

2013 GENERAL INFORMATION**Dangers, Warnings, and Cautions - Cruze****INTRODUCTION****DEFINITION OF DANGER, WARNING, CAUTION, AND NOTE**

The diagnosis and repair procedures in a GM Service Information contain both general and specific Dangers, Warnings, Cautions, Notes or Important. GM is dedicated to the presentation of service information that helps the technician to diagnose and repair the systems necessary for the proper operation of the vehicle, however, certain procedures may present a hazard to the technician if they are not followed in the recommended manner. Dangers, Warnings, Cautions and Notes or Important are elements designed to prevent these hazards, however, not all hazards can be foreseen. This information is placed at strategic locations within the service manual. This information is designed to prevent the following from occurring:

- Serious bodily injury or death to the technician
- Damage to the vehicle
- Unnecessary vehicle repairs
- Unnecessary component replacement
- Improper repair or replacement of vehicle components.
- Any warning or caution that appears in this service category is referenced from the individual service categories.

DANGER Defined

When encountering a DANGER, you will be asked to take a necessary action or not to take a prohibited action. If a DANGER is not heeded, the following consequences may occur:

- Serious bodily injury or death to the technician
- Serious bodily injury or death to other technicians in the workplace area

WARNING Defined

When encountering a WARNING, you will be asked to take a necessary action or not to take a prohibited action. If a WARNING is not heeded, the following consequences may occur:

- Serious bodily injury to the technician
- Serious bodily injury to other technicians in the workplace area
- Serious bodily injury to the driver and/or passenger(s) of the vehicle, if the vehicle has been improperly repaired

CAUTION Defined

CAUTIONS call special attention to a necessary action or to a prohibited action. If a CAUTION is not heeded,

the following consequences may occur:

- Damage to the vehicle
- Unnecessary vehicle repairs
- Unnecessary component replacement
- Improper operation or performance of the system or component under repair
- Damage to any systems or components which are dependent upon the proper operation of the system or component under repair
- Improper operation or performance of any systems or components which are dependent upon the proper operation or performance of the system or component under repair
- Damage to fasteners, basic tools, or special tools
- The leakage of coolant, lubricant, or other vital fluids

NOTE or IMPORTANT Defined

NOTE and IMPORTANT statements emphasize a necessary characteristic of a diagnostic or repair procedure. NOTE or IMPORTANT statements are designed to do the following:

- Clarify a procedure
- Present additional information for accomplishing a procedure
- Give insight into the reason or reasons for performing a procedure in the manner recommended
- Present information that will help to accomplish a procedure in a more effective manner
- Present information that gives the technician the benefit of past experience in accomplishing a procedure with greater ease

ABS COMPONENT HANDLING WARNING

WARNING: Certain components in the Antilock Brake System (ABS) are not intended to be serviced individually. Attempting to remove or disconnect certain system components may result in personal injury and/or improper system operation. Only those components with approved removal and installation procedures should be serviced.

ACTIONS TO TAKE WHEN WORKING WITH FUEL WARNING

WARNING: Fuel Vapors can collect while servicing fuel system parts in enclosed areas such as a trunk. To reduce the risk of fire and increased exposure to vapors:

- Use forced air ventilation such as a fan set outside of the trunk.
- Plug or cap any fuel system openings in order to reduce fuel vapor formation.
- Clean up any spilled fuel immediately.

- Avoid sparks and any source of ignition.
- Use signs to alert others in the work area that fuel system work is in process.

APPROVED EQUIPMENT FOR COLLISION REPAIR WARNING

WARNING: To avoid personal injury when exposed to welding flashes or to galvanized (Zinc Oxide) metal toxic fumes while grinding/cutting on any type of metal or sheet molded compound, you must work in a properly ventilated area, wearing an approved respirator, eye protection, earplugs, welding gloves, and protective clothing.

ASSISTANT DRIVING WARNING

WARNING: An assistant should drive the vehicle while the technician checks for the location of the reported condition. Otherwise, personal injury could result.

BATTERY DISCONNECT WARNING

WARNING: Unless directed otherwise, the ignition and start switch must be in the OFF or LOCK position, and all electrical loads must be OFF before servicing any electrical component. Disconnect the negative battery cable to prevent an electrical spark should a tool or equipment come in contact with an exposed electrical terminal. Failure to follow these precautions may result in personal injury and/or damage to the vehicle or its components.

For Vehicles equipped with OnStar® (UE1) with Back Up Battery:

The Back Up Battery is a redundant power supply to allow limited OnStar® functionality in the event of a main vehicle battery power disruption to the VCIM (OnStar® module). Do not disconnect the main vehicle battery or remove the OnStar® fuse with the ignition key in any position other than OFF. Retained accessory power should be allowed to time out or be disabled (simply opening the driver door should disable retained accessory power) before disconnecting power. Disconnecting power to the OnStar® module in any way while the ignition is On or with retained accessory power activated may cause activation of the OnStar® Back-Up Battery system and will discharge and permanently damage the back-up battery. Once the Back-Up Battery is activated it will stay on until it has completely discharged. The back-up battery is not rechargeable and once activated the back-up battery must be replaced.

BRAKE DUST WARNING

WARNING: Avoid taking the following actions when you service wheel brake parts:

- Do not grind brake linings.
- Do not sand brake linings.
- Do not clean wheel brake parts with a dry brush or with compressed air.

Some models or aftermarket brake parts may contain asbestos fibers which can become airborne in dust. Breathing dust with asbestos fibers may cause serious bodily harm. Use a water-dampened cloth in order to remove any dust on brake parts. Equipment is available commercially in order to perform this washing function. These wet methods prevent fibers from becoming airborne.

BRAKE FLUID IRRITANT WARNING

WARNING: Brake fluid may irritate eyes and skin. In case of contact, take the following actions:

- Eye contact-rinse thoroughly with water.
- Skin contact-wash with soap and water.
- If ingested-consult a physician immediately.

BRAKE FLUID WARNING

WARNING: Use only Delco Supreme 11, GM P/N 12377967 (Canadian P/N 992667), or equivalent DOT 3 brake fluid from a clean, sealed container. Do not use fluid from an open container that may be contaminated with water. Improper or contaminated fluid could result in damage to components, or loss of braking, with possible injury.

CHECKING HOT TRANSMISSION FLUID THROUGH DRAIN PLUG HOLE WARNING

WARNING: The engine must be running when the transmission fluid fill plug is removed, or excessive fluid loss will occur. Transmission fluid may be hot. Since the actual fluid level is unknown, stand clear when removing the fill plug. Have a container ready to capture any lost fluid. Do not turn the engine off with the fill plug removed, as you can be injured by hot transmission fluid being expelled out of the oil fill opening.

