

GENERAL INFORMATION

General Information - Canyon, Colorado

INTRODUCTION

ARROWS AND SYMBOLS

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

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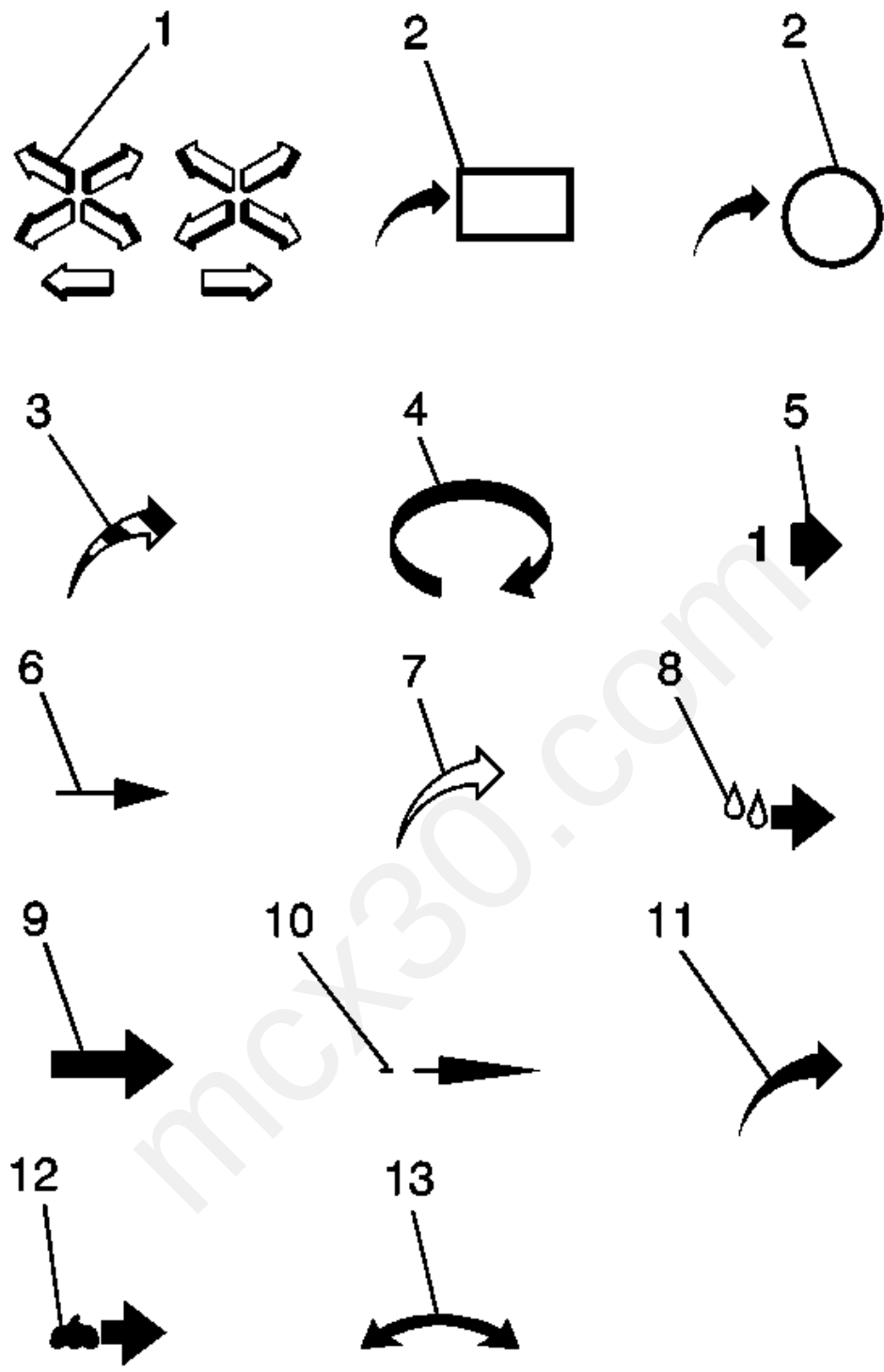


Fig. 1: Identifying Different Service Operations Symbols
Courtesy of GENERAL MOTORS COMPANY

Callout	Component Name
1	Front of Vehicle
2	View Detail
2	View Detail
3	Ambient Air Mixed with Another Gas or Indicate Temperature Change

	Meaning	Component Name Definition
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.
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.

	Meaning	Definition
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.
CO ₂	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.

	Meaning	Definition
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 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 recirculating a portion of an engine's exhaust gas back to the engine cylinders.

	Meaning	Definition
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.
HO2S	Heated Oxygen Sensor	Heated oxygen sensors have an internal heater circuit that brings the sensor up to operating temperature more quickly than an 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.

	Meaning	Definition
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 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.

	Meaning	Definition
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.
PCMCIA	Personal Computer Memory Card Industry Association	An international standards body and trade association with over 100 member 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.
RF	Radio Frequency	A frequency or rate of oscillation within the 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.

	Meaning	Definition
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 transferred in both directions at the same time. It is a standard bus technology like CAN or I2C.
SPS	Service Programming System	System that enables repair facilities to update the software in control modules.
SUV	Sport Utility Vehicle	A passenger vehicle which combines the towing capacity of a pickup truck with the passenger-carrying space of a minivan.
SVS	Service Vehicle Soon	Indicator lamp or symbol for a malfunction related to a vehicle component or system.
TA	Traffic Announcement	Message spoken on radio regarding the movement of vehicles or pedestrians through an area or along a route. The buttons on radios that enable this announcements are also often labeled TA.

	Meaning	Definition
TAC	Throttle Actuator Control	A motor which moves the engine throttle plate or valve, controlled by the engine control module. A throttle plate limits the amount of air entering a internal combustion gasoline engine.
TAP	Transmission Adaptive Pressure	The transmission control module learns each component's characteristics and adjusts fluid pressure accordingly.
TCC	Torque Converter Clutch	Resides in a torque converter to connect an engine to an automatic transmission. The clutch is applied when conditions are correct to achieve a 1:1 ratio of engine crankshaft to transmission input shaft.
TCM	Transmission Control Module	A module that controls electronic automatic transmissions. It uses sensors from the vehicle as well as data provided by the Engine Control Module to calculate how and when to change gears in the vehicle for optimum performance, fuel economy and shift quality.
TDC	Top Dead Center	The piston is in its highest position relative to the combustion chamber.
TIS	Techline Information System	The PC-based global dealership diagnostic software that provides the technician the ability to reference the most recent service information via the service department's computer.
TPA	Terminal Position Assurance	An additional locking mechanism inside an electric connector that holds the pins in place.
TV	Television	A telecommunication system for broadcasting and receiving moving pictures and sound over a distance.
USB	Universal Serial Bus	A type of communication bus connection between a computer and a peripheral device.
VCI	Vehicle Communications Interface	A diagnostic tool that communicates to modules of multiple communication protocols in a vehicle by converting vehicle serial data into PC serial data communication.
VIN	Vehicle Identification Number	Used by manufacturers to uniquely identify motor vehicles using 17 characters.
VSCM	Vehicle Stability Control Module	This module uses information from several sensors to detect a loss of vehicle traction, then works with the antilock brake system to apply individual brakes to help keep the vehicle on its intended path.
VSS	Vehicle Speed Sensor	Sends data regarding how fast the car is traveling at the moment of driving. It is designed to be able to record the rate at which the vehicle's crankshaft is spinning.
WOT	Wide Open Throttle	When the throttle blade or valve is at its maximum open position, allowing maximum air to enter an internal combustion gasoline engine.
WLAN	Wireless Local Area Network	Standard to transmit digital data via radio frequency.

it	Meaning	Meaning	Definition
XM	XM (Satellite Radio)	XM Satellite Radio Holdings (XM) is one of two satellite radio services in the United States and Canada. XM provides pay-for-service radio, analogous to cable television. Its service includes 73 different music channels, 39 news, sports, talk, and entertainment channels, 21 regional traffic and weather channels and 23 play-by-play sports channels (2008).	
XML	Extensible Markup Language	A markup language that defines a set of rules for encoding documents in a format that is both human-readable and machine-readable.	

Units

Unit	Meaning	Definition
m ²	Square Meter	Area
A	Ampere	Electrical
Ah	Ampere Hour	Electrical
C	Coulomb	Electrical
dBm	Decibel Meter	Electrical
dBmV	Decibel Millivolt	Electrical
mV/DIV	Millivolts per Division	Electrical
mV/s	Millivolts per Second	Electrical
Ω	Ohm	Electrical
V	Volt	Electrical
V/DIV	Volts per Division	Electrical
V/ms	Volts per Millisecond	Electrical
W	Watt	Electrical
mm ³ /stroke	Cubic Millimeters per Stroke	Flow
gal/h	Gallons per Hour	Flow
g/s	grams per second	Flow
g/stroke	Grams per Stroke	Flow
kg/100km	Kilograms per 100 Kilometer	Flow
kg/h	Kilograms per Hour	Flow
km/L	kilometer/liter	Flow
L/100km	Liters per 100 Kilometers	Flow
L/h	Liters per Hour	Flow
L/min	Liters per Minute	Flow
MPG	Miles per Gallon	Flow
mg/s	Milligrams per Second	Flow
mg/stroke	Milligrams per stroke	Flow
ft	feet	Length
in	Inch	Length
m	Meter	Length
mi	Mile	Length
bar	Bar	Mechanical
bar/min	Bars per Minute	Mechanical
in. H2O	Inches of Water	Mechanical

it	Meaning	Definition
in. H2O/s	Inches of Water per second	Mechanical
kPa/s	Kilopascals per Second	Mechanical
N	Newton	Mechanical
Â	Newton Meter	Mechanical
Pa	Pascal	Mechanical
Pa/s	Pascals per Second	Mechanical
lb ft	Pound Foot	Mechanical
PSI	Pound-Force per Square Inch	Mechanical
Counts	Counts	Misc.
Cycles	Cycles	Misc.
dB	Decibel	Misc.
Â°	Degree	Misc.
Â°C	Degree Centigrade	Misc.
Â°CA	Degree Crankshaft Angle	Misc.
Â°F	Degree Fahrenheit	Misc.
Â°/s	Degree per Second	Misc.
Hz	Hertz	Misc.
kbit/s	Kilobit per second	Misc.
lx	Lux	Misc.
ppm	Parts per Million	Misc.
%	Percent	Misc.
%/min	Percents per Minute	Misc.
%/sec	Percents per Second	Misc.
Pulses	Pulses	Misc.
:1	Ratio	Misc.
RPM	Revolutions per Minute	Misc.
Steps	Steps	Misc.
W/m ²	Watts per Square Meter	Misc.
g	g (Acceleration)	Movement
km/h	Kilometers per Hour	Movement
m/s	Meters per Second	Movement
m/s ³	Meters per Second Cubed	Movement
m/s ²	Meters per Second Squared	Movement
MPH	Miles per Hour	Movement
mm/s	Millimeters per Second	Movement
d	Day	Time
h	Hour	Time
hh:mm:ss	Hour:Minute:Second	Time
ms/DIV	Milliseconds per Division	Time
min	Minute	Time
s	Second	Time
s/DIV	Seconds per Division	Time
yy-mm-dd	Year-Month-Day (2 digits)	Time
yyyy-mm-dd	Year-Month-Day (4 digits, preferred)	Time

It	Meaning	Description	Definition
m ³	Cubic Meter		Volume
gal	Gallon		Volume
L	Liter		Volume
mL	milliliters		Volume
US gal	US Gallon		Volume
US pt	US Pint		Volume
US qt	US Quart		Volume
kg	Kilogram		Weight

TEXT FORMATS AND SYMBOLS

Service Information Text Strings

Text strings have been introduced in the Service Information procedures in an effort to increase consistent and common global phrases. Text strings are common, predefined, fixed phrases used in service information.

