actuator: a DC motor, a rotation driving section consisting of three gears (final gear: worm gear), a brush which rotates as an integral part with the output shaft, a position detecting section which utilizes a switch pattern installed at the case side, a braking circuit which applies braking electrically to the DC motor so as to assure positioning accuracy.



FRONT AXLE & SUSPENSION

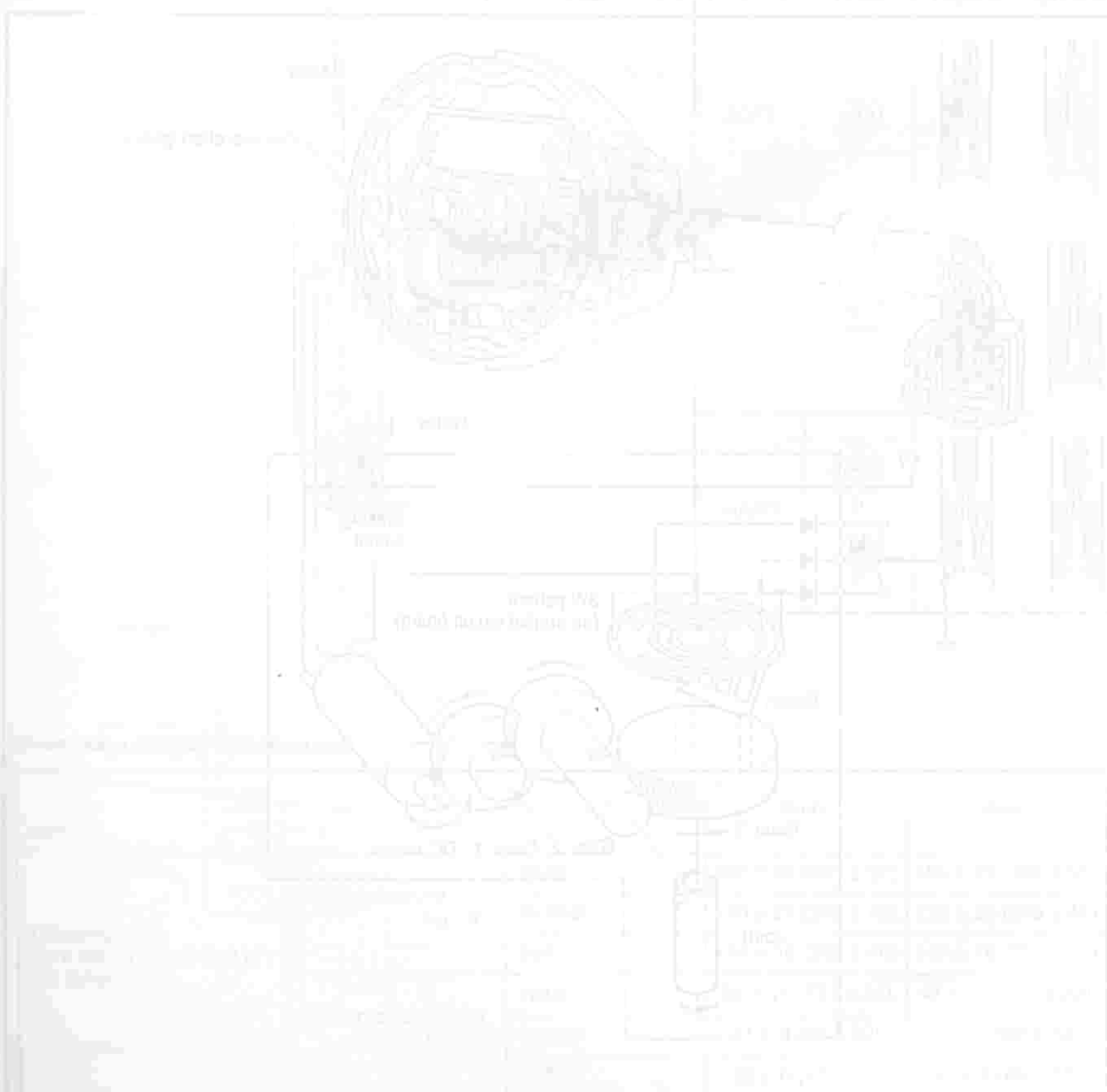
3-stage Damper Selector Switch

The damper selector switch is located in the center console box.



F 8404-050

WRE91-FS030



FRONT WHEEL ALIGNMENT ADJUSTMENT

PRELIMINARY CHECK ITEMS

1. Check of tire and tire wear

- Ensure that all tires have the same, designated size and that they are made by the same manufacturer.
- Ensure that there is no significant difference in wear between the tires at the right and left sides.

Designated Tire Size:

6.00-16-4	215R15 100Q
6.00-16C-6	215SR15
6.50-16-4	215R15C-8
6.50-16C-8	215/80R-15 100Q
7.50-16-8	255/70R-15 108Q
215R15	H78-15-4

WRE91-FS031

2. Check of tire inflation pressure

Set the tire inflation pressure to the specified value in accordance with the designated tires that have been mounted.

Unit: kgf/cm² (psi) <kPa>

Specification and destination	Tire size	Unloaded		Loaded	
		FRONT	REAR	FRONT	REAR
General specification	6.00-16-4	1.6 (23) [1.8 (26)]	2.1 (30) [2.1 (30)]	1.6 (23) [1.8 (26)]	2.1 (30) [2.1 (30)]
EC specification	H78-15-4 (H78-15)	1.8 (26) <180> [1.8]	1.8 (26) <180> [1.8]	1.8 (26) <180> [1.8]	1.8 (26) <180> [1.8]
Australian specification	215R15 100Q (215R15)	1.8 (26) <180> [1.8]	1.8 (26) <180> [1.8]	1.8 (26) <180> [1.8]	1.8 (26) <180> [1.8]
	215SR15	1.8 (26)	1.8 (26)	1.8 (26)	1.8 (26)
	255/70R15 108Q	1.8 (26) <180>	1.8 (26) <180>	1.8 (26) <180>	1.8 (26) <180>
	6.50-16C-8	1.8 (26) <180>	2.4 (34) <240>	1.8 (26) <180>	4.25 (61) <425>
NOTE: < >: Australian spec. []: with winch	6.50-16-4 (Sand tire)	1.6 (23) on road	2.1 (30) on road	1.1 (16) on sand	1.3 (18) on sand
	6.00-16C-6	1.8 (26)	2.4 (34)	1.8 (26)	3.25 (46)
Pick-up	215R15, 215R15C-8	1.8 (26) <180>	1.8 (26) <180>	1.8 (26) <180>	4.25 (61) <425>
General specification	7.50-16-8 (Sand tire)	1.8 (26) on road	4.25 (61) on road	1.8 (26) on sand	2.4 (34) on sand
EC specification	6.50-16C-8	1.8 (26) <180>	2.4 (34) <240>	1.8 (26) <180>	4.25 (61) <425>
G.C.C. specification Saudi Arabian specification without winch	215/80R-15 100Q (215SR15)	F70 1.6 (23) F75 1.4 (20)	1.6 (23) 1.4 (20)	1.6 (23) 1.4 (20)	1.6 (23) 1.6 (23)
	6.00-16-4	1.6 (23)	2.1 (30)	1.6 (23)	2.1 (30)
	H78-15-4	F70 1.6 (23)	1.6 (23)	1.6 (23)	1.6 (23)
		F75 1.4 (20)	1.4 (20)	1.4 (20)	1.6 (23)
	6.50-16-4 (Sand tire)	1.6 (23) on road	2.1 (30) on road	1.1 (16) on sand	1.3 (18) on sand
	6.00-16-4	1.8 (26)	2.1 (30)	1.8 (26)	2.1 (30)
G.C.C. specification Saudi Arabian specification with winch	H78-15-4	1.6 (23)	1.6 (23)	1.6 (23)	1.6 (23)
	215/80R15 100Q (215SR15)	1.6 (23)	1.6 (23)	1.6 (23)	1.6 (23)
	6.00-16C-6	1.8 (26)	2.4 (34)	1.8 (26)	3.25 (46)
	6.50-16-4 (Sand tire)	1.6 (23) on road	2.1 (30) on road	1.1 (16) on sand	1.3 (18) on sand

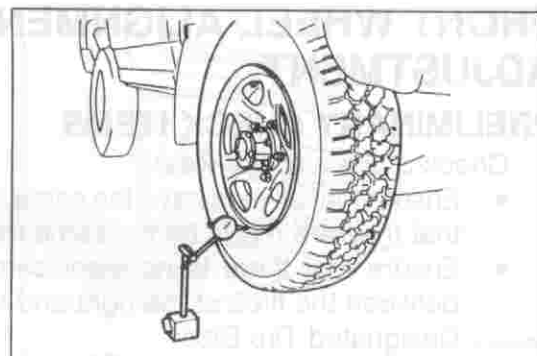
NOTE:

The tire inflation pressure should be checked under the unloaded state and when the tires are cold.

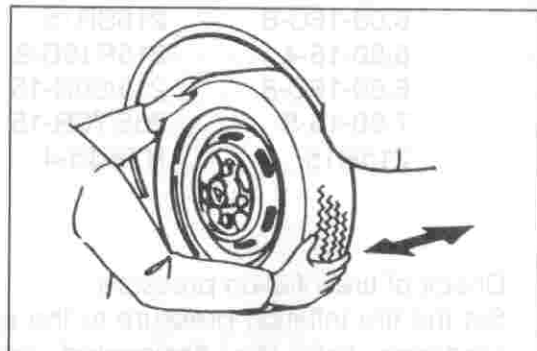
WRE91-FS032

FRONT AXLE & SUSPENSION

3. Check of disc wheel and tire for runout
 - (1) Check the disc wheel for runout, using a dial gauge.
Allowable Limit: Mean value of runouts at front and rear sides not to exceed 1.0 mm.
 - (2) Check the tire for runout, using a dial gauge.
Radial Runout: Not to Exceed 1.4 mm.
Lateral Runout: Not to Exceed 2.0 mm.
4. Check the suspension-related sections for bolt and nut tightness.
5. Check that the front shock absorber operates correctly while rocking the vehicle body.



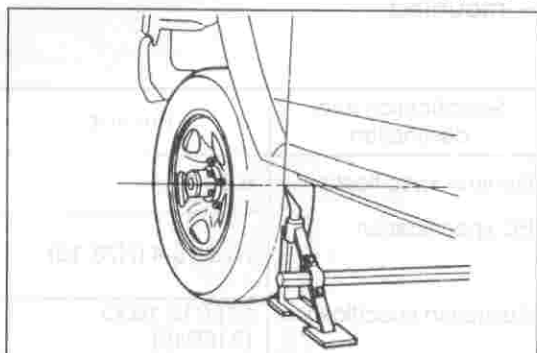
WRE91-FS033



WRE91-FS034

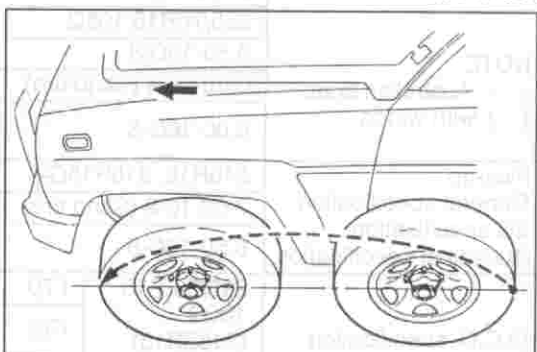
Toe-in check

1. Move the vehicle forward so that the front wheels becomes straight.
2. Apply a toe-in gauge to the center point of the height at the rear side of each front wheel of the vehicle.
3. Mark the tread center at the rear side of each front tire.
Measure the distance between the marks.



WRE91-FS035

4. Move the vehicle slowly until the front wheels turn 180 degrees.



WRE91-FS036

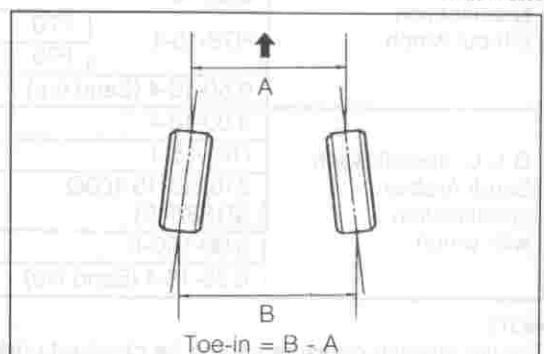
5. Measure the distance between the marks at the front side of each front wheel. Determine the toe-in amount by calculating the difference.

Specified Value:

6.00-16, 6.50-16, 7.50-16-8: 0 - 8 mm

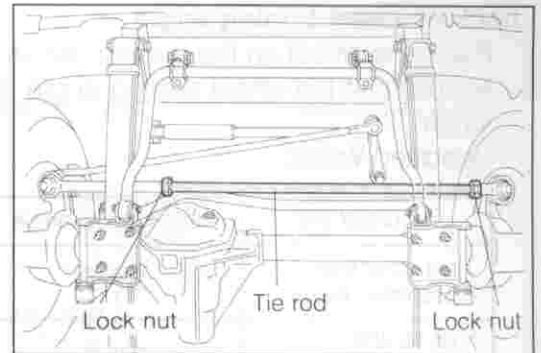
215R15, 215SR15, 215/80R15, 255/70R15,

H78-15-4: -3 - 5 mm



WRE91-FS037

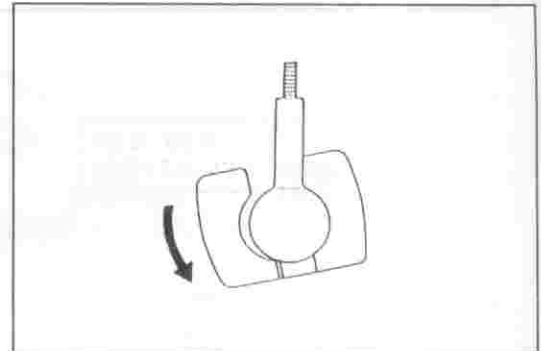
If the toe-in amount fails to conform to the specification, adjust the tie rod length by turning the tie rod tube, until the toe-in becomes within the specified value.



WRE91-FS038

NOTE:

- At this point, the adjustment should be conducted under the condition where the ball joint sockets at the sections "A" and "B" have been turned to such an extent that the sockets make contact with the ball stud shafts.



WRE91-FS039

<Tie rod adjusting nut tightening procedure>

- Turn the tie rod ends, until the ball joint sockets at the tie rod ends "A" and "B" make contact with the ball stud shafts.
- While maintaining the condition under the step 1, temporarily tighten the lock nuts at both sides to the specified tightening torque.

Tightening Torque:

19.6 - 29.4 N·m (2.0 - 3.0 kgf-m, 14.5 - 21.7 ft-lb)

- Alternately tighten the lock nut to the specified torque, twice each time, following the procedure given below.

Tightening Sequence: A → B → A → B or
B → A → B → A

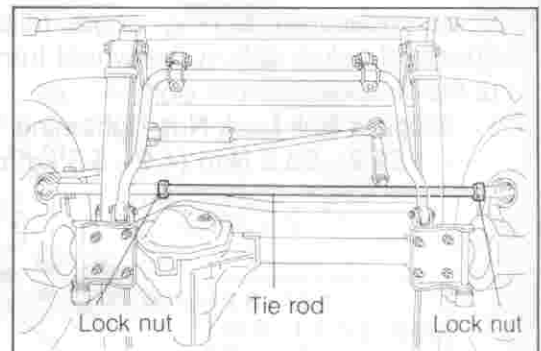
Tightening Torque:

118 - 167 N·m (12 - 17 kgf-m, 87 - 123 ft-lb)

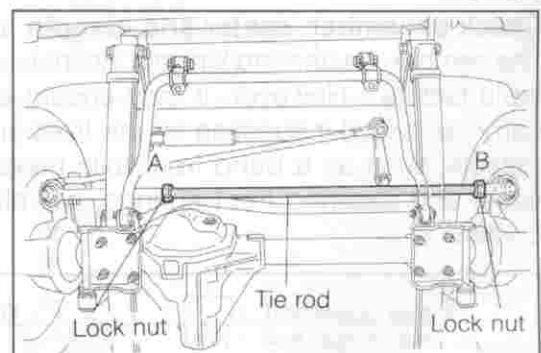
Check of sideslip

Ensure that the sideslip amount is within the specified range, using a sideslip tester.

Specified Value: 0 ± 3 mm



WRE91-FS040



WRE91-FS041

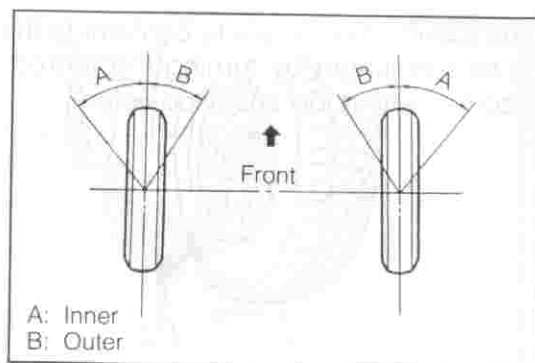
FRONT AXLE & SUSPENSION

Check of wheel turning angle

1. Place the wheel on the turning radius gauge.
2. Ensure that the wheel turning angle is within the specified value.

Specified Value:

Mounted tire	Inner turning angle	Outer turning angle
Tires other than those listed below	$30^{\circ} \pm \frac{1}{2}^{\circ}$	$28^{\circ} \pm \frac{1}{2}^{\circ}$
H78-15-4PR, 215SR15, 255/70R15	$28^{\circ} \pm \frac{1}{2}^{\circ}$	$26^{\circ} \pm \frac{1}{2}^{\circ}$

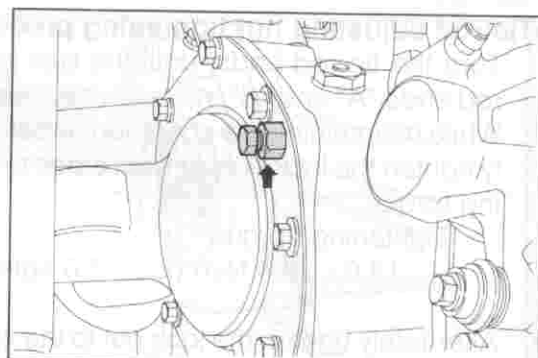


WRE91-FS042

3. If the measured turning angle fails to conform to the specified value, adjust the wheel turning angle by means of the knuckle stopper bolt.

Stopper Bolt Lock Nut Tightening Torque:

39.2 - 53.9 N-m (4.0 - 5.5 kgf-m, 28.9 - 39.8 ft-lb)

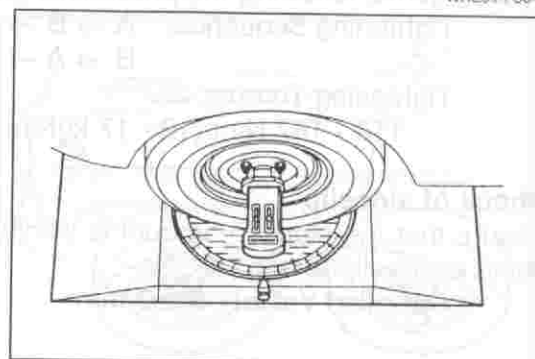


WRE91-FS043

Check of camber, caster and kingpin inclination angles

The camber, caster and kingpin inclination angles are unadjustable factors. However, if they should show unusual values, carry out a total inspection on the front ends. Those front end defects, such as a bend front axle housing, defective spring seats and flattened front springs, will affect the camber and caster.

Camber	$1^{\circ} 00' \pm 1^{\circ}$
Caster	$1^{\circ} 30' \pm 1^{\circ}$
Kingpin inclination angle	$9^{\circ} 30' \pm 1^{\circ}$



WRE91-FS044

If the test vehicle exhibits some of the aforesaid defects, it may be impossible to adjust the front wheel alignment. Therefore, it is mandatory to perform the checks prior to the front wheel alignment adjustment.

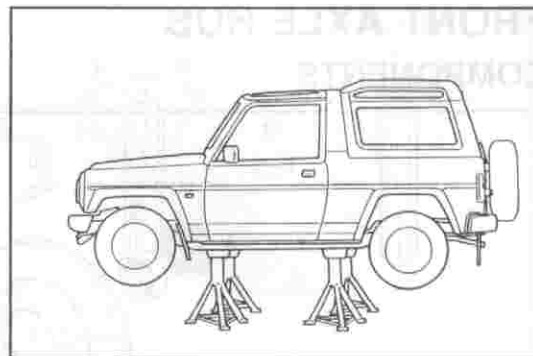


FRONT AXLE & SUSPENSION

CHECK OF FREE WHEEL HUB OPERATION

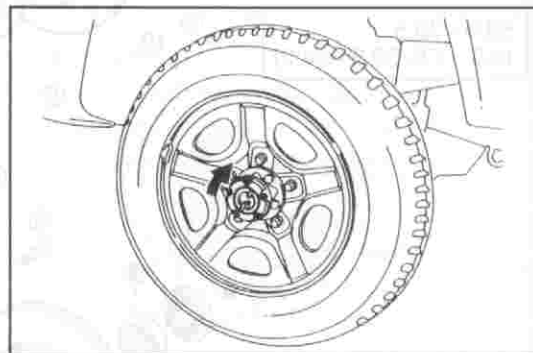
1. Check of manual free wheel hub

- (1) Jack up the vehicle and support it with safety stands.
(See the GI section.)



WRE91-FS046

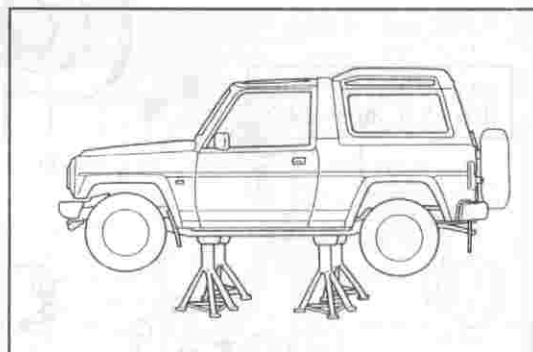
- (2) Set the handle of the free wheel hub to the "LOCK" position.
- (3) Turn the tire several times. At this time, ensure that the tire at the opposite side and/or the front propeller shaft is turning.
If not, replace the free wheel hub.
- (4) Set the handle of the free wheel hub to the "FREE" position.
- (5) Turn the tire several times. At this time, ensure that the tire at the opposite side and/or the propeller shaft is not turning.
- (6) Jack down the vehicle.



WRE91-FS047

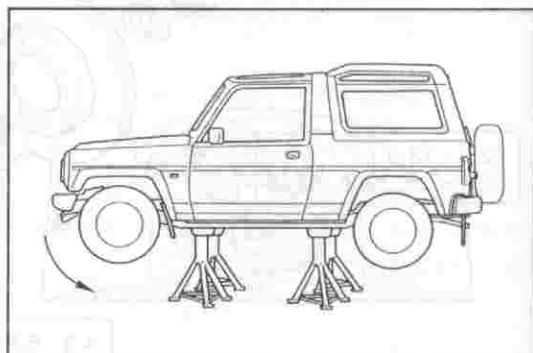
2. Check of automatic free wheel hub

- (1) Jack up the vehicle and support it with safety stands.
(See the GI section.)



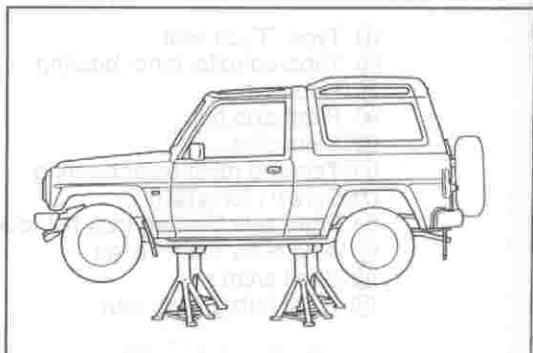
WRE91-FS048

- (2) Shift the shift lever to the 4H position.
- (3) Start the engine. When the driving force is applied to the wheel, ensure that the front wheels turn.
If not, replace the free wheel hub.



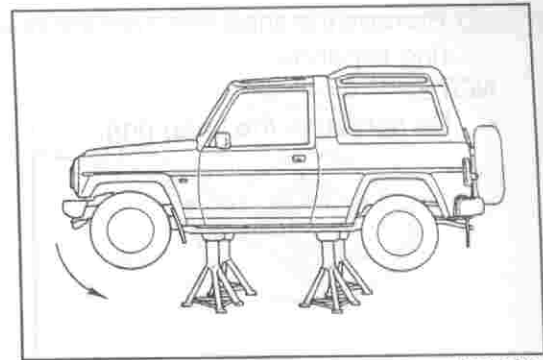
WRE91-FS049

- (4) Shift the shift lever to the 2H position.
- (5) While slightly applying the brake, apply the driving force to the wheel in a direction opposite to the former direction in the step (3). In this way, turn the wheel more than three times.



WRE91-FS050

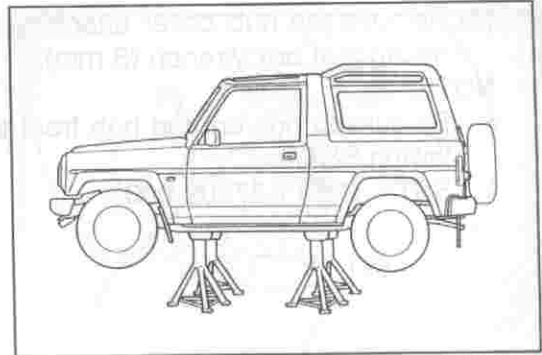
- (6) Stop the engine.
- (7) While turning the wheel by hands, ensure that the tire at the opposite side and/or the propeller shaft is not turning.
If not, replace the free wheel hub.



WRE91-FS051

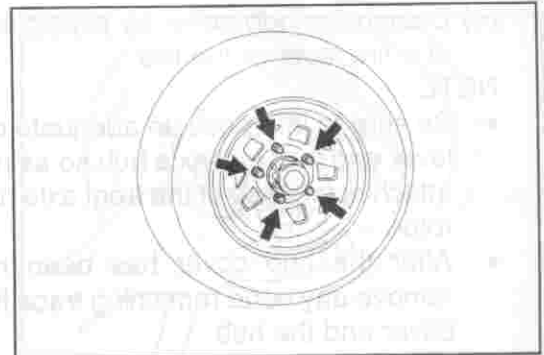
REMOVAL/DISASSEMBLY OF FRONT AXLE HUB

1. Jack up the vehicle and support it with safety stands.
(See the GI section.)



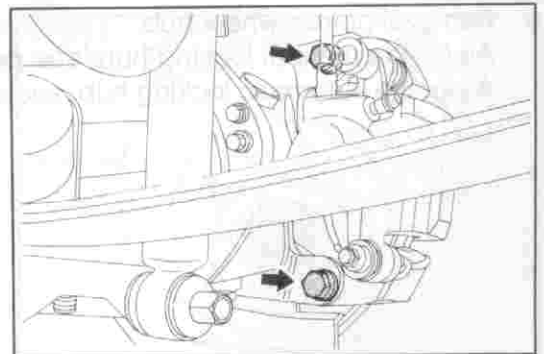
WRE91-FS052

2. Remove the front wheel.



WRE91-FS053

3. Remove the brake mounting support attaching bolts. Remove the brake mounting support together with calipers. Suspend the brake mounting support from the upper frame in such a way that no undue force is applied to the brake hose.



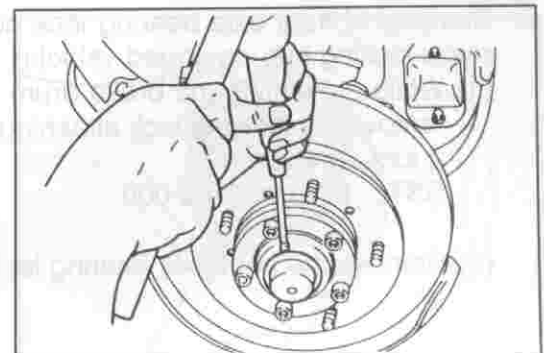
WRE91-FS054

4. Removal of hub cap (rigid type only)

- (1) Remove the hub cap by lightly and evenly driving a chisel or the like into between the hub cap and the cover.

NOTE:

- Do not reuse the hub cap.
- Be very careful not to damage the hub cap during the removal.



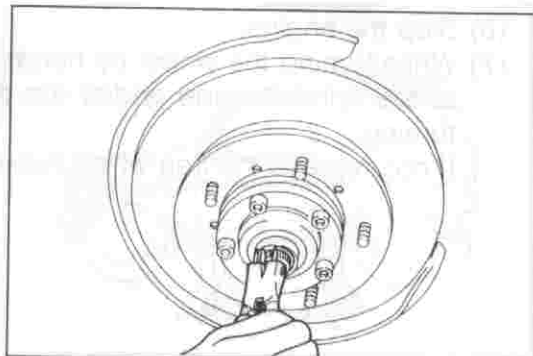
WRE91-FS055

FRONT AXLE & SUSPENSION

- (2) Remove the snap ring from the drive shaft, using a snap ring expander.

NOTE:

- Do not reuse the snap ring.



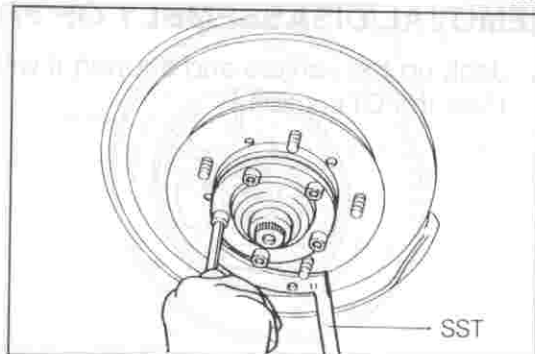
WRE91-FS056

- (3) Remove the hub cover attaching bolts by means of a hexagonal box wrench (8 mm).

NOTE:

- Be sure to prevent the hub from turning, using the following SST.

SST: 09511-87202-000

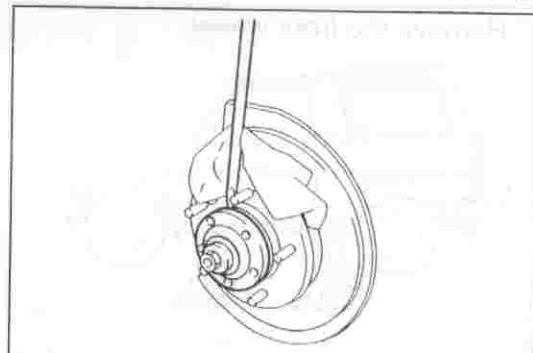


WRE91-FS057

- (4) Detach the hub cover by prying it off evenly by means of a tire lever or the like.

NOTE:

- Be sure to interpose an adequate cloth between the tire lever and the front axle hub so as not to damage the tire attaching surface of the front axle hub as well as the disc rotor.
- After the hub cover has been removed, completely remove any bond remaining trace from between the hub cover and the hub.

