



# FRONT SUSPENSION

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# SPECIFICATIONS

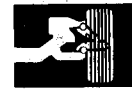
## GENERAL SPECIFICATIONS

	A187AMNSL A187AMRSL	A187AMNFGL	
Suspension system	McPherson strut type	McPherson strut type	
Coil spring			
Wire dia. × O.D. × free length mm (in.)	12.8 × 142.8 × 339 (.50 × 5.62 × 13.35)	12.8 × 142.8 × 346 (.50 × 5.62 × 13.62)	12.8 × 142.8 × 327 (.50 × 5.62 × 12.87)
Coil spring identification color	Pink - 1 Blue - 1	Pink - 1 Green - 1	Green - 1 Blue - 1
Shock absorber			
Type	Hydraulic, cylindrical, double-acting type	Hydraulic, cylindrical, double-acting type	Gas damper type
Max. length mm (in.)	623 (24.5)	620 (24.4)	620 (24.4)
Stroke mm (in.)	169 (6.7)	155 (6.1)	155 (6.1)

## SERVICE SPECIFICATIONS

Standard value		
Toe-in mm (in.)		
Recommended setting		0
Acceptable range		5 (.2) toe-in to 5 (.2) toe-out
Camber		-0°30'
Caster		5°50'
Protruding length of stabilizer bar installation bolt mm (in.)		15-17 (.59-.67)
Ball joint starting torque Ncm (in.lbs.)		500-800 (43-69)
Limit		
Piston rod O.D. mm (in.)		21.95 (.8642)

# SPECIFICATIONS



## TORQUE SPECIFICATIONS

Nm (ft.lbs.)

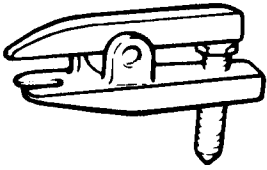
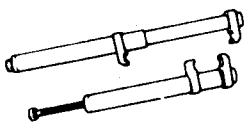

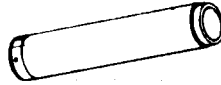
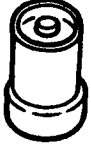

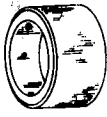
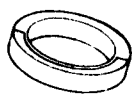
Front hub to brake disc	35-40 (25-29)
Strut insulator to body	25-35 (18-25)
Shock absorber ring nut	140-150 (101-108)
Strut piston rod nut	60-70 (43-51)
Strut bar bracket to frame	35-45 (25-33)
Stabilizer bar bracket	8-12 (6-9)
Stabilizer bar to lower control arm	10-20 (7-14)
Strut bar to strut bar bracket	75-85 (54-61)
Strut bar to lower control arm	60-70 (43-51)
Lower control arm shaft	80-95 (58-69)
Knuckle arm to ball joint	60-72 (43-52)
Knuckle arm to McPherson strut assembly	80-100 (58-72)
Lower control arm to ball joint	60-70 (43-51)
Crossmember to body	60-80 (43-58)

## LUBRICANT

	Specified lubricant	Quantity
Front wheel hub and ball joint	MOPAR Multi-Mileage Lubricant Part Number 2525035 or equivalent	As required



## SPECIAL TOOLS

Tool (Number and name)	Use	Tool (Number and name)	Use
<b>MB990635</b> Steering linkage puller 	Disconnection of the tie rod Removal of the knuckle arm	<b>L4514</b> Spring compressor 	Compression of the front coil spring
<b>MB990799</b> Ball joint remover and installer A 	Installation of the dust cover and lower control arm bushing	<b>C-3717</b> Sleeve 	Press-fitting of the hub bearing outer races
<b>MB990828</b> Lower control arm bushing remover and installer 	Removal and installation of the ball joints and the lower control arm bushing	<b>C-4171</b> Drive handle  <b>L-4446</b> Installer 	Press-fitting of the hub bearing outer races
<b>MB990885</b> Support ring 	Press-fitting of the hub oil seal		

# TROUBLESHOOTING



Symptom	Probable cause	Remedy
Excessive steering effort	Low tire pressure	Inflate to specifications
	Power steering pump	Check drive belts Check fluid level Output pressure test
	Power steering gear	Inspect and replace if necessary
	Binding linkage	Lubricate Inspect and replace parts
Vehicle pulls to one side	Tires	Check inflation Check tire size(s) Check tires for side to side match Check for abnormalities and replace if necessary
	Wheel alignment	Check and correct
	Font springs	Check vehicle height and correct as necessary
Steering wheel vibration or shimmy	Loose wheel nuts	Tighten to specified torque
	Excessive wheel runout	Replace
	Tires	Check for excessive runout Check tire balance Check for abnormalities and replace if necessary
	Steering linkage	Check for looseness and replace worn parts
	Steering gear	Check for loose steering gear mounting bolts Check for loose steering gear adjustments
	Suspension components	Check for looseness and replace as necessary
	Wheel bearings	Check for improper adjustment Check for damaged bearings, and replace if necessary
Excessive body roll	Stabilizer bar	Loose or deteriorated mounts or bushings Replace broken parts
	Strut assemblies	Check for leaks Check vehicle jounce Replace cartridge if necessary Check vehicle height and replace coil springs if necessary



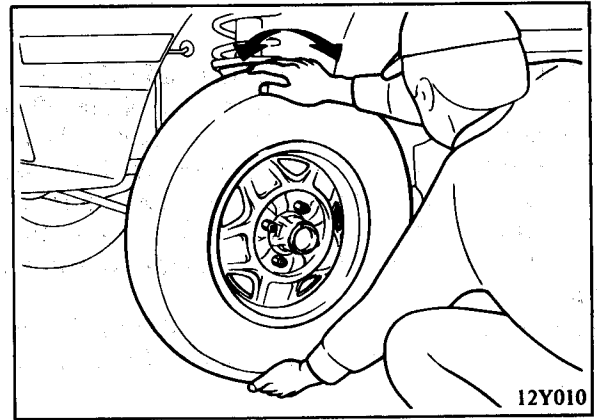
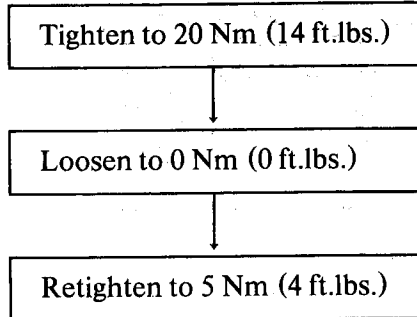
## TROUBLESHOOTING

Symptom	Probable cause	Remedy
Poor ride control	Improper tire inflation	Inflate to specifications
	Defective tire	Replace
	Loose wheel nuts Suspension securing bolt(s) loose	Tighten to specified torque
	Damaged or broken components Worn bushings Faulty shock absorber Sagging or broken coil spring	Replace
	Improper wheel alignment	Adjust or replace parts
Improper vehicle height	Tires	Inflate to specifications Check for proper size
	Sagging or broken coil springs	Replace



**WHEEL BEARING ADJUSTMENT**

1. Inspect the play of the bearings while the vehicle is jacked up and resting on floor stands. (12Y010)
2. If there is any play, remove the hub cap, cotter pin, and lock cap, and then loosen the nut.
3. Tighten the nut by the following procedure.



4. Install the lock cap and cotter pin. If the position of the cotter pin is not matched with the holes of the lock cap, reposition the lock cap so that the holes align. If this cannot be accomplished, back off the nut by not more than 15°, align lock cap and install cotter pin.

**FRONT WHEEL ALIGNMENT**

**NOTE**

The front suspension assembly must be free of worn, loose or damaged parts prior to measurement of front wheel alignment.

**Camber**

Camber is pre-set at the factory and cannot be adjusted.

**NOTE**

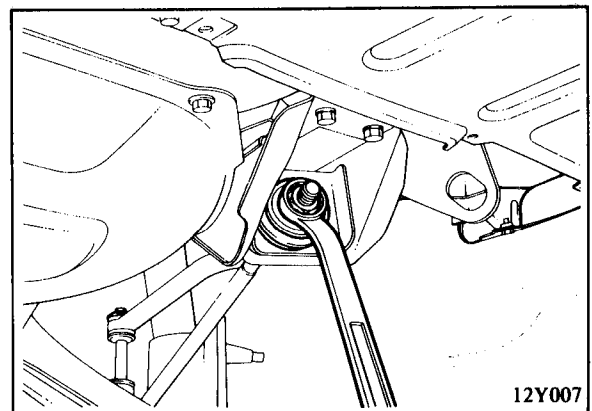
If camber is not within specifications, replace bent or damaged parts.