Text Strings - Sentence Format

Text string sentences are used when frequently used procedure steps require additional explanation. They are complete sentences that contain the necessary elements to describe an action or a fact.

Text Strings - Chain Format

Text string chains contain a component name and an action verb. Text string chains are used when little explanation is required to complete a procedure step.

Text String Chain Symbols

Symbol	Description
^>	This symbol is used to separate the object from the task or nominal value.
:	Used to separate tool and secondary qualifier statements from the details (operational, scan tool, or circuit information).
&	Separates two electrical test points.
@	Used to separate any location information (replaces "from the", "to the" or "at").
()	Used for illustration callout references.
[]	Used for quantity references.
{ }	Used to identify decisional information (RPOs, AWD, If equipped, etc.).
-	Dashes are used to separate additional information. Additional information goes at the end of the subject matter.

CUSTOMER CONCERN VERIFICATION SHEETS

NOTE: This procedure is not used in Brazil.

The GM Customer Concern Verification Sheets have been designed to improve communications between the service customer and the technician. The more clearly the technician understands the concern and its symptoms, the more likely the concern will be fixed right the first time.

The GM-wide Customer Concern Verification Sheets are available in DealerWorld. The Customer Concern Verification Sheets may be printed and reproduced locally.

TRAINING

All U.S. GM Dealers participating in the Center of Learning / GM Service Technical College (STC) Programs can enroll through the Center of Learning website at <https://www.centerlearning.com>. Within the website, there are individual training paths that are designed to assist in planning the training needs for each individual and their job role. Dealers who have questions about Center of Learning Training should contact the Center of Learning help desk at 1-888-748-2687. The help desk is available Monday through Friday, 8:00 am - 9:00 pm Eastern Standard Time, excluding holidays. For GM Access support, contact the GM Access Help Desk at 1-888-337-1010.

Fleets

GM Fleet customers with GM Warranty In-Shop agreements are able to participate in service technical training through the Center of Learning/GM Service Technical College (STC).

Assistance for GM fleet registered customers using GM STC training is provided by the Center of Learning help desk at 1-888-748-2687. The help desk is available Monday through Friday, 8:00 am-9:00 pm Eastern Standard Time, excluding holidays. For GM Access support, contact the GM Access Help Desk at 1-888-337-1010.

Most GM STC course materials have associated charges.

To purchase authentic GM STC Training Materials, contact the GM Training Materials Headquarters at 1-800-393-4831.

Non-GM Dealer Technicians

Technician training for non-GM dealers is available through ACDelco. This training is for ACDelco PSC and Fleet program members employed in the automotive or truck service industry.

ACDelco courses are available at approved GM STC Training Centers. Availability and schedules can be obtained by calling 1-800-825-5886 (prompt 1) or contact us via the web at www.acdelcotechconnect.com and select the Training tab. Seminars are also offered through the ACDelco Warehouse Distribution channel. Contact your Local ACDelco representative or distributor directly for more information.

VEHICLE, ENGINE AND TRANSMISSION ID AND VIN LOCATION, DERIVATIVE AND USAGE

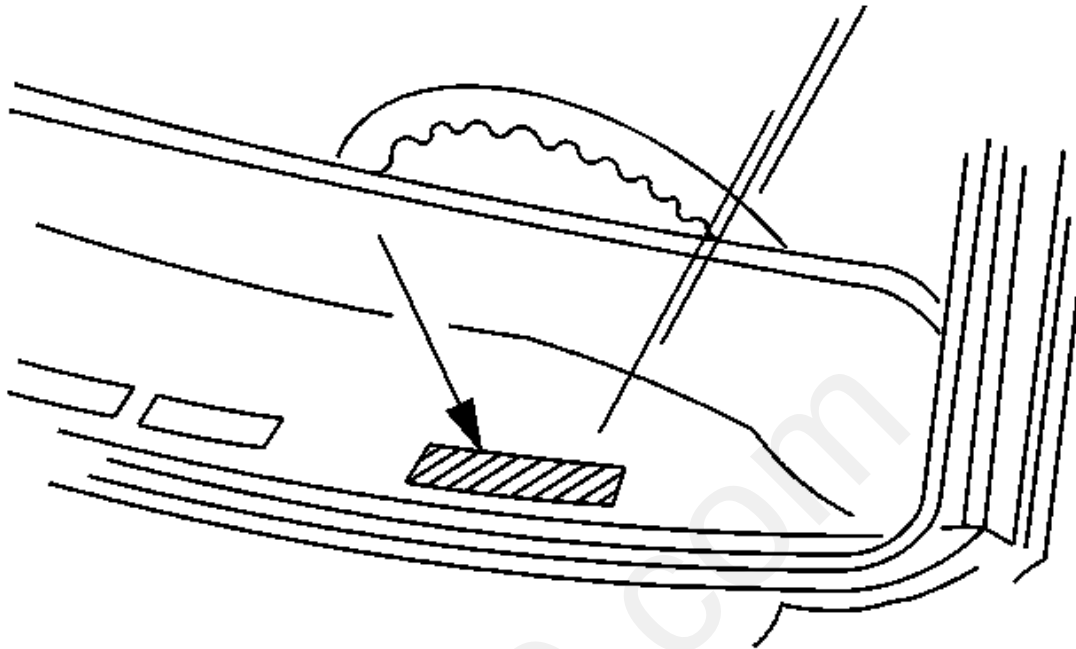


Fig. 2: Locating Vehicle Identification Number (VIN) Plate

Courtesy of GENERAL MOTORS COMPANY

The VIN plate is the legal identifier of the vehicle. The VIN plate is located on the upper left corner of the instrument panel (I/P) and can be seen through the windshield from the outside of the vehicle:

Vehicle Identification Number (VIN) System

Position	Definition	Character	Description
1	Country of Origin	1	United States
2	Manufacturer	G	General Motors
3	Vehicle Brand/Type	B	Chevrolet Incomplete Truck
		C	Chevrolet Truck
		D	GMC Incomplete Truck
		T	GMC Truck
4	GVWR/Brake System/Body Style	G	5001-6000/Hydraulic - Crew Cab (43)
		H	5001-6000/Hydraulic - Extended Cab (53)
		S/A	Chevrolet Colorado, Base 2WD
		S/B	Chevrolet Colorado, Work Truck 2WD
		S/C	Chevrolet Colorado, LT 2WD
		S/D	Chevrolet Colorado, Z71 2WD

	Definition	Character	Description
5-6	Chassis/Series	T/B	Chevrolet Colorado, Work Truck 4WD
		T/C	Chevrolet Colorado, LT 4WD
		T/D	Chevrolet Colorado, Z71 4WD
		5/A	GMC Canyon, Base 2WD
		5/B	GMC Canyon, Work Truck 2WD
		5/C	GMC Canyon, SLE 2WD
		5/D	GMC Canyon, SLT 2WD
		6/B	GMC Canyon, Work Truck 4WD
		6/C	GMC Canyon, SLE 4WD
		6/D	GMC Canyon, SLT 4WD
7	Restraint System	E	Active Manual Belts, Airbags - Driver and Passenger Front (1st row), Front Seat Side (1st row), Roof Side (All seating rows)
8	Engine Type	A	RPO LCV, Engine Gas, 4 Cylinder, 2.5L, L4, SIDI, DOHC, DCVCP, VVT, E85 MAX, E0-E100, Aluminum
		1	RPO LWN, Engine Diesel, 4 Cylinder, 2.8L, DOHC, Turbo, Euro4, 140KW, GMNA
		3	RPO LFX, Engine Gas, 6 Cylinder, 3.6L, SIDI, DOHC, VVT, E85 MAX, Alum, GM
9	Check Digit	-	Check Digit
10	Model Year	G	2016
11	Plant Location	1	Wentzville, MO
12-17	Plant Sequence Number	-	Plant Sequence Number

2.5L LCV Engine ID and VIN Derivative Location

Refer to [Engine Identification](#) .

3.6L LFX Engine ID and VIN Derivative Location

Refer to [Engine Identification](#) .

2.8L LWN Diesel Engine ID and VIN Derivative Location

Refer to [Engine Identification](#) .

6L50 MYB Transmission ID and VIN Derivative Location

Refer to [Transmission Identification Information](#) .

VEHICLE CERTIFICATION, TIRE PLACARD, ANTI-THEFT, AND SERVICE PARTS ID LABEL

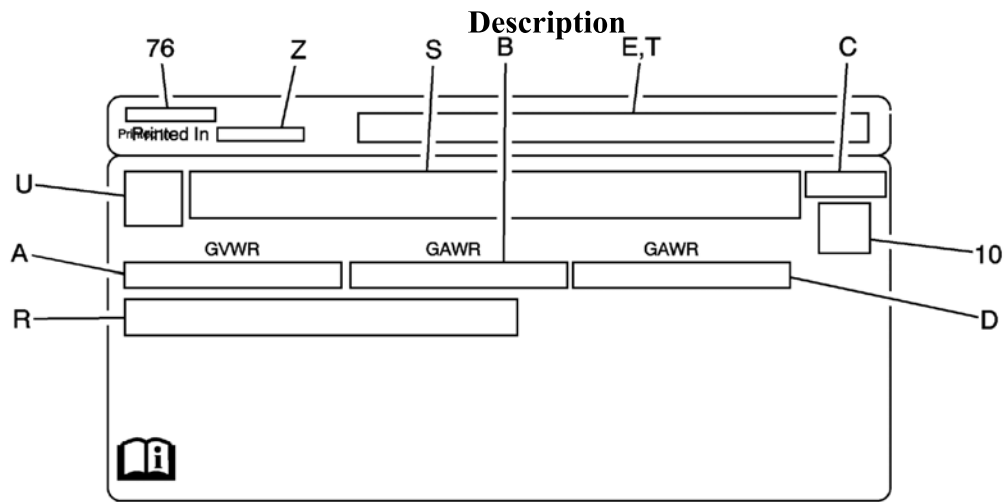


Fig. 3: Vehicle Certification, Tire Placard, Anti-Theft, and Service Parts ID Label
 Courtesy of GENERAL MOTORS COMPANY

Vehicle Certification Label

Callout	Description
A	Maximum Gross Vehicle Weight (GVW) in Kilograms (Optional)
B	Maximum Gross Axle Weight - Front (GAWF) in Kilograms (Optional)
C	Final Date of Manufacture (Month and Year MM/YY) Date of manufacture callout C is to reflect the date that the vehicle is counted as built. In those cases where a replacement label is needed, the replacement label should reflect the actual build date not the date of replacement.
D	Maximum Gross Axle Weight - Rear (GAWR) in Kilograms (Optional)
E	Country Product Line (CPL) Number (Optional)
R	Vehicle Identification Number (VIN)
S	Name of Legal Entity (Manufacturer)
T	Current Sequence Number (CSN) (Optional)
U	Logo (Optional)
Z	Vendor to Supply Country of Origin of Blank Stock (When Required)
10	2D Bar Code (Datamatrix)
76	Pre-Printed Part Number Location (Optional) Part number location to print on waste portion of label stock.

