

# SUSPENSION - FRONT

1988 Toyota Celica

FRONT SUSPENSION  
Toyota

## DESCRIPTION

Vehicles are equipped with front wheel drive and independent MacPherson strut front suspension. Suspension consists of vertically mounted strut assemblies, control arms and a stabilizer bar.

Struts are mounted between the inner fender and steering knuckle. Tie rod ends connect rack and pinion steering to steering knuckle. A ball joint connects the steering knuckle to lower control arm which attaches to frame crossmember. Stabilizer bar attaches to lower control arms and 2 points on the crossmember. On Camry and Tercel, the stabilizer bar acts as a strut rod and permits caster adjustment.

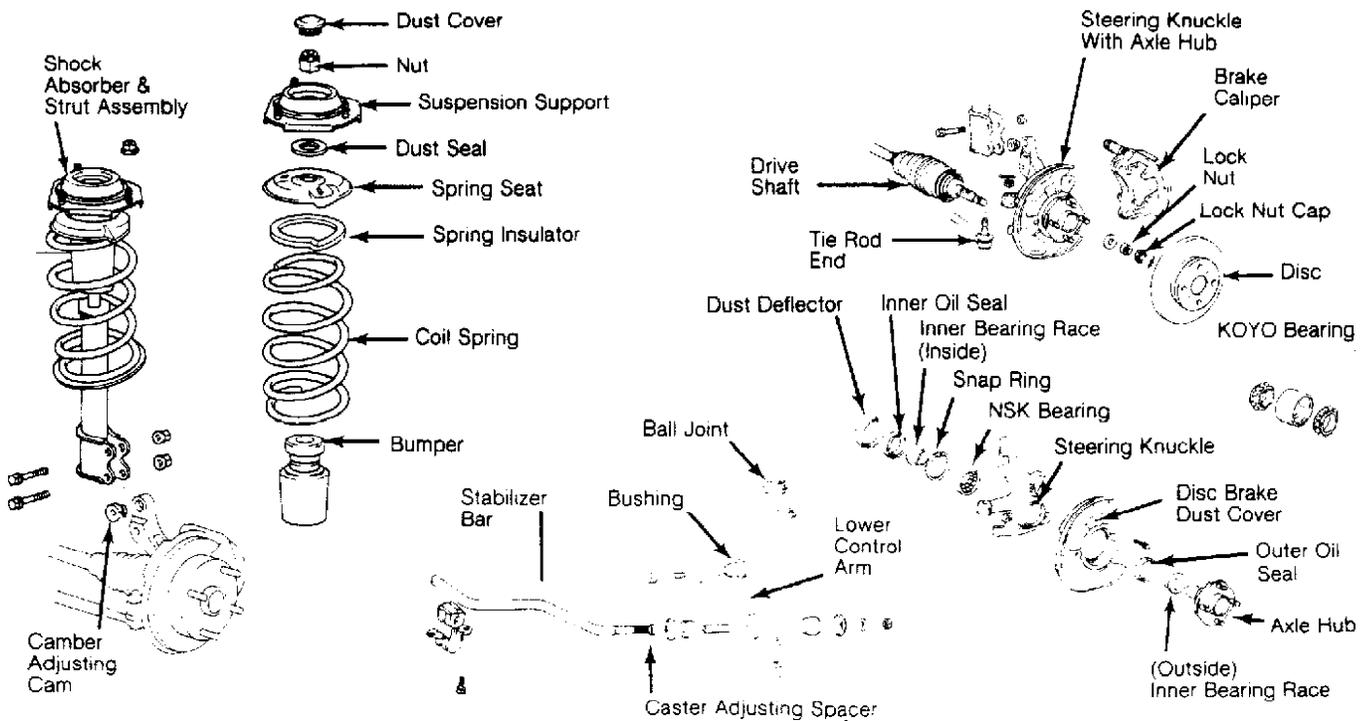


Fig. 1: Tercel Front Suspension Components  
Courtesy of Toyota Motor Sales, U.S.A., Inc.

## ADJUSTMENTS & INSPECTION

### WHEEL ALIGNMENT SPECIFICATIONS & PROCEDURES

See WHEEL ALIGNMENT SPECIFICATIONS & PROCEDURES in WHEEL ALIGNMENT section.

### WHEEL BEARING

Wheel bearings are not adjustable. Whenever bearings are removed, replace with new bearings, races, and oil seals.

## BALL JOINT CHECKING

1) Raise vehicle and place a wooden block with a height of 7.09-7.87" (180.0-200.0 mm) under one front tire. Lower floor jack until there is about half the load of the vehicle on front struts. Place safety stands under vehicle.