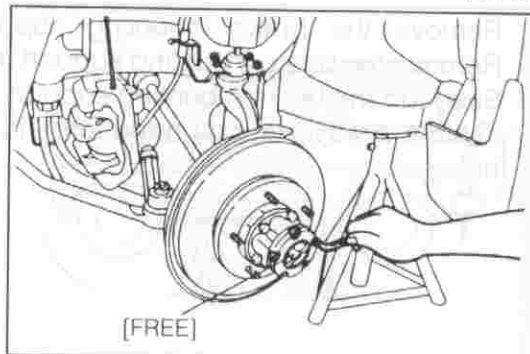


WRE91-FS058

5. Removal of free wheel hub

As for the manual locking hub, see page FS-34 to FS-36.

As for the automatic locking hub, see page FS-39 to FS-42.



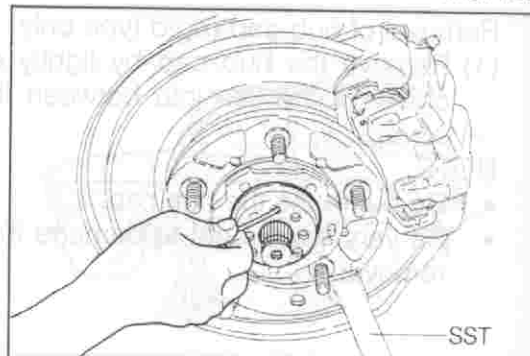
WRE91-FS059

6. Removal of front axle bearing lock nut lock (except automatic locking hub-equipped vehicle)

- (1) While preventing the brake drum from turning by SST, remove the lock nut lock attaching screws by means of a torx® wrench.

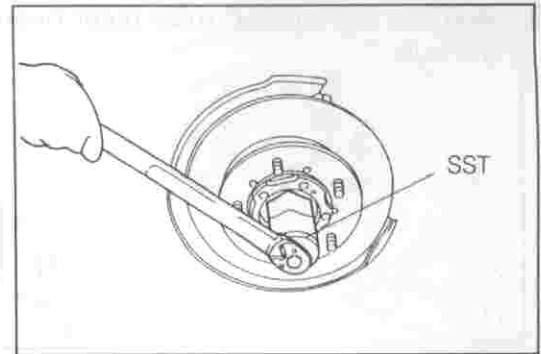
SST: 09511-87202-000

- (2) Remove the front axle bearing lock nut lock.

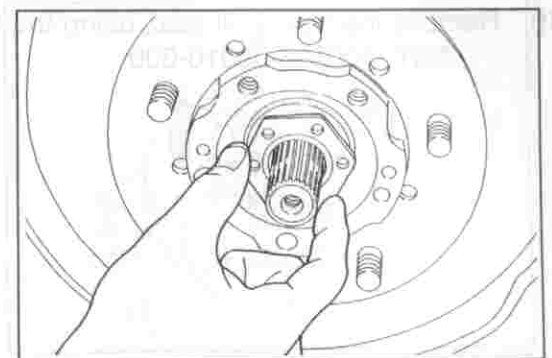


WRE91-FS060

- (3) Remove the lock nut, using the following SSTs.
SST: 09607-60020-000



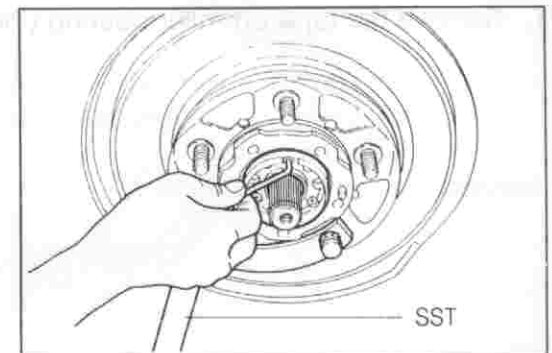
WRE91-FS061



WRE91-FS062

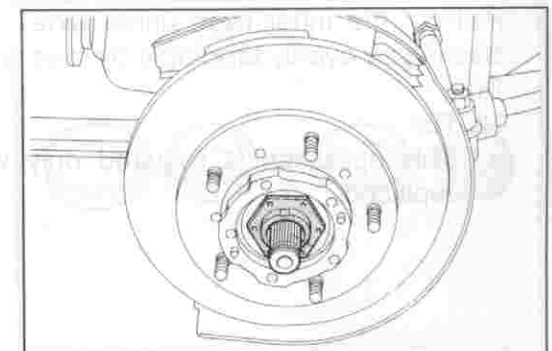
7. Removal of lock nut (Automatic locking hub-equipped vehicle only)

- (1) While preventing the brake disc from turning, remove the brake drum by means of a torx wrench. For this operation, use the following SST.
SST: 09511-87202-000



WRE91-FS063

- (2) Remove the lock nut, using the following SSTs.
SST: 09607-60020-000

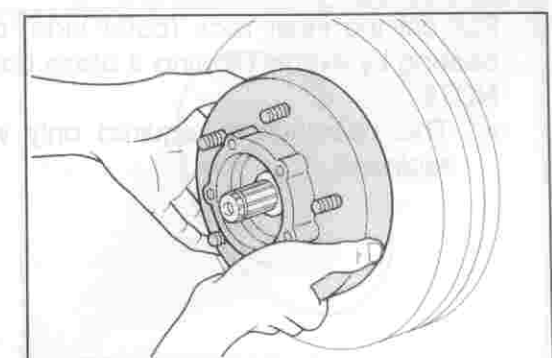
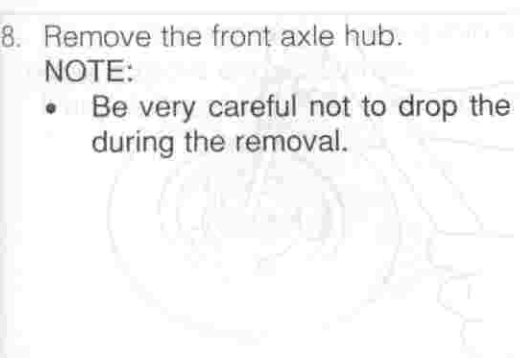


WRE91-FS064

8. Remove the front axle hub.

NOTE:

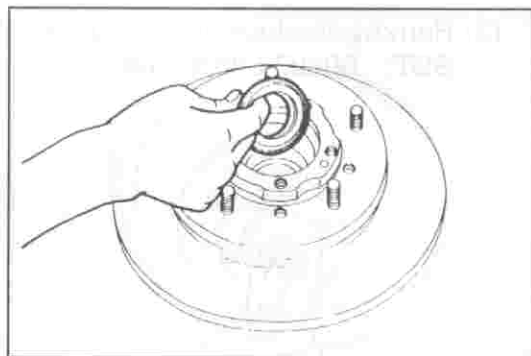
- Be very careful not to drop the outer bearing and hub during the removal.



WRE91-FS065

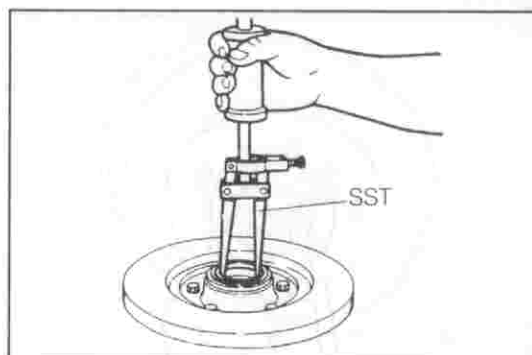
FRONT AXLE & SUSPENSION

9. Remove the tapered roller outer bearing (outer side) from the hub.



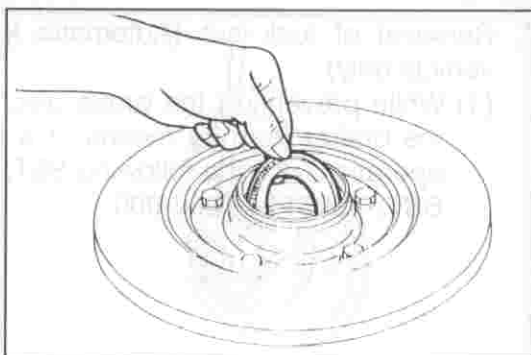
WRE91-FS066

10. Remove the type T oil seal, using the following SST.
SST: 09308-00010-000



WRE91-FS067

11. Remove the tapered roller bearing (inner side).

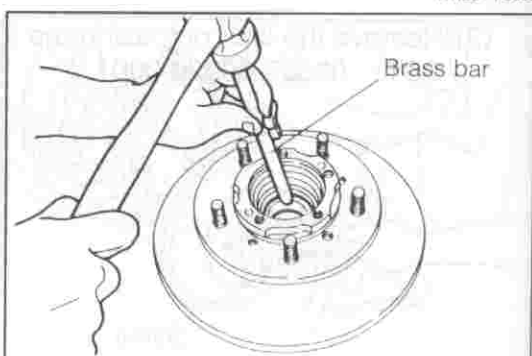


WRE91-FS068

12. Pull out the inner race (inner side) of the tapered roller bearing by evenly tapping it by means of a brass bar or the like.

NOTE:

- This operation is required only when the bearing is replaced.

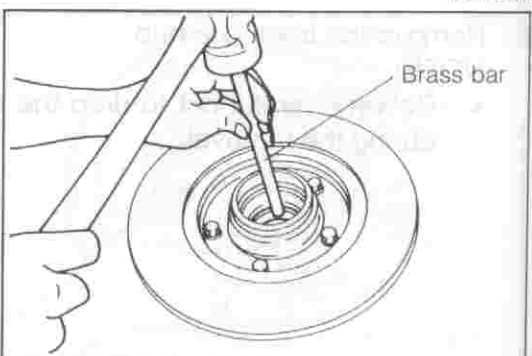


WRE91-FS069

13. Pull out the inner race (outer side) of the tapered roller bearing by evenly tapping a brass bar or the like.

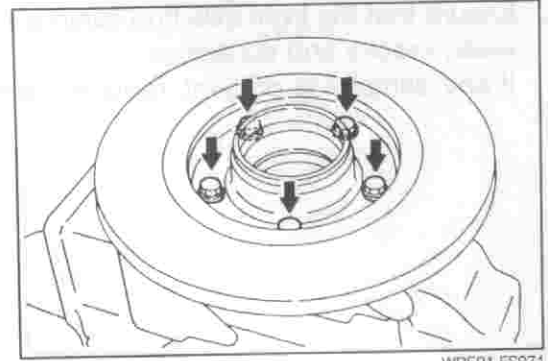
NOTE:

- This operation is required only when the bearing is replaced.



WRE91-FS070

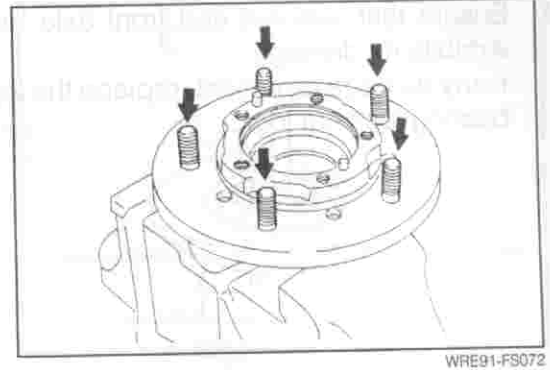
14. Remove the brake disc by removing the brake disc attaching bolts from the front axle hub.



15. Drive out the hub bolt from the front axle hub by means of a plastic hammer or the like.

NOTE:

- Attach the nut in place so that the threaded portion may not be damaged.



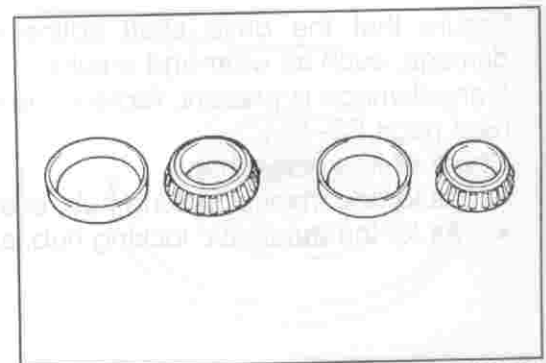
INSPECTION

Wash the disassembled parts and dry them with compressed air, except for the free wheel hub. As for the brake discs, degrease them with cleaning solvent, such as alcohol.

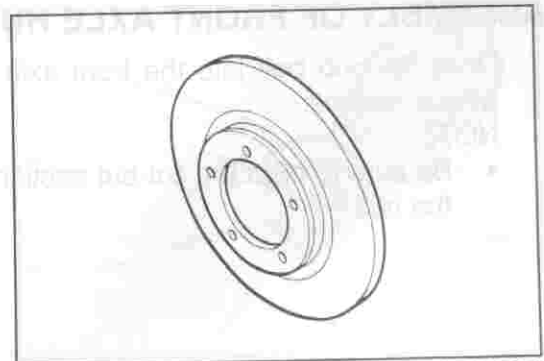
1. Ensure that the inner and outer tapered roller bearings exhibit no damage, such as wear and scratches. If they exhibit damage, replace the defective bearings.

NOTE:

- Be sure to handle the inner race and outer race as a set.

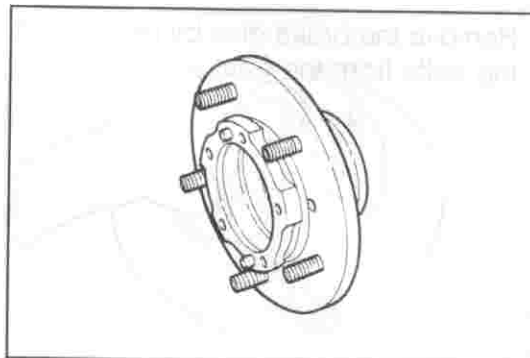


2. Ensure that the brake disc exhibits no damage, such as wear, cracks and scratches. If any damage is present, replace the brake disc.



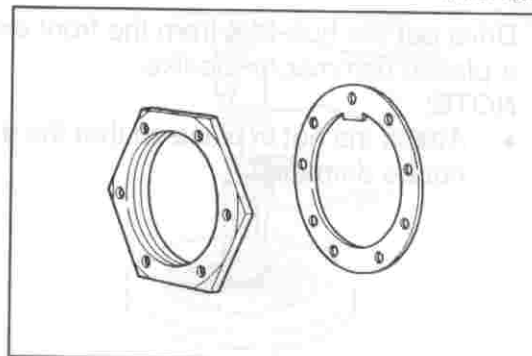
FRONT AXLE & SUSPENSION

3. Ensure that the front axle hub exhibits no damage, such as wear, cracks and scratches.
If any damage is present, replace the front axle hub.



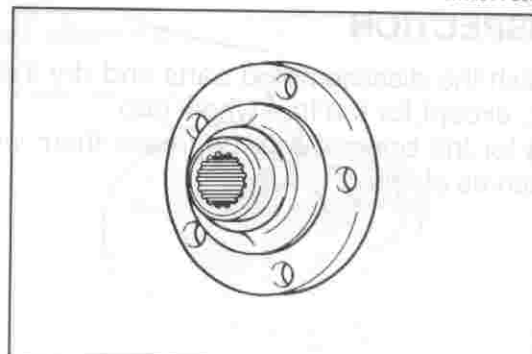
WRE91-FS076

4. Ensure that lock nut and front axle bearing lock nut lock exhibits no damage.
If any damage is present, replace the lock nut and front axle bearing lock nut lock.



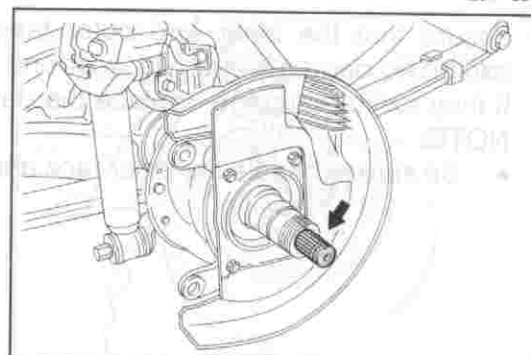
WRE91-FS077

5. Ensure that the hub cover exhibits no damage, such as wear and cracks.
If any damage is present, replace the hub cover.
If the spline section exhibits damage, check the spline at the drive shaft side.



WRE91-FS078

6. Ensure that the drive shaft spline section exhibits no damage, such as wear and cracks.
If any damage is present, replace the drive shaft.
(See page FS-46.)



WRE91-FS079

7. Check of free wheel hub

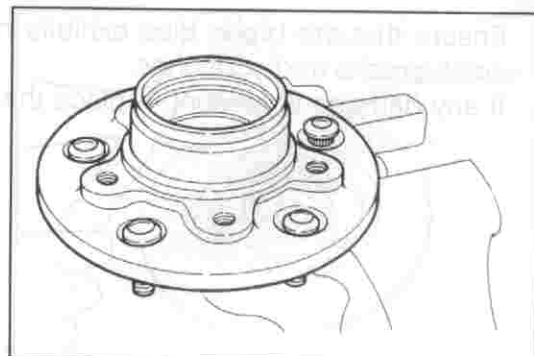
- As for the manual locking hub, see page FS-36.
- As for the automatic locking hub, see page FS-42.

ASSEMBLY OF FRONT AXLE HUB

1. Drive the hub bolt into the front axle hub by means of a plastic hammer.

NOTE:

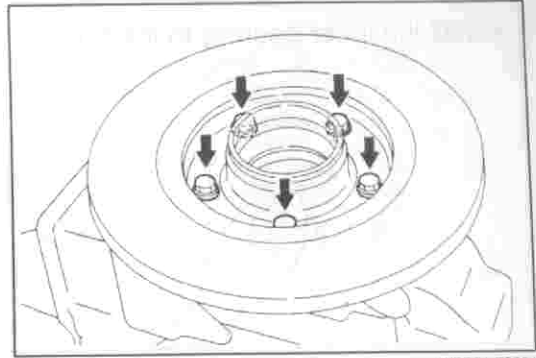
- Be sure to align the cut-out section of the hub bolt with the hub.



WRE91-FS080

2. Install the brake disc to the front axle hub. Evenly tighten the attaching bolts to the specified torque over two or three stages.

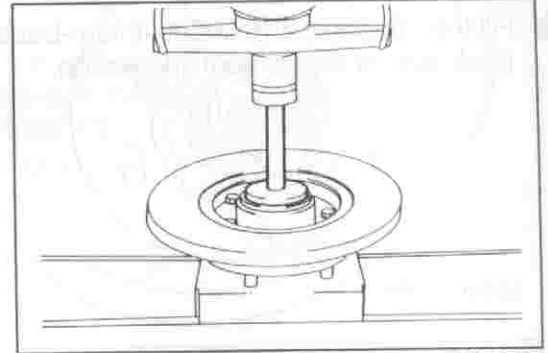
Tightening Torque: 53.9 - 73.5 N·m
(5.5 - 7.5 kgf-m, 39.8 - 54.2 ft-lb)



WRE91-FS081

3. Install the outer race (inner side) of the tapered roller bearing, using the following SST.

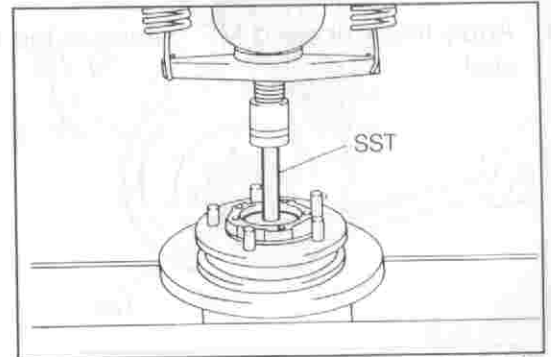
SST: 09608-20011-000



WRE91-FS082

4. Install the outer race (outer side) of the tapered roller bearing, using the following SST.

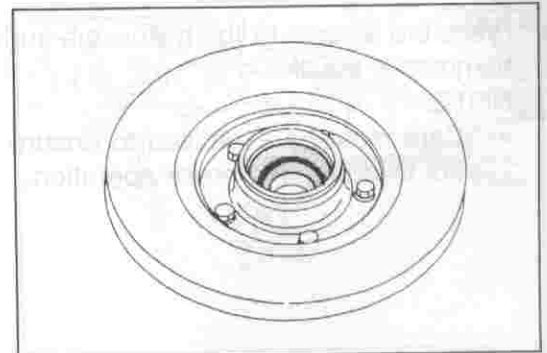
SST: 09608-20011-000



WRE91-FS083

5. Fill the specified amount of lithium-based MP grease to a space between the outer races of the inner and outer bearings.

Filling Amount: 66 - 67 grams

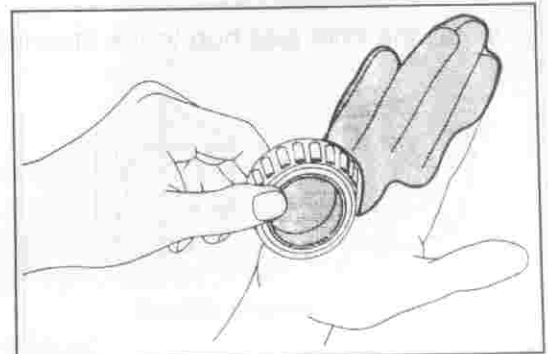


WRE91-FS084

6. Fill lithium-based MP grease to the inner and outer bearings.

NOTE:

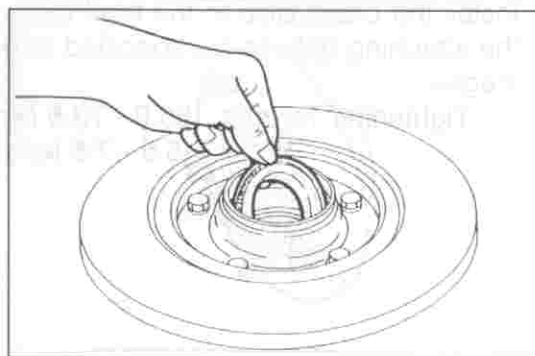
- Fill grease to a space between the inner race and the bearing guide, until the grease oozes from the inside of the bearing guide. Then, apply grease to the surface.



WRE91-FS085

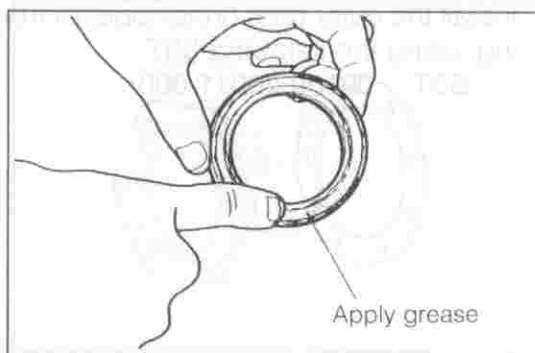
FRONT AXLE & SUSPENSION

7. Install the inner bearing to the hub.



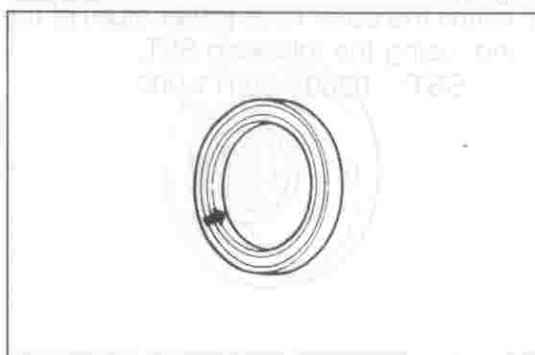
WRE91-FS086

8. Fill the specified amount of lithium-based MP grease to the back side of the oil seal lip section.



WRE91-FS087

9. Apply lithium-based MP grease to the lip section of the oil seal.

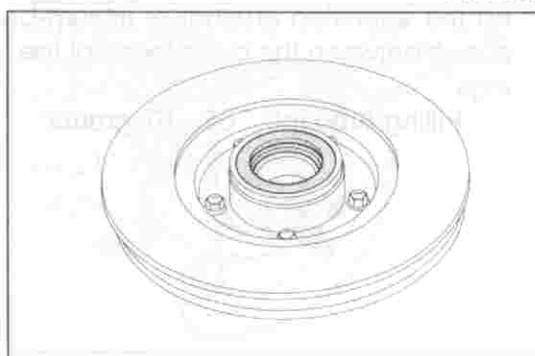


WRE91-FS088

10. Press the oil seal to the hub edge surface, using a plastic hammer or the like.

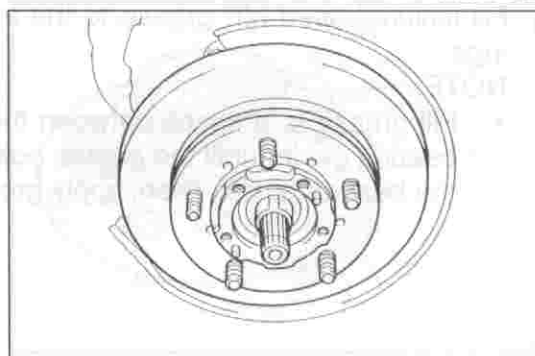
NOTE:

- Care must be exercised to ensure that the oil seal will not tilt during the press operation.



WRE91-FS089

11. Install the front axle hub to the steering knuckle.



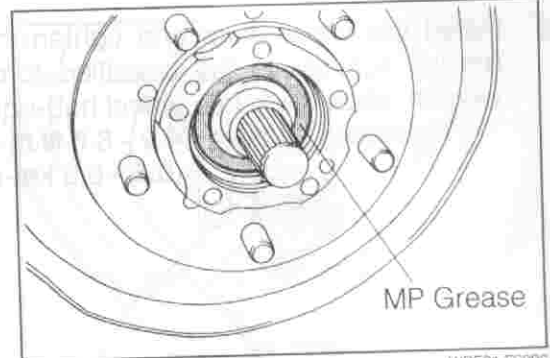
WRE91-FS091

12. Insert the outer bearing into the front axle hub.



WRE91-FS092

13. Fill lithium-based MP grease to the outer bearing.



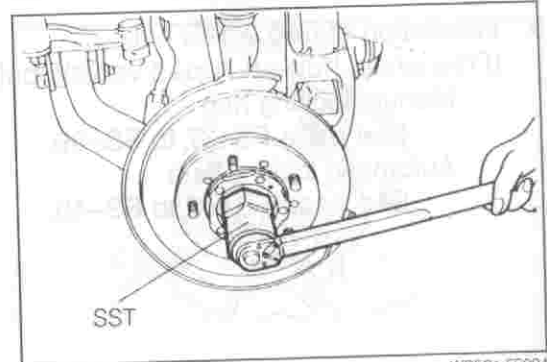
MP Grease

WRE91-FS093

14. Tighten the lock nut to the specified torque, using the following SST. Then, back off the lock nut one sixth turn.

SST: 09607-60020-000

Tightening Torque: 98.0 - 147 N·m
(10 - 15 kgf-m, 72.0 - 109 ft-lb)



SST

WRE91-FS094

15. Rotate the axle hub two or three turns so that the axle hub may be bedded in.

16. Adjust the lock nut so that the starting torque may conform to the specified value.

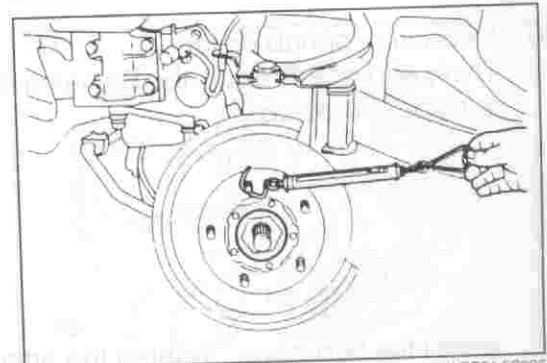
Starting Load: 1.4 - 3.6 kgf

[Reference]

Starting Torque:

0.98 - 2.45 N·m

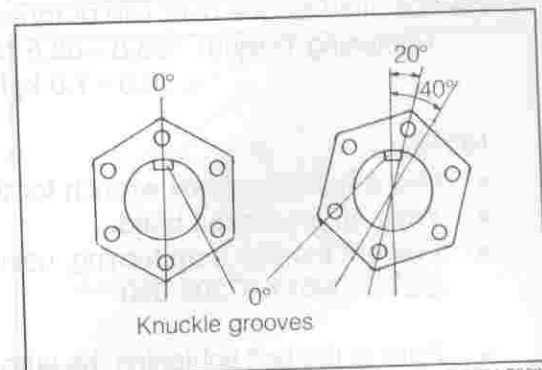
(10 - 25 kgf-cm, 8.7 - 21.7 inch-lb)



WRE91-FS095

NOTE:

- Adjust the hub nut in such a way that the hub nut position comes at the position indicated in the right figure after completion of the adjustment.



Knuckle grooves

WRE91-FS096

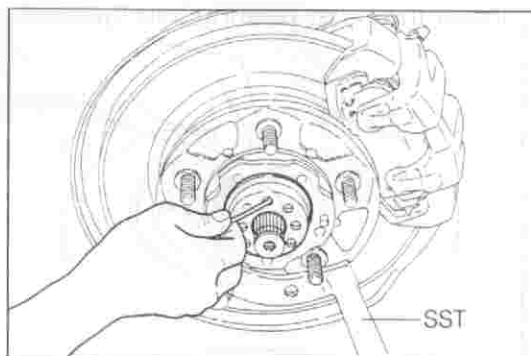
FRONT AXLE & SUSPENSION

17. Installation of front axle bearing lock nut lock. (except automatic locking hub equipped vehicle)

(1) Install the front axle bearing lock nut lock with three attaching screw.

(2) Tighten the attaching screws to the specified torque, using the torx® wrench

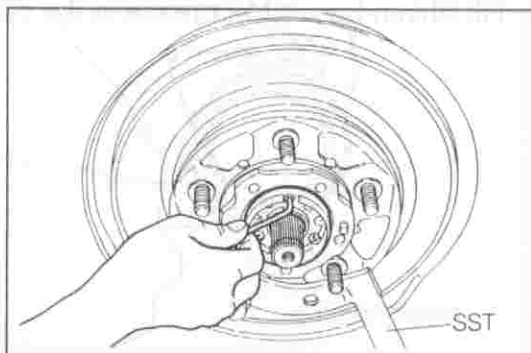
Tightening Torque: 4.9 - 8.8 N·m
(0.5 - 0.9 kgf-m, 3.6 - 6.5 ft-lb)



WRE91-FS097

18. Install the brake drum and tighten the attaching screws (torque screws) to the specified torque using the torx® wrench. (Automatic free wheel hub-equipped vehicle only)

Tightening Torque: 4.9 - 8.8 N·m
(0.5 - 0.9 kgf-m, 3.6 - 6.5 ft-lb)



WRE91-FS100

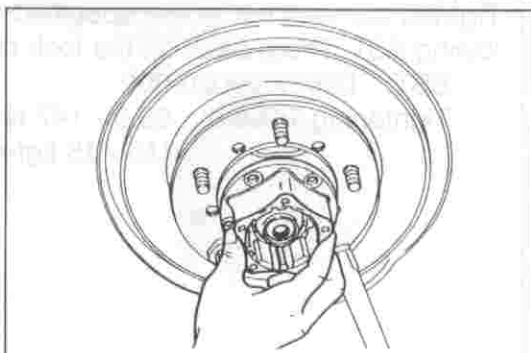
19. Installation of free wheel hub
(Free wheel hub-equipped vehicle only)

Manual locking hub

See page FS-37 to FS-39.

