

SUSPENSION

Suspension General Diagnosis - Corvette

SPECIFICATIONS

TRIM HEIGHT SPECIFICATIONS

Trim Height Specifications

Model	RPO	P-Height	R-Height	Z-Height	D-Height
1YY07/1YY67	FE1, FE2	692 mm± 10 mm (27.2 in± 0.39 in)	738 mm± 10 mm (29.1 in± 0.39 in)	40 mm± 7 mm (1.81 in± 0.28 in)	96 mm± 7 mm (4.80 in± 0.28 in)
1YX07/1YX67 1YZ07/1YZ67	FE3, FE4	693 mm± 10 mm (27.3 in± 0.39 in)	737 mm± 10 mm (29.0 in± 0.39 in)	40 mm± 7 mm (1.61 in± 0.28 in)	96 mm± 7 mm (4.29 in± 0.28 in)

DIAGNOSTIC INFORMATION AND PROCEDURES

SYMPTOMS - SUSPENSION GENERAL DIAGNOSIS

IMPORTANT: The following steps must be completed before using the symptom tables.

1. Determine whether the vehicle is equipped with an electrically assisted or active suspension system. Perform electrical diagnosis prior to beginning mechanical diagnosis. Refer to the following list in order to diagnose the system:
 - Symptoms - Tire Pressure Monitoring
 -
2. Review the system description and operation in order to familiarize yourself with the system functions. Refer to the appropriate description and operation:
 - Front Suspension Description and Operation
 - Rear Suspension Description and Operation
 - General Description

Visual/Physical Inspection

- Inspect for aftermarket devices which could affect the operation of any of the suspension subsystems.
- Inspect the easily accessible or visible system components for obvious damage or conditions which could cause the symptom.
- Inspect for proper tire size and inflation pressure. Refer to Vehicle Certification, Tire Placard,

Symptom List

Refer to a symptom diagnostic procedure from the following list in order to diagnose the symptom:

- Ride Diagnosis
- Vehicle Leads/Pulls
- Body Leans or Sways in Corners
- Suspension Bottoms
- Memory Steer
- Noise Diagnosis - Front Suspension
- Noise Diagnosis - Rear Suspension
- Suspension Strut and Shock Absorber Testing - On Vehicle
- Wheel Bearings Diagnosis
- Radial Tire Lead/Pull Correction

RIDE DIAGNOSIS

Ride Diagnosis

Step	Action	Yes	No
1	Did you review the General Description and perform the necessary inspections?	Go to Step 2	Go to Symptoms - Suspension General Diagnosis
2	IMPORTANT: Verify the vehicle suspension package RPO. Verify that the ride is too soft or too hard. Does the vehicle ride normally?	System OK	Go to Step 3
3	Check the tire inflation and adjust to specifications. Refer to Vehicle Certification, Tire Placard, Anti-Theft and Service Parts ID Label . Did you adjust the tire pressure?	Go to Step 6	Go to Step 4
4	Inspect the vehicle trim height. Refer to Trim Height Inspection . Did you find and correct the condition?	Go to Step 6	Go to Step 5
5	Inspect the following suspension components for wear or damage: • Shock Absorbers-Refer to Suspension Strut and Shock Absorber Testing - On Vehicle. • Springs		-

	Did you find and correct the condition?	Go to Step 6	
6	Drive the vehicle in order to verify the repair. Did you correct the condition?	System OK	Go to Step 3

VEHICLE LEADS/PULLS

Vehicle Leads/Pulls

Step	Action	Yes	No
DEFINITION: At a constant highway speed on a typical straight road, lead/pull is the amount of effort required at the steering wheel to maintain the vehicle straight path.			
1	Did you review the General Description and perform the visual/physical inspections?	Go to Step 2	Go to Symptoms - Suspension General Diagnosis
2	Road test the vehicle in order to verify the complaint. Does the vehicle operate normally?	System OK	Go to Step 3
3	Inspect the tire/wheel assemblies for: • Correct tire pressure-Refer to the tire placard. • Correct tire size-Refer to the tire placard. • Abnormal tire wear or damage Did you find and correct the condition?	Go to Step 9	Go to Step 4
4	Perform the Radial Tire Lead/Pull Correction . Did you find and correct the condition?	Go to Step 9	Go to Step 5
5	Inspect and correct/adjust the suspension and steering systems for: • Vehicle trim height-Refer to Trim Height Specifications. • Excessively worn, loose or damaged components Did you find and correct the condition?	Go to Step 9	Go to Step 6
6	Inspect the brake system for brake drag. With the vehicle suspended on a hoist, brake drag can be identified by rotating each wheel several times and observing whether more force is needed to rotate the left wheel or the right wheel. Refer to Symptoms - Hydraulic		

	Did you find and correct the condition?	Go to Step 9	Go to Step 7
7	Inspect the wheel alignment and adjust as necessary. Refer to Wheel Alignment Measurement . Did you correct the condition?	Go to Step 9	Go to Step 8
8	Inspect the steering gear for unequal effort. The vehicle must be suspended on a hoist, the engine running and the transmission in park or neutral. Grasp the tire assembly and manually simulate a turn from the left of center and the right of center observing whether more force is needed to turn to the left or to the right. If this condition exists, replace the steering gear. Did you correct the condition?	System OK	Go to Step 3
9	Operate the vehicle in order to verify the repair. Did you correct the condition?	System OK	Go to Step 3

BODY LEANS OR SWAYS IN CORNERS

Body Leans or Sways in Corners

Step	Action	Yes	No
1	Did you review the General Description and perform the necessary inspections?	Go to Step 2	Go to Symptoms - Suspension General Diagnosis
2	Verify the vehicle leans or sways in corners. Does the vehicle operate normally?	System OK	Go to Step 3
3	Inspect the following components for wear or damage: • Rear Coil Springs • Front Coil Springs Are the components worn or damaged?	Go to Step 5	Go to Step 4
4	1. Inspect the stabilizer shaft link for wear or damage. 2. Repair as necessary. Did you find and correct the condition?	Go to Step 6	Go to Step 2
5	Replace the springs as necessary. Did you complete the repair?	Go to Step 6	-
6	Operate the vehicle in order to verify the repair. Did you correct the condition?	System OK	Go to Step 3

Suspension Bottoms

Step	Action	Yes	No
DEFINITION: A loud bang or thump that can usually be felt and/or heard when the vehicle is driven over bumps. This condition is commonly noticed when the vehicle trim height is too low.			
1	Did you review the General Description and perform the necessary inspections?	Go to Step 2	Go to Symptoms - Suspension General Diagnosis
2	Verify that the suspension bottoms. Does the vehicle operate normally?	System OK	Go to Step 3
3	Inspect for vehicle overloading and correct the overloading condition as necessary. Refer to Vehicle Certification, Tire Placard, Anti-Theft and Service Parts ID Label for specifications. Did you find and correct the condition?	Go to Step 6	Go to Step 4
4	Inspect the following components: - Inspect the shock absorbers. Refer to Suspension Strut and Shock Absorber Testing - On Vehicle. - Inspect for damaged coil springs, torsion bar or leaf springs and replace as necessary. Did you find and correct the condition?	Go to Step 6	Go to Step 5
5	Inspect the vehicle trim height. Refer to Trim Height Inspection . Did you complete the trim height inspection procedure?	Go to Step 6	-
6	Operate the vehicle in order to verify the repair. Did you correct the condition?	System OK	Go to Step 3

MEMORY STEER

Memory Steer

Step	Action	Yes	No
DEFINITION: The steering wheel does not return to center after completing a turn.			
1	Did you review the General Description and perform the necessary inspections?	Go to Step 2	Go to Symptoms - Suspension General Diagnosis
2	Verify that memory steer is present. Does the system operate normally?	System OK	Go to Step 3
3	Ensure that all of the tires are inflated to the correct pressure. Refer to Vehicle Certification, Tire Placard, Anti-Theft and Service Parts ID		

