

2009 Suspension

Front Suspension - Journey

DIAGNOSIS AND TESTING

SUSPENSION AND STEERING

CONDITION	POSSIBLE CAUSES	POTENTIAL CORRECTIONS
Front End Whine On Turns	1. Defective Wheel Bearing 2. Incorrect Wheel Alignment 3. Worn Tires 4. Low Power Steering Fluid Level	1. Replace Wheel Bearing 2. Check And Reset Wheel Alignment 3. Replace Tires 4. Fill power steering fluid reservoir to proper level and check for leaks (make sure all air is bled from the system fluid)
Front End Growl Or Grinding On Turns	1. Defective Wheel Bearing 2. Engine Mount Grounding Against Frame Or Body Of Vehicle. 3. Worn Or Broken C/V Joint 4. Loose Wheel Lug Nuts 5. Incorrect Wheel Alignment 6. Worn Tires	1. Replace Wheel Bearing 2. Check For Motor Mount Hitting Frame Rail And Reposition Engine As Required 3. Replace C/V Joint 4. Verify Wheel Lug Nut Torque 5. Check And Reset Wheel Alignment 6. Replace Tires
Front End Clunk Or Snap On Turns	1. Loose Wheel Lug Nuts 2. Worn Or Broken C/V Joint 3. Worn Or Loose Tie Rod Or Ball Joint 4. Worn Control Arm Bushing 5. Loose Sway Bar Or Upper Strut Attachment	1. Verify Wheel Lug Nut Torque 2. Replace C/V Joint 3. Tighten Or Replace Tie Rod End Or Ball Joint 4. Replace Control Arm 5. Tighten Sway Bar Or Upper Strut Attachment To Specified Torque
Front End Popping/Clicking/Snapping During Acceleration After Drive-To-Reverse Shift,	1. Insufficient grease on mating surface of	1. Separate half shaft from hub and bearing and wipe mating

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Reverse-To-Drive Shift Or While Turning	axle half shaft outer C/V joint mating surface to wheel hub/bearing.	surfaces clean. Apply light coating of wheel bearing grease to C/V joint mating surface and reassemble. Tighten hub nut to specified torque.
Front End Whine With Vehicle Going Straight At A Constant Speed	1. Defective Wheel Bearing 2. Incorrect Wheel Alignment 3. Worn Tires	1. Replace Wheel Bearing 2. Check And Reset Wheel Alignment 3. Replace Tires
Front End Growl Or Grinding With Vehicle Going Straight At A Constant Speed	1. Engine Mount Grounding 2. Worn Or Broken C/V Joint	1. Reposition Engine As Required 2. Replace C/V Joint
Front End Whine When Accelerating Or Decelerating	1. Worn Or Defective Transaxle Gears Or Bearings	1. Replace Transaxle Gears Or Bearings
Front End Clunk When Accelerating Or Decelerating	1. Loose Wheel Lug Nuts 2. Worn Or Broken Engine Mount 3. Worn Or Defective Transaxle Gears Or Bearings 4. Worn Or Broken C/V Joint 5. Worn Or Loose Ball Joint 6. Worn Or Loose Control Arm Bushing 7. Loose Crossmember Bolts	1. Verify Wheel Lug Nut Torque 2. Replace Engine Mounts 3. Replace Transaxle Gears Or Bearing 4. Replace C/V Joint 5. Tighten Or Replace Ball Joint 6. Tighten To Specified Torque Or Replace Control Arm 7. Tighten Crossmember Bolts To Specified Torque
Road Wander	1. Incorrect Tire Pressure 2. Incorrect Front Or Rear Wheel Toe 3. Worn Wheel Bearings 4. Worn Control Arm Bushings 5. Excessive Friction In Steering Gear 6. Excessive Friction In Steering Shaft Coupling	1. Inflate Tires To Recommended Pressure 2. Check And Reset Front Wheel Toe 3. Replace Wheel Bearing 4. Replace Control Arm 5. Replace Steering Gear 6. Replace Steering Coupler

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	7. Excessive Friction In Strut Upper Bearing	7. Replace Strut Bearing
Lateral Pull	1. Unequal Tire Pressure 2. Radial Tire Lead 3. Incorrect Front Wheel Camber 4. Power Steering Gear Imbalance 5. Wheel Braking 6. Excessive Cross-Caster	1. Inflate All Tires To Recommended Pressure 2. Rotate or Cross-switch tires - Refer To <u>TIRES/WHEELS - SERVICE INFORMATION</u> 3. Check And Reset Front Wheel Camber 4. Replace Power Steering Gear 5. Correct Braking Condition Causing Lateral Pull 6. Check wheel alignment and adjust as necessary
Excessive Steering Free Play	1. Incorrect Steering Gear Adjustment 2. Worn Or Loose Tie Rod Ends 3. Loose Steering Gear Mounting Bolts 4. Loose Or Worn Steering Shaft Coupler	1. Adjust Or Replace Steering Gear 2. Replace Or Tighten Tie Rod Ends 3. Tighten Steering Gear Bolts To The Specified Torque 4. Replace Steering Shaft Coupler
Excessive Steering Effort	1. Low Tire Pressure 2. Lack Of Lubricant In Steering Gear 3. Low Power Steering Fluid Level 4. Loose Power Steering Pump Belt 5. Lack Of Lubricant In Steering Ball Joints 6. Steering Gear Malfunction 7. Lack Of Lubricant In Steering Coupler	1. Inflate All Tires To Recommended Pressure 2. Replace Steering Gear 3. Fill Power Steering Fluid Reservoir To Correct Level 4. Check and replace automatic belt tensioner as necessary. If drive belt is worn or glazed, replace belt. 5. Lubricate Or Replace Steering Ball Joints 6. Replace Steering Gear 7. Replace Steering Coupler

STANDARD PROCEDURE

LUBRICATION

There are no serviceable lubrication points on the front or rear suspension. The ball joints and tie rod ends are

sealed for life and require no maintenance.

FRONT

DESCRIPTION

DESCRIPTION

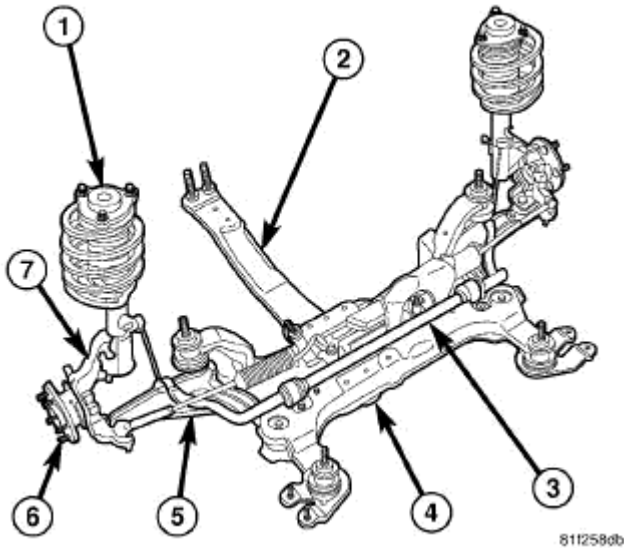


Fig. 1: Front Suspension Components

Courtesy of CHRYSLER LLC

This vehicle has a gas pressurized MacPherson strut type front suspension design.

Each side of the front suspension consists of these major components:

- (1) Strut Assembly
- (2) Fore/Aft Crossmember
- (3) Stabilizer Bar
- (4) Front Suspension Crossmember
- (5) Lower Control Arm
- (6) Hub And Bearing
- (7) Knuckle

Service procedures for the front suspension crossmember and fore/aft crossmember can be found in the **FRAME AND BUMPERS**.

WARNING

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WARNINGS AND CAUTIONS

WARNING: Chrysler LLC does not manufacture any vehicles or replacement parts that contain asbestos. Aftermarket products may or may not contain asbestos. Refer to aftermarket product packaging for product information.

Whether the product contains asbestos or not, dust and dirt can accumulate on brake parts during normal use. Follow practices prescribed by appropriate regulations for the handling, processing and disposing of dust and debris.

WARNING: Do not remove the strut rod nut while strut assembly is installed in vehicle, or before the coil spring is compressed with a compression tool. The spring is held under high pressure.

CAUTION: At no time when servicing a vehicle can a sheet metal screw, bolt, or other metal fastener be installed in the shock tower to take the place of an original plastic clip. It may come into contact with the strut or coil spring.

CAUTION: Wheel bearing damage will result if after loosening the axle hub nut, the vehicle is rolled on the ground or the weight of the vehicle is allowed to be supported by the tires for any length of time.

SPECIFICATIONS

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DESCRIPTION	N.m	Ft. Lbs.	In. Lbs.
Brake Shield	10	7	89
Crossmember Mounting Bolts	135	100	-
Crossmember Reinforcement Bracket Mounting Screws	50	37	-
Hub And Bearing Mounting Bolts	82	60	-
Hub Nut	132	97	-
Lower Ball Joint Stud Nut	95	70	-
Lower Control Arm Front Pivot Bolt	200	148	-
Lower Control Arm Rear Pivot Bolt Nut	145	107	-
Stabilizer Bar Cushion Retainer Screws	60	44	-
Stabilizer Bar Link Nuts	48	35	-
Strut Clevis-to-Knuckle Nuts	140	103	-
Strut Rod Nut	60	44	-
Strut-to-Tower Nuts	55	41	-
Tie Rod Adjuster Jam Nut	75	55	-

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Tie Rod End Knuckle Nut	85	63	-
Wheel Mounting (Lug) Nuts	135	100	-

SPECIAL TOOLS

SPECIAL TOOL

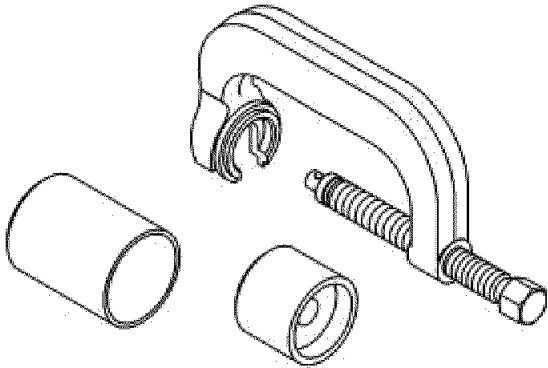


Fig. 2: Remover/Installer 8441
Courtesy of CHRYSLER LLC

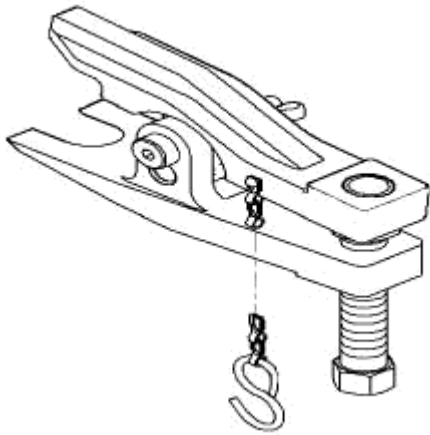


Fig. 3: Remover, Ball Joint 9360
Courtesy of CHRYSLER LLC

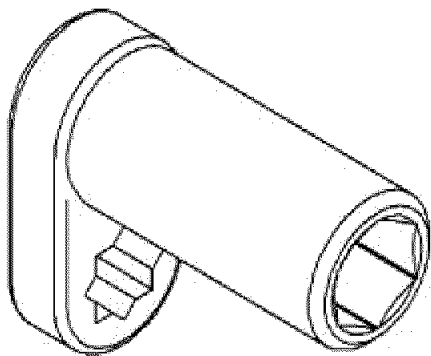


Fig. 4: Wrench, Strut Nut 9362
Courtesy of CHRYSLER LLC



Fig. 5: Remover/Installer 9964
Courtesy of CHRYSLER LLC

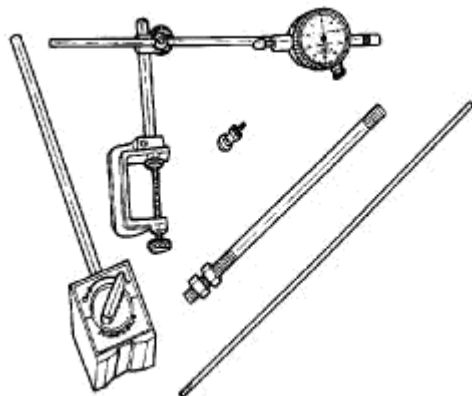


Fig. 6: Dial Indicator C-3339A
Courtesy of CHRYSLER LLC

ARM, LOWER CONTROL

Diagnosis and Testing

LOWER CONTROL ARM

Inspect the lower control arm for signs of damage from contact with the ground or road debris. If the lower control arm shows any sign of damage, look for distortion. Do not attempt to repair or straighten a broken or bent lower control arm. If damaged, the lower control arm is serviced only as a complete component.

Inspect both lower control arm isolator bushings for severe deterioration and replace the lower control arm as required.

Removal

REMOVAL

NOTE: Before proceeding. See WARNINGS AND CAUTIONS .

1. Raise and support the vehicle. Refer to Vehicle Quick Reference/Hoisting - Standard Procedure

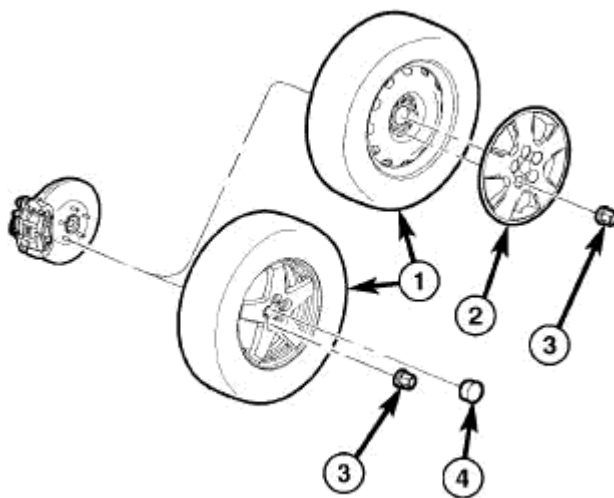


Fig. 7: TIRE AND WHEEL MOUNTING
Courtesy of CHRYSLER LLC

2. Remove the wheel mounting nuts (3), then the tire and wheel assembly (1).

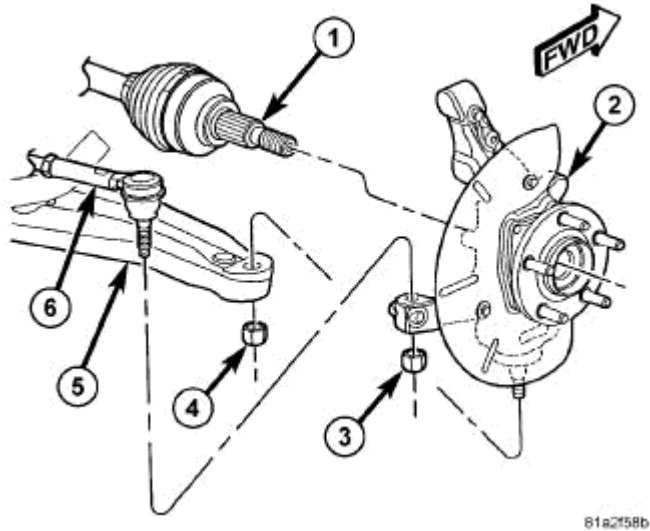


Fig. 8: Front Knuckle Mounting
Courtesy of CHRYSLER LLC

3. Remove the nut (4) attaching the lower ball joint to the lower control arm (5).

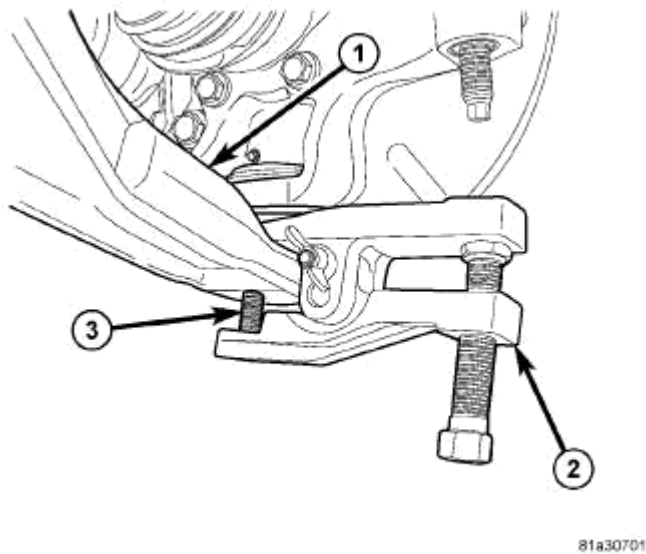


Fig. 9: Using 9360 On Lower Ball Joint
Courtesy of CHRYSLER LLC

4. Release the lower ball joint (3) from the lower control arm (1) using Remover (2) 9360. Do not lift the knuckle out of the lower control arm at this time.

CAUTION: Upon removing the knuckle from the ball joint stud, do not pull outward on the knuckle. Pulling the knuckle outward at this point can

separate the inner C/V joint on the half shaft thus damaging it.

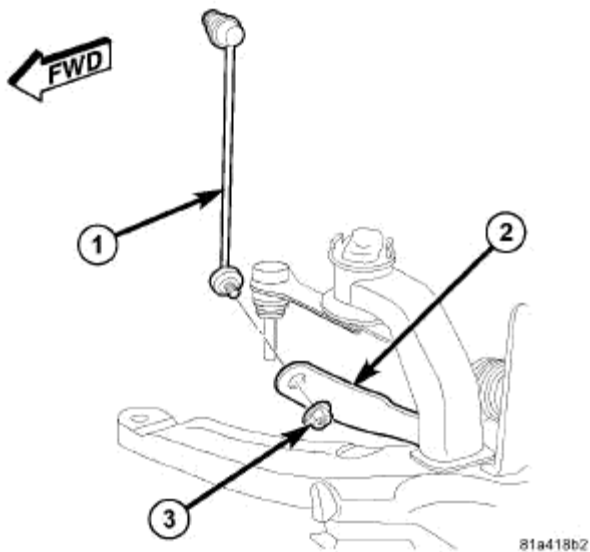


Fig. 10: Stabilizer Link Mounting To Bar
Courtesy of CHRYSLER LLC

5. At each end of the stabilizer bar, while holding the stabilizer bar link (1) lower stud stationary, remove the nut (3) securing the link to the stabilizer bar (2).
6. Rotate the ends of the stabilizer bar (2) upward away from the lower control arm.

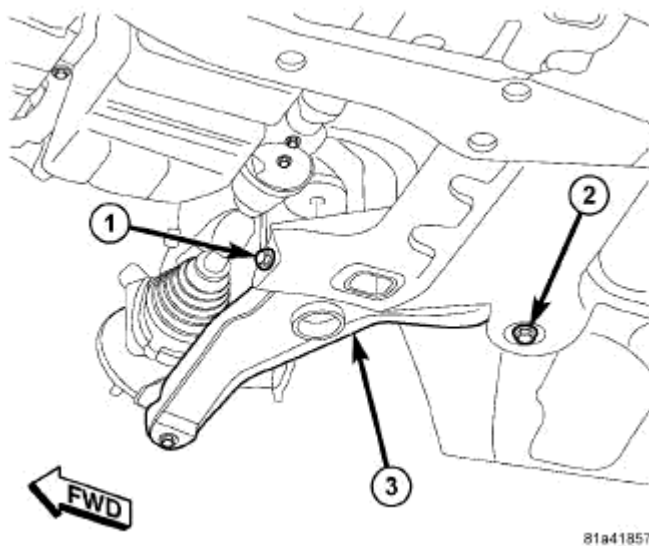


Fig. 11: Lower Control Arm Mounting
Courtesy of CHRYSLER LLC

7. Remove the front bolt (1) attaching the lower control arm (3) to the front suspension crossmember.

8. Remove the nut on the rear bolt (2) attaching the lower control arm (3) to the front suspension crossmember. Remove the bolt.
9. Remove the lower control arm (3) from the crossmember.

Installation

INSTALLATION

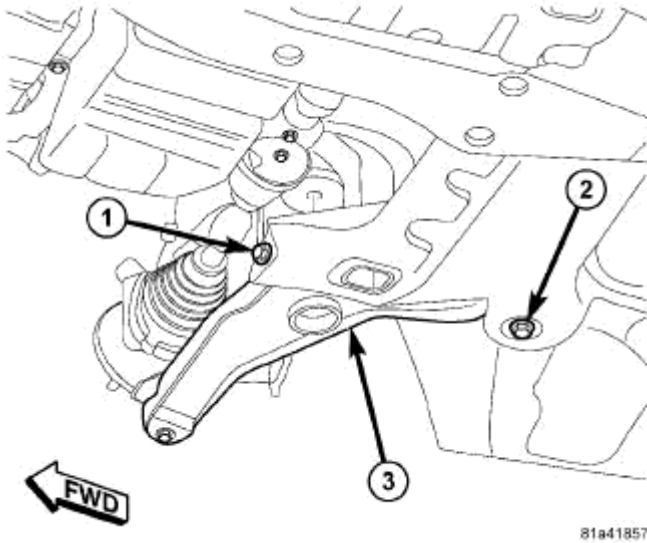


Fig. 12: Lower Control Arm Mounting
Courtesy of CHRYSLER LLC

1. Place the lower control arm (3) into the front suspension crossmember.
2. Insert the rear bolt (2) up through the crossmember and lower control arm (3). Install the nut on the top-end of the bolt, but do not tighten it at this time.
3. Install, but do not fully tighten, the front bolt (1) attaching the lower control arm (3) to the crossmember.
4. With no weight or obstruction on the lower control arm, tighten the lower control arm **front** mounting bolt (1) to 200 N.m (148 ft. lbs.).
5. With no weight or obstruction on the lower control arm, tighten the lower control arm **rear** mounting bolt nut to 145 N.m (107 ft. lbs.).

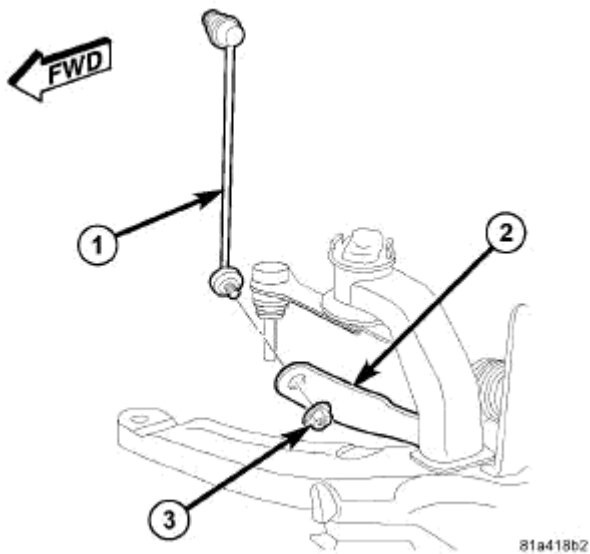


Fig. 13: Stabilizer Link Mounting To Bar
 Courtesy of CHRYSLER LLC

6. Attach the stabilizer bar link (1) at each end of the stabilizer bar (2). At each link, install and tighten the nut (3) while holding the stabilizer bar link lower stud stationary. Tighten the nuts to 48 N.m (35 ft. lbs.).

NOTE: If a new or cleaned lower control arm is being installed, it is important to have a film of general purpose grease around the ball joint mounting hole on the lower control arm to avoid any future corrosion issues. Make sure the grease does not get inside the ball joint mounting hole or on the ball joint stud during installation.

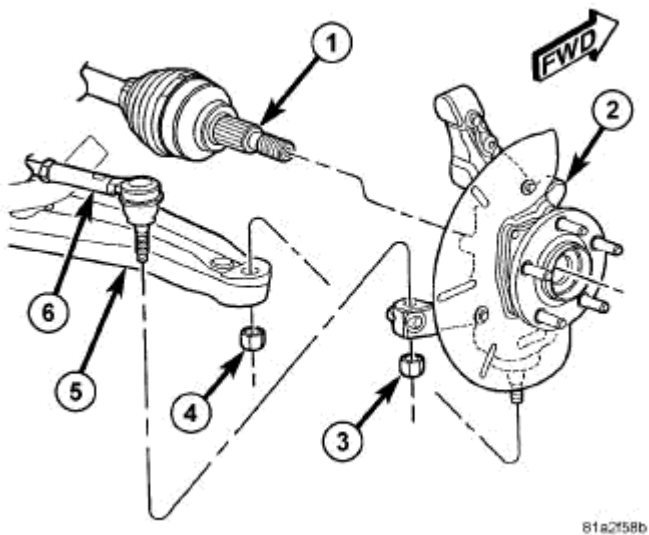


Fig. 14: Front Knuckle Mounting

Courtesy of CHRYSLER LLC

7. Insert the lower ball joint stud into the mounting hole in the lower control arm (5).
8. Install a NEW ball joint stud nut (4). Tighten the nut to 95 N.m (70 ft. lbs.).