Camber [Standard value] ..... -0°30'

**Caster**

Caster, as a rule, requires no adjustment, although it is slightly adjustable by means of the threaded end of the strut bar. (12Y007)

Caster [Standard value] ..... 5°50'



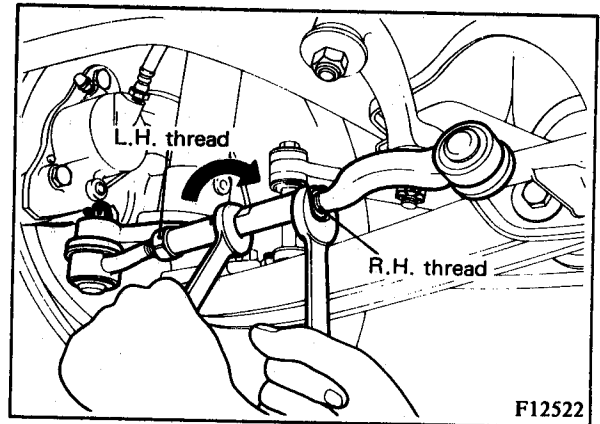


## SERVICE ADJUSTMENT PROCEDURES

### Toe-In

If the toe-in is not within the standard value, make adjustment of the toe-in by using the turnbuckle of the left tie rod. Toe-in increases when the turnbuckle is turned in the direction of the arrow in the illustration. The difference in the length between right and left tie rods should not exceed 5 mm (.2 in.). If the difference exceeds 5 mm (.2 in.), remove the right tie rod from the knuckle and adjust its length so that the difference is within 5 mm (.2 in.).

Then make adjustment of toe-in. Toe-in changes by about 15 mm (.59 in.) when the turnbuckle of the left tie rod is turned once.




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Toe-in [Standard value]	mm (in.)
Recommended setting	..... 0
Acceptable range	..... 5 toe-in – 5 toe-out (.2 toe-in – .2 toe-out)

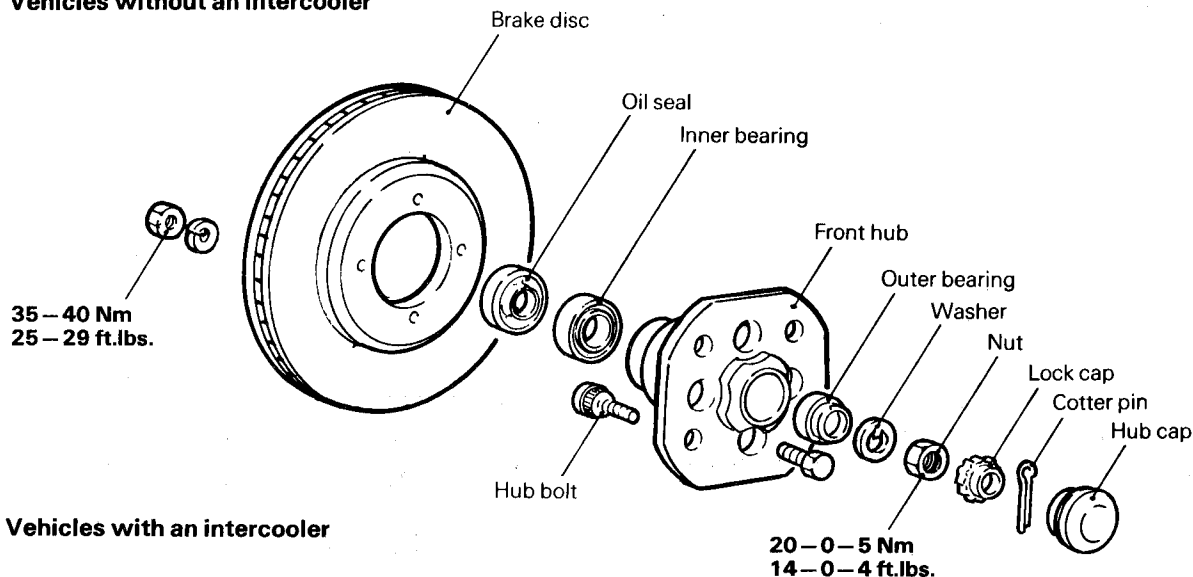
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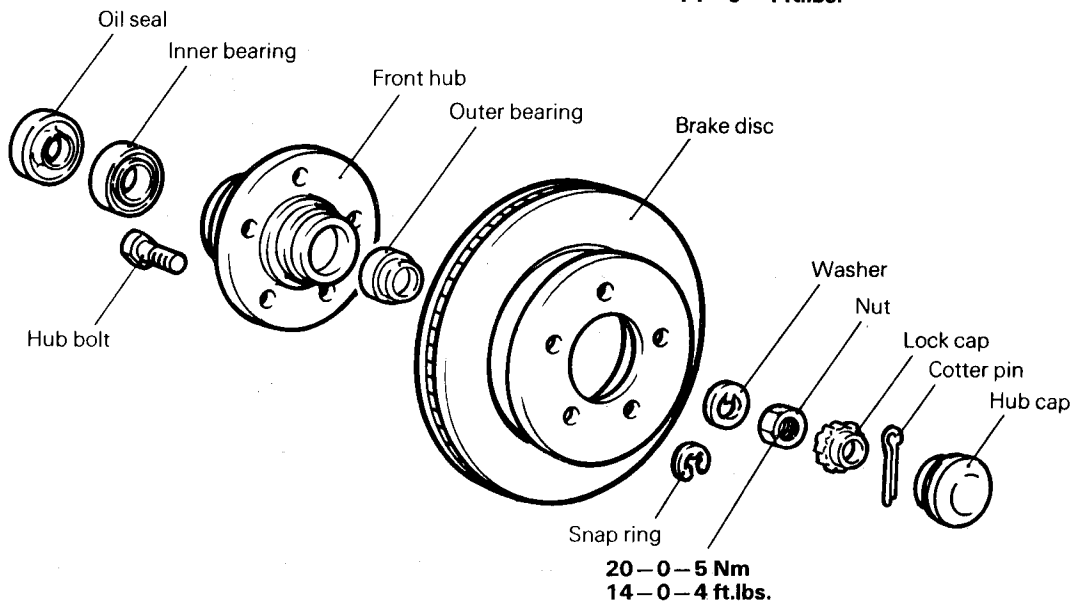


COMPONENTS

Vehicles without an intercooler



Vehicles with an intercooler



12Y706

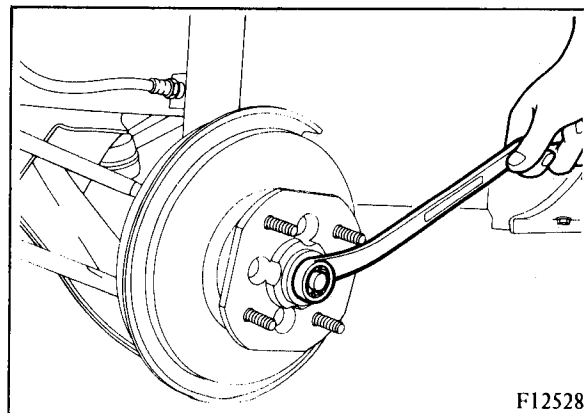
REMOVAL

1. Remove the front brake assembly with the brake hose connected. (Refer to GROUP 5.)

NOTE

To prevent the brake hose from being twisted, suspend the brake assembly with wires.

2. Remove the hub cap, cotter pin and nut. (F12528)
3. Remove the rotor from the knuckle together with the hub and bearings.