	Label . Has the inspection/adjustment been performed?	Go to Step 4	-
4	1. Lubricate the tie rod ends and the ball joints if applicable. 2. Inspect the suspension system for worn or damaged components. 3. Repair as necessary. 4. Road test the vehicle in order to verify the customer complaint.		
	Does the vehicle still exhibit memory steer?	Go to Step 5	System OK
5	1. Check for proper wheel alignment. Refer to <u>Wheel Alignment Measurement</u> . Adjust as necessary. 2. Road test the vehicle in order to verify the customer complaint.		
	Does the vehicle still exhibit memory steer?	Go to Step 6	System OK
6	1. Raise and support the vehicle. Refer to <u>Vehicle Certification, Tire Placard, Anti-Theft and Service Parts ID Label</u> . 2. Disconnect both of the outer tie rod ends from the steering knuckles. Refer to <u>Steering Linkage Outer Tie Rod Replacement</u> . 3. Use your hands in order to move the tie rod ends.		
	Are either of the tie rod ends abnormally difficult to move?	Go to Step 7	Go to Step 8
7	Replace the outer tie rod end(s) as necessary. Refer to <u>Steering Linkage Outer Tie Rod Replacement</u> . Did you complete the repair?	Go to Step 14	-
8	1. Remove the tire/wheel. 2. Disconnect the lower control arm from the steering knuckle. 3. Use your hands to rotate the ball joint stud.		
	Is the ball joint abnormally difficult to rotate?	Go to Step 9	Go to Step 10
9	Replace the lower control arm. Refer to <u>Lower Control Arm Replacement</u> . Did you complete the repair?	Go to Step 14	-

10	1. Raise and support the vehicle. Refer to <u>Vehicle Certification, Tire Placard, Anti-Theft and Service Parts ID Label</u> . 2. Rotate the steering wheel ONE revolution in either direction. 3. Rotate the steering wheel back to the original position. Was the steering wheel abnormally difficult to rotate in either direction?	Go to Step 11	Go to Step 14
11	1. Disconnect the intermediate shaft. IMPORTANT: Do NOT rotate the steering wheel more than one complete revolution. 2. Note the position of the steering wheel and rotate the steering wheel ONE revolution in either direction. 3. Rotate the steering wheel back to the original position as previously noted. Was the steering wheel abnormally difficult to rotate in either direction?	Go to Step 13	Go to Step 12
12	1. Replace the steering gear. Refer to <u>Electric Belt Drive Rack and Pinion Steering Gear Replacement</u> . 2. Road test the vehicle in order to verify the customer complaint. Did you complete the repair?	Go to Step 14	-
13	Repair the steering column as necessary. Did you complete the repair?	Go to Step 14	-
14	Operate the vehicle in order to verify the repair. Did you correct the condition?	System OK	Go to Step 3

NOISE DIAGNOSIS - FRONT SUSPENSION

Noise Diagnosis - Front Suspension

Step	Action	Yes	No
DEFINITION: Any noise emitted from the front of the vehicle that is induced by VEHICLE SPEED or DRIVING TERRAIN as related to the front suspension.			
1	Did you review the General Description and perform the necessary inspections?		Go to <u>Symptoms</u> -

		Go to Step 2	General Diagnosis
2	Attempt to duplicate the condition. Road test the vehicle. Did you duplicate the condition?	Go to Step 3	System OK
3	Is the noise reactive to vehicle load or speed?	Go to Step 4	Go to Step 6
4	Inspect the tires for the following condition: • Proper tire inflation and adjust as necessary-Refer to <u>Vehicle Certification, Tire Placard, Anti-Theft and Service Parts ID Label</u> . • Unusual tire wear-Refer to <u>Vibration Analysis - Tire and Wheel</u> . • Inspect the wheel nuts for looseness and tighten as necessary. Refer to <u>Fastener Tightening Specifications</u> . Did you find and correct the condition?	Go to Step 13	Go to Step 5
5	Inspect the front wheel bearings. Refer to <u>Wheel Bearings Diagnosis</u> . Did you find and correct the condition?	Go to Step 13	Go to Step 6
6	Bounce the front of the vehicle in order to duplicate the noise. Did you duplicate the noise?	Go to Step 7	Go to Step 8
7	1. Raise and support the vehicle. Refer to <u>Lifting and Jacking the Vehicle</u> . 2. Inspect the front suspension components for looseness. Refer to <u>Fastener Tightening Specifications</u> . 3. Inspect the front suspension components for damage and repair as necessary. Did you find and correct the condition?	Go to Step 13	Go to Step 8
8	1. Install the J 39570 chassis ear or equivalent. 2. Bounce the front of the vehicle, using the J 39570 chassis ear or equivalent, in order to locate the source of the noise. If necessary, road test the vehicle. 3. Repair or replace any damaged components as necessary. Did you find and correct the condition?	Go to Step 13	Go to Step 9

9	Inspect the ball joints and steering components for the following conditions. • Lack of lubrication where applicable • Looseness in the ball joints-Refer to <u>Lower Control Arm Ball Joint Inspection</u> and <u>Upper Control Arm Ball Joint Inspection</u>. • Looseness in the steering column-Refer to <u>Looseness in Steering Column</u>. • Looseness in the outer tie rods-Refer to <u>Steering Linkage Outer Tie Rod Inspection</u>. • Looseness in the inner tie rods-Refer to <u>Steering Linkage Inner Tie Rod Inspection</u>.		
	Did you find and correct the condition?	Go to Step 13	Go to Step 10
10	Inspect for damaged shock absorbers. Refer to <u>Suspension Strut and Shock Absorber Testing - On Vehicle</u>. Did you find and correct the condition?	Go to Step 13	Go to Step 11
11	Inspect the front stabilizer shaft and stabilizer shaft links for damage and repair as necessary. Refer to <u>Stabilizer Shaft Replacement</u> or <u>Stabilizer Shaft Link Replacement</u>. Did you find and correct the condition?	Go to Step 13	Go to Step 12
12	Inspect for control arm damage and repair as necessary. Refer to <u>Lower Control Arm Replacement</u>, <u>Upper Control Arm Replacement</u>. Did you find and correct the condition?	Go to Step 13	-
13	Operate the system in order to verify the repair. Did you correct the condition?	System OK	Go to Step 3

NOISE DIAGNOSIS - REAR SUSPENSION

Noise Diagnosis - Rear Suspension

Step	Action	Yes	No
DEFINITION: Any noise emitted from the rear of the vehicle that is induced by VEHICLE SPEED or DRIVING TERRAIN as related to the rear suspension.			
1	Did you review the General Description and perform the necessary inspections?	Go to Step 2	Go to <u>Symptoms - Suspension</u> General Diagnosis

2	Attempt to duplicate the condition. Road test the vehicle. Did you duplicate the condition?	Go to Step 3	System OK
3	Is the noise reactive to vehicle load or speed?	Go to Step 4	Go to Step 6
4	Perform the following inspections: - Inspect and adjust the tire inflation. Refer to <u>Vehicle Certification, Tire Placard, Anti-Theft and Service Parts ID Label</u> . - Inspect for unusual tire wear. Refer to <u>Vibration Analysis - Tire and Wheel</u> . - Inspect the wheel nuts for looseness. Refer to <u>Fastener Tightening Specifications</u> . Did you find and correct the condition?	Go to Step 10	Go to Step 5
5	Inspect the rear wheel bearings. Refer to <u>Wheel Bearings Diagnosis</u> . Did you find and correct the condition?	Go to Step 10	Go to Step 6
6	Bounce the rear of the vehicle in order to duplicate the noise. Did you duplicate the noise?	Go to Step 7	Go to Step 9
7	- Raise the vehicle. Refer to <u>Lifting and Jacking the Vehicle</u> . - Inspect the rear suspension components for looseness. Refer to <u>Fastener Tightening Specifications</u> . - Inspect the rear suspension components for damage and repair as necessary. Did you find and correct the condition?	Go to Step 10	Go to Step 8
8	Inspect the rear shock absorber. Refer to <u>Suspension Strut and Shock Absorber Testing - On Vehicle</u> . Did you find and correct the condition?	Go to Step 10	Go to Step 9
9	- Install the J 39570 chassis ear or equivalent. - Bounce the rear of the vehicle, using the J 39570 chassis ear or equivalent, in order to locate the source of the noise. If necessary, road test the vehicle. - Repair or replace any defective component as necessary.		

