

DAIHATSU

F300

FRONT AXLE & SUSPENSION

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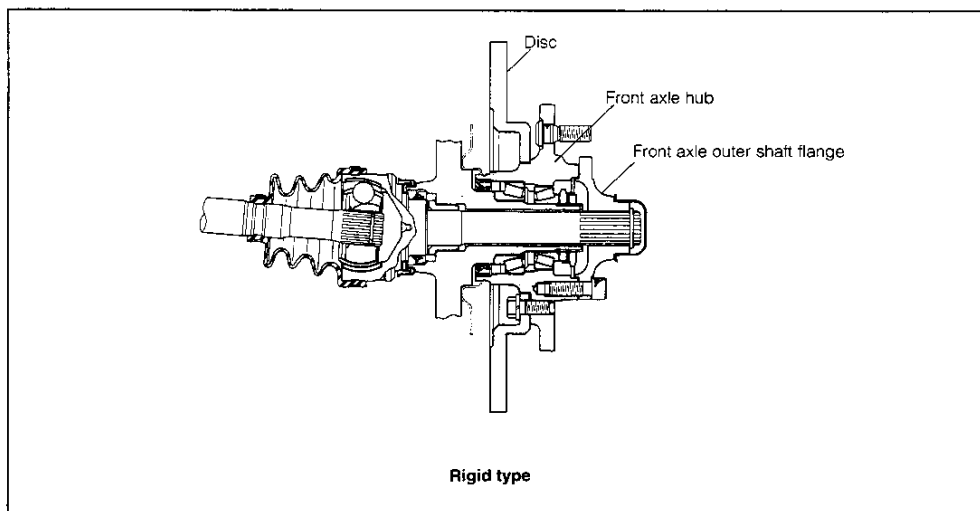
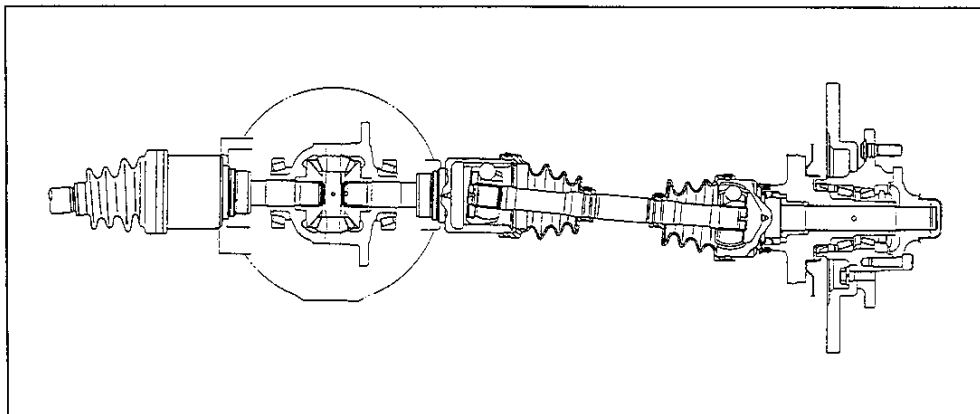
WFE90-FS001

FRONT AXLE & SUSPENSION

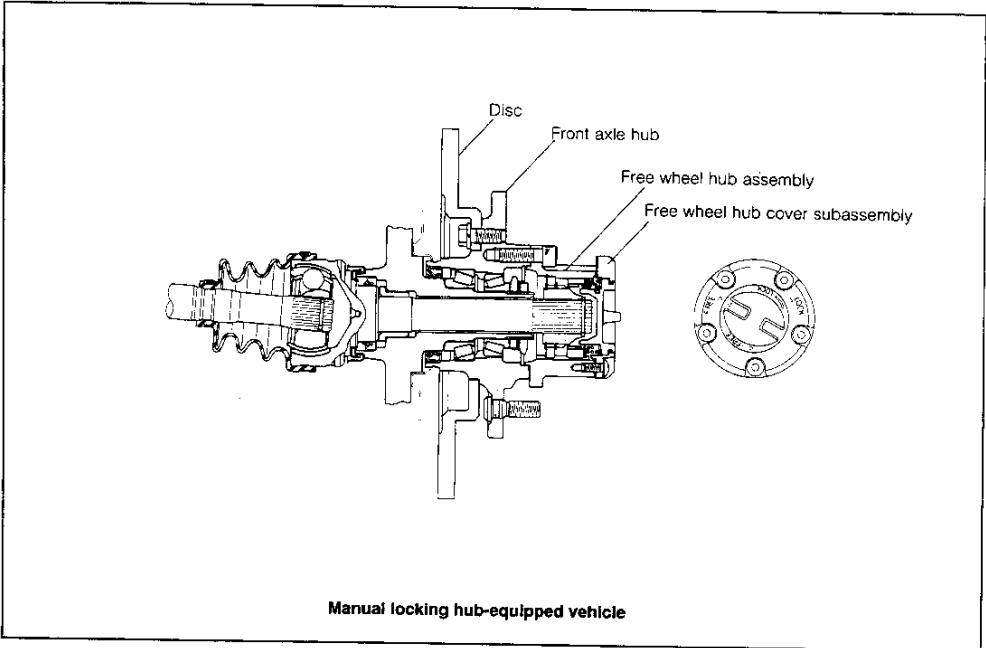
OUTLINE OF FRONT AXLE & SUSPENSION

FRONT AXLE

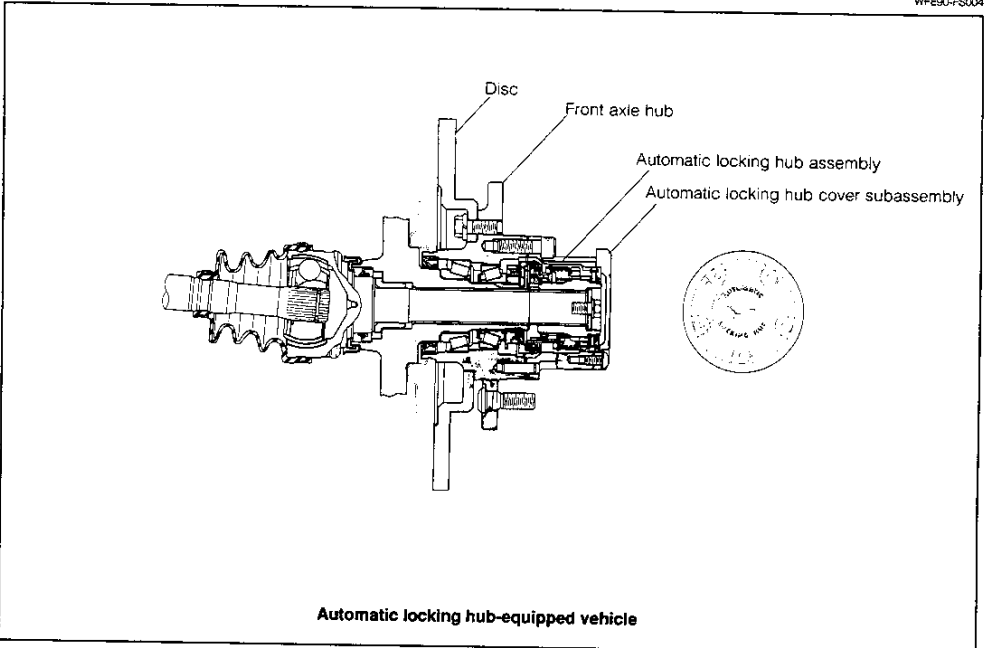
- The driving force from the engine is transmitted to the drive shafts at the right and left sides via the transmission, transfer, front propeller shaft and front differential, finally reaching the front hub meshed with the spline provided at the forward end of each drive shaft. Consequently, the tires are driven.
- The drive shaft employs a full floating type in which the vehicle weight is sustained by means of two tapered roller bearings located between the front axle hub and the steering knuckle. Hence, no vehicle weight is applied to the drive shaft.
- The forward section of the front axle hub adopts two types, depending upon the vehicle type: the rigid type and the locking hub type. Furthermore, the locking hub comes in two kinds: the manual locking hub mechanism and the automatic locking hub mechanism. This mechanism makes it possible to reduce a mechanical loss which will be generated when the power from the front wheel drives the front differential and transfer during the 2WD operation.



FRONT AXLE & SUSPENSION



WFE90-FS004



WFE90-FS005

FRONT AXLE & SUSPENSION

1. MANUAL LOCKING HUB

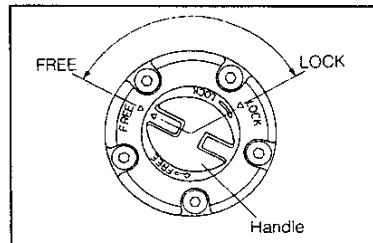
The manual locking hub is a mechanism whereby the switching of power flow is made so that the driving force from the front drive shaft can be transmitted to the front wheel or the torque from the front wheel can not be transmitted to the front drive shaft, etc. and this switching is performed through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

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.

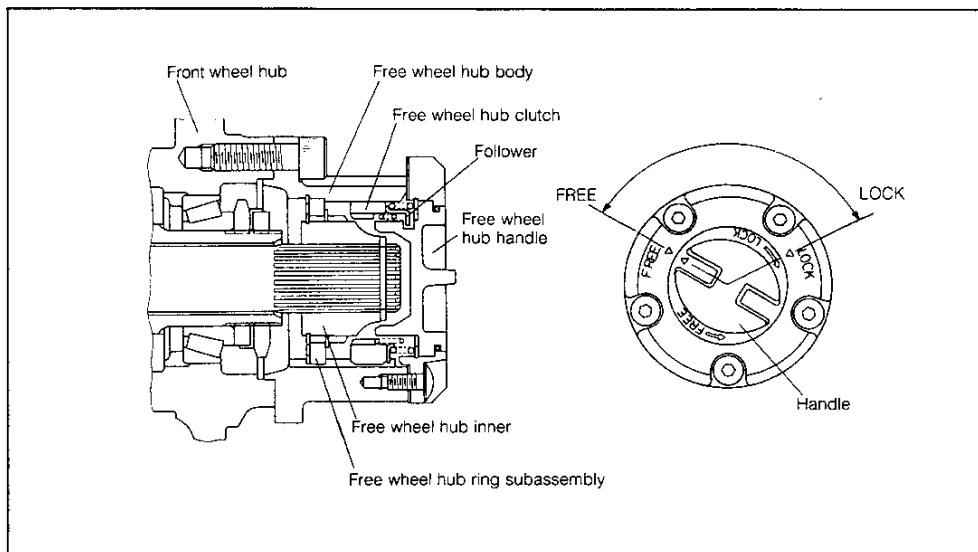
CAUTION

1. Do not move the vehicle if the handle (Δ 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 (Δ mark) on both the right and left wheels at the same position.



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.

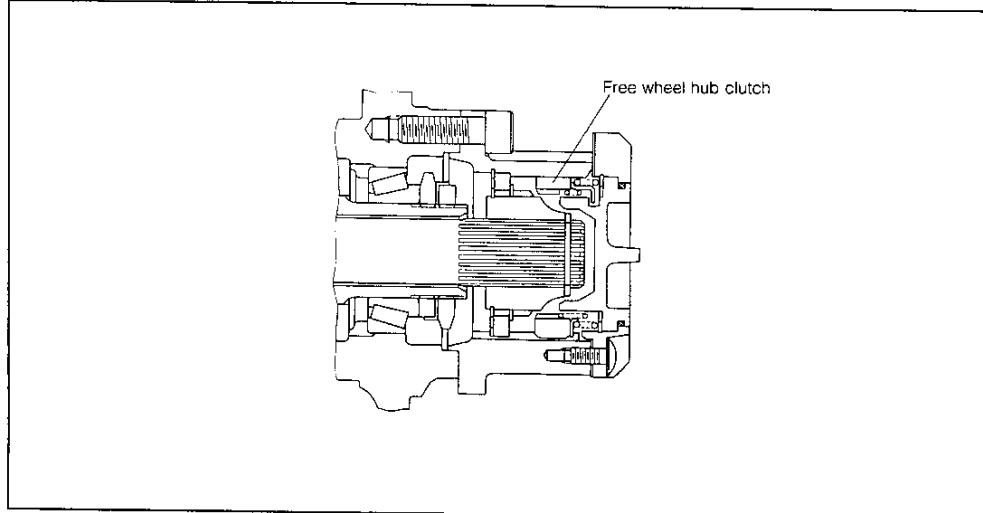


FRONT AXLE & SUSPENSION

Operation

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

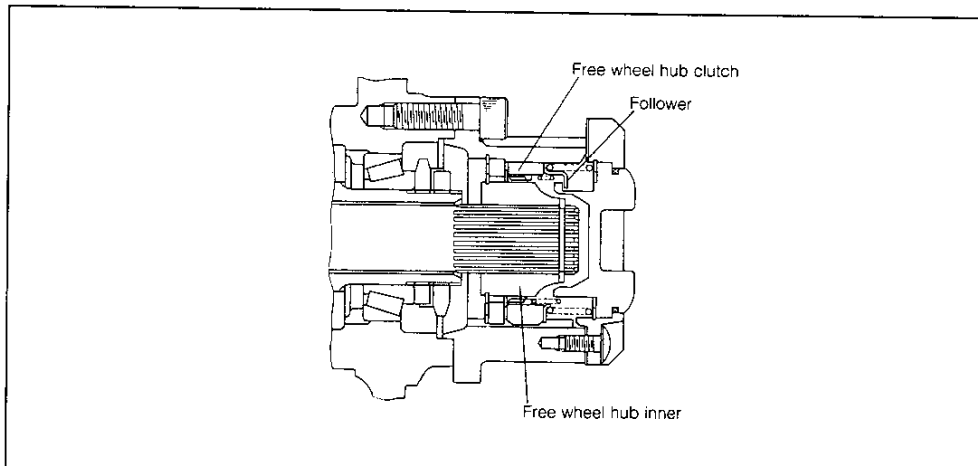
When the free wheel hub handle is set to the [FREE] position, the free wheel hub clutch comes at the outermost position on the spline of the free wheel hub body (at the extremely right position in the figure below), where no driving force from the drive shaft is transmitted to the front wheel hub.



WFE90-FS009

- 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 inner. 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.



WFE90-FS010

FRONT AXLE & SUSPENSION

2. AUTOMATIC LOCKING HUB

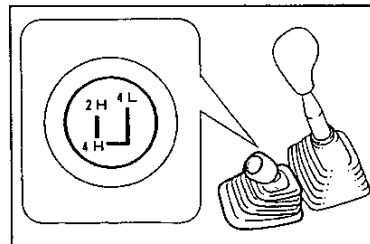
The automatic locking hub is a mechanism whereby the switching of power flow is made automatically so that the driving force from the front drive shaft can be transmitted to the front wheel or no driving force can not be transmitted to the front wheel when the transfer lever is shifted from the [2H]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

WFE90-FS011

How to operate

1. [FREE] STATE TO [LOCK] STATE

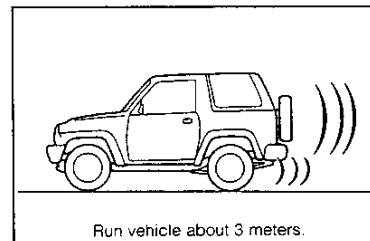
- (1) With the vehicle in a stationary state, shift the transfer shift lever from the [2H] position to the [4H] position or the [4L] position.
- (2) With the steering wheel set to a straight-ahead position, slowly move off the vehicle and run it approximately more than 3 meters. Then, the vehicle is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



WFE90-FS012

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.

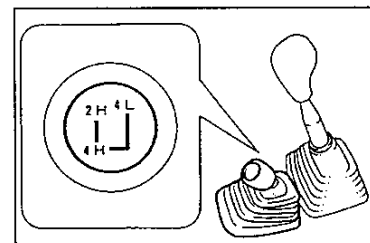


Run vehicle about 3 meters.

WFE90-FS013

2. [LOCK] STATE TO [FREE] STATE

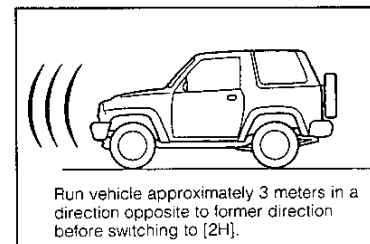
- (1) With the vehicle in a stationary state, shift the transfer shift lever from the [4H] or [4L] position to the [2H] position.
- (2) With the steering wheel set to a straight-ahead position, slowly move off the vehicle in a direction opposite to the former direction before the switching to [2H] position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



WFE90-FS014

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].

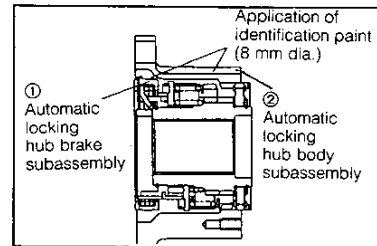
WFE90-FS015

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.



WFES0-FS016

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.

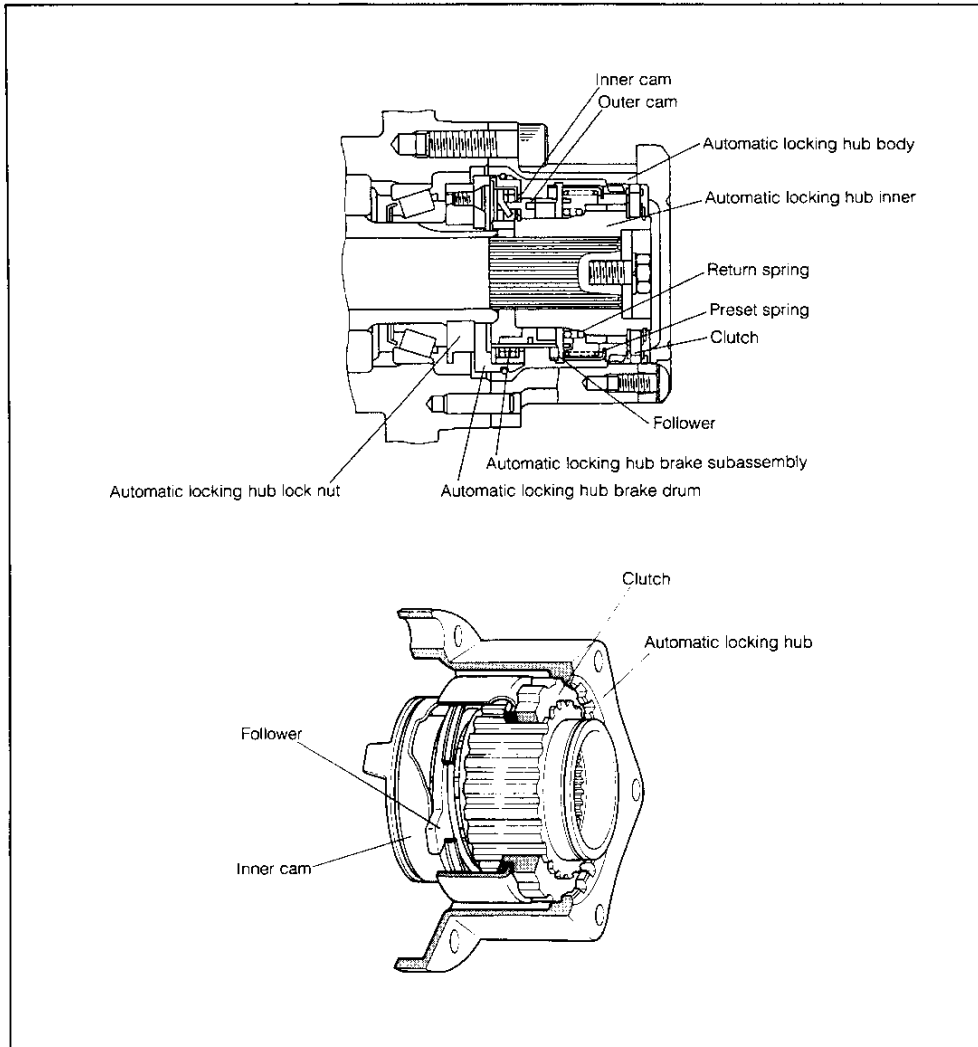
WFES0-FS017

WFES0-FS018

FRONT AXLE & SUSPENSION

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.



WP890-FS019

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.)

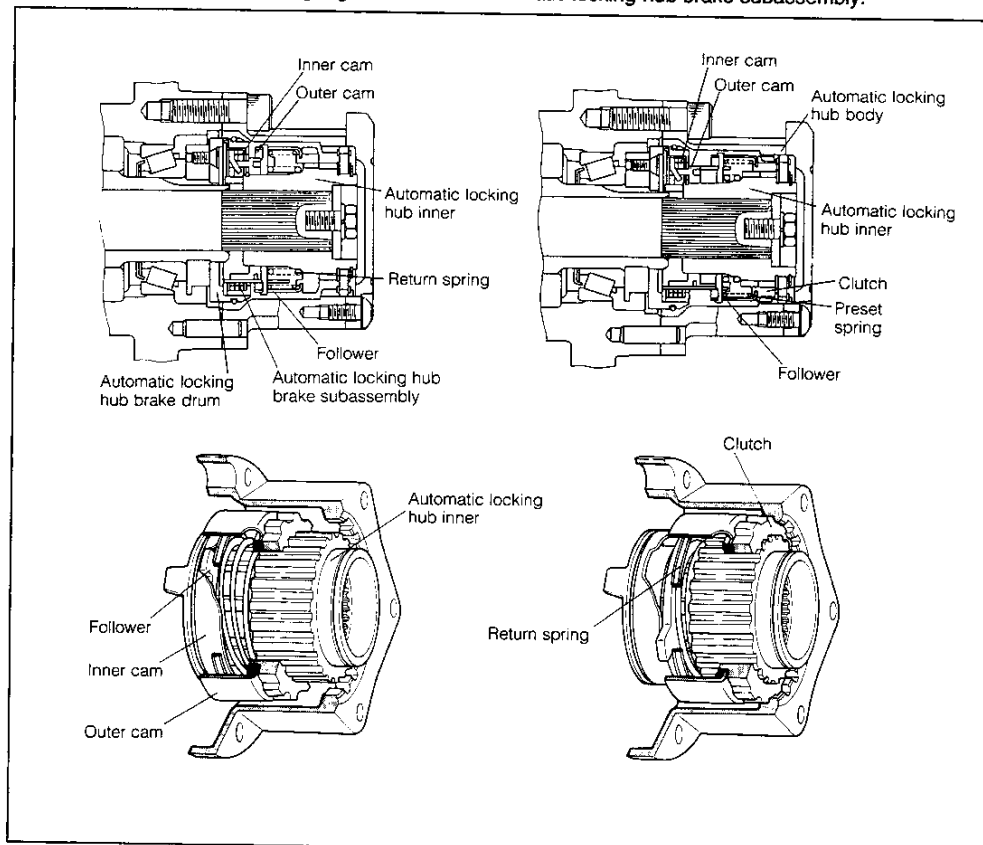
On the other hand, the inner and outer cams tend to remain in their position because of the operation of the automatic locking hub brake subassembly. As a result, the follower moves toward the outside while turning along with the diagonal surface of the inner cam. (The follower moves toward the right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

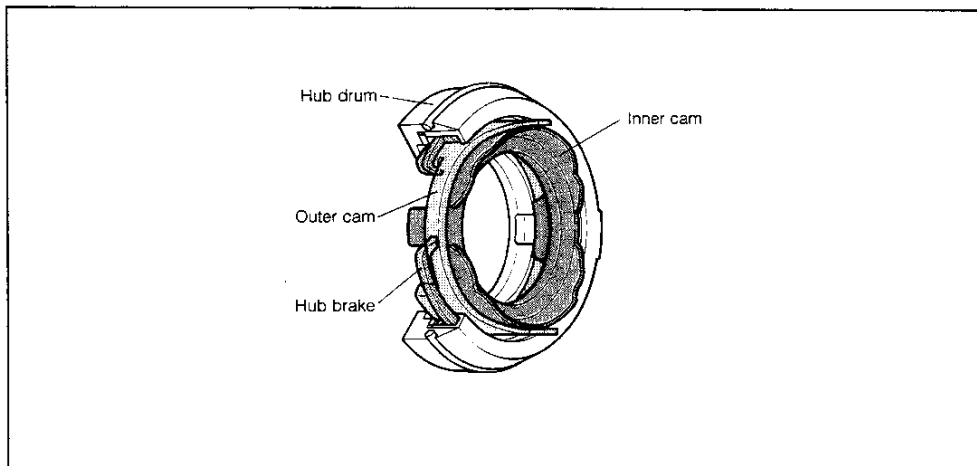


WFE90-FS020

FRONT AXLE & SUSPENSION

[Reference 1]

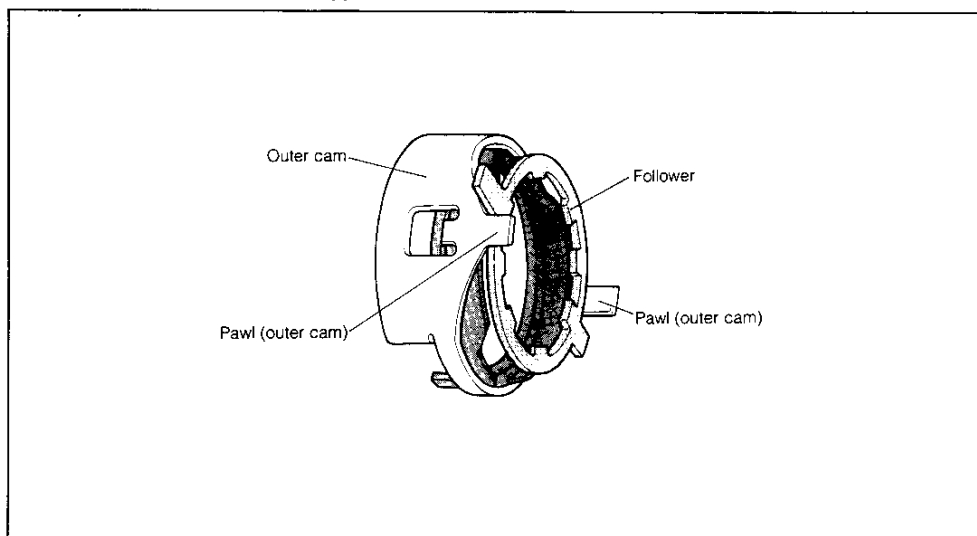
- ① The inner and outer cams have a pawl, respectively. Also, the automatic locking hub brake has an involute- shaped pawl.
- ② In the beginning of the [LOCK] phase, both the inner and outer cams are turning. Thus, their respective pawls are contacting with the pawl of the automatic locking hub brake. 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.



WFE90-FS021

[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.



WFE90-FS022

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.)

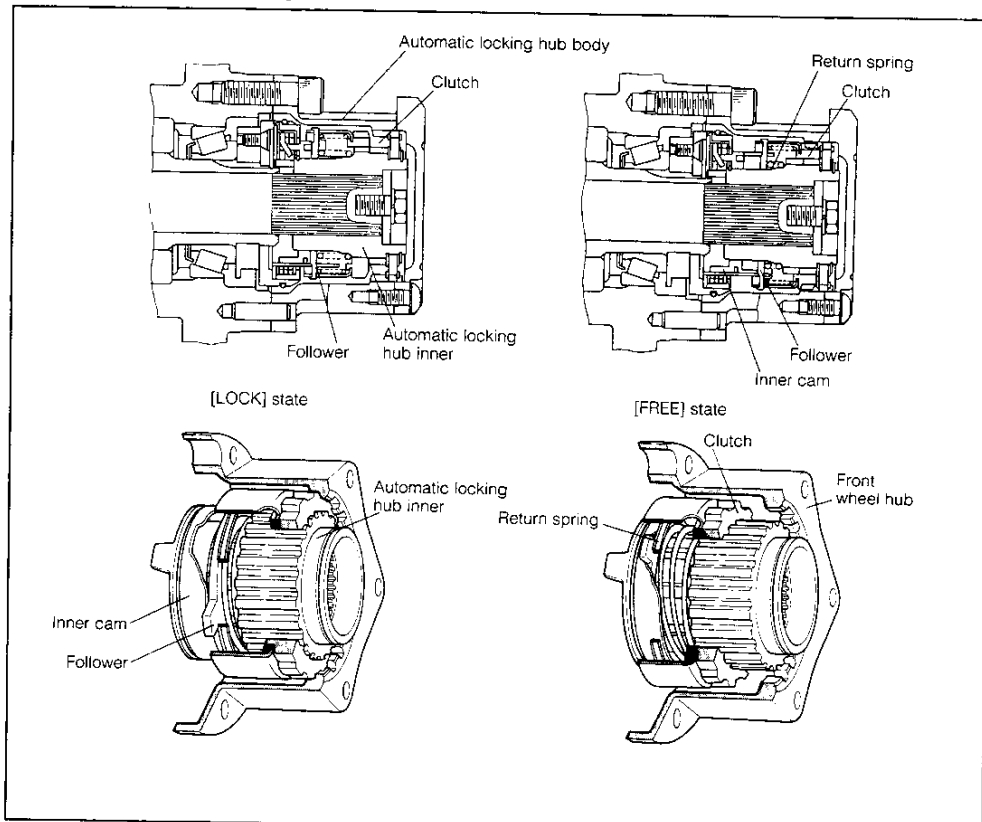
At this stage, the inner and outer cams tend to remain at their position, for their rotation is restricted by the automatic locking brake subassembly.

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.



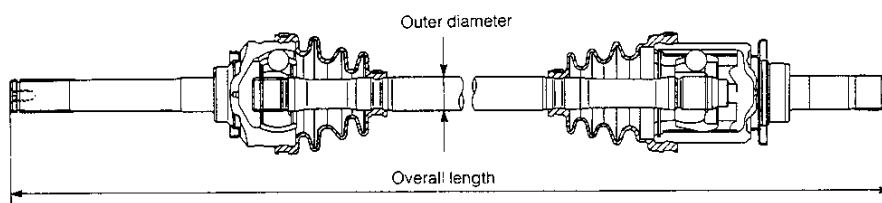
WFE90-PS023

FRONT AXLE & SUSPENSION

DRIVE SHAFTS

The drive shaft employing a Birfield constant-velocity joint is used for driving the front wheels.

The outboard joint at the tire side compensates for the angle change of the steering tire, whereas the inboard joint at the differential side compensates for the wheel movement in the up-and-down as well as in the axial directions. Thus, the power from the engine can be transmitted smoothly under various running conditions.



WFE90-FS024

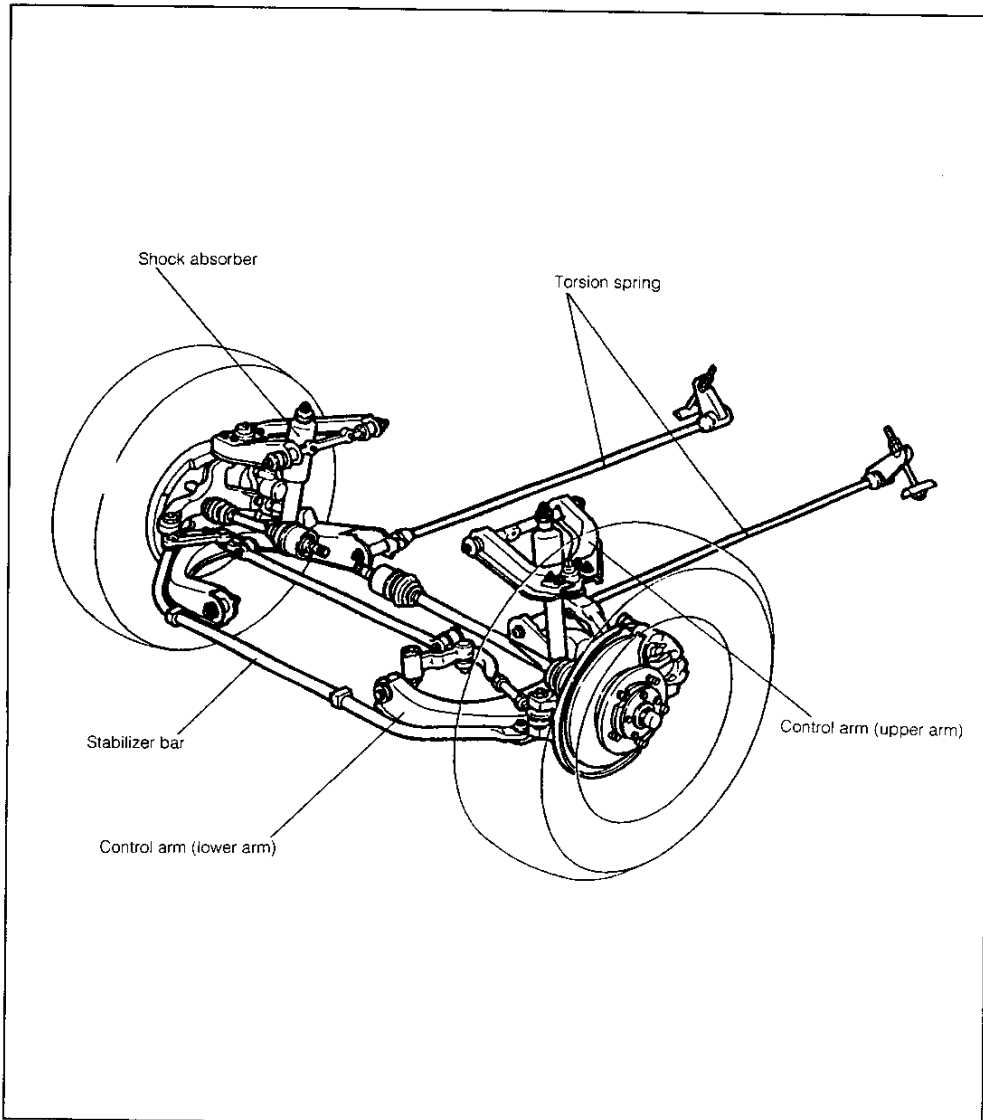
Drive Shaft Specifications

Overall length	mm	Right	599.7
		Left	884.3
Drive shaft outer diameter	mm	Right	25.5
		Left	25.5
Joint type	Wheel side	Birfield type	
	Differential side	Double offset type	
Grease to be used	Wheel side	Morilex S No. 2	
	Amount to be applied	g	90 ± 10
	Differential side	Morilex S No. 2	
	Amount to be applied	g	170 ± 10

WFE90-FS025

FRONT SUSPENSION

- The front suspension employs a double wishbone type where the vehicle body weight is sustained by two control arms.
- The springs adopt a torsion bar spring featuring light weight and a comparatively great energy absorption rate per unit weight.
- The shock absorbers employ a nitrogen-sealed type shock absorber.
- For improved running stability, a stabilizer bar is provided.



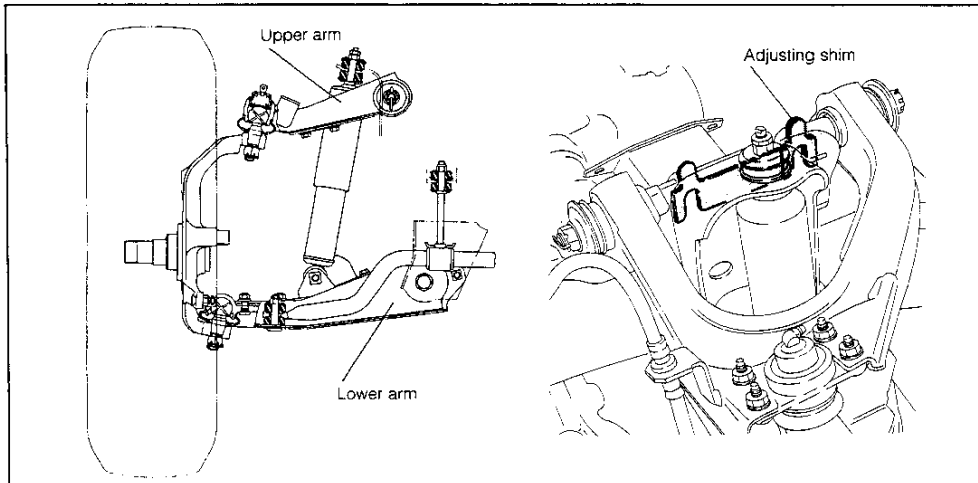
WFS90-FS026

FRONT AXLE & SUSPENSION

Upper arms & lower arms

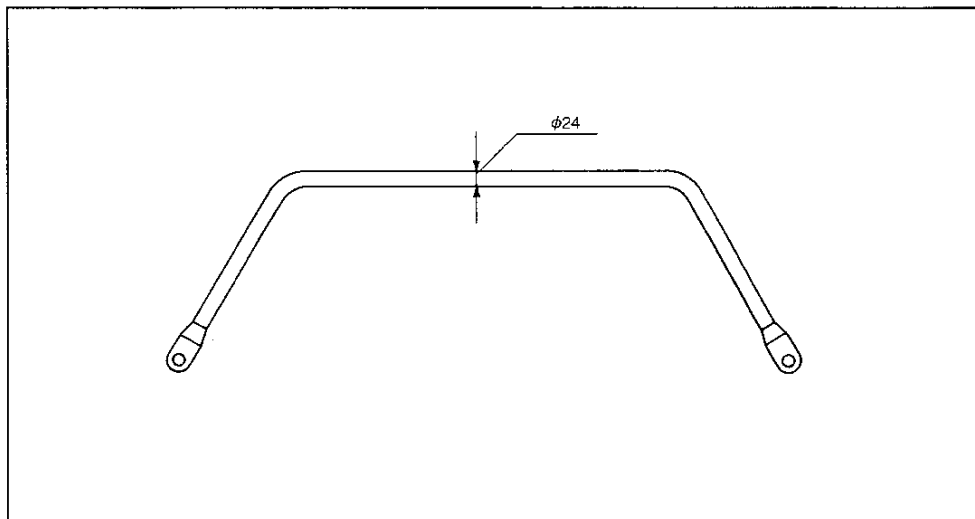
The front suspension employs a double wishbone type. In the suspension of this type, the driving, braking, lateral forces and so forth of the front wheels are supported by means of the upper and lower control arms. The camber and caster angles can be altered by changing the thickness of the adjusting shims for the upper arm.