F12528

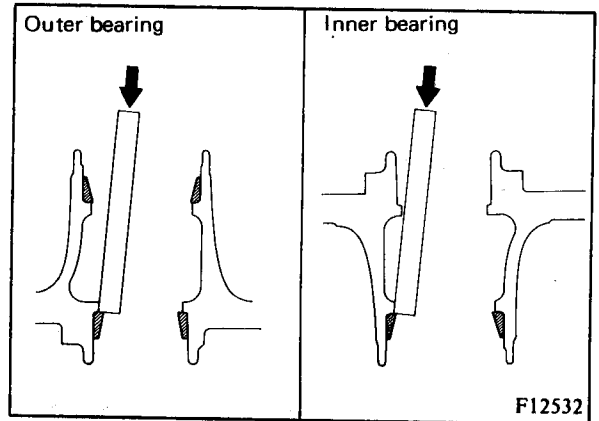


## INSPECTION

1. Check oil seals for deterioration.
2. Check bearings for wear or damage.

## BEARING REPLACEMENT

1. Remove the oil seal and inner bearing.
2. Drive out the bearing outer races by tapping them uniformly. (F12532)



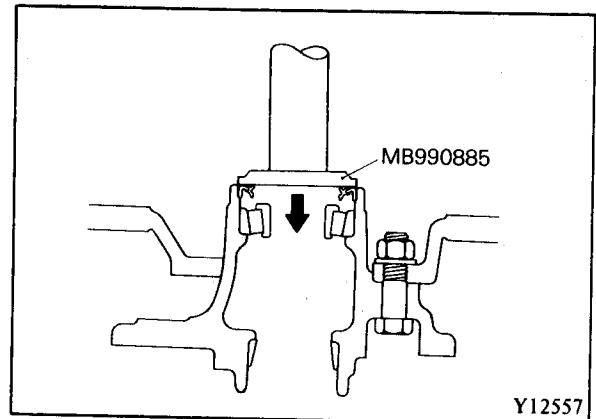
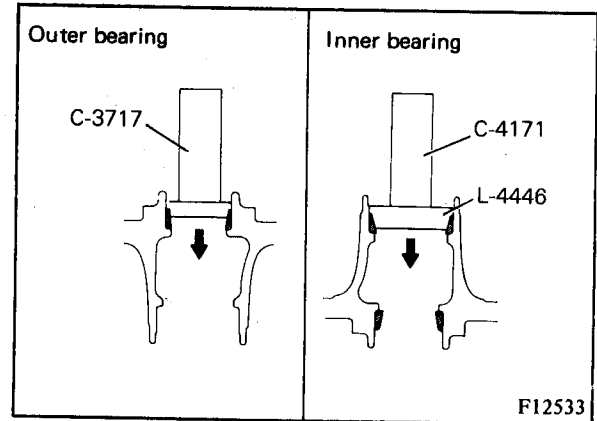
3. Press-fit the bearing outer races with the special tools. (F12533)
4. Properly pack the bearing with wheel bearing grease and install into hub.

Wheel bearing grease .....  
SAE J310a, NLGI grade #2EP

### NOTE

The bearing and outer race must be replaced as an assembly.

5. Press-fit the new oil seal into the hub with the special tools until it is flush with the hub surface.



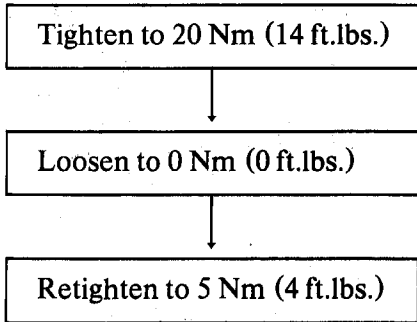


**INSTALLATION**

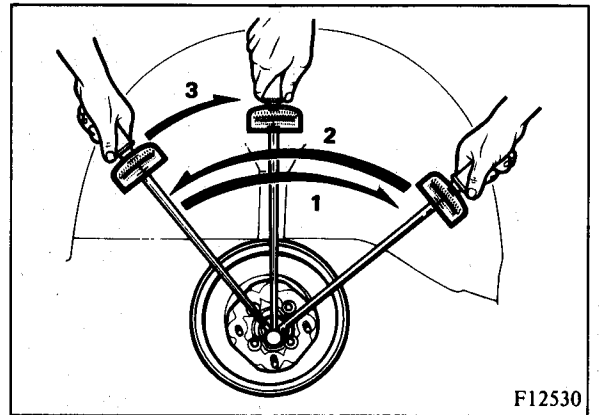
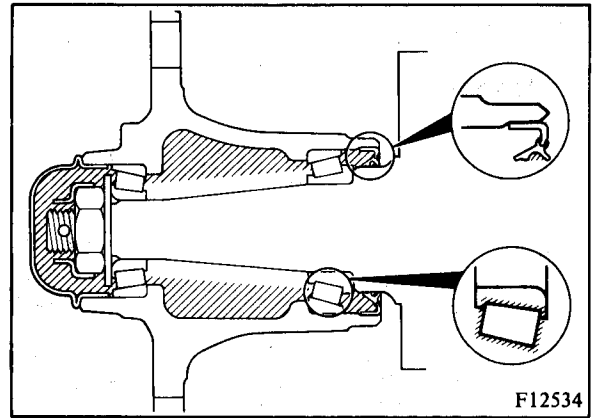
1. Ensure that the bearings are properly packed with wheel bearing grease.
2. Apply grease to the oil seal lip and inside surface of the hub. (F12534)

Wheel bearing grease .....  
 SAE J310a, NLGI grade #2EP

3. Install rotor and hub assembly on knuckle.
4. Install outer bearing, washer and nut.
5. Tighten the nut by the following procedure. (F12530)



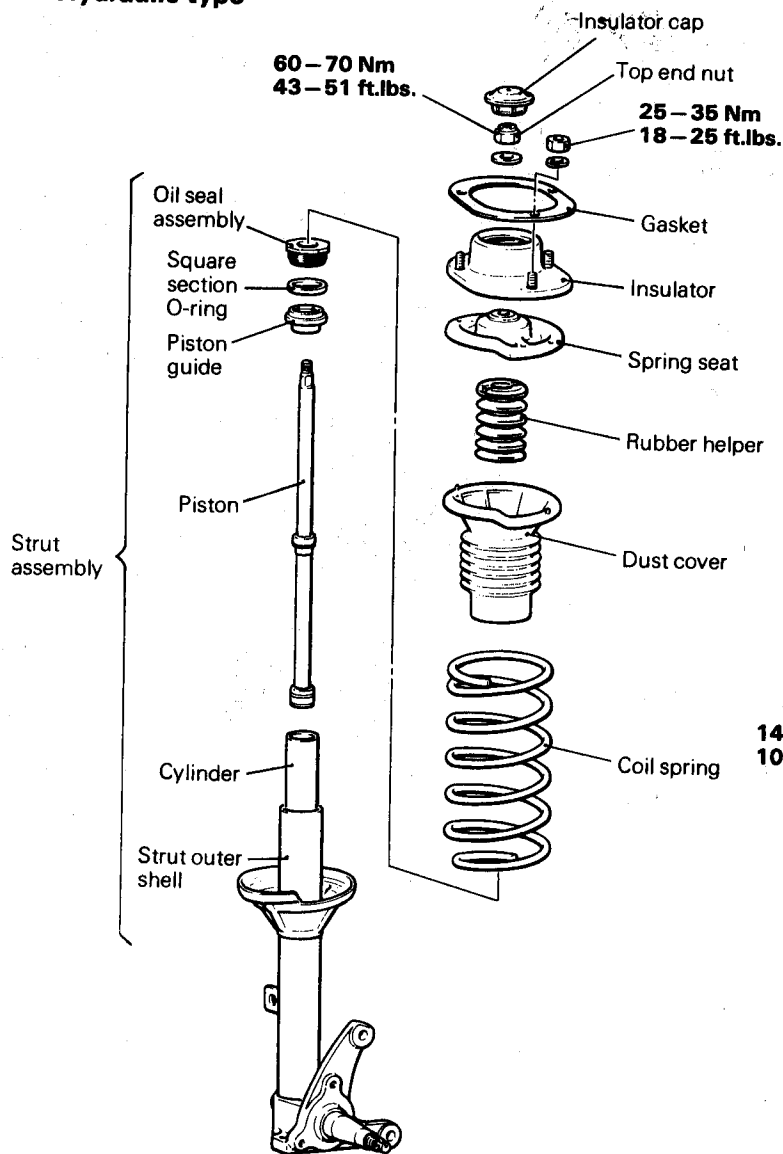
6. Install the lock cap and cotter pin. If the position of the cotter pin is not matched with the holes of the lock cap, reposition the lock cap so that the holes align. If this cannot be accomplished, back off the nut not more than 15°. Align lock cap and install cotter pin.