	Did you find and correct the condition?	Go to Step 10	System OK
10	Operate the system in order to verify the repair. Did you correct the condition?	System OK	Go to Step 3

LOWER CONTROL ARM BALL JOINT INSPECTION

Special Tools

J-8001 Dial Indicator

For equivalent regional tools, refer to **Special Tools** .

NOTE:

- The vehicle must rest on a level surface.
- The vehicle must be stable. Do not rock the vehicle on the floor stands.

1. Raise and support the vehicle. Refer to **Lifting and Jacking the Vehicle** .
2. Clean and inspect the ball joint seal for cuts or tears. If the ball joint seal is damaged, replace the ball joint or the lower control arm as applicable for this vehicle.
3. Support the lower control arm with a floor stand as far outboard as possible and raise the suspension until the lower control arm moves 25 mm (1 in).

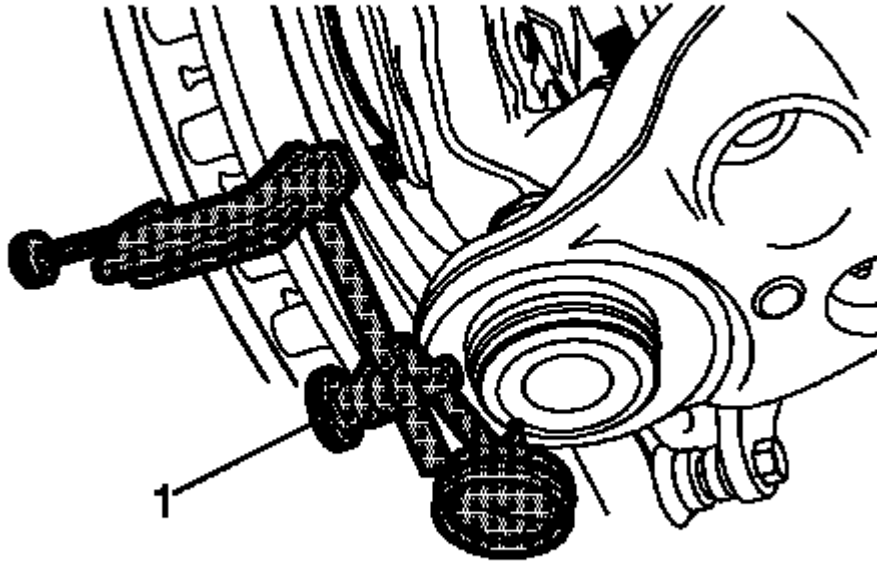


Fig. 1: Measuring Vertical Lash In Ball Joint
Courtesy of GENERAL MOTORS COMPANY

4. Install **J-8001** dial indicator or a suitable dial indicator to measure vertical lash in the ball joint.

CAUTION: Do not pry in such a way that the ball joint seal is contacted. Damage to the seal may result.

5. Gently lift or pry between the knuckle and the lower control arm to induce ball joint movement. Record the dial indicator measurement.
6. If the dial indicator reading is more than 0.5 mm (0.020 in), replace the ball joint or the lower control arm as applicable for this vehicle.

UPPER CONTROL ARM BALL JOINT INSPECTION

Special Tools

J-8001 Dial Indicator

For equivalent regional tools, refer to **Special Tools** .

NOTE:

- The vehicle must rest on a level surface.
- The vehicle must be stable. Do not rock the vehicle on the floor stands.
- This procedure was developed for checking the verticle movement of the upper ball joint. If there is movement in the horizontal or any other direction greater than the below specification, replace the upper control arm ball joint or upper control arm as applicable for this vehicle.

1. Raise and support the vehicle. Refer to Lifting and Jacking the Vehicle .
2. Clean and inspect the ball joint seal for cuts or tears. If the ball joint seal is damaged, replace the ball joint or the steering knuckle as applicable for this vehicle..
3. Support the lower control arm with a floor stand as far outboard as possible and raise the suspension until the lower control arm moves 25 mm (1 in).
4. Install **J-8001** dial indicator or a suitable dial indicator to measure vertical lash in the ball joint.

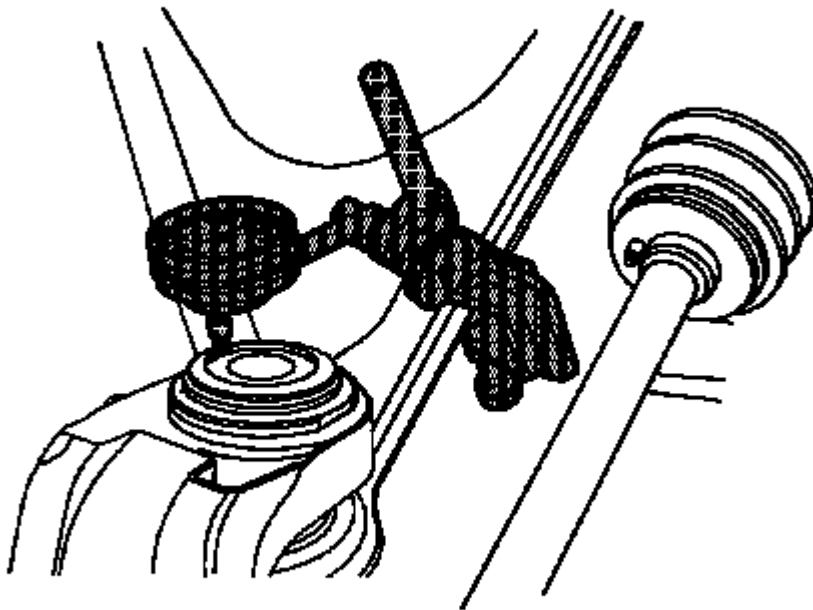


Fig. 2: Checking Upper Control Arm Using Dial Indicator
Courtesy of GENERAL MOTORS COMPANY

to the seal may result.

5. Apply downward force to the upper control arm and zero the indicator.
6. Apply upward force to the upper control arm and check the dial indicator. Record the measurement
7. If the dial indicator reading is more than 0.5 mm (0.002 in), replace the ball joint or the steering knuckle as applicable for this vehicle.

