

SUSPENSION

GENERAL PROCEDURES	R- 1	TORSION BAR SPRING AND LOWER ARM	
WHEEL ALIGNMENT	R- 1	REMOVAL/INSTALLATION (4×4)	R-10
WHEEL ALIGNMENT PREINSPECTION	R- 1	LOWER ARM INSPECTION	R-12
FRONT WHEEL ALIGNMENT	R- 2	UPPER ARM REMOVAL/INSTALLATION	R-13
FRONT SUSPENSION	R- 3	UPPER ARM INSPECTION	R-14
VEHICLE HEIGHT ADJUSTMENT	R- 3	STABILIZER AND TENSION ROD	
FRONT SHOCK ABSORBER REMOVAL/		REMOVAL/INSTALLATION (4×2)	R-14
INSTALLATION	R- 5	STABILIZER REMOVAL/INSTALLATION (4×4) .	R-15
FRONT SHOCK ABSORBER INSPECTION ..	R- 6	REAR SUSPENSION	R-16
FRONT SHOCK ABSORBER DISPOSAL		REAR SHOCK ABSORBER AND LEAF	
(VEHICLES BUILT FROM 08/2002)	R- 6	SPRING REMOVAL/INSTALLATION	R-16
TORSION BAR SPRING AND LOWER ARM		REAR SHOCK ABSORBER DISPOSAL	
REMOVAL/INSTALLATION (4×2)	R- 7	(VEHICLES BUILT FROM 08/2002)	R-18

GENERAL PROCEDURES

Wheels and tires removal/installation

- The removal and installation procedures for the wheels and tires are not mentioned in this section. If a wheel is removed, retighten it to the specified tightening torque, referring to section TD.

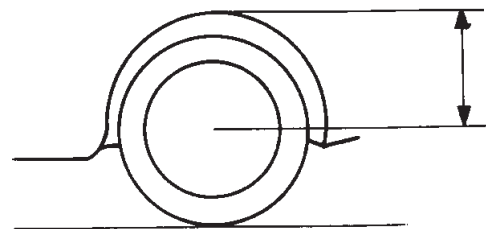
Suspension arms removal/installation

- Tighten any part of the suspension that uses rubber bushings only after the vehicle has been lowered and unloaded*.
- * Unloaded condition: Fuel tank is full. Engine coolant and engine oil are at specified levels. Spare tire, jack, and tools are in designated position.

WHEEL ALIGNMENT

WHEEL ALIGNMENT PREINSPECTION

1. Inspect the inflation of each tire, and set to the recommended pressure, as necessary.
2. Inspect the front wheel bearing play. Adjust the bearing preload or replace bearing(s) as necessary.
(Refer to section M, FRONT AXLE (4×2), WHEEL HUB, STEERING KNUCKLE INSPECTION or FRONT AXLE (4×4), WHEEL HUB, STEERING KNUCKLE INSPECTION.)
3. Inspect the wheel and tire runout at all wheels.
(Refer to section TD, SUSPENSION, Wheels and Tires.)
4. Inspect the ball joints and steering linkage for excessive looseness.
5. Place the vehicle on level ground with no luggage and passenger load.
6. The difference in height between the left and right sides from the center of the wheel to the fender brim must not exceed **10 mm {0.39 in}**. If not within the specification, adjust the vehicle height.
(Refer to FRONT SUSPENSION, VEHICLE HEIGHT ADJUSTMENT.)



7. Shake the vehicle to settle the suspension.

WHEEL ALIGNMENT

FRONT WHEEL ALIGNMENT Specifications

Item			Specification	
			4 × 2	4 × 4
Front wheel alignment (*1Unloaded condition)	Total toe-in	(mm {in})	3 ± 3 {0.12 ± 0.12}	
		(degree)	0° 16' ± 16'	0° 14' ± 14'
	Maximum steering angle	Inner	35° 00' ^{+2°} _{-3°}	33° 30' ^{+2°} _{-3°}
		Outer	33° 00' ^{+2°} _{-3°}	30° 00' ^{+2°} _{-3°}
	Camber angle*2		0° 56' ± 30'	1° 06' ± 30'
	Caster angle*3		1° 37' ± 45'	2° 02' ± 45'
	Steering axis inclination (reference value)		8° 04'	10° 15'

*1 Fuel tank is full. Engine coolant and engine oil are at specified level. Spare tire, jack, and tools are in designated position.

*2 Difference between left and right must not exceed 30'.

*3 Difference between left and right must not exceed 45'.

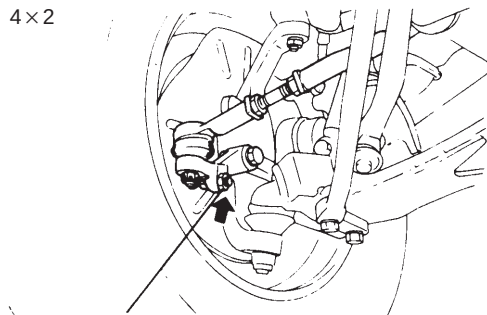
Maximum Steering Angle Adjustment

1. Loosen the adjusting bolt locknut.
2. Turn the adjusting bolt to provide the correct turning angle.
3. After adjustment, tighten the locknut to the specified torque.

Tightening torque

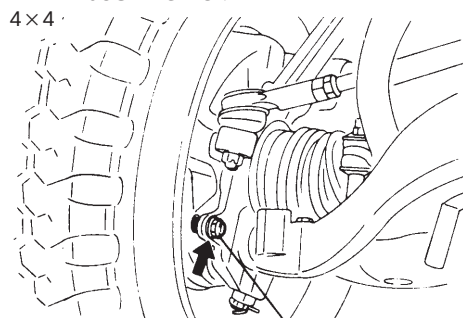
40—58 N·m {4.0—6.0 kgf·m, 29—43 ft·lbf}

4 × 2



ADJUSTING BOLT

4 × 4



ADJUSTING BOLT

Total Toe-in Adjustment

1. Loosen the tie-rod end locknuts.
2. Turn the tie rods by the same amount in the opposite direction.

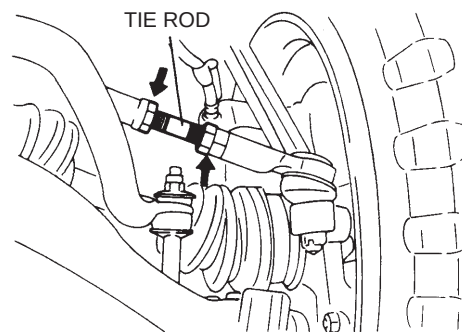
Note

- One turn of the tie rod (both sides) changes the toe-in by about **30 mm {1.18 in.}**.
- The left and right tie rods are both right threaded. To increase the toe-in, turn the right tie rod toward the front of the vehicle and the left tie rod equally toward the rear.

3. Tighten the tie-rod end locknuts.

Tightening torque

69—78 N·m {7.0—8.0 kgf·m, 51—57 ft·lbf}

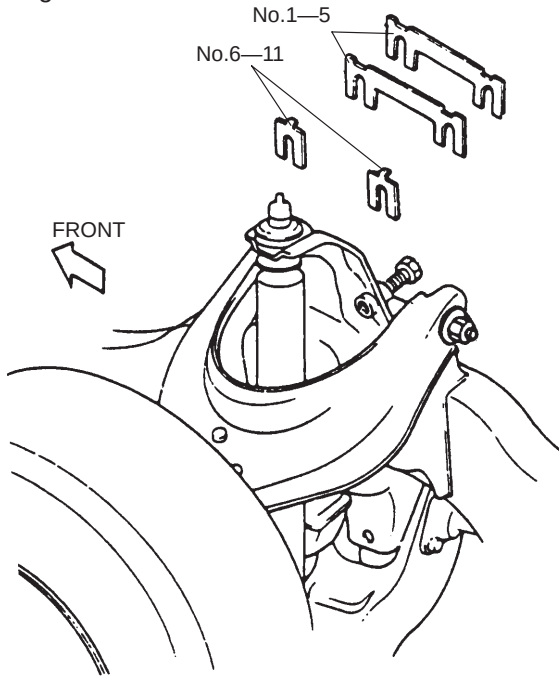


TIE ROD

WHEEL ALIGNMENT, FRONT SUSPENSION

Caster and Camber Adjustment

1. Loosen the upper arm shaft bolt and insert or remove adjustment shims to provide the correct angle.



Adjustment shim

No.	Thickness (mm {in})	No.	Thickness (mm {in})
1	1.0 {0.039}	7	1.0 {0.039}
2	1.6 {0.063}	8	1.6 {0.063}
3	2.0 {0.079}	9	2.0 {0.079}
4	3.2 {0.126}	10	3.2 {0.126}
5	4.0 {0.157}	11	4.0 {0.157}
6	0.6 {0.024}		

Note

- Shims No.1—5 are used on either side. Do not use more than two.
- Shims No.6—11 are used at the front and rear of either sides. Do not use more than one.
- Camber: A change of shim thickness (at front and rear) of **1 mm {0.039 in}** results in a change of **about 15°**.
- Caster: A change of shim thickness (at front or rear only) of **1 mm {0.039 in}** results in a change of **about 30°**.

