

2021 ENGINE

Engine Mechanical - 3.6L (LGZ) - Specifications - Canyon, Colorado

SPECIFICATIONS

FASTENER SPECIFICATIONS

Single Use Non-Threaded Fasteners/Components

NOTE:

***All
fasteners/components
listed in this table
MUST BE
DISCARDED and
replaced with NEW
after removal.***

Application
Camshaft Cover Seal
Connecting Rod Bearing
Crankshaft Lower Bearing
Crankshaft Thrust Upper Bearing
Crankshaft Upper Bearing
Crankshaft Rear Oil Seal Housing
Cylinder Head Gasket
Engine Coolant Thermostat Gasket
Engine Oil Level Indicator Switch O-Ring Seal
Engine Oil Manifold Check Valve
Fuel Feed Intermediate Pipe
Fuel Injector Nozzle Housing Seal
Fuel Injector Retainer
Fuel Injector Spacer
Fuel Pump Bracket Gasket
Fuel Pump O-Ring
Heater Inlet and Outlet Pipe Gasket
Intake Manifold Seal
Oil Filter
Oil Filter Gasket
Oil Level Indicator Tube Seal
Oil Pan High Pressure Port Seal
Oil Pump Housing Passage Seal
Oil Pump Suction Pipe Gasket
Positive Crankcase Ventilation Oil Separator Seal
Piston Pin Retainer
Spark Plug Shield Seal
Throttle Body Gasket
Timing Chain Tensioner Gasket
Turbocharger Coolant Feed and Return Pipe Gasket
Vacuum Pump Seal
Valve Stem Oil Seal
Water Inlet Seal

NOTE:

All fasteners/components listed in this table MUST BE DISCARDED and replaced with NEW after removal.

Application

Water Outlet Seal

Water Pump Gasket

Single Use Threaded Fastener/Component Tightening Specifications**NOTE:**

All fasteners/components listed in this table MUST BE DISCARDED and replaced with NEW after removal.

Application	Specification
	Metric (English)
Automatic Transmission Flex Plate Bolt	
• First Pass:	30 N.m (22 lb ft)
• Final Pass:	45 degrees
Connecting Rod Bolt	
• First Pass:	25 N.m (18 lb ft)
• Final Pass:	110 degrees
Crankshaft Balancer Bolt	
• First Pass:	80 N.m (59 lb ft)
• Final Pass:	125 degrees
Crankshaft Bearing Cap Bolt- Inner	
• First Pass:	20 N.m (15 lb ft)
• Final Pass:	120 degrees
Crankshaft Bearing Cap Bolt- Outer	
• First Pass:	20 N.m (15 lb ft)
• Final Pass:	80 degrees
Crankshaft Bearing Cap Bolt- Side	
• First Pass:	30 N.m (22 lb ft)

NOTE:

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Application	Specification
	Metric (English)
• Final Pass:	60 degrees
Cylinder Head BoltM8 x 80.8	
• First Pass:	15 N.m (11 lb ft)
• Final Pass:	75 degrees
Cylinder Head BoltM11 x 178	
• First Pass:	60 N.m (44 lb ft)
• Final Pass:	185 degrees
Engine Flywheel Bolt	67 N.m (49 lb ft)
Engine Mount Bolt- Left Side	58 N.m (43 lb ft)
Engine Mount Bolt- Right Side	
• First Pass:	85 N.m (63 lb ft)
• Final Pass:	45-60 degrees
Engine Mount Bracket Bolt- Left Side	
• First Pass:	50 N.m (37 lb ft)
• Final Pass:	60-75 degrees
Engine Mount Bracket Bolt- Right Side	58 N.m (43 lb ft)
Fuel Pump Bolt	25 N.m (18 lb ft)
Oil Pan Bolt M6	
• First Pass:	7 N.m (62 lb in)
• Final Pass:	180 degrees
Oil Pump Drive Bolt	
• First Pass:	15 N.m (11 lb ft)
• Final Pass:	110 degrees
Wiring Harness Connector Bolt	10 N.m (89 lb in)

Reusable Threaded Fastener Tightening Specifications

NOTE:

All fasteners listed in this table can be reused after removal.

Application	Specification
	Metric (English)
Camshaft Bearing Cap BoltM6 x 43.4	
• First Pass:	6 N.m (53 lb in)
• Final Pass:	45 degrees
Camshaft Bearing Cap BoltM6 x 43.4	
• Final Pass:	60 degrees
• First Pass:	6 N.m (53 lb in)
Camshaft Carrier BoltM6 x 60	
• First Pass:	6 N.m (53 lb in)
• Final Pass:	45 degrees
Camshaft Carrier BoltM6 x 60	
• First Pass:	6 N.m (53 lb in)
• Final Pass:	60 degrees
Camshaft Cover Bolt	15 N.m (11 lb ft)
Camshaft Position Actuator Bolt	
• First Pass:	20 N.m (15 lb ft)
• Final Pass:	45 degrees
Camshaft Position Actuator Solenoid Valve Bolt	10 N.m (89 lb in)
Camshaft Position Sensor Bolt	10 N.m (89 lb in)
Clutch Pressure Plate Bolt	30 N.m (22 lb ft)
Crankshaft Oil Deflector Nut	10 N.m (89 lb in)
Crankshaft Position Sensor Bolt	10 N.m (89 lb in)
Crankshaft Rear Oil Seal Housing Bolt	10 N.m (89 lb in)
Cylinder Head Core Hole PlugM12	25 N.m (18 lb ft)
Cylinder Head Core Hole PlugM14	35 N.m (26 lb ft)
Cylinder Head Oil Gallery Plug	10 N.m (89 lb in)
Cylinder Head Oil Gallery PlugM20	15 N.m (11 lb ft)
Cylinder Head Oil Gallery Plug	25 N.m (18 lb ft)
Cylinder Head Opening Plate Bolt	10 N.m (89 lb in)
Drive Belt Tensioner Bolt	30 N.m (22 lb ft)
Engine Block Oil Gallery Plug	25 N.m (18 lb ft)
Engine Block Oil Gallery PlugM16	40 N.m (30 lb ft)

NOTE:

All fasteners listed in this table can be reused after removal.

Application	Specification
	Metric (English)
Engine Block Core Hole Plug	40 N.m (30 lb ft)
Engine Block Core Hole PlugM18	45 N.m (33 lb ft)
Engine Coolant Air Bleed Pipe Bolt	10 N.m (89 lb in)
Engine Coolant Outlet Pipe Bolt	10 N.m (89 lb in)
Engine Coolant Temperature Sensor	9 N.m (80 lb in)
Engine Coolant Thermostat Housing Bolt	10 N.m (89 lb in)
Engine Front Cover BoltM6 x 45	10 N.m (89 lb in)
Engine Front Cover BoltM6 x 60	10 N.m (89 lb in)
Engine Front Cover BoltM8 x 66	15 N.m (11 lb ft)
Engine Front Cover BoltM12 x 55.8	60 N.m (44 lb ft)
Engine Front Cover BoltM12 x 75.9	60 N.m (44 lb ft)
Engine Front Cover Stud	15 N.m (11 lb ft)
Engine Mount Bracket Shield Bolt	5 N.m (44 lb in)
Engine Oil Cooler Adapter BoltM8 x 90.8	22 N.m (16 lb ft)
Engine Oil Cooler Fitting	35 N.m (26 lb ft)
Engine Oil Level Indicator Switch Bolt	10 N.m (89 lb in)
Engine Oil Pressure Sensor	35 N.m (26 lb ft)
Evaporative Emission Canister Purge Solenoid Valve Bolt	10 N.m (89 lb in)
Engine Wiring Harness Bracket Bolt	10 N.m (89 lb in)
Fuel Feed Intermediate Pipe Bolt	28 N.m (21 lb ft)
Fuel Feed Pipe Bolt	10 N.m (89 lb in)
Fuel Injection Fuel Rail Bolt	25 N.m (18 lb ft)
Fuel Injection Fuel Rail Fuel Pressure Sensor	33 N.m (24 lb ft)
Fuel Injection Fuel Feed Pipe Bracket Bolt	10 N.m (89 lb in)
Fuel Rail Crossover Pipe Fitting	30 N.m (22 lb ft)
Generator Bracket Bolt	22 N.m (16 lb ft)
Heater Inlet and Outlet Pipe Bolt	9 N.m (80 lb in)
Ignition Coil Bolt	10 N.m (89 lb in)
Intake Manifold Bolt	10 N.m (89 lb in)
Intake Manifold Bolt	25 N.m (18 lb ft)
Intake Manifold Insulator Retainer	7 N.m (62 lb in)
Knock Sensor Bolt	25 N.m (18 lb ft)
Lower Oil Pan Bolt	10 N.m (89 lb in)
Manifold Absolute Pressure Sensor Bolt	1.5 N.m (13 lb in)
Oil Filter Adapter Bolt	10 N.m (89 lb in)
Oil Filter Adapter Cap	25 N.m (18 lb ft)
Oil Level Indicator Tube Bolt	10 N.m (89 lb in)
Oil Pan Baffle Bolt	10 N.m (89 lb in)
Oil Pan BoltM8	25 N.m (18 lb ft)
Oil Pan Bolt M8	25 N.m (18 lb ft)
Oil Pan Drain Plug	25 N.m (18 lb ft)

NOTE:

All fasteners listed in this table can be reused after removal.

Application	Specification
	Metric (English)
Oil Pump Bolt	15 N.m (11 lb ft)
Oil Pump Suction Pipe Bolt	10 N.m (89 lb in)
Oil Pump Flow Control Valve Bolt	10 N.m (89 lb in)
Positive Crankcase Ventilation Oil Separator Drain Bolt	10 N.m (89 lb in)
Positive Crankcase Ventilation Oil Separator Bolt	15 N.m (11 lb ft)
Positive Crankcase Ventilation Oil Separator Drain Pipe Bolt	10 N.m (89 lb in)
Piston Oil Cooling Nozzle Bolt	10 N.m (89 lb in)
Spark Plug	18 N.m (13 lb ft)
Timing Chain Guide Bolt	25 N.m (18 lb ft)
Timing Chain Tensioner Bolt	25 N.m (18 lb ft)
Throttle Body Bolt	10 N.m (89 lb in)
Water Outlet Bolt	10 N.m (89 lb in)
Water Pump Bolt	15 N.m (11 lb ft)
Water Pump Inlet Pipe Bolt	15 N.m (11 lb ft)
Water Pump Pulley Bolt	10 N.m (89 lb in)

APPROXIMATE FLUID CAPACITIES

Application	Specification	
	Metric	English
3.6L LGZ		
• Oil Capacity - with Filter	5.7 Liters	6.0 Quarts

ENGINE MECHANICAL SPECIFICATIONS

Application	Specification	
	Metric	English
General		
• Engine Type	V-6	
• Displacement	3.6 Liter	220 cu in
• RPO	LGZ	
• VIN	N	
• Bore	95 mm	3.7402 in
• Stroke	85.6 mm	3.37 in
• Compression Ratio	10.2:1	
• Firing Order	1-2-3-4-5-6	
• Spark Plug Gap	0.90 mm	0.035 in
Block		
• Crankshaft Main Bearing Bore Diameter	76.021 - 76.035 mm	2.9929 - 2.9935 in
• Cylinder Bore Diameter	94.992 - 95.008 mm	3.7398 - 3.7405 in
• Cylinder Bore Out-of-Round - Production Max.	0.026 mm	0.001 in
Camshaft		
• Camshaft Bearing Inside Diameter - Front Number 1	31.000 - 31.020 mm	1.2205 - 1.2213 in
• Camshaft Bearing Inside Diameter - Middle and Rear Number 2 - 4	24.000 - 24.020 mm	0.9449 - 0.9457 in
• Camshaft End Play	0.055 - 0.465 mm	0.0022 - 0.0183 in
• Camshaft Journal Diameter - Front Number 1	30.936 - 30.960 mm	0.9424 - 0.9433 in
• Camshaft Journal Diameter - Middle and Rear Number 2 - 4	23.936 - 23.960 mm	1.0605 - 1.0614 in
• Camshaft Journal Out-of-Round	0.006 mm	0.0002 in
• Camshaft Journal to Bore Clearance	0.040 - 0.084 mm	0.0016 - 0.0033 in
• Camshaft Lobe Lift - Exhaust AFM	40.557 - 40.707 mm	1.5967 - 1.6026 in
• Camshaft Lobe Lift - Exhaust Non AFM	42.519 - 42.669 mm	1.6740 - 1.6799 in

Application	Specification	
	Metric	English
• Camshaft Lobe Lift - Intake AFM	40.353 - 42.503 mm	1.5887 - 1.5946 in
• Camshaft Lobe Lift - Intake Non AFM	42.317 - 42.467 mm	1.6660 - 1.6719 in
• Camshaft Runout - Front and Rear Number 1 and 4	0.025 mm	0.0010 in
• Camshaft Runout - Middle 2 and 3	0.050 mm	0.0020 in
• Valve Lift - Exhaust AFM	11.350 mm	0.4468 in
• Valve Lift - Exhaust Non AFM	11.222 mm	0.4418 in
• Valve Lift - Intake AFM	11.00 mm	0.4331 in
• Valve Lift - Intake Non AFM	10.872 mm	0.4280 in
Connecting Rod		
• Connecting Rod Bearing Clearance	0.010 - 0.070 mm	0.0004 - 0.0026 in
• Connecting Rod Bore Diameter - Bearing End	60.920 - 60.936 mm	2.3984 - 2.3990 in
• Connecting Rod Bore Diameter - Pin End - Production	23.007 - 23.017 mm	0.9056 - 0.9062 in
• Connecting Rod Bore Diameter - Pin End - Service Maximum	23.021 mm	0.9063 in
• Connecting Rod Length - Center to Center	148.8 mm	5.86 in
• Connecting Rod Side Clearance	0.095 - 0.355 mm	0.00037 - 0.0140 in
• Connecting Rod Width - Bearing End		
• Production	21.775 mm	0.8573 in
• Service	21.725 - 21.825 mm	0.8553 - 0.8593 in
• Connecting Rod Width - Pin End		
• Production	21.775 mm	0.8573 in
• Service	21.725 - 21.825 mm	0.8553 - 0.8593 in
Crankshaft		
• Connecting Rod Journal Diameter	57.292 - 57.308 mm	2.2556 - 2.2556 in
• Connecting Rod Journal Out-of-Round	0.005 mm	0.0002 in