SUSPENSION STRUT AND SHOCK ABSORBER TESTING - ON VEHICLE

Suspension Strut and Shock Absorber Testing - On Vehicle

Step	Action	Yes	No
1	Did you review the General Description and perform the necessary inspections?	Go to Step 2	Go to Symptoms - Suspension General Diagnosis
2	Verify that the malfunction is present. Does the vehicle operate normally?	System OK	Go to Step 3
3	IMPORTANT: A light film of oil on the top portion of the reservoir is normal. Inspect each strut or shock absorber for external fluid leakage. Is the strut or shock absorber leaking?	Go to Step 7	Go to Step 4
4	Inspect the vehicle trim height. Refer to Trim Height Specifications . Is the vehicle trim height correct?	Go to Step 5	Go to Step 6
5	1. Use your hands in order to lift up and push down each corner of the vehicle 3 times. 2. Remove your hands from the vehicle. Does the vehicle stop bouncing after 2 cycles?	Go to Step 8	Go to Step 7
6	Replace the front spring or the rear spring. Refer to the appropriate procedure: • Front Spring Replacement • Rear Spring Replacement Did you complete the repair?	Go to Step 8	-
	Replace the strut or shock absorber. Refer to the appropriate procedure:		

7	• <u>Shock Absorber Replacement</u> • <u>Shock Absorber Replacement (without FE2, FE4) , Shock Absorber Replacement (with FE2, FE4)</u>		-
	Did you complete the repair?	Go to Step 8	
8	Operate the vehicle in order to verify the repair. Did you correct the condition?	System OK	Go to Step 3

WHEEL BEARINGS DIAGNOSIS

Wheel Bearings Diagnosis

Step	Action	Values	Yes	No
1	Did you review the General Description and perform the necessary inspections?	-	-	Go to <u>Symptoms - Suspension General Diagnosis</u>
2	Road test the vehicle in order to verify the customer complaint. Does the vehicle operate normally?	-	System OK	Go to Step 3
3	1. Raise and support the vehicle. Refer to <u>Lifting and Jacking the Vehicle</u> . 2. Inspect for tire or wheel damage. Refer to <u>Tire and Wheel Assembly Runout Measurement - On-Vehicle</u> . Did you find and correct the condition?	-	Go to Step 7	Go to Step 4
4	1. Install the J 39570 chassis ear. 2. Road test the vehicle to verify the location of the wheel bearing noise. Did you locate the source of the wheel bearing noise?	-	Go to Step 6	Go to Step 5
	IMPORTANT: Support the vehicle by the lower control arms or the rear axle to prevent movement during wheel bearing/hub inspection. 1. Mount and secure the J 8001 dial			

5	indicator. 2. Ensure that the dial indicator contacts the vertical surface of the wheel as close as possible to the top wheel stud. 3. Push and pull on the top of the tire in order to inspect the total travel indicated by the dial indicator. Is the measurement greater than the specified value?	0.27 mm (0.005 in)		
			Go to Step 6	System OK
6	Replace the wheel bearing. Refer to Front Wheel Bearing and Hub Replacement or Rear Wheel Bearing and Hub Replacement . Did you complete the repair?	-	Go to Step 7	-
7	Road test the vehicle to verify the repair. Does the vehicle operate normally?	-	System OK	Go to Step 3

TRIM HEIGHT INSPECTION

Special Tools

- **J 8433-1** Puller bar
- **J 42451** Engine support adapter kit
- **J 42854** Trim Height Measurement Gauge
- **CH 51139** Protector

For equivalent regional tools, refer to **Special Tools**.

Trim Height Measurements

NOTE: Check the vehicle trim heights when diagnosing suspension concerns and before checking wheel alignment.

Trim height is a predetermined measurement relating to vehicle ride height. Incorrect trim heights can cause bottoming out over bumps, damage to the suspension components and symptoms similar to wheel alignment problems.

Trim Height Measurement Preliminary Procedure

Perform the following before measuring the trim heights:

1. Set the tire pressures to the pressure shown on the certification label. Refer to **Vehicle Certification, Tire Placard, Anti-Theft and Service Parts ID Label** .

2. Check the fuel level. Add additional weight if necessary to simulate a full tank. If additional weight is added, distribute the weight at the rear of the seat cushions or the front of the rear compartment.
3. Make sure the rear compartment is empty of cargo.
4. Make sure the vehicle is on a level surface, such as an alignment rack.
5. Close the doors.
6. Close the hood.
7. Secure the convertible top or removable roof panel, if equipped, in the fully closed position.
8. All dimensions are measured vertical to the ground.

P and R Measurement Definitions

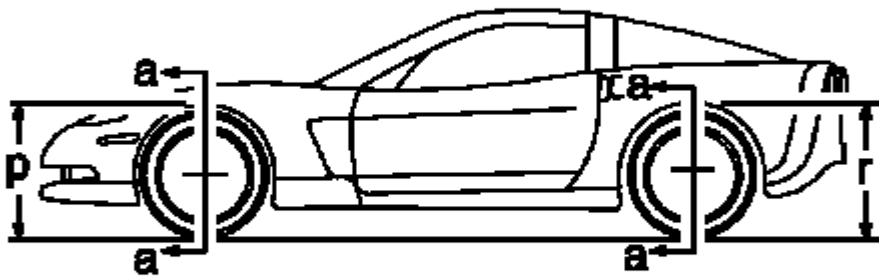


Fig. 3: P And R Measurement Definitions
Courtesy of GENERAL MOTORS COMPANY

- P Height: The vertical distance from the ground to the top of the wheel opening through the centerline of the front wheel.
- R Height: The vertical distance from the ground to the top of the wheel opening through the centerline of the rear wheel.

Measuring the P and R Dimensions

Use the following procedures to measure the P and R dimensions.

NOTE: The left and right P and R dimensions differences should be no more than 10 mm (.39 in).

1. Push the front bumper down a minimum of 25 mm (1.0 in) and release. Perform this step three times.
2. Measure and record the trim height per the "Measure and Definitions".
3. Lift the bumper up a minimum of 25 mm (1.0 in) and release. Repeat this step three times.
4. Measure and record the trim height according to the Measure Definitions.
5. The true P height measurement is the average of the measurements taken in steps 2 and 4. Refer to **Trim Height Specifications**.
6. Repeat the above steps at the rear of the vehicle for the R heights.
7. If the P and R heights are outside the specifications, measure the Z and D heights.

Z Height Measurement Definition

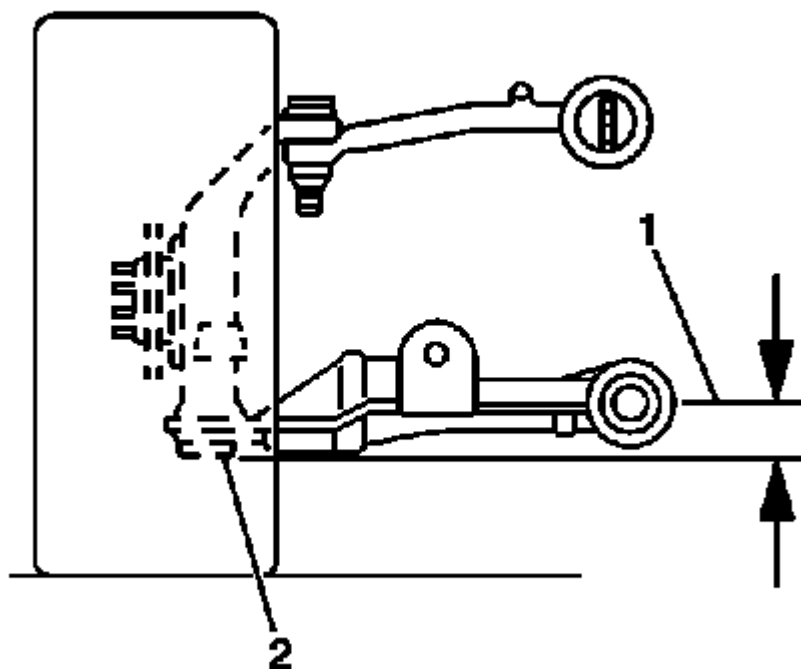


Fig. 4: Ball Joint & Lower Control Arm Mounting Bolt
Courtesy of GENERAL MOTORS COMPANY

The Z Height is the vertical distance from the center of the ball joint housing bottom surface to the center of the front lower control arm front bolt (threaded portion of the bolt) (1).

Z Height Measurement Dimensions

Use the following procedures to measure the Z dimensions.