2. After adjustment, tighten the upper arm shaft bolt to the specified torque.

Tightening torque

94—116 N·m {9.5—11.9 kgf·m, 69—86 ft·lbf}

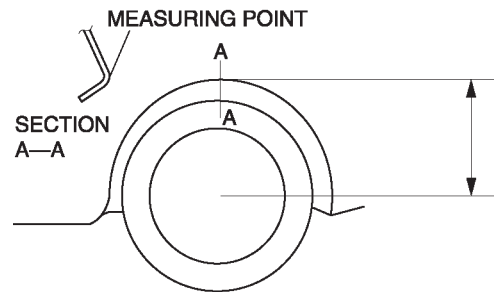
FRONT SUSPENSION

VEHICLE HEIGHT ADJUSTMENT

Caution

- If the vehicle height on a winch or towbar (bullbar or similar accessory) equipped vehicle is adjusted, it is possible that the vehicle height will drop below specification again or the tires will be subject to uneven wear. Without adjusting the vehicle height, adjust only the difference between the left and right sides and perform a wheel alignment to specification.

1. Place the vehicle on level ground.
2. Inspect the front and rear tire pressure and adjust it as necessary.
3. Measure the distance from the center of each front wheel to the fender brim.



Left/right difference

10 mm {0.39 in} max.

Standard vehicle height

Drive type	Cab type	Tire size	Vehicle height (mm {in})
4x2	Regular Cab, Stretch Cab*	ALL	427.0 {16.81}
	Double Cab		422.0 {16.61}
4x4	Regular Cab, Stretch Cab*	205R16	519.0 {20.43}
		235/75R15	515.0 {20.28}
		P235/75R15	
	Double Cab	265/70R15	518.0 {20.39}
		205R16	510.0 {20.08}
		235/75R15	506.0 {19.92}
		P235/75R15	
		265/70R15	509.0 {20.04}

* :Includes Stretch Cab (with Rear Access System) model.

WHEEL ALIGNMENT

Caution

- Adjust the vehicle height at the left and right wheels at the same time. Otherwise, the vehicle height may not be adjusted correctly.

4. If the difference between left and right is not within the specification, adjust the vehicle height by turning the torsion bar spring anchor bolt.

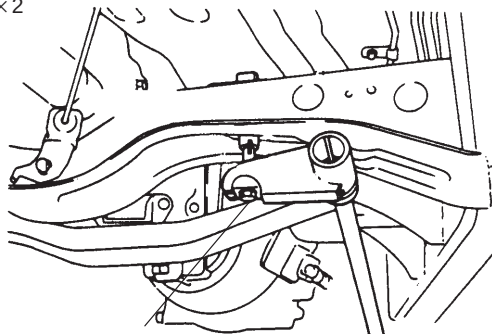
Note

- Vehicle height increase—decreases per one anchor bolt rotation as follows:

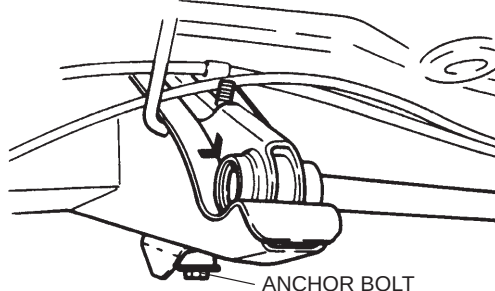
4x2: 3.5 mm {0.14 in}

4x4: 3.3 mm {0.13 in}

4×2



4×4 ANCHOR BOLT

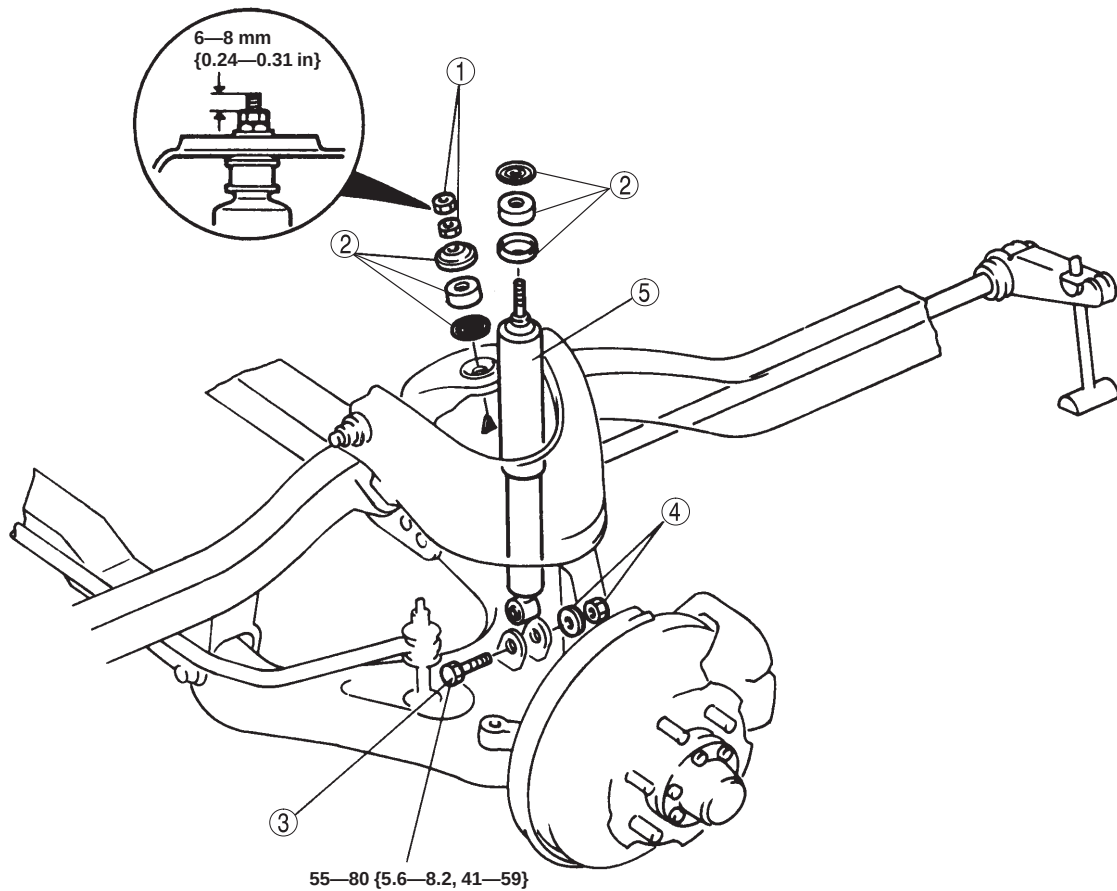


5. Move the vehicle forward and back to seat each part.
6. Verify that the vehicle height is within the standard.
 - If not, readjust the vehicle height.

