

## GENERAL DESCRIPTION

The front suspension is a McPherson Strut design. It is a combination strut and shock that adapts to the front wheel drive. The lower control arms pivot in the engine cradle. The cradle has isolation mounts to the body and conventional rubber bushings are used for the lower control arm pivots. The upper end of the strut is isolated by a rubber

mount which contains a non-serviceable bearing for wheel turning.

The lower end of the wheel steering knuckle pivots on a ball stud for wheel turning. The ball stud is retained in the lower control arm and the steering knuckle clamps to the stud portion.

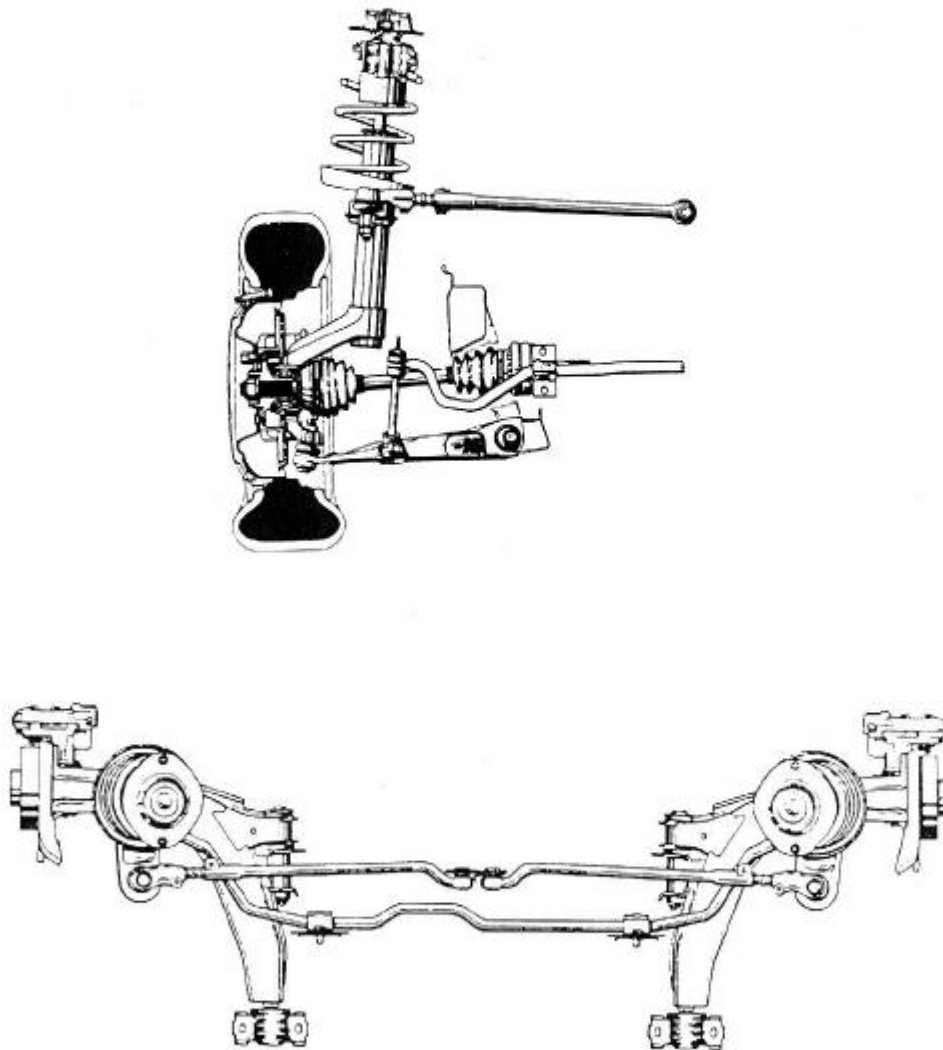
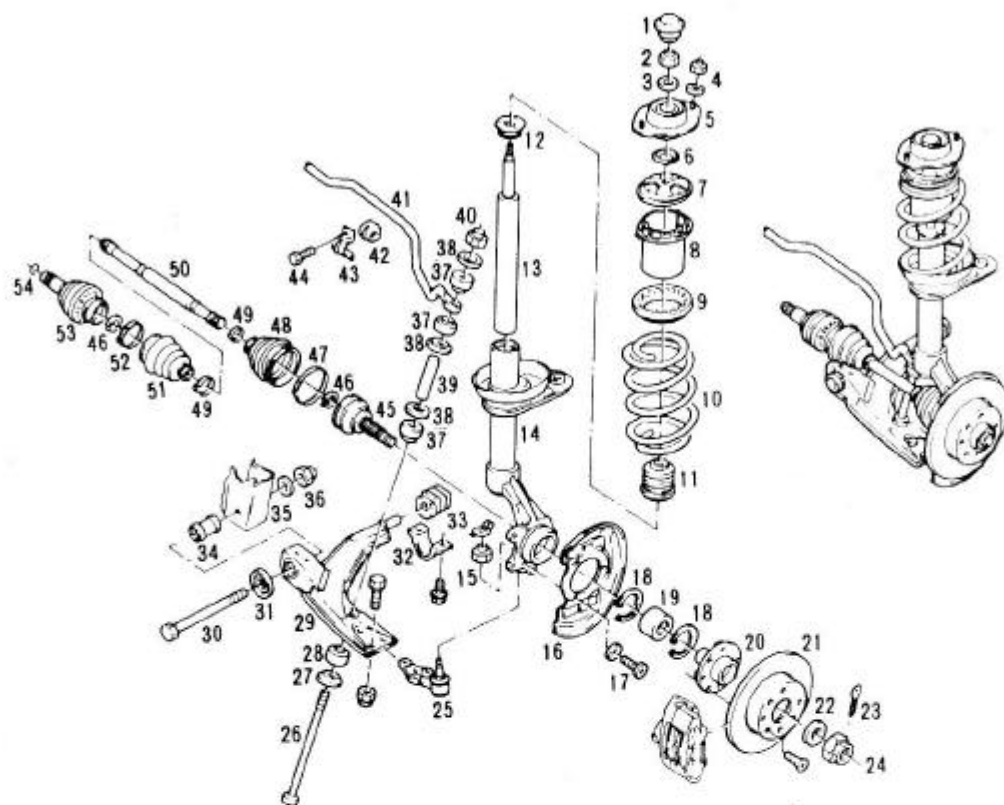


Fig. 1 Front Suspension Assembly.



- |                           |                           |                               |
|---------------------------|---------------------------|-------------------------------|
| 1. CAP : STRUT MOUNT      | 19. INCLINED BALL BEARING | 37. RUBBER BUMPER             |
| 2. NUT : HEX HEAD         | 20. FRONT WHEEL HUB       | 38. CUP                       |
| 3. WASHER                 | 21. BRAKE DISC            | 39. TUBE                      |
| 4. NUT AND WASHER         | 22. WASHER                | 40. NUT                       |
| 5. STRUT MOUNT            | 23. COTTER PIN            | 41. STABILIZER SHAFT          |
| 6. PLATE BALL BEARING     | 24. CASTLE NUT            | 42. BUSHING - STABILIZER      |
| 7. SEAT UPPER SPRING      | 25. BALL JOINT SET        | 43. CLAMP                     |
| 8. LOCATOR - FRONT SPRING | 26. SCREW - HEX HEAD      | 44. SCREW                     |
| 9. GUIDE RING             | 27. CUP                   | 45. JOINT - AXLE SHAFT, OUTER |
| 10. FRONT SPRING          | 28. BUMPER - STABILIZER   | 46. SNAP RING                 |
| 11. HOLLOW BUMPER         | 29. CONTROL ARM           | 47. CLAMP                     |
| 12. THREADED RING         | 30. SCREW                 | 48. BOOT - AXLE SHAFT, OUTER  |
| 13. CARTRIDGE STRUT       | 31. PLATE                 | 49. CLAMP                     |
| 14. STEERING KNUCKLE      | 32. CONTROL ARM COVER     | 50. DRIVE SHAFT               |
| 15. NUT                   | 33. DAMPER BUSHING        | 51. BOOT, INNER               |
| 16. CALIPER PLATE COVER   | 34. DAMPER BUSHING        | 52. CLAMP                     |
| 17. SCREW                 | 35. WASHER                | 53. JOINT - AXLE SHAFT, INNER |
| 18. RETAINING RING        | 36. NUT                   | 54. RING                      |

Fig. 2 Front Suspension Assembly in Exploded View

## HECK AND ADJUSTMENT ONT WHEEL ALIGNMENT

### CAMBER

Toe-in is the turning in of the tires, while toe-out is the turning out of the tires from the metric center line/thrust line. The purpose of toe is to ensure parallel rolling of the wheels.

Toe serves to offset the small deflections of wheel support system which occur when the vehicle is rolling forward. The specified toe angle is a pre-correction which results in achievement of toe when the vehicle is moving.

Incorrect toe-in toe-out will cause tire wear less than optimum fuel economy. As the individual steering and suspension components wear with extensive vehicle mileage, additional toe will be needed to compensate.

The toe dimension must always be corrected

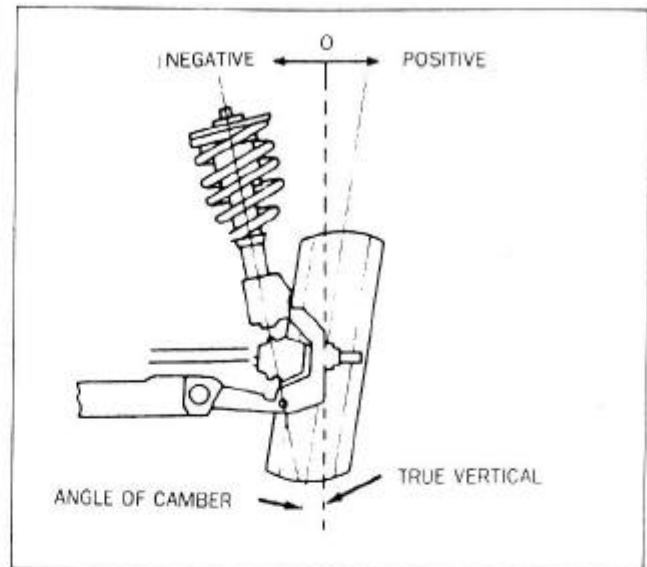


Fig. 4 Camber

### CASTER

Caster is the tilting of the upper most point of the steering axis either forward or backward from the vertical when viewed from the side of the vehicle. A backward tilt is positive(+) and a forward tilt is negative(-). Caster influences directional control of the steering but does not affect tire wear.

