

1997-2001 SUSPENSION

Rear - Corvette

DESCRIPTION

NOTE: For information on electronic Real Time Damping (RTD) suspension, see **ELECTRONIC - REAL TIME DAMPING** article.

Corvette uses an independent rear suspension. The main components consist of a lightweight fiberglass transverse spring mounted to the crossmember and lower control arms. The main components are as follows: Rear suspension knuckles, lower control arms, upper control arms, rear suspension toe links crossmember and driveshaft support tube. See **Fig. 1**.

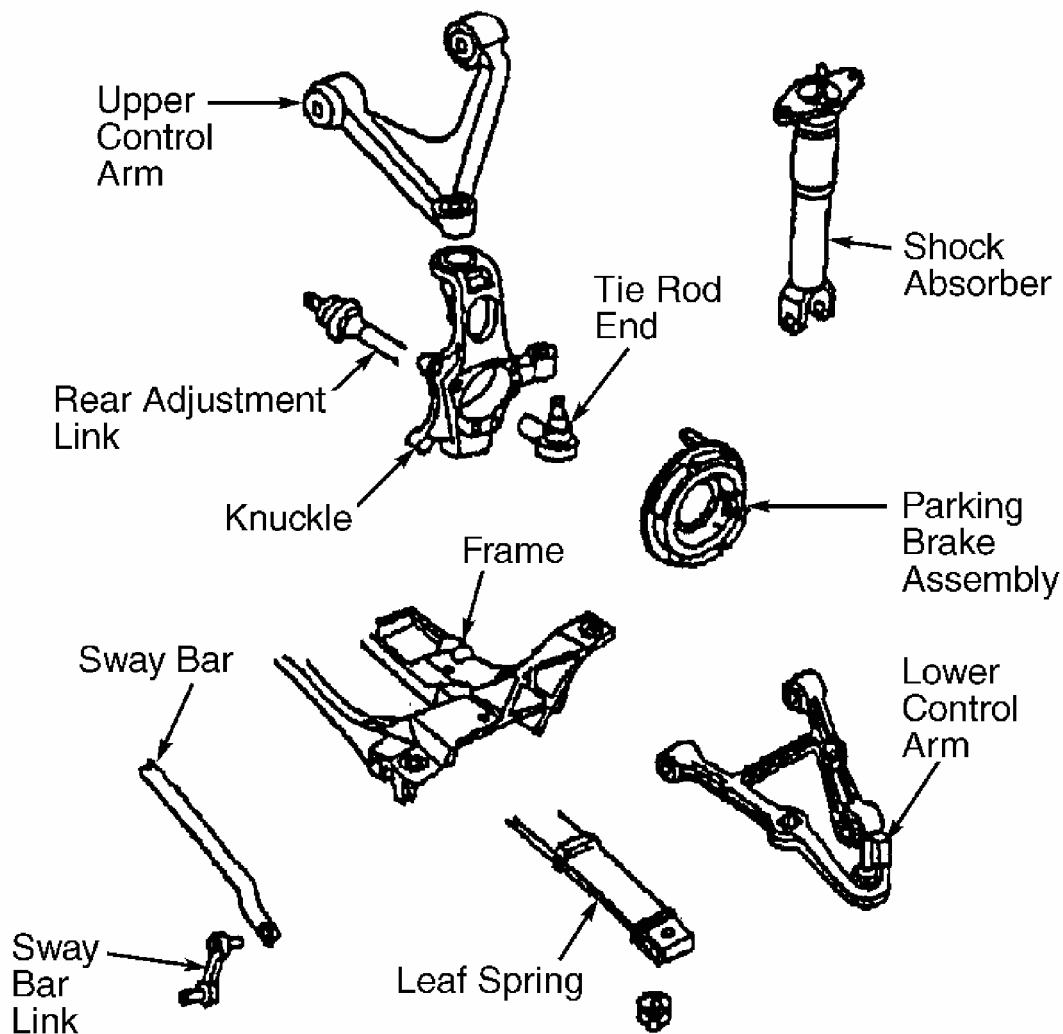


Fig. 1: Exploded View Of Rear Suspension
Courtesy of GENERAL MOTORS CORP.