Application	Specification	
	Metric	English
• Connecting Rod Journal Taper	0.005 mm	0.0002 in
• Connecting Rod Journal Width		
• Production	23.000 mm	0.9055 in
• Service	22.920 - 23.080 mm	0.9024 - 0.9417 in
• Crankshaft End Play	0.100 - 0.330 mm	0.0039 - 0.0130 in
• Crankshaft Main Bearing Clearance	0.028 - 0.063 mm	0.0011 - 0.0025 in
• Crankshaft Main Journal Diameter	70.992 - 71.008 mm	2.7950 - 2.7956 in
• Crankshaft Main Journal Out-of-Round	0.005 mm	0.0002 in
• Crankshaft Main Journal Taper	0.005 mm	0.0002 in
• Crankshaft Main Journal Thrust Wall		
• Runout	0.000 - 0.040 mm	0.0000 - 0.0016 in
• Square	0.000 - 0.010 mm	0.0000 - 0.0004 in
• Crankshaft Main Journal Width, #2, 4		
• Production	25.500 mm	1.0040 in
• Service	25.400 - 25.600 mm	1.0000 - 1.0079 in
• Crankshaft Main Journal Width, #3		
• Production	25.900 mm	1.0197 in
• Service	25.875 - 25.925 mm	1.0187 - 1.0207 in
• Crankshaft Pilot Bearing Bore Diameter	20.965 - 20.995 mm	0.8254 - 0.8266 in
• Crankshaft Rear Flange Runout	0.025 mm	0.0010 in
• Crankshaft Reluctor Ring Runout - Maximum	1.500 mm	0.0591 in
• Crankshaft Runout	0.030 mm	0.0012 in
• Crankshaft Thrust Bearing Clearance	0.076 - 0.305 mm	0.0030 - 0.0120 in
• Crankshaft Thrust Surface - Height Diameter	99.500 mm	3.9173 in

Application	Specification	
	Metric	English
Cylinder Head		
• Valve Guide Bore - Exhaust	6.000 - 6.020 mm	0.2362 - 0.2370 in
• Valve Guide Bore - Intake	6.000 - 6.020 mm	0.2362 - 0.2370 in
• Valve Guide Installed Height	16.050 - 16.550 mm	0.6319 - 0.5516 in
• Valve Seat Width - Exhaust Seating Surface	1.550 - 1.950 mm	0.0610 - 0.0768 in
• Valve Seat Width - Exhaust Relief Surface	0.780 - 0.980 mm	0.0307 - 0.0386 in
• Valve Seat Width - Intake Seating Surface	1.000 - 1.400 mm	0.0394 - 0.0551 in
• Valve Seat Width - Intake Relief Surface	0.500 - 0.700 mm	0.0197 - 0.0276 in
• Valve Lifter Bore Diameter	12.008 - 12.030 mm	0.4728 - 0.4736 in
Lubrication System		
• Oil Pressure - Minimum @ Idle	69 kPa	10 psi
• Oil Pressure - Minimum @ 2, 000 RPM	136 kPa	20 psi
• Piston Cooling Jet Valve Opening Pressure	3.15 - 3.85 bar	45.7 - 55.8 psi
Piston Rings		
• Piston Ring End Gap		
• First Compression Ring - Nominal	0.140 - 0.240 mm	0.0055 - 0.0102 in
• First Compression Ring - Maximum, Ring in Bore	0.290 mm	0.0094 in
• Second Compression Ring - Nominal	0.300 - 0.450 mm	0.0118 - 0.0177 in
• Second Compression Ring - Maximum, Ring in Bore	0.490 mm	0.0193 in
• Oil Control Ring	0.150 - 0.350 mm	0.0059 - 0.0138 in
• Piston Ring to Groove Clearance		
• First Compression Ring	0.03 - 0.08 mm	0.0011 - 0.0031 in
• Second Compression Ring	0.020 - 0.060 mm	0.0007 - 0.0024 in
• Oil Control Ring	0.06 - 0.19 mm	0.0024 - 0.0075 in
• Piston Ring Thickness		

First Compression Ring Application	Specification	
	Metric	English
Second Compression Ring	1.170 - 1.195 mm	0.0461 - 0.0470 in
Oil Control Ring	1.360 - 1.480 mm	0.0535 - 0.0583 in
Pistons and Pins		
Piston		
Piston Diameter - Measured Over Skirt Coating	94.976 - 95.014 mm	3.7392 - 3.7407 in
Piston Diameter - Service Limit Minimum w/more than 10K miles	94.926 mm	3.7372 in
Piston Pin Bore Diameter	23.004 - 23.009 mm	0.9055 - 0.9056 in
Piston Ring Groove Width - First Compression Ring	1.02 - 1.05 mm	0.0402 - 0.0413 in
Piston Ring Groove Width - Second Compression Ring	1.210 - 1.230 mm	0.0476 - 0.0484 in
Piston Ring Groove Width - Oil Control Ring	2.01 - 2.03 mm	0.0791 - 0.0799 in
Piston to Bore Clearance - Production; Measured at Skirt Coating	0.022 - 0.032 mm	0.0009 - 0.0013 in
Piston to Bore Clearance - Service Limit Maximum, w/more than 10k miles	0.050 mm	0.0020 in
Pin		
Piston Pin Clearance to Connecting Rod Bore - Production	0.007 - 0.020 mm	0.0002 - 0.0007 in
Piston Pin Clearance to Connecting Rod Bore - Service Maximum	0.030 mm	0.0012 in
Piston Pin Clearance to Piston Pin Bore - Production	0.004 - 0.012 mm	0.0002 - 0.0005 in
Piston Pin Clearance to Piston Pin Bore - Service Maximum	0.015 mm	0.0006 in
Piston Pin Diameter	22.997 - 23.000 mm	0.9053 - 0.9055 in
Piston Pin Length	55.7 - 56.0 mm	2.193 - 2.205 in
Valve System		
Valves		

Application	Specification	
	Metric	English
• Valve Face Angle	44 degrees (from combustion face)	
• Valve Face Runout	0.0500 mm	0.0020 in
• Valve Face Width - Exhaust	DO NOT GRIND, REPLACE VALVE	DO NOT GRIND, REPLACE VALVE
• Valve Face Width - Intake	DO NOT GRIND, REPLACE VALVE	DO NOT GRIND, REPLACE VALVE
• Valve Head Diameter - Exhaust	31.37-31.63 mm	1.2350-1.2453 in
• Valve Head Diameter - Intake	39.27-39.53 mm	1.5460-1.5563 in
• Valve Installed Height	35.23 - 36.69 mm	1.3870 - 1.4445 in
• Valve Length - Exhaust	100.54 mm	3.9583 in
• Valve Length - Intake	106.321 mm	4.1858 in
• Valve Seat Angle - Seating Surface	45 degrees	
• Valve Seat Angle - Relief Surface	30 degrees	
• Valve Seat Roundness - Maximum	0.008 mm	0.0003 in
• Valve Seat Runout - Maximum	0.025 mm	0.0010 in
• Valve Stem Diameter - Exhaust	5.945 - 5.965 mm	0.2341 - 0.2348 in
• Valve Stem Diameter - Intake	5.595 - 5.975 mm	0.2344 - 0.2352 in
• Valve Stem-to-Guide Clearance - Exhaust	0.035 - 0.075 mm	0.0014 - 0.0030 in
• Valve Stem-to-Guide Clearance - Intake	0.025 - 0.065 mm	0.0009 - 0.0025 in
• Valve Lifters - Stationary Hydraulic Lash Adjuster (SHLA)		
• Valve Lifter (SHLA) Diameter	11.989 - 12.000 mm	0.4720 - 0.4724 in
• Valve Lifter (SHLA)-to-Bore Clearance	0.008 - 0.041 mm	0.0003 - 0.0016 in
• Rocker Arms		
• Valve Rocker Arm Ratio	1.68 to 1	
• Valve Rocker Arm Roller Diameter	17.750 - 17.800 mm	0.6988 - 0.7008 in
• Valve Springs		

• Valve Spring Coil Thickness Application	Specification	
	Metric	English
• Valve Spring Diameter - Inside Top	12.200 - 12.700 mm	0.4803 - 0.5000 in
• Valve Spring Diameter - Inside Bottom	17.950 - 18.450 mm	0.7067 - 0.7264 in
• Valve Spring Free Length	44.34-47.34 mm	1.7457-1.8638 in
• Valve Spring Installed Height - Closed	37.50 mm	1.4764 in
• Valve Spring Installed Height - Open	26.2 mm	1.0315 in
• Valve Spring Load - Closed	247 - 273 N	56 - 61 lb
• Valve Spring Load - Open	611 - 669 N	137 - 150 lb

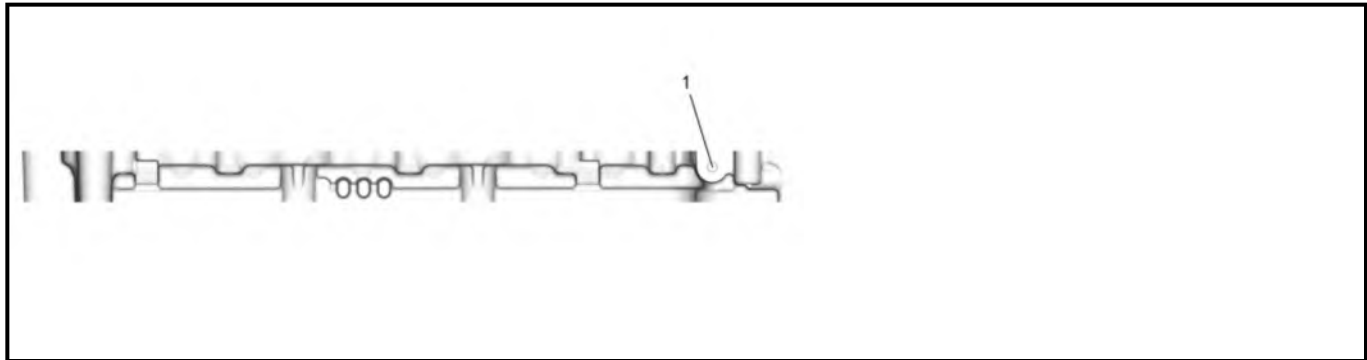
ADHESIVES, FLUIDS, LUBRICANTS, AND SEALERS

Application	Type of Material	GM Part Number	
		United States	Canada
Block Pan Rail *	Sealant	19369831	19369832
Camshaft Prelube	Lubricant	88862586	88862827
Camshaft Carrier	Sealant	19369831	19369832
Coolant Drain Threaded Plug	Sealant	12346004	10953480
Coolant Expansion Plugs	Threadlocker	12345382	10953489
Coolant and Oil Plug Threads	Sealant	12346004	10953480
Crankshaft Bearing Surfaces	5W-30	88865926	19353385
Crankshaft Connecting Rod Bearing Journal	5W-30	88865926	19353385
Crankshaft Prelube	5W-30	88865926	19353385
Crankshaft Rear Oil Seal Housing *	Sealant	19369831	19369832
Engine Front Cover/Split Lines *	Sealant	19369831	19369832
Engine Oil	5W-30	88865926	19353385
Fuel Injection Fuel Rail Fuel Pressure Sensor Sealing Cone/Threads	5W-30	88865926	19353385
Fuel Rail Sealing Cone/Threads	5W-30	88865926	19353385
Ignition Coils	Lubricant	19260901	19260902
Oil Gallery Threaded Plug	Sealant	12346004	10953480
Oil Pan *	Sealant	19369831	19369832
Piston Pin Bores	5W-30	88865926	19353385
Positive Crankcase Ventilation (PCV) Orifice	Sealant	19369831	19369832
Stationary Hydraulic Lash Adjustor (SHLA)	5W-30	88865926	19353385
SHLA Bores in Cylinder Head	5W-30	88865926	19353385
SHLA Pivot Spheres	5W-30	88865926	19353385
Thread Repair	Cleaner	88862650	88901247
	Threadlocker	89021297	10953488
Thread Repair Cutting Oil	Lubricant	1052864	992881
Valve Stem/Guide ID	5W-30	88865926	19353385

Application	Type of Material	GM Part Number	
		United States	Canada
* Ensure proper use of room temperature vulcanizing (RTV) sealant. <u>Use of Room Temperature Vulcanizing (RTV) and Anaerobic Sealant</u>			

THREAD REPAIR SPECIFICATIONS

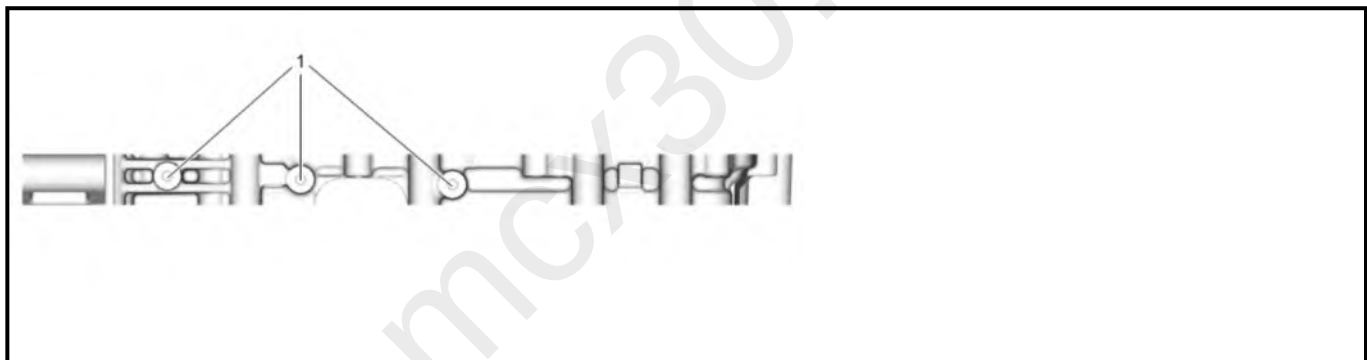
Left Cylinder Head Camshaft Carrier Left Face



Left Cylinder Head Camshaft Carrier Left Face

Hole Location	Thread Size	Drill	Counter Bore Tool	Stop Collar	Tap	Driver	Insert	Drill Depth (Maximum)		Tap Depth (Minimum)	
EN-42385 -								MM	(IN)	MM	(IN)
1	M6 x 1.0	201	202	N/A	203	204	63	23.0	.907	23.0	.907