CLEANING SOLVENT WARNING

WARNING: Bodily injury may occur if the cleaning solvent is inhaled or exposed to the skin.

CLUTCH ACTUATOR CYLINDER WARNING

WARNING: Do not apply any pressure to the clutch actuator cylinder with the transmission removed. The clutch actuator cylinder is not pressure-resistant and must only be actuated between two solid surfaces, such as the transmission and clutch assembly. Failure to follow this warning may cause personal injury and/or damage the clutch actuator cylinder.

COLLISION SECTIONING WARNING

WARNING: Sectioning should be performed only in the recommended areas. Failure to do so may compromise the structural integrity of the vehicle and cause personal injury if the vehicle is in a collision.

CRACKED WINDOW WARNING

WARNING: If a window is cracked but still intact, crisscross the window with masking tape in order to reduce the risk of damage or personal injury.

DEFROSTER OUTLET WARNING

WARNING: If broken glass falls into the defroster outlets, it can be blown into the passenger compartment and cause personal injury.

EXHAUST SERVICE WARNING

WARNING: In order to avoid being burned, do not service the exhaust system while it is still hot. Service the system when it is cool.

EXPRESS WINDOW DOWN WARNING

WARNING: Disconnect the power window switch when working inside the driver door. When operated, the Express Up/Down Feature allows the door window to move very quickly, without stopping, which could cause personal injury.

EYE PROTECTION WARNING

WARNING: Approved safety glasses and gloves should be worn when performing this procedure to reduce the chance of personal injury.

FOAM SOUND DEADENERS WARNING

WARNING: Foam sound deadeners must be removed from areas within 152.4 mm (6 in) of where flame is to be used for body repairs. When reinstalling foam sound deadeners, avoid inhaling fumes as bodily injury may result.

FUEL AND EVAPORATIVE EMISSION PIPE WARNING

WARNING: In order to reduce the risk of fire and personal injury observe the following items:

- Replace all nylon fuel pipes that are nicked, scratched or damaged during installation, do not attempt to repair the sections of the nylon fuel pipes
- Do not hammer directly on the fuel harness body clips when installing new fuel pipes. Damage to the nylon pipes may result in a fuel leak.
- Always cover nylon vapor pipes with a wet towel before using a torch near them. Also, never expose the vehicle to temperatures higher than 115°C (239°F) for more than one hour, or more than 90°C (194°F) for any extended period.
- Apply a few drops of clean engine oil to the male pipe ends before connecting fuel pipe fittings. This will ensure proper reconnection and prevent a possible fuel leak. (During normal operation, the O-rings located in the female connector will swell and may prevent proper reconnection if not lubricated.)

FUEL GAUGE LEAK WARNING

WARNING: Wrap a shop towel around the fuel pressure connection in order to reduce the risk of fire and personal injury. The towel will absorb any fuel leakage that occurs during the connection of the fuel pressure gauge. Place the towel in an approved container when the connection of the fuel pressure gauge is complete.

FUEL PIPE FITTING WARNING

WARNING: Always apply a few drops of clean engine oil to the male pipe ends before connecting the fuel pipe fittings. This will ensure proper reconnection and prevent a possible fuel leak. Always replace O-rings.

FUEL STORAGE WARNING

WARNING: Do not drain the fuel into an open container. Never store the fuel in an open container due to the possibility of a fire or an explosion.

FUEL VAPORS IN EVAPORATIVE EMISSION COMPONENTS WARNING

WARNING: Do not breathe the air through the EVAP component tubes or hoses. The fuel vapors inside the EVAP components may cause personal injury.

GASOLINE/GASOLINE VAPORS WARNING

WARNING: Gasoline or gasoline vapors are highly flammable. A fire could occur if an ignition source is present. Never drain or store gasoline or diesel fuel in an open container, due to the possibility of fire or explosion. Have a dry chemical (Class B) fire extinguisher nearby.

GLASS AND SHEET METAL HANDLING WARNING

WARNING: When working with any type of glass or sheet metal with exposed or rough edges, wear approved safety glasses and gloves in order to reduce the chance of personal injury.

HALOGEN BULB WARNING

WARNING: Halogen bulbs contain gas under pressure. Handling a bulb improperly could cause it to shatter into flying glass fragments. To help avoid personal injury:

- Turn off the lamp switch and allow the bulb to cool before changing the bulb.
- Leave the lamp switch OFF until the bulb change is complete.
- Always wear eye protection when changing a halogen bulb.
- Handle the bulb only by its base. Avoid touching the glass.
- Keep dirt and moisture off the bulb.
- Properly dispose of the used bulb.
- Keep halogen bulbs out of the reach of children.

HOOD HOLD-OPEN DEVICE WARNING

WARNING: When a hood hold open device is being removed or installed, provide alternate support to avoid the possibility of damage to the vehicle or personal injury.

HOT EXHAUST SYSTEM WARNING

WARNING: While engine is operating, the exhaust system will become extremely hot. To prevent burns avoid contacting a hot exhaust system.

MOVING PARTS AND HOT SURFACES WARNING

WARNING: Avoid contact with moving parts and hot surfaces while working around a running engine in order to prevent physical injury.

PARKING BRAKE AND DRIVE WHEELS WARNING

WARNING: Apply the parking brake and block the drive wheels before performing this procedure in order to prevent bodily injury.

PROTECTIVE GOGGLES AND GLOVE WARNING

WARNING: Always wear protective goggles and gloves when removing exhaust parts as falling rust and sharp edges from worn exhaust components could result in serious personal injury.

RELIEVING FUEL PRESSURE WARNING

WARNING: Remove the fuel tank cap and relieve the fuel system pressure before servicing the fuel system in order to reduce the risk of personal injury. After you relieve the fuel system pressure, a small amount of fuel may be released when servicing the fuel lines, the fuel injection pump, or the connections. In order to reduce the risk of personal injury, cover the fuel system components with a shop towel before disconnection. This will catch any fuel that may leak out. Place the towel in an approved container when the disconnection is complete.

ROAD TEST WARNING

WARNING: Road test a vehicle under safe conditions and while obeying all traffic laws. Do not attempt any maneuvers that could jeopardize vehicle control. Failure to adhere to these precautions could lead to serious personal injury and vehicle damage.

SAFETY GLASSES AND COMPRESSED AIR WARNING

WARNING: Wear safety glasses when using compressed air in order to prevent eye injury.

SAFETY GLASSES WARNING

WARNING: Wear safety glasses in order to avoid eye damage.