2) Position front wheels straight ahead and block them. Use a rod to move control arm up and down. Check for vertical ball joint play. Ball joints are serviceable as a unit only. If damaged or any vertical play is found, replace ball joint.

## REMOVAL & INSTALLATION

### WHEEL BEARING

#### Removal

1) Remove cotter pin, bearing lock nut cap and bearing lock nut (apply brakes when removing lock nut). Remove brake caliper. Do not disconnect brake line. Secure caliper out of the way. Remove disc brake rotor. Remove cotter pin and castle nut from tie rod end.

2) Using Puller (09950-20016) for Camry and Corolla models, Puller (09610-20012) for Tercel models, or Puller (09628-62011) for Celica models, pull tie rod end from steering knuckle. Place reference marks on lower strut bracket and camber adjusting cam.

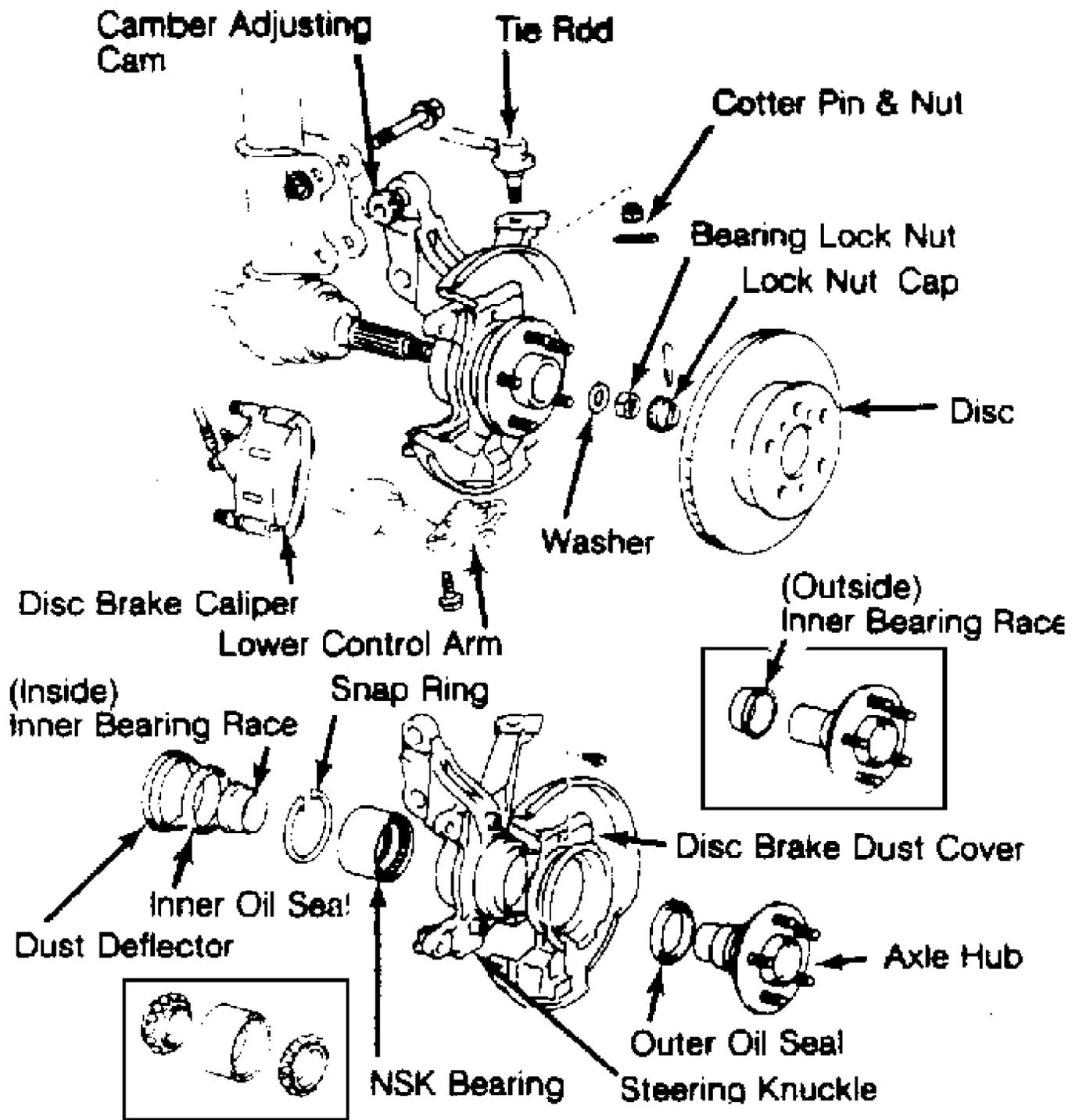
3) Remove bolts and nuts to separate steering knuckle and strut. On Camry and Tercel models, remove 2 bolts holding ball joint to steering knuckle and separate. On Celica and Corolla models, remove 1 bolt and 2 nuts, and separate lower arm from steering knuckle.

