

2017 GENERAL INFORMATION
General Information - Encore, Trax

INTRODUCTION

ARROWS AND SYMBOLS

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

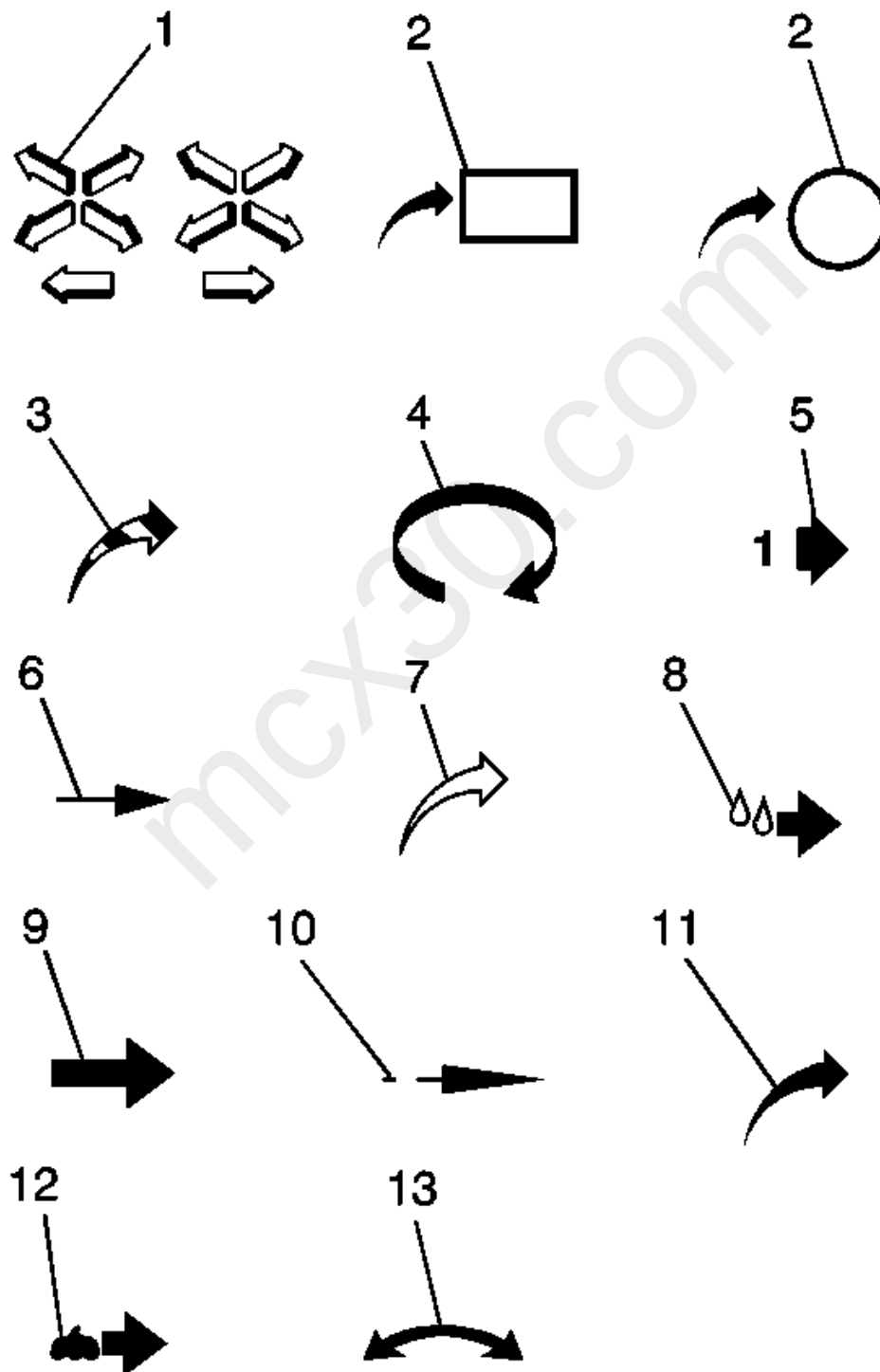


Fig. 1: Identifying Different Service Operations Symbols
Courtesy of GENERAL MOTORS COMPANY

Callout	Component Name
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.
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.

Acronym	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.

Acronym	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 NO _x (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.

Acronym	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.
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.

Acronym	Meaning	Definition
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.
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.

Acronym	Meaning	Definition
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.
ROM	Read-Only Memory	A class of storage media used in computers and other electronic devices. Data stored in ROM cannot be modified.

Acronym	Meaning	Definition
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.
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.

Acronym	Meaning	Definition
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.
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
------	---------	------------

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
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.

Unit	Meaning	Definition
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
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

These punctuation marks and symbols are used in the service information to separate information, values, data, and text.

NOTE: In the examples, the punctuation marks and symbols are bold only to highlight them; in the service information, they are not bold.

Punctuation/Symbol	Description

Punctuation/Symbol	Description
:	Colon separates the "what to do" statement from the "where to do it, how to do it, or which ones" Example: • Disconnect the electrical connector: X3 @ K20 Engine Control Module • Test for less than 10 Ω between the test points: Signal circuit terminal 1 & Ground • Install the following components: • Valve • Bolt [2x] • Nut [2x]
&	Ampersand separates two test points or two or more conditions Example: • Test for less than 10 Ω between the test points: Signal circuit terminal 1 & Ground • Throttle Angle = Greater than 0% & Engine Speed = Less than 1000 RPM
@	At sign separates location information relative to a component. Replaces "from the", "to the" or "at the". Example: • Signal circuit terminal 1 @ Control module harness • Instrument Panel Center Trim Plate Applique @ Instrument Panel » Remove
»	Chevron separates the action/condition/function/object from the object/task/value Example: • Perform the scan tool control function: EVAP Purge Solenoid Valve » 50% • Remove » Test Lamp • Test or replace » B34 Engine Coolant Temperature Sensor • Instrument Panel Center Trim Plate Applique @ Instrument Panel » Remove • If any of the DTCs are set » Repeat Step 5
=	Equal sign separates the observed object from the nominal value or when stating a value Example: • Verify the scan tool parameter: ECT Sensor = <i>Colder than -39Â°C (-38Â°F)</i> • Engine Run Time = Greater than 10 min • 0.75 to 1.5 V - A/C Compressor = Off • 1.3 to 2.5 V - A/C Compressor = On
-	Hyphen separates the component name from the location information relative to the vehicle (eg. Left, Right, Lower, Upper) Example: Cylinder Head - Left » Remove

Punctuation/Symbol	Description
-	Minus sign used for negative values Example: Engine Coolant Temperature= Between- 10 and - 5°C (14 and 23°F)
-	Ndash separates a consecutive numeric range Example: Cylinder 1- 8 Injector
—	Mdash separates additional information at the end of the subject matter Example: • Engine Controls Ignition Relay Feedback Circuit = Less than 5 V - For greater than 5 s • Switch @ Switch Bezel » Remove - Rotate counterclockwise
/	Forward slash separates conditions or alphanumeric terminals Example: • Screen - Misaligned / Missing / Restricted / Torn • Signal circuit terminal 1/ A @ Control module harness
()	Parenthesis identify a callout reference Example: Instrument Panel Center Trim Plate Applique (1)
[]	Brackets identify a quantity reference Example: Hood Hinge Bolt [2x]
{ }	Curly brackets identify decisional information at the beginning of a subject matter Example: • { If equipped } Instrument Panel Center Trim Plate Applique (1) » Remove • { 2.0L (LHU) } Low Reference circuit terminal 2 & Ground • { 2.4L (LAF) } Low Reference circuit terminal 5 & Ground

GRAPHIC COLORS AND GRAPHIC SYMBOLS

Graphic Colors - General

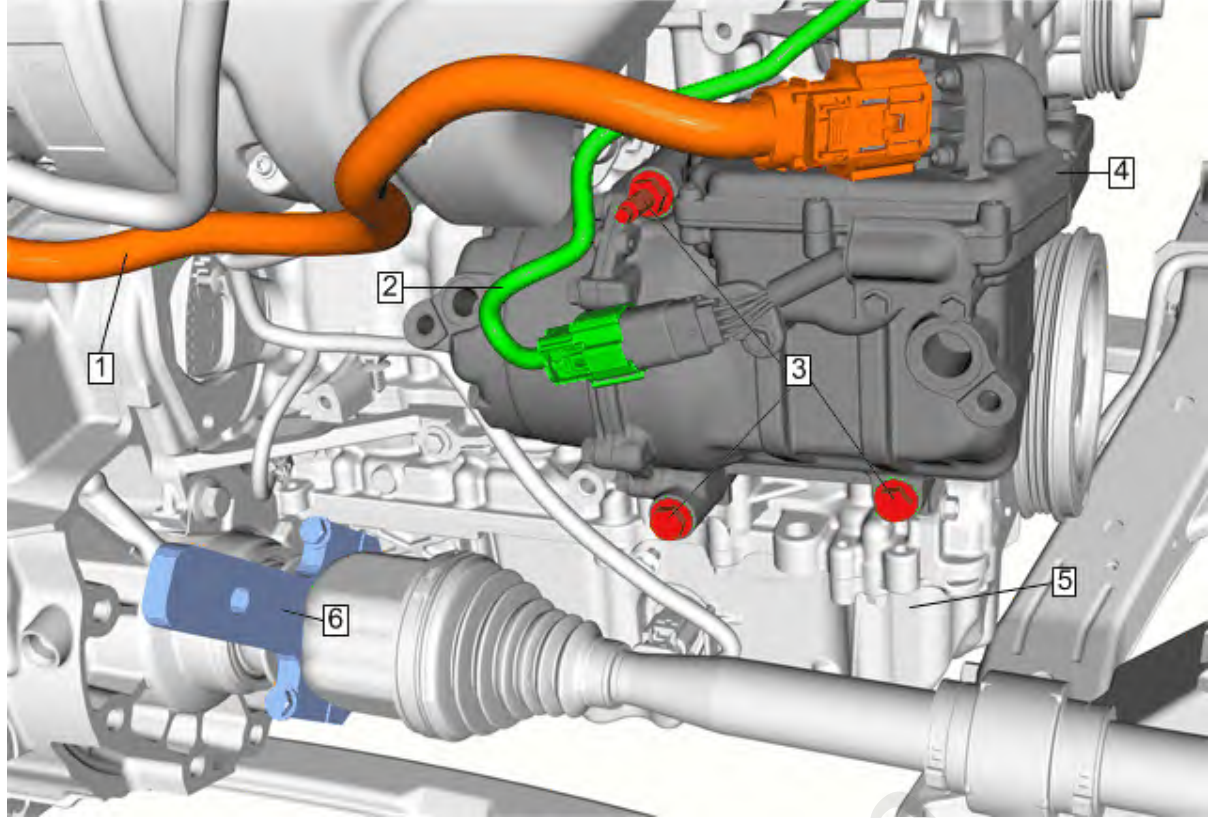


Fig. 2: Graphic Colors - General

Courtesy of GENERAL MOTORS COMPANY

Callout	Component Name
1	Orange - High voltage electrical connectors and harnesses being removed or installed.
2	Green - Electrical connectors and harnesses being removed or installed.
3	Red - Fasteners being removed or installed.
4	Dark Gray - Standout color that shows the component being removed or installed.
5	Light Gray - Background detail to show component location.
6	Light Blue - Special tool being used.