SAFETY GOGGLES AND FUEL WARNING

WARNING: Always wear safety goggles when working with fuel in order to protect the eyes from fuel splash.

SIR DEPLOYED INFLATOR MODULES ARE HOT WARNING

WARNING: After deployment, the metal surfaces of the SIR component may be very hot. To help avoid a fire or personal injury:

- Allow sufficient time for cooling before touching any metal surface of the SIR component.
- Do not place the deployed SIR component near any flammable objects.

SIR INFLATABLE MODULE DEPLOYMENT OUTSIDE VEHICLE WARNING

WARNING: When you are deploying an inflator module for disposal, perform the deployment procedures in the order listed. Failure to follow the procedures in the order listed may result in personal injury.

SIR INFLATOR MODULE DISPOSAL WARNING

WARNING: In order to prevent accidental deployment and the risk of personal injury, do not dispose of an undeployed inflator module as normal shop waste. Undeployed inflator modules contain substances that could cause severe illness or personal injury if their sealed containers are damaged during disposal. Use the following deployment procedures to safely dispose of an undeployed inflator module. Failure to observe the following disposal methods may be a violation of federal, state, or local laws.

SIR INFLATOR MODULE HANDLING AND STORAGE WARNING

WARNING: When carrying an undeployed inflator module:

- Do not carry the inflator module by the wires or connector.
- Make sure the air bag opening points away from you.

When storing an undeployed inflator module:

- Make sure the air bag opening points away from the surface on which the inflator module rests.
- Provide free space for the air bag to expand in case of an accidental deployment.
- When storing a steering column, do not rest the column with the air bag opening facing down and the column vertical. Lay the column

on its side.

Failure to observe these guidelines may result in personal injury.

SIR SEATBELT PRETENSIONER HANDLING WARNING

WARNING: When carrying an undeployed inflatable restraint seat belt retractor pretensioner:

- Do not carry the seat belt pretensioner by the seat belt webbing or pigtail connector, if equipped.
- Carry the seat belt pretensioner by the housing, keeping hands and fingers away from the seat belt webbing.
- Make sure the opening, from which the seat belt webbing extends, faces downward and the seat belt webbing hangs freely.

Failure to observe these guidelines may result in personal injury.

SIR SPECIAL TOOL WARNING

WARNING: Failure to observe the special tool recommendations and instructions could cause SIR deployment, personal injury, or unnecessary SIR system repairs.

SIR WARNING

WARNING: This vehicle is equipped with a Supplemental Inflatable Restraint (SIR) System. Failure to follow the correct procedure could cause the following conditions:

- Air bag deployment
- Personal injury
- Unnecessary SIR system repairs

In order to avoid the above conditions, observe the following guidelines:

- Refer to SIR Component Views in order to determine if you are performing service on or near the SIR components or the SIR wiring.
- If you are performing service on or near the SIR components or the SIR wiring, disable the SIR system. Refer to SIR Disabling and Enabling .

STEERING ANGLE SENSOR INITIALIZATION WARNING

WARNING: For vehicles with electric power steering (EPS) and without a vehicle stability enhancement program, the steering angle sensor **MUST** always be initialized after the battery has been disconnected. Failure to initialize the steering angle sensor could limit the operation of the EPS system and result in personal injury.

To ensure proper initialization of the EPS system, do the following:

1. The engine should be on with the vehicle stationary.
2. Turn the steering wheel counterclockwise until it stops.
3. Turn the steering wheel clockwise until it stops.

TORQUE-TO-YIELD FASTENER WARNING

WARNING: This component is equipped with torque-to-yield fasteners. Install a **NEW** torque-to-yield fastener when installing this component. Failure to replace the torque-to-yield fastener could cause bodily injury and damage to the vehicle or component.

WINDOW RETENTION WARNING

WARNING: When replacing stationary windows, only use a single component adhesive kit, or an adhesive system meeting GM Specifications, to maintain original installation integrity. Failure to use the single component adhesive kit will result in poor retention of the window which may allow unrestrained occupants to be ejected from the vehicle resulting in personal injury.

WORK STALL TEST WARNING

WARNING: One or more of the following guidelines may apply when performing specific required tests in the work stall:

- When a test requires spinning the drive wheels with the vehicle jacked up, adhere to the following precautions:
 - Do not exceed 56 km/h (35 mph) when spinning one drive wheel with the other drive wheel stopped. This limit is necessary because the speedometer indicates only one-half the actual vehicle speed under these conditions. Personal injury may result from excessive wheel spinning.
 - If all of the drive wheels are spinning at the same speed, do not exceed 112 km/h (70 mph). Personal injury may result from excessive wheel spinning.
 - All persons should stay clear of the rotating components and the balance weight areas in order to avoid possible personal

injury.

- **When running an engine in the repair stall for an extended period of time, use care not to overheat the engine and the transmission.**
- **When a test requires jacking up the vehicle and running with the wheels and brake rotors removed, adhere to the following precautions:**
 - **Support the suspension at normal ride height.**
 - **Do not apply the brake with the brake rotors removed.**
 - **Do not place the transmission in PARK with the drive axles spinning.**
 - **Turn Off the ignition in order to stop the powertrain components from spinning.**
- **When running an engine in the work stall, use the exhaust removal system to prevent breathing dangerous gases.**

AIR IN THE POWER STEERING SYSTEM CAUTION

CAUTION: If the power steering system has been serviced, an accurate fluid level reading cannot be obtained unless air is bled from the steering system. The air in the fluid may cause pump cavitation noise and may cause pump damage over a period of time.

AVOID CHIPPING OR SCRATCHING THE COATING CAUTION

CAUTION: Care should be taken to avoid chipping or scratching the coating when handling the suspension coil spring. Damage to the coating can cause premature failure.

BALL STUD REMOVAL CAUTION

CAUTION: Do not free the ball stud by using a pickle fork or a wedge-type tool. Damage to the seal or bushing may result.

BELT DRESSING CAUTION

CAUTION: Do not use belt dressing on the drive belt. Belt dressing causes the breakdown of the composition of the drive belt. Failure to follow this recommendation will damage the drive belt.

BRAKE CALIPER CAUTION

CAUTION: Support the caliper with a piece of wire to prevent damage to the brake

line.

BRAKE FLUID EFFECTS ON PAINT AND ELECTRICAL COMPONENTS CAUTION

CAUTION: Avoid spilling brake fluid onto painted surfaces, electrical connections, wiring, or cables. Brake fluid will damage painted surfaces and cause corrosion to electrical components. If any brake fluid comes in contact with painted surfaces, immediately flush the area with water. If any brake fluid comes in contact with electrical connections, wiring, or cables, use a clean shop cloth to wipe away the fluid.