Weak springs or overloading a vehicle will affect caster.

If one wheel has more positive caster than the other, it will cause that wheel to pull toward the right of the car. This condition will cause the car to veer or lead toward the side with the least amount of positive caster.

Caster is measured in degrees and it is not adjustable.

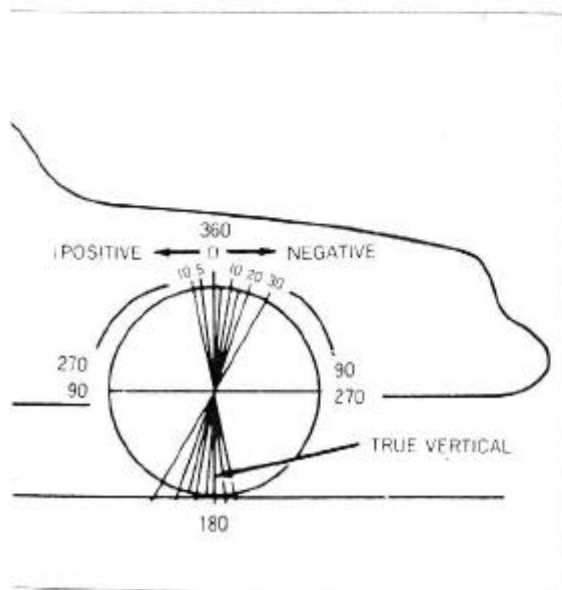


Fig. 3 Caster

Camber is the tilting of the top of the tire from the vertical when viewed from the front of the vehicle. When the tires tilt outward at the top, the camber is positive(+). When the tires tilt inward, the camber is negative(-). Camber is measured in degrees from the vertical. This is camber angle. Camber influences both directional control and tire wear.

If the vehicle has an excess amount of positive camber, the outside shoulder of the tire will wear. Likewise, if the vehicle has an excess amount of negative camber, the inside shoulder of the tire will wear.

Camber, like caster, is measured in degrees and is not adjustable.

### STEERING AXIS INCLINATION

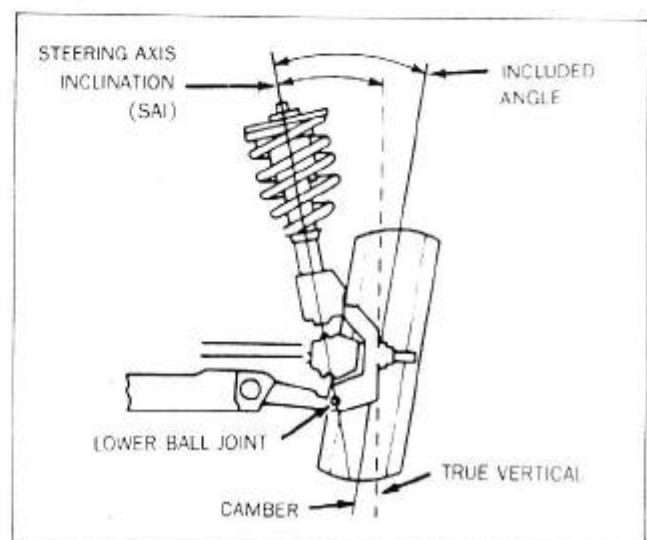


Fig. 5 SAI / Included Angle

Steering Axis Inclination (SAI) is the tilt (at the top) of the steering knuckle from vertical. The SAI angle is measured between true vertical and a line through the center of the strut and lower ball joint as viewed from the front of the vehicle.

Steering axis inclination helps the vehicle track straight down the road and assists the wheel back into the straight ahead position. SAI on front wheel drive vehicles should be negative.

### INCLUDED ANGLE

The included angle is the angle measured from the camber angle to the line through the center of the strut and lower ball joint as viewed from the front of the vehicle.

The included angle is calculated in degrees, but most alignment racks will not measure the included angle directly. To determine the included angle, subtract negative or add positive camber readings to the SAI.

### SCRUB RADIUS

The scrub radius is the distance between the line through the center of the strut and the lower ball joint to the road surface and the actual 0° or true vertical. Scrub radius is built into the design of the vehicle. It, therefore, is not measurable nor adjustable.

### SET BACK

The set back is the distance in which one front wheel spindle may be rearward of the other front wheel spindle. Set back is primarily caused by road hazard or vehicle collision.

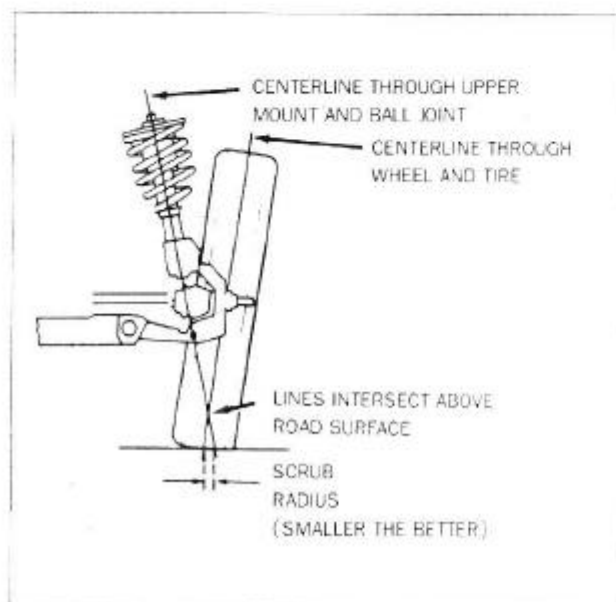


Fig. 6 Scrub Radius

### TURNING ANGLE

The turning angle is the angle of each front wheel when the vehicle is making a turn.

### TORQUE STEER

Torque steer is a trait common to most front-wheel drive vehicles. The vehicle will pull or lead in one direction during hard acceleration and will pull or lead in the other direction during deceleration. This is normal, but some customers may find it unusual. It can be explained best by pointing out that front-wheel drive cars use a transmission with different length axle shafts. Because of this, both axles tend to twist, but the longer axle will twist slightly more than the shorter one. This causes one wheel to start rolling quicker than the other, resulting in a very slight pull. It should be pointed out to the customer that this phenomenon will not be detrimental to vehicle life or customer safety.

### MEMORY STEER

Memory steer is a condition when after making a turn in one direction, the vehicle will want to lead or pull in that direction. After turning in the other direction, the vehicle will want to lead or pull in that direction. This is an uncommon problem. It is normally due to an overtightened MacPherson strut shock nut. When inspecting for a probable cause, don't overlook a bent manual rack-and-pinion steering gear or a spool valve problem in a power rack-and-pinion gear.

## PRELIMINARY INSPECTION

### CHECKING WHEEL ALIGNMENT

Steering and vibration complaints are not always the result of improper alignment. They may also be caused by wheel and tire unbalance. An additional item to be checked, is the tire lead due to worn or defective tires. "Lead" is the deviation of the vehicle from a straight path on a level road without hand pressure on the steering wheel.

To insure correct alignment, the following inspection should be made before checking wheel alignment:

#### Inspect

1. All tires for proper inflation pressures and normal tread wear.
2. Wheel bearings for looseness.
3. Loose ball joints, Tie rod ends. If excessive looseness is noted, correct before adjusting.
4. Run-out of wheels and tires.

Vehicle trim heights, if beyond the limits and a correction is to be made, the correction must be made before adjusting toe.

For loose rack and pinion mounting.

For improperly operating struts.

For loose control arms.

For excessive loads. If this excess load is normally carried in the vehicle, it should remain in the vehicle during alignment checks.

The condition of the equipment being used to check alignment, and follow the manufacturer's instructions.

Regardless of equipment used to check alignment the vehicle must be on a level surface fore, aft and transversely.

### Important

factory vehicle operation may occur over a range of suspension alignment settings.

Requirements cannot be met in order to reach specifications, check for damaged suspension members. Repair or replace as necessary.

Should front toe vary beyond the specified limits, adjustment is advisable. The specifications stated in the "Wheel Alignment Specification" chart should be used by trained alignment specialists as a guide in vehicle diagnosis, either for repairs under new vehicle warranty or for maintenance service at the customer's request. These specifications define an acceptable operating range, and they prevent abnormal tire wear.

Annual Periodic Motor Vehicle Inspection programs may include wheel alignment among items to be inspected. The specifications stated in the applicable chart are well within the range of vehicle operation.

### CHECKING RACK ALIGNMENT.

Proper wheel alignment cannot be performed on a rack that is no longer level or is out of calibration. Check the rack for levelness and calibration at least once a month.

To get an accurate caster reading and establish curb height, the turnplates or slider plates must move freely. Take them apart at least once a month to be cleaned and lubricated. Replace badly worn turnplates.

### Important

Following conditions must be met for correct FRONT and REAR wheel alignment:

1. Tread on all tires must be uniform, and tires must be in good condition.

2. Tire pressures must be in good condition.

3. Wheel rim must be checked and must be in satisfactory condition.

4. Load each of the front seats of this vehicle with 70Kg

5. Fuel tank should be half filled.

6. Rock the vehicle several times to stabilize the springs (also stabilize springs if vehicle was previously raised.)

- When using an alignment unit with a turntable records no lateral forces, the vehicle must first be rolled rearward 1 meter and then returned to its initial position.

7. The method of checking alignment will vary depending upon the type of equipment used. The instructions furnished by the equipment manufacturer should be followed.

### FRONT TOE ADJUSTMENT

#### Adjust

Toe is adjusted by changing the steering tie rod length. Loosen right and left tie rod end clamp bolts (B), then turn right and left tie rod adjusters (A) to align toe to specification. In this adjustment, right and left tie rods must be equal in length.

#### Tighten

- Clamp bolts to 20N · m

### FRONT CAMBER AND CASTER CHECK

Front camber and caster are not adjustable. If the camber or caster deviates from that specified in the "Wheel Alignment Specification Chart" locate and replace or repair the damaged, loose, bent, dented or worn suspension part(s). If the problem is body related, the body should be repaired according to the proper specifications.

To prevent an incorrect reading of camber or caster, bounce the bumper three times before inspection.