NOTE: **The left and right Z height differences should be no more than 7 mm (.28 in).**

1. Push the front bumper down a minimum of 25 mm (1.0 in). Perform this step three times.
2. Measure and record the trim height per the Z Height Measurement Definition.
3. Lift the bumper up a minimum of 25 mm (1.0 in) and release. Repeat this step three times.
4. Measure and record the trim height per the Z Height Measure and Definitions".
5. The true Z height dimension is the average of the measurement taken in steps 2 and 4. Refer to **Trim Height Specifications**.

Z Height Adjustment

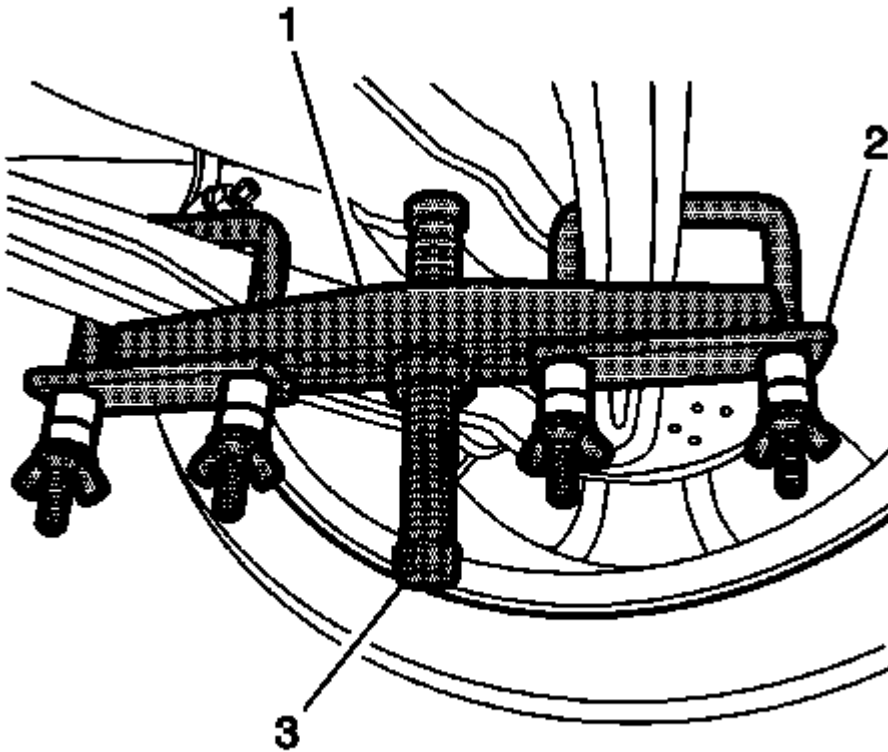


Fig. 5: Puller Bar, Engine Support Adapter Kit & Torsion Bar Unloader/Loader
 Courtesy of GENERAL MOTORS COMPANY

NOTE:

- When adjusting the spring adjuster bolt, the trim height adjustment tool must be used to prevent damage to the rubber shear pad on the end of the bolt.
- One complete turn of the spring adjuster bolt is equal to 2 mm (0.079 in) of trim height.

1. Assemble **J 8433-1** Puller Bar (1), **J 42451-1** Engine Support adapter kit (2) and put the **CH 51139** Protector on the end of forcing screw (3) as shown in the diagram. In some applications spacers maybe needed.
2. Tighten the forcing screw to relieve the tension from the spring adjuster; then adjust the Z trim height by turning the spring adjuster bolt.
3. Lower the transverse spring back onto the lower control arm and remove the trim height adjustment tool.
4. Repeat the Z height measurement procedure.

D Height Measurement Definitions

The D Height: The vertical distance from the center of the ball joint housing bottom surface (2) to the center of the rear lower control arm front bolt (threaded portion of the bolt) (1).

D Height Measurement Dimensions

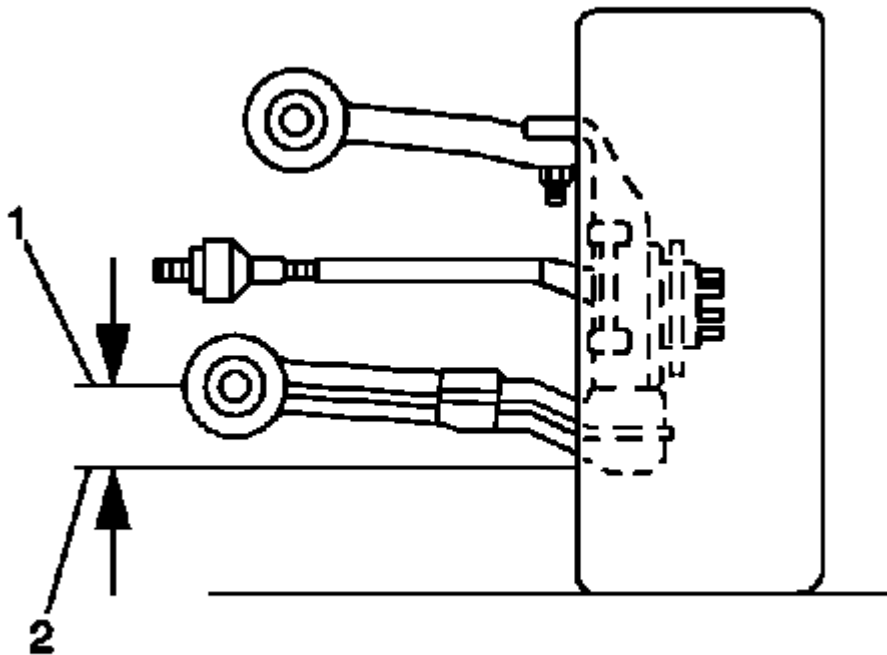


Fig. 6: Ball Joint & Lower Control Arm Mounting Bolt.
Courtesy of GENERAL MOTORS COMPANY

Use the following procedures to measure the D dimensions.

NOTE: The left and right D height difference should be no more than 7 mm (.28 in).

1. Push the rear bumper down a minimum of 25 mm (1.0 in). Perform this step three times.
2. Measure and record the trim height per the D Height Measurement Definition.
3. Lift the rear bumper up a minimum of 25 mm (1.0 in) and release. Repeat this step three times.
4. Measure and record the trim height according to the D Height Measurement Definition.
5. The true D height is the average of the measurements taken in steps 2 and 4. Refer to **Trim Height Specifications**.

6. If these measurements are out of specifications, continue to D Height Adjustment.

D Height Adjustment

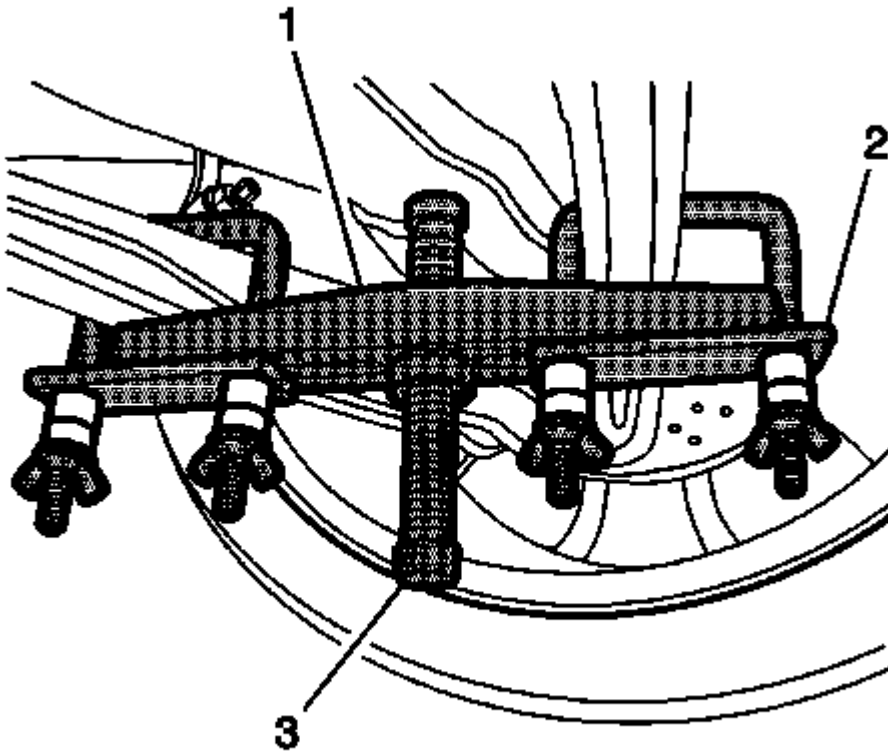


Fig. 7: Puller Bar, Engine Support Adapter Kit & Torsion Bar Unloader/Loader
Courtesy of GENERAL MOTORS COMPANY