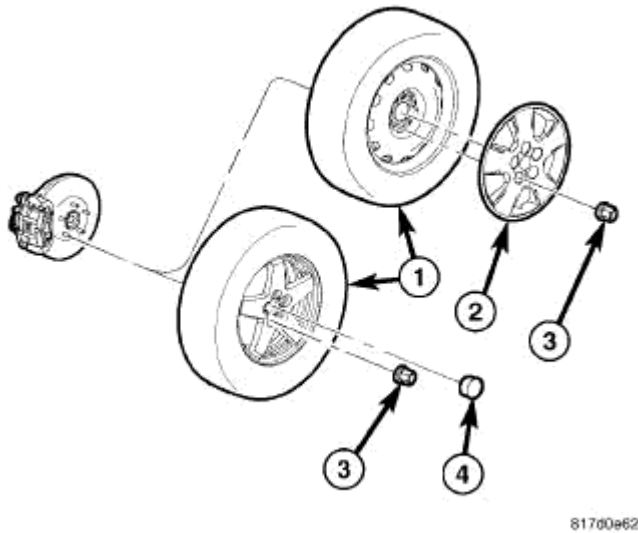


Fig. 15: TIRE AND WHEEL MOUNTING
Courtesy of CHRYSLER LLC

9. Install the tire and wheel assembly (1). Refer to **Tires and Wheels - Installation** . Install and tighten the wheel mounting nuts (3) to 135 N.m (100 ft. lbs.).
10. Lower the vehicle.
11. Perform wheel alignment as necessary. See **Standard Procedure**

BALL JOINT, SUSPENSION, LOWER

Diagnosis and Testing

LOWER BALL JOINT

1. Raise the vehicle allowing the front suspension to hang.
2. Remove the tire and wheel assembly.
3. Using Dial Indicator C-3339A, or equivalent, attach the dial indicator mount to the knuckle and align the dial indicator's plunger with the direction of the stud axis, touching the end of the ball joint stud in the lower control arm.
4. Push up on the lower control arm and zero the dial indicator.

NOTE: Use care when applying load to the knuckle as to avoid damaging the ball joint seal boot.

5. From the front of the vehicle, insert a pry bar between the knuckle and lower control arm, resting it on the lower control arm. Use lever principle to push the knuckle up from the lower control arm. Apply the load until the needle of the dial indicator no longer moves.
6. Record the ball joint movement. The end play is acceptable if no more than 1.0 mm (0.039 in.) of end play is achieved back-to-back.
7. Perform this procedure on each side of the vehicle as necessary.

Removal**REMOVAL**

NOTE: Before proceeding, review all Warnings and Cautions. See **WARNINGS AND CAUTIONS**

1. Raise and support the vehicle. Refer to **Vehicle Quick Reference/Hoisting - Standard Procedure**

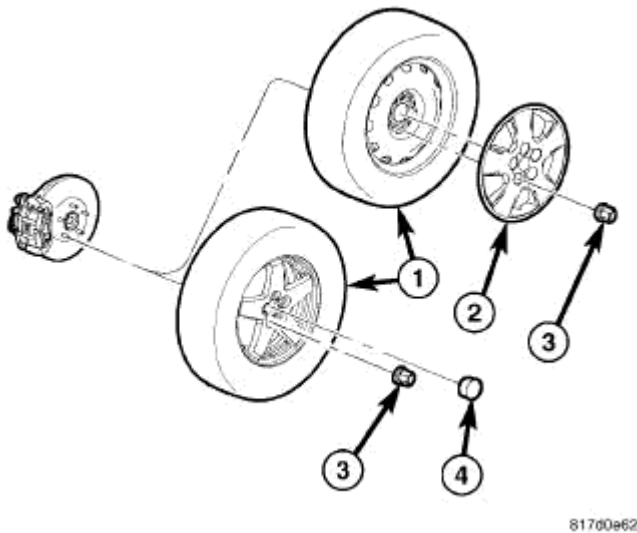


Fig. 16: TIRE AND WHEEL MOUNTING
Courtesy of CHRYSLER LLC

2. Remove the wheel mounting nuts (3), then the tire and wheel assembly (1).

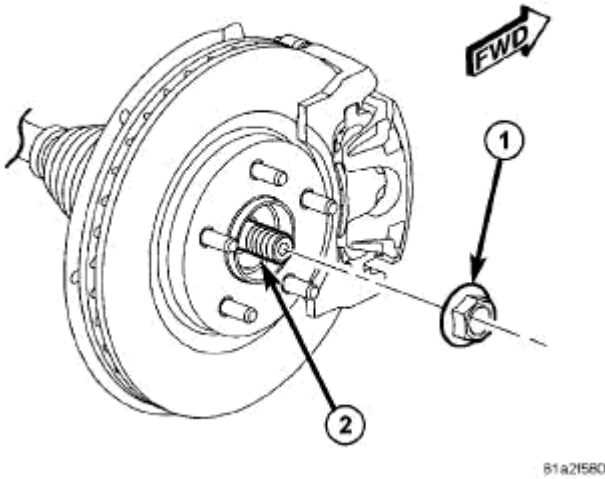


Fig. 17: View Of Hub Nut & Axle Shaft
 Courtesy of CHRYSLER LLC

3. While a helper applies the brakes to keep the hub from rotating, remove the hub nut (1) from the axle half shaft (2).
4. Access and remove the front brake rotor. Refer to **Brakes/Hydraulic/Mechanical/ROTOR, Brake - Removal**

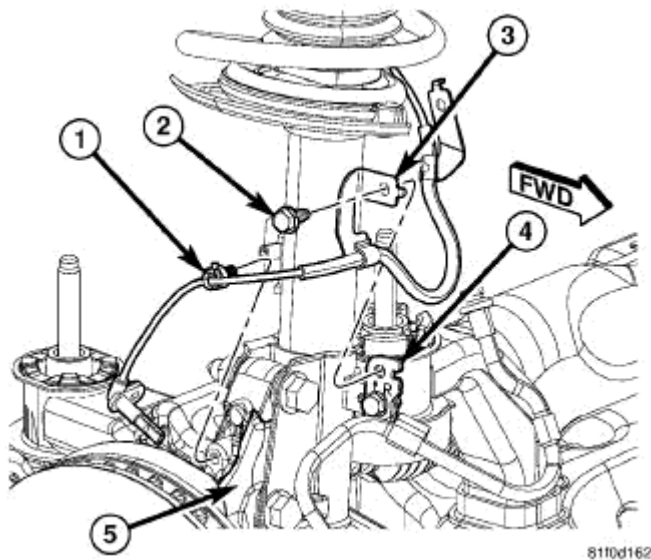


Fig. 18: Wheel Speed Sensor Routing & Brake Flex Hose Bracket
 Courtesy of CHRYSLER LLC

5. Remove the routing clip (1) securing wheel speed sensor cable to the knuckle (5).

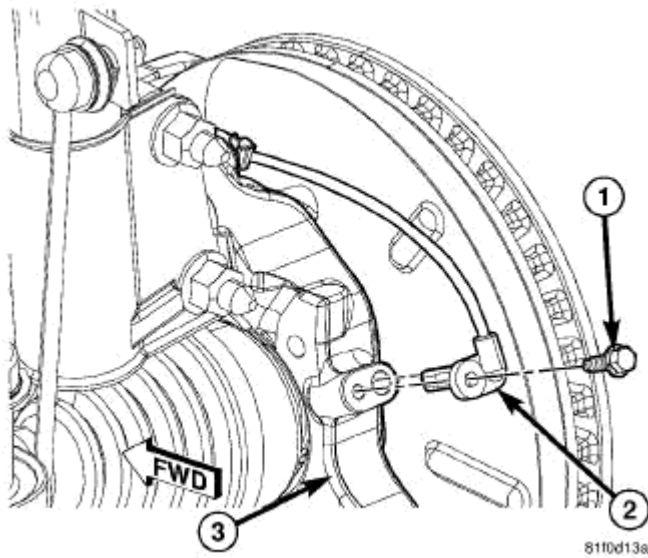


Fig. 19: Front Wheel Speed Sensor
Courtesy of CHRYSLER LLC

6. Remove the screw (1) fastening the wheel speed sensor head (2) to the knuckle (3). Pull the sensor head out of the knuckle.

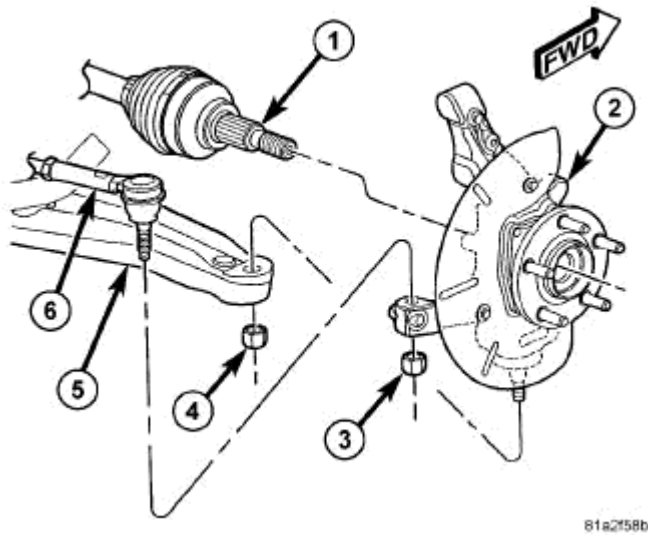
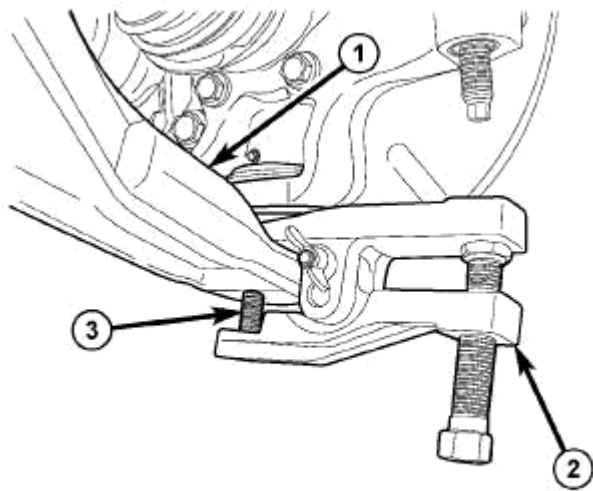


Fig. 20: Front Knuckle Mounting
Courtesy of CHRYSLER LLC

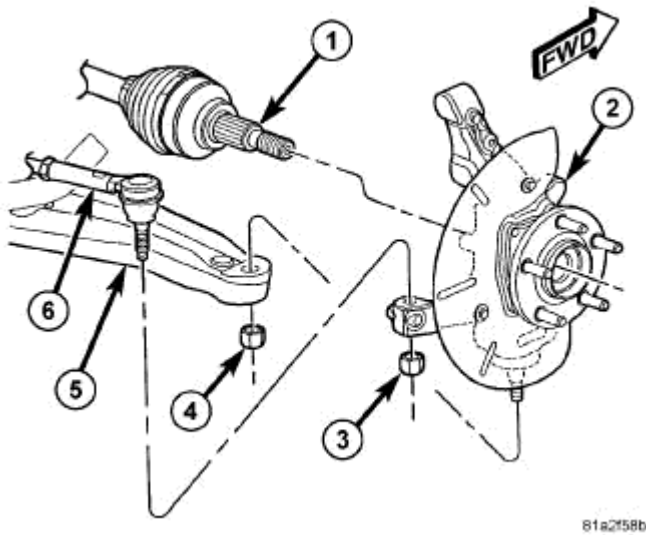
7. Remove the nut (4) attaching the lower ball joint to the lower control arm (5).



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Fig. 21: Using 9360 On Lower Ball Joint
Courtesy of CHRYSLER LLC

8. Release the lower ball joint (5) from the lower control arm (1) using Remover (2) 9360. Do not lift the knuckle out of the lower control arm at this time.



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Fig. 22: Front Knuckle Mounting
Courtesy of CHRYSLER LLC

9. Lift the knuckle (2) out of the lower control arm (5).

NOTE: Do not allow the half shaft (1) to hang by the inner C/V joint; it must be supported to keep the joint from separating during this operation.

10. Pull the knuckle (2) off the axle half shaft (1) outer C/V joint splines and support the half shaft.

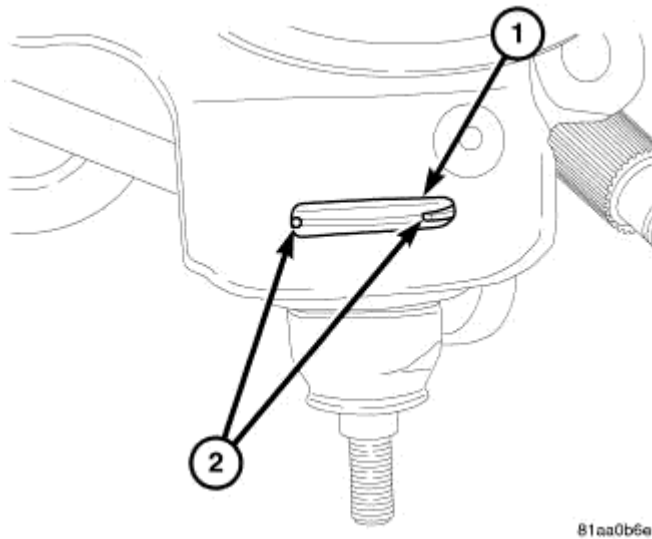


Fig. 23: Snap Ring

Courtesy of CHRYSLER LLC

11. Through the access hole (1) in the knuckle, tap the ends of the snap-ring (2) with a drift punch and remove it from the ball joint.

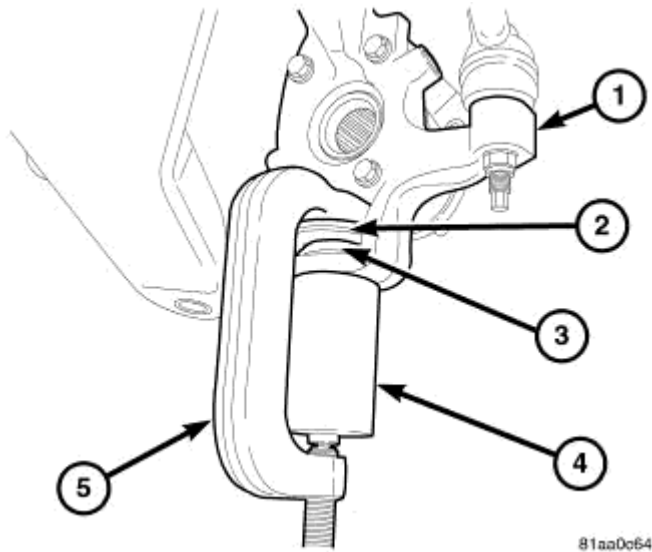


Fig. 24: Ball Joint Removal

Courtesy of CHRYSLER LLC

12. Install Remover (2) 9964-3, and Remover (4), Special Tool 9964-4 on Remover/Installer (5), Special Tool 8441-1. Place the tools over the ball joint (3) as shown in illustration, then hand tighten the screw-drive.
13. Using hand-tools, tighten the screw-drive forcing the ball joint (3) out of the knuckle (1).

14. Loosen the screw-drive and remove the tools and ball joint.

Installation

INSTALLATION

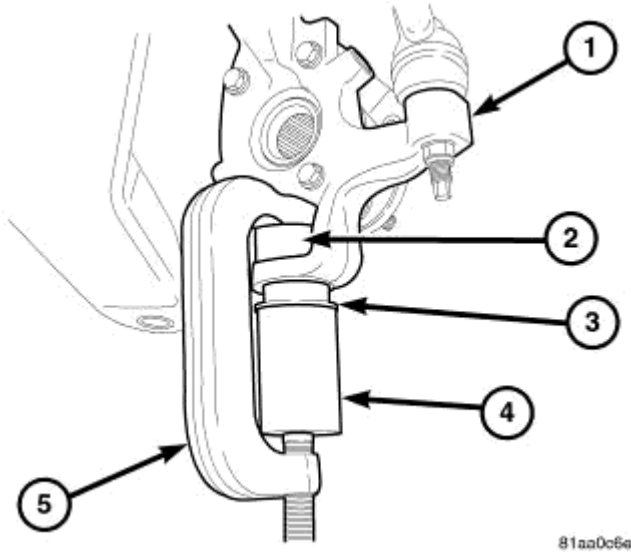


Fig. 25: Ball Joint Installation
Courtesy of CHRYSLER LLC

1. Install Installer (2), Special Tool 9964-1, and Installer (4), Special Tool 9964-2 on Remover/Installer (5), Special Tool 8441-1. Place a new ball joint (stem down) into Installer 9964-2.
2. Position the assembly onto the knuckle as shown in illustration, then hand tighten the screw-drive.
3. Using hand-tools, tighten the screw-drive forcing the ball joint (3) into the knuckle (1). Continue to install the ball joint until the flange on the ball joint comes to a stop against the bottom of the knuckle.
4. Loosen the screw-drive and remove the tools.
5. Install a NEW snap-ring into the groove in the ball joint using a drift punch.

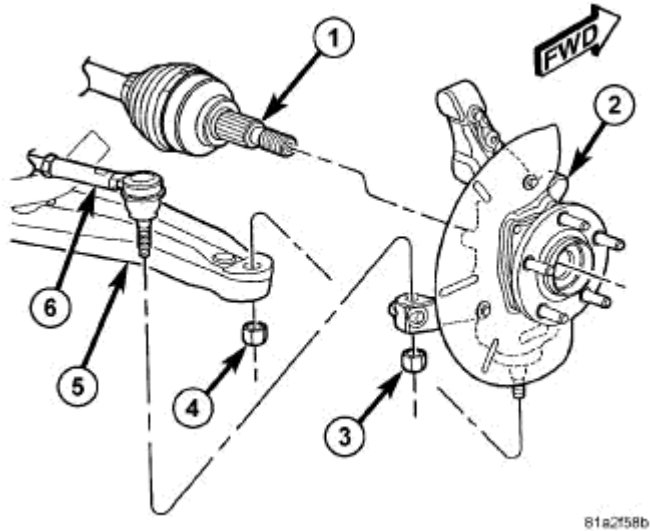


Fig. 26: Front Knuckle Mounting
Courtesy of CHRYSLER LLC

6. Slide the hub and bearing in the knuckle (2) onto the splines of the half shaft outer C/V joint (1).
7. Insert the lower ball joint stud into the mounting hole in the lower control arm.
8. Install a NEW ball joint stud nut (4). Tighten the nut to 95 N.m (70 ft. lbs.).

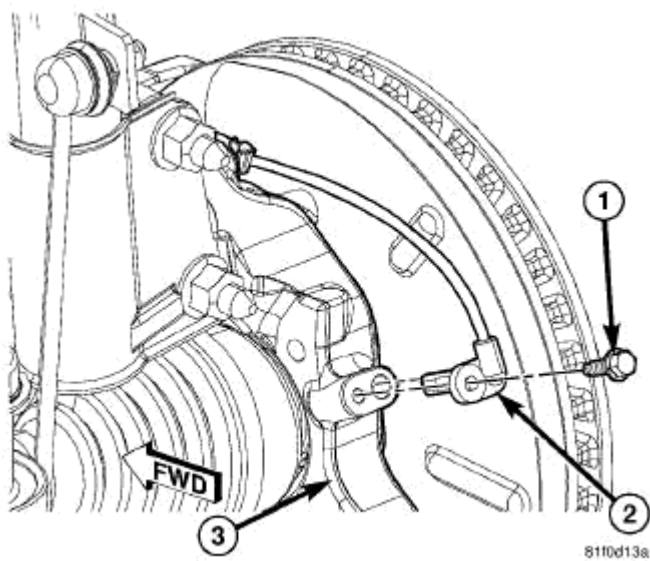


Fig. 27: Front Wheel Speed Sensor
Courtesy of CHRYSLER LLC

9. Install the wheel speed sensor head (2) into the knuckle (3). Install the mounting screw (1) and tighten it to 12 N.m (106 in. lbs.).

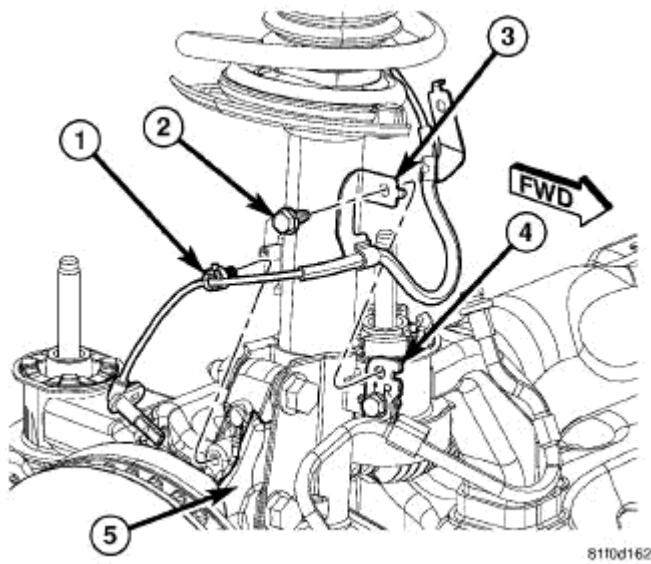


Fig. 28: Wheel Speed Sensor Routing & Brake Flex Hose Bracket
Courtesy of CHRYSLER LLC

10. Install the routing clip (1) securing the wheel speed sensor cable to the knuckle (5).
11. Install the brake rotor, disc brake caliper and adapter. Refer to **Brakes/Hydraulic/Mechanical/ROTOR, Brake - Installation**

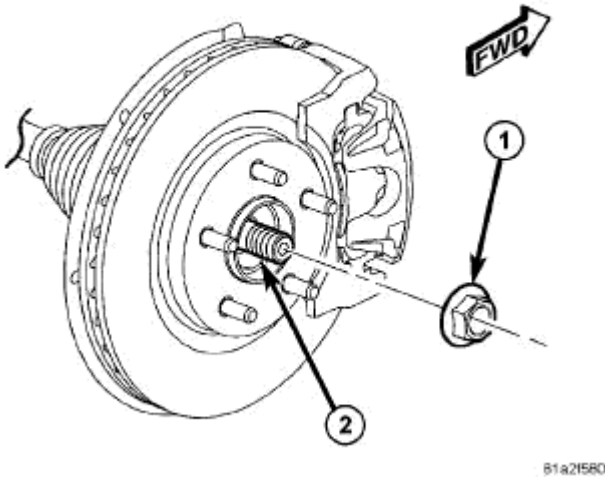


Fig. 29: View Of Hub Nut & Axle Shaft
Courtesy of CHRYSLER LLC

NOTE: Always install a new hub nut. The original hub nut is one-time use only and should be discarded when removed.

12. Clean all foreign matter from the threads of the half shaft outer C/V joint.
13. Install the hub nut (1) on the end of the half shaft (2) and snug it.
14. While a helper applies the brakes to keep the hub from rotating, tighten the hub nut (3) to 132 N.m (97 ft. lbs.).

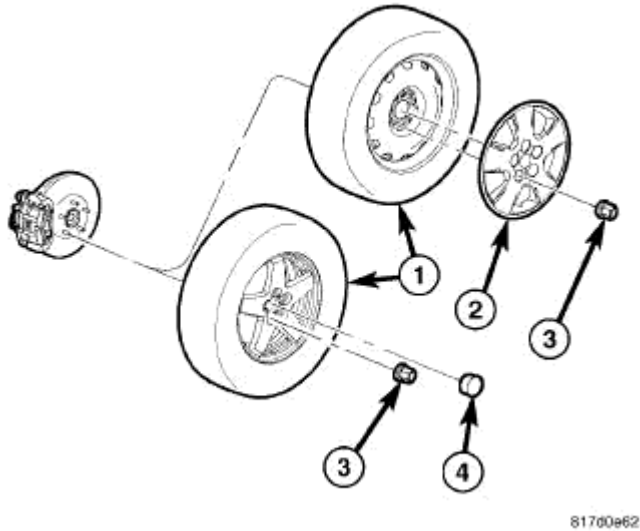


Fig. 30: TIRE AND WHEEL MOUNTING

Courtesy of CHRYSLER LLC

15. Install the tire and wheel assembly (1). Refer to **Tires and Wheels - Installation** . Install and tighten wheel mounting nuts (3) to 135 N.m (100 ft. lbs.).
16. Lower the vehicle.
17. Perform wheel alignment as necessary. See **Standard Procedure**

HUB AND BEARING

Description

DESCRIPTION

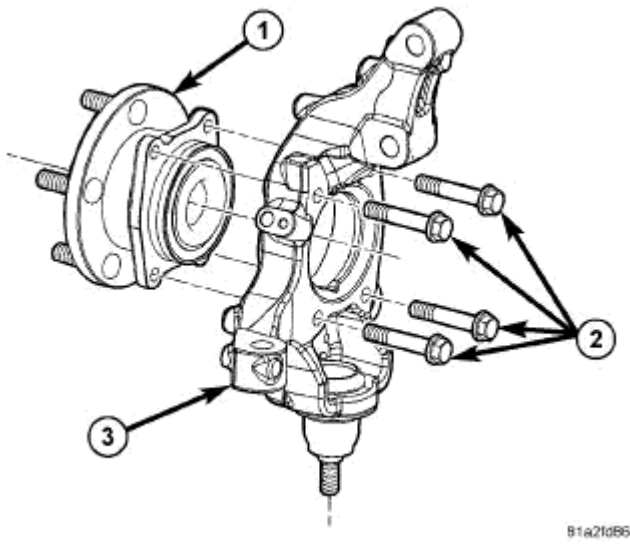


Fig. 31: Front Hub And Bearing Mounting
 Courtesy of CHRYSLER LLC

The front wheel bearing and wheel hub of this vehicle are a one piece sealed unit or hub and bearing unit type assembly.

The hub and bearing (1) is mounted to the knuckle using four mounting bolts (2) and to the axle half shaft using a retaining nut. The center of the hub and bearing is splined to match the outer joint of the axle half shaft.