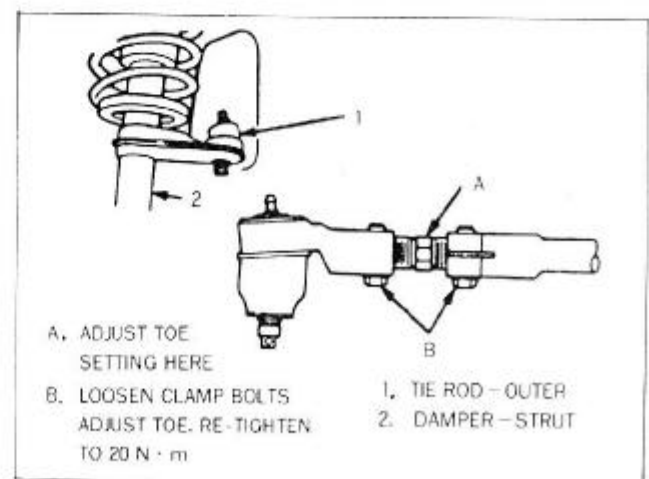


Fig.7 Toe Adjustment



# ON-VEHICLE SERVICE

## WHEEL BEARING

### Remove or Disconnect

1. Remove spring strut(see operation "Support Bearing" in this group.)

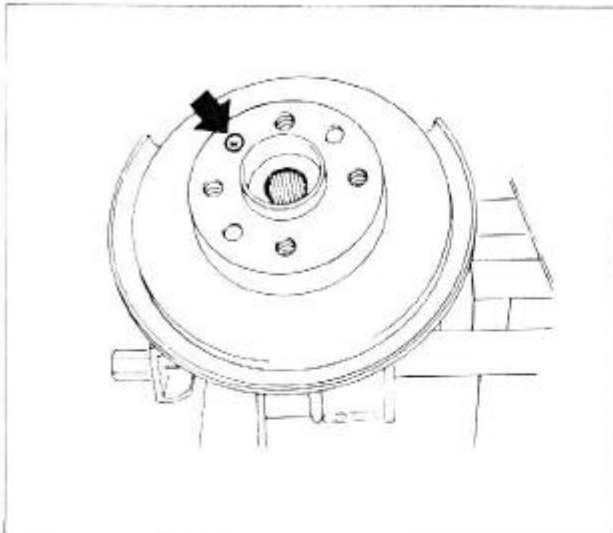


Fig. 8 Disc to Hub Screw

2. Remove stop screw from wheel hub and remove brake disc.

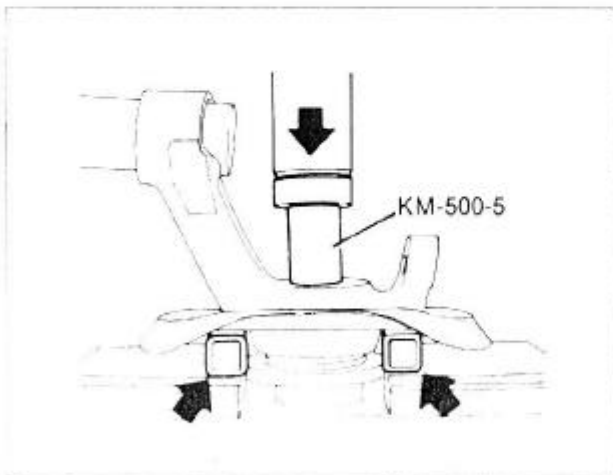


Fig. 9 Wheel Hub Removal

3. Press front wheel hub off of wheel bearing using KM-500-5.  
To remove, place two flat or square bar irons under steering knuckle.  
The wheel bearing will be destroyed.  
One half of the inner bearing ring remains on the wheel hub.

4. Unscrew brake cover plate from steering knuckle.

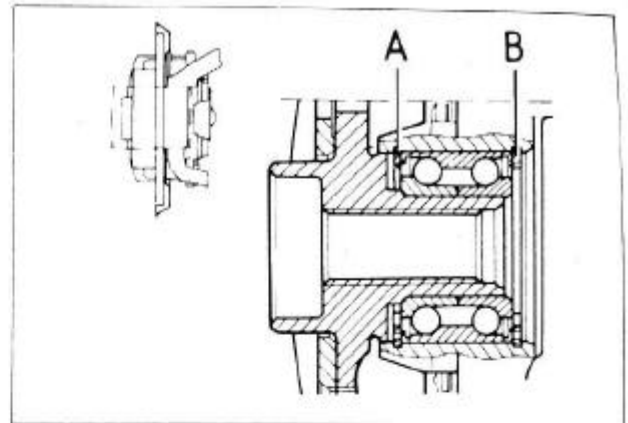


Fig. 10 Snap Rings

5. Remove both retaining rings("A"and "B")from steering knuckle.

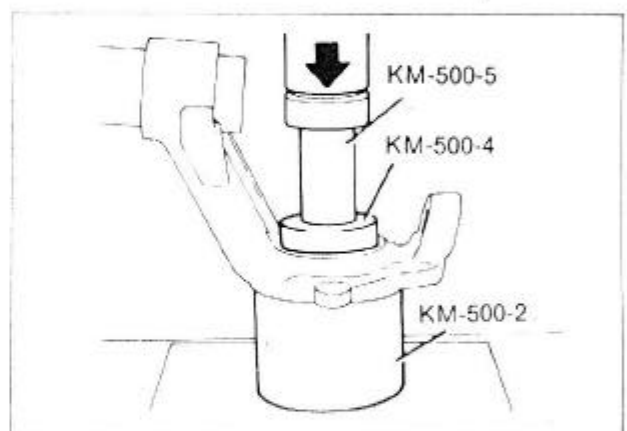


Fig. 11 Wheel Bearing Removal

6. Press wheel bearing out of steering knuckle using KM-500-4 and -5.  
To do this, place KM-500-2 under steering knuckle.

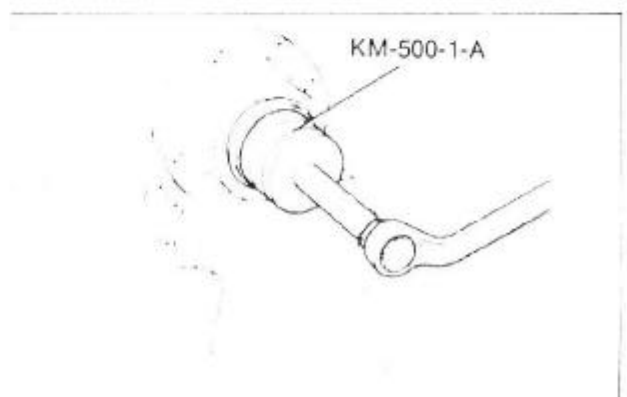


Fig. 12 Inner Bearing Ring Removal

Pull inner bearing ring off of front wheel hub using KM-500-1-A.

### Install or Connect

move wheel bearing must not be used again.

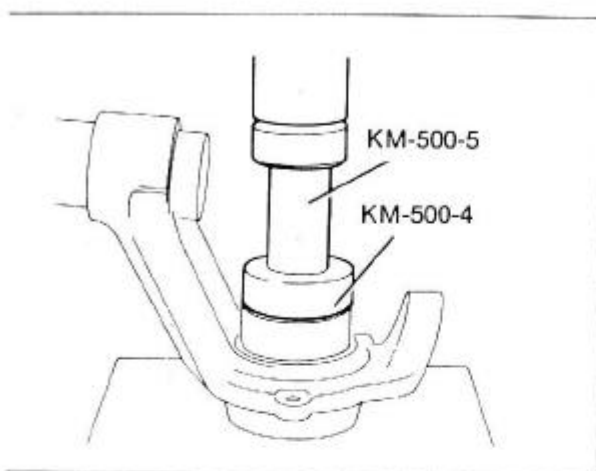


Fig. 13 Outer Retaining Ring Installation

Insert outer retaining ring into steering knuckle. Retaining ring must be seated properly in groove, in which case locking tabs of ring point downwards (installation position).

Using KM-500-4 and -5, press new wheel bearing into steering knuckle until it contacts retaining ring.

Insert inner retaining ring into steering knuckle. Retaining ring must be properly seated in groove, in which case locking tabs of ring point downwards (installation position).

Fasten brake cover plate to steering knuckle—observe prescribed torque.

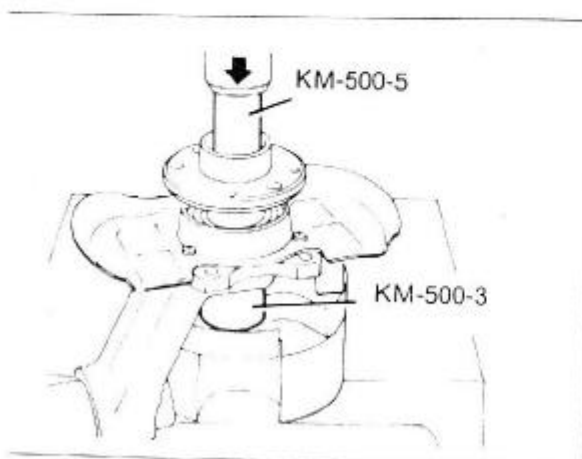


Fig. 14 Wheel Hub Installation

Press front wheel into wheel bearing using KM-500-5.

To do this, place KM 500-3 under wheel bearing inner ring.

6. Fasten brake disc to wheel hub with stop screw—observe prescribed torque.
7. Install spring strut (see operation "Support Bearing replacement" in this group).

## STEERING KNUCKLE (SPRING STRUT)

### Remove or Disconnect

1. Raise vehicle. Remove front wheel.
2. Unscrew brake caliper from steering knuckle and suspend.
3. Remove castellated nut of axle shaft from hub. Counterhold using suitable holder.
5. Press tie rod joint steering arm using KM-507-B.
6. Press swivel joint out of steering knuckle using KM-507-B.
7. Press axle shaft out of front wheel hub using wheel hub remover (if not possible by hand).
8. Unscrew spring strut completely from spring strut dome.
9. Fasten spring strut to Spring Compressor KM-465-A/KM-329-A.
10. Compress front spring.
11. Unscrew support bearing (ball bearing) from cartridge piston rod.
12. Remove threaded ring (plate nut) from support tube using KM-563.
13. Remove spring strut cartridge from support tube.
14. Release front spring and remove steering knuckle from KM-465-A/KM-329-A.
15. Remove brake disc stop screw from wheel hub and remove brake disc.
16. Press front wheel hub out of wheel bearing using KM-500-5.
17. In doing this, the wheel bearing will be destroyed.
18. Unscrew brake cover plate from steering knuckle.
19. Pull inner bearing ring off of front wheel hub using KM-500-1.
20. Replace steering knuckle.