# COMPONENT SERVICE – STRUT ASSEMBLY

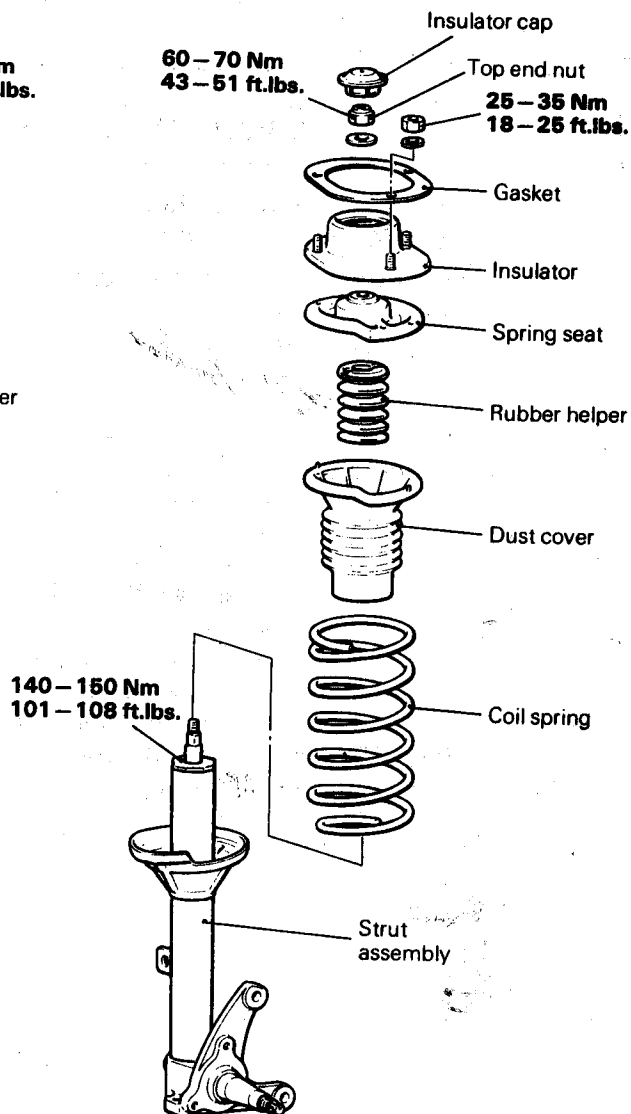
## COMPONENTS

### Hydraulic type



12Y708

### Gas damper type



12Y707

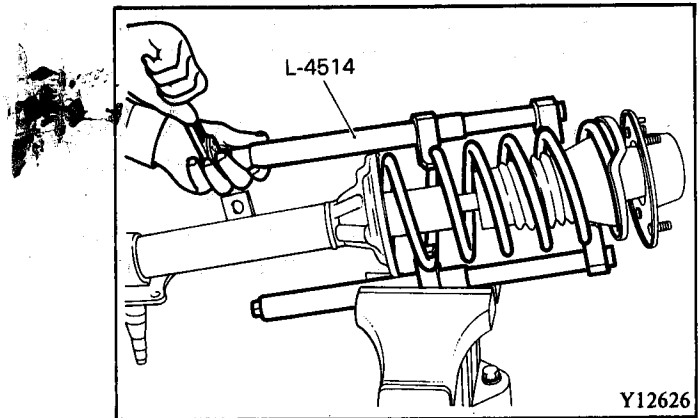
## REMOVAL

1. Remove the disc brake caliper assembly. (Refer to GROUP 5.)
2. Remove the hub cap, cotter pin, lock cap and nut.
3. Remove the hub and rotor assembly from the knuckle together with the bearings.
4. Remove the brake dust cover.
5. Disconnect the strut assembly from the knuckle arm.
6. Remove the mounting nuts which connect the strut insulator to the wheel house.
7. Remove the strut assembly from the vehicle.

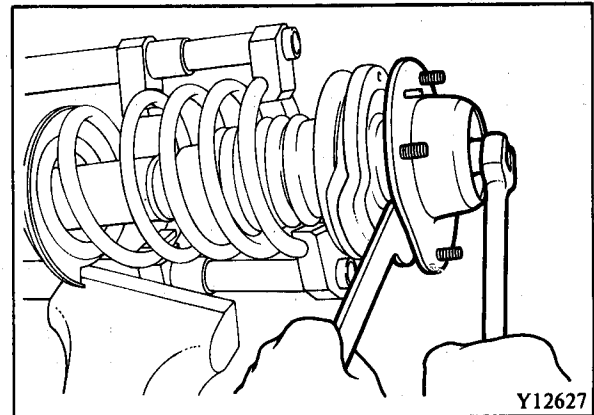


**DISASSEMBLY**

1. Compress the coil spring with the special tool.



2. Remove the insulator cap from the insulator.
3. Using power tool, remove the top end nut. (Y12627)
4. Take out the insulator, spring seat, rubber helper, dust cover and coil spring from the strut.

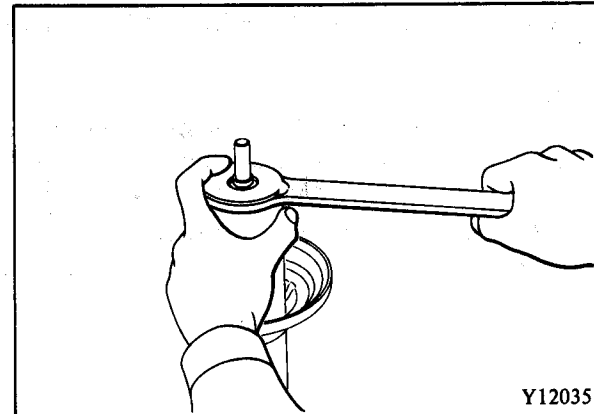


5. Disassemble the strut assembly of the hydraulic type shock absorber by the following procedure.
  - (1) To prevent entry of foreign material into the cylinder, shock absorber fluid, etc. during disassembly, thoroughly clean the external surface of the strut before disassembly.
  - (2) Lightly hold the strut upright in a vice, hanging down the piston rod to the bottom.

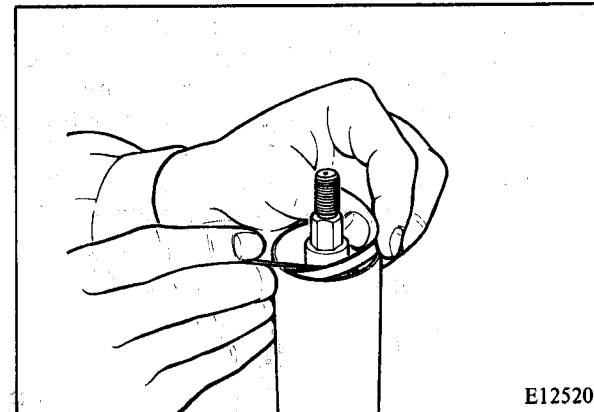
**NOTE**

When securing the strut in the vice, close the vice on the knuckle part, not the outer shell.

- (3) Remove the oil seal assembly. (Y12035)



- (4) Remove the square section O-ring.



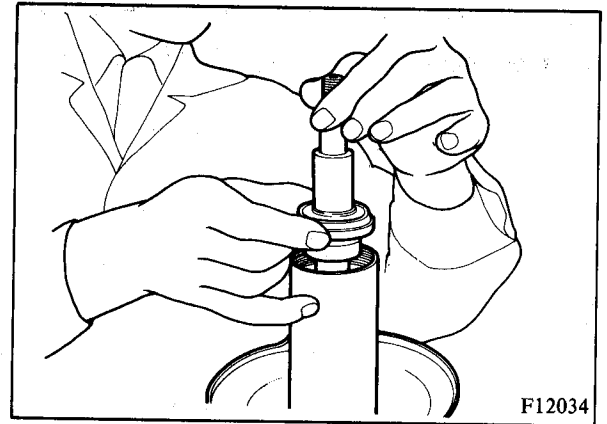


- (5) Slowly withdraw the piston rod from the cylinder together with the piston guide.

### Caution

Because the piston rod has a highly precise surface, handle it carefully.

- (6) Drain the shock absorber fluid.
- (7) Remove the piston guide from the piston rod.
- (8) Remove the cylinder from the strut outer shell.



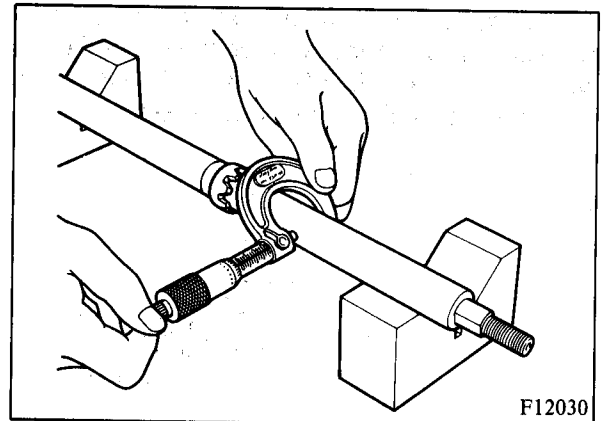
### INSPECTION

1. Check the insulator for deterioration, cracking or peeling.
2. Check the rubber helper and dust cover for cracks or damage.
3. Check the coil springs for cracks, damage and deterioration.
4. Check the strut piston rod for bends or wear.