Each front hub and bearing has five wheel mounting studs on the hub flange for mounting the wheel to the vehicle. The wheel mounting studs are the only replaceable components of the hub and bearing. Otherwise, the hub and bearing is serviced as a complete assembly.

Diagnosis and Testing

HUB AND BEARING

NOTE: The wheel bearing is designed to last for the life of the vehicle and requires no type of periodic maintenance.

The following procedure may be used for diagnosing the condition of the hub and bearing.

1. Remove the wheel and tire assembly, disc brake caliper and brake rotor. Refer to **Brakes/Hydraulic/Mechanical/ROTOR, Brake - Removal**
2. Rotate the wheel hub checking for resistance or roughness.

Any roughness or resistance to rotation may indicate dirt intrusion or a failed hub bearing. If the bearing exhibits any of these conditions, the hub bearing will require replacement. **Do not attempt to disassemble the bearing for repair.** If the wheel bearing is disassembled for any reason, it must be replaced.

Damaged bearing seals and the resulting excessive grease loss may also require hub and bearing replacement. Moderate grease weeping from the bearing is considered normal and should not require replacement of the hub and bearing.

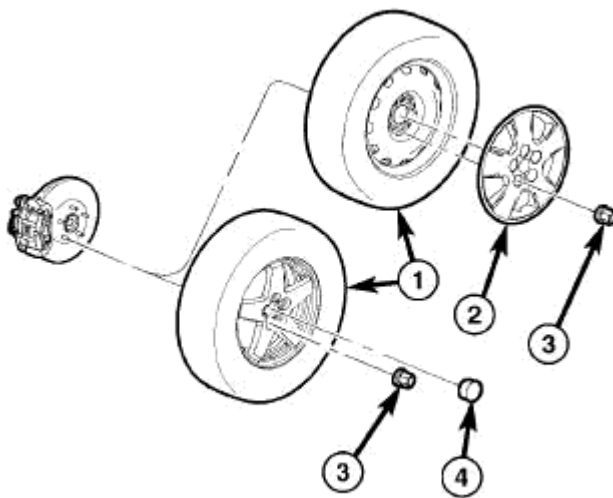
To diagnose a bent hub, measure hub runout. Refer to **Brakes/Hydraulic/Mechanical/ROTOR, Brake - Diagnosis and Testing**

Removal

REMOVAL

NOTE: Before proceeding, review all Warnings and Cautions. See **WARNINGS AND CAUTIONS**

1. Raise and support the vehicle. Refer to **Vehicle Quick Reference/Hoisting - Standard Procedure**



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Fig. 32: TIRE AND WHEEL MOUNTING

Courtesy of CHRYSLER LLC

2. Remove the wheel mounting nuts (3), then the tire and wheel assembly (1).

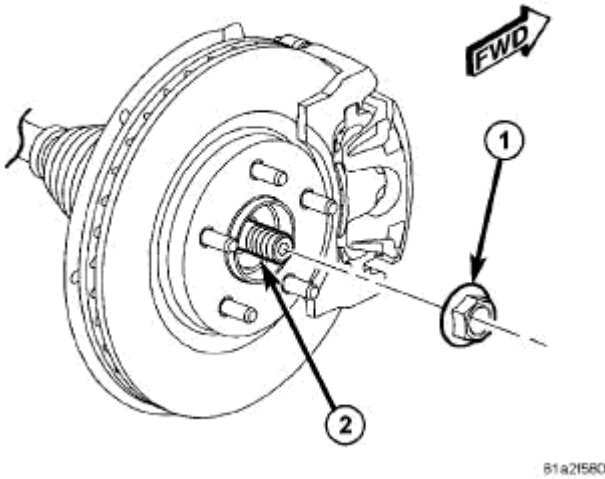


Fig. 33: View Of Hub Nut & Axle Shaft
Courtesy of CHRYSLER LLC

3. While a helper applies the brakes to keep the hub from rotating, remove the hub nut (1) from the axle half shaft (2).
4. Access and remove the front brake rotor. Refer to **Brakes/Hydraulic/Mechanical/ROTOR, Brake - Removal**

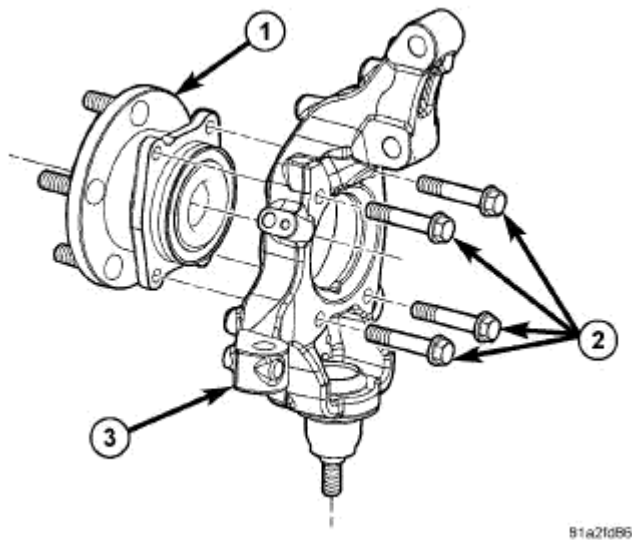


Fig. 34: Front Hub And Bearing Mounting
Courtesy of CHRYSLER LLC

5. Remove the four bolts (2) fastening the hub and bearing to the knuckle (3).
6. Slide the hub and bearing (1) off the half shaft and out of the knuckle.

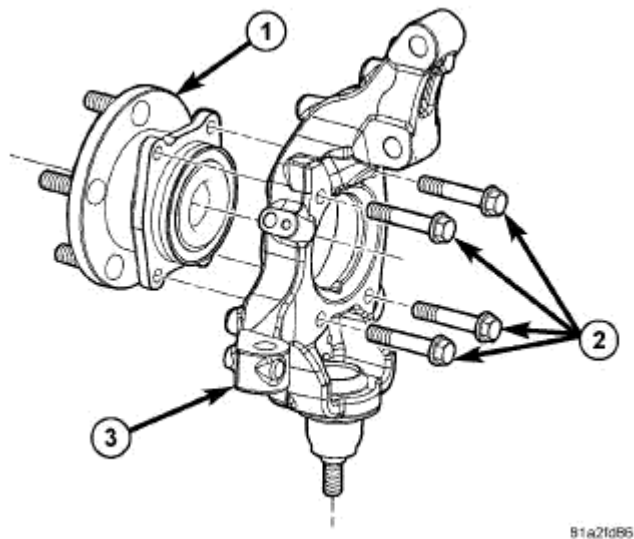
Installation**INSTALLATION**

Fig. 35: Front Hub And Bearing Mounting
Courtesy of CHRYSLER LLC

1. Install the hub and bearing (1) by sliding it over the half shaft and into the knuckle.
2. Install the four bolts (2) fastening the hub and bearing (1) to the knuckle (3). Tighten the four bolts to 82 N.m (60 ft. lbs.).
3. Install the brake rotor, disc brake caliper and adapter. Refer to **Brakes/Hydraulic/Mechanical/ROTOR, Brake - Installation**

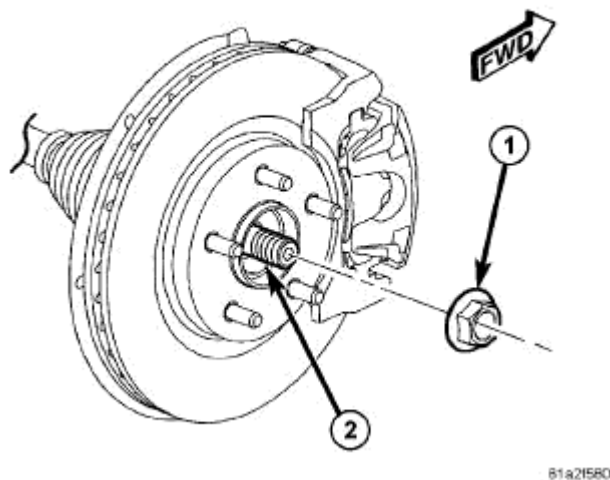


Fig. 36: View Of Hub Nut & Axle Shaft

Courtesy of CHRYSLER LLC

NOTE: Always install a new hub nut. The original hub nut is one-time use only and should be discarded when removed.

4. Clean all foreign matter from the threads of the half shaft outer C/V joint.
5. Install the hub nut (1) on the end of the half shaft (2) and lightly tighten it.
6. While a helper applies the brakes to keep the hub from rotating, tighten the hub nut (1) to 132 N.m (97 ft. lbs.).

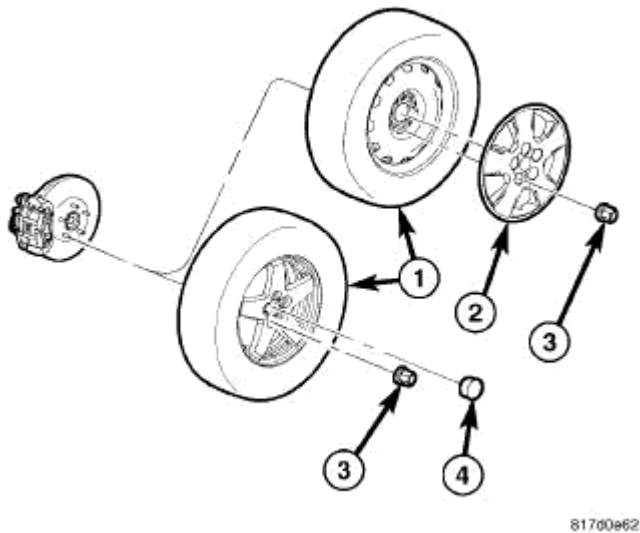


Fig. 37: TIRE AND WHEEL MOUNTING

Courtesy of CHRYSLER LLC

7. Install the tire and wheel assembly (1). Refer to **Tires and Wheels - Installation** . Install and tighten wheel mounting nuts (3) to 135 N.m (100 ft. lbs.).
8. Lower the vehicle.

KNUCKLE, STEERING

Description

DESCRIPTION

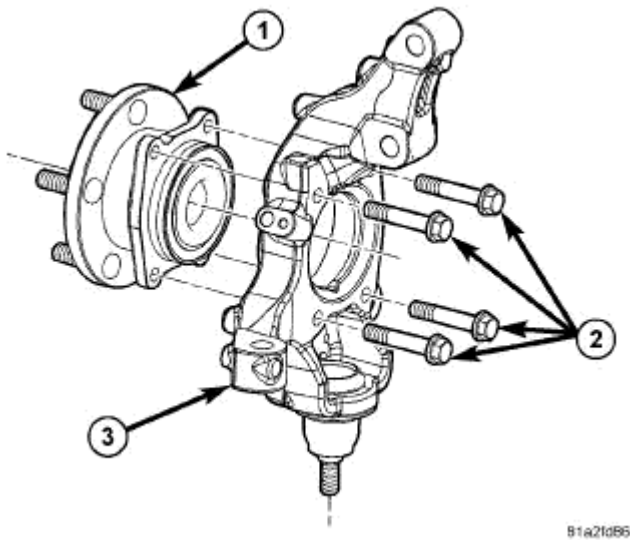


Fig. 38: Front Hub And Bearing Mounting
 Courtesy of CHRYSLER LLC

The knuckle (3) is a single casting with legs machined for attachment to the front strut assembly on the top and steering linkage on the trailing end. A ball joint is located on the bottom of the knuckle which attaches to the lower control arm. The knuckle also has two machined, drilled legs on the leading end casting to support and align the front disc brake caliper adapter.

The knuckle supports the hub and bearing (1). A shield (not shown in illustration) is fastened to the knuckle.

Diagnosis and Testing

KNUCKLE

The front suspension knuckle is not a repairable component of the front suspension. It must be replaced if found to be damaged in any way. If it is determined that the knuckle is bent when servicing the vehicle, no attempt is to be made to straighten the knuckle.

Inspect the lower ball joint per the inspection procedure in this Service Information . The lower ball joint can be replaced separately from the knuckle.

Removal

REMOVAL

NOTE: Before proceeding, review all Warnings and Cautions. See **WARNINGS AND CAUTIONS**

1. Raise and support the vehicle. Refer to **Vehicle Quick Reference/Hoisting - Standard Procedure**

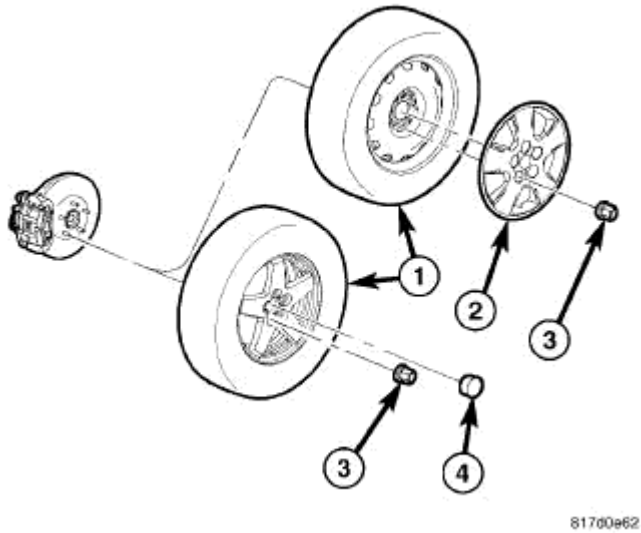


Fig. 39: TIRE AND WHEEL MOUNTING
Courtesy of CHRYSLER LLC

2. Remove the wheel mounting nuts (3), then the tire and wheel assembly (1).

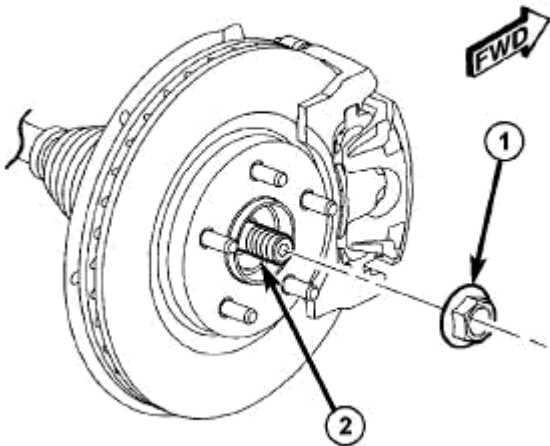


Fig. 40: View Of Hub Nut & Axle Shaft
Courtesy of CHRYSLER LLC

3. While a helper applies the brakes to keep the hub from rotating, remove the hub nut (1) from the axle half shaft (2).
4. Access and remove the front brake rotor. Refer to **Brakes/Hydraulic/Mechanical/ROTOR, Brake - Removal**

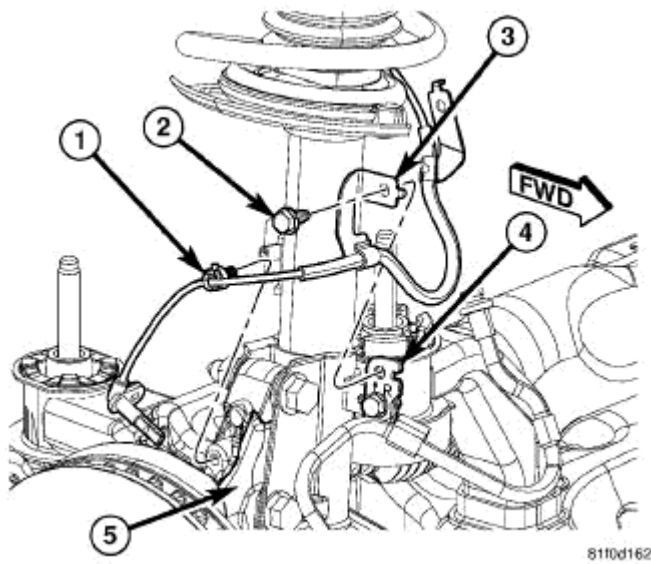


Fig. 41: Wheel Speed Sensor Routing & Brake Flex Hose Bracket
Courtesy of CHRYSLER LLC

5. Remove the routing clip (1) securing wheel speed sensor cable to the knuckle (5).

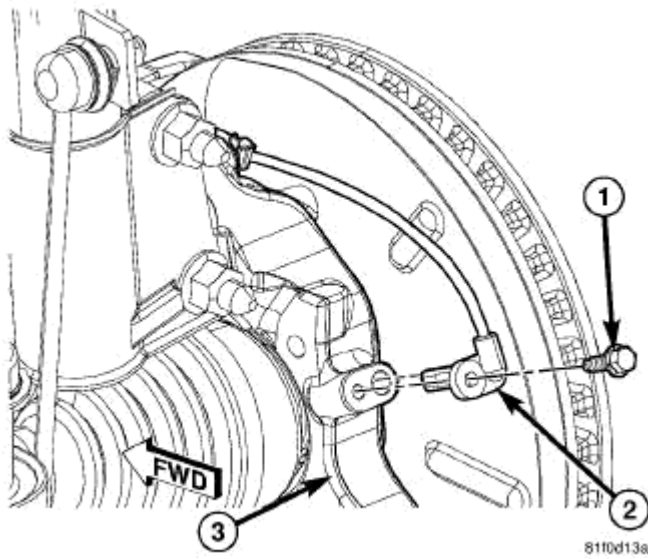


Fig. 42: Front Wheel Speed Sensor
Courtesy of CHRYSLER LLC

6. Remove the screw (1) fastening the wheel speed sensor head (2) to the knuckle (3). Pull the sensor head out of the knuckle.

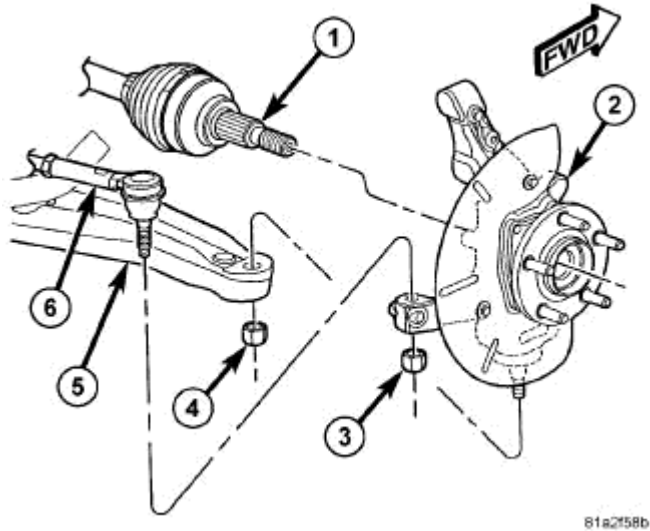


Fig. 43: Front Knuckle Mounting
Courtesy of CHRYSLER LLC

7. Remove the nut (3) attaching the outer tie rod (6) to the knuckle (2). To do this it might be necessary to hold the tie rod end stud with a wrench while loosening and removing the nut with a standard wrench or crowfoot wrench.

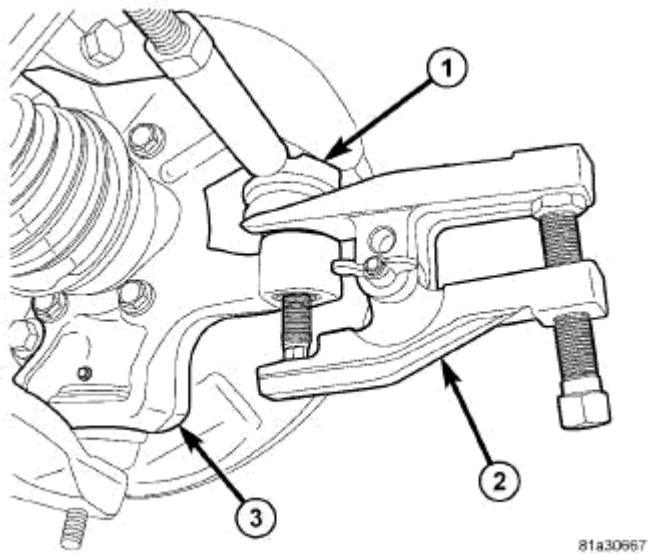


Fig. 44: Using 9360 On Tie Rod End
Courtesy of CHRYSLER LLC

8. Release the outer tie rod end (1) from the knuckle (3) using Remover (2), Special Tool 9360.
9. Remove the outer tie rod from the knuckle.

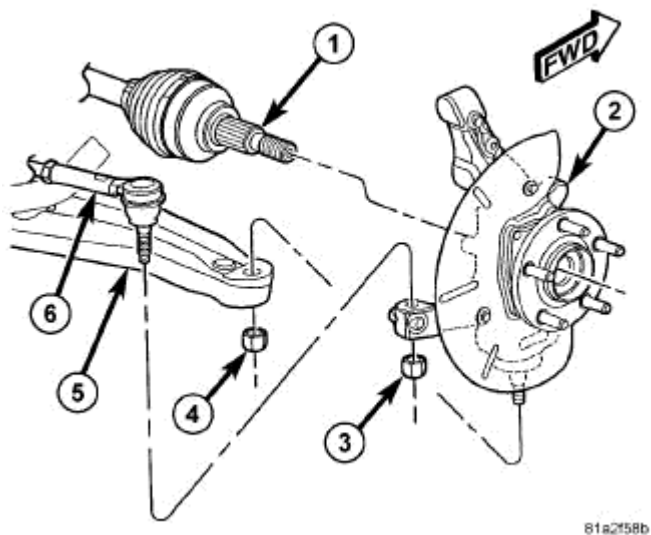


Fig. 45: Front Knuckle Mounting
Courtesy of CHRYSLER LLC

10. Remove the nut (4) attaching the lower ball joint to the lower control arm (5).

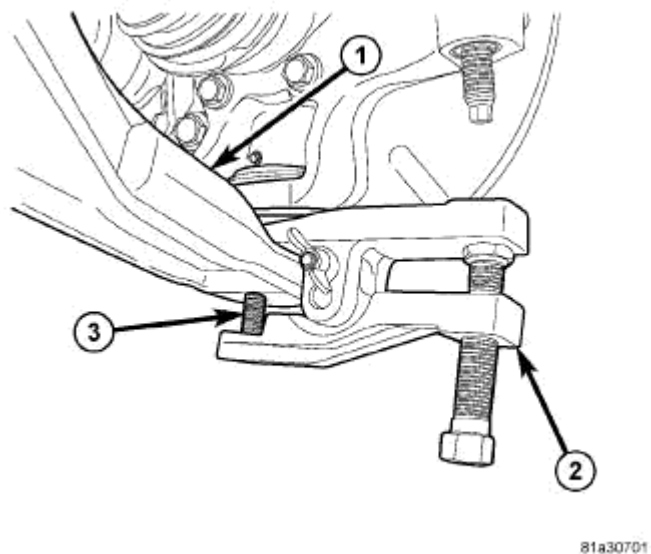
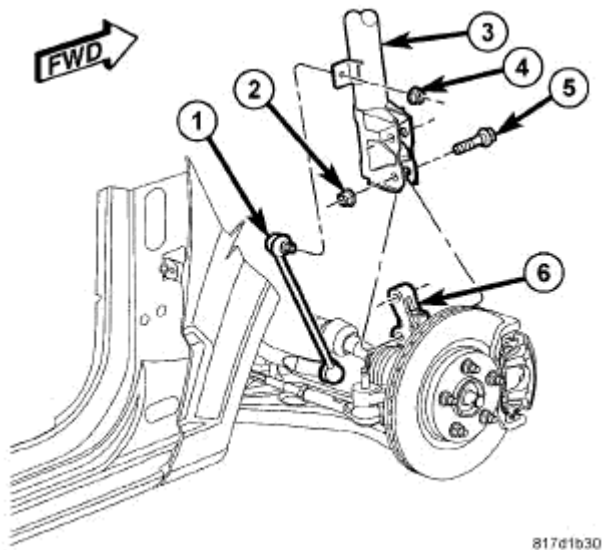


Fig. 46: Using 9360 On Lower Ball Joint
Courtesy of CHRYSLER LLC

11. Release the lower ball joint (3) from the lower control arm (1) using Remover (2), Special Tool 9360. Do not lift the knuckle out of the lower control arm at this time.

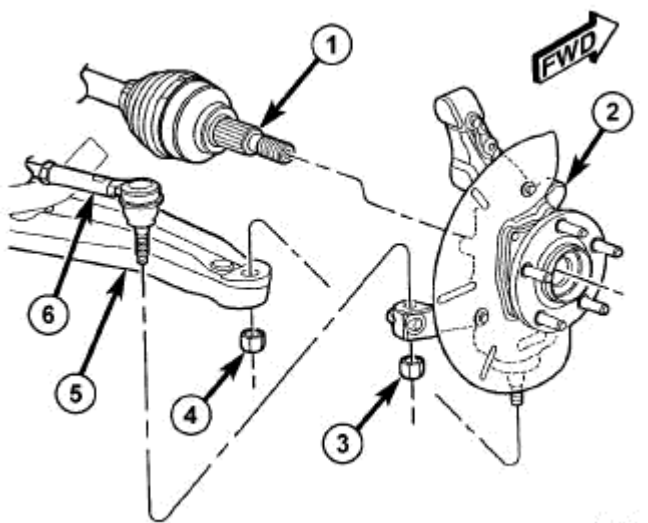


817d1b30

Fig. 47: Strut Mounting To Knuckle
Courtesy of CHRYSLER LLC

CAUTION: The strut assembly-to-knuckle attaching bolts (5) are serrated and must not be turned during removal. Proper removal is required. Refer to the following steps for the correct method.