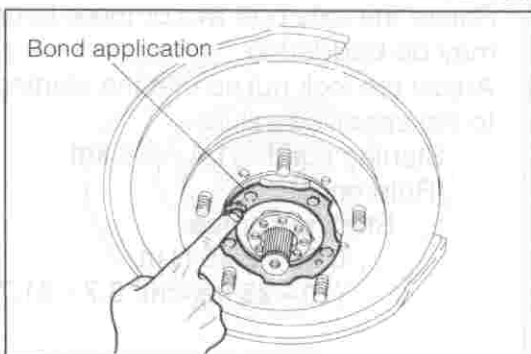
Automatic locking hub

See page FS-42 to FS-45.



WRE91-FS101

20. Installation of hub cover
Thinly and evenly apply the Daihatsu Bond No.4 to the edge surface of the hub.



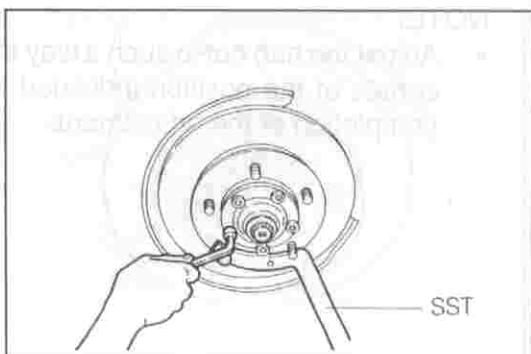
WRE91-FS102

21. Install the hub cover. Tighten the attaching bolts evenly to the specified torque over two or three stages.

Tightening Torque: 58.8 - 68.6 N·m
(6.0 - 7.0 kgf-m, 43.4 - 50.6 ft-lb)

NOTE:

- Use a hexagonal box wrench for the bolt tightening.
- Wipe off any oozed bond.
- Prevent the hub from turning, using the following SST.
SST: 09511-87202-000
- Prior to the bolt tightening, be sure to apply engine oil to the threaded portion of each bolt.

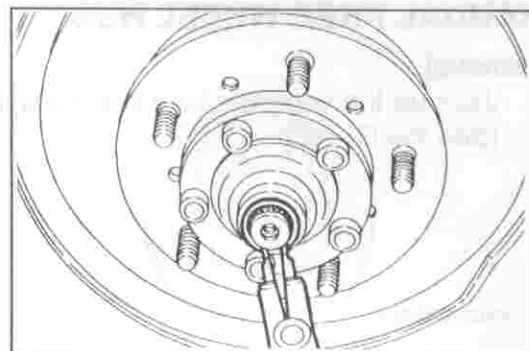


WRE91-FS103

22. Install a new snap ring to the groove section of the drive shaft.

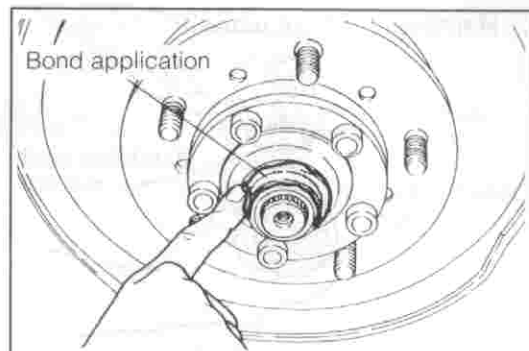
NOTE:

- Do not reuse the snap ring.



WRE91-FS104

23. Apply the Daihatsu Bond No.4 to the hub cap attaching surface of the hub cover.

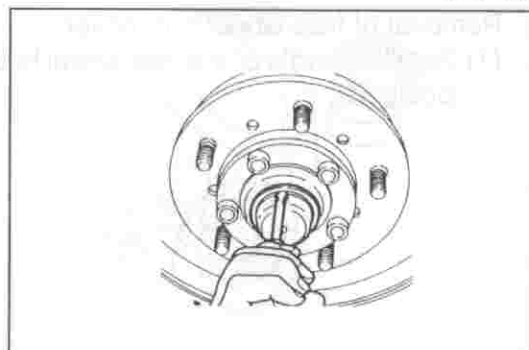


WRE91-FS105

24. Press a new hub cap, using a screwdriver or the like.

NOTE:

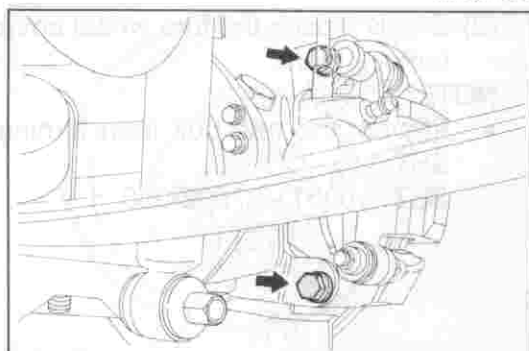
- Do not reuse the hub cap.
- Wipe off any bond that has oozed out.



WRE91-FS106

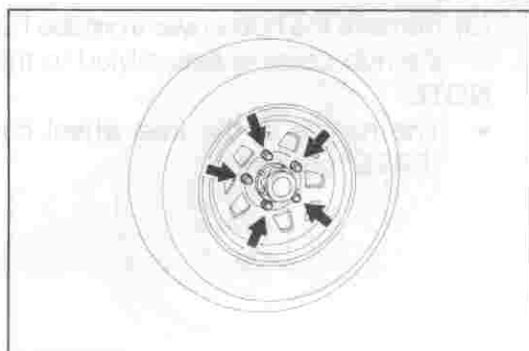
25. Install the brake mounting support together with calipers to the steering knuckle.

Tightening Torque: 68.6 - 88.3 N·m
(7.0 - 9.0 kgf-m, 50.6 - 65.1 ft-lb)



WRE91-FS107

26. Install the front wheel.



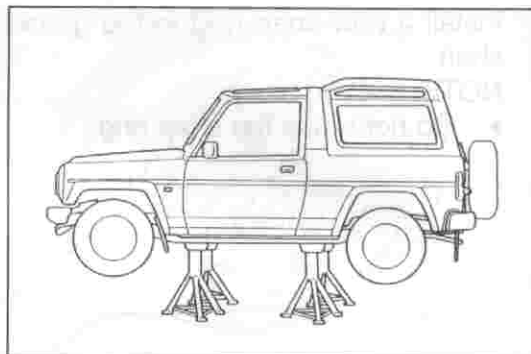
WRE91-FS108

FRONT AXLE & SUSPENSION

MANUAL FREE WHEEL HUB

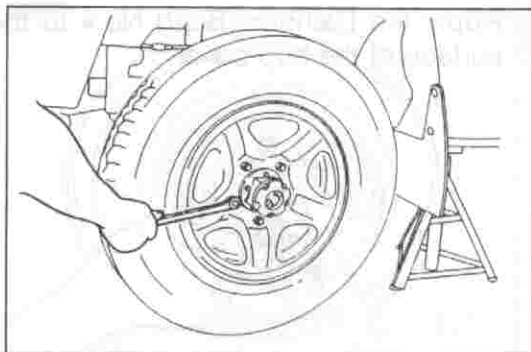
Removal

1. Jack up the vehicle and support it with safety stands.
(See the GI section.)



WRE91-FS109

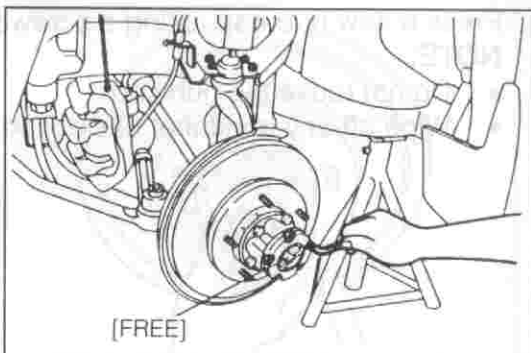
2. Remove the front wheel.



WRE91-FS110

3. Removal of free wheel hub cover

- (1) Set the handle of the free wheel hub cover to the "FREE" position.



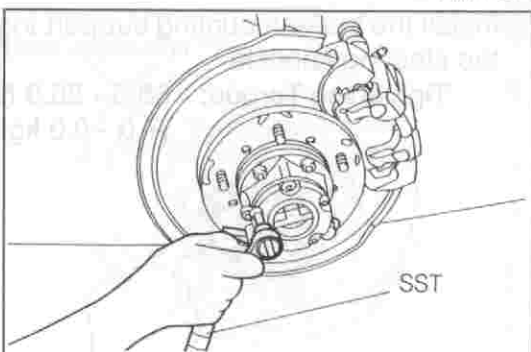
WRE91-FS111

- (2) Evenly loosen the free wheel cover attaching bolts and remove them.

NOTE:

- Prevent the hub bolt from turning, using the following SST.

SST: 09511-87202-000

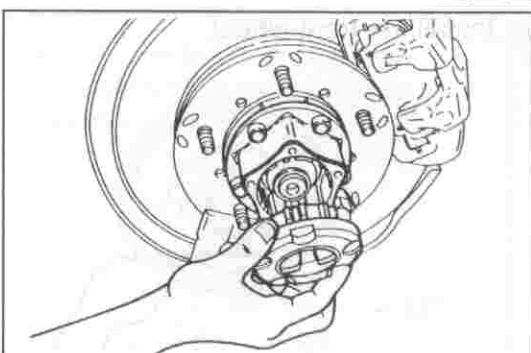


WRE91-FS112

- (3) Remove the hub cover from the hub body in a state that the hub cover is assembled to the clutch and spring.

NOTE:

- The handle of the free wheel cover should be at the "FREE" position.



WRE91-FS113

4. Removal of clutch subassembly

- (1) With the handle of the hub cover set to the "FREE" position, turn the clutch subassembly, until the clutch stops, while pushing the clutch subassembly against the cover side.

NOTE:

- Be very careful not to damage the compression spring and follower by applying excessive force during this operation.

- (2) Push the clutch toward the cover side further. Remove the pawl section of the follower from the stopper section of the hub cover handle. Then, remove the clutch subassembly from the cover.

NOTE:

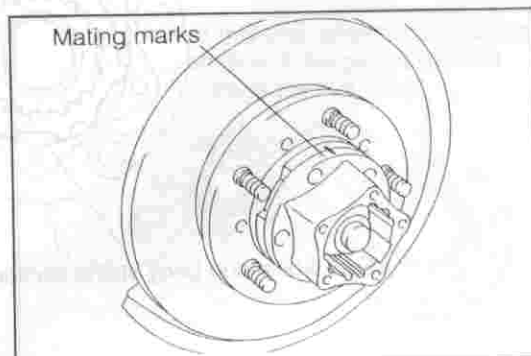
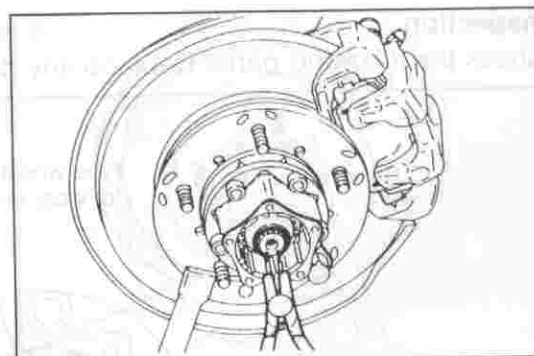
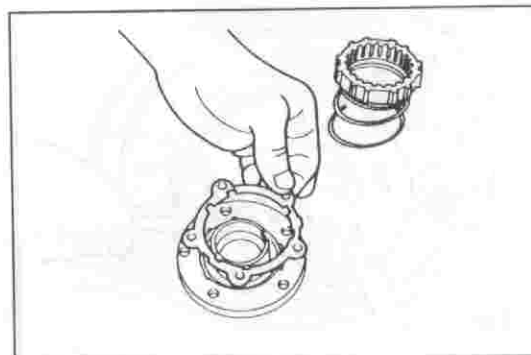
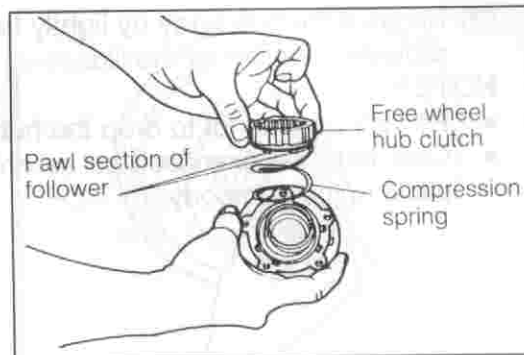
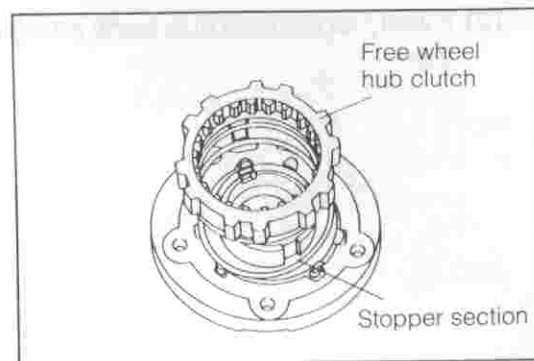
- Do not remove the compression spring from the follower.

- (3) Remove the gasket.

5. Remove the snap ring from the drive shaft.

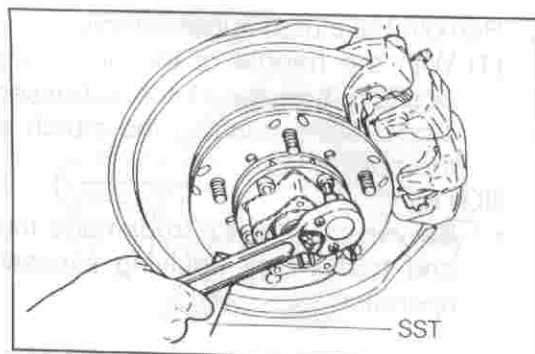
6. Removal of hub body

- (1) Put mating marks at a point between the hub body and the hub by means of a marker pen or the like.



FRONT AXLE & SUSPENSION

- (2) Evenly loosen the hub body attaching bolts and remove them.

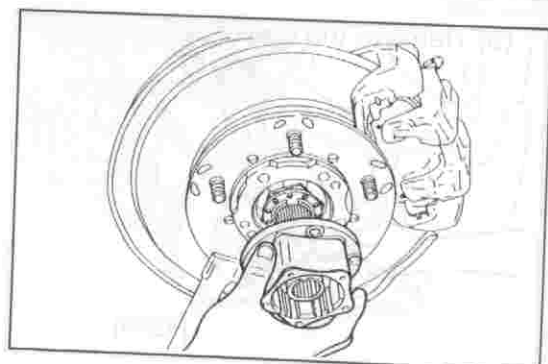
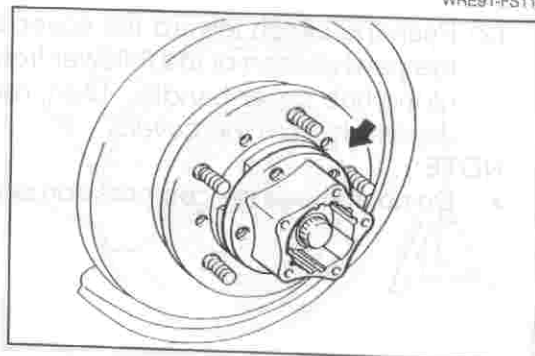


WRE91-FS119

- (3) Remove the hub body by lightly tapping it by means of a plastic hammer or the like.

NOTE:

- Be very careful not to drop the hub body.
- Care must be exercised so as not to apply strong impacts to the hub body.

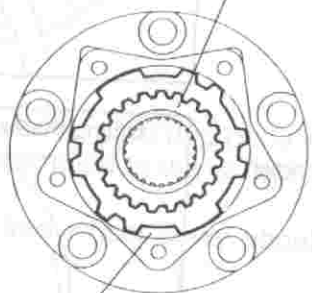


WRE91-FS120

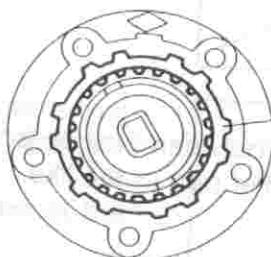
Inspection

Check the following parts. Replace any defective parts.

Free wheel hub inner spline section for wear and damage



Free wheel hub body spline section for wear and damage



Spline section of free wheel hub ring subassembly for wear and damage

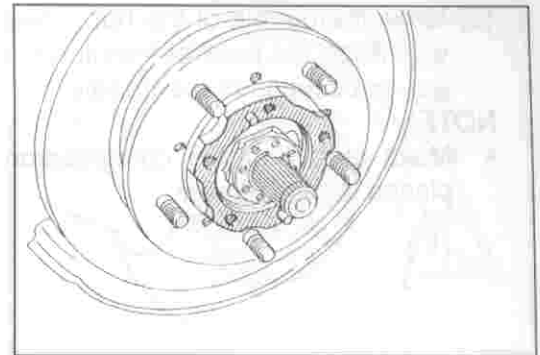
Installation

1. Installation of hub body

- (1) Clean the mating surfaces of the hub body and axle hub. Then, thinly and evenly apply the Daihatsu Bond No. 4.



- (2) While aligning the knock pin hole of the hub body with the knock pin of the hub, install the hub body to the hub.



WRE91-FS122

- (3) Tighten the hub body attaching bolts to the specified torque over two or three stages evenly.

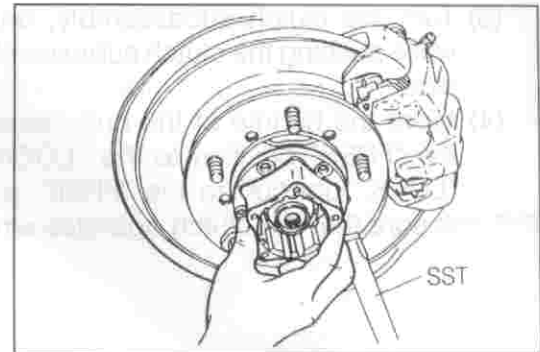
Tightening Torque: 58.8 - 68.6 N·m
(6.0 - 7.0 kgf-m, 43.4 - 50.6 ft-lb)

NOTE:

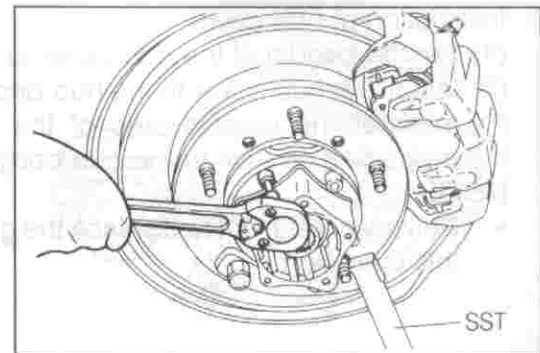
- Prevent the axle hub from turning, using the following SST.

SST: 09511-87202-000

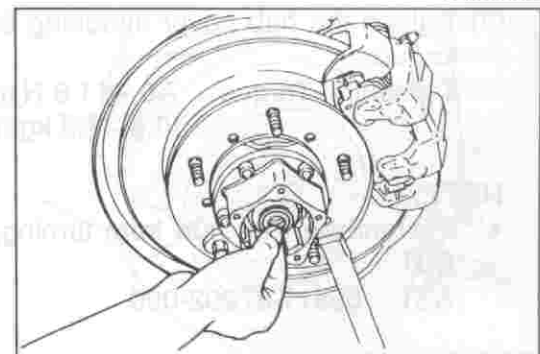
- Use a hexagonal box wrench for the bolt tightening.
- Prior to the bolt tightening, be sure to apply engine oil to the threaded portion of each bolt.
- Wipe off any oozed bond.



WRE91-FS123



WRE91-FS124



WRE91-FS125

2. Assemble a new snap ring to the drive shaft.

NOTE:

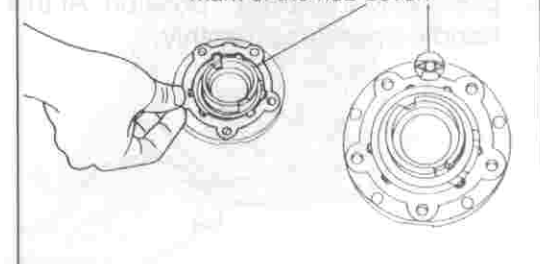
- Never reuse the snap ring.
- Fit the snap ring positively to the groove of the drive shaft.

3. Assembly of hub cover

- (1) Install a new gasket to the hub cover.



At this time, align the protruding section of the gasket with the mark of the hub cover.



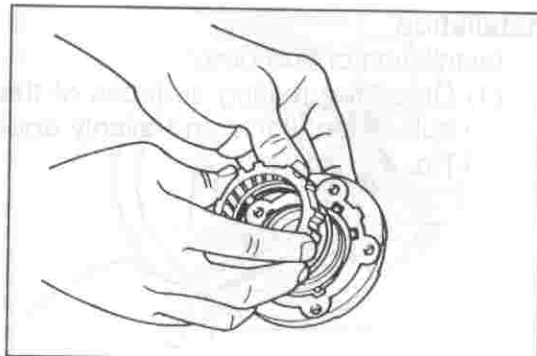
WRE91-FS126

FRONT AXLE & SUSPENSION

- (2) Move the handle of the hub cover to the "FREE" position. Align the pawl of the clutch subassembly with the cut-out section of the handle.

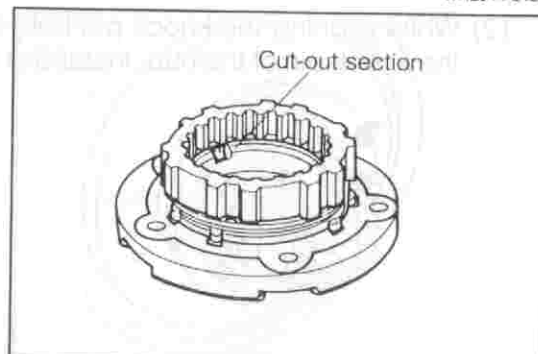
NOTE:

- Make sure that the compression spring is positively placed in the follower.



WRE91-FS127

- (3) Turn the clutch subassembly, until the clutch stops, while pushing the clutch subassembly against the cover side.
- (4) Move the handle of the hub cover several times from the "FREE" position to the "LOCK" position; from the "LOCK" position to the "FREE" position. At this time, ensure that the clutch operates smoothly.



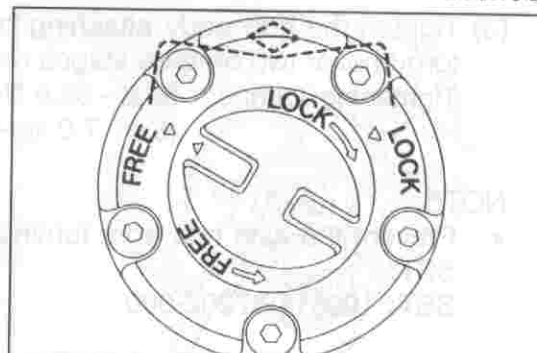
WRE91-FS128

4. Installation of hub cover

- (1) Set the handle of the hub cover to the "FREE" position.
- (2) Install the hub cover to the hub body, while aligning the mark at the reverse side of the hub cover with the protruding section at the hub body side.

NOTE:

- Be very careful not to displace the gasket position during this operation.



WRE91-FS129

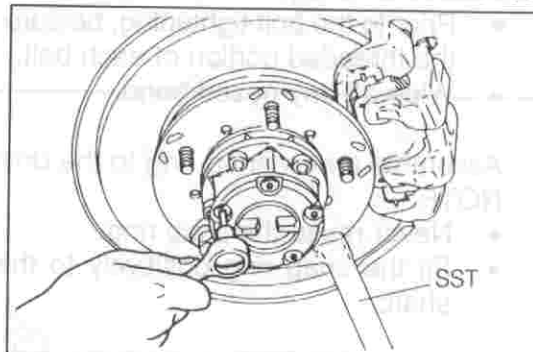
- (3) Tighten the hub cover attaching bolts to the specified torque.

Tightening Torque: 7.8 - 11.8 N·m
(0.8 - 1.2 kgf-m, 5.8 - 8.7 ft-lb)

NOTE:

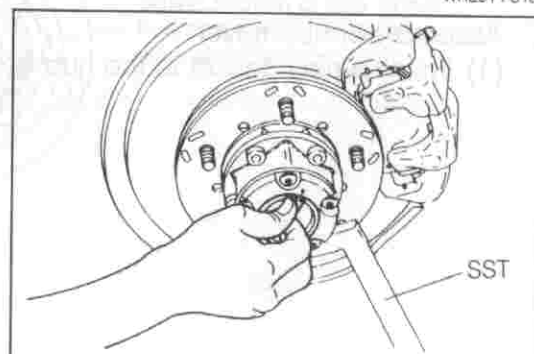
- Prevent the axle hub from turning, using the following SST.

SST: 09511-87202-000



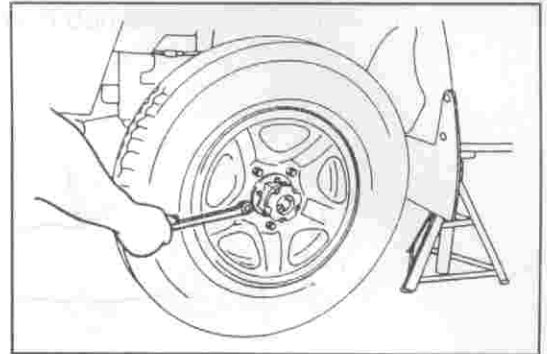
WRE91-FS130

5. Move the handle of the hub cover several times from the "FREE" position to the "LOCK" position; from the "LOCK" position to the "FREE" position. At this time, ensure that the handle operates smoothly.



WRE91-FS131

6. Install the front wheel temporarily.



WRE91-FS132

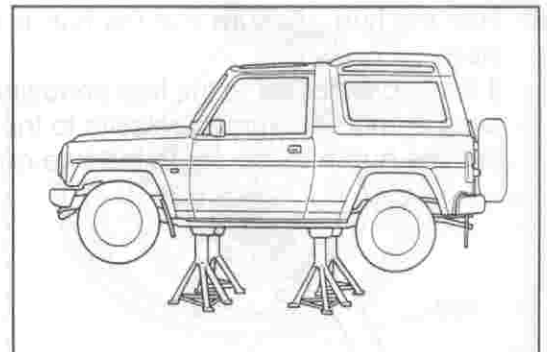
7. Perform the operation check.
(See page FS-22.)
8. Jack up the vehicle and remove the safety stands.
9. Tighten the front wheel attaching bolts to the specified torque.

WRE91-FS133

AUTOMATIC LOCKING HUB

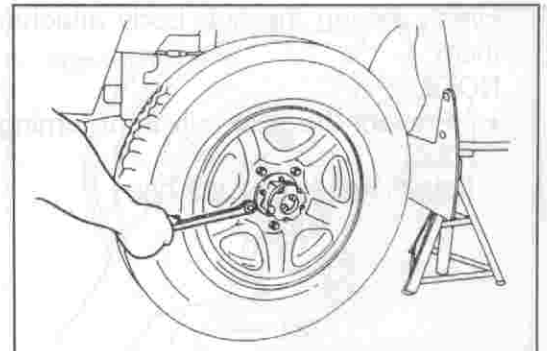
Removal

1. Jack up the vehicle and support it with safety stands.
(See the GI section.)



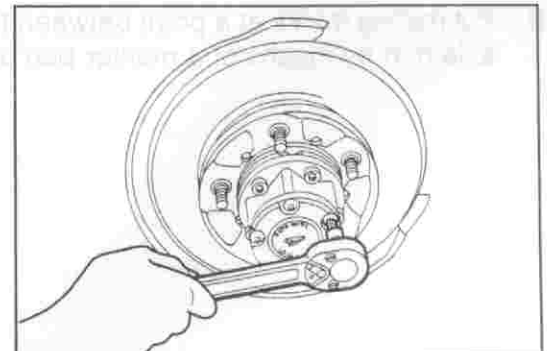
WRE91-FS134

2. Remove the front wheel.



WRE91-FS135

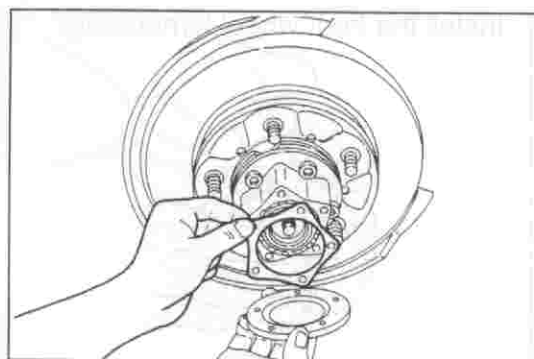
3. Remove the hub cover.



WRE91-FS136

FRONT AXLE & SUSPENSION

4. Remove the gasket from the hub body.

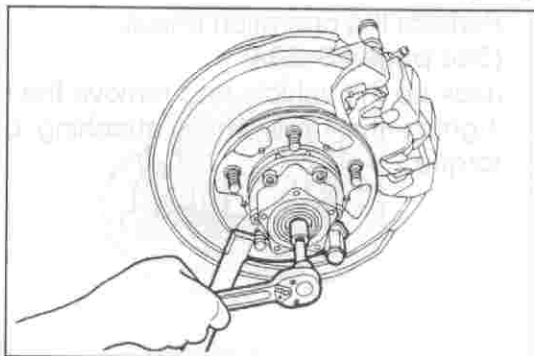


5. Remove the lock washer attaching bolt.

NOTE:

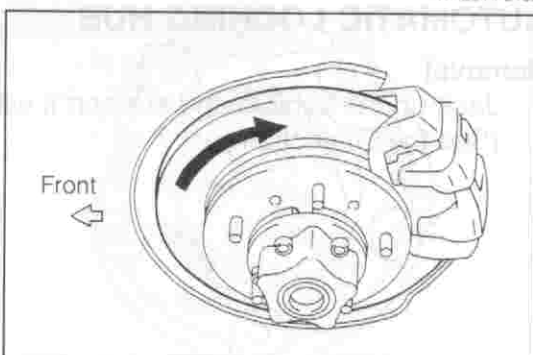
- Prevent the axle hub from turning, using the following SST.

SST: 09511-87202-000



6. Turn the hub. Ensure that the hub is set to the free wheel state.

If the hub is not set to the free condition, turn the hub (three turns or more) reversely relative to the forward direction so that the hub may be set to the free condition.

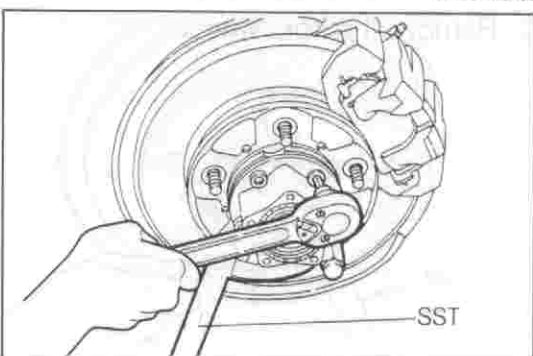


7. Evenly loosen the hub body attaching bolts and remove them.

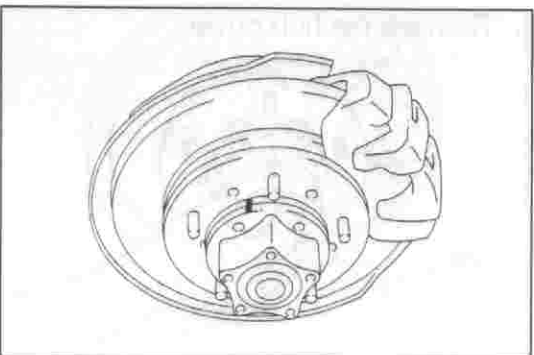
NOTE:

- Prevent the axle hub from turning, using the following SST.