4) On all models, use puller to pull axle hub from drive shaft. Cover drive boot with a cloth to prevent damage. On Celica and Corolla models, use Puller (09610-55012) to remove the ball joint from the steering knuckle.

5) Place steering knuckle in a vise and remove dust deflector. Using Seal Puller (09308-00010), pull inner oil seal out of steering knuckle. Remove snap ring from steering knuckle hole.

6) Remove the 3 bolts holding the disc brake dust cover to the steering knuckle. Using puller, push axle hub from steering knuckle. Remove disc brake dust cover. On models equipped with ABS, remove speed sensor rotor from axle hub. Remove inside inner bearing race. Using puller, remove outside inner race from axle hub. Pull outer oil seal from steering knuckle.

7) On all models, install old outside inner race on bearing. On Tercel models, use Fixture (09228-22020) and an arbor press to remove bearing from steering knuckle. On all other models, use Driver (09605-60010) and a hammer to remove bearing.



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Fig. 2: Camry, Celica & Corolla Axle Hub Components  
 Courtesy of Toyota Motor Sales, U.S.A., Inc.

CAUTION: Always replace bearings and races as an assembly.

Installation

- 1) On Camry, Celica and Corolla models use an arbor press and

Seal Driver (09608-32010) to press new bearing into steering knuckle. On Tercel models, use Bearing Driver (09309-35010) to press new bearing into steering knuckle. Place outside inner bearing race on outside bearing.

2) Using seal driver and Bushing Driver (09710-14012) for Camry, Celica and Corolla models, or Seal Driver (09515-35010) for Tercel models, drive new outer oil seal into steering knuckle. Apply sealer to dust cover and steering knuckle connection and assemble.

3) On models equipped with ABS, install speed sensor rotor onto axle hub. Use Bearing Driver (09310-35010) to press hub into steering knuckle. Do not interchange the inner and outer races on Tercel models. Install snap ring into hole of steering knuckle on all models.

4) Using seal driver and Bushing Driver (09710-14012) for Camry, Celica and Corolla models, drive new oil seal flush to the end surface of steering knuckle. On Tercel models, use Seal Driver (09309-35010) to drive inner oil seal .130" (3.3 mm) below the end surface of steering knuckle.

5) On Camry models, use Seal Driver (09223-41020) to drive new dust deflector into steering knuckle. On Tercel models, use Seal Driver (09608-16050). On Corolla models, use Seal Driver (09218-46010). On Celica models, use Seal Driver (09608-35014).

6) On Celica and Corolla models, seat ball joint to steering knuckle by tightening old nut to 14 ft. lbs. (20 N.m). Remove the nut, and install a new nut. Tighten the new nut to specification.

7) On all models, install steering knuckle with axle hub to driveshaft with the washer and nut. Do not tighten the nut. Tighten steering knuckle-to-control arm on Camry and Tercel models to specification. Tighten ball joint-to-lower control arm on Corolla and Celica models to specification.

8) Align reference marks of camber adjusting cam-to-strut. Install steering knuckle to strut. Tighten and torque to specifications.

NOTE: Camry and Corolla model strut bolts are installed from the rear side. Celica and Tercel model strut bolts are installed from the front side.

9) Install disc rotor to axle hub. Tighten and torque brake caliper to steering knuckle bolts to specifications. Install tie rod end to steering knuckle. Tighten to specification. To install wheel bearing lock nut, apply brakes and tighten axle nut on all models to 137 ft. lbs. (186 N.m). Install nut lock cap and new cotter pin. Check wheel alignment.

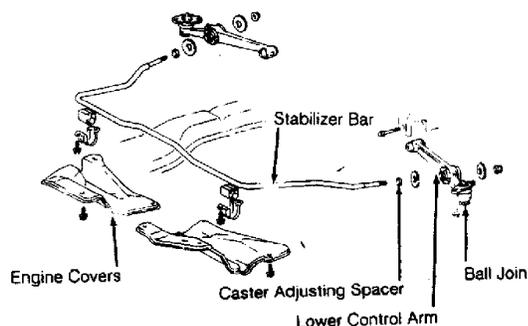


Fig. 3: Camry Lower Control Arm & Stabilizer  
Courtesy of Toyota Motor Sales, U.S.A., Inc.