Graphic Symbols - Collision Repair

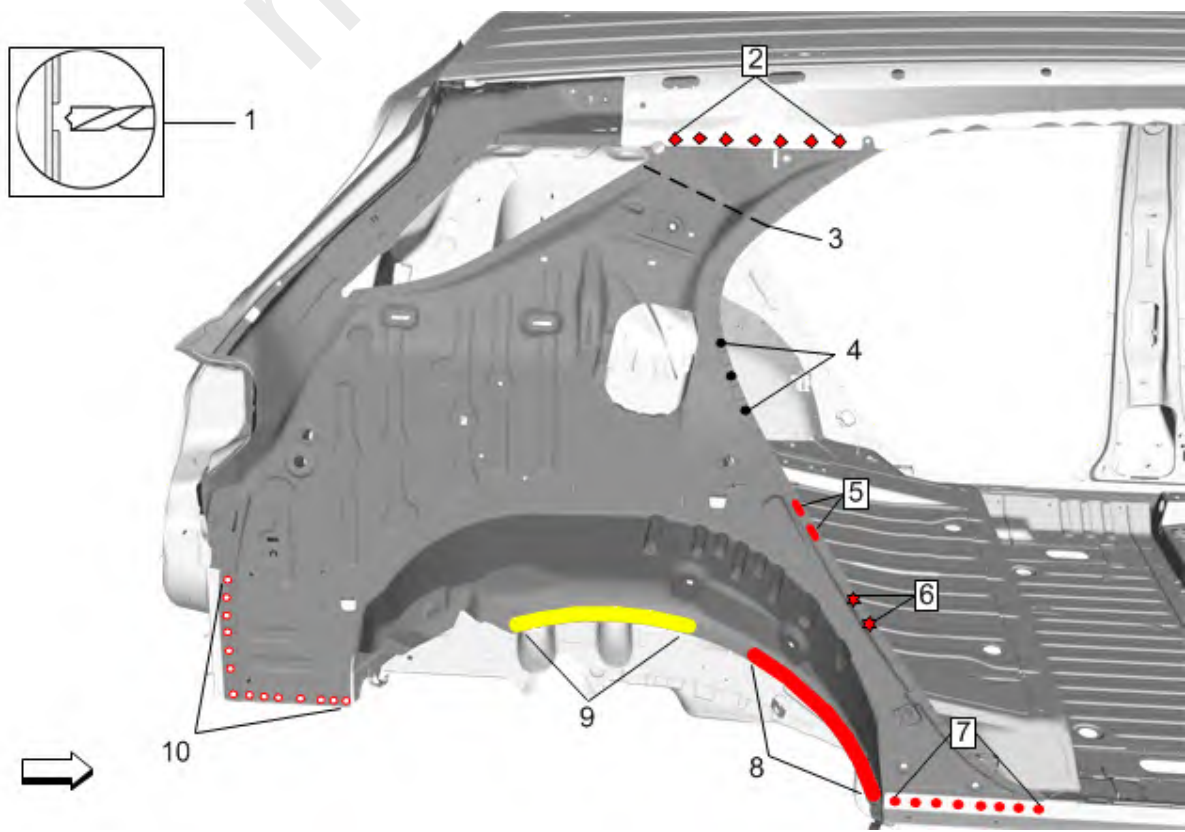


Fig. 3: Graphic Symbols - Collision Repair
 Courtesy of GENERAL MOTORS COMPANY

Callout	Component Name
1	Drill through top layer of material only
2	Structural Rivet
3	Sectioning Location
4	Drill Hole
5	Mig Braze Slot
6	Self-Piercing Rivet
7	Mig/Mag Plug Weld
8	Adhesive
9	Apply Heat
10	Resistance Spot Weld

CUSTOMER CONCERN VERIFICATION SHEETS

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.

VEHICLE, ENGINE AND TRANSMISSION ID AND VIN LOCATION, DERIVATIVE AND USAGE (CHEVROLET)

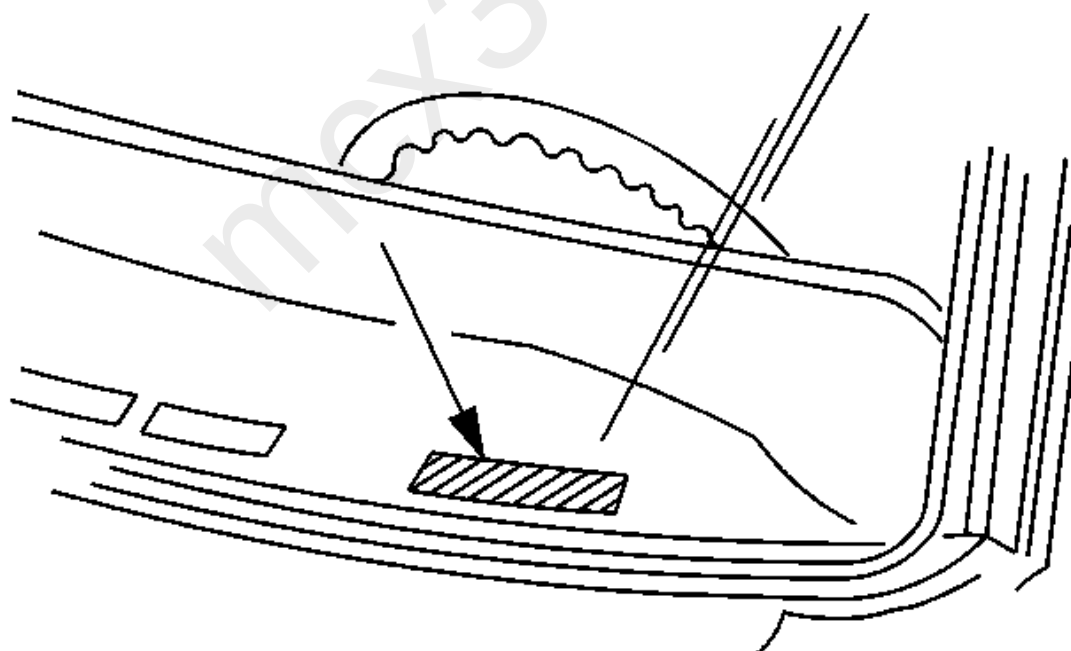


Fig. 4: Locating Vehicle Identification Number (VIN) Plate
 Courtesy of GENERAL MOTORS COMPANY

The vehicle identification number (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:

Position	Definition	Character	Description
1	Region of Build	3	Mexico
2	Manufacturer	G	General Motors
3	Make	N	Chevrolet MPV
4	GVWR/Brake System/Body Style	C	4, 001-5, 000 Hyd. 76
5-6	Chassis/Series	J/K	Chevrolet Trax LS (FWD)
		J/L	Chevrolet Trax 1LT (FWD)
		J/M	Chevrolet Trax 2LT (FWD)
		J/N	Chevrolet Trax LTZ (FWD)
		J/P	Chevrolet Trax 1LT (AWD)
		J/R	Chevrolet Trax 2LT (AWD)
		J/S	Chevrolet Trax LTZ (AWD)
		J/7	Chevrolet Trax (Export - Mexico)
		J/8	Chevrolet Trax/Tracker (Export - Non US, Non Canada or Non Mexico)
7	Restraint System	C	ADL - Active Manual Belts, Airbags Driver and Passenger Front (1st Row)
		E	AYC - Active Manual Belts, Airbags Driver and Passenger Front (1st Row), Front Seat Side (1st Row), Roof Side (All Seating Rows)
		S	AYF - Active Manual Belts, Airbags Driver and Passenger Front (1st Row), Front Seat Side (1st Row) and Rear Seat Side (2nd Row), Roof Side (All Seating Rows), Driver and Passenger Knee (1st Row)
8	Engine Type	B	RPO LUV ENGINE - GAS, 4 CYL, L4, 1.4L, MFI, DOHC, TURBO HO, GME E85 Max
		E	RPO 2H0 ENGINE - GAS, 4 CYL, 1.8L, MFI, 103KW, DOHC
		W	RPO LFH ENGINE - GAS, 4 CYL, 1.8L, MFI, E100 Max
9	Check Digit	X	Calculated by POMS
10	Model Year	G	2016
11	Plant Location	L	San Luis Potosi
12-17	Plant Sequence Number	-	Plant Sequence Number

1.4L Engine ID and VIN Derivative Location

Refer to [Engine Identification](#) .

1.8L Engine ID and VIN Derivative Location

Refer to [Engine Identification](#) .

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

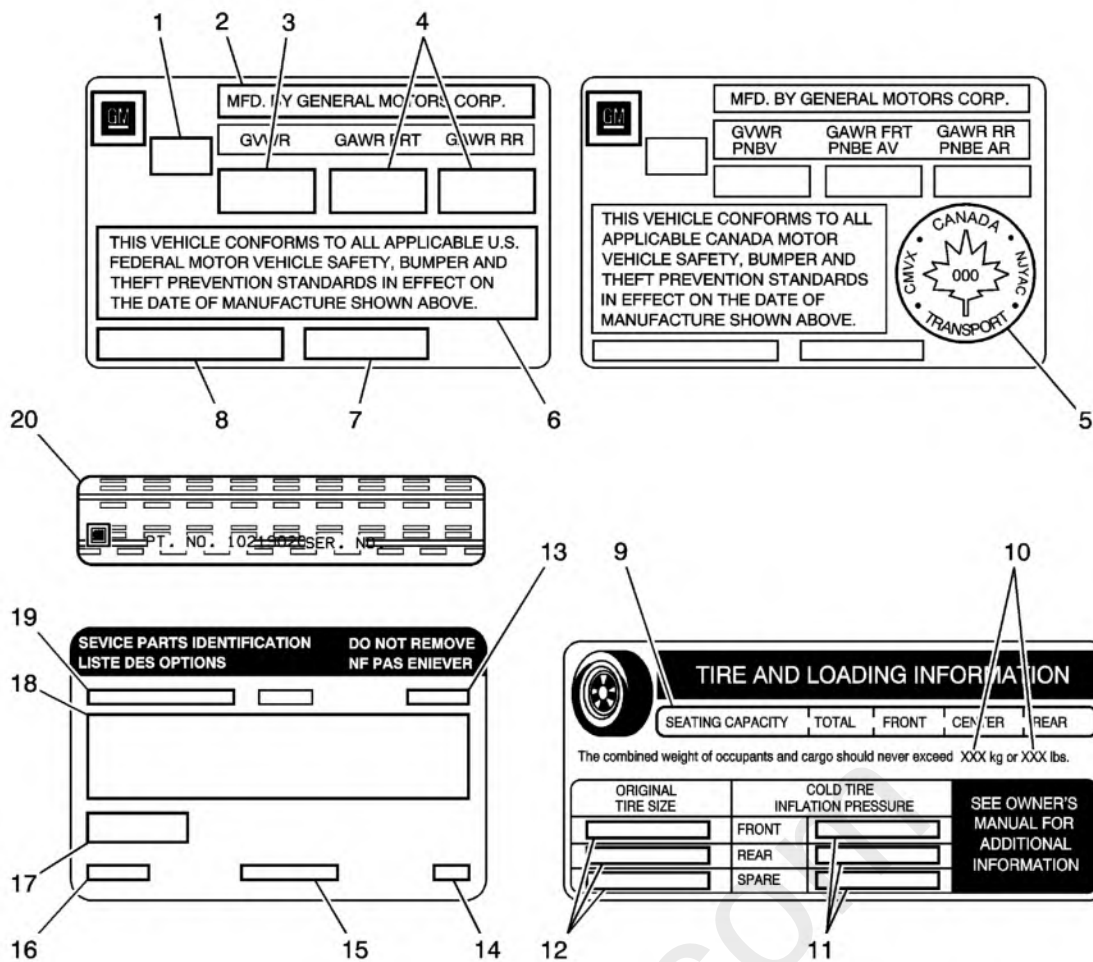


Fig. 5: Identifying Vehicle Certification, Tire Place Card, Anti-Theft & Service Parts ID Labels
 Courtesy of GENERAL MOTORS COMPANY

Callout	Description
Vehicle Certification Label The vehicle certification label is located on the left hand side of the B pillar and displays the following assessments: - Gross Vehicle Weight Rating (GVWR) - Gross Axle Weight Rating (GAWR), front and rear - The gross vehicle weight (GVW) is the weight of the vehicle and everything it carries. The gross vehicle weight must not exceed the Gross Vehicle Weight Rating. Include the following items when figuring the GVW: - The base vehicle weight (factory weight) - The weight of all vehicles accessories - The weight of the driver and the passengers - The weight of the cargo	
1	Name of Manufacturer
2	Gross Vehicle Weight Rating
3	Gross Axle Weight Rating (Front, Rear)
4	Canadian Safety Mark (w/RPO Z49)
5	Certification Statement
6	Vehicle Class Type (Pass Car, etc.)
7	Vehicle Identification Number
8	Date of Manufacture (Mo/Yr)
Tire Placard The tire placard label is located on the driver door and displays the following assessments:	

Callout	Description
9	Specified Occupant Seating Positions
10	Maximum Vehicle Capacity Weight
11	Tire Pressure, Front, Rear, and Spare (Cold)
12	Original Equipment Tire Size
Service Parts ID Label	
The vehicle service parts identification label is located in the rear compartment under the spare tire cover. The label is use to help identify the vehicle original parts and options.	
13	Vehicle Identification Number
14	Engineering Model Number (Vehicle Division, Line, and Body Style)
15	Interior Trim Level and Decor
16	Exterior (Paint Color) WA Number
17	Paint Technology
18	Special Order Paint Colors and Numbers
19	Vehicle Option Content
Anti-Theft Label	
20	The Federal law requires that General Motors label certain body parts on this vehicle with the VIN. The purpose of the law is to reduce the number of motor vehicle thefts by helping in the tracing and recovery of parts from stolen vehicles. Labels are permanently affixed to an interior surface of the part. The label on the replacement part contains the letter R, the manufacturer's logo, and the DOT symbol. The anti-theft label must be covered before any painting, rustproofing procedures, and uncovered after the procedures. Failure to follow the precautionary steps may result in liability for violation of the Federal Vehicle Theft Prevention Standard and possible suspicion to the owner that the part was stolen.