SST: 09511-87202-000



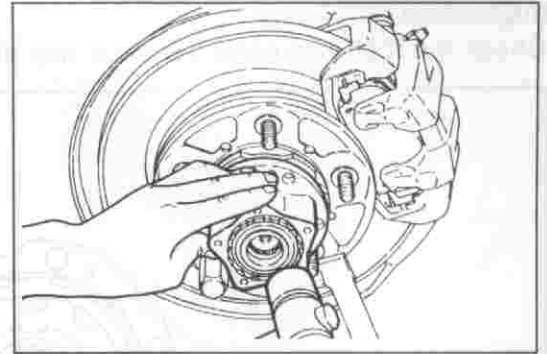
8. Put mating marks at a point between the hub body and the axle hub by means of a marker pen or the like.



9. Remove the hub body from the axle hub by lightly tapping the hub body by means of a plastic hammer or the like.

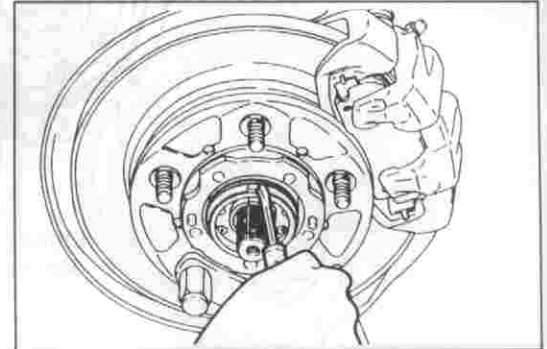
NOTE:

- Be very careful not to drop the hub body.
- Care must be exercised not to apply strong impacts to the hub body.



WRE91-FS142

10. Remove the brake shoe snap ring.

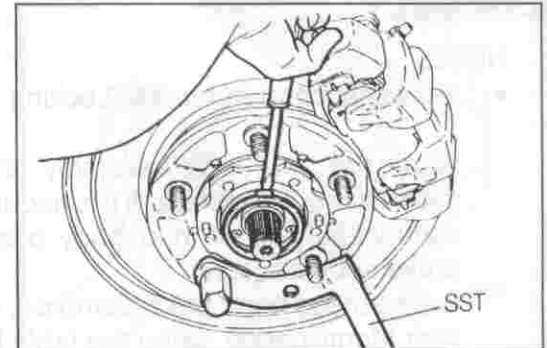


WRE91-FS143

11. Remove the brake shoe by lightly prying off the brake shoe by means of a screwdriver or the like.

NOTE:

- Since the brake shoe is provided with inserting sections at its upper and lower sides, be sure to pry off the brake shoe at upper and lower sides evenly and alternately.
- Be very careful not to scratch the brake drum and/or brake shoe.
- Do not remove the grease that has been applied to the removed brake shoe. Leave the grease as it is.
- Do not soil the removed brake shoe and grease.
- Do not allow the grease of the removed brake shoe to get to other sliding parts.
- Do not allow the grease of the removed brake shoe to get into other grease.



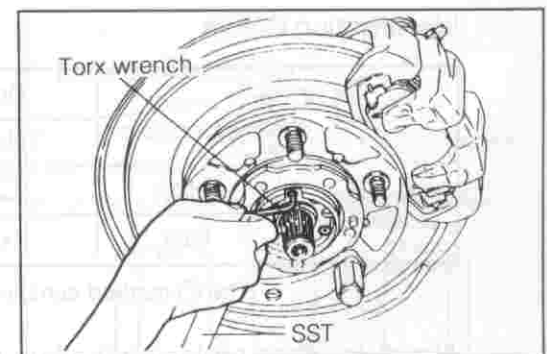
WRE91-FS144

12. Remove the brake drum from the lock nut, using a torx wrench.

NOTE:

- Prevent the axle hub from turning, using the following SST.

SST: 09511-87202-000

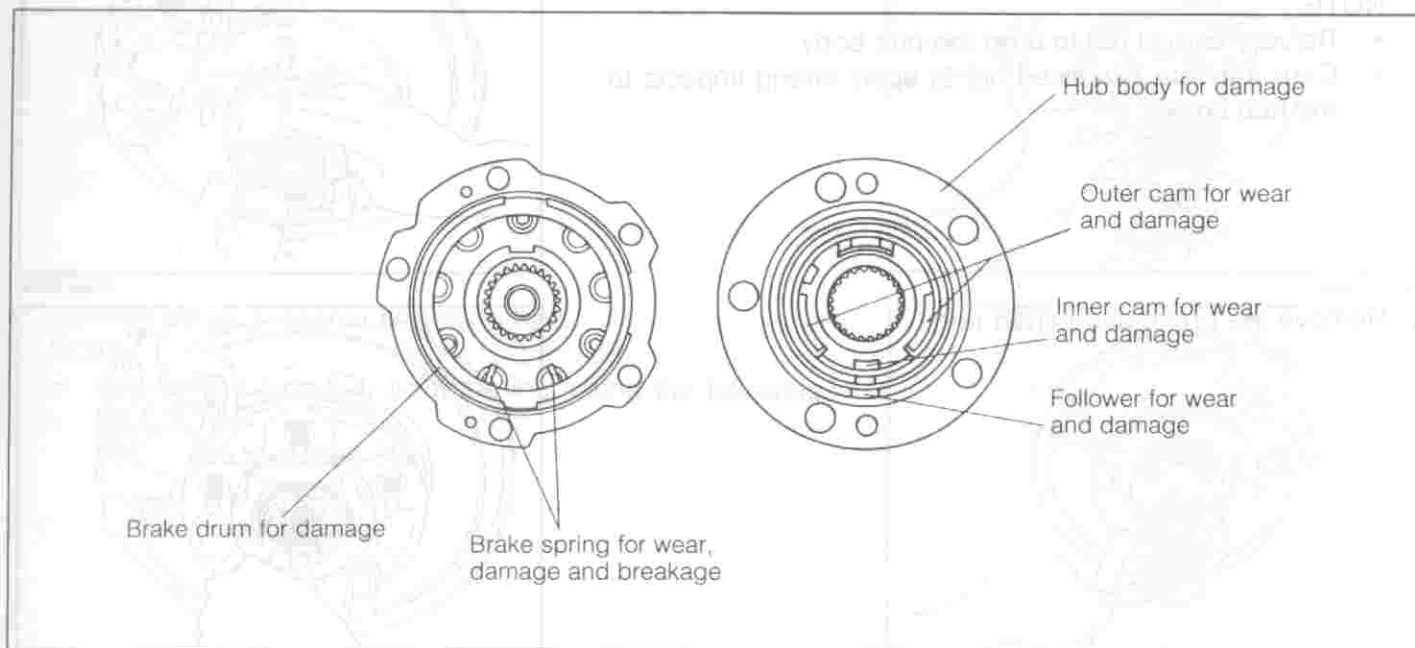


WRE91-FS145

FRONT AXLE & SUSPENSION

Inspection

Check the following parts. Replace any defective parts.



WRE91-FS146

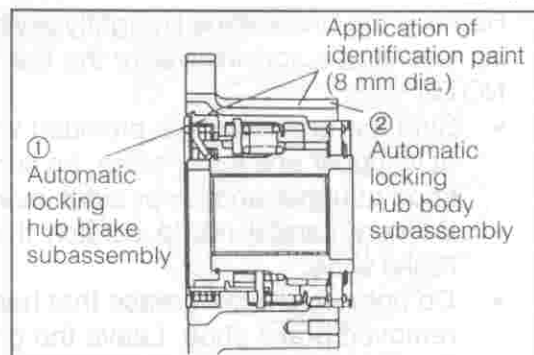
ASSEMBLY

NOTE:

- Identification of Automatic Locking Hub

When the hub body assembly and/or the hub brake subassembly is replaced, it is necessary to consider the combination of the hub body assembly and the hub brake subassembly.

Before these parts are assembled, be certain to confirm their identification, using the table below.



WRE91-FS147

Identification Colors

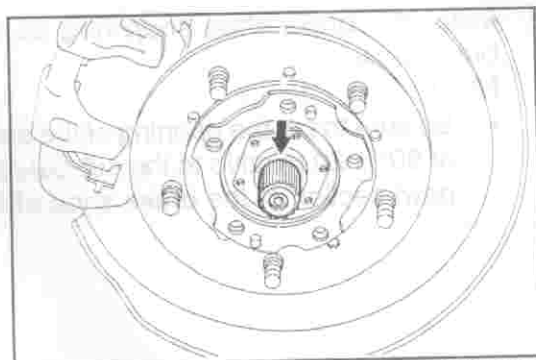
Identification color		Brake subassembly	
		Yellow	blue
Hub body assembly	Yellow	○	○
	Blue	×	○

The ○-marked combination only is acceptable.

However, when replacing the hub brake subassembly, if it is impossible to confirm the identification color of the hub body assembly, be certain to employ a blue brake subassembly.

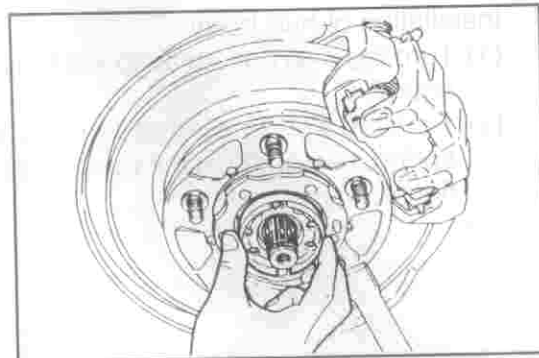
WRE91-FS148

1. Clean the serration section of the drive shaft so as to remove grease or the like.



WRE91-FS149

2. While aligning the brake drum with the groove of the knuckle, assemble them.



WRE91-FS150

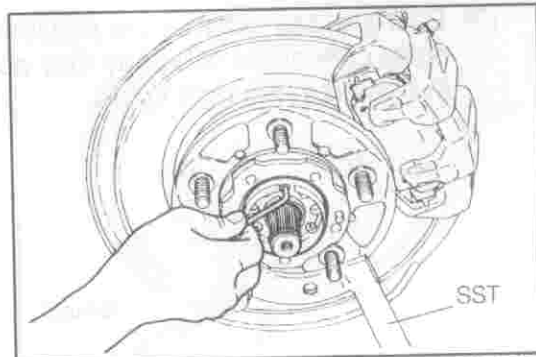
3. Tighten the brake drum attaching screws (torx®) to the specified torque.

Tightening Torque: 4.9 - 8.8 N·m
(0.5 - 0.9 kgf-m, 3.6 - 6.5 ft-lb)

NOTE:

- Prevent the axle hub from turning, using the following SST.

SST: 09511-87202-000

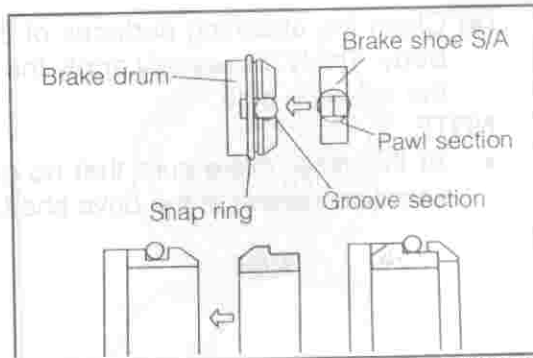


WRE91-FS151

4. Install the brake shoe to the brake drum.

NOTE:

- Since the width of the pawl of the brake shoe differs between the upper section and the lower section, be certain to confirm the width of the pawl before the installation.
- Make sure that the brake shoe is installed in the correct direction.
- Do not remove the grease that has been applied to the brake shoe.
- Do not soil the brake shoe and grease.
- Do not allow the grease applied to the brake shoe to get to other sliding parts.
- Do not allow the grease that has been applied to the brake shoe to get into other grease.



WRE91-FS152

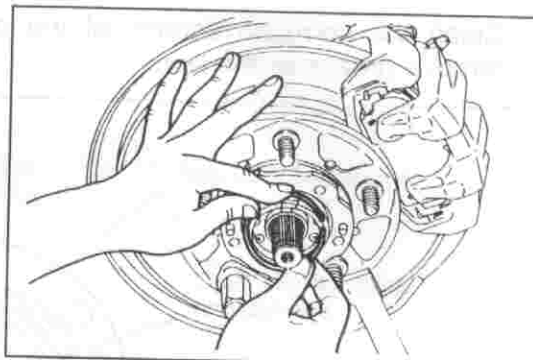
If the grease applied to the brake shoe should be soiled and/or removed, be sure to replace the brake shoe with a new one. The new brake shoe will be supplied with grease applied.

FRONT AXLE & SUSPENSION

5. Install the brake shoe snap ring so as to secure the the brake shoe.

NOTE:

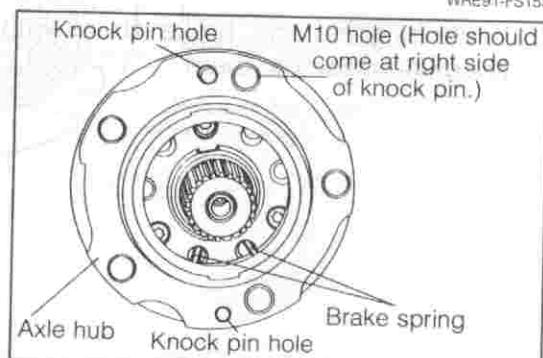
- Be sure to set the opening of the snap ring within a range of $90^\circ \pm 20$ relative to the cut-out section provided at the pawl section of the brake shoe of the brake drum.



WRE91-FS153

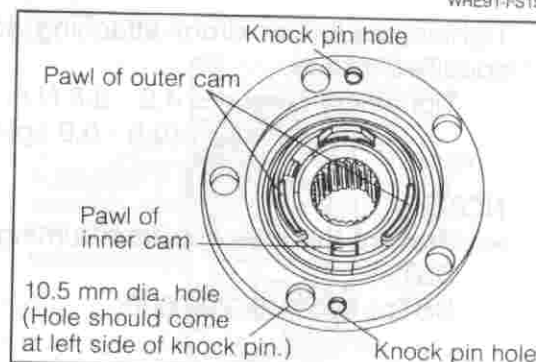
6. Installation of hub body

- (1) Turn the axle hub so as to set it, as indicated in the right figure.
- (2) Turn the spring so that the end section of the brake spring may come at the position as indicated in the right figure.



WRE91-FS154

- (3) Turn the cam so that the pawls of the inner cam and outer cam of the hub body may come at the position as indicated in the right figure.

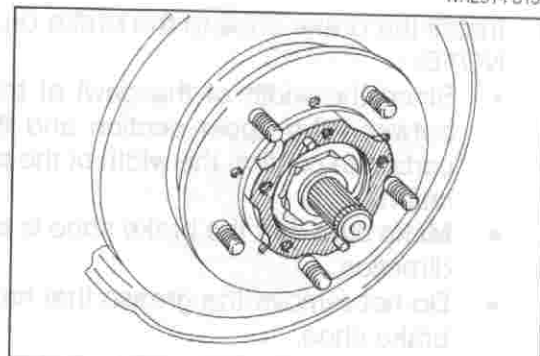


WRE91-FS155

- (4) Clean the attaching surfaces of the axle hub and hub body. Thinly and evenly apply the Three Bond® 1216 to the axle hub side.

NOTE:

- At this time, make sure that no grease is stuck to the serration section of the drive shaft.



WRE91-FS156

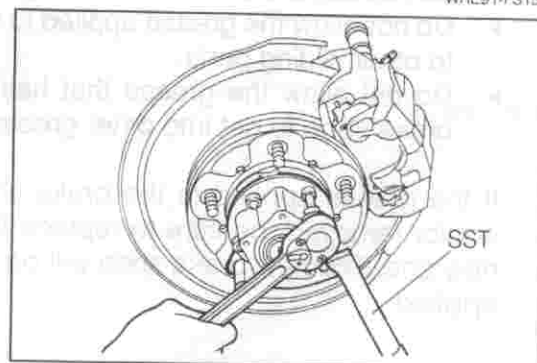
- (5) Install the hub body to the axle hub. Tighten the attaching bolts to the specified torque evenly over two or three stages.

Tightening Torque: 58.8 - 68.6 N·m
(6.0 - 7.0 kgf-m, 43.4 - 50.6 ft-lb)

NOTE:

- Prevent the axle hub from turning, using the following SST.

SST: 09511-87202-000



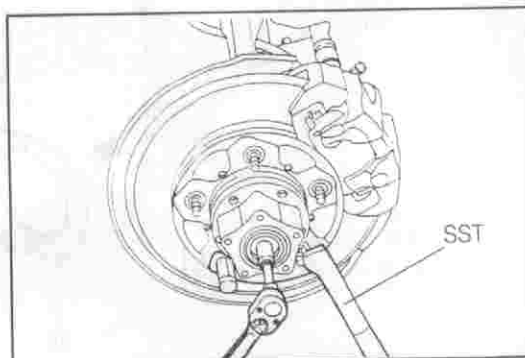
- Use a hexagonal box wrench for the bolt tightening.
- Wipe off any oozed bond.
- Be very careful not to get lithium-based MP grease to the brake shoe subassembly.
- Prior to the bolt tightening, be sure to apply engine oil to the threaded portion of each bolt.

WRE91-FS157

- (6) Install the plate washer with the attaching bolt.
 Tightening Torque: 14.7 - 21.6 N·m
 (1.5 - 2.2 kgf-m, 10.8 - 15.9 ft-lb)

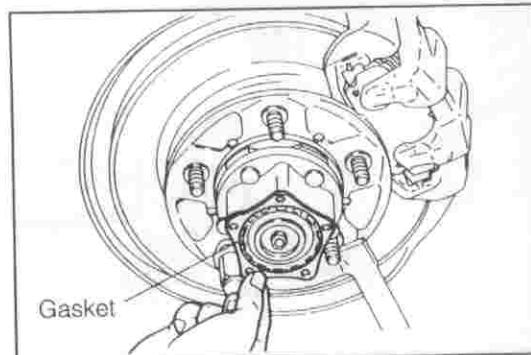
NOTE:

- Prevent the axle hub from turning, using the following SST.
- SST: 09511-87202-000



WRE91-FS158

7. Installation of hub cover
 (1) Install a new gasket to the hub body.

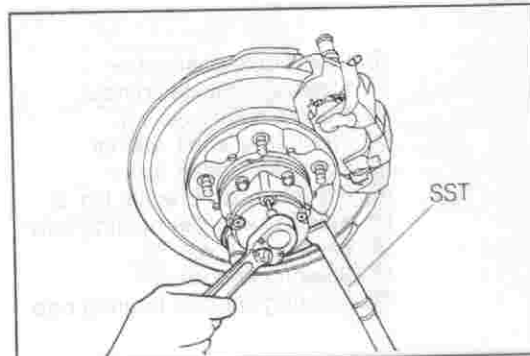


WRE91-FS159

- (2) Install the hub cover with the bolt.
 Tightening Torque: 7.8 - 11.8 N·m
 (0.8 - 1.2 kgf-m, 5.8 - 8.7 ft-lb)

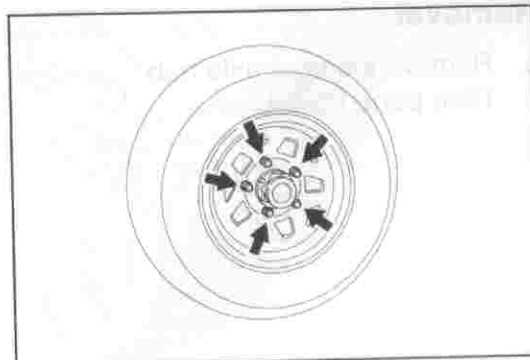
NOTE:

- Prevent the axle hub from turning, using the following SST.
- SST: 09511-87202-000



WRE91-FS160

8. Install the front wheel.
 9. Perform the operation check.
 (See page FS-22.)
 10. Jack up the vehicle and remove the safety stands. Then, jack down the vehicle.



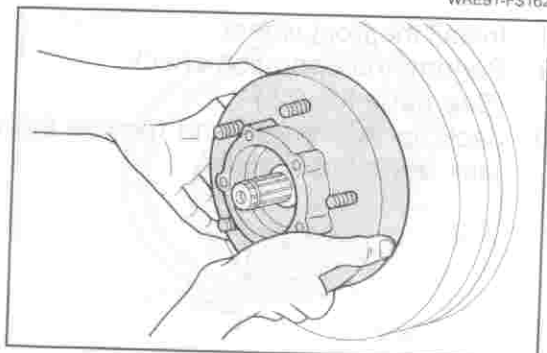
WRE91-FS161

The diagram shows an exploded view of a steering knuckle assembly. Key components include the steering knuckle (1), steering knuckle bearing cap (6), steering knuckle bearing cap (7), shim (11), tapered roller bearing (12), tapered roller bearing (13), plate plug (14), oil seal cover inner plate (15), Type "M" oil seal (16), oil seal cover outer No. 2 plate (17), oil seal cover inner plate (18), and Type "T" oil seal (19). Torque specifications are provided for various bolts and nuts, such as 9.8 - 15.7 (1.0 - 1.6, 7.2 - 11.6) for the front drive shaft Ay (5) and 39.2 - 58.8 (4.0 - 6.0, 28.9 - 43.4) for the steering knuckle bearing cap (6).

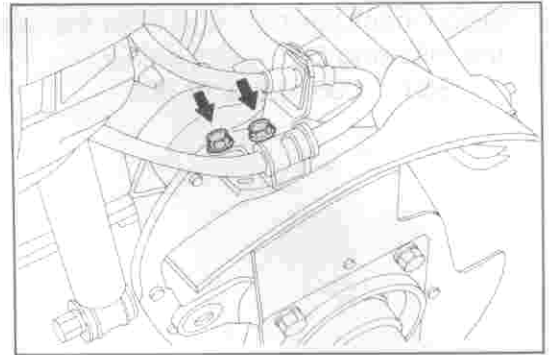
① Disc brake dust cover
② Steering knuckle spindle
③ Needle roller bearing
④ Front drive shaft washer
⑤ Front drive shaft Ay
⑥ Flexible hose bracket No. 5
⑦ Steering knuckle bearing cap
⑧ Shim
⑨ Steering knuckle
⑩ Steering knuckle bearing cap
⑪ Shim
⑫ Tapered roller bearing
⑬ Tapered roller bearing
⑭ Plate plug
⑮ Oil seal cover inner plate
⑯ Type "M" oil seal
⑰ Oil seal cover outer No. 2 plate
⑱ Oil seal cover inner plate
⑲ Type "T" oil seal

17.7 - 29.4 (1.8 - 3.0, 13.0 - 21.7)
9.8 - 15.7 (1.0 - 1.6, 7.2 - 11.6)
39.2 - 58.8 (4.0 - 6.0, 28.9 - 43.4)
17.7 - 29.4 (1.8 - 3.0, 13.0 - 21.7)
39.2 - 53.9 (4.0 - 5.5, 28.9 - 39.8)

1. Remove the front axle hub.
(See page FS-23.)

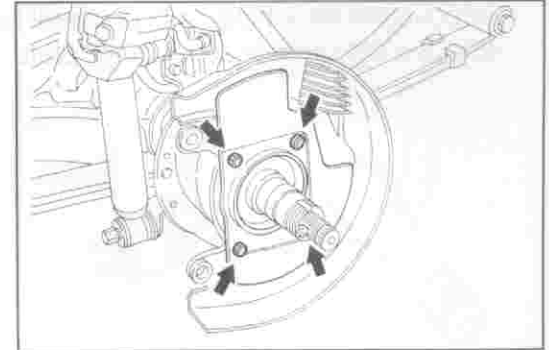


2. Remove the brake hose clamp from the steering knuckle.



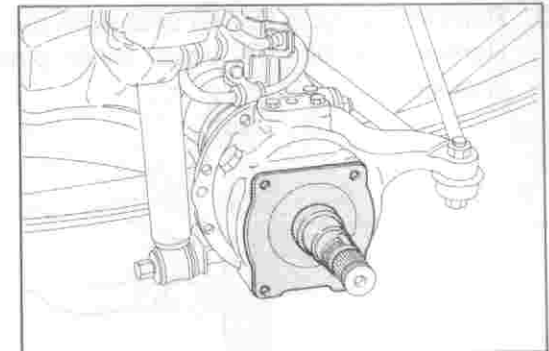
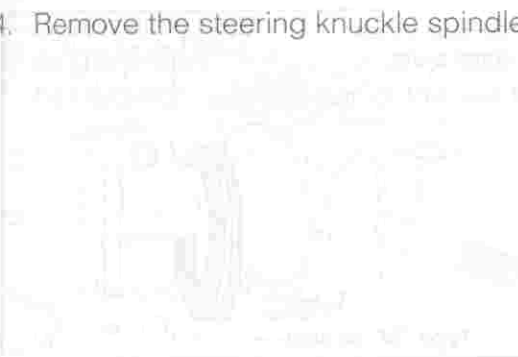
WRE91-FS164

3. Remove the disc brake dust cover.



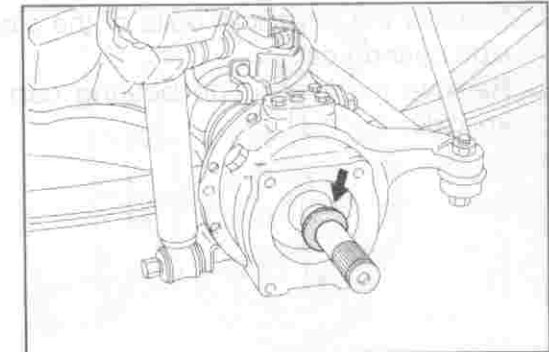
WRE91-FS165

4. Remove the steering knuckle spindle.



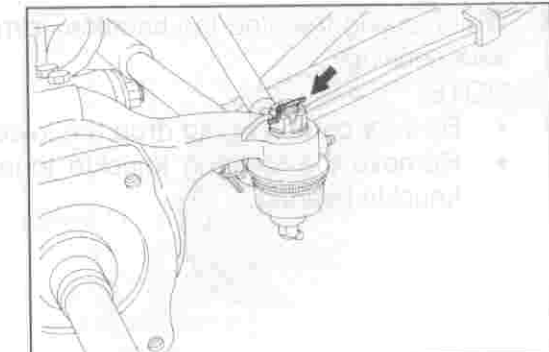
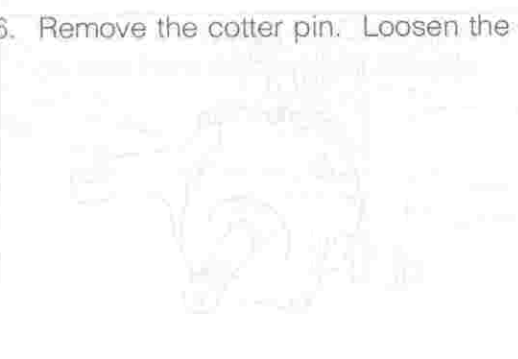
WRE91-FS166

5. Remove the thrust washer.



WRE91-FS167

6. Remove the cotter pin. Loosen the castle nut.

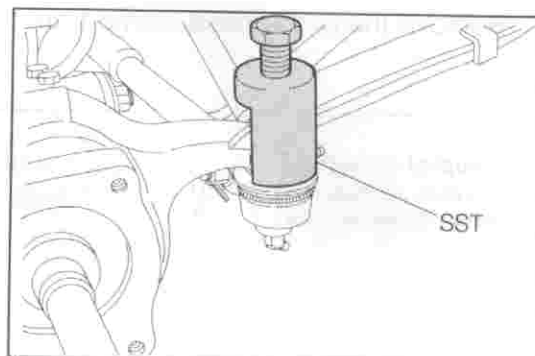


WRE91-FS168

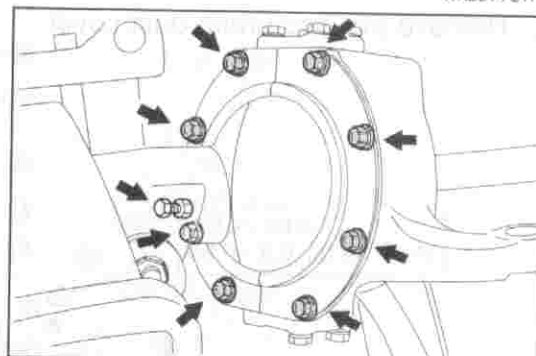
FRONT AXLE & SUSPENSION

7. Disconnect the ball joint from the steering knuckle, using the following SST given below.

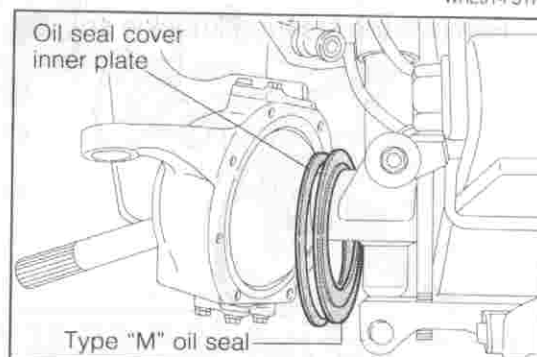
SST: 09610-20012-000



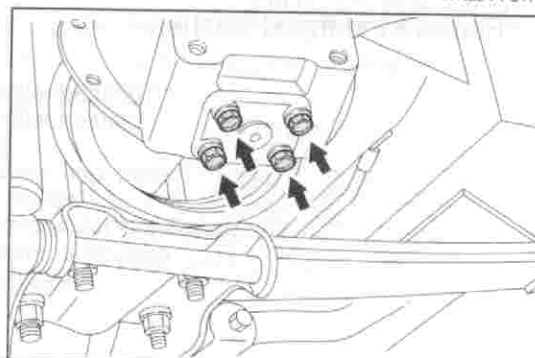
8. Remove the attaching bolts of the oil seal cover outer plate.
9. Remove the oil seal cover outer plate.



10. Remove the type "M" oil seal from the steering knuckle.
11. Remove the oil seal cover inner plate from the steering knuckle.



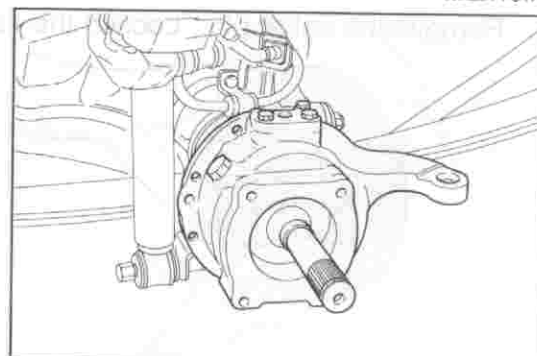
12. Remove the attaching bolts of the steering knuckle lower side bearing cap.
13. Remove the lower side bearing cap and shim from the knuckle.