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Piston rod outer diameter [Limit] .....  
21.95 mm (.8642 in.)

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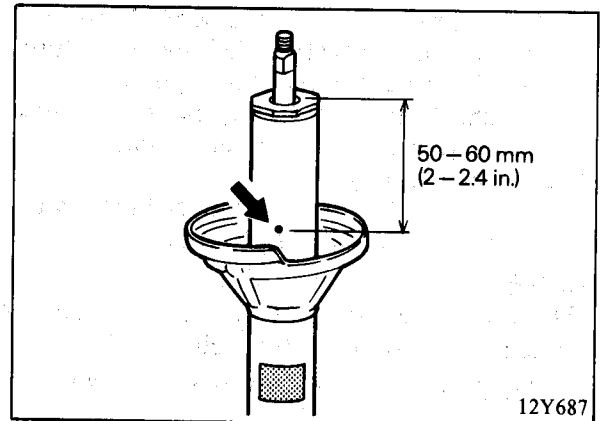


### GAS DAMPER TYPE SHOCK ABSORBER REPLACEMENT

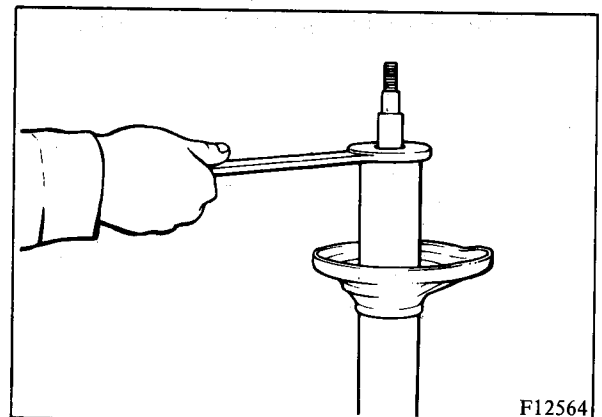
#### Caution

The shock absorber is filled with nitrogen gas. Do not disassemble it unless necessary for replacement. Replace the shock absorber inner parts as a kit.

1. Drill a 4 mm (.16 in.) or less diameter hole in the position of the illustration on the strut to bleed the nitrogen gas. (12Y687)



2. Remove the ring nut with the special tool. (F12564)
3. Remove the shock absorber assembly from the strut.
4. Install the new shock absorber assembly into the strut.
5. Tighten the ring nut to the specified torque with the special tool.
6. Attach the label furnished with the shock absorber over the drilled hole in the strut to prevent entry of water.

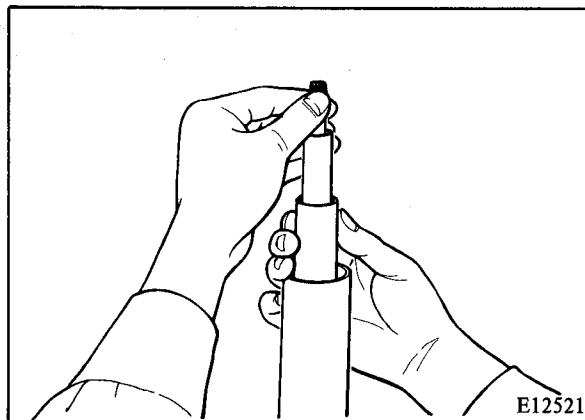




**REASSEMBLY**

1. Reassemble the strut assembly of the hydraulic type shock absorber by the following procedure.

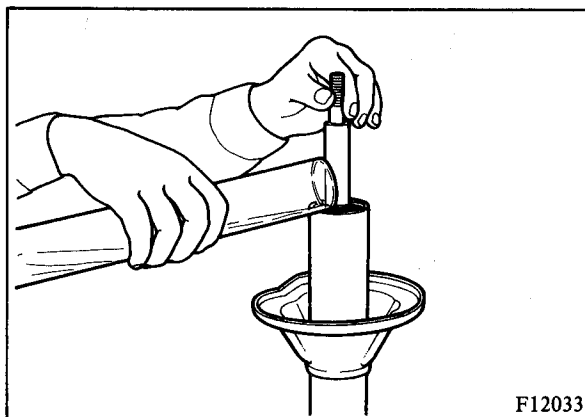
(1) Install the cylinder and piston assembly into the strut outer shell.



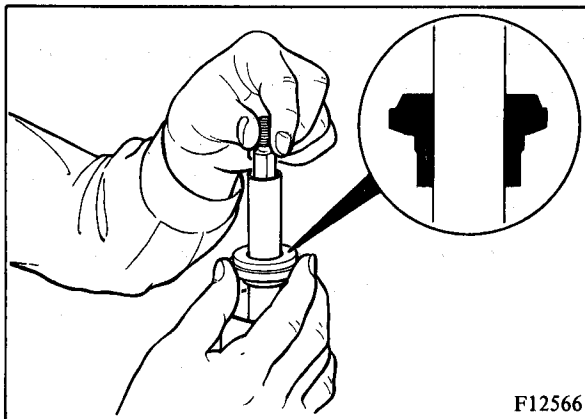
(2) Gradually pour shock absorber fluid into the cylinder while slowly moving the piston up and down.

**NOTE**

The above quantities are the capacities when the cylinder, piston and outer shell are completely dry. Be sure to take the amount of fluid adhering to the walls into consideration.



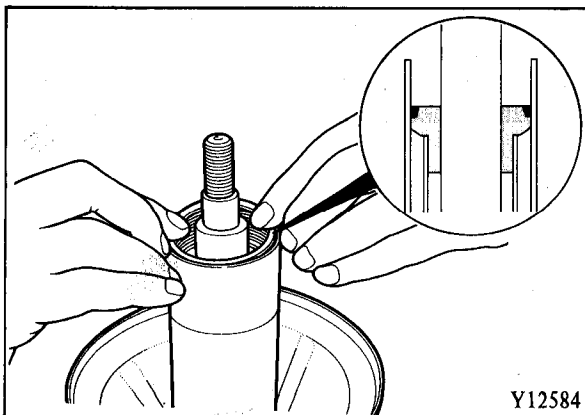
(3) With the flange of the piston guide facing upward, insert the piston guide to the piston rod until it contacts the cylinder end.



(4) Install the new square section O-ring to the piston guide.

**NOTE**

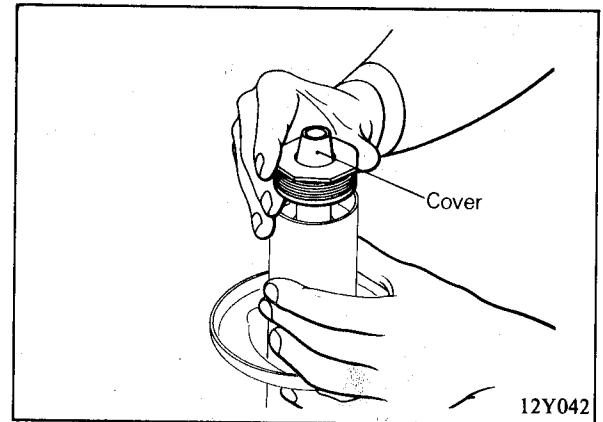
When the O-ring is set on the periphery of the piston guide, press the O-ring down evenly, taking care to prevent inclination and doubling.



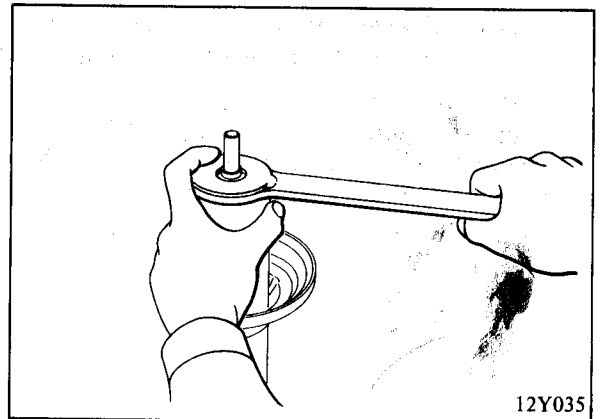


## COMPONENT SERVICE — STRUT ASSEMBLY

- (5) Cover the piston rod end and apply shock absorber fluid to the oil seal assembly lips and install the oil seal assembly.



- (6) Tighten the oil seal assembly, until its edge contacts the strut outer cylinder.