NOTE:

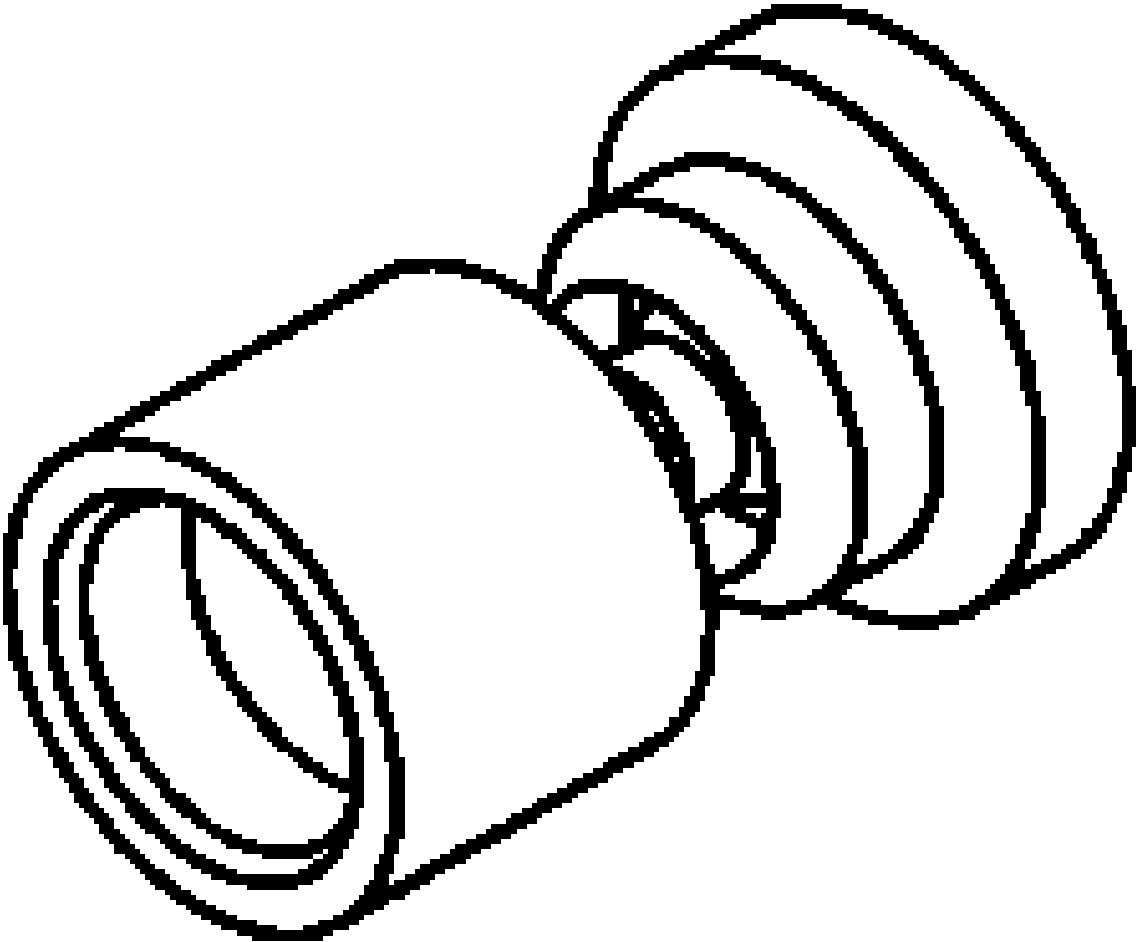
- When adjusting the spring adjuster bolt, the trim height adjustment tool must be used to prevent damage to the rubber shear pad on the end of the bolt.
- One complete turn of the spring adjuster bolt is equal to 2 mm (0.079 in) of trim height.

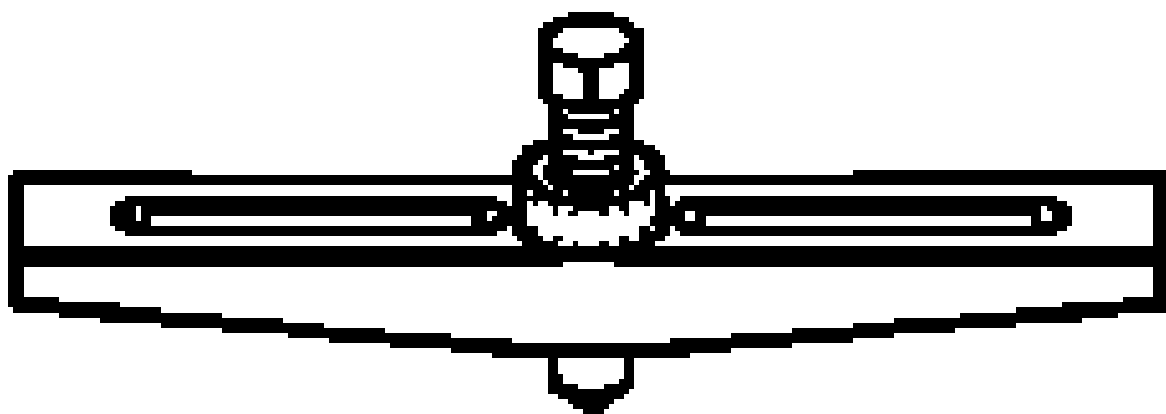
1. Assemble **J 8433-1** Puller Bar (1), **J 42451-1** Engine Support adapter kit (2) and put the **CH 51139** Protector on the end of forcing screw (3) as shown in the diagram. In some applications spacers maybe needed.
2. Tighten the forcing screw to relieve the tension from the spring adjuster; then adjust the D trim height by turning the spring adjuster bolt.
3. Lower the transverse spring back onto the lower control arm and remove the trim height adjustment tool.