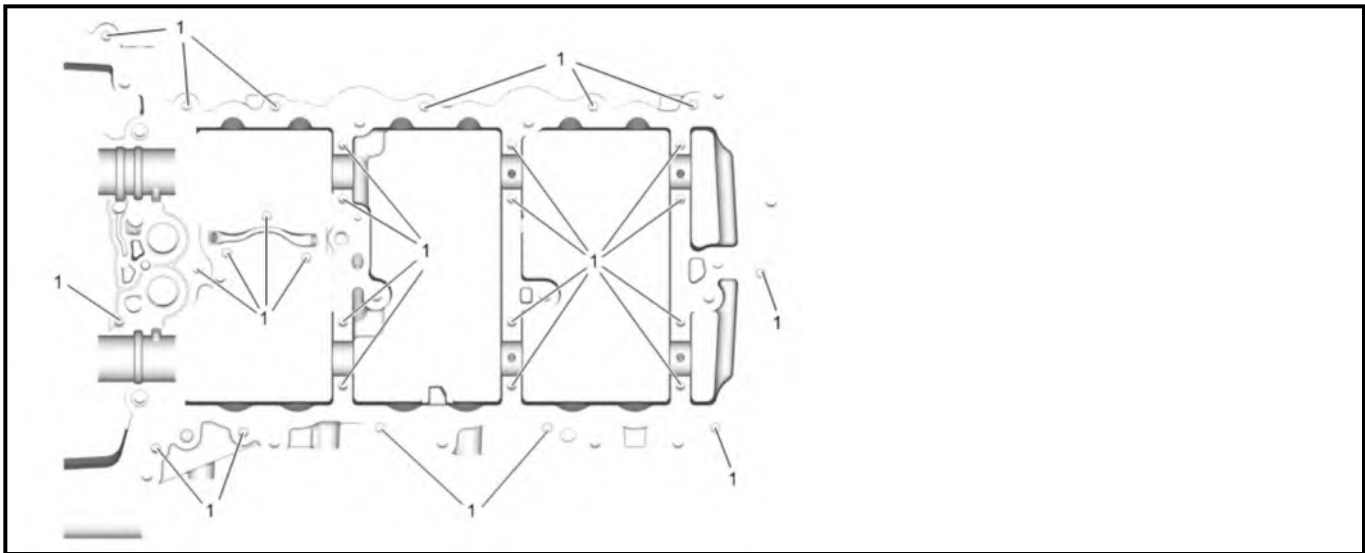
Left Cylinder Head Camshaft Carrier Right Face



Left Cylinder Head Camshaft Carrier Right Face

Hole Location	Thread Size	Drill	Counter Bore Tool	Stop Collar	Tap	Driver	Insert	Drill Depth (Maximum)		Tap Depth (Minimum)	
EN-42385 -								MM	(IN)	MM	(IN)
1	M6 x 1.0	201	202	N/A	203	204	63	23.0	.907	23.0	.907

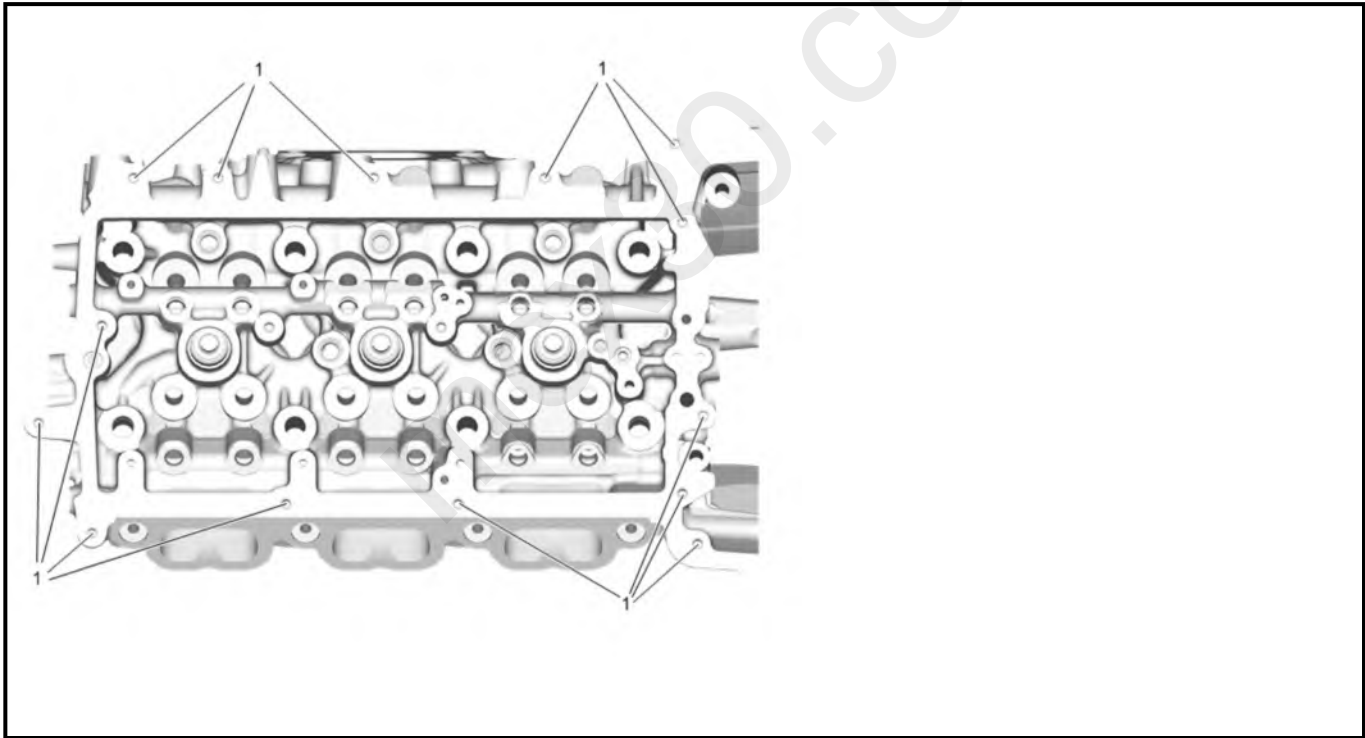
Left Cylinder Head Camshaft Carrier Top Face



Left Cylinder Head Camshaft Carrier Top Face

Hole Location	Thread Size	Drill	Counter Bore Tool	Stop Collar	Tap	Driver	Insert	Drill Depth (Maximum)		Tap Depth (Minimum)	
EN-42385 -								MM	(IN)	MM	(IN)
1	M6 x 1.0	201	202	N/A	203	204	63	23.0	.907	23.0	.907

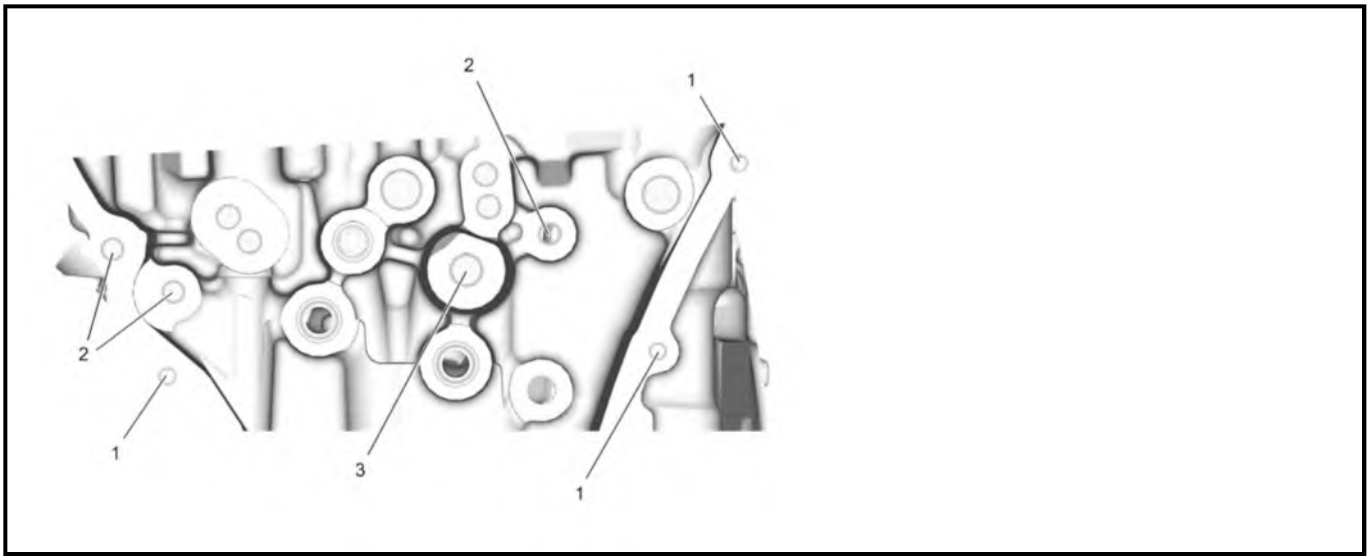
Left Cylinder Head Top Face



Left Cylinder Head Top Face

Hole Location	Thread Size	Drill	Counter Bore Tool	Stop Collar	Tap	Driver	Insert	Drill Depth (Maximum)		Tap Depth (Minimum)	
EN-42385 -								MM	(IN)	MM	(IN)
1	M6 x 1.0	201	202	N/A	203	204	63	23.0	.907	23.0	.907

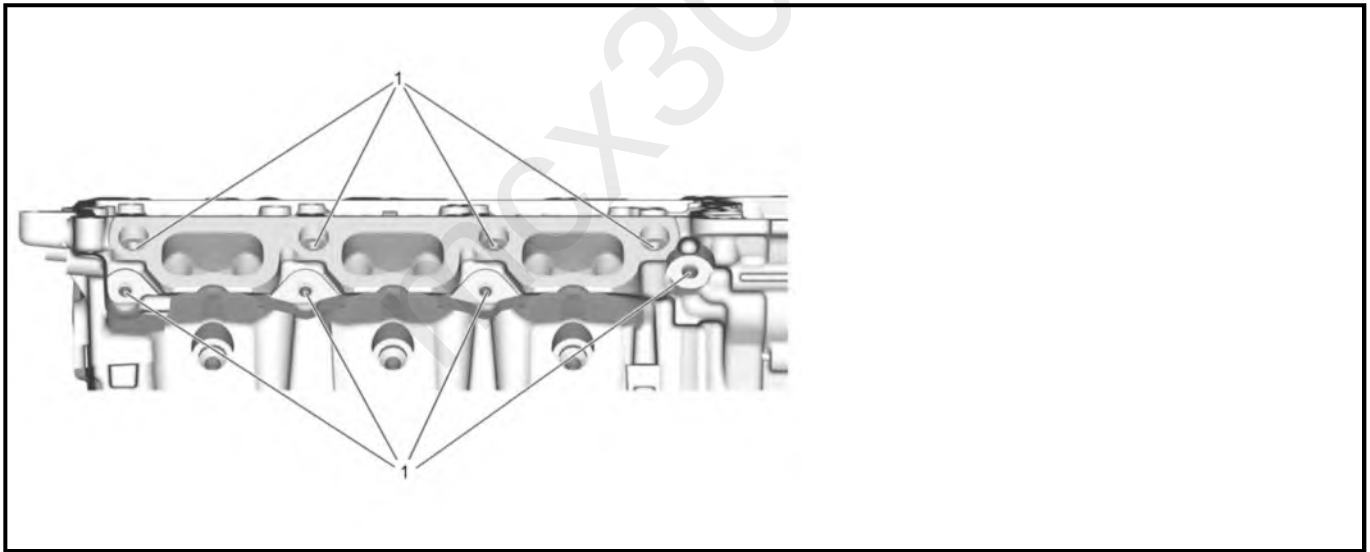
Left Cylinder Head Front Face



Left Cylinder Head Front Face

Hole Location	Thread Size	Drill	Counter Bore Tool	Stop Collar	Tap	Driver	Insert	Drill Depth (Maximum)		Tap Depth (Minimum)	
EN-42385 -								MM	(IN)	MM	(IN)
1	M6 x 1.0	201	202	N/A	203	204	63	23.0	.907	23.0	.907
2	M8 x 1.25	206	207	N/A	208	209	61	29.0	1.14	29.0	1.14
3	M12 x 1.75	856	857	N/A	858	859	58	35.0	1.38	35.0	1.38

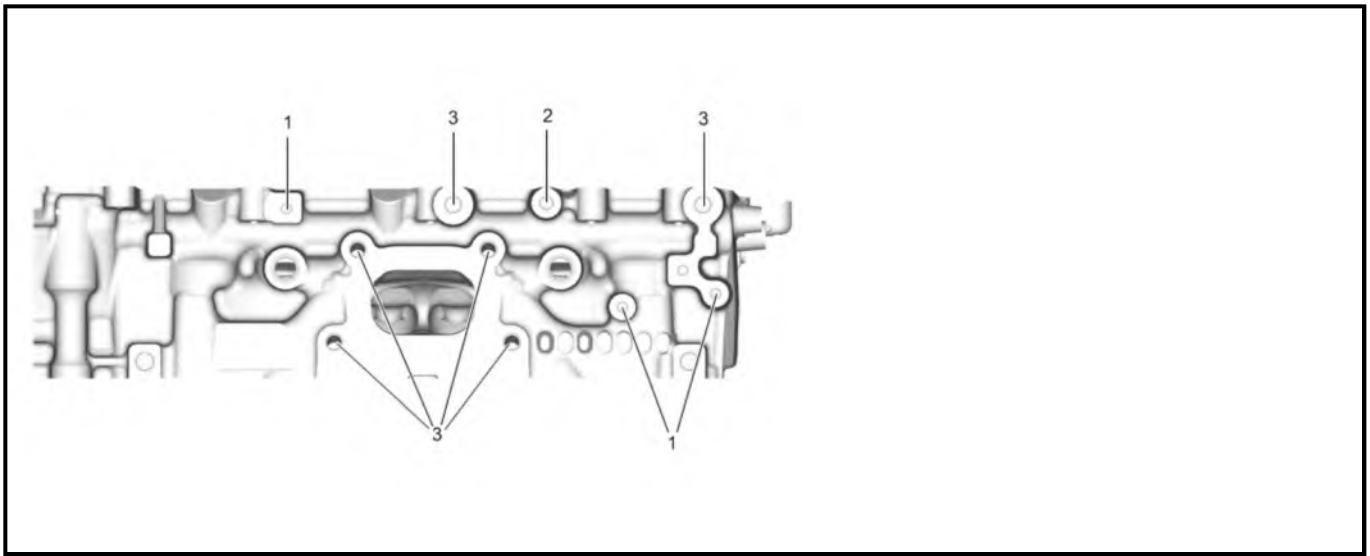
Left Cylinder Head Intake Face



Left Cylinder Head Intake Face

Hole Location	Thread Size	Drill	Counter Bore Tool	Stop Collar	Tap	Driver	Insert	Drill Depth (Maximum)		Tap Depth (Minimum)	
EN-42385 -								MM	(IN)	MM	(IN)
1	M8 x 1.25	206	207	N/A	208	209	61	29.0	1.14	29.0	1.14

