Chevrolet Cruze

Model Introduction Training For Approved Motor Body Repairers
A dynamic four-door coupe with superb design and fantastic value
This self-study programme highlights the design and function of new vehicle models, new automotive components or new technologies.

The self-study programme is not a repair manual!
All values given are intended as a guideline only.

For maintenance and repair work, always refer to the current technical literature.
# Models

<table>
<thead>
<tr>
<th>Cruze</th>
<th>1.6</th>
<th>L</th>
<th>Sedan</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cruze</td>
<td>1.6 &amp; 1.8</td>
<td>LS</td>
<td>Sedan</td>
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<tr>
<td>Cruze</td>
<td>1.8 &amp; 2.0</td>
<td>LT</td>
<td>Sedan</td>
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</table>
**Introduction**

Following on from the very successful re-introduction of the Chevrolet brand into the SA market, the new Chevrolet Cruze is set to make its mark in the South African and global auto markets with its fresh new global Chevrolet styling.

The new Cruze marks Chevrolet’s entry into the value sector of the midsize segment. In South Africa it will be available in 5 offerings, 1.6L Petrol 5M/T, 1.6LS Petrol 5M/T, 1.8LS Petrol 5M/T, 1.8LT Petrol 6A/T, 2.0LT Diesel 5M/T.

The arrival of Cruze spearheads an exciting new product roll-out program that is expected to propel the brand to even greater success globally.

![Chevrolet Cruze](image)

**Sporty, Refined looks**

Cruze features a dramatic re-interpretation of the traditional sedan featuring Chevrolet’s new global design language that is becoming a signature on all new products carrying the gold bowtie.

The Cruze’s arching roof-line extends from the steeply raked windshield to the sloping rear pillars and short rear deck, adding coupe-like proportions to the compact sedan.

This dramatic profile is matched by bold front styling, with large headlamp housings that wrap around the front corners and sweep up, arrow-like, into the fenders and sculpted hood. Noticeably tight body panel fits and a restrained use of exterior trim add to a high quality, ‘hewn from solid’ appearance. Wider and longer than most of its competitors, the Cruze has a purposeful stance, further emphasised by wheels located at the outer edges of the tautly drawn bodywork.

Other distinct design themes include a concave shoulder line, the two-tier grille and a “wheels-out/body–in” stance. Inside, Cruze features a ‘twin cockpit’ design motif, first introduced in the iconic Corvette sports car.
**Engine Performance**

At launch in South Africa, the Cruze will be available with **16-valve, 1.6-litre, 80 kW and 1.8-litre, 103 kW petrol** engines giving more power as well as better fuel economy and lower emissions. **A new 2.0-litre turbo diesel, developing 110 kW and 320 Nm of torque** adds power with even greater frugality. Five-speed manual gearboxes and an all-new automatic transmission, Chevrolet’s first six-speed application in the compact segment, complete the powertrain menu.

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**Interior comfort and safety features**

Cruze is the result of a development process harnessing GM’s global expertise and is the first of a new family of compact products that will deliver world class quality. It will be backed by expected highest scores in all major crash safety ratings.

The combination of easy-going fun driving and ample equipment is highlighted by an extensive list of standard comfort and safety features.

The new Chevrolet Cruze is available in a range of exterior colours; Carbon Flash (black), Misty Lake (blue/silver), Poly Silver, Galaxy White, Velvet Red. These have been selected to complement Cruze’s unique interior trim and styling.
## Specifications