### Important

The steering knuckle is supplied only as an assembly with support tube. The assembly may not be disassembled.

### Install or Connect

1. Insert outer retaining ring in steering knuckle.
2. Press new wheel bearing into new steering

- knuckle using KM-466-4 and -5
3. Insert inner retaining ring in steering knuckle.
  4. Fasten inner retaining ring in steering knuckle—observe prescribed torque.
  5. Mount steering knuckle on KM-329-A and compress front spring.
  6. Mount spring strut cartridge. Tighten threaded ring using KM-563—observe prescribed torque.
  7. Insert axle shaft into splines of front wheel hub. Screw castellated nut(washer) loosely on to shaft.
- NOTICE:** Use new castellated nut and washer.
8. Fasten swivel joint(important attachment part) with castellated nut to steering knuckle—observe prescribed torque. Secure with retaining clamp.

### Important

No play in front wheel bearing

9. To fasten axle shaft to front wheel hub, proceed as follows:
  1. Draw axle shaft with castellated nut(washer) into hub and tighten castellated nut to 100 Nm(bolted joint seats). Screw KM-468 to hub as counterstay.
  2. Release castellated nut and retighten to 20 Nm(pretension).
  3. Tighten castellated nut further by exactly 90°.
  4. If split pin and hole are offset, loosen(not tighten) castellated nut to nearest split pin hole and insert pin.
10. Fasten brake caliper to steering knuckle.—observe prescribed torque.
11. Tighten wheel bolts, alternating crosswise.—observe prescribed torque.

## FRONT WHEEL HUB

Corresponds to operation "Wheel Bearing"

**NOTICE:** A new bearing must always be installed. It is therefore not necessary to remove the inner bearing ring from the old hub when replacing the front wheel hub.

## AXLE SHAFT

### Important

If the vehicle has been driven a great number of miles (approx. 80,000 to 100,000km/50,000 to 62,000 miles), the left or right axle shaft in direction of travel is to be replaced as a complete assembly.

- The right axle shaft is approx. 34mm longer than the left one.  
The axle shaft need not be removed with the bellows collapsed.  
Remove small clamp, ventilate bellows and fasten with new clamp.

### Remove or Disconnect

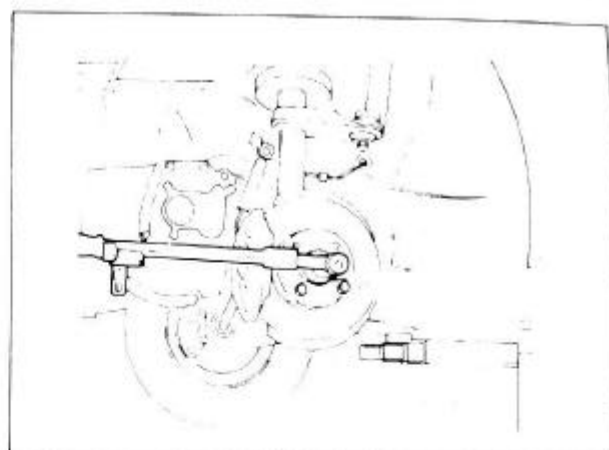


Fig. 15 Split Pin Removal

1. Raise vehicle. Remove front wheel.
2. Remove split pin and remove castellated nut from axle shaft.  
Attach suitable counter holder to hub with two wheel bolts to act as counterstay.
3. The brake caliper remains installed.

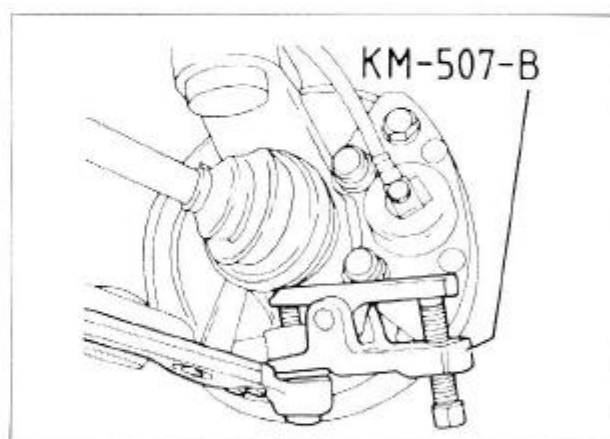


Fig. 16 Steering Knuckle Removal

4. Press swivel joint out of steering knuckle using KM-507-B.

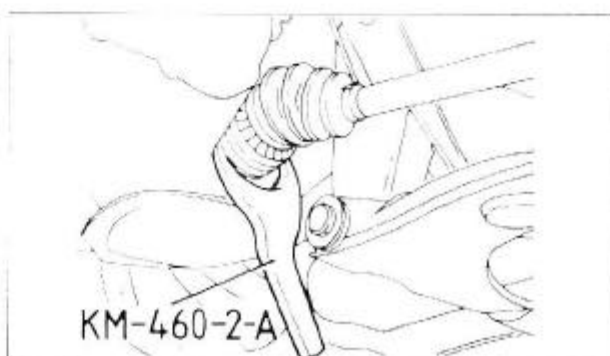


Fig. 17 Axle Shaft Removal



Force axle shaft out of transmission case using M-460-2-A(left side) or KM-460-1(right side).

**Important**

The chamfered side of the tool is always towards the transmission. It escapes. Therefore immediately seal axle shaft opening with plug to protect it against oil and dirt.

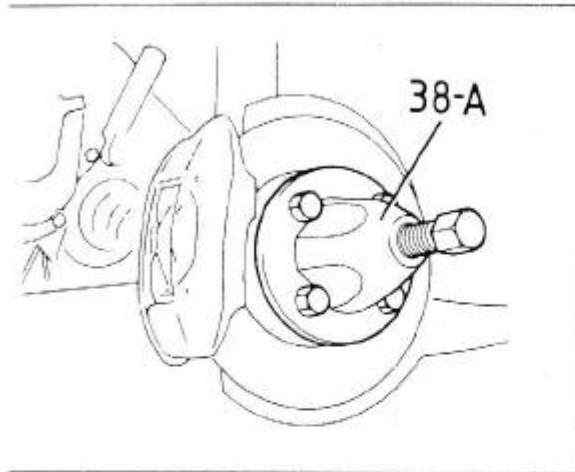


Fig. 18 Front Wheel Hub Removal

Pull axle shaft out of front wheel by hand. If it is not possible, press axle shaft out of front wheel hub using hub remover No. 38-A.

**Important**

After axle shaft has been removed from front wheel hub, wheel bearing must not be placed under load or vehicle moved, as this would change fitting position of two part inclined ball ring. If moving vehicle is unavoidable, insert substitute axle shaft bolt in hub and tighten with castellated nut(wheel bearing is tightened).

**Install or Connect**

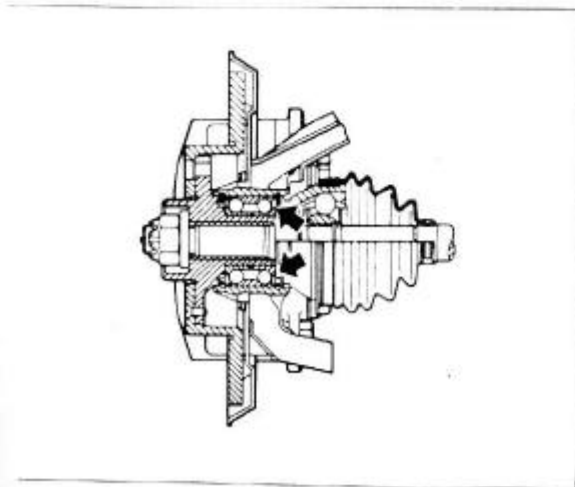


Fig. 19 Snap Rings

1. Contact shoulder of outer axle shaft joint and its contact surface on front wheel hub ball bearing must be absolutely free of dirt and foreign matter.
2. Insert axle shaft into splines of front wheel hub. Loosely screw castellated nut(washer) on to shaft. Lubricate splines with transmission fluid.

**Important**

Always use new castellated nut and washer.

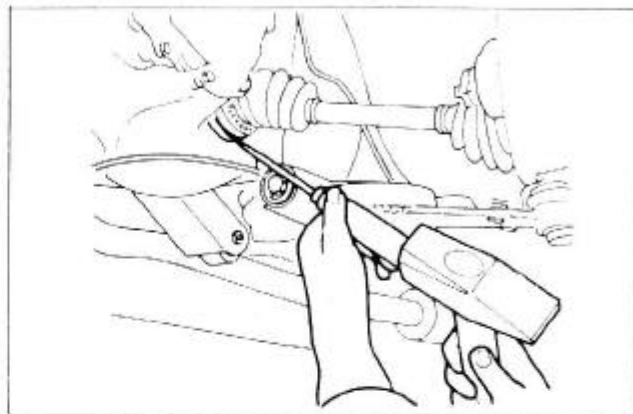


Fig. 20 Retaining Spring Insert

3. First press axle shaft into transmission case with retaining ring inserted in joint groove. Then drive in with screwdriver until retaining ring locates.

**Important**

Position screwdriver on bead of friction weld (not on metal covering).

4. After retaining locates, check for snug seat of axle shaft by pulling on outer diameter of joint by hand.
5. Fasten swivel joint to steering knuckle(Important attachment part) with castellated nut and secure with retaining clip—observe prescribed torque! Use new retaining clip.

**Important**

No play in front wheel bearing.