FRONT SUSPENSION

FRONT SHOCK ABSORBER REMOVAL/INSTALLATION

1. Remove in the order indicated in the table.
2. Install in the reverse order of removal.



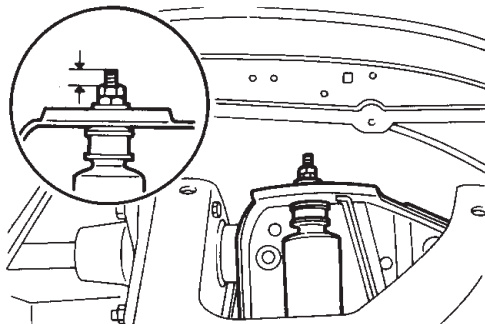
N·m {kgf·m, ft·lbf}

1	Nut + Installation Note
2	Retainer, bushing

3	Bolt
4	Washer and nut
5	Shock absorber

Nut Installation Note

- Tighten the nut so that the exposed thread of the shock absorber piston is **6–8 mm {0.24–0.31 in}**.



FRONT SUSPENSION

FRONT SHOCK ABSORBER INSPECTION

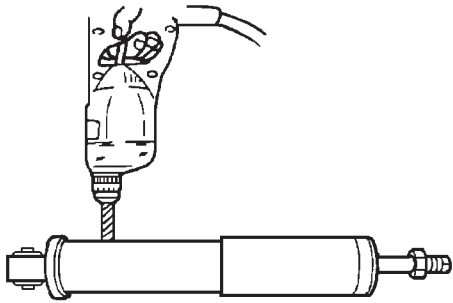
1. Remove the front shock absorber from the vehicle.
2. Inspect for damage and oil leakage.
3. Inspect the rubber bushing for deterioration and wear.
4. Compress and extend the shock absorber piston at least three (3) times. Verify that the operational force does not change and that there is no unusual noise.
5. Compress the shock absorber piston and release it. Verify that the piston extends fully at a normal speed.

FRONT SHOCK ABSORBER DISPOSAL (VEHICLES BUILT FROM 08/2002)

Warning

- **Whenever drilling into a shock absorber, wear protective eye wear. The gas in the shock absorber is pressurized, and could spray metal chips into the eyes and face when drilling.**

1. Clamp a shock absorber on a flat surface or with the piston pointing downwards.
2. Drill a **2–3 mm {0.08–0.12 in}** hole at a point **20–30 mm {0.8–1.2 in}** from the bottom of the tube, so that the gas can escape.



3. Turn the hole downwards.
4. The oil can be collected by moving the piston rod several times up and down and cutting the tube at the end.
5. Dispose of waste oil according to the waste disposal law.

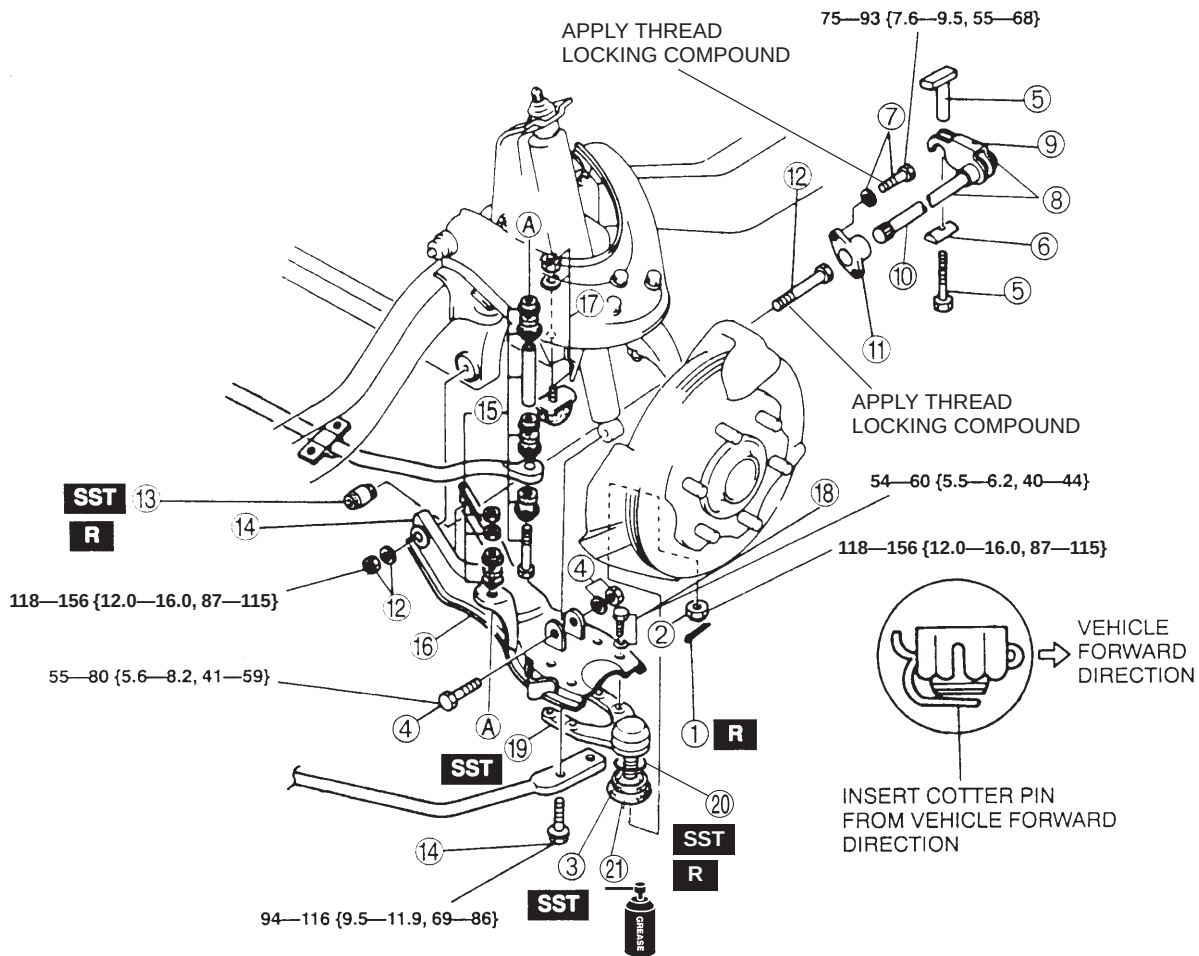
Note

- Shock absorber gas is nitrogen gas.
- Shock absorber oil is mineral oil.

FRONT SUSPENSION

TORSION BAR SPRING AND LOWER ARM REMOVAL/INSTALLATION (4×2)

1. Remove in the order indicated in the table.
2. Install in the reverse order of removal.
3. Inspect the vehicle height and adjust it as necessary.



N·m {kgf·m, ft·lbf}

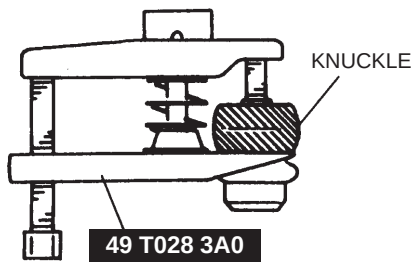
1	Cotter pin
2	Nut
3	Lower arm ball joint/Knuckle arm + Removal Note
4	Bolt, washer, and nut (shock absorber)
5	Anchor bolt + Removal Note + Installation Note
6	Anchor swivel
7	Bolt and washer
8	Torsion bar component
9	Anchor arm
10	Torsion bar spring + Removal Note + Installation Note

11	Torque plate
12	Lower arm spindle, washer, and nut
13	Rubber bushing + Removal Note + Installation Note
14	Tension rod bolt
15	Stabilizer bolt, bushing, retainer, spacer, and nut + Installation Note
16	Lower arm
17	Bound bumper, washer, and nut
18	Bolts and washer (ball joint)
19	Lower arm ball joint
20	Clip + Installation Note
21	Lower arm ball joint boot

FRONT SUSPENSION

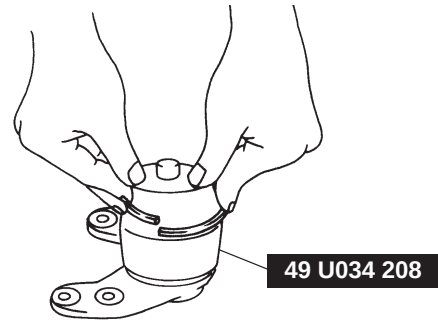
Lower Arm Ball Joint/Knuckle Arm Removal Note

- Separate the ball joint from the knuckle arm using the SST.



