

2007 Chevrolet TrailBlazer

2007 ENGINE Engine Mechanical - 6.0L - TrailBlazer

2007 ENGINE

Engine Mechanical - 6.0L - TrailBlazer

SPECIFICATIONS

FASTENER TIGHTENING SPECIFICATIONS

Fastener Tightening Specifications

Application	Specification	
	Metric	English
Air Cleaner Outlet Duct Clamp	7 N.m	62 lb in
Air Conditioning Belt Tensioner Bolt	50 N.m	37 lb ft
Air Conditioning Bracket Bolt	50 N.m	37 lb ft
Air Conditioning Compressor Line-to-Condenser Bolt	16 N.m	12 lb ft
Air Conditioning Compressor Line-to-Thermal Expansion Valve (TXV) Nut	20 N.m	15 lb ft
Camshaft Position (CMP) Sensor Bolt	12 N.m	106 lb in
CMP Sensor Wire Harness Bolt	12 N.m	106 lb in
Camshaft Retainer Bolts - Hex Head Bolts	25 N.m	18 lb ft
Camshaft Retainer Bolts - TORX® Head Bolts	15 N.m	11 lb ft
Camshaft Sprocket Bolt - First Pass	90 N.m	66 lb ft
Camshaft Sprocket Bolt - Final Pass	40 degrees	
Connecting Rod Bolts - First Pass	20 N.m	15 lb ft
Connecting Rod Bolts - Final Pass	75 degrees	
Coolant Air Bleed Pipe and Cover Bolts	12 N.m	106 lb in
Coolant Temperature Sensor	20 N.m	15 lb ft
Crankshaft Balancer Bolt - Installation Pass to Ensure the Balancer is Completely Installed	330 N.m	240 lb ft
Crankshaft Balancer Bolt - First Pass - Install a NEW Bolt After the Installation Pass and Tighten as Described in the First and Final Passes	50 N.m	37 lb ft
Crankshaft Balancer Bolt - Final Pass	140 degrees	
Crankshaft Bearing Cap M8 Bolts	25 N.m	18 lb ft
Crankshaft Bearing Cap M10 Bolts - First Pass in Sequence	20 N.m	15 lb ft
Crankshaft Bearing Cap M10 Bolts - Final Pass in Sequence	80 degrees	
Crankshaft Bearing Cap M10 Studs - First Pass in Sequence	20 N.m	15 lb ft
Crankshaft Bearing Cap M10 Studs - Final Pass in Sequence	51 degrees	
Crankshaft Oil Deflector Nuts	25 N.m	18 lb ft
Crankshaft Position (CKP) Sensor Bolt	25 N.m	18 lb ft
Crankshaft Rear Oil Seal Housing Bolts	30 N.m	22 lb ft
Cylinder Head M8 Bolts - in Sequence	30 N.m	22 lb ft

2007 Chevrolet TrailBlazer

2007 ENGINE Engine Mechanical - 6.0L - TrailBlazer

Cylinder Head M11 Bolts - First Pass in Sequence	30 N.m	22 lb ft
Cylinder Head M11 Bolts - Second Pass in Sequence	90 degrees	
Cylinder Head M11 Bolts - Final Pass in Sequence	70 degrees	
Cylinder Head Coolant Plug	20 N.m	15 lb ft
Drive Belt Idler Pulley Bolt	50 N.m	37 lb ft
Drive Belt Tensioner Bolt	50 N.m	37 lb ft
Engine Block Coolant Drain Hole Plug	60 N.m	44 lb ft
Engine Block Coolant Heater	50 N.m	37 lb ft
Engine Block Oil Gallery Plug	60 N.m	44 lb ft
Engine Ground Strap-to-Frame Nut	25 N.m	18 lb ft
Engine Ground-to-Engine Block Bolts	16 N.m	12 lb ft
Engine Harness Bracket Nut	10 N.m	89 lb in
Engine Mount Bracket Spacer	50 N.m	37 lb ft
Engine Mount Frame Bracket	100 N.m	74 lb ft
Engine Mount Nuts	50 N.m	37 lb ft
Engine Sight Shield Bolt	10 N.m	89 lb in
Engine Sight Shield Bracket Bolt	5 N.m	44 lb in
Exhaust Manifold Bolts - First Pass	15 N.m	11 lb ft
Exhaust Manifold Bolts - Final Pass	20 N.m	15 lb ft
Exhaust Manifold Heat Shield Bolts	9 N.m	80 lb in
Exhaust Manifold Studs	20 N.m	15 lb ft
Flywheel Bolts - First Pass	20 N.m	15 lb ft
Flywheel Bolts - Second Pass	50 N.m	37 lb ft
Flywheel Bolts - Final Pass	100 N.m	74 lb ft
Front Cover Bolts	25 N.m	18 lb ft
Fuel Injection Fuel Rail Bolts	10 N.m	89 lb in
Fuel Rail Crossover Tube Bolts	3.8 N.m	34 lb in
Fuel Rail Stop Bracket Bolt	50 N.m	37 lb ft
Generator Power Lead Nut	9 N.m	80 lb in
Ignition Coil Bracket-to-Valve Rocker Arm Cover Studs	12 N.m	106 lb in
Ignition Coil-to-Bracket Bolts	10 N.m	89 lb in
Intake Manifold Bolts - First Pass in Sequence	5 N.m	44 lb in
Intake Manifold Bolts - Final Pass in Sequence	10 N.m	89 lb in
J 41798 M8 Bolt	25 N.m	18 lb ft
J 41798 M10 Bolts	50 N.m	37 lb ft
J 42386-A Bolts	50 N.m	37 lb ft
Knock Sensor Bolts	20 N.m	15 lb ft
Oil Filter	30 N.m	22 lb ft
Oil Filter Fitting	55 N.m	40 lb ft
Oil Filter Tube-to-Bottom of Oil Pan Bolts	12 N.m	106 lb in
Oil Filter Tube-to-Side of Oil Pan Bolts	12 N.m	106 lb in

2007 Chevrolet TrailBlazer

2007 ENGINE Engine Mechanical - 6.0L - TrailBlazer

	25 N.m	18 lb ft
Oil Pan Baffle Bolts	12 N.m	106 lb in
Oil Pan Closeout Cover Bolt - Left Side	9 N.m	80 lb in
Oil Pan Closeout Cover Bolt - Right Side	9 N.m	80 lb in
Oil Pan Cover Bolts	12 N.m	106 lb in
Oil Pan Drain Plug	25 N.m	18 lb ft
Oil Pan M6 Bolts - Oil Pan-to-Rear Oil Seal Housing	12 N.m	106 lb in
Oil Pan M8 Bolts - Oil Pan-to-Engine Block and Oil Pan-to-Front Cover	25 N.m	18 lb ft
Oil Pan Oil Gallery Plugs	25 N.m	18 lb ft
Oil Pressure Sensor	35 N.m	26 lb ft
Oil Pump Cover Bolts	12 N.m	106 lb in
Oil Pump Relief Valve Plug	12 N.m	106 lb in
Oil Pump Screen Nuts	25 N.m	18 lb ft
Oil Pump Screen-to-Oil Pump Bolt	12 N.m	106 lb in
Oil Pump-to-Engine Block Bolts	25 N.m	18 lb ft
Spark Plugs	15 N.m	11 lb ft
Throttle Body Bolts	10 N.m	89 lb in
Throttle Body Nuts	10 N.m	89 lb in
Throttle Body Studs	6 N.m	53 lb in
Timing Chain Tensioner Bolts	25 N.m	18 lb ft
Upper Engine Mount Bracket	50 N.m	37 lb ft
Valley Cover Bolts	25 N.m	18 lb ft
Valve Lifter Guide Bolts	10 N.m	89 lb in
Valve Rocker Arm Bolts	30 N.m	22 lb ft
Valve Rocker Arm Cover Bolts	12 N.m	106 lb in
Water Inlet Housing Bolts	15 N.m	11 lb ft
Water Pump Bolts - First Pass	15 N.m	11 lb ft
Water Pump Bolts - Final Pass	30 N.m	22 lb ft

ENGINE MECHANICAL SPECIFICATIONS**Engine Mechanical Specifications**

Application	Specification	
	Metric	English
General		
• Engine Type	V8	
• Displacement	6.0L	364 CID
• RPO	LS2	
• VIN	H	

2007 Chevrolet TrailBlazer

2007 ENGINE Engine Mechanical - 6.0L - TrailBlazer

• Bore	101.618-101.636 mm	4.0007-4.0017 in
• Stroke	92.0 mm	3.622 in
• Compression Ratio	10.86:1	
• Firing Order	1-8-7-2-6-5-4-3	
• Spark Plug Gap	1.02 mm	0.04 in
Block		
• Camshaft Bearing Bore 1 and 5 Diameter	59.58-59.63 mm	2.345-2.347 in
• Camshaft Bearing Bore 2 and 4 Diameter	59.08-59.13 mm	2.325-2.327 in
• Camshaft Bearing Bore 3 Diameter	58.58-58.63 mm	2.306-2.308 in
• Crankshaft Main Bearing Bore Diameter	69.871-69.889 mm	2.75-2.751 in
• Crankshaft Main Bearing Bore Out-of-Round	0.006 mm	0.0002 in
• Cylinder Bore Diameter	101.618-101.636 mm	4.0007-4.0017 in
• Cylinder Head Deck Height - Measuring from the Centerline of Crankshaft to the Deck Face	234.57-234.82 mm	9.235-9.245 in
• Cylinder Head Deck Surface Flatness - Measured Within a 152.4 mm (6.0 in) Area	0.11 mm	0.004 in
• Cylinder Head Deck Surface Flatness - Measuring the Overall Length of the Block Deck	0.22 mm	0.008 in
• Valve Lifter Bore Diameter	21.417-21.443 mm	0.843-0.844 in
Camshaft		
• Camshaft End Play	0.025-0.305 mm	0.001-0.012 in
• Camshaft Journal Diameter	54.99-55.04 mm	2.164-2.166 in
• Camshaft Journal Out-of-Round	0.025 mm	0.001 in
• Camshaft Lobe Lift - Intake	7.78 mm	0.306 in
• Camshaft Lobe Lift - Exhaust	7.77 mm	0.305 in
• Camshaft Runout - Measured at the Intermediate Journals	0.05 mm	0.002 in
Connecting Rod		
• Connecting Rod Bearing Clearance - Production	0.023-0.065 mm	0.0009-0.0025 in
• Connecting Rod Bearing Clearance - Service	0.023-0.076 mm	0.0009-0.003 in
• Connecting Rod Bore Diameter - Bearing End	56.505-56.525 mm	2.224-2.225 in
• Connecting Rod Bore Out-of-Round - Bearing End - Production	0.004-0.008 mm	0.00015-0.0003 in
• Connecting Rod Bore Out-of-Round - Bearing End - Service	0.004-0.008 mm	0.00015-0.0003 in

2007 Chevrolet TrailBlazer

2007 ENGINE Engine Mechanical - 6.0L - TrailBlazer

• Connecting Rod Side Clearance	0.11-0.51 mm	0.00433-0.02 in
Crankshaft		
• Connecting Rod Journal Diameter - Production	53.318-53.338 mm	2.0991-2.0999 in
• Connecting Rod Journal Diameter - Service	53.308 mm	2.0987 in
• Connecting Rod Journal Out-of-Round - Production	0.005 mm	0.0002 in
• Connecting Rod Journal Out-of-Round - Service	0.01 mm	0.0004 in
• Connecting Rod Journal Taper - Maximum for 1/2 of Journal Length - Production	0.005 mm	0.0002 in
• Connecting Rod Journal Taper - Maximum for 1/2 of Journal Length - Service	0.02 mm	0.00078 in
• Crankshaft End Play	0.04-0.2 mm	0.0015-0.0078 in
• Crankshaft Main Bearing Clearance - Production	0.02-0.052 mm	0.0008-0.0021 in
• Crankshaft Main Bearing Clearance - Service	0.02-0.065 mm	0.0008-0.0025 in
• Crankshaft Main Journal Diameter - Production	64.992-65.008 mm	2.558-2.559 in
• Crankshaft Main Journal Diameter - Service	64.992 mm	2.558 in
• Crankshaft Main Journal Out-of-Round - Production	0.003 mm	0.000118 in
• Crankshaft Main Journal Out-of-Round - Service	0.008 mm	0.0003 in
• Crankshaft Main Journal Taper - Production	0.01 mm	0.0004 in
• Crankshaft Main Journal Taper - Service	0.02 mm	0.00078 in
• Crankshaft Rear Flange Runout	0.05 mm	0.002 in
• Crankshaft Reluctor Ring Runout - Measured 1.0 mm (0.04 in) Below Tooth Diameter	0.7 mm	0.028 in
• Crankshaft Thrust Surface - Production	26.14-26.22 mm	1.029-1.0315 in
• Crankshaft Thrust Surface - Service	26.22 mm	1.0315 in
• Crankshaft Thrust Surface Runout	0.025 mm	0.001 in
Cylinder Head		
• Cylinder Head Height/Thickness - Measured from the Cylinder Head Deck to the Valve Rocker Arm Cover Seal Surface	120.2 mm	4.732 in
• Surface Flatness - Block Deck - Measured Within a 152.4 mm (6.0 in) Area	0.08 mm	0.003 in
• Surface Flatness - Block Deck - Measuring the Overall Length of the Cylinder Head	0.1 mm	0.004 in
• Surface Flatness - Exhaust Manifold Deck	0.13 mm	0.005 in
• Surface Flatness - Intake Manifold Deck	0.08 mm	0.0031 in

2007 Chevrolet TrailBlazer

2007 ENGINE Engine Mechanical - 6.0L - TrailBlazer

<ul style="list-style-type: none"> Valve Guide Installed Height - Measured from the Spring Seat Surface to the Top of the Guide 	17.32 mm	0.682 in
Intake Manifold		
<ul style="list-style-type: none"> Surface Flatness - Measured at Gasket Sealing Surfaces and Measured Within a 200 mm (7.87 in) Area that Includes 2 Runner Port Openings 	0.3 mm	0.118 in
Lubrication System		
<ul style="list-style-type: none"> Oil Capacity - with Filter 	5.68 liters	6.0 quarts
<ul style="list-style-type: none"> Oil Capacity - without Filter 	5.20 liters	5.5 quarts
<ul style="list-style-type: none"> Oil Pressure - Minimum - Hot 	41 kPa at 1,000 engine RPM 124 kPa at 2,000 engine RPM 165 kPa at 4,000 engine RPM	6 psig at 1,000 engine RPM 18 psig at 2,000 engine RPM 24 psig at 4,000 engine RPM
<ul style="list-style-type: none"> Oil Pressure Relief Valve Oil Pressure - as Measured at Oil Pressure Sensor Location 	379-517 kPa Maximum	55-75 psig Maximum
Oil Pan		
<ul style="list-style-type: none"> Front Cover Alignment - at Oil Pan Surface 	0.0-0.5 mm	0.0-0.02 in
<ul style="list-style-type: none"> Crankshaft Rear Oil Seal Housing Alignment - at Oil Pan Surface 	0.0-0.5 mm	0.0-0.02 in
<ul style="list-style-type: none"> Oil Pan Alignment - to Rear of Engine Block at Transmission Bell Housing Mounting Surface 	0.0-0.1 mm	0.0-0.004 in
Piston Rings		
<ul style="list-style-type: none"> Piston Ring End Gap - First Compression Ring - Measured in Cylinder Bore - Production 	0.20-0.41 mm	0.008-0.016 in
<ul style="list-style-type: none"> Piston Ring End Gap - First Compression Ring - Measured in Cylinder Bore - Service 	0.20-0.41 mm	0.008-0.016 in
<ul style="list-style-type: none"> Piston Ring End Gap - Second Compression Ring - Measured in Cylinder Bore - Production 	0.37-0.69 mm	0.015-0.027 in
<ul style="list-style-type: none"> Piston Ring End Gap - Second Compression Ring - Measured in Cylinder Bore - Service 	0.37-0.69 mm	0.015-0.027 in
<ul style="list-style-type: none"> Piston Ring End Gap - Oil Control Ring - Measured in Cylinder Bore - Production 	0.22-0.79 mm	0.009-0.031 in
<ul style="list-style-type: none"> Piston Ring End Gap - Oil Control Ring - Measured in Cylinder Bore - Service 	0.22-0.79 mm	0.009-0.031 in
<ul style="list-style-type: none"> Piston Ring to Groove Clearance - First Compression Ring - Production 	0.030-0.10 mm	0.0012-0.0040 in
<ul style="list-style-type: none"> Piston Ring to Groove Clearance - First Compression 	0.030-0.10 mm	0.0012-0.0040 in

2007 Chevrolet TrailBlazer

2007 ENGINE Engine Mechanical - 6.0L - TrailBlazer

Ring - Service		
• Piston Ring to Groove Clearance - Second Compression Ring - Production	0.035-0.078 mm	0.0014-0.0031 in
• Piston Ring to Groove Clearance - Second Compression Ring - Service	0.035-0.078 mm	0.0014-0.0031 in
• Piston Ring to Groove Clearance - Oil Control Ring - Production	0.013-0.201 mm	0.0005-0.0079 in
• Piston Ring to Groove Clearance - Oil Control Ring - Service	0.013-0.201 mm	0.0005-0.0079 in
Pistons and Pins		
• Pin - Piston Pin Clearance to Piston Pin Bore - Production	0.002-0.01 mm	0.0008-0.0004 in
• Pin - Piston Pin Clearance to Piston Pin Bore - Service	0.002-0.015 mm	0.00008-0.0006 in
• Pin - Piston Pin Diameter	23.952-23.955 mm	0.943-0.943 in
• Pin - Piston Pin Fit in Connecting Rod Bore - Production	0.007-0.02 mm	0.00027-0.00078 in
• Pin - Piston Pin Fit in Connecting Rod Bore - Service	0.007-0.022 mm	0.00027-0.00086 in
• Piston - Piston Diameter - Measured Over Skirt Coating	101.611-101.642 mm	4.0-4.001 in
• Piston - Piston to Bore Clearance - Production	-0.022-0.030 mm	-0.0009-0.0012 in
• Piston - Piston to Bore Clearance - Service Limit with Skirt Coating Worn Off	0.024-0.08 mm	0.00094-0.0031 in
Valve System		
• Valves - Valve Face Angle	45 degrees	
• Valves - Valve Face Width	1.25 mm	0.05 in
• Valves - Valve Lash	Net Lash - No Adjustment	
• Valves - Valve Lift - Intake	13.23 mm	0.52 in
• Valves - Valve Lift - Exhaust	13.22 mm	0.52 in
• Valves - Valve Seat Angle	46 degrees	
• Valves - Valve Seat Runout	0.05 mm	0.002 in
• Valves - Valve Seat Width - Exhaust	1.78 mm	0.07 in
• Valves - Seat Width - Intake	1.02 mm	0.04 in
• Valves - Valve Stem Diameter - Production	7.955-7.976 mm	0.313-0.314 in
• Valves - Valve Stem Diameter - Service	7.95 mm	0.313 in
• Valves - Valve Stem-to-Guide Clearance - Production	0.025-0.066 mm	0.001-0.0026 in

2007 Chevrolet TrailBlazer

2007 ENGINE Engine Mechanical - 6.0L - TrailBlazer

- Intake		
• Valves - Valve Stem-to-Guide Clearance - Service - Intake	0.093 mm	0.0037 in
• Valves - Valve Stem-to-Guide Clearance - Production - Exhaust	0.025-0.066 mm	0.001-0.0026 in
• Valves - Valve Stem-to-Guide Clearance - Service - Exhaust	0.093 mm	0.0037 in
• Rocker Arms - Valve Rocker Arm Ratio	1.70:1	
• Valve Springs - Valve Spring Free Length	52.9 mm	2.08 in
• Valve Springs - Valve Spring Installed Height	45.75 mm	1.8 in
• Valve Springs - Valve Spring Load - Closed	340 N at 45.75 mm	76 lb at 1.8 in
• Valve Springs - Valve Spring Load - Open	980 N at 33.55 mm	220 lb at 1.32 in

SEALERS, ADHESIVES AND LUBRICANTS**Sealers, Adhesives and Lubricants**

Application	Type of Material	GM Part Number	
		United States	Canada
Coolant Temperature Sensor Threads	Sealant	12346004	10953480
Cylinder Head Core Hole Plug	Threadlock	12345382	10953489
Cylinder Head Plug	Threadlock	12345382	10953489
Engine Block Coolant Drain Hole Plug Sealing Washer	Sealant	12346004	10953480
Engine Block Front Oil Gallery Plug	Threadlock	12345382	10953489
Engine Block Oil Gallery Plug Sealing Washers	Sealant	12346004	10953480
Engine Oil Pressure Sensor Threads	Sealant	12346004	10953480
Engine Oil Supplement	Fluorescent Dye	12345795	10953470
Exhaust Manifold Bolts	Threadlock	12345493	10953488
Flywheel/Flex Plate Bolts	Threadlock	12345382	10953489
Fuel Injection Fuel Rail Bolts	Threadlock	12345382	10953489
Ignition Coil Bracket-to-Valve Cover Studs	Threadlock	12345382	10953489
Ignition Coil-to-Bracket Bolts	Threadlock	12345382	10953489
Intake Manifold Bolts	Threadlock	12345382	10953489
Oil Pan Oil Gallery Plug Threads	Sealant	12346004	10953480
Oil Pan Surface at Front Cover and Rear Housing	Sealant	12378521	88901148
Thread Repair Component Cleaner	Cleaner	12346139	10953463
Thread Repair Component Cleaner	Cleaner	12377981	10953463
Thread Repair Cutting Oil	Lubricant	1052864	992881

2007 Chevrolet TrailBlazer

2007 ENGINE Engine Mechanical - 6.0L - TrailBlazer

THREAD REPAIR SPECIFICATIONS

Engine Block - Front/Rear Views

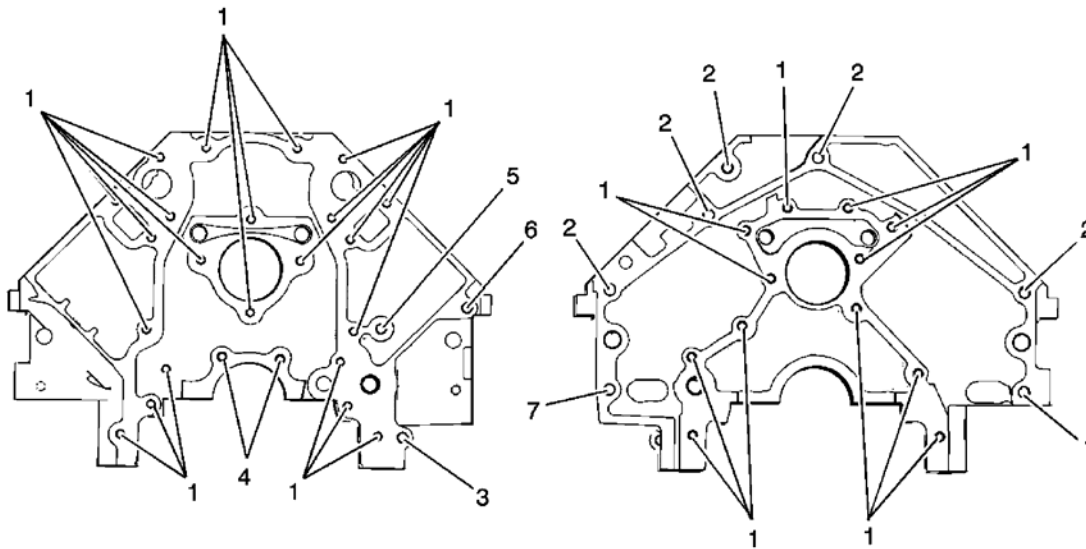


Fig. 1: Engine Block - Front/Rear Views
Courtesy of GENERAL MOTORS CORP.

Engine Block - Front/Rear Views

Hole	Thread Size	Insert	Drill	Counterbore Tool	Tap	Driver	Drill Depth - Maximum mm (in)	Tap Depth - Maximum mm (in)
J 42385-								
1	M8 x 1.25	210	206	207	208	209	22.5 (0.885)	17.5 (0.688)
2	M10 x 1.5	215	211	212	213	214	27.5 (1.08)	22.0 (0.866)
3	M10 x 1.5	215	211	212	213	214	Thru	Thru
4	M8 x 1.25	210	206	207	208	209	Thru	Thru
5	M10 x 1.5	215	211	212	213	214	25.0 (0.984)	19.5 (0.767)
6	M10 x 1.5	215	211	212	213	214	32.5 (1.279)	25.0 (0.984)
7	M10 x 1.5	215	211	212	213	214	Thru	Thru

Bolt hole 6 is drilled and tapped for aluminum block applications only.

2007 Chevrolet TrailBlazer

2007 ENGINE Engine Mechanical - 6.0L - TrailBlazer

Engine Block - Left/Right Side Views

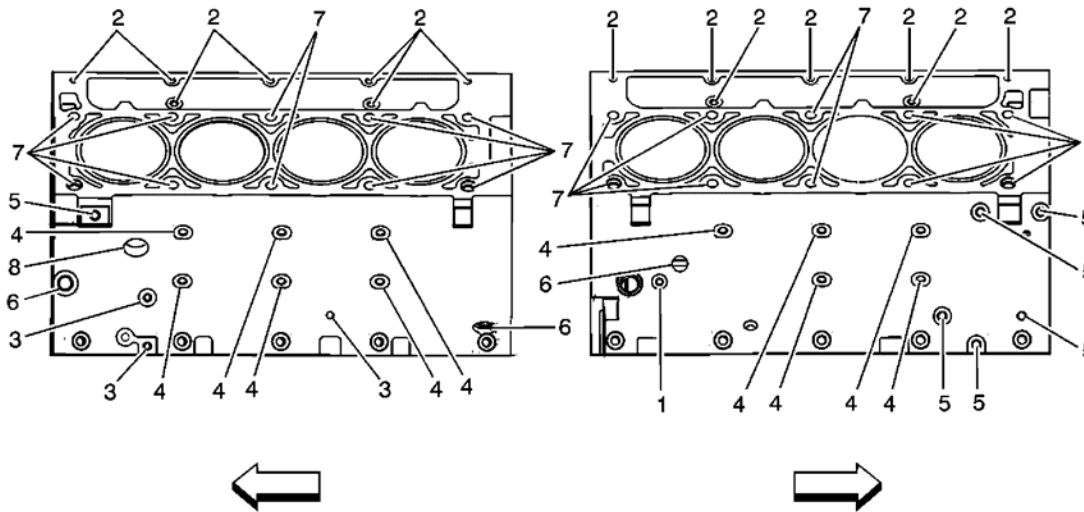


Fig. 2: Engine Block - Left/Right Side Views
Courtesy of GENERAL MOTORS CORP.

Engine Block - Left/Right Side Views

Hole	Thread Size	Insert	Drill	Counterbore Tool	Tap	Driver	Drill Depth - Maximum mm (in)	Tap Depth - Maximum mm (in)
J 42385-								
1	M8 x 1.25	210	206	207	208	209	22.5 (0.885)	17.5 (0.688)
2	M8 x 1.25	210	206	207	208	209	28.5 (1.122)	23.0 (0.905)
3	M8 x 1.25	210	206	207	208	209	21.5 (0.846)	16.0 (0.629)
4	M10 x 1.25	215	211	212	213	214	29.0 (1.141)	23.0 (0.905)
5	M10 x 1.5	215	211	212	213	214	27.0 (1.062)	21.5 (0.846)
6	M16 x 1.5	N/A	N/A	N/A	N/A	N/A	N/A	N/A
7	M11 x 2.0	108	105	N/A	106	107	69.0 (2.72)	60.0 (2.36)
8	M28 x 1.25	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Bolt hole 7 has a 30 mm (1.18 in) counterbore included in the 69.0 mm (2.72 in) drill depth. Use sleeve J 42385-315 with the drill and tap.

2007 Chevrolet TrailBlazer

2007 ENGINE Engine Mechanical - 6.0L - TrailBlazer

Engine Block - Top/Bottom Views

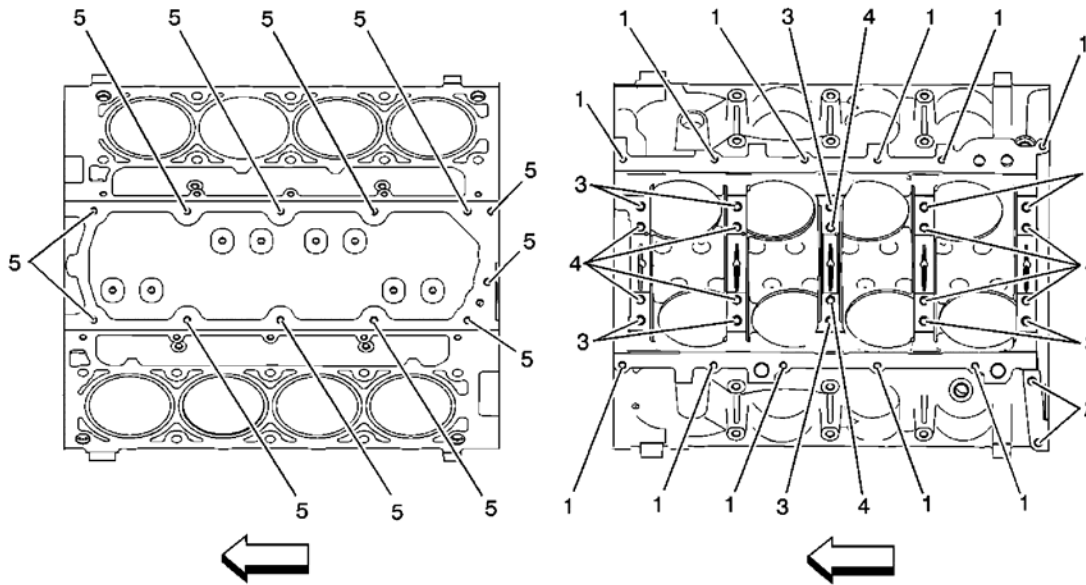


Fig. 3: Engine Block - Top/Bottom Views
Courtesy of GENERAL MOTORS CORP.