12. While holding the bolt heads stationary, remove the two nuts (2) from the bolts (5) attaching the strut (3) to the knuckle (6).
13. Remove the two bolts (5) attaching the strut (3) to the knuckle (6) using a pin punch.



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Fig. 48: Front Knuckle Mounting
Courtesy of CHRYSLER LLC

NOTE: Do not allow the half shaft (1) to hang by the inner C/V joint; it must be supported to keep the joint from separating during this operation.

14. Pull the knuckle (2) off the half shaft (1) outer C/V joint splines and remove the knuckle from the vehicle.

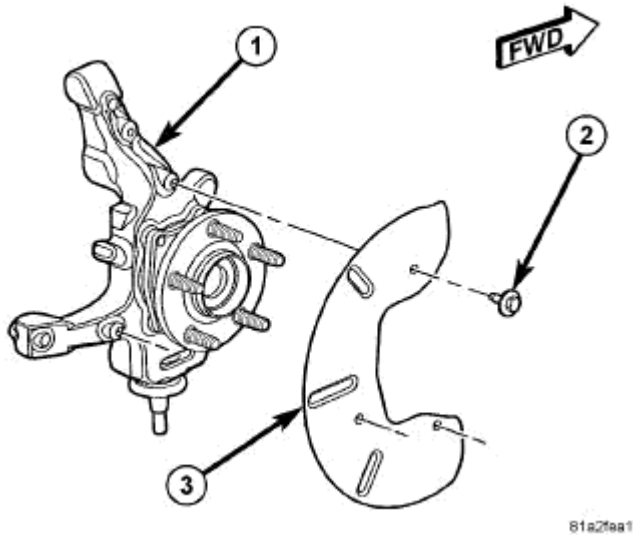


Fig. 49: Shield Mounting
Courtesy of CHRYSLER LLC

15. If required, remove the three screws (2) fastening the shield (3) to the knuckle (1). Remove the shield.

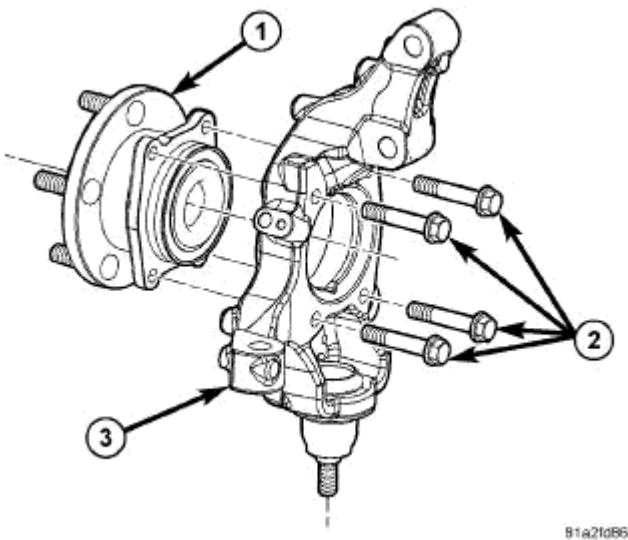


Fig. 50: Front Hub And Bearing Mounting
Courtesy of CHRYSLER LLC

16. If required, remove the four bolts (2) fastening the hub and bearing (1) to the knuckle (3).
17. If required, slide the hub and bearing (1) out of the knuckle.

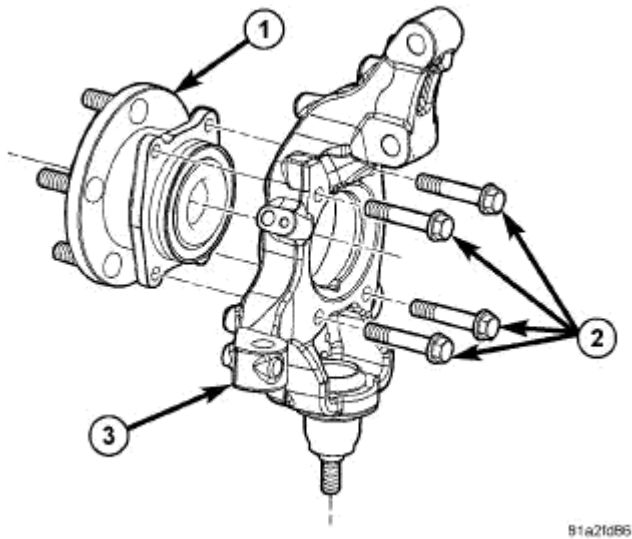
Installation**INSTALLATION**

Fig. 51: Front Hub And Bearing Mounting
Courtesy of CHRYSLER LLC

1. If required, install the hub and bearing (1) by sliding it into the knuckle.
2. If installing hub and bearing, install the four bolts (2) fastening the hub and bearing (1) to the knuckle (3). Tighten the four bolts to 82 N.m (60 ft. lbs.).

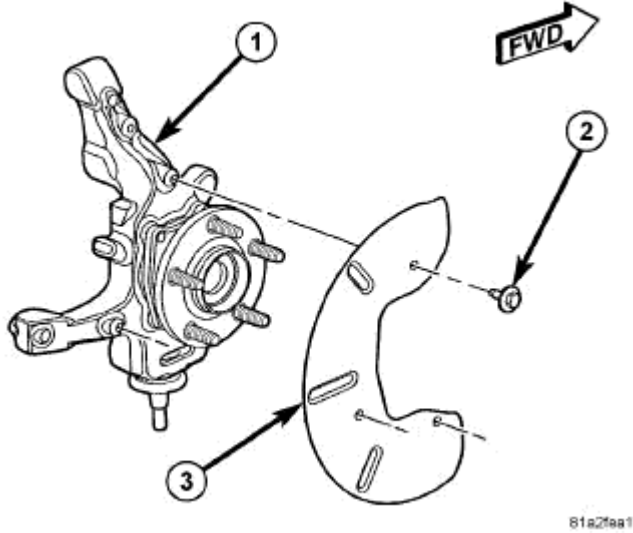


Fig. 52: Shield Mounting
Courtesy of CHRYSLER LLC

3. If required, install the shield on the knuckle. Install and tighten the three mounting screws (2) to 10 N.m (89 in. lbs.).

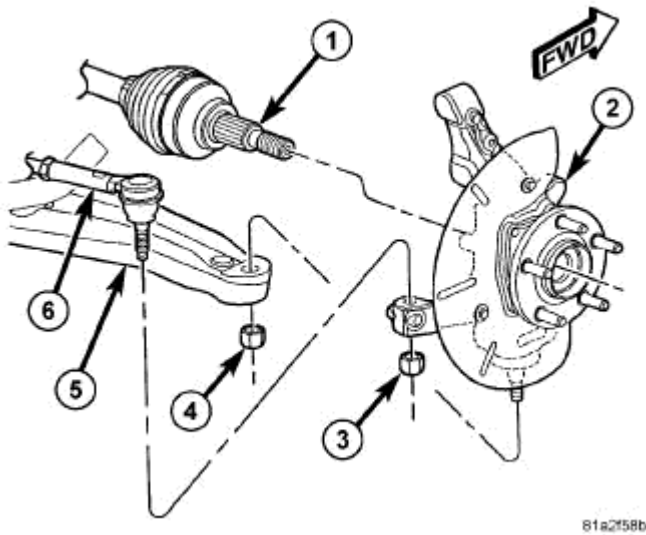
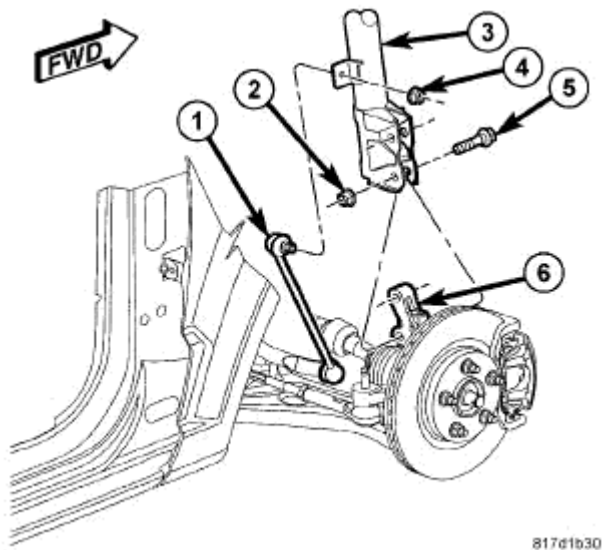


Fig. 53: Front Knuckle Mounting
Courtesy of CHRYSLER LLC

4. Slide the hub and bearing in the knuckle (2) onto the splines of the half shaft outer C/V joint (1).
5. Insert the lower ball joint stud into the mounting hole in the lower control arm.
6. Install a NEW ball joint stud nut (4). Tighten the nut to 95 N.m (70 ft. lbs.).

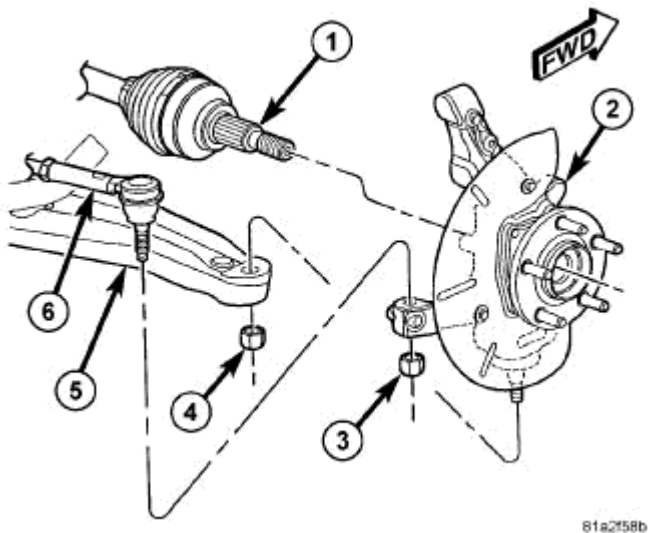


817d1b30

Fig. 54: Strut Mounting To Knuckle
Courtesy of CHRYSLER LLC

CAUTION: The strut clevis-to-knuckle bolts (5) are serrated and must not be turned during installation. Install the nuts while holding the bolts stationary in the steering knuckle. Refer to the following step.

7. Position the lower end of the strut assembly (3) in line with the upper end of the knuckle (6), aligning the mounting holes. Install the two mounting bolts (5).
8. Install the nuts (2) on the two bolts (5). While holding the bolts in place, tighten the nuts to 140 N.m (103 ft. lbs.).



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Fig. 55: Front Knuckle Mounting

Courtesy of CHRYSLER LLC

9. Install the outer tie rod (6) ball stud into the hole in the knuckle (2) arm. Start the tie rod end-to-knuckle nut (4) onto the stud. While holding the tie rod end stud with a wrench, tighten the nut with a wrench or crowfoot wrench to 85 N.m (63 ft. lbs.).

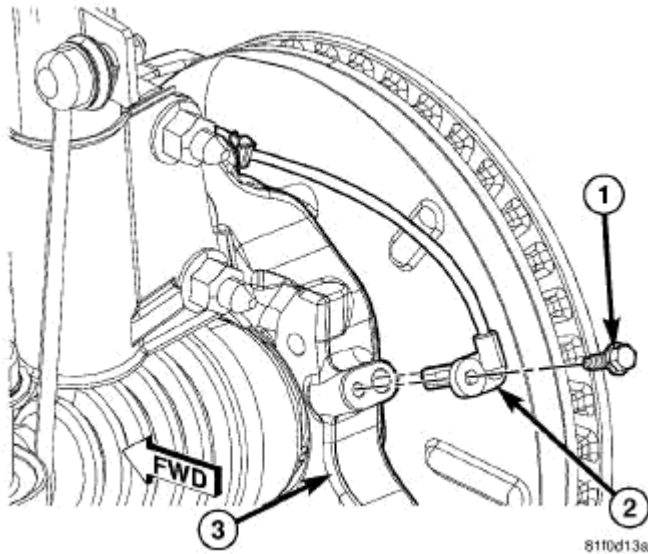


Fig. 56: Front Wheel Speed Sensor
Courtesy of CHRYSLER LLC

10. Install the wheel speed sensor head (2) into the knuckle (3). Install the mounting screw (1) and tighten it to 12 N.m (106 in. lbs.).

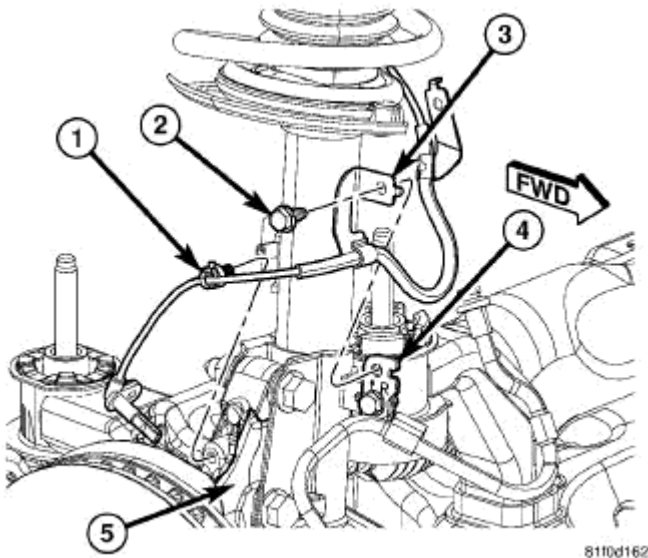


Fig. 57: Wheel Speed Sensor Routing & Brake Flex Hose Bracket

Courtesy of CHRYSLER LLC

11. Install the routing clip (1) securing the wheel speed sensor cable to the knuckle (5).
12. Install the brake rotor, disc brake caliper and adapter. Refer to **Brakes/Hydraulic/Mechanical/ROTOR, Brake - Installation**

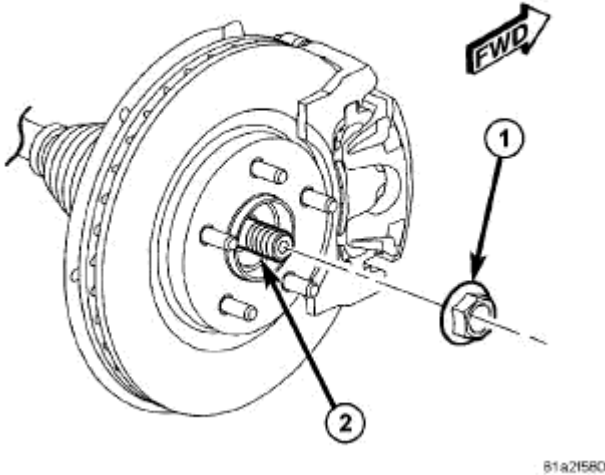
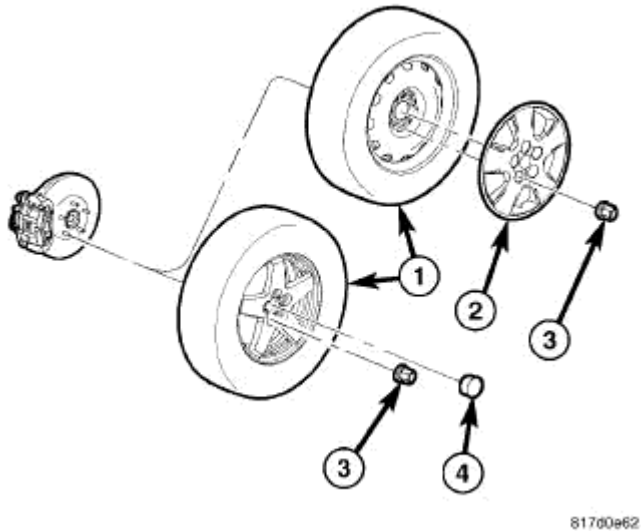


Fig. 58: View Of Hub Nut & Axle Shaft
Courtesy of CHRYSLER LLC

NOTE: Always install a new hub nut. The original hub nut is one-time use only and should be discarded when removed.

13. Clean all foreign matter from the threads of the half shaft outer C/V joint.
14. Install the hub nut (1) on the end of the half shaft (2) and snug it.
15. While a helper applies the brakes to keep the hub from rotating, tighten the hub nut (3) to 132 N.m (97 ft. lbs.).

**Fig. 59: TIRE AND WHEEL MOUNTING****Courtesy of CHRYSLER LLC**

16. Install the tire and wheel assembly (1). Refer to **Tires and Wheels - Installation** . Install and tighten wheel mounting nuts (3) to 135 N.m (100 ft. lbs.).
17. Lower the vehicle.
18. Perform wheel alignment as necessary. See **Standard Procedure**

LINK, STABILIZER BAR**Removal****REMOVAL**

NOTE: Before proceeding. See **WARNINGS AND CAUTIONS** .

1. Raise and support the vehicle. Refer to **Vehicle Quick Reference/Hoisting - Standard Procedure**

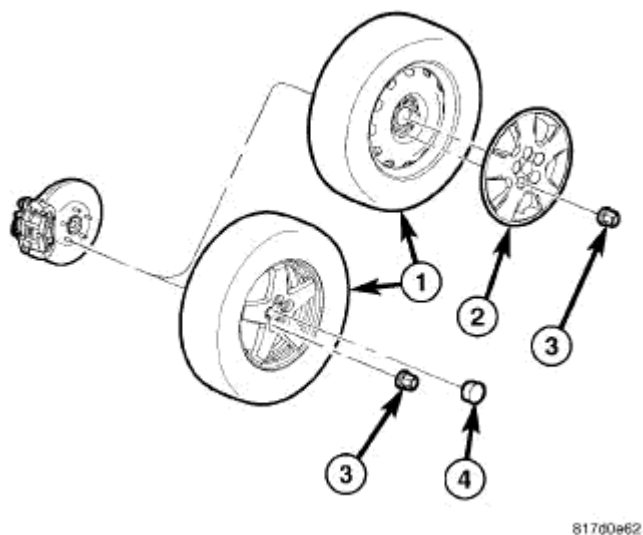


Fig. 60: TIRE AND WHEEL MOUNTING
Courtesy of CHRYSLER LLC

2. Remove the wheel mounting nuts (3), then the tire and wheel assembly (1).

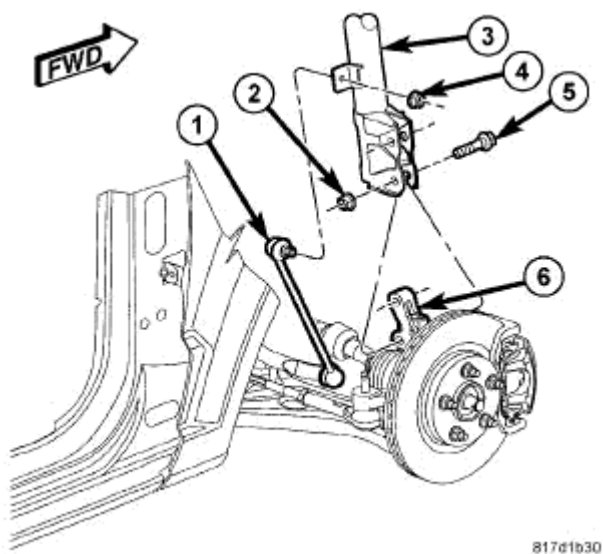


Fig. 61: Strut Mounting To Knuckle
Courtesy of CHRYSLER LLC

3. While holding the stabilizer bar link (1) stud stationary, remove the nut (4) securing the link to the strut (3).

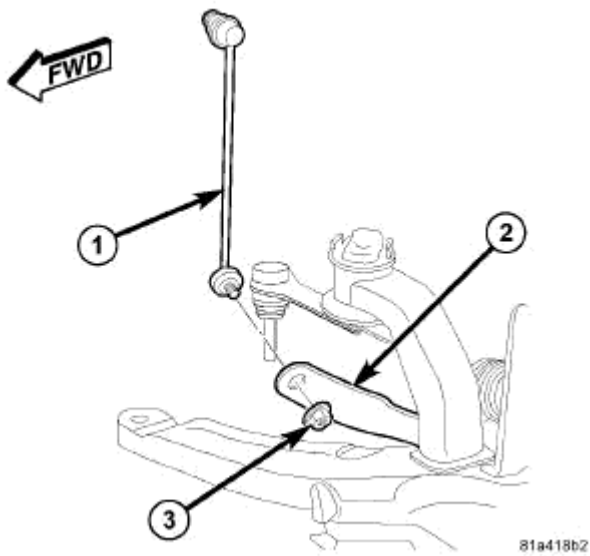


Fig. 62: Stabilizer Link Mounting To Bar
Courtesy of CHRYSLER LLC

4. While holding the stabilizer bar link (1) lower stud stationary, remove the nut (3) securing the link to the stabilizer bar (2).
5. Remove the stabilizer bar link (1).

Installation

INSTALLATION

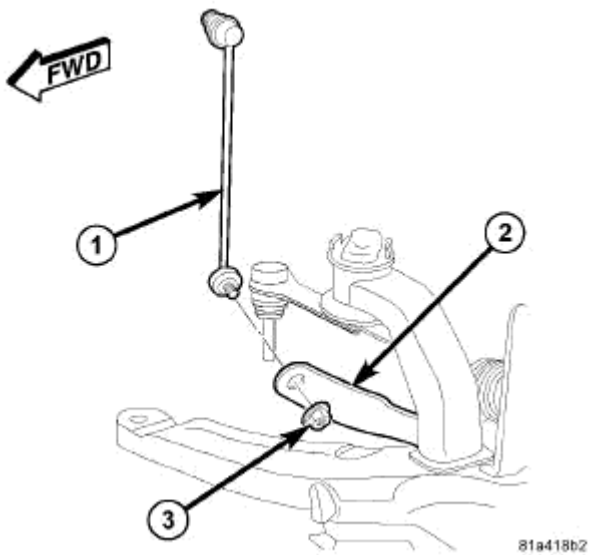


Fig. 63: Stabilizer Link Mounting To Bar
Courtesy of CHRYSLER LLC

1. Attach the stabilizer bar link (1) to the stabilizer bar (2). Install and tighten the nut (3) while holding the stabilizer bar link lower stud stationary. Tighten the nut to 48 N.m (35 ft. lbs.).

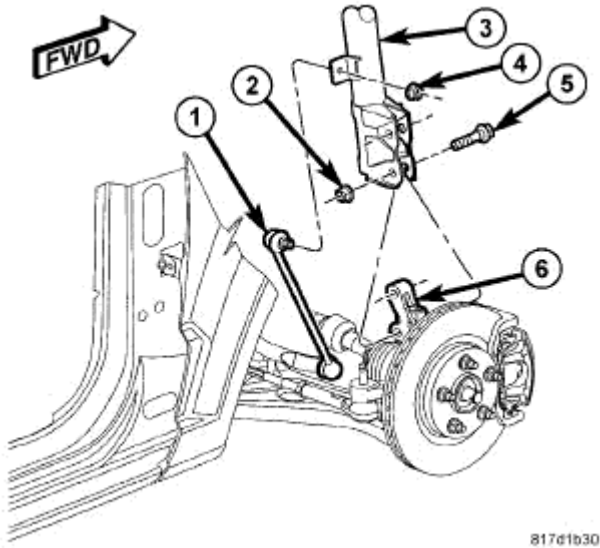


Fig. 64: Strut Mounting To Knuckle
Courtesy of CHRYSLER LLC

2. Attach the stabilizer bar link (1) to the strut (3). Install and tighten the nut (4) while holding the stabilizer bar link stud stationary. Tighten the nut to 48 N.m (35 ft. lbs.).

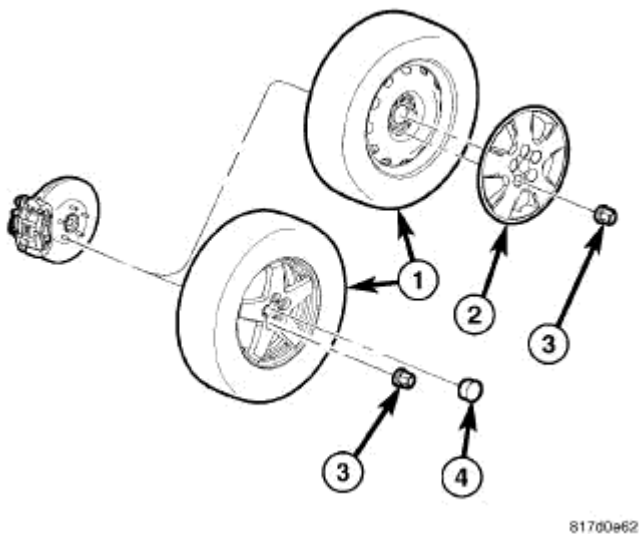


Fig. 65: TIRE AND WHEEL MOUNTING
Courtesy of CHRYSLER LLC

3. Install tire and wheel assembly (1). Refer to [Tires and Wheels - Installation](#) . Install and tighten wheel

mounting nuts (3) to 135 N.m (100 ft. lbs.).

4. Lower the vehicle.

STABILIZER BAR, FRONT

Removal

REMOVAL

NOTE: Before proceeding. See WARNINGS AND CAUTIONS .

1. Raise and support the vehicle. Refer to Vehicle Quick Reference/Hoisting - Standard Procedure
2. If equipped, remove the engine belly pan.
3. Remove the rear engine mount. Refer to ENGINE MOUNTING in appropriate Engine article.
4. Remove the front engine mount through-bolt.