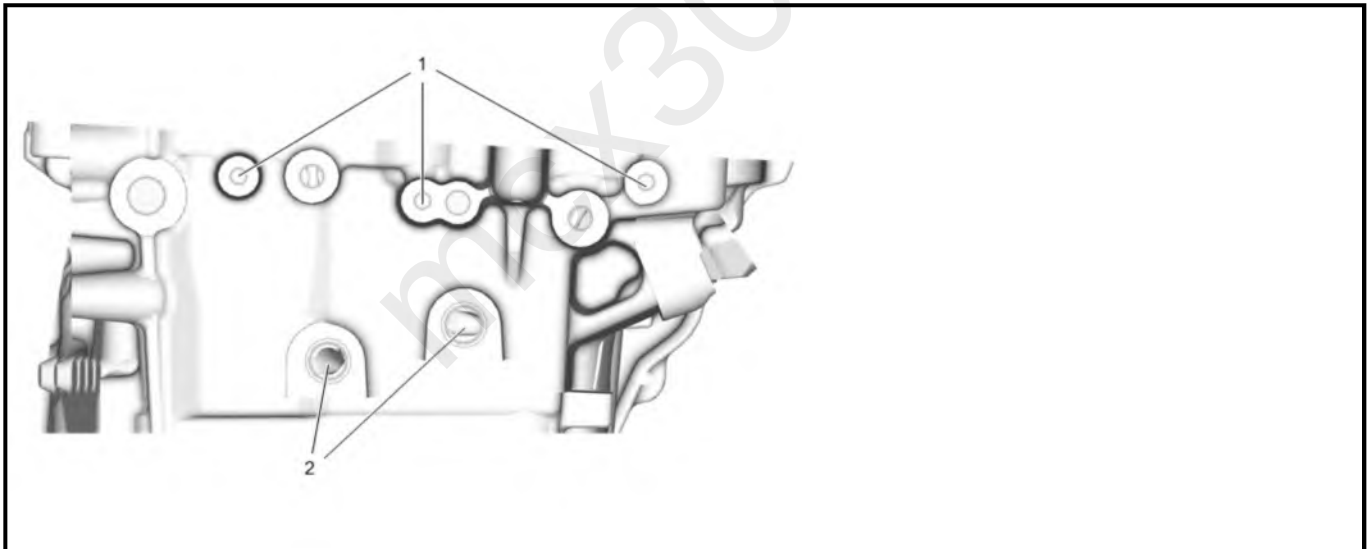
Left Cylinder Head Exhaust Face



Left Cylinder Head Exhaust Face

Hole Location	Thread Size	Drill	Counter Bore Tool	Stop Collar	Tap	Driver	Insert	Drill Depth (Maximum)		Tap Depth (Minimum)	
EN-42385 -								MM	(IN)	MM	(IN)
1	M6 x 1.0	201	202	N/A	203	204	63	23.0	.907	23.0	.907
2	M8 x 1.25	206	207	N/A	208	209	61	29.0	1.14	29.0	1.14
3	M10 x 1.5	211	212	N/A	213	214	514	34.0	1.35	34.0	1.35

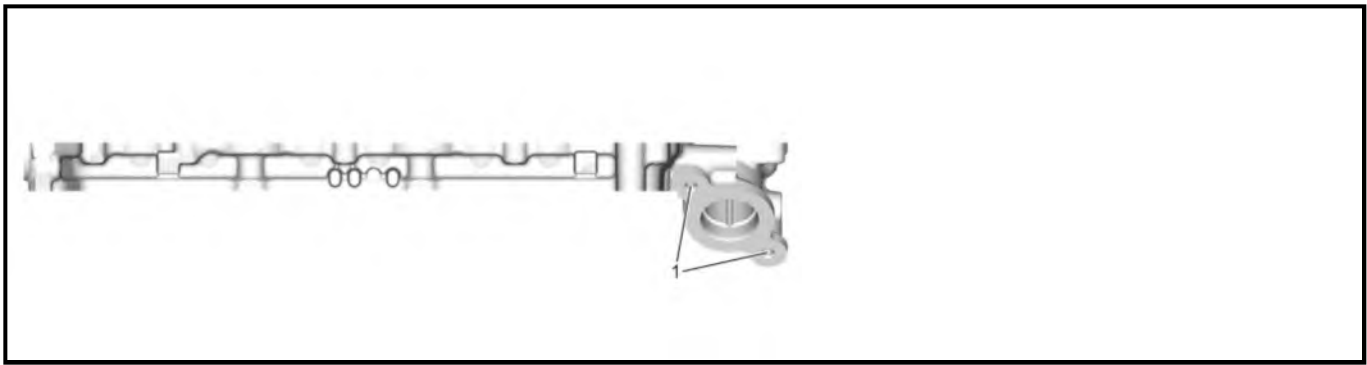
Left Cylinder Head Rear Face



Left Cylinder Head Rear Face

Hole Location	Thread Size	Drill	Counter Bore Tool	Stop Collar	Tap	Driver	Insert	Drill Depth (Maximum)		Tap Depth (Minimum)	
EN-42385 -								MM	(IN)	MM	(IN)
1	M6 x 1.0	201	202	N/A	203	204	63	23.0	.907	23.0	.907
2	14 x 1.5	409	410	N/A	411	412	735	19.0	.748	19.0	.748

Right Cylinder Head Camshaft Carrier Left Face



Right Cylinder Head Camshaft Carrier Left Face

Hole Location	Thread Size	Drill	Counter Bore Tool	Stop Collar	Tap	Driver	Insert	Drill Depth (Maximum)		Tap Depth (Minimum)	
EN-42385 -								MM	(IN)	MM	(IN)
1	M8 x 1.25	206	207	N/A	208	209	61	29.0	1.14	29.0	1.14

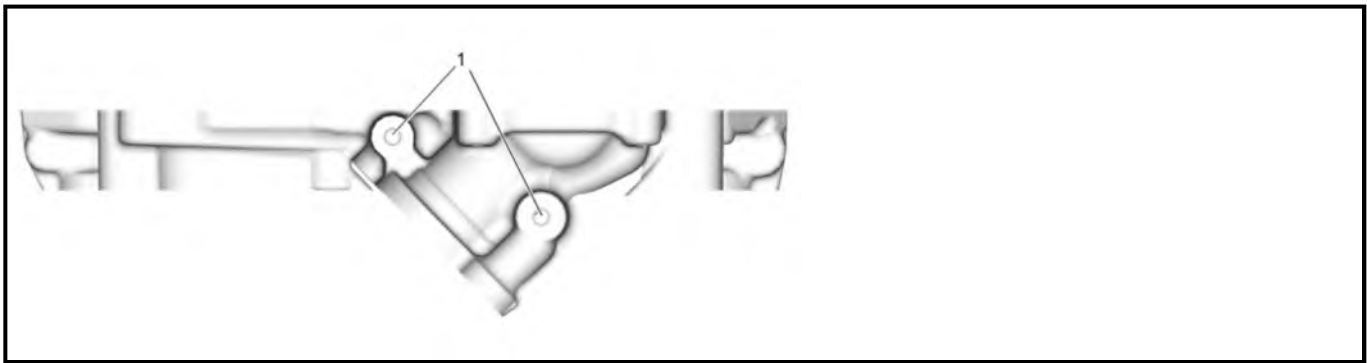
Right Cylinder Head Camshaft Carrier Right Face



Right Cylinder Head Camshaft Carrier Right Face

Hole Location	Thread Size	Drill	Counter Bore Tool	Stop Collar	Tap	Driver	Insert	Drill Depth (Maximum)		Tap Depth (Minimum)	
EN-42385 -								MM	(IN)	MM	(IN)
1	M6 x 1.0	201	202	N/A	203	204	63	23.0	.907	23.0	.907

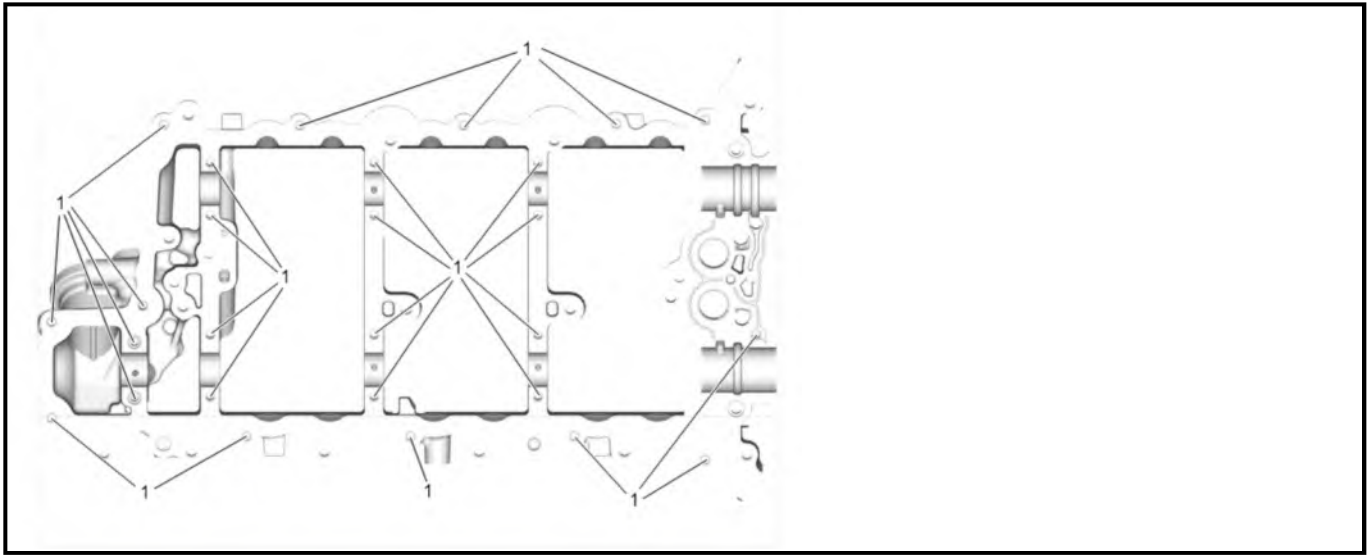
Right Cylinder Head Camshaft Carrier Rear Face



Right Cylinder Head Camshaft Carrier Rear Face

Hole Location	Thread Size	Drill	Counter Bore Tool	Stop Collar	Tap	Driver	Insert	Drill Depth (Maximum)		Tap Depth (Minimum)	
EN-42385 -								MM	(IN)	MM	(IN)
1	M6 x 1.0	201	202	N/A	203	204	63	23.0	.907	23.0	.907

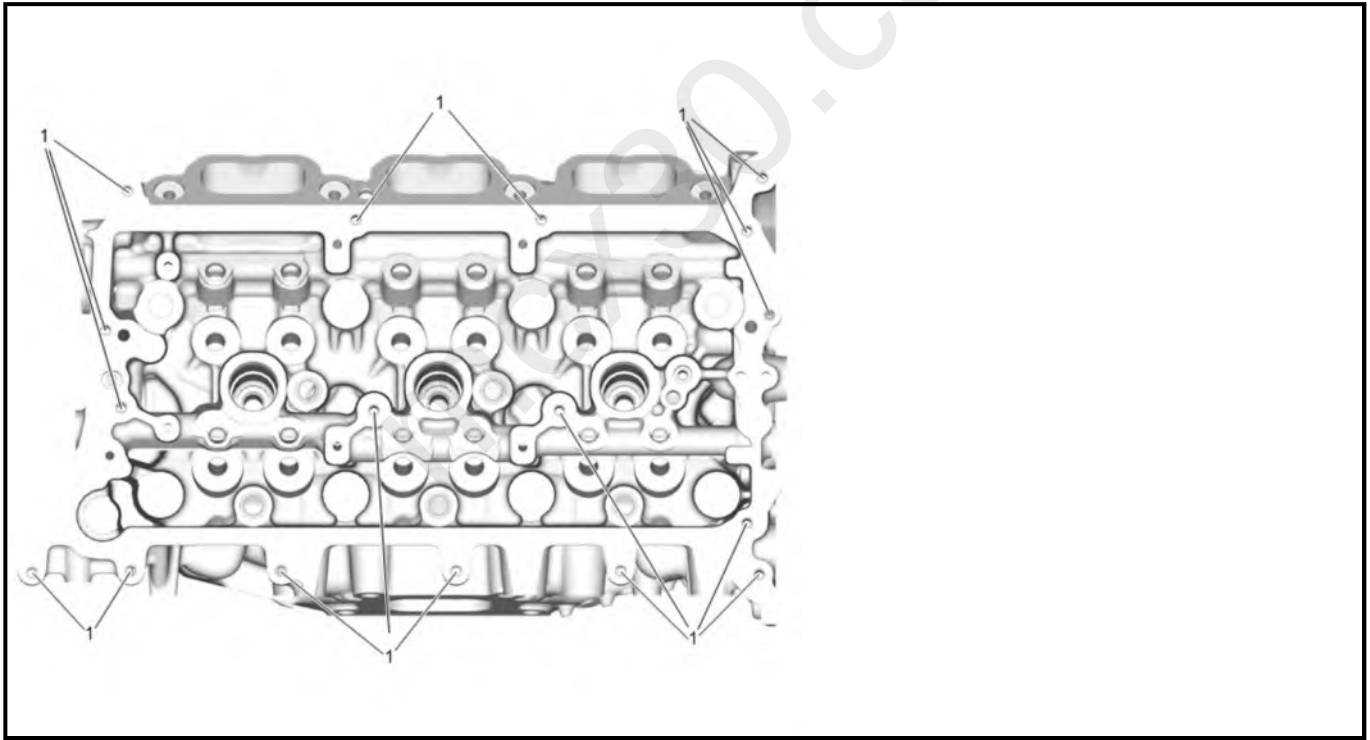
Right Cylinder Head Camshaft Carrier Top Face



Right Cylinder Head Camshaft Carrier Top Face

Hole Location	Thread Size	Drill	Counter Bore Tool	Stop Collar	Tap	Driver	Insert	Drill Depth (Maximum)		Tap Depth (Minimum)	
EN-42385 -								MM	(IN)	MM	(IN)
1	M6 x 1.0	201	202	N/A	203	204	63	23.0	.907	23.0	.907