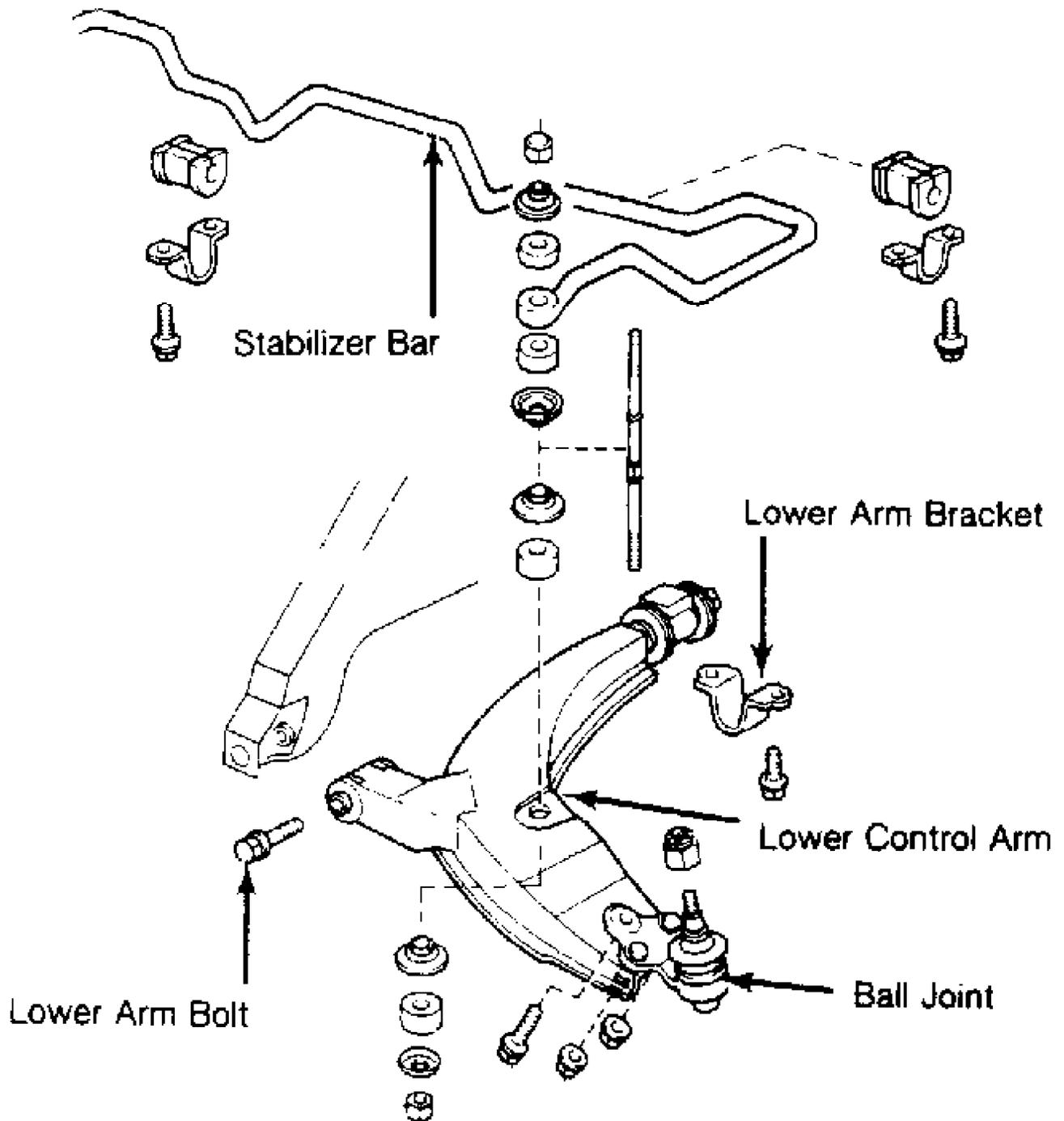


Fig. 4: Corolla Lower Control Arm & Stabilizer  
 Courtesy of Toyota Motor Sales, U.S.A., Inc.