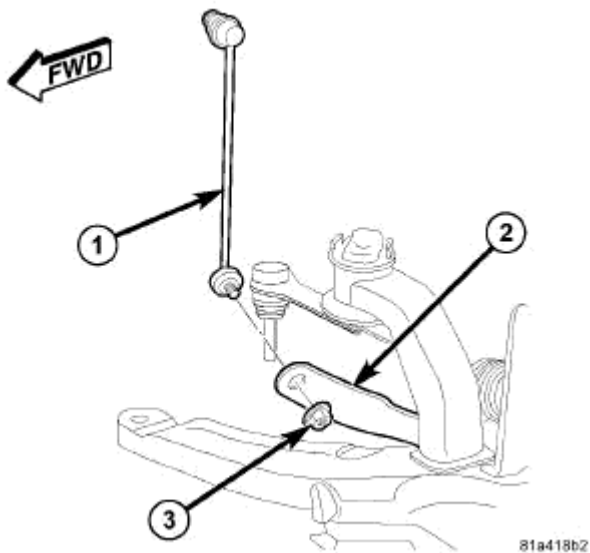


Fig. 66: Stabilizer Link Mounting To Bar
Courtesy of CHRYSLER LLC

5. At each end of the stabilizer bar, while holding the stabilizer bar link (1) lower stud stationary, remove the nut (3) securing the link to the stabilizer bar (2).

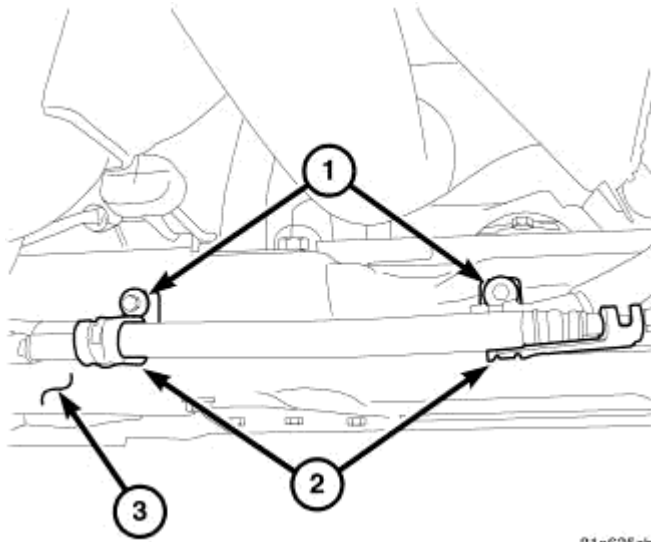


Fig. 67: Hoses At Rear Of Crossmember
Courtesy of CHRYSLER LLC

6. Remove the screws (1) securing the power steering hose routing clamps (2) to the rear of the crossmember.

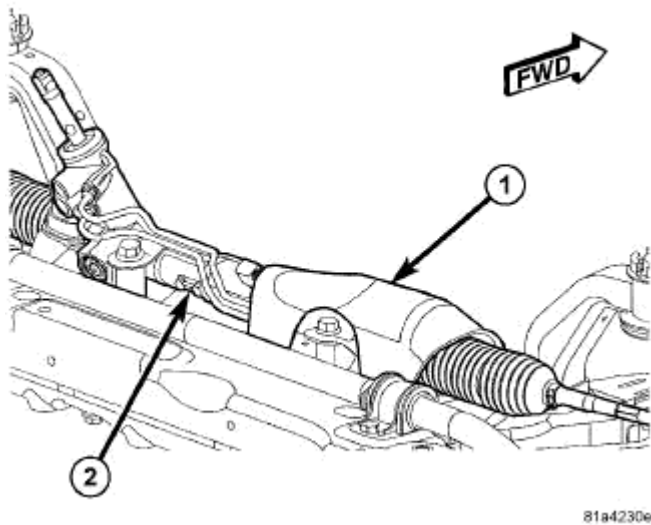


Fig. 68: Heat Shield
Courtesy of CHRYSLER LLC

7. Remove the screws and push-pins securing the heat shield (1) over the right side of the steering gear (2).

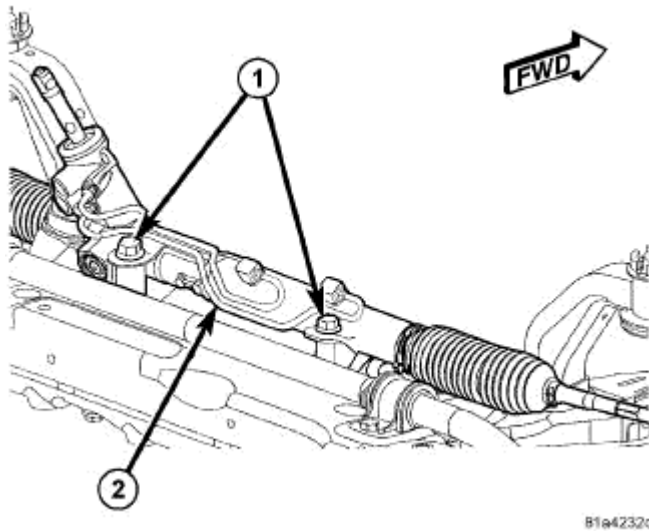


Fig. 69: Identifying Steering Gear Mounting
Courtesy of CHRYSLER LLC

8. Remove the two bolts (1) securing the steering gear (2) to the crossmember.
9. Support the steering gear using a bungee cord or other to keep the steering gear from lowering when the crossmember is lowered.

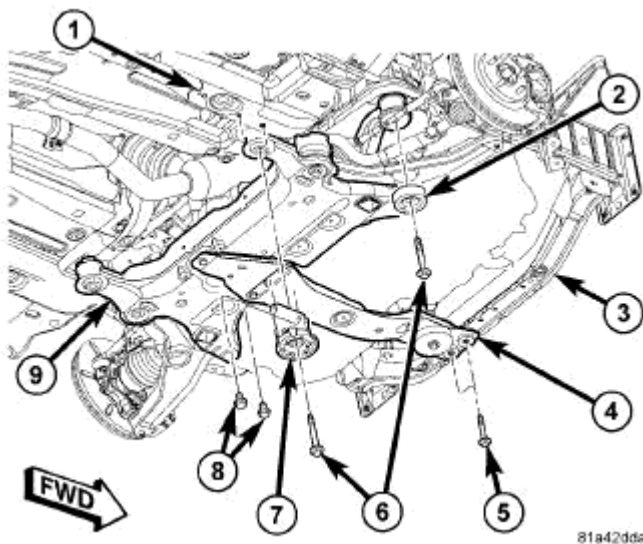


Fig. 70: Front Crossmember Mounting
Courtesy of CHRYSLER LLC

NOTE:

Before removing the front suspension crossmember from the vehicle, the location of the crossmember must be marked on the body of the vehicle. Do this so the crossmember can be relocated, upon reinstallation, against

the body of vehicle in the same location as before removal. If the front suspension crossmember is not reinstalled in exactly the same location as before removal, the preset front wheel alignment settings (caster and camber) may be lost.

10. Mark the location of the front crossmember (9) on the body near each mounting bolt.
11. Support the crossmember (9) with a transmission jack.
12. Remove the four mounting bolts (6) securing the front crossmember (9) to the body.
13. Remove the mounting screws (8) securing the front crossmember reinforcement brackets (7) (one each side of vehicle) to the body (1). Remove the brackets.
14. Slowly lower the crossmember using the jack until there is enough space present to remove the stabilizer bar between the rear of the crossmember and the body. Due to the fact that the fore-and-aft crossmember is still attached, do not lower crossmember any more than necessary to remove the stabilizer bar.

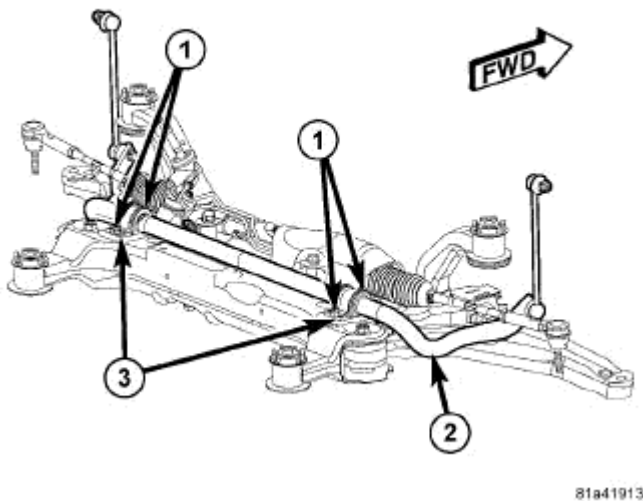


Fig. 71: Stabilizer Bar Mounting
Courtesy of CHRYSLER LLC

15. Remove the screws (1) securing the stabilizer bushing retainers (3) to the crossmember.
16. Remove the two stabilizer bushing retainers (3).
17. Utilizing the slit cut into the cushions (bushings), remove the two cushions from the stabilizer bar.
18. Remove the stabilizer bar (2) from the vehicle.

Installation

INSTALLATION

NOTE: Before stabilizer bar installation, inspect the cushions and links for excessive wear, cracks, damage and distortion. Replace any pieces failing inspection.

NOTE: Before installing the stabilizer bar, make sure the bar is not upside-down. The stabilizer bar must be installed so that when in mounted position, the ends of the bar curve under the steering gear tie rods, up to the links.

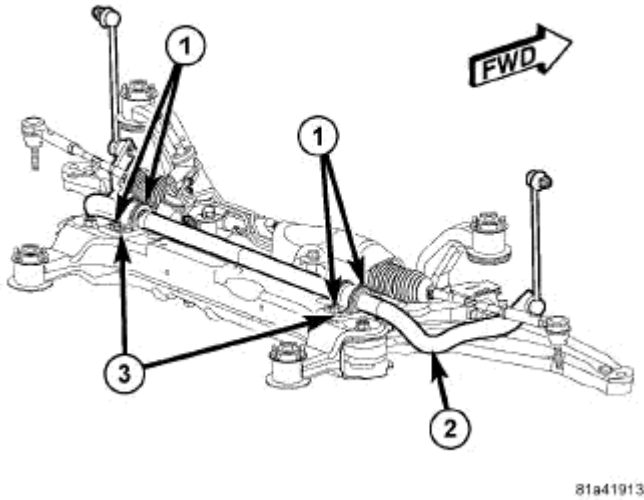


Fig. 72: Stabilizer Bar Mounting

Courtesy of CHRYSLER LLC

1. Install the stabilizer bar, link ends first, from the rear over top of the crossmember. Curve the ends of the bar (2) under the steering gear.
2. Install the two cushions (bushings) on the stabilizer bar utilizing the slit cut into the cushion sides.
3. Install the two stabilizer bushing retainers (3) over the cushions.
4. Install the screws (1) securing the stabilizer bushing retainers (3) to the crossmember. Tighten all four stabilizer bar cushion retainer screws to 60 N.m (44 ft. lbs.).

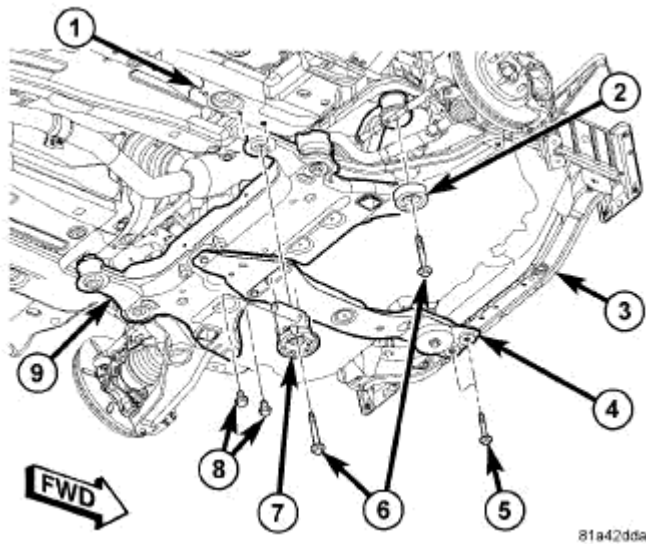


Fig. 73: Front Crossmember Mounting
Courtesy of CHRYSLER LLC

5. Slowly raise the crossmember (9) into mounted position using the transmission jack matching the crossmember to the marked locations on the body made during removal.
6. Position the front crossmember reinforcement brackets (7) (one each side of vehicle) over the crossmember rear mounting bushings and install the mounting screws (8), but do not tighten at this time.

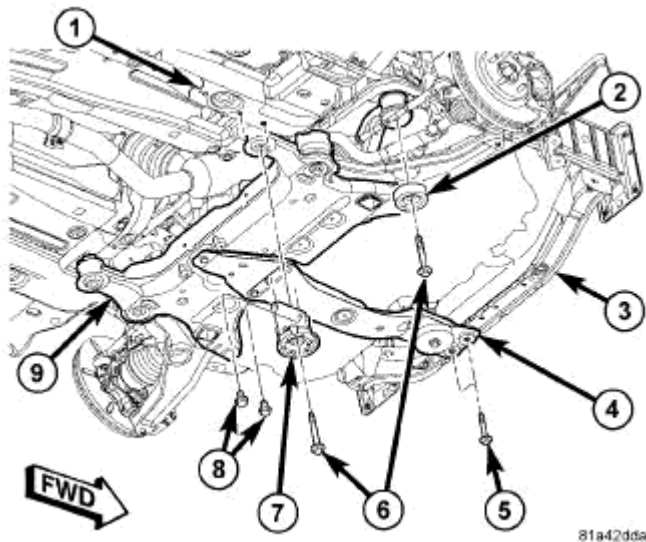


Fig. 74: Front Crossmember Mounting
Courtesy of CHRYSLER LLC

7. Install the four mounting bolts (6) securing the front crossmember (1) to the body. Tighten the crossmember mounting bolts to 135 N.m (100 ft. lbs.).

8. Tighten the crossmember reinforcement bracket mounting screws (8) to 50 N.m (37 ft. lbs.).
9. Remove the transmission jack.

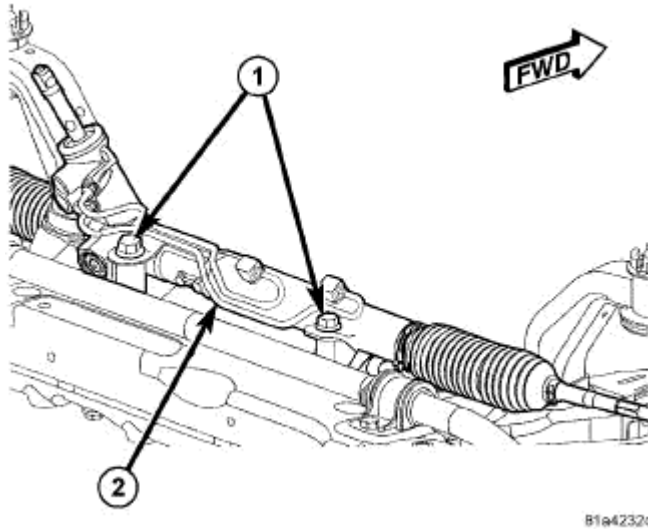


Fig. 75: Identifying Steering Gear Mounting
Courtesy of CHRYSLER LLC

10. Remove the bungee cord or other supporting the steering gear (2).
11. Install the two bolts (1) securing the steering gear (2) to the crossmember. Tighten the steering gear mounting bolts to 100 N.m (74 ft. lbs.).

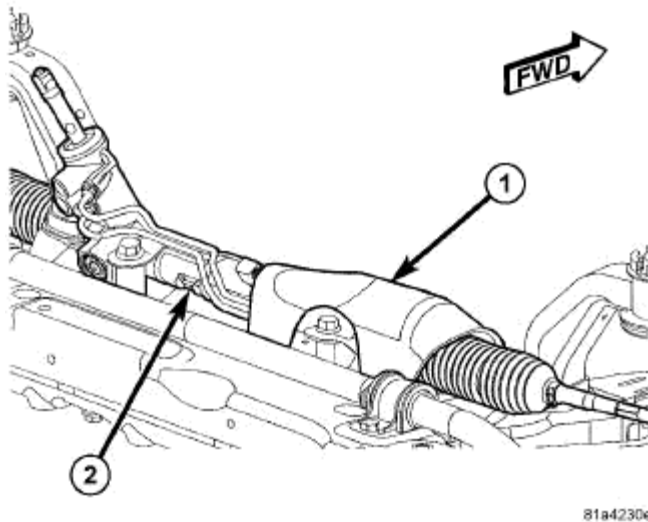


Fig. 76: Heat Shield
Courtesy of CHRYSLER LLC

12. Position the heat shield (1) over the steering gear (2). Install the mounting screws and push-pins. Tighten the screws to 6 N.m (53 in. lbs.).

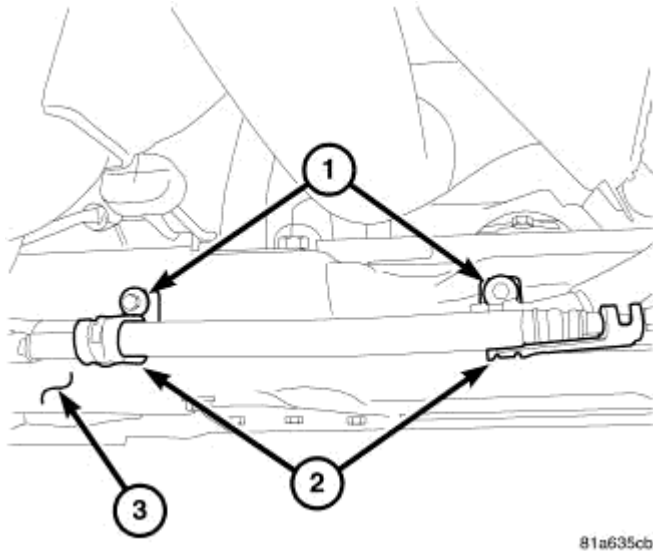


Fig. 77: Hoses At Rear Of Crossmember
Courtesy of CHRYSLER LLC

13. Position the power steering hose routing clamps (2) on the crossmember. Install and tighten the screws to 8 N.m (71 in. lbs.).

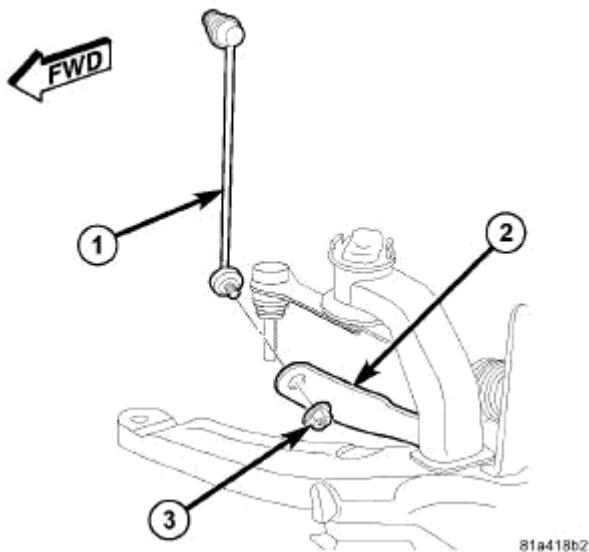


Fig. 78: Stabilizer Link Mounting To Bar
Courtesy of CHRYSLER LLC

14. Attach the stabilizer bar link (1) at each end of the stabilizer bar (2). At each link, install and tighten the nut (3) while holding the stabilizer bar link lower stud stationary. Tighten the nuts to 48 N.m (35 ft. lbs.).

15. Install the rear engine mount. Refer to ENGINE MOUNTING in appropriate Engine article.
16. Install the front engine mount through-bolt.
17. If equipped, install the engine belly pan.
18. Lower the vehicle.

STRUT, SUSPENSION, ASSEMBLY

Description

DESCRIPTION

A Macpherson type design strut assembly is used in place of the traditional front suspension upper control arm and upper ball joint. The bottom of the strut mounts directly to the steering knuckle using two attaching bolts and nuts going through the strut clevis bracket and knuckle. The top of the strut mounts directly to the strut tower of the vehicle using the three threaded studs on the strut assembly's upper mount.

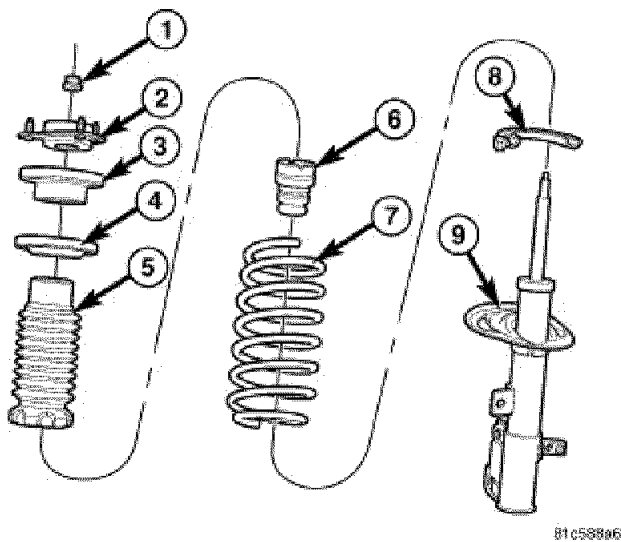


Fig. 79: Strut Assembly (Exploded)

Courtesy of CHRYSLER LLC

The strut assembly includes the following components:

- Upper mount (2)
- Bearing and upper spring seat (3)
- Upper spring isolator (4)
- Dust shield (5)
- Jounce bumper (6)
- Coil spring (7)
- Lower spring isolator (8)

- Strut (damper) (9)

Each component is serviced by removing the strut assembly from the vehicle and disassembling it.

Coil springs are rated separately for each corner or side of the vehicle depending on optional equipment and type of vehicle service. If a coil spring requires replacement, be sure that it is replaced with a spring meeting the correct load rating for the vehicle and its specific options.

Operation

OPERATION

The strut assembly cushions the ride of the vehicle, controlling vibration, jounce and rebound of the suspension.

The coil spring controls ride quality and maintains proper ride height.

The spring isolators isolate the coil spring at the top and bottom from coming into metal-to-metal contact with the upper mounting seat and the strut.

The jounce bumper limits suspension travel and metal-to-metal contact under full jounce condition.

The strut dampens jounce and rebound motions of the coil spring and suspension.

Diagnosis and Testing

STRUT ASSEMBLY

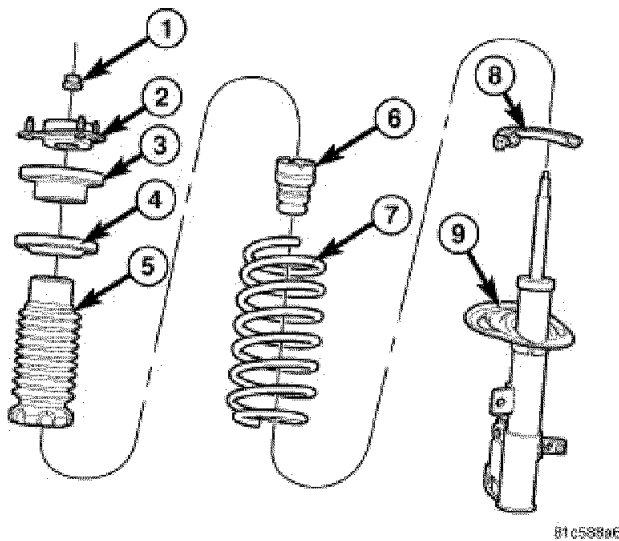


Fig. 80: Strut Assembly (Exploded)
Courtesy of CHRYSLER LLC

Inspect the strut assembly for the following conditions:

- Inspect for a damaged or broken coil spring (7).
- Inspect for a torn or damaged dust shield (5).
- Inspect for torn or deteriorated spring isolators (4, 8).
- Lift the dust shield and inspect the strut assembly for evidence of fluid running from the upper end of the strut fluid reservoir. (Actual leakage will be a stream of fluid running down the side and dripping off lower end of unit). A slight amount of seepage between the strut shaft and strut shaft seal is not unusual and does not affect performance of the strut assembly.
- Inspect the jounce bumper (6) for signs of damage or deterioration.
- Inspect the clearance between the shock tower and the coil spring. Make sure no fasteners are protruding through the shock tower possibly contacting the coil spring and strut. Because of the minimum clearance in this area, installation of metal fasteners could damage the coil spring coating and lead to a corrosion failure of the spring.

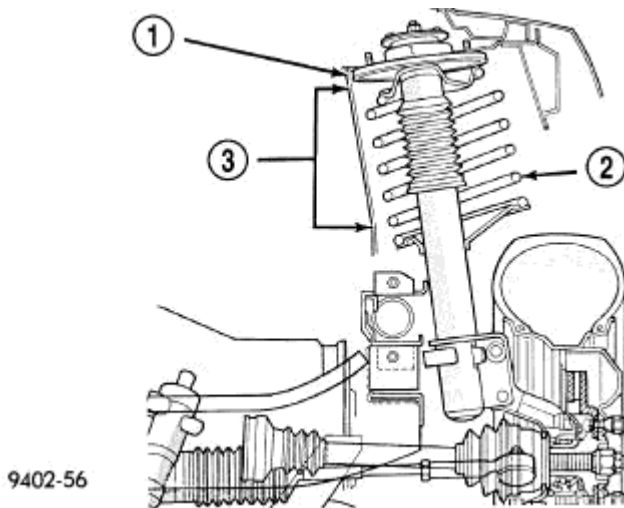


Fig. 81: Shock Tower Area (Typical)
Courtesy of CHRYSLER LLC

CAUTION: At no time when servicing a vehicle can a sheet metal screw, bolt or other metal fastener be installed into the strut tower (1) to take the place of an original plastic clip. Also, do not drill holes into the front strut tower for the installation of any metal fasteners into the shock tower area indicated (3).