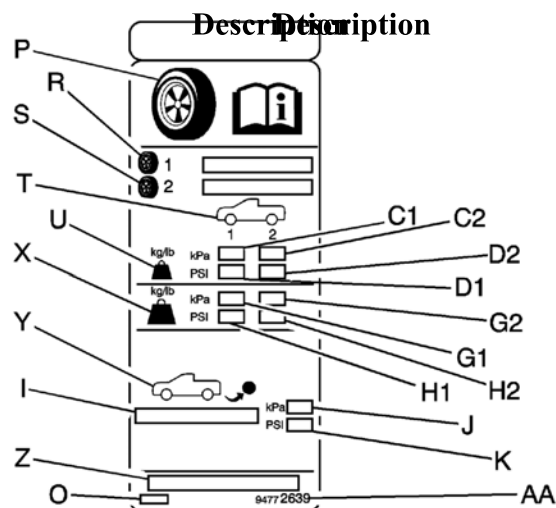


Fig. 4: Tire Placard

Courtesy of GENERAL MOTORS COMPANY

Tire Placard

Callout	Description
C1	Vehicle Normal Load Condition Front Tire Cold Inflation Pressure (kPa)
C2	Vehicle Normal Load Condition Rear Tire Cold Inflation Pressure (kPa)
D1	Vehicle Normal Load Condition Front Tire Cold Inflation Pressure (PSI)
D2	Vehicle Normal Load Condition Rear Tire Cold Inflation Pressure (PSI)
G1	Gross Vehicle Mass Load Condition Front Tire Cold Inflation Pressure (kPa)
G2	Gross Vehicle Mass Load Condition Rear Tire Cold Inflation Pressure (kPa)
H1	Gross Vehicle Mass Load Condition Front Tire Cold Inflation Pressure (PSI)
H2	Gross Vehicle Mass Load Condition Rear Tire Cold Inflation Pressure (PSI)
I	Spare Tire Size Designation and Service Description
J	Spare Tire Cold Inflation Pressure (kPa)
K	Spare Tire Cold Inflation Pressure (PSI)
O	Broadcast Code For Pre-Printed Label (Labels Printed Outside Vehicle Assembly Plant) May Be Optional
P	Generic Tire Picture
R	Front Tire Axle Position
S	Rear Tire Axle Position
T	Vehicle Profile With Axle Positions
U	Vehicle Normal Load Condition
X	Gross Vehicle Mass Load Condition
Y	Vehicle Profile For Spare Position
Z	Vehicle Identification Number (VIN) For Computer Generated Labels (Labels Printed Inside Vehicle Assembly Plant) May Be Optional
AA	Tire Placard Label Format Part Number

RPO CODE LIST

RPO	Description
01U	PRIMARY COLOR-EXTERIOR, SPECIAL (02)

)	Description
4AA	INTERIOR TRIM-JET BLACK
4D7	INTERIOR TRIM-JET BLACK/DK ASH
4DP	INTERIOR TRIM-COCOA / DUNE
4EE	INTERIOR TRIM-JET BLACK/DK GALVANIZED WITH ICED BLUE ACCENT
4GB	INTERIOR TRIM-JET BLACK/ COBALT RED
5G8	CALIBRATION-ACTIVATION 'ON', TOW/HAUL MODE
5JY	ACCESSORY-TONNEAU - RR COMPT - SOFT FOLDING
5K2	ACCESSORY-DECAL PACKAGE - BODY SIDE, DESIGN 1
5V4	ACCESSORY-EXTERIOR APPEARANCE PACKAGE 1
5VI	ACCESSORY-TIE DOWN RINGS - CARGO AREA
5W7	ACCESSORY-AIR FILTER - PERFORMANCE
5Y3	ACCESSORY-TOW BALL - TRAILER HITCH
5Y4	ACCESSORY-COVER - TRAILER HITCH TOW BALL
5YN	ACCESSORY-BADGE - INTERIOR TRIM, DESIGN 1
9B7	MIRROR AUX-O/S SPOT, CONVEX
9H3	FUEL TANK-76L, 20 GAL
9J4	BUMPER RR-(NONE)
A28	WINDOW RR-FULL WIDTH, SLIDING
AAQ	ADJUSTER PASS ST-POWER, 4 WAY
ACO	IDENTIFICATION-ACCESSORY CATALOG OFFERING
AH6	ADJUSTER FRT ST-SEAT, POWER, 4 WAY, VERT, DRIVER
AJ2	SEAT RR-FOLDING, JUMPSEAT
AKJ	WINDSHIELD STYLE-SHADE BAND
AL9	LUMBAR DRIVER-SEAT, POWER, 2 WAY
AM7	SEAT RR-FOLDING
AR7	SEAT-FRT BKT, STANDARD
AT9	LUMBAR PASSENGER-SEAT, POWER, 2 WAY
ATG	LOCK CONTROL, ENTRY-REMOTE ENTRY, STANDARD RANGE
ATZ	SEAT RR-NONE
AXG	WINDOW REG DRVR DR-POWER OPERATED, EXPRESS UP/DOWN
AY0	RESTRAINT SYSTEM-SEAT, INFLATABLE, DRIVER & PASS FRT, SEAT SIDE, ROOF SIDE
B30	COVERING FLOOR-CARPET
B34	COVERING FRT-FLOOR MATS, CARPETED INSERT
B35	COVERING REAR-FLOOR MATS, CARPETED INSERT
B38	COVERING FLOOR-VINYL, FRT & RR, FULL WIDTH
BAE	EQUIPMENT-SECURITY SYSTEM, IMMOBILIZATION
BJA	PARTS PKG-TRUCK APPLICATION VAR.1
BTV	REMOTE START-ENGINE
BW4	MOLDING B/S (OPEL)-EXTR, MLDG, SIDE WINDOW REVEAL, CHROME
BW5	MOLDING B/S (OPEL)-EXTR, MLDG, SIDE WINDOW REVEAL, BLACK
BW7	ORNAMENTATION-EXTR, PLR APLQ
BWN	STEPS-CORNER ASSIST, BUMPER
BYH	FOOT REST-DRIVER

)	Description
C49	DEFOGGER-RR WINDOW, ELECTRIC
C67	HVAC SYSTEM-AIR CONDITIONER FRT, ELECTRONIC CONTROLS
C68	HVAC SYSTEM-AIR CONDITIONER FRT, AUTO, ELECTRONIC CONTROLS
C74	LAMP-INTR, ROOF, DUAL READING
CGN	LINER-PUBX, SPRAY ON
CV3	COUNTRY-MEXICO
D07	CONSOLE-FRT COMPT, FLOOR, CUSTOM
D31	MIRROR I/S R/V-TILT
D72	HANDLE O/S DOOR-BLACK
D75	HANDLE O/S DOOR-BODY COLOR
D87	HANDLE, REAR CLOSURE-O/S, L/GATE, R/CMPT, BLACK
DBI	MIRROR O/S-LH & RH, MANUAL CONTROL, MANUAL FOLDING
DD8	MIRROR I/S R/V-LT SENSITIVE
DEG	SUNSHADE-DRIVER, W/MIRROR, COVER, ILLUM, SLIDING, PASS, W/MIRROR, COVER, ILLUM, SLIDING
DK6	CONSOLE ROOF-INTERIOR
DL6	MIRROR O/S-LH & RH, REMOTE CONTROL, ELECTRIC, MANUAL FOLDING, COLOR
DL9	MIRROR O/S-LH & RH, REMOTE CONTROL, ELECTRIC, HEATED, CHROME
DLU	MIRROR I/S FRT VAN-SUNSHADE, DRIVER, W/O MIRROR, PASS, W/MIRROR & COVER
DNS	EQUIPMENT-SUPPLIER INSTALLED
E20	HANDLE O/S DOOR-CHROME
E25	ACCESSORY-ASSIST STEPS - TUBULAR - CHROME
E33	HANDLE-I/S, DR, GLOSSY CHROME
E49	HANDLE-I/S, DR, JET BLACK
E63	BODY EQUIPMENT-FLEETSIDE PICK-UP BOX
EF7	COUNTRY-UNITED STATES OF AMERICA (USA)
EN5	END GATE--LOCKING-
FE9	CERTIFICATION-EMISSION, FEDERAL
FHX	VEHICLE FUEL-DIESEL B20
FJW	VEHICLE FUEL-GASOLINE E15
FX3	RIDE AND HANDLING-AUTOMATIC ELECTRONIC CONTROLLED
G7C	PRIMARY COLOR-EXTERIOR, PULL ME OVER RED SOLID (130X)
G7J	PRIMARY COLOR-EXTERIOR, UNRIPENED GREEN MET (136X)
G7P	PRIMARY COLOR-EXTERIOR, TIN ROOF RUSTED MET (138X)
G7Z	PRIMARY COLOR-EXTERIOR, LASER BLUE MET (218M)
G80	AXLE POSITRACTION-LIMITED SLIP
GAN	PRIMARY COLOR-EXTERIOR, SWITCHBLADE SILVER MET (G) 636R
GAT	APPEARANCE PACKAGE-GMC "ALL TERRAIN"
GAZ	PRIMARY COLOR-EXTERIOR, SUMMIT WHITE (G) 8624
GBA	PRIMARY COLOR-EXTERIOR, BLACK (G) 8555
GBV	PRIMARY COLOR-EXTERIOR, CYBER GRAY MET (G) 637R
GCR	PRIMARY COLOR-EXTERIOR, INFERNO ORANGE MET (502Q)