<table>
<thead>
<tr>
<th><strong>CHEVROLET CRUZE</strong></th>
<th>1.6 L</th>
<th>1.6 &amp; 1.8LS</th>
<th>1.8 &amp; 2.0LT</th>
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</thead>
<tbody>
<tr>
<td><strong>DIMENSIONS - mm</strong></td>
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<tr>
<td>Length</td>
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<tr>
<td>Height</td>
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<tr>
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<td>1.6 &amp; 1.8L</td>
<td>1.8 &amp; 2.0L</td>
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<td>Displacement</td>
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<td>1598/1797cc</td>
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<td>16V DOHC</td>
<td>16V DOHC</td>
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<td>Power - kW @ r/min</td>
<td>80KW@ 6400rpm</td>
<td>80KW@ 6400rpm@ 104KW@ 6200rpm</td>
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<tr>
<td>Torque - Nm @ r/min</td>
<td>153@ 4200</td>
<td>153@ 4200/176@ 3800</td>
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<td><strong>TRANSMISSION</strong></td>
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<td>6SPD A/T - 1.8LT</td>
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<td>5 Speed manual transmission - STANDARD</td>
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<td><strong>PERFORMANCE</strong></td>
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<td>Tank capacity (litres)</td>
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<td>60L</td>
<td>60L</td>
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<td>6.5Jx16/205/60R16</td>
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<td>Front suspension</td>
<td>McPherson Strut</td>
<td>McPherson Strut</td>
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<tr>
<td>Rear suspension</td>
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<td>Compound Crank Axle</td>
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<td>Electronic Stability Programme (ESPLUS)</td>
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<td>Power, Disc</td>
<td>Power, Disc</td>
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<td>Rear Discs 15&quot;</td>
<td>Rear Discs 15&quot;</td>
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<td>3-spoke</td>
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<td>Telescopic Steering Column</td>
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<td>Lock Control - Steering Column</td>
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<td>SEATS</td>
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<tr>
<td>Sport front seats</td>
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<td>Leather seat</td>
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<td>Height adjustable driver seat</td>
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<td><strong>COMFORT and CONVENIENCE</strong></td>
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<td>Arm Rest Rear seat, storage</td>
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<td>Cup holder front (for two large</td>
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<tr>
<td>cups)/Cupholders in front of gearlever</td>
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<td><strong>SAFETY &amp; SECURITY</strong></td>
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<td>Car Alarm (with ultra sound and</td>
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<tr>
<td>glass break detector)</td>
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<td>ISOFIX attachments on outer rear seats</td>
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<td>Speed sensitive automatic door locking</td>
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<td>Door unlock - button in dash</td>
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<td><strong>AIRBAGS</strong></td>
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<td>Airbag driver front</td>
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<tr>
<td>Airbag passenger front</td>
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<tr>
<td>Airbag front side</td>
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<td><strong>INFOTAINMENT</strong></td>
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<td>Radio / SCD</td>
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<tr>
<td>MP3 Compatible</td>
<td>✬</td>
<td>✬</td>
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<tr>
<td>Auxiliary 1 input (Adaptor for iPod &amp; MP3 player)</td>
<td>✬</td>
<td>✬</td>
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<tr>
<td>No. of speakers</td>
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<tr>
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<td>On board computer</td>
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<td>Triple Info Display</td>
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<td><strong>WARRANTY AND SERVICE</strong></td>
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<td>3/100000</td>
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<tr>
<td>Warranty (yrs / km)</td>
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<td>3yr</td>
<td>3yr</td>
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<td>Anti corrosion (yrs)</td>
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<td>15 000km/12 months</td>
<td>15 000km/12 months</td>
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<tr>
<td>Service intervals</td>
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<td>Service Plan</td>
<td>3yr / 60 000km</td>
<td>3yr / 60 000km</td>
<td>3yr / 60 000km</td>
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<tr>
<td><strong>OPTIONS</strong></td>
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<tr>
<td>Metallic Paint</td>
<td>✬</td>
<td>✬</td>
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</table>
**Mild Steel:** This type of steel normally has a tensile strength less than 270 MPa.

**High Strength Low Alloy Steel:** This type of steel normally has a tensile strength range from 300 - 700 MPa. (Also known as HSLA).

**Dual Phase Steel:** This type of steel normally has a tensile strength up to and including 800 MPa. (Also known as DP)

**High Strength Dual Phase Steel:** This type of steel normally has a tensile strength greater than 800 MPa. (Also known as DPX).

**Vehicle identification Number**

The VIN number can be found on three different places on the Chevrolet Cruze:

**Left of front windscreen**

**Under carpet on drivers floor**

**Engine compartment firewall**
**Front End Upper Tie Bar Replacement**

**Removal**

**Warning:** Refer to [Approved Equipment for Collision Repair Warning](#) in the Preface section.

**Warning:** Refer to [Collision Sectioning Warning](#) in the Preface section.

**Warning:** Refer to [Glass and Sheet Metal Handling Warning](#) in the Preface section.

1. Disable the SIR System. Refer to [SIR Disabling and Enabling](#).

2. Disconnect the negative battery cable. Refer to [Battery Negative Cable Disconnection and Connection](#).

3. Remove all related panels and components.

4. Visually inspect the damage. Repair as much of the damage as possible.

6. Create cut lines on the front end upper tie bar support.

7. Cut the panel where sectioning is to be performed.

8. Locate and mark all of the factory welds of the front end upper tie bar support.

9. Drill all factory welds. Note the number and location of welds for installation of the new part.

10. Remove the damaged part.
Installation Procedure

1. Cut the front end upper tie bar support in corresponding locations to fit the remaining original panel. The sectioning joint should be trimmed to allow a gap of one-and-one-half-times the metal thickness at the sectioning joint.

2. Create a 50 mm (2 in) backing plate from the unused portion of the service part.

3. Drill 8 mm holes along the sectioning cut on the remaining original part. Locate these holes 13 mm from the edge of part and spaced 40 mm apart.