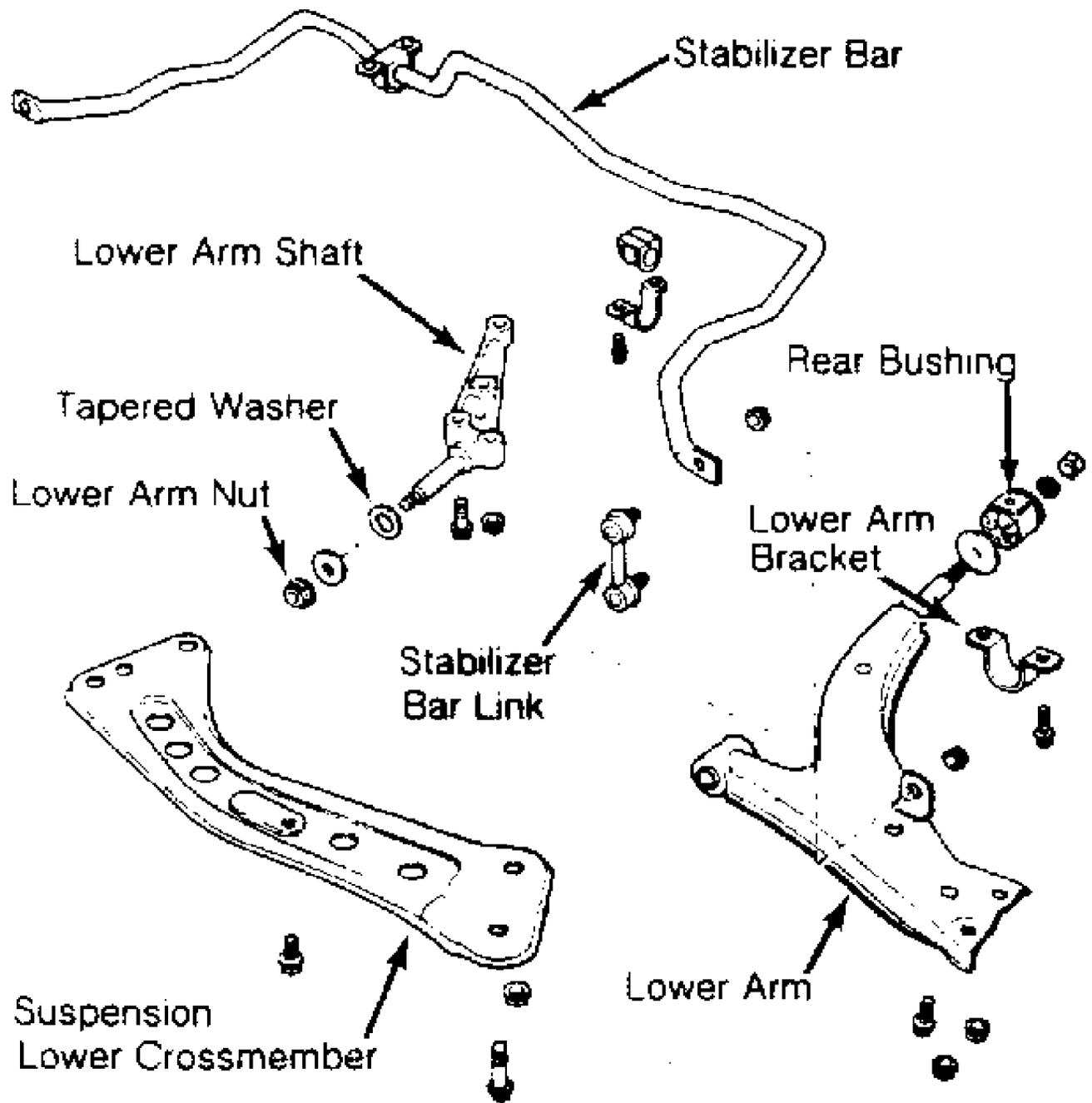


Fig. 5: Celica Lower Control Arm & Stabilizer  
 Courtesy of Toyota Motor Sales, U.S.A., Inc.

### CONTROL ARM & BALL JOINT

#### Removal

1) Raise vehicle and support with jackstands. On Tercel and Camry models remove 2 bolts holding ball joint to steering knuckle and separate. On Celica and Corolla models remove 1 bolt and 2 nuts holding the ball joint to the control arm and separate. On Celica models, remove nut and disconnect stabilizer link from lower arm. On all other models, remove stabilizer bar nut, retainer and cushion from

lower arm.

2) On Celica and Corolla models remove 2 bolts holding the lower arm rear brackets to the frame. Loosen the lower arm bolt (Corolla) or nut and washer (Celica) and remove lower arm. On Celica models only, remove suspension lower crossmember and lower arm shaft.

NOTE: On Celica models equipped with automatic transmission, left side lower control arm must be removed together with lower arm shaft. Remove suspension lower crossmember first before removing lower arm and shaft assembly.

3) On Camry and Tercel models, loosen the lower arm bolt. Pry on arm and pull out bolt. Disconnect lower arm from stabilizer. Be careful not to lose the caster adjusting spacer.