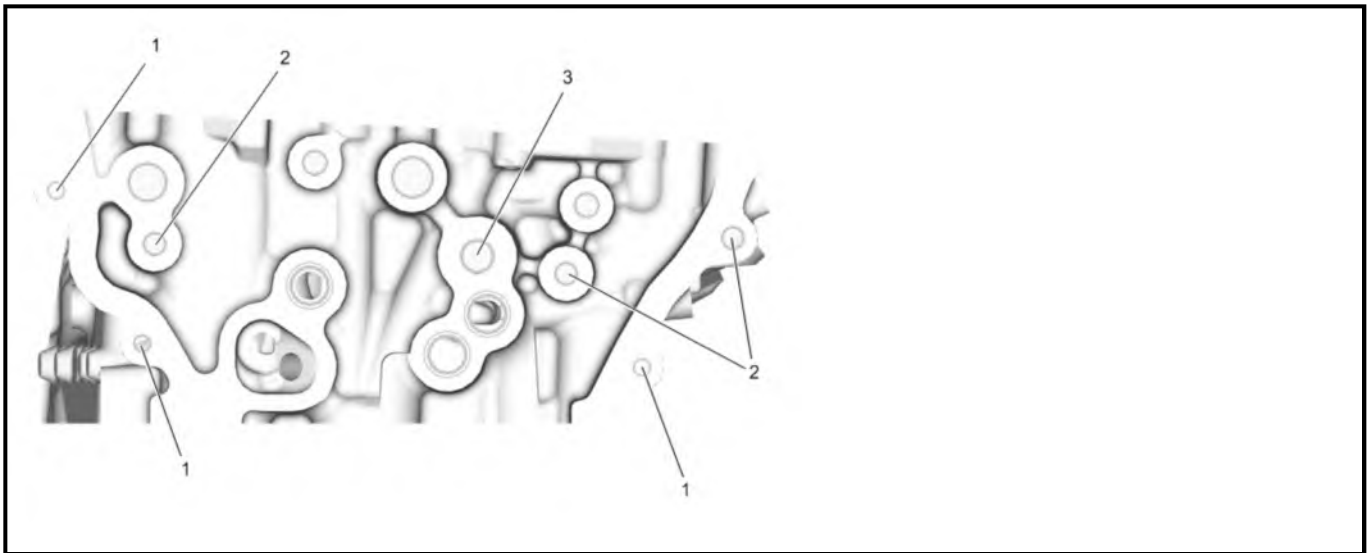
Right Cylinder Head Top Face



Right Cylinder Head Top Face

Hole Location	Thread Size	Drill	Counter Bore Tool	Stop Collar	Tap	Driver	Insert	Drill Depth (Maximum)		Tap Depth (Minimum)	
EN-42385 -								MM	(IN)	MM	(IN)
1	M6 x 1.0	201	202	N/A	203	204	63	23.0	.907	23.0	.907

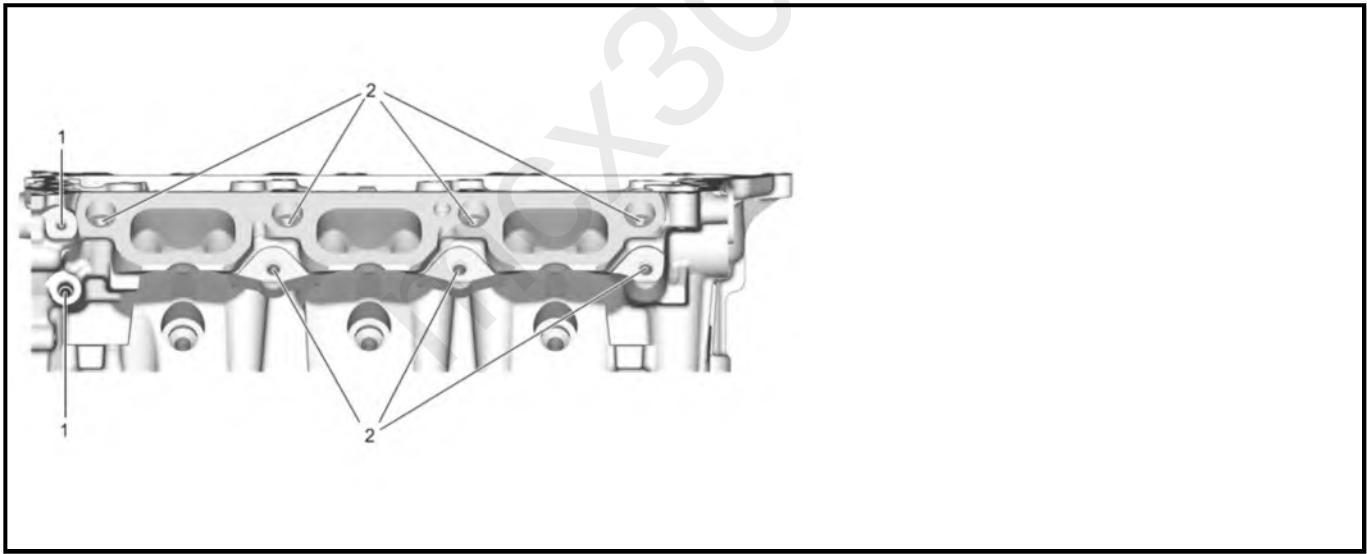
Right Cylinder Head Front Face



Right Cylinder Head Front Face

Hole Location	Thread Size	Drill	Counter Bore Tool	Stop Collar	Tap	Driver	Insert	Drill Depth (Maximum)		Tap Depth (Minimum)	
EN-42385 -								MM	(IN)	MM	(IN)
1	M6 x 1.0	201	202	N/A	203	204	63	23.0	.907	23.0	.907
2	M8 x 1.25	206	207	N/A	208	209	61	29.0	1.14	29.0	1.14
3	M12 x 1.75	856	857	N/A	858	859	58	35.0	1.38	35.0	1.38

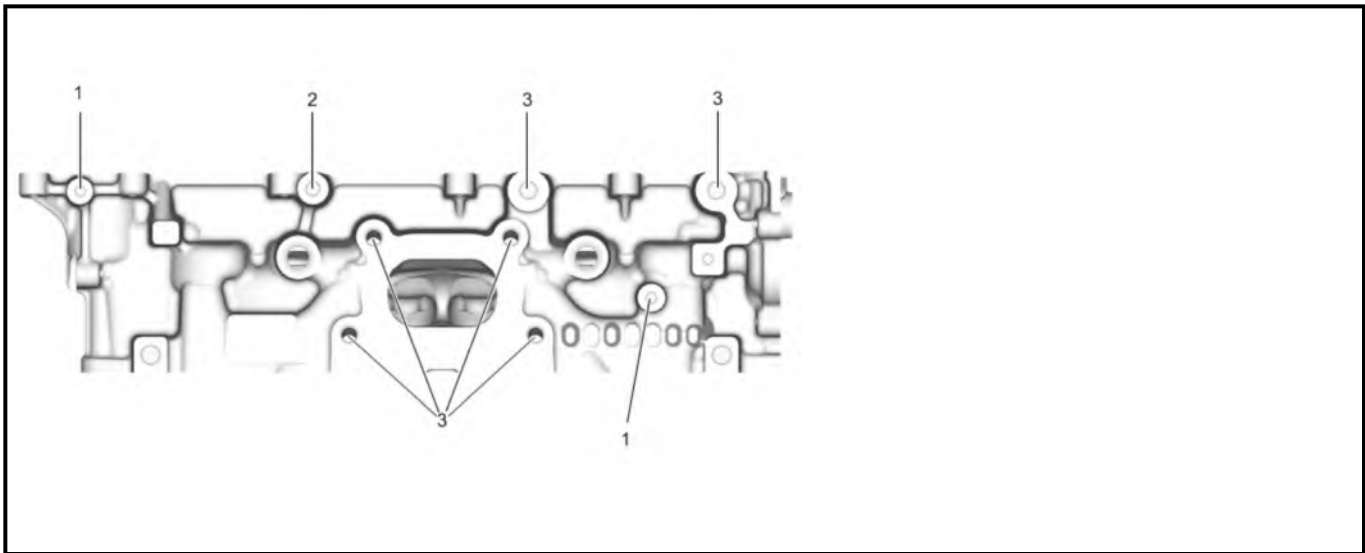
Right Cylinder Head Intake Face



Right Cylinder Head Intake Face

Hole Location	Thread Size	Drill	Counter Bore Tool	Stop Collar	Tap	Driver	Insert	Drill Depth (Maximum)		Tap Depth (Minimum)	
EN-42385 -								MM	(IN)	MM	(IN)
1	M6 x1.0	201	202	N/A	203	204	63	23.0	.907	23.0	.907
2	M8 x 1.25	206	207	N/A	208	209	61	29.0	1.14	29.0	1.14

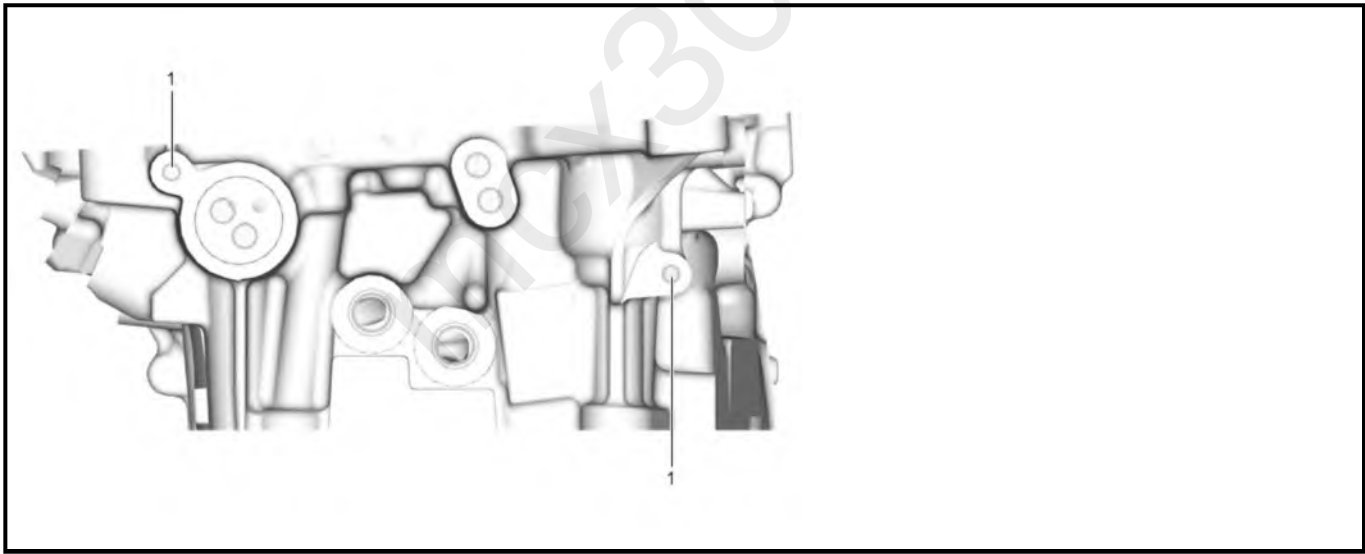
Right Cylinder Head Exhaust Face



Right Cylinder Head Exhaust Face

Hole Location	Thread Size	Drill	Counter Bore Tool	Stop Collar	Tap	Driver	Insert	Drill Depth (Maximum)		Tap Depth (Minimum)	
EN-42385 -								MM	(IN)	MM	(IN)
1	M6 x 1.0	201	202	N/A	203	204	63	23.0	.907	23.0	.907
2	M8 x 1.25	206	207	N/A	208	209	61	29.0	1.14	29.0	1.14
3	M10 x 1.5	211	212	N/A	213	214	514	34.0	1.35	34.0	1.35

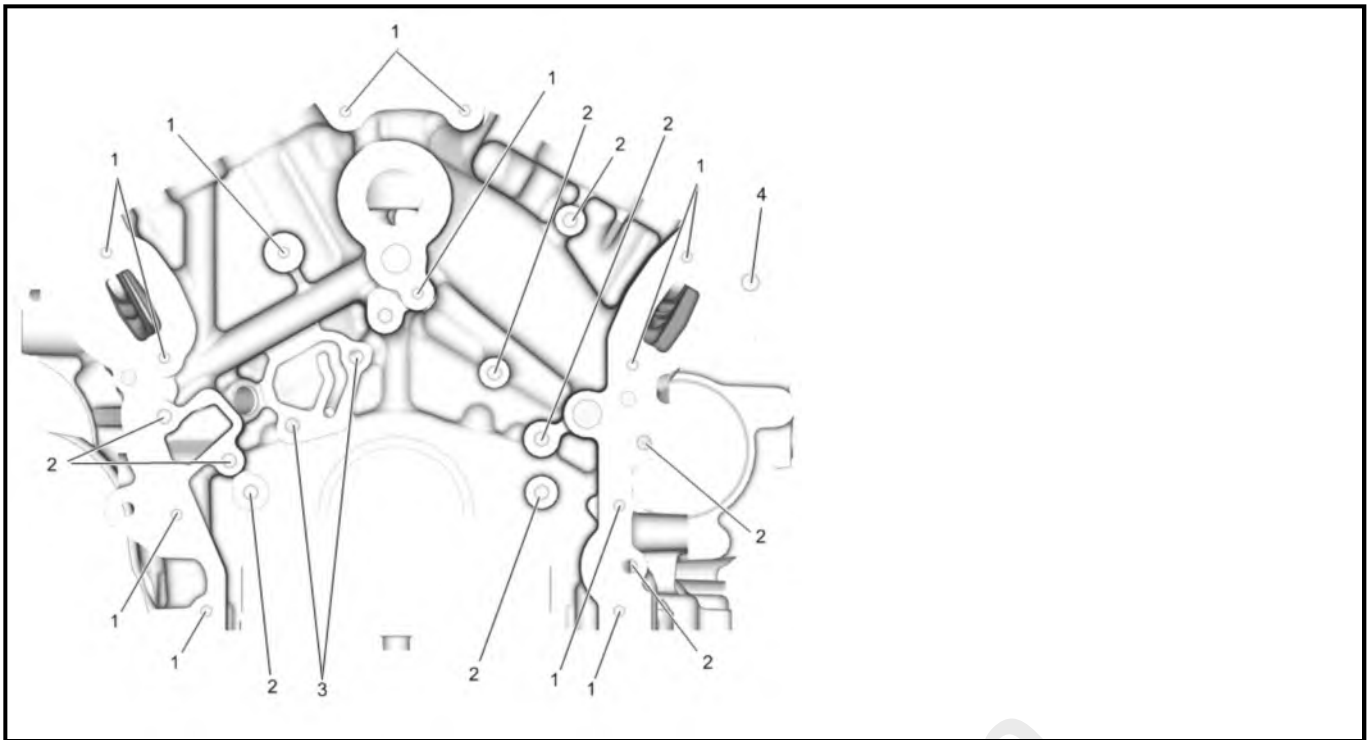
Right Cylinder Head Rear Face



Right Cylinder Head Rear Face

Hole Location	Thread Size	Drill	Counter Bore Tool	Stop Collar	Tap	Driver	Insert	Drill Depth (Maximum)		Tap Depth (Minimum)	
EN-42385 -								MM	(IN)	MM	(IN)
1	M6 x 1.0	201	202	N/A	203	204	63	23.0	.907	23.0	.907