RPO CODE DESCRIPTION

The following table provides the description of the Regular Production Option (RPO) codes that are available on the vehicle. The vehicle's RPO list is printed on the Service Parts Identification Label.

RPO	Description
01A	TRIM COLOR SEAT-JET BLACK VAR 1
01J	TRIM COLOR SEAT-BROWNSTONE
01S	TRIM COLOR SEAT-MED TITANIUM
05E	TRIM COLOR SEAT-SADDLE UP
1AB	TRIM COLOR DR PANEL-JET BLACK
1AM	TRIM COLOR DR PANEL-BROWNSTONE
1AR	TRIM COLOR DR PANEL-MED TITANIUM
1CT	TRIM COLOR DR PANEL-SADDLE UP
2H0	ENGINE-GAS, 4 CYL, 1.8L, MFI, 103KW, DOHC
3DB	MOLDING I/P-KOTO CINNAMON, WOOD FILM
3DD	MOLDING I/P-TILIA SILVER, WOOD FILM
4AA	INTERIOR TRIM-JET BLACK
4AI	INTERIOR TRIM-JET BLACK/BROWNSTONE
4AV	INTERIOR TRIM-JET BLACK/MED TITANIUM
4C6	INTERIOR TRIM-COCOA/SADDLE UP
4C8	INTERIOR TRIM-MED TITANIUM/JET BLACK
5P4	WHEEL-18 X 7.0, J, ALUMINUM, DESIGN 5
8EF	FASCIA INSERT-RR LOWER, BLACK
A33	WINDOW REG REAR DR-POWER OPERATED
A50	SEAT-FRT BKT
A66	WINDOW REG PASS DR-POWER OPERATED
A69	RESTRAINT-SEAT BELT TENSIONER, FRT, VAR. 2
A70	RESTRAINT-SEAT BELT TENSIONER, FRT

RPO	Description
A77	SEAT RR-SPLIT, FOLDING, 60/40
AAG	MEMORY-SEAT ADJUSTER, MIRROR, POWER, DRIVER, HVAC, RADIO PRESET
AAL	RESTRAINT-KNEE, BOLSTER, LH/RH
AAW	INTERIOR TRIM CONFIG-#17
AAX	INTERIOR TRIM CONFIG-#18
AAZ	INTERIOR TRIM CONFIG-#16
ACO	IDENTIFICATION-ACCESSORY CATALOG OFFERING
ADL	RESTRAINT SYSTEM-SEAT, INFLATABLE, DRIVER & PASS, SINGLE STAGE
AED	WINDOW REG PASS DR-POWER OPERATED, EXPRESS DOWN
AEQ	WINDOW REG REAR DR-POWER OPERATED, EXPRESS DOWN
AES	INTERIOR TRIM CONFIG-#37
AET	INTERIOR TRIM CONFIG-#38
AEV	INTERIOR TRIM CONFIG-#39
AEW	INTERIOR TRIM CONFIG-#40
AEX	INTERIOR TRIM CONFIG-#41
AEY	INTERIOR TRIM CONFIG-#42
AFJ	INTERIOR TRIM CONFIG-#10
AFK	INTERIOR TRIM CONFIG-#11
AFN	INTERIOR TRIM CONFIG-#14
AFO	INTERIOR TRIM CONFIG-#15
AFP	INTERIOR TRIM CONFIG-#44
AFQ	INTERIOR TRIM CONFIG-#45
AFR	INTERIOR TRIM CONFIG-#46
AG5	ADJUSTER PASS ST-MANUAL, 2 WAY
AG9	ADJUSTER FRT ST-POWER, 6 WAY
AH3	ADJUSTER FRT ST-MANUAL, 4 WAY, DRIVER
AIB	RESTRAINT-SEAT, PASS, RETR, 3 POINT, LOAD LIMIT
AIF	RESTRAINT-SEAT, DRIVER, RETR, 3 POINT, LOAD LIMIT
AJC	RESTRAINT-HEAD, FRT SEAT, UP/DOWN ADJUSTMENT
AK9	RESTRAINT SYSTEM RR-SEAT, SHLDR, RETR, 3 POINT, CTR LAP
AKK	WINDSHIELD STYLE-ACOUSTIC PVB
AKO	WINDOW TYPE-PRIVACY
AKP	WINDOW TYPE-SOLAR ABSORBING
AKX	WINDSHIELD TYPE-SOLAR ABSORBING
AL0	SENSOR INDICATOR-INFLATABLE RESTRAINT, FRT PASS/CHILD PRESENCE DETECTOR
AMG	SEAT RR-BENCH, 60/40 SPLIT BACK, FOLDING
AP9	NET-CONVENIENCE
AQ5	ADJUSTER PASS ST-POWER 6 WAY
AR9	SEAT-FRT BKT, DELUXE
ASV	EQUIPMENT-SENSOR AIR MOISTURE & W/S TEMP
AT7	RESTRAINT SYSTEM RR-SEAT, SHLDR, RETR, 3 POINT, 3 SHLDR
ATG	LOCK CONTROL, ENTRY-REMOTE ENTRY, STANDARD RANGE
AXG	WINDOW REG DRVR DR-POWER OPERATED, EXPRESS UP/DOWN
AXP	VEHICLE TYPE-MULTI-PURPOSE PASSENGER VEHICLE
AY0	RESTRAINT SYSTEM-SEAT, INFLATABLE, DRIVER & PASS FRT, SEAT SIDE, ROOF SIDE
AYC	RESTRAINT SYSTEM-SEAT, INFLATABLE, DRIVER & PASS FRT, SEAT SIDE, ROOF SIDE, SINGLE STAGE
AYF	RESTRAINT SYSTEM-SEAT, INFLATABLE, DRIVER & PASS FRT, FRT SEAT SIDE & RR SEAT SIDE, ROOF SIDE, KNEE

RPO	Description
B32	COVERING FRT-FLOOR MATS, AUX
B33	COVERING REAR-FLOOR MATS, AUX
B41	COVERING-FLOOR MAT, LOAD FLOOR
B70	PLATE-DOOR SILL COVER
BA8	COMPARTMENT-STOWAGE, FRT SEAT, PASS
BAG	PARTS PKG-EXPORT
BQU	MOLDING B/S-DARK COCOA ASH
BQX	MOLDING B/S-SATIN NICKEL METALLIC
BT3	MOLDING B/S-DARK ARGENT METALLIC
BTT	ALARM-REMOTE PANIC
BTV	REMOTE START-ENGINE
BUP	PLANT CODE-BUPYEONG 1, KOREA
BV5	ORNAMENTATION-NAME PLATE "TURBO"
BXQ	ORNAMENTATION-EXTR, PLR APLQ, REVEAL, BLACK
C25	WIPER SYS RR WINDOW-INTERMITTENT
C32	HEATER-HEATING/DEFROSTER SYSTEM, REINFORCED, ELECTRIC
C41	HVAC SYSTEM-HEATER, OUTSIDE AIR, WITH FAN
C4P	HVAC SYSTEM-AIR CONDITIONER FRT, SEMIAUTOMATIC, ELECTRONIC CONTROLS
C60	HVAC SYSTEM-AIR CONDITIONER FRT, MAN CONTROLS
C67	HVAC SYSTEM-AIR CONDITIONER FRT, ELECTRONIC CONTROLS
C93	LAMP-INTR, AMBIENT
CAV	ACCESSORY-TRAY - TRUNK/CARGO AREA
CE1	WIPER SYS WINDSHIELD-PULSE, MOISTURE SENSITIVE
CF5	ROOF-SUN, GLASS, SLIDING, ELEC
CGS	MODEL CONVERSION-CHEVROLET, LS AWD
CGT	MODEL CONVERSION-CHEVROLET, LT AWD
CGU	MODEL CONVERSION-CHEVROLET, LTZ AWD
CGV	MODEL CONVERSION-BUICK, CX2
CGW	MODEL CONVERSION-BUICK, CXL2
CJ2	HVAC SYSTEM-AIR CONDITIONER FRT, AUTO TEMP CONT, AUX TEMP CONT
CJP	GVW RATING-1990 KG
CMI	GVW RATING-1944 KG (4286 LBS)
CV3	COUNTRY-MEXICO
CWR	COUNTRY-REUNION ISLAND
D05	ARM REST-FRT SEAT, DRIVER
D2O	COUNTRY-CURACAO
D2Z	COUNTRY-ANTILLES(NL)
D31	MIRROR I/S R/V-TILT
D3J	COUNTRY-CAYMAN ISLANDS
D3K	COUNTRY-DOMINICAN REPUBLIC
D3L	COUNTRY-EL SALVADOR
D3M	COUNTRY-GUATEMALA
D3P	COUNTRY-HAITI
D3Q	COUNTRY-HONDURAS
D3U	COUNTRY-ST MAARTEN
D48	MIRROR O/S-LH & RH, REMOTE CONTROL, ELECTRIC, COLOR.
D4G	COUNTRY-BAHAMAS
D4H	COUNTRY-BELIZE
D4N	COUNTRY-COSTA RICA

RPO	Description
D4X	COUNTRY-ARUBA
D5D	COUNTRY-NICARAGUA
D6I	MIRROR I/S FRT VAN-SUNSHADE, DRIVER, W/MIRROR, COVER, ILLUM, PASS, W/MIRROR, COVER, ILLUM
D75	HANDLE O/S DOOR-BODY COLOR
D7A	HANDLE O/S DOOR-BODY COLOR, CHROME STRIP
D7P	SEAT BACK-FOLDING, FLAT, RH
D7X	TRAY-LOAD FLOOR, STORAGE, TWO-PIECE
DD8	MIRROR I/S R/V-LT SENSITIVE
DG6	MIRROR O/S-LH & RH, REMOTE CONTROL, ELECTRIC, MANUAL FOLDING, HEATED, COLOR
DGJ	MIRROR O/S-LH & RH, REMOTE CONTROL, ELECTRIC, MANUAL FOLDING, TURN SIGNAL, COLOR
DLS	MIRROR O/S-LH & RH, REMOTE CONTROL, ELECTRIC, HEATED, MANUAL FOLDING, COLOR, TURN SIG IND
DLV	MIRROR I/S FRT VAN-SUNSHADE, DRIVER & PASS, W/MIRROR & COVER
DPU	COUNTRY-BONAIRE
DPX	COUNTRY-TURKS AND CAICOS ISLANDS
E19	BUMPER-5.0 MPH
E27	HANDLE-ASSIST, PASS
E28	HANDLE-ASSIST
E2U	ORNAMENTATION-LETTERING, "LS"
E3E	HANDLE, REAR CLOSURE-O/S, L/GATE, R/CMPT, CHROME
E7Q	COUNTRY-BRITISH VIRGIN ISLANDS
E90	POCKET-FRONT SEAT BACK, DRIVER
E91	POCKET-FRONT SEAT BACK, PASS
EEQ	TRIM SEAT-CLOTH, PRESS BOX FABRIC
EER	TRIM SEAT-CLOTH, MAGNETIC FABRIC
EF5	COUNTRY-PANAMA
EF7	COUNTRY-UNITED STATES OF AMERICA (USA)
EN6	COVER, RR COMPT-HARD FOLDING, RR COMPT, CARGO
ESN	TRIM SEAT-LEATHERETTE, SHEFFIELD
ESQ	TRIM SEAT-LEATHER, JASMINE
EVK	TRIM SEAT-CLOTH/LEATHERETTE, MAGNETIC
EY7	TRIM SEAT-CLOTH, LIGHTHOUSE
F46	CHASSIS DRIVE LINE-ALL WHEEL DRIVE (AWD), FULL TIME
FE2	SUSPENSION SYSTEM-RIDE, HANDLING
FE4	SUSPENSION SYSTEM-SPECIAL RIDE & HANDLING
FE9	CERTIFICATION-EMISSION, FEDERAL
FHA	FUEL SYSTEM-ELECTRONIC, RETURNLESS
FHO	VEHICLE FUEL-GASOLINE E10
FJT	RATIO-TRANSAXLE FINAL DRIVE 4.933
FJW	VEHICLE FUEL-GASOLINE E15
FLE	TRIM DOOR-PVC LEATHER, PURISME
FW7	RATIO-TRANSAXLE FINAL DRIVE 3.83
FW8	RATIO-TRANSAXLE FINAL DRIVE 4.28
FXH	RATIO-TRANSAXLE FINAL DRIVE 3.53
G6V	PRIMARY COLOR-EXTERIOR, ORANGE ROCK (357X)
G7C	PRIMARY COLOR-EXTERIOR, PULL ME OVER RED SOLID (130X)
G7T	PRIMARY COLOR-EXTERIOR, BAROQUE RED MET (142X)
G7U	PRIMARY COLOR-EXTERIOR, PLUM BERRY MET (143X)
G8F	PRIMARY COLOR-EXTERIOR, SUNSET ORANGE MET (633H)