ADJUSTMENTS & INSPECTION

WHEEL ALIGNMENT

NOTE: See appropriate **SPECIFICATIONS & PROCEDURES** article in **WHEEL ALIGNMENT**.

BALL JOINT

Inspection

Raise and support vehicle. Grasp top and bottom of tire. Shake tire and wheel assembly. Feel for movement at the stud end of ball joint. Inspect for worn or damaged ball studs. Inspect for worn or damaged knuckles. Repair or replace any damaged component. Lower vehicle.

WHEEL BEARING

Inspection

NOTE: Hub and bearing assemblies are pre-adjusted and prelubricated, and require no routine maintenance or adjustment. If faulty, replace as a complete assembly.

1. Raise and support vehicle. Remove tire and wheel assembly. Mount Dial Indicator (J8001) to knuckle with button on surface of disc rotor .5" (13.0 mm) from rotor edge. Zero dial indicator. Push and pull on rotor, observe dial reading. If dial indicates more than .005" (.13 mm), bearing must be replaced. See **HUB & BEARING** under REMOVAL & INSTALLATION.
2. Remove brake rotor. See appropriate DISC article in BRAKES. Clean expose surface with Hub Cleaner (J42450-A). Mount dial indicator so button contacts vertical surface of hub at outer edge. Zero dial indicator. Rotate hub one revolution, observe dial indicator. If runout exceeds .0015" (.04 mm), bearing must be replaced. See **HUB & BEARING** under REMOVAL & INSTALLATION.