4. Prepare all mating surfaces as necessary.

5. Fit the backing plates halfway into the sectioning joints, clamp in place and plug weld to the vehicle.

6. Align the front end upper tie bar support.

7. Clean and prepare the attaching surfaces for welding.

8. Position the front end upper tie bar support on the vehicle and verify the fit.

9. Clamp the part into position.

10. Plug weld accordingly. To create a solid weld with minimum heat distortion, make 25mm stitch welds along the seam with 25mm gaps. Then go back and complete the stitch weld.

11. Apply sealers, anti-corrosion etc as per the repair manual.
**Front Compartment Front Rail Sectioning**

**Removal Procedure**

1. Disable the SIR system.
2. Disconnect the negative battery cable.
3. Remove all related panels and components.
4. Visually inspect the damage. Repair as much of the damage as possible.
5. Remove the sealers and anti-corrosion materials from the repair area, as necessary.
6. Create cut lines on the front compartment front rail.

7. Cut the panel where sectioning is to be performed, and remove damaged part.
Installation Procedure

1. Cut the front compartment front rail in corresponding locations to fit the remaining original panel. The sectioning joint should be trimmed to allow a gap of one-and-one-half times the metal thickness at the sectioning joint.

2. Create a 50mm backing plate from the unused portion of the service part.

3. Drill 8mm holes along the sectioning cut on the remaining original part. Locate these holes 13mm from the edge and spaced 40mm apart.

4. Prepare all mating surfaces as necessary.

5. Fit the backing plates halfway into the sectioning joints, clamp in place and plug weld to the vehicle.

6. Position the new part on the vehicle.

7. Clamp the front compartment rail into position.

8. Plug weld accordingly.

9. To create a solid weld with minimum heat distortion, make 25mm stitch welds along the seam with 25mm gaps between them. Then go back and complete the stitch weld.
Front Compartment Upper Side Rail Replacement

Removal
1. Disable the SIR system.
2. Disconnect the negative battery cable.
3. Remove all related panels and components.
4. Visually inspect the damage. Repair as much of the damage as possible.
5. Remove the sealers and anti-corrosion materials from the repair area, as necessary.
6. Locate and mark all the necessary factory welds and weld seams of the front compartment upper side rail.
7. Drill all factory welds. Note the number and location of welds for installation of the new part.
8. Grind factory weld seams.
9. Remove the front compartment upper side rail.
Installation Procedure

1. Drill 8 mm holes for plug welding along the edges of the front compartment upper side rail as noted from the original panel.

2. Clean and prepare the attaching surfaces for welding.
3. Position the new part on the vehicle and verify the fit.
4. Clamp the part into position.
5. Plug weld accordingly.
6. Apply sealers, anti-corrosion etc as per repair manual.

Note: Plug weld factory slots in the front hinge pillar body area(1) as noted from the original panel.
Front Compartment Upper Side rail sectioning

Removal Procedure

1. Disable the SIR system.
2. Disconnect the negative battery cable.
3. Remove all related panels and components.
4. Visually inspect the damage. Repair as much of the damage as possible.

6. Create cut lines on the front compartment upper side rail

7. Cut the panel where sectioning is to be performed.

8. Drill all factory welds. Note the number and location of welds for installation of the new part.

9. Remove the damaged part.
**Installation Procedure**

1. Cut the new part in corresponding locations to fit the remaining original panel. The sectioning joint should be trimmed to allow a gap of one-and-one-half-times the metal thickness at the sectioning joint.

2. Create a 50mm backing plate from the unused portion of the service part.

3. Drill 8mm holes along the sectioning cut on the remaining original part. Locate these holes 13mm from the edge and 40mm apart.

4. Prepare all mating surfaces as necessary.

5. Fit the backing plates halfway into the sectioning joints, clamp in place and plug weld to the vehicle.

6. Align the front compartment upper side rail.

7. Drill 8mm holes for plug welding along the edges of the front compartment upper side rail.

8. Clean and prepare the attaching surfaces for welding.

9. Position the front compartment upper side rail on the vehicle and verify the fit.

10. Clamp the new part into position.

11. Plug weld accordingly.

12. To create a solid weld with minimum heat distortion, make 25mm stitch welds along the seam with 25mm gaps between them. Then go back and complete the stitch weld.

13. Apply sealers, anti-corrosion etc as per repair manual.
Body Hinge Pillar lower reinforcement replacement

**Removal Procedure**

1. Disable the SIR system.
2. Disconnect the negative battery cable.
3. Remove all related panels and components.
4. Visually inspect the damage. Repair as much of the damage as possible.
5. Remove the sealers and anti-corrosion materials from the repair area, as necessary.
6. Locate and mark all the necessary factory welds of the front hinge pillar body.
7. Drill all factory welds. Note the number and location of welds for installation of the new part.