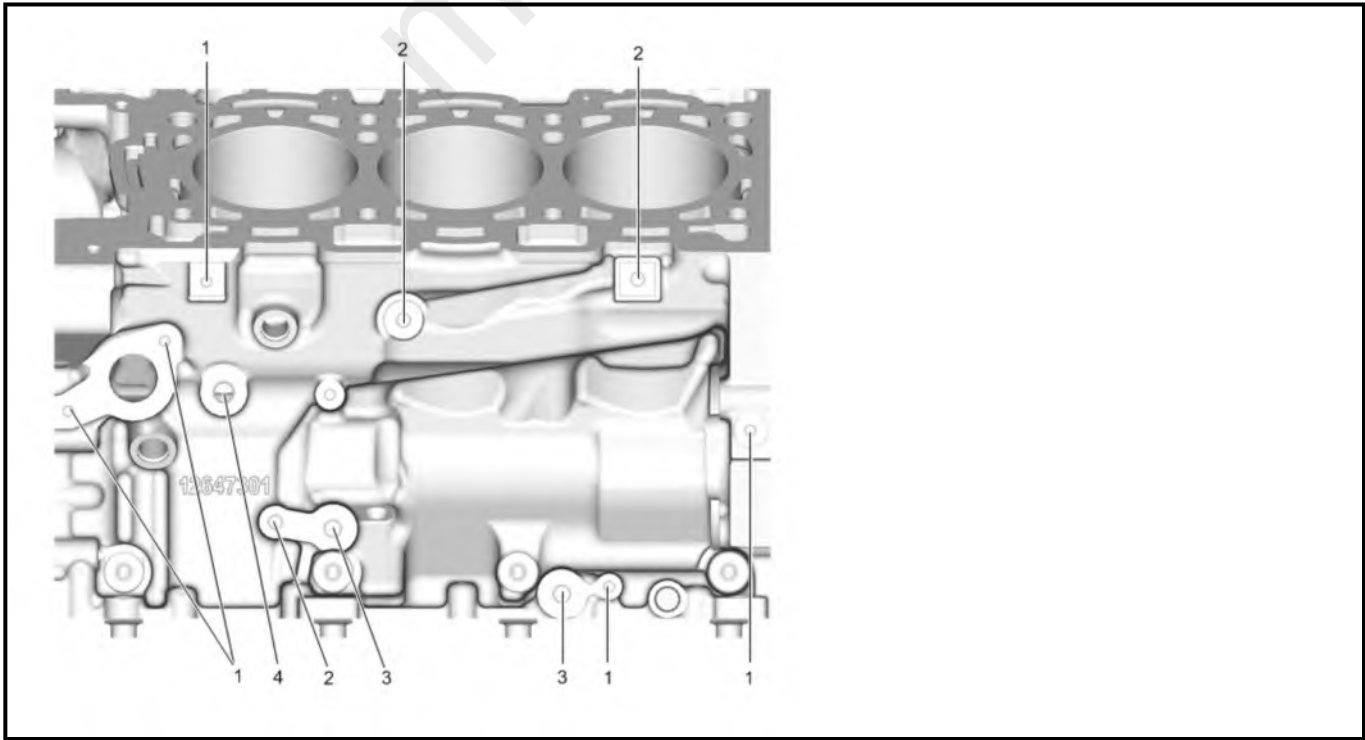
Engine Block Front Face



Engine Block Front Face

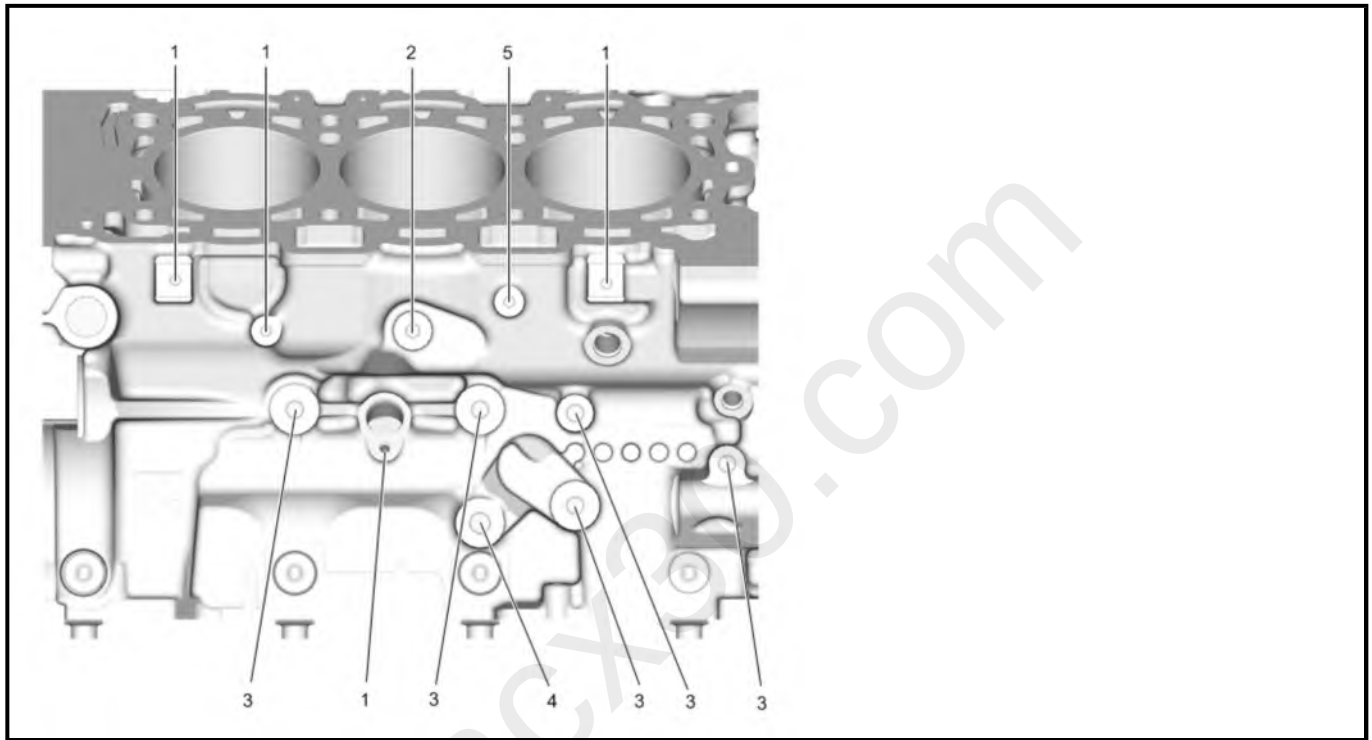
Hole Location	Thread Size	Drill	Counter Bore Tool	Stop Collar	Tap	Driver	Insert	Drill Depth (Maximum)		Tap Depth (Minimum)	
EN-42385 -								MM	(IN)	MM	(IN)
1	M6 x 1.0	201	202	N/A	203	204	63	23.0	.907	23.0	.907
2	M8 x 1.25	206	207	N/A	208	209	61	29.0	1.14	29.0	1.14
3	M8 x 1.25	206	207	N/A	208	209	210	23.0	.905	23.0	.905
4	M10 x 1.5	211	212	N/A	213	214	215	34.0	1.35	34.0	1.35

Engine Block Left Face



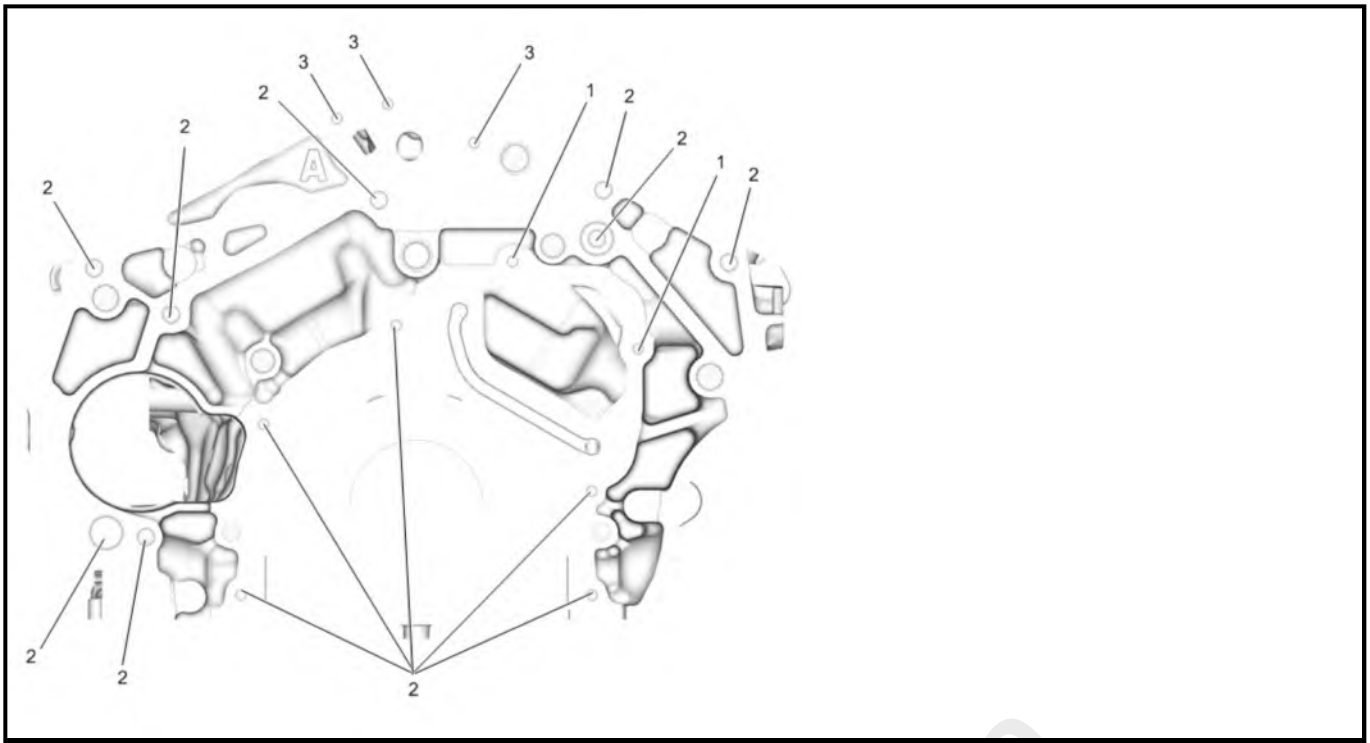
Engine Block Left Face

Hole Location	Thread Size	Drill	Counter Bore Tool	Stop Collar	Tap	Driver	Insert	Drill Depth (Maximum)		Tap Depth (Minimum)	
EN-42385 -								MM	(IN)	MM	(IN)
1	M6 x 1.0	210	202	N/A	203	204	205	18.0	.709	18.0	.709
2	M8 x 1.25	206	207	N/A	208	209	61	29.0	1.14	29.0	1.14
3	M10 x 1.5	211	212	N/A	213	214	215	34.0	1.35	34.0	1.35
4	M12 x 1.75	856	857	N/A	858	859	416	23.0	.905	23.0	.905

Engine Block Right Face**Engine Block Right Face**

Hole Location	Thread Size	Drill	Counter Bore Tool	Stop Collar	Tap	Driver	Insert	Drill Depth (Maximum)		Tap Depth (Minimum)	
EN-42385 -								MM	(IN)	MM	(IN)
1	M6 x 1.0	210	202	N/A	203	204	63	23.0	.907	23.0	.907
2	M8 x 1.25	206	207	N/A	208	209	61	29.0	1.14	29.0	1.14
3	M10 x 1.5	211	212	N/A	213	214	215	34.0	1.35	34.0	1.35
4	M12 x 1.75	856	857	N/A	858	859	416	23.0	.905	23.0	.905
5	M6 x 1.0	210	202	N/A	203	204	205	18.0	.709	18.0	.709

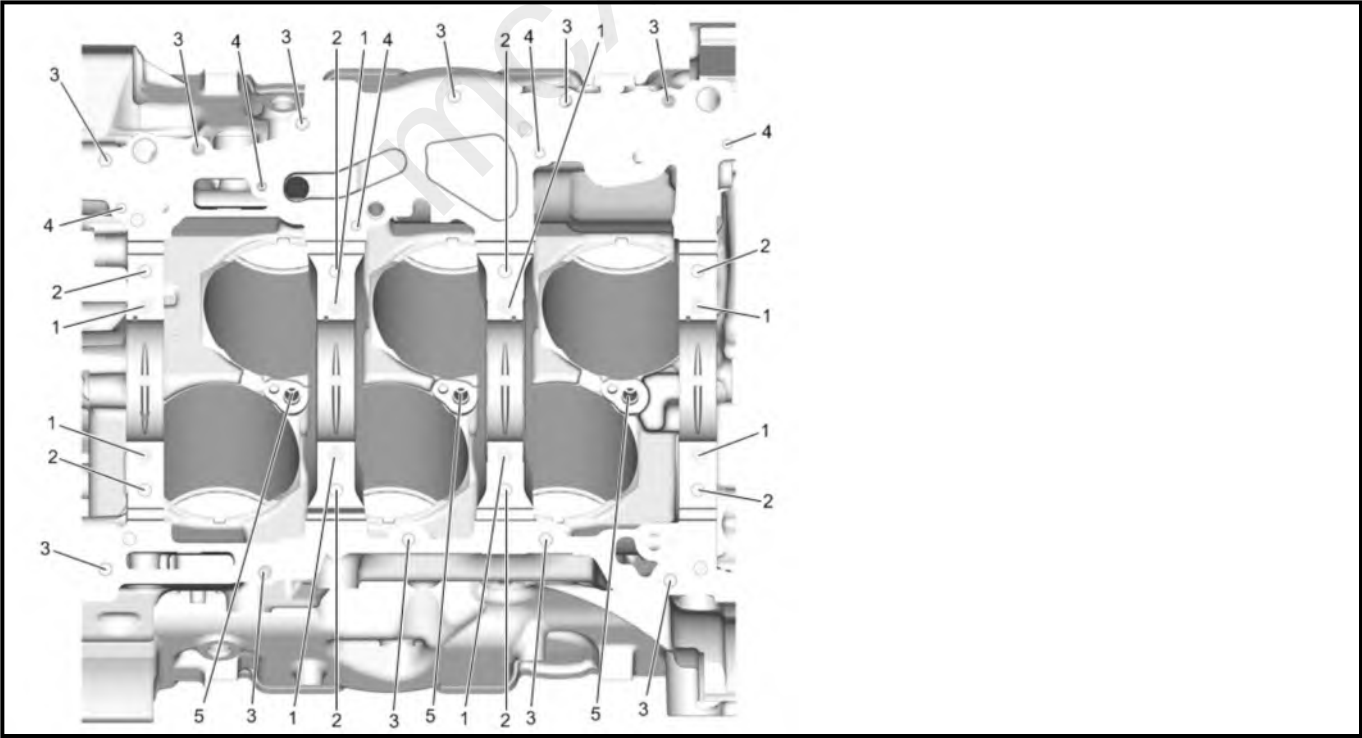
Engine Block Rear Face



Engine Block Rear Face

Hole Location	Thread Size	Drill	Counter Bore Tool	Stop Collar	Tap	Driver	Insert	Drill Depth (Maximum)		Tap Depth (Minimum)	
EN-42385 -								MM	(IN)	MM	(IN)
1	M6 x 1.0	210	202	N/A	203	204	205	18.0	.709	18.0	.709
2	M10 x 1.5	211	212	N/A	213	214	215	34.0	1.35	34.0	1.35
3	M6 x 1.0	210	202	N/A	203	204	63	23.0	.907	23.0	.907