RPO	Description
GAN	PRIMARY COLOR-EXTERIOR, SWITCHBLADE SILVER MET (G) 636R
GAR	PRIMARY COLOR-EXTERIOR, CARBON FLASH MET (G) 501Q
GAZ	PRIMARY COLOR-EXTERIOR, SUMMIT WHITE (G) 8624
GB8	PRIMARY COLOR-EXTERIOR, BLACK MEET KETTLE MET (384A)
GBV	PRIMARY COLOR-EXTERIOR, CYBER GRAY MET (G) 637R
GCS	PRIMARY COLOR-EXTERIOR, VELVET RED MET (681R)
GD7	PRIMARY COLOR-EXTERIOR, LIQUOR BROWN MET (475A)
GK2	PRIMARY COLOR-EXTERIOR, SON OF A GUN GRAY MET3 (482B)
GQM	PRIMARY COLOR-EXTERIOR, BORACAY BLUE MET (895T)
GTS	PRIMARY COLOR-EXTERIOR, LUXO BLUE MET (933L) (44U)
GWT	PRIMARY COLOR-EXTERIOR, CHAMPAGNE SILVER MET (102V)
GX5	PRIMARY COLOR-EXTERIOR, BLAZE RED (466Y)
GYN	PRIMARY COLOR-EXTERIOR, SNOWFLAKE WHITE PEARL (203V)
GYO	PRIMARY COLOR-EXTERIOR, DEEP ESPRESSO BROWN METALLIC (204V)
I16	ENGINEERING YEAR-2016
J87	INDICATOR-MANUAL TRANS SHIFT
JBD	BOOSTER-BRAKE, SINGLE RATE
JBE	BOOSTER-BRAKE, DUAL RATE
JL4	CONTROL,-ACTIVE BRAKE
JL9	BRAKE SYSTEM-PWR, FRT & RR DISC, ANTILOCK, FRT & RR WHL
JM4	BRAKE SYSTEM-PWR, FRT DISC, RR DRUM, CAST IRON, ANTILOCK, FRT &RR WHL
K05	HEATER ENG-BLOCK
K12	FILTER-AIR, POLLUTANT
K34	CRUISE CONTROL-AUTOMATIC, ELECTRONIC
K4E	BATTERY-LN3, AGM, 12V, 70AH, 760 ENCCA
K60	GENERATOR-100 AMP
KA1	HEATER SEAT FRT-DRVR & PASS
KE3	KNOB-TRANS CONT LEVER, CHROME
KG8	GENERATOR-130 AMP
KI6	RECEPTACLE-ELECTRICAL, FRT CONSOLE RR 110 VOLT
KL9	ENG CONTROL-STOP/START SYS
KNV	KNOB-TRANS CONT LEVER, SATIN SILVER, CHROME
KPK	HEATER-OIL PAN
KR1	REFRIGERANT-AIR CONDITIONING
KRH	FILTER-AIR, POLLUTANT & ODOR
KTF	KEY-PRIMARY FOLDABLE, ADDITIONAL FOLDABLE
LE2	ENGINE-GAS, 4 CYL, L4, 1.4L, DI, DOHC, VVT, TURBO, ALUM, GEN 1, GMNA
LHD	VEHICLE DRIVE-LEFTHAND DRIVE
LUV	ENGINE-GAS, 4 CYL, 1.4L, MFI, DOHC, TURBO, VVT, ALUM, GME, E85 MAX
M4P	TRANSMISSION-MAN 5 SPD, GMAP, 72MM, FWD, 3.81 1ST, 2.15 2ND, 1.34 3RD, 0.97 4TH, 0.76 5TH, D16
M97	SHIFTER INTERLOCK-BRAKE, TRANS
MCY	PORT, ELEK DEVICE-USB ONLY
MDP	MOLDING B/S-ANTHRACITE
MNH	TRANSMISSION-AUTO 6 SPD, 6T40, GEN3, VAR1
MNK	TRANSMISSION-AUTO 6 SPD, 6T40, GEN3

RPO	Description
MR5	TRANSMISSION-MAN 6 SPD, OPEL, 76.5 MM, 4.273 1ST, 2.353 2ND, 1.475 3RD, 1.067 4TH, 0.875 5TH, 0.744 6TH, M32-6 WR
N08	LOCK CONTROL-FUEL FILLER DR, REM CONT
N33	STEERING COLUMN-TILT TYPE
N34	STEERING WHEEL-LEATHER, 3 SPOKES
N37	STEERING COLUMN-TILT, TELESCOPING
N40	STEERING-POWER, NON-VARIABLE RATIO
N45	STEERING WHEEL-3 SPOKES
NBR	EXHAUST-STAINLESS TIP
NE1	CERTIFICATION-EMISSION, GEOGRAPHICALLY RESTRICTED REGISTRATION FOR VEHICLES UP TO 14, 000 LBS GVW (USE 2003 MDL YR
NE9	EMISSION SYSTEM-EEC 09
NJ1	STEERING-POWER, NON-VARIABLE RATIO, ELECTRIC
NKC	NOISE CONTROL-SYSTEM, ACTIVE NOISE CANCELLATION
NT4	EMISSION SYSTEM-EEC 05
NT7	EMISSION SYSTEM-FEDERAL, TIER 2
NU5	EMISSION SYSTEM-CALIFORNIA, BIN 4
NZA	CONTROL-STEERING WHEEL, WIRELESS INTERFACE, RADIO & PHONE, HANDSFREE CONTROLS
PCJ	CONTROL-SALES ITEM NO. 103
PDB	CONTROL-SALES ITEM NO. 119
Q8E	JACK-MECHANICAL, W/TOOLS
RAJ	TIRE ALL-P205/70R16 SL 96H BW AL3
RAK	TIRE ALL-P215/55R18 SL 94H BW AL3
RDK	WHEEL-18 X 7.0, J, ALUMINUM, DESIGN 4
RNI	WHEEL-18 X 7.0, J, ALUMINUM, DESIGN 12
RRY	WHEEL-16 X 6.5, J, STEEL, DESIGN 1
RRZ	WHEEL-16 X 6.5, J, ALUMINUM, DESIGN 1
RVZ	WHEEL SPARE-16 X 4.0, T, STEEL, DESIGN 1
RWK	ACCESSORY-BODY SIDE MOLDINGS - PAINTED
RWU	ACCESSORY-CARGO AREA ORGANIZER - COLLAPSIBLE
S0B	ACCESSORY-HOLDER - SUN GLASS
S3U	ACCESSORY-LAMP KIT - FRONT FOG
SAO	ACCESSORY-SMOKERS PACKAGE
SB7	ACCESSORY-DECAL PACKAGE - DESIGN 1
SDD	ACCESSORY-TRAILER HITCH - FIXED
SE4	ACCESSORY-WHEEL - 18" - ALUMINUM - DESIGN 1
SFE	ACCESSORY-WHEEL LOCKS
SJ8	ACCESSORY-ILLUMINATION PACKAGE - INTERIOR AMBIENT
SPM	PLANT CODE-SAN LUIS POTOSI, MEXICO
T3U	LAMP FRT FOG-FRT FOG
T3W	LAMP SYSTEM-DAYTIME RUNNING, REDUCED INTENSITY LOW BEAM
T4A	HEADLAMPS-HALOGEN
T83	CONTROL, HEADLAMPS-AUTOMATIC ON-OFF
TD1	REFLECTOR-SAFETY TRIANGLE
TDY	ORNAMENTATION-LETTERING, "CHEVROLET"
TM7	BATTERY-LN2, FLA, 12V, 60AH, 438 ENCCA
TVM	LAMP-TAIL & STOP, SAE
U04	HORN-SINGLE NOTE
U05	HORN-DUAL
U18	SPEEDOMETER-INST, KILO

RPO	Description
U2K	DIGITAL AUDIO SYSTEM-S-BAND
U68	DISPLAY-DRIVER INFO CENTER
U71	ANTENNA-ROOF, RADIO
U80	DISPLAY-COMPASS
UBA	ANTENNA-ROOF, RADIO, GPS, PHONE, S BAND XM
UC1	SPEEDOMETER-INST, MILES
UC3	CONTROL-STEERING WHEEL, RADIO & PHONE, REDUNDANT CONTROLS
UD5	PARK ASSIST-FRONT AND REAR
UD7	PARK ASSIST-REAR
UDB	DISPLAY INSTRUMENT-DRIVER INFO ENHANCED (SEGMENTED)
UDC	DISPLAY INSTRUMENT-DRIVER INFO ENHANCED (ONE COLOR GRAPHIC)
UDG	DISPLAY INSTRUMENT-TRIP ODOMETER (SEGMENTED)
UDN	INFOTAINMENT DISPLAY-COLOR INFO DISPLAY (CID) 7", WVGA
UE1	COMMUNICATION SYSTEM-VEHICLE, ONSTAR
UEU	SENSOR INDICATOR-FORWARD COLLISION ALERT
UF7	RADIO-AM/FM STEREO, SEEK/SCAN, ETR, CLOCK DSP, MP3/WMA, USB, AUX/IN, WIRELESS INTERFACE
UFG	SENSOR INDICATOR-REAR CROSS TRAFFIC ALERT
UFL	LANE ACTIVE SAFETY-DEPARTURE WARNING
UFT	SIDE ACTIVE SAFETY-OBSTACLE DETECTION
UFU	RADIO-AM/FM STEREO, SINGLE CD, MP3 (AUX IN), USB, GMNA
UGM	SENSOR EQUIPMENT-OUTSIDE AIR TEMPERATURE SENSOR
UH0	INDICATOR-SEAT BELT WARNING, LH
UH1	INDICATOR-SEAT BELT WARNING, RH
UH7	RADIO-AM/FM STEREO, SEEK/SCAN, CD, ETR, CLOCK DSP, MP3/WMA, USB, AUX/IN, WIRELESS INTERFACE
UHQ	RADIO-AM/FM STEREO, SINGLE CD, MP3 (AUX IN), USB, NAVIGATION (GMNA VERSION)
UJM	TIRE PRESS INDICATOR-MANUAL LEARN
UMT	RADIO-AM/FM STEREO, SEEK/SCAN, CLOCK, ETR, USB
UP9	WIRELESS INTERFACE-SHORT RANGE, VOICE RECOG, MUSIC NAVIGATOR, STREAMING AUDIO
UPF	WIRELESS INTERFACE-SHORT RANGE, VOICE REC
UQ3	SPEAKER SYSTEM-ENHANCED AUDIO
UQA	SPEAKER SYSTEM-PREMIUM AUDIO BRANDED WITH AMPLIFIER
UQG	SPEAKER SYSTEM-ENHANCED AUDIO WITH AMPLIFIER
UQL	RESTRAINT PROVISIONS-CHILD, ISOFIX 2 POINT ONLY, POINT/LAT CH(INC 3 TOP TETHER POINTS)
USR	RECEPTACLE-USB
UTJ	THEFT DETERENT-ELECTRICAL, UNAUTHORIZED ENTRY
UVC	VISION-REAR VIEW, MONO, ANALOG
UVD	STEERING WHEEL HEAT-MANUAL
UW4	SPEAKER SYSTEM-4, CUSTOM
UW6	SPEAKER SYSTEM-6, CUSTOM
V2P	LUGGAGE CARRIER-RF RAIL
V48	COOLANT-ENGINE MAXIMUM PROTECTION
V5M	CALIBRATION-TCM, NEUTRAL IDLE CONTROL
V5O	EQUIPMENT-IIHS IMPROVEMENT
V61	RAIL-LOAD FLOOR
VAV	ACCESSORY-FLOOR MATS - ALL WEATHER