)	Description
GT5	AXLE REAR-4.10 RATIO
GU6	AXLE REAR-3.42 RATIO
GWX	PRIMARY COLOR-EXTERIOR, SUBTERRANEAN MET (105V)
H0K	INTERIOR TRIM CONFIG-LEATHER, LEVEL 3, COCOA / DUNE
H0U	INTERIOR TRIM CONFIG-CLOTH, LEVEL 2, JET BLACK
H2Q	INTERIOR TRIM CONFIG-VINYL, LEVEL 1, JET BLACK /DK ASH
H2R	INTERIOR TRIM CONFIG-CLOTH, LEVEL 1, JET BLACK/ DK ASH
H2S	INTERIOR TRIM CONFIG-CLOTH, LEVEL 2, JET BLACK / DK ASH
H2T	INTERIOR TRIM CONFIG-CLOTH, LEVEL 2, COCOA / DUNE
H2U	INTERIOR TRIM CONFIG-LEATHER, LEVEL 3, JET BLACK
H2V	INTERIOR TRIM CONFIG-LEATHER, LEVEL 3, JET BLACK / DK ASH
HH1	INTERIOR TRIM CONFIG-CLOTH, LEVEL 4, JET BLACK / DK GALVANIZED WITH ICED BLUE ACCENT
HJX	INTERIOR TRIM CONFIG-CLOTH, LEVEL 4, JET BLACK / COBALT RED
I16	ENGINEERING YEAR-2016
IO3	RADIO-INFOTAINMENT SYSTEM - BASE HMI
IO4	RADIO-INFOTAINMENT SYSTEM - BASE HMI, ENHANCED CONNECTIVITY
IO5	RADIO-INFOTAINMENT SYSTEM - UPLEVEL HMI, ENHANCED CONNECTIVITY
IO6	RADIO-INFOTAINMENT SYSTEM - UPLEVEL HMI, ENHANCED CONNECTIVITY, EMBEDDED NAVIGATION
JHD	CONTROL-HILL DESCENT, GEAR HOLD
JL1	CONTROL-INTEGRATED TRAILER BRAKE
JL9	BRAKE SYSTEM-PWR, FRT & RR DISC, ANTILOCK, FRT & RR WHL
K05	HEATER ENG-BLOCK
K34	CRUISE CONTROL-AUTOMATIC, ELECTRONIC
K40	ENGINE BRAKE-EXHAUST
KA1	HEATER SEAT FRT-DRVR & PASS
KG4	GENERATOR-150 AMP
KG9	GENERATOR-140 AMP
LCV	ENGINE-GAS, 4 CYL, 2.5L, L4, SIDI, DOHC, DCVCP, VVT, E85 MAX, E0-E100, ALUM
LFX	ENGINE-GAS, 6 CYL, 3.6L, SIDI, DOHC, VVT, E85 MAX, ALUM, GM
LWN	ENGINE-ENGINE DIESEL, 2.8L, DI, L4, DOHC, TURBO, XLDE
MCY	PORT, ELEK DEVICE-USB ONLY
MCZ	PORT, MULTI ELEK DEV-USB
MYB	TRANSMISSION-AUTO 6 SPD, 6L50
N30	STEERING WHEEL-DELUXE
N33	STEERING COLUMN-TILT TYPE
N37	STEERING COLUMN-TILT, TELESCOPING
N8D	TRANSMISSION-MAN 6 SPD, 85MM, 4.45 1ST, 2.56 2ND, 1.53 3RD, 1.00 4TH, 0.87 5TH, 0.76 6TH
NE1	CERTIFICATION-EMISSION, GEOGRAPHICALLY RESTRICTED REGISTRATION FOR VEHICLES UP TO 14, 000 LBS GVW (USE 2003 MDL YR

)	Description
NP5	STEERING WHEEL-LEATHER WRAPPED
NQ6	TRANSFER CASE-2 SPD, ACTIVE, PART TIME 4WD, L/H DROP, LOW RATIO 2.72:1
NQ7	TRANSFER CASE-2 SPD, SWITCH ACTIVATED, PART TIME 4WD, L/H DROP, LOW RATIO 2.72:1
NT7	EMISSION SYSTEM-FEDERAL, TIER 2
NU5	EMISSION SYSTEM-CALIFORNIA, BIN 4
NUF	EMISSION SYSTEM-CALIFORNIA, ULEV125
NW9	TRACTION CONTROL-ELECTRONIC
NY7	SHIELD-TRANSFER CASE
PPA	EQUIPMENT-ASSIST, OPEN & CLOSE, TAILGATE
PZX	WHEEL-18 X 8.5, J, ALUMINUM, DESIGN 2
Q5U	WHEEL-17 X 8.0, J, ALUMINUM, DESIGN 2
Q5W	WHEEL-17 X 8.0, J, ALUMINUM, DESIGN 1
QDC	TIRE SPARE-T175/90D18 LL 111M BW SPR
QHE	TIRE ALL-255/65R17 SL 110T BW AT
QHR	TIRE ALL-255/65R17 SL 110T BW ALS
QIA	TIRE ALL-265/60R18 SL 110T BW AL2
QJJ	TIRE ALL-265/70R16 SL 112T BW ALS
R1U	WHEEL-17 X 8.0, J, ALUMINUM, DESIGN 3
R28	WHEEL-17 X 8.0, J, ALUMINUM, DESIGN 4
RGO	ACCESSORY-TIRE ALL - 265/65R17 SL 112S BSL AT VAR 1
RIA	ACCESSORY-FLOOR LINER - CONTOURED
RS1	WHEEL-16 X 7.0, J, ALUMINUM, DESIGN 1
RS2	WHEEL-16 X 7.0, J, STEEL, DESIGN 1
RT5	WHEEL-18 X 8.5, J, ALUMINUM, DESIGN 1
RTX	WHEEL SPARE-18 X 4.5, B, ALUMINUM, DESIGN 1
RVG	ACCESSORY-ADAPTER - TRAILER HARNESS
RVP	ACCESSORY-ASSIST STEPS - REMOVABLE
RVS	ACCESSORY-ASSIST STEPS - TUBULAR - ROUND - BLACK
RVX	ACCESSORY-BALL MOUNT - TRAILER HITCH
RVY	ACCESSORY-PUBX CARGO DIVIDER
RW6	ACCESSORY-BED STORAGE BOX - FIXED FULL WIDTH - METAL
RWS	ACCESSORY-FLOOR MATS - CARPET
RXH	ACCESSORY-CENTER CAP - WHEEL - DESIGN 1
RXQ	ACCESSORY-CONVENIENCE NET - BED MOUNTED
RYT	ACCESSORY-FIRST AID KIT
RZW	ACCESSORY-HARNESS - TRAILER HITCH
S08	ACCESSORY-HIGHWAY SAFETY KIT
S0Y	ACCESSORY-LAMPS - CARGO AREA
S1K	WHEEL SPARE-16 X 7.0, J, STEEL, DESIGN 1
S3U	ACCESSORY-LAMP KIT - FRONT FOG
S3X	ACCESSORY-LAMPS - FRONT ROOF MOUNTED - OFF-ROAD
S41	ACCESSORY-LINER - WHEEL HOUSE
S42	ACCESSORY-LOAD STOPS - UTILITY RACK

)	Description
S44	ACCESSORY-LOCKING PIN - TRAILER HITCH
S47	ACCESSORY-LUG NUTS
S52	ACCESSORY-MOLDED HOOD PROTECTOR - SMOKED
S6P	ACCESSORY-REMOTE START KIT
S6W	ACCESSORY-SEAT COVER - MUDDER (PROTECTIVE)
SA5	ACCESSORY-SHIELD - UNDERBODY
SAI	ACCESSORY-SILL PLATES - STAINLESS
SAO	ACCESSORY-SMOKERS PACKAGE
SBY	ACCESSORY-SPORT BAR - BED MOUNTED - DESIGN 1
SCZ	ACCESSORY-TAILGATE HANDLE - ALTERNATE FINISH - CHROME
SDE	ACCESSORY-TRAILER HITCH - REMOVABLE
SDI	ACCESSORY-TRIANGLE - REFLECTIVE
SDS	ACCESSORY-WEATHER DEFLECTORS - SIDE WINDOW - SMOKED
SE4	ACCESSORY-WHEEL - 18" - ALUMINUM - DESIGN 1
SE5	ACCESSORY-WHEEL - 18" - ALUMINUM - DESIGN 2
SE6	ACCESSORY-WHEEL - 18" - ALUMINUM - DESIGN 3
SE7	ACCESSORY-WHEEL - 18" - ALUMINUM - DESIGN 4
SF5	ACCESSORY-WHEEL FLARES - ALTERNATE DESIGN - MOLDED COLOR
SFE	ACCESSORY-WHEEL LOCKS
SG1	ACCESSORY-EMBLEM - EXTERIOR - DESIGN 2
SIE	ACCESSORY-PUBX TIERED STORAGE
SIZ	ACCESSORY-PUBX CARGO DIVIDER - ALTERNATE DESIGN
SKY	ACCESSORY-WHEEL - 18 X 8.5 - J - ALUMINUM - DESIGN 1
SL6	ACCESSORY-PUBX CARGO RAIL HOOKS
SL7	ACCESSORY-PUBX LADDER / UTILITY RACK STANCHIONS
SMY	ACCESSORY-WHEEL - 17 X 8.0 - J - ALUMINUM - DESIGN 1
T3C	HEADLAMP FUNCTION-PROJECTOR, LOW/HIGH BEAM (DO NOT USE AFTER '09 MAJOR PROGRAMS, USE HDL&HDL CONT&VCS FAM AS NEEDED)
T3U	LAMP FRT FOG-FRT FOG
T4A	HEADLAMPS-HALOGEN
T4Z	SHIFTER INTERLOCK-SEAT BELT ASSURANCE SYSTEM
TCA	LAMP-DOME, CENTER
TCK	DEFLECTOR-RR TIRE, AIR
TR0	LAMP-INTR, ROOF, RR, COURTESY & DUAL READING
U19	SPEEDOMETER-INST, KILO & MILES, KILO ODOMETER
U2K	DIGITAL AUDIO SYSTEM-S-BAND
U73	ANTENNA-FIXED, RADIO
UDC	DISPLAY INSTRUMENT-DRIVER INFO ENHANCED (ONE COLOR GRAPHIC)
UDD	DISPLAY INSTRUMENT-DRIVER INFO ENHANCED (MULTI COLOR STANDARD GRAPHIC)
UE1	COMMUNICATION SYSTEM-VEHICLE, ONSTAR
UEU	SENSOR INDICATOR-FORWARD COLLISION ALERT
UF2	LAMP-CARGO
UFL	LANE ACTIVE SAFETY-DEPARTURE WARNING