The camber angle decreases when the thickness of adjusting shims for the upper arm is increased. Furthermore, the caster angle can be altered by changing the thickness of adjusting shims for the upper arm at the forward side or the backward side.



Stabilizer bar

For improved running stability, the stabilizer bar is standard equipment on all vehicle models. It is provided between the lower arms at the right and left sides.

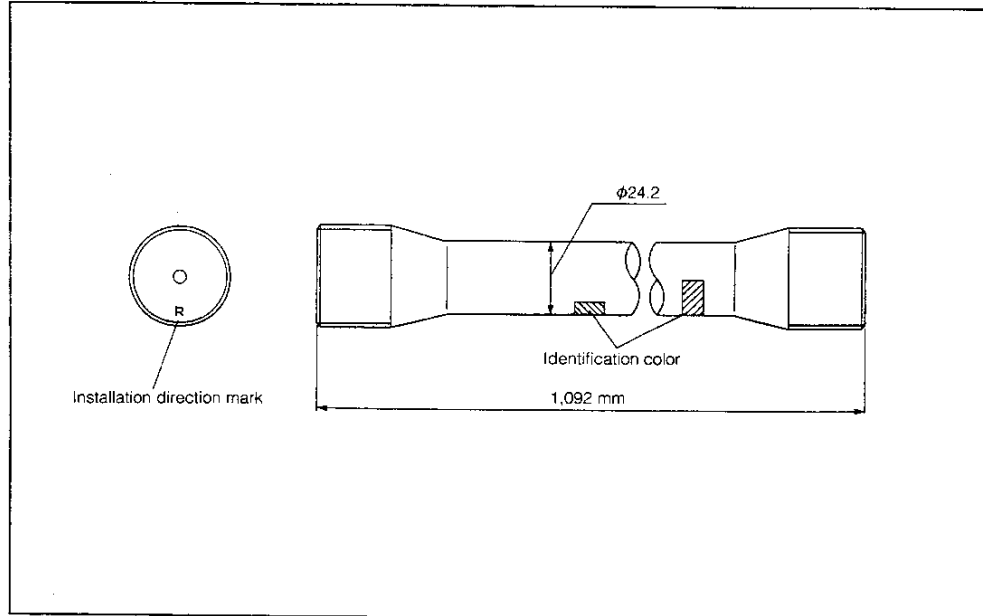


FRONT AXLE & SUSPENSION

Front springs

The front springs adopt a torsion bar spring that features light weight and a comparatively great energy absorption rate per unit weight.

The torsion bar springs come in two kinds; One for the right side and the other for the left side. Hence, make sure that the respective springs are installed at the correct side. If the springs should be installed at a wrong side, the durability will drop.



WFE90-FS029

Identification

Right	White (*Pink mark)
Left	Yellow (*Light green mark)

* For the United Kingdom

WFE90-FS030

Torsion Spring Specifications

Overall length	1092 mm
Outer diameter	24.2 (*25.1) mm
Spring constant	4.31 (*4.99) kgf-m/degree
Hardness	455 - 528 HV
Treatment	Shot peening

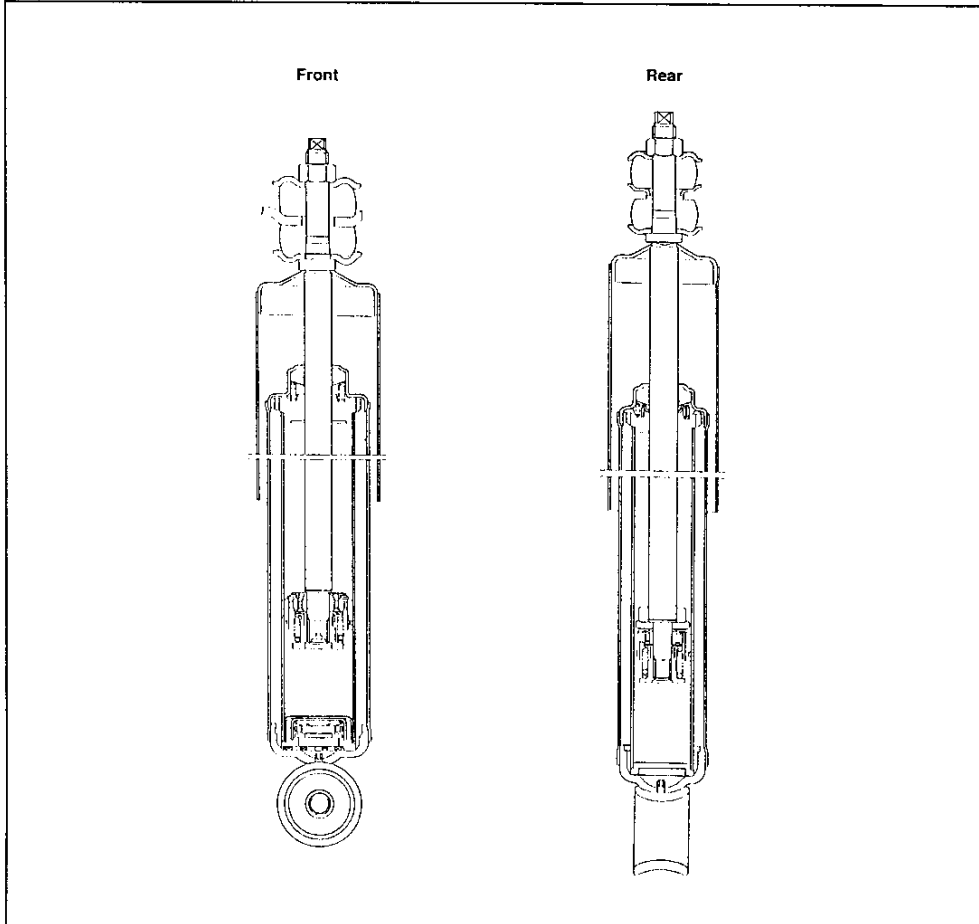
* For the United Kingdom

WFE90-FS031

FRONT AXLE & SUSPENSION

SHOCK ABSORBERS

The front and rear shock absorbers employ a nitrogen gas sealed type shock absorber.



WFE90-FS032

Shock Absorber Specifications

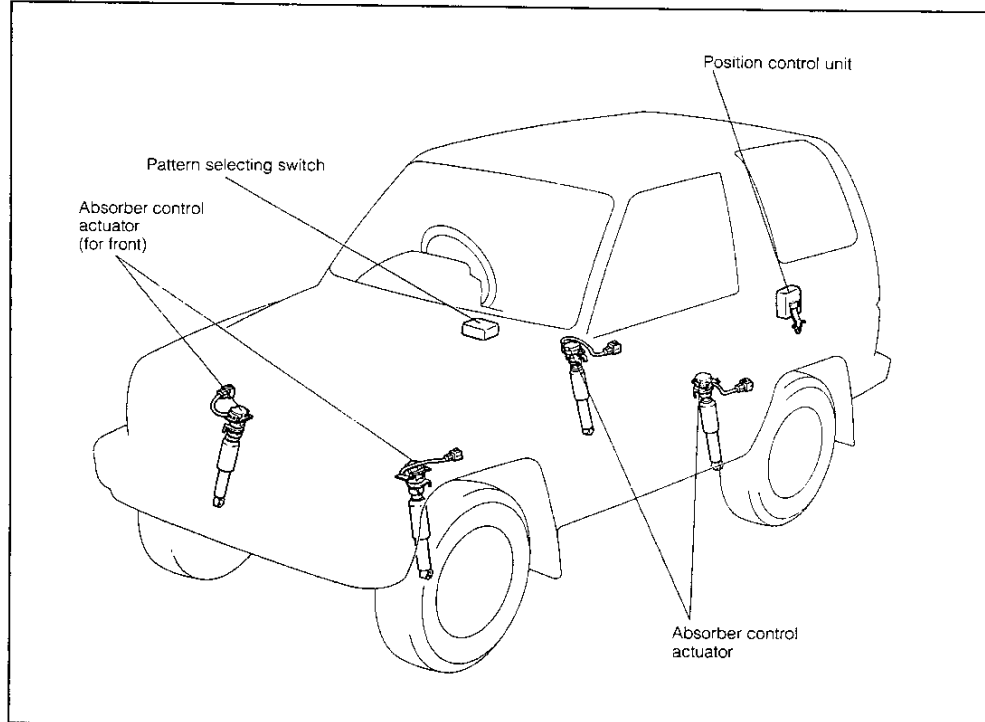
Item		Kind	FRONT	REAR
Maximum length		mm	365	453
Minimum length		mm	230	276
Stroke		mm	135	177
Damping force (at a piston speed of 0.3 m/sec)	Rebound stroke	kg	320 (*345)	205 (*162)
	Compression stroke	kg	50 (*55)	21 (*27)

* For the United Kingdom

THREE-STAGE DAMPERS

(Three-Stage Adjustable Shock Absorbers)

A three-stage damper is available as optional equipment for some models. This shock absorber is so designed that its damping force can be altered in accordance with the road and running conditions. The setting is performed through a switch arranged at the instrument panel.



WFE90-FS034

Three-Stage Dampers Specifications

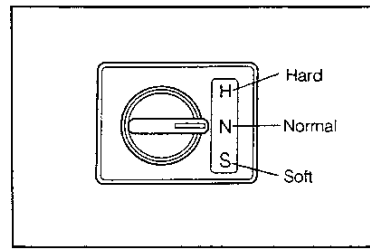
Item			Kind	FRONT	REAR
Maximum length			mm	360	446 (*440)
Minimum length			mm	245	281 (*278)
Stroke			mm	115	165 (*162)
Damping force (at a piston speed of 0.3 m/sec)	Rebound stroke	kg	HARD	360	222 (*211)
			MEDIUM	320	265 (*192)
			SOFT	290	153 (*142)
	Compression stroke	kg	HARD	60 (*63)	25 (*32)
			MEDIUM	48 (*57)	21 (*28)
			SOFT	40	13 (*20)

* For the United Kingdom

FRONT AXLE & SUSPENSION

PATTERN SELECTION SWITCH ASSEMBLY

The pattern selection switch assembly is a switch which switches the shock absorber damping force to three stages. It is installed at the lower section of the combination meter of the instrument panel.



WFE90-FS036

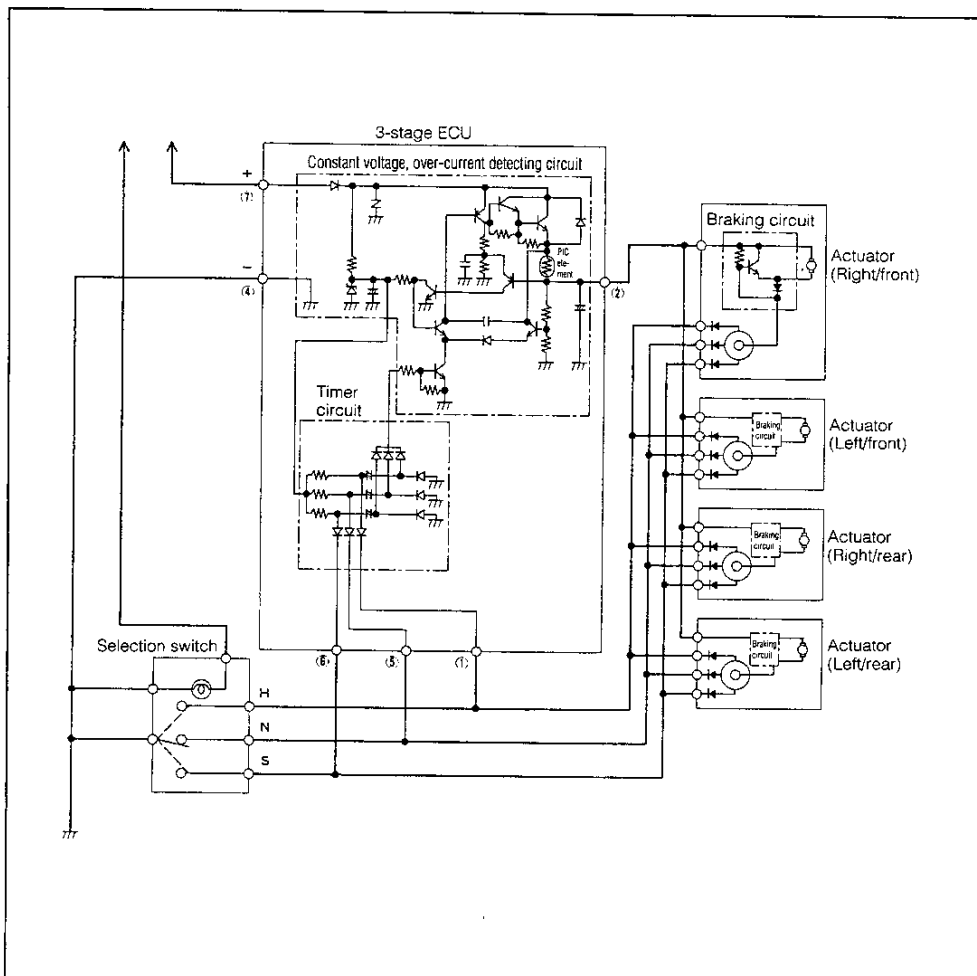
POSITION CONTROL UNIT

Braking operation

1. When the three-stage selection switch is operated, the actuator motor is energized. Then, the rotor interlocking with the motor begins to rotate.
2. When the rotor rotates to the specified position, the switch provided inside the actuator is turned OFF. (This switch is made of contact points consisting of patterns on the printed circuit board and a brush.) Then, the braking circuit is actuated, thereby stopping the rotation.
3. The rotor turns the control rod located inside the shock absorber proper, thus switching the damping force.

If the actuator should be encountered with malfunction or continuous rotation, the actuator energizing time is restricted to four to seven seconds so as to protect the motor.

Circuit Diagram

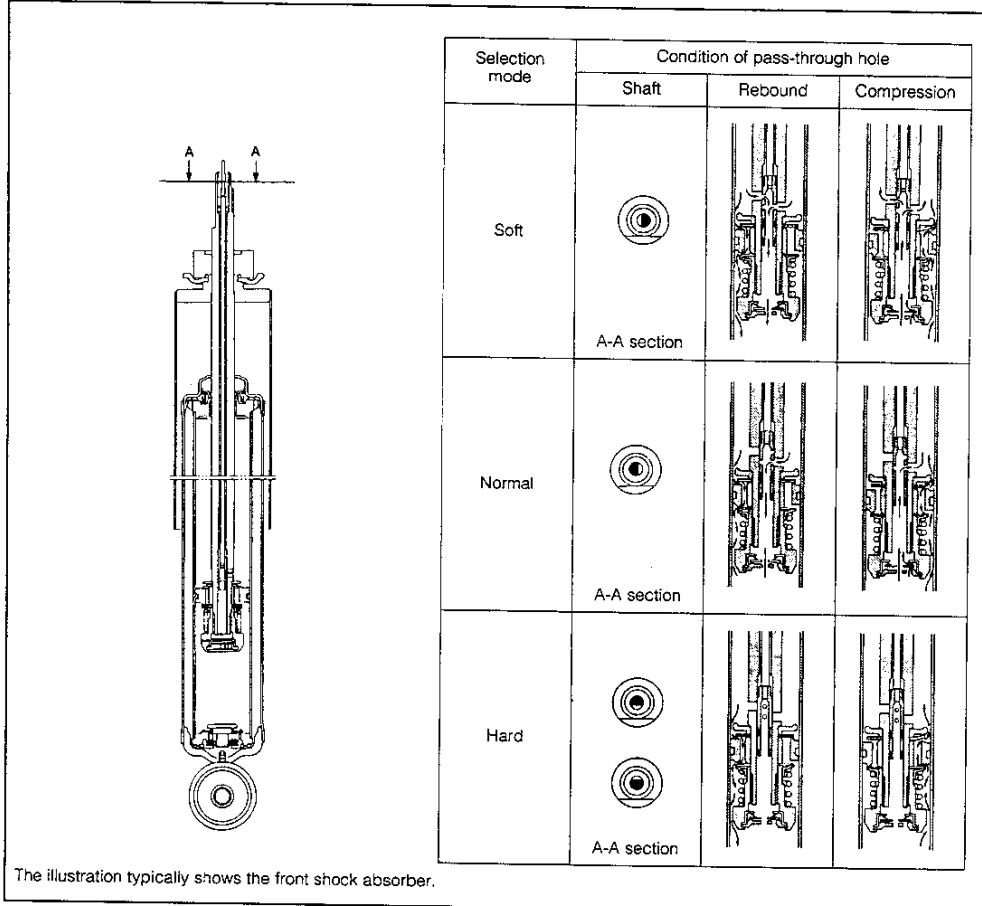


WFES90-FS037

FRONT AXLE & SUSPENSION

THREE-STAGE DAMPER (SHOCK ABSORBER)

Construction



WFE90-FS038

Operation

In accordance with the rotating position of the control rod, the rate of the oil passing through the pass-through holes provided at the control rod and shaft varies. As a result, the damping force is switched.

1. Soft

The pass-through holes of the control rod and shaft are aligned at both two positions. Consequently, a large amount of oil passes through the holes, thus softening the damping force.

2. Normal

The pass-through holes are aligned at one position, providing a slightly increased damping force.

3. Hard

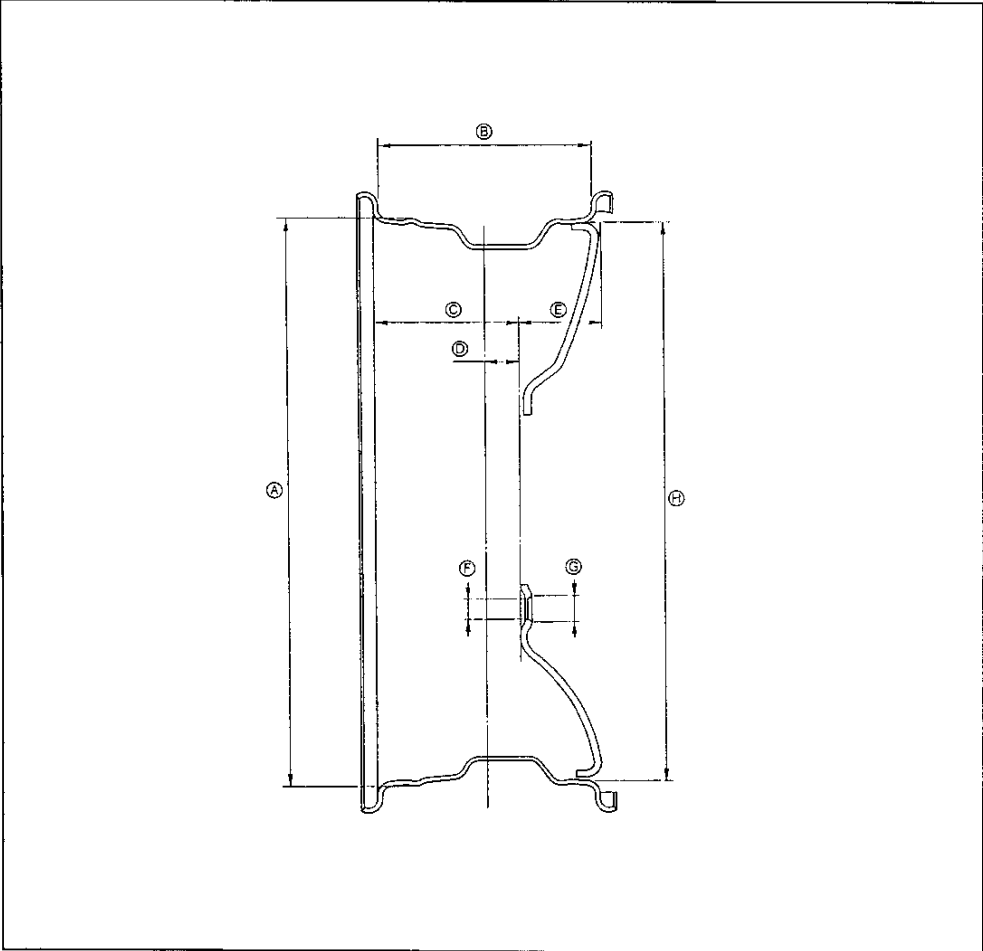
All pass-through holes are shut, thereby enhancing the damping force further.

The damping force is generated at the pass-through hole and piston valve section.

WFE90-FS039

FRONT AXLE & SUSPENSION

Disc Wheel Specifications



WFE90-FS045

mm

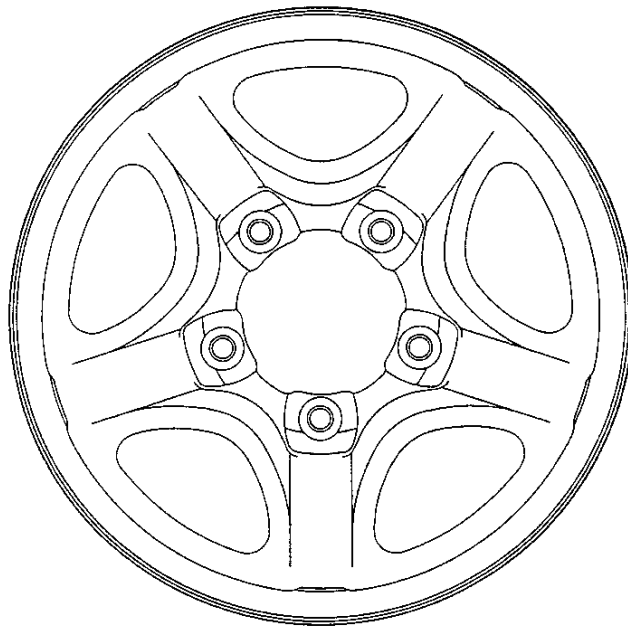
Dimension A	380.2
Dimension B	152.5
Dimension C	99.05
Dimension D	19.0
Dimension E	64.0
Dimension F	14.0
Dimension G	17.5
Dimension H	374.0

WFE90-FS046

DISC WHEELS

The disc wheel employs a 15 × 6JJ size.

The exterior color of the standard disc wheel is silver metallic. Chrome-plated disc wheel and aluminum disc wheel are available as option.



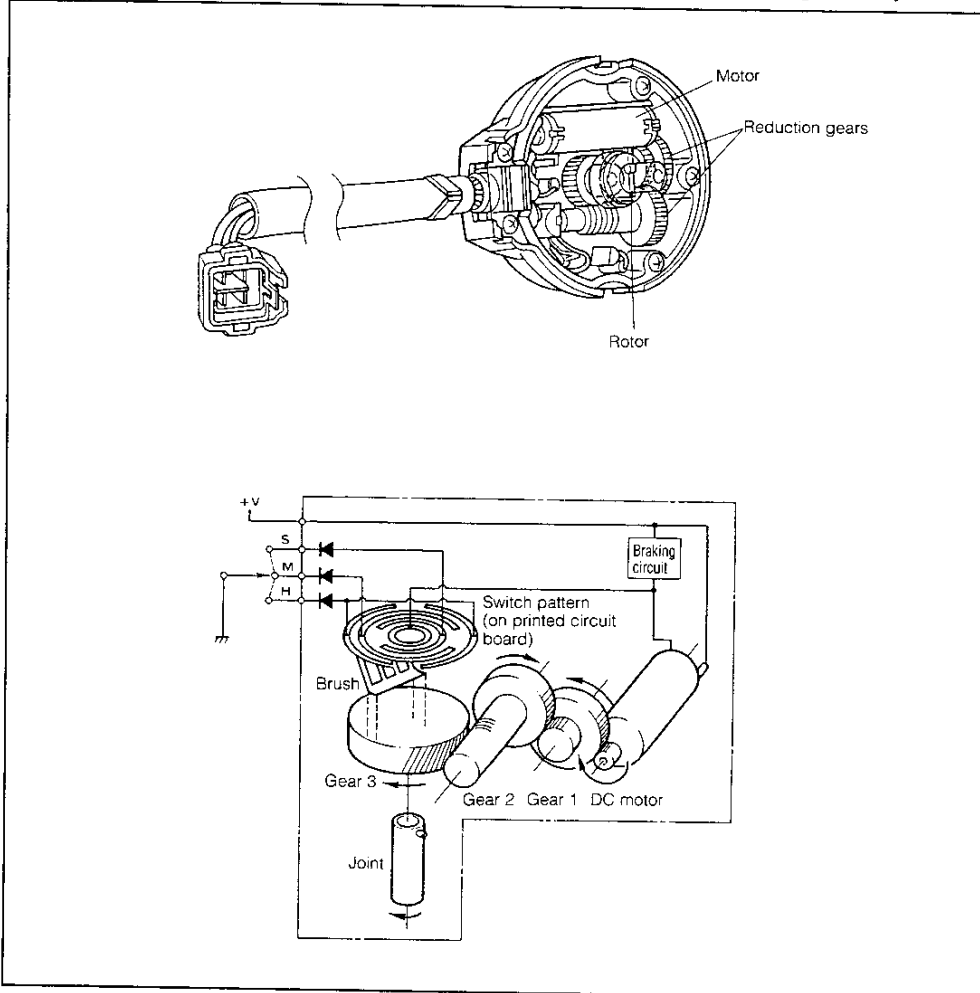
Steel disc wheels

WFE90-FS044

ABSORBER CONTROL ACTUATOR

Construction

As for the internal construction, the actuator is composed of the following sections: the rotation driving section consisting of a DC motor and a 3-stage gear (final gear: worm gear), the position detecting section consisting of a brush which rotates integrally with the output shaft and switch patterns which are secured to the case, and the braking circuit which brakes the DC motor electrically to assure the positioning accuracy.



Operation

Energized by the motor driving current sent from the controller, the rotor rotates to the specified position.

1. The motor driving current from the controller drives the actuator in the following sequence: motor → reduction gear → rotor.
2. The control current stops the motor at the specified position, simultaneously locking the rotor.

FRONT AXLE & SUSPENSION

TIRES

Radial tires are mounted on all vehicle models. These tires come either in tubeless or with/tube, depending upon destinations.

Tire \ Destination	ECE & EEC	General	Australian	G.C.C.
195 R15 94S (Tubeless)	○	○	○	—
195 R15 94S (W/Tube)	—	—	—	—
195/80 R15 94S (W/Tube)	—	—	—	○
225/70 R15 100S (Tubeless)	○	○	○	—
225/70 R15 100S (W/Tube)	—	—	—	○

WFE90-FS042

Tire Size and Tire Pressure

Destination			ECE & EEC	General	Australian	G.C.C.
Tire						
195 R15 94S (Tubeless)	Unloaded	Front	1.6 kgf/cm ²	1.6 kgf/cm ²	160 kpa	—
		Rear	2.1 kgf/cm ²	2.1 kgf/cm ²	210 kpa	—
	Loaded	Front	1.6 kgf/cm ²	1.6 kgf/cm ²	160 kpa	—
		Rear	2.3 kgf/cm ²	2.3 kgf/cm ²	230 kpa	—
195 R15 94S (W/Tube)	Unloaded	Front	—	1.6 kgf/cm ²	—	—
		Rear	—	2.1 kgf/cm ²	—	—
	Loaded	Front	—	1.6 kgf/cm ²	—	—
		Rear	—	2.3 kgf/cm ²	—	—
195/80 R15 94S (W/Tube)	Unloaded	Front	—	—	—	1.6 kgf/cm ²
		Rear	—	—	—	2.1 kgf/cm ²
	Loaded	Front	—	—	—	1.6 kgf/cm ²
		Rear	—	—	—	2.3 kgf/cm ²
225/70 R15	Unloaded	Front	1.6 kgf/cm ²	1.6 kgf/cm ²	160 kpa	1.6 kgf/cm ²
		Rear	2.1 kgf/cm ²	2.1 kgf/cm ²	210 kpa	2.1 kgf/cm ²
	Loaded	Front	1.6 kgf/cm ²	1.6 kgf/cm ²	160 kpa	1.6 kgf/cm ²
		Rear	2.3 kgf/cm ²	2.3 kgf/cm ²	230 kpa	2.3 kgf/cm ²
Tire air inflation pressure caution label affixing position			Lower part of front door striker at driver's seat side		Inside glove compartment	Lower part of front door striker at driver's seat side

WFE90-FS043

FRONT AXLE & SUSPENSION

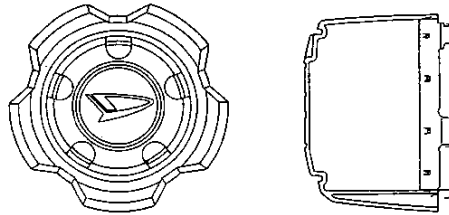
WHEEL CAPS

Wheel caps are installed on EL and EL-II grades. The wheel cap for the front wheel comes in two kinds; a standard wheel cap and a wheel cap for the front wheel with free wheel hub.

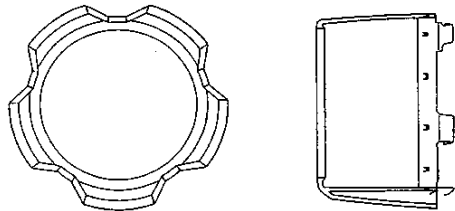
On the rear wheels, the same wheel caps are installed on EL and EL-II grades.

A steel wheel cap is provided for the aluminum wheel.

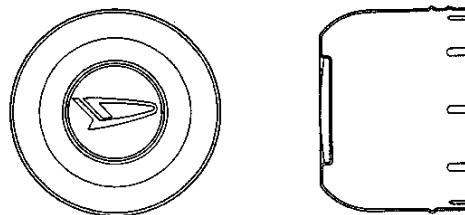
Wheel cap for rear wheels and standard front wheels



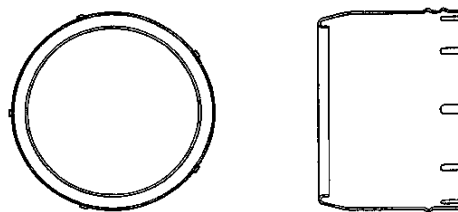
Wheel cap for front wheels with free wheel hub



Wheel cap for rear wheels and standard front wheels on aluminum wheel

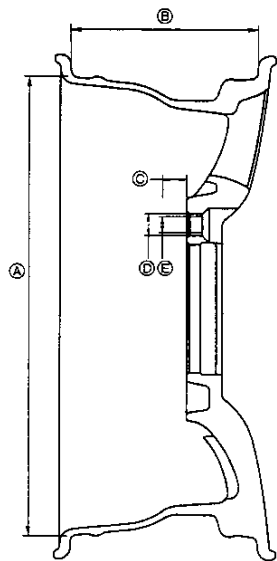
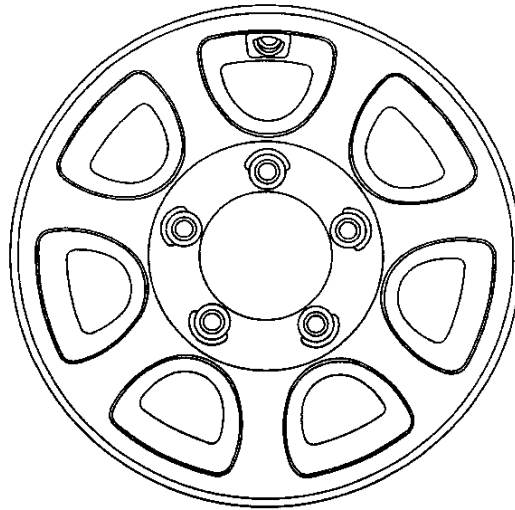


Wheel cap for front wheels with free wheel hub on aluminum wheel



WFE90-FS047

FRONT AXLE & SUSPENSION



(mm)

Dimension A	380.2
Dimension B	151.0
Dimension C	19.0
Dimension D	φ19.0
Dimension E	φ14.0

Aluminum disc wheel

WFE90-FS429

WHEELS & TIRES

NOTE:

- The tires should exhibit no damage, such as excessive wear, uneven wear and scratches.
- Any foreign matter, such as grit caught in the groove of the tire, should be removed in advance.
- The tires should not be so worn that slip signs appear on their tread surfaces.

WFE90-FS048

1. Check of tire size

Confirm the following points.

- (1) Ensure that the tires having the designated tire size are mounted.

Designated Tire Size:

195 R15

195/80 R15

225/70 R15

- (2) Ensure that the four tires have the same size and they are ones made by the same manufacturer.
- (3) There is no significant difference in wear between the right and left tires.

WFE90-FS049

2. Tire inflation pressure

Ensure that the tires are inflated to the specified air pressure.

Specified Value

kgf/cm²

	Front		Rear	
	Unloaded	Loaded	Unloaded	Loaded
195 R15 94S	1.6	1.6	2.1	2.3
225/70 R15 100S	1.6	1.6	2.1	2.3
195/80 R15 94S	1.6	1.6	2.1	2.3

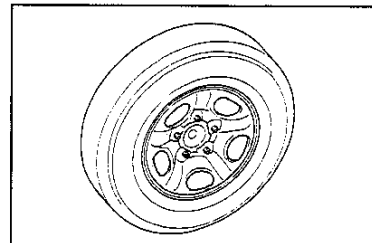
NOTE:

- The tire inflation pressure should be adjusted when the tire temperature is at the ambient temperature (prior to the running).
- The tire inflation pressure should be adjusted under the unloaded state.

WFE90-FS050

3. Check of disc wheel and tire

- (1) Ensure that the disc wheel exhibits no damage, such as deformation and cracks.
If any damage is present, replace the disc wheel.
- (2) Jack up the vehicle and support it with safety stands.
(See the GI section.)



WFE90-FS051

FRONT AXLE & SUSPENSION

- (3) Check the wheel and tire for runout, using a dial gauge. Ensure that the runout is within the allowable limit.

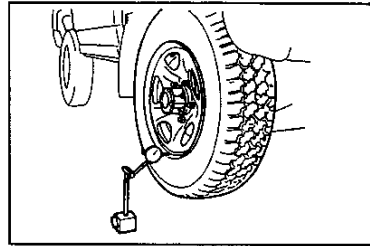
Wheel Maximum Runout:

Mean value of runouts at front and rear sides not to exceed 1.0 mm (0.04 inch)

Tire Maximum Runout:

Vertical Runout: Not to Exceed 1.4 mm
(Not to Exceed 0.0551 inch)

Lateral Runout: Not to Exceed 2.0 mm
(Not to Exceed 0.0787 inch)



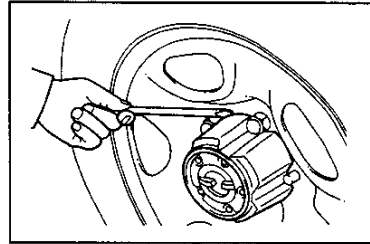
- (4) Jack down the vehicle.

4. Removal and installation of tire

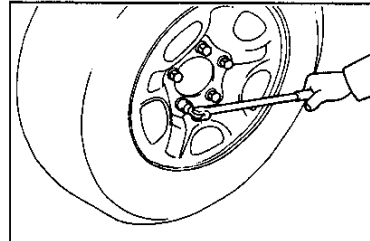
- (1) Pry off the center cap by inserting an L type handle into between the wheel and the center cap.

NOTE:

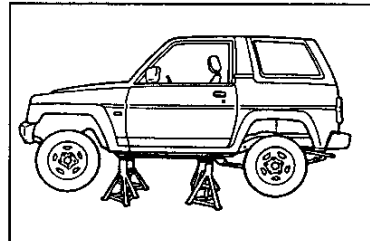
- Be very careful not to damage the wheel.



