

Suspension General Diagnosis

cardiagn.com

Diagnostic Information and Procedures

cardiagn.com

1. SUSPENSION
2. SUSPENSION GENERAL DIAGNOSIS
3. DIAGNOSTIC INFORMATION AND PROCEDURES
- 4.

Symptoms - Suspension General Diagnosis

Note:

The following step must be completed before using the symptom tables.

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](#)

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 correct tire size and inflation pressure.

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](#)
- [Torque Steer](#)
- [Memory Steer](#)
- [Noise Diagnosis - Front Suspension](#)
- [Noise Diagnosis - Rear Suspension](#)

1. SUSPENSION
2. SUSPENSION GENERAL DIAGNOSIS
3. DIAGNOSTIC INFORMATION AND PROCEDURES
- 4.

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	Note: 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	Inspect the tire inflation and adjust to specifications. Tire Inflation Description Did you adjust the tire pressure?	Go to Step 6	Go to Step 4
4	Inspect the vehicle trim height. 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 Suspension Strut and Shock Absorber Testing - On Vehicle - Springs Did you find and correct the condition?	Go to Step 6	â€”
6	Drive the vehicle in order to verify the repair. Did you correct the condition?	System OK	Go to Step 3

1. SUSPENSION
2. SUSPENSION GENERAL DIAGNOSIS
3. DIAGNOSTIC INFORMATION AND PROCEDURES
- 4.

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 the following conditions: • 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 procedure. 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 the following conditions: • 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. Did you find and correct the condition?	Go to Step 9	Go to Step 7
7	Inspect the wheel alignment and adjust as necessary. 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

1. SUSPENSION
2. SUSPENSION GENERAL DIAGNOSIS
3. DIAGNOSTIC INFORMATION AND PROCEDURES
- 4.

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: • Front coil springs • Rear 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. Replace 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	â€”
6	Operate the vehicle in order to verify the repair. Did you correct the condition?	System OK	Go to Step 3

1. SUSPENSION
2. SUSPENSION GENERAL DIAGNOSIS
3. DIAGNOSTIC INFORMATION AND PROCEDURES
- 4.

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. Did you find and correct the condition?	Go to Step 6	Go to Step 4
4	Inspect the following components: - Inspect the shock absorbers. Suspension Strut and Shock Absorber Testing - On Vehicle - Inspect for damaged coil springs and torsion bar, 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. Trim Height Inspection Did you complete the trim height inspection procedure?	Go to Step 6	â€”
6	Operate the vehicle in order to verify the repair. Did you correct the condition?	System OK	Go to Step 3

1. SUSPENSION
2. SUSPENSION GENERAL DIAGNOSIS
3. DIAGNOSTIC INFORMATION AND PROCEDURES
- 4.

Torque Steer

Step	Action	Yes	No
DEFINITION: On a dry, smooth, flat road, the vehicle has a left or right steering force only during acceleration.			
1	Did you review the General Description and perform the necessary inspections?	Go to Step 2	Go to Symptoms - Suspension General Diagnosis
2	1. Drive the vehicle on a straight, smooth, flat road. 2. Press the accelerator and determine if any additional steering input is required to maintain a straight ahead direction. 3. Repeat this test with the vehicle traveling in the opposite direction in order to eliminate crosswind effects. Lead/pull caused by unlevel roads and crosswinds are considered normal. Does the vehicle exhibit torque steer when the accelerator is pressed?	Go to Step 3	System OK
3	1. Drive the vehicle on a straight, smooth, flat road at 64â€”97â€”km/h (40â€”60â€”mph). 2. Remove your foot from the accelerator. 3. Shift the transmission into NEUTRAL in order to allow the vehicle to coast. 4. Is any additional steering input required to maintain a straight ahead direction? 5. Repeat this test with the vehicle traveling in the opposite direction in order to eliminate crosswind effects. Lead/pull caused by unlevel roads and crosswinds are considered normal. Does the vehicle direction change when the steering wheel is momentarily released?	Go to Vehicle Leads/Pulls	Go to Step 4
4	Inspect the front suspension and powertrain mounts for worn or damaged components and repair as necessary. Did you find and correct the condition?	Go to Step 6	Go to Step 5
5	Inspect the vehicle trim height. Trim Height Inspection Did you find and correct the condition?	Go to Step 6	â€”
6	Operate the vehicle in order to verify the repair. Did you correct the condition?	System OK	â€”