NOTE: On Tercel models, jack up the opposite wheel to remove lower arm.

4) To remove ball joint from lower arm, use ball joint puller. Temporarily install nut to prevent ball joint from falling out of control arm when removing.

#### Installation

1) Reverse removal procedure. Tighten ball joint nut to specification. Replace cotter pin.

2) On all models except Celica, install control arm and finger tighten the bolts and the stabilizer nut. Tighten ball joint to steering knuckle on Camry and Tercel models to specification. Tighten ball joint to lower arm on Corolla models to specification.

3) On Celica models, install lower arm shaft or lower arm shaft/control arm assembly and tighten shaft nut and bolt to specification. Ensure shaft washer tapered side faces body. Install lower suspension crossmember and tighten the fasteners to specification. Tighten ball joint to lower control arm to specification. Finger tighten lower arm nut, rear bracket bolts and stabilizer bar link nut.

4) Install wheels and lower vehicle. Bounce vehicle to settle the suspension. Tighten stabilizer bar nut to specification. Tighten lower arm bolts on Camry and Tercel models to specification. Tighten Corolla lower arm rear bracket bolts and lower arm bolt to specification. Tighten Celica lower arm nut and lower arm rear bracket bolts to specification. Check alignment.

## CONTROL ARM BUSHING

#### Removal (Camry & Tercel)

1) Before removing control arm bushing, cut off excess rubber from flange. Using a hammer and a chisel, bend bushing flange inward.

2) Using a pair of pliers, bend and break off flange. Using an arbor press and Fixture (09726-32010), press bushing from control arm.

#### Installation (Camry & Tercel)

When installing control arm bushing, there must be no oil or grease on bushing or arm boss. Using an arbor press and Fixture (09726-32010), press bushing into control arm boss.

#### Removal (Celica & Corolla)

On a vise. Remove nut, retainer and bushing from control arm.

#### Installation (Celica & Corolla)

Install new bushing, retainer and nut. Tighten nut to specification.

## STRUT ASSEMBLY

### Removal

1) On Camry and Corolla models only, disconnect brake tube from flexible brake hose. Drain brake fluid into a container. Remove 2 clips and 2 "E" rings. Remove 2 bolts from the brake caliper and remove the caliper. Do not disconnect the flexible brake hose from the caliper assembly.

2) On Celica models, remove union bolt and 2 washers and disconnect brake hose from disc brake caliper. Drain fluid into a container. Remove clip from brake hose and pull off hose from bracket.

3) On all models, place reference marks on strut lower bracket and camber adjusting cam. Remove the 2 nuts and bolts and separate strut from steering knuckle.

4) Remove dust cover from top of strut. Loosen strut support nut on Tercel models only. On all models, remove 3 nuts holding top of strut to body. Remove strut from vehicle.

CAUTION: When removing strut, cover drive shaft boot with a cloth for protection.

### Disassembly

1) Install a bolt and 2 nuts to the strut lower bracket to prevent distortion of strut shell when clamped. Clamp bottom of strut in a vise.

2) Using Compressor (09727-22032), compress coil spring. Hold the spring seat with Lever (09729-22031) and remove strut rod top nut. Remove components.

### Inspection (Corolla)

Inspect for leaks or damage. Pull up shock absorber piston rod at a constant rate to see if tension is even throughout length of pull. Rapidly move piston up and down .20-.39" (5.0-10.0 mm) to see if there is a change in tension. If shock is defective, replace as an assembly.

### Inspection (Camry, Celica & Tercel)

Inspect for leaks or damage. Push the piston rod in fully and release it. The rod should return at a constant speed throughout the stroke. Check for abnormal resistance or noise when compressing the rod. If shock is defective, replace as an assembly.

CAUTION: Be sure and discharge the gas in the shock by loosening the ring nut 2 or 3 turns before discarding. Use Shock Absorber Wrench (09720-00011) on ring nut.

### Installation

1) To install, reverse removal procedure. On Celica, Corolla and Camry models, ensure "OUT" mark on spring seat faces towards the outside of the vehicle. On Celica, Corolla and Camry models, tighten support nut to specification. On Tercel models, install nut but do not tighten.

2) Install strut to body. Tighten and torque the 3 nuts to specification.

3) Install strut to steering knuckle and tighten bolts. See step 8) in WHEEL BEARING INSTALLATION in this article.

4) On Tercel, tighten support nut to specification. On all models, install dust cover after packing bearing in suspension support with grease. Bleed brakes. On Celica models, ensure flexible brake hose peg aligns with caliper hole. On all models, check front end alignment. See WHEEL ALIGNMENT section.