Engine Block - Top/Bottom Views

Hole	Thread Size	Insert	Drill	Counterbore Tool	Tap	Driver	Drill Depth - Maximum mm (in)	Tap Depth - Maximum mm (in)
J 42385-								
1	M8 x 1.25	210	206	207	208	209	22.5 (0.885)	17.5 (0.688)
2	M10 x 1.5	215	211	212	213	214	42.5 (1.67)	37.0 (1.45)
3	M10 x 2.0	104	101	N/A	102	103	31.0 (1.22)	25.5 (1.0)
4	M10 x 2.0	104	101	N/A	102	103	53.5 (2.10)	44.0 (1.73)
5	M8 x 1.25	210	206	207	208	209	26.5 (1.043)	19.0 (0.748)
<ul style="list-style-type: none">• Bolt hole 2 has an 11.5 mm (0.452 in) counterbore included in the 42.5 mm (1.67 in) drill depth. Use sleeve J 42385-311 with the drill and tap.• Bolt hole 3 has a 1.5 mm (0.059 in) counterbore included in the 31.0 mm (1.22 in) drill depth. Use sleeve J 42385-316 with the drill and tap.• Bolt hole 4 has a 20.5 mm (0.807 in) counterbore included in the 53.5 mm (2.10 in) drill depth.								

Cylinder Head - Top/End Views

2007 Chevrolet TrailBlazer

2007 ENGINE Engine Mechanical - 6.0L - TrailBlazer

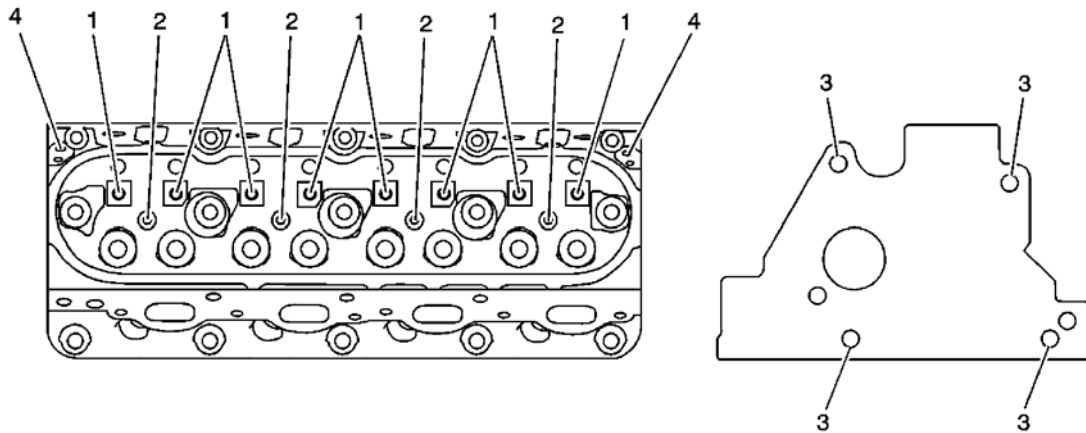


Fig. 4: Cylinder Head - Top/End Views
Courtesy of GENERAL MOTORS CORP.

Cylinder Head - Top/End Views

Hole	Thread Size	Insert	Drill	Counterbore Tool	Tap	Driver	Drill Depth - Maximum mm (in)	Tap Depth - Maximum mm (in)
J 42385-								
1	M8 x 1.25	210	206	207	208	209	26.5 (1.04)	19.0 (0.784)
2	M6 x 1.0	205	201	202	203	204	20.05 (0.789)	16.05 (0.632)
3	M10 x 1.5	215	211	212	213	214	28.0 (1.10)	20.0 (0.787)
4	M6 x 1.0	205	201	202	203	204	22.5 (0.885)	15.0 (0.688)

Cylinder Head - Intake/Exhaust Side Views

2007 Chevrolet TrailBlazer

2007 ENGINE Engine Mechanical - 6.0L - TrailBlazer

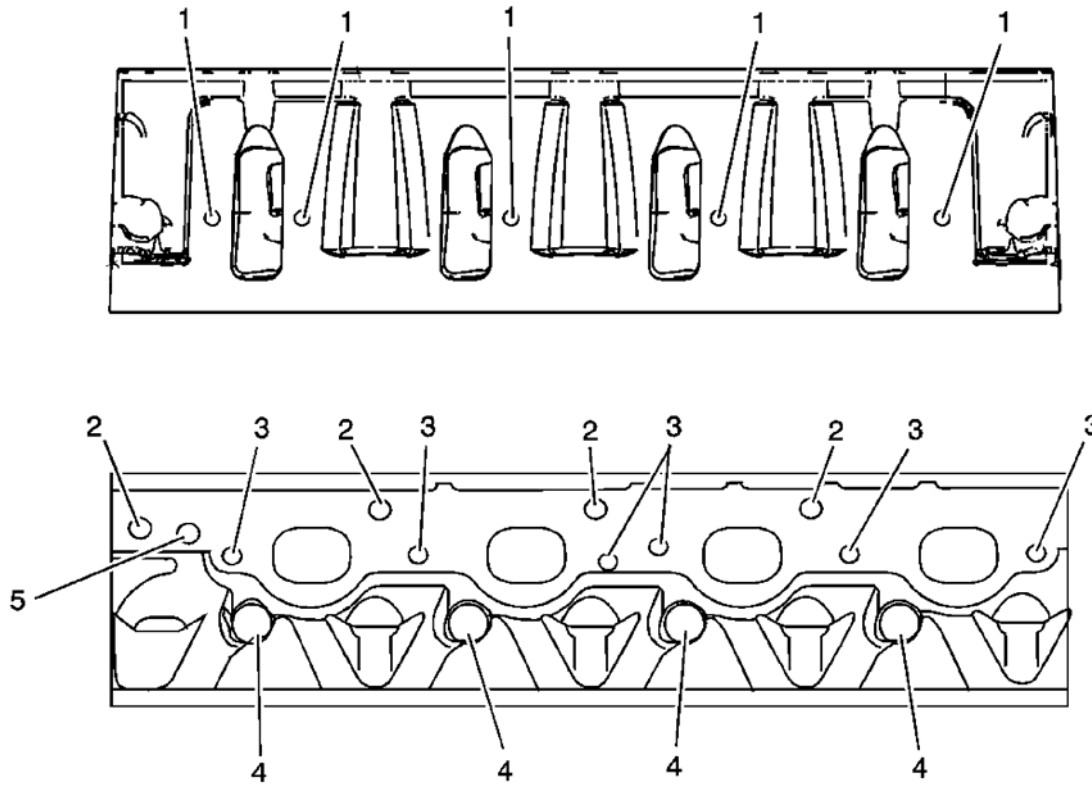


Fig. 5: Cylinder Head - Intake/Exhaust Side Views
Courtesy of GENERAL MOTORS CORP.

Cylinder Head - Intake/Exhaust Side Views

Hole	Thread Size	Insert	Drill	Counterbore Tool	Tap	Driver	Drill Depth - Maximum mm (in)	Tap Depth - Maximum mm (in)
J 42385-								
1	M6 x 1.0	205	201	202	203	204	Thru	Thru
2	M10 x 1.5	215	211	212	213	214	28.0 (1.10)	20.0 (0.787)
3	M8 x 1.25	210	206	207	208	209	21.0 (0.826)	16.0 (0.629)
4	M14 x 1.25	N/A	N/A	N/A	N/A	N/A	N/A	N/A
5	M12 x 1.5	N/A	N/A	N/A	N/A	N/A	N/A	N/A

COMPONENT LOCATOR

DISASSEMBLED VIEWS

2007 Chevrolet TrailBlazer

2007 ENGINE Engine Mechanical - 6.0L - TrailBlazer

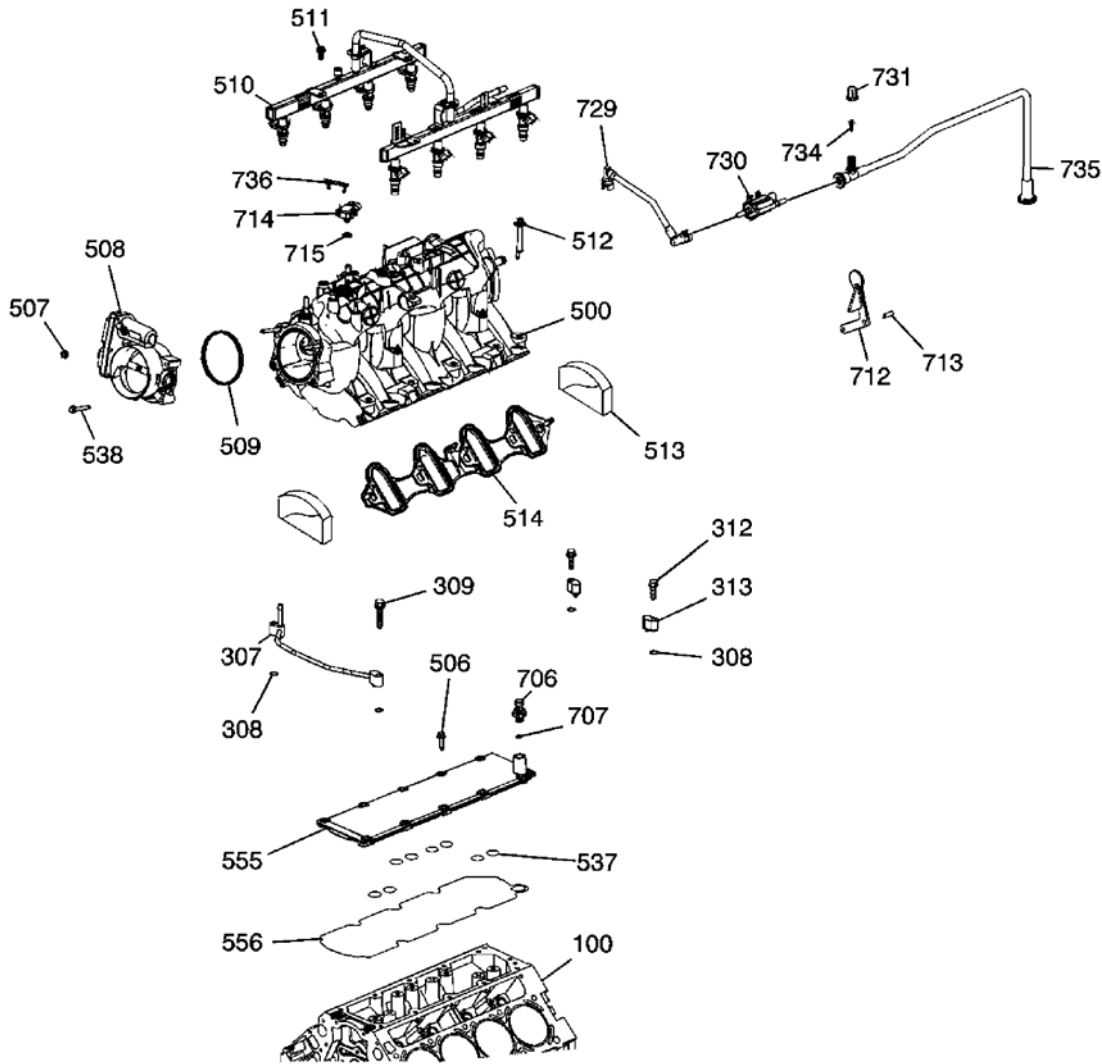


Fig. 6: Disassembled View Of Intake Manifold/Upper Engine
Courtesy of GENERAL MOTORS CORP.

Callouts For Fig. 6

Callout	Component Name
100	Engine Block
307	Engine Coolant Air Bleed Pipe
308	Seal
308	Seal
309	Bolt
312	Bolt
313	Engine Coolant Air Bleed Cover
500	Intake Manifold
506	Bolt

2007 Chevrolet TrailBlazer

2007 ENGINE Engine Mechanical - 6.0L - TrailBlazer

507	Nut
508	Throttle Body
509	Throttle Body Gasket
510	Fuel Rail with Injectors
511	Bolt
512	Bolt
513	Seal
514	Intake Manifold Gasket
537	O-Ring
538	Bolt
555	Valley Cover
556	Valley Cover Gasket
706	Oil Pressure Sensor
707	Washer
712	Fuel Injection Fuel Rail Stop Bracket
713	Bolt
714	Manifold Absolute Pressure (MAP) Sensor
715	Seal
729	Evaporative Emission (EVAP) Canister Purge Tube
730	EVAP Canister Purge Solenoid Valve
731	Service Valve Cap
734	Service Valve
735	EVAP Canister Purge Tube
736	MAP Sensor Retainer

2007 Chevrolet TrailBlazer

2007 ENGINE Engine Mechanical - 6.0L - TrailBlazer

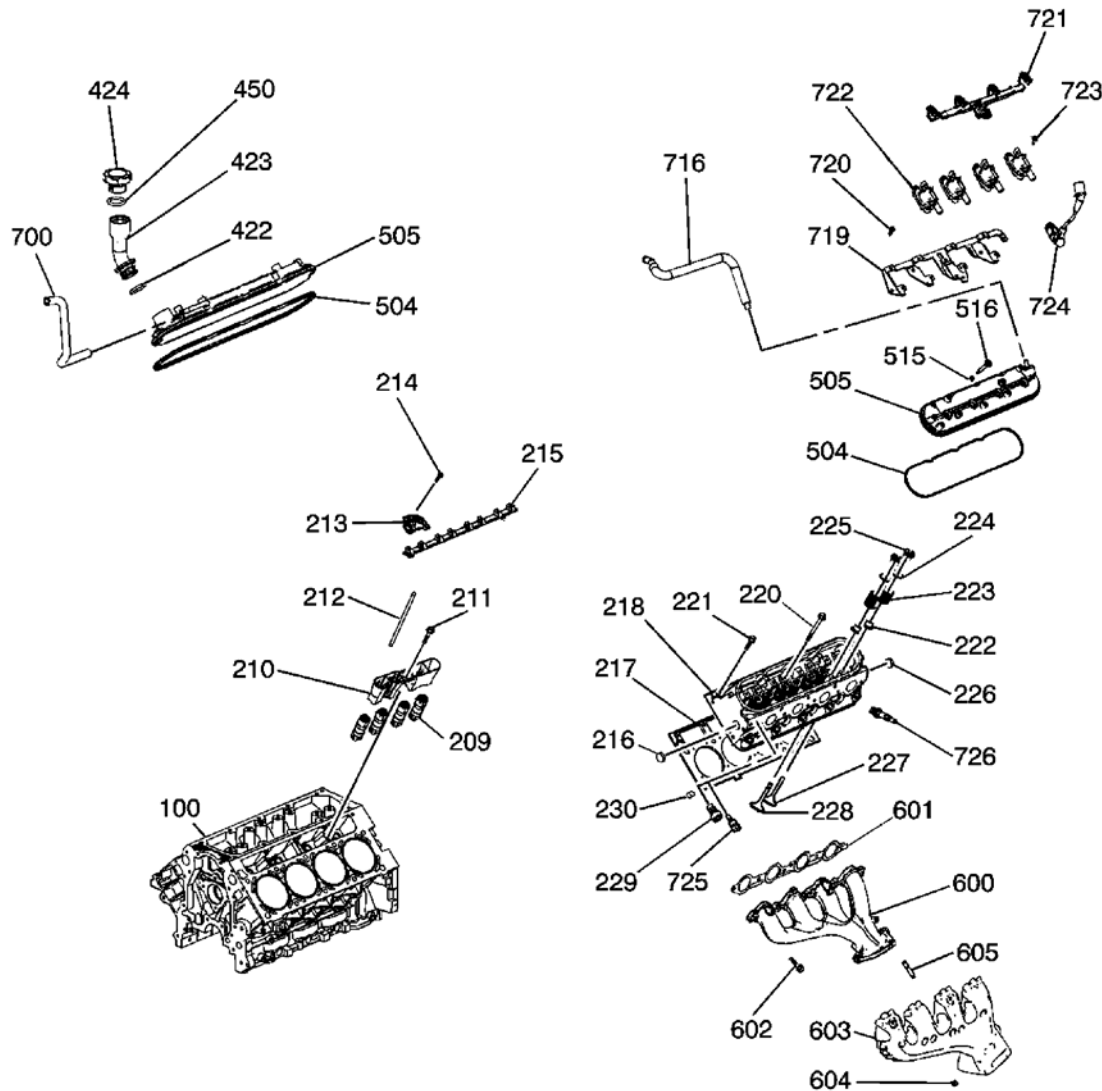


Fig. 7: Disassembled View Of Cylinder Head/Upper Engine
Courtesy of GENERAL MOTORS CORP.

Callouts For Fig. 7

Callout	Component Name
100	Engine Block
209	Valve Lifter
210	Valve Lifter Guide
211	Bolt
212	Pushrod
213	Valve Rocker Arm
214	Bolt
215	Valve Rocker Arm Pivot Support

2007 Chevrolet TrailBlazer

2007 ENGINE Engine Mechanical - 6.0L - TrailBlazer

216	Core Hole Plug
217	Cylinder Head Gasket
218	Cylinder Head
220	Cylinder Head Bolt - M11
221	Cylinder Head Bolt - M8
222	Valve Stem Oil Seal
223	Valve Spring
224	Valve Spring Cap
225	Valve Stem Key
226	Core Hole Plug
227	Intake Valve
228	Exhaust Valve
229	Cylinder Head Plug
230	Cylinder Head Locating Pin
422	O-Ring
423	Oil Fill Tube
424	Oil Fill Cap
450	O-Ring
504	Valve Rocker Arm Cover Gasket
504	Valve Rocker Arm Cover Gasket
505	Valve Rocker Arm Cover
505	Valve Rocker Arm Cover
515	Bolt Grommet
516	Bolt
600	Exhaust Manifold
601	Exhaust Manifold Gasket
602	Bolt
603	Exhaust Manifold Heat Shield
604	Bolt
605	Stud
700	Positive Crankcase Ventilation (PCV) Hose - Fresh Air
716	PCV Hose - Dirty Air
719	Ignition Coil Bracket
720	Stud
721	Ignition Coil Wire Harness Assembly
722	Ignition Coil
723	Bolt
724	Spark Plug Wire
725	Coolant Temperature Sensor (CTS)
726	Spark Plug

2007 ENGINE Engine Mechanical - 6.0L - TrailBlazer



Callout	Component Name
1	Water Inlet Housing
2	Bolt
3	O-Ring
4	Thermostat
5	Bolt
6	Water Pump
7	Water Pump Gasket
8	Oil Level Indicator
9	O-Ring
10	Bolt
11	Oil Level Indicator Tube
12	O-Ring
13	Engine Block

2007 Chevrolet TrailBlazer

2007 ENGINE Engine Mechanical - 6.0L - TrailBlazer

14	Camshaft Bearings
15	Camshaft
16	Camshaft Sprocket Locating Pin
17	Camshaft Retainer Plate
18	Bolt
19	Camshaft Sprocket
20	Bolt
21	Crankshaft Sprocket
22	Timing Chain
23	Timing Chain Tensioner
24	Bolt
25	Engine Front Cover Gasket
26	Engine Front Cover
27	Bolt
28	Crankshaft Front Oil Seal
29	Crankshaft Balancer
30	Bolt
31	Bolt
32	Camshaft Position (CMP) Sensor
33	O-Ring
34	Bolt
35	CMP Sensor Wire Harness
36	Oil Pump Housing Cover
37	Bolt
38	Bolt
39	Oil Pump Drive Gear
40	Oil Pump Driven Gear
41	Oil Pump
42	O-Ring
43	Bolt
44	Nut
45	Oil Pump Screen
46	Oil Pump Housing Plug
47	Oil Pump Pressure Relief Valve Spring
48	Oil Pump Pressure Relief Valve

2007 Chevrolet TrailBlazer

2007 ENGINE Engine Mechanical - 6.0L - TrailBlazer

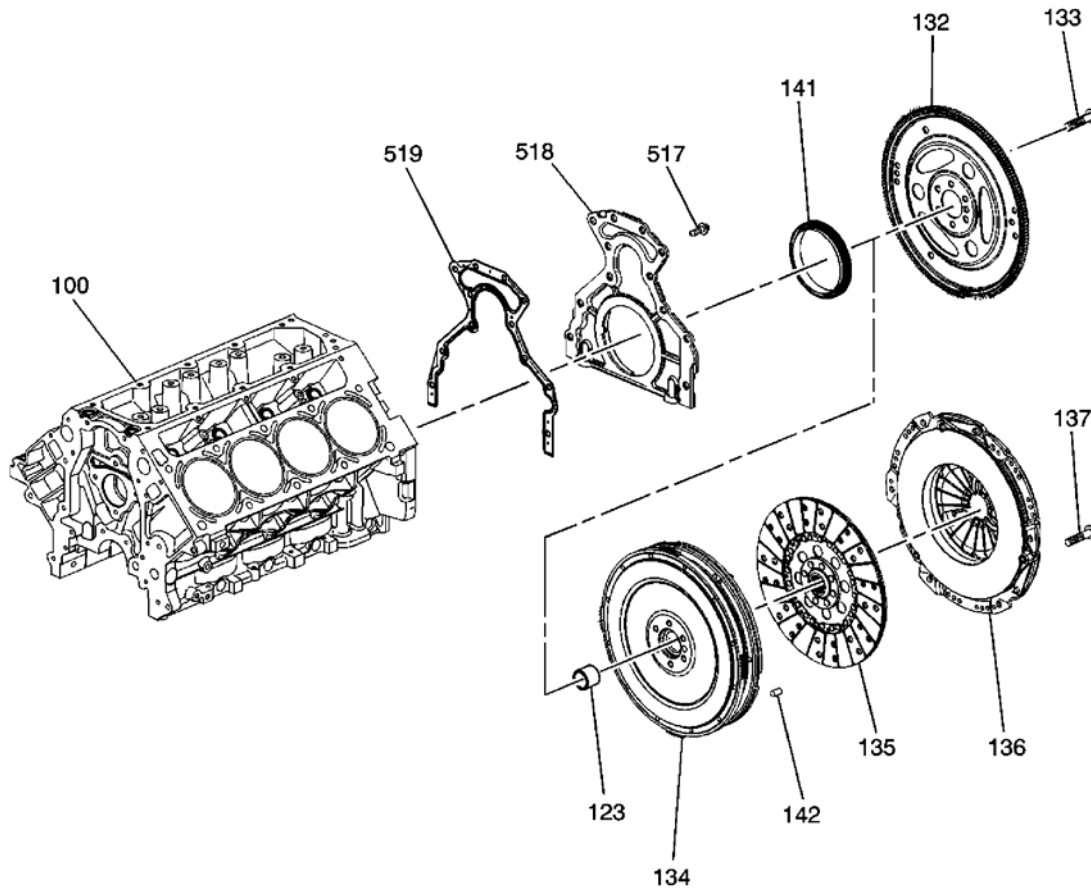


Fig. 9: Disassembled View Of Rear Of Engine
Courtesy of GENERAL MOTORS CORP.

Callouts For Fig. 9

Callout	Component Name
100	Engine Block
123	Transmission Pilot Bearing - Manual Transmission
132	Flex Plate - Automatic Transmission
133	Bolt
134	Flywheel - Manual Transmission
135	Clutch Driven Plate - Manual Transmission
136	Clutch Pressure Plate - Manual Transmission
137	Bolt
141	Crankshaft Rear Oil Seal
142	Clutch Pressure Plate Locating Pin - Manual Transmission
517	Bolt
518	Crankshaft Rear Oil Seal Housing
519	Crankshaft Rear Oil Seal Housing Gasket

2007 Chevrolet TrailBlazer

2007 ENGINE Engine Mechanical - 6.0L - TrailBlazer

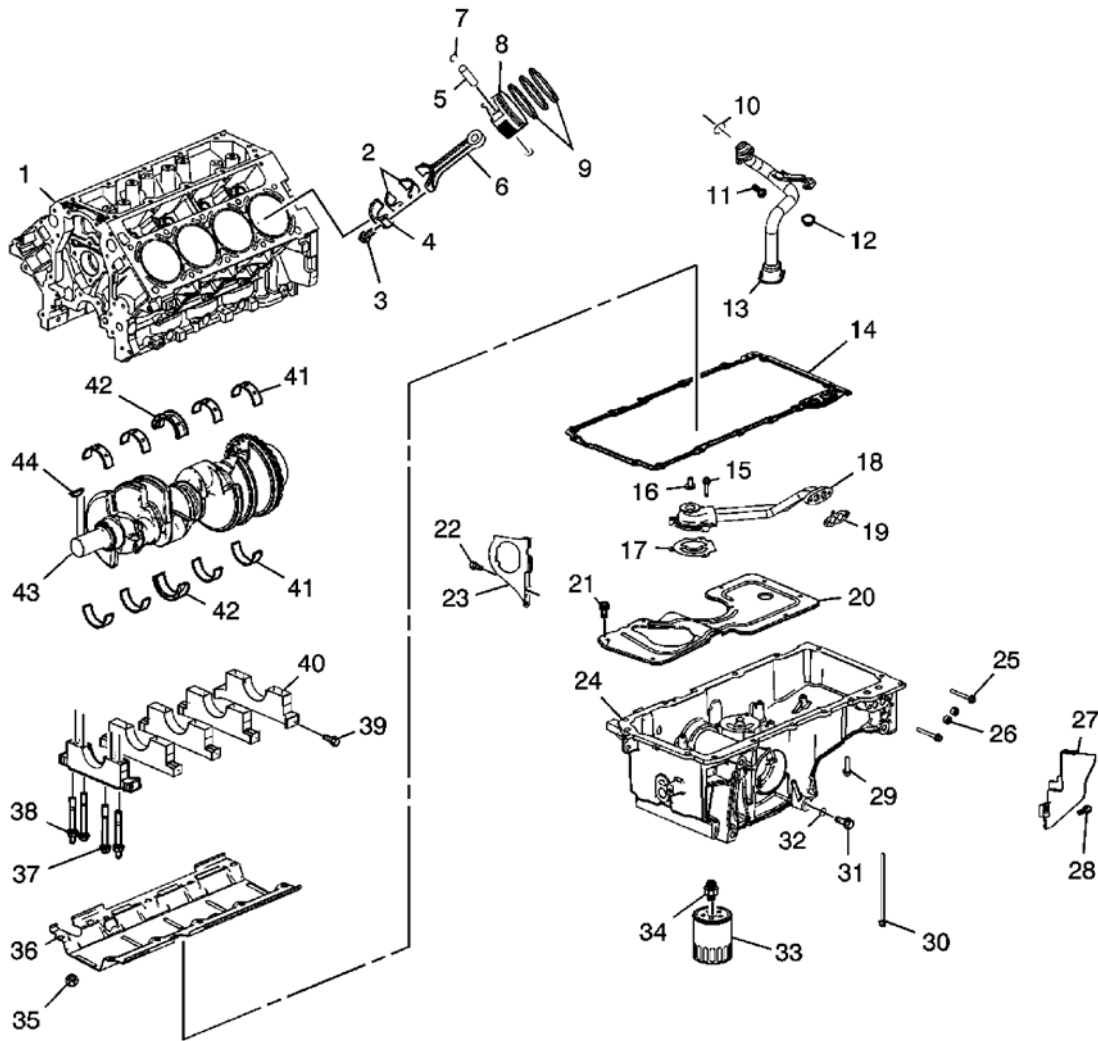


Fig. 10: View Of Lower Engine Assembly
Courtesy of GENERAL MOTORS CORP.