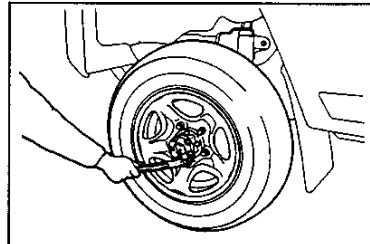
- (2) Slightly loosen the wheel hub nuts in the sequence indicated in the right figure.



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

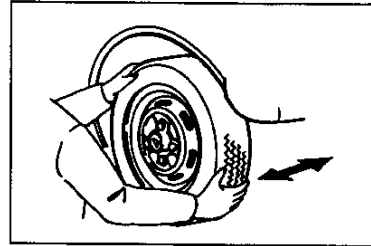


- (4) Remove the wheel hub nuts. Remove the wheel from the vehicle.



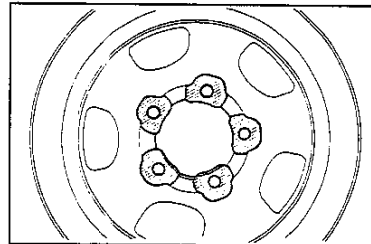
FRONT AXLE & SUSPENSION

- (5) Ensure that no foreign matter, such as dirt, gets to the wheel attaching surface at the vehicle side.



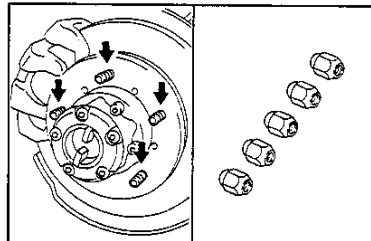
WFE90-FS057

- (6) Ensure that no foreign matter gets to the wheel attaching surface.



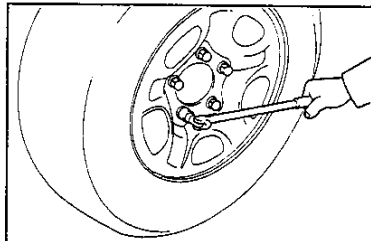
WFE90-FS058

- (7) Ensure that the hub bolts and hub nuts exhibit no damage.
If any hub bolt or hub nut exhibits damage, replace the damaged hub bolt and/or hub nut.
- (8) Attach the wheel to the vehicle. Temporarily tighten the hub nut, until the wheel can be secured.



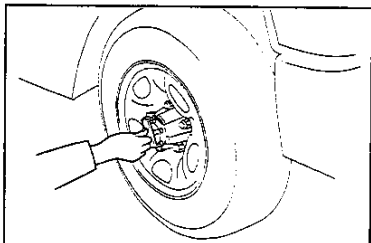
WFE90-FS059

- (9) Jack down the vehicle.
- (10) Evenly tighten the wheel hub nuts to the specified torque over two or three stages in the sequence indicated in the right figure.
- Tightening Torque:** 89.2 - 118 N·m
(9.0 - 12.0 kgf-m, 65.1 - 87.0 ft-lb)



WFE90-FS060

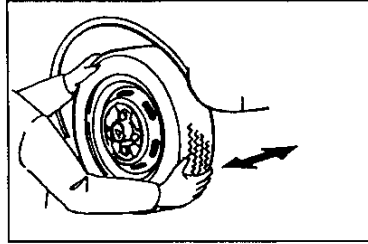
- (11) Attach the vehicle tool indicated in the right figure to the wheel cap. Press the wheel cap to the wheel.



WFE90-FS061

FRONT AXLE & SUSPENSION

5. Check of each related part for excessive play
- (1) Front wheel bearing for excessive play
 - (2) Suspension ball joint for excessive play
 - (3) Steering linkage for excessive play and deformation
 - (4) Suspension-related parts for excessive play and deformation
- Check the items above by rocking the tire in a fore-&-aft direction as well as in a right-&-left direction.



WFE90-FS062

FRONT AXLE & SUSPENSION

FRONT WHEEL ALIGNMENT TROUBLE SHOOTING

Symptom	Possible causes	Checking points
Tire unevenly worn at inner side	Toe-in amount too small	Check toe-in.
	Camber amount too small	Check camber.
Tire unevenly worn at outer side	Toe-in amount too large or camber amount too large	Check toe-in.
		Check camber.
Turning effort is too great when steering wheel is turned with vehicle in stationary state.	Caster angle too large	Check caster.
	Tire air inflation pressure too low	Check tire air inflation pressure.
Vehicle pulls to one side continuously while straight-ahead driving.	Caster angle too small	Check caster.
	Excessive difference in camber angle between right and left sides	Check camber.
Vehicle pulls to one side during braking.	Kingpin angle improperly set	Check upper arm bush. Check upper arm for damage or deformation.
		Check upper arm ball joint for excessive play.
		Check lower arm bush.
		Check lower arm for damage or deformation.
		Check lower arm ball joint for excessive play. Knuckle deformed
		Check frame dimensions at installation side of suspension upper arm and lower arm.

WFE90-FS063

PRELIMINARY CHECK ITEMS

1. Check of tire size and tire wear
Ensure that the tires having the designated size are mounted and that there is no significant difference in wear between the right and left tires.

Designated Tire Size:

195 R15
195/80 R15
225/70 R15

WFE90-FS064

2. Check of tire inflation pressure
Set the tire inflation pressure to the specified value in accordance with the designated tires mounted.

Specified Value

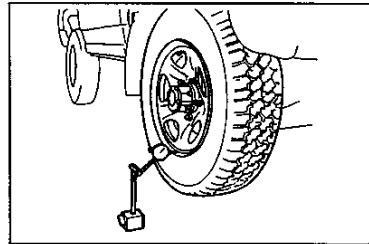
kgf/cm²

	Front		Rear	
	Unloaded	Loaded	Unloaded	Loaded
195 R15 94S	1.6	1.6	2.1	2.3
225/70 R15 100S	1.6	1.6	2.1	2.3
195/80 R15 94S	1.6	1.6	2.1	2.3

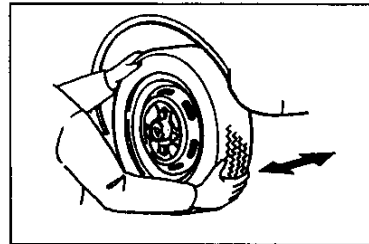
WFE90-FS065

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.



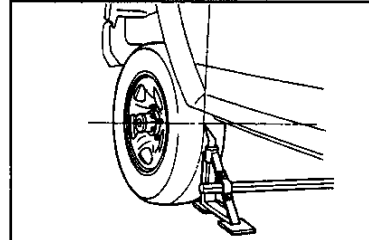
WFEB0-FS066



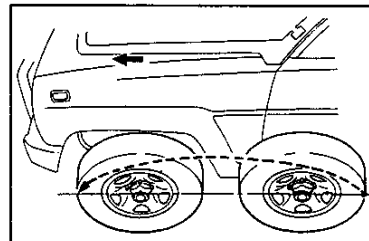
WFEB0-FS067

Toe-in check

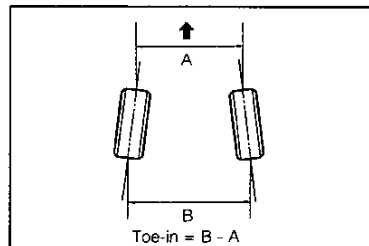
1. Move the vehicle forward so that the front wheels becomes straight.
2. Apply a toe-in gauge to the center point of the height at the rear side of each front wheel of the vehicle.
3. Mark the tread center at the rear side of each front tire. Measure the distance between the marks.
4. Move the vehicle slowly until the front wheels turn 180 degrees.
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: 4 ± 3 mm



WFEB0-FS068



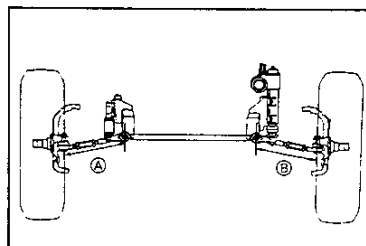
WFEB0-FS069



WFEB0-FS070

FRONT AXLE & SUSPENSION

If the toe-in amount fails to conform to the specification, adjust the tie rod length by turning the tie rod adjusting tube the same amount at the right and left sides, until the difference in length between the right and left tie rods (A) and (B) shown in the right figure becomes within 3 mm.

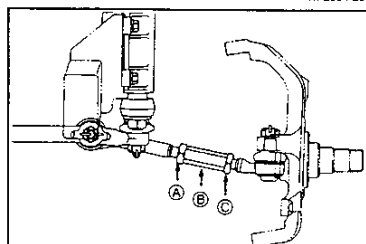


WFE90-FS071

<Tie Rod Tightening Procedure>

1. Tighten the tie rod by turning the nut (A), with a wrench applied to the section (B) shown in the right figure.
2. Tighten the tie rod by turning the nut (C), with a wrench applied to the section (B) shown in the right figure.

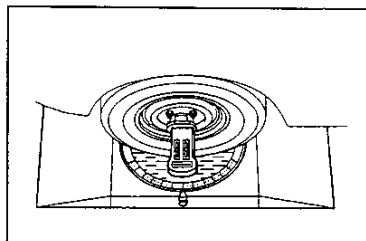
Tightening Torque: 118 - 167 N·m
(12 - 17 kgf-m, 87.0 - 123 ft-lb)



WFE90-FS072

Camber check and caster check

1. Place the wheel on a turning radius gauge.
2. Remove the free wheel hub cover.
3. Align the forward end of the center rod of the camber, caster and kingpin gauge with the center of the drive shaft section.
Proceed to make the forward end of the center rod closely contact with the hub body.



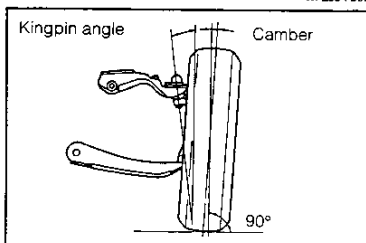
WFE90-FS073

4. Camber measurement

Specified Camber Amount: $1^{\circ} \pm 1'$

NOTE:

- The measurement should be performed in the same way at the right and left wheels.



WFE90-FS074

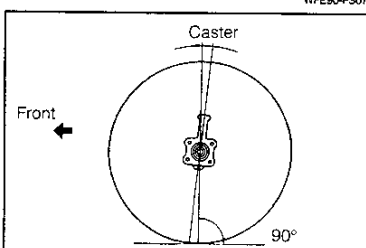
5. Caster measurement

Specified Caster Amount: $2^{\circ} \pm 30'$

Specified Kingpin Angle: $9^{\circ}30'$

NOTE:

- For the alignment checks, turn the steering wheel until the reading of the turning radius gauge becomes 20 degrees at the right wheel or the left wheel, respectively.

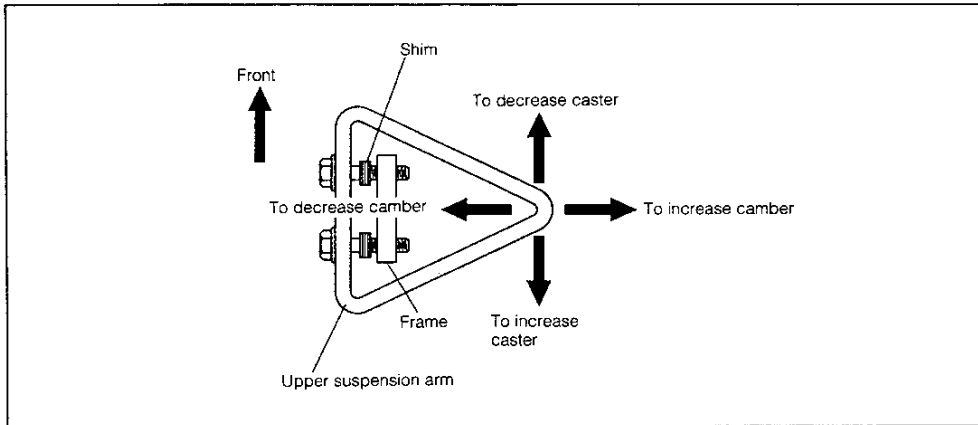


WFE90-FS075

FRONT AXLE & SUSPENSION

Adjusting procedure for camber and caster

The camber and caster vary by increasing/decreasing the number of the adjusting shims provided at the frame installation surface of the upper arm shaft.



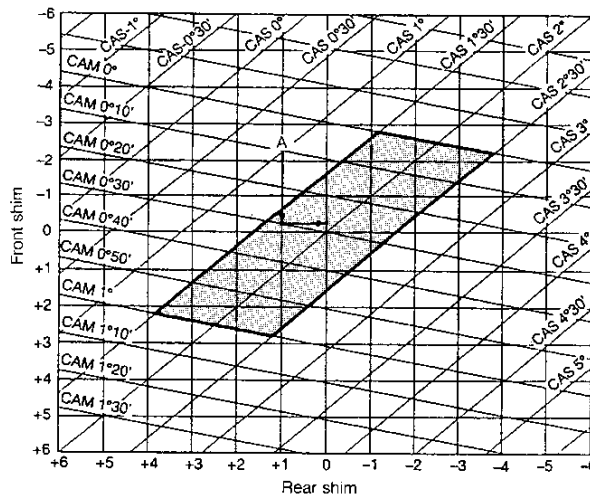
WFE90-FS076

Selecting method of adjusting shim

1. Select a suitable adjusting shim, using the diagram below.

<How to Read Diagram>

- (1) Suppose that the measurement on a vehicle reveals the following results:
Caster: 1° Camber: $0^{\circ}10'$
- (2) Plot the intersection of the caster line with camber line in the diagram below. The intersection is designated as the point A.
- (3) Decrease the front shim thickness by 2 mm and increase the rear shim thickness by 1 mm. Thus, the point A enters into the specified range.



NOTE:
The area enclosed by heavy lines () in the left diagram denotes the permissible range for camber and caster angle.

WFE90-FS077

FRONT AXLE & SUSPENSION

- Both the front and rear shim thickness should not exceed 8 mm. The difference in thickness between the front shim and the rear shim should not exceed 4 mm.
- After the adjusting shims have been installed, finally ensure that the front alignment conforms to the specifications.

WFE90-FS078

Check of steering wheel turning angle

- Place the wheel on the turning radius gauge. Check the wheel turning angle.

Specified Value:

Mounted tire	Inner turning (A)	Outer turning (B)
195/80 R15 195 R15	31°05' \pm 3'	27°15'
225/70 R15	27°05' \pm 3'	23°55'

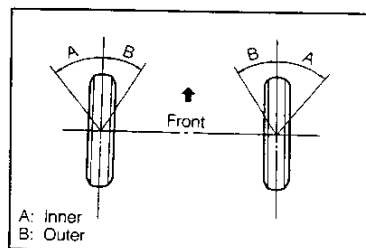
- If the measured turning angle fails to conform to the specifications, adjust the wheel turning angle by means of the knuckle stopper bolt.

Stopper Bolt Lock Nut Tightening Torque:

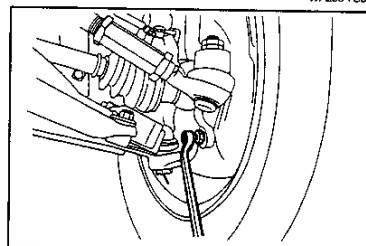
78.5 - 98.0 N·m (8.0 - 10.0 kg-m, 57.9 - 72.0 ft-lb).

NOTE:

- After completion of the adjustment, be sure to install the cap to the stopper bolt.



WFE90-FS079

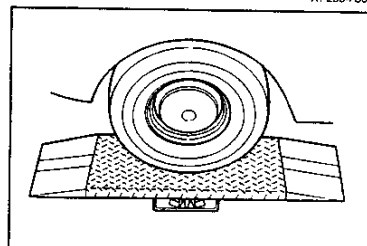


WFE90-FS080

Sideslip check

- Check the sideslip, using a sideslip tester.

Specified Value: Within 3 mm per one meter

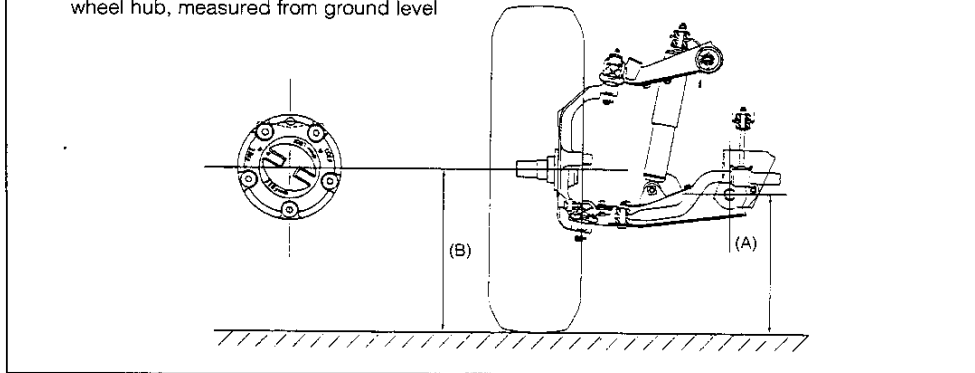


WFE90-FS081

FRONT AXLE & SUSPENSION

<Checking and Adjusting Procedures for Vehicle Height>

- (A): Height of center of attaching bolt at front side of lower arm, measured from ground level
(B): Height of center of wheel ornament or free wheel hub, measured from ground level



Care must be exercised as to the following points before the vehicle height check is carried out.

- (1) The designated tires are installed.
- (2) The tires are inflated to the specified value.
- (3) The vehicle is under no-loaded state.

NOTE:

- The measurement should be conducted with the vehicle under no-loaded state.

- (4) Rock the vehicle several times so as to settle the suspensions.
- (5) Move the vehicle about three meters twice in a fore-and-aft direction.

WFE90-FS082

Adjusting procedure

1. Adjust the anchor bolt so that the following specified value may be obtained.

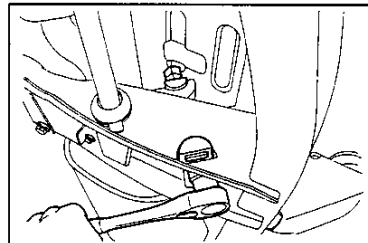
Specified Value: $(B) - (A) = 41 \pm 10 \text{ mm}$

NOTE:

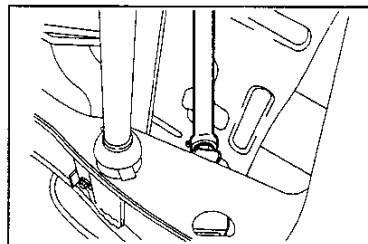
1. As regards the vehicle height, the adjustment should be carried out so that any variation in the specified value between the right and left sides may become within 10 mm.
 2. With regard to the protrusion height of the anchor bolt, the adjustment should be carried out so that any variation between the right and left sides may become within 10 mm.
2. Secure the anchor bolt by means of the lock nut.
Tightening Torque: 68.6 - 88.3 N·m
(7.0 - 9.0 kg-m, 50.6 - 65.1 ft-lb)

NOTE:

- Secure the anchor bolt by tightening the upper nut while preventing the lower nut from turning by means of a spanner.



WFE90-FS083

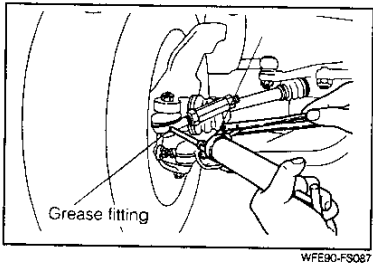
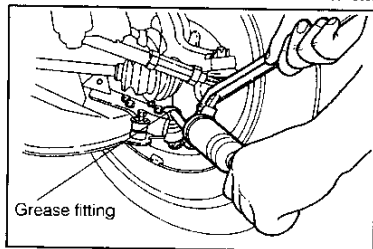
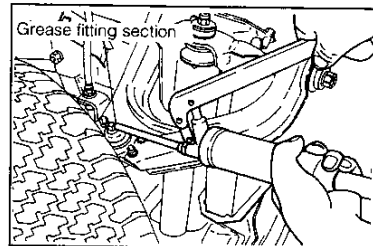


WFE90-FS084

FRONT AXLE & SUSPENSION

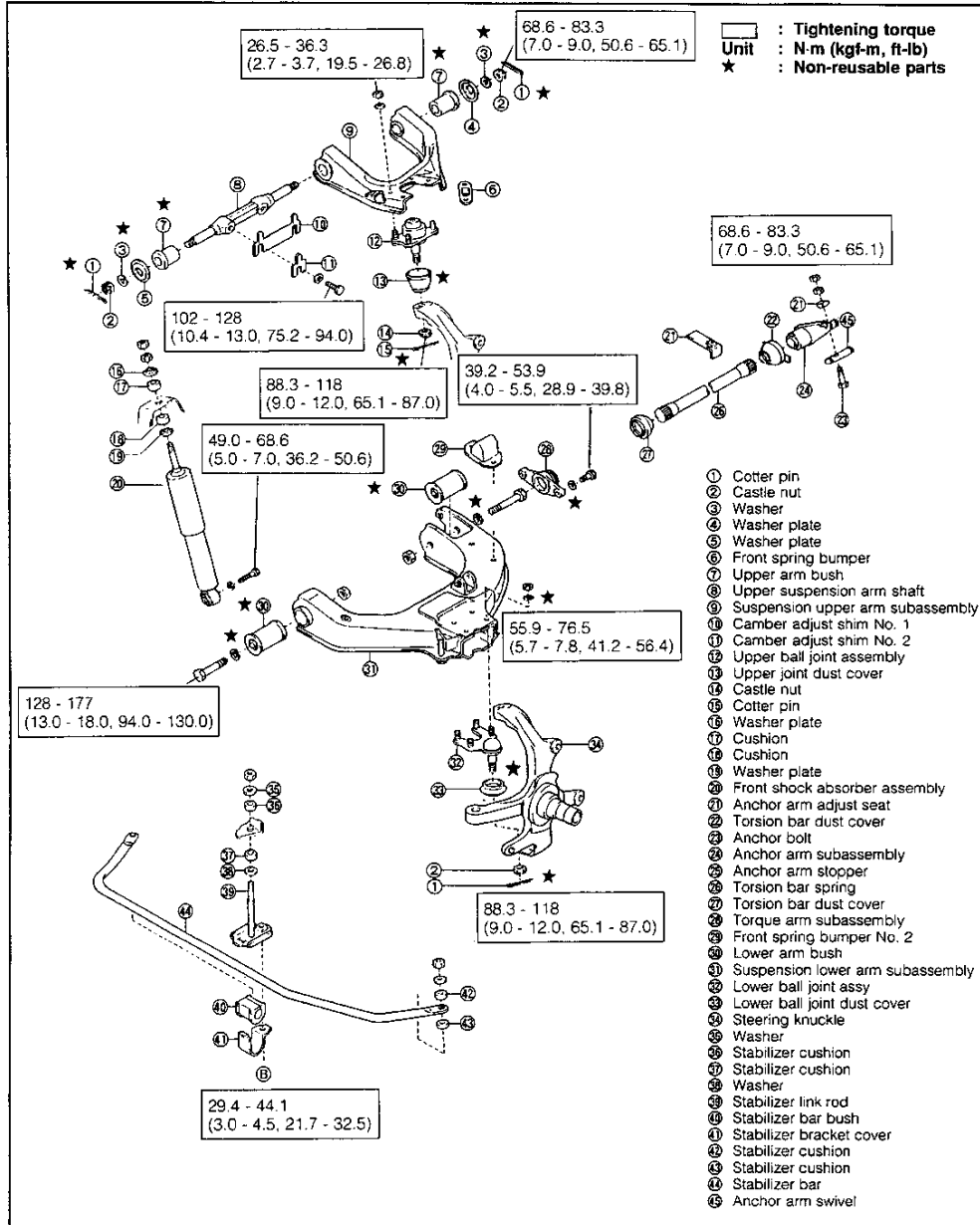
GREASE LUBRICATION

1. Upper arm ball joint
 - (1) Clean the grease fitting of the upper arm ball joint.
 - (2) Ensure that the grease fitting of the upper arm ball joint exhibits no damage.
If any damage is present, replace the damaged grease fitting.
 - (3) Fill grease from the grease fitting, using a grease gun.
Specified Grease: Lithium-based MP grease
Filling Amount: 27 grams
(In cases where a new part is installed)
2. Lower arm ball joint
 - (1) Clean the grease fitting of the lower arm ball joint.
 - (2) Ensure that the grease fitting of the upper arm ball joint exhibits no damage.
If any damage is present, replace the damaged grease fitting.
 - (3) Fill grease from the grease fitting, using a grease gun.
Specified Grease: Lithium-based MP grease
Filling Amount: 10 grams
Filling Amount: (In cases where a new part is installed)
3. Tie rod end ball joint
(See the Steering section.)



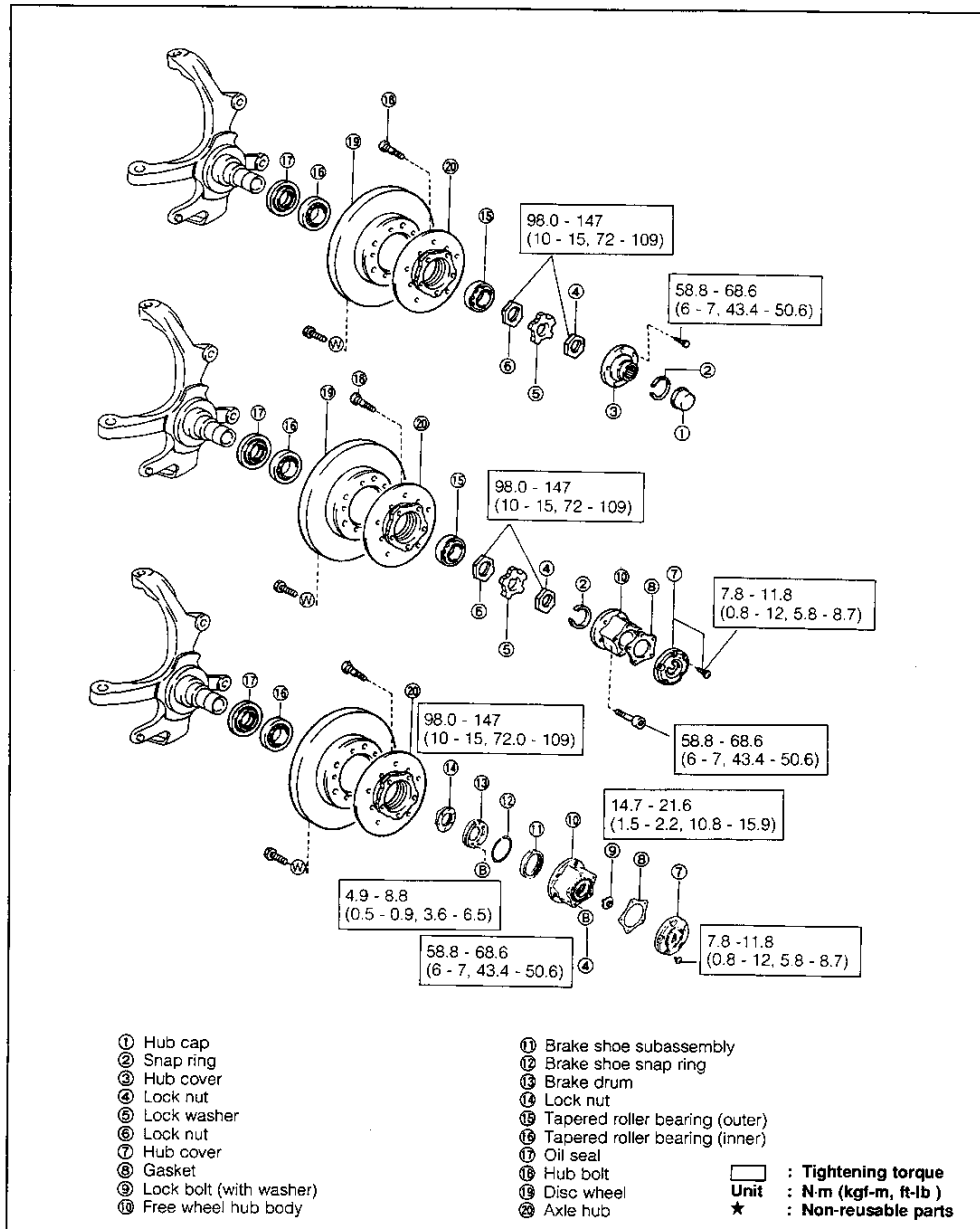
FRONT AXLE & SUSPENSION

FRONT SUSPENSION COMPONENTS



WFE90-FS068

FRONT AXLE HUB COMPONENTS



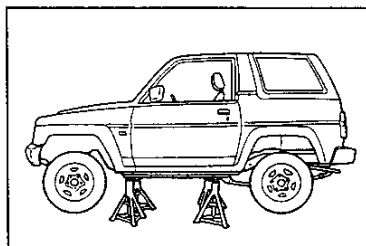
WFE90-FS069

FRONT AXLE & SUSPENSION

CHECK OF FREE WHEEL HUB OPERATION

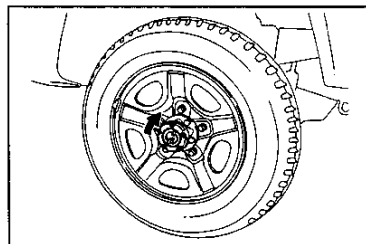
1. Check of manual free wheel hub

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



WFE90-FS090

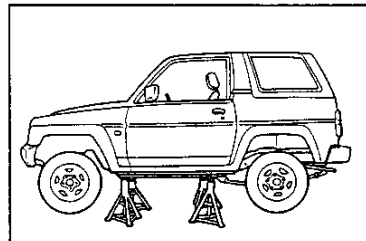
- (2) Set the handle of the free wheel hub to the "LOCK" position.
- (3) Turn the tire several times. At this time, ensure that the front drive shaft turns together.
If not, replace the free wheel hub.
- (4) Set the handle of the free wheel hub to the "FREE" position.
- (5) Turn the tire several times. At this time, ensure that the front drive shaft will not turn together.
- (6) Jack down the vehicle.



WFE90-FS091

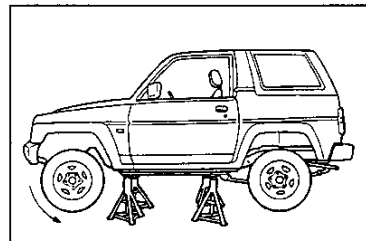
2. Check of automatic free wheel hub

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



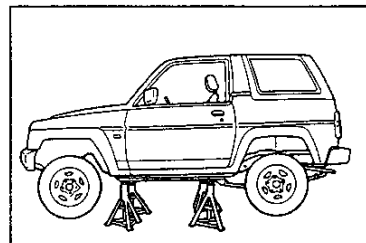
WFE90-FS092

- (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.



WFE90-FS093

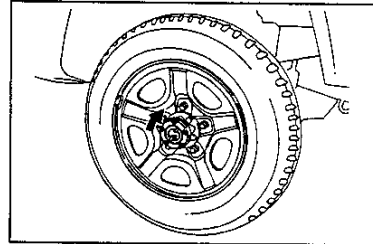
- (4) Shift the shift lever to the 2H position.
- (5) While slightly applying the brake, apply the driving force to the wheel in a direction opposite to the former direction in the step (3). In this way, turn the wheel more than three times.



WFE90-FS094

FRONT AXLE & SUSPENSION

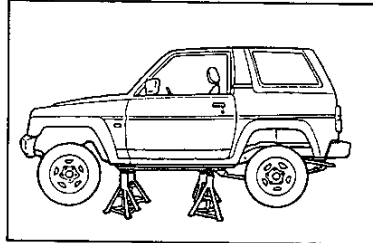
- (6) Stop the engine.
- (7) When turning the wheel by hands, ensure that the drive shaft will not turn together.
If not, replace the free wheel hub.



WFE90-FS085

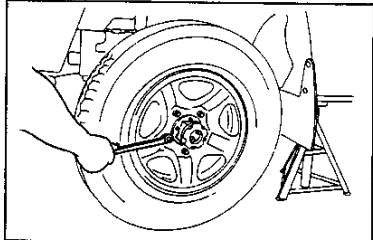
REMOVAL/DISASSEMBLY OF FRONT AXLE HUB

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



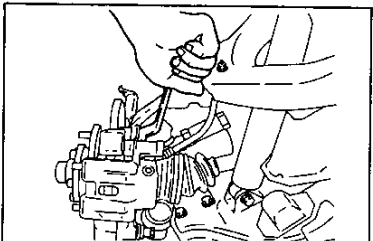
WFE90-FS096

2. Remove the front wheel.
(See page FS-28.)



WFE90-FS097

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.

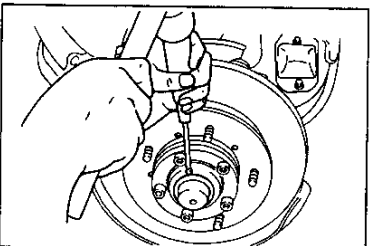


WFE90-FS098

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.



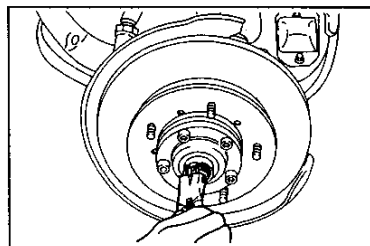
WFE90-FS099

FRONT AXLE & SUSPENSION

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

NOTE:

- Do not reuse the snap ring.



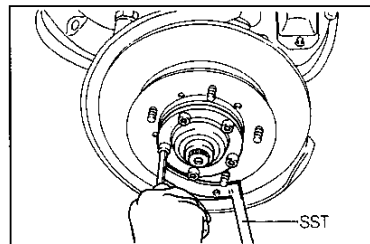
WFE90-FS100

- (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

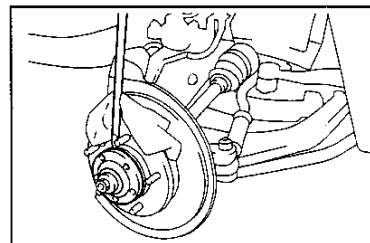


WFE90-FS101

- (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.

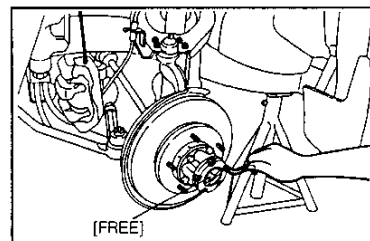


WFE90-FS102

5. Removal of free wheel hub

As for the manual locking hub, see page FS-52 to FS-55.

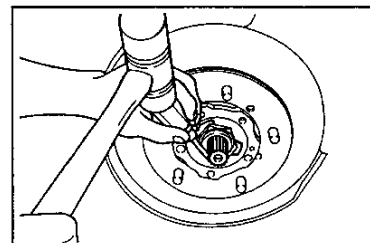
As for the automatic locking hub, see page FS-58 to FS-60.



WFE90-FS103

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

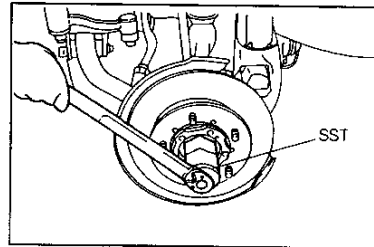
- (1) Raise the pawl of the lock washer by means of a chisel or the like.



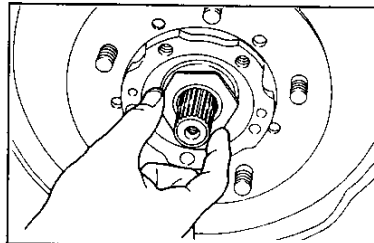
WFE90-FS104

FRONT AXLE & SUSPENSION

- (2) Remove the lock nut, using the following SSTs.
SST: 09607-87602-000

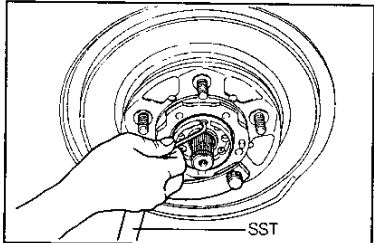


- (3) Remove the lock washer.
(4) Remove the lock nut, using the same SSTs as the step (2).