## STABILIZER BAR

### Removal (Camry)

Remove covers below engine. Remove the 2 hole covers and the 8 bolts from the center engine mounting members. Remove stabilizer brackets from body. Disconnect bar from lower arms. Note positions of bushings and spacers. Remove the stabilizer bar. It may be necessary to remove one of the lower control arms to remove stabilizer.

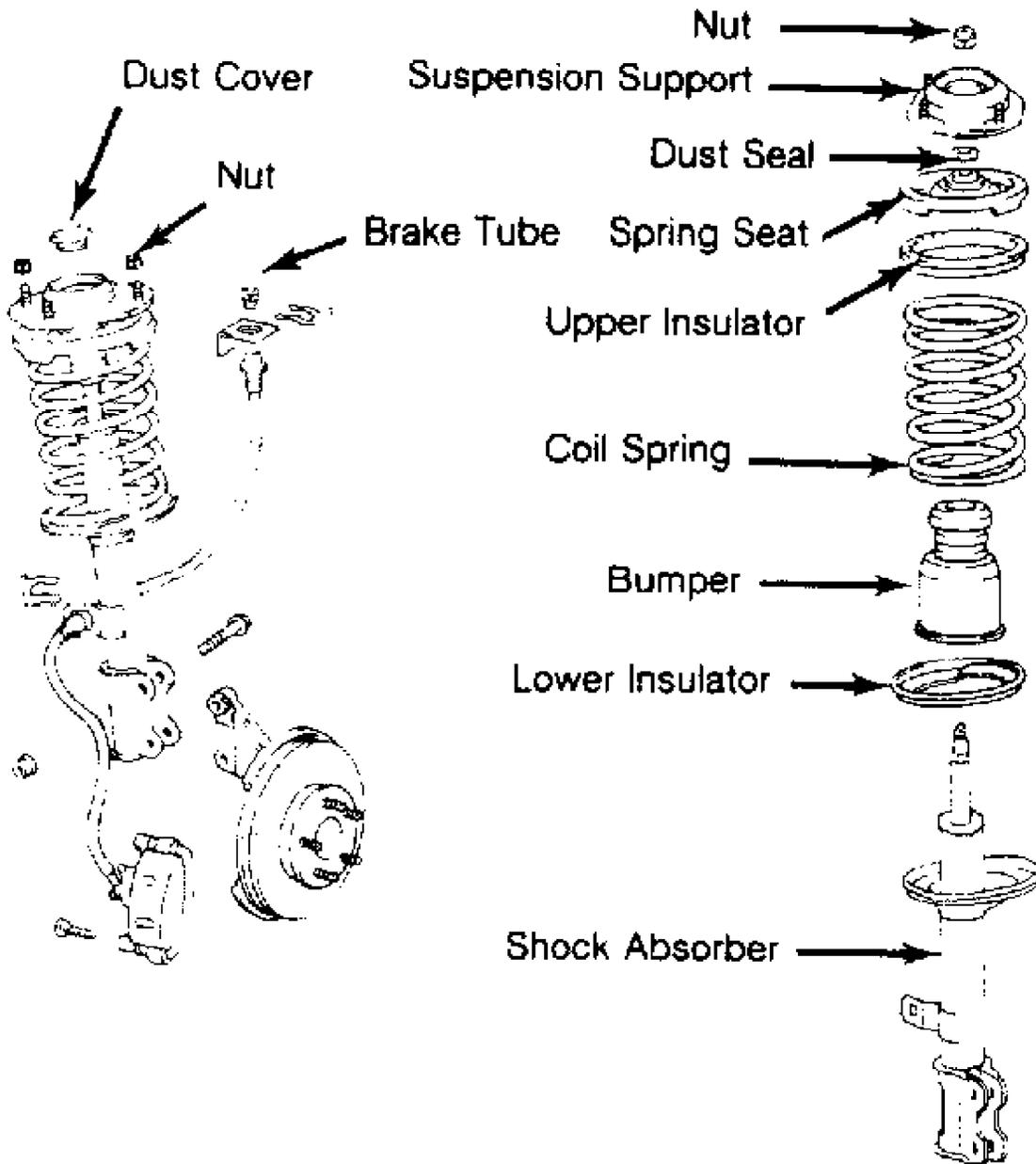


Fig. 6: Camry & Corolla Shock Absorber  
 Courtesy of Toyota Motor Sales, U.S.A. Inc.

### Removal (Celica)

Disconnect stabilizer link from lower arm and stabilizer bar.