6. To fasten axle shaft to front wheel hub, proceed as follows :
  - Draw axle shaft into hub with castellated nut (washer) and tighten castellated nut to 100Nm (bolted joint seats). Bolt KM-468 on the hub as counterstay.
  - Release castellated nut and retighten to 20Nm (pre-tension).
  - Tighten castellated nut further by exactly 90°.
  - If split pin and hole are offset, loosen(not tighten) castellated nut to nearest hole and insert pin.
7. Tighten wheel bolts, alternating crosswise—observe prescribed torque.
8. Check transmission fluid level and top up if required (top up in opening for vent plug screw) Fluid level—lower edge of inspection opening

## JOINT OF ONE AXLE SHAFT

### Remove or Disconnect

1. Remove axle shaft.  
See operation "Axle Shaft"

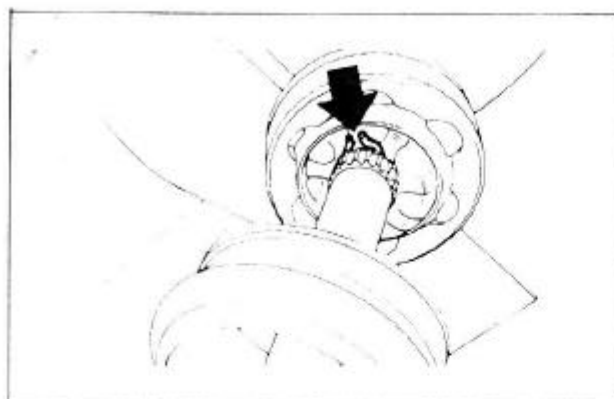


Fig. 21 Retaining Ring Removal

2. Remove bellows from joint and invert. Beforehand, remove strap.
3. Spread retaining in outer or inner joint with pliers.

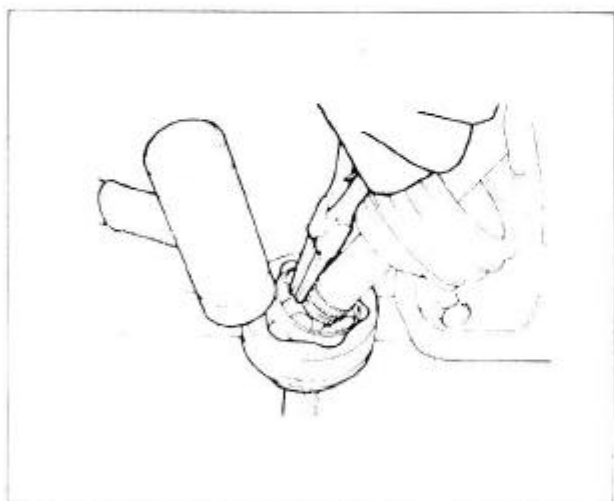


Fig. 22 Joint Removal

4. Tap off joint from shaft splines using plastic mallet.

### Install or Connect

#### Important

The joint is only replaced as an assembly.

1. Fill hollow spaces of joint with special grease.
2. Retaining ring must be properly seated in its groove.
3. Tap joint on to shaft splines using a plastic mallet until retaining locates.

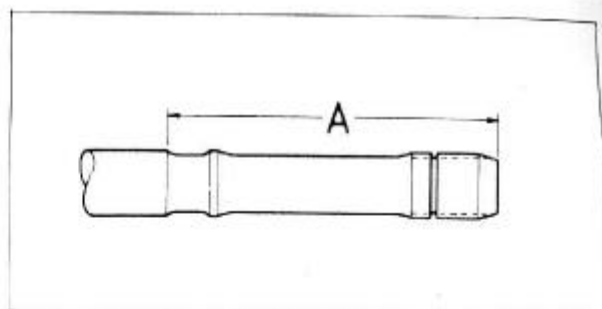


Fig. 23 Joint

#### Important

Position of inner joint on long side of shaft for fastening bellows (Length A=approx. 135mm), outer joint on short side of shaft.

4. Mount bellows and fasten with new retaining strap. Bellows must not be twisted on axle shaft. Tighten strap with special clamping pliers (commercially available.)
5. Install axle shaft.

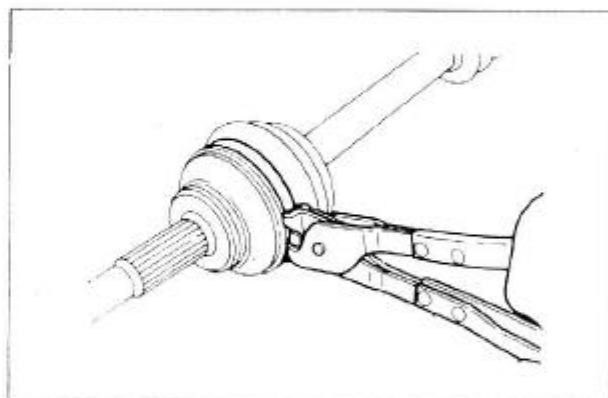


Fig. 24 Joint Installation

## BELLOWS OF ONE AXLE SHAFT

### Remove or Disconnect

1. Remove axle shaft.
2. Remove strap and bellow from respective joint.
3. Spread retaining ring in inner or outer joint and tap off from shaft splines.
4. Remove respective retaining strap and bellows from axle shaft.

### Install or Connect

1. Thoroughly clean out old grease from joint and fill hollow spaces of joint with special grease.
2. Place outer or inner joint on shaft splines and secure with retaining ring.
3. Fasten new bellows to axle shaft with retaining with retaining strap.

Mount bellows on joint concerned and fasten with retaining strap.

Install axle shaft.

**NOTICE:** When replacing both bellows, only one joint is to be removed from the shaft splines. Either the outer or the inner joint.

## SPRING STRUT BEARING (SPRING STRUT)

### Remove or Disconnect

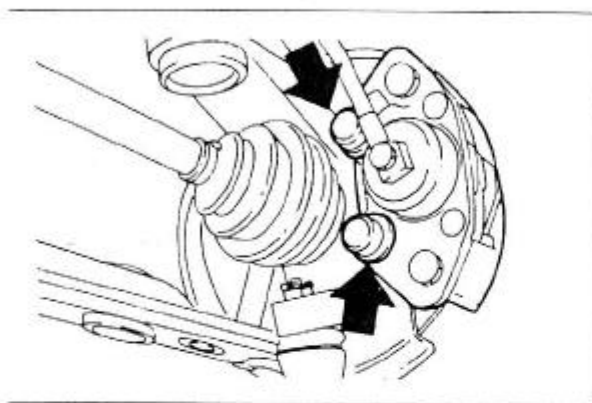


Fig. 25 Protective Cap Removal

Raise vehicle. Remove front wheel.  
Remove protective cap.  
Unscrew brake caliper from steering knuckle and suspend.  
(Brake system remains closed).

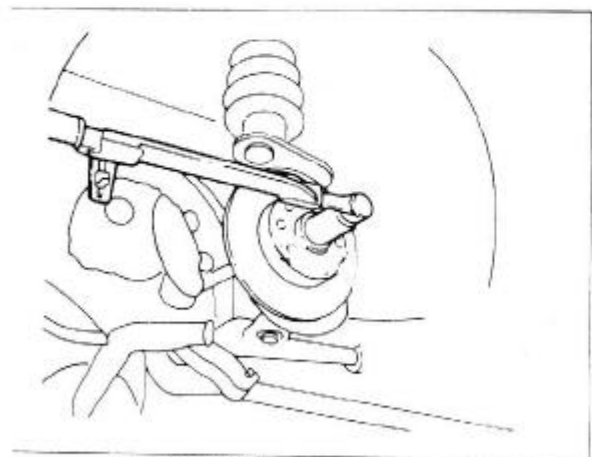


Fig. 26 Split Pin Removal

Fasten suitable counter holder to hub with two wheel bolts to act as counterstay.  
Remove split pin from castellated nut and remove nut from axle shaft.  
Press out tie rod end from steering arm using KM-507-B.  
Press out swivel joint from steering knuckle using KM-507-B.

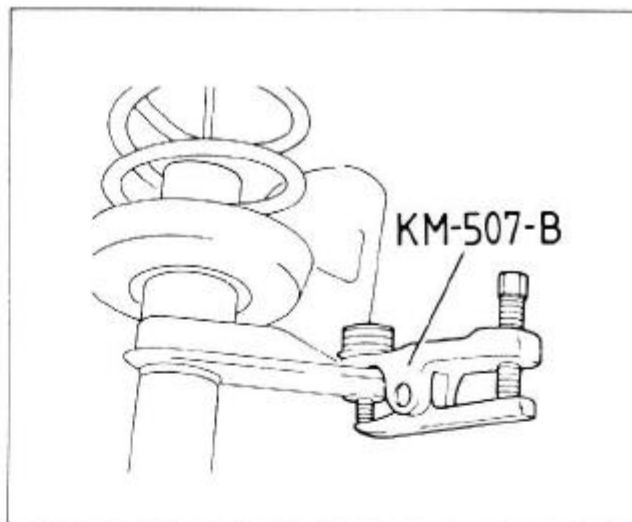


Fig. 27 Swivel Joint Removal

8. Pull axle shaft out of front wheel hub by hand. If this is not possible, press out axle shaft from hub using hub remover No. 38-A (transition position between press fit and push fit).

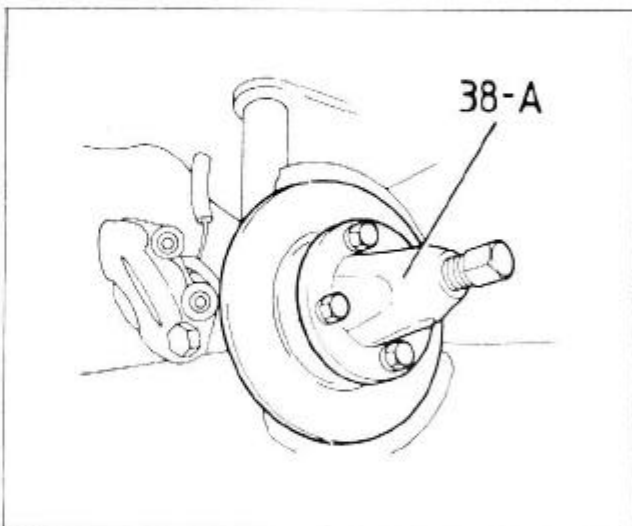


Fig. 28 Axle Shaft Removal

9. Suspend axle shaft.

### **[?] Important**

After axle shaft has been removed from front wheel hub, wheel bearing must not be placed under load vehicle must not be moved, since this would change installation position of two part inclined ball bearing.

If moving vehicle is unavoidable, insert substitute axle shaft butt in hub and tighten with castellated nut (wheel bearing is tightened).