1. SUSPENSION
2. SUSPENSION GENERAL DIAGNOSIS
3. DIAGNOSTIC INFORMATION AND PROCEDURES
- 4.

Memory Steer

Step	Action	Yes	No
DEFINITION: A lead or pull in the direction the driver previously turned the vehicle. Additionally, after turning in the opposite direction, the vehicle will want to lead or pull in that direction.			
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	1. Raise and support the vehicle. Lifting and Jacking the Vehicle 2. Lubricate the tie rod ends and the ball joints if applicable. 3. Inspect the suspension system for worn or damaged components. 4. Repair as necessary. Did you find and correct the condition?	Go to Step 7	Go to Step 4
4	Inspect for binding strut bearings. 1. Disconnect the strut from the steering knuckle. 2. If the strut is abnormally difficult to rotate, repair or replace the upper bearing mount. Did you find and complete the repair?	Go to Step 7	Go to Step 5
5	Inspect for binding in the lower ball joints. If the joint is binding, replace the joint. Did you find and complete the repair?	Go to Step 7	Go to Step 6
6	Inspect the wheel alignment and adjust as necessary. Wheel Alignment Measurement Did you complete the wheel alignment?	Go to Step 7	â€”
7	Operate the vehicle in order to verify the repair. Did you correct the condition?	System OK	â€”

1. SUSPENSION
2. SUSPENSION GENERAL DIAGNOSIS
3. DIAGNOSTIC INFORMATION AND PROCEDURES
- 4.

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 Step 2	Go to Symptoms - Suspension 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 7
4	Inspect the tires for the following condition: • Proper tire inflation and adjust as necessary. Refer to Tire Inflation Description. • Unusual tire wear. Refer to Tire Diagnosis - Irregular or Premature Wear. • Inspect the wheel nuts for looseness and tighten as necessary. Refer to Fastener Specifications. Did you find and correct the condition?	Go to Step 14	Go to Step 5
5	Inspect the front wheel bearings. Refer to Wheel Bearings Diagnosis . Did you find and correct the condition?	Go to Step 14	Go to Step 6
6	Inspect for front axle or transaxle noises. Did you find and correct the condition?	Go to Step 14	Go to Step 7
7	Bounce the front of the vehicle in order to duplicate the noise. Did you duplicate the noise?	Go to Step 8	Go to Step 9
8	1. Raise and support the vehicle. Refer to Lifting and Jacking the Vehicle. 2. Inspect the front suspension components for looseness. Refer to Fastener Specifications. 3. Inspect the front suspension components for damage and repair as necessary. Did you find and correct the condition?	Go to Step 14	Go to Step 9
9	1. Install the CH-39570 chassis ear or equivalent. 2. Bounce the front of the vehicle, using CH-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 14	Go to Step 10
10	Inspect the ball joints and steering components for the following conditions: • Lack of lubrication where applicable • Looseness in the ball joints • Looseness in the tie rods Did you find and correct the condition?	Go to Step 14	Go to Step 11
11	Inspect for damaged shock absorbers. Refer to Suspension Strut and Shock Absorber Testing - On Vehicle . Did you find and correct the condition?	Go to Step 14	Go to Step 12