Removal

REMOVAL

NOTE: Before proceeding. See WARNINGS AND CAUTIONS .

1. Remove the engine appearance cover.

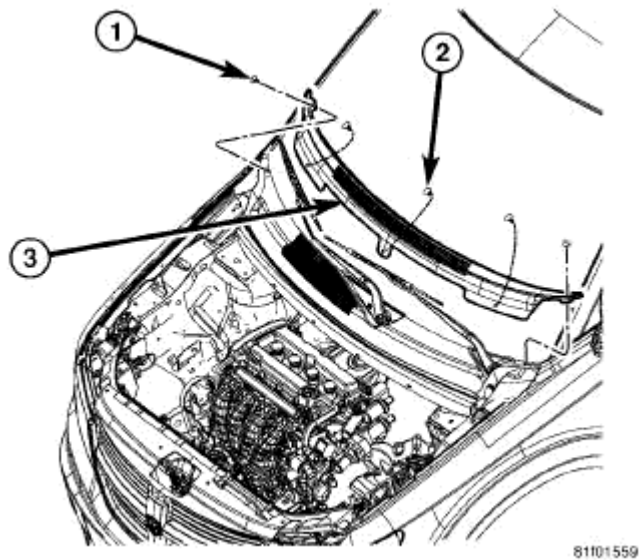


Fig. 82: Cowl Top Screen

Courtesy of CHRYSLER LLC

2. Remove the two push-pins (1) securing the cowl top screen at the ends. Remove the remaining push-pins (2). Remove the cowl top screen (3).
3. Remove the wiper arms. Refer to **Electrical - Wipers/Washers/Wipers/Washers/ARM, Wiper - Removal**

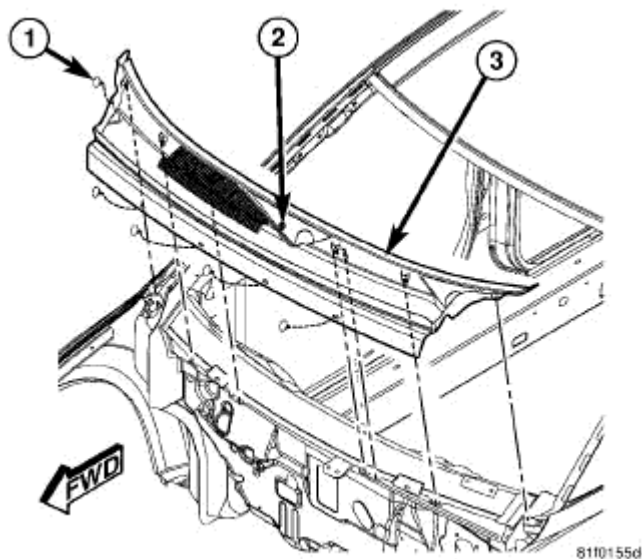


Fig. 83: Cowl Screen

Courtesy of CHRYSLER LLC

4. Remove the push-pins (1) securing the cowl screen to the wheelhouse brace and cowl. Rotate the screw (2) in the center of the cowl screen 90° clockwise to release the screen. Remove the cowl screen (3).

5. Raise and support the vehicle. Refer to **Vehicle Quick Reference/Hoisting - Standard Procedure**

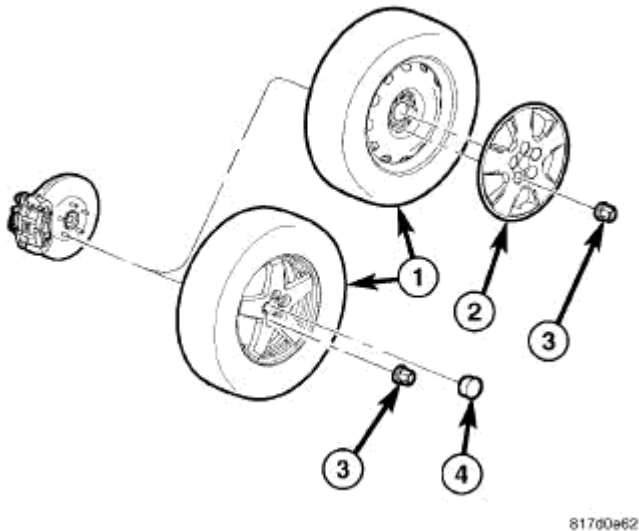


Fig. 84: TIRE AND WHEEL MOUNTING

Courtesy of CHRYSLER LLC

6. Remove the wheel mounting nuts (3), then the tire and wheel assembly (1).

NOTE: If both strut assemblies are to be removed, mark the strut assemblies right or left and keep the parts separated to avoid mix-up. Not all parts of the strut assembly are interchangeable side-to-side.

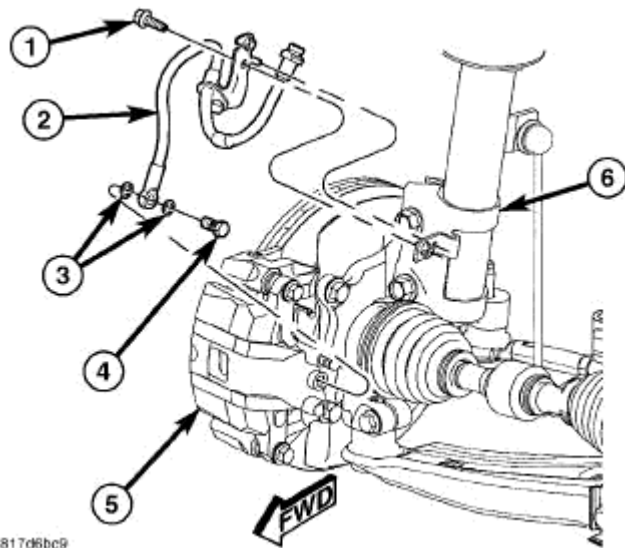


Fig. 85: Brake Hose Mounting To Strut

Courtesy of CHRYSLER LLC

7. Remove the screw (1) securing the flex hose (2) routing bracket to the strut (6).

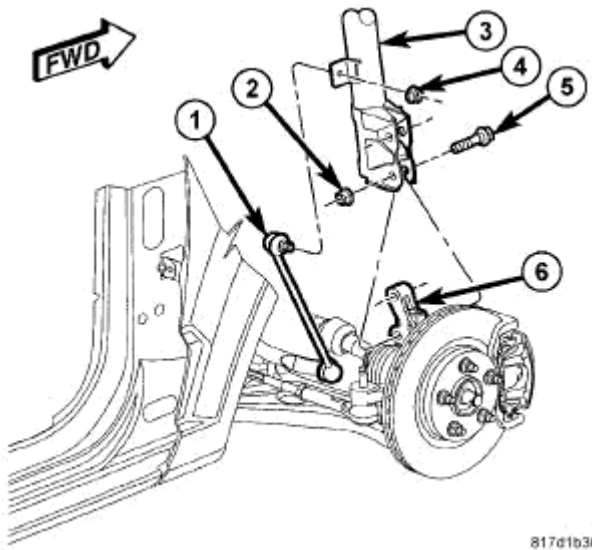


Fig. 86: Strut Mounting To Knuckle
Courtesy of CHRYSLER LLC

8. While holding the stabilizer bar link (1) stud stationary, remove the nut (4) securing the link to the strut (3).

CAUTION: The strut assembly-to-knuckle attaching bolts (5) are serrated and must not be turned during removal. Hold the bolts stationary in the knuckle while removing the nuts, then tap the bolts out using a pin punch.

9. While holding the bolt heads stationary, remove the two nuts (2) from the bolts (5) attaching the strut (3) to the knuckle (6).
10. Remove the two bolts (5) attaching the strut (3) to the knuckle (6) using a pin punch.
11. Lower the vehicle just enough to open the hood without allowing the tires to touch the floor.

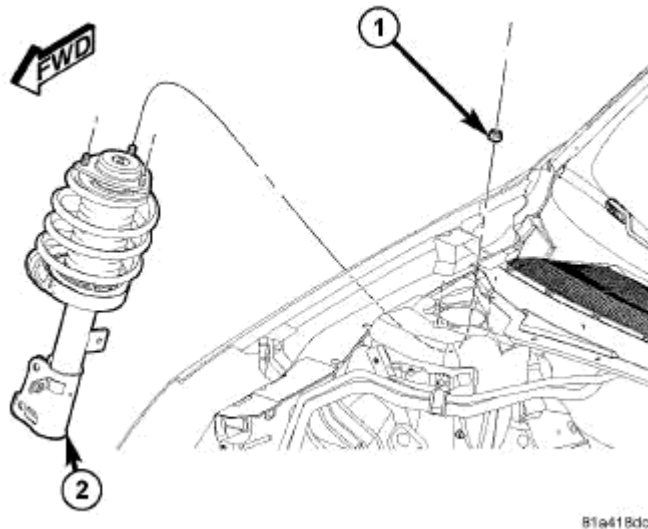


Fig. 87: Strut Upper Mounting Nuts
Courtesy of CHRYSLER LLC

12. Remove the three nuts (1) attaching the strut assembly (2) upper mount to the strut tower.
13. Remove the strut assembly (2) from the vehicle.
14. For disassembly. See **Disassembly** .

Disassembly

DISASSEMBLY

NOTE: The strut assembly must be removed from the vehicle for it to be disassembled and assembled. See **Removal**

For the disassembly and assembly of the strut assembly, use strut spring compressor, team PSE tool 223-7400, or the equivalent, to compress the coil spring. Follow the manufacturer's instructions closely.

WARNING: Do not remove the strut rod nut before the coil spring is properly compressed. The coil spring is held under pressure. The coil spring must be compressed, removing spring tension from the upper mount and bearing, before the strut rod nut is removed.

1. If both struts are being serviced at the same time, mark both the coil spring and strut assembly according to which side of the vehicle the strut is being removed from.

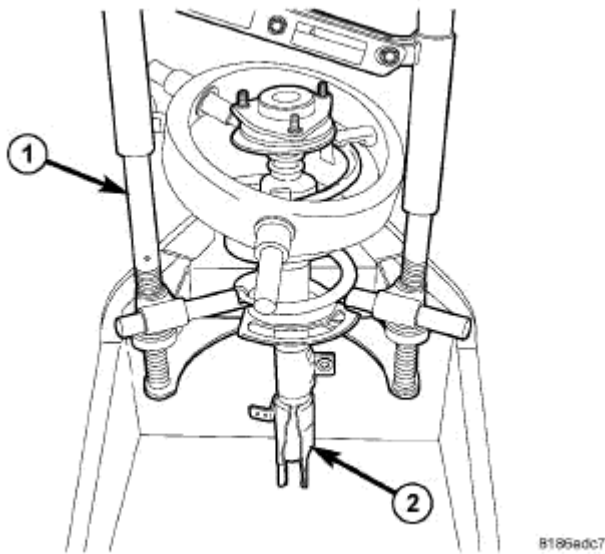


Fig. 88: Identifying Strut Assembly Positioned In Strut Coil Spring Compressor
 Courtesy of CHRYSLER LLC

2. Position the strut assembly (2) in the strut coil spring compressor (1) following the manufacturer's instructions and set the lower and upper hooks of the compressor on the coil spring. Position the strut clevis bracket (2) straight outward, away from the compressor.
3. Compress the coil spring until all coil spring tension is removed from the upper mount and bearing.

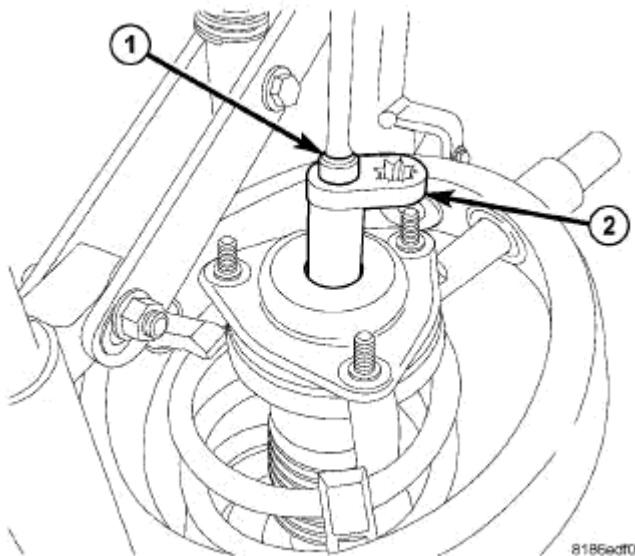


Fig. 89: Special Tools On Strut Rod Nut
 Courtesy of CHRYSLER LLC

CAUTION: Never use impact or high speed tools to remove the strut rod nut.
 Damage to the strut internal bearings can occur.

4. Once the spring is sufficiently compressed, install Strut Nut Wrench (2) 9362, on the strut rod nut. Next, install a deep socket (1) on the end of the strut rod. While holding the strut rod from turning, remove the nut using the strut nut wrench.

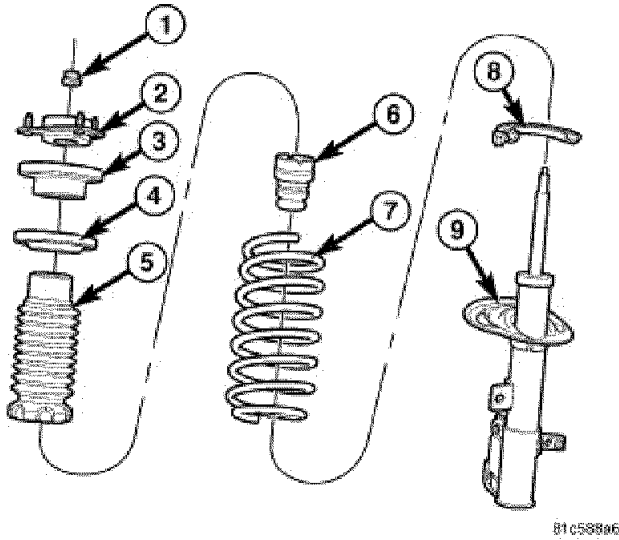


Fig. 90: Strut Assembly (Exploded)
Courtesy of CHRYSLER LLC

5. Remove the clamp (if installed) from the bottom of the coil spring and remove the strut (damper) (9) out through the bottom of the coil spring.
6. Remove the lower spring isolator (8) from the strut seat.
7. remove the dust shield (5) and jounce bumper (6).
8. Remove the upper strut mount (2) from the top of the bearing and upper spring seat (3).
9. Remove the upper spring seat (3) and isolator (4) from the top of the coil spring (5).

NOTE: If the coil spring needs to be serviced, proceed with the next step, otherwise, proceed with 11.

10. Release the tension from the coil spring by backing off the compressor drive completely. Push back the compressor hooks and remove the coil spring.

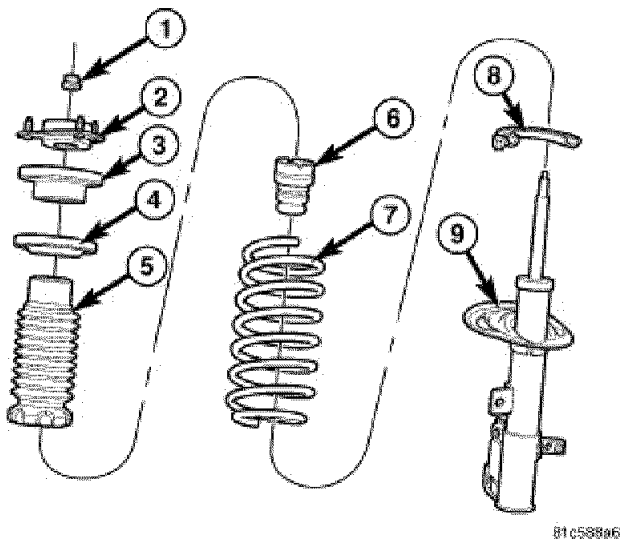


Fig. 91: Strut Assembly (Exploded)

Courtesy of CHRYSLER LLC

11. Inspect the strut assembly components for the following and replace as necessary:

NOTE: For reassembly. See Assembly .

- Inspect the strut (damper) (9) for shaft binding over the full stroke of the shaft.
- Inspect the jounce bumper (6) for cracks and signs of deterioration.
- Inspect the dust shield (5) for cracks and tears.
- Check the upper mount (2) for cracks and distortion and its retaining studs for any sign of damage.
- Check the bearing and upper spring seat (3) for any binding.
- Inspect the upper and lower spring isolators (4, 8) for material deterioration and distortion.
- Inspect the coil spring (7) for any sign of damage to the coating.

Assembly

ASSEMBLY

NOTE: If the coil spring has been removed from the spring compressor, proceed with the next step, otherwise, proceed with 3.

NOTE: To determine the flat coil end of the coil spring for the following step, attempt to stand the coil spring on-end on a flat, level surface. If the coil spring stands on end, the end on the flat surface is the flat coil end. If the coil spring falls over, the end on the flat surface is not the flat coil end. Stand the coil spring on the opposite end to verify.

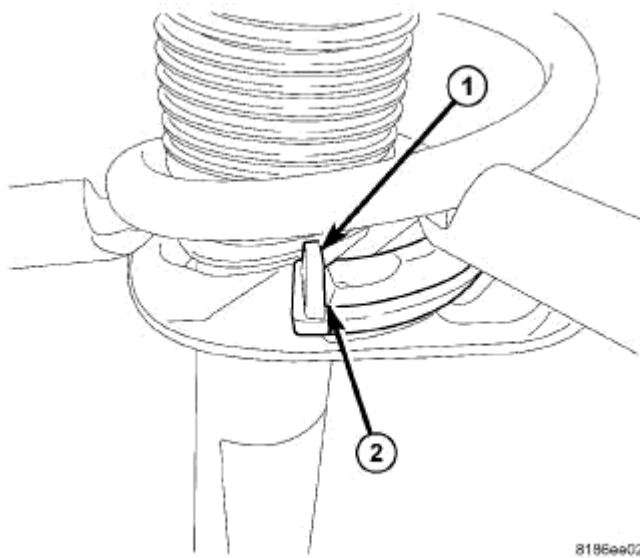


Fig. 93: Coil Spring Against Stop
Courtesy of CHRYSLER LLC

7. Install the strut up through the bottom of the coil spring and upper spring seat, mount, and bearing until the lower spring seat contacts the lower end of the coil spring. Rotate the strut as necessary until the end of the bottom coil (2) comes in contact with the stop (1) built into the lower spring isolator.

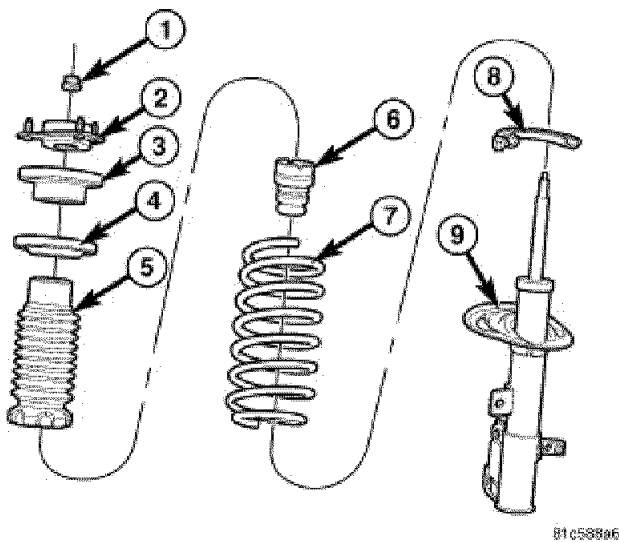


Fig. 94: Strut Assembly (Exploded)
Courtesy of CHRYSLER LLC

8. While holding the strut in position, install the nut (1) on the end of the strut rod.

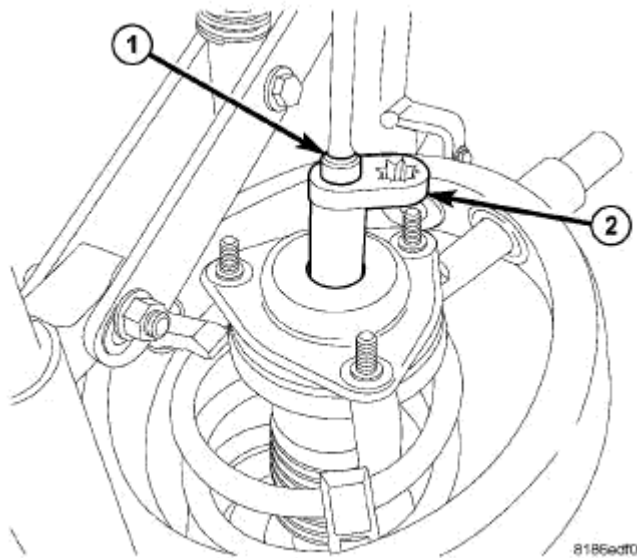


Fig. 95: Special Tools On Strut Rod Nut
Courtesy of CHRYSLER LLC

CAUTION: Never use impact or high speed tools to remove the strut rod nut. Damage to the strut internal bearings can occur.

9. Install Strut Nut Wrench (2) 9362, on the strut rod nut. Next, install a deep socket (1) on the end of the strut rod. While holding the strut rod from turning, tighten the strut rod nut to 60 N.m (44 ft. lbs.) using a torque wrench on the end of Strut Nut Wrench (2) 9362.

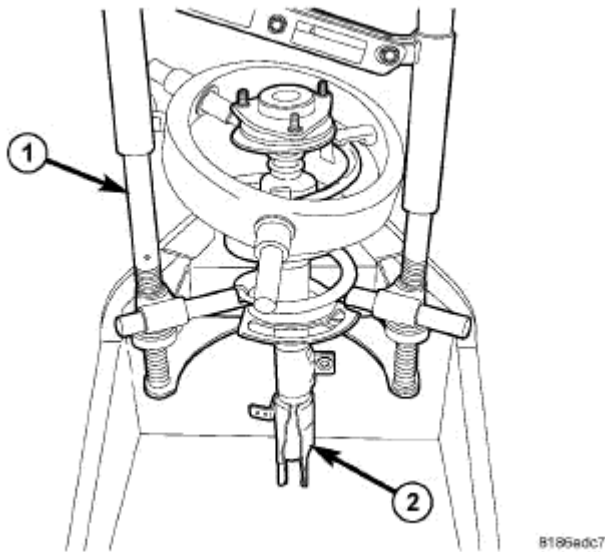
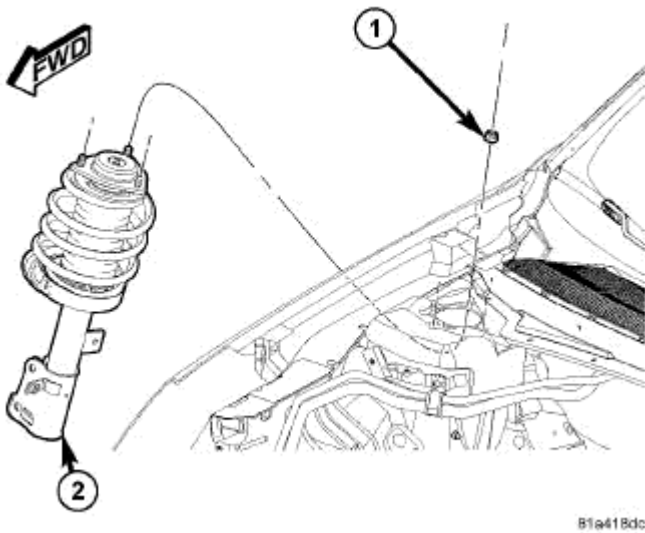
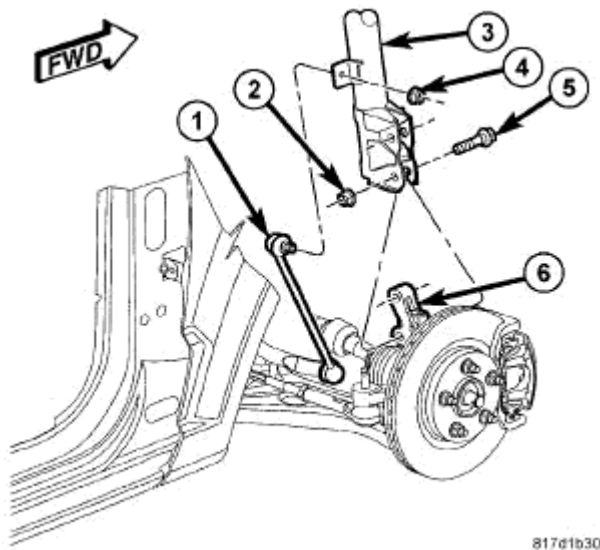


Fig. 96: Identifying Strut Assembly Positioned In Strut Coil Spring Compressor
Courtesy of CHRYSLER LLC

10. Slowly release the tension from the coil spring by backing off the compressor (1) drive completely. As the tension is relieved, make sure the upper mount and bearing align properly. Verify the upper mount does not bind when rotated.
11. Remove the strut assembly from the spring compressor.
12. Install the strut assembly on the vehicle. See **Installation**

Installation**INSTALLATION****Fig. 97: Strut Upper Mounting Nuts****Courtesy of CHRYSLER LLC**

1. Raise the strut assembly (2) into the strut tower, aligning the three studs on the strut assembly upper mount with the holes in strut tower. Install the three mounting nuts (1) on the studs. Tighten the three nuts to 55 N.m (41 ft. lbs.).