Callouts For Fig. 10

Callout	Component Name
1	Engine Block
2	Connecting Rod Bearings
3	Bolt
4	Connecting Rod Cap
5	Piston Pin
6	Connecting Rod
7	Retainer
8	Piston
9	Piston Rings

2007 Chevrolet TrailBlazer

2007 ENGINE Engine Mechanical - 6.0L - TrailBlazer

10	O-Ring
11	Bolt
12	Nut
13	Oil Pump Screen
14	Oil Pan Gasket
15	Bolt
16	Oil Pressure Relief Valve
17	Oil Filter Tube Gasket
18	Oil Filter Tube
19	Oil Filter Tube Gasket
20	Oil Pan Baffle
21	Bolt
22	Bolt
23	Cover - Right
24	Oil Pan
25	Bolt
26	Plug
27	Cover - Left
28	Bolt
29	Bolt
30	Bolt
31	Oil Pan Drain Plug
32	O-Ring
33	Oil Filter
34	Oil Filter Fitting
35	Nut
36	Crankshaft Oil Deflector
37	Bolt - M10
38	Stud - M10
39	Bolt - M8
40	Crankshaft Bearing Cap
41	Crankshaft Main Bearing
41	Crankshaft Main Bearing
42	Crankshaft Thrust Bearing
42	Crankshaft Thrust Bearing
43	Crankshaft
44	Crankshaft Sprocket Key

2007 Chevrolet TrailBlazer

2007 ENGINE Engine Mechanical - 6.0L - TrailBlazer

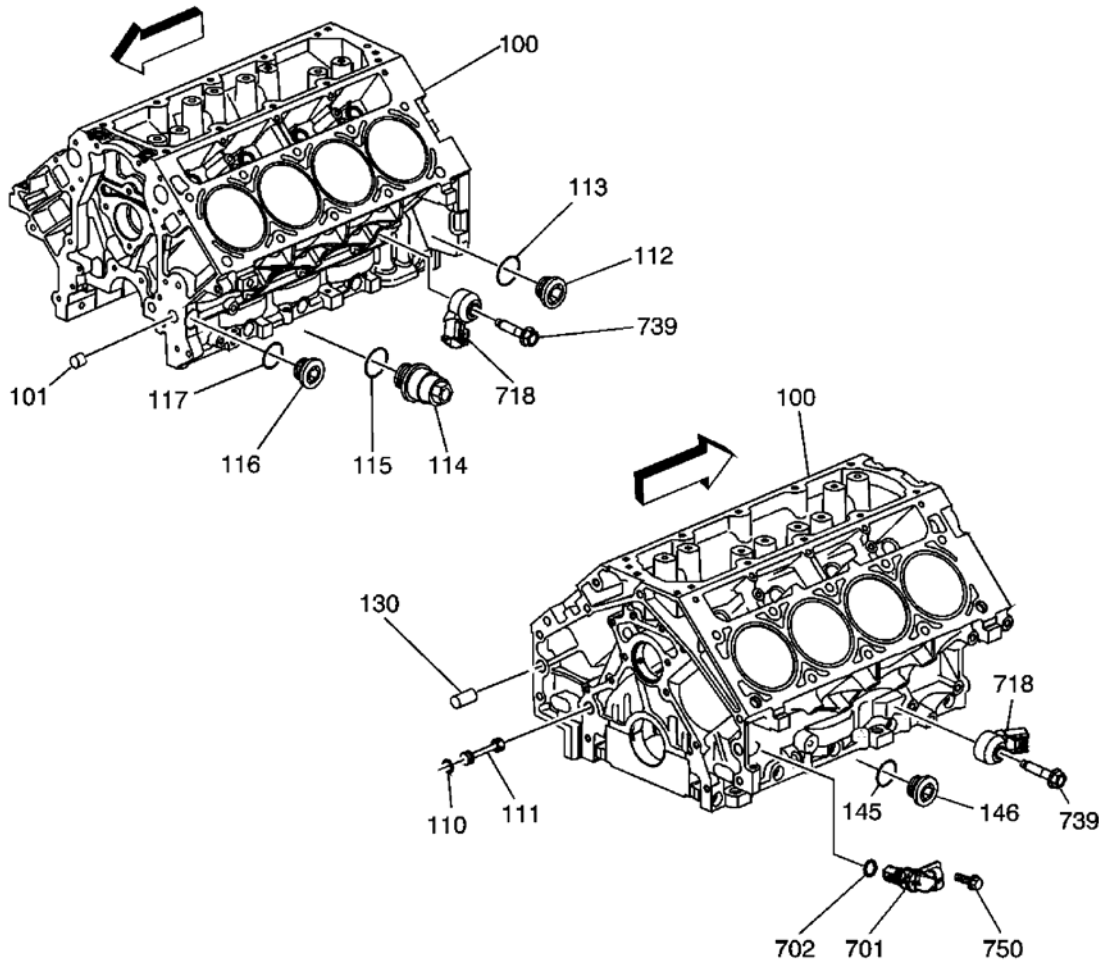


Fig. 11: Exploded View Of Engine Block Plugs/Sensors Components
Courtesy of GENERAL MOTORS CORP.

Callouts For Fig. 11

Callout	Component Name
100	Engine Block
100	Engine Block
101	Oil Gallery Plug - Front
110	O-Ring
111	Oil Gallery Plug - Rear
112	Oil Gallery Plug - Side
113	Washer
114	Engine Coolant Heater
115	Washer
116	Oil Gallery Plug - Side
117	Washer
130	Oil Gallery Plug - Front
701	Oil Gallery Plug - Rear
702	O-Ring
718	Oil Gallery Plug - Side
739	Washer
750	Engine Coolant Heater
770	Oil Gallery Plug - Front

2007 Chevrolet TrailBlazer

2007 ENGINE Engine Mechanical - 6.0L - TrailBlazer

130	Transmission Housing Locating Pin
145	Washer
146	Engine Block Coolant Drain Hole Plug
701	Crankshaft Position (CKP) Sensor
702	O-Ring
718	Knock Sensor
718	Knock Sensor
739	Bolt
739	Bolt
750	CKP Sensor Bolt

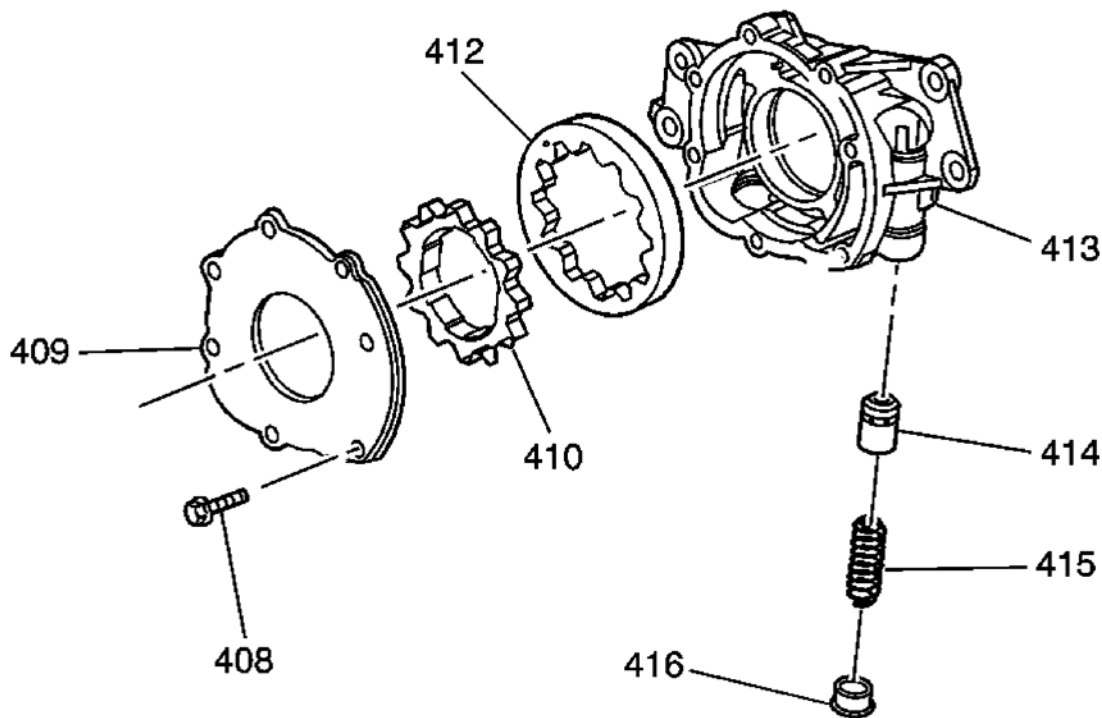


Fig. 12: Exploded View Of Oil Pump Assembly
Courtesy of GENERAL MOTORS CORP.

Callouts For Fig. 12

Callout	Component Name
408	Bolt
409	Oil Pump Housing Cover
410	Oil Pump Drive Gear
412	Oil Pump Driven Gear
413	Oil Pump
414	Oil Pump Pressure Relief Valve

2007 Chevrolet TrailBlazer

2007 ENGINE Engine Mechanical - 6.0L - TrailBlazer

415	Oil Pump Pressure Relief Valve Spring
416	Oil Pump Housing Plug

ENGINE IDENTIFICATION

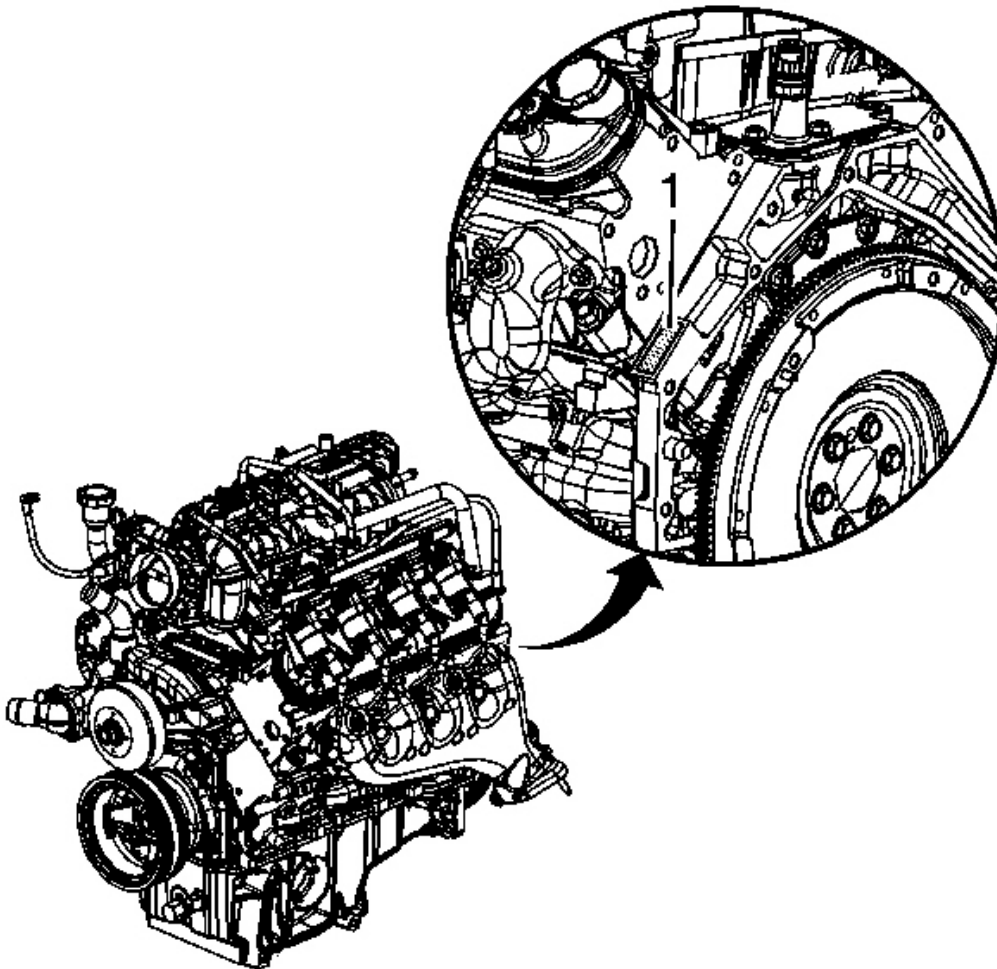


Fig. 13: Locating VIN

Courtesy of GENERAL MOTORS CORP.

The vehicle identification number (VIN) is located on the left side rear of the engine block (1) and is typically a 9 digit number stamped or laser-etched onto the engine at the vehicle assembly plant.

- The first digit identifies the division.

- The second digit identifies the model year.
- The third digit identifies the assembly plant.
- The fourth through ninth digits are the last 6 digits of the VIN.

DIAGNOSTIC INFORMATION AND PROCEDURES

DIAGNOSTIC STARTING POINT - ENGINE MECHANICAL

Begin the system diagnosis by reviewing the **Disassembled Views, Engine Component Description, Lubrication Description (Component Locator)** or **Lubrication Description (Main Pressure Below 55 psi)** or **Lubrication Description (Main Pressure Above 55 psi)** and **Drive Belt System Description** . Reviewing the description and operation information will help you determine the correct symptom diagnostic procedure when a malfunction exists. Reviewing the description and operation information will also help you determine if the condition described by the customer is normal operation. Refer to **Symptoms - Engine Mechanical** in order to identify the correct procedure for diagnosing the system and where the procedure is located.

SYMPTOMS - ENGINE MECHANICAL

Strategy Based Diagnostics

1. Perform the **Diagnostic System Check - Vehicle** before using the symptom tables, if applicable.
2. Review the system operations in order to familiarize yourself with the system functions. Refer to **Disassembled Views, Engine Component Description, Lubrication Description (Component Locator), Lubrication Description (Main Pressure Below 55 psi), Lubrication Description (Main Pressure Above 55 psi)** and **Drive Belt System Description** .

All diagnosis on a vehicle should follow a logical process. Strategy based diagnostics is a uniform approach for repairing all systems. The diagnostic flow may always be used in order to resolve a system condition. The diagnostic flow is the place to start when repairs are necessary. For a detailed explanation, refer to **Strategy Based Diagnosis** .

Visual/Physical Inspection

- Inspect for aftermarket devices which could affect the operation of the engine. Refer to **Checking Aftermarket Accessories** .
- Inspect the easily accessible or visible system components for obvious damage or conditions which could cause the symptom.
- Inspect for the correct oil level, proper oil viscosity and correct oil filter.
- Verify the exact operating conditions under which the concern exists. Note factors such as engine RPM, ambient temperature, engine temperature, amount of engine warm-up time and other specifics.
- Compare the engine sounds, if applicable, to a known good engine and make sure you are not trying to correct a normal condition.

Intermittent

2007 Chevrolet TrailBlazer

2007 ENGINE Engine Mechanical - 6.0L - TrailBlazer

Test the vehicle under the same conditions that the customer reported in order to verify the system is operating properly.

Symptom List

Refer to a symptom diagnostic procedure from the following list in order to diagnose the symptom:

- Base Engine Misfire without Internal Engine Noises
- Base Engine Misfire with Abnormal Internal Lower Engine Noises
- Base Engine Misfire with Abnormal Valve Train Noise
- Base Engine Misfire with Coolant Consumption
- Base Engine Misfire with Excessive Oil Consumption
- Engine Noise on Start-Up, but Only Lasting a Few Seconds
- Upper Engine Noise, Regardless of Engine Speed
- Lower Engine Noise, Regardless of Engine Speed
- Engine Noise Under Load
- Engine Will Not Crank - Crankshaft Will Not Rotate
- Coolant in Combustion Chamber
- Coolant in Engine Oil
- Engine Compression Test
- Cylinder Leakage Test
- Oil Consumption Diagnosis
- Oil Pressure Diagnosis and Testing
- Oil Pressure Relief Valve Diagnosis and Testing
- Oil Leak Diagnosis
- Crankcase Ventilation System Inspection/Diagnosis
- Drive Belt Chirping, Squeal and Whine Diagnosis
- Drive Belt Rumbling and Vibration Diagnosis
- Drive Belt Falls Off and Excessive Wear Diagnosis
- Drive Belt Tensioner Diagnosis

BASE ENGINE MISFIRE WITHOUT INTERNAL ENGINE NOISES

Base Engine Misfire without Internal Engine Noises

Cause	Correction
Fuel injector harness connectors are connected to the incorrect fuel injectors/cylinders	Relocate the fuel injector harness connectors, as necessary.
Abnormalities, such as severe cracking, bumps or missing areas in the accessory drive belt Abnormalities in the accessory drive system and/or components may cause engine RPM variations and	Replace the drive belt. Refer to <u>Drive Belt Replacement - Accessory</u> .

2007 Chevrolet TrailBlazer

2007 ENGINE Engine Mechanical - 6.0L - TrailBlazer

lead to a misfire DTC. A misfire code may be present without an actual misfire condition.	
Worn, damaged or mis-aligned accessory drive components or excessive pulley runout May lead to a misfire DTC. A misfire code may be present without an actual misfire condition.	Inspect the components and repair or replace, as required.
Loose or improperly installed engine flywheel or crankshaft balancer A misfire code may be present without an actual misfire condition.	Repair or replace the flywheel and/or balancer, as required. Refer to <u>Engine Flywheel Replacement</u> or <u>Crankshaft Balancer Replacement</u> .
Restricted exhaust system A severe restriction in the exhaust flow can cause significant loss of engine performance and may set a DTC. Possible causes of restrictions include collapsed or dented pipes or plugged mufflers and/or catalytic converters.	Repair or replace, as required.
Improperly installed or damaged vacuum hoses	Repair or replace, as required.
Improper sealing between the intake manifold and cylinder heads or throttle body	Replace the intake manifold, gaskets, cylinder heads, and/or throttle body, as required.
Improperly installed or damaged manifold absolute pressure (MAP) sensor The sealing grommet of the MAP sensor should not be torn or damaged.	Repair or replace the MAP sensor, as required.
Worn or loose rocker arms The rocker arm bearing end caps and/or needle bearings should be intact and the rocker arm in the proper position.	Replace the valve rocker arms, as required.
Worn or bent pushrods	<ul style="list-style-type: none">• Replace the pushrods.• Inspect the top of the pistons for valve contact. If the top of the piston shows valve contact, replace the piston and pin assembly.
Stuck valves Carbon buildup on the valve stem can cause the valve not to close properly.	Repair or replace, as required.
Excessively worn or mis-aligned timing chain	Replace the timing chain and sprockets, as required.
Worn camshaft lobes	Replace the camshaft and valve lifters.
Excessive oil pressure A lubrication system with excessive oil pressure may lead to excessive valve lifter pump-up and loss of compression.	<ol style="list-style-type: none">1. Perform an oil pressure test. Refer to <u>Oil Pressure Diagnosis and Testing</u>.2. Repair or replace the oil pump, as required.
Faulty cylinder head gaskets and/or cracking or other damage to the cylinder heads and engine block cooling system passages Coolant consumption may or may not cause the	<ol style="list-style-type: none">1. Inspect for spark plugs saturated by coolant. Refer to <u>Spark Plug Inspection</u>.2. Inspect the cylinder heads, engine block,

2007 Chevrolet TrailBlazer

2007 ENGINE Engine Mechanical - 6.0L - TrailBlazer

engine to overheat.	and/or head gaskets. Refer to <u>Coolant in Combustion Chamber</u> .
Worn piston rings Oil consumption may or may not cause the engine to misfire.	3. Repair or replace, as required. 1. Inspect the spark plugs for oil deposits. Refer to <u>Spark Plug Inspection</u> . 2. Inspect the cylinders for a loss of compression. Refer to <u>Engine Compression Test</u> . 3. Perform cylinder leak down and compression testing to identify the cause. Refer to <u>Cylinder Leakage Test</u> . 4. Repair or replace, as required.
A damaged crankshaft reluctor wheel A damaged crankshaft reluctor wheel can result in different symptoms depending on the severity and location of the damage. <ul style="list-style-type: none">• Systems with electronic communications, DIS or coil per cylinder and severe reluctor ring damage may exhibit periodic loss of crankshaft position, stop delivering a signal and then sync the crankshaft position.• Systems with electronic communication, DIS or coil per cylinder and slight reluctor ring damage may exhibit no loss of crankshaft position and no misfire may occur. However, a P0300 DTC may be set.• Systems with mechanical communications, high voltage switch and severe reluctor ring damage may cause additional pulses and affect fuel and spark delivery to the point of generating a P0300 DTC or P0336.	Replace the sensor and/or crankshaft, as required.

BASE ENGINE MISFIRE WITH ABNORMAL INTERNAL LOWER ENGINE NOISES

Base Engine Misfire with Abnormal Internal Lower Engine Noises

Cause	Correction
Abnormalities, such as severe cracking, bumps or missing areas in the accessory drive belt Abnormalities in the accessory drive system and/or components may cause engine RPM variations, noises similar to a faulty lower engine and also lead to a misfire condition. A misfire code may be present without an actual misfire condition.	Replace the drive belt. Refer to <u>Drive Belt Replacement - Accessory</u> .

2007 Chevrolet TrailBlazer

2007 ENGINE Engine Mechanical - 6.0L - TrailBlazer

Worn, damaged or mis-aligned accessory drive components or excessive pulley runout A misfire code may be present without an actual misfire condition.	Inspect the components and repair or replace, as required.
Loose or improperly installed engine flywheel or crankshaft balancer A misfire code may be present without an actual misfire condition.	Repair or replace the flywheel and/or balancer, as required. Refer to <u>Engine Flywheel Replacement</u> or <u>Crankshaft Balancer Replacement</u> .
Worn piston rings Oil consumption may or may not cause the engine to misfire.	<ol style="list-style-type: none">1. Inspect the spark plugs for oil deposits. Refer to <u>Spark Plug Inspection</u> .2. Inspect the cylinders for a loss of compression. Refer to <u>Engine Compression Test</u> .3. Perform cylinder leak down and compression testing to determine the cause. Refer to <u>Cylinder Leakage Test</u>.4. Repair or replace, as required.
Worn crankshaft thrust bearings Severely worn thrust surfaces on the crankshaft and/or thrust bearing may permit fore and aft movement of the crankshaft and create a DTC without an actual misfire condition.	Replace the crankshaft and bearings, as required.

BASE ENGINE MISFIRE WITH ABNORMAL VALVE TRAIN NOISE

Base Engine Misfire with Abnormal Valve Train Noise

Cause	Correction
Worn or loose rocker arms The rocker arm bearing end caps and/or needle bearings should be intact within the rocker arm assembly.	Replace the valve rocker arms, as required.
Worn or bent pushrods	<ul style="list-style-type: none">• Replace the pushrods.• Inspect the top of the pistons for valve contact. If the top of the piston shows valve contact, replace the piston and pin assembly.
Stuck valves Carbon buildup on the valve stem can cause the valve not to close properly.	Repair or replace, as required.
Excessively worn or mis-aligned timing chain	Replace the timing chain and sprockets, as required.
Worn camshaft lobes	Replace the camshaft and valve lifters.
Sticking lifters	Replace, as required.
Improper operation of the oil pressure relief valve	Repair, as required. Refer to <u>Oil Pressure Relief Valve Diagnosis and Testing</u> .

2007 Chevrolet TrailBlazer

2007 ENGINE Engine Mechanical - 6.0L - TrailBlazer

Cut or damaged oil pump screen O-ring seal, which may cause aeration of the engine oil	Repair, as required. Refer to <u>Oil Pressure Diagnosis and Testing</u> .
--	--

BASE ENGINE MISFIRE WITH COOLANT CONSUMPTION

Base Engine Misfire with Coolant Consumption

Cause	Correction
Faulty cylinder head gaskets and/or cracking or other damage to the cylinder heads and engine block cooling system passages Coolant consumption may or may not cause the engine to overheat.	<ol style="list-style-type: none">1. Inspect for spark plugs saturated by coolant. Refer to <u>Spark Plug Inspection</u> .2. Perform a cylinder leak down test. Refer to <u>Cylinder Leakage Test</u>.3. Inspect the cylinder heads and engine block for damage to the coolant passages and/or a faulty head gasket. Refer to <u>Coolant in Combustion Chamber</u>.4. Repair or replace, as required.

BASE ENGINE MISFIRE WITH EXCESSIVE OIL CONSUMPTION

Base Engine Misfire with Excessive Oil Consumption

Cause	Correction
Worn valves, valve guides and/or valve stem oil seals	<ol style="list-style-type: none">1. Inspect the spark plugs for oil deposits. Refer to <u>Spark Plug Inspection</u> .2. Repair or replace, as required.
Worn piston rings Oil consumption may or may not cause the engine to misfire.	<ol style="list-style-type: none">1. Inspect the spark plugs for oil deposits. Refer to <u>Spark Plug Inspection</u> .2. Inspect the cylinders for a loss of compression. Refer to <u>Engine Compression Test</u> .3. Perform cylinder leak down and compression testing to determine the cause. Refer to <u>Cylinder Leakage Test</u>.4. Repair or replace, as required.

ENGINE NOISE ON START-UP, BUT ONLY LASTING A FEW SECONDS

Engine Noise on Start-Up, but Only Lasting a Few Seconds

Cause	Correction
Incorrect oil filter without anti-drainback feature	Install the correct oil filter.
Incorrect oil viscosity	<ol style="list-style-type: none">1. Drain the oil.2. Install the correct viscosity oil.
High valve lifter leak down rate	Replace the lifters, as required.

2007 Chevrolet TrailBlazer

2007 ENGINE Engine Mechanical - 6.0L - TrailBlazer

Worn crankshaft thrust bearing	<ol style="list-style-type: none">1. Check the crankshaft end play.2. Inspect the thrust bearing and crankshaft.3. Repair or replace, as required.
Damaged or faulty oil filter bypass valve The bypass valve is now internal to the oil filter.	<ol style="list-style-type: none">1. Inspect the oil filter bypass valve for proper operation.2. Repair or replace, as required.

UPPER ENGINE NOISE, REGARDLESS OF ENGINE SPEED

Upper Engine Noise, Regardless of Engine Speed

Cause	Correction
Low oil pressure	<ol style="list-style-type: none">1. Perform an oil pressure test. Refer to <u>Oil Pressure Diagnosis and Testing</u>.2. Repair or replace, as required.
Loose and/or worn valve rocker arm attachments	<ol style="list-style-type: none">1. Inspect the valve rocker arm, bolt and pedestal.2. Repair or replace, as required.
Worn or damaged valve rocker arm	<ol style="list-style-type: none">1. Inspect the rocker arm for wear or missing needle bearings2. Replace the valve rocker arms, as required.
Bent or damaged push rod	<p>Inspect the following components and replace, as required:</p> <ul style="list-style-type: none">• The valve rocker arm• The valve push rod• The valve lifter• The valve lifter guide• The piston <p>Inspect the top of the pistons for valve contact. If the top of the piston shows valve contact, replace the piston and pin assembly.</p>
Improper lubrication to the valve rocker arms	<p>Inspect the following components and repair or replace, as required:</p> <ul style="list-style-type: none">• The valve rocker arm• The valve push rod• The valve lifter• The oil filter bypass valve

2007 Chevrolet TrailBlazer

2007 ENGINE Engine Mechanical - 6.0L - TrailBlazer

	<ul style="list-style-type: none">• The oil pump and pump screen• Improper operation of the oil pressure relief valve• The engine block oil galleries
Broken valve spring	Replace the valve spring and spring shim.
Worn or dirty valve lifters	Replace the valve lifters.
Stretched or broken timing chain and/or damaged sprocket teeth	Replace the timing chain and sprockets.
Worn engine camshaft lobes	<ol style="list-style-type: none">1. Inspect the engine camshaft lobes.2. Replace the camshaft and valve lifters, as required.
Worn valve guides or valve stems	Inspect the following components and repair, as required: <ul style="list-style-type: none">• The valves• The valve guides
Stuck valves Carbon on the valve stem or valve seat may cause the valve to stay open.	Inspect the following components and repair, as required: <ul style="list-style-type: none">• The valves• The valve guides
Cut or damaged oil pump screen O-ring seal, which may cause aeration of the engine oil	Repair, as required. Refer to <u>Oil Pressure Diagnosis and Testing</u> .

LOWER ENGINE NOISE, REGARDLESS OF ENGINE SPEED

Lower Engine Noise, Regardless of Engine Speed

Cause	Correction
Low oil pressure	<ol style="list-style-type: none">1. Perform an oil pressure test. Refer to <u>Oil Pressure Diagnosis and Testing</u>.2. Repair or replace damaged components, as required.
Worn accessory drive components Abnormalities, such as severe cracking, bumps or missing areas in the accessory drive belt and/or misalignment of system components.	<ol style="list-style-type: none">1. Inspect the accessory drive system.2. Repair or replace, as required.
Loose or damaged crankshaft balancer	<ol style="list-style-type: none">1. Inspect the crankshaft balancer.2. Repair or replace, as required.
Detonation or spark knock	Verify the correct operation of the ignition controls system. Refer to <u>Diagnostic Starting Point - Engine Controls</u> in Engine Controls - 6.0L.
Loose torque converter bolts	

2007 Chevrolet TrailBlazer

2007 ENGINE Engine Mechanical - 6.0L - TrailBlazer

	<ol style="list-style-type: none">1. Inspect the torque converter bolts and flex plate.2. Repair or replace, as required.
Loose or damaged flywheel	Repair or replace the flywheel.
Oil pump screen loose, damaged or restricted	<ol style="list-style-type: none">1. Inspect the oil pump screen.2. Repair or replace, as required.
Excessive piston-to-cylinder bore clearance	<ol style="list-style-type: none">1. Inspect the piston and cylinder bore.2. Repair, as required.
Excessive piston pin-to-bore clearance	<ol style="list-style-type: none">1. Inspect the piston, pin and connecting rod.2. Replace the piston and pin as an assembly, as required.
Excessive connecting rod bearing clearance	Inspect the following components and repair, as required: <ul style="list-style-type: none">• The connecting rod bearings• The connecting rods• The crankshaft• The crankshaft journals
Excessive crankshaft bearing clearance	Inspect the following components and repair, as required: <ul style="list-style-type: none">• The crankshaft bearings• The crankshaft journals
Incorrect piston, piston pin and connecting rod installation Pistons must be installed with the mark or dimple on the top of the piston facing the front of the engine. Piston pins must be centered in the connecting rod pin bore.	<ol style="list-style-type: none">1. Verify the pistons, piston pins and connecting rods are installed correctly. Refer to <u>Piston, Connecting Rod and Bearing Installation</u>.2. Repair, as required.