CLEAN, DRY, LOW PRESSURE GAS SOURCE CAUTION

CAUTION: Use the Evaporative Emission (EVAP) System Tester (EEST) GE 41413-A in order to provide a clean, dry, low pressure nitrogen gas source. Do not substitute any other pressurized source, gas or otherwise. Damage may result to the EVAP system, test equipment or cause a safety risk.

CLEARCOAT/ULTRAVIOLET SCREENERS CAUTION

CAUTION: Removing more than 0.5 mils of the clearcoat can result in early paint failure. The clearcoat contains ultraviolet screeners. Do not finesse sand more than what is required to remove the defect.

CLUTCH ACTUATOR CYLINDER AND SEAL CAUTION

CAUTION: Do not contaminate the clutch actuator cylinder or the clutch actuator cylinder seal with oil. The clutch actuator cylinder and the clutch actuator cylinder seal are not oil resistant. Failure to follow this caution may cause a leak or damage to the clutch actuator cylinder.

CLUTCH ACTUATOR CYLINDER MOUNTING SLEEVE CAUTION

CAUTION: Use a mounting sleeve when installing the clutch actuator cylinder to the transmission. The transmission input shaft has sharp edges and can damage the clutch actuator cylinder. Failure to follow this caution may cause a leak and damage to the clutch actuator cylinder.

COMPONENT FASTENER TIGHTENING CAUTION

CAUTION: Replacement components must be the correct part number for the application. Components requiring the use of the thread locking compound, lubricants, corrosion inhibitors, or sealants are identified in the service procedure. Some replacement components may come with these coatings already applied. Do not use these coatings on components

unless specified. These coatings can affect the final torque, which may affect the operation of the component. Use the correct torque specification when installing components in order to avoid damage.

DRIVE AXLE CAUTION

CAUTION: Support the lower control arms in the normal horizontal position in order to avoid damage to the drive axles. Do not operate the vehicle in gear with the wheels hanging down at full travel.

ENGINE COOLANT THERMOSTAT HOUSING CAUTION

CAUTION: Use care when performing this procedure. Use of excessive force may damage the coolant thermostat.

EXTERIOR TRIM EMBLEM REMOVAL CAUTION

CAUTION: Use a plastic, flat-bladed tool to prevent paint damage when removing an emblem/name plate.

FASTENER CAUTION

CAUTION: Use the correct fastener in the correct location. Replacement fasteners must be the correct part number for that application. Do not use paints, lubricants, or corrosion inhibitors on fasteners, or fastener joint surfaces, unless specified. These coatings affect fastener torque and joint clamping force and may damage the fastener. Use the correct tightening sequence and specifications when installing fasteners in order to avoid damage to parts and systems. When using fasteners that are threaded directly into plastic, use extreme care not to strip the mating plastic part(s). Use hand tools only, and do not use any kind of impact or power tools. Fastener should be hand tightened, fully seated, and not stripped.

FILLING THE MASTER CYLINDER CAUTION

CAUTION: When filling the master cylinder, use only Delco Supreme 11, GM P/N 12377967 (Canadian P/N 992667), or equivalent DOT 3 brake fluid. Do not use a container which has been used for petroleum based fluids, or a container which is wet with water. Petroleum based fluids will cause swelling and distortion of rubber parts in the hydraulic brake system, and water will mix with brake fluid, lowering the boiling point. Keep all fluid containers capped to prevent contamination.

FUEL AND EVAPORATIVE EMISSION HOSE/PIPE CONNECTION CLEANING CAUTION

CAUTION: Clean all of the following areas before performing any disconnections in order to avoid possible contamination in the system:

- The fuel pipe connections
- The hose connections
- The areas surrounding the connections

HEATED OXYGEN AND OXYGEN SENSOR CAUTION

CAUTION: Do not remove the pigtail from either the heated oxygen sensor (HO2S) or the oxygen sensor (O2S). Removing the pigtail or the connector will affect sensor operation.

Handle the oxygen sensor carefully. Do not drop the HO2S. Keep the in-line electrical connector and the louvered end free of grease, dirt, or other contaminants. Do not use cleaning solvents of any type.

Do not repair the wiring, connector or terminals. Replace the oxygen sensor if the pigtail wiring, connector, or terminal is damaged.

This external clean air reference is obtained by way of the oxygen sensor signal and heater wires. Any attempt to repair the wires, connectors, or terminals could result in the obstruction of the air reference and degraded sensor performance.

The following guidelines should be used when servicing the heated oxygen sensor:

- Do not apply contact cleaner or other materials to the sensor or vehicle harness connectors. These materials may get into the sensor causing poor performance.
- Do not damage the sensor pigtail and harness wires in such a way that the wires inside are exposed. This could provide a path for foreign materials to enter the sensor and cause performance problems.
- Ensure the sensor or vehicle lead wires are not bent sharply or kinked. Sharp bends or kinks could block the reference air path through the lead wire.
- Do not remove or defeat the oxygen sensor ground wire, where applicable. Vehicles that utilize the ground wired sensor may rely on this ground as the only ground contact to the sensor. Removal of the ground wire will cause poor engine performance.
- Ensure that the peripheral seal remains intact on the vehicle harness connector in order to prevent damage due to water intrusion. The engine harness may be repaired using Packard's Crimp and Splice

Seals Terminal Repair Kit. Under no circumstances should repairs be soldered since this could result in the air reference being obstructed.

HEATED OXYGEN SENSOR RESISTANCE LEARN RESET CAUTION

CAUTION: When replacing the HO2S perform the following:

- A code clear with a scan tool, regardless of whether or not a DTC is set
- HO2S heater resistance learn reset with a scan tool, where available

Perform the above in order to reset the HO2S resistance learned value and avoid possible HO2S failure.

INSTALLING HOSES WITHOUT TWISTS OR BENDS CAUTION

CAUTION: The inlet and outlet hoses must not be twisted during installation. Do not bend or distort the inlet or outlet hoses to make installation easier. Failure to follow these procedures could result in component damage.

PIPE WRENCH POSITIONING CAUTION

CAUTION: The pipe wrench must be placed at the valve end of the steering gear and positioned up against the inner tie rod housing. Placing the pipe wrench in any other location will cause damage to the steering gear.

POWER STEERING HOSE DISCONNECTED CAUTION

CAUTION: Do not start the vehicle with any power steering gear inlet or outlet hoses disconnected. When disconnected, plug or cap all openings of components. Failure to do so could result in contamination or loss of power steering fluid and damage to the system.