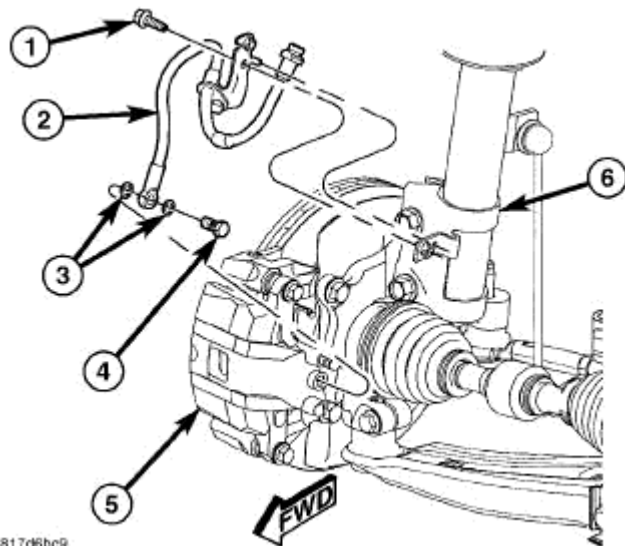


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Fig. 98: Strut Mounting To Knuckle
 Courtesy of CHRYSLER LLC

CAUTION: The strut clevis-to-knuckle bolts (5) are serrated and must not be turned during installation. Install the nuts while holding the bolts stationary in the knuckle.

2. Position the lower end of the strut assembly (3) in line with the upper end of the knuckle (6), aligning the mounting holes. Install the two attaching bolts (5). Install the nuts (2). While holding the bolts in place, tighten the nuts to 140 N.m (103 ft. lbs.).
3. Attach the stabilizer bar link (1) to the strut (3). Install and tighten the nut (4) while holding the stabilizer bar link stud stationary. Tighten the nut to 48 N.m (35 ft. lbs.).

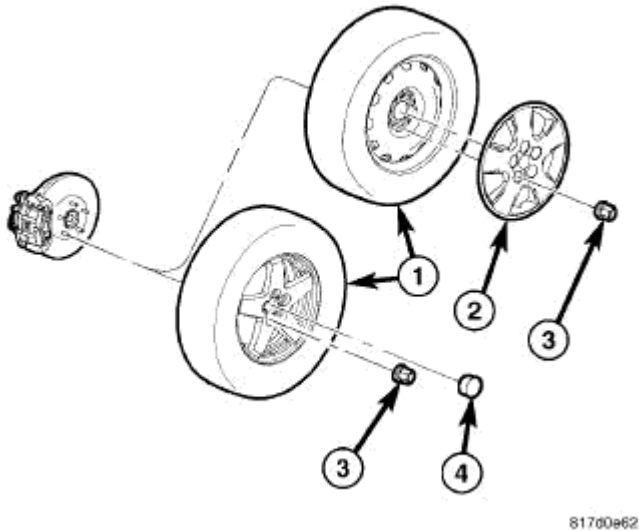


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Fig. 99: Brake Hose Mounting To Strut

Courtesy of CHRYSLER LLC

4. Secure the flex hose (2) routing bracket to the strut (6) with the mounting screw (1). Tighten the mounting screw to 13 N.m (120 in. lbs.).

**Fig. 100: TIRE AND WHEEL MOUNTING**

Courtesy of CHRYSLER LLC

5. Install tire and wheel assembly (1). Refer to **Tires and Wheels - Installation** . Install and tighten wheel mounting nuts (3) to 135 N.m (100 ft. lbs.).
6. Lower the vehicle.

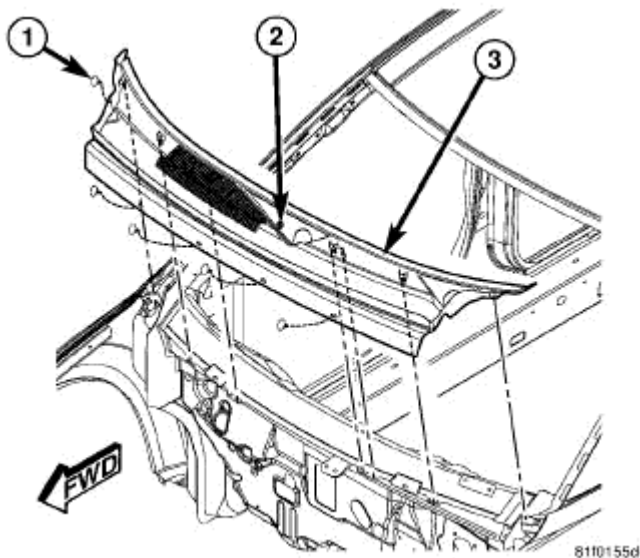
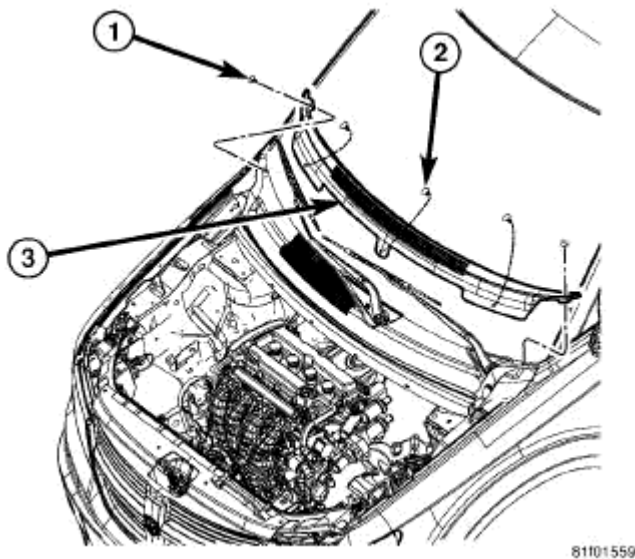


Fig. 101: Cowl Screen

Courtesy of CHRYSLER LLC

7. Install the cowl screen. Install the push-pins (1) securing the cowl screen to the wheelhouse brace and cowl. Rotate the screw (2) in the center of the cowl screen 90° counterclockwise to lock the screen in place.
8. Install the wiper arms. Refer to **Electrical - Wipers/Washers/Wipers/Washers/ARM, Wiper - Installation**

**Fig. 102: Cowl Top Screen**

Courtesy of CHRYSLER LLC

9. Install the cowl top screen (3). Install the two push-pins (1) securing the cowl top screen at the ends. Install the remaining push-pins (2).
10. Install the engine appearance cover.

WHEEL ALIGNMENT

DESCRIPTION

DESCRIPTION

Vehicle wheel alignment is the positioning of all interrelated front and rear suspension angles. These angles affect the handling and steering of the vehicle when it is in motion. Proper wheel alignment is essential for efficient steering, good directional stability, and proper tire wear.

The method of checking a vehicle's front and rear wheel alignment varies depending on the manufacturer and type of equipment used. The manufacturer's instructions should always be followed to ensure accuracy of the alignment, except when Chrysler Corporation's wheel alignment specifications differ.

2009 Dodge Journey R/T

2009 Suspension Front Suspension - Journey

On this vehicle, the suspension angles that can be adjusted are as follows:

Front

- Camber (with cradle shift or service adjustment bolt package)
- Caster (limited adjustment with cradle shift)
- Toe

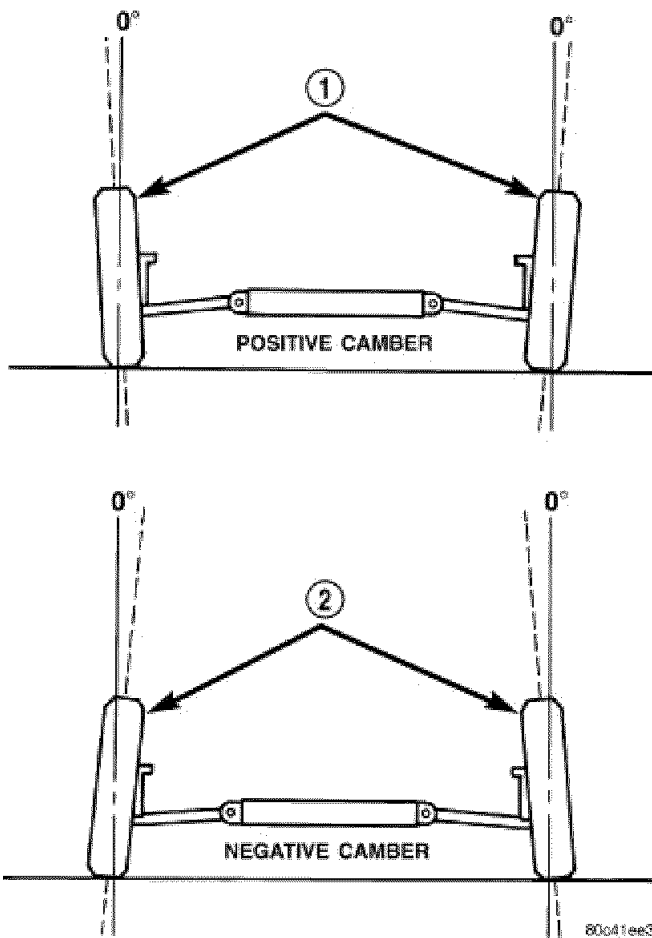
Rear

- Toe

Check the wheel alignment and make all wheel alignment adjustments with the vehicle standing at its proper curb height specification. Curb height is the normal riding height of the vehicle. It is measured from a certain point on the vehicle to the ground or a designated area while the vehicle is sitting on a flat, level surface. Refer to **CURB HEIGHT MEASUREMENT** in this service information for additional information.

Typical wheel alignment angles and measurements are described in the following paragraphs.

CAMBER

**Fig. 103: Camber**

Courtesy of CHRYSLER LLC

1 - WHEELS TILTED OUT AT TOP

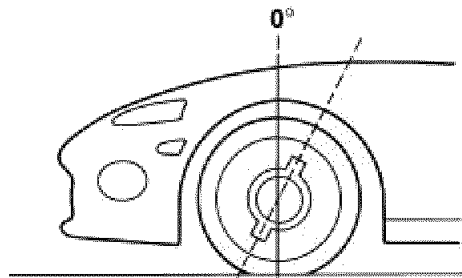
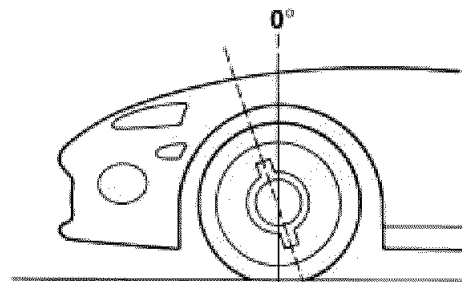
2 - WHEELS TILTED IN AT TOP

Camber is the inward or outward tilt of the top of the tire and wheel assembly. Inward tilt (2) is known as negative camber. Outward tilt (1) is known as positive camber. Camber is measured in degrees of angle relative to a true vertical line. Camber is a tire wearing angle.

- Excessive negative camber will cause tread wear at the inside of the tire.
- Excessive positive camber will cause tread wear on the outside of the tire.

CROSS CAMBER

Cross camber is the difference between left and right camber. To achieve the cross camber reading, subtract the right side camber reading from the left. For example, if the left camber is -0.7° and the right camber is -0.5° , the cross camber would be -0.2° ($-0.7 - (-0.5) = -0.7 + 0.5 = -0.2$).

CASTER**POSITIVE CASTER****NEGATIVE CASTER**

86x41e04

Fig. 104: Caster

Courtesy of CHRYSLER LLC

Caster is the forward or rearward tilt of the steering knuckle in reference to the position of the upper and lower ball joints. Caster is measured in degrees of angle relative to a true vertical center line. This line is viewed from the side of the tire and wheel assembly.

- Forward tilt (upper ball joint ahead of lower) results in a negative caster angle.
- Rearward tilt (upper ball joint trailing lower) results in a positive caster angle.

Although caster does not affect tire wear, a caster imbalance between the two front wheels may cause the vehicle to lead to the side with the least positive caster.

CROSS CASTER

Cross caster is the difference between left and right caster. To achieve the cross caster reading, subtract the right side caster reading from the left. For example, if the left caster is 2.5° and the right caster is 2.7° , the cross caster would be -0.2° ($2.5 - 2.7 = -0.2$).

TOE

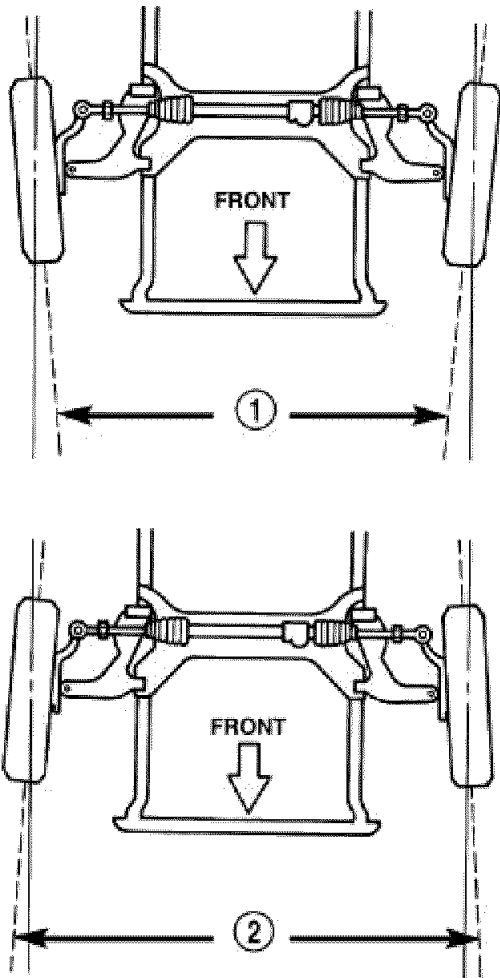


Fig. 105: Toe
Courtesy of CHRYSLER LLC

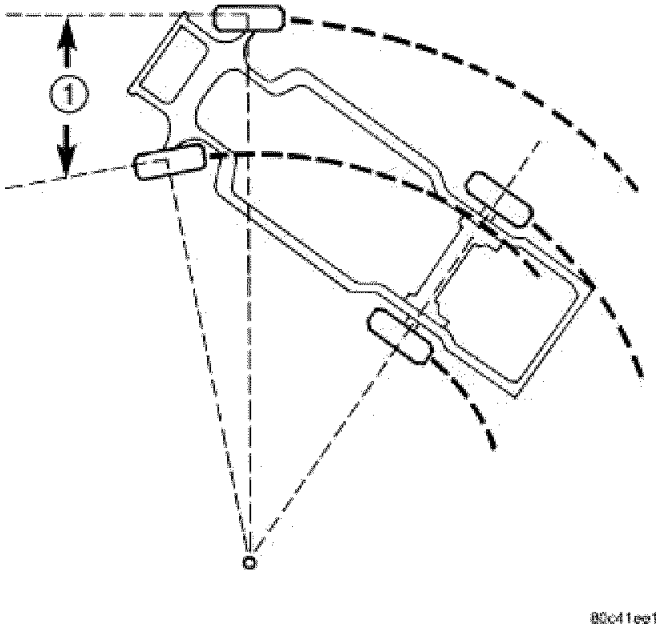
- | |
|-------------|
| 1 - TOE-IN |
| 2 - TOE-OUT |

Toe is the inward or outward angle of the wheels as viewed from above the vehicle.

- Toe-in (1) is produced when the front edges of the wheels on the same axle are closer together than the rear edges.
- Toe-out (2) is produced when the front edges of the wheels on the same axle are farther apart than the rear edges.

Toe-in and toe-out can occur at the front wheels and the rear wheels.

Toe is measured in degrees or inches. The measurement identifies the amount that the front of the wheels point inward (toe-in) or outward (toe-out). Toe is measured at the spindle height. Zero toe means the front and rear edges of the wheels on the same axle are equal distant.

TOE-OUT ON TURNS

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Fig. 106: Toe-Out On Turns
 Courtesy of CHRYSLER LLC

1 - TOE-OUT ON TURNS

Toe-out on turns (1), sometimes referred to as Ackerman Steering, is the relative positioning of the front wheels while steering through a turn. This compensates for each front wheel's turning radius. As the vehicle encounters a turn, the outboard wheel must travel in a larger radius circle than the inboard wheel. The steering system is designed to make each wheel follow its particular radius circle. To accomplish this, the front wheels must progressively toe outward as the steering is turned from center. This eliminates tire scrubbing and undue tire wear when steering a vehicle through a turn.

DYNAMIC TOE PATTERN

Dynamic toe pattern is the inward and outward toe movement of the front and rear tires through the suspension's jounce and rebound travel. As the vehicle's suspension moves up and down, the toe pattern varies. Toe pattern is critical in controlling the directional stability of the vehicle while in motion. Front and rear dynamic toe pattern is preset by the factory at the time the vehicle is assembled.

It is not necessary to check or adjust front or rear dynamic toe pattern when doing a normal wheel alignment. The only time dynamic toe pattern needs to be checked or adjusted is if the frame of the vehicle has been damaged.

STEERING AXIS INCLINATION (S.A.I.)

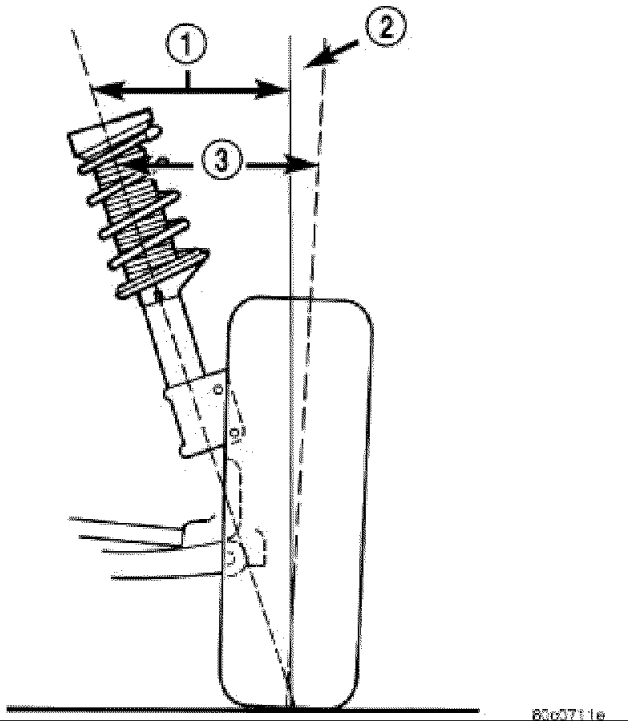


Fig. 107: Identifying Steering Axis Inclination, Included Angle, & Camber
Courtesy of CHRYSLER LLC

1 - S.A.I.

2 - CAMBER

3 - I.A.

Steering axis inclination (1) is the angle between a true vertical line starting at the center of the tire at the road contact point and a line drawn through the center of the upper ball joint (or strut) and the lower ball joint. S.A.I. is built into the vehicle and is not an adjustable angle. If S.A.I. is not within specifications, a bent or damaged suspension component may be the cause.

INCLUDED ANGLE (I.A.)

Included angle (3) is the sum of the S.A.I. angle (1) plus or minus the camber angle (2), depending on whether or not the wheel has positive or negative camber. If camber is positive, add the camber angle to the S.A.I. angle. If camber is negative, subtract the camber angle from the S.A.I. angle. Included angle is not adjustable, but can be used to diagnose a frame misalignment or bent suspension component (spindle, strut).

THRUST ANGLE

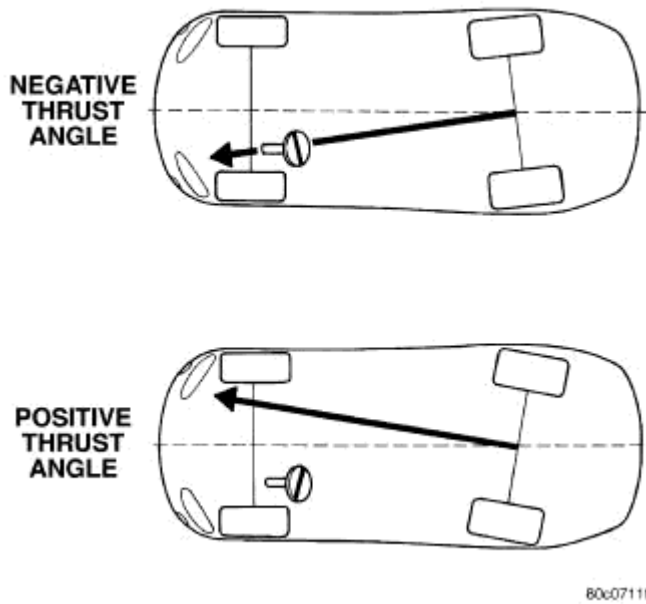


Fig. 108: Thrust Angle

Courtesy of CHRYSLER LLC

Thrust angle is the averaged direction the rear wheels are pointing in relation to the vehicle's center line. The presence of negative or positive thrust angle causes the rear tires to track improperly to the left or right of the front tires (dog tracking).

- Negative thrust angle means the rear tires are tracking to the left of the front tires.
- Positive thrust angle means the rear tires are tracking to the right of the front tires.

Improper tracking can cause undue tire wear, a lead or pull and a crooked steering wheel. Excessive thrust angle can usually be corrected by adjusting the rear wheel toe so that each wheel has one-half of the total toe measurement.

STANDARD PROCEDURE

CURB HEIGHT MEASUREMENT

The wheel alignment is to be checked and all alignment adjustments made with the vehicle at its required curb height specification.

Vehicle height is to be checked with the vehicle on a flat, level surface, preferably a vehicle alignment rack. The tires are to be inflated to the recommended pressure. All tires are to be the same size as standard equipment.

Vehicle height is checked with the fuel tank full of fuel, and no passenger or luggage compartment load.

Vehicle height is not adjustable. If the measurement is not within specifications, inspect the vehicle for bent or weak suspension components. Compare the parts tag on the suspect coil spring(s) to the parts book and the

vehicle sales code, checking for a match. Once removed from the vehicle, compare the coil spring height to a correct new or known good coil spring. The heights should vary if the suspect spring is weak.

NOTE: Prior to reading the curb height measurement, the front and rear of the vehicle must be jounced to settle the suspension. Induce jounce by pushing down on the center of the bumper (fascia), using care not to damage the vehicle, moving the vehicle up and down, gradually increasing the suspension travel with each stroke. Release the bumper at the bottom of each stroke, repeating this action several times. Perform this to both front and rear suspensions an equal amount of times.

Measure curb height as follows:

1. Jounce the vehicle. Refer to above note.

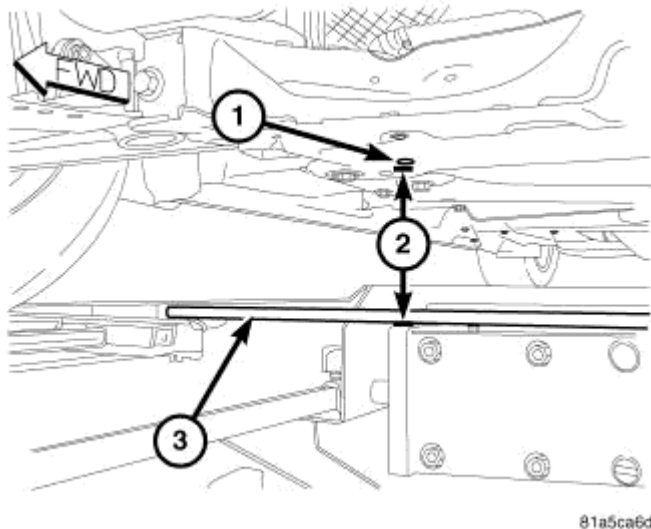


Fig. 109: Front Curb Height Measurement
Courtesy of CHRYSLER LLC

NOTE: On some vehicles it may be necessary to remove an engine belly pan in order to gain access to the lower control arm pivot bolt.

2. Front - On each side of the vehicle, measure the distance (2) from the flat surface behind the PLP hole (1) to the floor or alignment rack/lift runway surface. It may be necessary to measure to the bottom of a straight edge (3), placed from lift runway to runway, to get an accurate measurement.

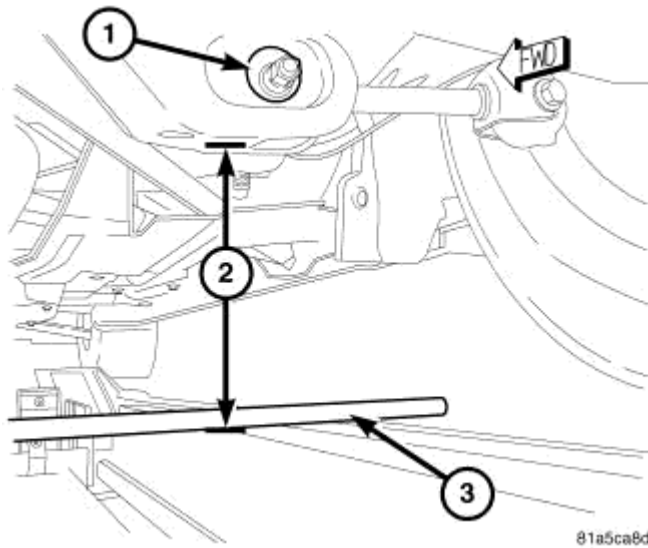


Fig. 110: Rear Curb Height Measurement

Courtesy of CHRYSLER LLC

3. Rear - On each side of the vehicle, measure the distance (2) from the flat surface below the rear toe adjustment cam bolt (1) to the floor or alignment rack/lift runway surface. It may be necessary to measure to the bottom of a straight edge (3), placed from lift runway to runway, to get an accurate measurement.
4. Compare the measurements to specifications listed in the following **CURB HEIGHT SPECIFICATIONS** chart. Maximum left-to-right differential is not to exceed 12.5 mm (0.5 in.).
5. If curb height is found to be out of specification and there is no sign of excessive body damage, curb height can be changed by replacing the applicable spring with a spring offering a different check load. See **Removal**

CURB HEIGHT SPECIFICATIONS

WHEEL SIZE	FRONT	REAR
16 INCH	201 mm $\pm$ 12 mm 7.91 in. $\pm$ 0.47 in.	232 mm $\pm$ 12 mm 9.13 in. $\pm$ 0.47 in.
17 INCH	200 mm $\pm$ 12 mm 7.87 in. $\pm$ 0.47 in.	230 mm $\pm$ 12 mm 9.06 in. $\pm$ 0.47 in.
19 INCH	205 mm $\pm$ 12 mm 8.07 in. $\pm$ 0.47 in.	235 mm $\pm$ 12 mm 9.25 in. $\pm$ 0.47 in.