)	Description
UIC	ACCESSORY-ACCY COMBINATION PKG 1
UID	ACCESSORY-ACCY COMBINATION PKG 2
UIE	ACCESSORY-ACCY COMBINATION PKG 3
UIG	ACCESSORY-ACCY COMBINATION PKG 4
UMN	SPEEDOMETER-INST, MILES & KILO, MILES ODOMETER
UQ3	SPEAKER SYSTEM-ENHANCED AUDIO
UQA	SPEAKER SYSTEM-PREMIUM AUDIO BRANDED WITH AMPLIFIER
US2	VEHICLE VIN-NON-SALEABLE, 0777 SERIES
USR	RECEPTACLE-USB
UTJ	THEFT DETERENT-ELECTRICAL, UNAUTHORIZED ENTRY
UVC	VISION-REAR VIEW, MONO, ANALOG
VAT	ACCESSORY-GRILLE / GRILLE INSERTS - ALTERNATE FINISH - CHROME
VAV	ACCESSORY-FLOOR MATS - ALL WEATHER
VBR	ACCESSORY-PUBX RUBBER MAT
VJH	BUMPER RR-CHROME
VJQ	HOOK-TOW, FRT
VK3	LICENSE PLATE FRONT-FRT MOUNTING PKG
VKU	ACCESSORY-MIRROR CAPS - CHROME
VKY	ACCESSORY-DOOR HANDLES - ALTERNATE FINISH - CHROME
VPB	ACCESSORY-TONNEAU - RR COMPT - VINYL W/ INTEGRAL CROSSBOW SUPPORTS
VQK	ACCESSORY-SPLASH GUARDS - CUSTOM MOLDED
VQY	ACCESSORY-TOW HOOKS - CHROME
VQZ	ACCESSORY-EXHAUST TIP - DESIGN 1
VT5	BUMPER RR-COLOR KEYED
VTG	ACCESSORY-INTERIOR TRIM KIT
VUK	ACCESSORY-TAILGATE LINER - PUBX
VV4	COMMUNICATION EQUIP-MOBILE INTERNET CONNECTIVITY
VYQ	ACCESSORY-STRIPE PACKAGE - HOOD AND FENDER - BLACK
VZX	ACCESSORY-PUBX BEDLINER
W03	ACCESSORY-HEATED SEATS
W1Y	CONTROL-STEERING WHEEL, RADIO, REDUNDANT CONTROLS
WBC	ACCESSORY-EXHAUST UPGRADE - DUAL MODE
WEN	PLANT CODE-WENTZVILLE, MO, USA
WMG	VIN MODEL YEAR-2016
WPD	SALES PACKAGE-SAFETY
X88	MARKET BRAND-CHEVROLET
XAJ	ACCESSORY-TIRE-265/60R18 SL 110T BW AL2 - VAR1
YF5	CERTIFICATION-EMISSION, CALIFORNIA
YM8	IDENTIFICATION-LIMITED PERSONALIZATION OPTION (LPO)
Z49	COUNTRY-CANADA
Z71	CHASSIS PACKAGE-"OFF ROAD"
Z82	TRAILER PROVISIONS-SPECIAL EQUIPMENT, H.D.
Z85	CHASSIS PACKAGE-INCREASED CAPACITY

Component Name	Description
Z88	MARKET BRAND-GMC
ZJJ	TIRE SPARE-265/70R16 SL 112T BW ALS
ZW9	BODY EQUIPMENT-BASE BODY OR CHASSIS
ZY1	COLOR COMBINATION-SOLID

FASTENERS

Metric Fasteners

This vehicle provides fastener dimensions using the metric system. Most metric fasteners are approximate in diameter to equivalent English fasteners. Make replacements using fasteners of the same nominal diameter, thread pitch, and strength.

A number marking identifies the OE metric fasteners except cross-recess head screws. The number also indicates the strength of the fastener material. A Posidrive® or Type 1A cross-recess identifies a metric cross-recess screw. For best results, use a Type 1A cross-recess screwdriver, or equivalent, in Posidrive® recess head screws.

GM Engineering Standards and North American Industries have adopted a portion of the ISO-defined standard metric fastener sizes. The purpose was to reduce the number of fastener sizes used while retaining the best thread qualities in each thread size. For example, the metric M6.0 X 1 screw, with nearly the same diameter and 25.4 threads per inch replaced the English 1/4-20 and 1/4-28 screws. The thread pitch is midway between the English coarse and fine thread pitches.

Fastener Strength Identification

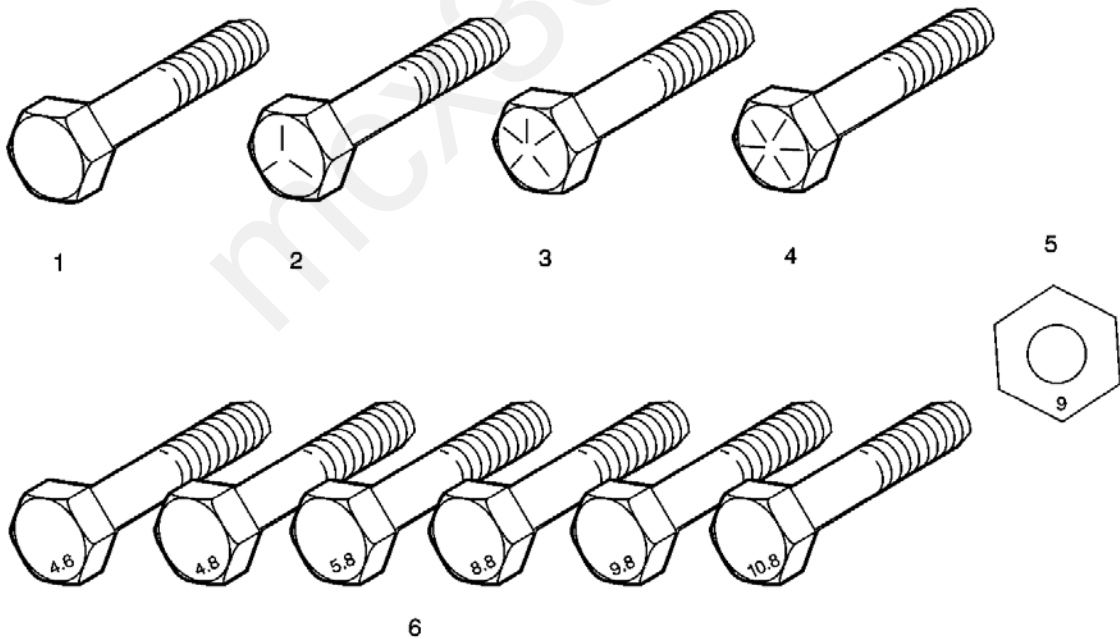


Fig. 5: Identifying Fastener Strength Marks
 Courtesy of GENERAL MOTORS COMPANY

Callout	Component Name

	Component Name
1	English Bolt, Grade 2 (Strength Class)
2	English Bolt, Grade 5 (Strength Class)
3	English Bolt, Grade 7 (Strength Class)
4	English Bolt, Grade 8 (Strength Class)
5	Metric Nut, Strength Class 9
6	Metric Bolts, Strength Class Increases as Numbers Increase

The most commonly used metric fastener strength property classes are 9.8 and 10.9. The class identification is embossed on the head of each bolt. The English, inch strength classes range from grade 2 to grade 8. Radial lines are embossed on the head of each bolt in order to identify the strength class. The number of lines on the head of the bolt is 2 lines less than the actual grade. For example, a grade 8 bolt will have 6 radial lines on the bolt head. Some metric nuts are marked with a single digit strength identification number on the nut face.

The correct fasteners are available through GM SPO. Many metric fasteners available in the aftermarket parts channels are designed to metric standards of countries other than the United States, and may exhibit the following:

- Lower strength
- No numbered head marking system
- Wrong thread pitch

The metric fasteners on GM products are designed to new, international standards. The following are the common sizes and pitches, except for special applications:

- M6.0 X 1
- M8 X 1.25
- M10 X 1.5
- M12 X 1.75
- M14 X 2.00
- M16 X 2.00

Prevailing Torque Fasteners

Prevailing torque fasteners create a thread interface between the fastener and the fastener counterpart in order to prevent the fastener from loosening.

All Metal Prevailing Torque Fasteners

These fasteners accomplish the thread interface by a designed distortion or deformation in the fastener.

Nylon Interface Prevailing Torque Fasteners

These fasteners accomplish the thread interface by the presence of a nylon material on the fastener threads.

Adhesive Coated Fasteners

These fasteners accomplish the thread interface by the presence of a thread-locking compound on the fastener threads. Refer to the appropriate repair procedure in order to determine if the fastener may be reused and the applicable thread-locking compound to apply to the fastener.

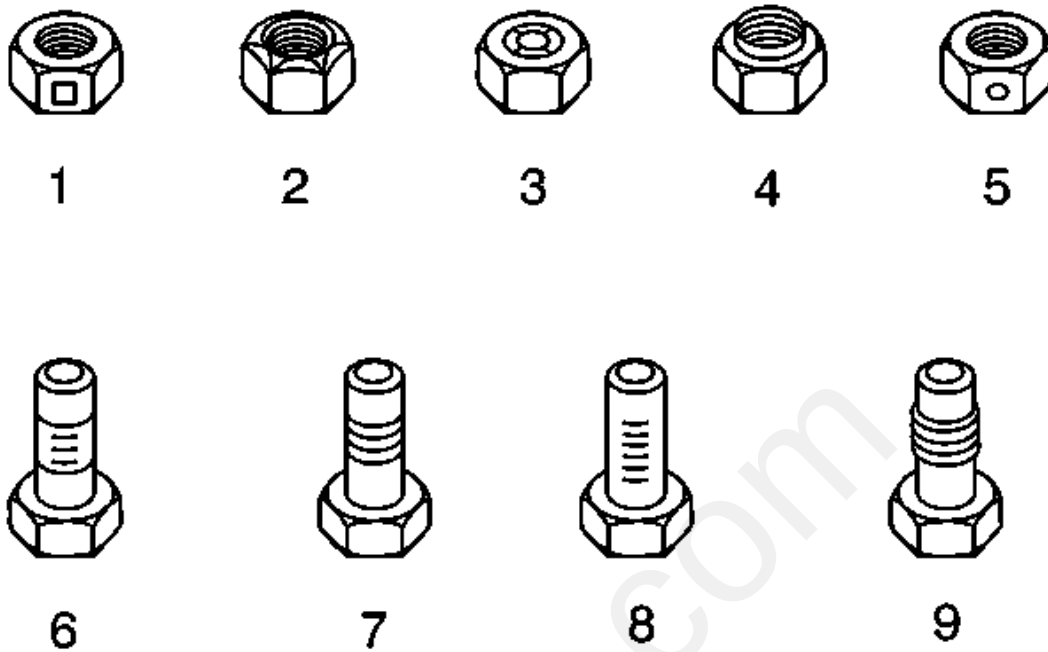


Fig. 6: Identifying Adhesive Coated Fasteners
Courtesy of GENERAL MOTORS COMPANY

Callout	Component Name
1	Prevailing Torque Nut, Center Lock Type
2	Prevailing Torque Nut, Top Lock Type
3	Prevailing Torque Nut, Nylon Patch Type
4	Prevailing Torque Nut, Nylon Washer Insert Type
5	Prevailing Torque Nut, Nylon Insert Type
6	Prevailing Torque Bolt, Dry Adhesive Coating Type
7	Prevailing Torque Bolt, Thread Profile Deformed Type
8	Prevailing Torque Bolt, Nylon Strip Type
9	Prevailing Torque Bolt, Out-of-Round Thread Area Type