RPO	Description
VEY	EQUIPMENT-SKID PLATE, FASCIA, SILVER
VGC	PROTECTOR-FILM, PAINT ETCH PREVENTIVE
VIX	PLATE-VEHICLE IDENTIFICATION - VISUAL (GMDAT)
VK3	LICENSE PLATE FRONT-FRT MOUNTING PKG
VK8	HOLDER-EYEGLASSES
VLI	ACCESSORY-MAT - TRUNK / CARGO AREA
VLL	ACCESSORY-CROSS RAILS - ROOF RACK - REMOVABLE
VMT	BUMPER-FRT LOW SPEED, RR LIGHT WEIGHT
VNU	VIN FORMAT-U.S. TYPE
VQK	ACCESSORY-SPLASH GUARDS - CUSTOM MOLDED
VRV	ACCESSORY-SPLASH GUARDS - CUSTOM MOLDED - PAINTED
VS1	FIRST AID KIT-VEHICLE
VV4	COMMUNICATION EQUIP-MOBILE INTERNET CONNECTIVITY
W2D	ACCESSORY-CARGO NET
WCM	ORNAMENTATION-LETTERING "LT"
WJN	ORNAMENTATION-LETTERING, "TRAX"
WMG	VIN MODEL YEAR-2016
WR7	WHEEL-16 X 6.5, J, ALUMINUM, DESIGN 9
WWA	ORNAMENTATION-LETTERING "LTZ"
XL4	CHASSIS OPTIONS-PROTECTION KIT, ENGINE COMPARTMENT
XL7	FREQUENCIES RATING-315 MHZ, LONG DISTANCE
YF5	CERTIFICATION-EMISSION, CALIFORNIA
YM8	IDENTIFICATION-LIMITED PERSONALIZATION OPTION (LPO)
Z1Y	PAINT-TWO COAT, BASE COAT & CLEAR COAT
Z49	COUNTRY-CANADA
ZDC	TIRE SPARE-T125/70R16 SL 96 M BW SPR
ZFH	TIRE SPARE-T125/70D16 SL 96M BW SPR

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

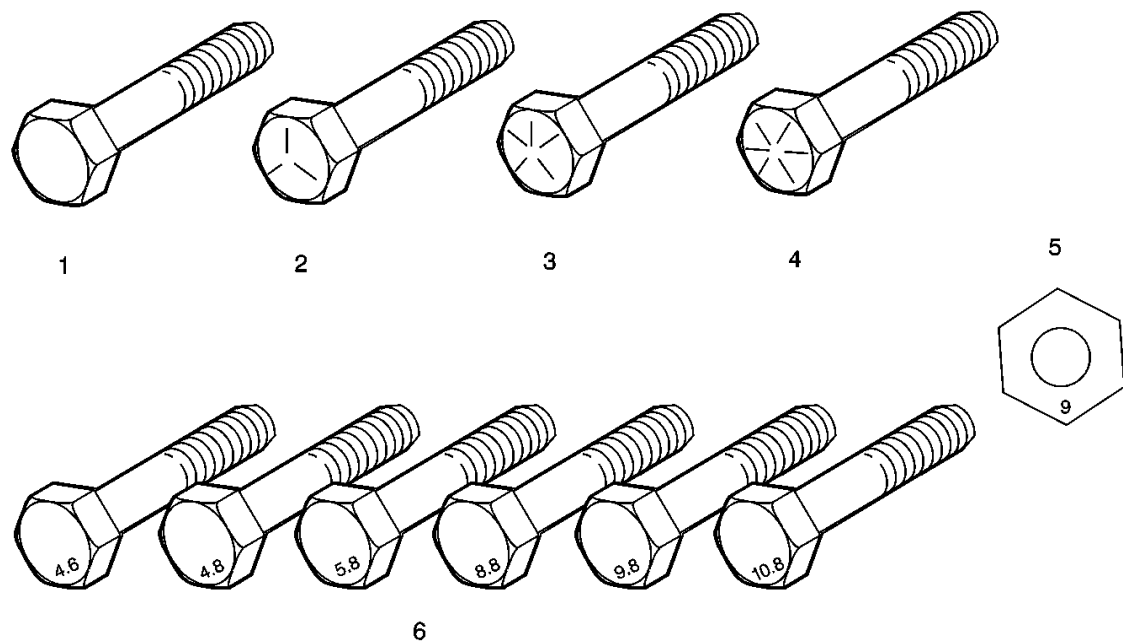


Fig. 6: Identifying Fastener Strength Marks
Courtesy of GENERAL MOTORS COMPANY

Callout	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.

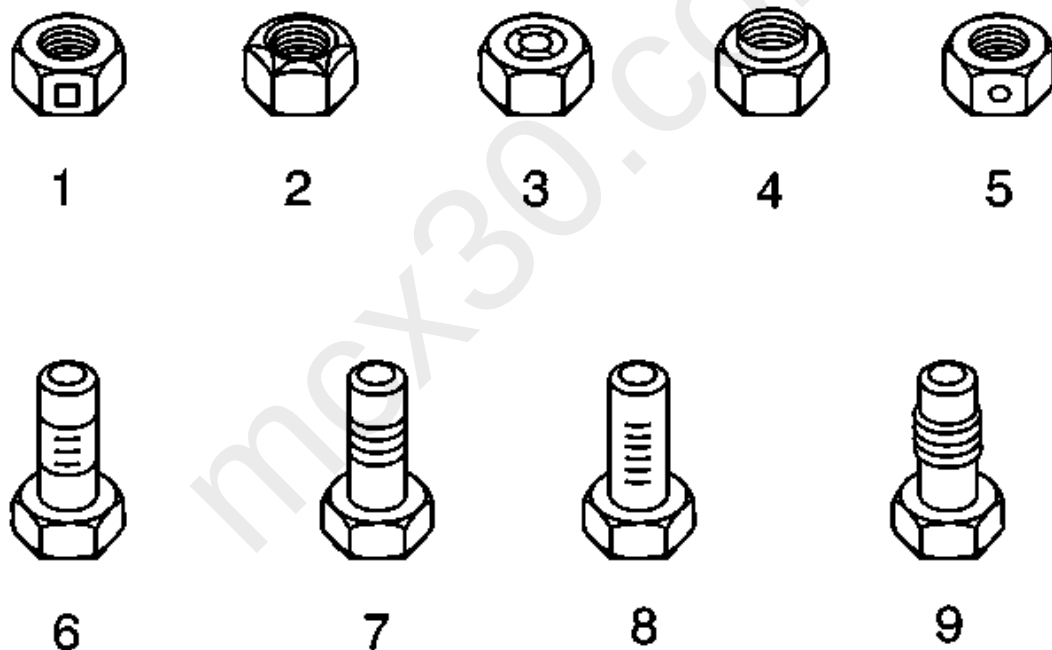


Fig. 7: Identifying Adhesive Coated Fasteners
Courtesy of GENERAL MOTORS COMPANY

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

Callout	Component Name
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

Metric Prevailing Torque Fastener Minimum Torque Development

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

Application	Specification	
	Metric	English
• 20 mm	5.5 N.m	49 lb in
• 24 mm	8.5 N.m	75 lb in

English Prevailing Torque Fastener Minimum Torque Development

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

THREAD INSERTS

General Purpose Thread Repair Kits.

These kits are available commercially.

Repair Procedure

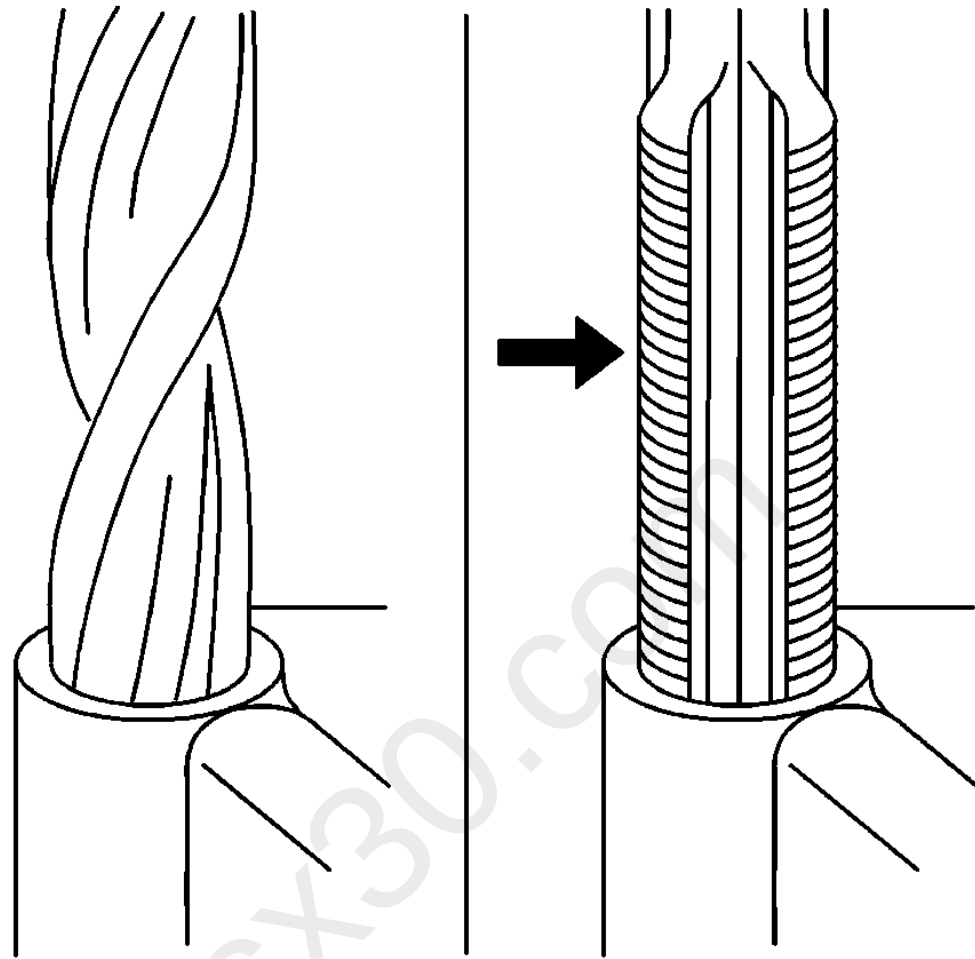


Fig. 8: Drilling & Tapping Damaged Threads
Courtesy of GENERAL MOTORS COMPANY

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

NOTE: Refer to the thread repair kit manufacturer 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. Lubricate the tap with light engine oil. Tap the hole. Clean the threads.

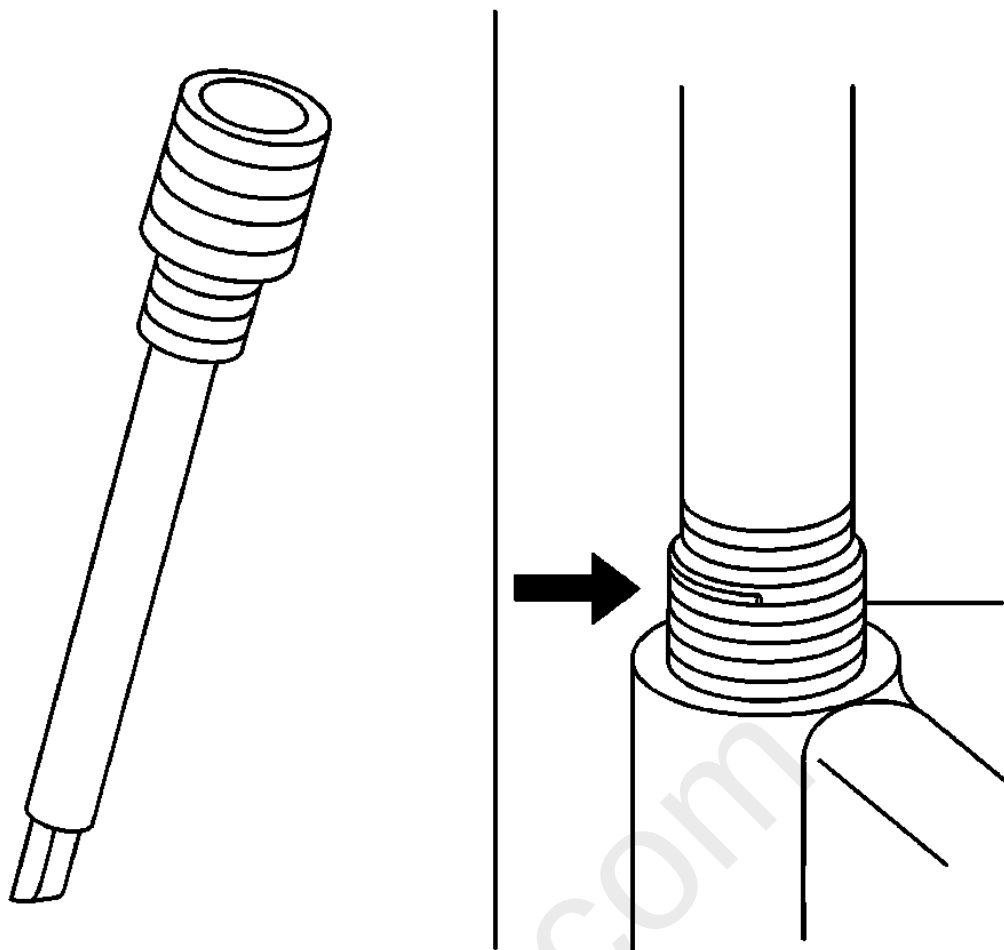


Fig. 9: View Of Thread Insert
Courtesy of GENERAL MOTORS COMPANY

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®
ACDelco®
Active Fuel Management™
Acuzinc®
Airbank®
Allison®
AMMCO®
AUTOFUSE®