**Installation Procedure**

1. Prepare all mating surfaces as necessary.
2. Align the front hinge pillar body reinforcement.
3. Drill 8mm holes for plug welding along the edges.
4. Clean and prepare the attaching surfaces for welding.

5. Position the front hinge pillar body reinforcement on the vehicle and verify the fit.
6. Clamp into position and plug weld accordingly.
7. Stitch weld into place.
8. Apply the sealers and anti-corrosion materials etc as per the workshop manual.
Rocker Inner Panel Replacement

Removal Procedure

1. Disable the SIR system.
2. Disconnect the negative battery cable.
3. Remove all related panels and components.
4. Visually inspect the damage. Repair as much of the damage as possible.
5. Remove the sealers and anti-corrosion materials from the repair area, as necessary.
6. Create cut lines on the body side inner panel.
7. Cut the panel where sectioning is to be performed.
8. Locate and mark all the necessary factory welds of the body side inner panel.
9. Drill all factory welds. Note the number and location of welds for installation of the service assembly.
10. Remove the body side inner panel.
11. Locate and mark all the necessary factory welds of the rocker inner panel.
12. Drill all factory welds. Note the number and location of welds for installation of the service assembly.

13. Remove the damaged rocker inner panel.
Installation Procedure

1. Align the rocker inner panel.
2. Drill 8mm holes for plug welding along the edges of the outer panel as noted from the original part.

3. Clean and prepare the attaching surfaces for welding.
4. Position the rocker inner panel on the vehicle.
5. Verify the fit of the quarter outer panel.
6. Clamp the rocker panel into position.
7. Plug weld accordingly.

8. Plug weld the cover plate on.
9. To create a solid weld with minimum heat distortion, make 25mm stitch welds along the seam with 25mm gaps between them. Then go back and complete the stitch weld.
Rocker Outer Panel Sectioning

Removal Procedure

1. Disable the SIR system.
2. Disconnect the negative battery cable.
3. Remove all related panels and components.
4. Visually inspect the damage. Repair as much of the damage as possible.
5. Remove the sealers and anti-corrosion materials from the repair area, as necessary.
6. Create cut lines on the body side inner panel.
7. Cut the panel where sectioning is to be performed.
8. Locate and mark all the necessary factory welds of the rocker outer panel.
9. Drill all factory welds. Note the number and location of welds for installation of the service assembly.
10. Remove the damaged rocker outer panel.
**Installation Procedure**

1. Cut the rocker outer panel in corresponding locations to fit the remaining original panel. The sectioning joint should be trimmed to allow a gap of one-and-one-half-times the metal thickness at the sectioning joint.
2. Create a 50mm backing plate from the unused portion of the service part.
3. Drill 8mm holes along the sectioning cut on the remaining original part. Locate these holes 13mm from the edge of part and spaced 40mm apart.
4. Prepare all mating surfaces as necessary.
5. Fit the backing plates halfway into the sectioning joints, clamp in place and plug weld to the vehicle.
6. Align the rocker outer panel.
7. Drill 8mm holes for plug welding along the edges of the rocker panel.
8. Clean and prepare the attaching surfaces for welding.
9. Position the rocker outer panel on the vehicle.
10. Verify the fit of the rocker outer panel.
11. Clamp the rocker outer panel into position.
12. Plug weld accordingly.
13. To create a solid weld with minimum heat distortion, make 25mm stitch welds along the seam with 25mm gaps between them. Then go back and complete the stitch weld.
14. Apply the sealers and anti-corrosion materials, etc. as per the workshop manual.
**Body Lock Pillar Outer Panel Reinforcement Replacement.**

**Removal Procedure**

1. Disable the SIR system.
2. Disconnect the negative battery cable.
3. Remove all related panels and components.
4. Visually inspect the damage. Repair as much of the damage as possible.
5. Remove the sealers and anti-corrosion materials.
6. Locate and mark all the necessary factory welds of the body lock pillar outer panel reinforcement.
7. Drill all factory welds. Note the number and location of welds for installation of the service assembly.
8. Remove the damaged body lock pillar outer panel reinforcement.

**Installation Procedure**

1. Prepare all mating surfaces as necessary.
2. Align the body lock pillar outer panel reinforcement.
3. Drill 8mm holes for plug welding along the edges of the body lock pillar outer panel reinforcement as noted from the original panel.
4. Clean and prepare the attaching surfaces for welding.
5. Position the body lock pillar outer panel reinforcement on the vehicle.
6. Verify the fit of the body lock pillar outer panel reinforcement.
7. Clamp the part into position and plug weld.
8. Then go back and complete the stitch weld.
9. Apply the sealers and anti-corrosion materials etc as per workshop manual.
Roof Outer Panel Replacement

Removal Procedure

1. Disable the SIR system.
2. Disconnect the negative battery cable.
3. Remove all related panels and components.
4. Visually inspect the damage. Repair as much of the damage as possible.
5. Remove the sealers and anti-corrosion materials from the repair area, as necessary.
6. Locate and mark all factory welds.
7. Drill all factory welds. Note the number and location of welds for installation of the new part.
8. Cut the adhesive with an appropriate tool.
9. Remove the damaged roof panel.
Installation Procedure

1. Drill 8mm holes for plug welding along the edges of the service panel as noted from the original panel.
2. Clean and prepare the attaching surfaces for welding.