Step	Action	Yes	No
12	Inspect the front stabilizer shaft and stabilizer shaft links for damage and repair as necessary. Refer to Stabilizer Shaft Replacement or Stabilizer Shaft Link Replacement . Did you find and correct the condition?	Go to Step 14	Go to Step 13
13	Inspect for control arm damage and repair as necessary. Refer to Lower Control Arm Replacement . Did you find and correct the condition?	Go to Step 14	â€”
14	Operate the system in order to verify the repair. Did you correct the condition?	System OK	Go to Step 3

cardiagn.com

1. SUSPENSION
2. SUSPENSION GENERAL DIAGNOSIS
3. DIAGNOSTIC INFORMATION AND PROCEDURES
- 4.

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 Symptoms - Suspension 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. Tire Inflation Description - Inspect for unusual tire wear. Tire Diagnosis - Irregular or Premature Wear - Inspect the wheel nuts for looseness. Fastener Specifications Did you find and correct the condition?	Go to Step 10	Go to Step 5
5	Inspect the rear wheel bearings. Wheel Bearings Diagnosis 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 and support the vehicle. Lifting and Jacking the Vehicle - Inspect the rear suspension components for looseness. Fastener Specifications - 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. Suspension Strut and Shock Absorber Testing - On Vehicle Did you find and correct the condition?	Go to Step 10	Go to Step 9
9	- Install the CH-39570 chassis ear or equivalent. - Bounce the rear of the vehicle, using CH-39570 chassis ear or equivalent, in order to locate the source of the noise. If necessary, road test the vehicle. - Repair or replace any defect 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

1. SUSPENSION
2. SUSPENSION GENERAL DIAGNOSIS
3. DIAGNOSTIC INFORMATION AND PROCEDURES
- 4.

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 customer concern is present. Does the vehicle operate normally?	System OK	Go to Step 3
3	Note: A light film of oil on the top portion of the shock reservoir is normal. Inspect each strut or shock absorber for external fluid leakage. Is a strut or shock absorber leaking?	Go to Step 5	Go to Step 4
4	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. 3. Locate a shock or strut that exceeds 2 cycles. Did you locate a shock or strut that exceeds 2 cycles?	Go to Step 5	Go to Step 6
5	Note: Inspect the vehicle trim height in order to correct any possible causes of shock/strut failures. Trim Height Inspection Replace the strut or shock absorber. Strut, Strut Component, or Spring Replacement or Shock Absorber Replacement Did you complete the repair?	Go to Step 6	â€”
6	Operate the vehicle in order to verify the repair. Did you correct the condition?	System OK	Go to Step 3

Related Part Information

Part Name	Catalog Name	Part Code
Front Shock Absorber	ABSORBER,FRT SHK(W/SPR)	0045A
Front Shock Absorber	ABSORBER,FRT SHK (W/ AIR SPR)	0046A
Front Shock Absorber	ABSORBER KIT,FRT SHK	0049Z
Front Shock Absorber	ABSORBER,FRT SHK	0050A
Front Shock Absorber	ABSORBER,FRT SHK	0050B
Front Shock Absorber	ABSORBER,FRT SHK (W/ RSVR)	0051A
Front Shock Absorber	ABSORBER,FRT SHK (W/ RSVR)	0051B
Front Suspension Strut	STRUT PKG,FRT SUSP	0599Y
Front Suspension Strut	STRUT KIT,FRT SUSP	0599Z
Front Suspension Strut	STRUT,FRT SUSP	0600A
Front Suspension Strut	STRUT,FRT SUSP(W/SPR)	0625A
Front Suspension Strut	STRUT,FRT SUSP (W/SPR)	0626A
Front Suspension Strut	STRUT,FRT SUSP (W/SPR)	0627A
Front Suspension Strut	STRUT,FRT SUSP (W/ SPR) (RPR)	0628A
Front Suspension Strut	STRUT,FRT SUSP (W/CMPRN VLV)	0630A
Rear Shock Absorber	ABSORBER,RR SHK(W/SPR)	0045A
Rear Shock Absorber	ABSORBER,RR SHK (W/ SHLD)	0046A