4. Repeat the D height measurement procedure.

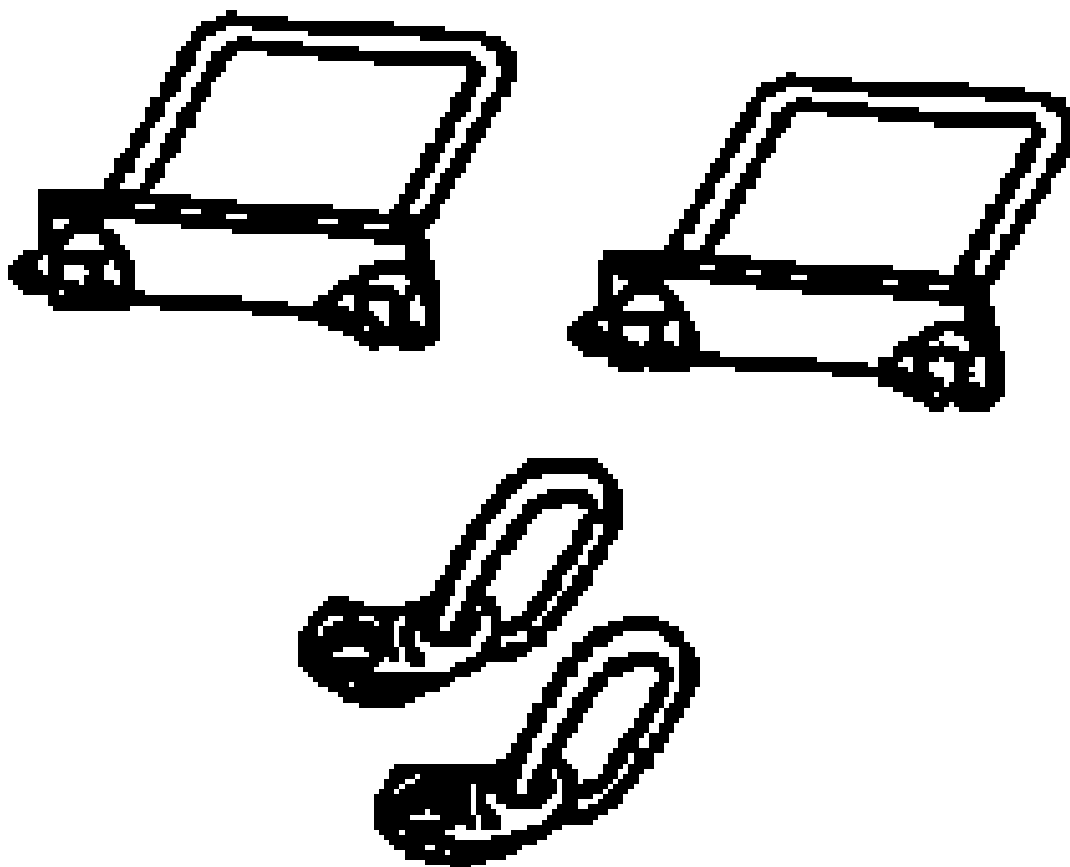
SPECIAL TOOLS AND EQUIPMENT

SPECIAL TOOLS

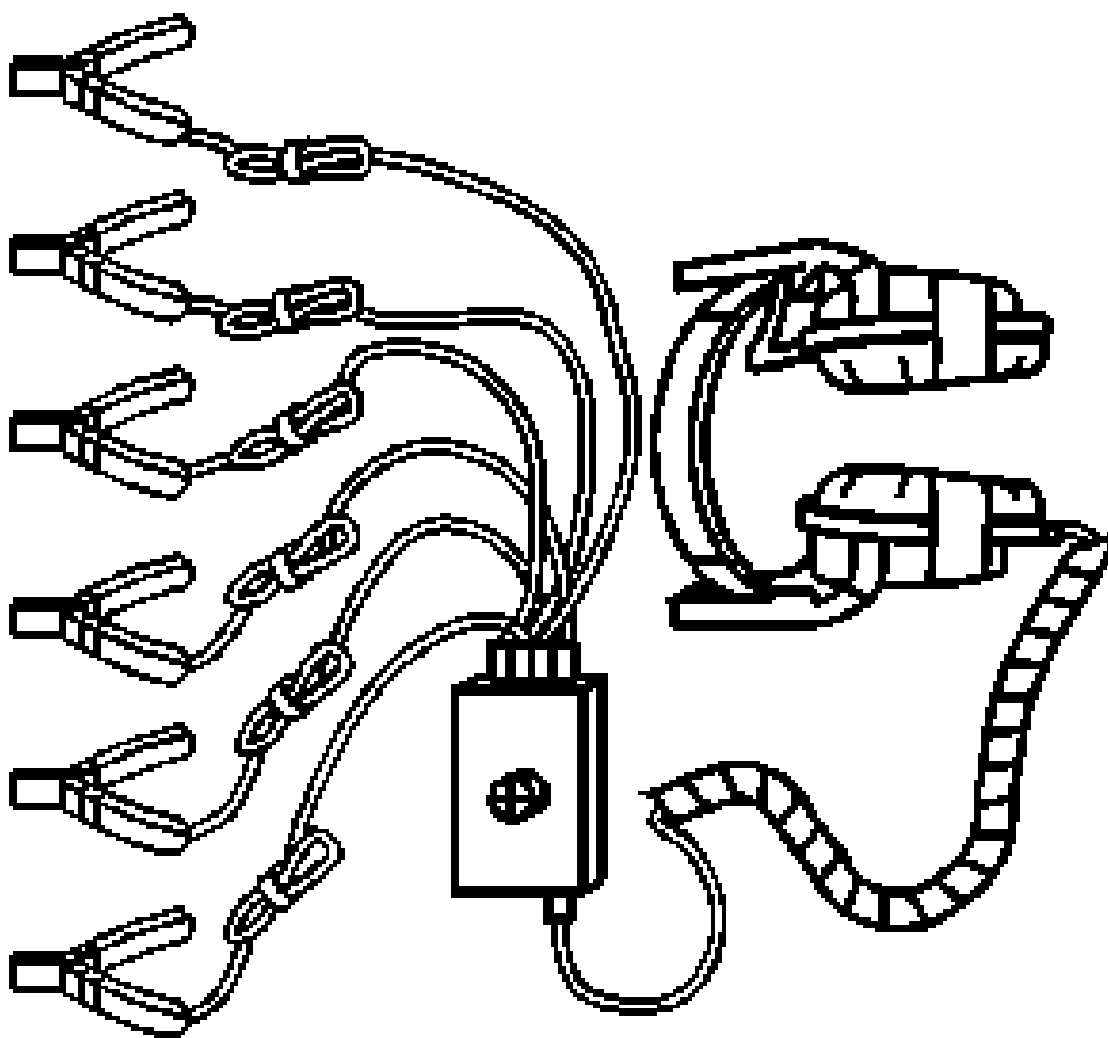
Illustration	Tool Number/Descri
	CH 51139 Trim Heigh Adjustment Adz