A prevailing torque fastener may be reused ONLY if:

- The fastener and the fastener counterpart are clean and not damaged
- There is no rust on the fastener
- The fastener develops the specified minimum torque against its counterpart prior to the fastener seating

Minimum Torque Development		Specification
Application	Metric	English
Application	Metric	English
All Metal Prevailing Torque Fasteners		
• 6 mm	0.4	4 lb in
• 8 mm	0.8	7 lb in
• 10 mm	1.4	12 lb in
• 12 mm	2.1	19 lb in
• 14 mm	3	27 lb in
• 16 mm	4.2	37 lb in
• 20 mm	7	62 lb in
• 24 mm	10.5	93 lb in
Nylon Interface Prevailing Torque Fasteners		
• 6 mm	0.3	3 lb in
• 8 mm	0.6	5 lb in
• 10 mm	1.1	10 lb in
• 12 mm	1.5	13 lb in
• 14 mm	2.3	20 lb in
• 16 mm	3.4	30 lb in
• 20 mm	5.5	49 lb in
• 24 mm	8.5	75 lb in

Sizing Torque Fastener Minimum Torque Development		Specification
Application	Metric	Specification English
Application	Metric	English
All Metal Prevailing Torque Fasteners		
• 1/4 in	0.5	4.5 lb in
• 5/16 in	0.8	7.5 lb in
• 3/8 in	1.3	11.5 lb in
• 7/16 in	1.8	16 lb in
• 1/2 in	2.3	20 lb in
• 9/16 in	3.2	28 lb in
• 5/8 in	4	36 lb in
• 3/4 in	7	62 lb in
Nylon Interface Prevailing Torque Fasteners		
• 1/4 in	0.3	3 lb in
• 5/16 in	0.6	5 lb in
• 3/8 in	1	9 lb in
• 7/16 in	1.3	12 lb in
• 1/2 in	1.8	16 lb in
• 9/16 in	2.5	22 lb in
• 5/8 in	3.4	30 lb in
• 3/4 in	5	45 lb in

THREADS

General Purpose Thread Repair Kits.

These kits are available commercially.

Repair Procedure

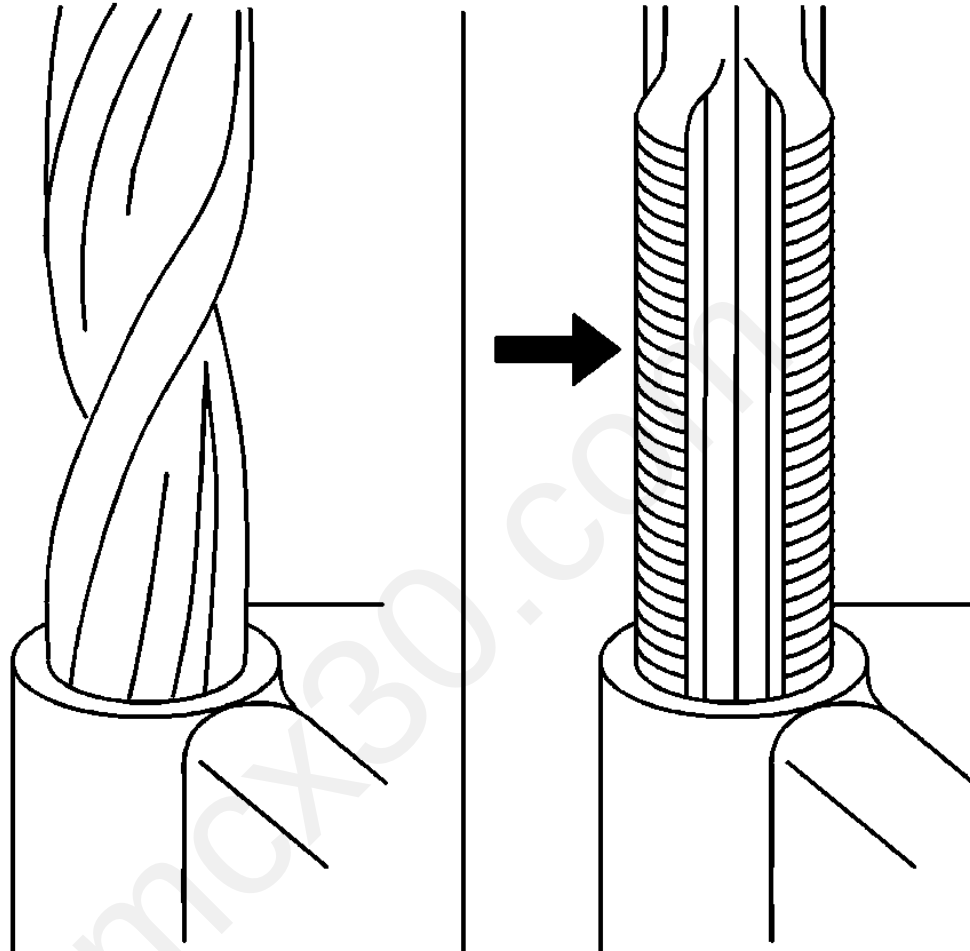


Fig. 7: Drilling & Tapping Damaged Threads
Courtesy of GENERAL MOTORS COMPANY

WARNING: Refer to [Safety Glasses Warning](#) .

NOTE: Refer to the thread repair kit manufacturer's instructions regarding the size of the drill and tap to use.

Avoid any buildup of chips. Back out the tap every few turns and remove the chips.

1. Determine the size, the pitch, and the depth of the damaged thread. If necessary, adjust the stop collars on the cutting tool and tap to the required depth.
2. Drill out the damaged threads. Clean out any chips.

3 the tap with light engine oil. Tap the hole. Clean the threads.

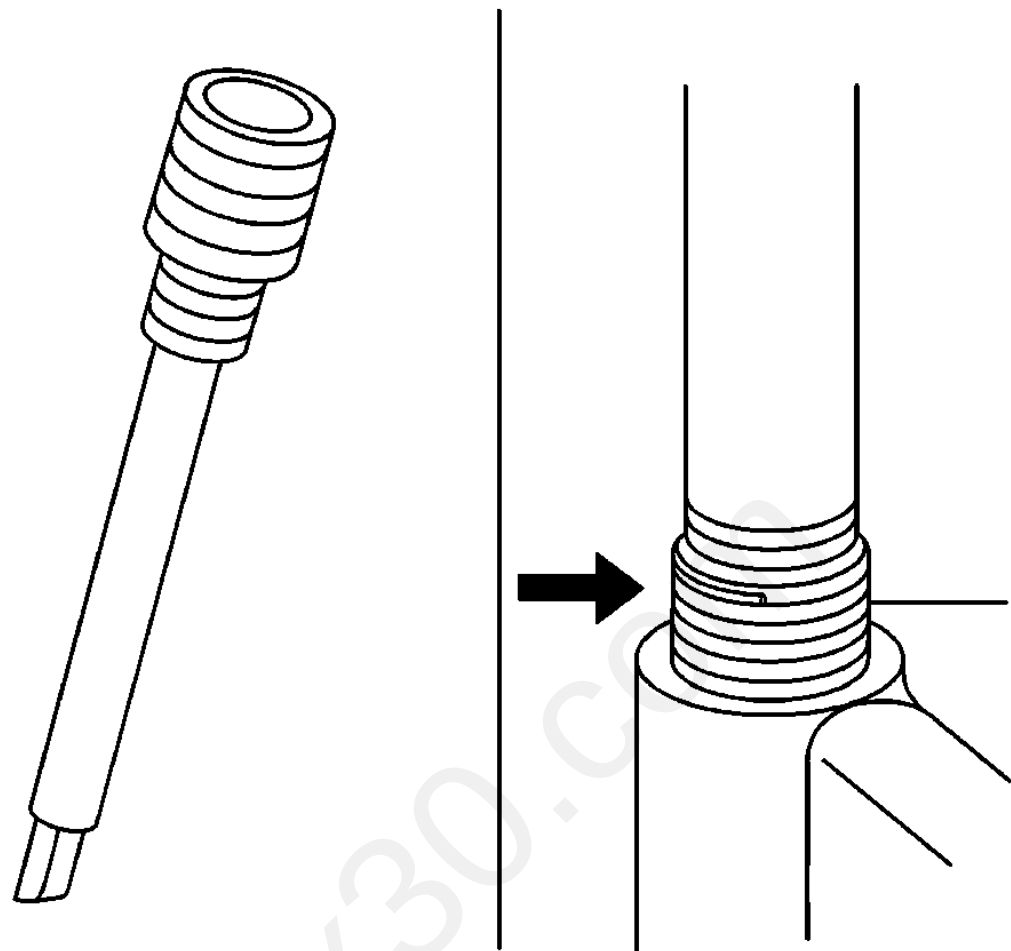


Fig. 8: View Of Thread Insert
Courtesy of GENERAL MOTORS COMPANY

4. Thread the thread insert onto the mandrel of the installer. Engage the tang of the insert onto the end of the mandrel.

NOTE: The insert should be flush to one turn below the surface.

5. Lubricate the insert with light engine oil, except when installing in aluminum and install the insert.
6. If the tang of the insert does not break off when backing out the installer, break the tang off with a drift.

REGISTERED AND NON-REGISTERED TRADEMARKS

Listed below are Registered Trademarks (®) or Non-Registered Trademarks (™) which may appear in this service manual.

A	
AC®	
ACCUTURN®	

Active Fuel Management™

Acuzinc®

Airbank®

Allison®

AMMCO®

AUTOFUSE®

AUTOTRAC®

B

Bendix®

Bluetooth®

BON-AMI®

Bosch®

Bose®

C

Caterpillar®

CAT®

C-Quam®

D

Delco®

Delco Bose®

Delco Electronics®

Delco Freedom®

Delco LOC II®

Delco Moraine®

Delco Remy®

Delco Sound®

Delco Supreme®

Delco Tech®

DELCORE®

Delphi®

DEX-COOL®

DEXOIL®

DEXRON®

DEXSTEER™

DNR®

Dolby®

DR®

Duracell®

Duraguard®

Durastop®

Duramax™

E

Eaton Corporation®

EMD®

ETR®

F

FLO-LITE®

G

General Motors®

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GM Goodwrench Service®

GM Optikleen®

GM Parts™

GM Pass®

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GMAC®

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Solar-Ray®
Stabilitrak®
Sunrayce®
Superlube®
Syclone®
T
Tech 2®
Techline®
Teflon®
Tefzel®
Theft-IA®
Theftlock®
Tiltmaster®
TORX®
Transjel®
Transguide®
Twilight Sentinel®
U
Ultralite®
V
Velcro®
W
Weatherpack™

DOOR LOCK AND IGNITION LOCK FOLDING AND NON-FOLDING KEY CUTTING

High Security keys are available from the service parts system.