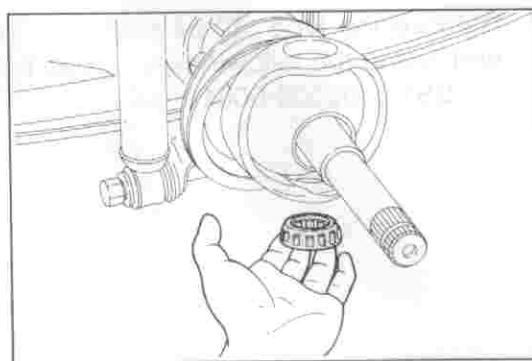
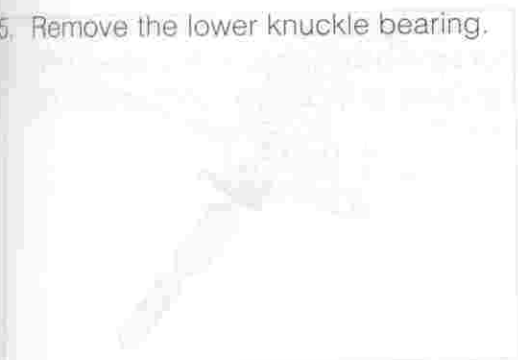
14. While raising the steering knuckle, remove it from the front axle housing.

NOTE:

- Be very careful not to drop the lower knuckle bearing.
- Remove the steering knuckle together with the upper knuckle bearing.

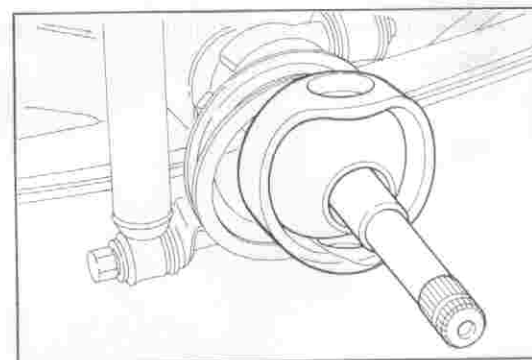
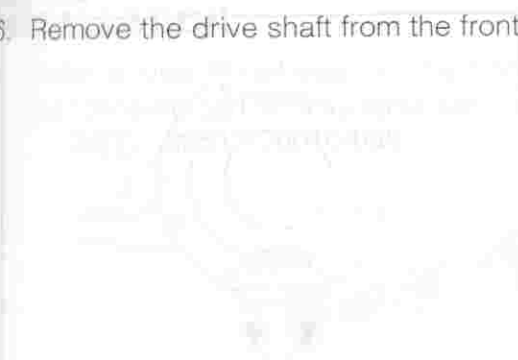


15. Remove the lower knuckle bearing.



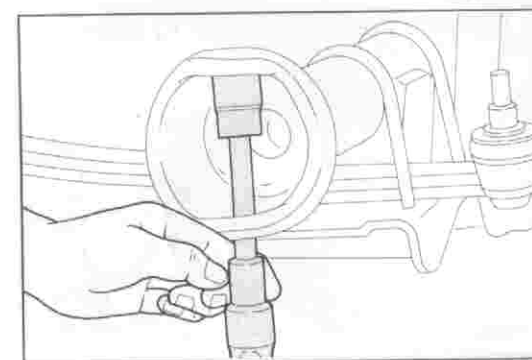
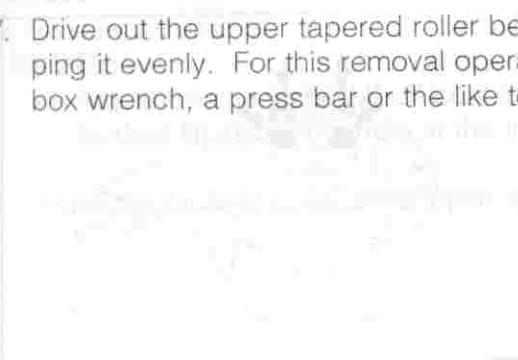
WRE91-FS175

16. Remove the drive shaft from the front axle housing.



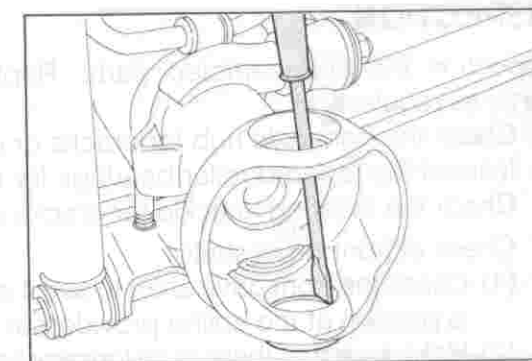
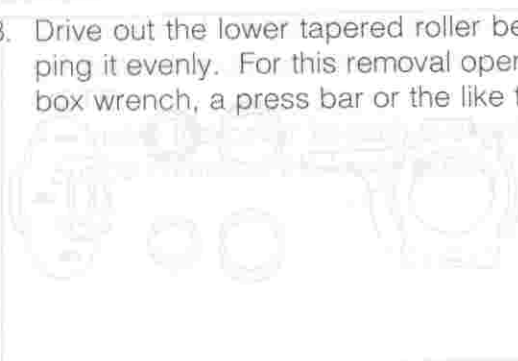
WRE91-FS176

17. Drive out the upper tapered roller bearing outer race, tapping it evenly. For this removal operation, apply a suitable box wrench, a press bar or the like to the outer race.



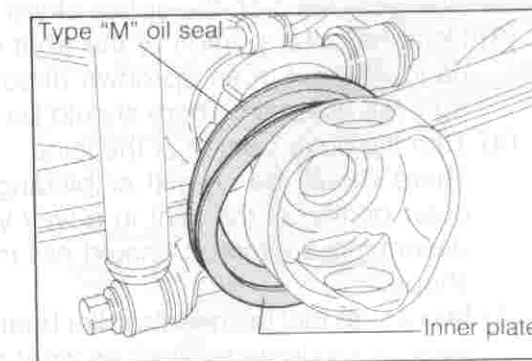
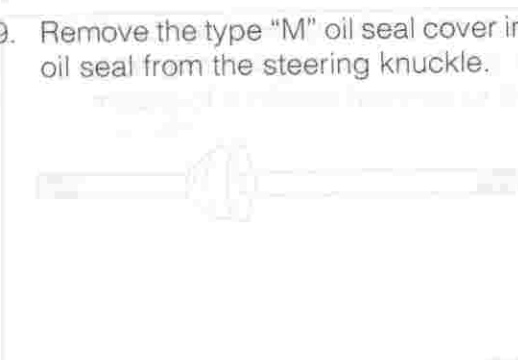
WRE91-FS177

18. Drive out the lower tapered roller bearing outer race, tapping it evenly. For this removal operation, apply a suitable box wrench, a press bar or the like to the outer race.



WRE91-FS178

19. Remove the type "M" oil seal cover inner plate and type "M" oil seal from the steering knuckle.

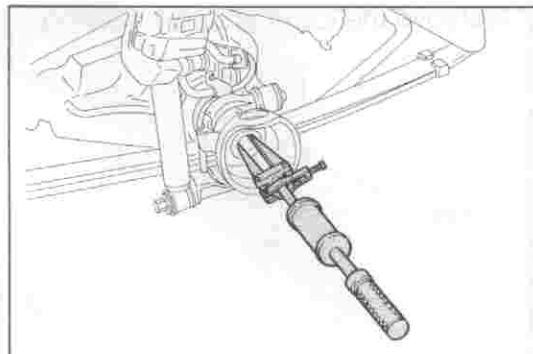


WRE91-FS179

FRONT AXLE & SUSPENSION

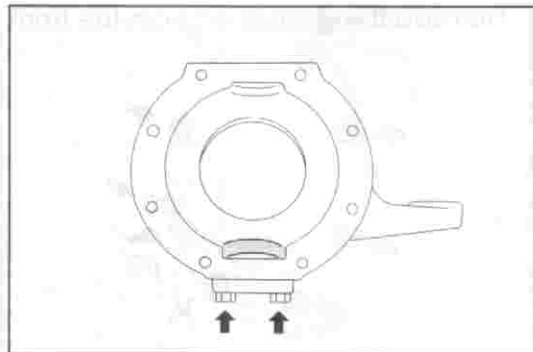
20. Remove the type "T" oil seal from the front axle housing end, using the following SST given below.

SST: 09308-00010-000



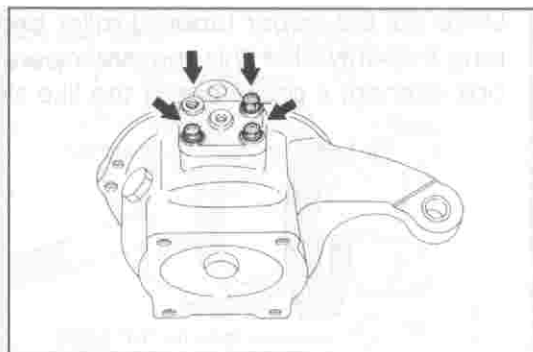
WRE91-FS180

21. Remove the tapered roller bearing from the upper bearing cap.



WRE91-FS181

22. Remove the upper bearing cap.

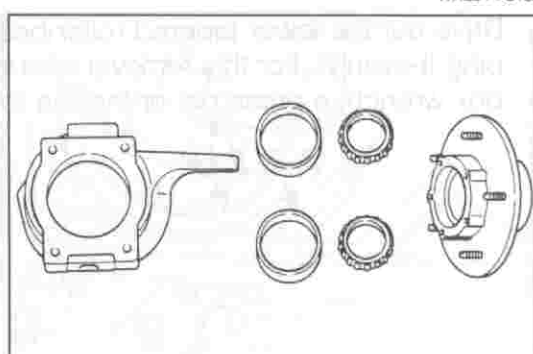


WRE91-FS182

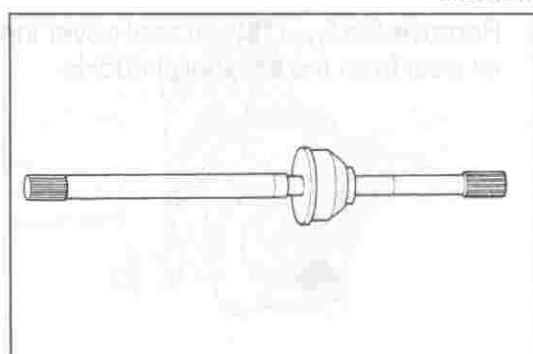
INSPECTION

Inspect the disassembled parts. Replace any defective parts, as required.

1. Check the front axle hub for cracks or damage.
2. Inspect the tapered roller bearings for damage or wear.
3. Check the steering knuckle for cracks or damage.
4. Check of front drive shaft.
 - (1) Check the front drive shaft to see if any damage or wear is present at the spline provided at its end.
 - (2) Make sure that there is no looseness with the differential side gear fitted on the spline of the front drive shaft.
 - (3) Hold the outer portion of the front drive shaft by your hand. Move it in an up-down direction as well as in a right-left direction. There should be no looseness.
 - (4) Turn the outer portion of the joint. There should be no stiff or binding feeling. Move the outer portion of the joint in a way you would do when describing a circle. It should not move in a triangular shape.
 - (5) Make sure that the needle roller bearing contact surface exhibits no damage, such as wear and seizure.

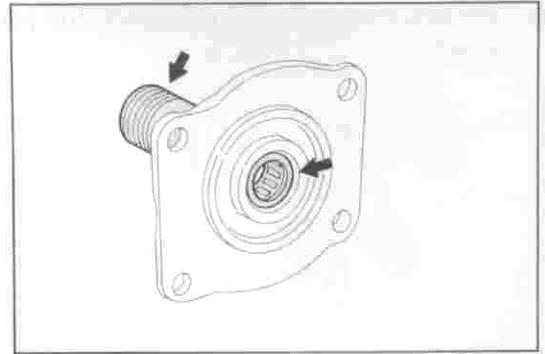


WRE91-FS183



WRE91-FS184

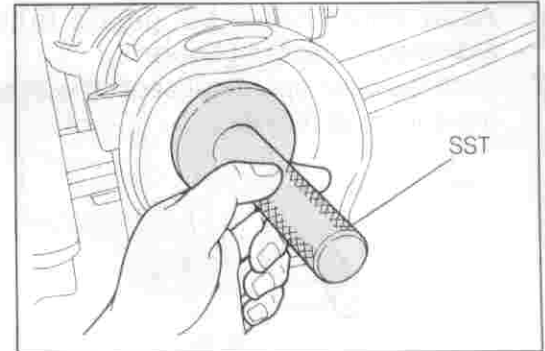
5. Check of steering knuckle spindle
 - (1) Check the bearing-fitting-area for wear or damage.
 - (2) Inspect the needle roller bearing for damage or wear.



WRE91-FS185

INSTALLATION

1. Install a type "T" oil seal into the front housing end, using the following SST or a suitable tool.
SST: 09517-30010-000



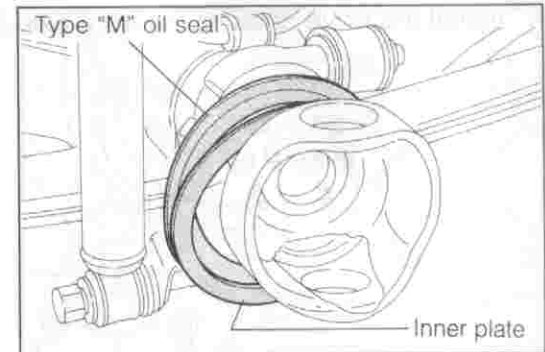
WRE91-FS186

2. Install the type "M" oil seal to the front axle.

NOTE:

- Assemble the type "M" oil seal in such a direction that its dust lip section comes at the inside of the vehicle.

3. Install the oil seal cover inner plate to the front axle.



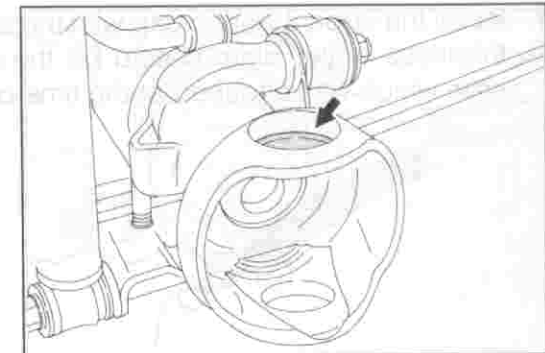
WRE91-FS187

4. Installation of tapered roller bearing outer race

- (1) Install the upper bearing lower cover to the front axle.

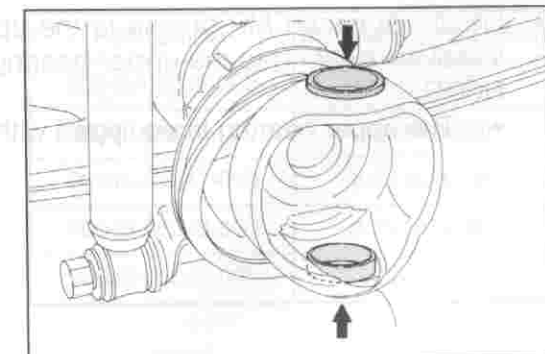
NOTE:

- Install the cover in such a direction that the protruded side comes to the lower side.



WRE91-FS188

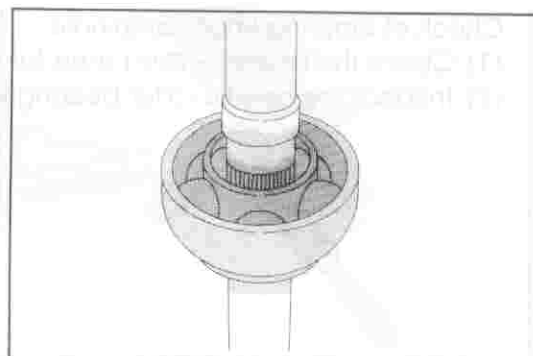
- (2) Place the bearing outer race to the front axle. Drive the race into position by applying a force to it evenly by means of a plastic hammer or the like.



WRE91-FS189

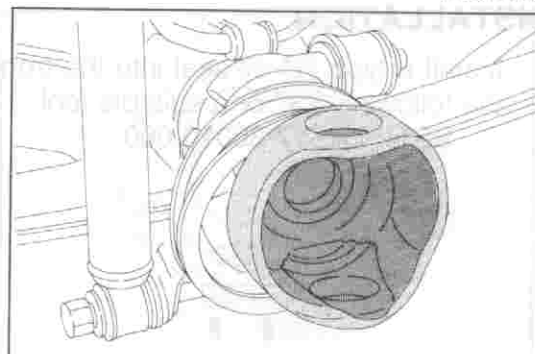
FRONT AXLE & SUSPENSION

5. Fill lithium based MP grease to the joint section of the drive shaft.



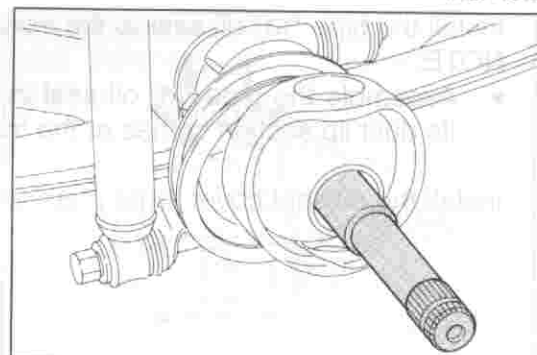
WRE91-FS190

6. Apply lithium based MP grease to the front axle end as indicated in the right figure.
7. Coat the outer spherical section with a film of MP grease of more than 10 mm thick.



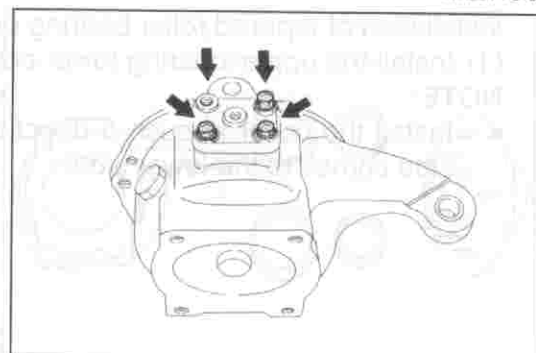
WRE91-FS191

8. Install the drive shaft to the front axle housing.



WRE91-FS192

9. Install the upper bearing cap with the shim interposed. The thickness of this shim should be the same as that of the shim which was attached at the time of disassembly.

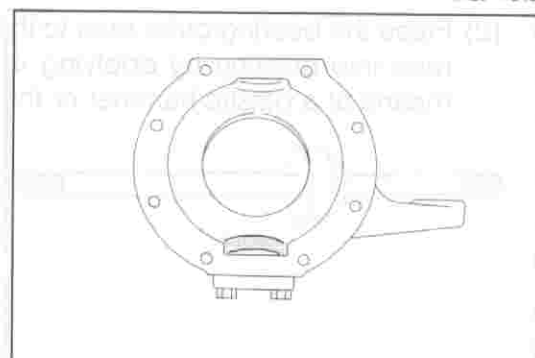


WRE91-FS193

10. Fill lithium based MP grease to the upper bearing. Then, install the bearing to the upper bearing cap.

NOTE:

- The upper bearing is equipped with an oil seal.

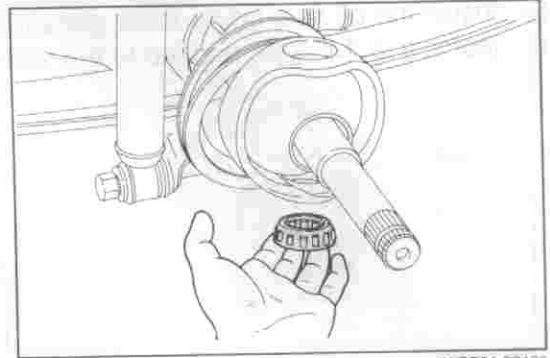


WRE91-FS194

11. Fill grease to the lower bearing. Then, install the bearing to the front axle.

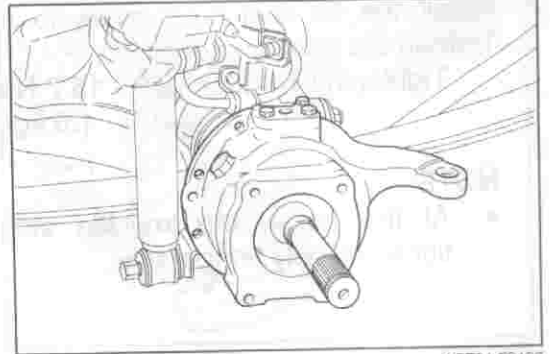
NOTE:

- Be very careful not to drop the bearing.



WRE91-FS195

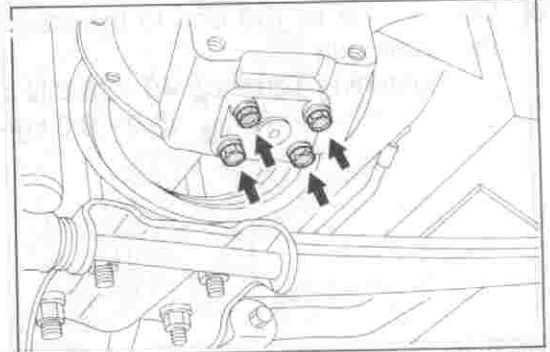
12. Assemble the steering knuckle to the front axle.



WRE91-FS196

13. Install the lower bearing cap to the steering knuckle with the shim interposed. The thickness of this shim should be the same as that of the shim which was attached at the time of disassembly.

Tightening Torque: 17.7 - 29.4 N·m
(1.8 - 3.0 kgf-m, 13 - 21.7 ft-lb)



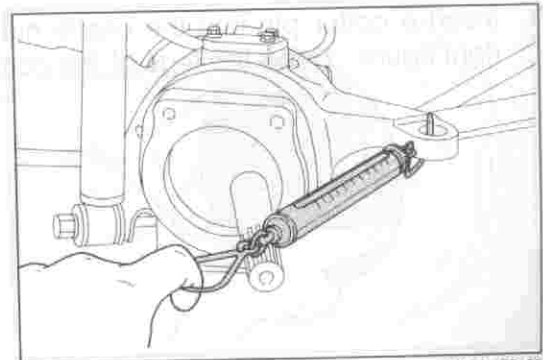
WRE91-FS197

14. Adjust the starting torque of the tapered roller bearing (kingpin preload) as follows:

- (1) Hook a spring scale at the steering knuckle's hole which accommodates the tie rod end. Gently pull the spring scale so as to measure starting torque.

Starting Torque: 16.7 - 41.2 N·cm
1.7 - 4.2 kgf-cm, 1.5 - 3.6 inch-lbs)

Starting Load: 0.1 - 0.3 kgf (0.2 - 0.7 lb)



WRE91-FS198

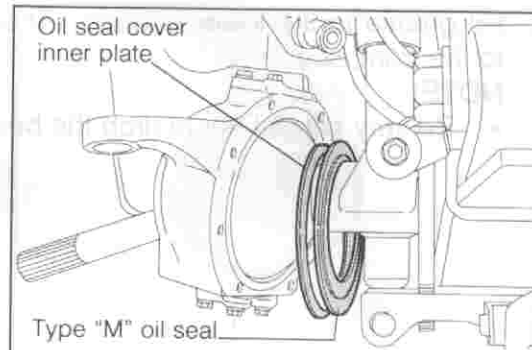
- (2) Select a shim pack from among shims shown in the right table in order that the specified starting torque may be obtained. When the shim pack thickness decreases, the starting torque will become greater. Conversely, when the shim pack thickness increases, the starting torque will become less. The thickness of the upper shim pack should be the same as that of the lower shim pack.

Part number	Thickness	mm (inch)
90045-65045-000	0.1	(0.0039)
90045-65046-000	0.15	(0.0059)
90045-65047-000	0.20	(0.0079)
90045-65048-000	0.25	(0.0098)
90045-65049-000	0.30	(0.012)

WRE91-FS199

FRONT AXLE & SUSPENSION

15. Install the oil seal cover inner plate to the steering knuckle.
16. Install the "M" type oil seal to the steering knuckle.

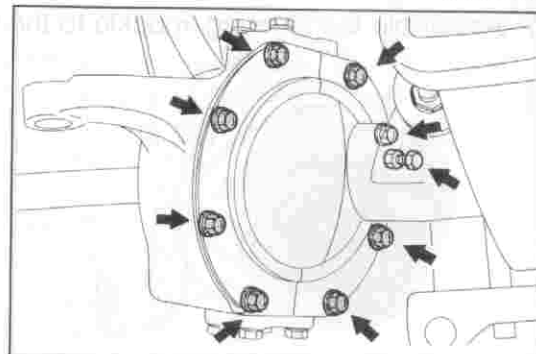


17. Install the oil seal outer plate to the steering knuckle. Tighten the attaching bolts.

Tightening Torque: 9.8 - 15.7 N·m
(1.0 - 1.6 kgf-m, 7.2 - 11.6 ft-lb)

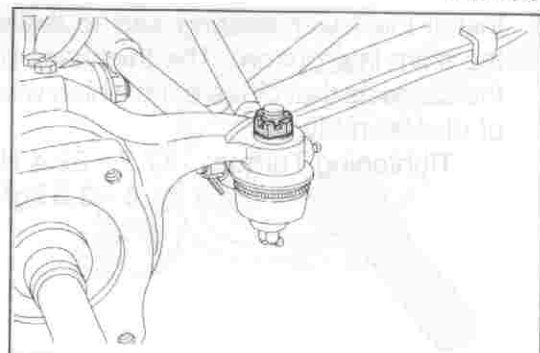
NOTE:

- At this stage, the knuckle stopper bolt should be tightened only temporarily.

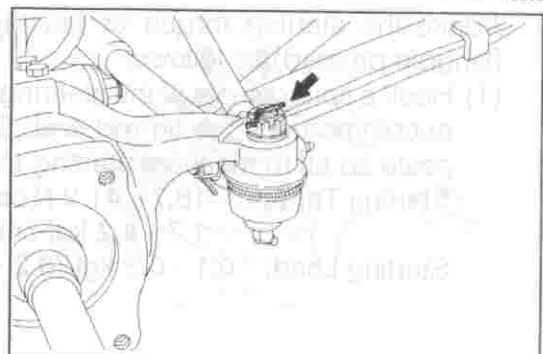


18. Connect the tie rod end to the steering knuckle. Tighten the castle nut.

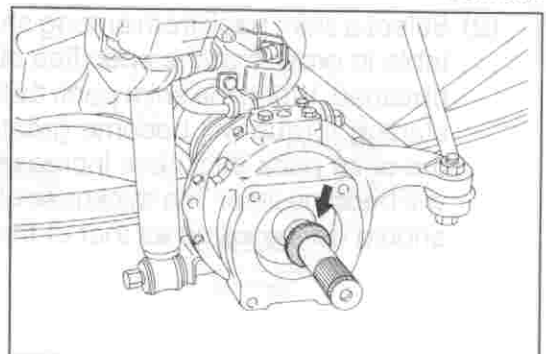
Tightening Torque: 49 - 88.2 N·m
(5.0 - 9.0 kgf-m, 36.2 - 65.1 ft-lb)



19. Insert a cotter pin into the castle nut, as indicated in the right figure. Bend the legs of the cotter pin.

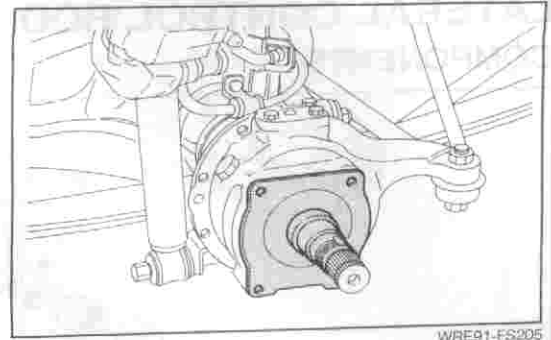


20. Apply lithium-based MP grease to the thrust washer. Insert the thrust washer into the drive shaft.
21. Fill 480 to 530 grams of grease into the steering knuckle.



22. Install the steering knuckle spindle to the steering knuckle.
NOTE:

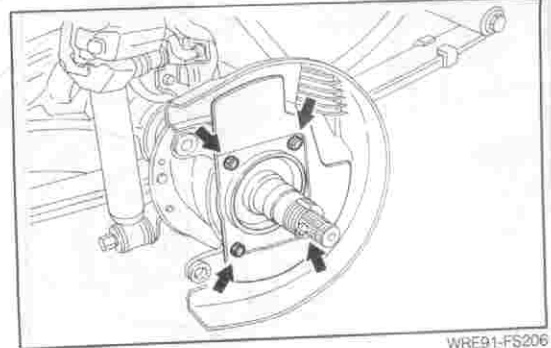
- Prior to the installation, apply Three Bond[®] 1104 to the steering knuckle attaching surface of the steering knuckle spindle.