ENGINE NOISE UNDER LOAD

Engine Noise Under Load

Cause	Correction
Low oil pressure	<ol style="list-style-type: none">1. Perform an oil pressure test. Refer to <u>Oil Pressure Diagnosis and Testing</u>.2. Repair or replace, as required.
Detonation or spark knock	Verify the correct operation of the ignition controls. Refer to <u>Diagnostic Starting Point - Engine Controls</u> in Engine Controls - 6.0L.
Loose torque converter bolts	<ol style="list-style-type: none">1. Inspect the torque converter bolts and flex

2007 Chevrolet TrailBlazer

2007 ENGINE Engine Mechanical - 6.0L - TrailBlazer

	plate. 2. Repair, as required.
Cracked flex plate - automatic transmission	1. Inspect the bolts and flex plate. 2. Repair, as required.
Excessive connecting rod bearing clearance	Inspect the following components and repair, as required: <ul style="list-style-type: none">• The connecting rod bearings• The connecting rods• The crankshaft
Excessive crankshaft bearing clearance	Inspect the following components and repair, as required: <ul style="list-style-type: none">• The crankshaft bearings• The crankshaft journals• The cylinder block crankshaft bearing bore

ENGINE WILL NOT CRANK - CRANKSHAFT WILL NOT ROTATE

Engine Will Not Crank - Crankshaft Will Not Rotate

Cause	Correction
Seized accessory drive system component	1. Remove the accessory drive belts. 2. Confirm that the engine will rotate. Rotate the crankshaft by hand at the crankshaft balancer or flywheel location. 3. Repair or replace the components, as required.
Seized automatic transmission torque converter	1. Remove the torque converter-to-flywheel bolts. 2. Confirm that the engine will rotate. Rotate the crankshaft by hand at the crankshaft balancer or flywheel location. 3. Repair or replace the components, as required.
Broken timing chain	1. Inspect the timing chain and gears. 2. Repair or replace the components, as required.
Seized timing chain or timing gears	1. Inspect the timing chain and gears for foreign material or a seized chain. 2. Repair or replace the components, as required.

2007 Chevrolet TrailBlazer

2007 ENGINE Engine Mechanical - 6.0L - TrailBlazer

Seized or broken camshaft	<ol style="list-style-type: none">1. Inspect the camshaft and the camshaft bearings.2. Repair or replace the components, as required.
Bent valve in the cylinder head	<ol style="list-style-type: none">1. Inspect the valves and the cylinder heads.2. Repair or replace the components, as required.
Seized oil pump	<ol style="list-style-type: none">1. Inspect the oil pump assembly.2. Repair or replace, as required.
Hydraulically locked cylinder <ul style="list-style-type: none">• Coolant/antifreeze in the cylinder• Oil in the cylinder• Fuel in the cylinder	<ol style="list-style-type: none">1. Remove spark plugs and check for fluid in the cylinder. When rotating the engine with the spark plugs removed, the piston, on compression stroke, will push fluid from the combustion chamber. Refer to <u>Coolant in Combustion Chamber</u>.2. Inspect for failed/broken head gaskets.3. Inspect for a cracked engine block or cylinder head.4. Inspect for a sticking fuel injector.5. Repair or replace the components, as required.
Material in the cylinder <ul style="list-style-type: none">• Broken valve• Broken piston rings• Piston material• Foreign material	<ol style="list-style-type: none">1. Inspect the cylinder for damaged components and/or foreign materials.2. Repair or replace the components, as required.
Seized crankshaft or connecting rod bearings	<ol style="list-style-type: none">1. Inspect crankshaft and connecting rod bearings.2. Repair or replace the components, as required.
Bent or broken connecting rod	<ol style="list-style-type: none">1. Inspect the connecting rods.2. Replace the piston and pin as an assembly, as required.
Broken crankshaft	<ol style="list-style-type: none">1. Inspect the crankshaft.2. Repair or replace the components, as required.

COOLANT IN COMBUSTION CHAMBER

2007 Chevrolet TrailBlazer

2007 ENGINE Engine Mechanical - 6.0L - TrailBlazer

Coolant in Combustion Chamber

Cause	Correction
DEFINITION: Excessive white smoke and/or coolant type odor coming from the exhaust pipe may indicate coolant in the combustion chamber. Low coolant levels, an inoperative cooling fan or a faulty thermostat may lead to an overtemperature condition which may cause engine component damage.	
<ol style="list-style-type: none">1. A slower than normal cranking speed may indicate coolant entering the combustion chamber. Refer to <u>Engine Will Not Crank - Crankshaft Will Not Rotate</u>.2. Remove the spark plugs and inspect for spark plugs saturated by coolant or coolant in the cylinder bore.3. Inspect by performing a cylinder leak-down test. During this test, excessive air bubbles within the coolant may indicate a faulty gasket or damaged component.4. Inspect by performing a cylinder compression test. Two cylinders side-by-side on the engine block, with low compression, may indicate a failed cylinder head gasket. Refer to <u>Engine Compression Test</u>.	
Cracked intake manifold or failed gasket	Replace the components, as required.
Faulty cylinder head gasket	Replace the head gasket and components, as required. Refer to <u>Cylinder Head Cleaning and Inspection</u> and <u>Cylinder Head Replacement - Left Side</u> or <u>Cylinder Head Replacement - Right Side</u> .
Warped cylinder head	Machine the cylinder head to the proper flatness, if applicable and replace the cylinder head gasket. Refer to <u>Cylinder Head Cleaning and Inspection</u> .
Cracked cylinder head	Replace the cylinder head and gasket.
Cracked cylinder liner or engine block	Replace the components, as required.
Cylinder head or engine block porosity	Replace the components, as required.

COOLANT IN ENGINE OIL

Coolant in Engine Oil

Cause	Correction
DEFINITION: Foamy or discolored oil or an engine oil overfill condition may indicate coolant entering the engine crankcase. Low coolant levels, an inoperative cooling fan or a faulty thermostat may lead to an overtemperature condition which may cause engine component damage. Contaminated engine oil and oil filter should be changed.	
<ol style="list-style-type: none">1. Inspect the oil for excessive foaming or an overfill condition. Oil diluted by coolant may not properly lubricate the crankshaft bearings and may lead to component damage. Refer to <u>Lower Engine Noise, Regardless of Engine Speed</u>.2. Inspect by performing a cylinder leak-down test. During this test, excessive air bubbles within the cooling system may indicate a faulty gasket or damaged component.3. Inspect by performing a cylinder compression test. Two cylinders side-by-side on the engine block with low compression may indicate a failed cylinder head gasket. Refer to <u>Engine Compression Test</u>.	

2007 Chevrolet TrailBlazer

2007 ENGINE Engine Mechanical - 6.0L - TrailBlazer

Faulty external engine oil cooler	Replace the components, as required.
Faulty cylinder head gasket	Replace the head gasket and components, as required. Refer to <u>Cylinder Head Cleaning and Inspection</u> and <u>Cylinder Head Replacement - Left Side</u> or <u>Cylinder Head Replacement - Right Side</u> .
Warped cylinder head	Machine the cylinder head to proper flatness, if applicable and replace the cylinder head gasket. Refer to <u>Cylinder Head Cleaning and Inspection</u> .
Cracked cylinder head	Replace the cylinder head and gasket.
Cracked cylinder liner or engine block	Replace the components, as required.
Cylinder head, block or manifold porosity	Replace the components, as required.

ENGINE COMPRESSION TEST

1. Charge the battery if the battery is not fully charged.
2. Disable the ignition system.
3. Disable the fuel injection system.
4. Remove all spark plugs.
5. Turn the ignition to the ON position.
6. Depress the accelerator pedal to position the throttle plate wide open.
7. Start with the compression gage at zero and crank the engine through 4 compression strokes, 4 puffs.
8. Measure the compression for each cylinder. Record the readings.
9. If a cylinder has low compression, inject approximately 15 ml (1 tablespoon) of engine oil into the combustion chamber through the spark plug hole. Measure the compression again and record the reading.
10. The minimum compression in any 1 cylinder should not be less than 70 percent of the highest cylinder. No cylinder should read less than 690 kPa (100 psi). For example, if the highest pressure in any 1 cylinder is 1 035 kPa (150 psi), the lowest allowable pressure for any other cylinder would be 725 kPa (105 psi). ($1\ 035 \times 70\% = 725$) ($150 \times 70\% = 105$).
 - Normal - Compression builds up quickly and evenly to the specified compression for each cylinder.
 - Piston Rings Leaking - Compression is low on the first stroke. Compression builds up with the following strokes, but does not reach normal. Compression improves considerably when you add oil.
 - Valves Leaking - Compression is low on the first stroke. Compression usually does not build up on the following strokes. Compression does not improve much when you add oil.
 - If 2 adjacent cylinders have lower than normal compression and injecting oil into the cylinders does not increase the compression, the cause may be a head gasket leaking between the cylinders.

CYLINDER LEAKAGE TEST

Tools Required

J 35667-A Cylinder Head Leakdown Tester or equivalent

IMPORTANT: A leakage test may be performed in order to measure cylinder/combustion chamber leakage. High cylinder leakage may indicate one or more of the following conditions:

- Worn or burnt valves
- Broken valve springs
- Stuck valve lifters
- Incorrect valve lash
- Damaged piston
- Worn piston rings
- Worn or scored cylinder bore
- Damaged cylinder head gasket
- Cracked or damaged cylinder head
- Cracked or damaged engine block

Test Procedure

CAUTION: Refer to Battery Disconnect Caution .

1. Disconnect the battery ground negative cable.
2. Remove the spark plugs. Refer to Spark Plug Replacement .
3. Rotate the crankshaft to place the piston in the cylinder being tested at top dead center (TDC) of the compression stroke.
4. Install the **J 35667-A** or equivalent.

IMPORTANT: It may be necessary to hold the crankshaft balancer bolt to prevent the crankshaft from rotating.

5. Apply shop air pressure to the **J 35667-A** and adjust according to the manufacturers instructions.
6. Record the cylinder leakage value. Cylinder leakage that exceeds 25 percent is considered excessive and may require component service. In excessive leakage situations, inspect for the following conditions:
 - Air leakage noise at the throttle body or air inlet hose that may indicate a worn or burnt intake valve or a broken valve spring.
 - Air leakage noise at the exhaust system tailpipe that may indicate a worn or burnt exhaust valve or a broken valve spring.
 - Air leakage noise from the crankcase, oil level indicator tube or oil fill tube that may indicate worn piston rings, a damaged piston, a worn or scored cylinder bore, a damaged engine block or a damaged cylinder head.
 - Air bubbles in the cooling system may indicate a damaged cylinder head or a damaged cylinder head gasket.

2007 Chevrolet TrailBlazer

2007 ENGINE Engine Mechanical - 6.0L - TrailBlazer

7. Perform the leakage test on the remaining cylinders and record the values.

OIL CONSUMPTION DIAGNOSIS

Oil Consumption Diagnosis

Checks	Causes
Excessive oil consumption, not due to leaks, is the use of 1 L (1 qt) or more of engine oil within 3 200 kilometers (2,000 miles).	
Preliminary	<p>The causes of excessive oil consumption may include the following conditions:</p> <ul style="list-style-type: none">• External oil leaks <p>Refer to <u>Oil Leak Diagnosis</u> .</p> <ul style="list-style-type: none">• Incorrect oil level or improper reading of the oil level indicator <p>With the vehicle on a level surface, run the engine for a few minutes, allow adequate drain down time, 2-3 minutes and check for the correct engine oil level.</p> <ul style="list-style-type: none">• Improper oil viscosity <p>Refer to the vehicle owners manual and use the recommended SAE grade and viscosity for the prevailing temperatures.</p> <ul style="list-style-type: none">• Continuous high speed driving and/or severe usage• Crankcase ventilation system restrictions or malfunctioning components• Worn valve guides and/or valve stems• Worn or improperly installed valve stem oil seals• Piston rings broken, worn or not seated properly <p>Allow adequate time for the rings to seat.</p> <p>Replace worn piston rings as necessary.</p> <ul style="list-style-type: none">• Piston and rings improperly installed or not fitted to the cylinder bore

OIL PRESSURE DIAGNOSIS AND TESTING

Tools Required

- **EN-47971** Oil Pressure Gage Adapter

- **J 21867** Pressure Gage

Test Procedure

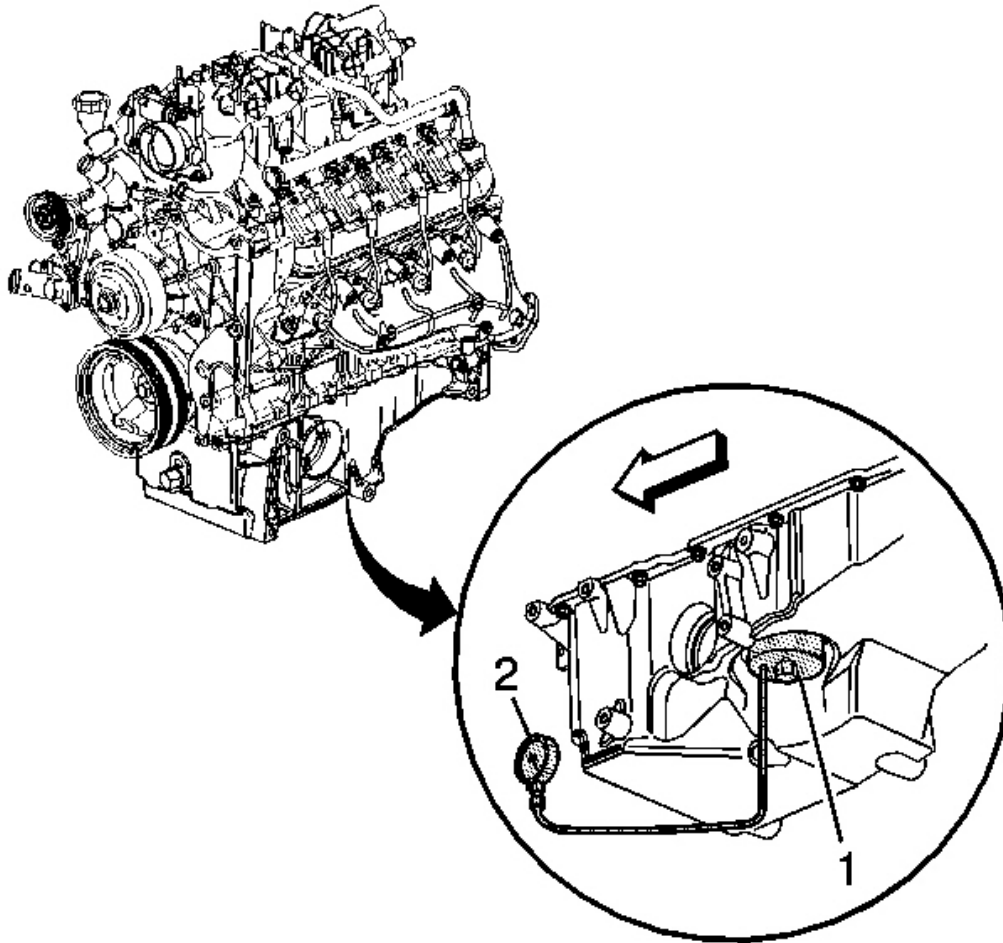


Fig. 14: View Of J 21867 & J 42907
Courtesy of GENERAL MOTORS CORP.

1. With the vehicle on a level surface, run the vehicle for a few minutes, allow adequate drain down time, 2-3 minutes and measure the oil level.
2. If required, add the recommended grade engine oil and fill the crankcase until the oil level measures full on the oil level indicator.
3. Run the engine briefly, 10-15 seconds and verify low or no oil pressure on the vehicle gage or light.
4. Listen for a noisy valve train or a knocking noise.

2007 Chevrolet TrailBlazer

2007 ENGINE Engine Mechanical - 6.0L - TrailBlazer

5. Inspect for the following conditions:
 - Oil diluted by water or glycol antifreeze
 - Foamy oil
6. Remove the oil filter and install the **EN-47971** (1).
7. Install the **J 21867** or equivalent to the **EN-47971** (1).
8. Run the engine and measure the engine oil pressure.
9. Compare the readings to **Engine Mechanical Specifications**.
10. If the engine oil pressure is below specifications, inspect the engine for one or more of the following conditions:
 - Oil pump worn or dirty

Refer to **Oil Pump Cleaning and Inspection** .

- Oil pump-to-engine block bolts loose

Refer to **Oil Pump, Screen and Crankshaft Oil Deflector Installation** .

- Oil pump screen loose, plugged or damaged
- Oil pump screen O-ring seal missing or damaged
- Oil transfer tube loose or a leaking or damaged gasket
- Malfunctioning oil pump pressure relief valve

Refer to **Oil Pressure Relief Valve Diagnosis and Testing**.

- Excessive bearing clearance
- Cracked, porous or restricted oil galleries
- Oil gallery plugs missing or incorrectly installed

Refer to **Engine Block Plug Installation**.

- Broken valve lifters

Repair as necessary.

- Improper operation of the oil pressure relief valve

Refer to **Oil Pressure Relief Valve Diagnosis and Testing**.

OIL PRESSURE RELIEF VALVE DIAGNOSIS AND TESTING

Tools Required

- **EN-47971** Oil Pressure Gage Adapter

2007 Chevrolet TrailBlazer

2007 ENGINE Engine Mechanical - 6.0L - TrailBlazer

- **J 21867** Pressure Gage
- **J-21867-16** Oil Pressure Adapter

Test Procedure

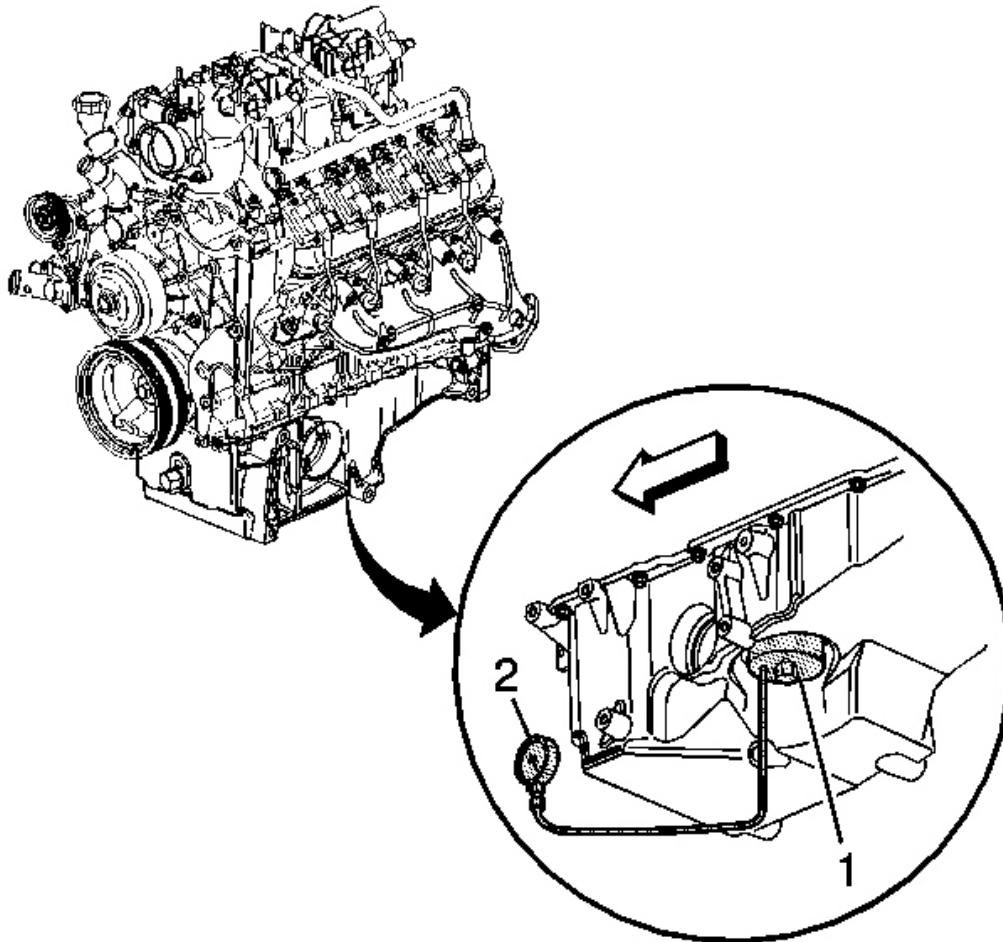


Fig. 15: View Of J 21867 & J 42907
Courtesy of GENERAL MOTORS CORP.

IMPORTANT: This test is performed to verify the operation of the oil pressure relief valve mounted in the oil pan. Refer to Lubrication Description (Component Locator), Lubrication Description (Main Pressure Below 55 psi) or Lubrication Description (Main Pressure Above 55 psi).

2007 Chevrolet TrailBlazer

2007 ENGINE Engine Mechanical - 6.0L - TrailBlazer

1. With the vehicle on a level surface, run the vehicle for a few minutes, allow adequate drain down time, 2-3 minutes and measure the oil level.
2. If required, add the recommended grade engine oil and fill the crankcase until the oil level measures full on the oil level indicator.
3. Run the engine briefly, 10-15 seconds and verify low or no oil pressure on the vehicle gage or light.
4. Listen for a noisy valve train or a knocking noise.
5. Inspect for the following conditions:
 - Oil diluted by water or glycol antifreeze
 - Foamy oil
6. Remove the oil filter and install the **EN-47971** (1).
7. Install the **J 21867** (2) or equivalent to the **EN-47971** (1).

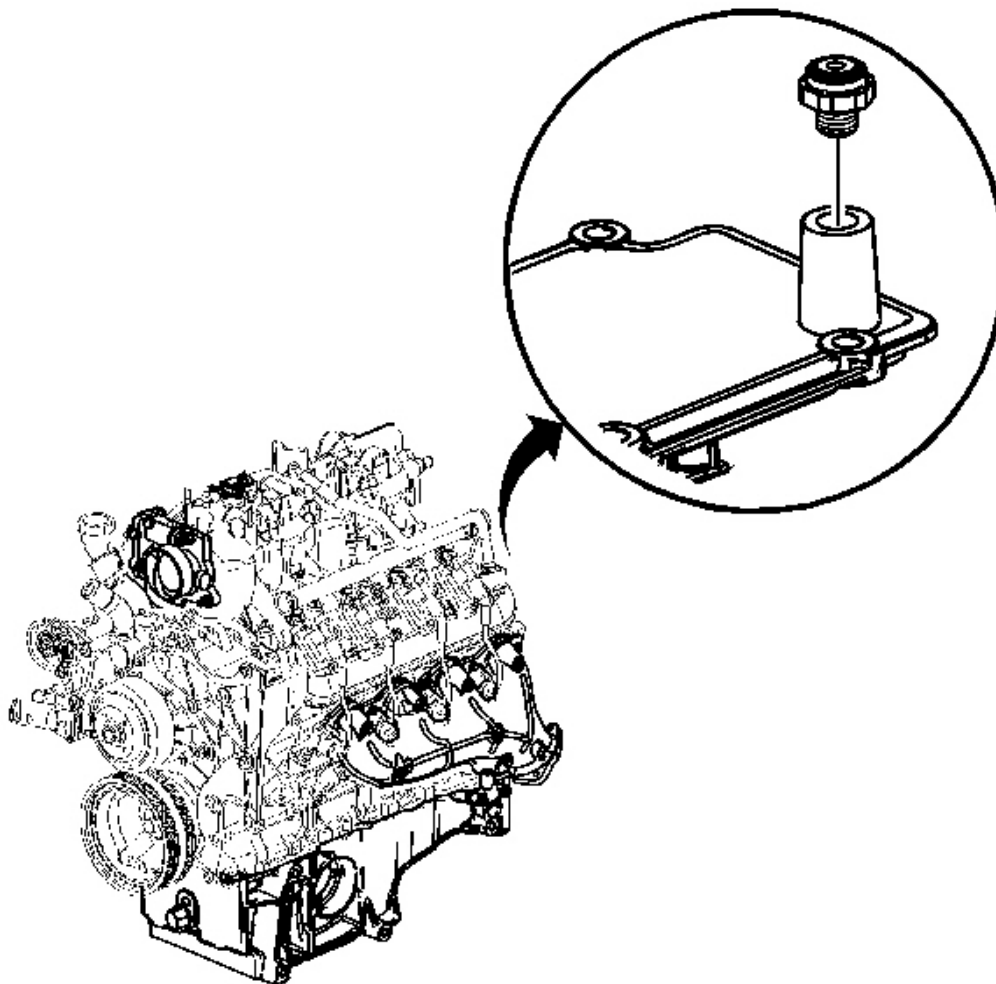


Fig. 16: View Of Oil Pressure Sensor
Courtesy of GENERAL MOTORS CORP.

8. Remove the oil pressure sensor and install the **J-21867-16** .

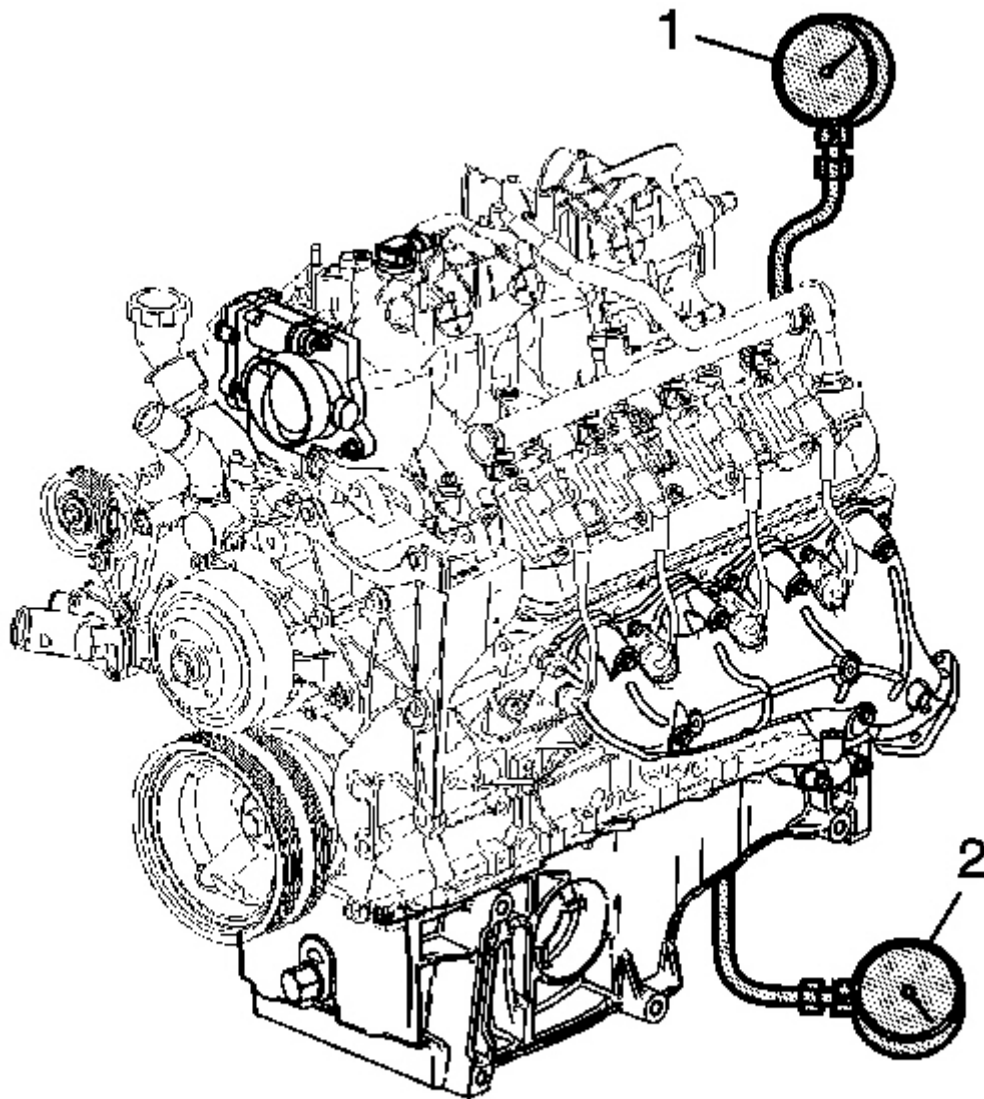


Fig. 17: Measuring Oil Pressure
Courtesy of GENERAL MOTORS CORP.

9. Install **J 21867** or equivalent to the **J-21867-16**.
10. Run the engine and measure the engine oil pressure while observing both gages.

Operate the throttle, as required, to increase and decrease the engine oil pressure.

2007 Chevrolet TrailBlazer

2007 ENGINE Engine Mechanical - 6.0L - TrailBlazer

- With the engine running and the lower pressure gage (2) measuring below 379 kPa (55 psi), both gages should display the same pressure reading. If the readings are not the same and the lower gage (2) has a higher reading, the oil pressure relief valve is stuck in the open position.
- With the engine running and the lower pressure gage (2) measuring above 379 kPa (55 psi), the upper gage (1) should display no greater than 379-517 kPa (55-75 psi). If the reading on the upper gage (1) is greater than 517 kPa (75 psi), the oil pressure relief valve is stuck in the closed position.

11. Repair, as required.

OIL LEAK DIAGNOSIS

Oil Leak Diagnosis

Step	Action	Yes	No
IMPORTANT: You can repair most fluid leaks by first visually locating the leak, repairing or replacing the component or by resealing the gasket surface. Once the leak is identified, determine the cause of the leak. Repair the cause of the leak as well as the leak itself.			
1	<ol style="list-style-type: none">1. Operate the vehicle until it reaches normal operating temperature.2. Park the vehicle on a level surface, over a large sheet of paper or other clean surface.3. Wait 15 minutes.4. Inspect for drippings. <p>Are drippings present?</p>	Go to Step 2	System OK
2	Can you identify the type of fluid and the approximate location of the leak?	Go to Step 10	Go to Step 3
3	<ol style="list-style-type: none">1. Visually inspect the suspected area. Use a small mirror to assist in looking at hard to see areas.2. Inspect for leaks at the following locations:<ul style="list-style-type: none">• Sealing surfaces• Fittings• Cracked or damaged components <p>Can you identify the type of fluid and the approximate location of the leak?</p>	Go to Step 10	Go to Step 4
	<ol style="list-style-type: none">1. Completely clean the entire engine and surrounding components.2. Operate the vehicle for several kilometers, miles, at normal operating temperature and at varying speeds.		