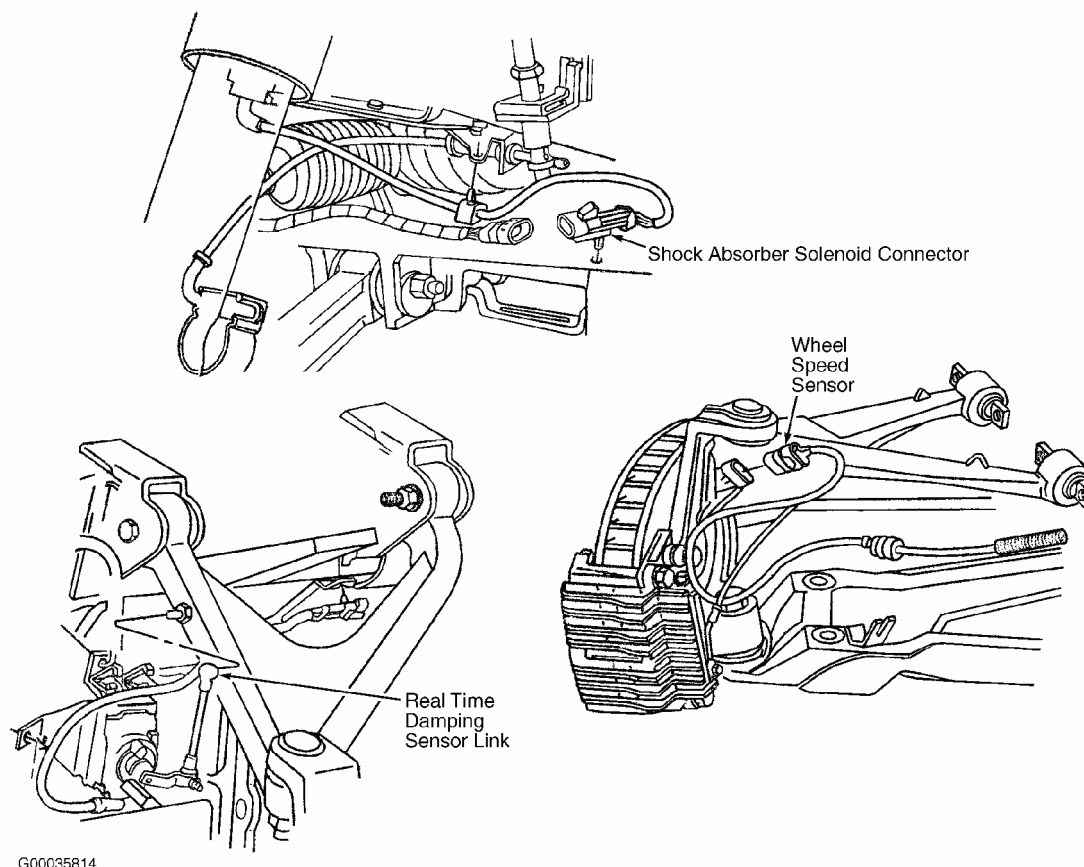
REMOVAL & INSTALLATION

CAUTION: Use correct fastener in correct location. Ensure replacement fasteners are correct part number for that application. Fasteners requiring replacement or use of thread locking compound are specified in service procedure. Do not use paints, lubricants, or corrosion inhibitors on fasteners or joint surfaces unless specified.

UPPER BALL JOINT

Removal

1. Place transmission in Park (A/T) or Neutral (M/T). Apply parking brake. Raise and support vehicle. Remove wheel and tire assembly. Remove wheel spindle nut retainer, nut and washer. Release parking brake. Disconnect wheel speed sensor. Disconnect Real Time Damping (RTD) sensor (if equipped). Remove shock absorber solenoid connector (if equipped). See **Fig. 2** Remove brake caliper and rotor. See appropriate DISC BRAKE article in BRAKES.
2. Separate tie rod end from suspension knuckle. See **TIE ROD** . Disconnect upper control arm from suspension knuckle. See **UPPER CONTROL ARM** . Disconnect lower control arm from suspension knuckle. See **LOWER CONTROL ARM** . Remove suspension knuckle from vehicle.
3. Remove ball joint from suspension knuckle, using Ball Joint Removal Kit (J9519-E), and Upper Ball Joint Removal Adapter (J21474-5A).



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Fig. 2: Identifying Rear Suspension Electronic Connectors
Courtesy of GENERAL MOTORS CORP.

Installation

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Using ball joint removal kit and Upper Ball Joint Installation Adapter (J28685), install ball joint into suspension knuckle. To complete installation, reverse removal procedure. Tighten all fasteners to specification. See **TORQUE SPECIFICATIONS** . Perform rear wheel alignment. See SPECIFICATIONS & PROCEDURES article in WHEEL ALIGNMENT.

LOWER BALL JOINT

Removal & Installation

Remove lower control arm from vehicle. See **LOWER CONTROL ARM** . Remove ball joint from lower control arm using Ball Joint Removal Kit (J9519-E) and Lower Ball Joint Removal Kit (J9519-98). To install, reverse removal procedure. Use ball joint removal kit and Ball Joint Installation Kit (J9519-99) for installation. Tighten all fasteners to specification **TORQUE SPECIFICATIONS** .

UPPER CONTROL ARM

Removal

1. Raise and support vehicle. Remove wheel and tire assembly. Disconnect wheel speed sensor. Disconnect real time damping sensor link (if equipped). See **Fig. 2** .
2. Support lower control arm with jack stand. Use Ball Joint Separator (J 42188) to separate suspension knuckle from upper control arm. Loosen, but do not remove upper ball joint stud nut. Remove ball joint separator and ball joint stud nut from ball joint stud.
3. Remove upper control arm to frame bolts. Remove upper control arm from vehicle.

Installation

To install, reverse removal procedure. It may be necessary to use an Allen wrench to keep ball joint stud from spinning while tightening ball joint stud nut. Tighten fasteners to specification. See **TORQUE SPECIFICATIONS** . Perform rear wheel alignment. See SPECIFICATIONS & PROCEDURES article in WHEEL ALIGNMENT.