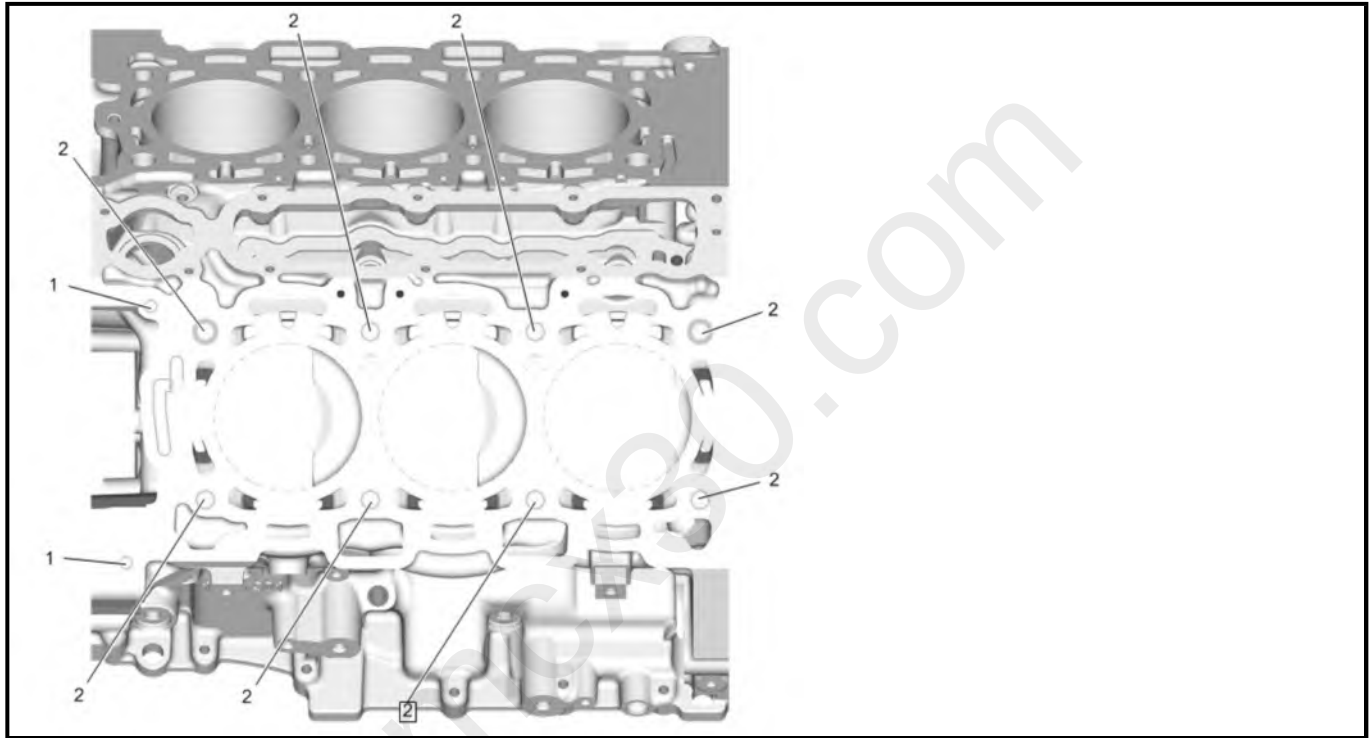
Engine Block Bottom Face



Engine Block Bottom Face

Hole Location	Thread Size	Drill	Counter Bore Tool	Stop Collar	Tap	Driver	Insert	Drill Depth (Maximum)		Tap Depth (Minimum)	
EN-42385 -								MM	(IN)	MM	(IN)
1	M10 x 2.0	101	N/A	N/A	102	103	104	52.0	2.047	52.0	2.047
2	M8 x 1.25	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
3	M8 x 1.25	206	207	N/A	208	209	61	29.0	1.14	29.0	1.14
4	M6 x 1.0	210	202	N/A	203	204	205	18.0	.709	18.0	.709
5	M10 x 1.5	211	212	N/A	213	214	215	34.0	1.35	34.0	1.35

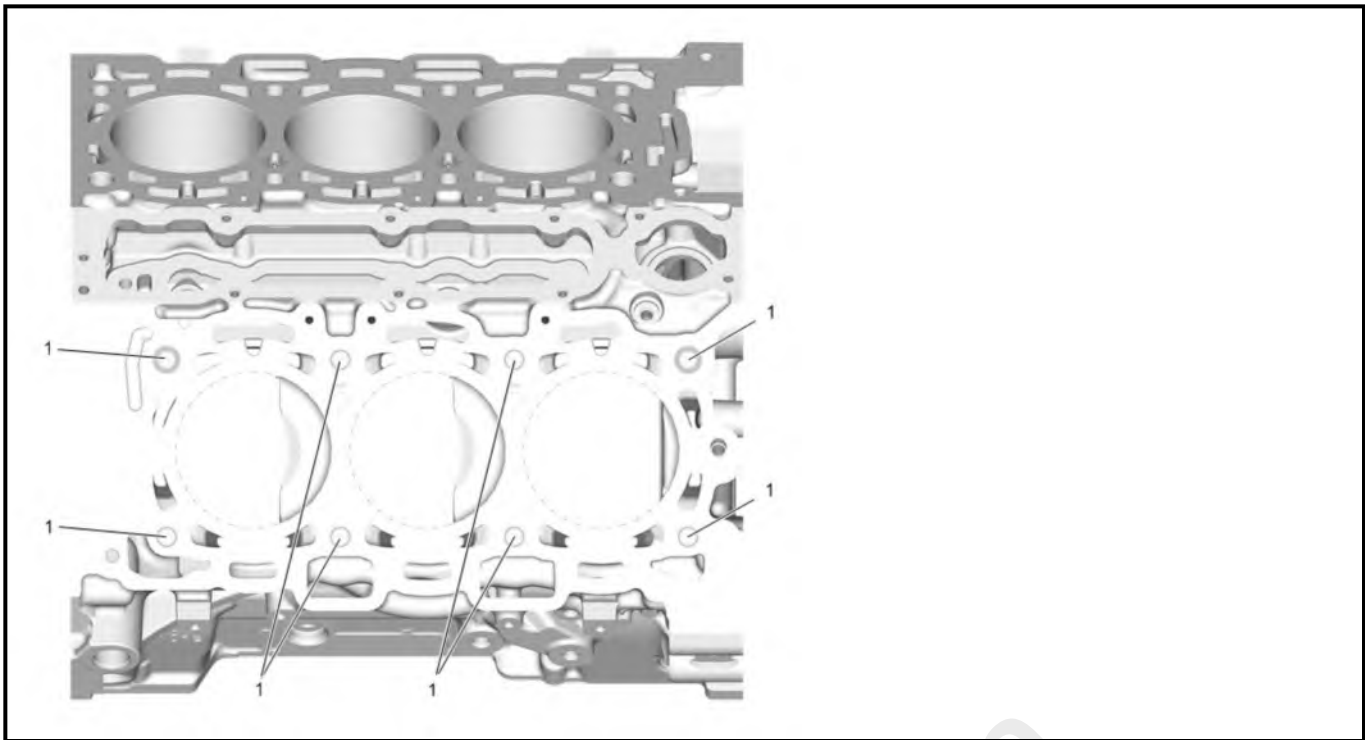
Engine Block Left Deck Face



Engine Block Left Deck Face

Hole Location	Thread Size	Drill	Counter Bore Tool	Stop Collar	Tap	Driver	Insert	Drill Depth (Maximum)		Tap Depth (Minimum)	
EN-42385 -								MM	(IN)	MM	(IN)
1	M8 x 1.25	206	207	N/A	208	209	61	29.0	1.14	29.0	1.14
2	M12 x 1.75	EN-51	N/A	N/A	EN-52	EN-53	EN-58	29.0	1.14	29.0	1.14

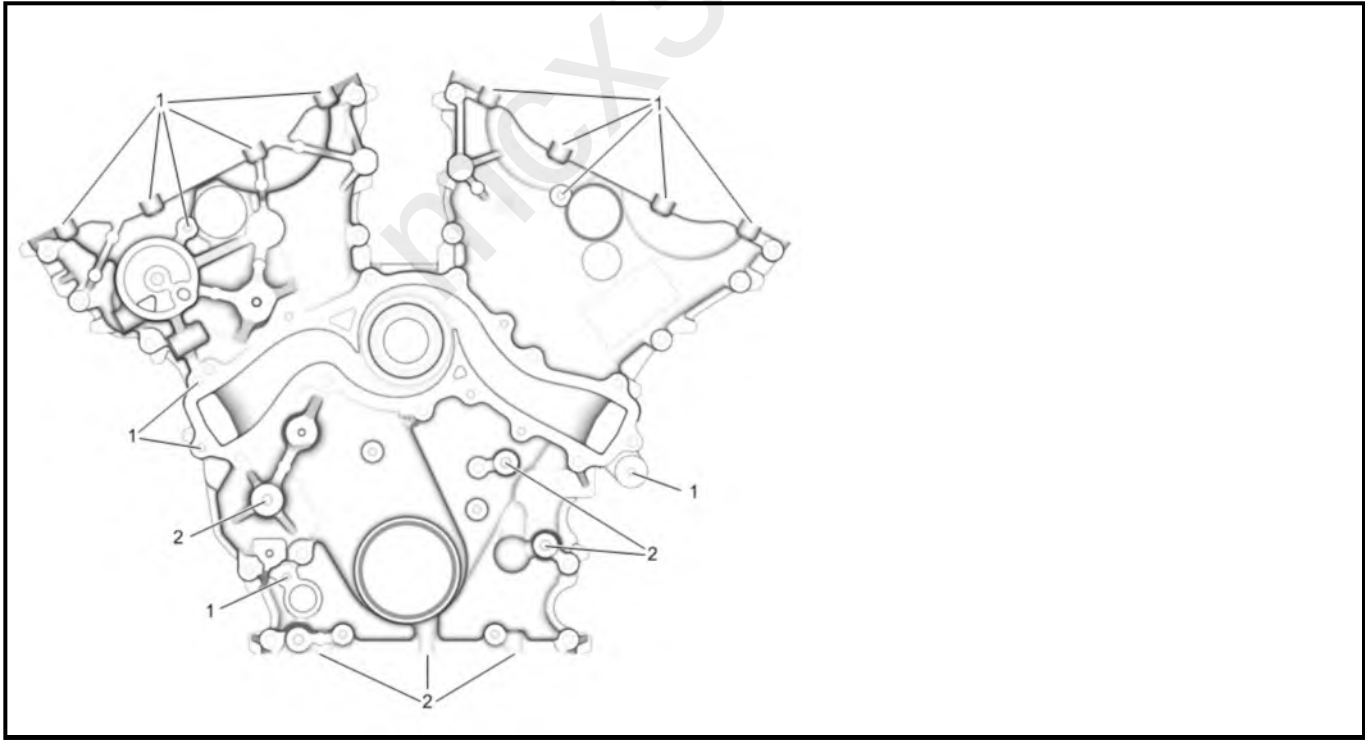
Engine Block Right Deck Face



Engine Block Right Deck Face

Hole Location	Thread Size	Drill	Counter Bore Tool	Stop Collar	Tap	Driver	Insert	Drill Depth (Maximum)		Tap Depth (Minimum)	
EN-42385 -								MM	(IN)	MM	(IN)
1	M12 x 1.75	EN-51	N/A	N/A	EN-52	EN-53	EN-58	29.0	1.14	29.0	1.14

Engine Front Cover

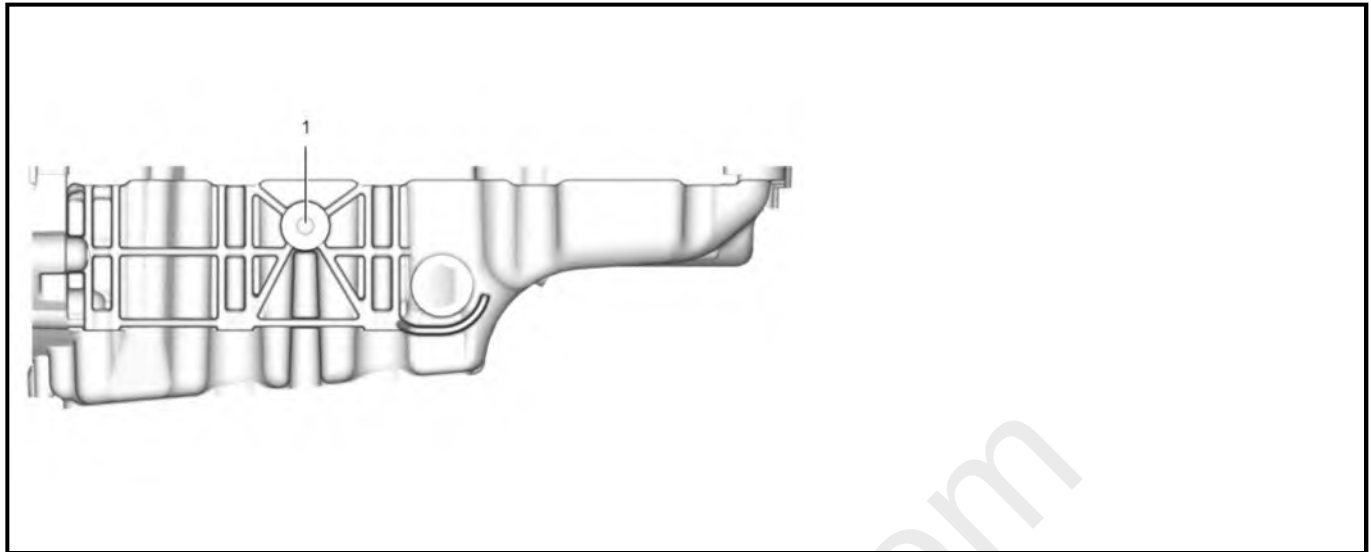


Engine Front Cover

Hole Location	Thread Size	Drill	Counter Bore Tool	Stop Collar	Tap	Driver	Insert	Drill Depth (Maximum)		Tap Depth (Minimum)	
EN-42385 -								MM	(IN)	MM	(IN)
1	M6 x 1.0	201	202	N/A	203	204	63	23.0	.907	23.0	.907