SILICON CONTAMINATION OF HEATED OXYGEN SENSORS CAUTION

CAUTION: Contamination of the oxygen sensor can result from the use of an inappropriate RTV sealant (not oxygen sensor safe) or excessive engine coolant or oil consumption. Remove the HO2S and visually inspect the portion of the sensor exposed to the exhaust stream in order to check for contamination. If contaminated, the portion of the sensor exposed to the exhaust stream will have a white powdery coating. Silicon contamination causes a high but false HO2S signal voltage (rich exhaust indication). The control module will then reduce the amount of fuel delivered to the engine, causing a severe driveability problem. Eliminate the source of contamination before replacing the oxygen sensor.

STEERING COLUMN IN LOCK POSITION CAUTION

CAUTION: With wheels of the vehicle facing straight ahead, secure the steering wheel utilizing steering column anti-rotation pin, steering column lock, or a strap to prevent rotation. Locking of the steering column will prevent damage and a possible malfunction of the SIR system. The steering wheel must be secured in position before disconnecting the following components:

- The steering column
- The steering shaft coupling
- The intermediate shaft(s)

After disconnecting these components, do not rotate the steering wheel or move the front tires and wheels. Failure to follow this procedure may cause the SIR coil assembly to become un-centered and cause possible damage to the SIR coil. If you think the SIR coil has become un-centered, refer to your specific SIR coil's centering procedure to re-center SIR Coil.

STEERING GEAR PRELOAD ADJUSTMENT CAUTION

CAUTION: Do not change the steering gear preload adjustment before moving the inner tie rod from the steering gear. Changing the steering gear preload adjustment before moving the inner tie rod could result in damage to the pinion and the steering gear.

STEERING WHEEL IN THE FULL TURN POSITION CAUTION

CAUTION: Do not hold the steering wheel in the full turn position longer than 5 seconds, as damage to the steering pump may result.

STEERING WHEEL STRAIGHT AND COLUMN LOCKED CAUTION

CAUTION: With wheels of the vehicle facing straight ahead, secure the steering wheel utilizing steering column anti-rotation pin, steering column lock, or a strap to prevent rotation. Locking of the steering column will prevent damage and a possible malfunction of the SIR system. The steering wheel must be secured in position before disconnecting the following components:

- The steering column
- The intermediate shaft(s)
- The steering gear

After disconnecting these components, do not rotate the steering wheel or move the front tires and wheels. Failure to follow this procedure may cause the SIR coil assembly to become un-centered and cause possible

damage to the SIR coil. If you think the SIR coil has become un-centered, refer to your specific SIR coil's centering procedure to re-center SIR Coil.

TEST PROBE CAUTION

CAUTION: Do not insert test equipment probes (DMM etc.) into any connector or fuse block terminal. The diameter of the test probes will deform most terminals. A deformed terminal will cause a poor connection, which will result in a system failure. Always use the EL-35616 GM Approved Terminal Test Probe Kit in order to front probe terminals. Do not use paper clips or other substitutes to probe terminals.

When using the EL-35616 GM Approved Terminal Test Probe Kit, ensure the terminal test adapter choice is the correct size for the connector terminal. Do not visually choose the terminal test adapter because some connector terminal cavities may appear larger than the actual terminal in the cavity. Using a larger terminal test adapter will damage the terminal. Refer to the EL-35616 GM Approved Terminal Test Probe Kit label on the inside of the EL-35616 GM Approved Terminal Test Probe Kit for the correct adapter along with the connector end view.

THREE-WAY CATALYTIC CONVERTER DAMAGE CAUTION

CAUTION: In order to avoid damaging the replacement three-way catalytic converter, correct the engine misfire or mechanical fault before replacing the three-way catalytic converter.

TORQUE REACTION AGAINST TIMING DRIVE CHAIN CAUTION

CAUTION: A wrench must be used on the hex of the camshaft when loosening or tightening in order to prevent component damage. Failure to prevent the torque reaction against the timing drive chain can lead to timing drive chain failure.

TORQUE-TO-YIELD FASTENER CAUTION

CAUTION: This vehicle is equipped with torque-to-yield or single use fasteners. Install a NEW torque-to-yield or single use fastener when installing this component. Failure to replace the torque-to-yield or single use fastener could cause damage to the vehicle or component.

TRANSMISSION FLUID VENT CAP REMOVAL CAUTION

CAUTION: The fluid vent cap must be removed before checking the fluid level, in order to ensure the proper level. Improper fluid level may damage the

transmission.

TRANSMISSION OVERFILL CAUTION

CAUTION: Check the transmission fluid level immediately after adding fluid and before vehicle operation. Do not overfill the transmission. An overfilled transmission may result in foaming or fluid to be expelled out the vent tube when the vehicle is operated. Overfilling will result in possible damage to the transmission.

TRANSMISSION SHIFT FORK CAUTION

CAUTION: Do not move the transmission shift forks while removing or installing the transmission shifter. The shift forks must remain in the neutral position. Failure to follow this caution can cause severe damage to the transmission.

USING PROPER POWER STEERING FLUID CAUTION

CAUTION: When adding fluid or making a complete fluid change, always use the proper power steering fluid. Failure to use the proper fluid will cause hose and seal damage and fluid leaks.

VALVE LIFTER PRIMING CAUTION

CAUTION: Ensure each valve lifter is filled with clean engine oil and the valve lifter does not tip over (plunger down) before the installation of the valve lifters. The loss of oil in the valve lifter lower pressure chamber or the dry stroking/cycling of the valve lifter plunger will allow air to travel into the high pressure chamber of the valve lifter. Air in the high pressure chamber of the valve lifter may not be purged causing extensive engine component damage.

WINDOW EDGE DAMAGE CAUTION

CAUTION: Avoid damage to the window from impacting objects due to an exposed edge. The window must be 1 mm (0.025 in) below the surface of the sheet metal to avoid window damage.

2013 GENERAL INFORMATION

General Information - Cruze

SPECIFICATIONS

VOLATILE MEMORY PROGRAMMING

Electric Window Lifters

Move all the windows to the topmost position and hold the switch pressed down for 2 seconds.

Sliding Sunroof

Move the sliding roof to the respective end stops to recalibrate the sensors.

Initialize Steering Angle Sensor (Vehicles without ESP and with Electric Power Steering)

WARNING: For vehicles with electric power steering (EPS) and without a vehicle stability enhancement program, the steering angle sensor **MUST** always be initialized after the battery has been disconnected. Failure to initialize the steering angle sensor could limit the operation of the EPS system and result in personal injury.

To ensure proper initialization of the EPS system, do the following:

1. The engine should be on with the vehicle stationary.
2. Turn the steering wheel counterclockwise until it stops.
3. Turn the steering wheel clockwise until it stops.