LOWER CONTROL ARM

Removal

NOTE: **Measure and record transverse spring stud height for reassembly reference.**

1. Raise and support vehicle. Remove wheel and tire assembly. Measure transverse spring stud height.
2. Install Spring Compressor (J33432-A) onto transverse spring. Compress spring. Remove transverse spring to lower control arm nuts, bolts and insulators. Remove spring from control arm.

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3. Support lower control arm with jackstand. Disconnect shock absorber from lower control arm. Loosen, but do not remove lower ball joint stud nut. Separate lower ball joint stud from knuckle using Ball Joint Separator (J42188). Remove separator and stud nut from ball joint stud from knuckle.
4. Disconnect stabilizer shaft link from control arm. Mark position of lower control arm cam bolts and nuts for future reference. Remove lower control arm cam bolts. Remove lower control arm.

Installation

NOTE: **Tighten lower control arm bolts. DO NOT torque to final specification prior to wheel alignment.**

To install, reverse removal procedure. It may be necessary to use an Allen wrench to keep ball joint stud from spinning while tightening ball joint stud nut. Place lower control arm cam bolts at position marked during removal. Perform a rear wheel alignment. See SPECIFICATIONS & PROCEDURES article in WHEEL ALIGNMENT. Tighten fasteners to specification. See **TORQUE SPECIFICATIONS** .

HUB & BEARING

NOTE: **The front and rear wheel hub/wheel speed sensors are not interchangeable. When replacing a wheel hub/wheel speed sensor, be sure to use correct wheel hub/wheel speed sensor part number.**

Removal

1. Shift transmission into Park (A/T) or Neutral (M/T). Apply parking brake. Raise and support vehicle. Remove wheel and tire assembly. Remove spindle nut retainer, spindle nut and washer from drive shaft. Release parking brake. Disconnect wheel speed sensor. Disconnect shock absorber solenoid connector (if equipped). Disconnect real time damping sensor link (if equipped). See **Fig. 2** . Remove brake caliper and rotor. See appropriate DISC article in BRAKES.
2. Disconnect outer tie rod end from suspension knuckle. See **TIE ROD** . Separate upper control arm from knuckle. See **UPPER CONTROL ARM** . Separate lower control arm from knuckle. See **LOWER CONTROL ARM** . Remove suspension knuckle.
3. Remove wheel hub to knuckle mounting bolts. Remove hub and bearing assembly from suspension knuckle.

Installation

To install, reverse removal procedure. Perform rear wheel alignment. See appropriate SPECIFICATIONS & PROCEDURES article in WHEEL ALIGNMENT. Tighten fasteners

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to specification. See **TORQUE SPECIFICATIONS** .

CROSSMEMBER

Removal

1. Raise and support vehicle. Remove wheel and tire assemblies. Disconnect wheel speed sensors. Disconnect real time damping position sensor links (if equipped). Disconnect shock absorber solenoid connectors (if equipped). See **Fig. 2** . Remove transverse spring. See **TRANSVERSE SPRING** .
2. Support crossmember with transmission jack. Remove stabilizer shaft. See **STABILIZER SHAFT** . Disconnect tie rod ends from knuckle assemblies. See **TIE ROD** . Remove transaxle lower mount nuts.
3. Disconnect shock absorbers from lower control arms. Loosen, but do not remove lower ball joint stud nuts. Disconnect lower control arms from rear suspension knuckles. Remove rear drive CV joints from differential housing. Support suspension knuckles and drive shafts.
4. Disconnect all electrical connectors from crossmember. Disconnect brake lines from crossmember. Support transaxle under transmission pan with jack. Remove rear crossmember mounting nuts. Remove rear crossmember.

Installation

To install, reverse removal procedure. Align crossmember dowel pins to frame. Align transaxle mount studs to crossmember. Use NEW crossmember mounting nuts. Tighten all fasteners to specification. See **TORQUE SPECIFICATIONS** .

SHOCK ABSORBER

WARNING: Gas charged shock absorbers contain high pressure gas. Do not remove snap ring from inside top of tube. If removed, contents of shock will come out with extreme force which may result in personal injury.