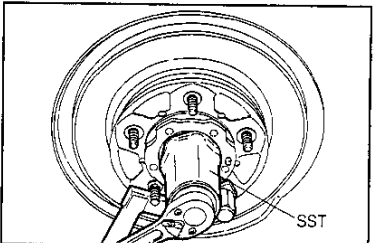


7. Removal of lock nut (Automatic locking hub-equipped vehicle only)

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

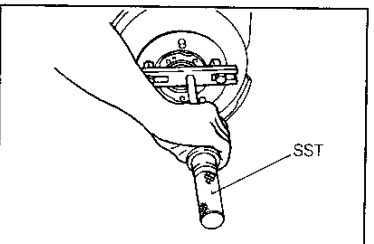


- (2) Remove the lock nut, using the following SSTs.
SST: 09607-87603-000



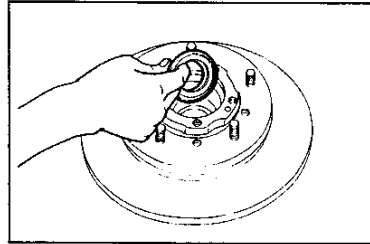
8. Remove the front axle hub, using the following SST.
NOTE:

- Be very careful not to drop the outer bearing and hub during the removal.
- SST: 09520-00031-000

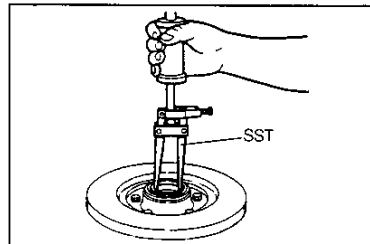


FRONT AXLE & SUSPENSION

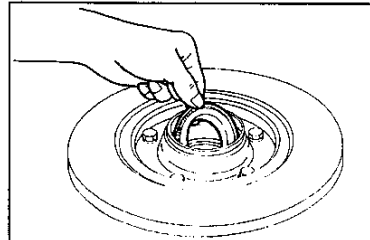
9. Remove the tapered roller outer bearing (outer side) from the hub.



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



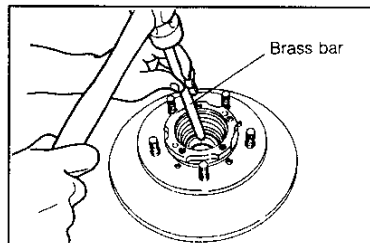
11. Remove the tapered roller bearing (inner side).



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:

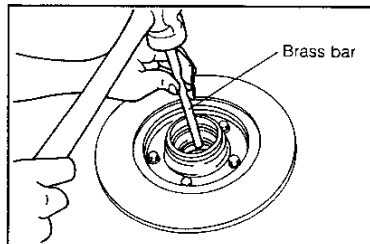
- This operation is required only when the bearing is replaced.



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

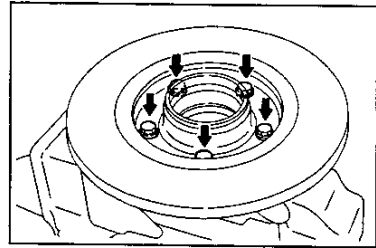
NOTE:

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



FRONT AXLE & SUSPENSION

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

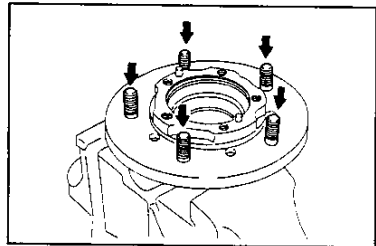


WFE90-FS115

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.



WFE90-FS116

INSPECTION

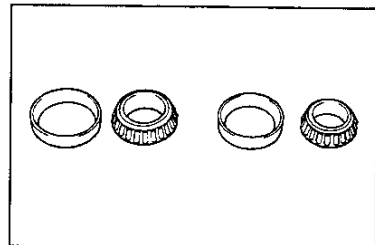
Wash the disassembled parts and dry them with compressed air, except for the free wheel hub.
As for the brake discs, degrease them with cleaning solvent, such as alcohol.

WFE90-FS117

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.

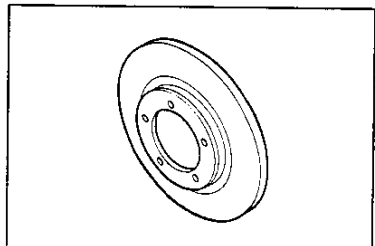
NOTE:

- The inner race and outer race should be handled as a set.



WFE90-FS118

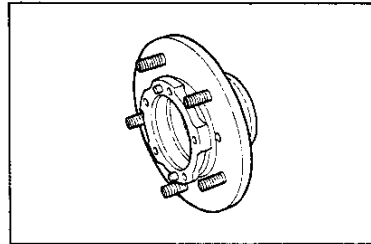
2. Ensure that the brake disc exhibits no damage, such as wear, cracks and scratches.
If any damage is present, replace the brake disc.



WFE90-FS119

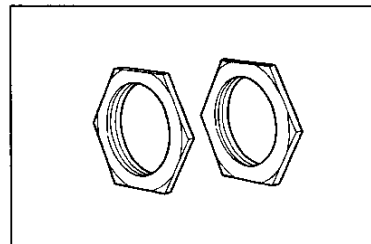
FRONT AXLE & SUSPENSION

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.



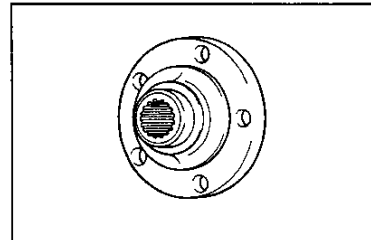
WFE90-FS120

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



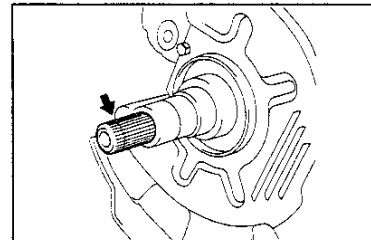
WFE90-FS121

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.



WFE90-FS122

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-102.)



WFE90-FS123

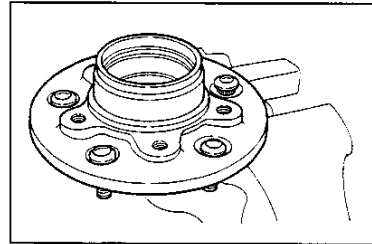
7. Check of free wheel hub
- As for the manual locking hub, see page FS-39.
 - As for the automatic locking hub, see page FS-39.

ASSEMBLY OF FRONT AXLE HUB

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

NOTE:

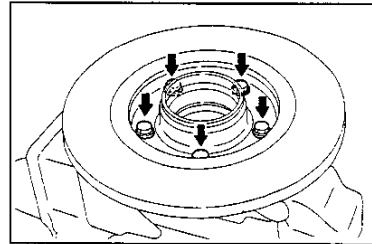
- Be sure to align the cut-out section of the hub bolt with the hub.



WFE90-FS124

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

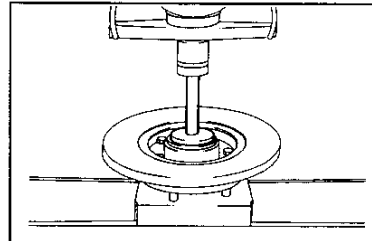
Tightening Torque: 53.9 - 73.5 N·m
(5.5 - 7.5 kgf-m, 39.8 - 54.2 ft-lb)



WFE90-FS125

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

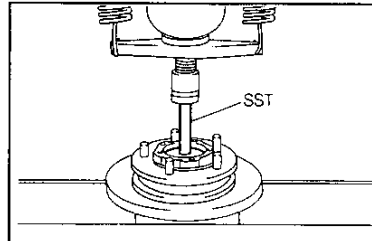
SST: 09608-87604-000
09611-87506-000



WFE90-FS126

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

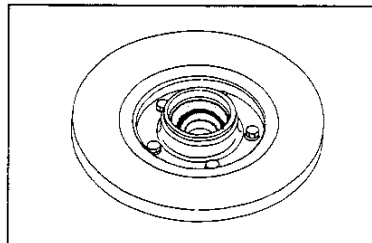
SST: 09608-87603-000
09611-87506-000



WFE90-FS127

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: 35 - 40 grams



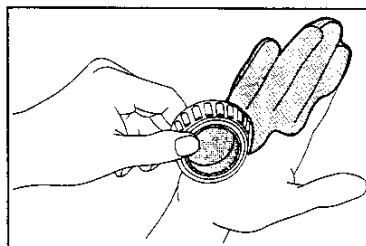
WFE90-FS128

FRONT AXLE & SUSPENSION

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

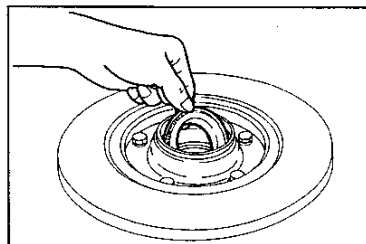
NOTE:

- 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.



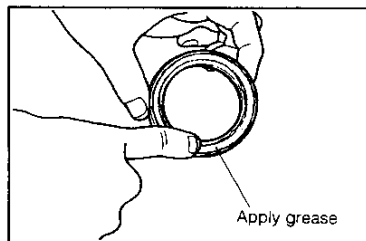
WFE90-FS129

7. Install the inner bearing to the hub.



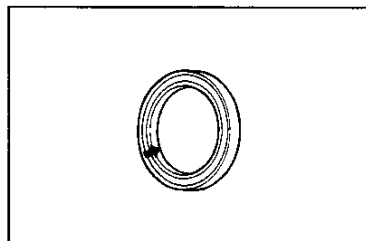
WFE90-FS130

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



WFE90-FS131

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



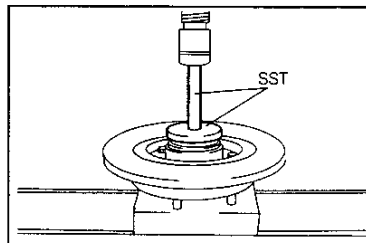
WFE90-FS132

10. Press the oil seal to the hub edge surface, using the following SST.

SST: 09608-87602-000
09611-87506-000

NOTE:

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

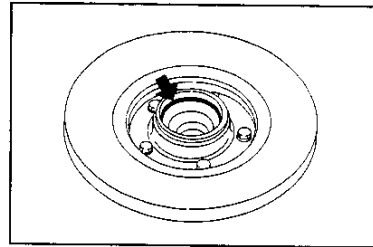


WFE90-FS133

FRONT AXLE & SUSPENSION

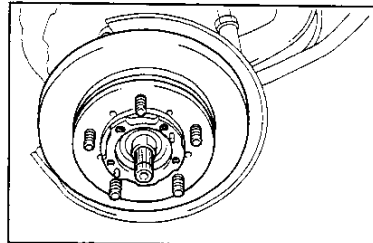
11. Fill lithium-based MP grease between the oil seal and the bearing.

Filling Amount: 25 - 30 grams



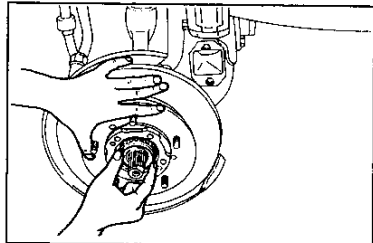
WFE90-FS134

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



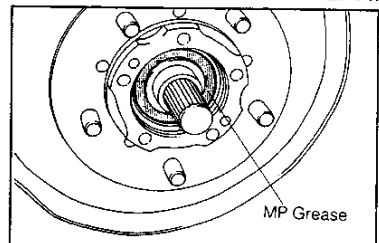
WFE90-FS135

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



WFE90-FS136

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



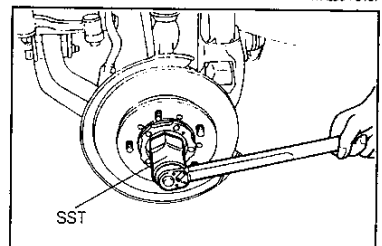
WFE90-FS137

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

SST: Manual locking hub-equipped vehicle and full-time 4WD vehicle: 09607-87602-000

Automatic locking hub-equipped vehicle:
09607-87603-000

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



WFE90-FS138

FRONT AXLE & SUSPENSION

16. Rotate the axle hub two or three turns so that the axle hub may be bedded in.
17. Adjust the lock nut so that the starting torque may conform to the specified value.

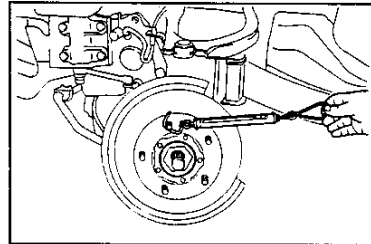
Starting Load: 1.4 - 3.6 kgf

[Reference]

Starting Torque:

0.98 - 2.45 N·m

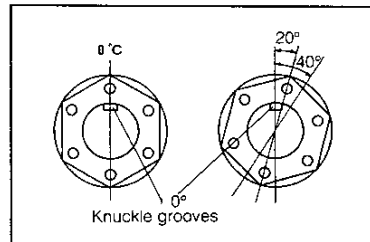
(10 - 25 kgf-cm, 8.7 - 21.7 inch-lb)



WFE90-FS139

NOTE:

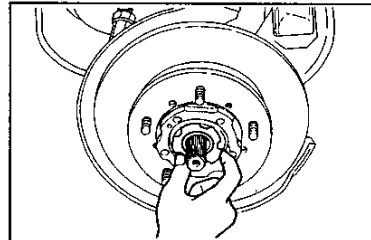
- Adjust the automatic locking hub nut in such a way that the hub nut position comes at the position indicated in the right figure after completion of the adjustment.



WFE90-FS140

18. Installation of lock washer and lock nut (except automatic locking hub-equipped vehicle)

(1) Install the lock washer.



WFE90-FS141

(2) Tighten the lock nut to the specified torque, using the following SST.

SST: 09607-87602-000

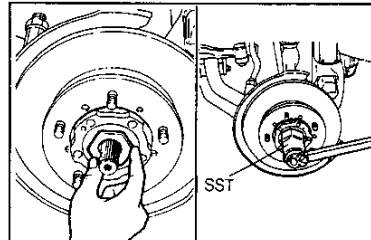
Tightening Torque: 98.0 - 147 N·m

(10 - 15 kgf-m, 72.0 - 109 ft-lb)

(3) Ensure that the starting torque is within the specifications.

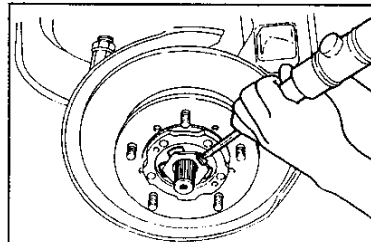
(See the step 17.)

If not, adjust the lock nut back-off amount described at the step 15. Perform the operations from the step 15 onward again.



WFE90-FS142

(4) Bend the tang of the lock washer toward the lock nut edge surface at the inner and outer sides.

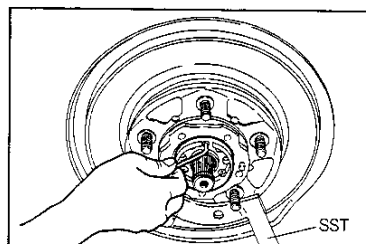


WFE90-FS143

FRONT AXLE & SUSPENSION

19. Install the brake drum and tighten the attaching screws (torque screws) to the specified torque. (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)



WFES90-FS144

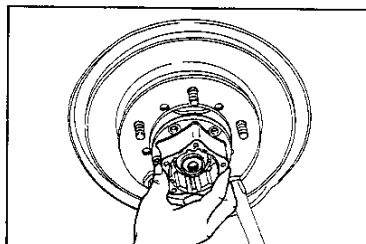
20. Installation of free wheel hub
(Free wheel hub-equipped vehicle only)

Manual locking hub

See page FS-55 to FS-58.

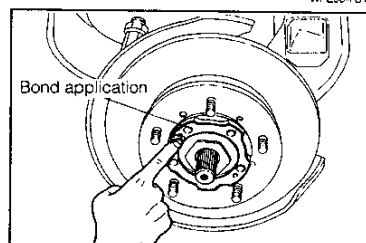
Automatic locking hub

See page FS-61 to FS-64.



WFES90-FS145

21. Installation of hub cover (Full-time 4WD vehicle only)
Thinly and evenly apply the Daihatsu Bond No.4 to the edge surface of the hub.



WFES90-FS146

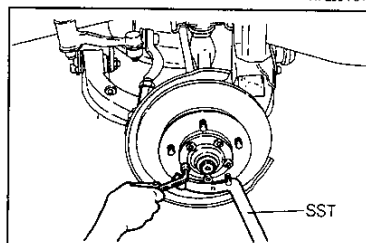
22. Install the hub cover. Tighten the attaching bolts evenly to the specified torque over two or three stages.
(Full-time 4WD vehicle only)

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

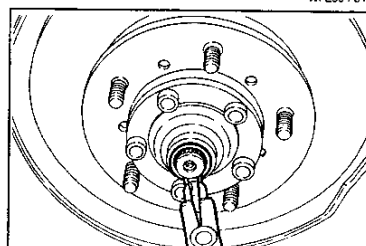


WFES90-FS147

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

NOTE:

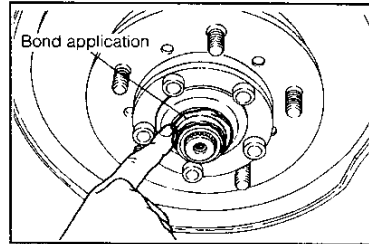
- Do not reuse the snap ring.



WFES90-FS148

FRONT AXLE & SUSPENSION

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



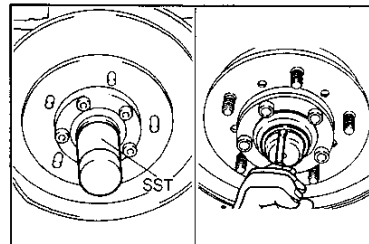
WFE90-FS149

25. Press the hub cap, using the following SST or a screwdriver or the like.

SST: 09608-87613-000

NOTE:

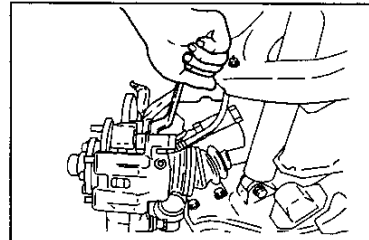
- Do not reuse the hub cap.
- Wipe off any bond that has oozed out.



WFE90-FS150

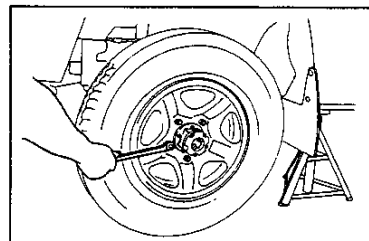
26. Install the brake mounting support together with calipers to the steering knuckle.

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



WFE90-FS151

27. Install the front wheel.
(See page FS-28)

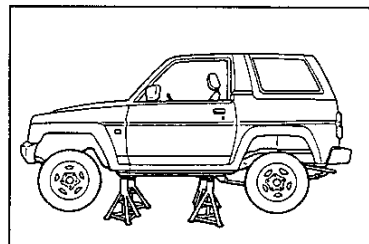


WFE90-FS152

MANUAL FREE WHEEL HUB

Disassembly

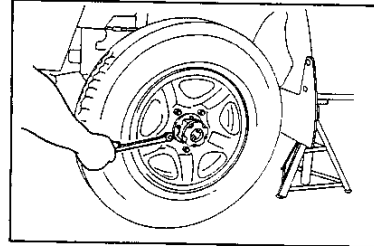
1. Jack up the vehicle and support it with safety stands.
(See GI section.)



WFE90-FS153

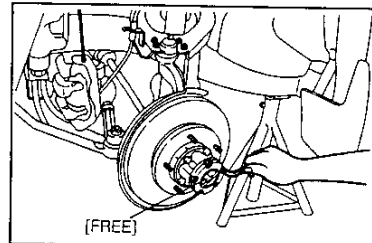
FRONT AXLE & SUSPENSION

2. Remove the front wheel.
(See page FS-28.)



WFE90-FS154

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



(FREE)

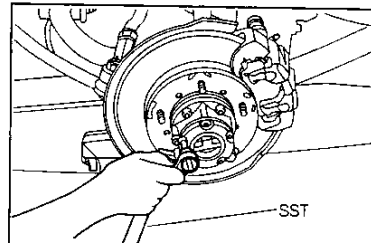
WFE90-FS155

- (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



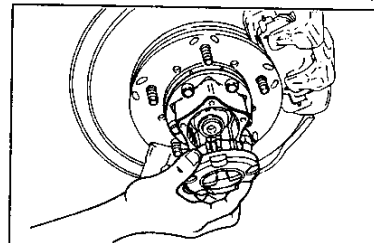
SST

WFE90-FS156

- (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.

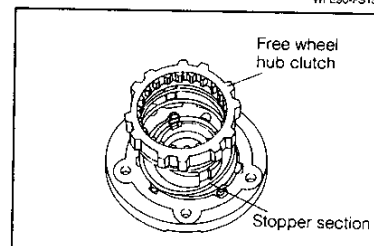


WFE90-FS157

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.



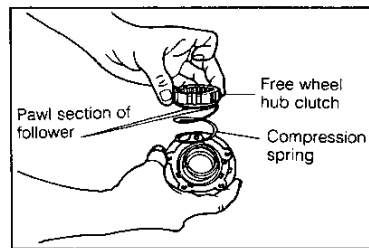
WFE90-FS158

FRONT AXLE & SUSPENSION

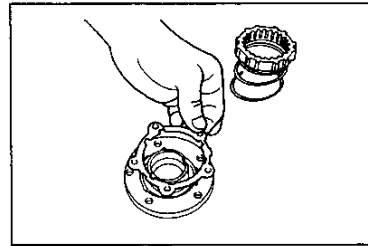
- (2) Push the clutch toward the cover side further. Remove the pawl section of the follower from the stopper section of the hub cover handle. Then, remove the clutch sub-assembly from the cover.

NOTE:

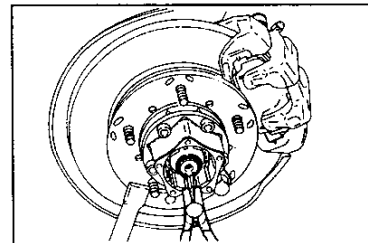
- Do not remove the compression spring from the follower.



- (3) Remove the gasket.

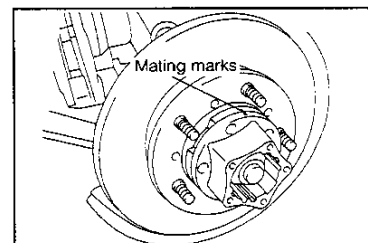


5. Remove the snap ring from the drive shaft.

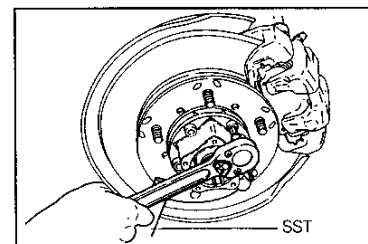


6. Removal of hub body

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



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

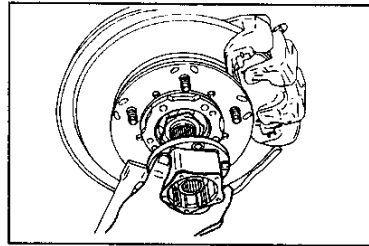
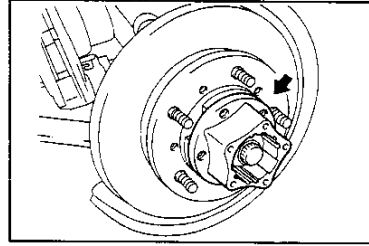


FRONT AXLE & SUSPENSION

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

NOTE:

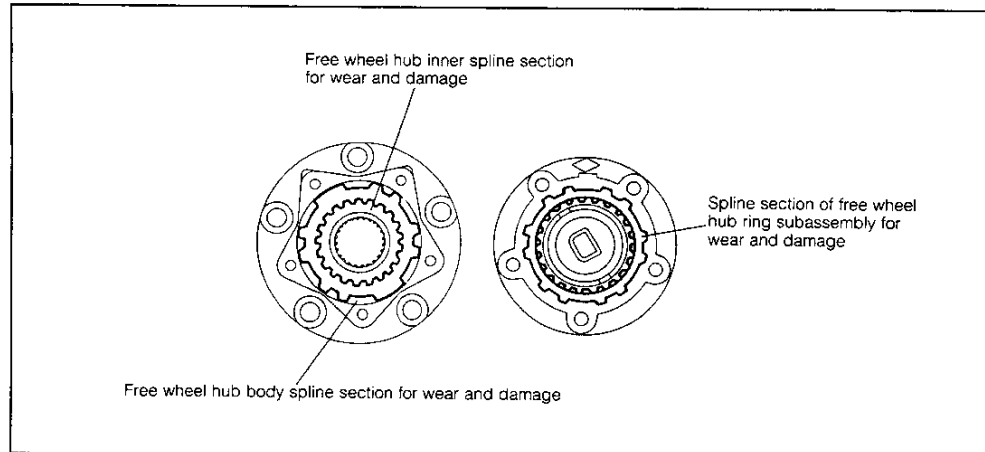
- Be very careful not to drop the hub body.
- Care must be exercised so as not to apply strong impacts to the hub body.



WFE90-FS164

Inspection

Check the following parts. Replace any defective parts.

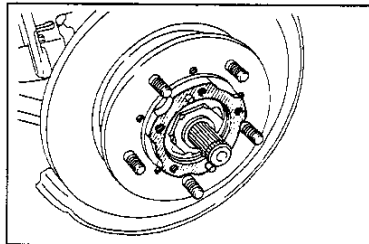


WFE90-FS165

Assembly

1. Installation of hub body

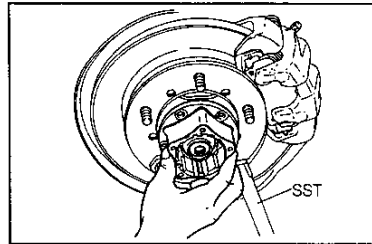
- (1) Clean the mating surfaces of the hub body and axle hub. Then, thinly and evenly apply the Daihatsu Bond No. 4.



WFE90-FS166

FRONT AXLE & SUSPENSION

- (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.



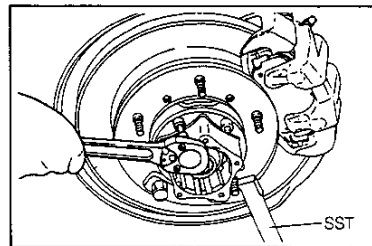
WFE90-FS167

- (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

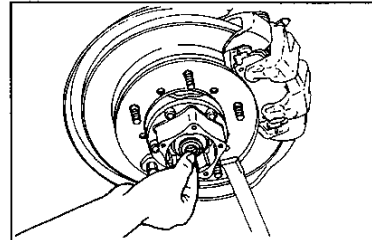


WFE90-FS168

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

NOTE:

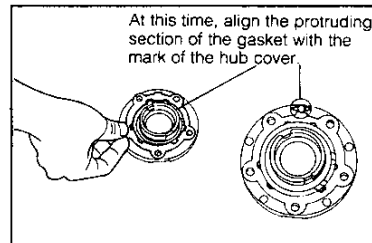
- Never reuse the snap ring.
- Fit the snap ring positively to the groove of the drive shaft.



WFE90-FS169

3. Assembly of hub cover

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

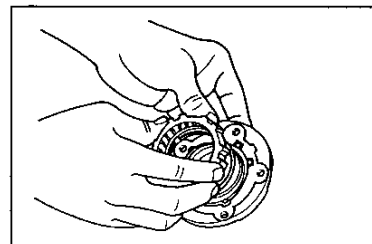


WFE90-FS170

- (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:

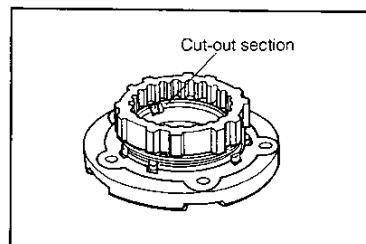
- Make sure that the compression spring is positively placed in the follower.



WFE90-FS171

FRONT AXLE & SUSPENSION

- (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.



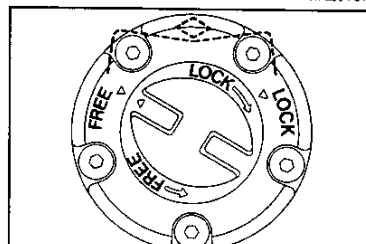
WFE90-FS172

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.



WFE90-FS173

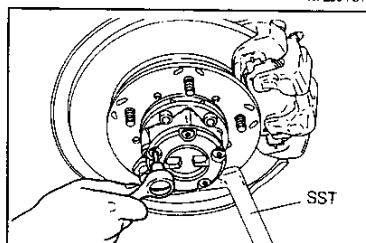
- (3) Tighten the hub cover attaching bolts to the specified torque.

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

NOTE:

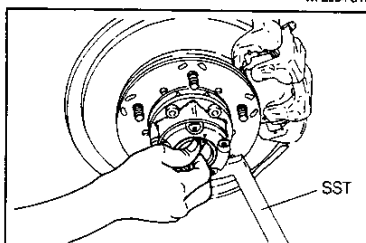
- Prevent the axle hub from turning, using the following SST.

SST: 09511-87202-000



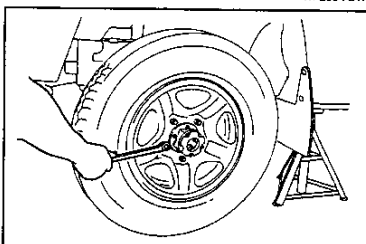
WFE90-FS174

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.



WFE90-FS175

6. Install the front wheel temporarily.



WFE90-FS176

FRONT AXLE & SUSPENSION

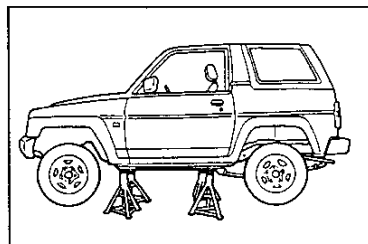
7. Perform the operation check.
(See page FS-40.)
8. Jack up the vehicle and remove the safety stands.
9. Tighten the front wheel attaching bolts to the specified torque.
(See page FS-29.)

WFE90-FS177

AUTOMATIC LOCKING HUB

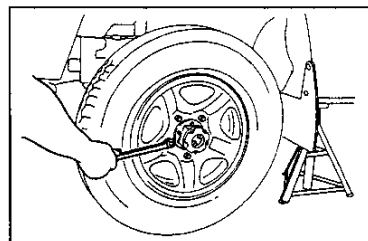
Removal

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



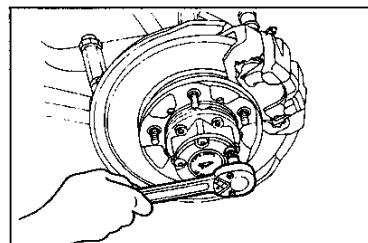
WFE90-FS178

2. Remove the front wheel.
(See page FS-28.)



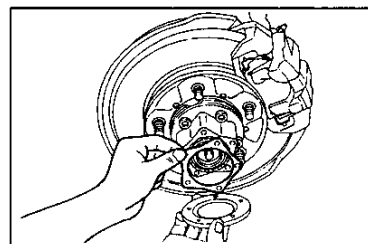
WFE90-FS179

3. Remove the hub cover.



WFE90-FS180

4. Remove the gasket from the hub body.



WFE90-FS181

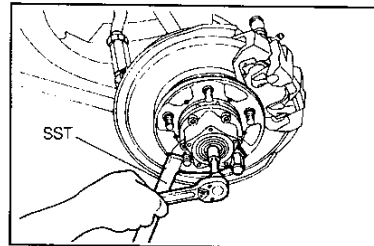
FRONT AXLE & SUSPENSION

5. Remove the lock washer attaching bolt.

NOTE:

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

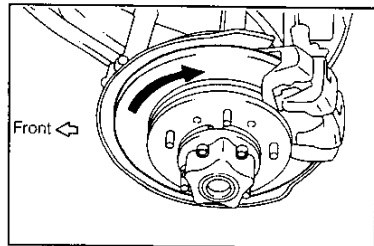
SST: 09511-87202-000



WFE90-FS182

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.



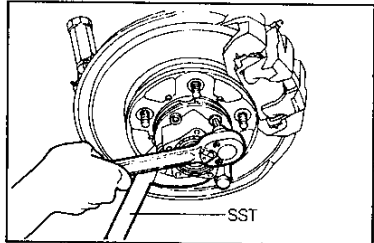
WFE90-FS183

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

NOTE:

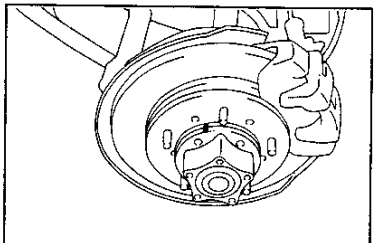
- Prevent the axle hub from turning, using the following SST.

SST: 09511-87202-000



WFE90-FS184

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

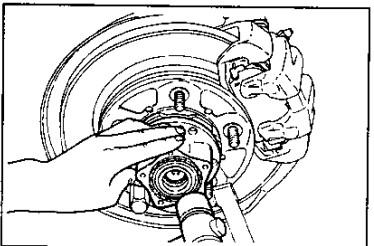


WFE90-FS185

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:

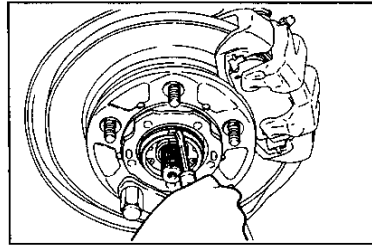
- Be very careful not to drop the hub body.
- Care must be exercised not to apply strong impact to hub body.



WFE90-FS186

FRONT AXLE & SUSPENSION

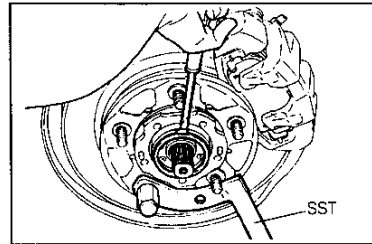
10. Remove the brake shoe snap ring.



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.

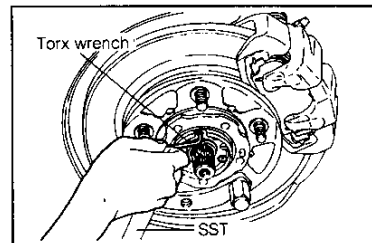


12. Remove the brake drum from the lock nut, using a torx wrench.

NOTE:

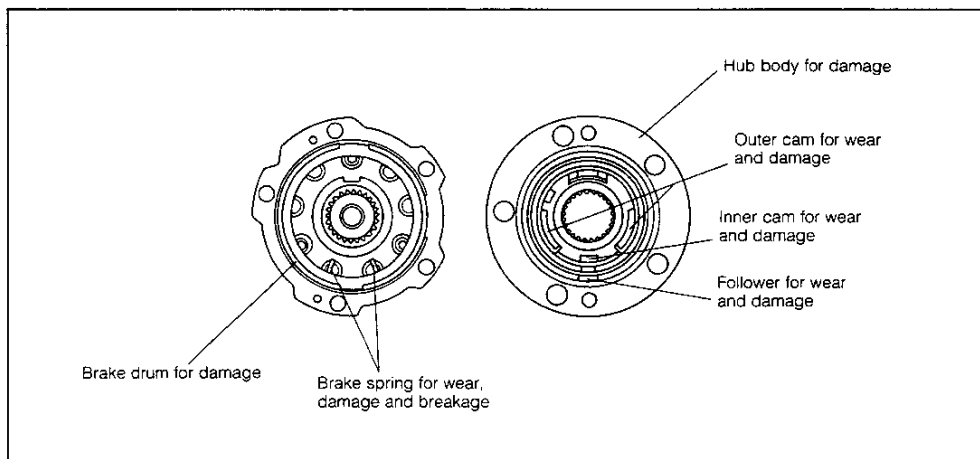
- Prevent the axle hub from turning, using the following SST.

SST: 09511-87202-000



Inspection

Check the following parts. Replace any defective parts.



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.

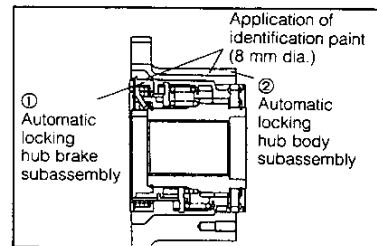
Before these parts are assembled, be certain to confirm their identification, using the table below.

Identification colors

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

The ○-marked combination only is acceptable.

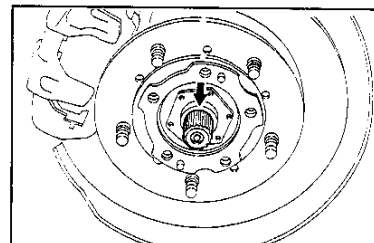
However, when replacing the hub brake subassembly, if it is impossible to confirm the identification color of the hub body assembly, be certain to employ a blue brake subassembly.