2007 Chevrolet TrailBlazer

2007 ENGINE Engine Mechanical - 6.0L - TrailBlazer

4	<ol style="list-style-type: none">3. Park the vehicle on a level surface, over a large sheet of paper or other clean surface.4. Wait 15 minutes.5. Identify the type of fluid and the approximate location of the leak. <p>Can you identify the type of fluid and the approximate location of the leak?</p>	Go to Step 10	Go to Step 5
5	<ol style="list-style-type: none">1. Visually inspect the suspected area. Use a small mirror to assist in looking at hard to see areas.2. Inspect for leaks at the following locations:<ul style="list-style-type: none">• Sealing surfaces• Fittings• Cracked or damaged components <p>Can you identify the type of fluid and the approximate location of the leak?</p>	Go to Step 10	Go to Step 6
6	<ol style="list-style-type: none">1. Completely clean the entire engine and surrounding components.2. Apply an aerosol-type powder, baby powder, foot powder, etc., to the suspected area.3. Operate the vehicle for several kilometers, miles, at normal operating temperature and at varying speeds.4. Identify the type of fluid and the approximate location of the leak, from the discolorations in the powder surface. <p>Can you identify the type of fluid and the approximate location of the leak?</p>	Go to Step 10	Go to Step 7
7	<ol style="list-style-type: none">1. Visually inspect the suspected area. Use a small mirror to assist in looking at hard to see areas.2. Inspect for leaks at the following locations:<ul style="list-style-type: none">• Sealing surfaces• Fittings• Cracked or damaged components		

2007 Chevrolet TrailBlazer

2007 ENGINE Engine Mechanical - 6.0L - TrailBlazer

	Can you identify the type of fluid and the approximate location of the leak?	Go to Step 10	Go to Step 8
8	Use the J 28428-E high-intensity black light kit in order to identify the type of fluid and the approximate location of the leak. Refer to the manufacturer's instructions when using the tool. Can you identify the type of fluid and the approximate location of the leak?	Go to Step 10	Go to Step 9
9	<ol style="list-style-type: none">1. Visually inspect the suspected area. Use a small mirror to assist in looking at hard to see areas.2. Inspect for leaks at the following locations:<ul style="list-style-type: none">• Sealing surfaces• Fittings• Cracked or damaged components Can you identify the type of fluid and the approximate location of the leak?	Go to Step 10	System OK
10	<ol style="list-style-type: none">1. Inspect the engine for mechanical damage. Special attention should be shown to the following areas:<ul style="list-style-type: none">• Higher than recommended fluid levels• Higher than recommended fluid pressures• Plugged or malfunctioning fluid filters or pressure bypass valves• Plugged or malfunctioning engine ventilation system• Improperly tightened or damaged fasteners• Cracked or porous components• Improper sealants or gaskets, where required• Improper sealant or gasket installation• Damaged or worn gaskets or seals• Damaged or worn sealing surfaces2. Inspect the engine for customer modifications.		

2007 Chevrolet TrailBlazer

2007 ENGINE Engine Mechanical - 6.0L - TrailBlazer

	Is there mechanical damage or customer modifications to the engine?	Go to Step 11	System OK
11	Repair or replace all damaged or modified components. Does the engine still leak oil?	Go to Step 1	System OK

CRANKCASE VENTILATION SYSTEM INSPECTION/DIAGNOSIS

Crankcase Ventilation System Inspection/Diagnosis

Symptom	Correction
External oil leak	Inspect for any of the following conditions: <ul style="list-style-type: none">• Restricted positive crankcase ventilation (PCV) orifice• Restricted or kinked PCV hose or engine vent hose• Damaged, incorrect or incorrectly installed PCV hose• Excessive crankcase pressure
Rough Idle	Inspect for any of the following conditions: <ul style="list-style-type: none">• Restricted PCV orifice• Restricted or kinked PCV hose or engine vent hose• Leaking (damaged) PCV hose• Vacuum hoses worn or not properly installed
Stalling or slow idle speed	Inspect for any of the following conditions: <ul style="list-style-type: none">• Restricted PCV orifice• Restricted or kinked PCV hose or engine vent hose• Leaking (damaged) PCV hose
High idle speed	Inspect for a leaking (damaged) PCV hose
Sludge in the engine	Inspect for any of the following conditions: <ul style="list-style-type: none">• Restricted PCV orifice• Restricted or kinked PCV hose or engine vent hose

DRIVE BELT CHIRPING, SQUEAL AND WHINE DIAGNOSIS

Diagnostic Aids

- A chirping or squealing noise may be intermittent due to moisture on the drive belt(s) or the pulley(s). It may be necessary to spray a small amount of water on the drive belt(s) in order to duplicate the customers concern. If spraying water on the drive belt duplicates the symptom, cleaning the belt pulley(s) may be the probable solution.
- If the noise is intermittent, verify the accessory drive components by varying their loads making sure they are operated to their maximum capacity. An overcharged A/C system, power steering system with a

2007 Chevrolet TrailBlazer

2007 ENGINE Engine Mechanical - 6.0L - TrailBlazer

pinched hose or incorrect fluid or a generator failing are suggested items to inspect.

- A chirping, squeal or whine noise may be caused by a loose or improper installation of a body or suspension component. Other items of the vehicle may also cause the noise.
- The drive belts will not cause a whine noise.

Test Description

The numbers below refer to the step numbers on the diagnostic table.

2: The noise may not be engine related. This step is to verify that the engine is making the noise. If the engine is not making the noise do not proceed further with this table.

3: The noise may be an internal engine noise. Removing the drive belts one at a time and operating the engine for a brief period will verify the noise is related to the drive belt. When removing the drive belt the water pump may not be operating and the engine may overheat. Also diagnostic trouble codes (DTCs) may set when the engine is operating with the drive belt(s) removed.

4: Inspect all drive belt pulleys for pilling. Pilling is the small balls or pills or it can be strings in the drive belt grooves from the accumulation of rubber dust.

6: Misalignment of the pulleys may be caused from improper mounting of the accessory drive component, incorrect installation of the accessory drive component pulley or the pulley bent inward or outward from a previous repair. Test for a misaligned pulley using a straight edge in the pulley grooves across two or three pulleys. If a misaligned pulley is found refer to that accessory drive component for the proper installation procedure for that pulley.

10: Inspecting of the fasteners can eliminate the possibility that a wrong bolt, nut, spacer or washer was installed.

12: Inspecting the pulleys for being bent should include inspecting for a dent or other damage to the pulleys that would prevent the drive belt from not seating properly in all of the pulley grooves or on the smooth surface of a pulley when the back side of the belt is used to drive the pulley.

14: This test is to verify that the drive belt tensioner operates properly. If the drive belt tensioner is not operating properly, proper belt tension may not be achieved to keep the drive belt from slipping which could cause a squeal noise.

15: This test is to verify that the drive belt is not too long, which would prevent the drive belt tensioner from working properly. Also if an incorrect length drive belt was installed, it may not be routed properly and may be turning an accessory drive component in the wrong direction.

16: Misalignment of the pulleys may be caused from improper mounting of the accessory drive component, incorrect installation of the accessory drive component pulley or the pulley bent inward or outward from a previous repair. Test for a misaligned pulley using a straight edge in the pulley grooves across two or three pulleys. If a misaligned pulley is found refer to that accessory drive component for the proper installation procedure for that pulley.

17: This test is to verify that the pulleys are the correct diameter or width. Using a known good vehicle compare the pulley sizes.

19: Replacing the drive belt when it is not damaged or there is not excessive pilling will only be a temporary repair.

Drive Belt Chirping, Squeal and Whine Diagnosis

2007 Chevrolet TrailBlazer

2007 ENGINE Engine Mechanical - 6.0L - TrailBlazer

Step	Action	Yes	No
NOTE: Refer to <u>Belt Dressing Notice</u> .			
DEFINITION: The following items are indications of chirping:			
<ul style="list-style-type: none">• A high pitched noise that is heard once per revolution of the drive belt or pulley.• Chirping may occur on cold damp start-ups and will subside once the vehicle reaches normal operating temperature.			
DEFINITION: The following items are indications of drive belt squealing:			
<ul style="list-style-type: none">• A loud screeching noise that is caused by a slipping drive belt. This is unusual for a drive belt with multiple ribs.• The noise occurs when a heavy load is applied to the drive belt, such as an air conditioning compressor engagement snapping the throttle or slipping on a seized pulley or a faulty accessory drive component.			
DEFINITION: The following items are indications of drive belt whining:			
<ul style="list-style-type: none">• A high pitched continuous noise.• The noise may be caused by an accessory drive component failed bearing.			
1	Did you review the Symptoms-Engine Mechanical operation and perform the necessary inspections?	Go to Step 2	Go to <u>Symptoms - Engine Mechanical</u>
2	Verify that there is a chirping, squealing or whining noise. Does the engine make the chirping, squealing or whining noise?	Go to Step 3	Go to <u>Diagnostic Aids</u>
3	1. Remove the drive belt. If the engine has multiple drive belts, remove the belts one at a time and perform the test below each time a belt is removed. 2. Operate the engine for no longer than 30-40 seconds. 3. Repeat this test if necessary by removing the remaining belt(s). Does the chirping, squealing or whining noise still exist?	Go to <u>Symptoms - Engine Mechanical</u>	Go to Step 4
	If diagnosing a chirping noise, inspect for severe pilling exceeding 1/3 of the belt groove depth.		

2007 Chevrolet TrailBlazer

2007 ENGINE Engine Mechanical - 6.0L - TrailBlazer

4	If diagnosing a squealing or whining noise, proceed to step 13. Does the belt grooves have pilling?	Go to Step 5	Go to Step 6
5	Clean the drive belt pulleys with a suitable wire brush. Did you complete the repair?	Go to Step 20	Go to Step 6
6	Inspect for misalignment of the pulleys. Are any of the pulleys misaligned?	Go to Step 7	Go to Step 8
7	Replace or repair any misaligned pulleys. Did you complete the repair?	Go to Step 20	Go to Step 8
8	Inspect for bent or cracked accessory brackets. Did you find any bent or cracked brackets?	Go to Step 9	Go to Step 10
9	Replace any bent or cracked accessory brackets. Did you complete the repair?	Go to Step 20	Go to Step 10
10	Inspect for incorrect, loose or missing fasteners. Did you find the condition?	Go to Step 11	Go to Step 12
11	<p>NOTE: Refer to <u>Fastener Notice</u> .</p> <ol style="list-style-type: none"> 1. Tighten any loose fasteners. Refer to <u>Fastener Tightening Specifications</u>. 2. Replace any incorrect or missing fasteners. <p>Did you complete the repair?</p>	Go to Step 20	Go to Step 12
12	Inspect for a bent pulley. Did you find the condition?	Go to Step 18	Go to Step 19
13	Inspect for an accessory drive component seized bearing or a faulty accessory drive component. Did you find and correct the condition? If diagnosing a whining noise and the condition still exists, proceed to <u>Diagnostic Aids</u> .	Go to Step 20	Go to Step 14
14	Test the drive belt tensioner for correct operation. Refer to <u>Drive Belt Tensioner Diagnosis</u> . Did you find and correct the condition?	Go to Step 20	Go to Step 15
15	Inspect for the correct drive belt length. Did you find and correct the condition?	Go to Step 20	Go to Step 16
16	Inspect for misalignment of a pulley. Did you find and correct the condition?	Go to Step 20	Go to Step 17
17	Inspect for the correct pulley size. Did you find and correct the condition?	Go to Step 20	Go to <u>Diagnostic Aids</u>
18	Replace the bent pulley. Did you complete the repair?	Go to Step 20	Go to Step 19
19	Replace the drive belt(s). Did you complete the repair?	Go to Step 20	Go to <u>Diagnostic Aids</u>

2007 Chevrolet TrailBlazer

2007 ENGINE Engine Mechanical - 6.0L - TrailBlazer

20

Operate the system in order to verify the repair.
Did you correct the condition?

System OK

Go to **Step 3**

DRIVE BELT RUMBLING AND VIBRATION DIAGNOSIS

Diagnostic Aids

The accessory drive components can have an affect on engine vibration. Vibration from the engine operating may cause a body component or another part of the vehicle to make rumbling noise. Vibration can be caused by, but not limited to the A/C system being over charged, the power steering system being restricted or the incorrect fluid being used or an extra load on the generator. To help identify an intermittent or an improper condition, vary the loads on the accessory drive components.

The drive belt may have a rumbling condition that can not be seen or felt. Sometimes replacing the drive belt may be the only repair for the symptom.

If replacing the drive belt, completing the diagnostic table and the noise is only heard when the drive belts are installed, there might be an accessory drive component with a failure. Varying the load on the different accessory drive components may aid in identifying which component is causing the rumbling noise.

Test Description

The numbers below refer to the step numbers on the diagnostic table.

2: This test is to verify that the symptom is present during diagnosing. Other vehicle components may cause a similar symptom.

3: This test is to verify that one of the drive belts is causing the rumbling noise or vibration. Rumbling noise may be confused with an internal engine noise due to the similarity in the description. Remove only one drive belt at a time if the vehicle has multiple drive belts. When removing the drive belts the water pump may not be operating and the engine may overheat. Also, diagnostic trouble codes (DTCs) may set when the engine is operating with the drive belt(s) removed.

4: Inspecting the drive belts is to ensure that they are not causing the noise. Small cracks across the ribs of the drive belt will not cause the noise. Belt separation is identified by the plys of the belt separating and may be seen at the edge of the belt our felt as a lump in the belt.

5: Small amounts of pilling is a normal condition and acceptable. When the pilling is severe the drive belt does not have a smooth surface for proper operation.

9: Inspection of the fasteners can eliminate the possibility that the incorrect bolt, nut, spacer or washer was installed.

11: This step should only be performed if the water pump is driven by the drive belt. Inspect the water pump shaft for being bent. Also inspect the water pump bearings for smooth operation and excessive play. Compare the water pump with a known good water pump.

12: Accessory drive component brackets that are bent, cracked or loose may put extra strain on that accessory component causing it to vibrate.

Drive Belt Rumbling and Vibration Diagnosis

2007 Chevrolet TrailBlazer

2007 ENGINE Engine Mechanical - 6.0L - TrailBlazer

Step	Action	Yes	No
NOTE: Refer to <u>Belt Dressing Notice</u> .			
DEFINITION: The following items are indications of drive belt rumbling: <ul style="list-style-type: none"> • A low pitch tapping, knocking or thumping noise heard at or just above idle. • Heard once per revolution of the drive belt or a pulley. • Rumbling may be caused from: <ul style="list-style-type: none"> ○ Pilling, the accumulation of rubber dust that forms small balls (pills) or strings in the drive belt pulley groove ○ The separation of the drive belt ○ A damaged drive belt 			
DEFINITION: The following items are indications of drive belt vibration: <ul style="list-style-type: none"> • The vibration is engine-speed related. • The vibration may be sensitive to accessory load. 			
1	Did you review the Symptoms-Engine Mechanical operation and perform the necessary inspections?	Go to Step 2	Go to <u>Symptoms - Engine Mechanical</u>
2	Verify that there is a rumbling noise or that the vibration is engine related. Does the engine make the rumbling noise or vibration?	Go to Step 3	Go to <u>Diagnostic Aids</u>
3	1. Remove the drive belt(s). If the engine has multiple drive belts, remove the belts one at a time and perform the test below each time a belt is removed. 2. Operate the engine for no longer than 30-40 seconds. 3. Repeat this test if necessary by removing the remaining belt(s). Does the rumbling or vibration still exist?	For rumbling diagnosis, go to <u>Symptoms - Engine Mechanical</u> . For vibration diagnosis, go to <u>Vibration Analysis - Engine</u> .	Go to Step 4
4	Inspect the drive belt(s) for wear, damage, separation, sections of missing ribs, and/or debris build-up. Did you find any of these conditions?	Go to Step 7	Go to Step 5
	Inspect for severe pilling of more than 1/3 of		

2007 Chevrolet TrailBlazer

2007 ENGINE Engine Mechanical - 6.0L - TrailBlazer

5	the drive belt pulley grooves. Did you find severe pilling?	Go to Step 6	Go to Step 7
6	1. Clean the drive belt pulleys using a suitable wire brush. 2. Reinstall the drive belts. Did you correct the condition?	Go to Step 8	Go to Step 7
7	Install a new drive belt. Did you complete the replacement?	Go to Step 8	-
8	Operate the system in order to verify the repair. Did you correct the condition?	System OK	Go to Step 9
9	Inspect for improper, loose or missing fasteners. Did you find any of these conditions?	Go to Step 10	Go to Step 11
10	NOTE: Refer to <u>Fastener Notice</u> . 1. Tighten any loose fasteners. Refer to <u>Fastener Tightening Specifications</u> . 2. Replace any improper or missing fasteners. Did you complete the repair?	Go to Step 13	-
11	Inspect for a bent water pump shaft. Did you find and correct the condition?	Go to Step 13	Go to Step 12
12	Inspect for bent or cracked accessory brackets. Did you find and correct the condition?	Go to Step 13	Go to <u>Diagnostic Aids</u>
13	Operate the system in order to verify the repair. Did you correct the condition?	System OK	Go to Step 3

DRIVE BELT FALLS OFF AND EXCESSIVE WEAR DIAGNOSIS

Diagnostic Aids

If the drive belt repeatedly falls off the drive belt pulleys, this is a result of pulley misalignment.

An extra load that is quickly applied or released by an accessory drive component may cause the drive belt to fall off the pulley. Verify the accessory drive components operate properly.

If the drive belt is the incorrect length, the drive belt tensioner may not apply the proper tension on the drive belt.

Excessive wear on a drive belt is usually caused by an incorrect installation or the incorrect drive belt for the application.

2007 Chevrolet TrailBlazer

2007 ENGINE Engine Mechanical - 6.0L - TrailBlazer

Minor misalignment of the drive belt pulleys will not cause excessive wear, but will probably cause the drive belt to make a noise or to fall off.

Excessive misalignment of the drive belt pulleys will cause excessive wear but may also make the drive belt fall off.

Test Description

The numbers below refer to the step numbers on the diagnostic table.

2: This inspection is to verify the condition of the drive belt. Damage may have occurred to the drive belt when the drive belt fell off. The drive belt may be damaged, which caused the drive belt to fall off. Inspect the belt for cuts, tears, sections of ribs missing or damaged belt plys.

4: Misalignment of the pulleys may be caused from improper mounting of the accessory drive component, incorrect installation of the accessory drive component pulley or the pulley being bent inward or outward from a previous repair. Test for a misaligned pulley using a straight edge in the pulley grooves across 2 or 3 pulleys. If a misaligned pulley is found refer to that accessory drive component for the proper repair procedure of that pulley.

5: Inspecting the pulleys for being bent should include inspecting for a dent or other damage to the pulleys that would prevent the drive belt from not seating properly in all of the pulley grooves or on the smooth surface of a pulley when the back side of the belt is used to drive the pulley.

6: Accessory drive component brackets that are bent or cracked may allow the drive belt to fall off.

7: Inspecting of the fasteners can eliminate the possibility that a incorrect bolt, nut, spacer or washer was installed. Missing, loose or an incorrect fastener may cause pulley misalignment from the bracket moving under load. Over tightening of the fasteners may cause misalignment of the accessory component bracket.

13: The inspection is to verify the drive belt is correctly installed on all of the drive belt pulleys. Wear on the drive belt may be caused by mis-positioning the drive belt by one groove on a pulley.

14: The installation of a drive belt that is too wide or too narrow will cause wear on the drive belt. The drive belt ribs should match all of the grooves on all of the pulleys.

15: This inspection is to verify the drive belt is not contacting any component of the engine or body while the engine is operating. There should be sufficient clearance when the drive belt accessory drive components load varies. The drive belt should not come in contact with an engine or a body component when snapping the throttle.

Drive Belt Falls Off and Excessive Wear Diagnosis

Step	Action	Yes	No
NOTE: Refer to <u>Belt Dressing Notice</u> .			
DEFINITION <ul style="list-style-type: none">The drive belt falls off the pulleys or may not sit correctly on the pulleys.Wear at the outside ribs of the drive belt may be due to an incorrectly installed drive belt.			
	Did you review the symptoms-engine mechanical		Go to Symptoms -

2007 Chevrolet TrailBlazer

2007 ENGINE Engine Mechanical - 6.0L - TrailBlazer

1	operation and perform the necessary inspections?	Go to Step 2	<u>Engine Mechanical</u>
2	If diagnosing excessive wear, proceed to step 13. If diagnosing a drive belt that falls off, inspect for a damaged drive belt. Did you find the condition?	Go to Step 3	Go to Step 4
3	Install a new drive belt. Does the drive belt continue to fall off?	Go to Step 4	System OK
4	Inspect for pulley misalignment. Did you find and repair the condition?	Go to Step 12	Go to Step 5
5	Inspect for a bent or dented pulley. Did you find and repair the condition?	Go to Step 12	Go to Step 6
6	Inspect for a bent or a cracked accessory bracket. Did you find and repair the condition?	Go to Step 12	Go to Step 7
7	Inspect for improper, loose or missing fasteners. Did you find loose or missing fasteners?	Go to Step 8	Go to Step 9
8	<p>NOTE: Refer to <u>Fastener Notice</u> .</p> <p>1. Tighten any loose fasteners. Refer to <u>Fastener Tightening Specifications</u>.</p> <p>2. Replace any improper or missing fasteners.</p> <p>Does the drive belt continue to fall off?</p>	Go to Step 9	System OK
9	Inspect the drive belt tensioner for proper operation. Refer to <u>Drive Belt Tensioner Diagnosis</u> . Does the drive belt tensioner operate properly?	Go to Step 11	Go to Step 10
10	Replace the drive belt tensioner. Does the drive belt continue to fall off?	Go to Step 11	System OK
11	Inspect for failed drive belt idler and/or drive belt tensioner pulley bearings. Did you find and repair the condition?	Go to Step 12	Go to <u>Diagnostic Aids</u>
12	Operate the system in order to verify the repair. Did you correct the condition?	System OK	Go to Step 2
13	Inspect the drive belt for the proper installation. Did you find this condition?	Go to Step 16	Go to Step 14
14	Inspect for the proper drive belt. Did you find this condition?	Go to Step 16	Go to Step 15
15	Inspect the drive belt for contact against a bracket, hose or wiring harness. Did you find and repair the condition?	Go to Step 17	Go to <u>Diagnostic Aids</u>
16	Replace the drive belts. Did you complete the replacement?	Go to Step 17	-

17	Operate the system in order to verify the repair. Did you correct the condition?	System OK	-
----	---	-----------	---

DRIVE BELT TENSIONER DIAGNOSIS

Inspection Procedure

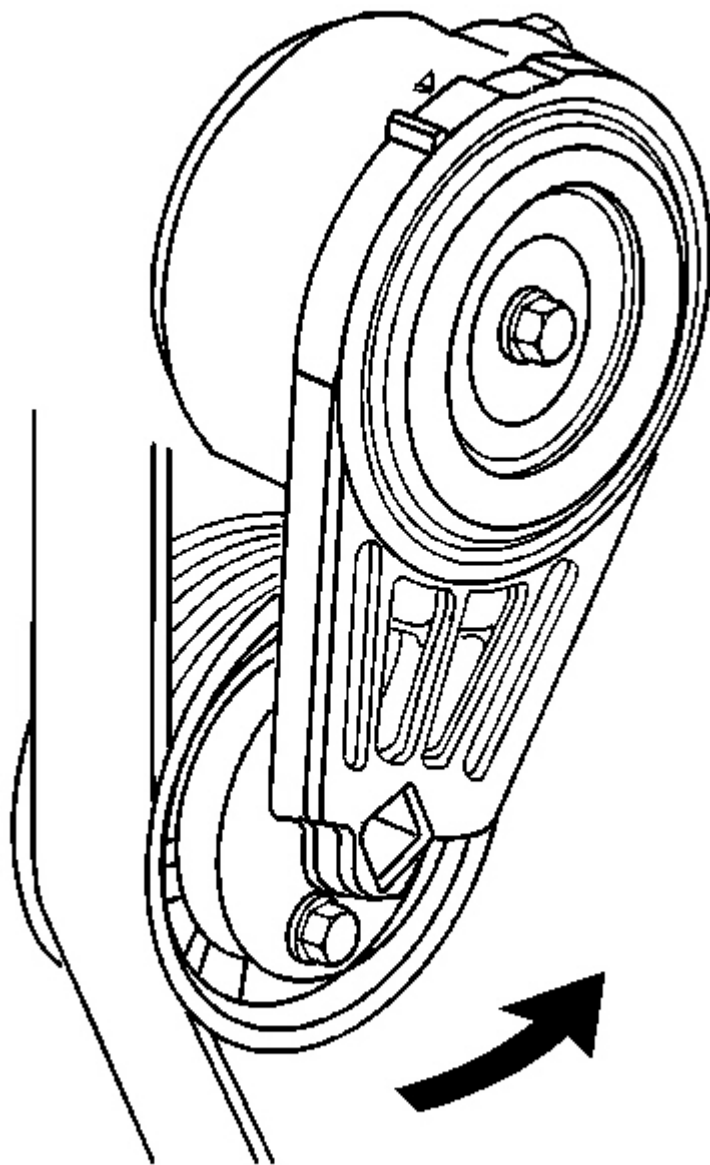


Fig. 18: View Of Drive Belt Tension

Courtesy of GENERAL MOTORS CORP.

NOTE: Allowing the drive belt tensioner to snap into the free position may result in damage to the tensioner.

IMPORTANT: When the engine is operating the drive belt tensioner arm will move. Do not replace the drive belt tensioner because of movement in the drive belt tensioner arm.

1. Remove the drive belt. Refer to **Drive Belt Replacement - Accessory** or to **Drive Belt Replacement - Air Conditioning**.
2. Move the drive belt tensioner through its full travel.
 - The movement should feel smooth.
 - There should be no binding.
 - The tensioner should return freely.
3. If any binding is observed, replace the drive belt tensioner. Refer to **Drive Belt Tensioner Replacement - Accessory** or to **Drive Belt Tensioner Replacement - Air Conditioning**.
4. Install the drive belt. Refer to **Drive Belt Replacement - Accessory** or to **Drive Belt Replacement - Air Conditioning**.

REPAIR INSTRUCTIONS

DRIVE BELT REPLACEMENT - ACCESSORY

Removal Procedure

1. Remove the air cleaner resonator outlet duct. Refer to **Air Cleaner Resonator Outlet Duct Replacement**.

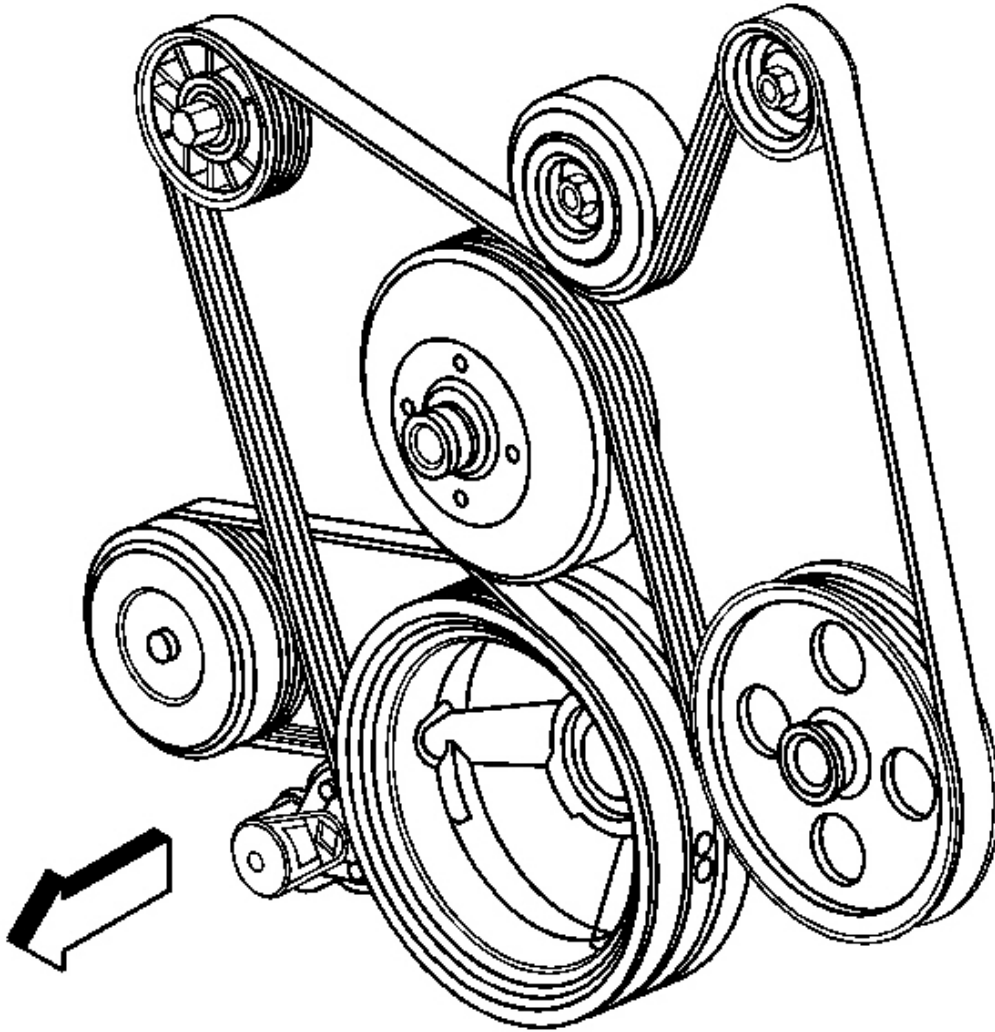


Fig. 19: View Of Accessory Drive Belt & Pulley
Courtesy of GENERAL MOTORS CORP.