AUTOTRACA®
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®
GM®
GM Goodwrench Service®
GM Optikleen®
GM Parts™
GM Pass®
GM Ultralite®
GMAC®
Goodwrench®
GTP®
H

Homelink™
HYDRA-MATIC®
I
Illumination®
INSTA-TRAC®
Intune®
L
LOCTITE™
Lord Fusor™
M
MAGNASTEER®
Maxifuse®
Metripack®
Micropack®
Minifuse®
Mr Goodwrench®
N
Northstar®
O
OnStar®
Optikleen®
P
PASS-KEY®
PASS-KEYII®
PASSLOCK™
PK3®
Pozidriv®
Pro®
Q
Quad 4®
R
RAINSENSE™
Rapid Fire®
S
ScotchBrite™
Scotchguard™
Signals®
Sikkens™
Soft-Ray®
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 (FREE WHEELING)

Special Tools

BO-49753 Assembly Tool

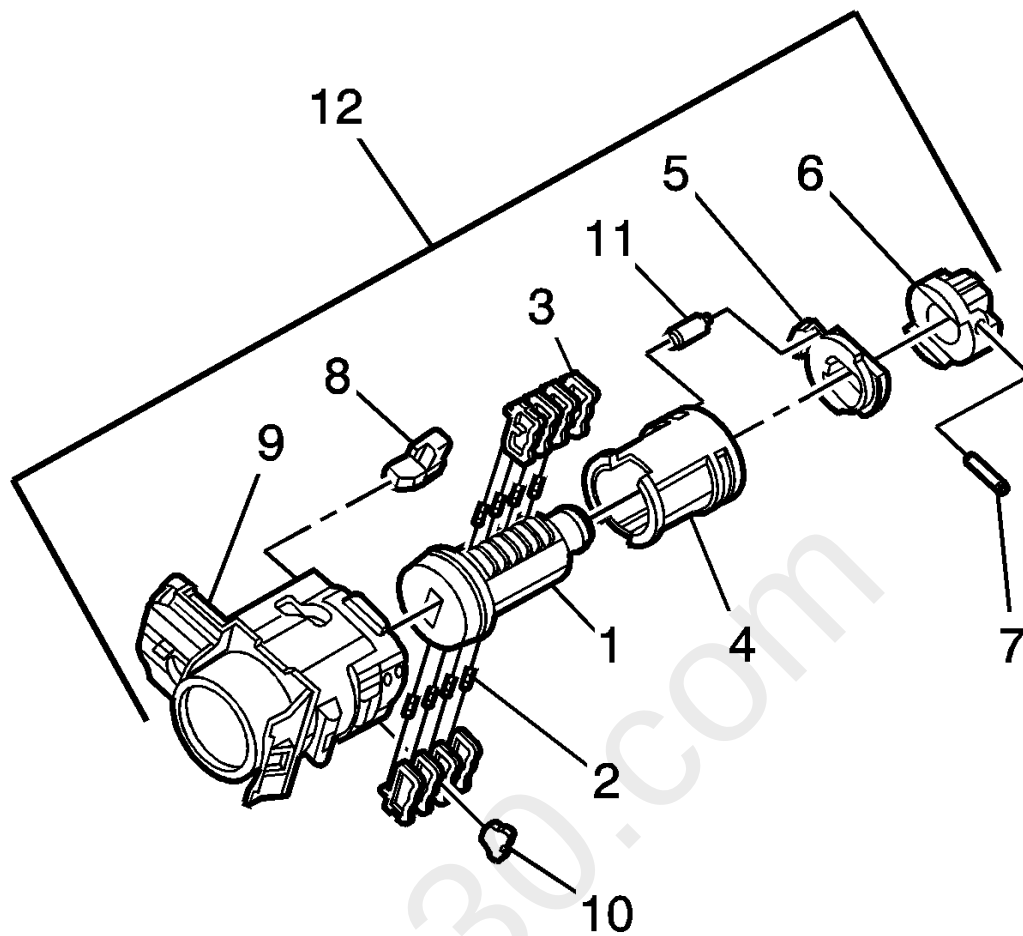


Fig. 10: Identifying Lock Components

Courtesy of GENERAL MOTORS COMPANY

The door lock cylinder uses 8 of the 8 cut positions. The tumbler positions are staggered from side to side, 4 on one side and 4 on the other, are not self-retaining, and are not snap in.

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. Hold the door lock cylinder (1) so the side with the 4 tumbler spring pockets faces up, pocket nearest to the cylinder head.
2. Insert the tumbler springs (2) into the 4 spring pockets. This side uses left tumblers.

3. Install the tumbler (3) for key cut position one in the slot nearest to the front of the lock cylinder. Install the remaining tumblers, key cut positions 3, 5, and 7, following the key code and same process. Press the tumblers in place until they are secure.
4. Check the correct loading of the tumblers by inserting the key into the cylinder. All tumblers should be flush with the lock cylinder body.
5. Turn the cylinder so the side with the 4 tumbler spring wells faces up. This side uses right tumblers.
6. Insert the tumbler springs into the 4 spring pockets.
7. The first tumbler closest to the front of the lock cylinder to be loaded will be the second key cut position, the second number in the key code. Install the remaining tumblers for the key cut positions 4, 6, and 8. Press the tumblers in place until they are secure.
8. Check the correct loading of the tumblers by inserting the key into the cylinder. All tumblers should be flush with the lock cylinder body.
9. Insert the key and lightly lubricate the cylinder body diameter and tumbler surfaces and a small amount in the head of the cylinder using the supplied grease.
10. Insert the sleeve (4) onto the cylinder assembly.
11. Insert the clutch (5) and driver (6) onto the cylinder (1).

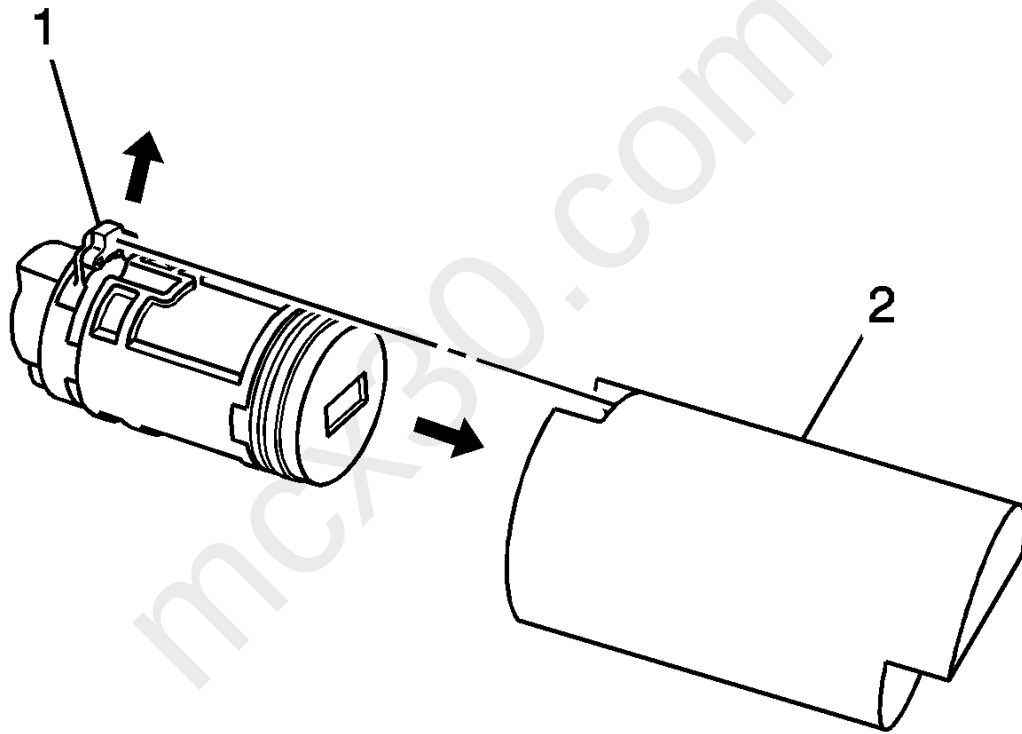


Fig. 11: Loading Cylinder Into Special Tool

Courtesy of GENERAL MOTORS COMPANY

12. Load the cylinder into the **BO-49753** assembly tool so that the clutch (1) indexes with the notch in the opening of the tool (2).

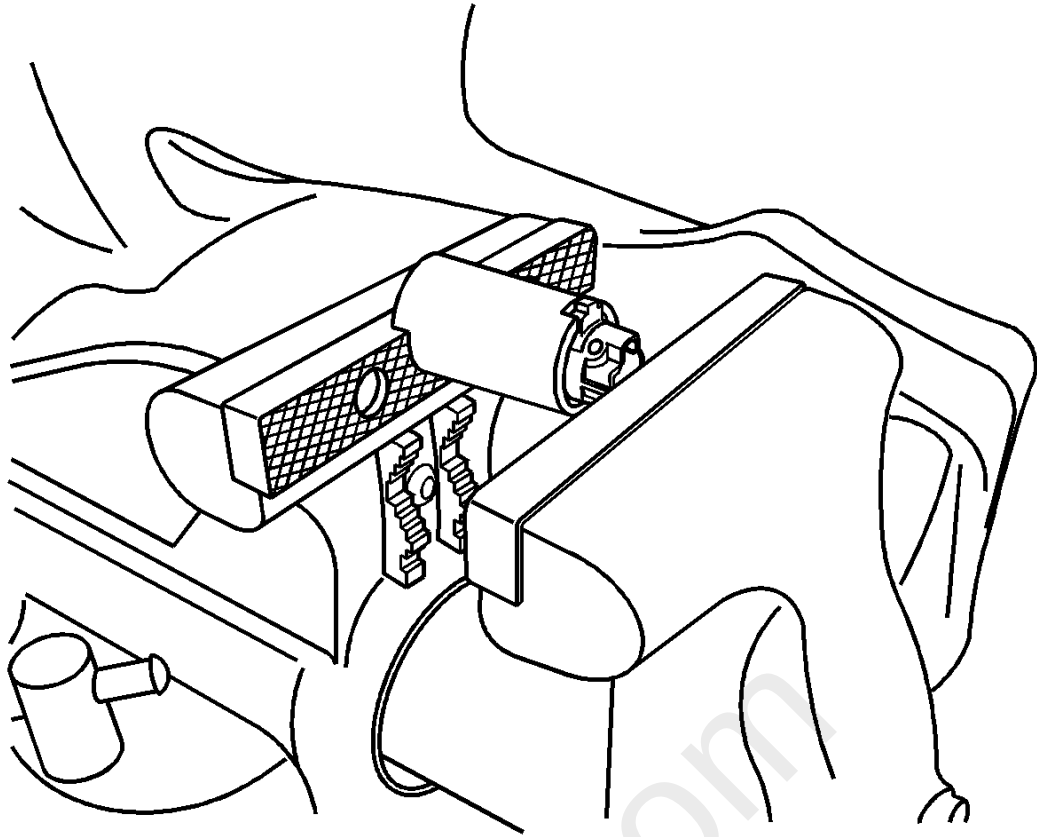


Fig. 12: Loading Assembly Tool Into Vice
Courtesy of GENERAL MOTORS COMPANY

13. Load the assembly tool with the lock cylinder into a vice and tighten the vice ONLY enough to hold the tool and lock the cylinder in place.