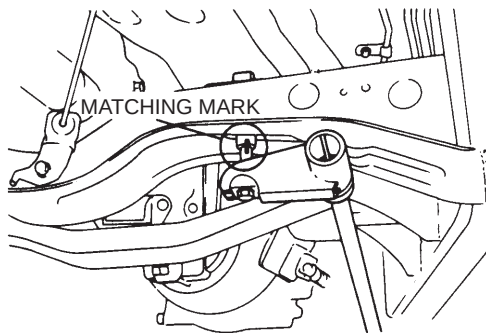
Clip Installation Note

1. Install the **SST** to the ball joint stud with the stud stands straight up.
2. Install the clip in the dust boot groove.



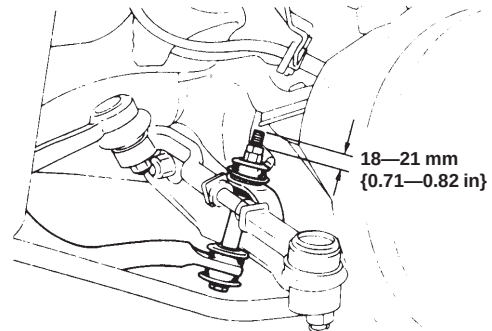
Anchor Bolt Removal Note

- Mark the anchor bolt and swivel for reference during installation.



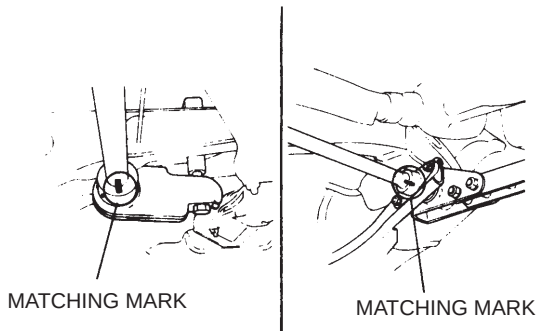
Stabilizer Bolt, Bushing, Retainer, Spacer And Nut Installation Note

- Tighten the nuts so that 18—21 mm {0.71—0.82 in} of thread is exposed at the end of the bolt.



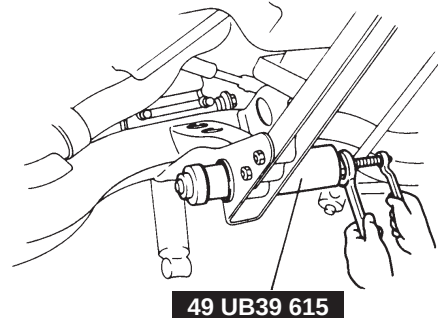
Torsion Bar Spring Removal Note

- Mark the torsion bar spring and anchor arm and the torsion bar spring and torque plate for reference during installation.



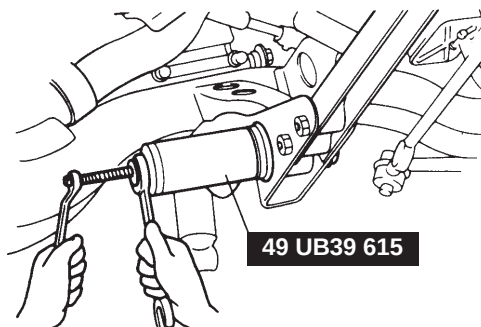
Rubber Bushing Installation Note

- Install a new bushing using the SST.



Rubber Bushing Removal Note

- Remove the rubber bushing from the body using the SST.



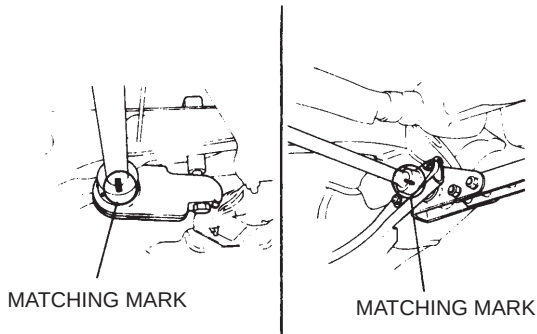
FRONT SUSPENSION

Torsion Bar Spring Installation Note

1. Before installation, check the identification mark on the end of the torsion bar spring.

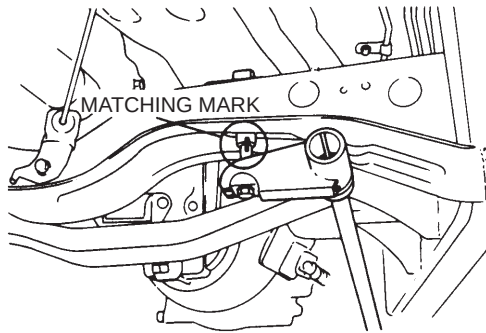
L: Left bar, R: Right bar

2. Align the marks made during removal, and connect the torsion bar spring to the torque plate.



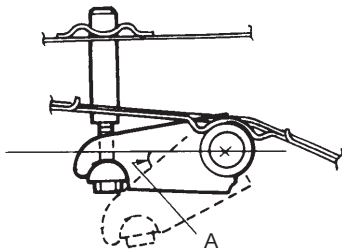
Anchor Bolt Installation Note

- Install the anchor bolt, and tighten it until the marks made during removal are aligned.



Note

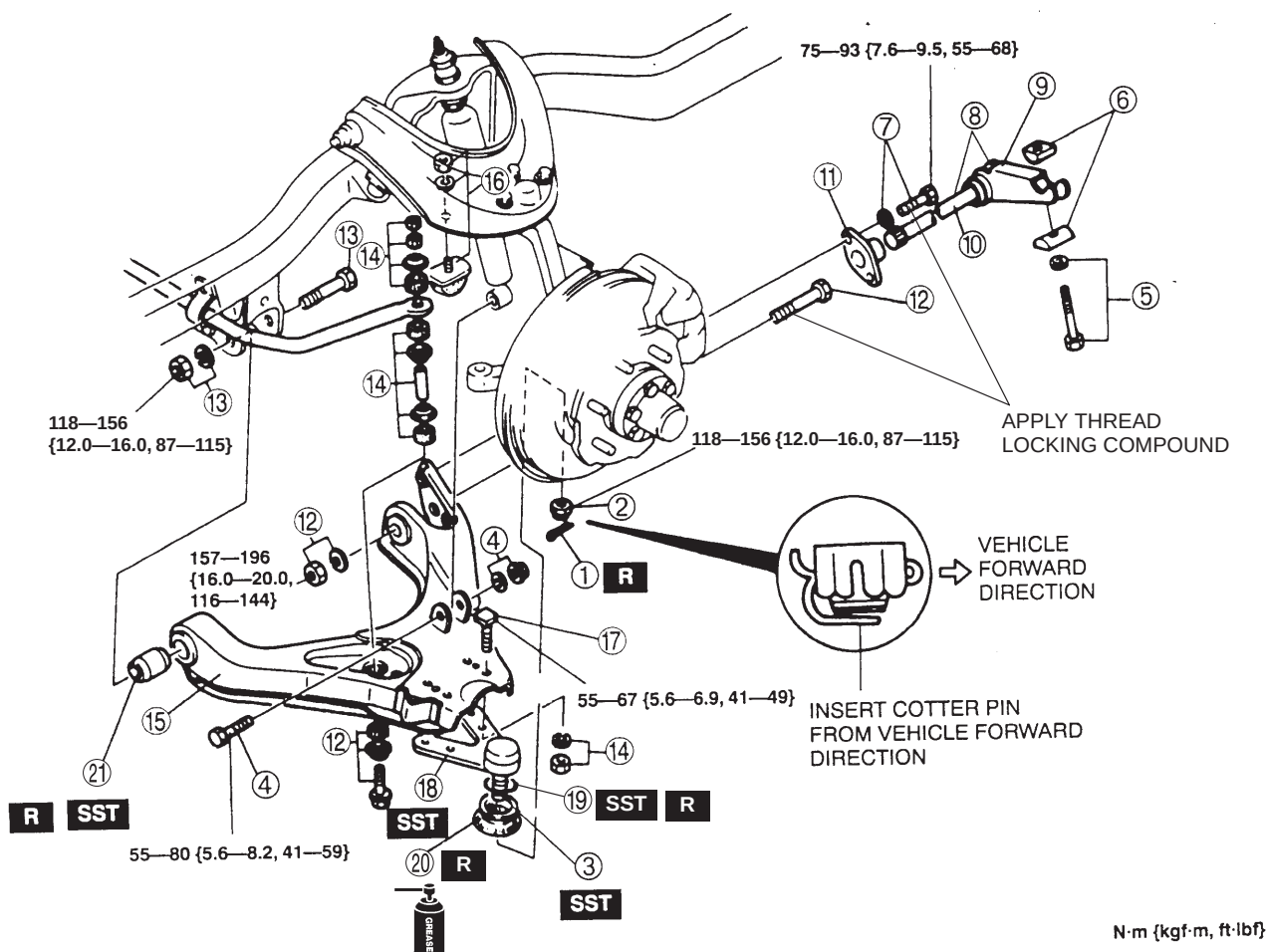
- If the anchor bolt was not marked during removal, install it as follows:
 - (1) Lower the front suspension until the upper arm contacts the rebound stopper.
 - (2) Install the anchor arm so that the angle A is $34^{\circ} \pm 4.5^{\circ}$.
 - (3) Install the anchor bolt and tighten it 27.3 turns.