INTRODUCTION

ARROWS AND SYMBOLS

This service manual uses various symbols in order to describe different service operations.

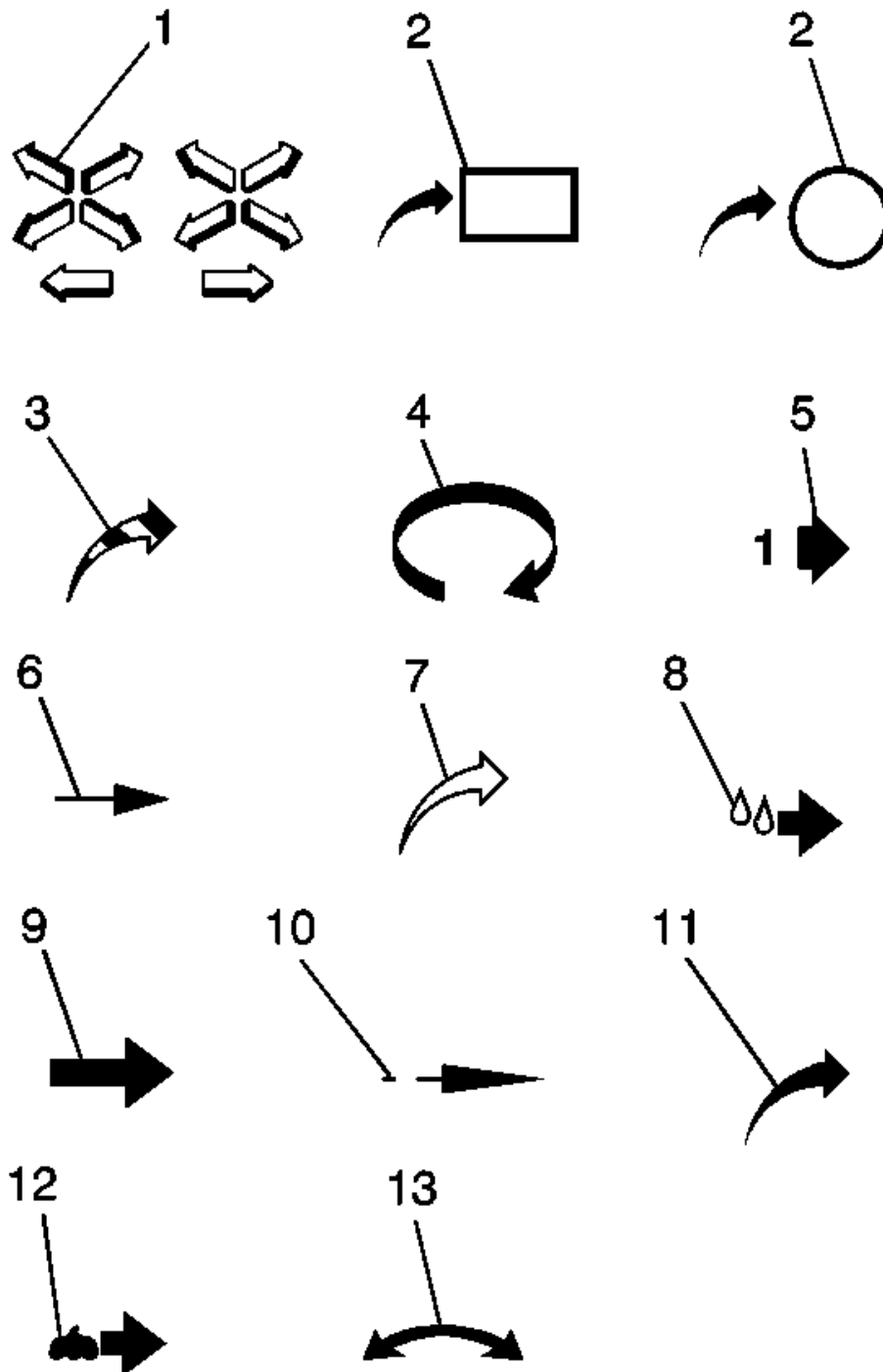


Fig. 1: Identifying Different Service Operations Symbols
 Courtesy of GENERAL MOTORS COMPANY

Callout	Component Name
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1	Front of Vehicle
2	View Detail
2	View Detail
3	Ambient Air Mixed with Another Gas or Indicate Temperature Change
4	Motion or Direction
5	View Angle
6	Dimension (1:2)
7	Ambient/Clean Air Flow or Cool Air Flow
8	Lubrication Point- Oil or Fluid
9	Task Related
10	Sectioning (1:3)
11	Gas Other Than Ambient Air or Hot Air Flow
12	Lubrication Point- Grease or Jelly
13	Multidirectional Arrow

ACRONYMS AND UNITS

Acronyms

Acronym	Meaning	Definition
2WD	Two-Wheel Drive	Indicates that a vehicle has 2 driven wheels OR that a 4WD vehicle uses only 2 wheels for propulsion. So it can be the description of a vehicle configuration OR the operational mode of the drivetrain.
4WD	Four-Wheel Drive	Four-wheeled vehicle with a drivetrain that allows all four wheels to receive power from the engine simultaneously which provides better control on various surfaces. Can be used to describe the configuration of the vehicle OR as the operational mode of the drivetrain. 4WD vehicles usually can turn 2 wheels off to be in a 2WD mode. See also AWD.
A/C	Air Conditioning	The cooling and dehumidification of indoor air for thermal comfort.
A/D	Analog to Digital	Used in context of converting electrical analog signals to digital signals.
ABS	Antilock Braking System	System on motor vehicles which prevents the wheels from locking while braking which helps the driver maintain control in heavy braking conditions.
AC	Alternating Current	An electrical current whose magnitude and direction vary cyclically.