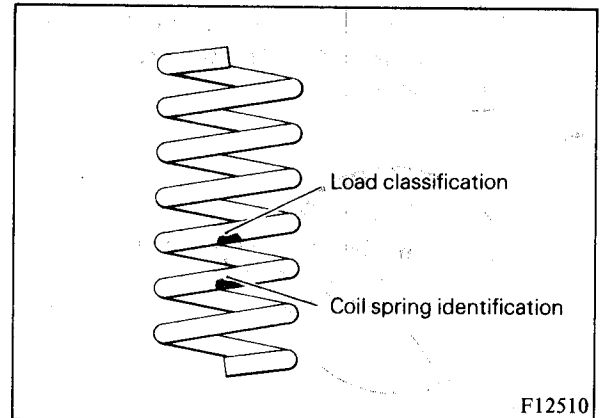


### NOTE

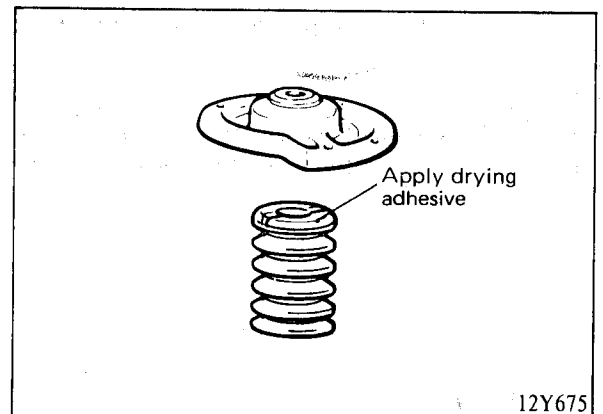
Coil springs have color marks to indicate coil spring identification and load classification.

The coil spring identification mark indicates the applicable vehicle model equipped with that particular coil spring. When replacing a coil spring, be sure to use a spring having the appropriate identification mark.

2. If the coil spring is not already compressed, compress it with special tool (L4514).



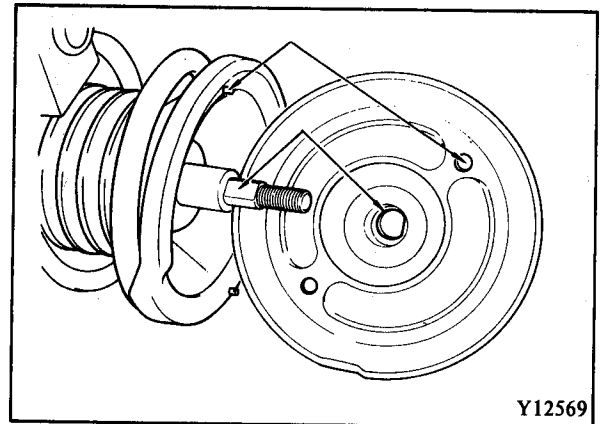
3. Bond the spring seat to the rubber helper with a drying adhesive. (12Y675)
4. Install the rubber helper seat, coil spring, dust cover, rubber helper and spring seat onto the strut.







- Align the D-shaped hole in the spring seat with the flat on the piston rod. Align the projections on the dust cover with the holes in the spring seat.



Y12569

- Install the strut insulator, hold the spring seat with the special tool and tighten the top end nut to the specified torque.

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Strut top end nut tightening torque .....  
60 – 70 Nm (43 – 57 ft.lbs.)

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**NOTE**

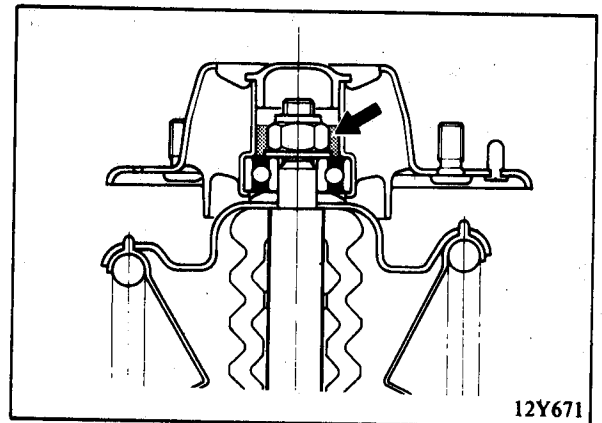
Use a new top end nut.

- Verify coil spring is properly aligned in the top and bottom spring seats.

- Pack the multipurpose grease in the strut insulator and install the cap.

**NOTE**

Do not apply grease to the rubber parts.

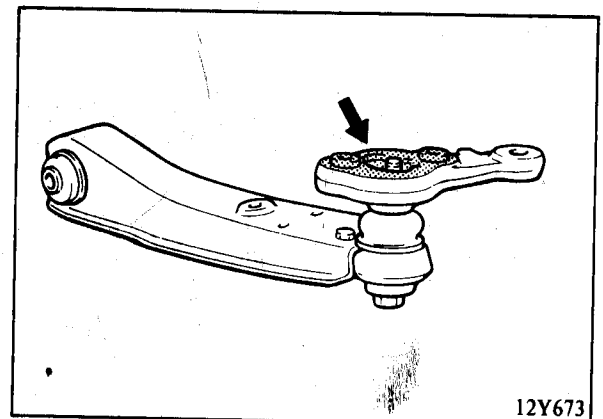


12Y671

**INSTALLATION**

**NOTE**

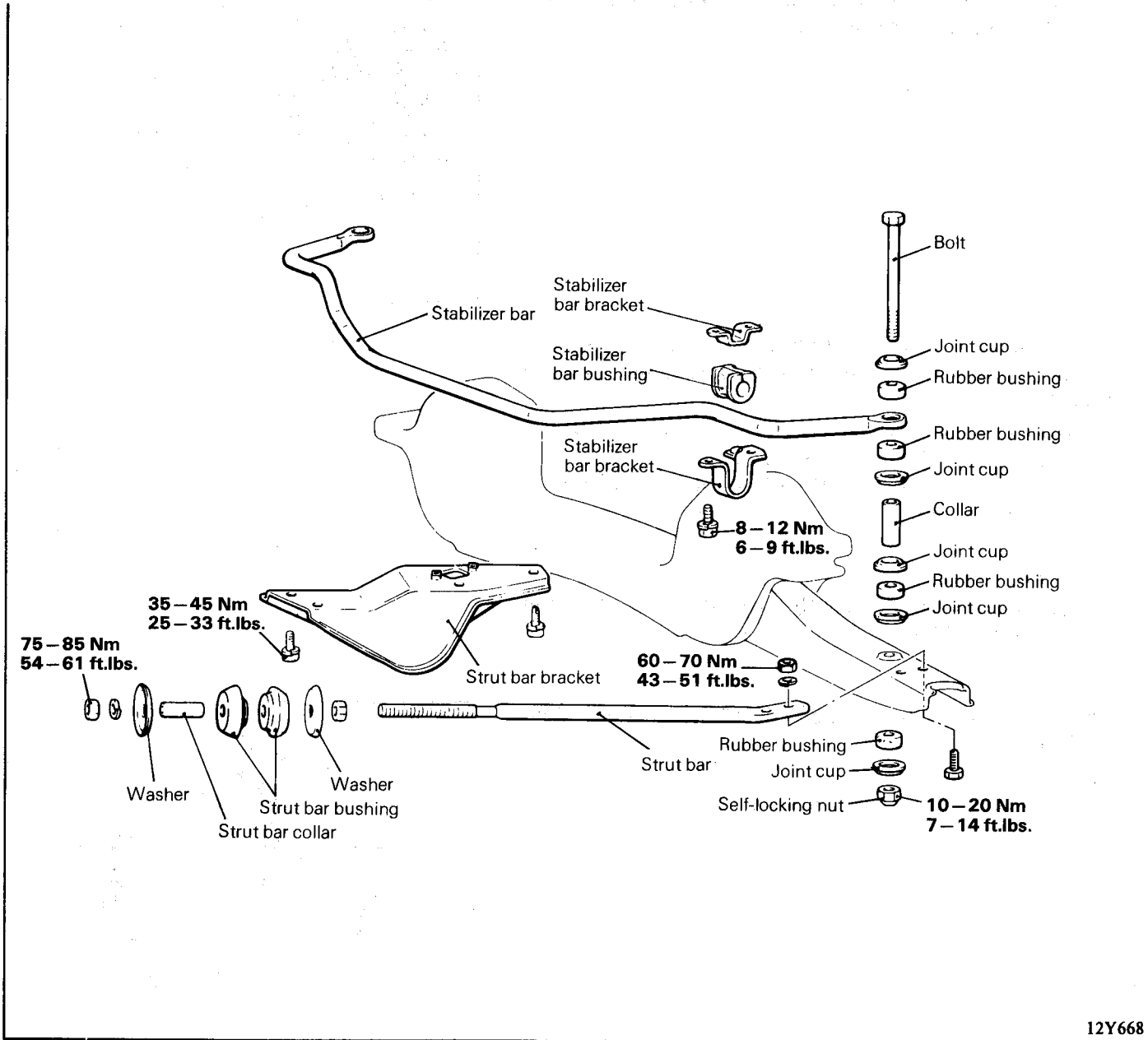
When the knuckle arm is installed to the strut, apply semi-drying sealant to the flange of the knuckle arm.