10. Unscrew complete spring strut from spring strut dome.

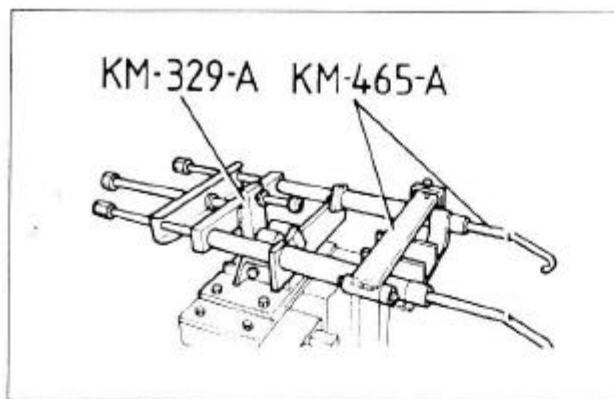


Fig. 29 Spring Compressor

11. Mount Front Spring compressor KM-465-A together with KM-329-A on mounting trestle or on workbench or on any other suitable surface with spring compressor retaining plate. Hook with blue marking must align with yellow marking on compressor frame.

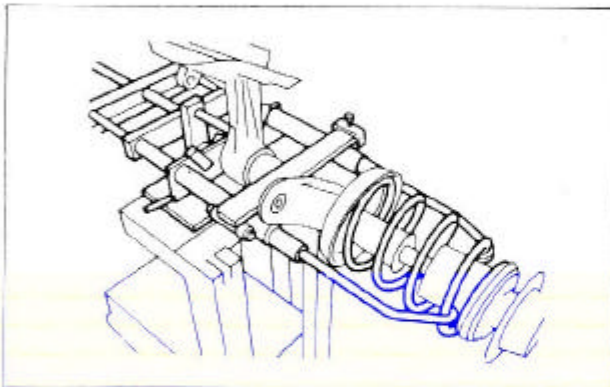


Fig. 30 Spring Strut Installation

12. Fasten spring strut to Spring Compressor.  
13. Ensure that hooks are properly seated Compress front spring.

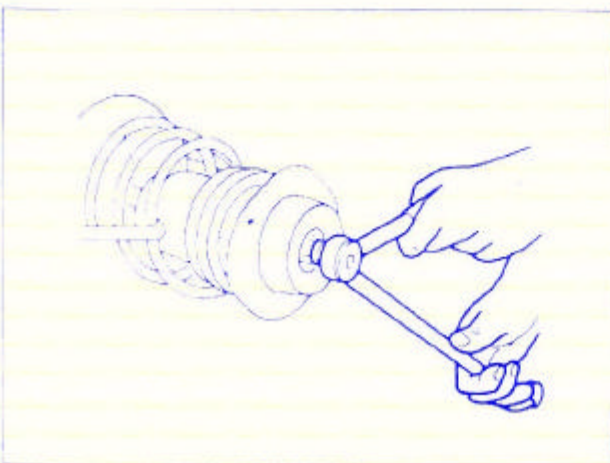


Fig. 31 Support Bearing Removal

14. Counterhold on piston rod (spring strut cartridge). Unscrew support bearing (ball bearing) using ring spanner. Use commercially available double rim spanner (span 19mm/0.75 in), sharply offset.  
15. Remove support bearing assembly with ball bearing from piston rod (spring strut cartridge).

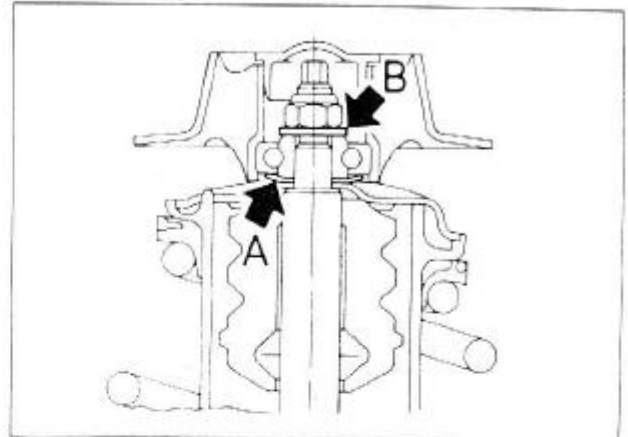


Fig. 32 Ball Bearing Assembly Installation

16. Lubricate ball bearing with bearing grease. Support bearing is only supplied as a assembly with ball bearing. This assembly may not be disassembled.  
17. Push support bearing assembly on to piston rod (spring strut cartridge). Place metal washer (A) below ball bearing with raised edge on top (ball bearing seal) and thrust washer (B) above ball bearing.

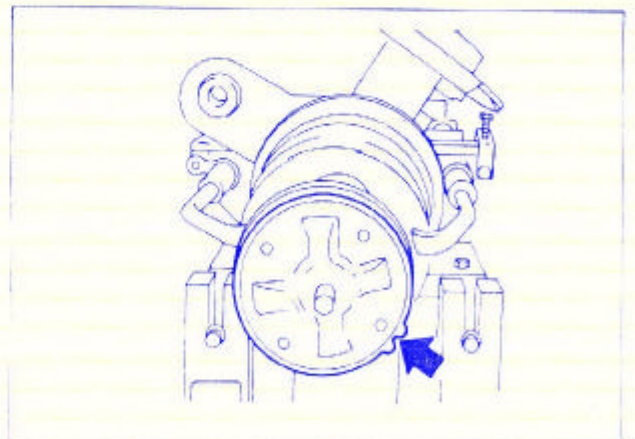


Fig. 33 Spring Mount Alignment

18. Lug on plastic front spring mount serves as installation guide: looking in direction of travel, lug points forwards on spring strut for left side of vehicle; on spring strut for right side of vehicle, lug points backwards.  
19. Tighten nut for support bearing mounting.



important attachment part) using ring spanner — observe prescribed torque!  
Counterhold at piston rod. Use new self-locking nut.

Release front spring.

Install spring strut in vehicle, fastening spring strut(support bearing) to spring strut dome — observe prescribed torque.

Use new self-locking nut.

Insert axle shaft in splines of front wheel hub. Screw castellated nut(washer) loosely onto shaft. Lubricate splines with transmission fluid.

Always use new castellated nut and washer.

Fasten swivel joint to steering knuckle(important attachment part) with castellated nut and secure with retaining clip — observe prescribed torque. Use new retaining clip.

Fasten tie rod joint to steering arm — observe prescribed torque.

Use new self-locking nut.

### **[?] Important**

No play in front wheel bearing.

To fasten the axle shaft to the the front wheel hub proceed as follows :

1. Draw axle shaft into hub with castellated nut (washer) and tighten castellated nut to 100Nm (bolted joint Seats).

Fasten suitable counter holder to hub to act as counterstay.

2. Release castellated nut and retighten to 20 Nm (pre-tension).

3. Tighten castellated nut further by exactly 90°.

4. If split pin and hole are offset, loosen(not tighten) castellated nut to next split pin hole and insert pin.

Fasten brake caliper to steering knuckle — observe prescribed torque.

Coat new screw(not microencapsulated) with locking compound.

Rebore threaded socket to M12×1.5

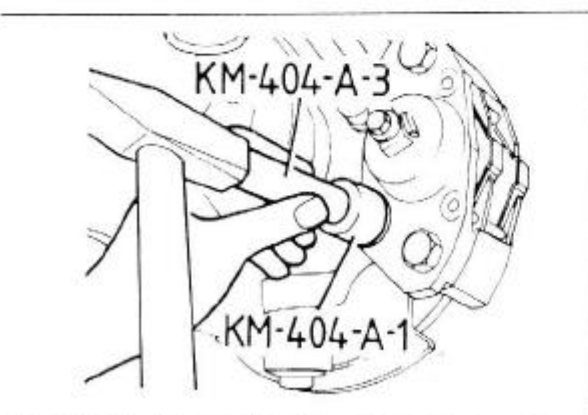


Fig. 34 Protective Caps Installation

Drive on protective caps as far as stop on brake

caliper using KM-404-A-1 and KM-404-A-3.

Use new protective caps.

28. Tighten wheel bolts, alternating crosswise — observe prescribed torque.

## FRONT SPRINGS(STRUT)

### **[⇐] Remove or Disconnect**

1. Remove support bearing(see operation "Support Bearing" in this group).

2. Release tension on front spring and replace.

### **[⇒] Install or Connect**

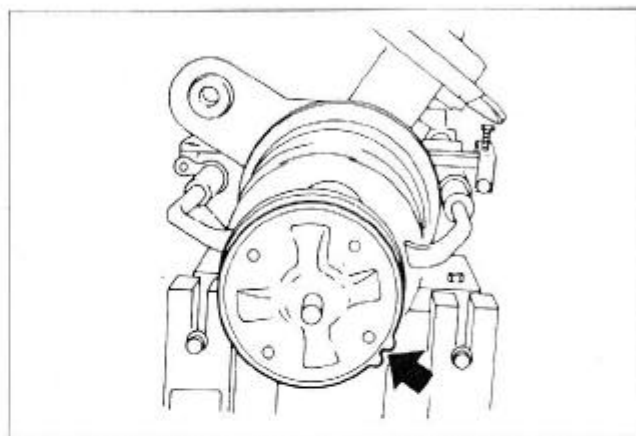


Fig. 35 Spring Mount Alignment

1. Place new front spring on spring strut and compress using KM-465-A together with KM-329-A.

The spring end rests on the stop of the lower spring mounting.

The left and right front springs are identical.

Lug on the plastic front spring mounting serves as an installation guide: looking in the direction of travel, it points forwards on the spring strut for the left side of the vehicle; on the spring strut for the right side it points backwards.

2. Install support bearing(see operation "Support Bearing" in this group.).

## SPRING STRUT CARTRIDGE

### **[⇐] Remove or Disconnect**

1. Remove support bearing(see operation "Support Bearing" in this group).

2. Remove spring washer with damper ring from front spring and stop buffer with synthetic bellows from cartridge piston rod.

3. Remove threaded ring (plate nut) from support tube using KM-563.

### **[?] Important : High torque**

4. Replace spring strut cartridge.



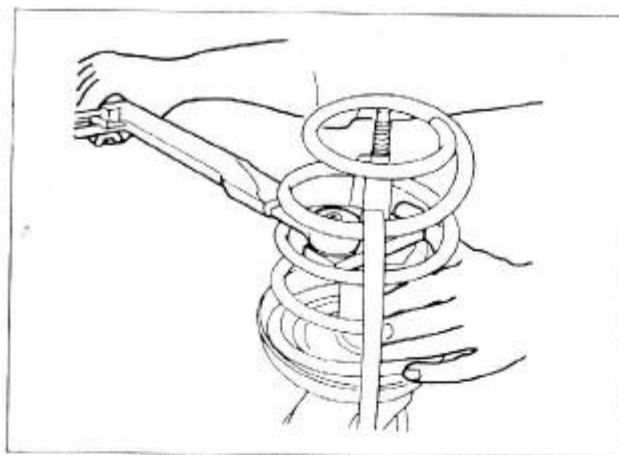


Fig. 36 Spring Strut Cartridge Installation

5. Fasten threaded ring using KM-563.

**[?] Important**

The prescribed torque and the position of the torque wrench at 90° to KM-563.