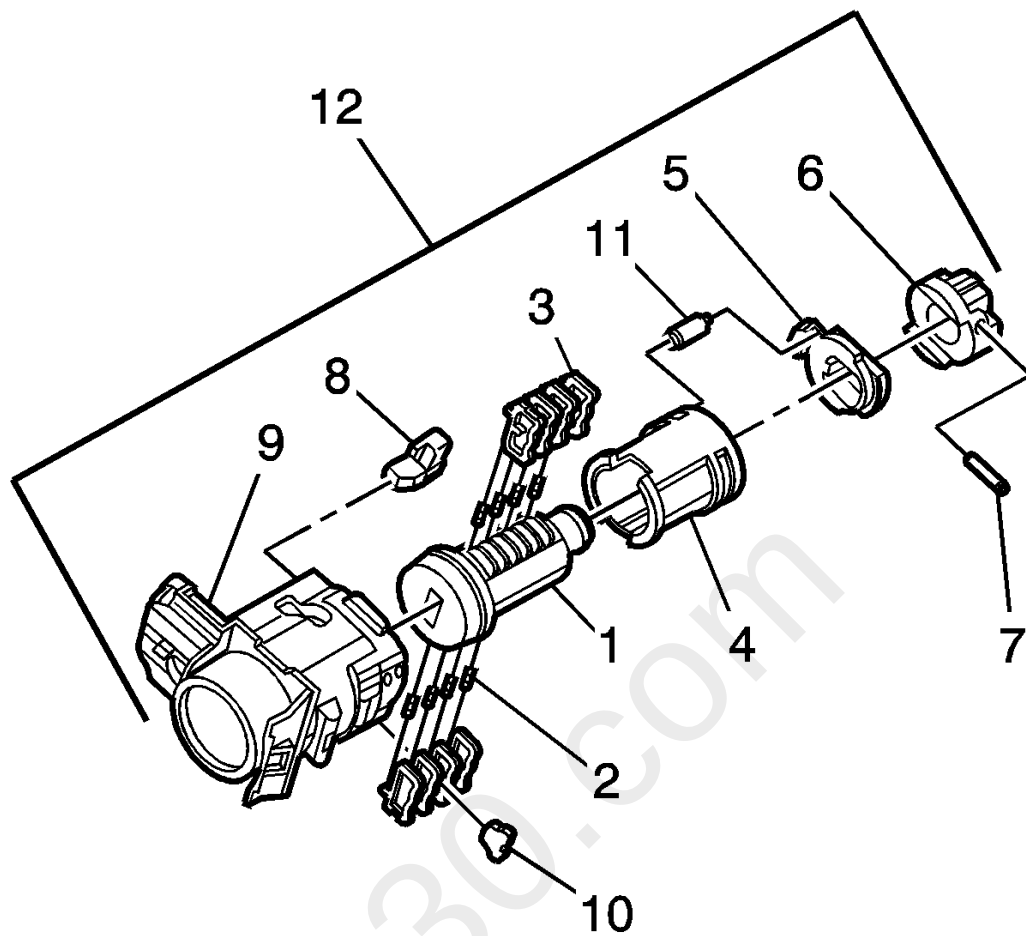


Fig. 13: Identifying Lock Components

Courtesy of GENERAL MOTORS COMPANY

14. Insert the roll pin (7) into the driver (6) and install it using a 1/16 inch pin punch.
15. Insert the buffer (8) in the case (9), verify the buffer is properly seated.
16. Install the free wheel pin (11) in the sleeve (4) and clutch (5) and insert the assembly into the case (9).
17. With the lock cylinder assembly installed in the case (9), install the retainer (10) and stake the retainer in place using a small punch and hammer to peen the case material onto the exposed ends of the installed retainer (10).
18. Insert the key into the lock and function the lock to check for proper assembly and smooth operation.

FRONT SIDE DOOR LOCK CYLINDER CODING (NON FREE WHEELING)

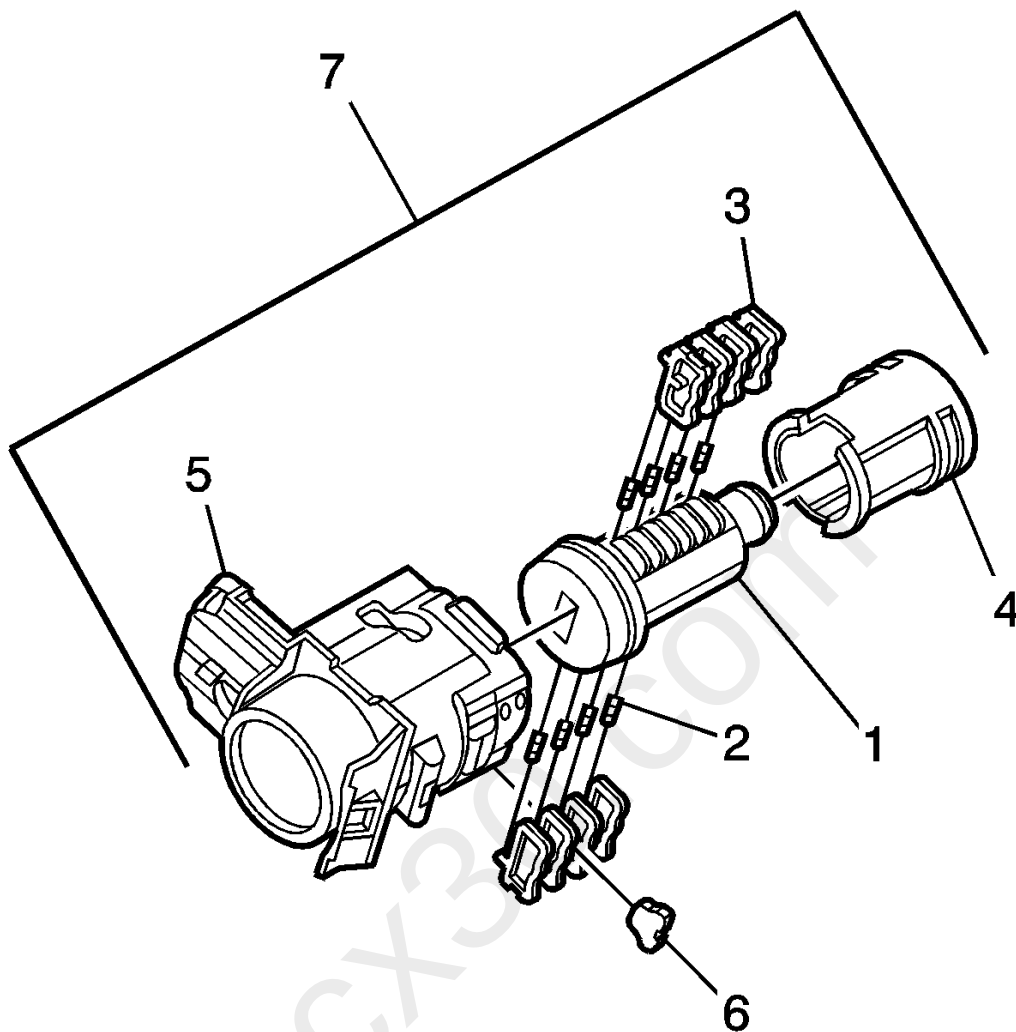


Fig. 14: Door Lock Cylinder Components (Non Free Wheeling)
 Courtesy of GENERAL MOTORS COMPANY

The door lock cylinder uses 8 of the 8 cut positions. The tumbler positions are staggered from side to side, 4 on one side and 4 on the other, are not self-retaining, and are not snap in.

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. Hold the door lock cylinder (1) so the side with the 4 tumbler spring pockets faces up, pocket nearest to the cylinder head.
2. Insert the tumbler springs (2) into the 4 spring pockets. This side uses left tumblers.

3. Install the tumbler (3) for key cut position one in the slot nearest to the front of the lock cylinder. Install the remaining tumblers, key cut positions 3, 5, and 7, following the key code and same process. Press the tumblers in place until they are secure.
4. Check the correct loading of the tumblers by inserting the key into the cylinder. All tumblers should be flush with the lock cylinder body.
5. Turn the cylinder so the side with the 4 tumbler spring wells faces up. This side uses right tumblers.
6. Insert the tumbler springs into the 4 spring pockets.
7. The first tumbler closest to the front of the lock cylinder to be loaded will be the second key cut position, the second number in the key code. Install the remaining tumblers for the key cut positions 4, 6, and 8. Press the tumblers in place until they are secure.
8. Check the correct loading of the tumblers by inserting the key into the cylinder. All tumblers should be flush with the lock cylinder body.
9. Insert the key and lightly lubricate the cylinder body diameter and tumbler surfaces and a small amount in the head of the cylinder using the supplied grease.
10. Insert the sleeve (4) onto the cylinder assembly.
11. Insert the assembly into the case (5).
12. With the lock cylinder assembly installed in the case (5), install the retainer (6) and stake the retainer in place using a small punch and hammer to peen the case material onto the exposed ends of the installed retainer (6).
13. Insert the key into the lock and function the lock to check for proper assembly and smooth operation.

LOCK CYLINDER CODING - IGNITION

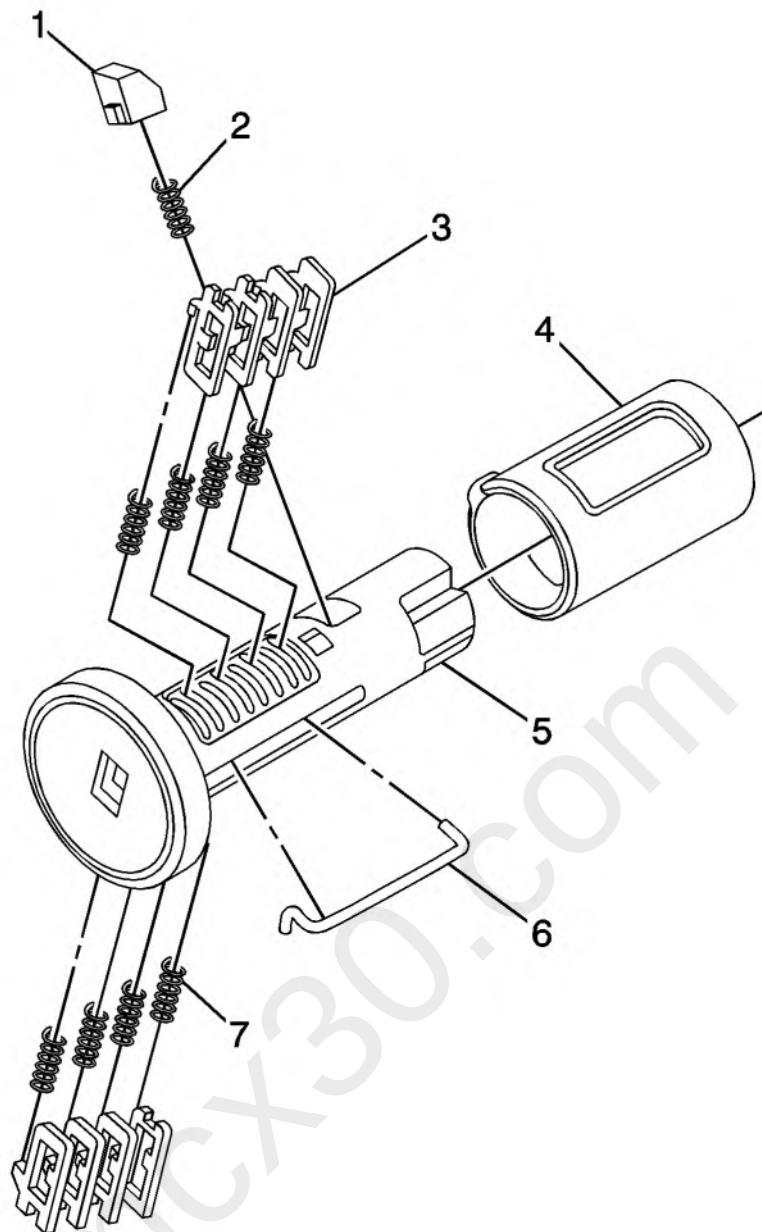


Fig. 15: Lock Cylinder Coding - Ignition

Courtesy of GENERAL MOTORS COMPANY

The ignition lock cylinder uses 8 key cut positions, 1-8. The ignition cylinder tumblers (3) are located on alternate sides of the cylinder (5). They are not snap-in and are not self-retaining. It follows the key code with the first tumbler being the first depth of the key code, closest to the head of the key.

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. Hold the ignition cylinder assembly (5) so the side with the tumbler spring pocket located closest to the head of the cylinder is facing up.