Obtain the key code from the security card or from the GM Dealer World, Parts, Key Code Look Up system.

If you have the key code and access to a Triax-E., BD Laser or other code key cutting machine from the GM Dealer Equipment Catalog, you may cut a new key.

If you have the original key and access to a Matrix S, BD Laser or other key duplicating machine, you may duplicate the key.

If you do not have a high security key cutting machine, order the side cut key from the service parts system. Include the key code in the NOTE field. Indicate the timing and the method of the shipment.

Inspect the new key operation in the lock cylinder. Ensure the new key operates effectively.

FRONT SIDE DOOR LOCK CYLINDER CODING

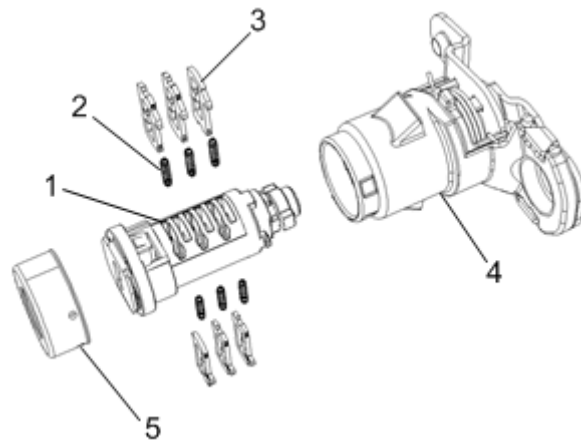


Fig. 9: Front Side Door Lock Cylinder Coding
 Courtesy of GENERAL MOTORS COMPANY

The free-wheeling door lock cylinder only uses six of the eight cut positions, 5 through 10 (when counting from the key head). The tumbler positions are staggered from side to side and are not self-retaining and must be held in place if the key is not fully inserted into the lock cylinder or until the cylinder (1) is assembled into the case (4).

NOTE: All lock cylinders for side milled keys have right and left tumblers. The location of the tooth of the tumbler determines whether it is right or left. All tumblers are marked 1R, 1L, 2R, 2L, etc. The number is cut depth and the letter identifies right or left. Tumblers identified as 1L to 4L must be inserted in the cylinder side where the first spring pocket is nearest to the back of the key head, tumblers identified as 1R to 4R must be inserted in the opposite side.

1. Hold the cylinder (1) positioned so the side with the tumbler spring pocket nearest to the cylinder head faces up.
2. Insert one tumbler spring (2) into each of the three spring pockets.
3. The first tumbler to be loaded will be the key cut position number 3 (the third number in the key code). Determine the cut depth at this position and install the corresponding tumbler (3) into the tumbler slot nearest the front of the lock cylinder assembly (the end where the key is inserted).
4. In the same manner, determine the cut depth and corresponding tumbler and install the two remaining tumblers (3) into the tumbler slots located at key cut positions 5 and 7.
5. Check the correct loading by holding the tumblers (3) in position and fully inserting the key into the cylinder (1). All tumblers should be flush with the outside diameter of the cylinder.
6. Rotate the cylinder (1) so the tumbler spring pockets on the opposite side are facing up and then remove the key. Remember the tumblers (3) are not self-retained and must be held in place.
7. Insert one tumbler spring (2) into each of the three spring pockets.
8. The first tumbler to be loaded will be the key cut position number 4. Determine the cut depth at this position and install the corresponding tumbler (3) into the tumbler slot nearest the front of the lock cylinder assembly.
9. In the same manner, determine the cut depth and corresponding tumbler and install the two remaining tumblers (3) into the tumbler slots located at key cut positions 6 and 8.
10. Check the correct loading by holding the tumblers (3) in position and fully inserting the key into the cylinder (1). All tumblers should be flush with the outside diameter of the cylinder.
11. Lightly lubricate the tumbler (3) surfaces using the grease provided.
12. With the key fully inserted into the cylinder assembly, install the cylinder (1) into the case (4). Hold the lever and case (4) while pressing in on the cylinder (1) and rotate 90°.

the key being careful to ensure the cylinder (1) is locked into the case (4).

14. Install the lock cylinder cap (5) by aligning the open window of the cap with the corresponding protrusion area of the case (4). Snap the cap into place with light hand pressure. Be sure the cap is securely retained on the case.

LOCK CYLINDER CODING - IGNITION

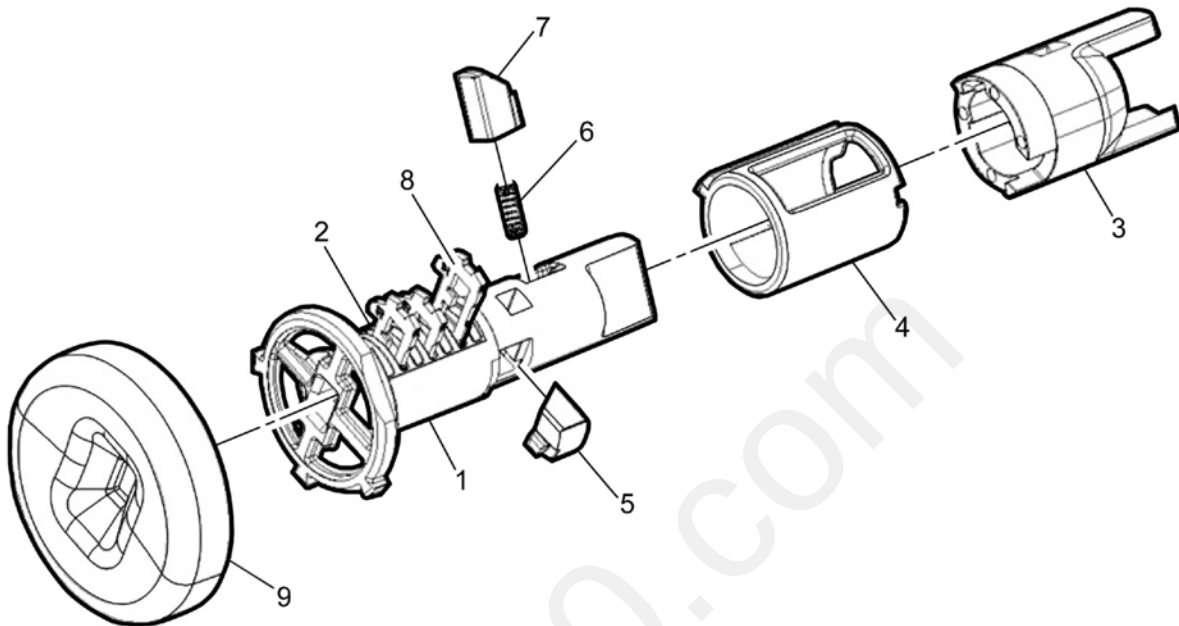


Fig. 10: Lock Cylinder - Ignition

Courtesy of GENERAL MOTORS COMPANY

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

The ignition locks uses 7 cut positions and tumblers numbered 1 through 4 (R and L). The tumbler positions are staggered from side to side, four on one side and three on the other. The lock cylinder tumblers are not snap-in/self-retaining.

1. Hold the cylinder component (1) as shown.
2. Insert one tumbler spring (2) into each of the three spring cavities on cylinder (1).
3. The first loaded tumbler (3) will correspond to the first cut position, which will be first number in the key code. Install the first tumbler in the slot nearest the head of lock cylinder. Install the remaining tumblers following the key code into slots at key cut positions 3, 5 and 7.
4. Check the correct loading by holding the tumblers down in position and fully inserting the key into cylinder assembly. All tumblers should be flush with the outside diameter of the cylinder assembly body.
5. Rotate the cylinder component (1) so the opposite tumbler slots are facing upward and then remove the key. Keep in mind it will be required to hold down all tumblers previously inserted before removing the key to keep them from falling out.
6. Insert one tumbler spring (2) into each of the three remaining spring cavities.
7. The first tumbler (3) to be loaded will correspond to the second key cut position, the second number in the key code. Install the tumbler in the slot nearest the head of lock cylinder. Install the remaining tumblers

g the key code into the slots at key cut positions 4 and 6.

8. Repeat step 4 to confirm all tumblers are properly configured on the cylinder per required key code.
9. Lightly lubricate the tumbler surface and the small detent recess on the side of the cylinder assembly using the provided grease.
10. Slide the sleeve (4) over the cylinder (1) to secure all tumblers already in place/inserted (Do not remove the key).
11. Rotate the sleeve (4) once over the tumbler area on the cylinder (1) and align the cylinder slot to match sleeve slot for the actuator component tab (to allow it to be inserted in). Now rotate back the sleeve (4) until all tumblers snaps into sleeve slot and can be secured, proceed to remove key.
12. Insert in retainer spring (6) in direction shown and thereafter cylinder retainer (7) over the spring (make sure cylinder retainer is able to be pushed in all the way in).
13. Insert retainer collar (8) as direction shown, until you hear and feel the snap in of the cylinder retainer (7).
14. Finally, insert the ignition wingless knob (9) as per direction shown (make sure this component is properly secured on cylinder head to prevent its fall off).
15. As a final inspection, insert back the key all the way in to confirm the cylinder sleeve (4) can freely rotate over the cylinder assembly.