Part Name	Catalog Name	Part Code
Rear Shock Absorber	ABSORBER,RR SHK (W/UPR MT)	0048Y
Rear Shock Absorber	ABSORBER,RR SHK(W/UPR MT)	0049A
Rear Shock Absorber	ABSORBER,RR SHK (W/UPR MT)	0049B
Rear Shock Absorber	ABSORBER KIT,RR SHK	0049Z
Rear Shock Absorber	ABSORBER,RR SHK	0050A
Rear Shock Absorber	ABSORBER,RR SHK	0050B
Rear Shock Absorber	ABSORBER,RR SHK (RPR)	0050C
Rear Suspension Strut	STRUT,RR SUSP (W/ SPR)	2694A
Rear Suspension Strut	STRUT,RR SUSP (W/ SPR)	2695A
Rear Suspension Strut	STRUT KIT,RR SUSP	2699Z
Rear Suspension Strut	STRUT,RR SUSP	2700A
Rear Suspension Strut	STRUT,RR SUSP (W/ CMPRN VLV)	2710A
Front Shock Absorber	ABSORBER,FRT SHK	SJ697
Rear Shock Absorber	ABSORBER,RR SHK	SJ698
Front Shock Absorber	ABSORBER,FRT SHK (W/SPRING)	SJ072
Rear Shock Absorber	ABSORBER,RR SHK (W/SPRING)	SJ073
Rear Shock Absorber	ABSORBER,RR SHK	SS317
Front Shock Absorber	ABSORBER,FRT SHK	SS318

1. SUSPENSION
2. SUSPENSION GENERAL DIAGNOSIS
3. DIAGNOSTIC INFORMATION AND PROCEDURES
- 4.

Wheel Bearings 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	Road test the vehicle in order to verify the customer's complaint. Does the vehicle operate normally?	System OK	Go to Step 3
3	1. Raise and support the vehicle. Lifting and Jacking the Vehicle 2. Inspect for tire or wheel damage. Did you find and correct the condition?	Go to Step 7	Go to Step 4
4	1. Install the <i>CH-39570</i> chassis ear. 2. Road test the vehicle to verify the location of the wheel bearing noise. Did you find and correct the condition?	Go to Step 6	Go to Step 5
5	1. Note: Support the vehicle by the lower control arms or the rear axle to prevent movement during wheel bearing/hub inspection. 2. Mount and secure the <i>J-8001</i> dial indicator. 3. Ensure that the dial indicator contacts the vertical surface of the wheel as close as possible to the top wheel stud. 4. Push and pull on the top of the tire in order to inspect the total travel indicated by the dial indicator. 5. Specification Maximum allowable wheel bearing end play: 0.127mm (0.005in) Is the measurement greater than the specified value?	Go to Step 6	System OK
6	Replace the wheel bearing. Front Wheel Bearing and Hub Replacement or Rear Wheel Bearing and Hub Replacement Did you complete the repair?	Go to Step 7	â€”
7	Road test the vehicle to verify the repair. Does the vehicle operate normally?	System OK	Go to Step 3

1. SUSPENSION
2. SUSPENSION GENERAL DIAGNOSIS
3. DIAGNOSTIC INFORMATION AND PROCEDURES
- 4.

Trim Height Inspection

Trim Height Measurement

Trim height is a predetermined measurement relating to vehicle ride height. Incorrect trim heights can cause the vehicle to bottom out over bumps, damage to the suspension components and symptoms similar to wheel alignment problems. Check the trim heights when diagnosing suspension concerns and before checking the wheel alignment.

Perform the following before measuring the trim heights:

- Set the tire pressure to the specifications shown on the certification label. Refer to [Tire Inflation Description](#).
- Check the fuel level. Add additional weight if necessary to simulate a full tank.
- Make sure the passenger and rear compartments are empty, except for the spare tire.
- Make sure the vehicle is on a flat and level surface, such as an alignment rack.
- Check that all the vehicle doors are securely closed.
- Check that the vehicle hood and rear deck lids are securely closed.
- Check for installed after market accessories or modifications that could affect trim height measurement.

Measuring the Trim Height

Note:

All dimensions are measured vertical to the ground. Trim height should be within 10â€mm (39â€in) to be considered correct.