3. Apply one-part windscreen urethane adhesive as noted from the original panel.
4. Position the roof panel on the vehicle.
5. Verify the fit of the panel and clamp into position.

6. Plug weld accordingly.
7. Apply the sealers and anti-corrosion materials etc as per workshop manual.
**Sunroof**

**Description and operation**

The tilt/slide sunroof consists of a moving glass panel and a manual sunshade. In the sunroof system the rear of the glass tilts up for venting and slides between the headliner and roof panel as it slides open. The glass is controlled by an integrated motor/controller. The sunshade has a mechanical connection to the glass causing it to open with the glass and keeping it from closing more than the glass.

The electrical portion of the tilt/slide sunroof system consists of:

- Body control module (BCM)
- Sunroof glass control module
- Sunroof control switch assembly
- Vent control switch assembly
- Local interconnected network (LIN-Bus)

1) Sunroof frame  
2) Sunroof sunshade  
3) Sunroof window  
4) Sunroof window seal  
5) Sunroof housing rear drain hose  
6) Sunroof housing drain gutter  
7) Sunroof frame bolts  
8) Sunroof window guide  
9) Sunroof air deflector cover  
10) Sunroof window motor  
11) Sunroof window seal  
12) Sunroof air deflector  
13) Sunroof housing Front drain hose  
14) Sunroof window bolts
The petrol engines have variable valve timing on both inlet and exhaust sides of the engine, while the diesel uses common rail technology.

<table>
<thead>
<tr>
<th>Engine</th>
<th>1.6 L</th>
<th>1.8 L</th>
<th>2.0 L</th>
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<tbody>
<tr>
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<td>Diesel</td>
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<tr>
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<td>1.796</td>
<td>1.991</td>
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<td>17.5:1</td>
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<tr>
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<td>320 NM</td>
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<tr>
<td>Engine Control</td>
<td>Delphi</td>
<td>Simtec</td>
<td>Bosch</td>
</tr>
</tbody>
</table>
**Flexi Belt**

In the 1.8L engines the power steering belt is a flexi belt. This is a maintenance free belt. Due to its characteristics the belt cannot be fitted without the special tool. There are also other advantages to a flexi belt such as weight reduction and cost reduction.

Standard Belt  Flexi (stretchy) Belt
New Service Tools

Engine Carrier

Front Adaptor to carrier frame

Rear Adaptor to carrier frame
Centerring adaptor

Transmission Holder

Strut Spring Nut Adaptor
**Brakes**

The vehicle is equipped with a Continental Teves Mk60/Mk70 brake system. The electronic brake control module (EBCM) and the brake pressure modulator valve assembly are serviced separately. The brake pressure modulator valve assembly uses a 4 circuit configuration to control hydraulic pressure to each wheel independently.

Depending on options, the following vehicle performance enhancement systems are provided.
- Antilock brake system (ABS)
- Traction control
- Stability control
- Dynamic rear proportioning
- Hydraulic brake assist

**ABS**

When wheel slip is detected during a brake application, an ABS event occurs. During ABS braking, hydraulic pressure in the individual wheel circuits is controlled to prevent any wheel from slipping.

**Traction Control**

When drive wheel slip is noted, the EBCM will enter traction control mode. First, the EBCM requests the engine control module (ECM) to reduce the amount of torque to the drive wheels via a serial data message. The ECM reduces torque to the drive wheels and reports the amount of delivered torque.

If the engine torque reduction does not reduce drive wheel slip, the EBCM will actively apply the brakes on the slipping drive wheel. Traction control can be manually disabled or enabled by pressing the traction control switch.
**Stability Control**

Stability control provides added stability during aggressive manoeuvres. Yaw rate is the rate of rotation about the vehicle’s vertical axis. The stability control is activated when the EBCM determines that the desired yaw rate does not match the actual yaw rate as measured by the yaw rate sensor.

The desired yaw rate is calculated by the EBCM using the following inputs:
- Steering wheel position
- Vehicle speed
- Lateral acceleration

The difference between the desired yaw rate and the actual yaw rate is the yaw rate error, which is a measurement of oversteer or understeer. When a yaw rate error is detected, the EBCM attempts to correct the vehicle's yaw motion by applying brake pressure to one or more of the wheels. The engine torque may be reduced also, if it is necessary to slow the vehicle while maintaining stability.