Hole Location	Thread Size	Drill	Counter Bore Tool	Stop Collar	Tap	Driver	Insert	Drill Depth (Maximum)		Tap Depth (Minimum)	
EN-42385 -								MM	(IN)	MM	(IN)
2	M8 x 1.25	206	207	N/A	208	209	61	29.0	1.14	29.0	1.14

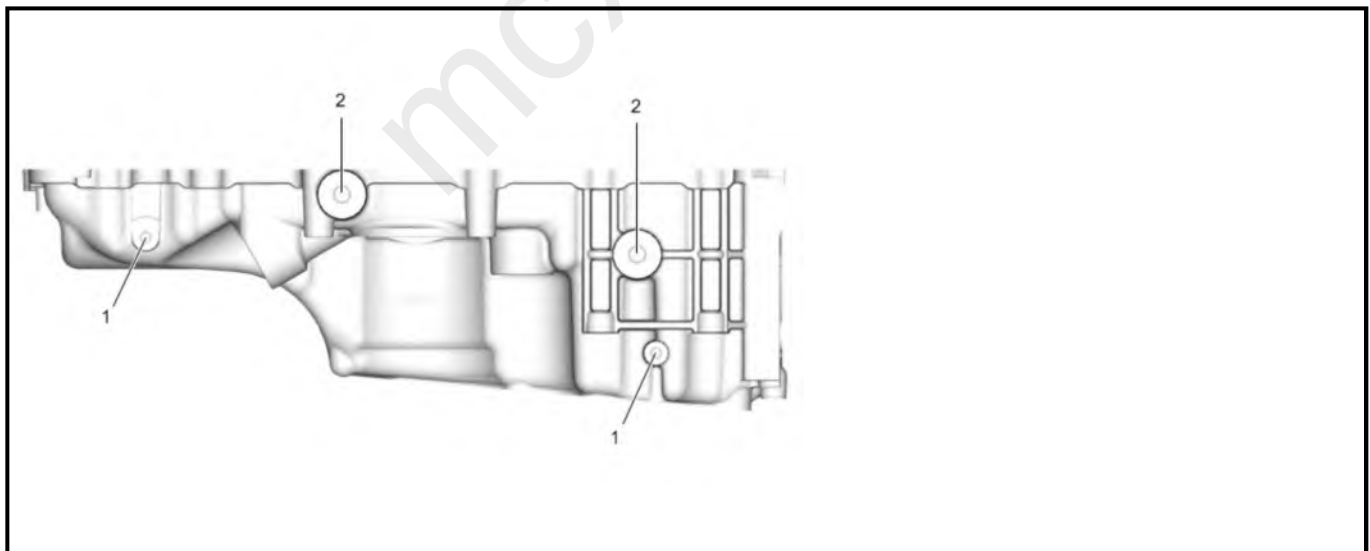
Oil Pan Left Side



Oil Pan Left Side

Hole Location	Thread Size	Drill	Counter Bore Tool	Stop Collar	Tap	Driver	Insert	Drill Depth (Maximum)		Tap Depth (Minimum)	
EN-42385 -								MM	(IN)	MM	(IN)
1	M10 x 1.5	211	212	N/A	213	214	514	34.0	1.35	34.0	1.35

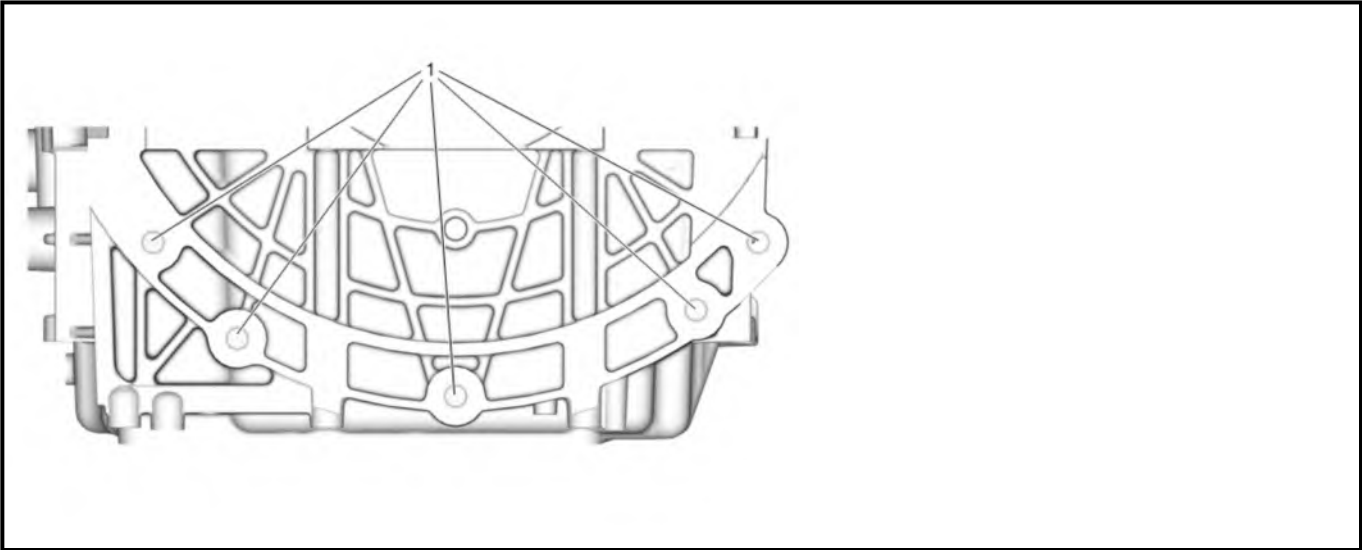
Oil Pan Right Side



Oil Pan Right Side

Hole Location	Thread Size	Drill	Counter Bore Tool	Stop Collar	Tap	Driver	Insert	Drill Depth (Maximum)		Tap Depth (Minimum)	
EN-42385 -								MM	(IN)	MM	(IN)
1	M6 x 1.0	201	202	N/A	203	204	63	23.0	.907	23.0	.907
2	M10 x 1.5	211	212	N/A	213	214	514	34.0	1.35	34.0	1.35

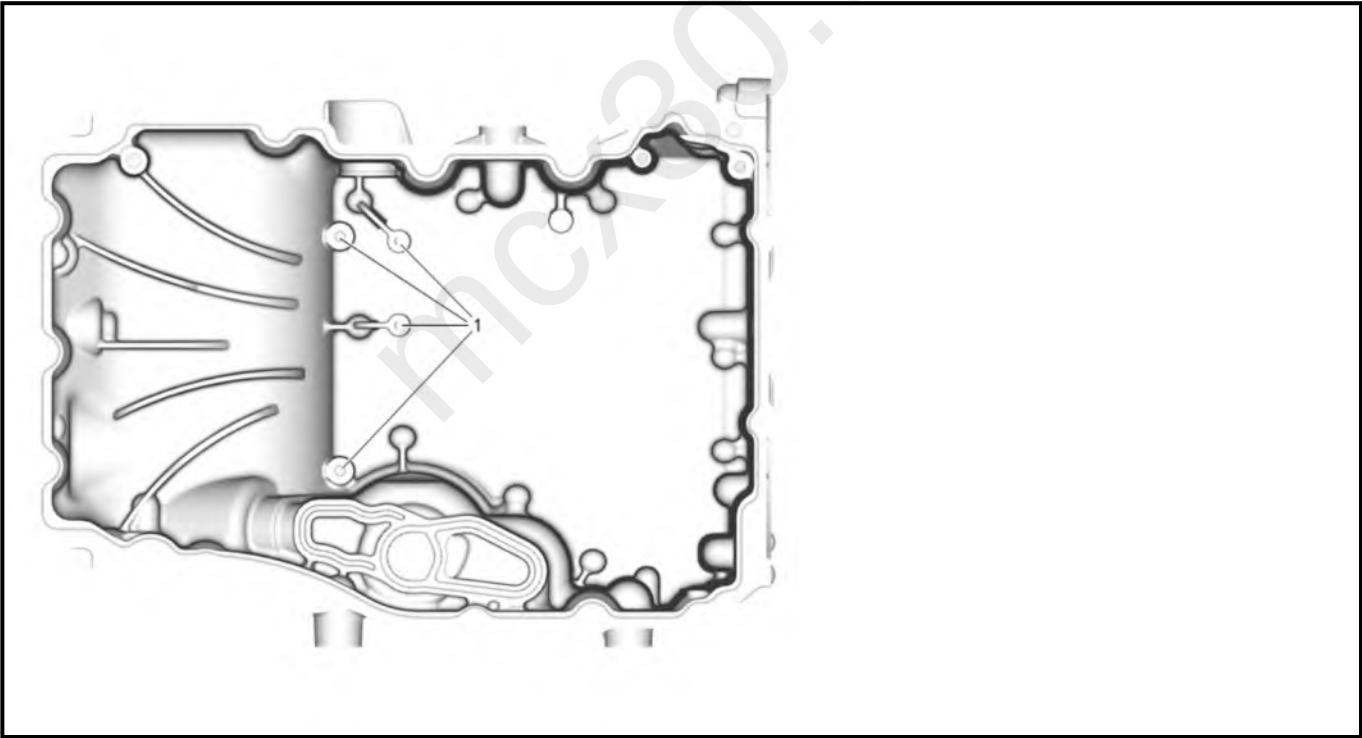
Oil Pan Rear Face



Oil Pan Rear Face

Hole Location	Thread Size	Drill	Counter Bore Tool	Stop Collar	Tap	Driver	Insert	Drill Depth (Maximum)		Tap Depth (Minimum)	
EN-42385 -								MM	(IN)	MM	(IN)
1	M10 x 1.5	211	212	N/A	213	214	514	34.0	1.35	34.0	1.35

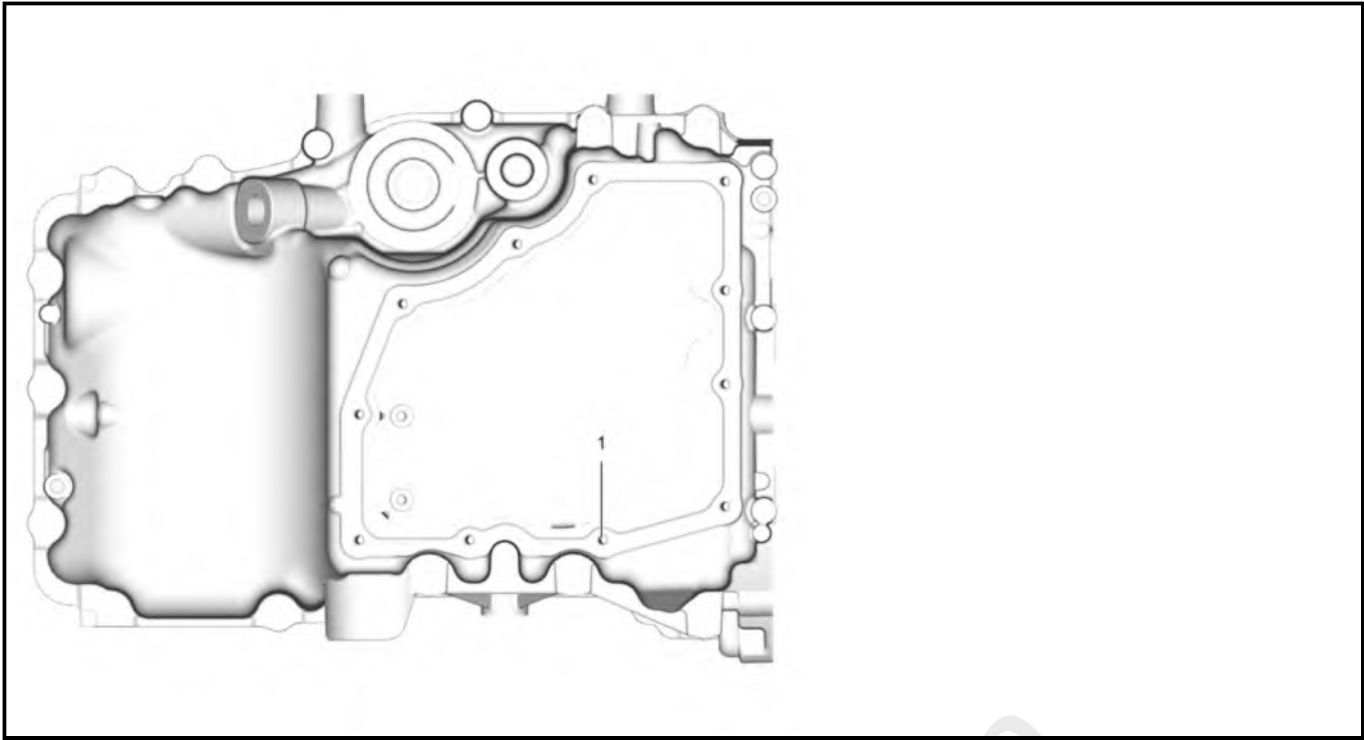
Oil Pan Top Face



Oil Pan Top Face

Hole Location	Thread Size	Drill	Counter Bore Tool	Stop Collar	Tap	Driver	Insert	Drill Depth (Maximum)		Tap Depth (Minimum)	
EN-42385 -								MM	(IN)	MM	(IN)
1	M6 x 1.0	201	202	N/A	203	204	63	23.0	.907	23.0	.907

Oil Pan Bottom Face



Oil Pan Bottom Face

Hole Location	Thread Size	Drill	Counter Bore Tool	Stop Collar	Tap	Driver	Insert	Drill Depth (Maximum)		Tap Depth (Minimum)	
EN-42385 -								MM	(IN)	MM	(IN)
1	M6 x 1.0	201	202	N/A	203	204	63	23.0	.907	23.0	.907