2. Install a breaker bar with hex-head socket to the drive belt tensioner bolt.
3. Rotate the drive belt tensioner clockwise in order to relieve tension on the belt.
4. Remove the belt from the generator pulley.
5. Slowly release the tension on the drive belt tensioner.
6. Remove the breaker bar and socket and from the drive belt tensioner bolt.
7. Remove the belt from the remaining pulleys.

8. Clean and inspect the belt surfaces of all the pulleys.

Installation Procedure

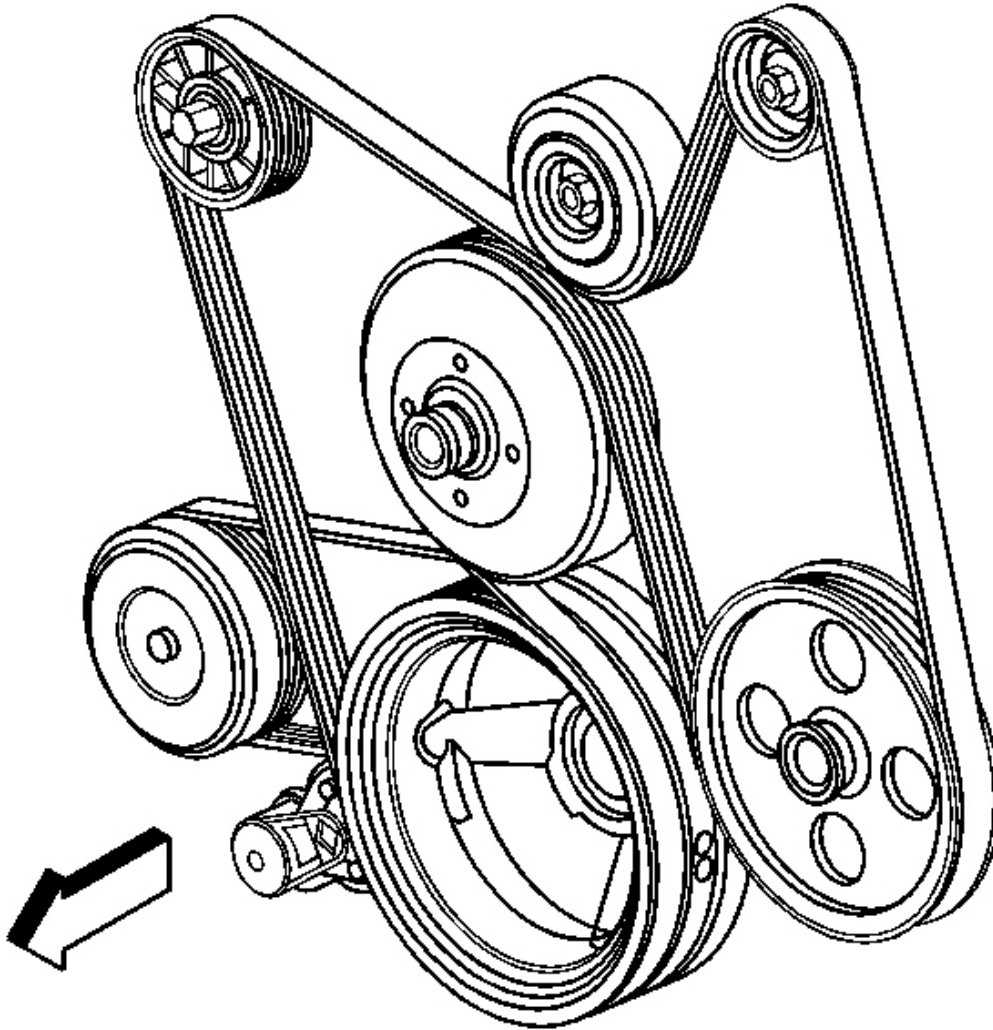


Fig. 20: View Of Accessory Drive Belt & Pulley
Courtesy of GENERAL MOTORS CORP.

1. Route the drive belt around all the pulleys except the generator pulley.
2. Install the breaker bar with hex-head socket to the belt tensioner bolt.
3. Rotate the belt tensioner clockwise in order to relieve the tension on the belt.

4. Install the drive belt on the generator pulley.
5. Slowly release the tension on the belt tensioner.
6. Remove the breaker bar and socket from the belt tensioner bolt.
7. Inspect the drive belt for proper installation and alignment.
8. Install the air cleaner resonator outlet duct. Refer to **Air Cleaner Resonator Outlet Duct Replacement** .

DRIVE BELT REPLACEMENT - AIR CONDITIONING

Removal Procedure

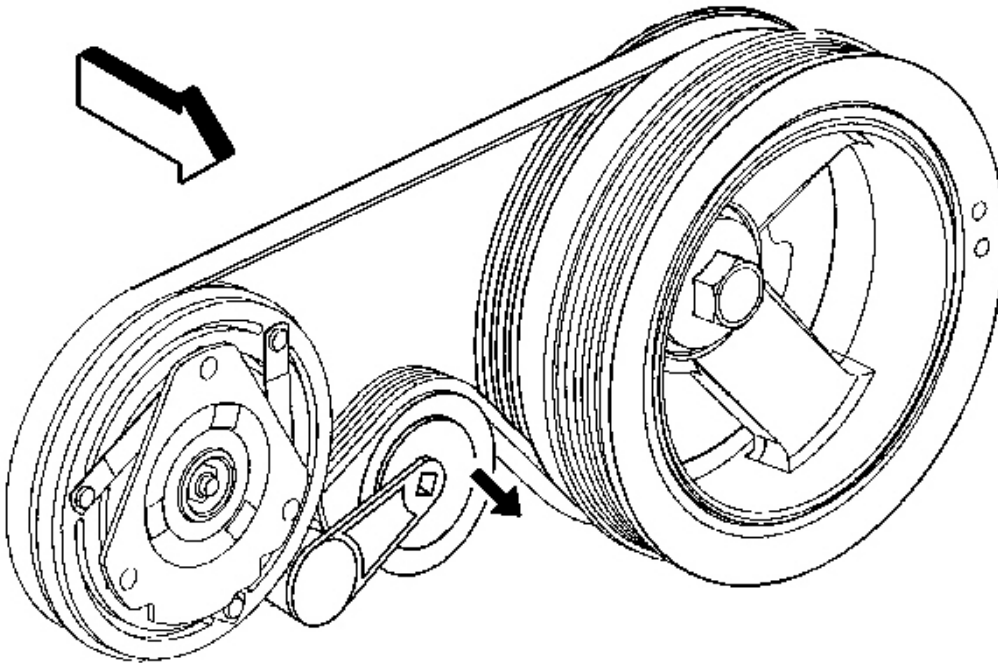


Fig. 21: View Of A/C Belt & Pulleys
Courtesy of GENERAL MOTORS CORP.

1. Remove the accessory drive belt. Refer to **Drive Belt Replacement - Accessory**.
2. Raise the vehicle. Refer to **Lifting and Jacking the Vehicle** .
3. Install a ratchet into the square opening of the air conditioning (A/C) belt tensioner.
4. Rotate the A/C belt tensioner clockwise in order to relieve tension on the belt.
5. Remove the A/C belt from the pulleys.
6. Slowly release the tension on the A/C belt tensioner.

7. Remove the ratchet from the A/C belt tensioner.
8. Clean and inspect the belt surfaces of all the pulleys.

Installation Procedure

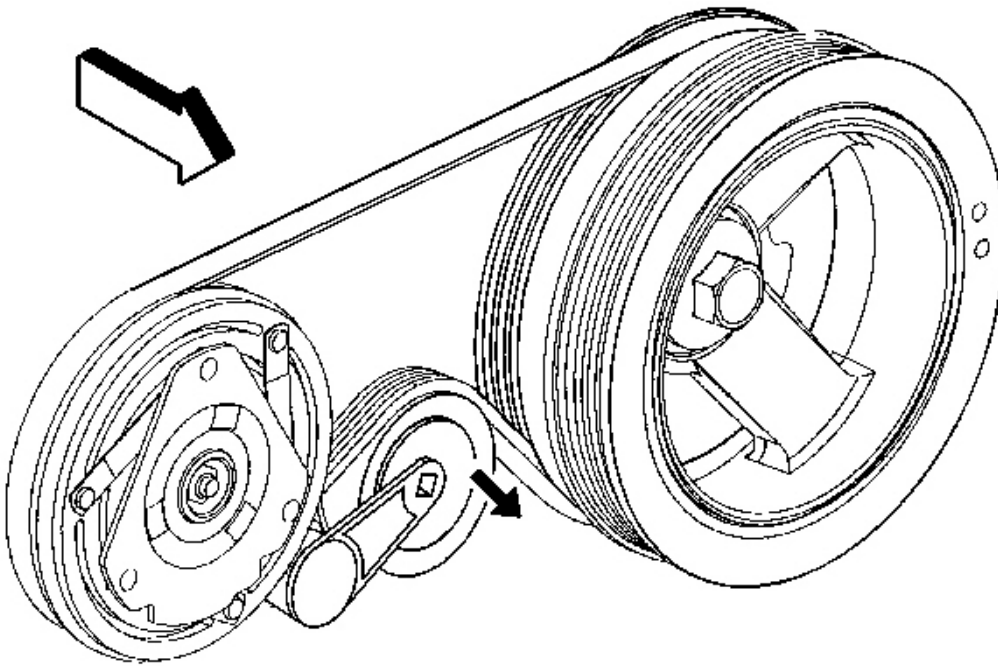


Fig. 22: View Of A/C Belt & Pulleys
Courtesy of GENERAL MOTORS CORP.

1. Install the A/C belt around the crankshaft balancer.
2. Install a ratchet into the square opening of the A/C drive belt tensioner.
3. Rotate the A/C belt tensioner clockwise in order to relieve tension on the belt.
4. Install the A/C belt over the idler pulley.
5. Install the A/C belt around the A/C compressor pulley.
6. Slowly release the tension on the A/C belt tensioner.
7. Remove the ratchet from the A/C belt tensioner.
8. Inspect the A/C belt for proper installation and alignment.
9. Lower the vehicle.
10. Install the accessory drive belt. Refer to **Drive Belt Replacement - Accessory.**

DRIVE BELT IDLER PULLEY REPLACEMENT

Removal Procedure

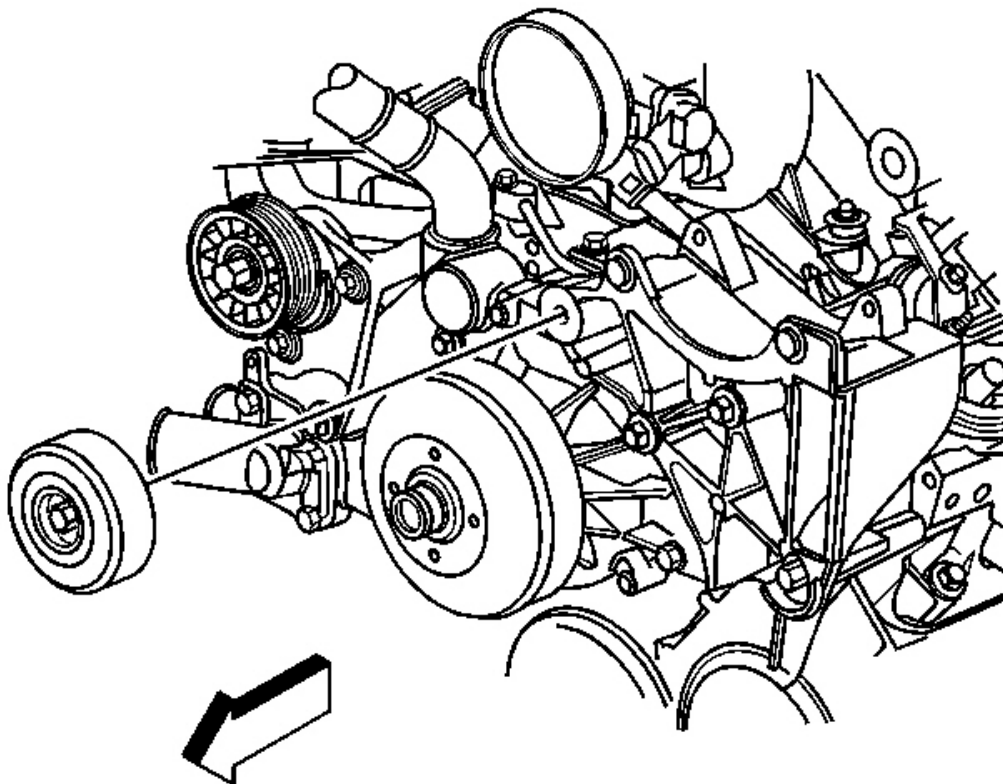


Fig. 23: View Of Accessory Drive Belt Idler Pulley
Courtesy of GENERAL MOTORS CORP.

1. Remove the accessory drive belt. Refer to **Drive Belt Replacement - Accessory**.
2. Remove the drive belt idler pulley and bolt.

Installation Procedure

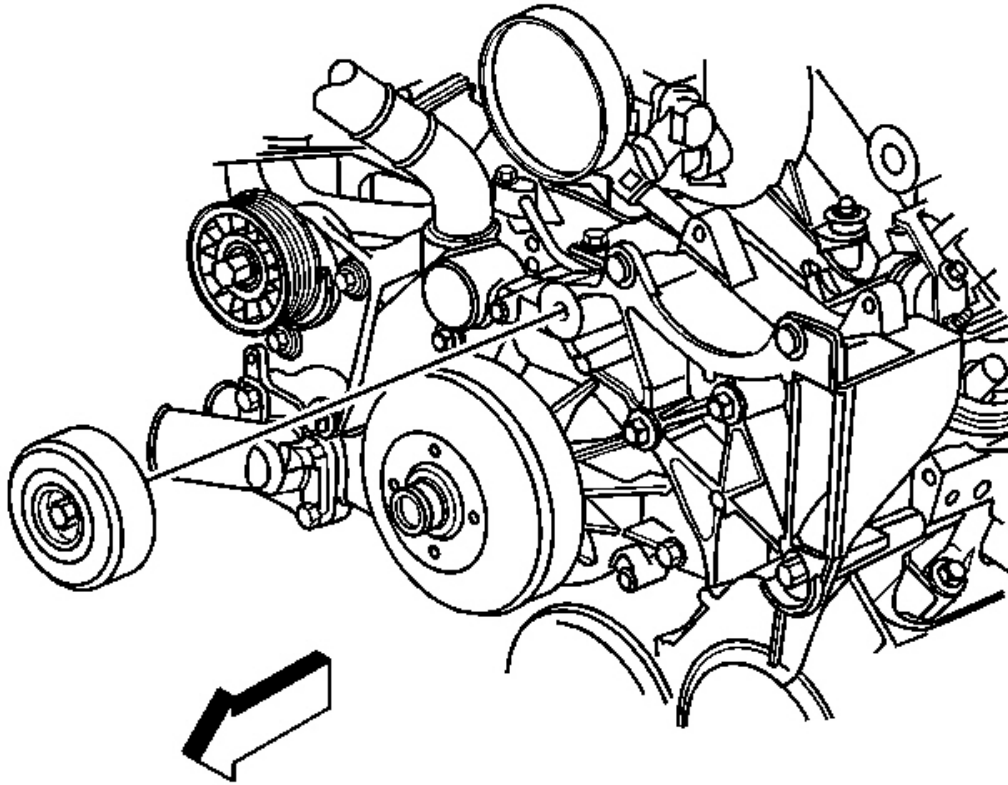


Fig. 24: View Of Accessory Drive Belt Idler Pulley
Courtesy of GENERAL MOTORS CORP.

NOTE: Refer to Fastener Notice .

1. Install the drive belt idler pulley and bolt to the generator bracket.

Tighten: Tighten the bolt to 50 N.m (37 lb ft).

2. Install the drive belt. Refer to Drive Belt Replacement - Accessory.

DRIVE BELT TENSIONER REPLACEMENT - ACCESSORY

Removal Procedure

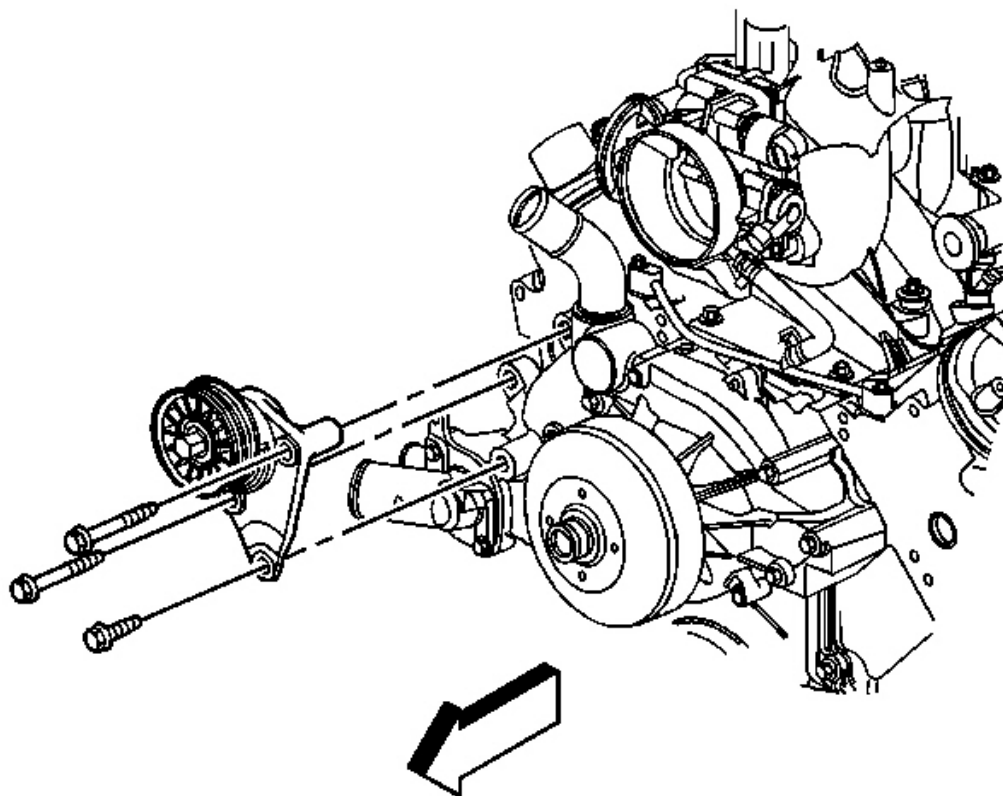


Fig. 25: View Of Drive Belt Tensioner & Bolts
Courtesy of GENERAL MOTORS CORP.

1. Remove the accessory drive belt. Refer to **Drive Belt Replacement - Accessory**.
2. Remove the drive belt tensioner bolts.
3. Remove the drive belt tensioner.

Installation Procedure

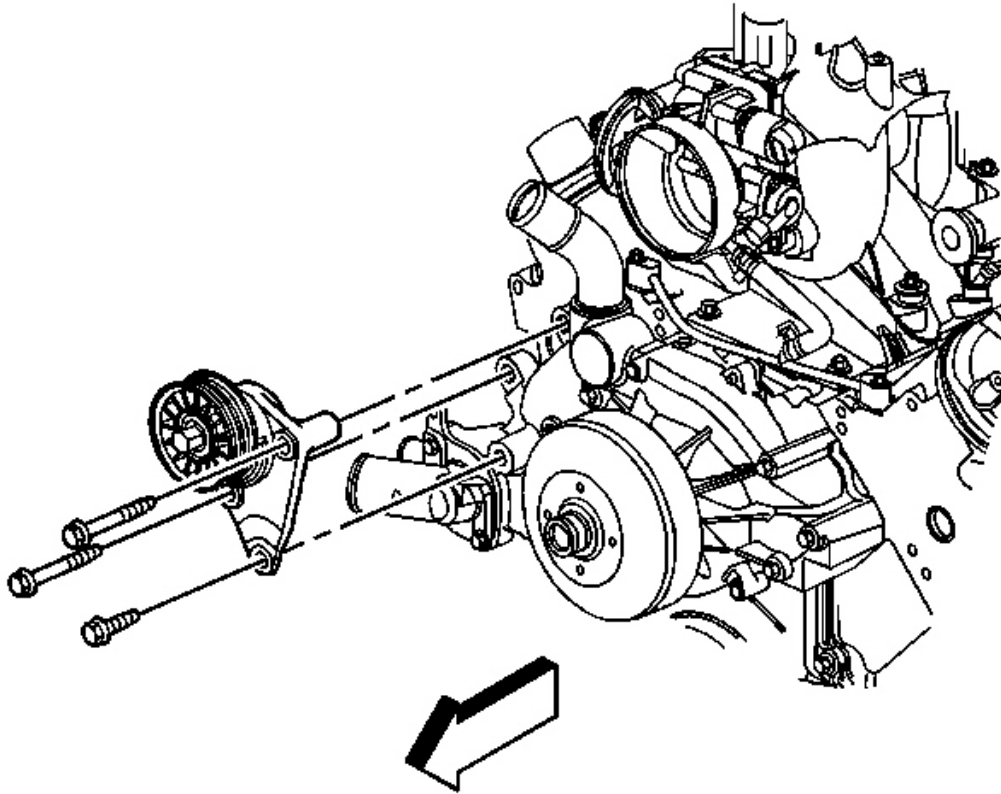


Fig. 26: View Of Drive Belt Tensioner & Bolts
Courtesy of GENERAL MOTORS CORP.

1. Install the drive belt tensioner.
2. Install the drive belt tensioner bolts.

NOTE: Refer to Fastener Notice .

3. Tighten the drive belt tensioner bolts.

Tighten: Tighten the bolts to 50 N.m (37 lb ft).

4. Install the accessory drive belt. Refer to Drive Belt Replacement - Accessory.

DRIVE BELT TENSIONER REPLACEMENT - AIR CONDITIONING

Removal Procedure

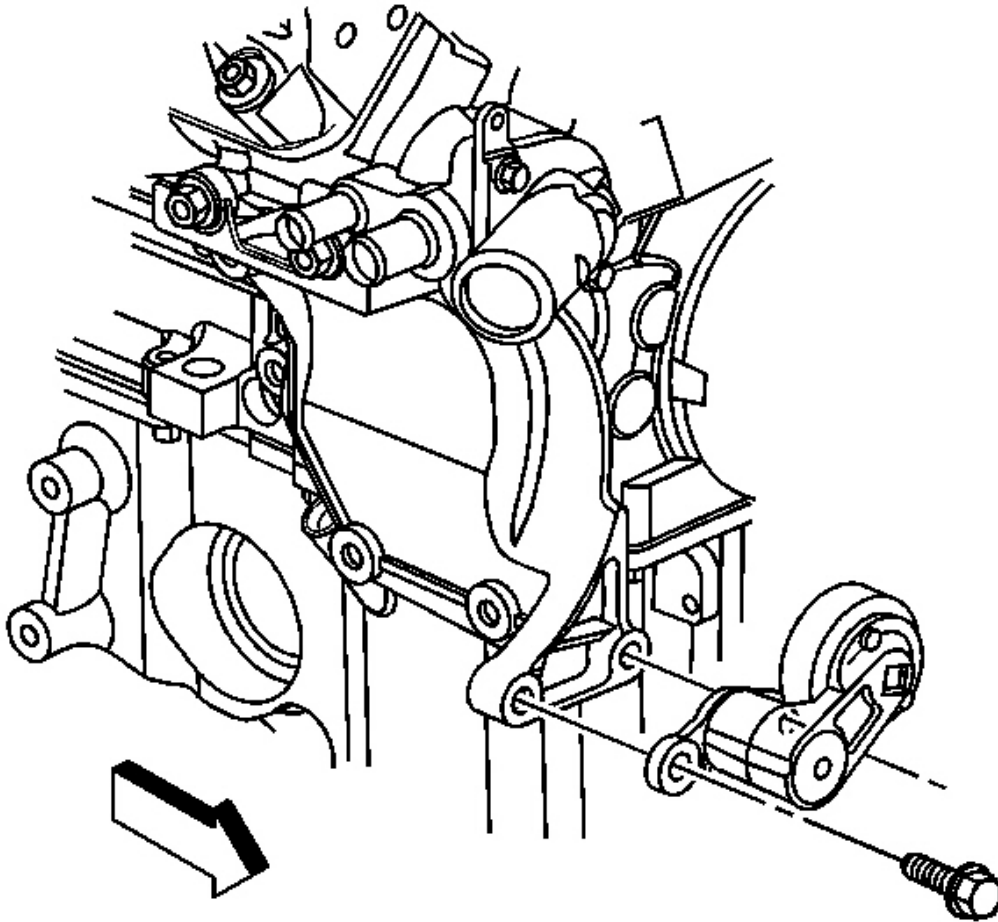


Fig. 27: View Of A/C Drive Belt Tensioner & Bolts
Courtesy of GENERAL MOTORS CORP.

1. Remove the air conditioning (A/C) drive belt. Refer to **Drive Belt Replacement - Air Conditioning**.
2. Raise and suitably support the vehicle. Refer to **Lifting and Jacking the Vehicle**.
3. Remove the A/C belt tensioner bolts.
4. Remove the A/C belt tensioner.

Installation Procedure

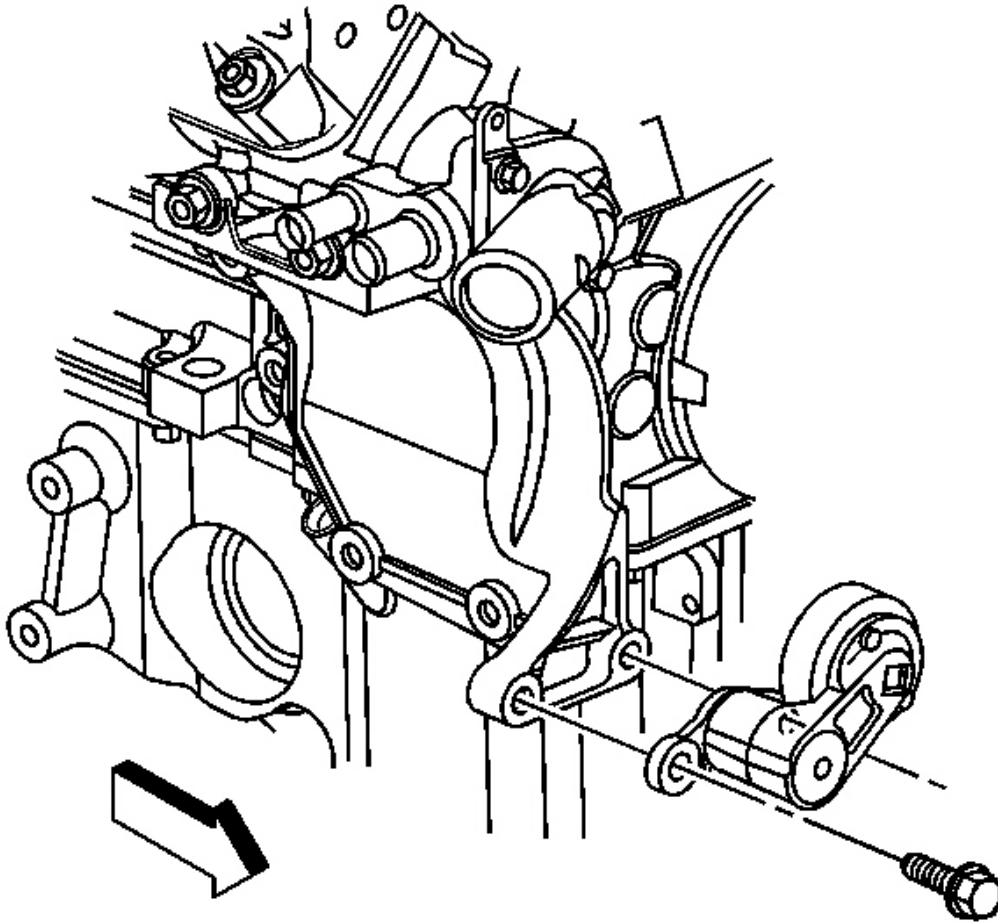


Fig. 28: View Of A/C Drive Belt Tensioner & Bolts
Courtesy of GENERAL MOTORS CORP.

NOTE: Refer to Fastener Notice .

1. Install the A/C belt tensioner.
2. Install the A/C belt tensioner bolts.

Tighten: Tighten the bolts to 50 N.m (37 lb ft).

3. Lower the vehicle.
4. Install the A/C drive belt. Refer to Drive Belt Replacement - Air Conditioning.

ENGINE MOUNT INSPECTION

Front Engine Mount

NOTE: Broken or deteriorated mounts can cause misalignment and destruction of certain drive train components. When a single mount breaks, the remaining mounts are subjected to abnormally high stresses.