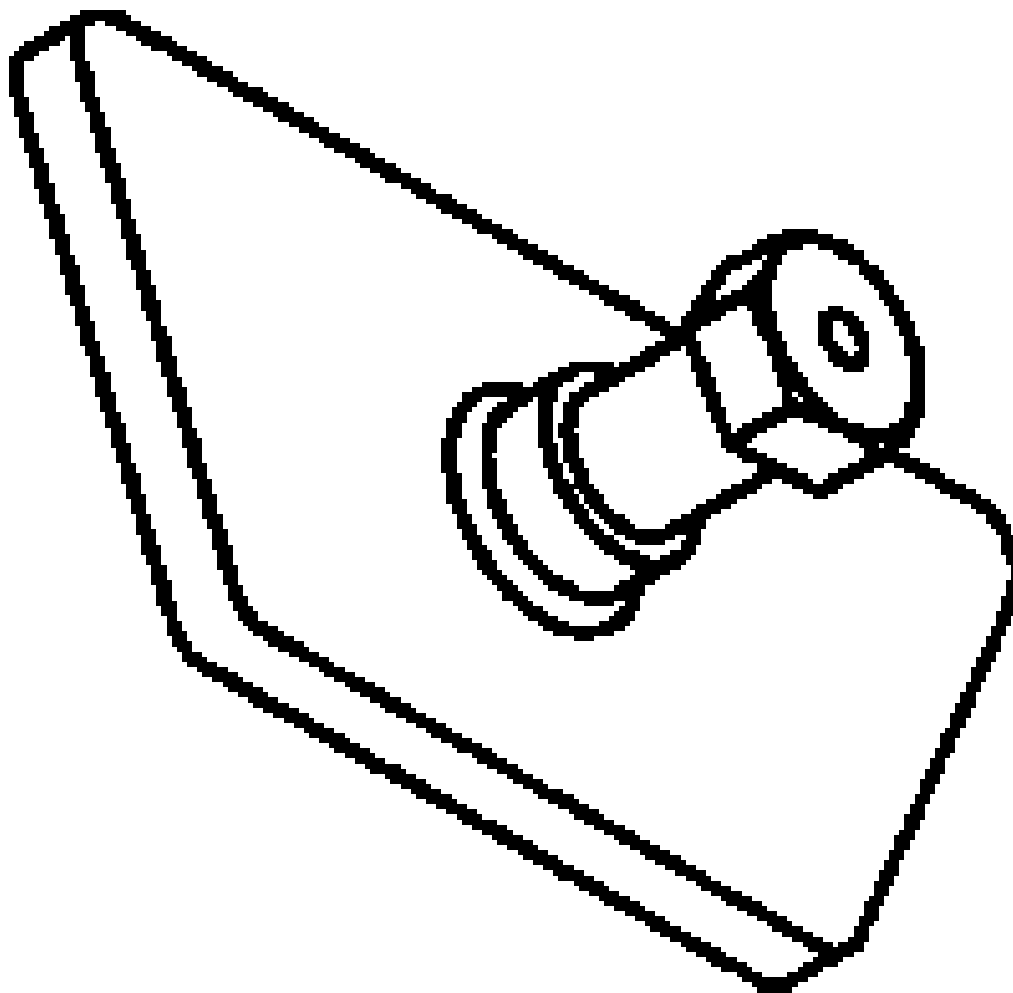
J 8433-1
Puller Bar



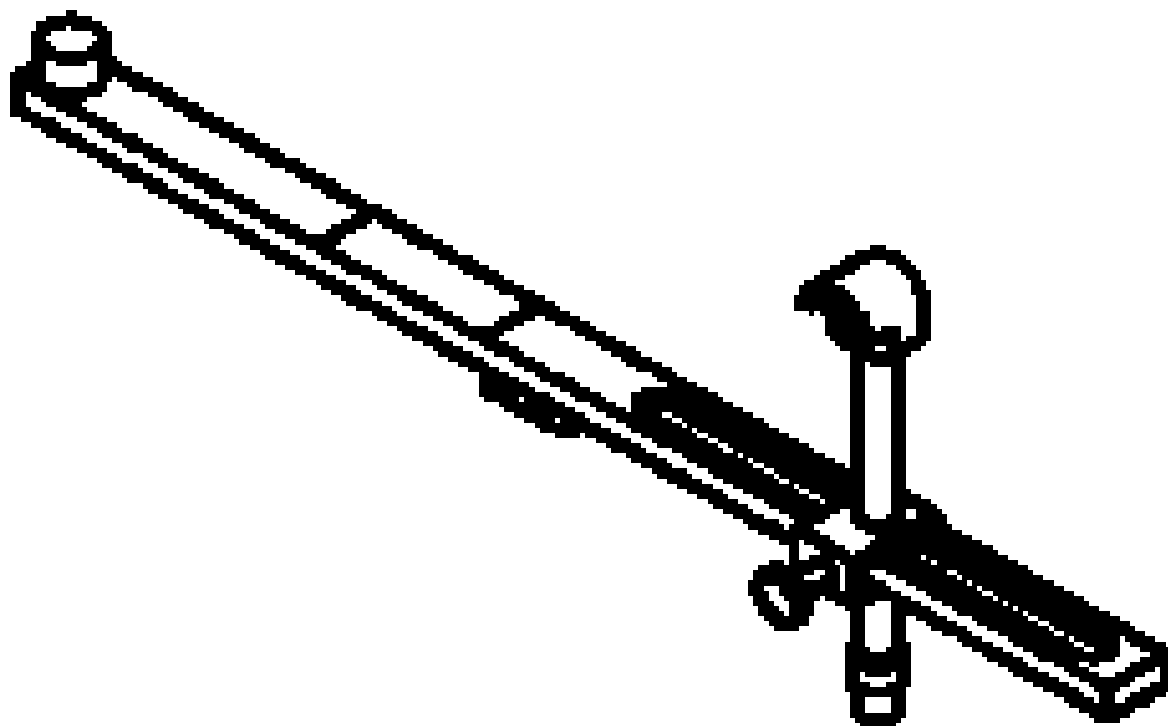
J 424251-1
J 36857
Engine Support
adapter



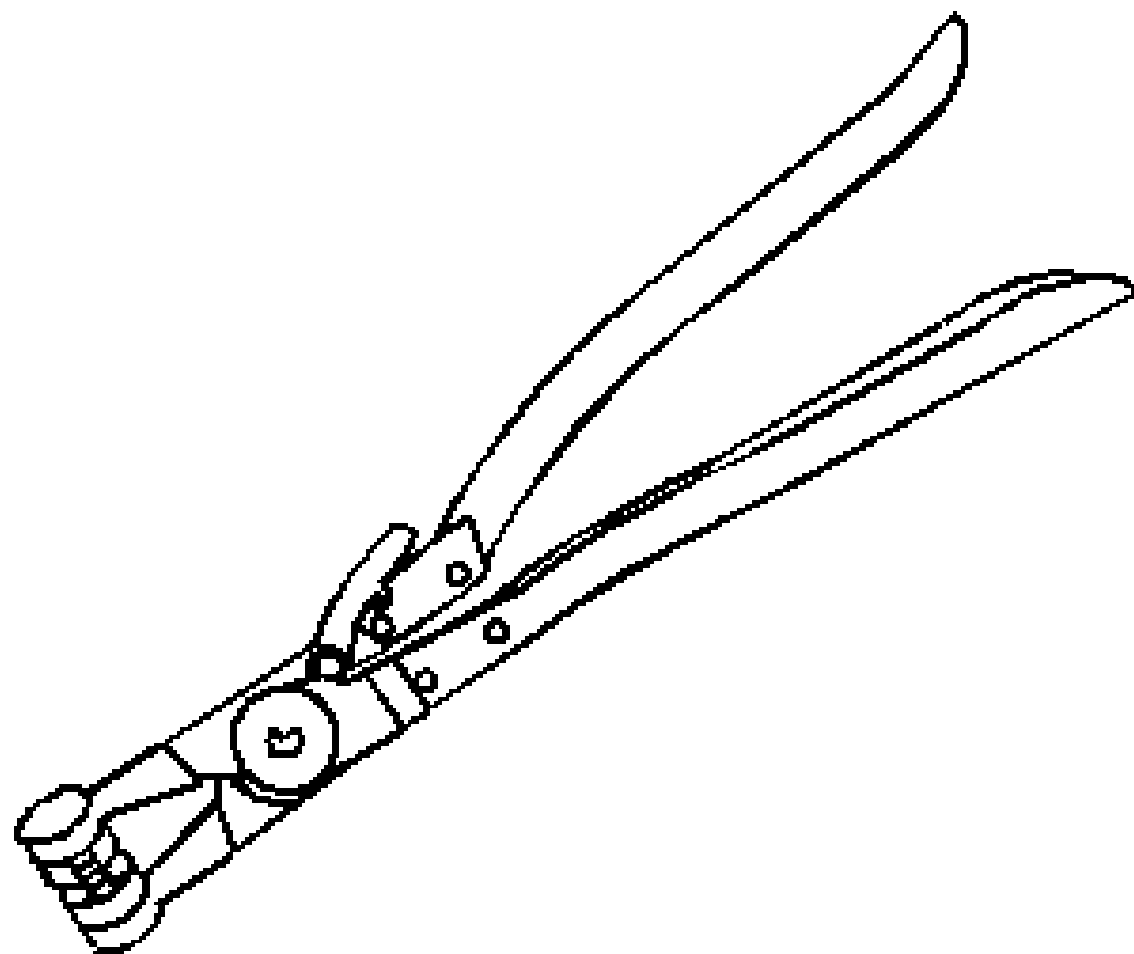
J 39570
Chassis Ear



J 42743
Trim Height Adj



J 42854
Trim Height Gauge



J 8001
Dial Indicator