Stability control activations generally occur in turns during aggressive driving. Stability control can be manually disabled or enabled by pressing the traction control switch for 5 seconds.

**Dynamic Rear Proportioning**

The dynamic rear proportioning is a control system that replaces the mechanical proportioning valve. Under certain driving conditions the EBCM will reduce the rear wheel brake pressure by commanding the appropriate solenoid valves on and off.

**Hydraulic brake assist**

The hydraulic brake assist function is designed to support the driver in emergency braking situations. The EBCM receives inputs from the brake pressure sensor. When the EBCM senses an emergency braking situation, the EBCM will actively increase the brake pressure to a specific maximum.
**Brake Pressure Modulator Valve Pressure Sensor**

**Calibration**

The brake pressure sensor does not require calibration often. Calibration of the brake pressure sensor might be required after certain service procedures are performed. Some of these procedures are as follows:

- Electronic brake control module (EBCM) replacement
- Brake pressure modulator valve assembly replacement

Calibration can be completed with a scan tool.

**Variable Steering System**

The Variable Effort Steering (VES) system or MAGNASTEER varies the amount of effort required to steer the vehicle as vehicle speed changes. At low speeds the system provides minimal steering effort for easy turning and parking manoeuvres. Steering effort is increased at higher speeds to provide firmer steering (road feel) and directional stability.

The VES control module uses vehicle speed and steering wheel speed to command a current that is most appropriate for each speed to the VES actuator. The actuator is a variable electromagnetic actuator.

At lowest speed, around 5 km/h the coils are polarised in such a way that the magnetic forces are repelling each other and hardly any effort is needed to turn the steering.

At mid speed, around 70 km/h no current is sent through the coils and steering is assisted by hydraulics only. At high speeds the coils are polarised in such a way that the magnetic forces are attracting each other and high effort is required to turn the ring magnet between them.

The VES control module has the ability to detect malfunctions in the actuator. Any malfunctions detected will cause the system to supply zero amps. Steering will be assisted by hydraulics only and a DTC is set.
**Steering Angle Sensor Centring**

The steering angle sensor does not require centring often. Centring of the steering angle sensor might be required after certain service procedures are performed. Some of these procedures are as follows:

- Electronic brake control module replacement (EBCM)
- Steering angle sensor replacement
- Steering gear replacement
- Steering column replacement
- Collision or other physical damage

The steering angle sensor centring procedure can be completed with a scan tool.

**Front Suspension**

- McPherson layout on subframe
- Damping bushings between subframe and body

*Note:* Wheel bearing/hub bolts must be discarded and replaced if bearing/hub is removed.

**Tighten the bearing /hub bolts in three phases.**

- Tighten up to 90NM
- Turn up to 60°
- Turn up to 15°
Rear Suspension

- One type of rear axle
- No adjustment possible

*Note:* Different part numbers for different driveline configuration.

The rear suspension on the new compact sedans features a specifically adapted compound crank (torsion beam) with double walled, u-shaped profile at the rear.

*Note:* Wheel bearing/hub bolts must be discarded and replaced if bearing/hub is removed.

Tighten hub/bearing bolts in 2 phases. (and in a cross pattern)

- 50Nm
- Turn up to 40°

**Self Adjusting Cable System (SACS)**

The Self Adjusting Cable System (SACS) automatically adjusts the tension of the park brake cable by a mechanical tension spring. The park brake system does not require adjustment under normal operating conditions. The cable can be disconnected and connected while doing servicing with no extra adjustment needed.
Electrical

Data Link Connector
The data link connector (DLC) is a standardised 16 pin connector. Connector design and location is dictated by an industry wide standard. The 16 pin connector is located on the driver's side under the dashboard.

Fuse Box Location
There are two fuse boxes in the new Chevrolet Cruze. The main fuse box is positioned in the left front of the engine compartment and a secondary fuse box inside the vehicle at the left front.

Alarm

Immobilizer Description and Operation

The remote function receiver module provides a coil which is installed on the column lock. This coil is used to read out the transponder information of the key. The transponder information is used to determine whether the engine may be engaged or not.

The immobilizer function is performed as an interaction between several control modules. If any condition within this function is not met, the engine will not be engaged and the starter, fuel injection and spark are disabled. In addition, an indicator in the instrument cluster indicates the error.

Remote function Receiver Module

The keyless entry system can arm and disarm the theft deterrent system. It is located on top of the front windshield in front of the rear view mirror.
**Windscreen Temperature and inside moisture sensor**

The values received from the sensor are used as control inputs for the HVAC control module to calculate A/C compressor power needed.