FRONT SUSPENSION

TORSION BAR SPRING AND LOWER ARM REMOVAL/INSTALLATION (4×4)

1. Remove the driveshaft snap ring.
2. Remove in the order indicated in the table.
3. Install in the reverse order of removal.
4. Inspect the vehicle height and adjust it as necessary.



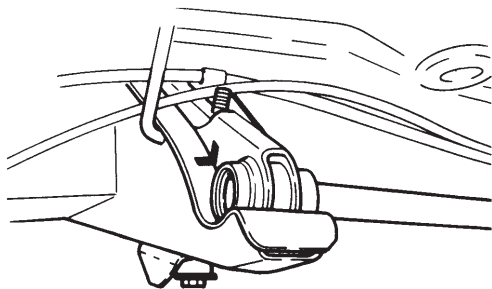
1	Cotter pin
2	Nut
3	Lower arm ball joint/Knuckle arm + FRONT SUSPENSION, TORSION BAR SPRING AND LOWER ARM REMOVAL/INSTALLATION (4×2), Lower Arm Ball Joint/Knuckle Arm Removal Note
4	Bolt, washer and nut (shock absorber)
5	Anchor bolt and washer + Installation Note
6	Anchor swivel
7	Bolt and washer
8	Torsion bar spring component
9	Anchor arm + Removal Note + Installation Note
10	Torsion bar spring + Removal Note + Installation Note
11	Torque plate
12	Lower arm spindle (rear), washer and nut

13	Lower arm spindle (front), washer and nut
14	Stabilizer bolt, bushing, retainer, spacer and nut + FRONT SUSPENSION, TORSION BAR SPRING AND LOWER ARM REMOVAL/INSTALLATION (4×2), Stabilizer Bolt, Bushing, Retainer, Spacer, And Nut Installation Note
15	Lower arm
16	Bound bumper, washer, and nut
17	Bolt, washer and nut
18	Lower arm ball joint
19	Clip + FRONT SUSPENSION, TORSION BAR SPRING AND LOWER ARM REMOVAL/INSTALLATION (4×2), Clip Installation Note
20	Lower arm ball joint boot
21	Lower arm bushing + Removal Note + Installation Note

FRONT SUSPENSION

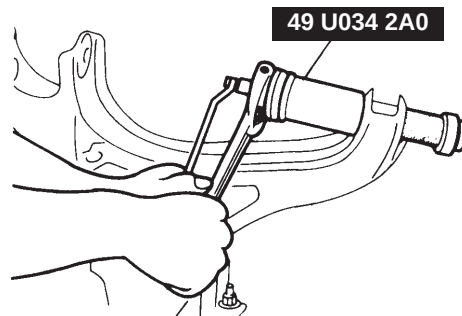
Anchor Arm Removal Note

- Mark the anchor arm and body for reference during installation.



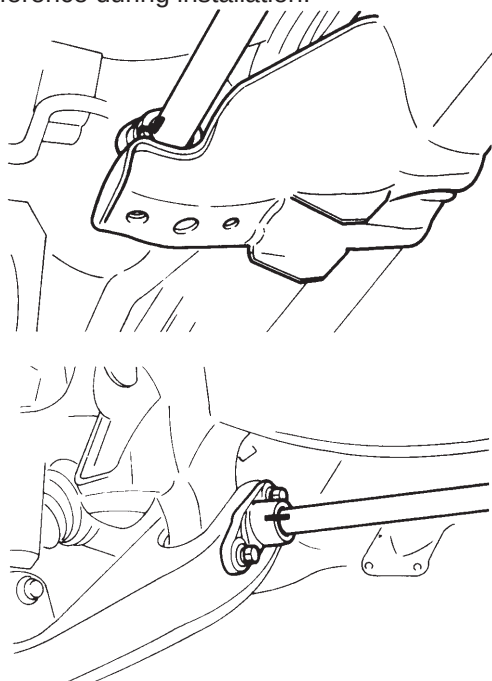
Lower Arm Bushing Installation Note

1. Apply soapy water to the new bushing.
2. Install the bushing using the SST.



Torsion Bar Spring Removal Note

- Mark the torsion bar spring and anchor arm and the torsion bar spring and torque plate for reference during installation.

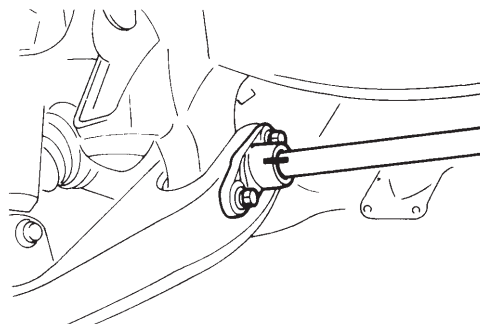


Torsion Bar Spring Installation Note

1. Before installation, inspect the identification mark on the end of the torsion bar spring.

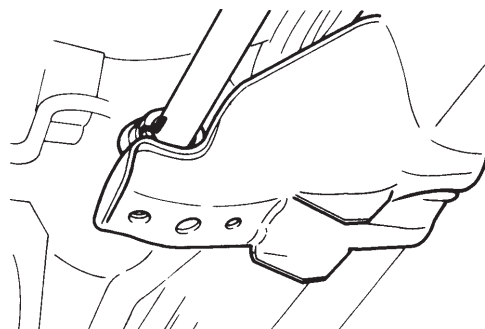
L: Left bar, R: Right bar

2. Align the marks made during removal, and connect the torsion bar spring to the torque plate.



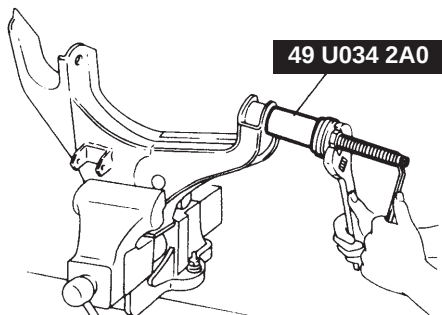
Anchor Arm Installation Note

- Align the marks made during removal, and install the anchor arm onto the torsion bar spring.



Lower Arm Bushing Removal Note

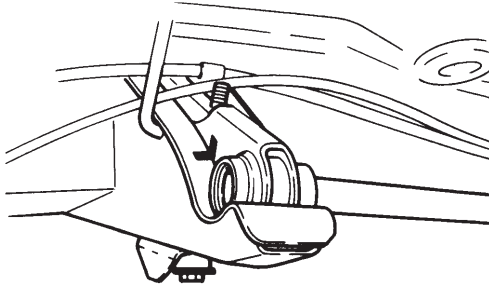
- Remove the lower arm bushing using the SST.