WRE91-FS205

23. Install the disc brake dust cover and tighten the attaching bolts to the specified torque.

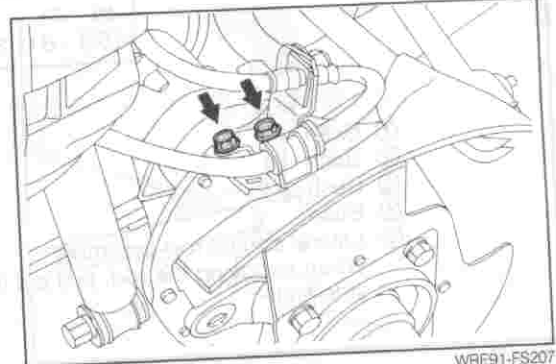
Tightening Torque: 39.2 - 53.9 N·m
(4.0 - 5.5 kgf-m, 28.9 - 39.8 ft-lb)



WRE91-FS206

24. Install the brake hose clamp to the steering knuckle.

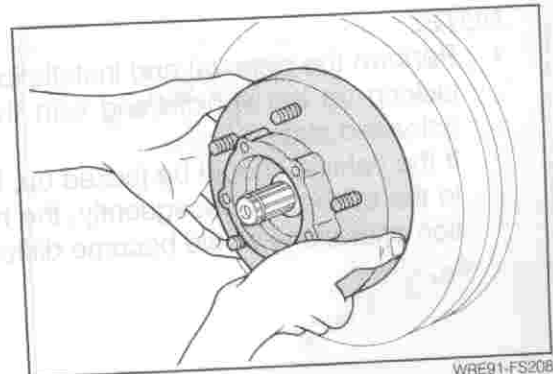
Tightening Torque: 17.6 - 29.4 N·m
(1.8 - 3.0 kgf-m, 13.0 - 21.7 ft-lb)



WRE91-FS207

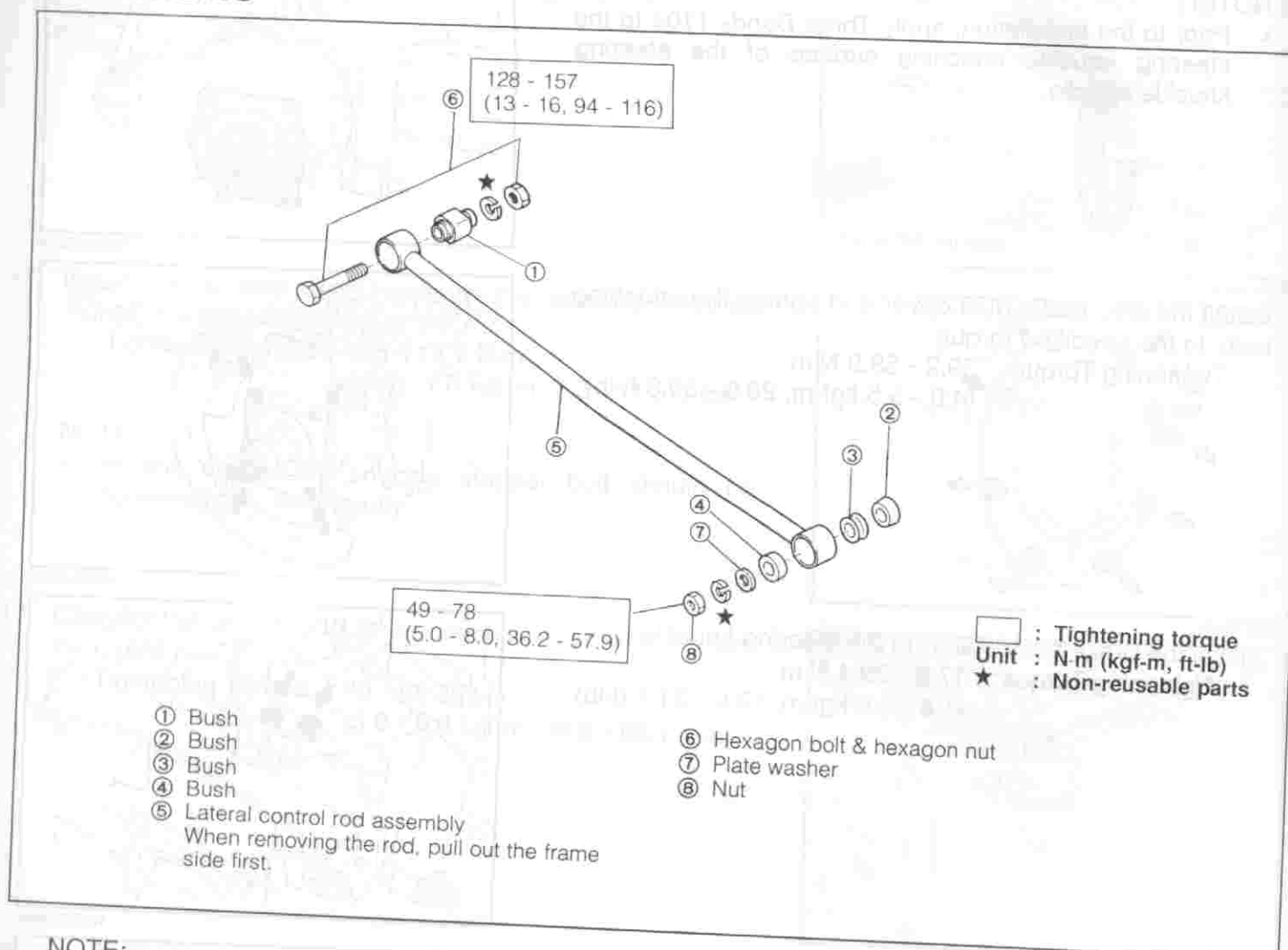
25. Install the front axle hub.
(See page FS-28.)

26. Adjust the wheel turning angle.
(See page FS-20.)



WRE91-FS208

LATERAL CONTROL ROD COMPONENTS

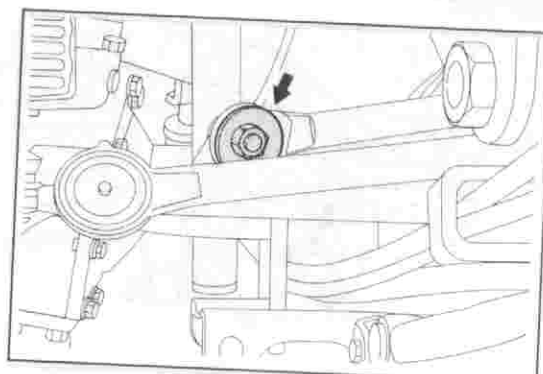


NOTE:

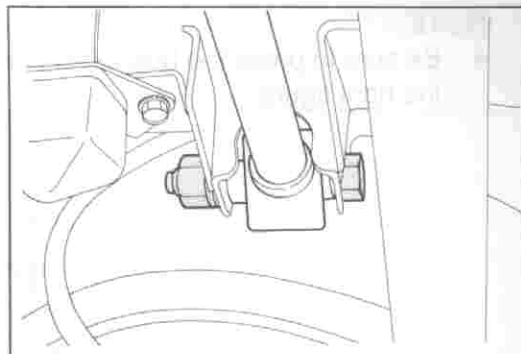
- Perform the removal and installation operations without jacking up the vehicle and with the vehicle under the unloaded state.
If the vehicle should be jacked up, loads will be applied to the bushes. Consequently, the removal and installation operations would become difficult.

REMOVAL

1. Remove the attaching nut, spring washer, plate washer and bush of the lateral control rod at the front axle side.

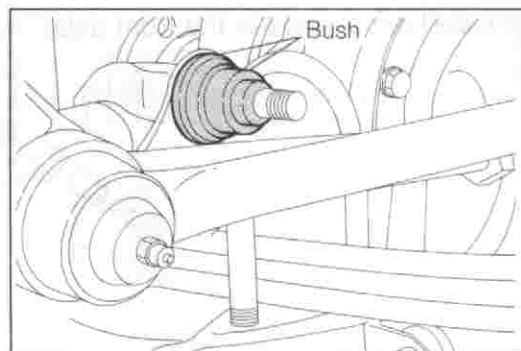


2. Remove the attaching nut at the frame side of the lateral control rod. Remove the spring washer and bolt.
3. Remove the lateral control rod from the vehicle.



WRE91-FS212

4. Remove the bushes from the front axle.

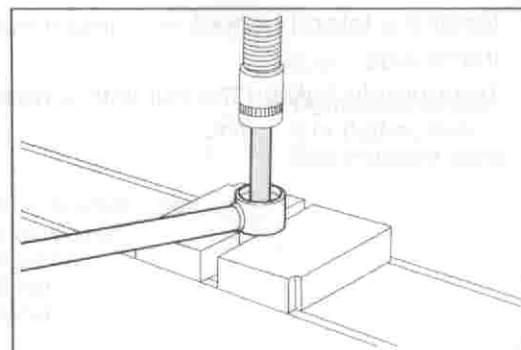


WRE91-FS213

5. Press off the lateral control rod bushes by means of a hydraulic press or the like.

NOTE:

- Never reuse the removed bushes.



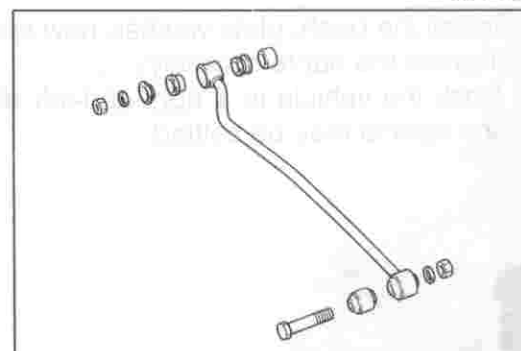
WRE91-FS214

INSPECTION

1. Check that the lateral control rod exhibits no defect, such as deformation, cracks and abnormal bend.
2. Check that the bolts, nuts and plate washers exhibit no damage, such as deformation and cracks.
3. Check that the bushes exhibit no defect, such as wear.

NOTE:

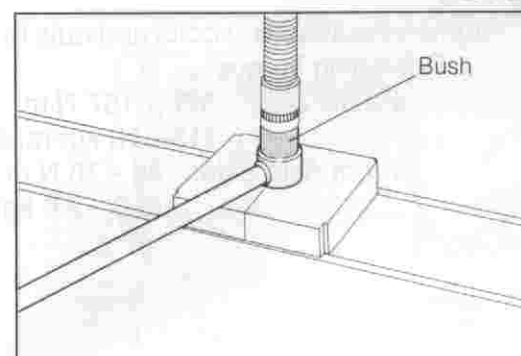
- Never reuse the pressed bushes.



WRE91-FS215

INSTALLATION

1. Press the bushes to the lateral control rod by means of a hydraulic press or the like.



WRE91-FS216

FRONT AXLE & SUSPENSION

NOTE:

- Be sure to press the bushes into position as indicated in the right figure.

2. Install the bushes to the front axle.

3. Install the lateral control rod. Insert the attaching bolt at the frame side.
4. Temporarily tighten the nut with a new washer interposed.

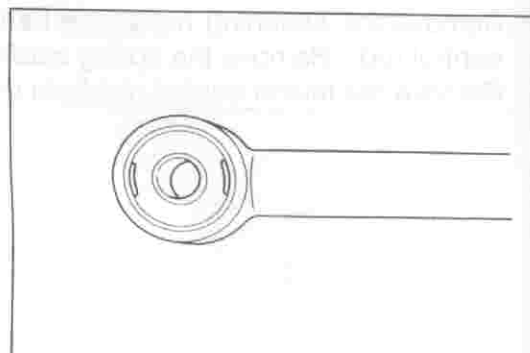
5. Install the bush, plate washer, new spring washer and nut. Tighten the nut temporarily.
6. Rock the vehicle in a right-and-left direction in order that the vehicle may be settled.

7. Tighten the attaching bolts and nuts to the specified torque.

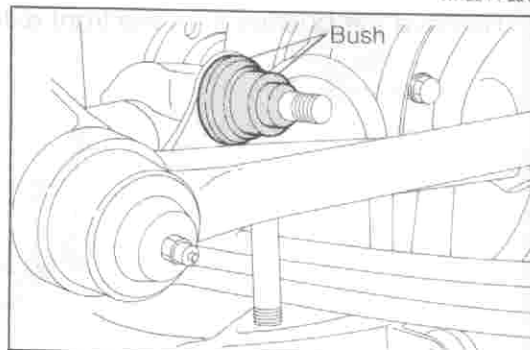
Tightening Torque:

Frame Side: 128 - 157 N·m
(13 - 16 kgf·m, 94-116 ft·lb)

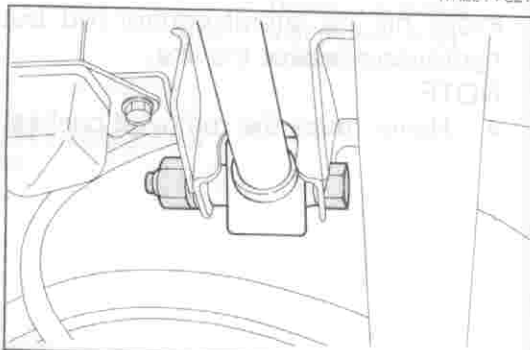
Front Axle Side: 49 - 78 N·m
(5.0 - 8.0 kgf·m, 36.2 - 57.9 ft·lb)



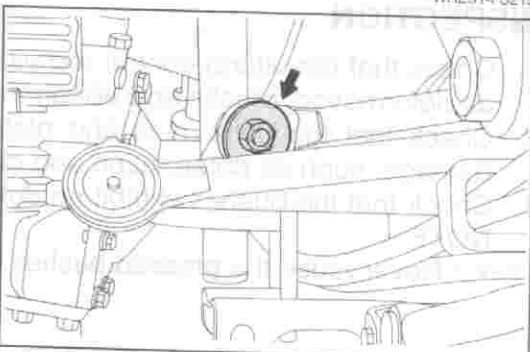
WRE91-FS217



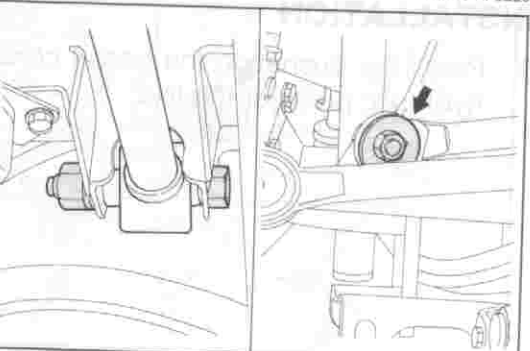
WRE91-FS218



WRE91-FS219

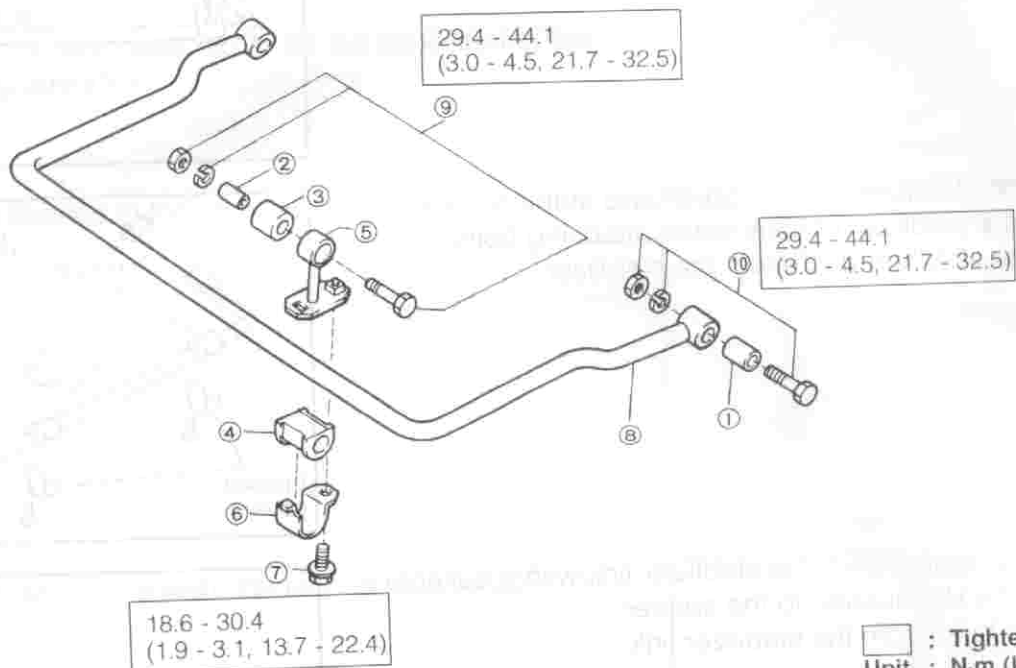


WRE91-FS220



WRE91-FS221

STABILIZER COMPONENTS



- ① Bush
- ② Spacer
- ③ Bush
- ④ Stabilizer bush
- ⑤ Stabilizer link sub assembly

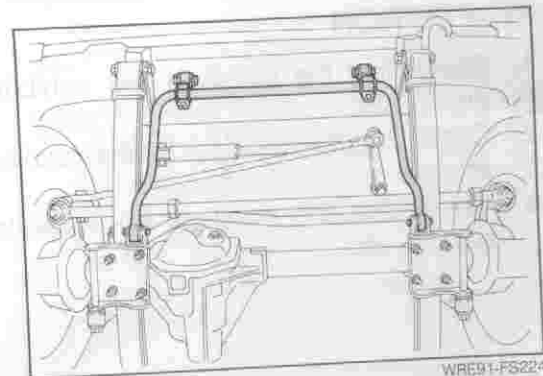
- ⑥ Stabilizer bracket cover
- ⑦ Bolt with washer
- ⑧ Stabilizer bar
- ⑨ Bolt & nut
- ⑩ Bolt & nut

NOTE:

- Perform the removal and installation operations without jacking up the vehicle and with the vehicle under the unloaded state.
If the vehicle should be jacked up, loads will be applied to the stabilizer. Consequently, the removal and installation operations would become difficult.

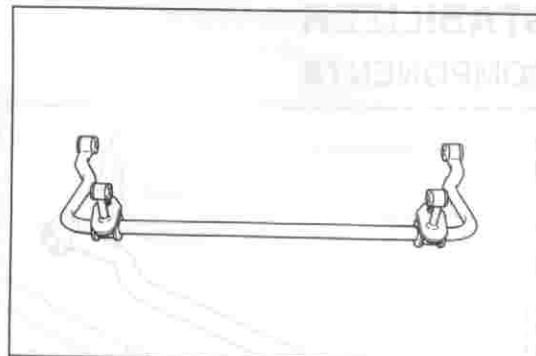
REMOVAL

1. Remove the stabilizer, attaching nuts, spring washers and bolts.



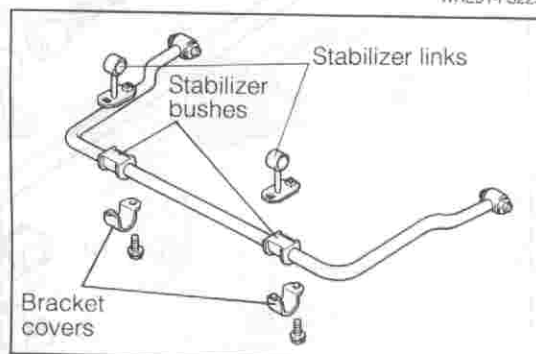
FRONT AXLE & SUSPENSION

2. Remove the stabilizer assembly from the vehicle.



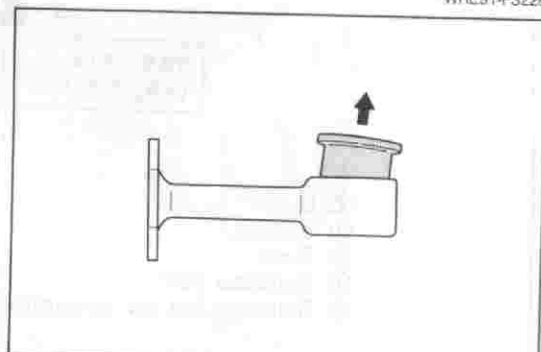
WRE91-FS225

3. Remove the stabilizer bracket cover and stabilizer link by removing the stabilizer bracket cover attaching bolts.
4. Remove the stabilizer bush from the stabilizer.



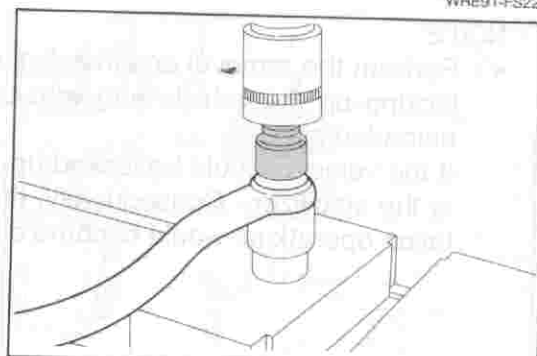
WRE91-FS226

5. Drive out the spacer from the stabilizer link with a suitable iron rod or the like applied to the spacer.
6. Remove the bush from the stabilizer link.



WRE91-FS227

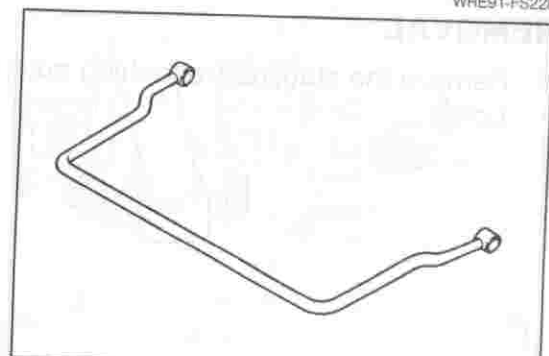
7. Drive out the bush from the stabilizer bar, using a suitable box wrench or the like, (as required).



WRE91-FS228

INSPECTION

1. Check that the stabilizer bar exhibits no deformation or cracks, etc.
2. Check that the stabilizer bushes exhibit no wear or cracks, etc.
3. Check that the stabilizer link exhibits no deformation or cracks, etc.



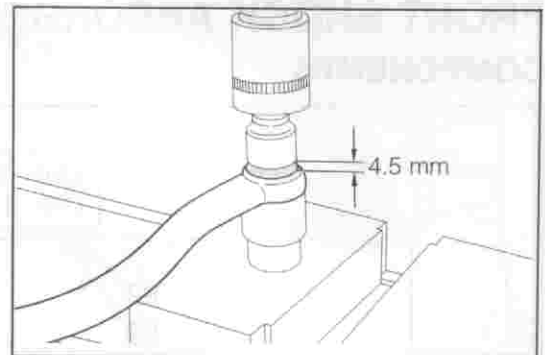
WRE91-FS229

INSTALLATION

1. Press the bush into the stabilizer bar, using a suitable box wrench or the like.

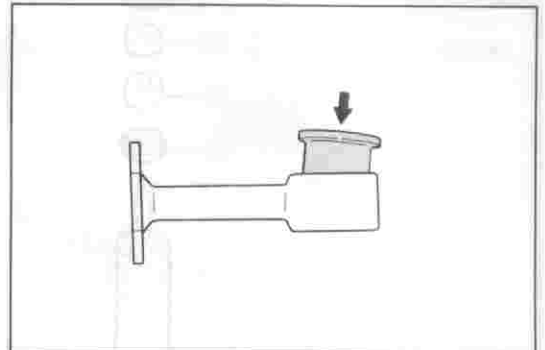
NOTE:

- The bush should be protruded 4.5 mm from the stabilizer edge surface.
- Care must be exercised not to tilt the bush during the press-fitting operation.



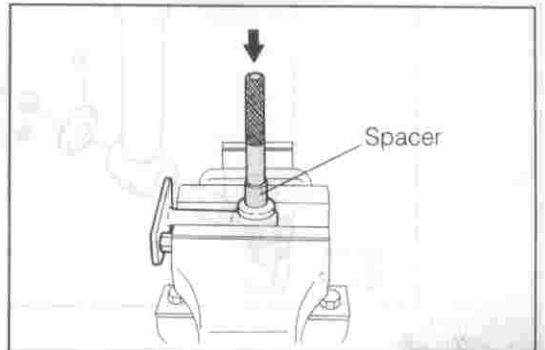
WRE91-FS230

2. Assemble the bushes to the stabilizer link.



WRE91-FS231

3. Insert the spacer into the stabilizer link, using a suitable rod or the like.

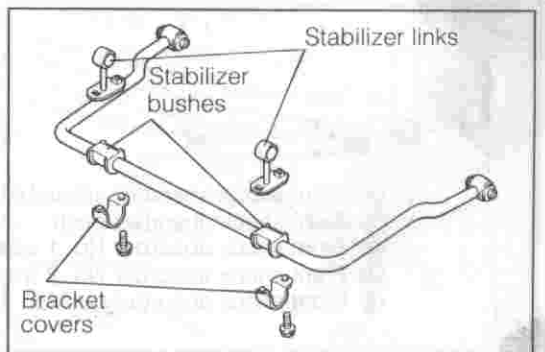


WRE91-FS232

4. Install the stabilizer bushes to the stabilizer.
5. Install the stabilizer links to the stabilizer bushes.
6. Install the stabilizer bracket covers. Temporarily tighten the attaching bolts.
7. Install the stabilizer assembly to the vehicle with the bolts, new spring washers and nuts. Temporarily tighten the stabilizer assembly.

NOTE:

- Do not reuse the spring washers.



WRE91-FS233

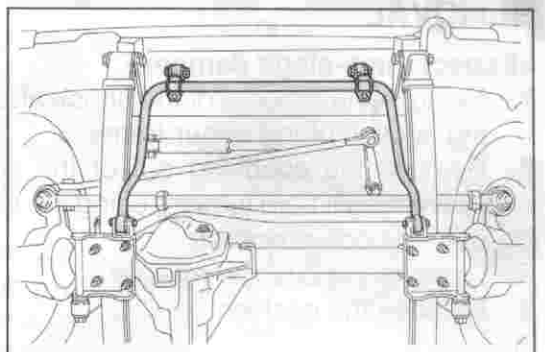
8. Rock the vehicle several times in order that the vehicle may be settled.
9. Tighten the attaching bolts and nuts of the stabilizer assembly to the specified torque.

Tightening Torque:

Frame Side: 29.4 - 44.1 N·m
(3.0 - 4.5 kgf-m, 21.7 - 32.5 ft-lb)

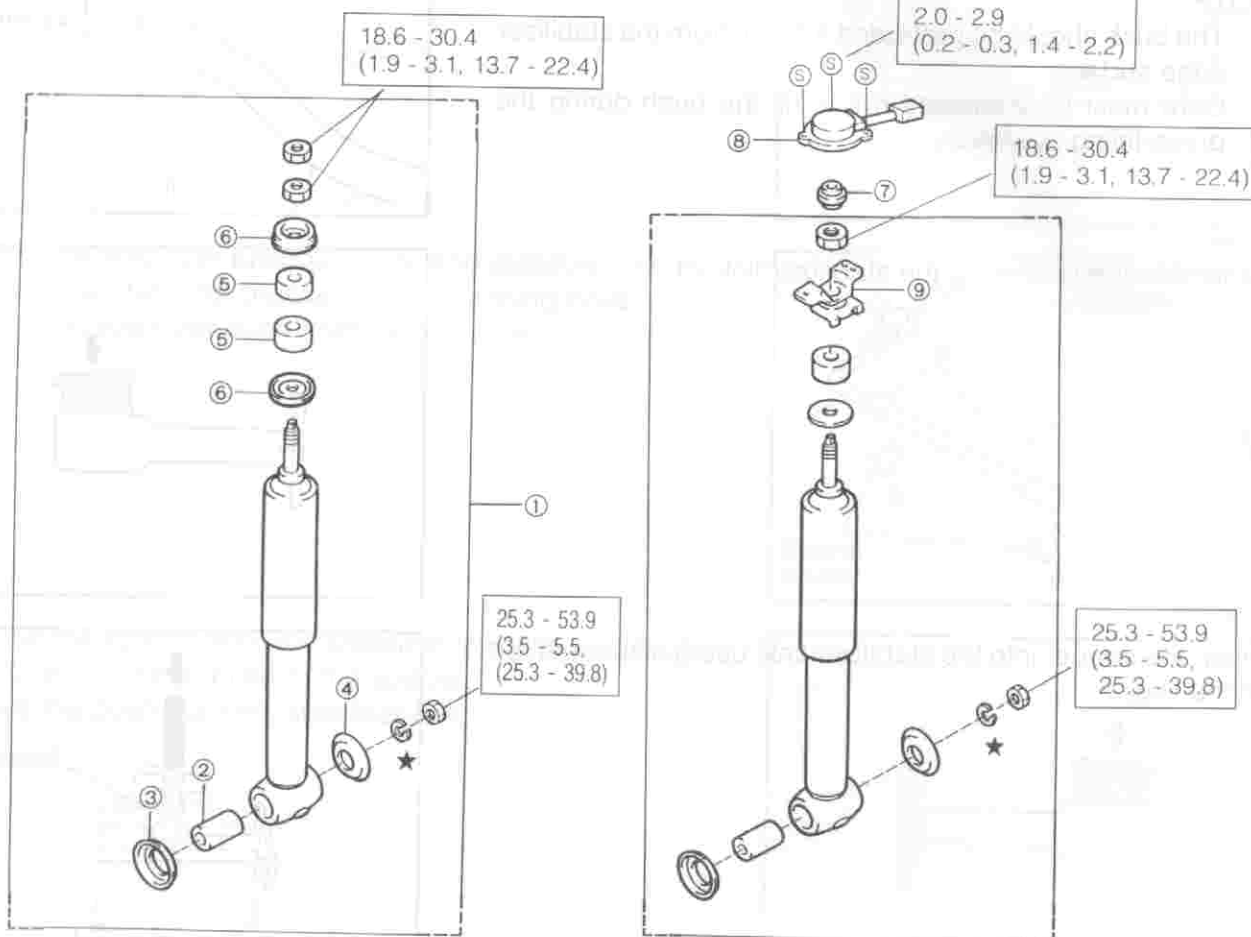
Front Axle Side: 29.4 - 44.1 N·m
(3.0 - 4.5 kgf-m, 21.7 - 32.5 ft-lb)

Stabilizer Bracket Cover:
18.6 - 30.4 N·m
(1.9 - 3.1 kgf-m, 13.7 - 22.4 ft-lb)



WRE91-FS234

FRONT SHOCK ABSORBER COMPONENTS



- ① Front shock absorber assembly
- ② Front shock absorber bush
- ③ Front shock absorber No. 1 washer
- ④ Front shock absorber No. 2 washer
- ⑤ Front shock absorber cushion

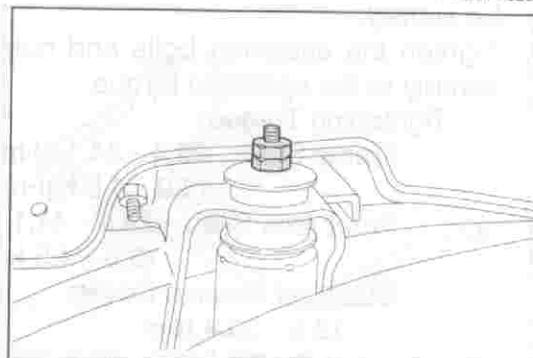
- ⑥ Front shock absorber cushion retainer
- ⑦ Dust seal
- ⑧ Absorber control actuator
- ⑨ Absorber control actuator bracket

□ : Tightening torque
Unit : N·m (kgf-m, ft-lb)
★ : Non-reusable parts

REMOVAL

<Expect three-stage damper>

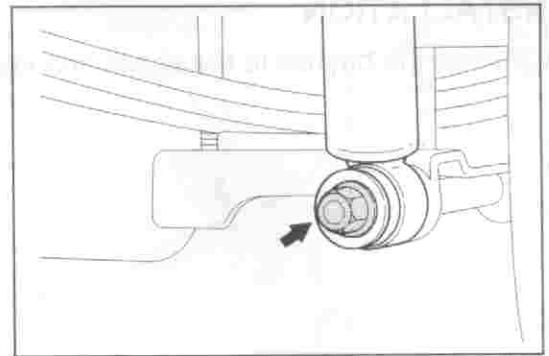
1. Remove the lock nut of the shock absorber at the connecting section of the upper frame.
2. Remove the attaching nut of the shock absorber, while preventing it from turning, using the section across two flats of the shock absorber.
3. Remove the cushion retainer.
4. Remove the cushion.



WRE91-FS235

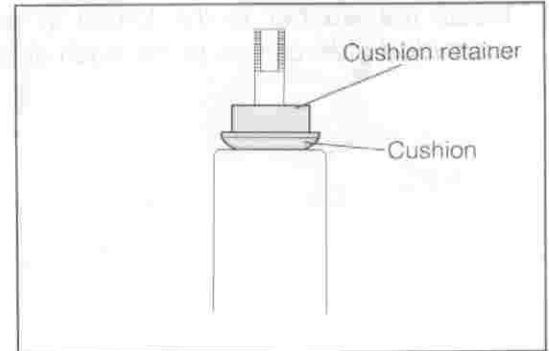
WRE91-FS236

5. Remove the attaching nut at the connecting section of the U-bolt seat of the shock absorber. Remove the plate washer and spring washer.
6. Remove the shock absorber from the vehicle, while contracting the shock absorber.