CURB HEIGHT SPECIFICATIONS - EXPORT

WHEEL SIZE	FRONT	REAR
16 INCH	184 mm $\pm$ 12 mm 7.25 in. $\pm$ 0.47 in.	216 mm $\pm$ 12 mm 8.50 in. $\pm$ 0.47 in.
17 INCH	198 mm $\pm$ 12 mm 7.80 in. $\pm$ 0.47 in.	228 mm $\pm$ 12 mm 8.98 in. $\pm$ 0.47 in.
19 INCH	203 mm $\pm$ 12 mm 8.00 in. $\pm$ 0.47 in.	233 mm $\pm$ 12 mm 9.17 in. $\pm$ 0.47 in.

WHEEL ALIGNMENT**PRE-WHEEL ALIGNMENT INSPECTION**

Before any attempt is made to change or correct the wheel alignment, the following inspection and necessary corrections must be made to the vehicle to ensure proper alignment.

1. Verify the fuel tank is full of fuel. If the fuel tank is not full, the reduction in weight will affect the curb height of the vehicle and the alignment specifications.
2. The passenger and luggage compartments of the vehicle should be free of any load that is not factory equipment.
3. Check the tires on the vehicle. The tires are to be inflated to the recommended air pressure. All tires must be the same size and in good condition with approximately the same tread wear.
4. Check the front tire and wheel assemblies for excessive radial runout.
5. Inspect all suspension component fasteners for looseness and proper torque.
6. Inspect the lower front ball joints and all steering linkage for looseness and any sign of wear or damage.
7. Inspect the rubber bushings on all the suspension components for signs of wear or deterioration. If any bushings show signs of wear or deterioration, they should be replaced prior to aligning the vehicle.
8. Check vehicle curb height to verify it is within specifications. See **Standard Procedure**

WHEEL ALIGNMENT SETUP

1. Position the vehicle on an alignment rack.
2. Install all required alignment equipment on the vehicle, per the alignment equipment manufacturer's instructions. On this vehicle, a four-wheel alignment is recommended.

NOTE: Prior to reading the vehicle's alignment readouts, the front and rear of vehicle should be jounced. Induce jounce (rear first, then front) by grasping the center of the bumper and jouncing each end of vehicle an equal number of times. The bumper should always be released when vehicle is at the bottom of the jounce cycle.

3. Read the vehicle's current front and rear alignment settings. Compare the vehicle's current alignment settings to the vehicle specifications for camber, caster and toe-in. See **Specifications**

REAR CAMBER

Rear camber settings on this vehicle are determined at the time the vehicle is designed, by the location of the vehicle's suspension components. This is referred to as Net Build. The result is no required adjustment of camber after the vehicle is built or when servicing the suspension components. Thus, when performing a wheel alignment, rear camber is not considered an adjustable angle.

CAUTION: Do not attempt to adjust the vehicle's wheel alignment by heating or bending any of the suspension components.

FRONT CAMBER AND CASTER

Front camber and caster settings on this vehicle are determined at the time the vehicle is designed, by the location of the vehicle's suspension components. This is referred to as Net Build. The result is no required adjustment of camber and caster after the vehicle is built or when servicing the suspension components. Thus, when performing a wheel alignment, caster and camber are not normally considered adjustable angles but some adjustment can be made. Camber and caster should be checked to ensure they meet vehicle specifications. See **Specifications**

If individual front camber or caster is found not to meet alignment specifications, each can be adjusted by shifting the front crossmember or by using an available service adjustment bolt package. If an adjustment bolt package installation is necessary, inspect the suspension components for any signs of damage or bending first.

CAUTION: Do not attempt to adjust the vehicle's wheel alignment by heating or bending any of the suspension components.

ADJUSTMENT BY SHIFTING CROSSMEMBER

CAUTION: Always use care when shifting crossmember to avoid damaging other components on the vehicle.

1. Loosen the four bolts fastening the front crossmember to the frame just enough to allow movement of the crossmember. Refer to **Frame and Bumpers/Frame/CROSSMEMBER - Removal**
2. Loosen the bolts fastening the fore/aft crossmember to the frame just enough to allow movement of the crossmember. Refer to **Frame and Bumpers/Frame/CROSSMEMBER - Removal**

CAUTION: When shifting the front crossmember, keep in mind that the front and rear engine mounts are attached to the front crossmember and fore/aft crossmember and should be inspected following the crossmember shift to make sure they are properly aligned.

3. Shift front crossmember as necessary (See following tables) to bring camber or caster into specifications. When shifting crossmember, use care not to move other angles (camber or caster) that are within specifications, out of specifications.

FRONT CAMBER ADJUSTMENT BY SHIFTING CROSSMEMBER*	
Left Camber Below Specification	Move crossmember to the right
Left Camber Above Specification	Move crossmember to the left
Right Camber Below Specification	Move crossmember to the left
Right Camber Above Specification	Move crossmember to the right
Cross Camber Below Specification	Move crossmember to the right
Cross Camber Above Specification	Move crossmember to the left
* For every move to adjust one side of the vehicle, a countermove on the opposite side will occur.	

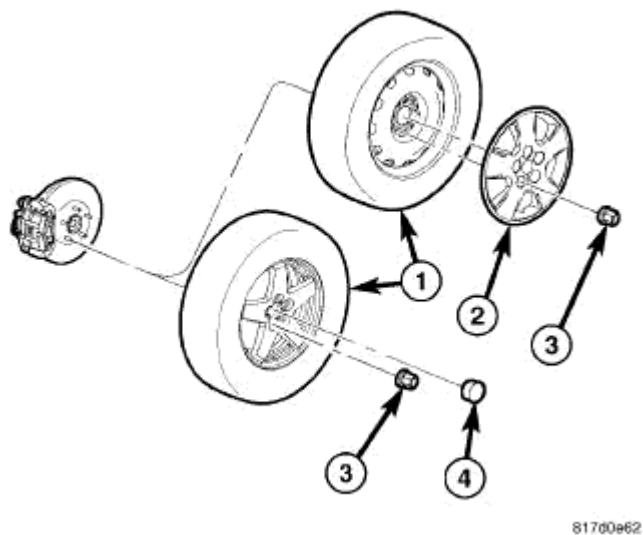
FRONT CASTER ADJUSTMENT BY SHIFTING CROSSMEMBER

Left Caster Below Specification	Move left side of crossmember forward
Left Caster Above Specification	Move left side of crossmember rearward
Right Caster Below Specification	Move right side of crossmember forward
Right Caster Above Specification	Move right side of crossmember rearward
Cross Caster Below Specification	Move left side of crossmember forward and right side rearward
Cross Caster Above Specification	Move left side of crossmember rearward and right side forward

4. Tighten all previously loosened fasteners (bolts) securing the crossmember to the vehicle to specifications. Refer to **Frame and Bumpers/Frame/CROSSMEMBER - Installation**
5. Jounce the rear, then front of the vehicle an equal amount of times.
6. Measure camber and caster. If camber and caster are within specifications, proceed to **TOE**TOE. If camber cannot be brought into specifications, perform **CAMBER ADJUSTMENT BOLT PACKAGE INSTALLATION**.

CAMBER ADJUSTMENT BOLT PACKAGE INSTALLATION

1. Raise the vehicle until its tires are not supporting the weight of the vehicle. Refer to **Vehicle Quick Reference/Hoisting - Standard Procedure**

**Fig. 111: TIRE AND WHEEL MOUNTING**

Courtesy of CHRYSLER LLC

2. Remove the wheel mounting nuts (3), then the front tire and wheel assembly (1).

CAUTION: The strut clevis-to-knuckle attaching bolt shanks are serrated and must not be turned during removal. Remove the nuts while holding the bolts stationary, then tap the bolts out using a punch.

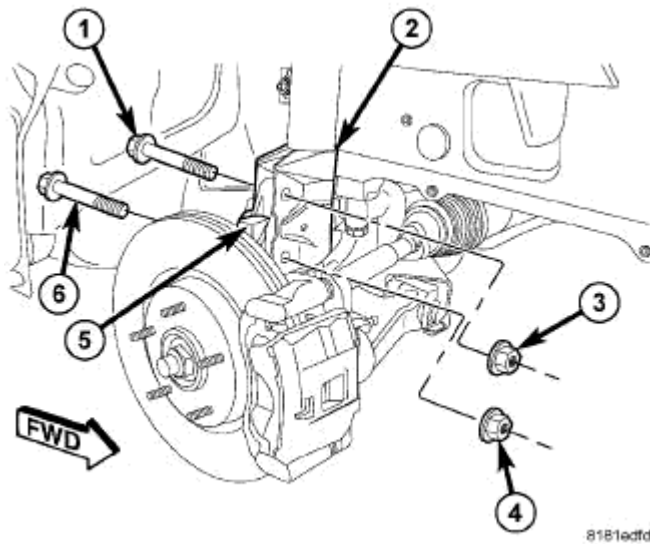


Fig. 112: Strut Clevis Bracket
Courtesy of CHRYSLER LLC

3. Remove the original nuts (3, 4) and upper (1) and lower (6) bolts attaching the strut clevis bracket (2) to the knuckle (5).
4. Separate the knuckle (5) from the strut clevis bracket (2) and position knuckle so it is out of the way of the strut. Use care not to overextend the brake flex hose or axle half shaft.

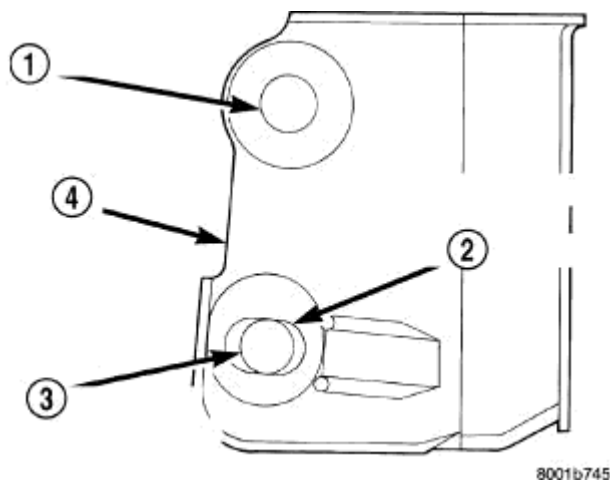


Fig. 113: Strut Clevis Bracket Bolt Hole Grinding Area
Courtesy of CHRYSLER LLC

CAUTION: When slotting the bottom mounting hole (3) on the strut clevis bracket (4), do not enlarge the hole beyond the indentations (2) on the sides of the strut clevis bracket.

5. Using an appropriate grinder and grinding wheel, slot the bottom hole (3) in both sides of the strut clevis

bracket (4).

CAUTION: After slotting the strut clevis bracket hole, do not install the original attaching bolts. Only the service package bolts and dog bone washers must be used to attach the knuckle to the strut once the mounting hole is slotted.

6. Position the strut clevis bracket in line with the upper end of the knuckle, aligning the mounting holes. Install the two service package bolts. **Be sure to place the bolt with the eccentric cam in the bottom (slotted) hole on strut clevis bracket.**
7. Install the dog bone washers provided in the service package and nuts on the replacement bolts. Tighten each nut just enough to hold the knuckle in position while adjusting camber, but still allows the knuckle to move in the clevis bracket.

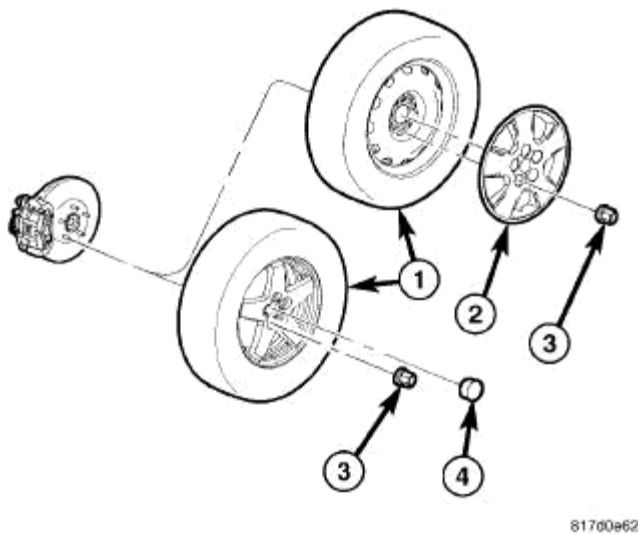


Fig. 114: TIRE AND WHEEL MOUNTING
Courtesy of CHRYSLER LLC

8. Install the tire and wheel assembly (1). Refer to **Tires and Wheels - Installation** . Install and tighten the wheel mounting nuts (3) to 135 N.m (100 ft. lbs.).
9. Perform the above procedure to opposite side strut as required.
10. Lower the vehicle and jounce the front and rear of the vehicle.
11. Adjust the front camber to the preferred setting using the cam bolt in the lower mounting hole. Once camber is set to specifications, tighten the upper and lower strut service package bolt nuts to 140 N.m (103 ft. lbs.). Again jounce the front and rear of the vehicle, then verify the camber settings.
12. Once camber is within specifications, adjust toe to meet the preferred specification setting. Refer to **TOE** within this wheel alignment service procedure.

TOE

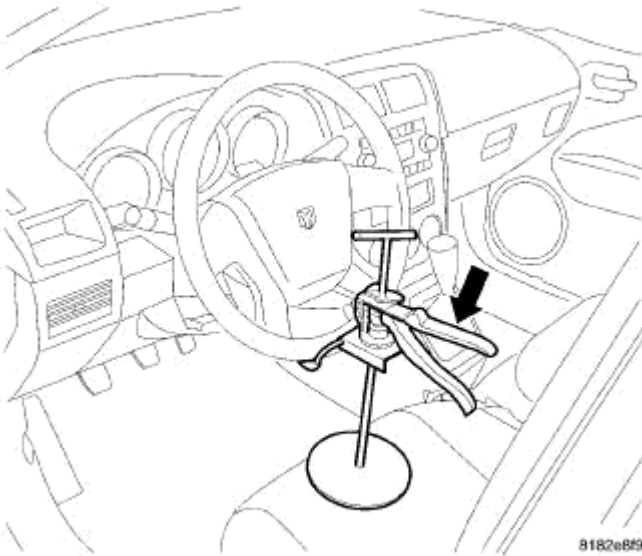


Fig. 115: Steering Wheel Holding Tool
Courtesy of CHRYSLER LLC

1. Center the steering wheel and lock it in place using a steering wheel clamp.

NOTE: When setting toe, make sure to set rear toe to the preferred specifications before setting front toe to the preferred specifications

NOTE: Perform the following at each rear wheel as necessary.

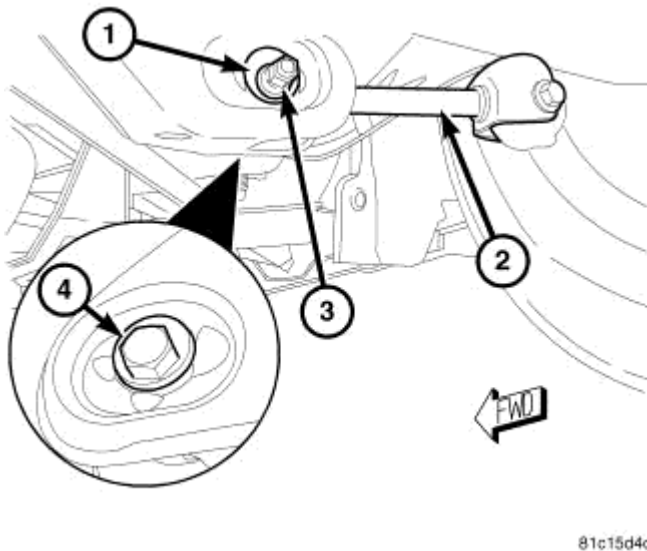


Fig. 116: Rear Toe Adjustment Cam Bolt
Courtesy of CHRYSLER LLC

NOTE: Perform the following at each front wheel as necessary.

CAUTION: Do not twist the inner tie rod-to-steering gear boot (bellows) while turning the inner tie rod during front toe adjustment. It may be necessary to remove the clamp where the boot meets the inner tie rod.

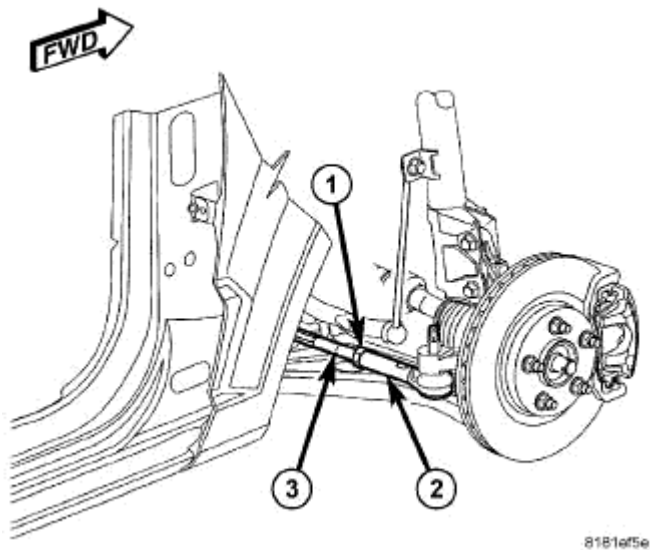


Fig. 117: Tie Rod Jam Nut
Courtesy of CHRYSLER LLC

REAR TOE

NOTE: Perform the following at each rear wheel as necessary.

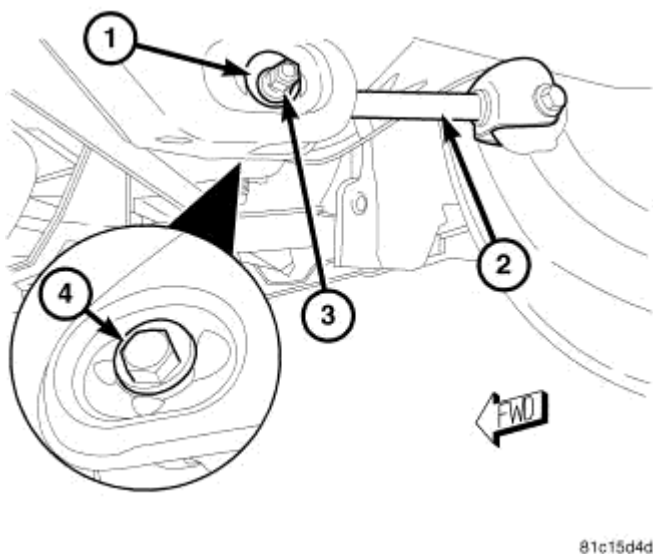


Fig. 118: Rear Toe Adjustment Cam Bolt
Courtesy of CHRYSLER LLC

2. While holding the cam bolt head (4) stationary, loosen the toe link mounting cam bolt nut (3).
3. Rotate the cam bolt head (4) left or right until the rear wheel toe for that rear wheel is set to the preferred specification. See **Specifications**
4. While holding the cam bolt head (4) stationary, tighten the toe link mounting cam bolt nut (3) to 100 N.m (74 ft. lbs.).

FRONT TOE

NOTE: Perform the following at each front wheel as necessary.

CAUTION: Do not twist the inner tie rod-to-steering gear boot (bellows) while turning the inner tie rod during front toe adjustment. It may be necessary to remove the clamp where the boot meets the inner tie rod.

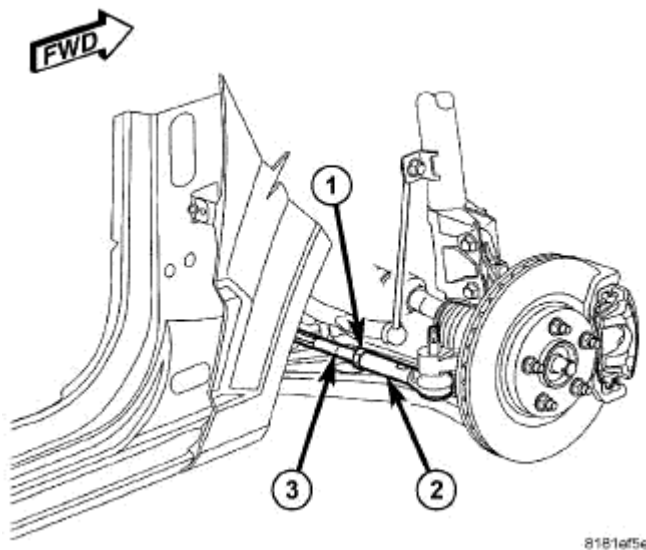


Fig. 119: Tie Rod Jam Nut
Courtesy of CHRYSLER LLC

5. Loosen the tie rod adjusting jam nut (1). Grasp the inner tie rod (3) and rotate it one way or the other until the front wheel toe is set to the preferred specification. See **Specifications**
6. Tighten the tie rod adjusting jam nut to of 75 N.m (55 ft. lbs.).
7. Make sure the inner tie rod-to-steering gear boot is not twisted. If removed, reinstall the clamp where the boot meets the inner tie rod.

ALL

8. Remove the steering wheel clamp.
9. Remove the alignment equipment.

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10. Road test the vehicle to verify the steering wheel is straight and the vehicle does not pull or wander.

SPECIFICATIONS**WHEEL ALIGNMENT**

NOTE: All specifications are given in degrees.

NOTE: All wheel alignments are to be set with the vehicle at curb height. See Standard Procedure

NOTE: Curb (ride) height specifications can be found in the Curb Height Measurement procedure. See Standard Procedure

ALL EXCEPT EXPORT

FRONT WHEEL ALIGNMENT	PREFERRED SETTING	ACCEPTABLE RANGE
CAMBER	-0.10°	-0.65° to +0.45°
Cross Camber (Maximum Side-To-Side Difference)	0.00°	-0.80° to +0.80°
CASTER	+3.00°	+2.00° to +4.00°
Cross Caster (Maximum Side-To-Side Difference)	0.00°	-0.50° to +0.50°
TOE - TOTAL*	+0.10°	-0.25° to +0.45°
Notes: * TOTAL TOE is the sum of both the left and right wheel toe settings. TOTAL TOE should be equally split between each wheel on the same axle to ensure the steering wheel is centered after setting toe. Positive toe (+) is toe-in and negative toe (-) is toe-out.		

REAR WHEEL ALIGNMENT	PREFERRED SETTING	ACCEPTABLE RANGE
CAMBER	-0.60°	-1.25° to +0.05°
Cross Camber (Maximum Side-To-Side Difference)	0.00°	-0.90° to +0.90°
TOE - INDIVIDUAL	0.00°	-0.15° to +0.15°
TOE - TOTAL*	0.00°	-0.30° to +0.30°
THRUST ANGLE	0.00°	-0.15° to +0.15°
Notes: * TOTAL TOE is the sum of both the left and right wheel toe settings. TOTAL TOE should be equally split between each wheel on the same axle to ensure the steering wheel is centered after setting toe. Positive toe (+) is toe-in and negative toe (-) is toe-out.		

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FRONT WHEEL ALIGNMENT	PREFERRED SETTING	ACCEPTABLE RANGE
CAMBER	-0.13°	-0.68° to +0.42°
Cross Camber (Maximum Side-To-Side Difference)	0.00°	-0.80° to +0.80°
CASTER	+3.00°	+2.00° to +4.00°
Cross Caster (Maximum Side-To-Side Difference)	0.00°	-0.50° to +0.50°
TOE - TOTAL *	+0.10°	-0.25° to +0.45°

Notes:

* TOTAL TOE is the sum of both the left and right wheel toe settings. TOTAL TOE should be equally split between each wheel on the same axle to ensure the steering wheel is centered after setting toe.

Positive toe (+) is toe-in and negative toe (-) is toe-out.

REAR WHEEL ALIGNMENT	PREFERRED SETTING	ACCEPTABLE RANGE
CAMBER	-0.40°	-1.05° to +0.25°
Cross Camber (Maximum Side-To-Side Difference)	0.00°	-0.90° to +0.90°
TOE - INDIVIDUAL	0.00°	-0.15° to +0.15°
TOE - TOTAL *	0.00°	-0.30° to +0.30°
THRUST ANGLE	0.00°	-0.15° to +0.15°

Notes:

* TOTAL TOE is the sum of both the left and right wheel toe settings. TOTAL TOE should be equally split between each wheel on the same axle to ensure the steering wheel is centered after setting toe.

Positive toe (+) is toe-in and negative toe (-) is toe-out.