FRONT SUSPENSION

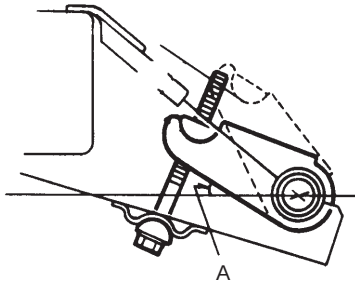
Anchor Bolt Installation Note

- Install the anchor bolt, and tighten it until the marks made during removal are aligned.



Note

- If the anchor bolt was not marked during removal, install it at follows:
 - (1) Lower the front suspension until the upper arm contacts the rebound stopper.
 - (2) Install the anchor arm so that the angle A is $60^\circ \pm 4.5^\circ$.
 - (3) Install the anchor bolt and tighten it 26.9 turns.

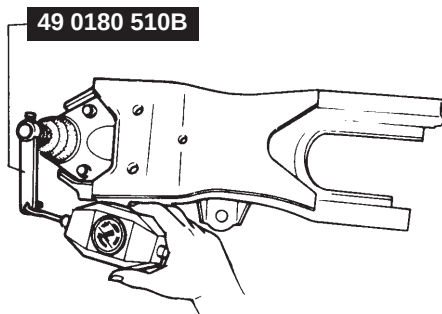


LOWER ARM INSPECTION

1. Remove the lower arm from the vehicle.
2. Inspect for damage, cracks, and bending.
3. Check the ball joint rotation torque.
 - (1) Rotate the ball joint five times.
 - (2) Connect the **SST** to the ball stud, and measure the rotation torque using a pull scale.
 - (3) Replace it if not within the specification.

Pull scale reading

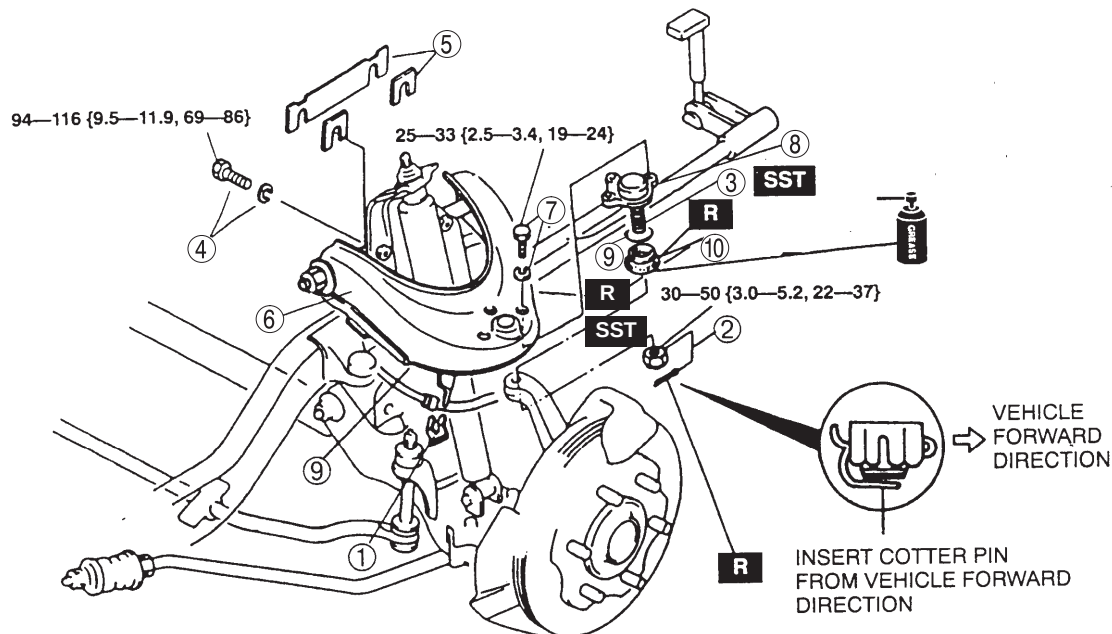
20—34 N {2.0—3.5 kgf, 4.4—7.7 lbf}



FRONT SUSPENSION

UPPER ARM REMOVAL/INSTALLATION

1. Remove in the order indicated in the table.
2. Install in the reverse order of removal.
3. Inspect the wheel alignment and adjust it as necessary.



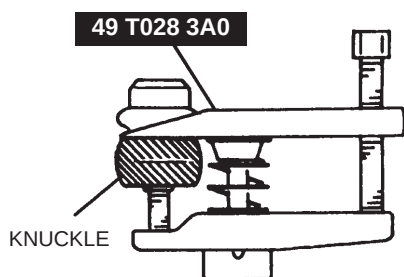
N·m {kgf·m, ft·lbf}

1	Clip
2	Cotter pin and nut
3	Upper arm ball joint/Knuckle arm + Removal Note
4	Bolt and washer
5	Adjustment shim + Removal Note

6	Upper arm component
7	Bolt and washer
8	Upper arm ball joint
9	Clip + Installation Note
10	Upper arm ball joint boot

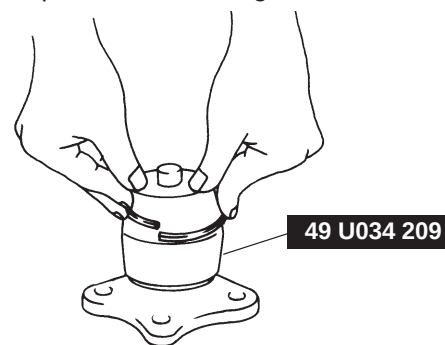
Upper Arm Ball Joint/Knuckle Arm Removal Note

- Separate the upper arm ball joint from the knuckle arm using the SST.



Clip Installation Note

1. Install the **SST** to the ball joint stud with the stud stands straight up.
2. Install the clip in the dust boot groove.



Adjustment Shim Removal Note

- Note the number, amount and position of the shims so that they are reinstalled in the correct positions.

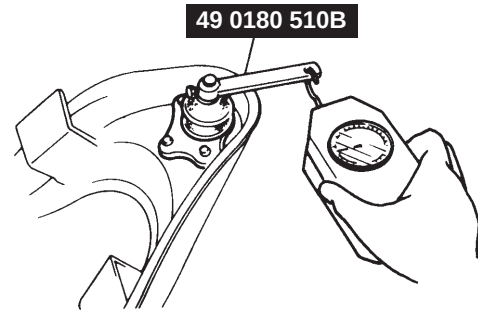
FRONT SUSPENSION

UPPER ARM INSPECTION

1. Remove the upper arm from the vehicle.
2. Inspect for damage, cracks, and bending.
3. Check the ball joint rotation torque.
 - (1) Rotate the ball joint five times.
 - (2) Connect the **SST** to the ball stud, and measure the rotation torque using a pull scale.
 - (3) Replace it if not within the specification.