12Y673



COMPONENTS



12Y668

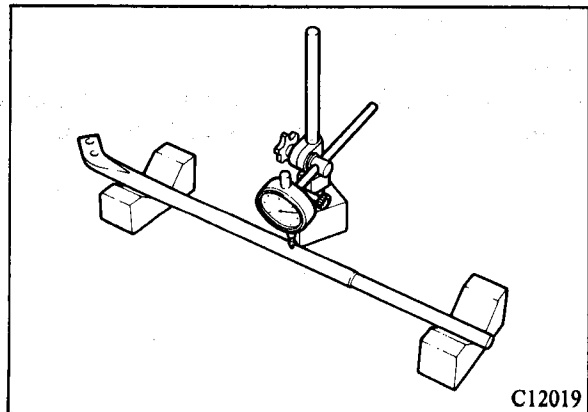
REMOVAL

Strut Bars

1. Disconnect the strut bars from the lower control arms.
2. Remove the strut bars from the strut bar brackets.

Stabilizer Bar

1. Disconnect the stabilizer bar from the lower control arm.
2. Remove the stabilizer bar from the body frame.



C12019



**INSPECTION**

1. Check the stabilizer bar for damage and deterioration.
2. Check the rubber bushing for cracks and wear.
3. Check the strut bar for cracks and runout.

Strut bar runout [Standard value] .....  
 0.25 mm (.01 in.)

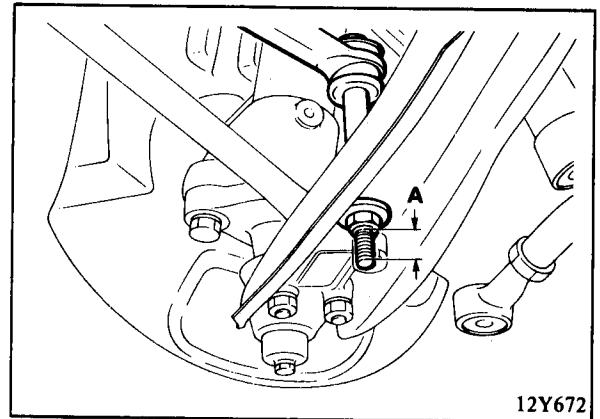
4. Check the strut bar bushing for cracks and damage.

**INSTALLATION**

**Stabilizer Bar**

Tighten the nut on the stabilizer bar bolt to the specified distance.

Distance A [Standard value] .....  
 15–17 mm (.59–.67 in.)



12Y672

**Strut Bar**

**NOTE**

When installing the strut bar, verify the identification mark stamped on it.

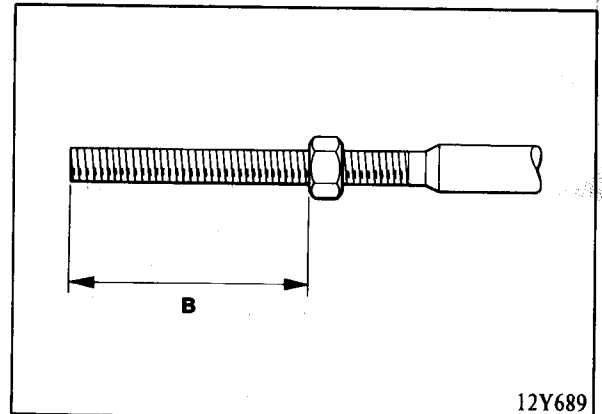
Identification mark  
 Left side — "L" or white mark  
 Right side — "R" or no mark



F12540

Tighten the nut on the strut bar so that the distance between the end of the strut bar and the front surface of the lock nut has the following dimension.

Distance B ..... 81 mm (3.19 in.)



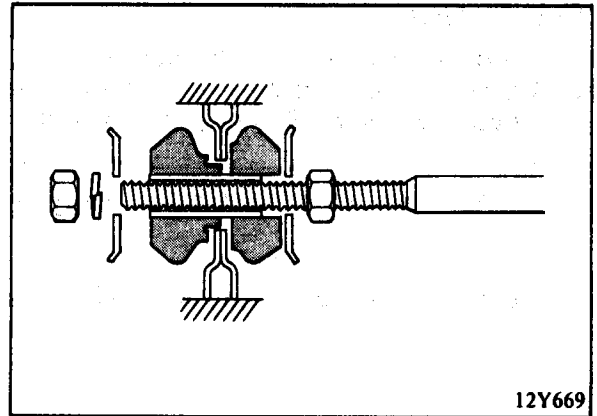
12Y689



## COMPONENT SERVICE — STRUT BAR AND STABILIZER BAR

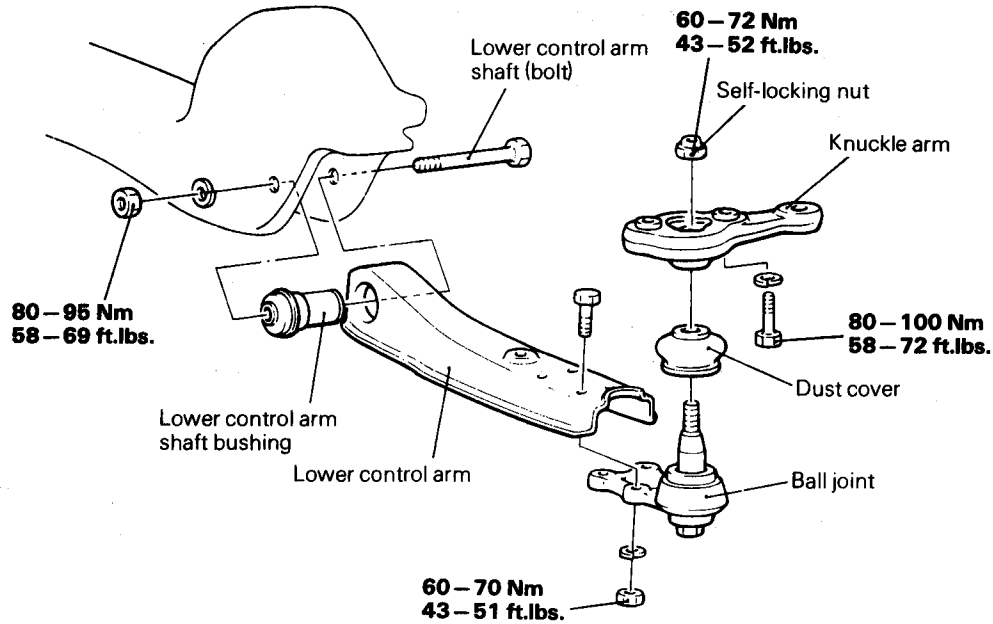
### NOTE

The front and rear strut bar bushings are different in shape. Install them as shown in the illustration. The top end nut should be torqued with the vehicle lowered to the ground and unloaded. After installing the strut bars, measure the caster.





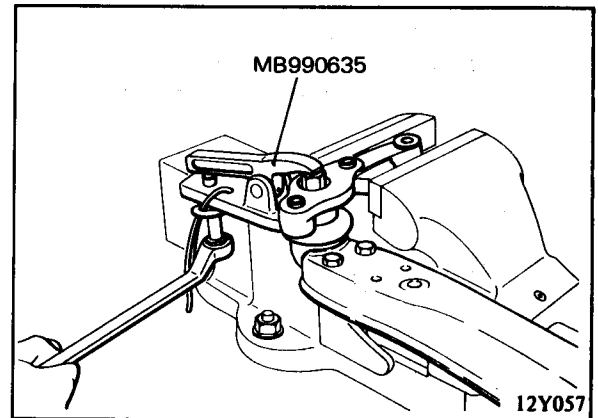
COMPONENTS



12Y676

REMOVAL

1. Disconnect the stabilizer bar and the strut bar from the lower control arm.
2. Disconnect the tie rod from the knuckle arm. (Refer to GROUP 19.)
3. Disconnect the McPherson strut from the knuckle arm.
4. Remove the lower control arm assembly and the knuckle arm from the crossmember.
5. Remove the knuckle arm from the lower control arm ball joint with the special tool. (12Y057)



12Y057

INSPECTION

1. Check the bushing for wear and deterioration.
2. Check the lower control arm for bend or breakage.
3. Check the ball joint dust cover for cracks.
4. Check all bolts for condition and straightness.
5. Check the ball joint for starting torque.