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AM	Amplitude Modulation	Method of impressing data onto an alternating-current (AC) carrier waveform.
APP	Accelerator Pedal Position	A pedal that controls the throttle valve.
AWD	All-Wheel Drive	All-wheel-drive systems are designed to function on all types of surfaces, both on- and off-road, and most of them cannot be switched off. This can also be called full-time four wheel drive. See also 4WD.
AWG	American Wire Gauge	American wire gauge is a standardized wire gauge system used since 1857 predominantly in the United States for the diameters of round, solid, nonferrous, electrically conducting wire. E.g. a wire of AWG10 has a diameter of 2.588mm, AWG20 corresponds to a diameter of 0.812mm.
B+	Battery Positive Voltage	The electrical potential on the positive terminal of the battery.
BARO	Barometric Pressure	Atmospheric pressure as measured by a barometer.
BCM	Body Control Module	This module supplies vehicle occupants with visual and audible information and controls various vehicle functions,
BECM	Battery Energy Control Module	Control module used to regulate the battery voltage.
BPP	Brake Pedal Position	Position of the foot pedal that moves a piston in the master brake cylinder.
CAN	Controller Area Network	Serial data connection between control modules by Bosch
CCM	Chassis Control Module	The module that controls various vehicle functions on the Chassis, like Engine/Trans Mount, Active Grille Air Shutter, Load Leveling, etc•••
CD	Compact Disc	A small optical disk on which data such as music, text, or graphic images is digitally encoded.
CNG	Compressed Natural Gas	This a substitute for gasoline or diesel fuel. It is made by compressing natural gas (which is mainly composed by methane (CH ₄), in a percentage range of 70% to 98%)
CO	Carbon Monoxide	This is a product of the incomplete combustion of carbon-containing compounds, at room temperature this is a gas. It consists of one carbon atom covalently bonded to one oxygen atom.

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CO2	Carbon Dioxide	Chemical compound composed of two oxygen atoms covalently bonded to a single carbon atom.
CPA	Connector Position Assurance	Part of an electrical connector that prevents the connector from moving out of its socket. Usually needs to be pressed to unlock the connector when disconnecting it.
CPP	Clutch Pedal Position	A lever operated with the foot that controls the coupling that connects or disconnects driving and driven parts of a driving mechanism.
CV	Constant Velocity	Used in conjunction with CV joints, which connect two shafts at an angle while both shafts always have the same rotational speed without variations.
CVT	Continuously Variable Transmission	A transmission in which the ratio of the rotational speeds of two shafts, as the input shaft and output shaft of a vehicle or other machine, can be varied continuously within a given range, providing an infinite number of possible ratios which improves fuel economy.
D	Drive	D on the transmission gear selector lever.
DAB	Digital Audio Broadcast	Technology for broadcasting of audio using digital radio (carries information via digital signal) transmission.
DC	Direct Current	Continuous current, constant flow of electric charge.
DLC	Data Link Connector	This is an electronic connector typically located underneath the driver's side dashboard, just above the pedals. The connector has 16 pins.
DMM	Digital Multimeter	Electronic measuring instrument that combines several functions in one unit. The most basic instruments include an ammeter, voltmeter, and ohmmeter.
DOHC	Dual Overhead Camshaft	Dual overhead camshafts (DOHC) are higher performance engines, they produce more power, and can run at higher speeds because they allow an engine to have four valves per cylinder. Each camshaft operates two of the valves, one camshaft handles the intake valves, and one handles the exhaust valves
DPF	Diesel Particulate Filter	Device designed to remove diesel particulate matter or soot from the exhaust

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		gas of a diesel engine.
DRL	Daytime Running Lamps	White lights mounted on the front of an automobile that automatically switch on when the key is turned and are intended for daytime use, to increase the visibility of the automobile.
DSCC	Distance Sensing Cruise Control	A type of cruise control that automatically maintains the distance between vehicles.
DSP	Digital Signal Processor	A specialized microprocessor designed specifically for digital signal processing, generally in real-time computing.
DTC	Diagnostic Trouble Code	An electronic signal stored in an automotive computer, indicating the presence of a fault detected by that computer.
DVD	DVD	A popular optical disc storage media format the size of a CD. Used mainly for movies but also for data. DVD has no spelled out version (officially it does not mean Digital Video Disc or Digital Versatile Disc, it just means DVD).
EBCM	Electronic Brake Control Module	This module contains a microprocessor and software for antilock braking system operation.
ECM	Engine Control Module	This electronic module works with a vehicle's sensors and engine control devices to insure that the engine operates at maximum efficiency and performance. It performs three vital functions. Receives electronic signals from engine sensors. Analyzes the data and makes an engine performance decision (based on the pre-set parameters within the unit). Sends an "output command" to an actuator that adjusts engine performance.
ECT	Engine Coolant Temperature	A measure of how hot or cold the fluid which flows through the engine in order to prevent its overheating, transferring the heat produced by the device to other devices that utilize or dissipate it.
EEPROM	Electrically Erasable Programmable Read-Only Memory	A non-volatile storage chip used in computers and other devices to store small amounts of volatile data, e.g. calibration tables or device configuration.
EGR	Exhaust Gas Recirculation	Is an NOx (nitrogen oxide and nitrogen dioxide) reduction technique used in most gasoline and diesel engines. EGR works by

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		recirculating a portion of an engine's exhaust gas back to the engine cylinders.
EMI	Electromagnetic Interference	Electromagnetic interference (also called radio frequency interference) is a disturbance that affects an electrical circuit due to either electromagnetic conduction or electromagnetic radiation emitted from an external source.
ESD	Electrostatic Discharge	The sudden and momentary electric current that flows between two objects at different electrical potentials.
EV	Electric Vehicle	A category of vehicles that only have an electric drive system.
EVAP	Evaporative Emission	A system that controls the fuel fumes in the fuel tank.
FM	Frequency Modulation	In telecommunication this is a way to convey information over a carrier wave by varying its frequency.
FWD	Front-Wheel Drive	A form of engine/transmission layout used in motor vehicles, where the engine drives the front wheels only.
GMLAN	General Motors Local Area Network	A local-area network is a computer network covering a small geographic area, like a home or vehicle. This specific type of LAN connects several controllers inside the vehicle and was developed by General Motors.
GPS	Global Positioning System	Satellite-based navigation system made up of a network of 24 satellites placed into orbit by the U.S. Department of Defense.
GSM	Global System for Mobile Communications	Globally accepted standard for digital cellular communication.
GVW	Gross Vehicle Weight	Maximum total weight of a road vehicle or trailer that is loaded, including the weight of the vehicle itself plus fuel, passengers, cargo, and trailer tongue weight.
HD	Heavy Duty	Robust design to accommodate large work loads.
HID	High Intensity Discharge	A type of light that produces a bright light by using gas filled bulbs. (gas is usually mercury, metal halide, and high-pressure sodium) Uses very little battery power and is a very "cool" light.
		Heated oxygen sensors have an internal heater circuit that brings the sensor up to operating temperature more quickly than an