WFE90-FS193

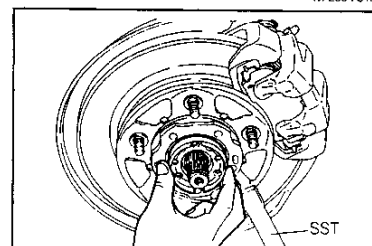
WFE90-FS194

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



WFE90-FS195

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



WFE90-FS191

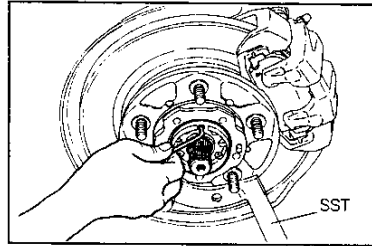
FRONT AXLE & SUSPENSION

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

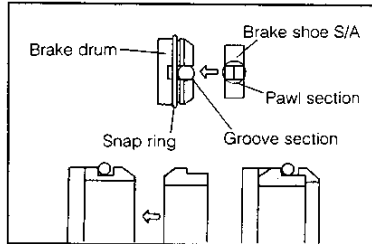


WFE90-FS192

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.



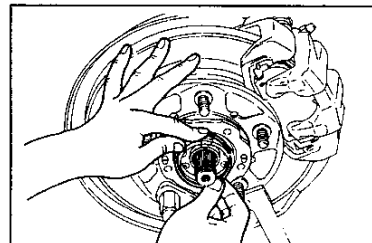
WFE90-FS196

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.

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

NOTE:

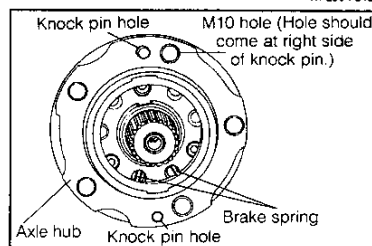
- Be sure to set the opening of the snap ring within a range of $90^\circ \pm 20$ relative to the cut-out section provided at the pawl section of the brake shoe of the brake drum.



WFE90-FS197

6. Installation of hub body

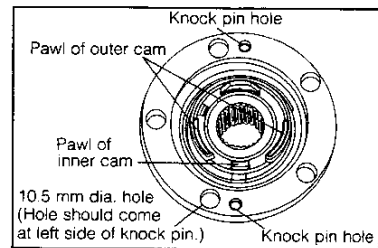
- (1) Turn the axle hub so as to set it, as indicated in the right figure.
- (2) Turn the spring so that the end section of the brake spring may come at the position as indicated in the right figure.



WFE90-FS198

FRONT AXLE & SUSPENSION

- (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.

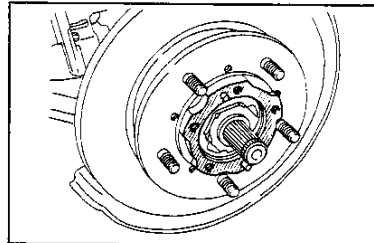


WFE90-FS199

- (4) Clean the attaching surfaces of the axle hub and hub body. Thinly and evenly apply the Daihatsu Bond No.4 to the axle hub side.

NOTE:

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



WFE90-FS200

- (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

- Wipe off any oozed bond.
- Be very careful not to get lithium-based MP grease to the brake shoe subassembly.

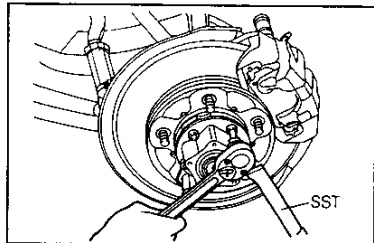
- (6) Install the plate washer with the attaching bolt.

Tightening Torque: 14.7 - 21.6 N·m
(1.5 - 2.2 kgf-m, 10.8 - 15.9 ft-lb)

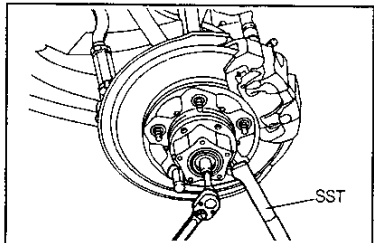
NOTE:

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

SST: 09511-87202-000



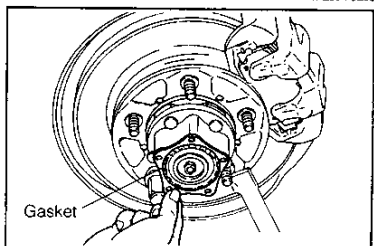
WFE90-FS201



WFE90-FS202

7. Installation of hub cover

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



WFE90-FS203

FRONT AXLE & SUSPENSION

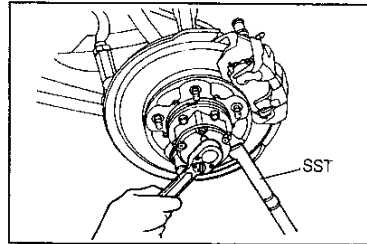
(2) Install the hub cover with the bolt.

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

NOTE:

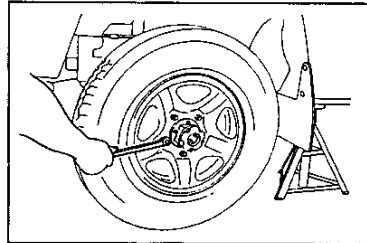
- Prevent the axle hub from turning, using the following SST.

SST: 09511-87202-000



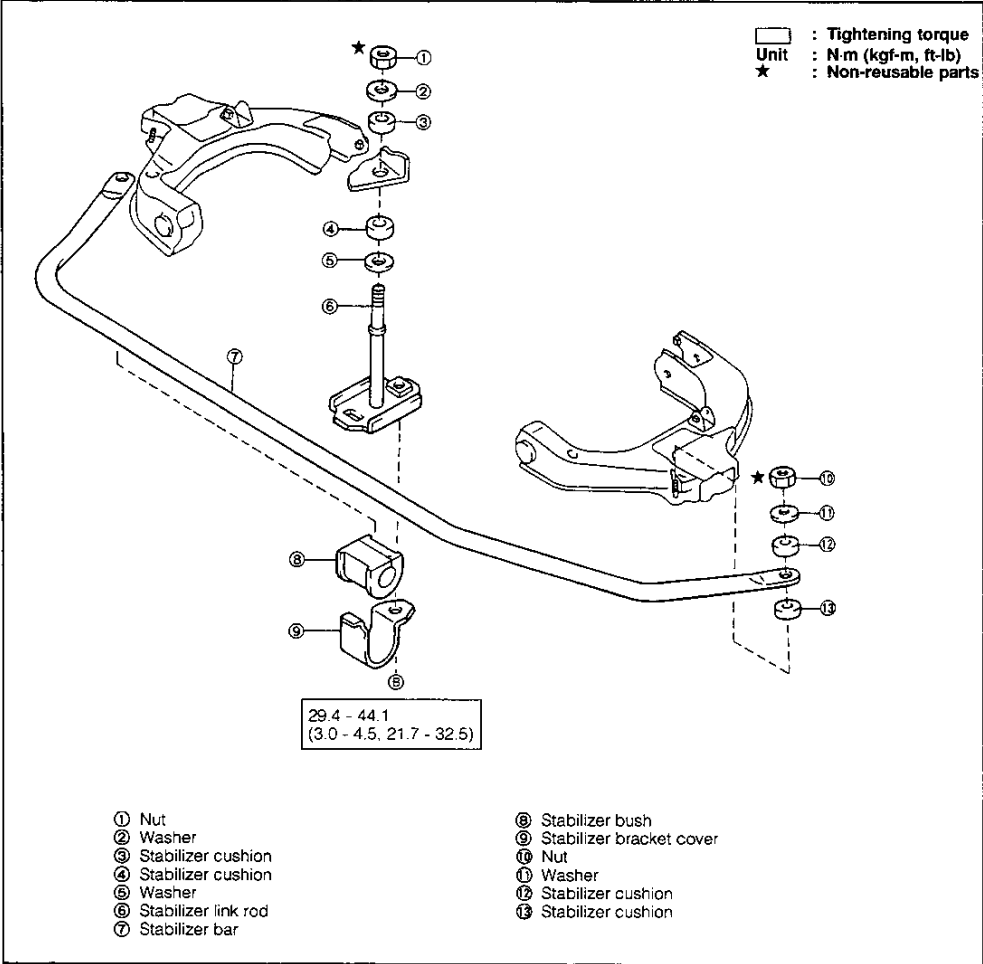
WFE90-FS204

8. Install the front wheel.
(See page FS-28.)
9. Perform the operation check.
(See page FS-40.)
10. Jack up the vehicle and remove the safety stands. Then, jack down the vehicle.



WFE90-FS205

STABILIZER BAR
COMPONENTS



WFE90-FS206

TROUBLE SHOOTING

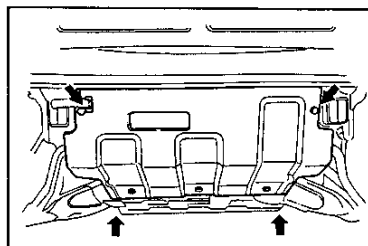
Symptom	Possible causes	Checking points
Excessive rolling of vehicle body during running	Stabilizer damaged	Check stabilizer.
	Stabilizer installing section damaged	Check stabilizer installing section.

WFE90-FS207

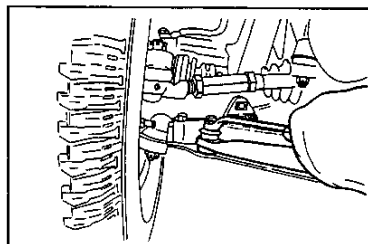
FRONT AXLE & SUSPENSION

REMOVAL

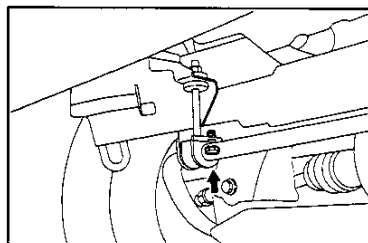
1. Place the vehicle in an unloaded state.
2. Remove the engine undercover at the front side.
3. Remove the bolts attaching the stabilizer bar to the lower arm at the right and left sides. Remove the washer and cushion.
4. Loosen the attaching bolts of the stabilizer bracket covers.
5. Remove the stabilizer link rod attaching nut. Remove the washer and cushion.
6. Remove the stabilizer bar from the lower arm. Remove the cushion.



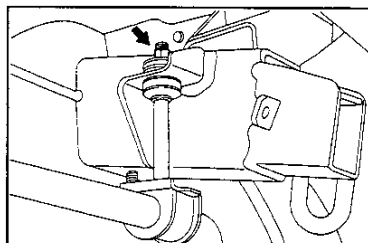
WFE90-FS208



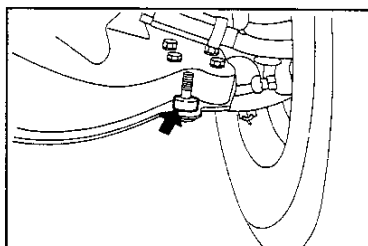
WFE90-FS209



WFE90-FS210



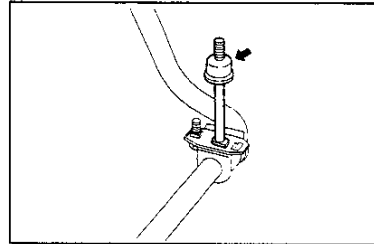
WFE90-FS211



WFE90-FS212

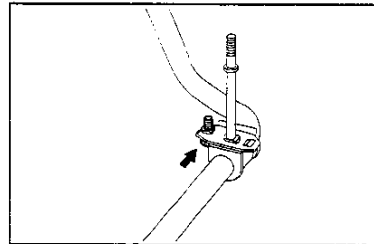
FRONT AXLE & SUSPENSION

7. Remove the cushion and washer from the stabilizer link rod.



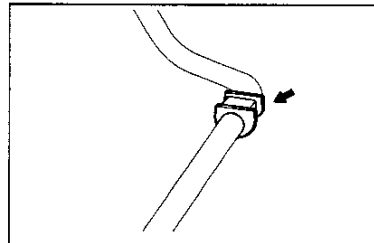
WFE90-FS213

8. Remove the stabilizer bracket cover.



WFE90-FS214

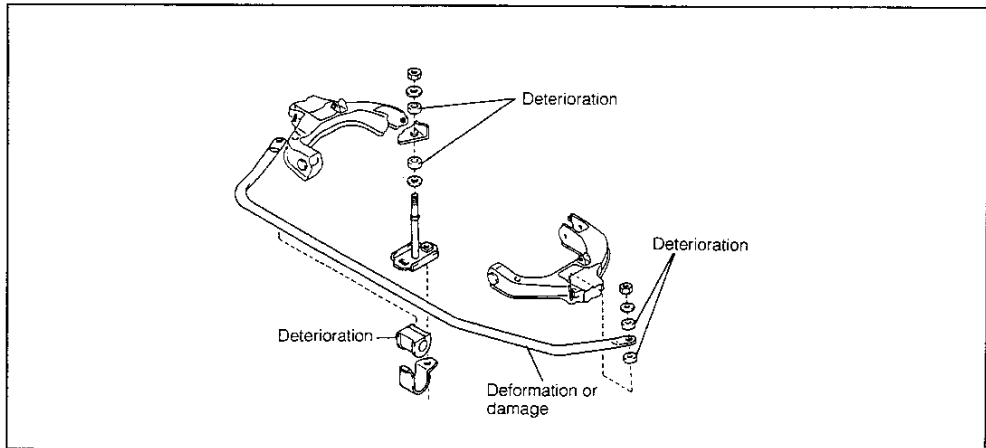
9. Remove the stabilizer bush.



WFE90-FS215

INSPECTION

Check the following parts. Replace any defective parts.

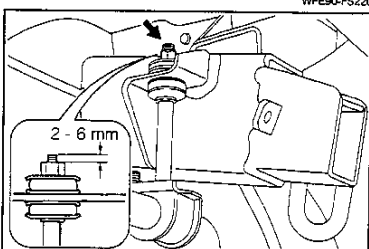
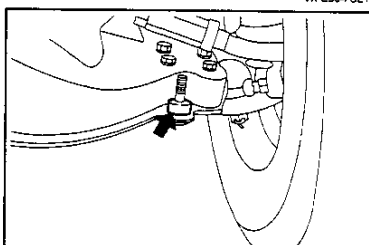
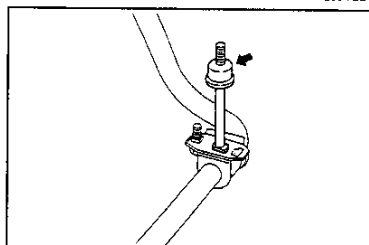
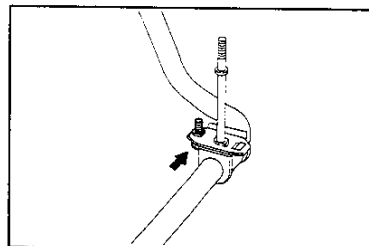
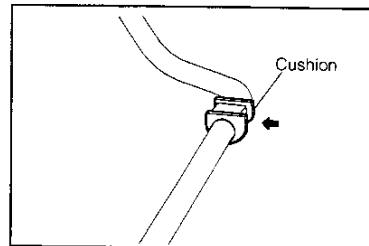


WFE90-FS216

FRONT AXLE & SUSPENSION

INSTALLATION

1. Install the bush to the stabilizer bar.
 2. Install the stabilizer link rod to the cushion. Temporarily install the stabilizer bracket cover.
 3. Install the washer and cushion to the stabilizer link rod.
 4. Install the cushion to the lower arm.
 5. Connect the stabilizer to the lower arm attaching bolt. Install the stabilizer link to the frame. Tighten the nut with the cushion and washer interposed.
- NOTE:**
- Tighten the nut so that the threaded portion of the stabilizer link protrudes 2 to 6 mm from the nut end surface.

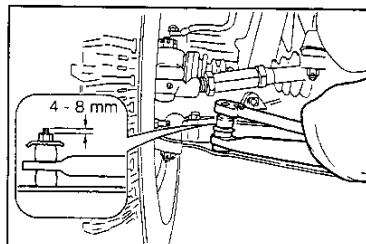


FRONT AXLE & SUSPENSION

6. Install the cushion and washer to the lower arm. Tighten the attaching nut.

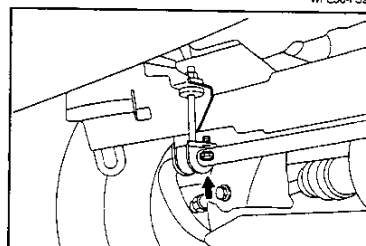
NOTE:

- Tighten the nut so that the threaded portion of the lower arm protrudes 4 to 8 mm from the nut end surface.



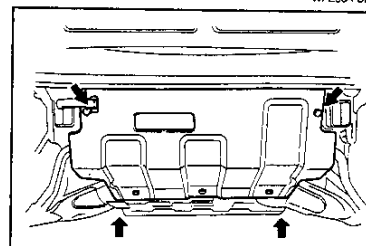
WFE90-FS222

7. Tighten the stabilizer bracket cover attaching bolt.
Tightening Torque: 29.4 - 44.1 N·m
(3.0 - 4.5 kgf-m, 21.7 - 32.5 ft-lb)



WFE90-FS223

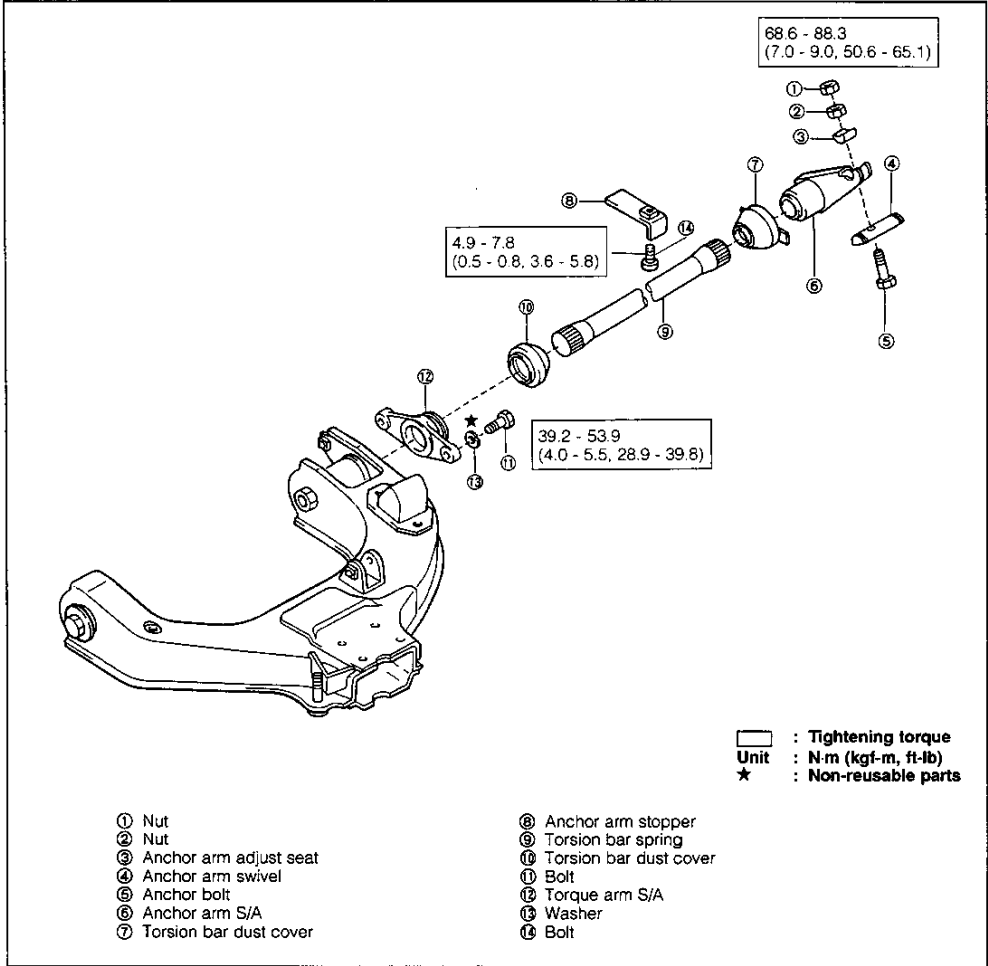
8. Install the engine front undercover.



WFE90-FS224

FRONT AXLE & SUSPENSION

TORSION BAR SPRINGS
COMPONENTS



WFE90-FS225

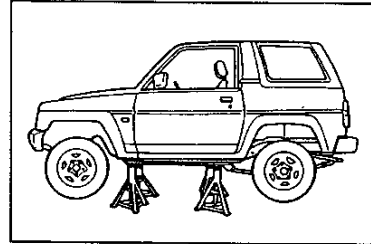
TROUBLE SHOOTING

Symptom	Possible causes	Checking points
Vehicle body tilted	Torsion bar improperly adjusted	Adjust vehicle height.

WFE90-FS226

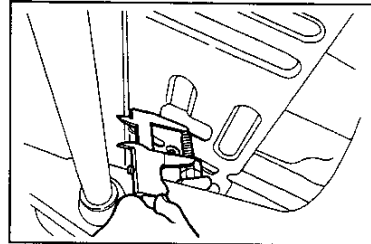
REMOVAL

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



WFE90-FS227

2. Measure the protruding dimension of the anchor bolt.
Record the measured value.

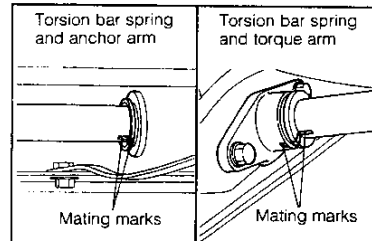


WFE90-FS228

3. Remove the rubber boot. Put mating marks at a point between the torsion bar spring and the anchor arm and also at a point between the torsion bar spring and the torque arm. For this identification marks, use white paint or the like.

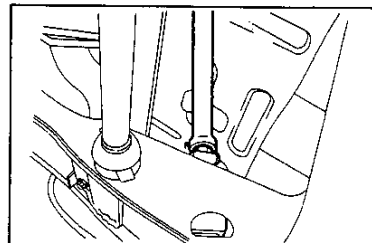
NOTE:

- Since the shape of the torsion bar spring differs between the right side and the left side, be sure to put mating marks, so that the torsion bar springs may be installed correctly in their original positions.



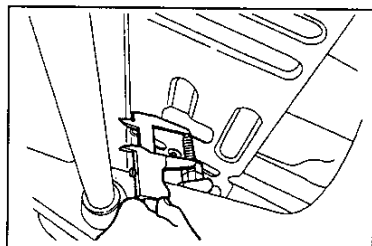
WFE90-FS229

4. Loosen the lock nut of the anchor bolt, until the reaction force of the torsion bar spring is just eliminated.



WFE90-FS230

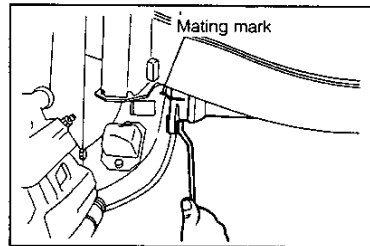
5. Measure the protruding dimension of the anchor bolt.
Record the measured value.



WFE90-FS231

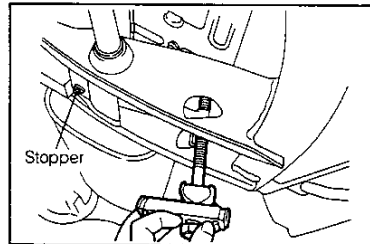
FRONT AXLE & SUSPENSION

6. Remove the torque arm from the lower arm by removing the torque arm attaching bolt.



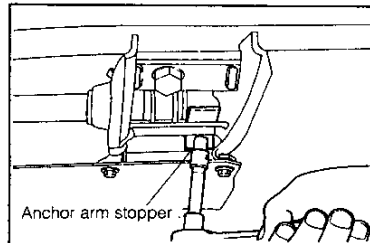
WFE90-FS232

7. Remove the adjusting seat from the anchor arm. Then, remove the anchor arm swivel together with the anchor bolts, nuts and anchor arm adjusting seat from the frame.



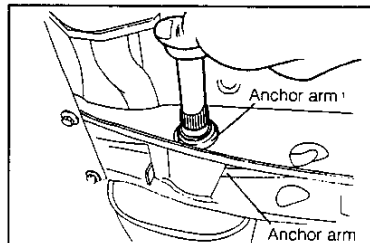
WFE90-FS233

8. Remove the anchor arm stopper from the frame.



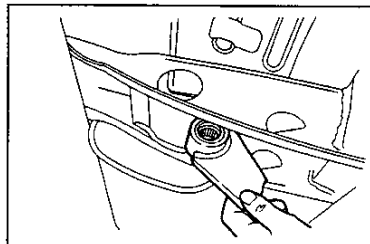
WFE90-FS234

9. Pull out the torsion bar spring from the anchor arm.



WFE90-FS235

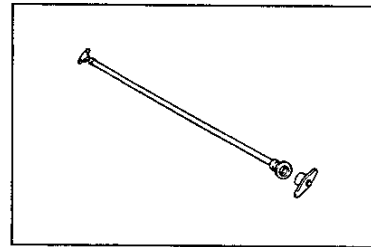
10. Remove the anchor arm from the frame.



WFE90-FS236

FRONT AXLE & SUSPENSION

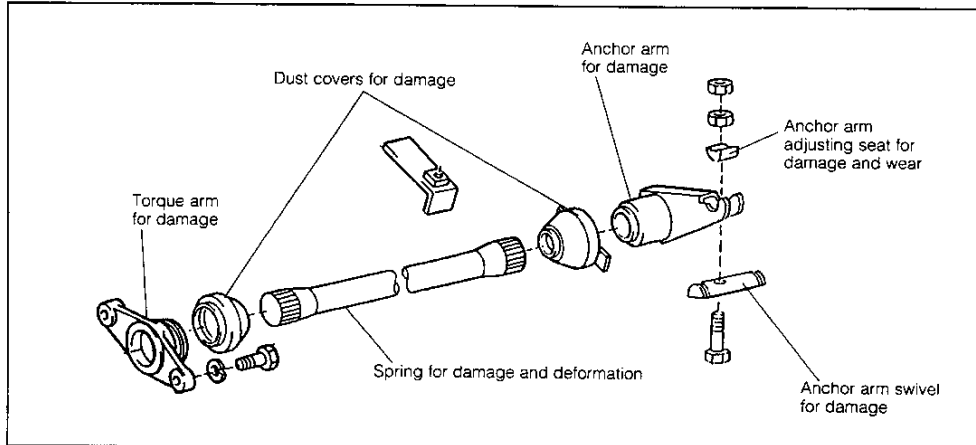
11. Remove the torque arm and dust covers from the torsion bar spring.



WFE90-FS237

INSPECTION

Check the following parts. Replace any defective parts.



NOTE:

- Torsion bar springs for the right and for the left are the designated parts exclusively for each side. Care must be exercised as to the following identification marks.

WFE90-FS238

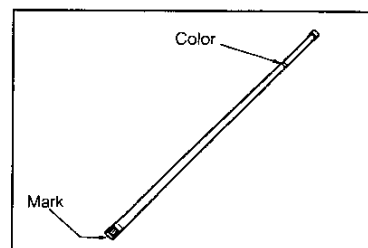
<Identification Marks>

	Left side	Right side
Color	Yellow (*Light green)	White (*pink)
Mark		

* For the United Kingdom

CAUTION:

- As respects the torsion bar springs, be sure to observe the combination above.
- If this caution should fail to be observed, the running performance may drop significantly.



WFE90-FS239

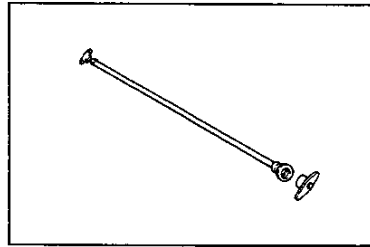
FRONT AXLE & SUSPENSION

INSTALLATION

1. Install the dust covers and torque arm to the torsion bar.

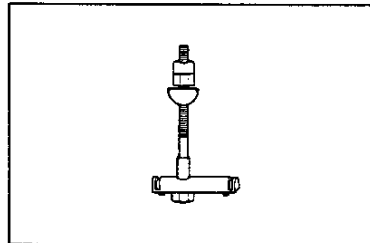
NOTE:

- Make sure that the front and rear dust covers are installed correctly in their respective positions.



WFE90-FS240

2. Install the anchor arm swivel, anchor arm stopper and lock nut to the anchor bolt.



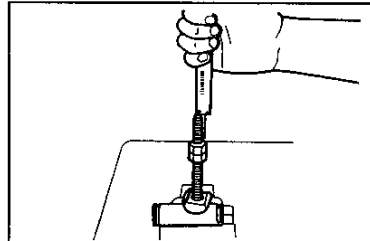
WFE90-FS241

3. Adjust the length from the anchor bolt end to the lock nut upper surface to the specified value.

Specified Value: 30 mm

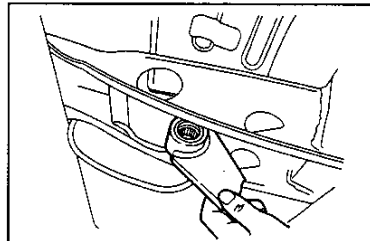
NOTE:

- In cases where the torsion bar, anchor arm and torque arm are reused, set their positions to the original heights measured during the disassembly.



WFE90-FS242

4. Insert the anchor arm into the frame.

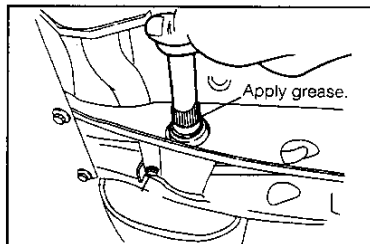


WFE90-FS243

5. Apply MP grease to the torsion bar spline section. Connect the torsion bar to the anchor arm.

NOTE:

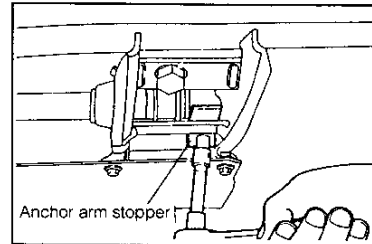
- In cases where the torsion bar, torque arm and anchor arm are reused, align the mating marks put during the removal.



WFE90-FS244

FRONT AXLE & SUSPENSION

6. Install the anchor arm stopper.
Tightening Torque: 4.9 - 7.8 N·m
(0.5 - 0.8 kgf-m, 3.6 - 5.8 ft-lb)

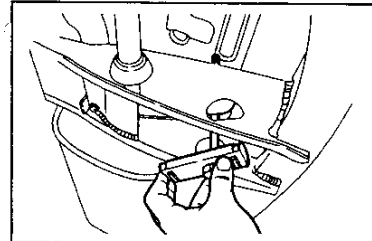


WFE90-FS245

7. Install the anchor arm stopper to the anchor. Install the anchor swivel to the frame.

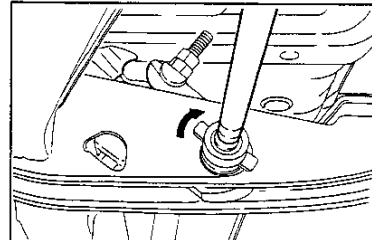
NOTE:

- Make sure that the anchor arm swivel is inserted into the frame positively.



WFE90-FS246

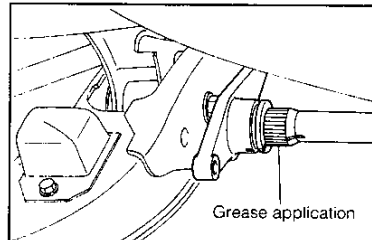
8. Turn the torque arm. Ensure that the anchor arm stopper and anchor swivel come at their correct positions.



WFE90-FS247

9. Under the condition described in the step 8, apply lithium-based MP grease to the spline section of the torsion bar spring. Install the torque arm to the lower arm.

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



WFE90-FS248

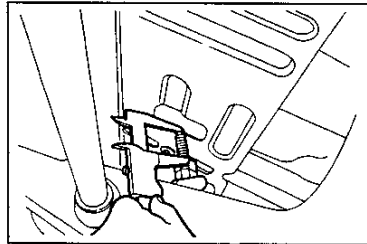
NOTE:

- In cases where the torque arm, torsion bar spring and anchor arm are reused, install the torque arm to the lower arm while aligning the mating marks put during the removal.
- At this time, make sure that the anchor arm stopper and anchor swivel are placed at their correct positional relationship and that no excessive play is present.

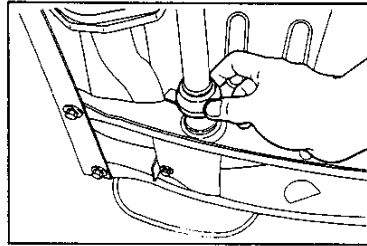
WFE90-FS249

FRONT AXLE & SUSPENSION

10. While preventing the lock nut at the frame side from turning, adjust the anchor bolt so that the protruding dimension of the anchor bolt may become the value measured before the disassembly.

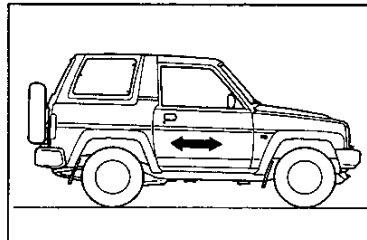


11. Install the dust covers to the torque arm and anchor arm.

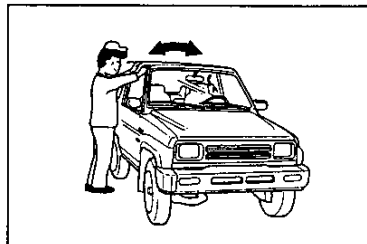


12. Remove the safety stands.
13. Check and adjustment of vehicle height
- Confirmation items prior to check and adjustment
- Ensure that the designated tires are installed.
 - Ensure that the tires are inflated to the specified air pressure. Also, ensure that the air inflation pressure is uniform on the four tires.
 - Ensure that the vehicle is under no-loaded state.
 - Ensure that the floor where the check and adjustment are carried out is level.

- (1) Rock the vehicle several times so as to stabilize the suspensions.

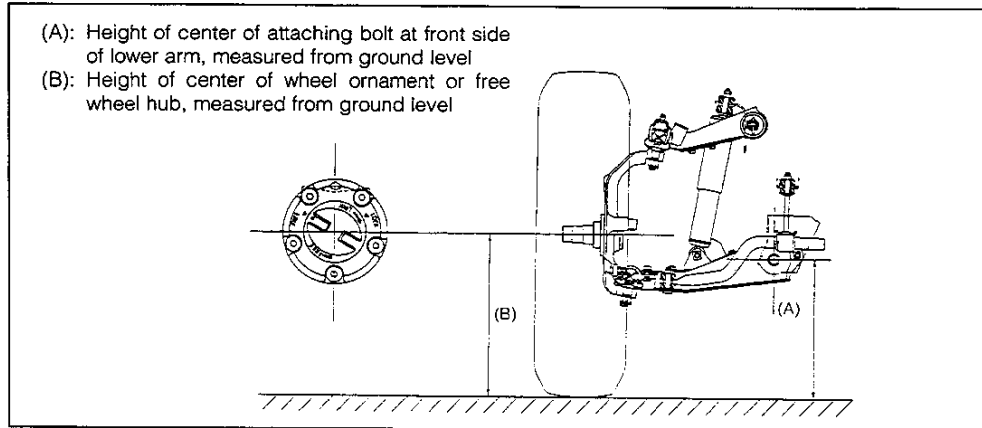


- (2) Move the vehicle about three meters twice in a fore-and-aft direction.



FRONT AXLE & SUSPENSION

- (3) Measure the distance from the center of the front ornament or the free wheel hub to the ground level. Also, measure the distance from the center of the attaching bolt of the lower arm at the front side to the ground level. Record the measured values.



WFE90-FS254

- (4) Calculate the measured value. Ensure that the difference conforms to the specified value.

However, the variation in the specified value between the right and left sides should be within 10 mm.

$B - A = \text{Specified value}$

Specified Value: 31 - 51 mm

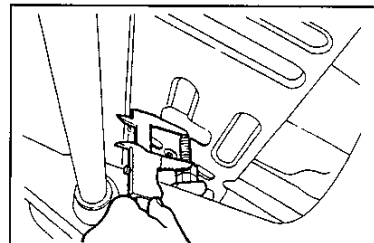
If the calculated results do not conform to the specified value or the variation in height between the right and left sides is 10 mm or more, adjust the vehicle height by means of the anchor bolt.

After the adjustment, repeat the operation from the step (1).

14. Measure the protruding dimension of the anchor bolt. Ensure that the variation between the right and left sides is within 10 mm.

If not, replace the torsion bar spring.

Prior to the replacement of the torsion bar, recheck to ensure that the spline exhibits no displacement under assembled condition.



WFE90-FS255

WFE90-FS256

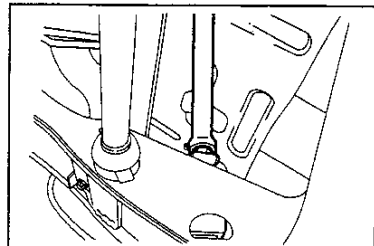
15. Tighten the lock nut of the anchor bolt and lock it.