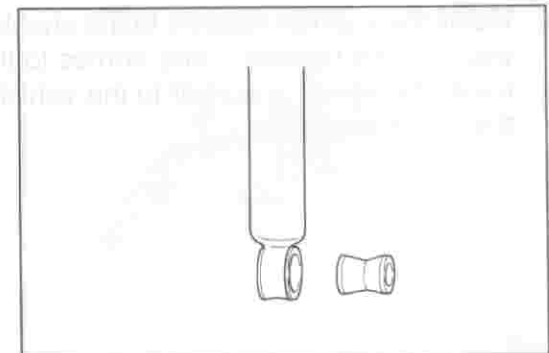
WRE91-FS237

7. Remove the cushion and cushion retainer from the removed shock absorber.



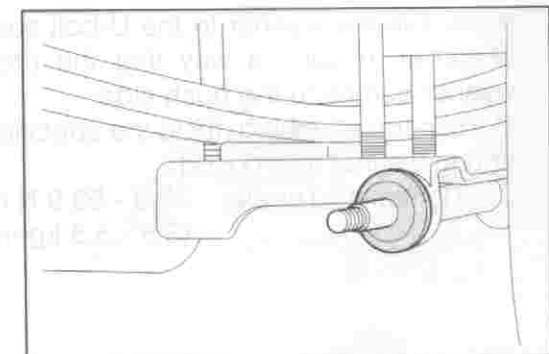
WRE91-FS238

8. Remove the bush from the shock absorber.



WRE91-FS239

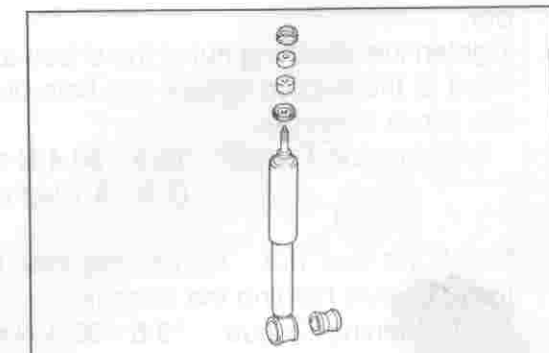
9. Remove the cushion retainer from the U-bolt seat.



WRE91-FS240

INSPECTION

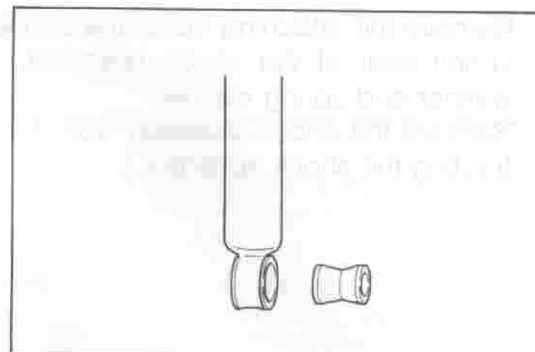
1. Check that the shock absorber exhibits no defect, such as deformation or oil leakage.
2. Check that the bushes and/or cushions exhibit no cracks or wear.
3. Check that the damping force is not abnormal.



WRE91-FS241

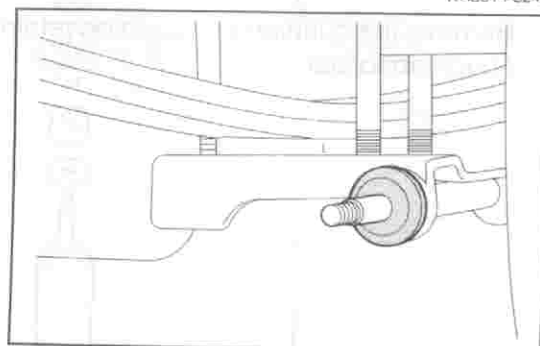
INSTALLATION

1. Install the bushes to the shock absorber.



WRE91-FS242

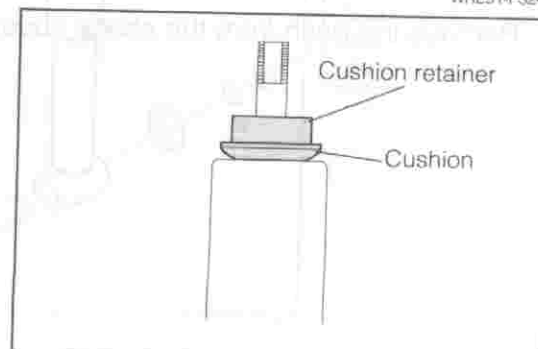
2. Install the washer to the U-bolt in such a way that the protruded side comes to the bush side.



WRE91-FS243

3. Install the cushion retainer to the shock absorber in such a way that the recessed side comes to the cushion side.

4. Install the shock absorber to the vehicle, while contracting the shock absorber.

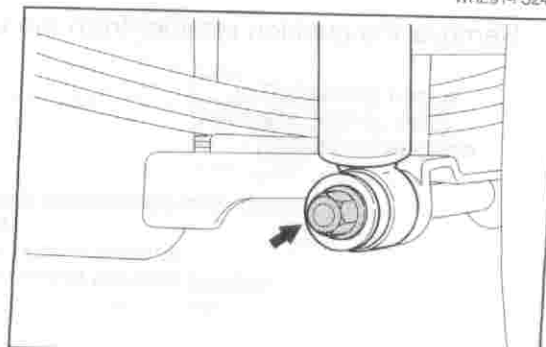


WRE91-FS244

5. Assemble the washer to the U-bolt seat side of the shock absorber in such a way that the protruded side of the washer comes to the bush side.

6. Tighten the attaching nut to the specified torque with a new spring washer interposed.

Tightening Torque: 25.3 - 53.9 N·m
(3.5 - 5.5 kgf-m, 25.3 - 39.8 ft-lb)

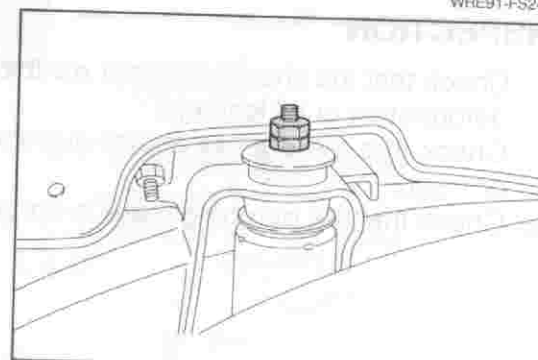


WRE91-FS245

7. Install the cushion and cushion retainer to the shock absorber.

8. Tighten the attaching nut of the shock absorber, while holding it at the section across two flats provided at the top of the shock absorber.

Tightening Torque: 18.6 - 30.4 N·m
(1.9 - 3.1 kgf-m, 13.7 - 22.4 ft-lb)



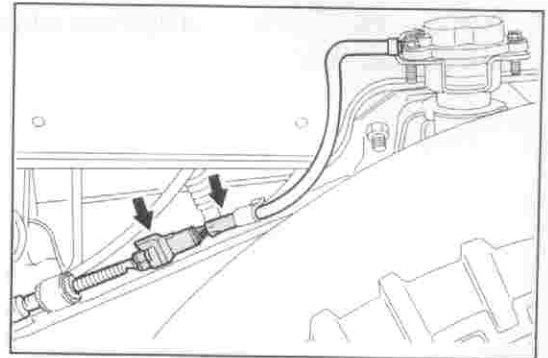
WRE91-FS246

9. Install the lock nut. Tighten the lock nut to the specified torque, while holding the attaching nut.

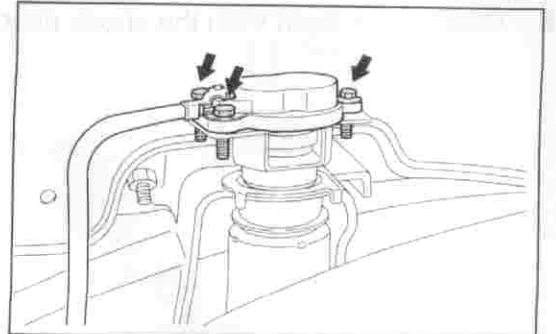
Tightening Torque: 18.6 - 30.4 N·m
(1.9 - 3.1 kgf-m, 13.7 - 22.4 ft-lb)

Three-stage damper>

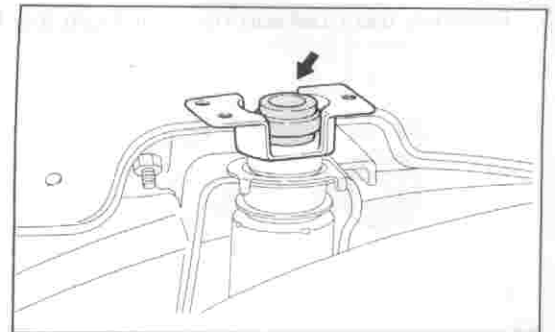
1. Disconnect the harness of the three-stage actuator. Remove the harness from the clamp.
2. Remove the three-stage actuator from the bracket.
3. Remove the dust-proof cover.
4. Remove the three-stage actuator bracket by removing the attaching nut.
5. Remove the attaching nut at the connecting section of the U-bolt seat of the shock absorber. Remove the plate washer and spring washer.
6. Remove the shock absorber from the vehicle, while contracting the shock absorber.



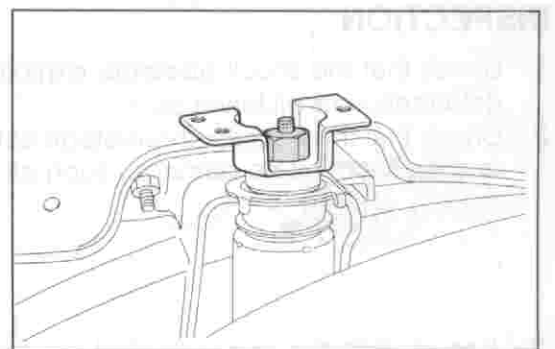
WRE91-FS247



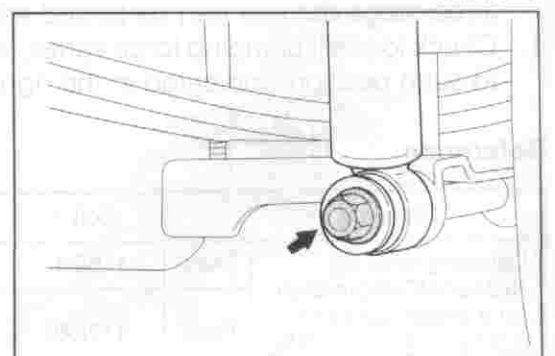
WRE91-FS248



WRE91-FS249



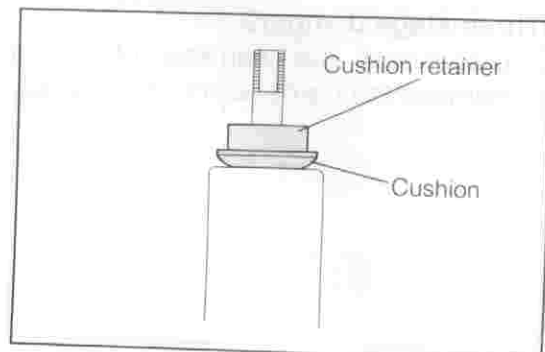
WRE91-FS250



WRE91-FS251

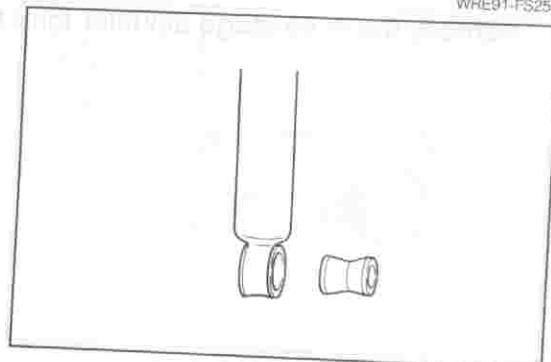
FRONT AXLE & SUSPENSION

- Remove the cushion and cushion retainer from the removed shock absorber.



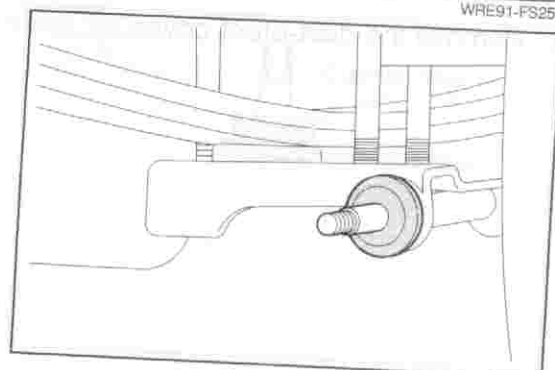
WRE91-FS252

- Remove the bush from the shock absorber.



WRE91-FS253

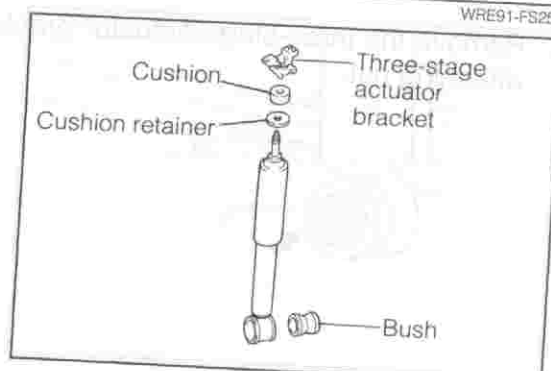
- Remove the cushion retainer from the U-bolt seat.



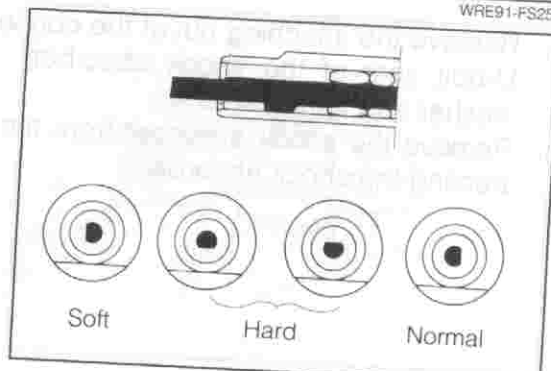
WRE91-FS254

INSPECTION

- Check that the shock absorber exhibits no defect, such as deformation or oil leakage.
- Check that the bushes, three-stage actuator bracket and/or cushions exhibit no damage, such as cracks or wear.
- Ensure that the rod provided on the upper side of the three-stage damper can be turned easily with a pliers.
- Check to see if damping force varies, when the rod is turned to such positions indicated in the right figure.



WRE91-FS255



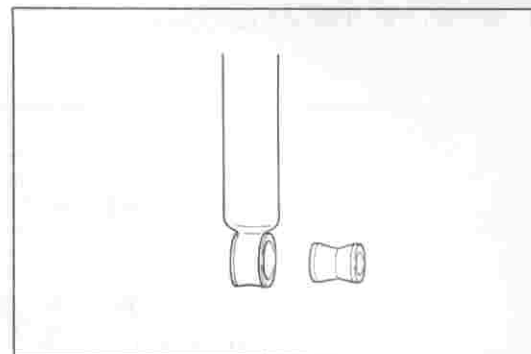
WRE91-FS256

Reference

Selecting mode		Soft	Normal	Hard
Damping force kg Rebound/Compression [at a piston speed of 0.3m/s]	Front	118/28	140/41	182/55
	Rear	117/30	135/40	180/47

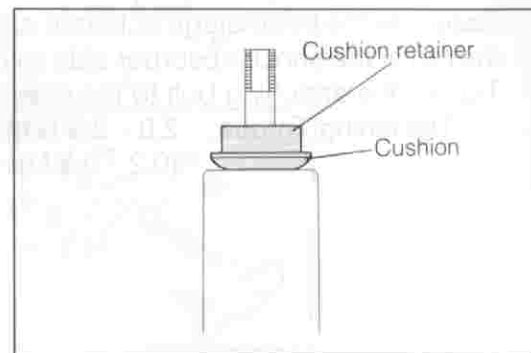
INSTALLATION

1. Install the bush to the shock absorber.



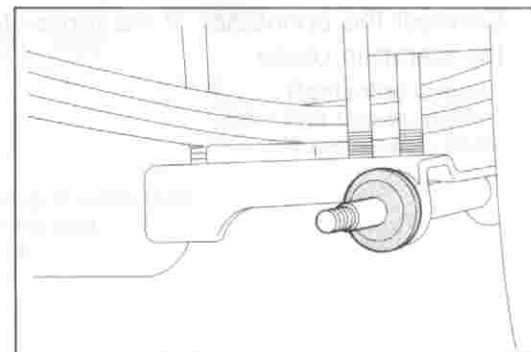
WRE91-FS257

2. Install the cushion retainer and cushion to the shock absorber.



WRE91-FS257A

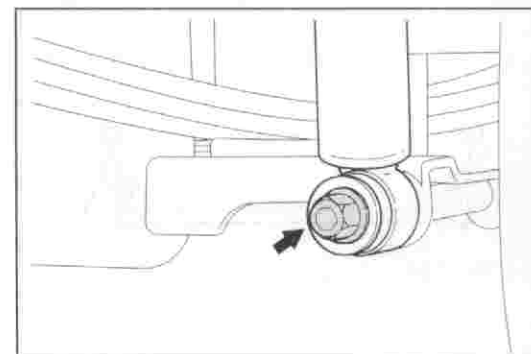
3. Assemble the washer to the U-bolt seat in such a way that the protruded side of the washer comes to the bush side.
4. Install the shock absorber to the vehicle, while contracting the shock absorber.



WRE91-FS258

5. Assemble the washer to the U-bolt seat side of the shock absorber in such a way that the protruded side of the washer comes to the bush side.
6. Install a new spring washer and nut. Tighten the attaching nut to the specified torque.

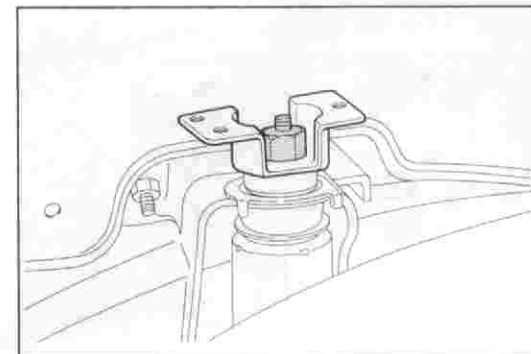
Tightening Torque: 25.3 - 53.9 N·m
(3.5 - 5.5 kgf-m, 25.3 - 39.8 ft-lb)



WRE91-FS259

7. Install the three-stage actuator bracket. Tighten the attaching nut to the specified torque.

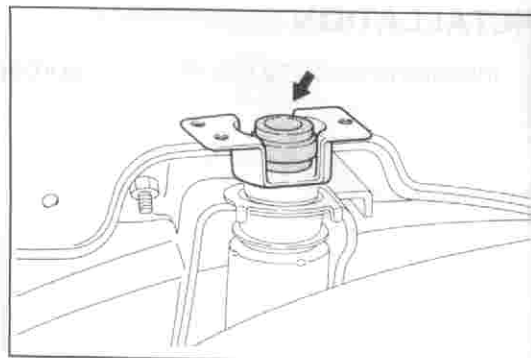
Tightening Torque: 18.6 - 30.4 N·m
(1.9 - 3.1 kgf-m, 13.7 - 22.4 ft-lb)



WRE91-FS260

FRONT AXLE & SUSPENSION

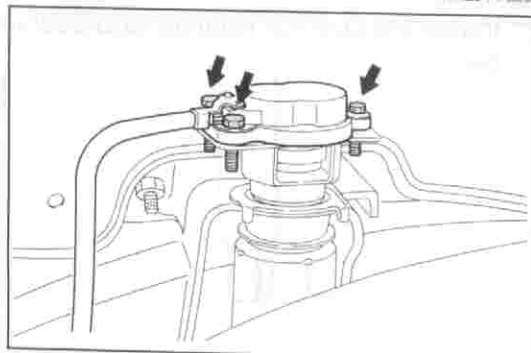
8. Install the dust-proof cover.



WRE91-FS261

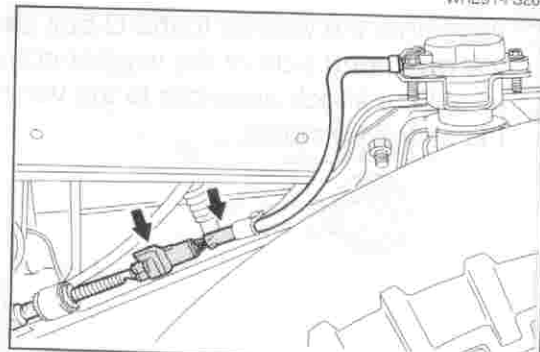
9. Assemble the three-stage actuator, aligning the direction of the rod at the shock absorber side with that of the actuator. Tighten the attaching bolt to the specified torque.

Tightening Torque: 2.0 - 2.9 N·m
(0.2 - 0.3 kgf-m, 1.4 - 2.2 ft-lb)



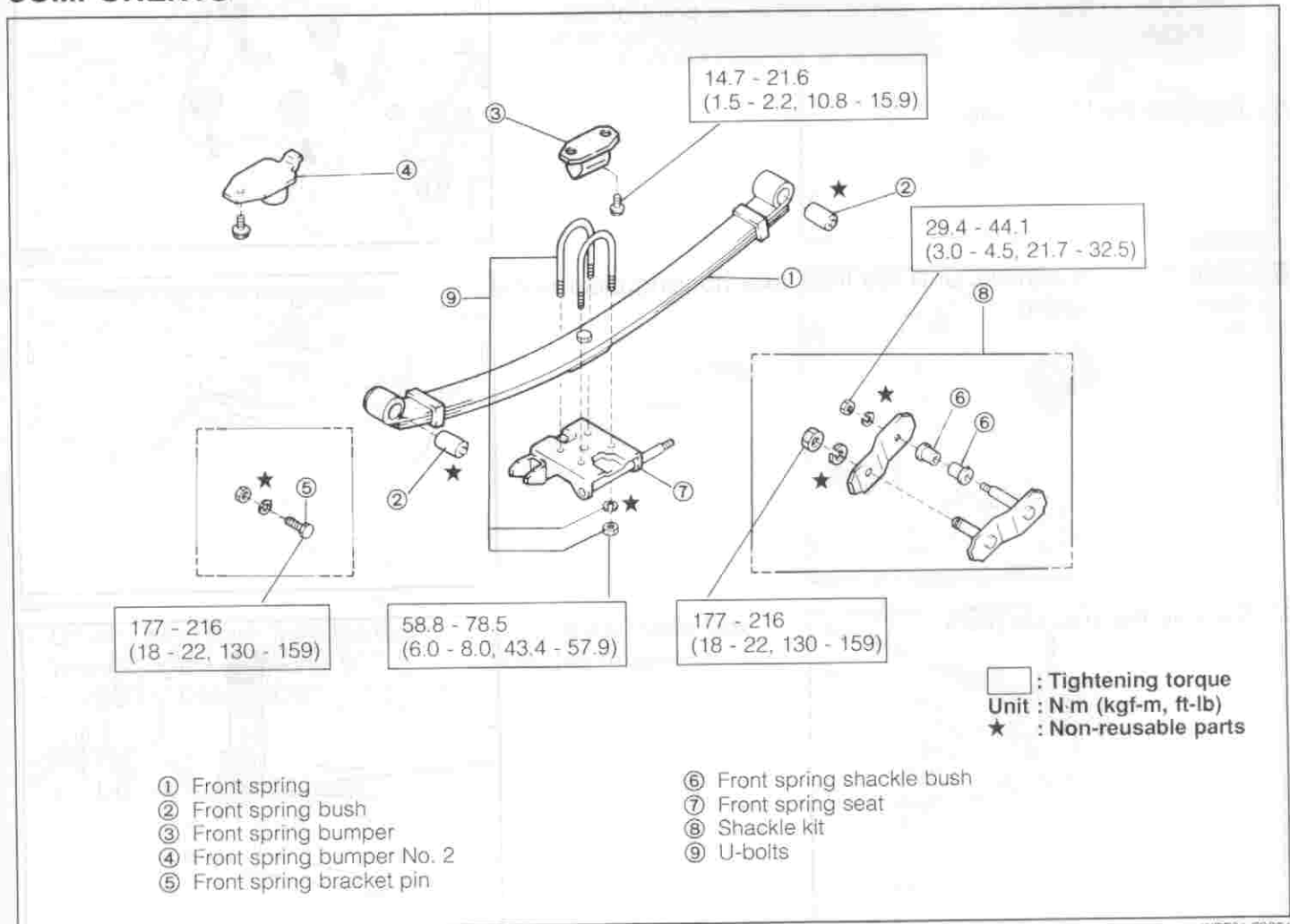
WRE91-FS262

10. Connect the connector of the three-stage actuator. Install the clamp in place.



WRE91-FS263

FRONT SPRING COMPONENTS

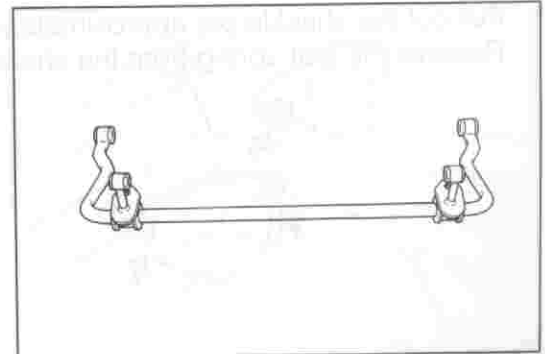


WRE91-FS264

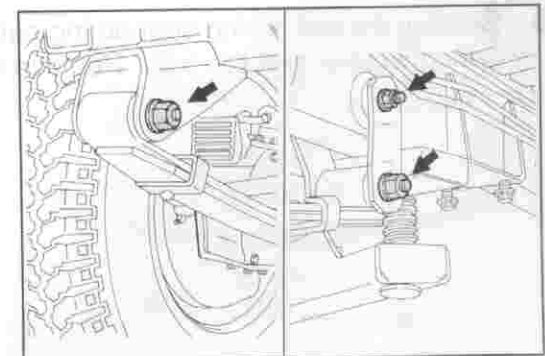
REMOVAL

1. Remove the stabilizer.
(See page FS-59.)
2. Remove the shock absorber.
(See page FS-62.)

3. Loosen the leaf spring attaching nuts.



WRE91-FS265



WRE91-FS266

FRONT AXLE & SUSPENSION

4. Jack up the vehicle at the frame.

WARNING:

Be sure to use the frame as the jacking-up point of the vehicle.

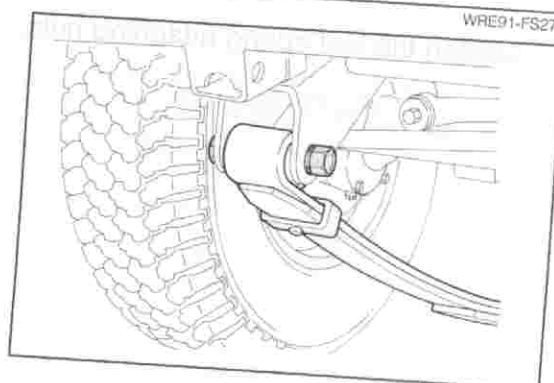
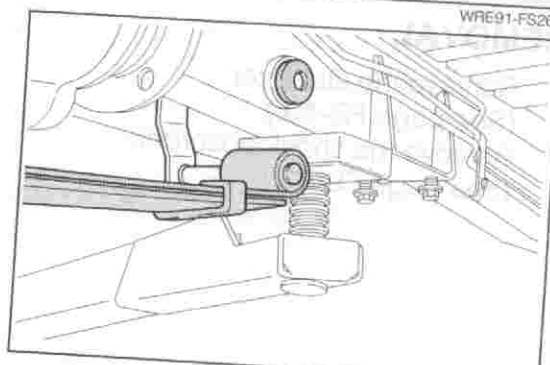
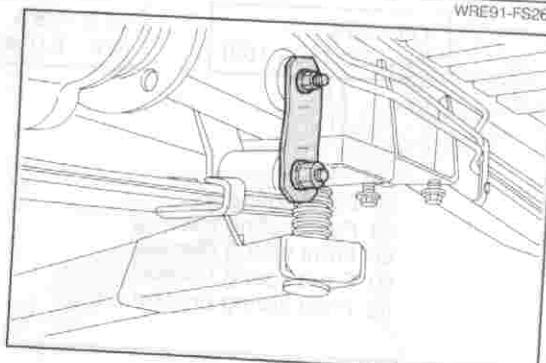
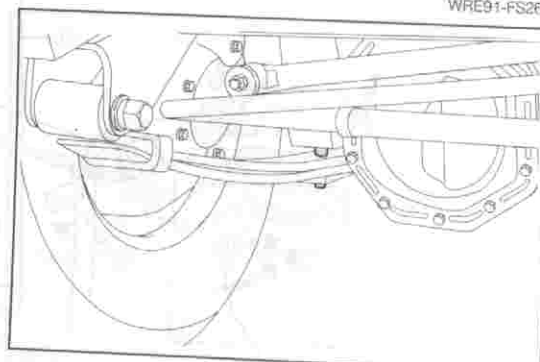
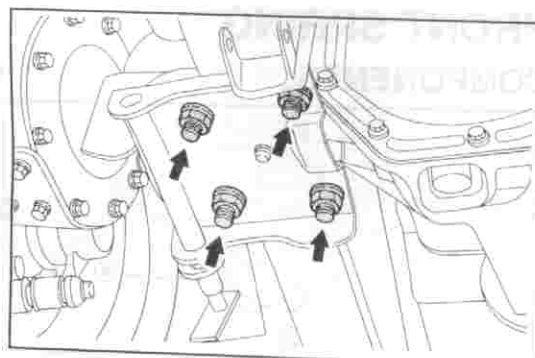
5. Remove the U-bolt nuts.

6. Jack down the vehicle, until the front axle housing clears from the leaf spring.

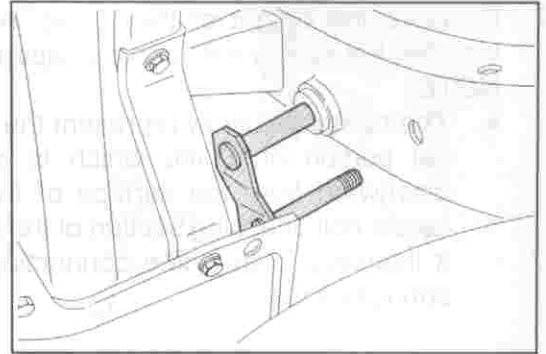
7. Remove the shackle plate.