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HO2S	Heated Oxygen Sensor	unheated sensor. An oxygen sensor must be hot (about 600-650°F) before it will generate a voltage signal. The hot exhaust from the engine will provide enough heat to bring an O2 sensor up to operating temperature.
HVAC	Heating Ventilation Air Conditioning	This system is sometimes referred to as climate control. Ventilation air ducts installed throughout a vehicle that supply conditioned air to a room through rectangular or round outlet vents.
I ² C	Inter-Integrated Circuit	Serial data connection between Integrated Circuits (microchips) inside a control module invented by Phillips
IAT	Intake Air Temperature	Temperature of the air entering intake air flow system of the engine.
ICE	Internal Combustion Engine	An engine in which the combustion of fuel and an oxidizer (typically air) occurs in a confined space called a combustion chamber.
ID	Identification	Number or Code that identifies a component or control module. Can be written on the part or be transmitted on a bus or via radio.
ISP	Internet Service Provider	A company that furnishes corporations and individual consumers with various services, mainly access to the Internet.
ISS	Input Shaft Speed	Rotational speed of the input shaft of a transmission.
LAN	Local Area Network	Standard network connection PC's.
LCD	Liquid Crystal Display	A thin, flat display device made up of any number of color or monochrome pixels arrayed in front of a light source or reflector.
LED	Light Emitting Diode	Small light bulbs that fit easily into an electrical circuit they do not have a filament that will burn out, and they do not get especially hot. They are illuminated solely by the movement of electrons in a semiconductor material.
LIN	Local Interconnect Network	Computer networking bus system used within automotive network architectures. Similar to CAN, but cheaper and less powerful.
LPG	Liquefied Petroleum Gas	A mixture of mainly propane and butane, produced commercially and stored under

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		pressure to keep it in a liquid state.
MAF	Mass Air Flow	The amount of air drawn into the engine
MAP	Manifold Absolute Pressure	Pressure in the engine intake system after the throttle valve referenced to a perfect vacuum.
MDI	Multiple Diagnostics Interface	A device used by GM dealers that enables a PC to communicate with the control modules in a vehicle.
MIL	Malfunction Indicator Lamp	An indicator of the internal status of a car engine.
MOST	Media Oriented Systems Transport	Serial communication bus to transmit audio and video information.
N	Neutral	A state of the transmission in which it is not engaged.
NiMH	Nickel Metal Hydride	A type of rechargeable battery that uses a hydrogen absorbing alloy for the negative electrode.
NOx	Nitrogen Oxides	Refers to any of the following oxygen compounds of nitrogen or a mixture of them. Nitric Oxide, Nitrogen dioxide, Nitrous Oxide, Dinitrogen trioxide, Dinitrogen tetroxide, Dinitrogen pentoxide.
O2	Oxygen	A colorless, odorless, tasteless, gaseous chemical element with the chemical symbol O and atomic number 8.
O2S	Oxygen Sensor	An electronic device that measures the proportion of oxygen (O2) in the gas or liquid being analyzed.
OBD	On-Board Diagnostic	A generic term referring to a vehicle's self-diagnostic and reporting capability.
OEM	Original Equipment Manufacturer	A producer that provides a product to its customers, who proceed to modify or bundle it before distributing it to their customers.
OSS	Output Shaft Speed	Rotational speed of the output shaft of a transmission.
P	Park	A state in which the transmission is set so one can leave the vehicle.
PCB	Printed Circuit Board	A thin plate on which chips and other electronic components are placed.
PCM	Powertrain Control Module	A control module that features the functions of both, the engine and the transmission control module.
		An international standards body and trade association with over 100 member

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PCMCIA	Personal Computer Memory Card Industry Association	companies that was founded in 1989 to establish standards for Integrated Circuit cards and to promote interchangeability among mobile computers where ruggedness, low power, and small size were critical.
PIN	Personal Identification Number	A secret numeric password shared between a user and a system that can be used to authenticate the user to the system.
PPE	Personal Protective Equipment	Protective clothing, helmets, goggles, or other garment designed to protect the wearer's body from injury.
PRNDL	Park, Reverse, Neutral, Drive, Low	Park, Reverse, Neutral, Drive, Low (automatic transmission positions).
PTC	Positive Temperature Coefficient	Refers to materials that experience an increase in electrical resistance when their temperature is raised.
PTO	Power Take-Off	A splined driveshaft, usually on a tractor or truck that can be used to provide power to an attachment or separate machine. This mechanism allows implements to draw energy from the tractor's engine.
PVC	Polyvinyl Chloride	A thermoplastic copolymer.
PWM	Pulse Width Modulation	Square shaped type of signal that carries the information in the ratio between on and off times.
R	Reverse	Rearward: directed or moving toward the rear;
RAM	Random Access Memory	A type of computer data storage. It today takes the form of integrated circuits that allow the stored data to be accessed in any order.
RCT	Radiator Coolant Temperature	This is the heat intensity of the radiator coolant measured in degrees. The radiator is a part of the cooling system that removes the engine heat. Coolant is a mixture of water and antifreeze (ethylene glycol) which lowers the freezing point of the water in the coolant system, this fluid also picks up heat from the engine and transfers it to the air.
RDS	Radio Data System	A standard from the European Broadcasting Union for sending small amounts of digital information using conventional FM radio broadcasts.
		A frequency or rate of oscillation within the

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RF	Radio Frequency	range of about 3 Hz and 300 GHz. This range corresponds to frequency of alternating current electrical signals used to produce and detect radio waves.
ROM	Read-Only Memory	A class of storage media used in computers and other electronic devices. Data stored in ROM cannot be modified.
RPO	Regular Production Option	A three digit/letter code given to parts, assemblies, and systems originally installed on the vehicle. These RPO codes designate options and are assigned by General Motors.
RSA	Rear Seat Audio	An auxiliary set of controls that operate the main audio system from the rear seat. Rear passengers can also operate a different media source than the front passengers.
RWD	Rear-Wheel Drive	A common engine/transmission layout in which the engine is in the front of the vehicle, but the front mid-engine, rear mid-engine and rear engine layouts are also used.
SCV	Speed Controlled Volume	The volume control is set for a desired sound level in the vehicle as the vehicle increases its speed, the sound level is adjusted.
SDM	Sensing and Diagnostic Module	The name given to air bag modules used in General Motors vehicles.
SIM	Subscriber Identity Module	Part of a removable smart card Integrated Circuit Card. This is used for mobile cellular telephone devices such as mobile computers and mobile phones. SIM cards securely store the service-subscriber key used to identify a subscriber. The SIM card allows users to change phones by simply removing the SIM card from one mobile phone and inserting it into another mobile phone or broadband telephony device.
SIR	Supplemental Inflatable Restraint	Technical term for the air bag. Air bag is a stretchable membrane, which inflates during an automobile accident to provide cushioning to the passenger's head and torso to prevent injury to the passengers.
SPI	Serial Peripheral Interface	This is an interface that enables the serial (one bit at a time) exchange of data between two devices. An SPI operates in full duplex mode. This means that data can be