**NOTICE:** Use new threaded ring (Contained in spring strut cartridge set).

The threaded ring is coated with wax.

Do not remove wax! It serves as a lubricant and corrosion protection.

6. Mount stop buffer on cartridge piston rod and spring mount with damping ring on front spring. The lug on the plastic front spring mount serves as an installation guide: looking in the direction of travel, it points forwards on the spring strut for the left side of the vehicle on the spring strut for the right side it points backwards.
7. Install support bearing (see operation "Support Bearing" in this group)

## CONTROL ARM

**[⇐] Remove or Disconnect**

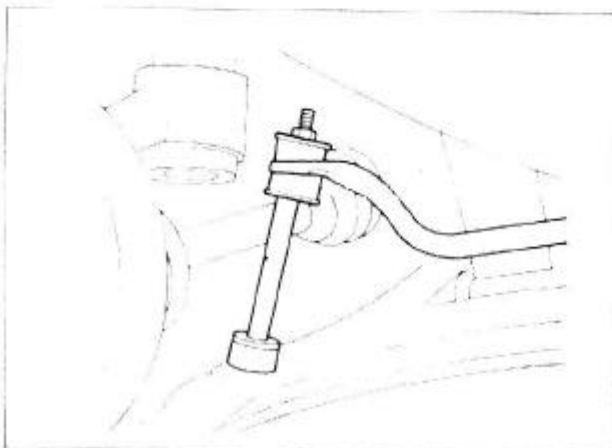


Fig. 37 Control Arm Removal

1. Raise vehicle. Remove front wheel.

2. If installed, unbolt stabilizer from control arm.

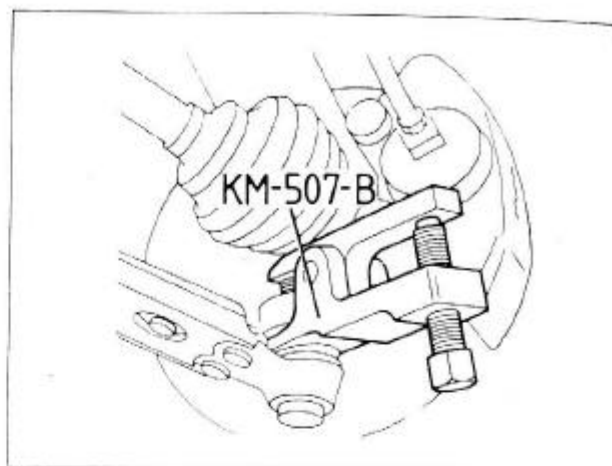


Fig. 38 Swivel Joint Removal

3. Press swivel joint out of steering knuckle using KM-507-B.

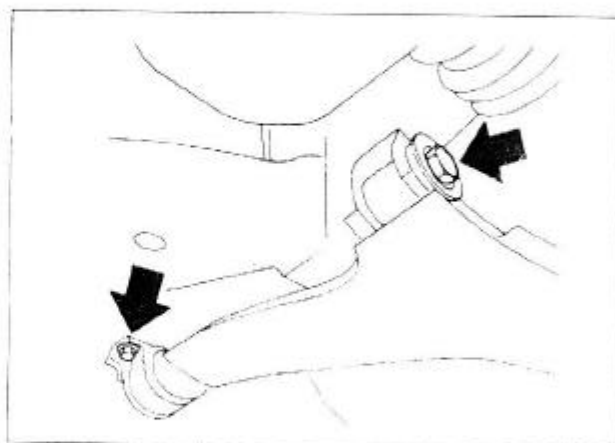


Fig. 39 Control Arm Removal

4. Unbolt control arm from underbody at front and rear.

**[⇒] Install or Connect**

1. Fasten control arm to under body—observe prescribed torque!

**[?] Important**

Raise control arm until it is almost horizontal (damper bushings are free of torsion).

2. Install bolts for front mounting from frontlocking in direction of travel. Use new selflocking nuts.
3. For rear mounting, coat two bolts (not microencapsulated) with sealing compound. The space between the holes of the mounting cover is 87mm/3.43 in. The cover must rest against the shoulder of the damper bushing.

The flattened surface of the rear damper bushing must rest against the floor panelling. Fasten swivel joint to steering knuckle with castellated nut and secure with new safety clamp—important attachment part, observe prescribed torque.

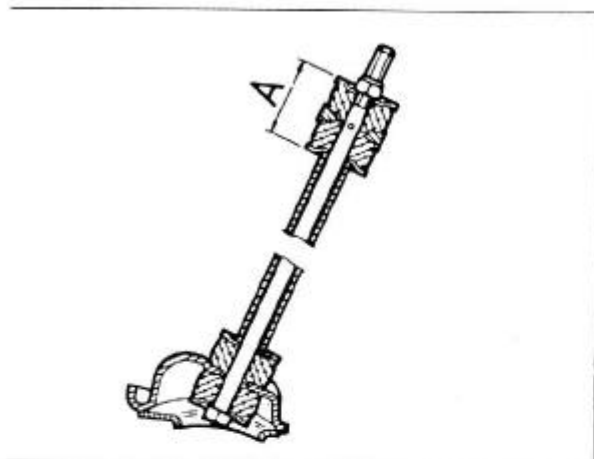


Fig. 40 Stabilizer Link

If installed, fasten stabilizer to control arm. Maintain preload dimension "A" ( $A=38$ ). If required, replace rubber buffer. The collar of the respective rubber buffer is seated in the stabilizer eye or the control arm. Use new self-locking nuts. Tighten wheel bolts, alternating crosswise—observe prescribed torque.

## REAR DAMPER BUSHINGS IN CONTROL ARM

### Remove or Disconnect

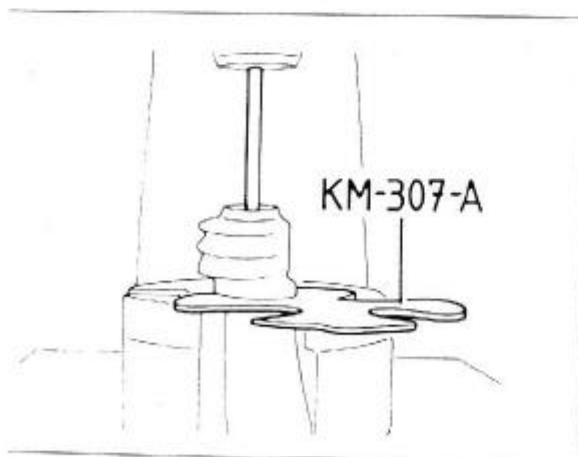


Fig. 41 Damper Bushing Removal

Remove control arm (see operation "Control arm" in this group). Force rear damper bushing out from under press

using suitable drift. To do this, place KM-307-A underneath.

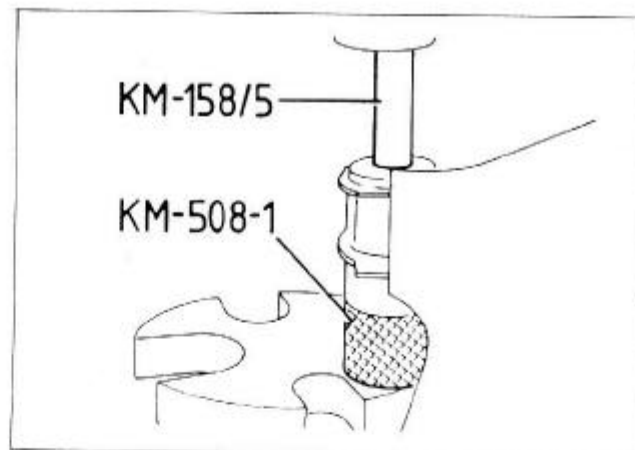


Fig. 42 Front Control Arm Bearing Removal

3. Press out front damper bushing from front to back using KM-158/5 and KM-508-1.

### Install or Connect

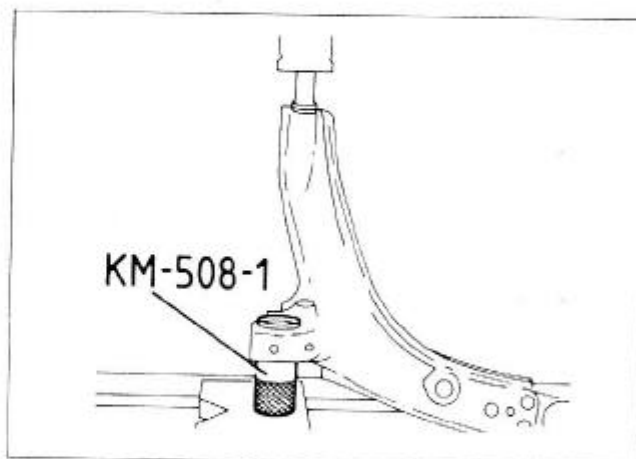


Fig. 43 Damper Bushing Installation.

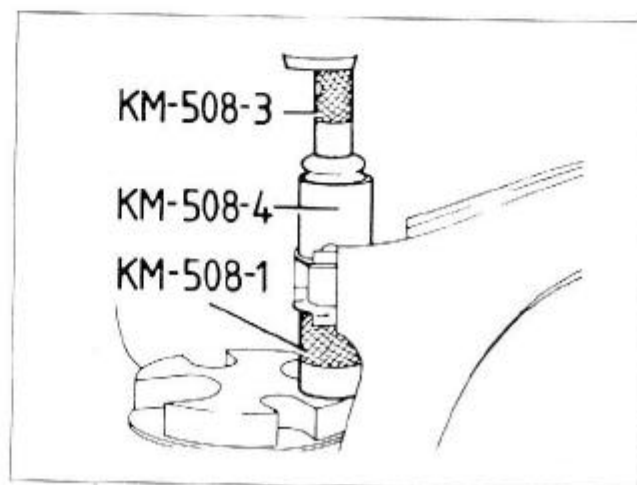


Fig. 44 Damper Bushing Removal

1. Press on new rear damper bushing as far as stop. To do this, place KM-508-1, underneath. Coat control arm pin with soap solution. Flattened surface of bushing faces towards swivel joint pin.
2. Press in new front damper bushing from front to rear using KM-508-1, -3 and -4—locking in direction of travel. The rubber bead of the bushing must project equally on either side after installation.
3. Install control arm(see operation "Control Arm" in this group).