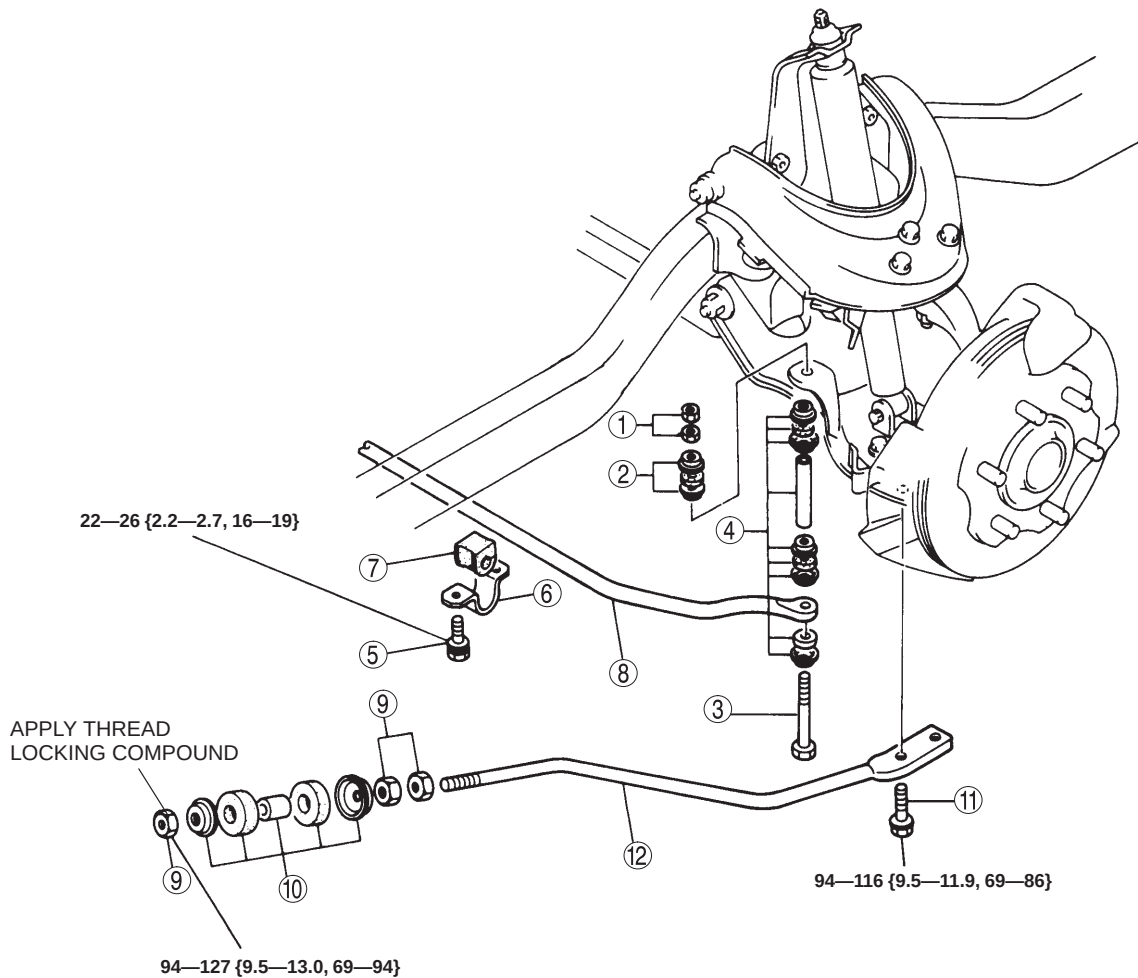
Pull scale reading

5.0—24 N {0.5—2.5 kgf, 1.2—5.5 lbf}



STABILIZER AND TENSION ROD REMOVAL/INSTALLATION (4 × 2)

1. Remove in the order indicated in the table.
2. Install in the reverse order of removal.



N·m {kgf·m, ft·lbf}

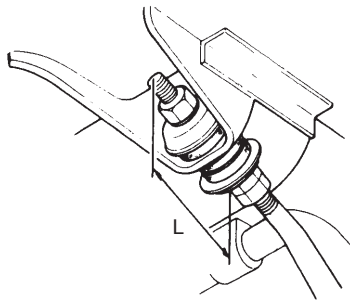
1	Nut + FRONT SUSPENSION, TORSION BAR SPRING AND LOWER ARM REMOVAL/INSTALLATION (4 × 2), Stabilizer Bolt, Bushing, Retainer, Spacer, And Nut Installation Note
2	Retainer
3	Bolt
4	Bushing, retainer and spacer
5	Bolt

6	Stabilizer bracket
7	Bushing
8	Stabilizer bar
9	Tension rod nut + Installation Note
10	Bushing and retainer
11	Bolt
12	Tension rod

FRONT SUSPENSION

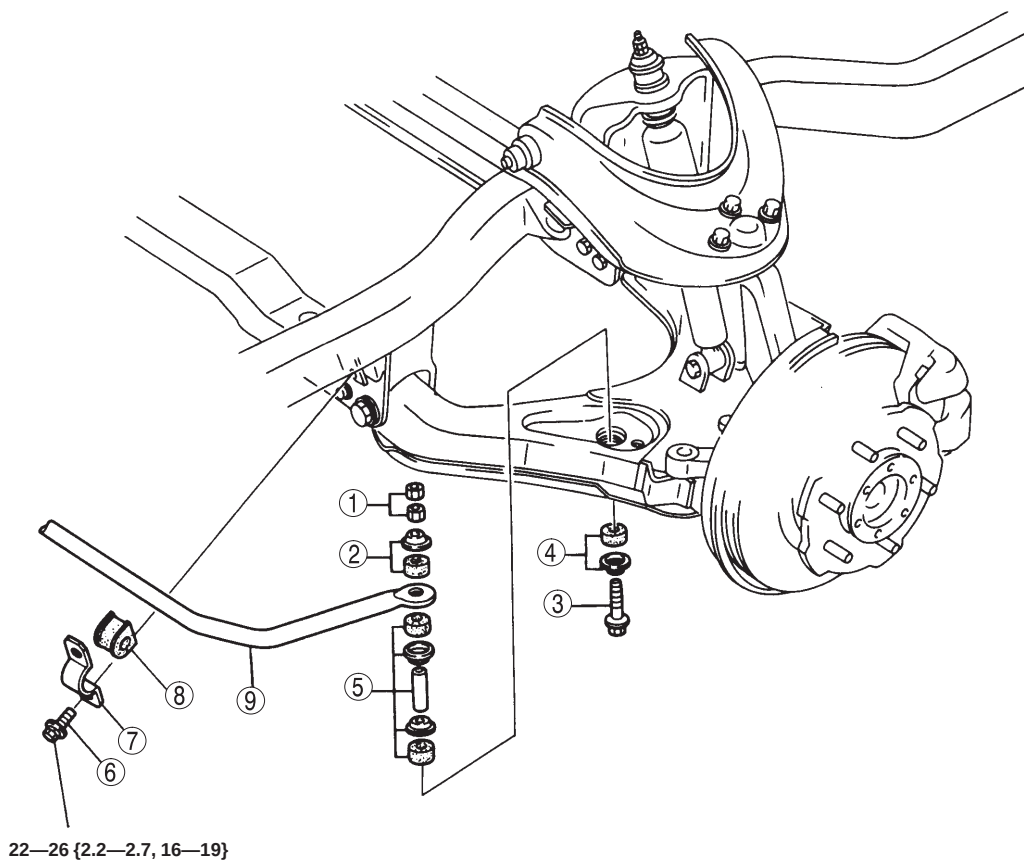
Tension Rod Nut Installation Note

- Tighten the tension rod nuts so that length L is **98.5 mm {3.88 in.}**



STABILIZER REMOVAL/INSTALLATION (4×4)

1. Remove in the order indicated in the table.
2. Install in the reverse order of removal.



N·m {kgf·m, ft·lbf}

1	Nut + FRONT SUSPENSION, STABILIZER AND TENSION ROD REMOVAL/INSTALLATION (4 × 2), Nut Installation Note
2	Retainer and bushing
3	Bolt
4	Retainer and bushing