2. Insert the tumbler spring (7) into each of the 4 spring pockets of the cylinder assembly. This side of the cylinder used left tumblers.
3. The first tumbler (3) to be loaded will be the first key cut position, which is the first number in the key code. Install the tumbler in the slot over the spring. Install the remaining right tumblers following the key code and same process, pressing the tumblers in place until they are secure.
4. Rotate the cylinder assembly. Insert the tumbler spring into each of the spring pockets of the cylinder assembly. This side of the cylinder used right tumblers.
5. The first tumbler (3) to be loaded will be the second key cut position, the second number in the key code. Install the first tumbler in the slot over the spring. Install the remaining left tumblers following the key code and same process, pressing the tumblers in place until they are secure.
6. Inspect for correct loading of the tumblers by inserting the key into the cylinder. All tumblers should drop flush with the lock cylinder body diameter.
7. With the key in the cylinder assembly insert the round connector (6), insert the retainer spring (2) in the retainer slot located in the cylinder assembly. Insert the retainer (1) lining it up in the slot over the spring. Depress the retainer and hold.
8. Insert the cylinder into the sleeve (4) as shown in the print. Make sure the actuator stays located properly in the cylinder.
9. When the key is removed, the lock should stay together.
10. Lightly lubricate the outside surface in the tumbler area of in the lock body and down the key slot using the provided grease. Insert and extract the key 5 times to lubricate the keyway.
11. Insert the key and function the lock 3 times to distribute the grease inside the sleeve.
12. Verify the key position for inserting the lock into the column.

REAR COMPARTMENT LID AND LIFTGATE LOCK CYLINDER CODING

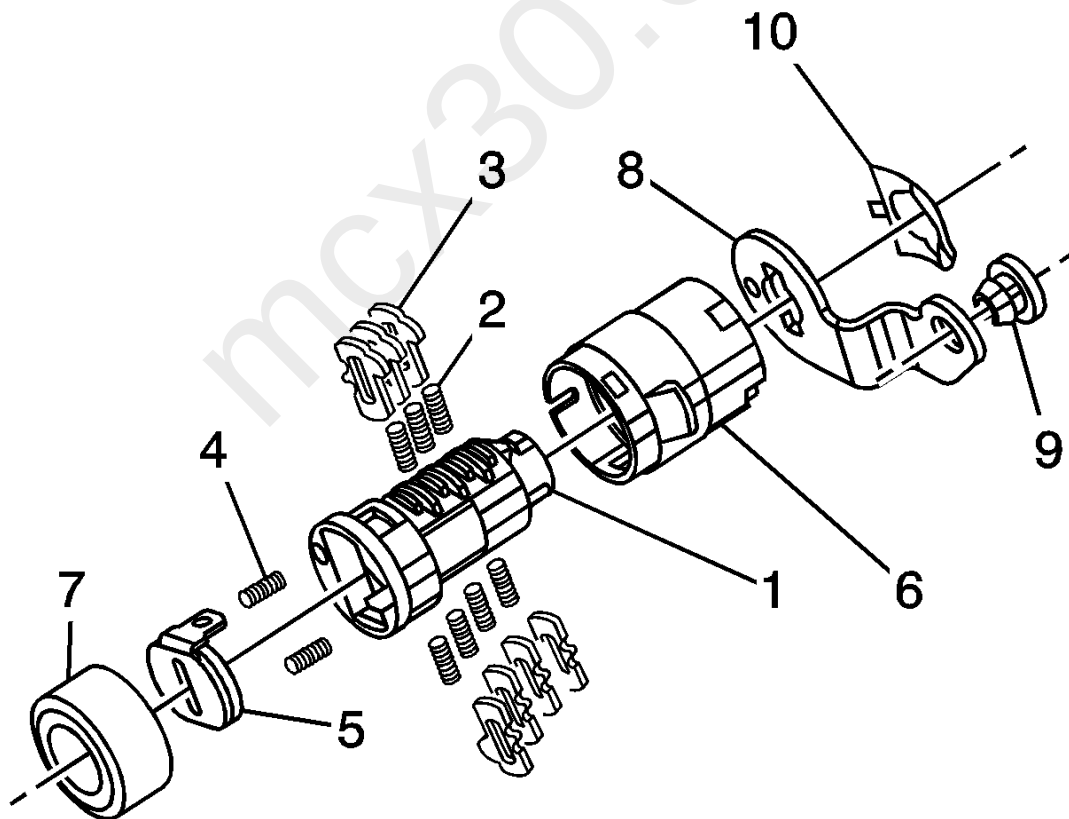


Fig. 16: Exploded View Of Lock Cylinder
 Courtesy of GENERAL MOTORS COMPANY

The deck lock cylinder only uses 7 of the 10 cut positions, 4 through 10. The tumbler positions are staggered from side to side, 4 on one side and 3 on the other side. The deck lock cylinder tumblers are self-retaining. After removing the current lock, identify the direction the lever or switch is attached to tail of the lock.

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 4 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 4 in the slot closest to the cylinder. Install the remaining tumblers, key cut positions 6, 8 and 10, following the key code and same process. Press the tumblers in place until they are secure.
4. Check the correct loading of the tumblers by inserting the key into the cylinder. All 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 the tumbler springs into the 3 spring wells.
7. The first tumbler closest to the front of the lock cylinder to be loaded will be the fifth key cut position. Install the remaining tumblers for key cut positions 7 and 9. Press the tumblers in place until they are secure.
8. Check the 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 spring wells in the head of the lock cylinder.
11. Snap the shutter assembly (5) into the cylinder.
12. Assemble the cylinder into the case (6).
13. Align dimples of the cylinder cap (7) with the 4 recesses in the cap. Secure by pressing the cap into place with light hand pressure. If the package contains a switch assembly instead of a lever, assembly switch to back of the lock matching the orientation of the lock removed. Place washer on top of switch and secure with retainer clip (10).
14. If required, assemble the rod clip (9) to the lever (8) using the recorded lever information.
15. Assemble the lever to the lock. Use retainer clip (10) to retain the lever assembly.
16. If supplied, assemble the gasket to the lock.
17. Insert the key into the lock and function the lock to check for proper assembly and smooth operation.

LIFTING AND JACKING THE VEHICLE

NOTE: The use of a **LOW PROFILE LIFT ARMS SYSTEM** may be required to avoid unwanted contact with the vehicle's body and structure depending on lifting equipment used. Refer to the manufacture's recommendation for their applications of low profile lift arms system for their lifting equipment.

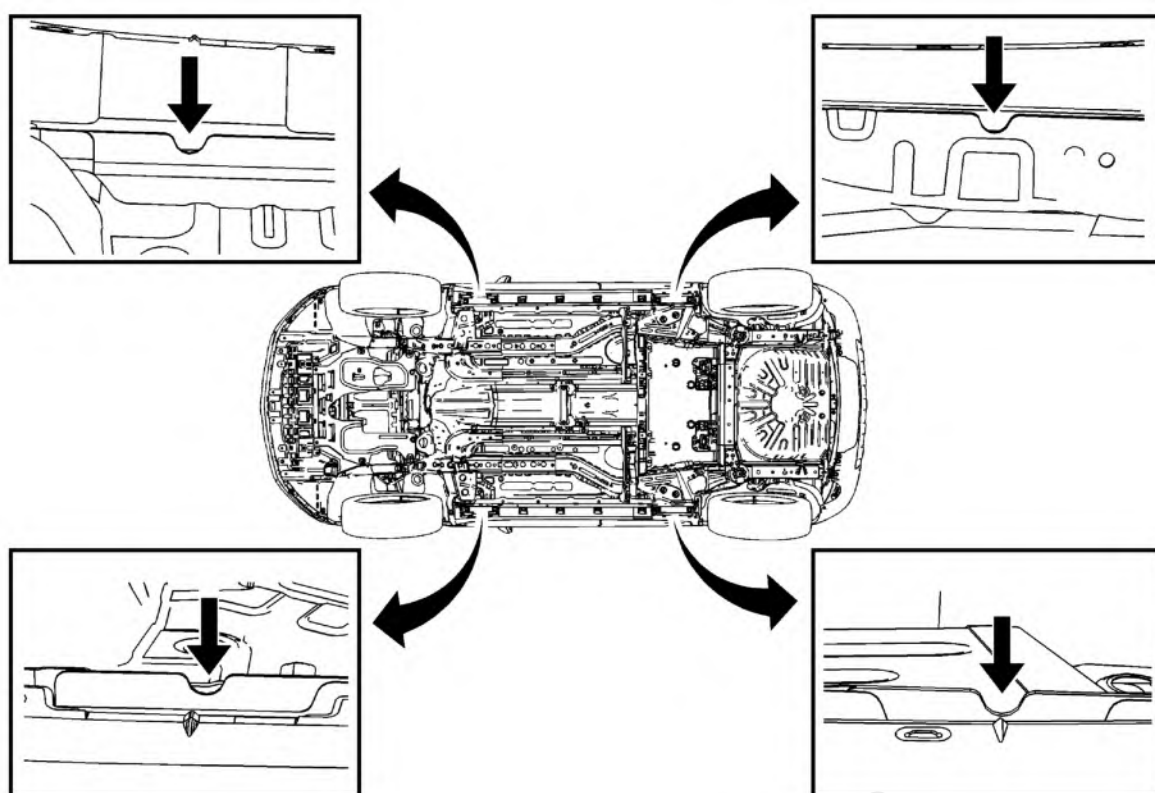


Fig. 17: Lifting and Jacking Points

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.
- When performing work in the engine compartment or under the vehicle, ensure that the hood is fully open, or opened to its secondary latch. When the hood is opened to the secondary latch, the vehicle will disable the remote start features from the key fob and OnStar mobile app. Failure to open the hood, or open the hood to the secondary latch while doing a repair in the engine compartment or under the vehicle can result in inadvertent vehicle starting which could result in personal injury or damage to a vehicle.

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.

Vehicle Lifting- Frame Contact Lift

Front Lift Pads

When lifting the vehicle with a frame-contact lift, place the front lift pads on the rocker outer panel weld flange, as shown

Rear Lift Pads

When lifting the vehicle with a frame-contact lift, place the rear lift pads on the rocker outer panel weld flange, as shown.

Vehicle Jacking

CAUTION: When you are jacking the vehicle at the front locations, be certain that the jack or the jack lift pad does not contact the front fascia, front fascia air dam, or the front fenders. If such contact occurs, vehicle damage may result. When jacking at selected front locations additional clearance may be required for the jacking points.

NOTE: When you are lifting a vehicle with a service jack, block the wheels at the opposite end from which you are lifting. Use jack stands to provide additional support.

Front of Vehicle

When using a service jack under the front of the vehicle use one of the following locations:

Place the service jack pad in the same location as shown for the front lift pads.

Rear of Vehicle

NOTE: Place jackstands **ONLY** under strong and stable vehicle structures.

Place the service jack pad in the same location as shown for the rear lift pads.

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

U.S.A

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

03600 Mexico City

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

Mitla No. 442 Col. Vertiz Narvarte

03600 Mexico City

Mexico

Phone: +5255 2595 1630

Fax: +5255 2595 1639

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

Brazil:

Bosch Automotive Service Solutions

Av. Maria Coelho de Aguiar, 573 - G10

05805-000 São Paulo

Brasil

Phone: +55 11 5851-7477

Fax: +55 11 5853-7479

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

Korea, Thailand, Vietnam, Laos, Cambodia:

Robert Bosch Korea Ltd, Service Solution

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

Fax: 0086 21 2218 2677

Australia:

Bosch Automotive Service Solutions Australia

1555 Centre Road,

Clayton

Vic. 3168

Phone: 1300 783 031

Fax: (3) 9541 6138

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

Iberica S.A.

Dealers based in Spain, Portugal and Canary Islands:

Bosch Automotive Service Solutions Europe

Nave 72 (Nudo Oeste), 19004 Guadalajara,

Spain

Phone: 34 949 208 337

Fax: 34 949 208 327

shop.service-solutions.com

Europe GmbH

Dealers based in The Netherlands, Belgium and Luxemburg:

Bosch Automotive Service Solutions Europe

Albert Tijsstraat 12, 6471 WX Kerkrade,

Netherlands

Phone: 31 -45 567 8870

Fax: 31-45 567 8871

shop.service-solutions.com

United Kingdom Limited

Dealers based in UK:

Bosch Automotive Service Solutions Europe

Ironstone Way; Brixworth, Northants, NN6 9UD,

Great Britain

Phone: 44 -1327 303 400

Fax: 44 -1327 303 499

shop.service-solutions.com

Italy

Dealers based in Italy:

Bosch Automotive Service Solutions Europe

Via provinciale, 12, 43038 Sala Baganza-PR,

Italy

Phone: 39 -521 837 508

Fax: 39 - 521 335 385

shop.service-solutions.com

Tech 2, MDI Diagnostic Tools and Accessories, Dealer Equipment

US and Canada

Dealer Equipment and Services

5775 Enterprise Drive

Warren

MI, U.S.A

48092-3463

Phone: 1-800-GM-TOOLS

Monday through Friday

8:00 am-6:00 pm EST

Fax: 1-586-578-7205

www.GMDEsolutions.net (US only) or www.des-canada.ca (Canada only)

mcx30.com