Tightening Torque: 68.6 - 88.3 N·m

(7.0 - 9.0 kgf·m, 50.6 - 65.1 ft·lb)

NOTE:

- As regards the tightening of the lock nut, be sure to prevent the lower nut from turning, using a spanner or the like. Then, tighten the upper nut.

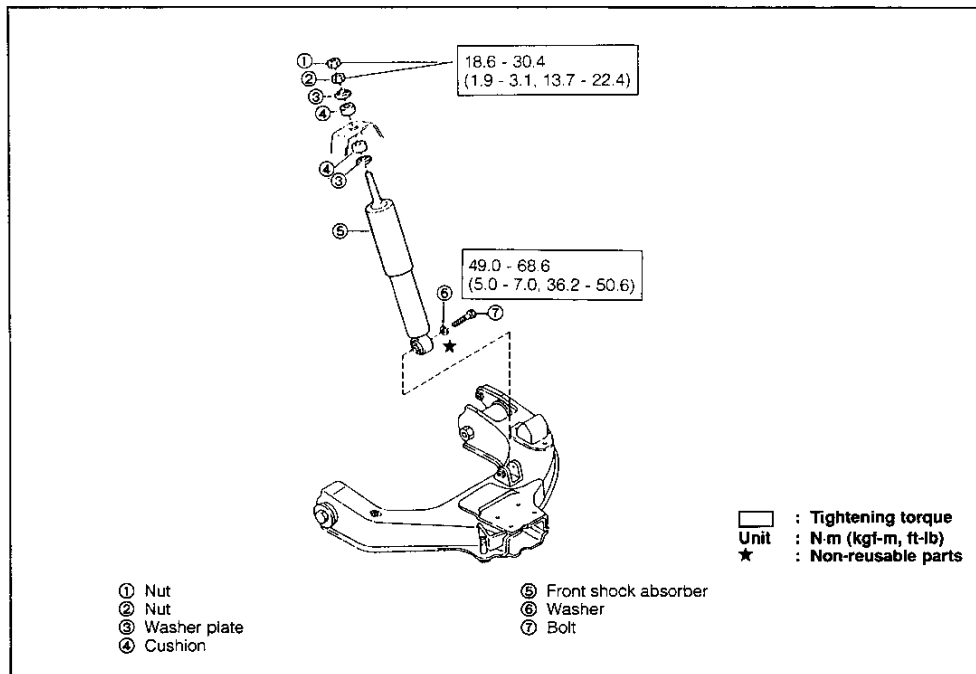


WFE90-FS257

FRONT AXLE & SUSPENSION

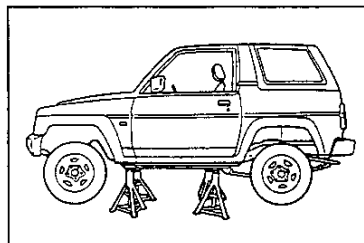
FRONT SHOCK ABSORBERS

(STANDARD TYPE) COMPONENTS

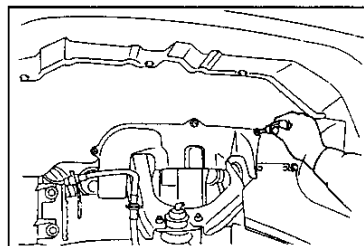


REMOVAL

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

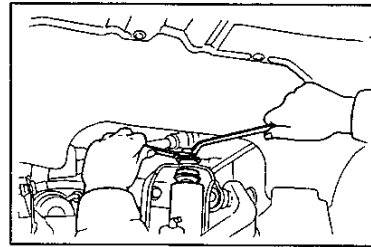


2. Remove the dust cover.



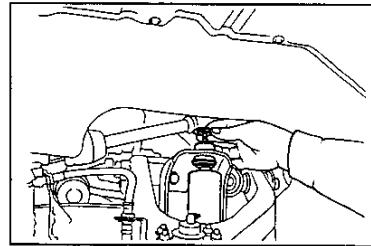
FRONT AXLE & SUSPENSION

3. Loosen the lock nut.
4. While preventing the lock nut and attaching nut from turning at the top of the shock absorber, remove them.



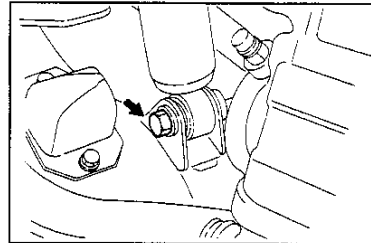
WFE90-FS261

5. Remove the plate washer and cushion.



WFE90-FS262

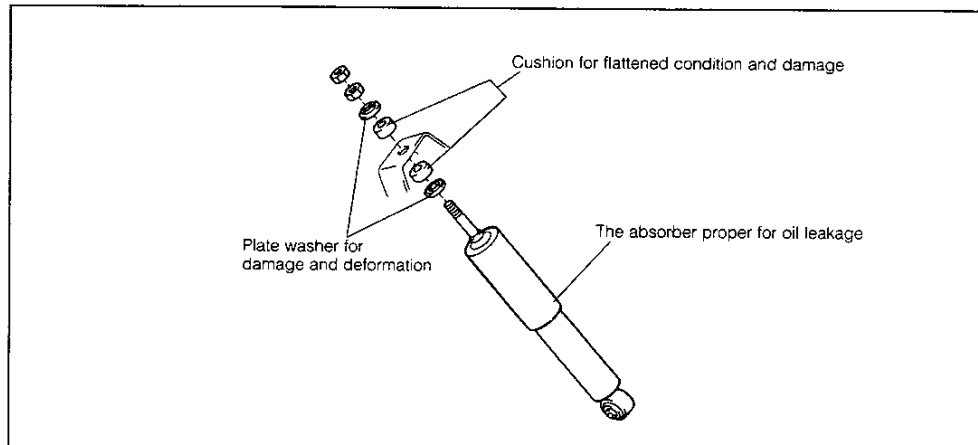
6. Remove the bolt connecting the shock absorber to the lower arm.
7. Remove the shock absorber from the vehicle by contracting it.
8. Remove the cushion and washer plate from the shock absorber.



WFE90-FS263

INSPECTION

Check the following parts. Replace any defective parts.

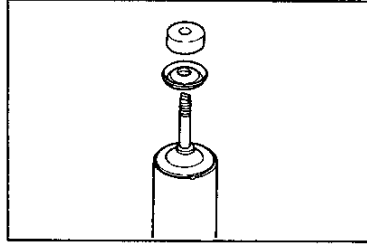


WFE90-FS264

FRONT AXLE & SUSPENSION

INSTALLATION

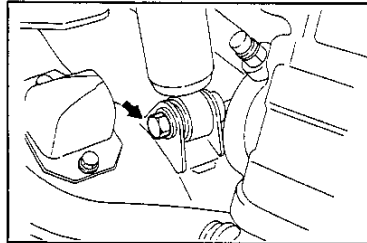
1. Install the washer plate and cushion to the shock absorber.



WFE90-FS265

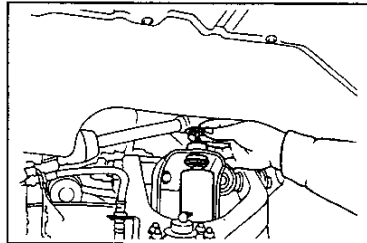
2. Insert the shock absorber into the attaching hole at the chassis side.
3. With the shock absorber contracted, connect the shock absorber to the lower arm attaching section. Tighten the attaching bolt.

Tightening Torque: 49.0 - 68.6 N·m
(5.0 - 7.0 kgf-m, 36.2 - 50.6 ft-lb)



WFE90-FS266

4. Install the cushion and washer plate.



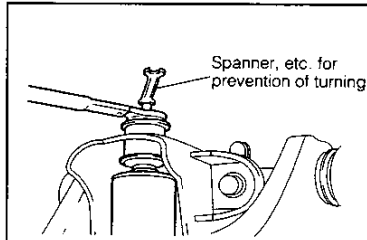
WFE90-FS267

5. Install the attaching nut to the top of the shock absorber. While preventing the attaching nut from turning, tighten the 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)

NOTE:

Nut thickness: 8 mm



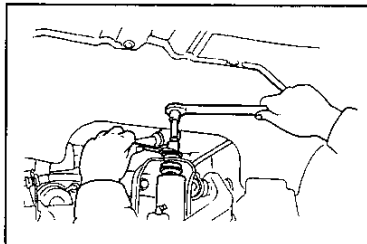
WFE90-FS268

6. Install the lock nut and tighten it to the specified torque.

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

NOTE:

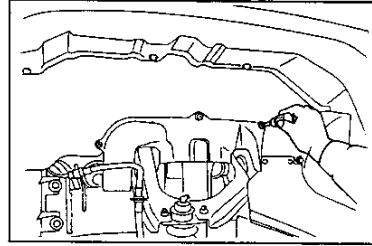
Nut thickness: 6 mm



WFE90-FS269

FRONT AXLE & SUSPENSION

7. Install the dust cover.



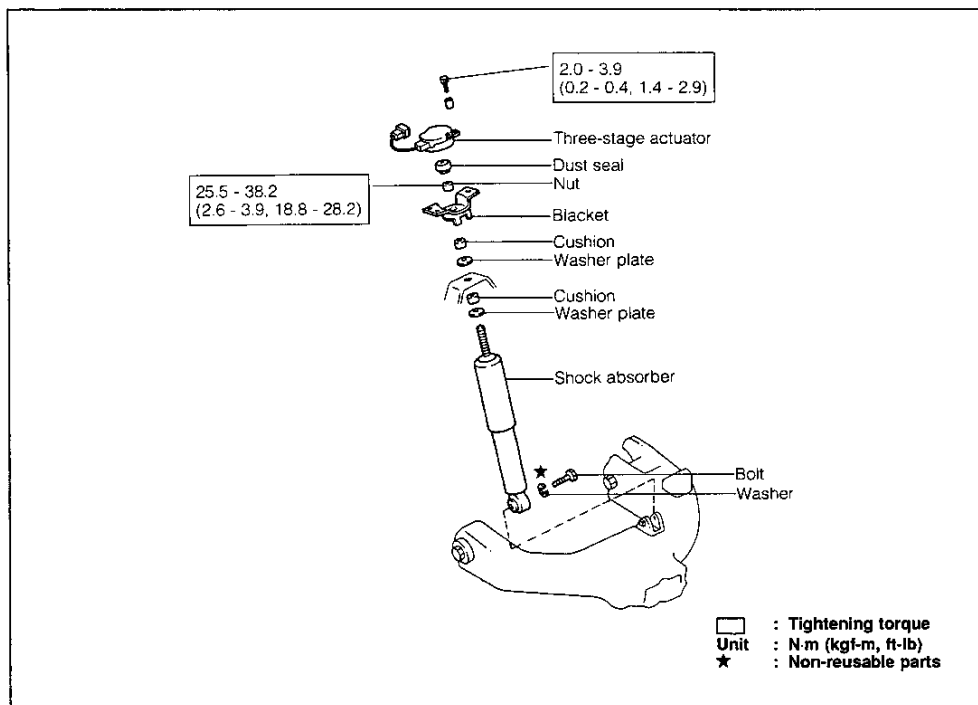
8. Jack up the vehicle and remove the safety stands. Then, jack down the vehicle.

WPE90-FS271

FRONT AXLE & SUSPENSION

(THREE-STAGE DAMPERS)

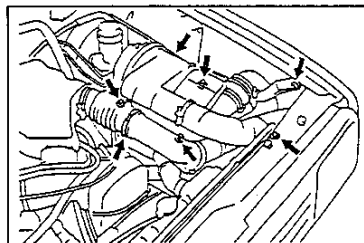
COMPONENTS



WFE90-FS272

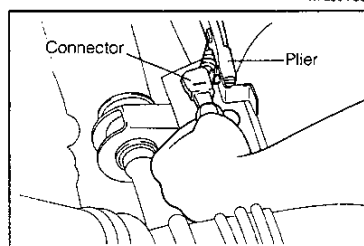
REMOVAL

1. Remove the air cleaner assembly with air duct. (Only cases where left actuator is to be removed)
(See the engine section.)



WFE90-FS273

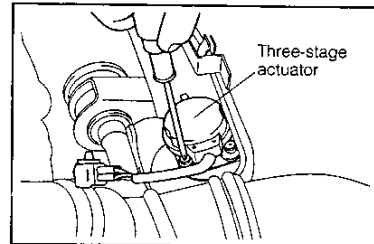
2. Remove the connector of the three-stage actuator from the bracket and disconnect the connector.



WFE90-FS274

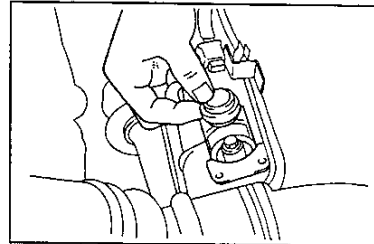
FRONT AXLE & SUSPENSION

3. Remove the three-stage actuator by removing its attaching screws.



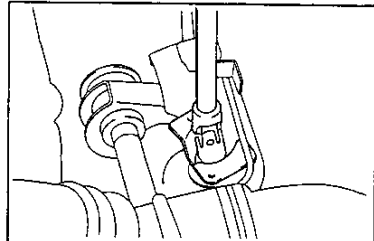
WFE90-FS275

4. Remove the dust seal from the shock absorber control bracket.



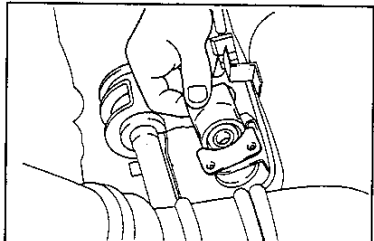
WFE90-FS276

5. Remove the lock nut.



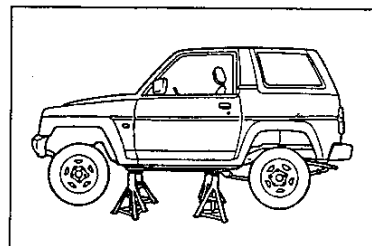
WFE90-FS277

6. Remove the shock absorber control bracket.
7. Remove the cushion and washer plate.



WFE90-FS278

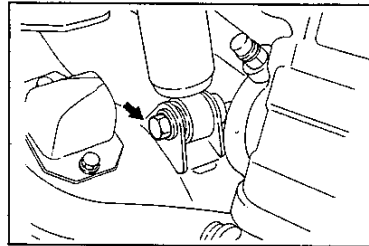
8. Jack up the vehicle and support it with safety stands. (See GI section.)



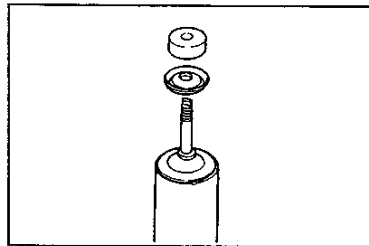
WFE90-FS279

FRONT AXLE & SUSPENSION

9. Remove the connecting bolts at the lower arm side of the shock absorber.
10. Remove the shock absorber from the vehicle by contracting it.
11. Remove the cushion and washer plate from the removed shock absorber.



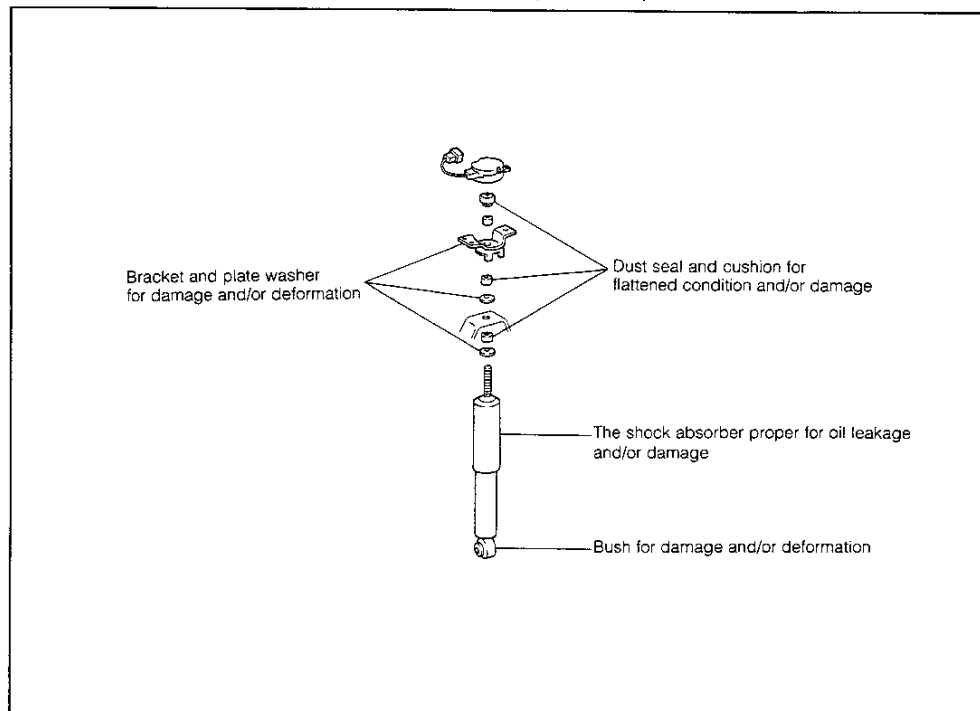
WFE90-FS280



WFE90-FS281

INSPECTION

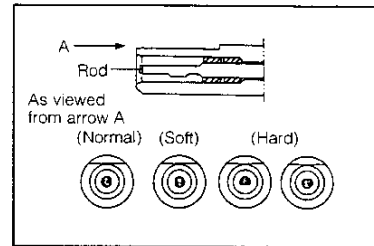
1. Inspect each section in the figure below. Replace any defective parts.



WFE90-FS282

FRONT AXLE & SUSPENSION

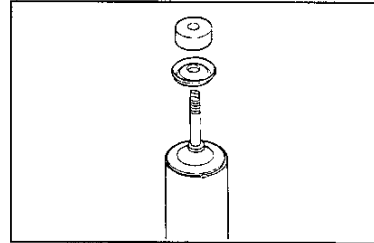
2. Ensure that the rod at the upper side of the three-stage damper can be turned easily by radio pliers or the like.
3. Set the rod as indicated in the figure. Ensure that the damping force varies according to the modes.



WFE90-FS283

INSTALLATION

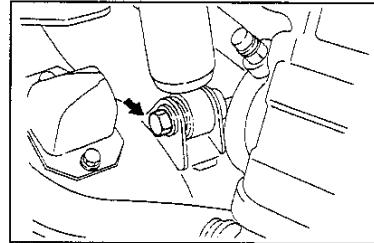
1. Install the washer plate and cushion to the shock absorber.



WFE90-FS285

2. Insert the shock absorber into the attaching hole at the chassis side.
3. With the shock absorber contracted, connect the shock absorber to the lower arm attaching section, tighten the attaching bolt.

Tightening Torque: 49.0 - 68.6 N·m
(5.0 - 7.0 kgf-m, 36.2 - 50.6 ft-lb)



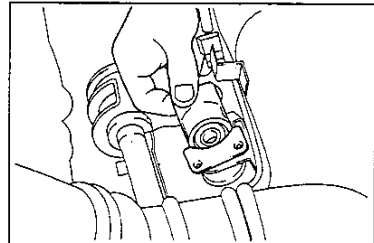
WFE90-FS286

4. Install the washer plate.

NOTE:

- Be certain to install the washer plate in such a way that the protruding surface of the washer plate may be fitted to the shock absorber installation hole of the chassis.

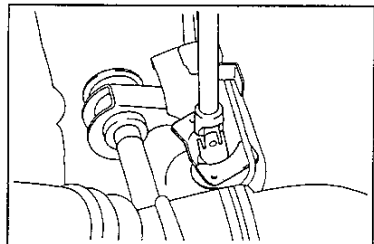
5. Install the cushion.
6. Install the shock absorber control bracket.



WFE90-FS287

7. Install new attaching nuts of the shock absorber control bracket. Tighten them to the specified torque.

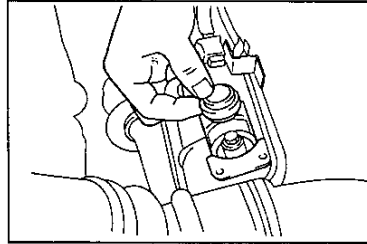
Tightening Torque: 25.5 - 38.2 N·m
(2.6 - 3.9 kgf-m, 18.8 - 28.2 ft-lb)



WFE90-FS288

FRONT AXLE & SUSPENSION

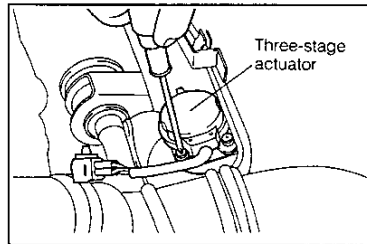
8. Install the dust seal on the attaching nuts of the shock absorber control bracket.



WFE90-FS289

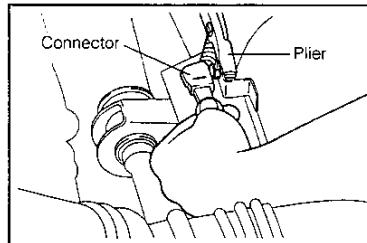
9. Install the three-stage actuator to the shock absorber control bracket. Tighten the attaching screws.

Tightening Torque: 2.0 - 3.9 N·m
(0.2 - 0.4 kgf-m, 1.4 - 2.9 ft-lb)



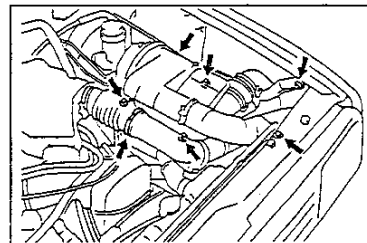
WFE90-FS290

10. Connect the connector of the three-stage actuator. Install it to the bracket.



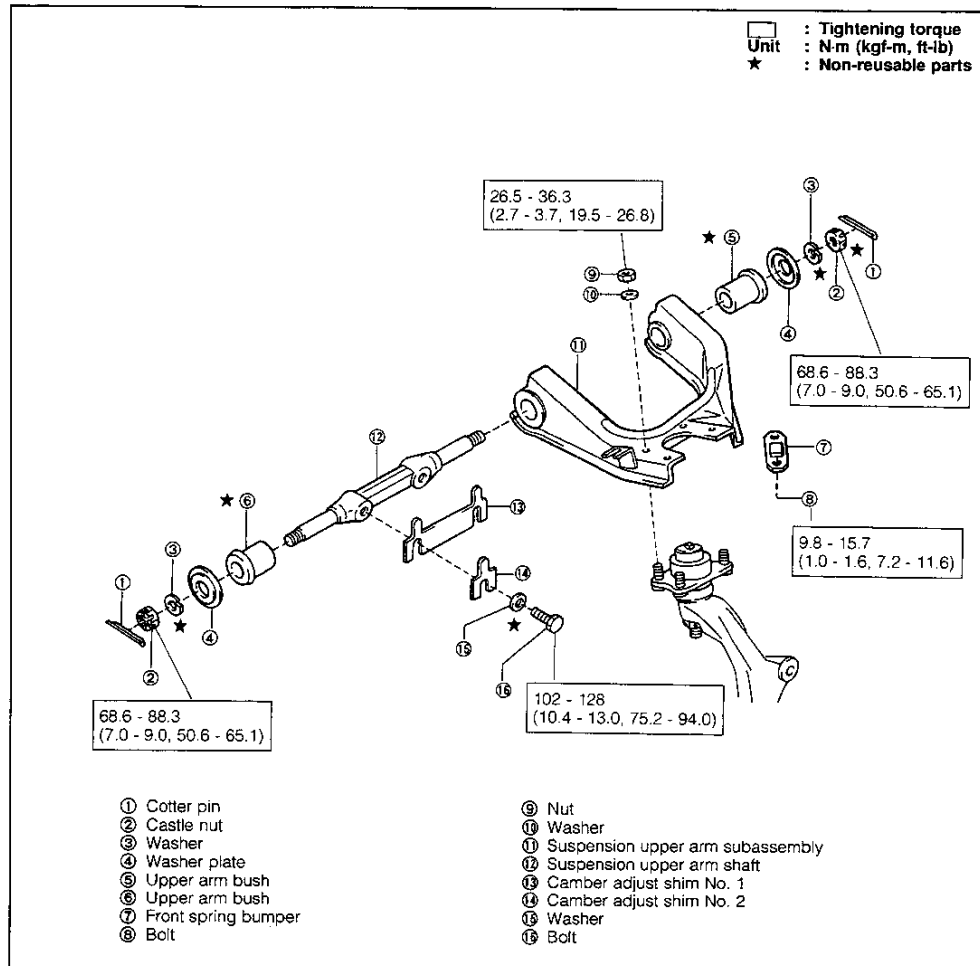
WFE90-FS291

11. Install the air cleaner assembly with air duct. (Only cases where left actuator is removed)
(See Engine section.)
12. Jack down the vehicle.



WFE90-FS292

UPPER ARMS COMPONENTS



WFE90-FS293

TROUBLE SHOOTING

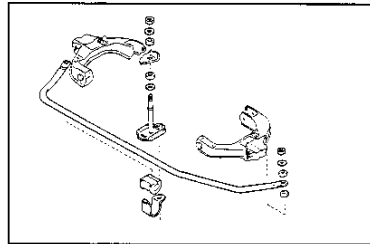
Symptom	Possible causes	Checking points
Improper front alignment (Improper camber and caster)	Bush worn or damaged Upper arm damaged or deformed	Check bush. Check upper arm.

WFE90-FS294

FRONT AXLE & SUSPENSION

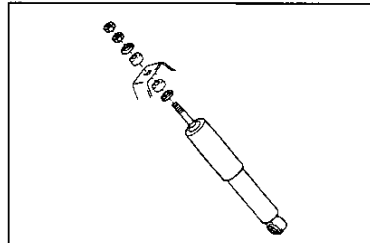
REMOVAL

1. Remove the torsion bar.



WFE90-FS235

2. Remove the front shock absorbers.
(See page FS-78.)



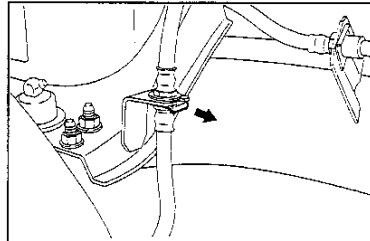
WFE90-FS206

3. Pull out the clip.

NOTE:

- Do not reuse the clip.

4. Disconnect the brake hose from the upper arm.

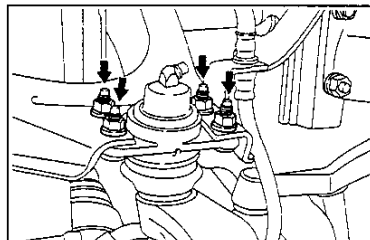


WFE90-FS237

5. Remove the attaching nut at the upper arm ball joint side.

NOTE:

- Do not reuse the spring washer.



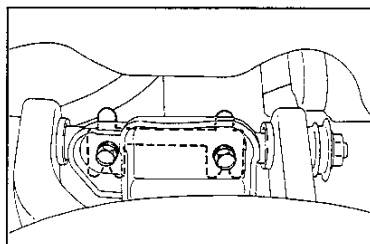
WFE90-FS238

6. Remove the camber adjusting shim by loosening the upper arm attaching bolt.

NOTE:

- Record the number, kind and installation position of the removed shim.

7. Remove the upper arm by removing the upper arm attaching bolts.



WFE90-FS239

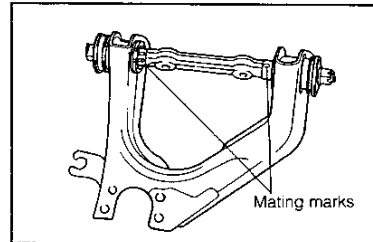
FRONT AXLE & SUSPENSION

DISASSEMBLY

1. Put mating marks at points between the upper arm and the upper shaft.

NOTE:

- Putting marks are required, only when either the upper arm or the upper shaft is reused.



WFE90-FS300

2. Remove the cotter pin.

NOTE:

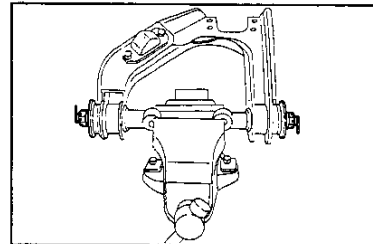
- Never reuse the cotter pin.

3. Remove the castle nuts.

4. Remove the washer and washer plate.

NOTE:

- Never reuse the washer.



WFE90-FS301

5. Removal of upper arm bush (at rear side)

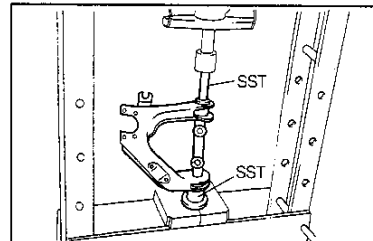
Remove the upper arm shaft together with the upper arm bush, using a hydraulic press in combination with the following SST.

SST: 09608-87612-000

09608-87609-000

NOTE:

- Be very careful not to drop the upper arm shaft.



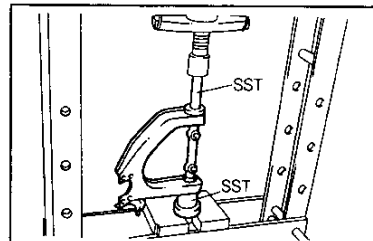
WFE90-FS302

6. Removal of upper arm bush (at front side)

Remove the upper arm bush, using a hydraulic press in combination with the following SST.

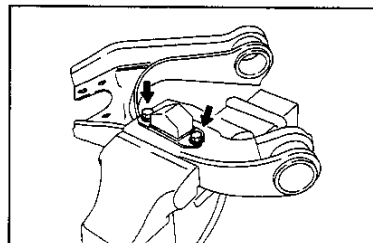
SST: 09608-87612-000

09608-87609-000



WFE90-FS303

7. Remove the front spring bumper from the upper arm.

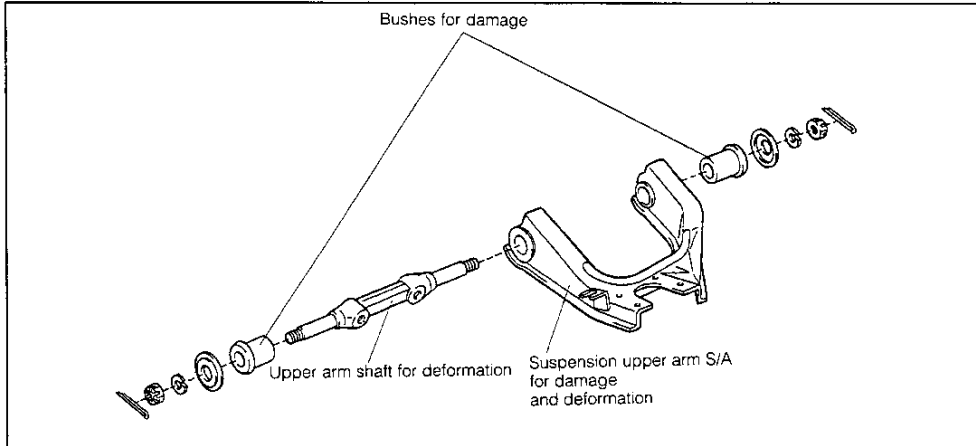


WFE90-FS304

FRONT AXLE & SUSPENSION

INSPECTION

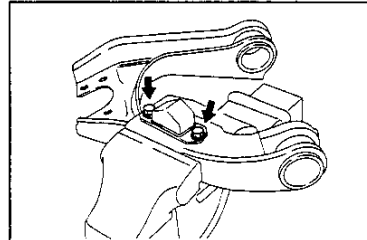
Check the following parts. Replace any defective parts.



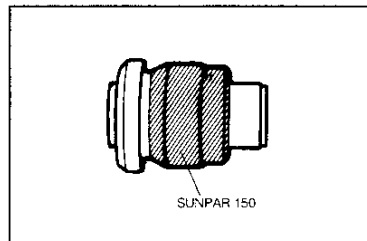
WFE90-FS305

ASSEMBLY OF SUSPENSION ARM

1. Install the front spring bumper to the upper arm.
Tightening Torque: 9.8 - 15.7 N·m
(1.0 - 1.6 kgf-m, 7.2 - 11.6 ft-lb)
2. Installation of upper arm bush (at front side)
 - (1) Apply the SUNPAR 150® to the press-fitting section of a new bush.
 - (2) Press the bush into the upper arm, using a hydraulic press in combination with the following SST.

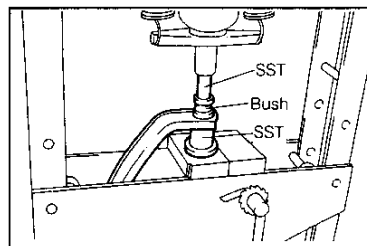


WFE90-FS306



SUNPAR 150

WFE90-FS307

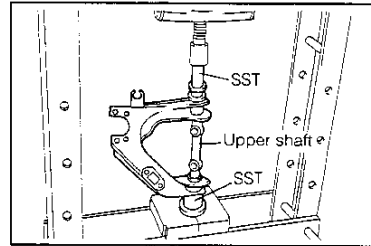


WFE90-FS308

FRONT AXLE & SUSPENSION

3. Installation of upper arm bush (at rear side)
 - (1) Install the upper arm shaft to the upper arm.
 - (2) Press the upper arm bush, using a hydraulic press in combination with the following SST.

SST: 09608-87612-000
09608-87610-000



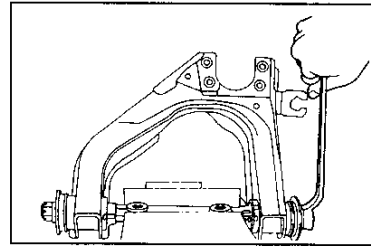
WFE90-FS309

4. Install the plate washer and washer.
5. Tighten the castle nut while aligning the mating marks which have been put at the upper arm and upper arm shaft during the disassembly. (In cases where the upper arm and upper shaft are reused.)

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

NOTE:

- Align the cotter pin hole with the cotter pin groove during the tightening.



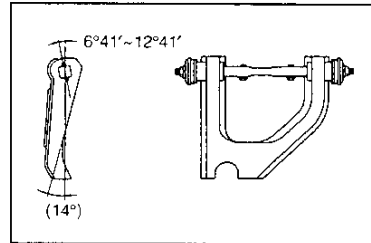
WFE90-FS310

6. Set the upper arm and upper shaft in such a way that they are placed at their positional relationship as indicated in the right figure.

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

NOTE:

- Align the cotter pin hole with the cotter pin groove during the tightening.

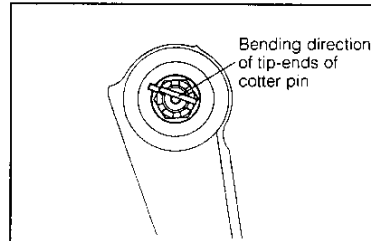


WFE90-FS311

7. Install a new cotter pin and bend its tip-ends, as indicated in the right figure.

NOTE:

- Do not reuse the cotter pin.



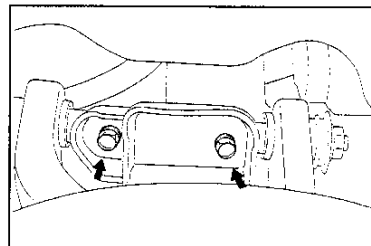
WFE90-FS312

INSTALLATION

1. Temporarily install the upper arm shaft to the chassis with bolts and new washer interposed.

NOTE:

- Do not reuse the spring washer.



WFE90-FS313

FRONT AXLE & SUSPENSION

2. Insert the camber adjusting shim into between the upper arm shaft and the chassis.

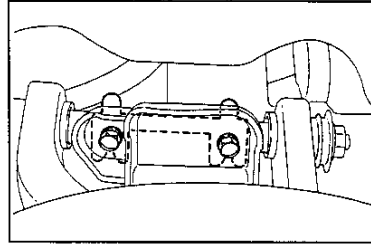
NOTE:

- Make sure that the correct number and kind of shims are installed in their respective installation positions.

3. Tighten the upper arm shaft attaching bolts.

Tightening Torque:

102 - 128 N·m (10.4 - 13.0 kgf-m, 75.2 - 94.0 ft-lb)

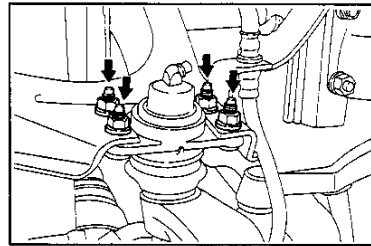


WFE90-FS314

4. Connect the upper arm ball joint to the upper arm. Tighten the attaching nuts with a new washer interposed.

Tightening Torque: 26.5 - 36.3 N·m

(2.7 - 3.7 kgf-m, 19.5 - 26.8 ft-lb)

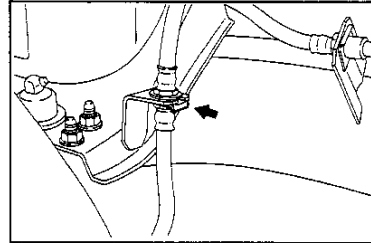


WFE90-FS315

5. Connect the brake hose to the upper arm. Install a new clip.

NOTE:

- Do not reuse the clip.