## SWIVEL JOINT ON CONTROL ARM

### ☐ Remove or Disconnect

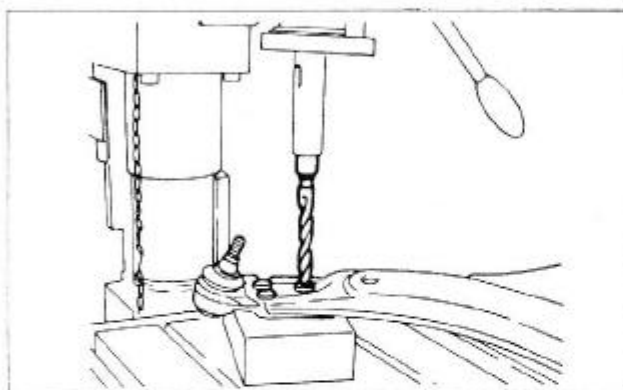


Fig. 45 Ball Joint Rivets

1. Remove control arm(see operation "Control Arm" in this group).
2. Drill off heads of three rivets attaching swivel joint to control arm using 12mm drill. Position drill on side of rivet head with centre mark.

### ☐ Install or Connect

#### ☐ Important

The new swivel joint supplied by Customer Service is bolted to the control arm(not riveted on).

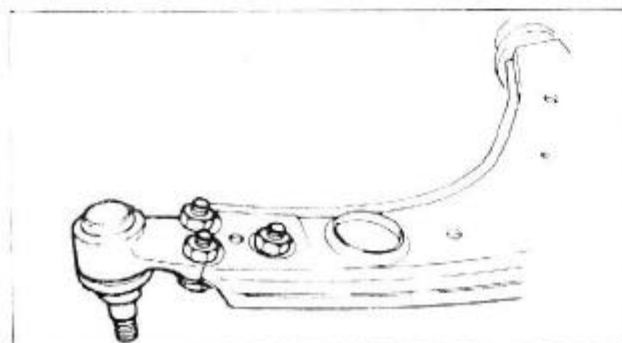


Fig. 46 Ball Joint Bolts

1. Fasten new swivel joint to control arm with bolts and self-locking nuts—observe prescribed torque.

#### ☐ Important

Install nuts from underside of control arm. The swivel joint is maintenance free, is only supplied as an assembly and cannot be disassembled.

2. Install control arm(see operation "Control Arm" in this group.)

## STABILIZER

### ☐ Remove or Disconnect

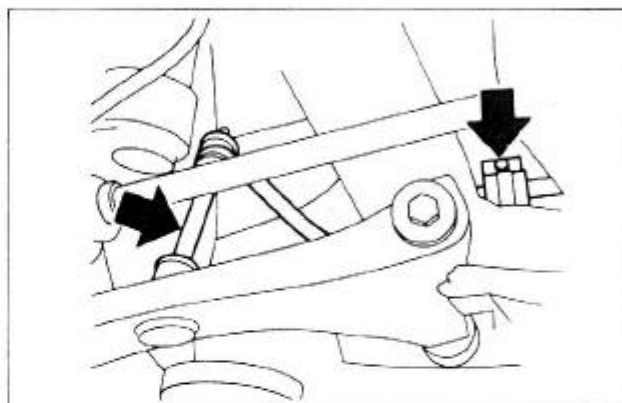


Fig. 47 Stabilizer Shaft Removal

1. Raise vehicle.
2. Unbolt stabilizer from both control arms.
3. Unbolt stabilizer left and right from dash panel.
4. Turn front wheels and remove stabilizer from side.

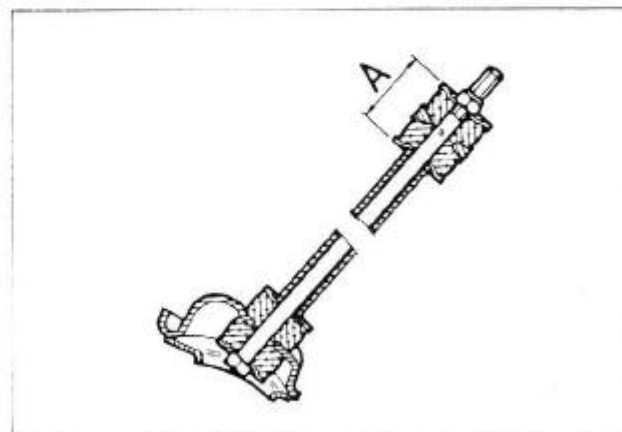


Fig. 48 Stabilizer Link

### ☐ Install or connect

1. Fasten new stabilizer left and right centrally to dash panel—observe prescribed torque. If required, replace rubber bearing. Dip rubber bearing in silicon lubricant.

Fasten stabilizer to left and right control arms.  
Maintain preload dimension "A"(A=38).  
If required, replace rubber buffer.

The collar of the rubber buffer is seated in the stabilizer eye or the control arm.  
Use new self-locking nuts.

## SPECIFICATIONS

### RIM HEIGHT

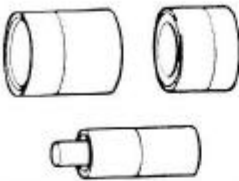
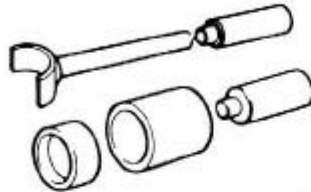
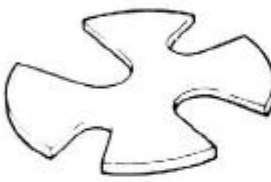
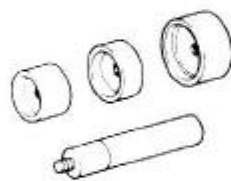

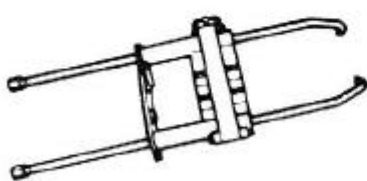
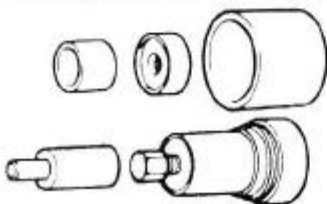
|                                     |       |
|-------------------------------------|-------|
| Locker Panel, Rear to Ground .....  | 191mm |
| Locker Panel, Front to Ground ..... | 195mm |

### TORQUE


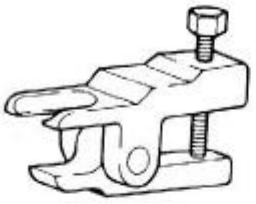
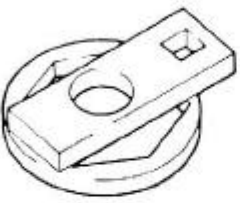
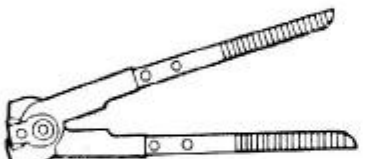
|   |       |
|---|-------|
| Stabilizer Shaft to Body Clamp Bolts .....  | 40Nm  |
| Wheel Bolts .....                           | 90Nm  |
| Strut Assembly to Body Nuts .....           | 25Nm  |
| Lower Ball Joint to Strut/Knuckle Nut ..... | 70Nm  |
| Stabilizer Rod to Knuckle Nut .....         | 60Nm  |
| Disc to Wheel Hub Screw .....               | 4Nm   |
| Control Arm Mounting Bolts—Rear .....       | 70Nm  |
| Control Arm Mounting Bolts—Front .....      | 140Nm |
| Ball Joint Nut .....                        | 70Nm  |
| Strut Cartridge Closure Nut .....           | 200Nm |

| FRONT WHEEL ALIGNMENT SPECIFICATIONS   |                |                                     |                 |
|--|----------------|-------------------------------------|-----------------|
| VEHICLE  | OPERATION      | SERVICE CHECKING                    | SERVICE SETTING |
| ESPERO   | CASTER (FRONT) | $1^{\circ}45' \pm 1^{\circ}$<br>(A) | NOT ADJUSTABLE  |
|  | CAMBER (FRONT) | $-25' \pm 45'$<br>(A)               | NOT ADJUSTABLE  |
|  | CAMBER (REAR)  | $-45' \sim -10'$                    | NOT ADJUSTABLE  |
|  | TOEIN (FRONT)  | $-1\text{mm} \sim 1\text{mm}$       | 0               |
|  | TOEIN (REAR)   | $-1\text{mm} \sim 3\text{mm}$       | NOT ADJUSTABLE  |
| See wheel alignment requirements<br>(A) Deviation from left to right side of vehicle: 1° max |                |                                     |                 |

## SPECIAL TOOLS

| Figure  | Tool No. and Function  |
|---|--|
|    | <p><b>KM-508-A Remover/Installer</b><br/>To remove and install front damper bushing in lower control arm together with KM-158/5.</p>                 |
|    | <p><b>KM-158 Remover/Installer</b><br/>To remove and install front damper bushing in lower control arm with drift part 5 together with KM-508-A.</p> |
|    | <p><b>KM-307-B Remove Plate</b><br/>To press out rear damper bushing from lower control arm.<br/>Use together with suitable drift.</p>               |
|   | <p><b>KM-404-A Installer</b><br/>To install protective caps for side sleeves.</p>  |
|  | <p><b>KM-460-A Removing Forks</b><br/>To knock both drive shaft out of transmission case.</p>  |
|  | <p><b>KM-500-A Front Spring Compressor</b><br/>To compress front spring in conjunction with KM-329-A</p>   |
|  | <p><b>KM-466-A Remover/Installer</b><br/>To remove and reinstall front wheel hub from and on to wheel bearing.</p>                                   |



| Figure   | Tool No. and Function  |
|--|--|
|   | <p>KM-476 Measuring Device<br/>To check steering gear for straight ahead position.</p> |
|   | <p>KM-507 Remover<br/>To remove tie rod end and swivel joint.</p>                      |
|   | <p>KM-563 Nut Wrench<br/>To remove plate from support tube.</p>                        |
|  | <p>KM-J-22610 Installer<br/>To fasten bellows to axle shaft with retaining strap.</p>  |