8. Pull out the shackle pin approximately halfway.
9. Remove the leaf spring from the shackle pin.

10. Remove the leaf spring connecting nut at the front side, the spring washer and the bolt. Remove the leaf spring.

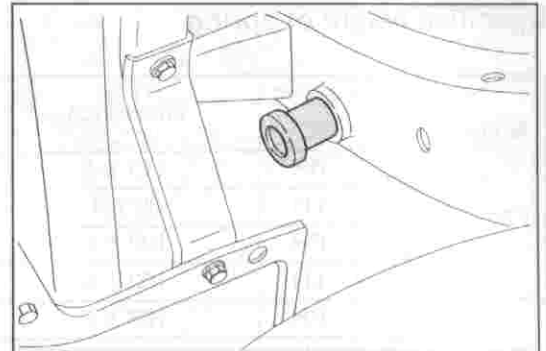


11. Remove the shackle pin.



WRE91-FS272

12. Remove the shackle pin bushes at the frame side.



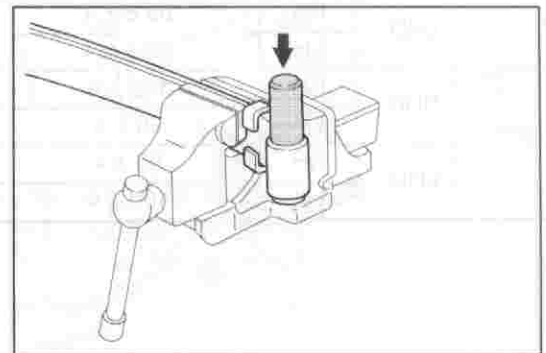
WRE91-FS273

13. Drive out the bush from the leaf spring, using a suitable box wrench or the following SST given below, (as required).

SST: 09608-87608-000

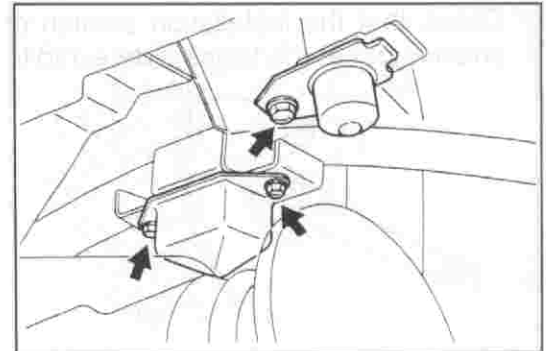
NOTE:

- Do not reuse the bush.



WRE91-FS274

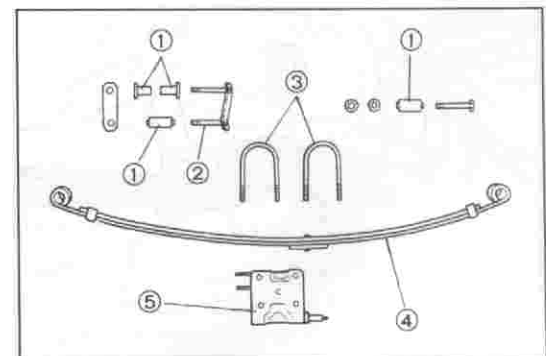
14. Remove the front spring bumper.



WRE91-FS275

INSPECTION

- Check of front spring.
 - Inspect the bushes ① for damage or wear.
 - Check the shackle pin ② and spring bracket pin ③ for damage, wear or rust.
 - Check the threaded section of the U-bolts ④ for damage or wear.
 - Inspect the front spring ⑤ for damage or flattened condition.
 - Inspect the U-bolt seat pin ⑥ for damage or rust.



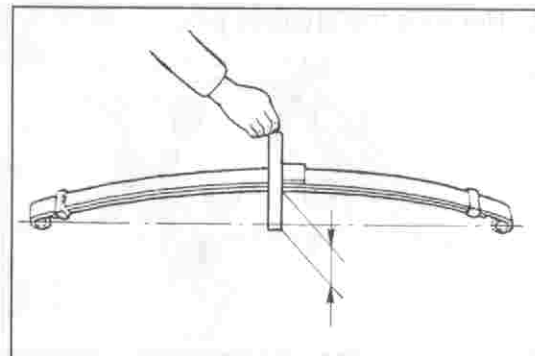
WRE91-FS276

FRONT AXLE & SUSPENSION

- Measure the height of the spring in order to determine whether the spring exhibits any flattened condition.

NOTE:

- The numerals below represent the distance of the vertical portion of a line which is drawn vertically and downward from the surface of the leaf spring at the center bolt attaching section of the No.1 leaf spring, until it intersects with a line connecting the centers of the spring bushes.

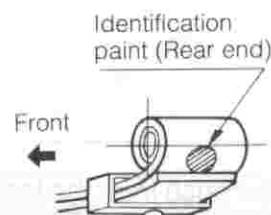


WRE91-FS277

Specified height of spring

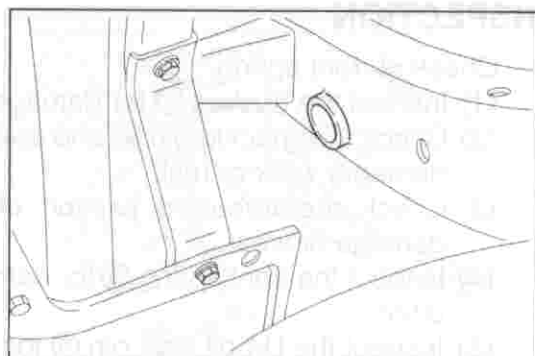
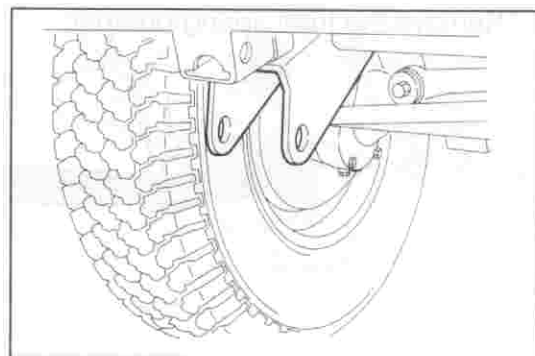
Unit: mm

Specifications			With winch	Without winch
Model				
F70	RHD	RH	113 ± 4	102 ± 4
		LH	89 ± 4	90 ± 4
	LHD	RH	102 ± 4	102 ± 4
		LH	102 ± 4	90 ± 4
F75	RHD	RH	105 ± 4	110 ± 4
		LH	89.5 ± 4	90 ± 4
	LHD	RH	89.5 ± 4	102 ± 4
		LH	89.5 ± 4	102 ± 4
F77	RHD	RH	102 ± 4	110 ± 4
		LH	90 ± 4	90 ± 4
	LHD	RH	90 ± 4	102 ± 4
		LH	102 ± 4	102 ± 4



WRE91-FS278

- Check that the installation section of the leaf spring and shackle pin at the frame side exhibits no damage.



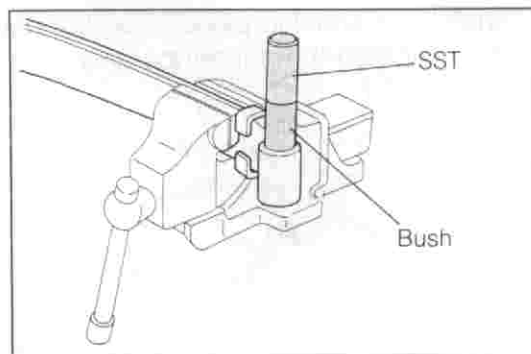
WRE91-FS279

INSTALLATION

1. Press a new bush to the leaf spring, using a suitable box wrench or the following SST given below.
SST: 09608-87608-000

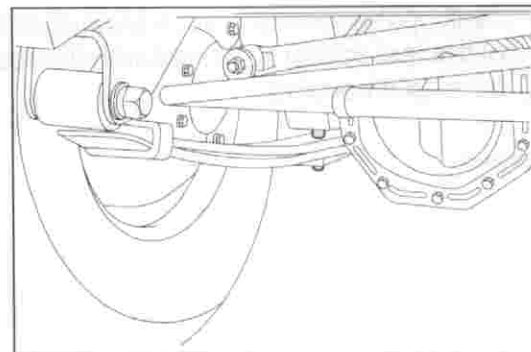
NOTE:

- The bush should be pressed up to the edge surface of the leaf spring.



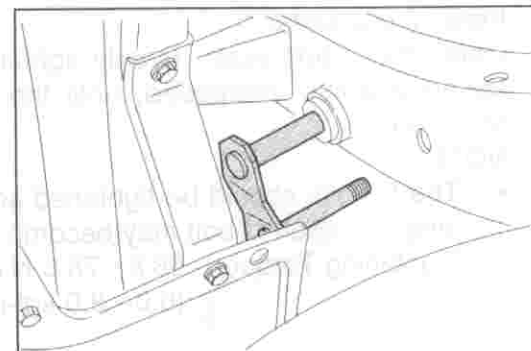
WRE91-FS280

2. Install the shackle pin bushes to the frame side.



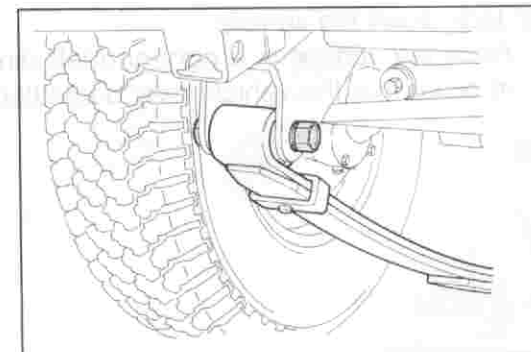
WRE91-FS281

3. Insert the shackle pin approximately halfway into the shackle pin bush.



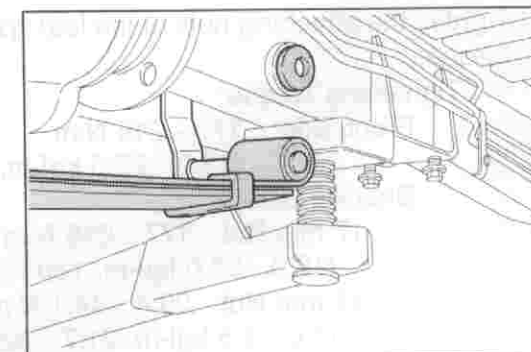
WRE91-FS282

4. Connect the leaf spring to the frame front side. Install the bolt, new leaf spring and nut. Tighten the nut temporarily.



WRE91-FS283

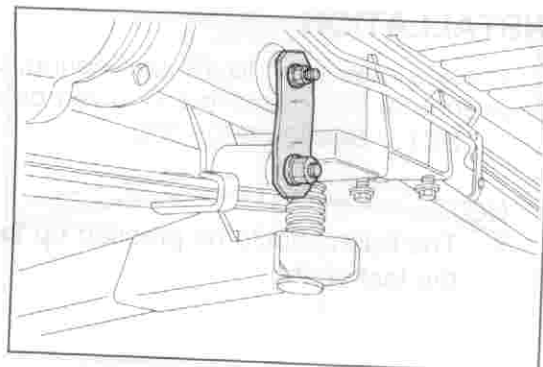
5. Install the leaf spring to the shackle pin. Insert the shackle pin fully.



WRE91-FS284

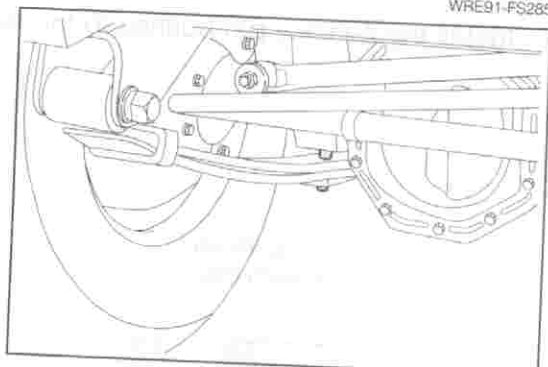
FRONT AXLE & SUSPENSION

6. Install the shackle plate. Install a new spring washer and nut. Tighten the nut temporarily.



WRE91-FS285

7. Jack up the vehicle in such a way that the protruded section of the leaf spring is aligned with the recessed section of the front axle housing.



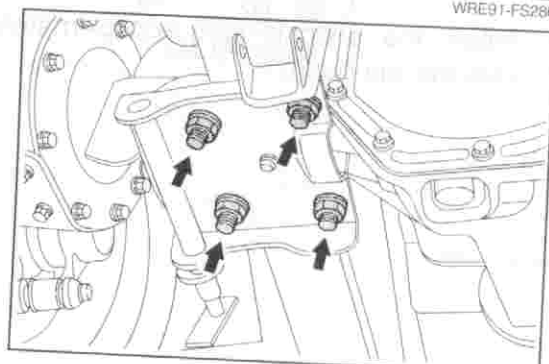
WRE91-FS286

8. Install the U-bolts.
9. Install the U-bolt seat. Evenly tighten the nuts with new spring washers interposed, until the specified torque is obtained.

NOTE:

- The U-bolts should be tightened so that the protruding length of each U-bolt may become the same.

Tightening Torque: 58.8 - 78.5 N·m
(6.0 - 8.0 kgf-m, 43.4 - 57.9 ft-lb)



WRE91-FS287

10. Jack down the vehicle.
11. Rock the vehicle in a right-and-left direction several times in order that the vehicle may be settled.

WRE91-FS288

12. Tighten the attaching nuts of the leaf spring to the specified torque.

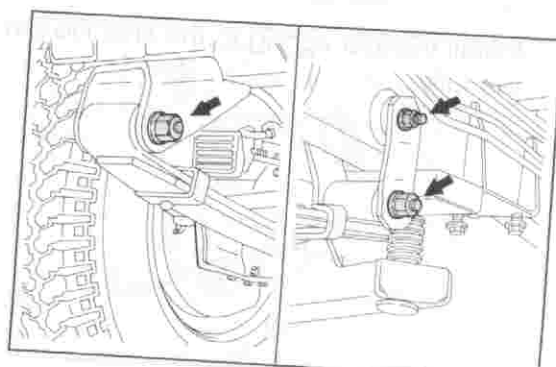
Tightening Torque:

Front Side: 177 - 216 N·m
(18.0 - 22.0 kgf-m, 130 - 159 ft-lb)

Shackle Side:

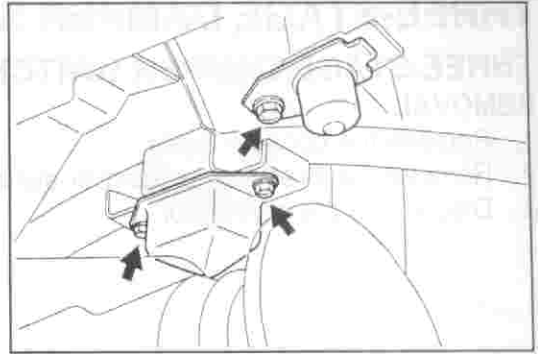
17 mm Nut 177 - 216 N·m
(18.0 - 22.0 kgf-m, 130 - 159 ft-lb)

14 mm Nut 29.4 - 44.1 N·m
(3.0 - 4.5 kgf-m, 21.7 - 32.5 ft-lb)



WRE91-FS289

13. Install the front spring bumper.



WRE91-FS290

14. Install the shock absorber.
(See page FS-67.)
15. Install the stabilizer.
(See page FS-61.)



WRE91-FS291



INSTALLATION

1. Remove the front suspension components.
2. Install the front suspension components.

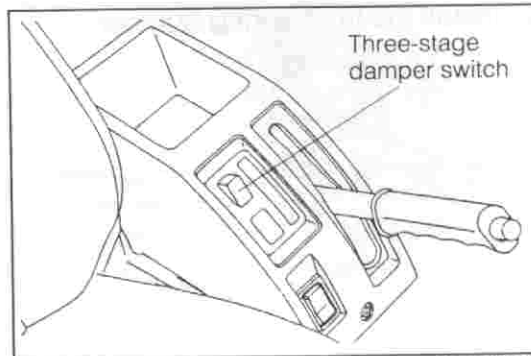
FRONT AXLE & SUSPENSION

THREE-STAGE DAMPER SYSTEM

THREE-STAGE DAMPER SWITCH

REMOVAL

1. Remove the console box.
2. Remove the three-stage damper switch.
3. Disconnect the connector.



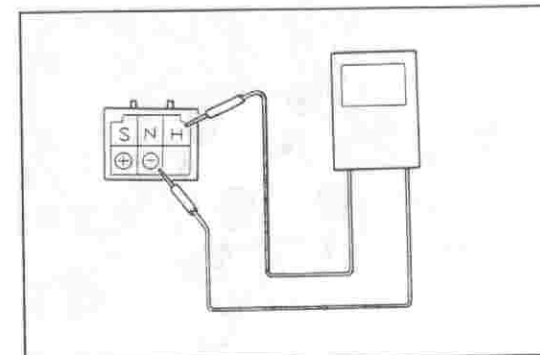
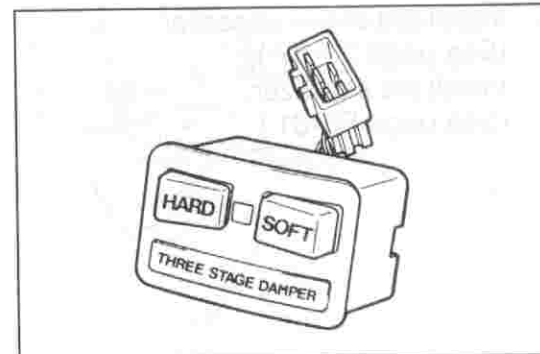
WRE91-FS292

INSPECTION

Ensure that continuity exists between the respective terminals as indicated in the continuity table below, using a tester.

○—○ Continuity exists.

Switch position \ Terminal	⊖	S	N	H	⊕
SOFT	○—○				
NORMAL	○—○		○—○		
HARD	○—○			○—○	



WRE91-FS293

INSTALLATION

1. Install the three-stage damper switch.
2. Connect the connector.
3. Install the console box.

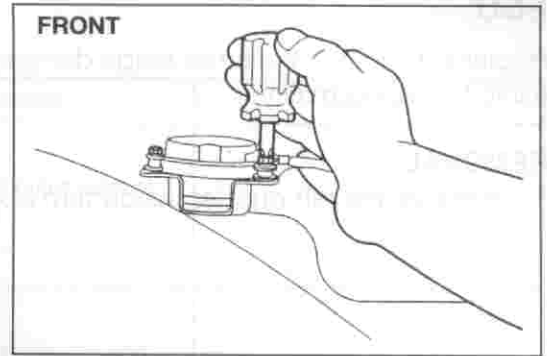
WRE91-FS294

ACTUATOR

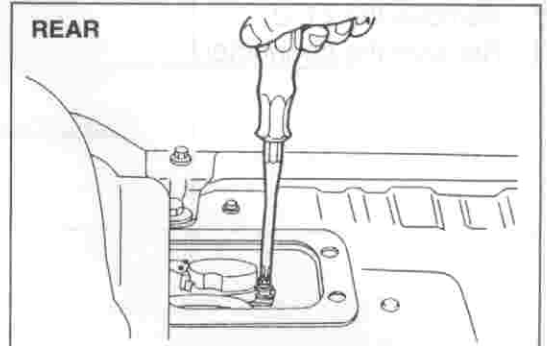
REMOVAL

1. Remove the actuator.
2. Disconnect the connector.

FRONT



REAR

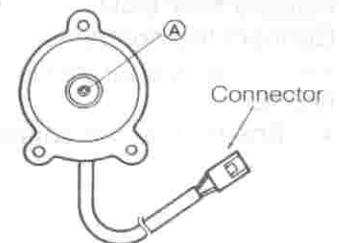


WRE91-FS295

INSPECTION

Apply a voltage of 12 V to the connector. Ensure that the center section ① of the actuator rotates in accordance with the table below.

Terminal \ Switch position	S	N	H	V+
SOFT	⊖			⊕
NORMAL		⊖		⊕
HARD			⊖	⊕



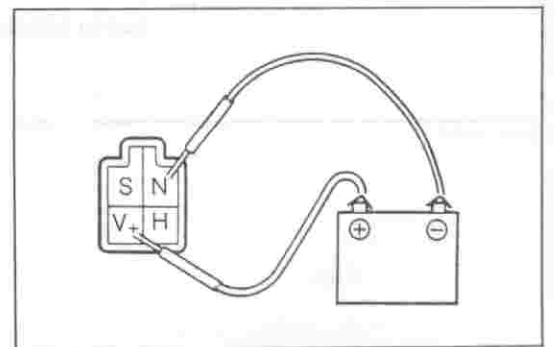
WRE91-FS296

Position of ① at each switch position

Soft	Hard	Normal

INSTALLATION

1. Install the actuator.
2. Connect the connector.



WRE91-FS297

WRE91-FS298

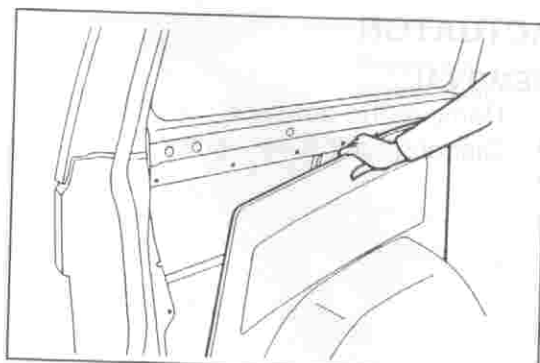
FRONT AXLE & SUSPENSION

ECU

Replace the ECU if the three-stage damper switch and actuator exhibit no abnormality.

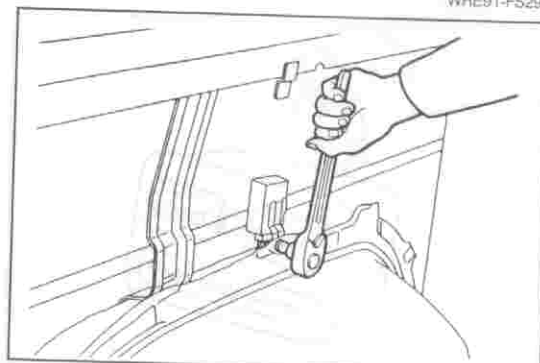
REMOVAL

1. Remove the left quarter inside trim board.



WRE91-FS299

2. Remove the ECU.
3. Remove the connector.



WRE91-FS300

INSTALLATION

1. Install a new ECU.
2. Connect the connector.
3. Install the quarter inside trim board.

NOTE:

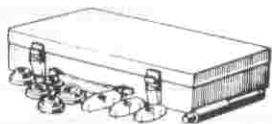
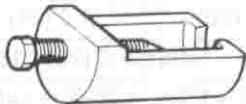
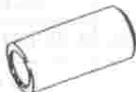
- Ensure that the connector has been installed properly.



WRE91-FS301



SSTs (Special Service Tools)

Shape	Parts No. and Name	Purpose	Remarks
	09608-20011-000 Front hub & drive pinion bearing tool set	Replacing the outer race of rear axle hub	
	09607-60020-000 Front hub bearing lock nut wrench	Removal/Installation of front hub bearing lock nut	
	09511-87202-000 Brake drum stopper	Prevent the axle hub from turning	
	09308-00010-000 Oil seal puller	Removal of "T" type oil seal	
	09610-20012-000 Pitman arm puller	Disconnect the ball joint from steering knuckle	
	09517-30010-000 Rear axle shaft oil seal replacer	Replacing "T" type oil seal of front axle housing end.	
	09608-87608-000 Leaf spring bush No. 1 remover & replacer	Removal/Installation of leaf spring bush	

WRE91-FS302

FRONT AXLE & SUSPENSION

SERVICE SPECIFICATION

Toe-in	Other than listed below	0 - 8 mm
	215R15, 215/80R15, 255/70R15, H78-15-4	-3 - 5 mm
Side slip		0 - 3 mm
Comber	(degree)	1°00' ±1°
Caster	(degree)	1°30' ±1°
King pin angle	(degree)	9°30' ±1°
Turning angle (degree)	H78-15-4, 215R15, 215SR-15, 225/70R-15, 215/80R-15	Inner 28, Outer 26
	Other than those listed above (F77)	Inner 30 (29), Outer 28 (27)
Tire pressure		

Specification and destination	Tire size	Unit: kgf/cm ² (psi) <kPa>			
		Unloaded		Loaded	
		FRONT	REAR	FRONT	REAR
General specification	6.00-16-4	1.6 (23) [1.8 (26)]	2.1 (30) [2.1 (30)]	1.6 (23) [1.8 (26)]	2.1 (30) [2.1 (30)]
EC specification	H78-15-4 (H78-15)	1.8 (26) <180> [1.8]	1.8 (26) <180> [1.8]	1.8 (26) <180> [1.8]	1.8 (26) <180> [1.8]
Australian specification	215R15 100Q (215R15)	1.8 (26) <180> [1.8]	1.8 (26) <180> [1.8]	1.8 (26) <180> [1.8]	1.8 (26) <180> [1.8]
NOTE: < >: Australian spec. []: with winch	215SR15	1.8 (26)	1.8 (26)	1.8 (26)	1.8 (26)
	255/70R15 108Q	1.8 (26) <180>	1.8 (26) <180>	1.8 (26) <180>	1.8 (26) <180>
	6.50-16C-8	1.8 (26) <180>	2.4 (34) <240>	1.8 (26) <180>	4.25 (61) <425>
	6.50-16-4 (Sand tire)	1.6 (23) on road	2.1 (30) on road	1.1 (16) on sand	1.3 (18) on sand
	6.00-16C-6	1.8 (26)	2.4 (34)	1.8 (26)	3.25 (46)
Pick-up	215R15, 215R15C-8	1.8 (26) <180>	1.8 (26) <180>	1.8 (26) <180>	4.25 (61) <425kPa>
General specification	7.50-16-8 (Sand tire)	1.8 (26) on road	4.25 (61) on road	1.8 (2.6) on sand	2.4 (34) on sand
EC specification	6.50-16C-8	1.8 (26) <180>	2.4 (34) <240>	1.8 (26) <180>	4.25 (61) <425>
G.C.C. specification Saudi Arabian specification without winch	215/80R-15 100Q (215SR15)	F70	1.6 (23)	1.6 (23)	1.6 (23)
		F75	1.4 (20)	1.4 (20)	1.6 (23)
	6.00-16-4		1.6 (23)	2.1 (30)	1.6 (23)
	H78-15-4	F70	1.6 (23)	1.6 (23)	1.6 (23)
		F75	1.4 (20)	1.4 (20)	1.6 (23)
	6.50-16-4 (Sand tire)		1.6 (23) on road	2.1 (30) on road	1.1 (16) on sand
					1.3 (18) on sand
G.C.C. specification Saudi Arabian specification with winch	6.00-16-4		1.8 (26)	2.1 (30)	1.8 (26)
	H78-15-4		1.6 (23)	1.6 (23)	1.6 (23)
	215/80R15 100Q (215SR15)		1.6 (23)	1.6 (23)	1.6 (23)
	6.00-16C-6		1.8 (26)	2.4 (34)	1.8 (26)
	6.50-16-4 (Sand tire)		1.6 (23) on road	2.1 (30) on road	1.1 (16) on sand

WRE91-FS303

FRONT AXLE & SUSPENSION

Disc wheel runout		Not to exceed 1.0 mm
Tire runout	Radial runout	Not to exceed 1.4 mm
	Lateral runout	Not to exceed 2.0 mm
Front axle hub grease		Lithium-based MP grease
Front axle hub		Starting torque Reference: Starting torque
		1.4 - 3.6 kgf 0.98 - 2.45 N·m (10 - 25 kgf-cm, 8.7 - 21.7 inch-lb)
Steering knuckle starting torque starting load		16.7 - 41.2 N·m (1.7 - 4.2 kgf-cm, 1.5 - 3.6 inch-lb) 0.1 - 0.3 kgf
Front spring free height		

Unit: mm

Specifications			With winch	Without winch
Model				
F70	RHD	RH	113 ± 4	102 ± 4
		LH	89 ± 4	90 ± 4
	LHD	RH	102 ± 4	102 ± 4
		LH	102 ± 4	90 ± 4
F75	RHD	RH	105 ± 4	110 ± 4
		LH	89.5 ± 4	90 ± 4
	LHD	RH	89.5 ± 4	102 ± 4
		LH	89.5 ± 4	102 ± 4
F77	RHD	RH	102 ± 4	110 ± 4
		LH	90 ± 4	90 ± 4
	LHD	RH	90 ± 4	102 ± 4
		LH	102 ± 4	102 ± 4

WRE91-FS305

FRONT AXLE & SUSPENSION

TIGHTENING TORQUE

Tightening component		N-m	kgf-m	ft-lb
Tiered x adjusting nut	Temporarily tightening	19.6 - 29.4	2.0 - 3.0	14.5 - 21.7
	Final tightening	118 - 167	12.0 - 17.0	87 - 123
Knuckle stopper bolt lock nut		39.2 - 53.9	4.0 - 5.5	28.9 - 39.8
Front axle hub x Front disc		53.9 - 73.5	5.5 - 7.5	39.8 - 54.2
Front axle bearing lock nut, lock x Lock nut (Torx® T20)		4.9 - 8.8	0.5 - 0.9	3.6 - 6.5
Axle outer shaft flange x Front axle hub (wet)		58.8 - 68.6	6.0 - 7.0	43.4 - 50.6
Free wheel hub assembly x Front axle hub (wet)		58.8 - 68.6	6.0 - 7.0	43.4 - 50.6
Brake drum (Automatic locking hub) x Lock nut (Torx® T20)		4.9 - 8.8	0.5 - 0.9	3.6 - 6.5
Brake mounting support x Steering knuckle		68.6 - 88.3	7.0 - 9.0	50.6 - 65.1
Free wheel hub cover x Free wheel locking hub		7.8 - 11.8	0.8 - 1.2	5.8 - 8.7
Bolt with plate washer (Automatic locking hub) x Drive shaft		14.7 - 21.6	1.5 - 2.2	10.8 - 15.9
Oil seal cover plate x Steering knuckle		9.8 - 15.7	1.0 - 1.6	7.2 - 11.6
Steering knuckle bearing cap x Steering knuckle		17.7 - 29.4	1.8 - 3.0	13.0 - 21.7
Disc brake dust cover x Steering nut		39.2 - 53.9	4.0 - 5.0	28.9 - 39.8
Lateral control rod x Frame		128 - 157	13.0 - 16.0	94 - 116
Lateral control rod x Front axle		49 - 78	5.0 - 8.0	36.2 - 57.9
Stabilizer x Front axle		29.4 - 44.1	3.0 - 4.5	21.7 - 32.5
Stabilizer link sub assembly x Stabilizer bracket cover		18.6 - 30.4	1.9 - 3.1	13.7 - 22.4
Stabilizer link sub assembly x Frame		29.4 - 44.1	3.0 - 4.5	21.7 - 32.5
Front shock absorber x Frame		18.6 - 30.4	1.9 - 3.1	13.7 - 22.4
Front shock absorber x Front spring seat		34.3 - 53.9	3.5 - 5.5	25.3 - 39.8
Front shock absorber x Actuator bracket		18.6 - 30.4	1.9 - 3.1	13.7 - 22.4
Absorber control actuator bracket x Control actuator		2.0 - 2.9	0.2 - 0.3	1.4 - 2.2
Front spring bumper x Frame		14.7 - 21.6	1.5 - 2.3	10.8 - 15.9
U bolt x Spring seat		58.8 - 78.5	6.0 - 8.0	43.4 - 57.9
Front spring x Frame		177 - 216	18.0 - 22.0	130 - 159
Front spring x Shackle		177 - 216	18.0 - 22.0	130 - 159
Shackle x Frame		29.4 - 44.1	3.0 - 4.5	21.7 - 32.5

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