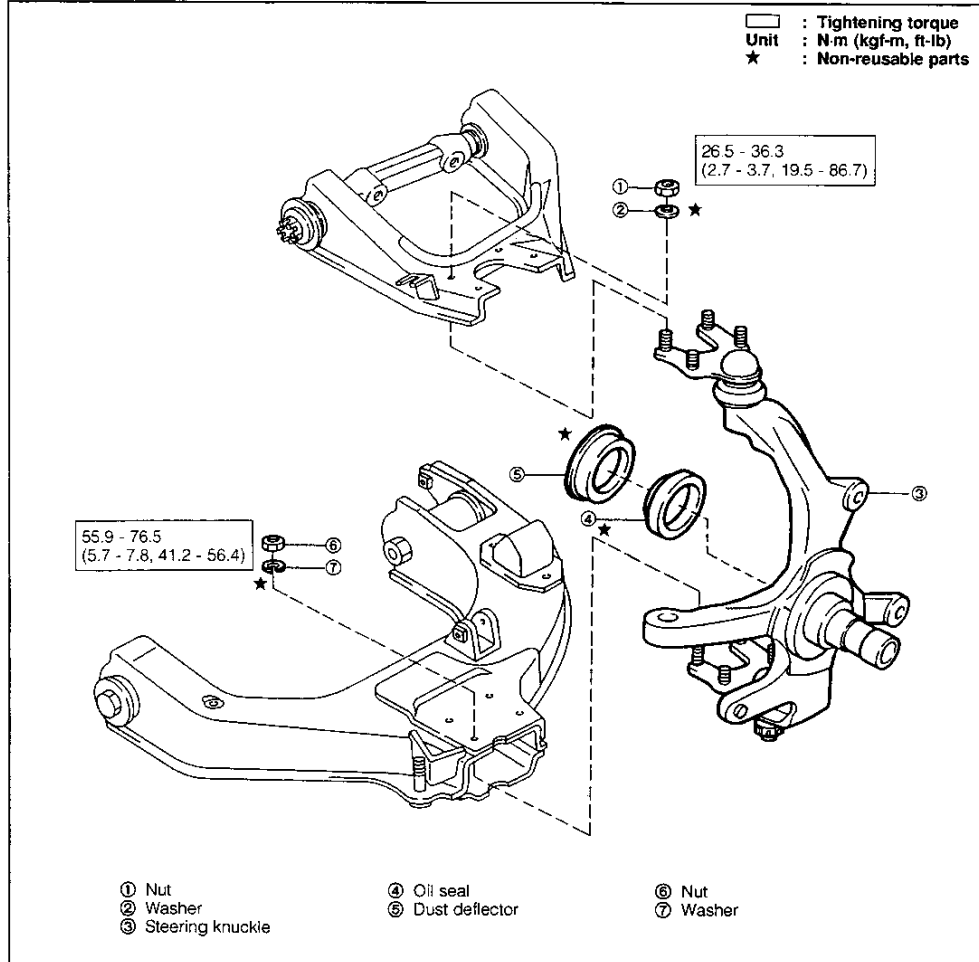


WFE90-FS316

6. Install the shock absorbers.
(See page FS-78.)
7. Install the torsion bar.
(See page FS-74.)
8. Check and adjust the front wheel alignment.

WFE90-FS317

STEERING KNUCKLES COMPONENTS



WFE90-FS318

TROUBLE SHOOTING

Symptom	Possible causes	Checking points
Oil leakage	Oil seal damaged Oil seal improperly installed	Installing condition of oil seal
Abnormal noise	Bush seized	Check inner bush.

WFE90-FS319

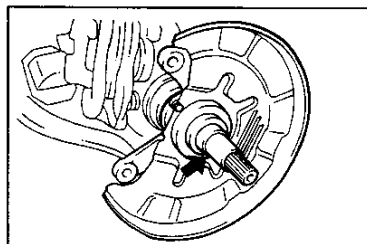
FRONT AXLE & SUSPENSION

REMOVAL

1. Remove the stabilizer bar.
(See page FS-66 to FS-67.)
2. Remove the torsion spring.
(See page FS-71 to FS-73.)
3. Remove the front axle hub.
(See page FS-41 to FS-45.)

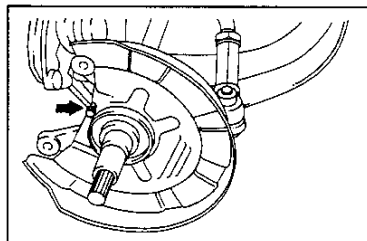
WFE90-FS320

4. Check of steering knuckle
Ensure that each section of the steering knuckle exhibits no damage, such as cracks and wear.
If any damage is present, replace the steering knuckle.



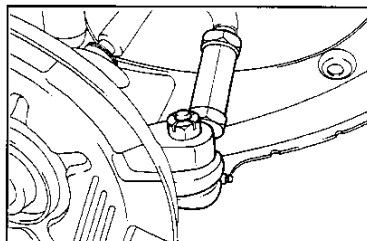
WFE90-FS321

Only when the brake disc dust cover is replaced, remove the brake disc dust cover attaching bolts. Then, remove the brake disc dust cover by lightly tapping it with a plastic hammer or the like.



WFE90-FS322

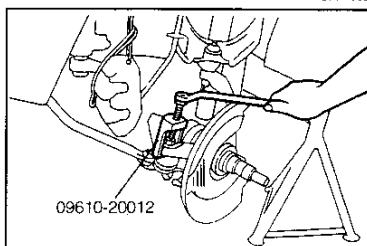
5. Removal of tie rod end
(1) Remove the cotter pin of the tie rod end attaching nut.
(2) Remove the attaching nut.



WFE90-FS323

- (3) Remove the tie rod end from the steering knuckle, using the following SST.
SST: 09610-20012-000

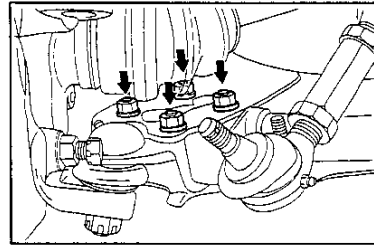
(See SR section.)



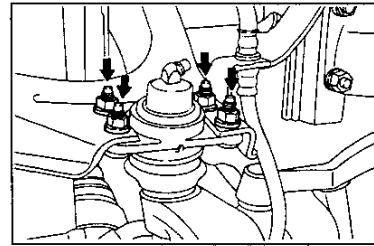
WFE90-FS324

FRONT AXLE & SUSPENSION

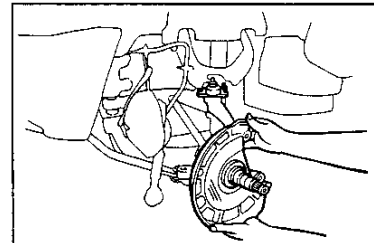
6. Remove the lower arm ball joint attaching nut from the lower arm.



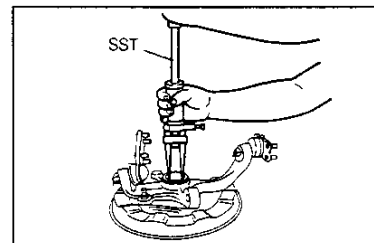
7. Remove the upper arm ball joint attaching nut from the upper arm.



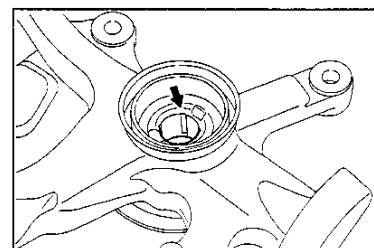
8. Remove the steering knuckle.
NOTE:
• Be very careful not to scratch the drive shaft during the removal.



9. Remove the oil seal, using the following SST.
SST: 09308-00010-000

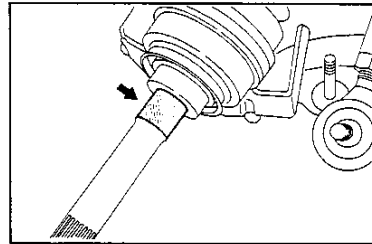


10. Check of steering knuckle bush
(1) Ensure that the steering knuckle bush exhibits no seizure and abnormal wear.
If any defect is present, replace the steering knuckle and drive shaft.



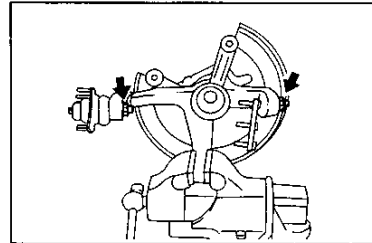
FRONT AXLE & SUSPENSION

- (2) Ensure that the steering knuckle bush contact surface of the drive shaft exhibits no seizure and abnormal wear.
If any defect is present, replace the steering knuckle and drive shaft.



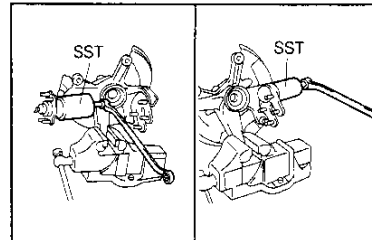
WFE90-FS330

11. Removal of ball joints
(1) Remove the cotter pin.
(2) Loosen the castle nut.



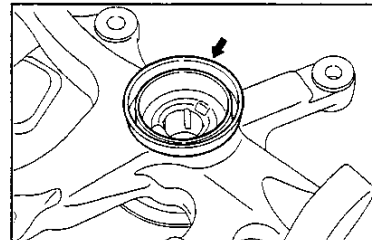
WFE90-FS331

- (3) Remove the ball joints from the steering knuckle, using the following SST.
SST: 09610-20012-000



WFE90-FS332

12. Check of dust deflector
Check the dust deflector for damage, such as deformation.
If any damage is present, replace the dust deflector.

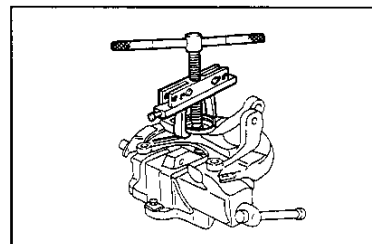


WFE90-FS333

13. Removal of dust deflector
(Only when the removal is required)
Remove the dust deflector, using the following SST.
SST: 09950-20017-000

NOTE:

- Do not reuse the dust deflector.

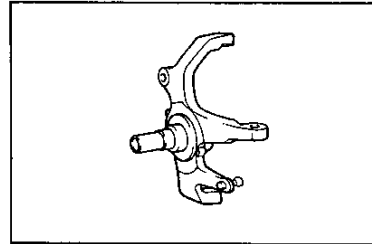


WFE90-FS334

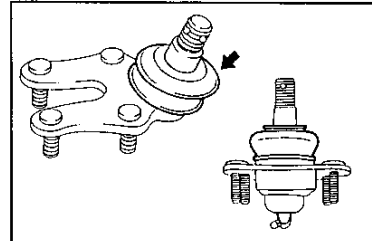
FRONT AXLE & SUSPENSION

INSPECTION

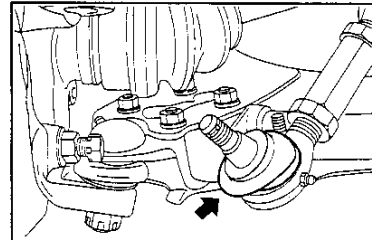
1. Steering knuckle
Ensure that the steering knuckle exhibits no damage, such as wear, seizure and cracks.
If any damage is present, replace the steering knuckle.
2. Check of upper and lower ball joints
Ensure that the boot sections of the upper and lower ball joints exhibit no damage.
If any damage is present, replace the boot.
(See page FS-118.)
3. Check of tie rod end
Ensure that the boot section of the tie rod end exhibits no damage.
If any damage is present, replace the boot.



WFE90-FS335



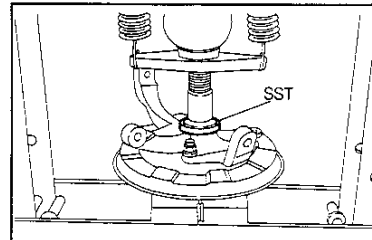
WFE90-FS336



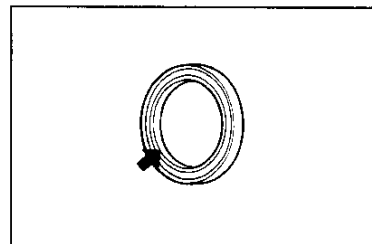
WFE90-FS337

INSTALLATION OF STEERING KNUCKLE

1. Press the oil deflector into the steering knuckle, using the following SST in combination with a hydraulic press.
SST: 09608-87605-000
2. Apply lithium-based MP grease to the oil seal lip section.



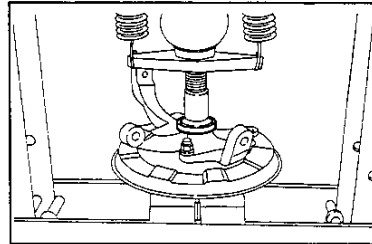
WFE90-FS338



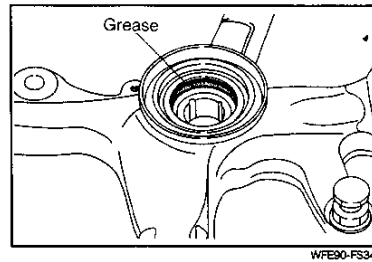
WFE90-FS339

FRONT AXLE & SUSPENSION

3. Press the oil seal into position, using the following SST.
SST: 09608-87605-000



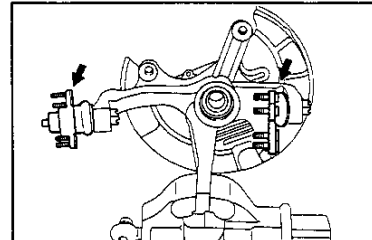
4. Fill lithium-based MP grease to a space between the oil seal and the bush.
Filling Amount of Grease: 25 - 30 grams



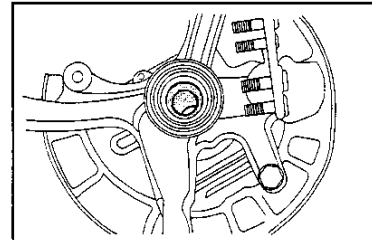
5. Install the upper and lower ball joints to the steering knuckle with castle nuts.

NOTE:

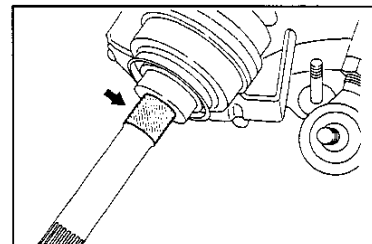
- Make sure that no grease and oil or the like is stuck on the tapered sections and threaded portions of the ball joints.



6. Apply the specified amount of lithium-based MP grease to the steering knuckle bush section.
Specified Amount: 25 - 30 grams



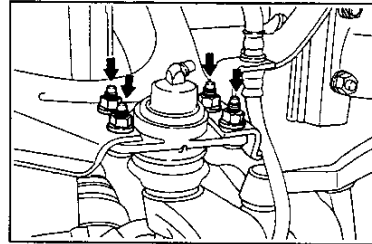
7. Clean the drive shaft. Apply lithium-based MP grease to the steering knuckle bush contact surface.



FRONT AXLE & SUSPENSION

8. Install the steering knuckle to the upper arm after passing the drive shaft through the steering knuckle.

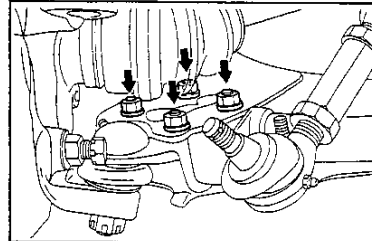
Tightening Torque: 26.5 - 36.3 N·m
(2.7 - 3.7 kgf-m, 19.5 - 26.8 ft-lb)



WFE90-FS345

9. Install the steering knuckle to the lower arm. Tighten the attaching bolts.

Tightening Torque: 55.9 - 76.5 N·m
(5.7 - 7.8 kgf-m, 41.2 - 56.4 ft-lb)



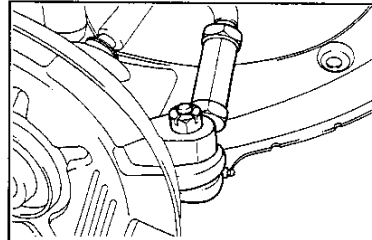
WFE90-FS346

10. Install the tie rod end to the steering knuckle. Tighten the castle nut.

Tightening Torque: 68.6 - 137 N·m
(7.0 - 14 kgf-m, 50.6 - 101 ft-lb)

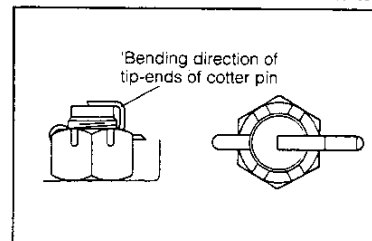
NOTE:

- Align the cotter pin hole of the ball joint with the cotter pin groove of the castle nut.



WFE90-FS347

11. Install the cotter pin to the castle nut, as indicated in the right figure.



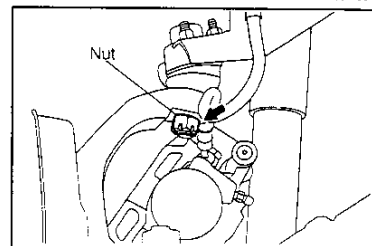
WFE90-FS348

12. Tighten the upper ball joint attaching castle nut.

Tightening Torque: 88.3 - 118 N·m
(9.0 - 12 kgf-m, 65.1 - 87.0 ft-lb)

NOTE:

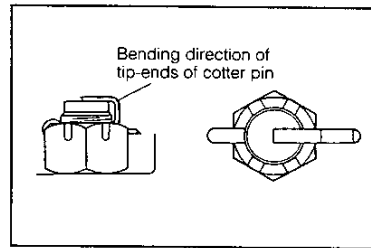
- Align the cotter pin hole of the ball joint with the cotter pin groove of the castle nut.



WFE90-FS349

FRONT AXLE & SUSPENSION

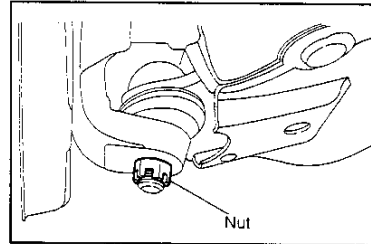
13. Install the cotter pin to the castle nut, as indicated in the right figure.



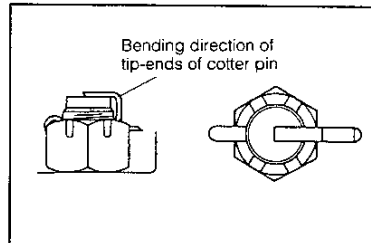
14. Tighten the lower ball joint attaching castle nut.
Tightening Torque: 88.3 - 118 N·m
(9 - 12 kgf-m, 65.1 - 87.0 ft-lb)

NOTE:

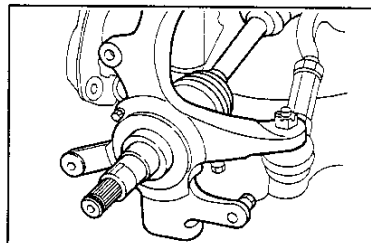
- Align the cotter pin hole of the ball joint with the cotter pin groove of the castle nut.



15. Install the cotter pin to the castle nut, as indicated in the right figure.



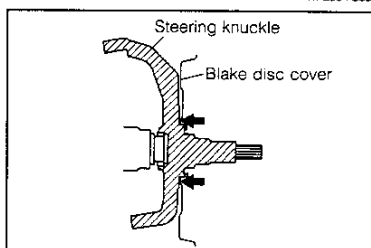
16. Installation of brake disc cover
(1) Slightly thread the brake disc cover attaching bolts into the steering knuckle.



- (2) Press a new brake cover into the steering knuckle with an appropriate rod applied to the point as indicated in the right figure.

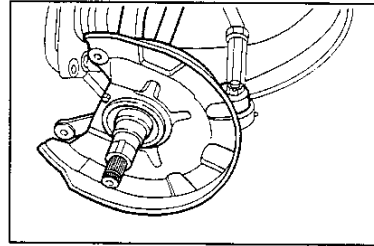
NOTE:

- Never reuse the brake disc cover.
- Care must be exercised to ensure that the arrowheaded sections are driven into position evenly.



FRONT AXLE & SUSPENSION

- (3) Tighten the attaching bolts.
Tightening Torque: 5.9 - 8.8 N·m
(0.6 - 0.9 kgf-m, 4.3 - 6.5 ft-lb)



WFE90-FS355

17. Install the front axle hub.
(See page FS-47 to FS-52.)
18. Install the torsion spring.
(See page FS-74 to FS-77.)
19. Install the stabilizer bar.
(See page FS-68 to FS-69.)

WFE90-FS356

20. Fill MP grease to the upper joint, lower joint and tie rod end, using a grease gun.

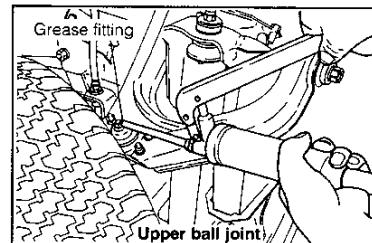
Grease Filling Amount

Upper ball joint: 27 grams
Lower ball joint: 10 grams
Pitman arm: 15 grams

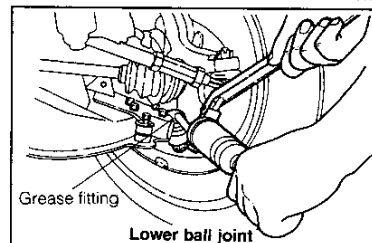
Grease to Be Used:
Lithium-based MP grease

NOTE:

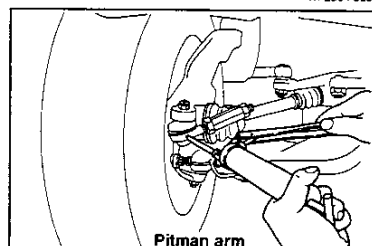
- The filling amount above is the specified amount for cases where new parts are assembled.



WFE90-FS357



WFE90-FS358

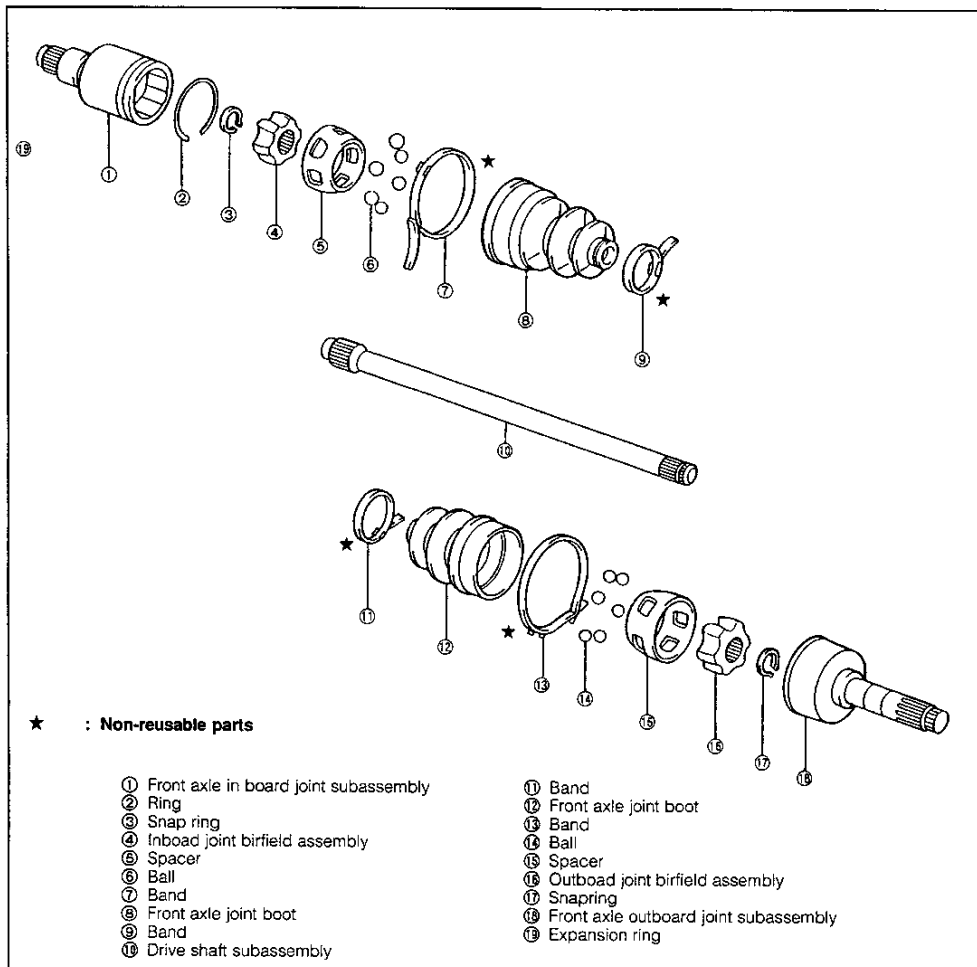


WFE90-FS359

21. Check the front alignment.
(See page FS-31.)

FRONT AXLE & SUSPENSION

DRIVE SHAFTS COMPONENTS



WFE90-FS360

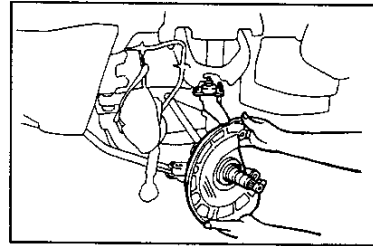
TROUBLE SHOOTING

Symptom	Possible causes	Checking points
Abnormal noise	Drive shaft bent or damaged	Check drive shaft.
Abnormal vibration	Joint section damaged	Check joint.
Oil leakage	Boot damaged	Check boot.

WFE90-FS361

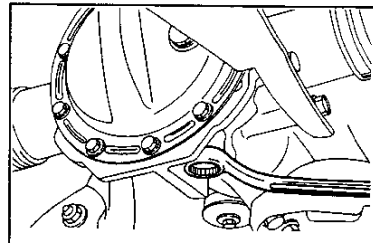
REMOVAL

1. Remove the steering knuckle.
(See page FS-94 under section "Removal of Steering Knuckle.")



WFE90-FS362

2. Drain the front differential oil.
(See Differential section.)

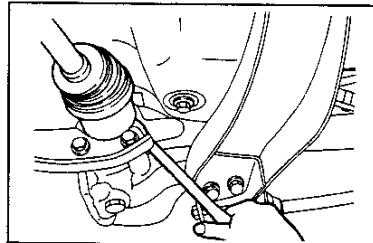


WFE90-FS363

3. Pull out the drive shaft, using a tire lever or the like.

NOTE:

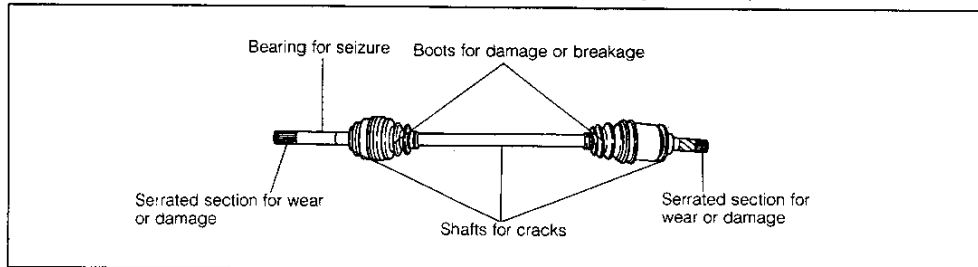
- Be very careful not to damage the spline, oil seal, boot and so forth during the removal.



WFE90-FS364

CHECK PRIOR TO DISASSEMBLY

Check the following points indicated in the figure below. Replace any defective parts.



NOTE:

1. The outboard bearing is a part not to be disassembled.
2. As for those parts to be reused, wash them using cleaning solvent and then dry them in advance.
3. If the bearing section is encountered with damage, such as seizure, check the bush section of the steering knuckle.
4. If the splined section at the outboard side is encountered with damage, check the splined section of the hub.
5. If the splined section at the inboard side is encountered with damage, check the side gears of the differential.

WFE90-FS365

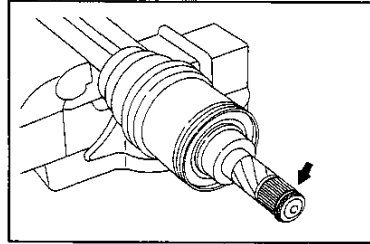
FRONT AXLE & SUSPENSION

DISASSEMBLY

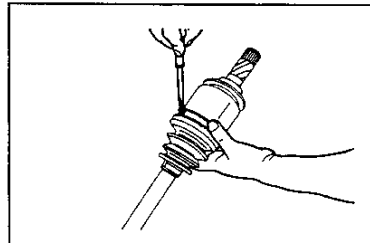
1. Remove the expansion ring from the inboard joint.

NOTE:

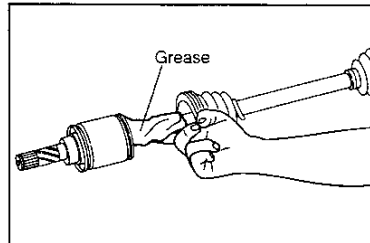
- Do not reuse the expansion ring.



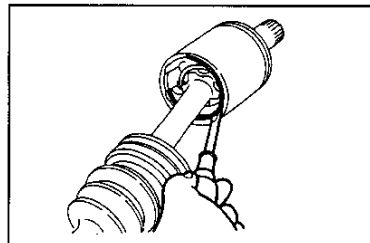
2. Raise the tang of each boot band of the inboard bearing by means of a screwdriver or the like so as to loosen the boot band.



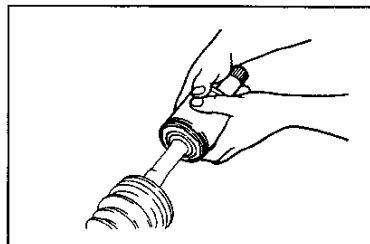
3. Displace the boot toward the inboard side and remove any grease from the inside of the boot.



4. Detach the hole snap ring from the inboard joint, using a minor screwdriver.



5. Remove the inboard joint from the drive shaft.

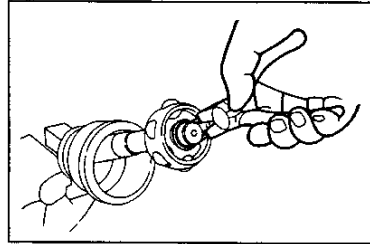


FRONT AXLE & SUSPENSION

6. Detach the snap ring from the drive shaft, using a snap ring expander.

NOTE:

- Do not reuse the removed snap ring.



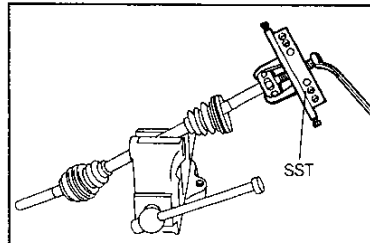
WFE90-FS371

7. Remove the ball subassembly from the drive shaft. If any difficulty is encountered in removing the ball subassembly by hands, drive it out by tapping it by means of an appropriate rod, or remove it using the following SST.

SST: 09950-20017-000

NOTE:

- When removing the ball subassembly, be sure to hold the inner race so as to avoid the interference with the bearing guide.

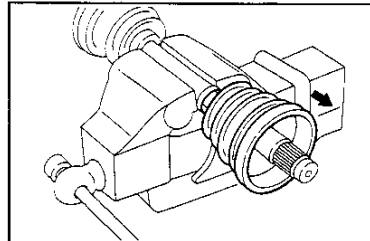


WFE90-FS372

8. Detach the boot and boot band at the inner race from the drive shaft.

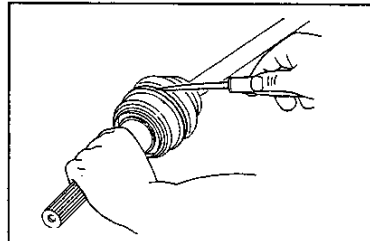
NOTE:

- Do not reuse the removed boot band.



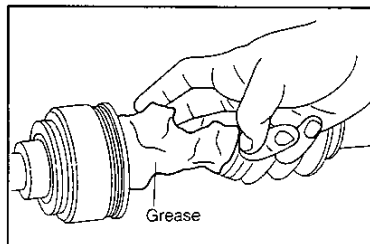
WFE90-FS373

9. Raise the tang of each boot band by means of a screwdriver or the like so as to loosen the boot band.



WFE90-FS374

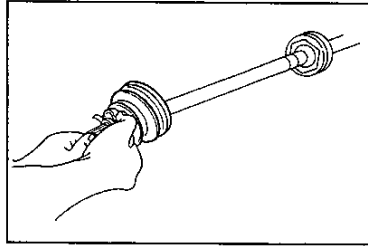
10. Displace the boot and remove any grease from the inside of the boot.



WFE90-FS375

FRONT AXLE & SUSPENSION

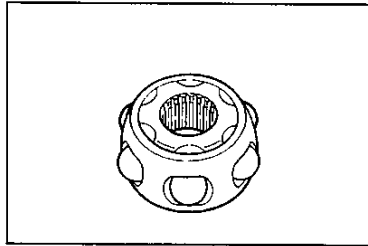
11. Detach the boot and boot band from the drive shaft.



WFE90-FS376

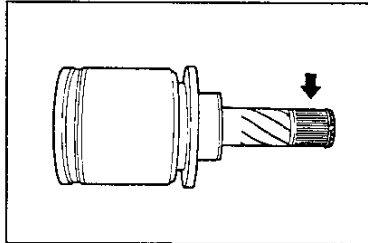
INSPECTION

1. Ensure that the ball subassembly exhibits no wear, cracks, scratches and so forth.
If any damage is present, replace the inboard assembly.



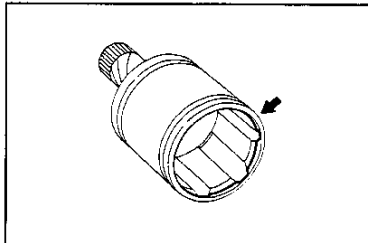
WFE90-FS377

2. Check of inboard joint
 - (1) Ensure that the spline section exhibits no damage, such as wear and cracks.
If any damage is present, replace the inboard assembly.



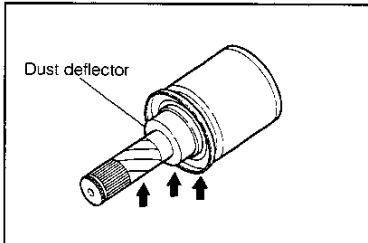
WFE90-FS378

- (2) Ensure that the ball joint groove section exhibits no damage, such as wear, cracks and scratches.
If any damage is present, replace the inboard assembly.



WFE90-FS379

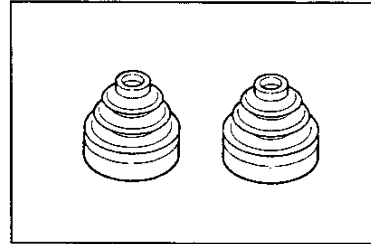
- (3) Ensure that the dust deflector exhibits no damage.
If any damage is present, replace the inboard subassembly.
 - (4) Ensure that the shaft section and oil seal contact surface exhibit no damage, such as wear, scratches and rust.
If any damage is present, replace the inboard assembly.



WFE90-FS380

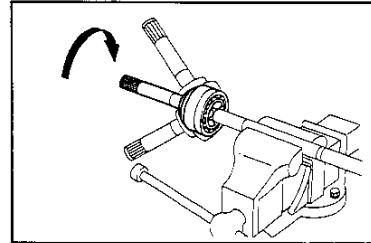
FRONT AXLE & SUSPENSION

3. Boot check
Ensure that the boot exhibits no damage, such as cracks.
If any damage is present, replace the boot.



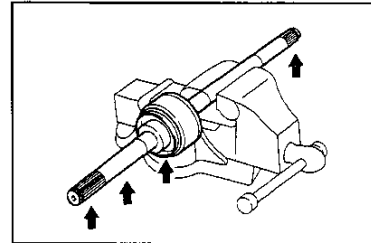
WFE90-FS381

4. Check of inboard joint
(1) Ensure that the inboard joint exhibits no excessive play and/or sticking.
If any damage is present, replace the inboard assembly.