SPARE WHEEL HOIST LOCK CYLINDER CODING

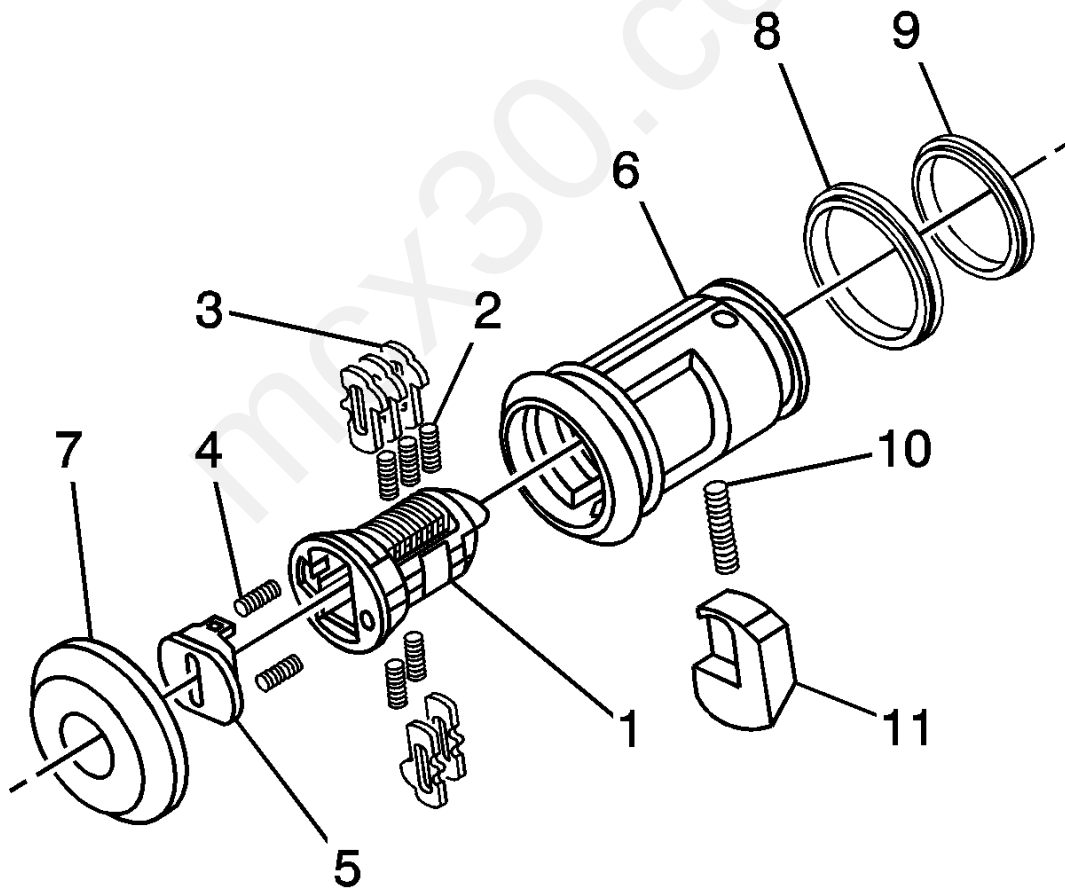


Fig. 11: Exploded View Of Spare Wheel Hoist Lock Cylinder
Courtesy of GENERAL MOTORS COMPANY

lock cylinder only uses 5 of the 10 cut positions, 6 through 10. The tumbler positions are on one side and self-retaining.

NOTE: All lock cylinders for side milled keys have right and left tumblers. The location of the tooth of the tumbler determines whether it is right or left. Illustrations in this procedure show the right tumblers on the top and the left tumblers on the bottom. All tumblers are marked 1R, 1L, 2R, or 2L. The number being cut depth and the letter meaning right or left.

1. Rotate the cylinder (1) so the side with the 5 tumbler spring wells faces up.
2. Insert the tumbler springs (2) into the 4 spring wells.
3. Install the tumbler (3) for key cut position 6 in the slot closest to the cylinder head. Install the remaining tumblers, key cut positions 8 and 10, following the key code and the same process. Press the tumblers in place until they are secure.
4. Check for correct loading of the tumblers by inserting the key into the cylinder. All of the tumblers should be flush with the lock cylinder body.
5. Turn the cylinder so the side with the 3 tumbler spring wells faces up.
6. Insert tumbler springs into the 2 spring wells.
7. The first tumbler closest to the front of the lock cylinder to be loaded will be the seventh key cut position. Install the remaining tumblers for key cut position 9, following the key code and same process. Press the tumblers in place until they are secure.
8. Check for correct loading of the tumblers by inserting the key into the cylinder. All of the tumblers should be flush with the lock cylinder body.
9. Apply lubricant to the cylinder body and tumbler surfaces along with a small amount in the head of the cylinder using the supplied grease.
10. Install 2 springs (4) into the 2 spring wells in the head of the cylinder.
11. Snap the shutter assembly (5) into the cylinder.
12. Insert the retainer spring (10) in the retainer pocket making sure it is positioned on the spring post.
13. Place the retainer bolt (11) in the pocket with the angle facing the back of the case. Depress the retainer bolt and hold.
14. With the key still in the cylinder, insert into case (6) 90 degrees to the right of the drain slot/retainer.
15. Rotate back 90 degrees to the key out position. Hold lock in case and remove the key. The cylinder should secure bolt in case.
16. Place the lock cylinder cap (7) on top of the lock assembly. Bend tabs on cap to underside of case making sure they are secure and pulled tight to case.
17. Insert key and rotate to verify the lock was assembled properly. The key should not be able to be removed when bolt is down. The lock should only rotate clockwise 90 degrees.
18. Assembly gaskets (9), if supplied in the groove located at the end of the case and gasket (8) in the groove at the front of the case.

LIFTING AND JACKING THE VEHICLE

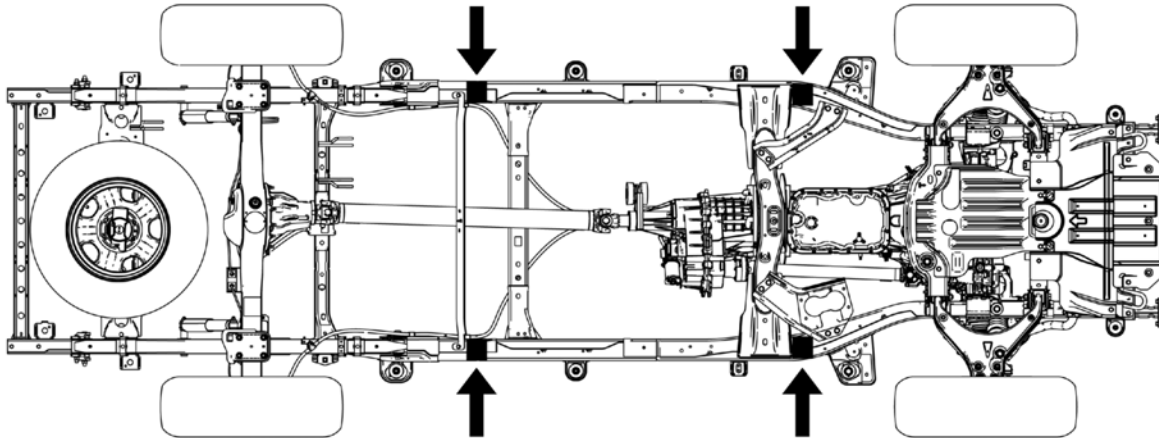


Fig. 12: Lifting and Jacking

Courtesy of GENERAL MOTORS COMPANY

WARNING: To avoid any vehicle damage, serious personal injury or death when major components are removed from the vehicle and the vehicle is supported by a hoist, support the vehicle with jack stands at the opposite end from which the components are being removed and strap the vehicle to the hoist.

WARNING: To avoid any vehicle damage, serious personal injury or death, always use the jackstands to support the vehicle when lifting the vehicle with a jack.

CAUTION: Perform the following steps before beginning any vehicle lifting or jacking procedure:

- Remove or secure all of the vehicle contents in order to avoid any shifting or any movement that may occur during the vehicle lifting or jacking procedure.
- The lifting equipment or the jacking equipment weight rating must meet or exceed the weight of the vehicle and any vehicle contents.
- The lifting equipment or the jacking equipment must meet the operational standards of the lifting equipment or jacking equipment manufacturer.
- Perform the vehicle lifting or jacking procedure on a clean, hard, dry, level surface.
- Perform the vehicle lifting or jacking procedure only at the identified lift points. **DO NOT** allow the lifting equipment or jacking equipment to contact any other vehicle components.

Failure to perform the previous steps could result in damage to the lifting equipment or the jacking equipment, the vehicle, and/or the vehicle contents.

- Ensure that the lifting equipment meets weight requirements and is in good working order. Always follow the lift manufacturer's instructions.
- You may lift and support the front of the vehicle at the front suspension near the wheel assemblies. Ensure that the arms of the front cradle are extended as close to the steering knuckle as possible.
- Ensure that the vehicle is centered on the hoist before attempting to lift.
- When using a suspension-contact hoist, ensure that the rear cradle has adequate clearance for the rear stabilizer bar.
- When lifting or jacking a vehicle, be certain that the lift pads do not contact the exhaust system, brake pipes, cables, HVAC lines, wiring harnesses, fuel lines, or underbody. Such contact may result in damage or unsatisfactory vehicle performance.
- When using a frame-contact hoist, only place the pads on flat surfaces. Do not place pads within 50 mm (2 in) of any radius.
- Before lifting the vehicle, verify that the vehicle loads are secure and equally distributed.
- When major components are removed from the vehicle when supported on a hoist, support the vehicle with jack stands at the opposite end from which the components are being removed and secure the vehicle frame to the hoist pads nearest the component to be removed.

Vehicle Jacking

- Park the vehicle on a clean, hard, level surface before jacking the vehicle.
- Any time you lift the vehicle on one end, chock the wheels at the opposite end.
- Use jack stands in order to provide support.
- When supporting the vehicle using jack stands, place the jack stands under the side rails or the axle.
- When lifting under the rear differential, do not allow the jack pad to contact the rear stabilizer bar or mounting hardware.

SPECIAL TOOLS AND EQUIPMENT

SPECIAL TOOLS ORDERING INFORMATION

Special Tools

The special service tools shown in this service manual that have product numbers beginning with J, BO, GE, CH, DT, EN, EL, SA, OR KM are available for worldwide distribution.

US, Canada and Caribbean only:

NOTE: For Special Service tools only - see different location below for diagnostic tools & equipment.

Bosch Automotive Service Solutions

28635 Mound Road

Warren

MI

48092-3499

Phone: 1-800-GM-TOOLS

Monday through Friday

8:00 am-7:00 pm Eastern Standard Time

Fax: 1-800-578-7375 or 586-578-7321

gmspecialservicetools.service-solutions.com

Mexico, Including Central America:

Bosch Automotive Service Solutions

Mitla No. 442 Col. Vertiz Narvarte

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Mexico

Phone: +5255 2595 1630

Fax: +5255 2595 1639

Inquiries can be sent to: herramientas@service-solutions.com

South America, Excluding Brazil:

Bosch Automotive Service Solutions

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Mexico

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Fax: +5255 2595 1639

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Fax: +55 11 5853-7479

e sent to: ferramentas@service-solutions.com

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689-17 Geumjeong-dong, Gunpo-si, Gyeonggi-do, 435-862

Korea

Phone: 82-31-457-9520

sales.korea@servicesolutions.com

Fax: 82-31-427-9522

Greater China, SGM, SGMW, FAW-GM, GM OPEL China:

Bosch Automotive Service Solutions China

333 Fuquan Road North IBP, Changning District

Shanghai 200335 P.R.

Phone: 86-21-22182668

sales.cn@service-solutions.com

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Australia:

Bosch Automotive Service Solutions Australia

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Clayton

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Phone: 1300 783 031

Fax: (3) 9541 6138

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Spain

Phone: 34 949 208 337

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