**Rain Sensor Module**

The rain sensor module is only fitted on vehicles with automatic wiper control. It allows the windscreen wipers to operate automatically when this function is selected.

**Security indicator**

The security LED is illuminated on the upper I/P by the BCM. The theft deterrent system uses the security LED to inform the driver of system status prior to arming.

**Ambient light/ Sunload sensor**

This sensor provides information about sun heat intensity and passenger compartment temperature. The HVAC system compensates accordingly.

**Air Quality sensor (AQS)**

The HVAC control module detects exhaust gas by an air quality sensor. The sensor evaluates the information regarding the air quality outside and closes the recirculation flap if necessary. This will happen if the concentration of pollutants exceeds a predefined value. The sensor is situated in the left side of the plenum chamber.
**Auxiliary Input Jack (If Equipped)**

A remote 3.5mm auxiliary stereo jack and USB connector allows playback of audio signals from remote devices (e.g. laptop computer, iPod, etc.)

1) USB jack plug  
2) Aux jack plug

**Vehicle Yaw Sensor**

The Yaw sensor does not require calibration often. Calibration of the Yaw rate sensor might be required after certain service procedures are performed. Some of these procedures are as follows:

- Electronic brake control module (EBCM) replacement  
- Body control module

The Yaw sensor is located under the centre console in front of the SDM.
**Front seat heater**

The heated front seats are not available on all models. The driver and passenger heated seats consist of the following components:

- Left heated seat switch
- Right heated seat switch
- HVAC control
- Seat heating control module
- Driver seat cushion heating element
- Driver seat backrest heating element
- Driver seat cushion temperature sensor
- Passenger seat cushion heating element
- Passenger seat backrest heating element
- Passenger seat cushion temperature sensor

The driver and passenger heated seats are controlled by a single seat heating control module that is located under the driver seat.
**Park assist**

The ultrasonic parking assist system is designed to identify and notify the driver of an object in the vehicle’s path when reversing. The distance and location of the object is determined by 4 object sensors located in the rear bumper. The parking assist system will notify the driver using an audible beep signal through the radio.

The system is made up of the following components:

- Object alarm module
- Rear object alarm sensors
- Parking assist indicator in the instrument panel cluster

The control module is located in the boot behind the left wheel well.
Supplemental Inflatable Restraint System

The frontal supplemental inflatable restraint system (SIR) consists of the following components:

- Airbag indicator located in the instrument panel cluster
- Inflatable restraint sensing and diagnostic module (SDM)
- Passenger Presence System (PPS)
- Passenger airbag on/off indicator
- Instrument panel module
- Steering wheel module
- Steering wheel module coil
- Seat belt retractor pretensioners
- Wiring harness
- Steering wheel and column
- Frontal Crash sensor

A frontal collision of sufficient force will deploy the frontal air bags and/or pretensioners. The sensing and diagnostic module (SDM) contains a sensing device that converts vehicle velocity changes to an electrical signal. The SDM compares these signals to values stored in memory. If the signals exceed a stored value, the SDM will determine the severity of the impact and either deploy the frontal airbags and pretensioners, or deploy the pretensioners only.

Sensing and Diagnostic Module

The Sensing and Diagnostic Module (SDM) is a microprocessor and the control centre for the supplemental restraint system. It is located underneath the centre console on top of the floor tunnel.
Passenger Presence System

The PPS is used to monitor the weight of an occupant on the front passenger seat and communicate the status to the sensing and diagnostic module (SDM) whether to enable or suppress the deployment of the passenger airbag. The PPS consists of an electronic control module, sensor mat heated seat element (if equipped), wiring harness, and passenger air bag ON/OFF indicators. The sensor is made up of several flexible conductive metal strips placed underneath the seat cushion trim. The weight of the occupant sitting in the front passenger seat is measured as a change of current flow within the sensor mat. If the sensor determines that the occupant weight is more than a specified value, the PPS module will send an enable signal to the SDM to enable the passenger airbag. The PPS will notify the driver of the enable/disable status by illuminating one of the passenger air bag ON/Off indicators located in the center of the instrument panel cluster (IPC).

The PPS will also notify the SDM of a fault and the SDM will request the IPC to illuminate the air bag indicator located on the IPC.

Inflatable Restraint Passenger Air Bag ON/OFF indicator

This indicator is used to notify the driver and passenger when the passenger airbag is enabled or not.
Instrument Panel Module (Passenger airbag)

Steering Wheel Module (Drivers airbag)
**Steering Wheel Module Coil**

The steering wheel module coil is attached to the steering column and is located under the steering wheel. The steering wheel module coil consists of two or more current-carrying coils. The coils allow the rotation of the steering wheel while maintaining continuous electrical contact between the airbag wiring harness and the drivers module.