Ball joint starting torque [Standard value] .....  
500 – 800 Ncm (43 – 69 in.lbs.)



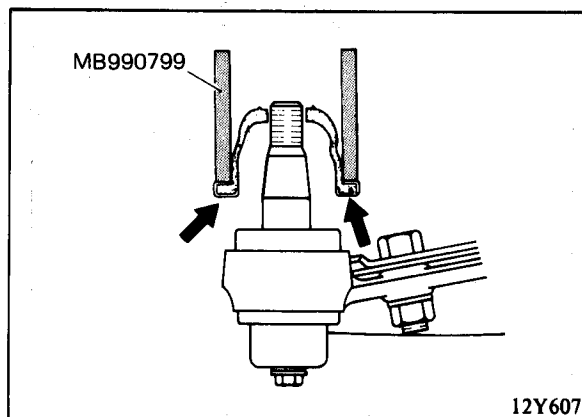
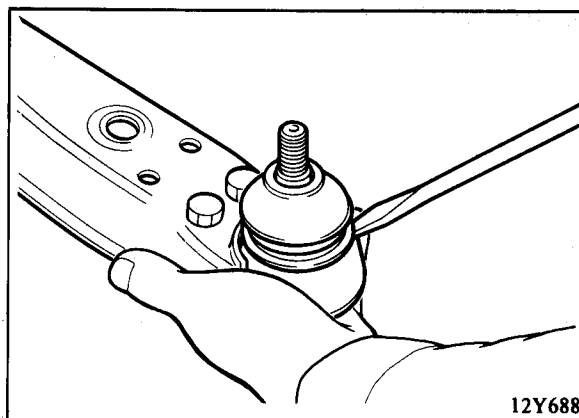
### NOTE

If ball joint starting torque exceeds the upper limit of standard value, replace the ball joint.

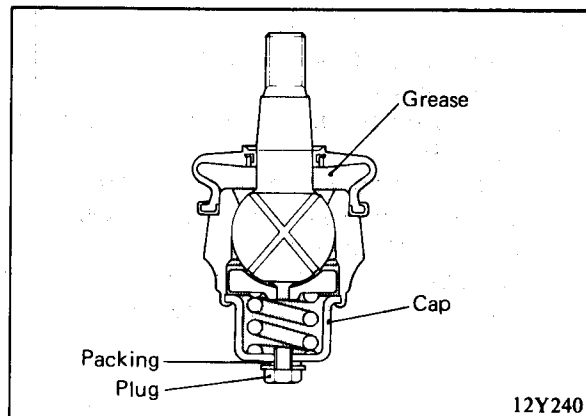
Even if ball joint starting torque is below the lower limit of standard value, the ball joint may be reused unless it has excessive play or a drag is felt.

### BALL JOINT DUST COVER REPLACEMENT

1. Remove the dust cover.
2. Apply sealant to the metal ring part of the new dust cover.
3. Drive in the dust cover with special tool until it is fully seated. (12Y607)



4. Exchange the ball joint plug with a grease nipple, and apply multipurpose grease.
5. Apply sealant to plug and reinstall plug.

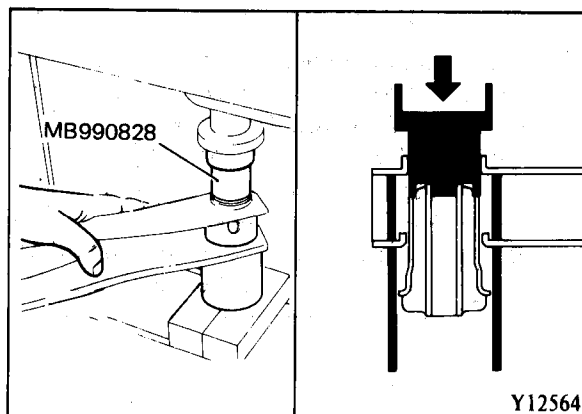


### LOWER CONTROL ARM BUSHING REPLACEMENT

#### Caution

Do not remove the lower control arm bushing unless absolutely necessary.

1. Press out the lower control arm bushing with the special tool. (Y12564)

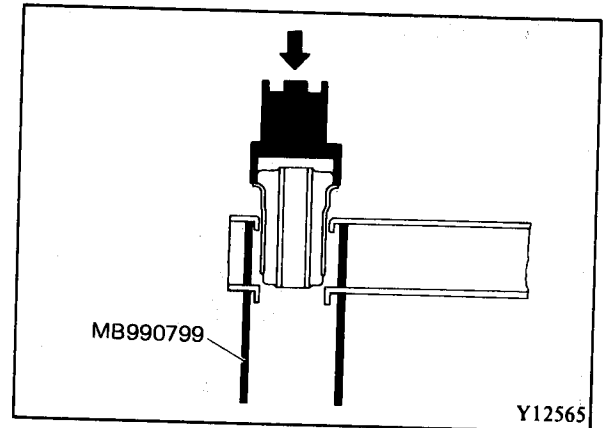




2. Press fit the new lower control arm bushing with the special tool until it is fully seated in the lower control arm. (Y12565)

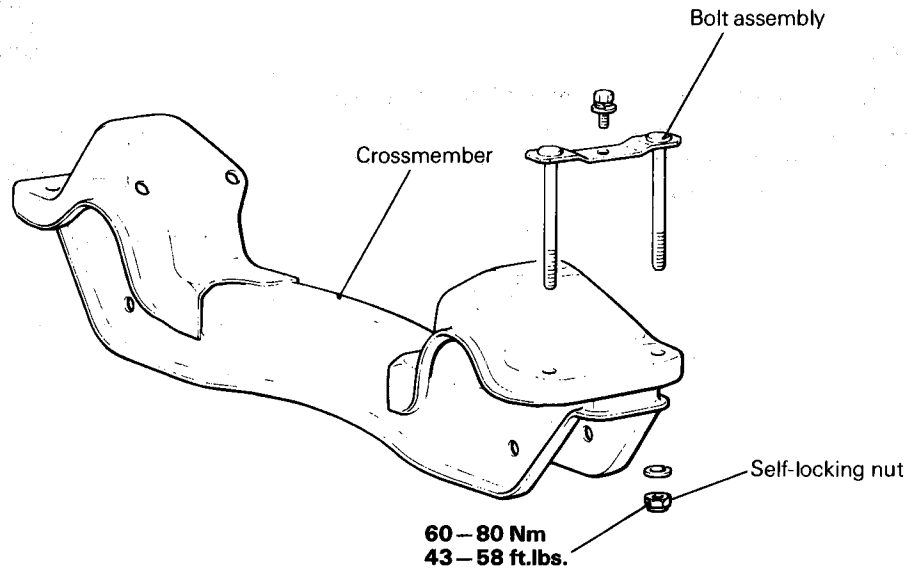
#### INSTALLATION

1. Apply semi-drying sealant to the flange of the knuckle arm, and install the knuckle arm to the McPherson strut.
2. Tighten the lower control arm shaft and the strut bar with the vehicle lowered to the ground.





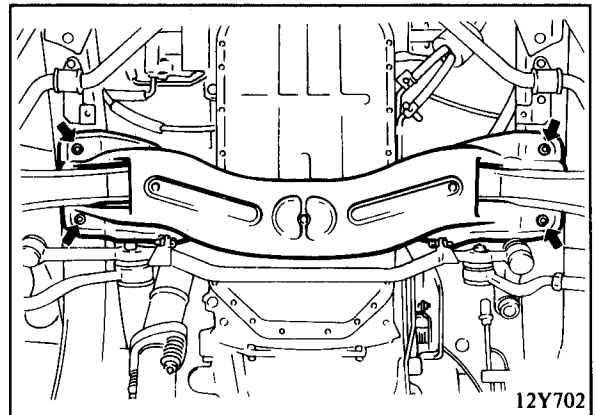
## COMPONENTS



12Y016

## REMOVAL

1. Remove the strut bars, stabilizer bar, steering linkage and the lower arms.
2. Use an engine hoist to secure the engine, and then disconnect the engine mounts.
3. Raise the engine slightly, and then remove the 4 nuts to remove the crossmember.



## INSPECTION

1. Check crossmember for cracks or damage.
2. Check dimension of crossmember as illustrated.