5	Retainer, bushing, and spacer
6	Bolt
7	Stabilizer bracket
8	Bushing
9	Stabilizer bar

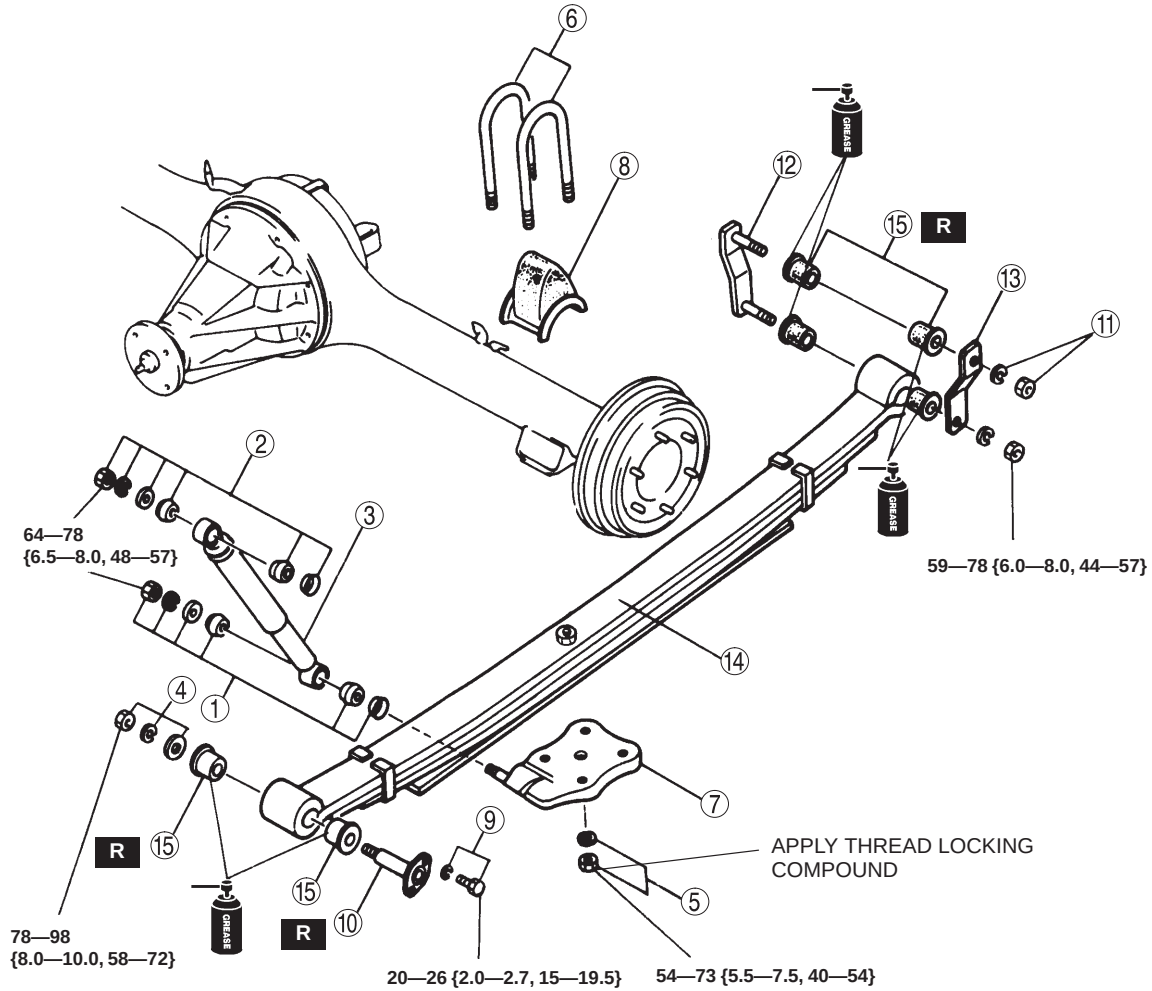
REAR SUSPENSION

REAR SUSPENSION

REAR SHOCK ABSORBER AND LEAF SPRING REMOVAL/INSTALLATION

1. Support the frame with safety stands and place a jack under the differential casing. Remove in the order indicated in the table. While supporting the differential casing with a jack, raise or lower the jack as necessary.
2. Install in the reverse order of removal.

4×2



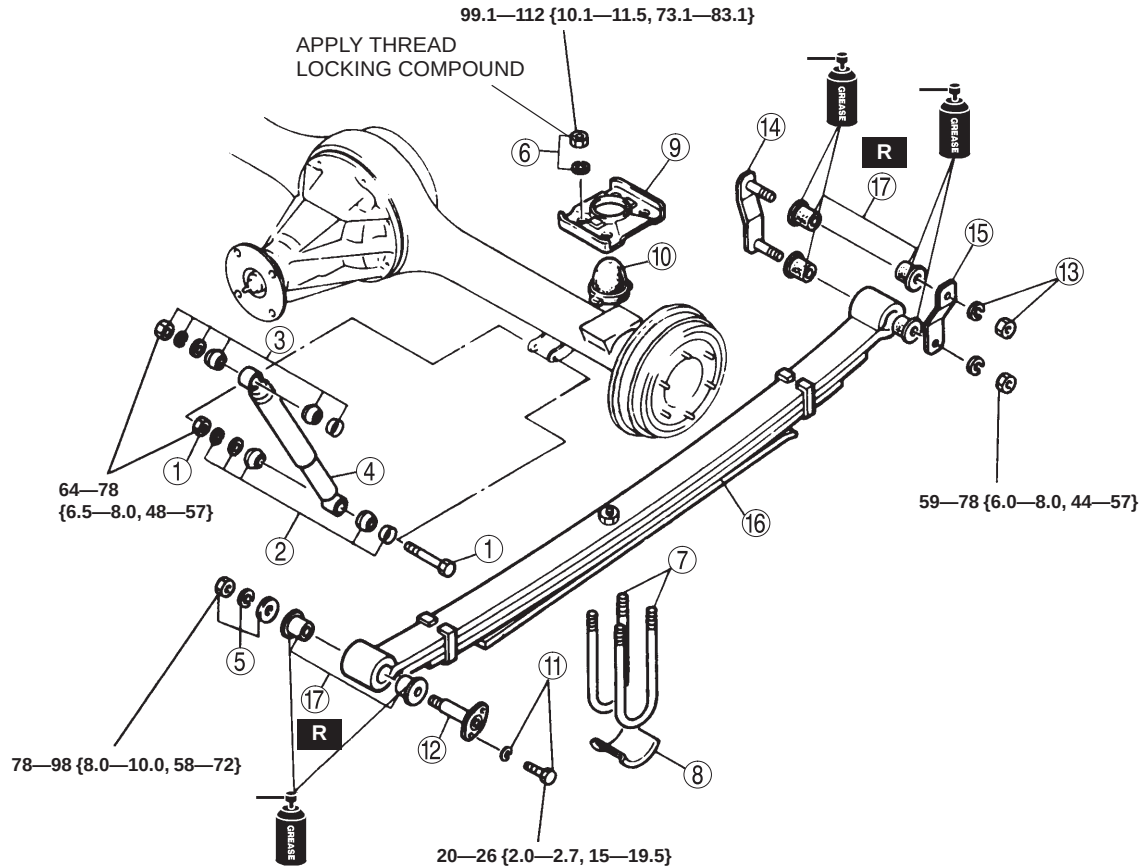
N·m {kgf·m, ft·lbf}

1	Nut, washer, retainer, and bushing
2	Nut, washer, retainer, and bushing
3	Shock absorber
4	Nut and washer
5	Nut and washer
6	U-bolt
7	Spring clamp
8	Stopper rubber
9	Bolt and washer

10	Spring pin
11	Nut and washer
12	Shackle pin
13	Shackle plate
14	Leaf spring component
15	Leaf spring bushing + Removal Note + Installation Note

REAR SUSPENSION

4×4



N·m {kgf·m, ft·lbf}

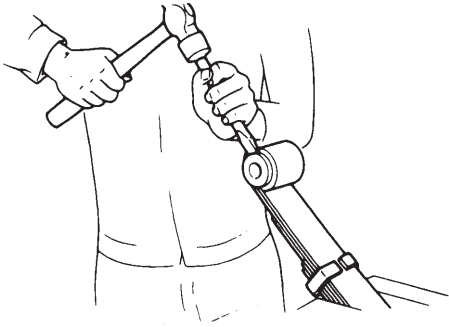
1	Bolt and nut
2	Washer, retainer, and bushing
3	Nut, washer, retainer, and bushing
4	Shock absorber
5	Nut and washer
6	Nut and washer
7	U-bolt
8	Set plate
9	Spring clamp
10	Stopper rubber

11	Bolt and washer
12	Spring pin
13	Nut and washer
14	Shackle pin
15	Shackle plate
16	Leaf spring component
17	Leaf spring bushing + Removal Note + Installation Note

REAR SUSPENSION

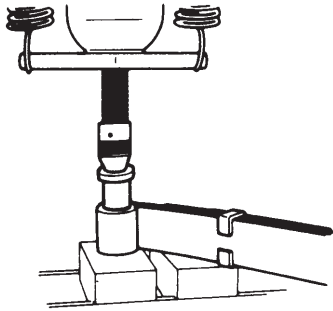
Leaf Spring Bushing Removal Note

- Secure the leaf spring in a vise and remove the bushing using a chisel.



Leaf Spring Bushing Installation Note

- Press in the bushing using a suitable pipe.



REAR SHOCK ABSORBER DISPOSAL (VEHICLES BUILT FROM 08/2002)

1. Dispose the rear shock absorber in the same way as the front shock absorber. (See FRONT SHOCK ABSORBER DISPOSAL).