Remove both brackets from body. On models equipped with 4WD, mark driveshaft flange for installation reference and remove drive shaft. Disconnect exhaust pipe from manifold. Disconnect exhaust pipe from tail pipe hanger ring. Remove stabilizer bar. Inspect stabilizer link ball joint arms. If movement of arms is not free in all directions, replace stabilizer link.

Removal (Corolla)

Disconnect bar from lower arms. Remove brackets from body. Disconnect exhaust pipe from exhaust manifold. Remove stabilizer.

Removal (Tercel)

Remove covers below engine. Remove brackets from crossmember. Disconnect both ends from lower arms, noting positions of bushings and spacers. Remove stabilizer bar.

Installation (All Models)

To install, reverse removal procedure. On Camry, tighten center engine mounting member bolts to 29 ft. lbs. (39 N.m). On all models, check wheel alignment. See WHEEL ALIGNMENT section.

## TORQUE SPECIFICATIONS

### TIGHTENING SPECIFICATIONS TABLE

Application	Ft. Lbs. (N.m)
<b>Camry</b>	
Axle Shaft Flange Bolts	
4WD .....	48 (65)
2WD .....	27 (36)
Axle Nut .....	137 (186)
Ball Joint-to-Control Arm Nut .....	67 (91)
Ball Joint-to-Knuckle Bolts .....	94 (127)
Brake Caliper Bolts .....	86 (117)
Control Arm-to-Body Bolt .....	156 (212)
Control Arm-to-Steering Knuckle .....	156 (212)
Stabilizer Bar Bracket Bolts .....	94 (127)
Stabilizer-to-Control Arm Nut .....	86 (117)
Steering Knuckle-to-Strut .....	166 (226)
Strut Assembly Top Support Nut .....	34 (47)
Strut Assembly-to-Body Nuts .....	47 (64)
Tie Rod End-to-Steering Knuckle .....	36 (49)
<b>Celica</b>	
Axle Shaft Flange Bolts	
4WD .....	48 (65)
2WD .....	27 (36)
Axle Nut .....	137 (186)
Ball Joint-to-Knuckle Nut .....	82 (111)
Ball Joint-to-Lower Arm .....	94 (127)
Brake Caliper-to-Knuckle .....	70 (95)
Brake Hose-to-Caliper .....	22 (30)
Control Arm Bushing Nut .....	76 (103)
Control Arm Bracket-to-Body .....	72 (98)
Crossmember Bolts (4) .....	156 (212)
Crossmember Nuts (2) .....	29 (39)
Drive Shaft Flange Bolts .....	54 (74)
Exhaust Pipe-to-Manifold .....	46 (62)
Exhaust Pipe-to-Tail Pipe .....	32 (43)
Knuckle-to-Strut .....	152 (206)
Lower Arm Shaft-to-Body .....	154 (208)
Lower Arm Nut .....	156 (212)

Stabilizer Link-to-		
Lower Arm & Bar .....	26	(35)
Stabilizer Bracket-to-Body .....	14	(19)
Strut Assembly Top Support Nut .....	34	(47)
Strut Assembly-to-Body Nuts .....	47	(64)
Tie Rod-to-Knuckle .....	36	(49)
Corolla		
Axle Shaft Flange Bolts .....	27	(36)
Axle Nut .....	137	(186)
Ball Joint-to-Steering Knuckle .....	82	(111)
Ball Joint-to-Control Arm .....	47	(64)
Brake Caliper Bolts .....	65	(88)
Control Arm Bracket-to-Body Bolts .....	64	(87)
Control Arm-to-Body Bolt .....	105	(142)
Control Arm Bushing Nut .....	76	(103)
Stabilizer Bar Nut .....	13	(18)
Steering Knuckle-to-Strut .....	105	(142)
Strut Assembly Top Support Nut .....	34	(47)
Strut Assembly-to-Body Nuts .....	23	(31)
Stabilizer Bracket Bolts .....	14	(19)
Tie Rod End-to-Steering Knuckle .....	36	(49)
Tercel		
Axle Nut .....	137	(186)
Ball Joint-to-Control Arm Nut .....	59	(80)
Ball Joint-to-Knuckle Bolts .....	59	(80)
Brake Caliper Bolts .....	70	(95)
Control Arm-to-Body Bolt .....	105	(142)
Stabilizer Bar Bracket Bolts .....	32	(44)
Stabilizer-to-Control Arm Nut .....	78	(105)
Steering Knuckle-to-Strut .....	105	(142)
Strut Assembly Top Support Nut .....	34	(47)
Strut Assembly-to-Body Nuts .....	23	(31)
Tie Rod End-to-Steering Knuckle .....	36	(49)

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