**Seat Belt Retractor Pretensioners**

The seat belt retracor pretensioners consist of a housing, a seat belt retractor, the seat belt webbing, an initiator, and a canister of gas generating materials. When the vehicle is involved in a collision of sufficient force, the sensing and diagnostic module (SDM) causes current to flow to seat belt pretensioners for deployment. This retracts the seat belt webbing, which removes all of the slack in the seat belts. Depending on the severity of the collision, the seat belt pretensioners may deploy without the frontal inflator modules deploying.

**Inflatable restraint wiring harness**

The inflatable restraint wiring harnesses connect the inflator modules, sensing and diagnostic module(SDM) and deployment loops using weather pack connectors. The SIR system connectors are yellow in colour for easy identification.

**Steering Wheel and Column**

The steering wheel and column are designed to absorb energy when driver contact is made with the steering wheel or inflated airbag. When the driver applies load to the airbag or the steering wheel the column will compress downward absorbing some of the impact, helping to reduce bodily injuries to the driver. The steering wheel and column must be inspected for damages after a collision.
Front Crash Sensor

The bolt is integral to the sensor assembly, DO NOT remove separately.

Knee Bolsters

The knee bolsters are designed to help restrain the lower torso of front seat occupants by absorbing the energy through the front seat occupants upper legs. In a frontal collision the front seat occupants legs may come in contact with the knee bolsters. The knee bolsters are designed to crush or deform, absorbing some of the impact, which helps reduce bodily injuries. The driver and passenger knee bolsters are located in the lower part of the instrument panel and must be inspected for damages after a collision.

Side SIR System Description

The side supplemental inflatable restraint (SIR) system consists of the following components:

- Air Bag indicator located in the instrument panel cluster (IPC)
- Sensing and Diagnostic Module (SDM)
- Side impact sensors (SIS)
- Roof rail modules (curtain airbag)
- Side impact module (seat airbag)
- Wiring harness

Side Impact sensors

The side impact sensor (SIS) contains a sensing device which monitors vehicle acceleration and velocity changes to detect side collisions that are severe enough to warrant air bag deployment. The SIS provides an input to the sensing and diagnostic module (SDM). This triggers the side airbags if necessary.
**Roof Rail Modules (Curtain Airbag)**

The roof rail modules are located under the headliner extending from the front windscreen pillar to the rear window pillar. The roof rail modules contain a housing, inflatable air bag, initiating device, and a canister of gas generating material.

**Side Impact modules (Seat Airbag)**

The side impact modules are located in the outside portion of the seat backrests. The side impact modules contain a housing, inflatable air bag, initiating device, and a canister of gas generating material.

**SIR Service precautions**

**Warning:** When performing service on or near the SIR components or the SIR wiring, the SIR system must be disabled. Failure to observe the correct procedure could cause deployment of the SIR components. Serious injury can occur. Failure to observe the correct procedure could also result in unnecessary SIR system repairs.

The inflatable restraint sensing and diagnostic module (SDM) maintains a reserved energy supply. The reserved energy supply provides deployment power for the air bags. Deployment power is available for as much as 1 minute after disconnecting the vehicle power. Disabling the SIR system prevents deployment of the air bags from the reserved energy supply.
**General Service instructions**

The following are general service instructions which must be followed in order to properly repair the vehicle and return it to its original integrity:

- Do not expose inflator modules to temperatures above 65°C.
- Verify the correct replacement part no. Do not substitute a component from another vehicle.
- Use only original GM replacement parts available from your authorised GM dealer. Do not use salvaged parts for repair to the SIR system.

Discard any of the following components if it has been dropped from a height of 91cm (3ft) or higher.

- Sensing and Diagnostic module (SDM)
- Passenger module
- Steering wheel module
- Steerin wheel module coil
- Roof rail modules
- Side impact sensors (SIS)
- Seat belt retractor pretensioners
- Front end sensor

**SIR Post accident procedure**

Following a severe frontal or side collision, various parts will need to be replaced regarding the SIR system. In the event of a frontal collision and the frontal airbags have deployed, the front airbags will have to be replaced. The seat belts will also need to be replaced as the seat belt pretensioners will always deploy if the front airbags have deployed. Depending on the severity of the collision it may occur that only the seat belt pretensioners deployed but not the airbags. In this case the frontal airbags do not need replacing but the seatbelts still need to be replaced.

The SDM will also need to be replaced as well as the steering wheel coil.

Take note that if the steering column has collapsed, it will also need to be replaced.

The front crash sensor will need to be replaced too.

Following a side collision the curtain airbag and side(seat) airbag will need to be replaced.

The side crash sensor will need to be replaced, but the SDM can be reset for side collisions and does not need to be replaced.