1. [Click here for full size](#)
2. Note:
The vehicle must be on a flat level surface.
3. Using your hands, lift the front bumper approximately 38mm (1.49in).
4. Gently remove your hands and allow the vehicle to lower.
5. Using your hands, bounce the front of the vehicle downward approximately 38mm (1.49in).
6. Gently remove your hands and allow the vehicle to rise.
7. Measure and note the C dimension. This height is measured vertically from the ground to the bottom lip of the wheel opening through the centerline of the front wheel.
8. Measure and note the A dimension for the left and right side of the vehicle from the bottom of the front wheel rim to the wheel arc along the centerline of the front wheel.
9. Compare the A and C dimension measurements to the trim height specifications. Refer to [Trim Height Specifications](#).
10. If the measurements are not within the specified range, replace the front coil springs as required. Refer to [Strut, Strut Component, or Spring Replacement](#).
11. Using your hands, lift the front bumper approximately 38mm (1.49in).
12. Gently remove your hands and allow the vehicle to lower.
13. Using your hands, bounce the front of the vehicle downward approximately 38mm (1.49in).
14. Gently remove your hands and allow the vehicle to rise.
15. Measure and note the C dimension. This height is measured vertically from the ground to the bottom lip of the wheel opening through the centerline of the rear wheel.

16. Measure and note the Bâ€™%dimension for the left and right side of the vehicle from the bottom of the rear wheel rim to the wheel arc along the centerline of the rear wheel.
17. Compare theâ€™%B and Dâ€™%dimension measurements to the trim height specifications. Refer to [Trim Height Specifications](#).
18. If the measurements are not within the specified range, replace the rear coil springs as required. Refer to [Rear Spring Replacement](#).

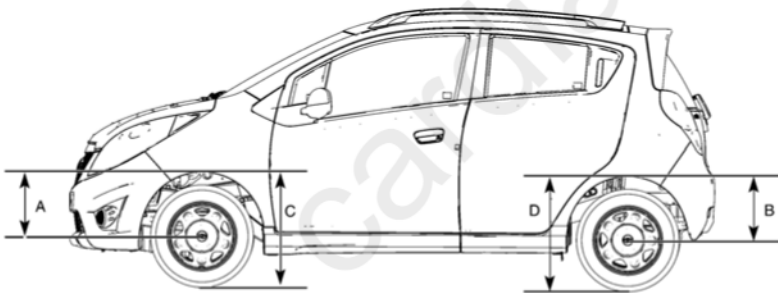
cardiagn.com

Specifications

cardiagn.com

1. SUSPENSION
2. SUSPENSION GENERAL DIAGNOSIS
3. SPECIFICATIONS
- 4.

Trim Height Specifications



[Click here for full size](#)

Transmission	Suspension Height mm (in)		Trim Height mm (in) (155/70 R14)	
	Front Suspension	Rear Suspension	Front Trim Height	Rear Trim Height
	Height 'A'	Height 'B'	'C'	'D'
Manual TM	358.1â€‰mm (14.10â€‰in)	357.2â€‰mm (14.06â€‰in)	625.4â€‰mm (24.62â€‰in)	631.9â€‰mm (24.88â€‰in)
Automatic TM	358.1â€‰mm (14.10â€‰in)	357.2â€‰mm (14.06â€‰in)	625.0â€‰mm (24.60â€‰in)	631.8â€‰mm (24.87â€‰in)
All measurements are for reference only and intended to be a guide. (Nominal curb weight)				

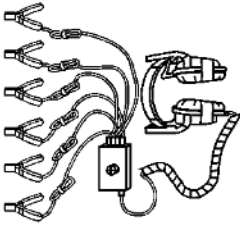
cardiagn.com

Special Tools and Equipment

cardiagn.com

1. SUSPENSION
2. SUSPENSION GENERAL DIAGNOSIS
3. SPECIAL TOOLS AND EQUIPMENT
- 4.

Special Tools

Illustration	Tool Number/ Description
 CH-39570 J-39570 Chassis Ear Click here for full size	
 CH-8001 J-8001 Dial Indicator Set Click here for full size	