1. Install a pole jack underneath the oil pan.

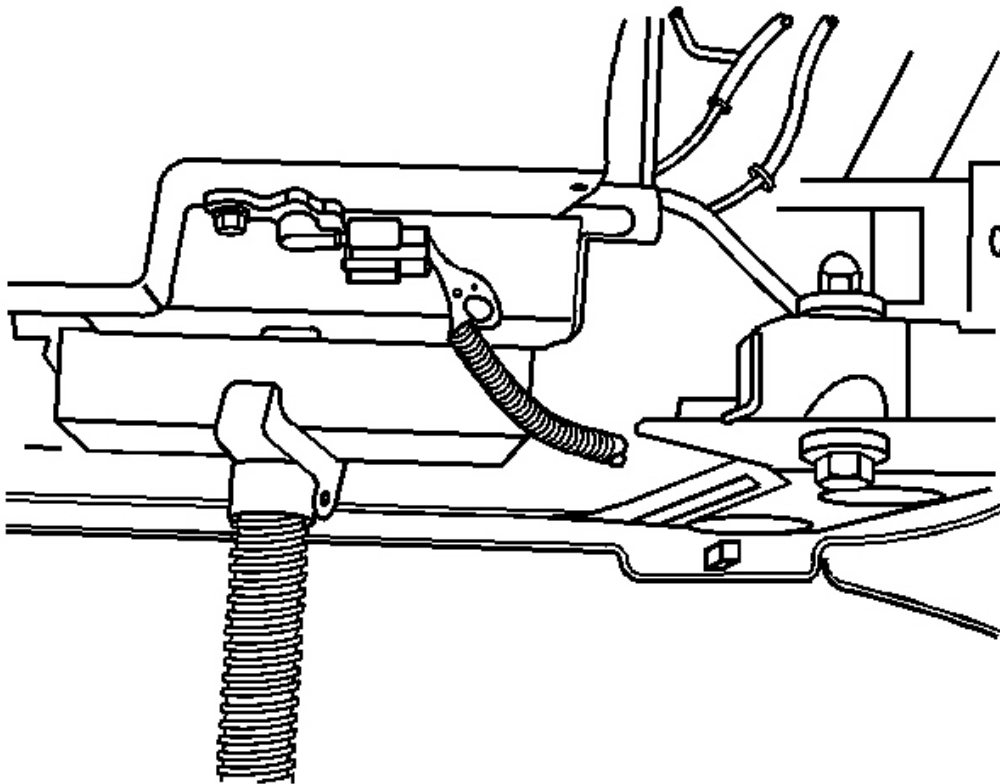


Fig. 29: View Of Wood Block Between Engine Oil Pan & Pole Jack
Courtesy of GENERAL MOTORS CORP.

2. Insert a block of wood between the engine oil pan and the pole jack.
3. Raise the jack until the wooden block contacts the engine oil pan.
4. Raise the engine in order to place a slight tension on the rubber cushion. Observe both mounts while raising the engine.

2007 Chevrolet TrailBlazer

2007 ENGINE Engine Mechanical - 6.0L - TrailBlazer

5. Replace the mounts if any of the following conditions exist:
 - Hard rubber surface covered with heat check cracks
 - The rubber cushion separated from the metal plate of the mount
 - The rubber cushion is split through the center
 - The mount is leaking
6. If there is movement between a metal plate of the mount and its attaching points, lower the engine and tighten the bolts or nuts attaching the mount to the engine, the frame or the bracket.

ENGINE MOUNT REPLACEMENT - LEFT SIDE (FOUR-WHEEL DRIVE)

Removal Procedure

1. Raise and support the vehicle. Refer to **Lifting and Jacking the Vehicle** .
2. Remove the front tire and wheels. Refer to **Tire and Wheel Removal and Installation** .
3. Remove the engine protection shield. Refer to **Engine Protection Shield Replacement** .
4. Remove the shock module. Refer to **Shock Module Replacement** .
5. Remove the left side wheel drive shaft. Refer to **Wheel Drive Shaft Replacement** .
6. Remove the front differential carrier. Refer to **Differential Carrier Assembly Replacement (4.2L In-Line Six Cylinder)** or **Differential Carrier Assembly Replacement (V8)** .

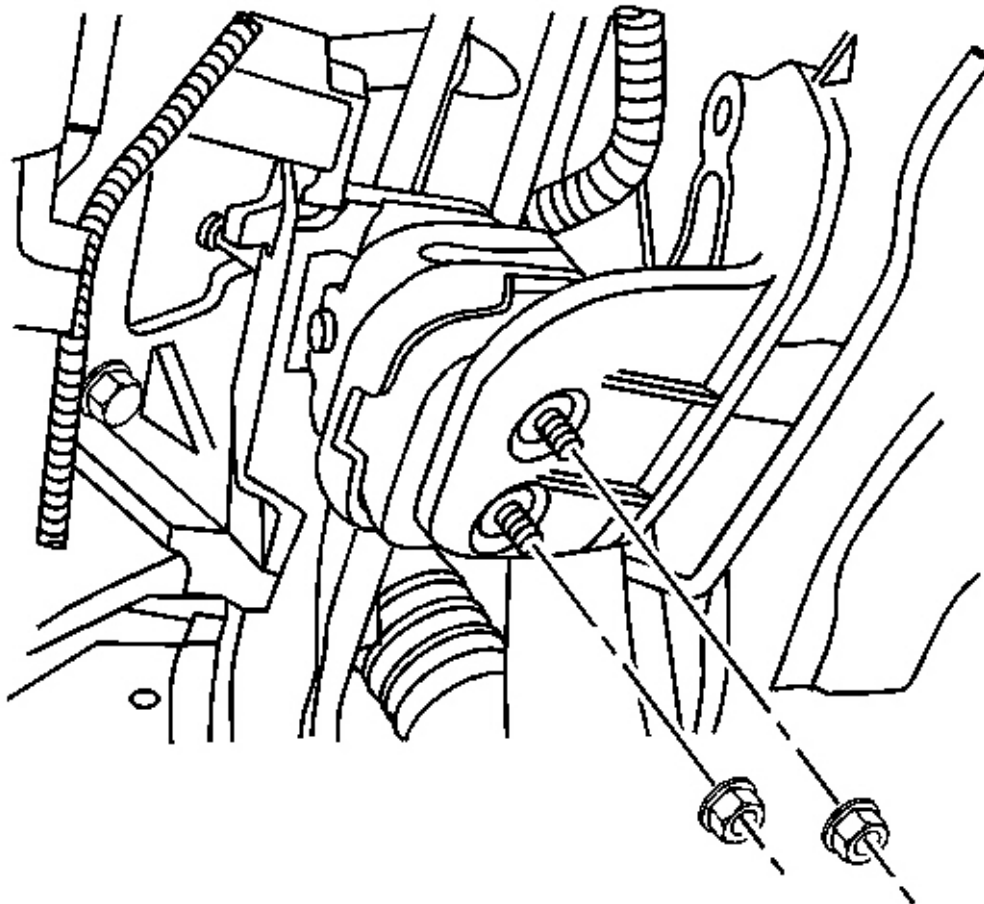


Fig. 30: View Of Left Lower Engine Mount
Courtesy of GENERAL MOTORS CORP.

7. Remove the lower engine mount retaining nuts from the engine mount frame bracket.

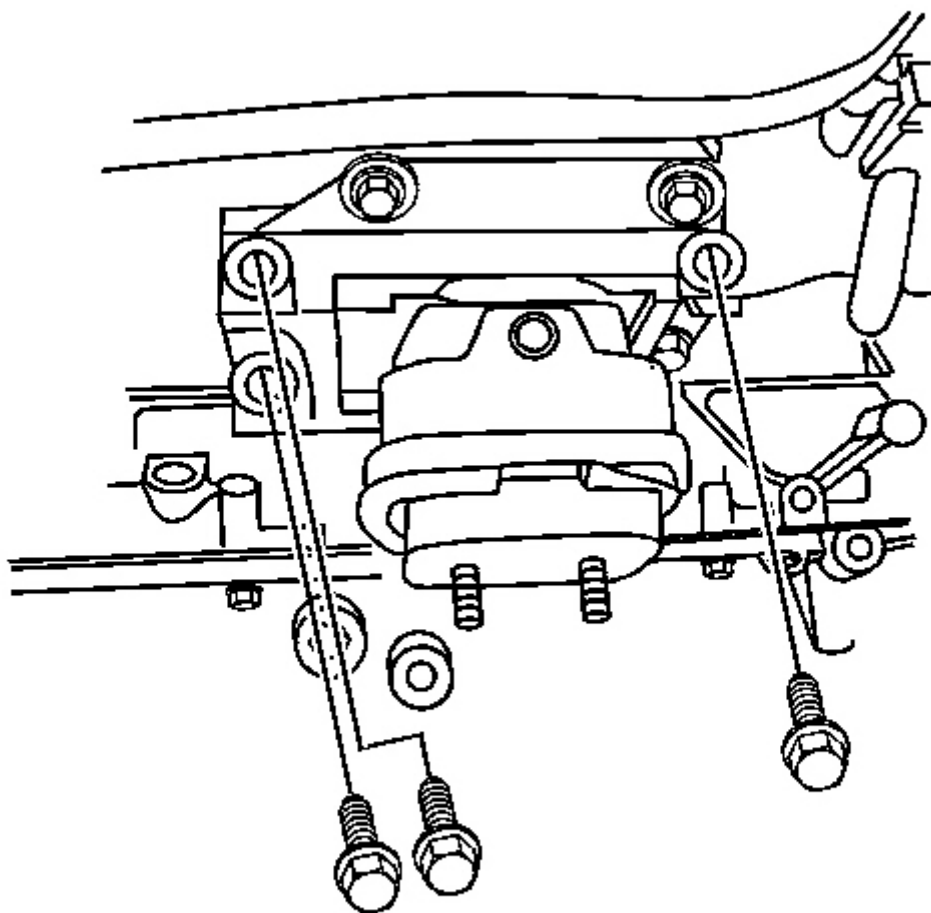


Fig. 31: Identifying Upper Engine Mount Assembly
Courtesy of GENERAL MOTORS CORP.

8. Remove the 3 mounting bolts that secure the upper engine mount bracket to the engine block bracket.

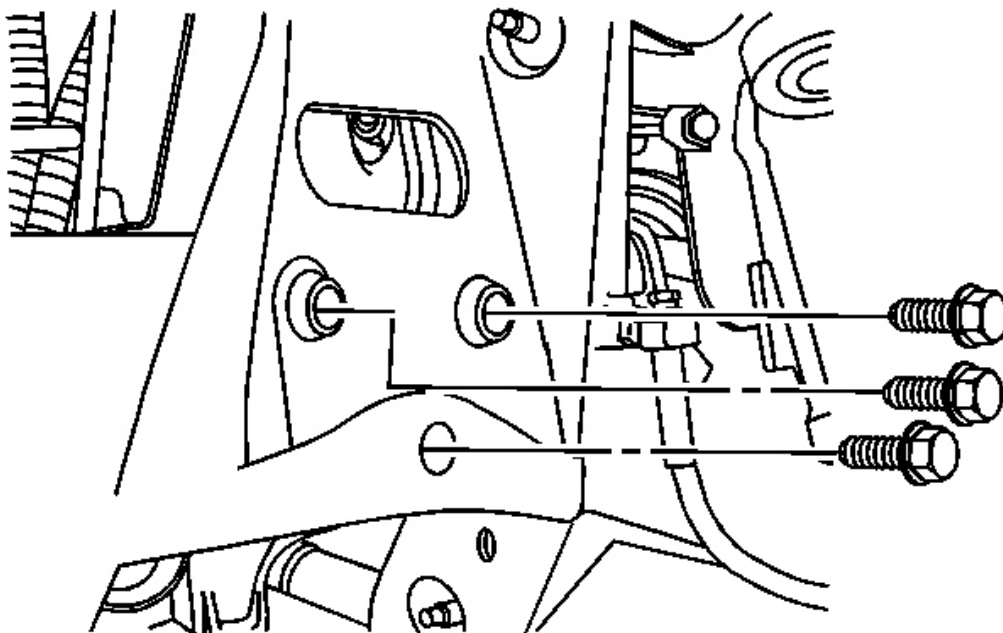


Fig. 32: View Of Frame Engine Mount Bracket Bolt Locations
Courtesy of GENERAL MOTORS CORP.

9. Remove the 3 retaining bolts to the frame engine mount bracket.

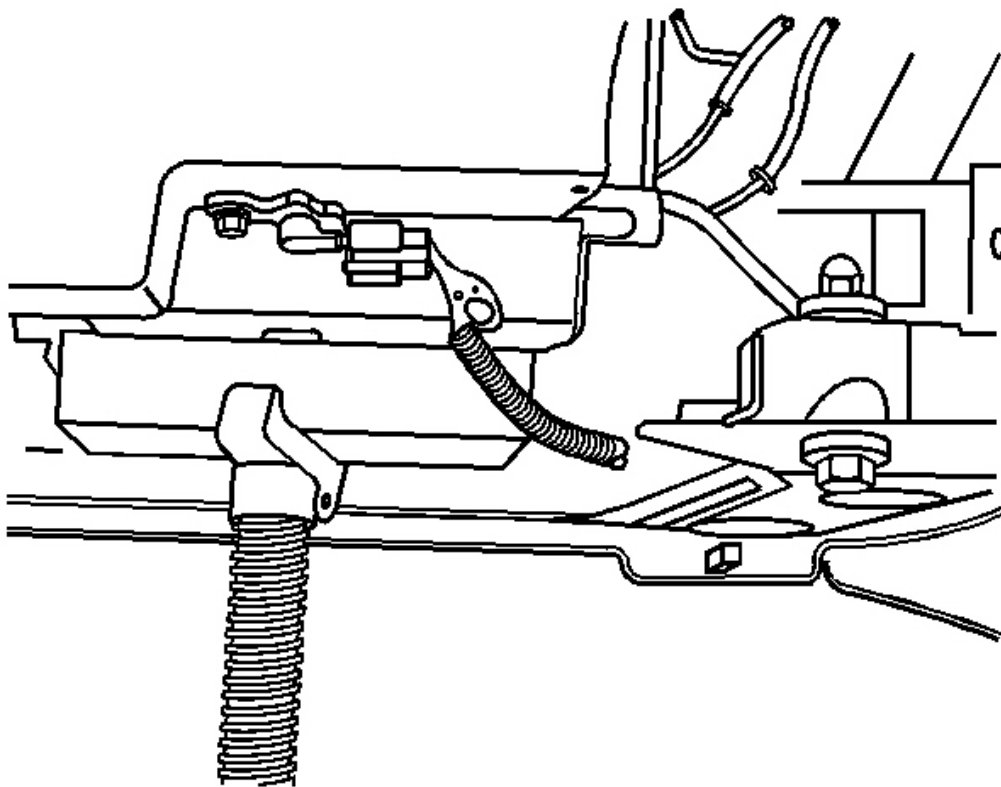


Fig. 33: View Of Wood Block Between Engine Oil Pan & Pole Jack
Courtesy of GENERAL MOTORS CORP.

10. Install a pole jack underneath the oil pan.
11. Insert a block of wood between the oil pan and the pole jack.

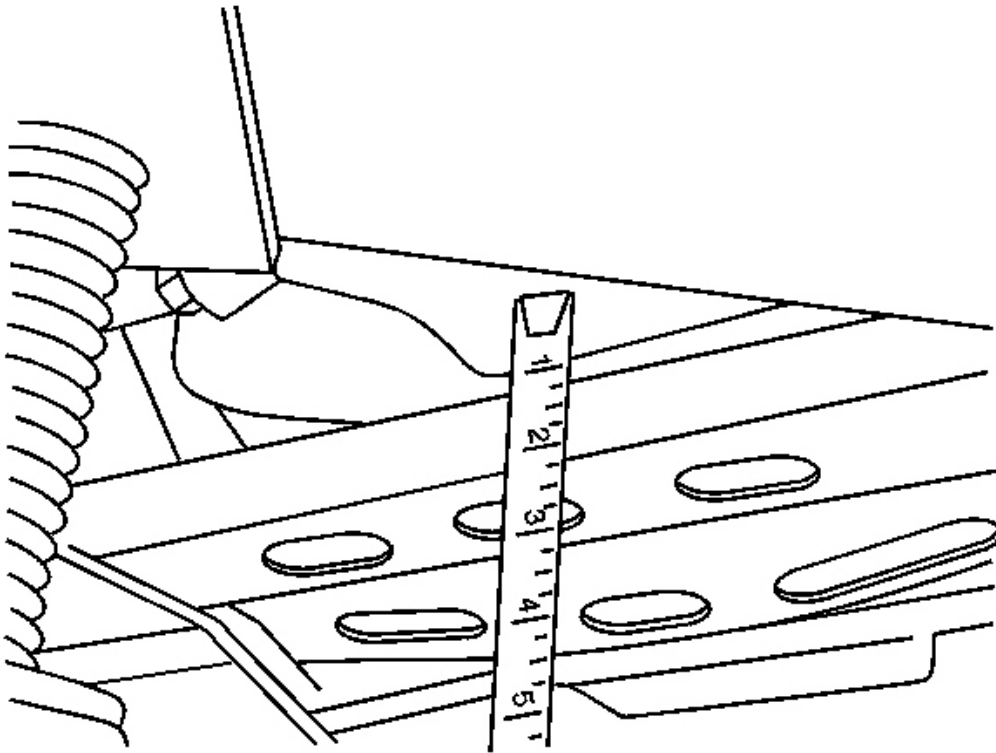


Fig. 34: Measuring Engine Elevation
Courtesy of GENERAL MOTORS CORP.

12. Raise the engine $2\frac{1}{4}$ inches measuring from the bottom of the oil pan to the front edge of the transmission support crossmember.

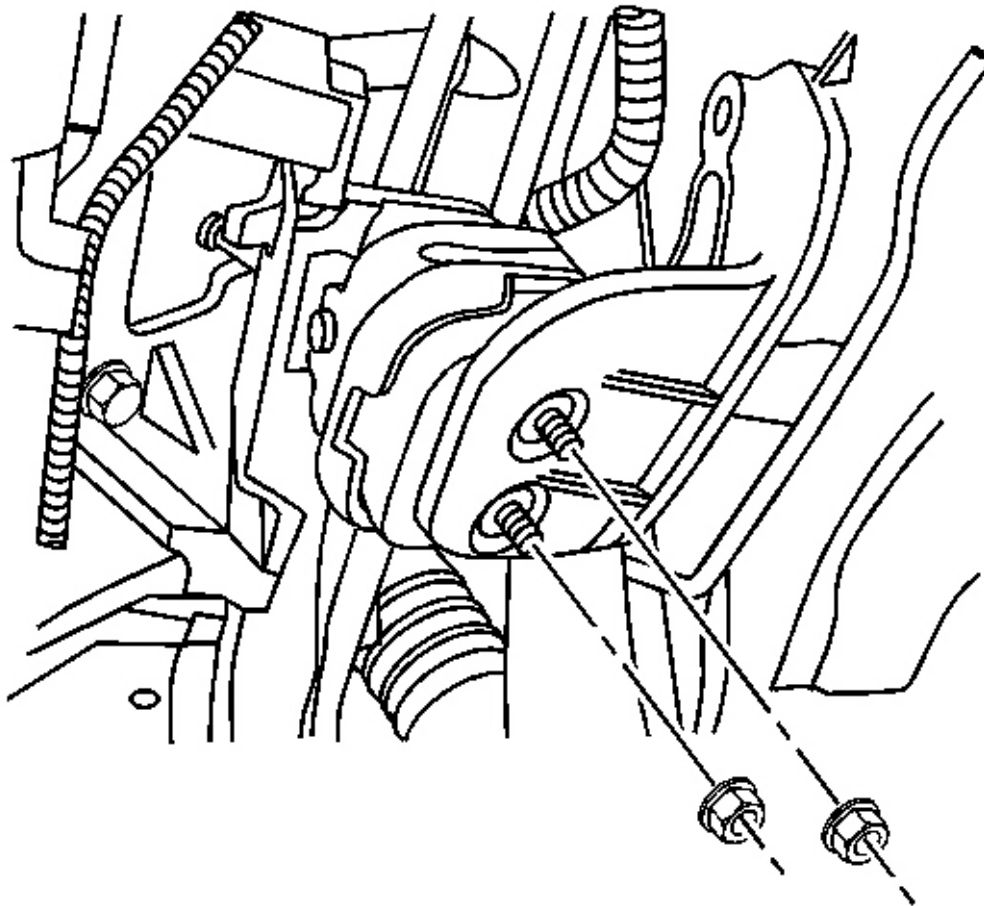


Fig. 35: View Of Left Lower Engine Mount
Courtesy of GENERAL MOTORS CORP.

13. Remove the engine mount frame bracket from the frame.

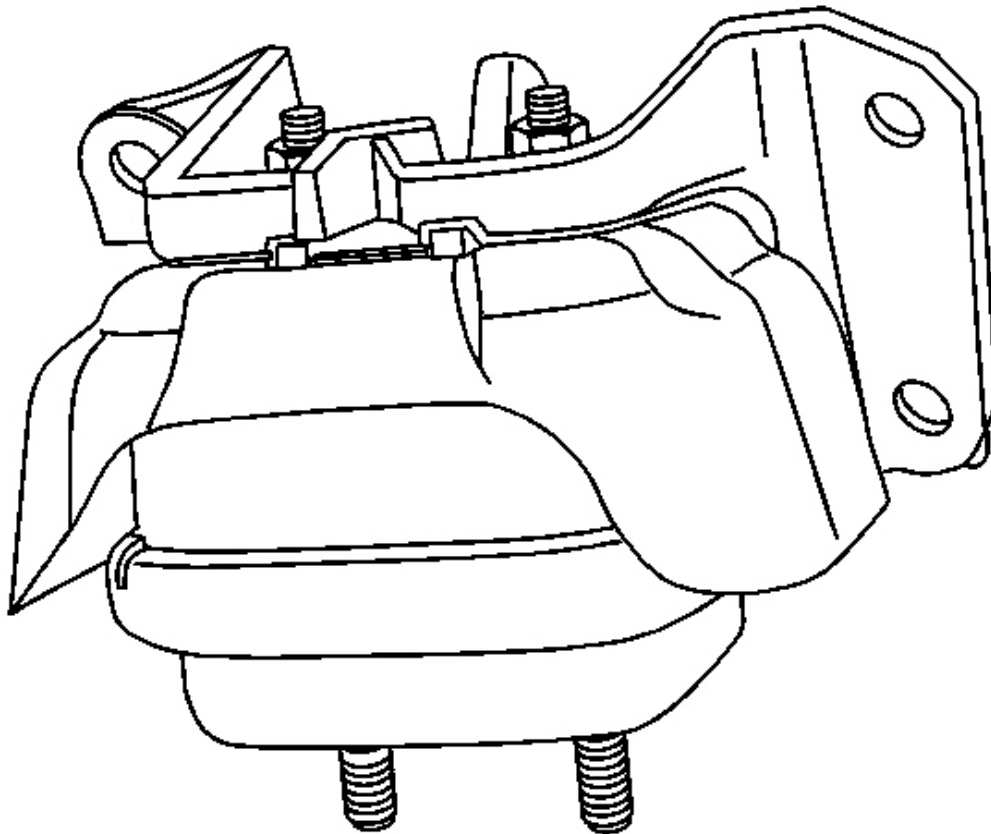


Fig. 36: View Of Engine Mount

Courtesy of GENERAL MOTORS CORP.

14. Remove the engine mount with the upper engine mount bracket as an assembly.
15. Separate the engine mount from the upper engine mount bracket.

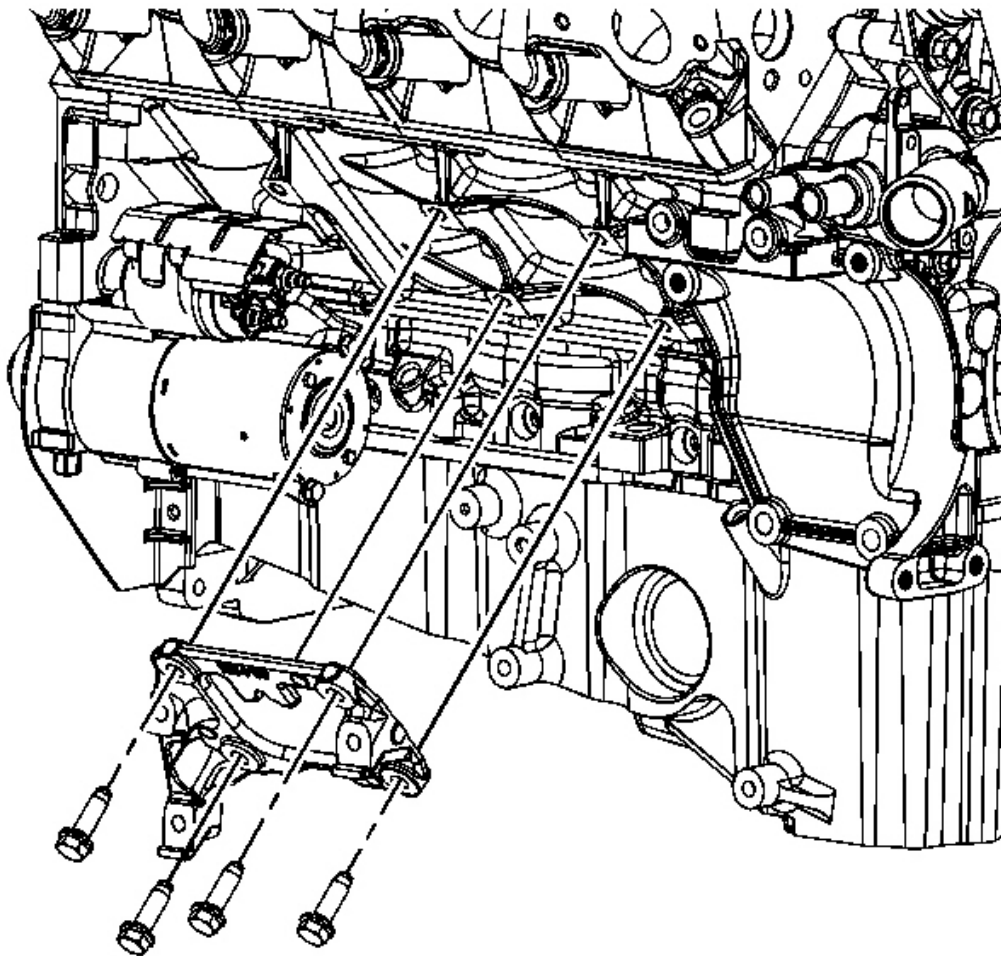


Fig. 37: View Of Engine Mounting Bracket
Courtesy of GENERAL MOTORS CORP.

16. Remove the engine mount bracket spacer if damaged.

Installation Procedure

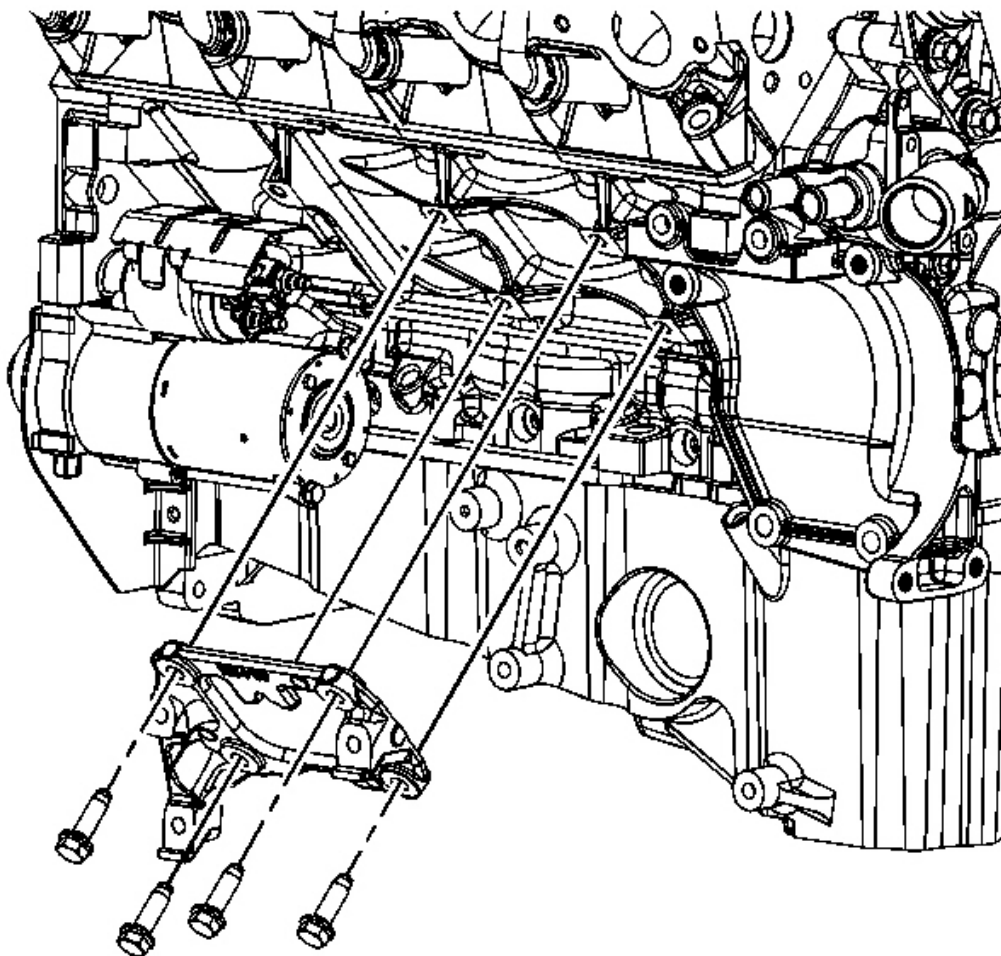


Fig. 38: View Of Engine Mounting Bracket
Courtesy of GENERAL MOTORS CORP.

NOTE: Refer to Fastener Notice .

1. Install the engine mount bracket spacer if necessary.

Tighten: Tighten the spacer bolts to 50 N.m (37 lb ft).