WFE90-FS382

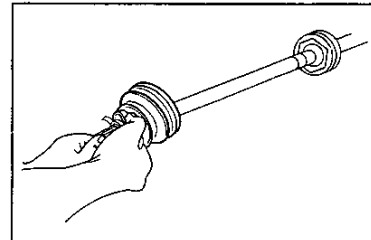
- (2) Ensure that the spline and shaft section exhibits no damage, such as wear, cracks and rust.
If any damage is present, replace the inboard assembly.
(3) Ensure that the dust deflector exhibits no damage.
If any damage is present, replace the inboard assembly.
(4) Ensure that the inboard ball subassembly attaching section exhibits no damage, such as wear and cracks.
If any damage is present, replace the inboard subassembly.



WFE90-FS383

ASSEMBLY

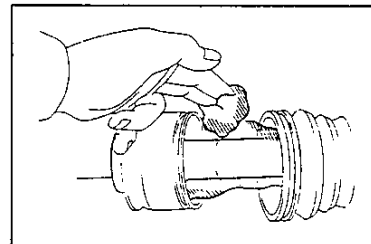
1. Install the boot to the outboard joint.
NOTE:
• Be very careful not to damage the boot.



WFE90-FS384

2. Positively fill the specified amount of grease furnished in the boot band or the boot set to the outboard joint as well as the inside of the boot.

Grease to Be Used: Morilex No. 2
Amount to Be Used: 80 - 100 grams



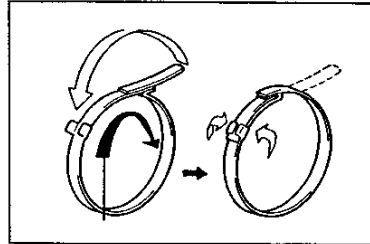
WFE90-FS385

FRONT AXLE & SUSPENSION

3. Install the boot correctly. Attach the boot bands and bend them in the sequence as indicated in the right figure.

NOTE:

1. Be sure to install the boot band in such a way that the bending direction of the boot band becomes opposite to the rotating direction of the drive shaft.
2. Be sure to use a new boot band.
3. Care must be exercised to ensure that no air is trapped inside of the boot, resulting in a bulging boot.

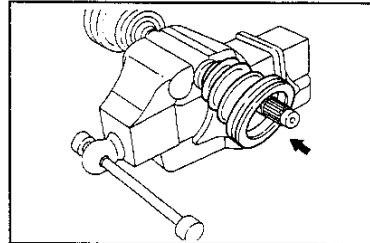


WFE90-FS386

4. Insert the boot and boot band at the inboard joint side into the drive shaft side.

NOTE:

- Make sure that the boot bands are bent in the correct direction.

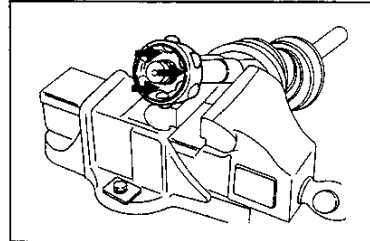


WFE90-FS387

5. Install the ball subassembly to the drive shaft by tapping the inner race of the ball subassembly by means of an appropriate rod.

NOTE:

- Be very careful not to damage the bearing guide section.
- Be sure to tap the inner race.

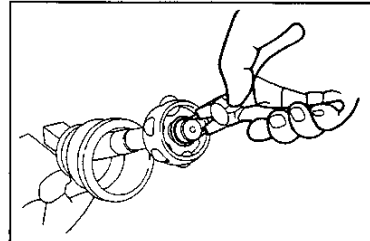


WFE90-FS388

6. Install the snap ring to the drive shaft, using a snap ring expander.

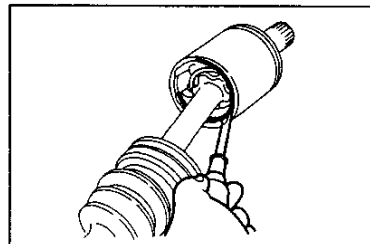
NOTE:

- Use a new snap ring.



WFE90-FS389

7. Connect the inboard joint to the ball subassembly. Install the hole snap ring to the inboard joint.



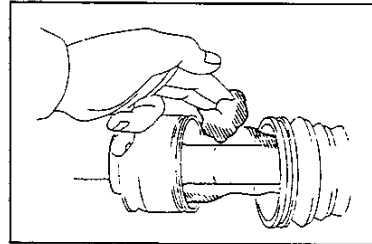
WFE90-FS390

FRONT AXLE & SUSPENSION

8. Positively fill the specified amount of grease furnished in the boot band or the boot set to the inboard joint as well as the inside of the boot.

Grease to Be Used: **Morilex No. 2**

Amount to Be Used: **160 - 180 grams**

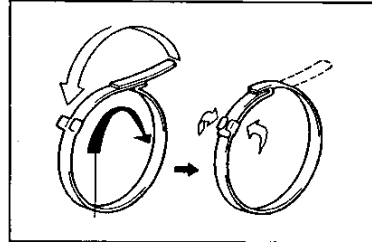


WFE90-FS391

9. Install the boot correctly. Attach the boot bands and bend them in the sequence as indicated in the right figure.

NOTE:

1. Be sure to install the boot band in such a way that the bending direction of the boot band becomes opposite to the rotating direction of the drive shaft.
2. Be sure to use a new boot band.
3. Care must be exercised to ensure that no air is trapped inside of the boot, resulting in a bulging boot.

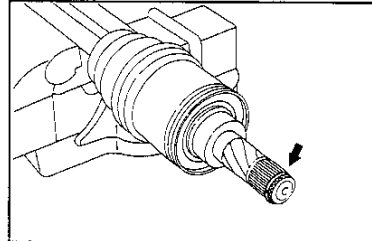


WFE90-FS392

10. Install the expansion ring to the inboard joint.

NOTE:

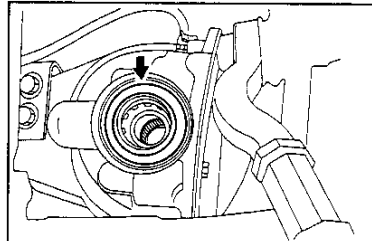
- Do not reuse the expansion ring.



WFE90-FS393

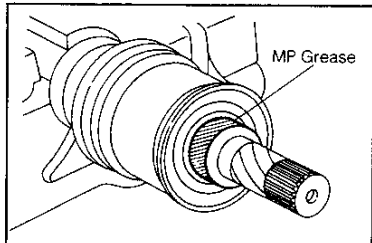
ASSEMBLY OF DRIVE SHAFT

1. Ensure that the oil seal at the front differential side exhibits no damage, such as scratches. If any damage is present, replace the oil seal. (See the Front Differential section.)
2. Apply lithium-based MP grease to the lip section of the front differential oil seal.



WFE90-FS394

3. Thinly apply lithium-based MP grease to the oil seal contact surface of the inboard.



WFE90-FS395

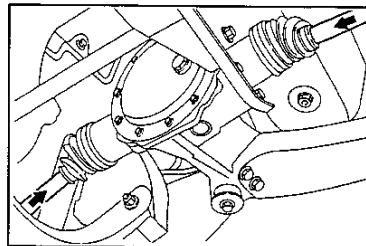
FRONT AXLE & SUSPENSION

4. Insert the inboard joint into the front differential.

NOTE:

- Be very careful not to get damage to the oil seal.

5. After inserting the inboard joint into the front differential, ensure that the inboard joint can not be pulled out by hands. If the inboard joint can be pulled out by hands, replace the expansion ring at the forward end of the inboard joint with a new part. After completion of the replacement, install the inboard joint again.

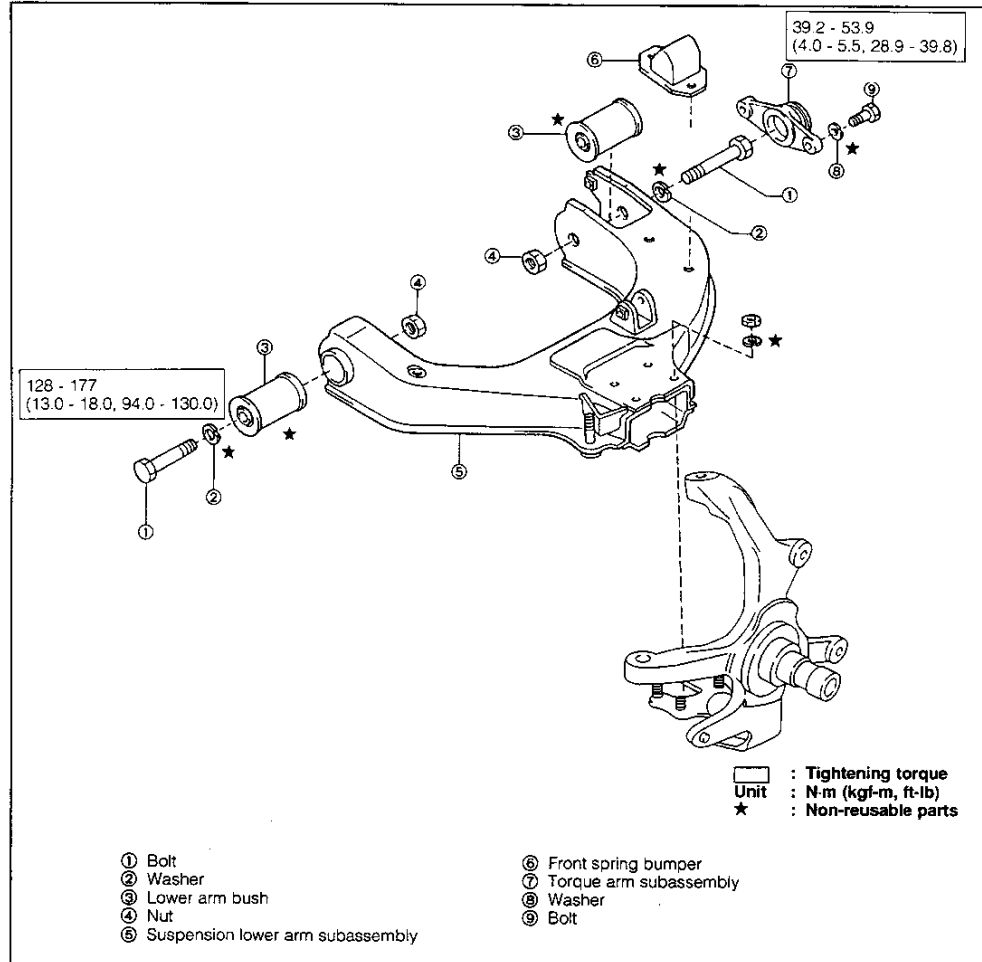


WFEB0-FS396

6. Fill front differential oil.
(See the Front Differential section.)
7. Install the steering knuckle.
(See page FS-97.)

WFEB0-FS397

LOWER ARMS COMPONENTS



TROUBLE SHOOTING

WFE90-FS396

Symptom	Possible causes	Checking points
Improper front alignment (Improper camber and caster)	Bush worn or damaged Lower arm damaged or deformed	Check bush. Check lower arm.
Abnormal noise		

WFE90-FS396

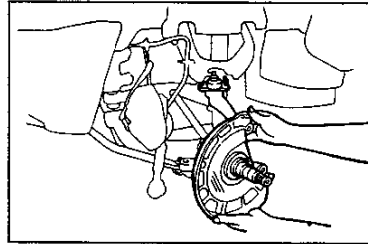
FRONT AXLE & SUSPENSION

REMOVAL

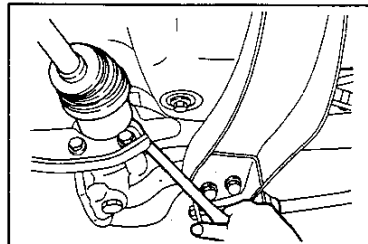
1. Remove the steering knuckle.
(See page FS-94 to FS-96.)
2. Remove the drive shaft (at the right side only).
(See page FS-103.)
3. Remove the shock absorber attaching bolts from the lower arm.
4. Remove the lower arm from the frame by removing the lower arm attaching bolts and nuts.
5. Removal of lower arm bush (at frame side)
Remove the lower arm bush, using the following SST.
SST: 09950-20017-000

NOTE:

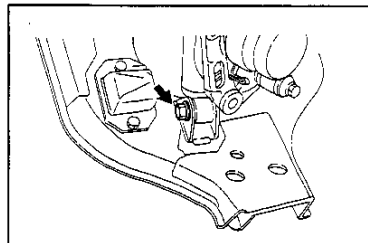
- Be sure to insert a suitable nut or the like to the bush contact surface of the SST so that the forward end of the SST may not be damaged.



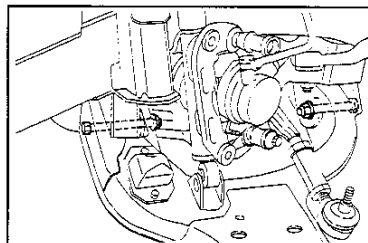
WFE90-FS400



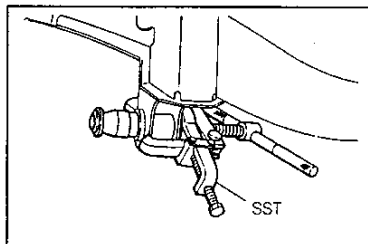
WFE90-FS401



WFE90-FS402



WFE90-FS403



WFE90-FS404

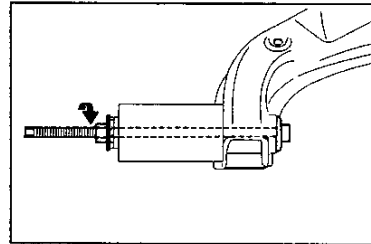
FRONT AXLE & SUSPENSION

6. Removal of lower arm bush (at lower arm side)
Remove the lower arm bush, using the following SST.
SST: 09608-87615-000

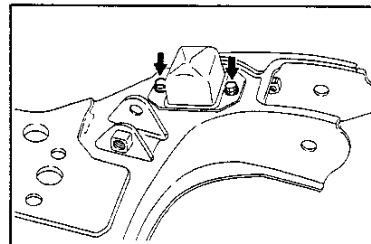
NOTE:

- Apply an adequate amount of MP grease to the threaded portion of the SST.
- If the bush rubber remains at the frame side, remove the rubber by attaching an appropriate plate waster to the SST.
- If the bolt turns when tightening the nut, prevent the bolt from turning, using the two flat sections provided at the forward end of the bolt. 5. Removal of lower arm bush (at lower arm side)

7. Remove the front spring bumper from the lower arm.



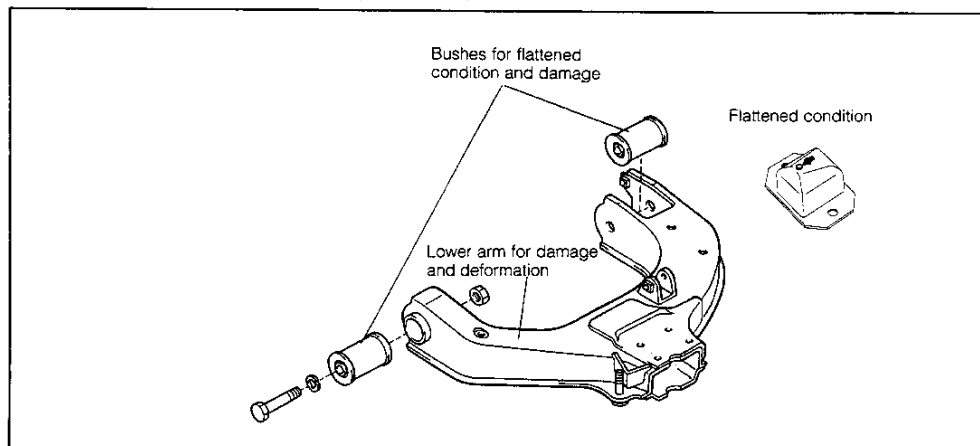
WFE90-FS405



WFE90-FS406

INSPECTION

Check the following parts. Replace any defective parts.



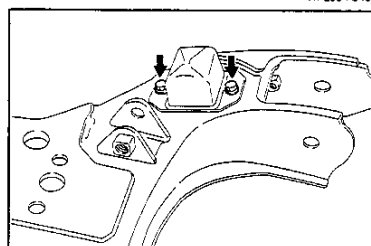
WFE90-FS407

INSTALLATION

1. Install the front spring bumper on the lower arm.

NOTE:

- Install the spring bumper in such a way that the arrow direction faces toward the forward direction of the vehicle.

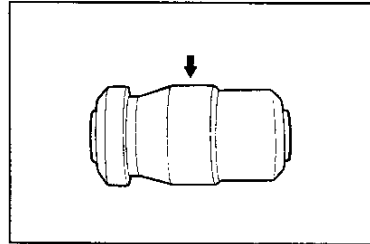


WFE90-FS408

FRONT AXLE & SUSPENSION

2. Installation of lower arm bush (at lower arm side)

- (1) Apply the SUNPAR 150® to the press-fitting section of the lower arm bush.



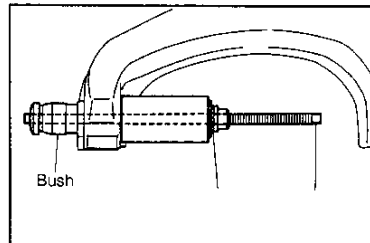
WFE90-FS409

- (2) Press the lower arm bush into the lower arm, using the following SST.

SST: 09608-87615-000

NOTE:

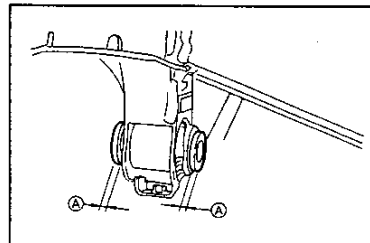
- If the bolt turns when tightening the nut, prevent the bolt from turning, using the two flat sections provided at the forward end of the bolt.



WFE90-FS410

- After completion of the press-fitting, perform adjustment so that the relationship between the bush edge surface and the lower arm may become as indicated in the right figure.

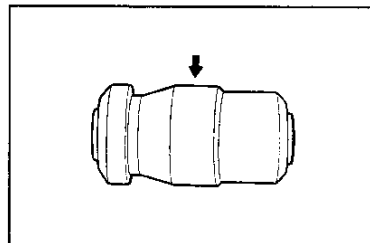
Dimension A: 7 ± 1 mm



WFE90-FS411

3. Installation of lower arm bush (at frame side)

- (1) Apply the SUNPAR 150® to the press-fitting section of the lower arm bush.



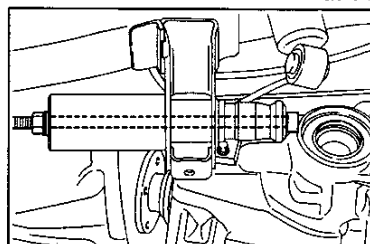
WFE90-FS412

- (2) Press the lower arm bush into the frame, using the following SST.

SST: 09608-87615-000

NOTE:

- If the bolt turns when tightening the nut, prevent the bolt from turning, using the two flat sections provided at the forward end of the bolt.

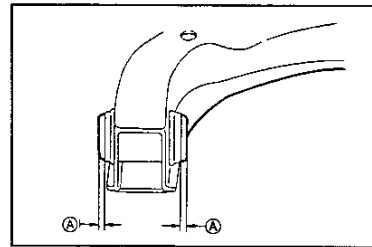


WFE90-FS413

FRONT AXLE & SUSPENSION

- After completion of the press-fitting, perform adjustment so that the relationship between the bush edge surface and the lower arm may become as indicated in the right figure.

Dimension A: 7 ± 1 mm

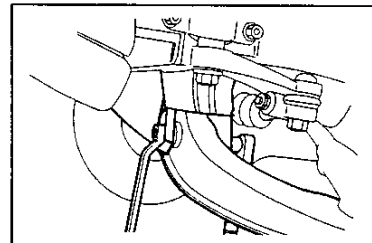


WFE90-FS414

4. Install the lower arm to the frame. Temporarily tighten the attaching bolts and nuts.

NOTE:

- Never reuse the spring washer.



WFE90-FS415

5. Set the lower arm so that it may become as indicated in the right figure. Tighten the lower arm attaching bolts.

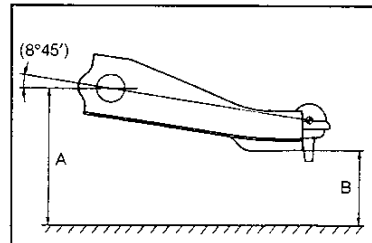
Installation Height: $A - B = C$

C: $87 (^{*}82) \pm 10$ mm

* For the United Kingdom

Tightening Torque:

128 - 177 N·m (13.0 - 18.0 kgf-m, 94.0 - 130 ft-lb)

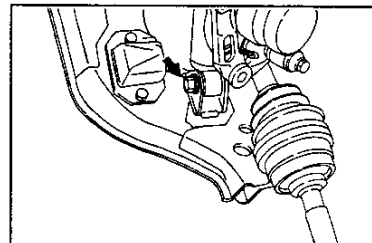


WFE90-FS416

6. Install the shock absorber to the lower arm with bolts.

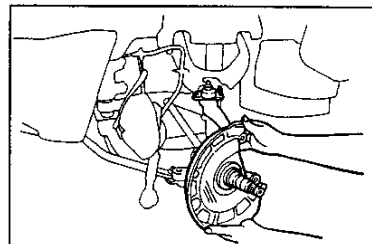
Tightening Torque: 49.0 - 68.6 N·m

(5.0 - 7.0 kgf-m, 36.2 - 50.6 ft-lb)



WFE90-FS417

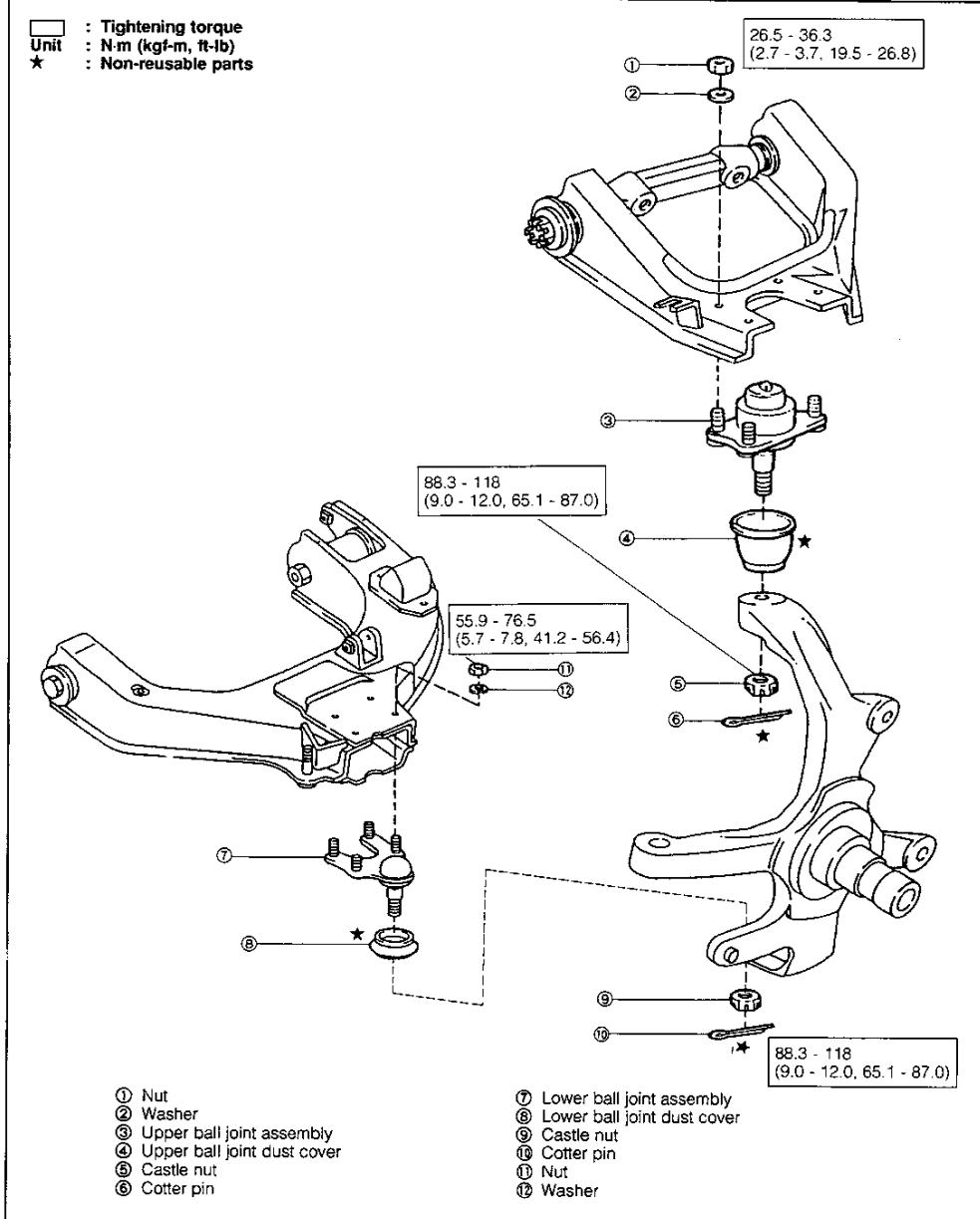
7. Install the steering knuckle.
(See page FS-97 to FS-101.)



WFE90-FS418

FRONT AXLE & SUSPENSION

UPPER & LOWER BALL JOINTS COMPONENTS

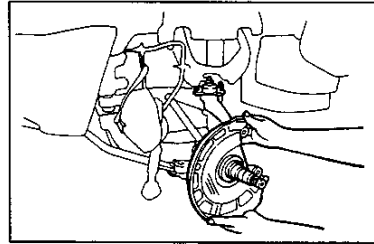


WFE90-FS419

FRONT AXLE & SUSPENSION

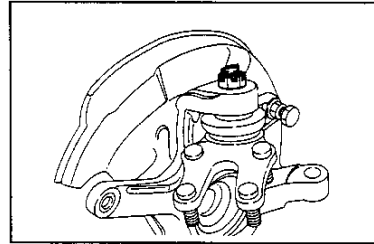
REMOVAL

1. Remove the steering knuckle arm.
(See page FS-94 to FS-96.)



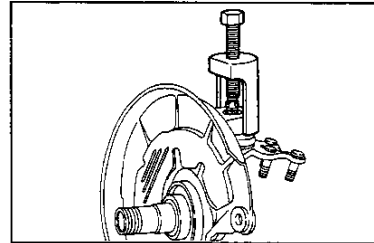
WFES0-FS420

2. Pull out the cotter pin.
3. Remove the castle nut.



WFES0-FS421

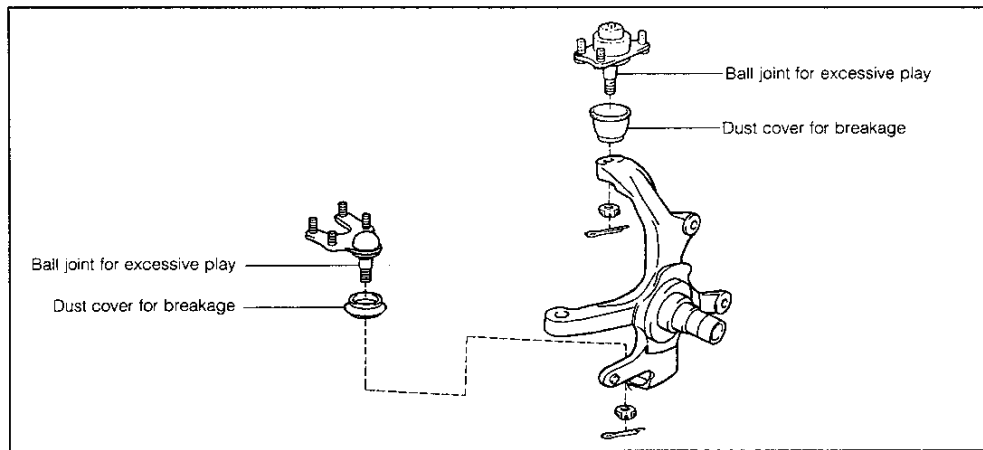
4. Remove the ball joint from the knuckle arm, using the following SST.
SST: 09610-20012-000



WFES0-FS422

INSPECTION

Check the following parts. Replace any defective parts.

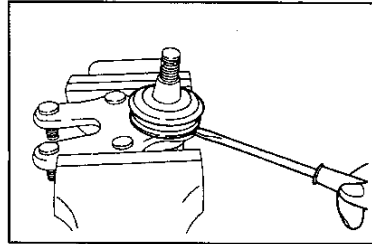


WFES0-FS423

FRONT AXLE & SUSPENSION

3. Replacement of rubber boot

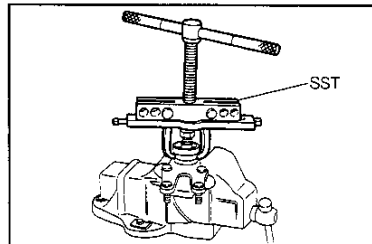
- (1) Detach the press-fitting section of the rubber boot from the ball joint by means of a screwdriver.



WFE90-FS424

- (2) Remove the rubber boot from the ball joint, using the following SST.

SST: 09950-20017-000

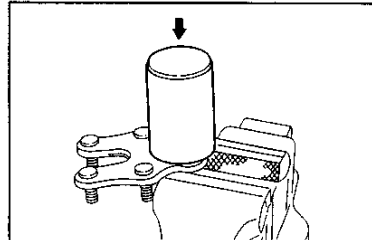


WFE90-FS425

- (3) Press a new rubber boot into position, using the following SST.

SST (lower ball joint): 09608-87611-000

(upper ball joint): 09608-87613-000



WFE90-FS426

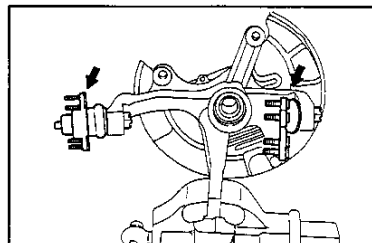
INSTALLATION

1. Connect the ball joint to the steering knuckle.

NOTE:

- Be very careful not to get any lubricant, such as grease, onto the tapered section.

2. Temporarily tighten the castle nut.

















WFE90-FS427

3. Install the steering knuckle arm.
(See page FS-97 to FS-101.)





WFE90-FS428

FRONT AXLE & SUSPENSION

SSTs (Special Service Tools)

Shape	Parts No. and Name	Purpose	Remarks
	09308-00010-000 Oil seal puller	Removal of front axle hub oil seal	
	09511-87202-000 Brake drum stopper	Prevention of hub from turning	
	09520-00031-000 Rear axle shaft puller	Removal of front axle hub	
	09607-87602-000 Front axle bearing lock nut wrench	Removal/installation of front axle hub lock nut	
	09607-87603-000 Front axle hub nut wrench	Removal/installation of front axle hub lock nut	
	09608-87603-000 Front axle hub outer bearing outer race replacer	Installation of front axle hub outer bearing and outer race	
	09608-87604-000 Front axle hub inner bearing outer race replacer	Installation of front axle hub inner bearing and outer race	
	09608-87605-000 Steering knuckle oil seal & dust deflector replacer	Installation of steering knuckle oil seal and/or dust deflector	
	09608-87609-000 Upper arm bush remover	Pulling out of upper arm bush	
	09608-87610-000 Upper arm bush replacer	Press-fitting of upper arm bush	
	09608-87611-000 Lower arm dust cover & tie rod end dust cover replacer	Installation of dust cover	
	09608-87612-000 Upper arm bush remover & replacer holder	Pulling out and/or press-fitting of upper arm bush	
	09608-87613-000 Pitman arm tie rod end dust cover & hub cap replacer	Installation of dust cover and/or hub cap	Except for hub cap for free wheel hub
	09608-87615-000 Lower arm bush remover & replacer	Removal/installation of lower arm bush	

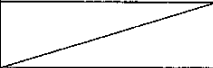
FRONT AXLE & SUSPENSION

Shape	Parts No. and Name	Purpose	Remarks
	09610-20012-000 Pitman arm puller	Disconnection of tie rod end	
	09611-87506-000 Handle	Used for press-fitting of inner race and other purposes	
	09950-20017-000 Universal puller	Removal of dust cover, etc. Removal of lower arm bush	
	09608-87602-000 Front axle hub oil seal replacer	Installation of oil seal	

WFE90-FS430

FRONT AXLE & SUSPENSION

SERVICE SPECIFICATION

Side slip Toe-in Camber Caster King pin angle	3 mm (0.118 inch) 4 $\frac{3}{4}$ mm (0.157 $\frac{1}{8}$ inch) 1° $\frac{1}{4}$ ' 2° ± 30' 9°30'				
Wheel turning angle	Tyre	Inner turning		Outer turning	
	195/80R15	31°05' $\frac{1}{4}$ '		27°15'	
	225/70R15	27°05' $\frac{1}{4}$ '		23°55'	
Tire inflation pressure		Front kgf/cm ²		Rear kgf/cm ²	
		Unloaded	Loaded	Unloaded	Loaded
	195 R15 94S	1.6	1.6	2.1	2.3
	225/70 R15 100S	1.6	1.6	2.1	2.3
	195/80 R15 94S	1.6	1.6	2.1	2.3
Wheel runout (maximum) Tyre runout (maximum) Vertical runout Lateral runout	0.1 mm (0.04 inch) 1.4 mm (0.0551 inch) 2.0 mm (0.0787 inch)				
Front vehicle height	41 ± 10 mm (1.6 ± 0.39 inches) (See page FS-75)				
Front axle bearing starting torque	1.4 - 3.6 kgf (3.1 - 7.9 lb)				

WFE90-FS431

FRONT AXLE & SUSPENSION

TIGHTENING TORQUE

Tightening component	N·m	kgf·m	ft·lb
Wheel hub nuts	89.2 - 118	9.0 - 12.0	65.1 - 87.0
Knuckle stopper bolt lock nut	78.5 - 98.0	8.0 - 10.0	57.9 - 72.0
Tie rod (Lock nut)	118 - 167	12 - 17	87 - 123
Torsion spring lock nut	68.6 - 88.3	7.0 - 9.0	50.6 - 65.1
Lock nut (Axle hub nut)	98.0 - 147	10 - 15	72 - 109
Steering knuckle × Brake mounting support	68.6 - 88.3	7.0 - 9.0	50.6 - 65.1
Lock nut (Axle hub nut) × brake drum (Automatic free wheel hub equipped vehicle only)	4.9 - 8.8	0.5 - 0.9	3.6 - 6.5
Axle hub × Hub cover (Free wheel hub body)	58.8 - 68.6	6.0 - 7.0	43.4 - 50.6
Free wheel hub body × Free wheel hub cover (Free wheel hub equipped vehicle only)	7.8 - 11.8	0.8 - 1.2	5.8 - 8.7
Axle hub × Brake disc	53.9 - 73.5	5.5 - 7.5	39.8 - 54.2
Drive shaft × Lock bolt with washer (Automatic locking hub equipped vehicle only)	14.7 - 21.6	1.5 - 2.2	10.8 - 15.9
Stabilizer link × Stabilizer bracket cover	29.4 - 44.1	3.0 - 4.5	21.7 - 32.5
Anchor arm stopper × Frame	4.9 - 7.8	0.5 - 0.8	3.6 - 5.8
Torque arm × Lower arm	39.2 - 53.9	4.0 - 5.5	28.9 - 39.8
Anchor bolt × Lock nut	68.6 - 88.3	7.0 - 9.0	50.6 - 65.1
Shock absorber × Frame	18.6 - 30.4	1.9 - 3.1	13.7 - 22.4
Shock absorber × Lower arm	49.0 - 68.6	5.0 - 7.0	36.2 - 50.6
Shock absorber × Shock absorber control bracket	25.5 - 38.2	2.6 - 3.9	18.8 - 28.2
Shock absorber control bracket × Three-stage actuator	2.0 - 3.9	0.2 - 0.4	1.4 - 2.9
Suspension upper arm shaft × Frame	102 - 128	10.4 - 13.0	75.2 - 94.0
Suspension upper arm shaft × Upper arm sub assembly	68.6 - 88.3	7.0 - 9.0	50.6 - 65.1
Upper arm × Front spring bumper	9.8 - 15.7	1.0 - 1.6	7.2 - 11.6
Upper arm × Upper ball joint	26.5 - 36.3	2.7 - 3.7	19.5 - 26.8
Lower arm × Lower ball joint	55.9 - 76.5	5.7 - 7.8	41.2 - 56.4
Steering knuckle × Tie rod end	68.6 - 137	7.0 - 14	50.6 - 101
Upper ball joint × Steering knuckle	88.3 - 118	9.0 - 12.0	65.1 - 87.0
Lower ball joint × Steering knuckle	88.3 - 118	9.0 - 12.0	65.1 - 87.0
Lower arm × Frame	128 - 177	13 - 18	94 - 130

WFE90-FS432