Removal

1. Raise and support vehicle. Remove wheel and tire assembly. Disconnect rear shock absorber solenoid connector (if equipped). See **Fig. 2** .
2. Remove shock absorber to lower control arm bolt. Remove upper shock absorber mounting bolts. Remove shock absorber. Remove upper insulator retainer and insulator from shock absorber.

Inspection

Push on shock absorber, check for smooth operation through full stroke, both compression

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and extension. Shock absorber should move freely. If it does not, gas is leaking, and shock absorber should be replaced.

Installation

To install, reverse removal procedure. Tighten all fasteners to specification. See **TORQUE SPECIFICATIONS** .

TRANSVERSE SPRING

Removal & Installation

CAUTION: Do not scratch spring coating.

Raise and support vehicle. Remove wheel and tire assembly. Measure transverse spring stud height. Install Spring Compressor (J33432-A) and compress spring. disconnect spring from lower control arms. Disconnect spring from crossmember. Remove Spring from vehicle. To install, reverse removal procedure. Set transverse spring stud height to that measured during removal. Tighten all fasteners to specification. See **TORQUE SPECIFICATIONS** .

TIE ROD

Removal & Installation

Raise and support vehicle. Remove wheel and tire assembly. Loosen, but do not remove tire rod end stud nut. Install Ball Joint Separator (J42188) between knuckle and tie rod. Separate ball joint and remove tool and tire rod stud nut. Remove tie rod from knuckle. Loosen jam nut on rear suspension adjustment link. Remove tie rod end from suspension adjustment link. To install, reverse removal procedure. See **TORQUE SPECIFICATIONS** . Prior to tightening rear suspension adjustment jam nut, adjust rear wheel toe. See appropriate SPECIFICATIONS & PROCEDURES article in WHEEL ALIGNMENT.

STABILIZER SHAFT

Removal & Installation

Raise and support vehicle. Remove wheel and tire assembly. Remove stabilizer link nuts from stabilizer. Remove stabilizer to crossmember nuts, clamps and bolts. Remove stabilizer shaft. Remove insulators from stabilizer shaft. To install, reverse removal procedure. Use NEW insulators on stabilizer shaft. Tighten all fasteners to specification. See **TORQUE SPECIFICATIONS** .

STABILIZER SHAFT LINK

Removal & Installation

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Raise and support vehicle. Remove wheel and tire assembly. Remove stabilizer shaft link nut from lower control arm. Remove stabilizer shaft link nut from stabilizer shaft. Remove stabilizer link. To install, reverse removal procedure. Tighten fasteners to specification. See **TORQUE SPECIFICATIONS** .

TORQUE SPECIFICATIONS**TORQUE SPECIFICATIONS**

Application	Ft. Lbs. (N.m)
Lower Control Arm Bolt	
Front	107 (145)
Rear	70 (95)
Lower Control Arm Joint Stud Nut	
Step 1	15 (20)
Step 2	3.5 flats
Step 3	41 (56)
Tie Rod End Stud Nut	
Step 1	15 (20)
Step 2	160 Degrees
Step 3	33 (48)
Rear Crossmember Mounting Nuts ⁽¹⁾	81 (110)
Rear Drive Axle Spindle Nut	118 (160)
Rear Suspension Adjustment Link Nut	44 (60)
Shock Absorber Mounting Bolt	
Lower	162 (220)
Upper	22 (30)
Stabilizer Shaft Insulator Clamp Nut	
Lower	70 (95)
Upper	49 (66)
Stabilizer Shaft Link Nuts	53 (72)
Tie Rod End Jam Nut	44 (60)
Transverse Spring Mounting Bolts	46 (62)
Upper Control Arm Ball Joint Stud Nut	
Step 1	15 (20)
Step 2	250 Degrees
Step 3	41 (56)
Upper Control Arm Mounting Bolt	81 (110)
Wheel Hub Mounting Bolts	96 (130)
Wheel Assembly Lug Nut	100 (136)

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(1) Install NEW mounting nuts.