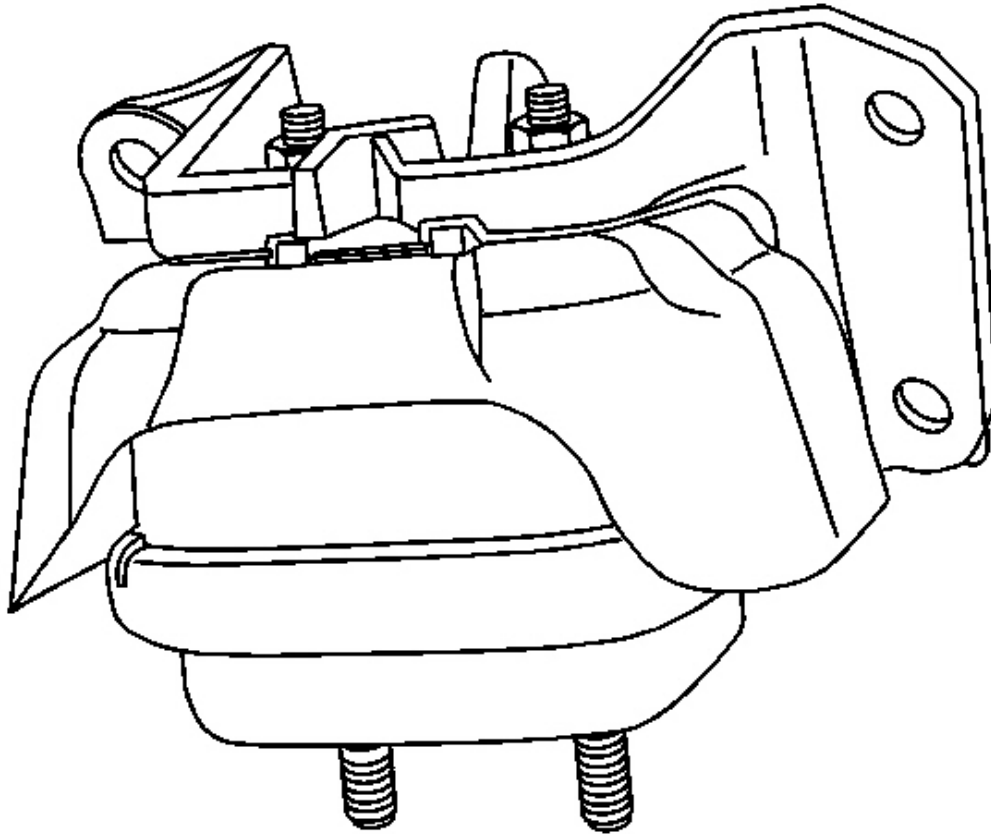


Fig. 39: View Of Engine Mount

Courtesy of GENERAL MOTORS CORP.

IMPORTANT: Verify that the cut out side of the engine mount shield is positioned away from the engine.

2. Install the engine mount to the upper engine mount bracket.

Tighten: Tighten the engine mount nuts to 50 N.m (37 lb ft).

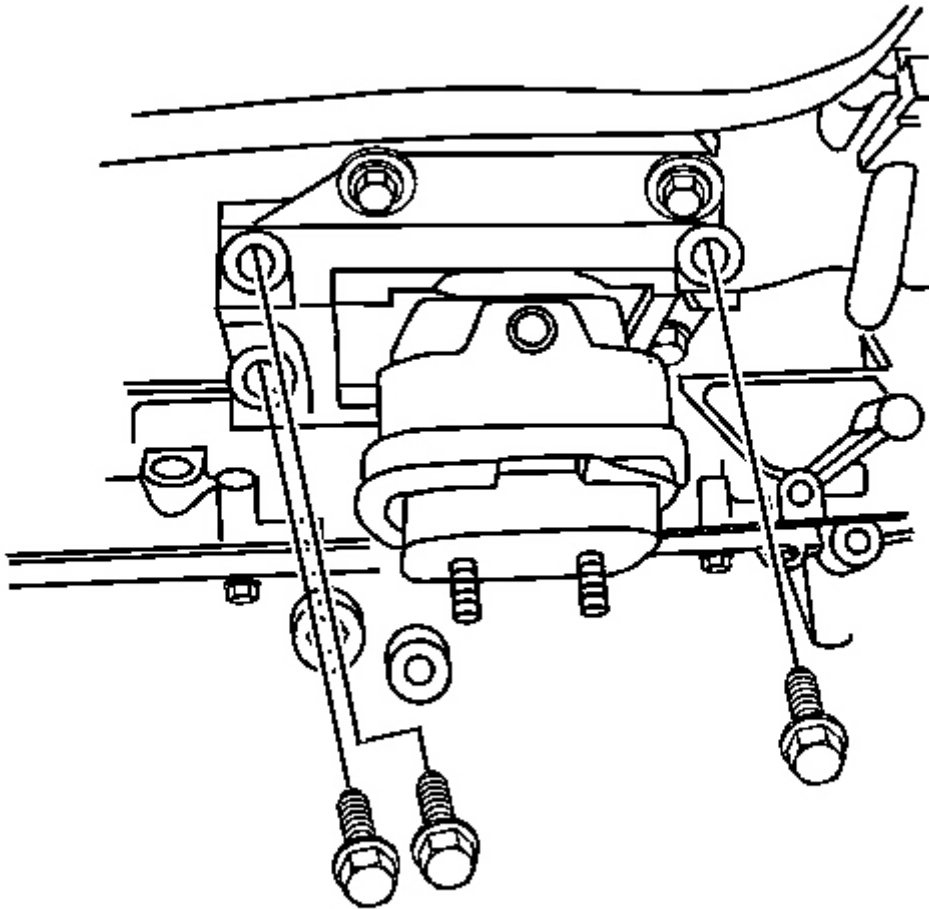


Fig. 40: Identifying Upper Engine Mount Assembly
Courtesy of GENERAL MOTORS CORP.

3. Install the engine mount to engine.

Tighten: Tighten the engine mount bolts to 50 N.m (37 lb ft).

4. Install the engine mount frame bracket to the frame.
5. Install the engine mount frame bracket retaining bolts.

Tighten: Tighten the bolts to 100 N.m (74 lb ft).

6. Install the left side engine mount frame bracket.

7. Install the left side engine mount frame bracket retaining bolts.

Tighten: Tighten the bolts to 100 N.m (74 lb ft).

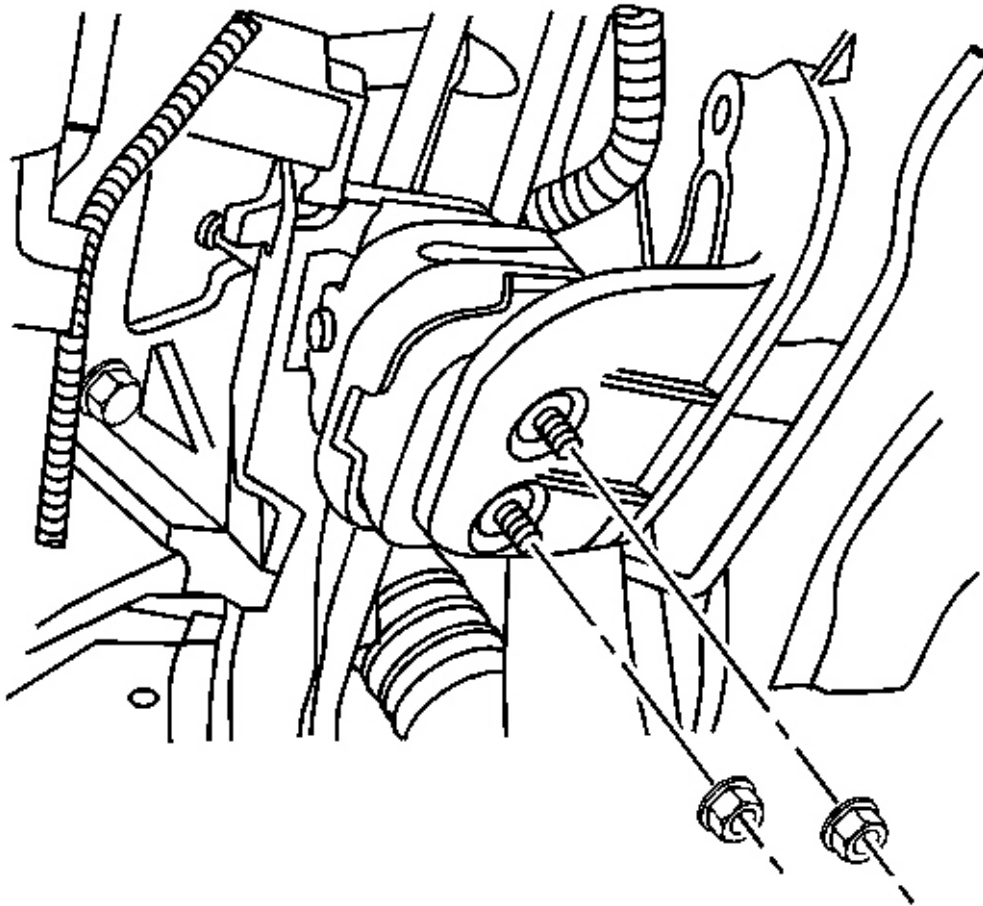


Fig. 41: View Of Left Lower Engine Mount
Courtesy of GENERAL MOTORS CORP.

8. Lower the engine, aligning the engine mount studs with the holes in the frame bracket.
9. Remove the pole jack and block of wood.
10. Tighten the engine mount nuts.

Tighten: Tighten the nuts to 50 N.m (37 lb ft).

2007 Chevrolet TrailBlazer

2007 ENGINE Engine Mechanical - 6.0L - TrailBlazer

11. Install the shock module. Refer to **Shock Module Replacement** .
12. Install the front differential carrier. Refer to **Differential Carrier Assembly Replacement (4.2L In-Line Six Cylinder)** or **Differential Carrier Assembly Replacement (V8)** .
13. Install the left side wheel drive shaft. Refer to **Wheel Drive Shaft Replacement** .
14. Install the engine protection shield. Refer to **Engine Protection Shield Replacement** .
15. Install the front tire and wheels. Refer to **Tire and Wheel Removal and Installation** .
16. Lower the vehicle. Refer to **Lifting and Jacking the Vehicle** .

ENGINE MOUNT REPLACEMENT - LEFT SIDE (TWO-WHEEL DRIVE)

Removal Procedure

1. Raise and support the vehicle. Refer to **Lifting and Jacking the Vehicle** .
2. Remove the front tire and wheels. Refer to **Tire and Wheel Removal and Installation** .
3. Remove the engine protection shield. Refer to **Engine Protection Shield Replacement** .
4. Remove the shock module. Refer to **Shock Module Replacement** .

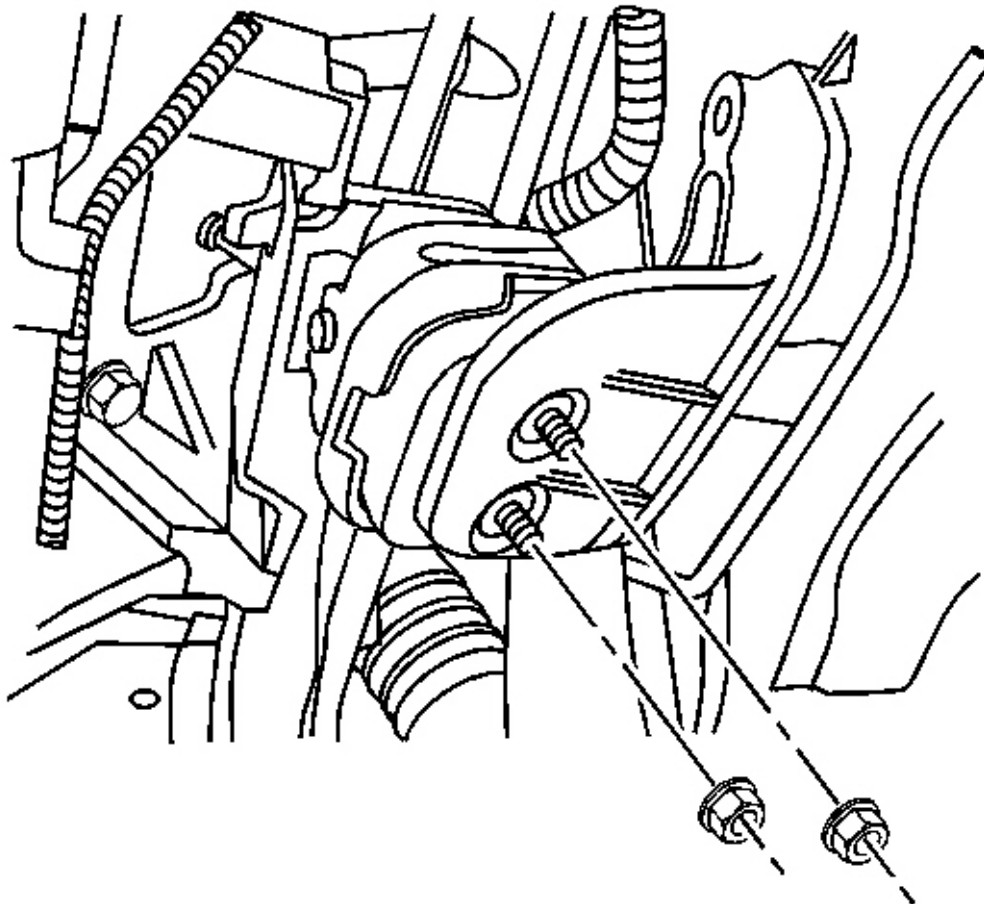


Fig. 42: View Of Left Lower Engine Mount
Courtesy of GENERAL MOTORS CORP.

5. Remove the lower engine mount retaining nuts from the engine mount frame bracket.

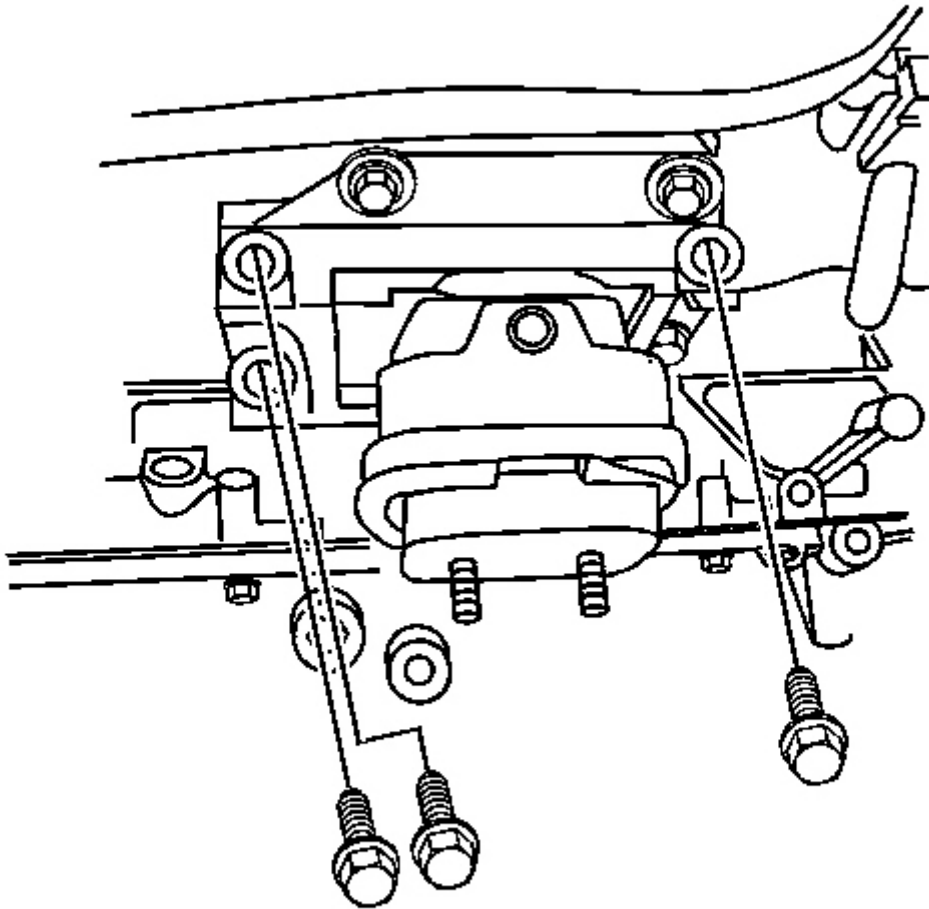


Fig. 43: Identifying Upper Engine Mount Assembly
Courtesy of GENERAL MOTORS CORP.

6. Remove the 3 mounting bolts that secure the upper engine mount bracket to the engine block bracket.

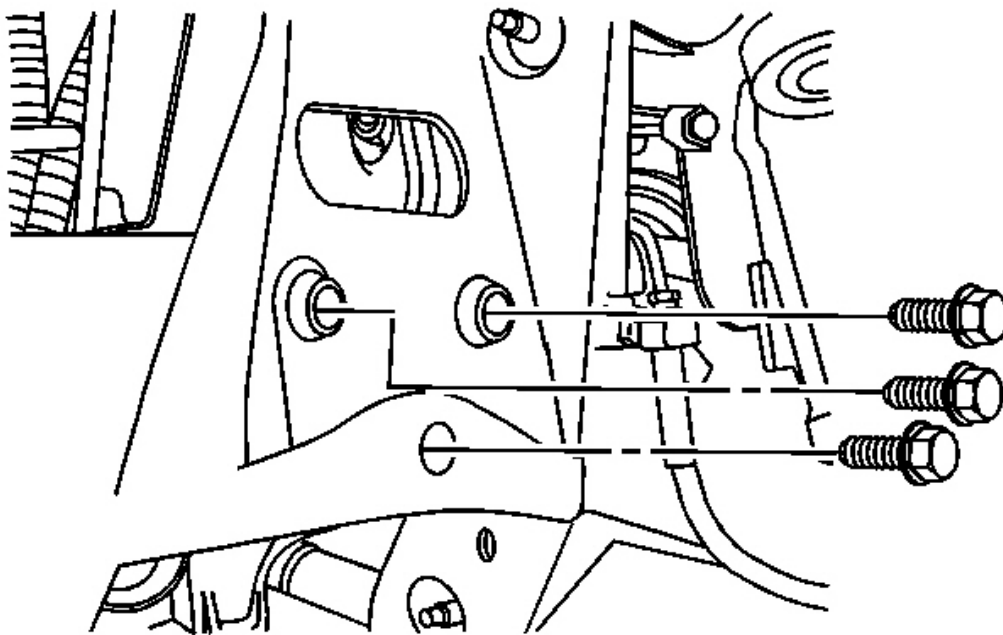


Fig. 44: View Of Frame Engine Mount Bracket Bolt Locations
Courtesy of GENERAL MOTORS CORP.

7. Remove the 3 frame engine mount bracket retaining bolts.

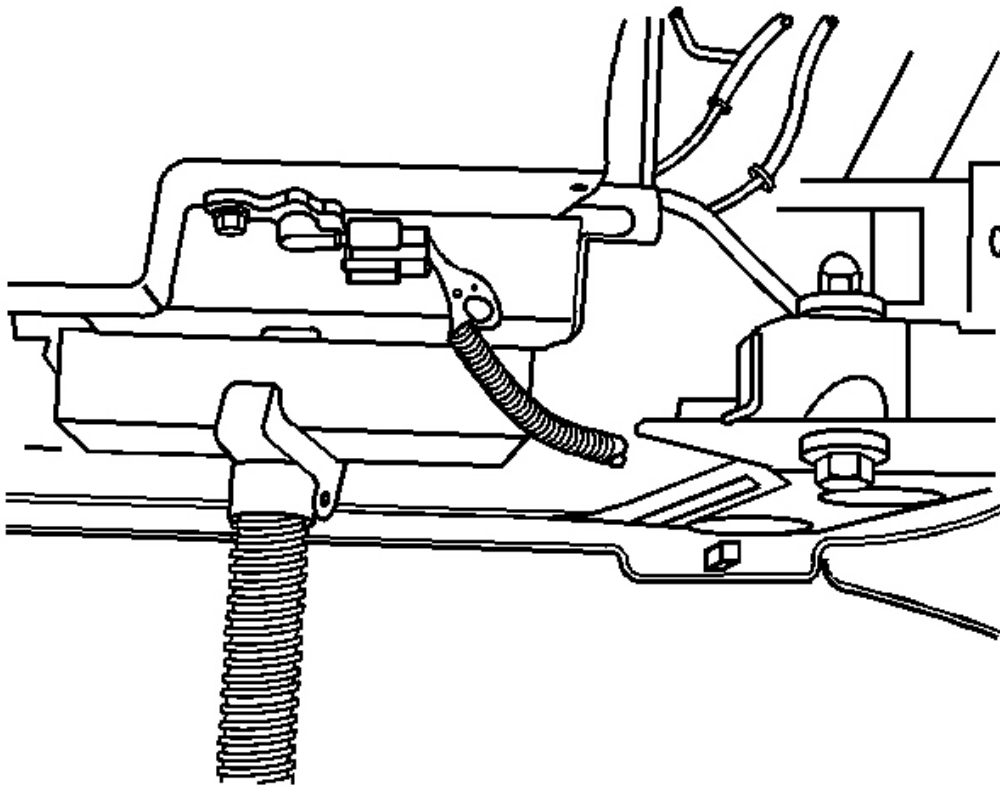


Fig. 45: View Of Wood Block Between Engine Oil Pan & Pole Jack
Courtesy of GENERAL MOTORS CORP.

8. Install a pole jack underneath the oil pan.
9. Insert a block of wood between the oil pan and the pole jack.

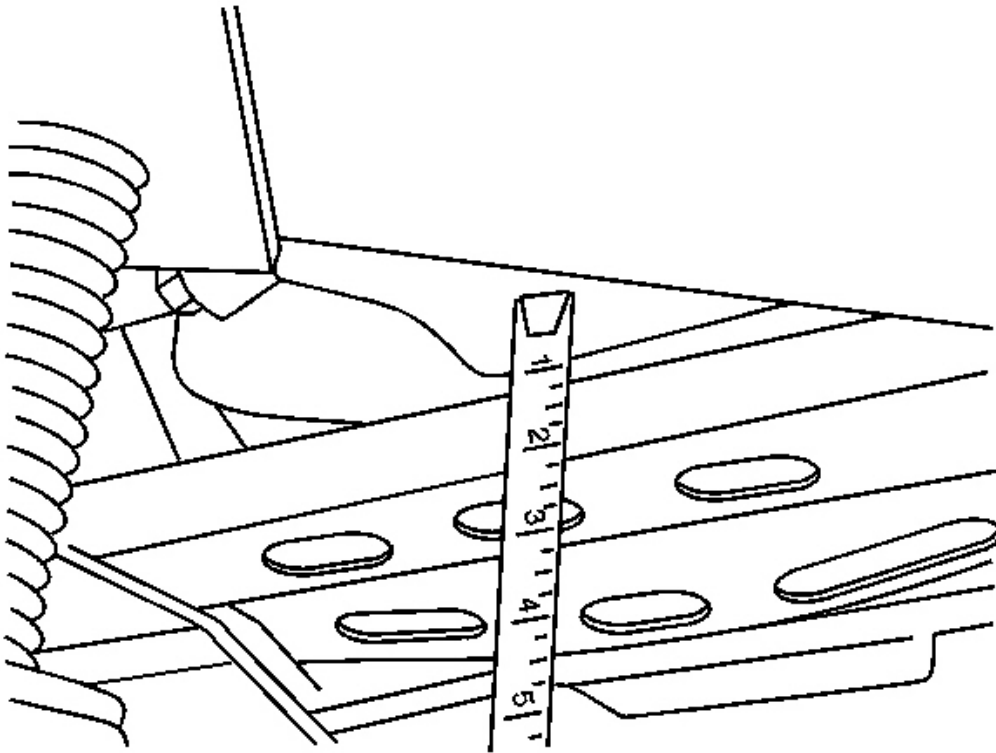


Fig. 46: Measuring Engine Elevation
Courtesy of GENERAL MOTORS CORP.

10. Raise the engine $2\frac{1}{4}$ inches measuring from the bottom of the oil pan to the front edge of the transmission support crossmember.

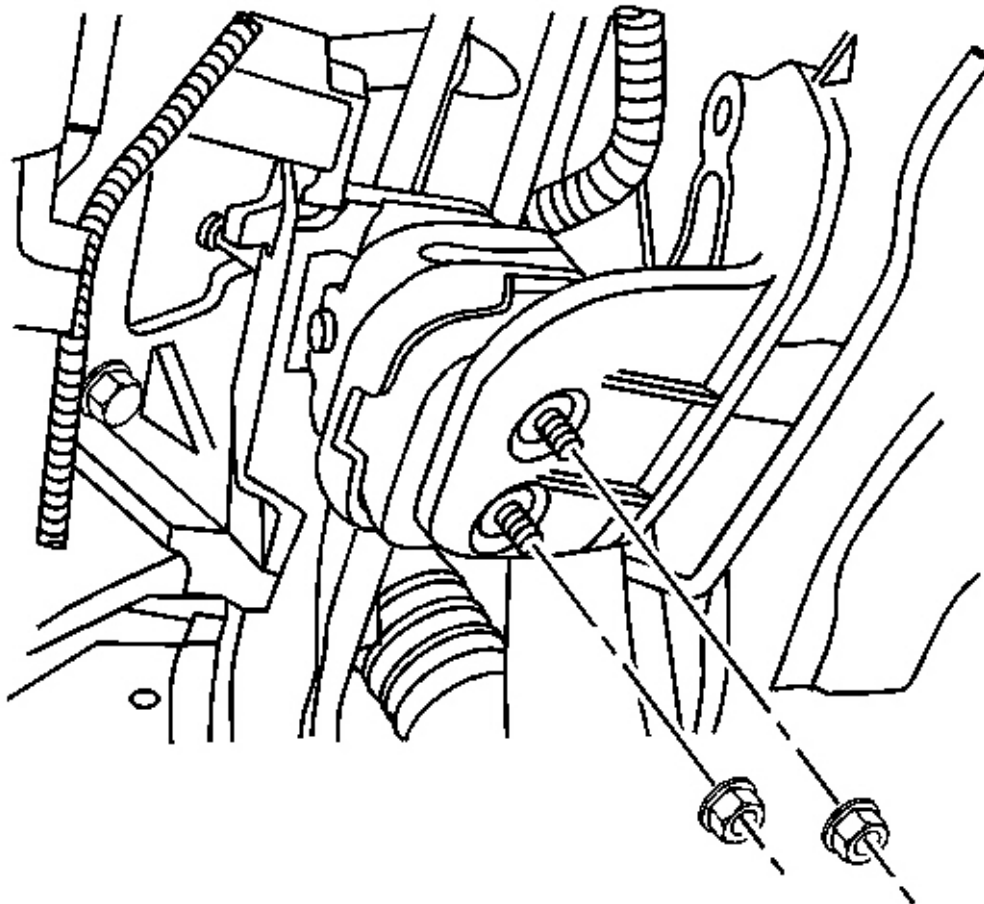


Fig. 47: View Of Left Lower Engine Mount
Courtesy of GENERAL MOTORS CORP.

11. Remove the engine mount frame bracket from the frame.

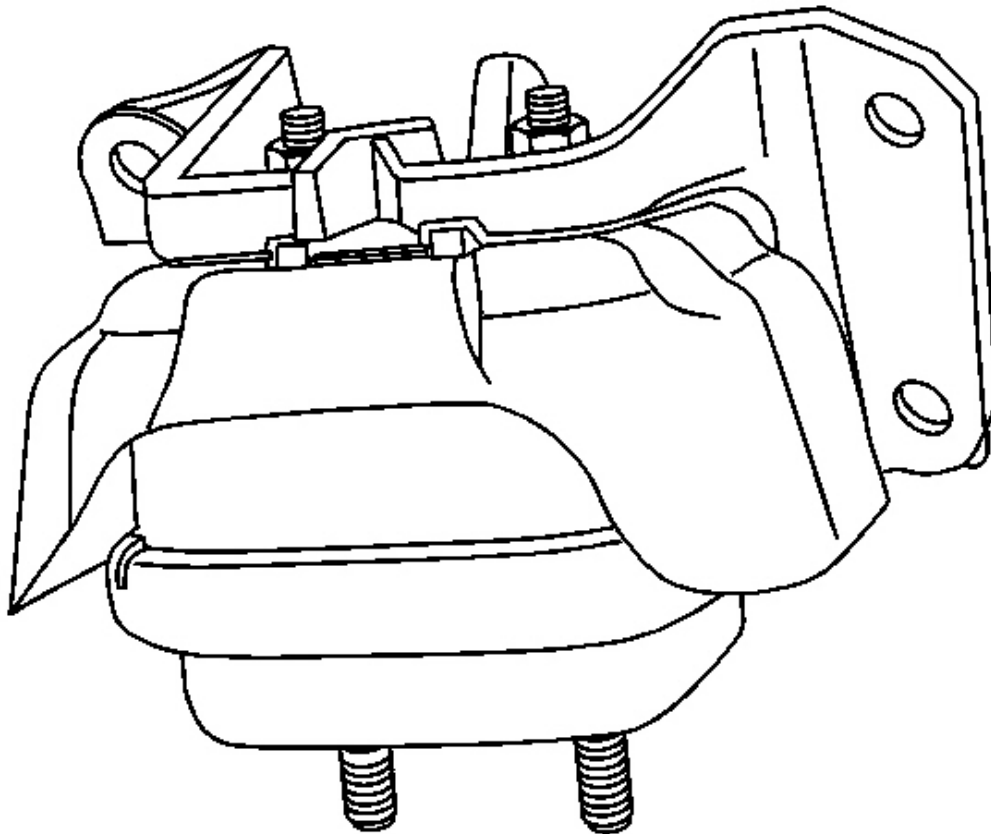


Fig. 48: View Of Engine Mount

Courtesy of GENERAL MOTORS CORP.

12. Remove the engine mount with the upper engine mount bracket as an assembly.
13. Separate the engine mount from the upper engine mount bracket.

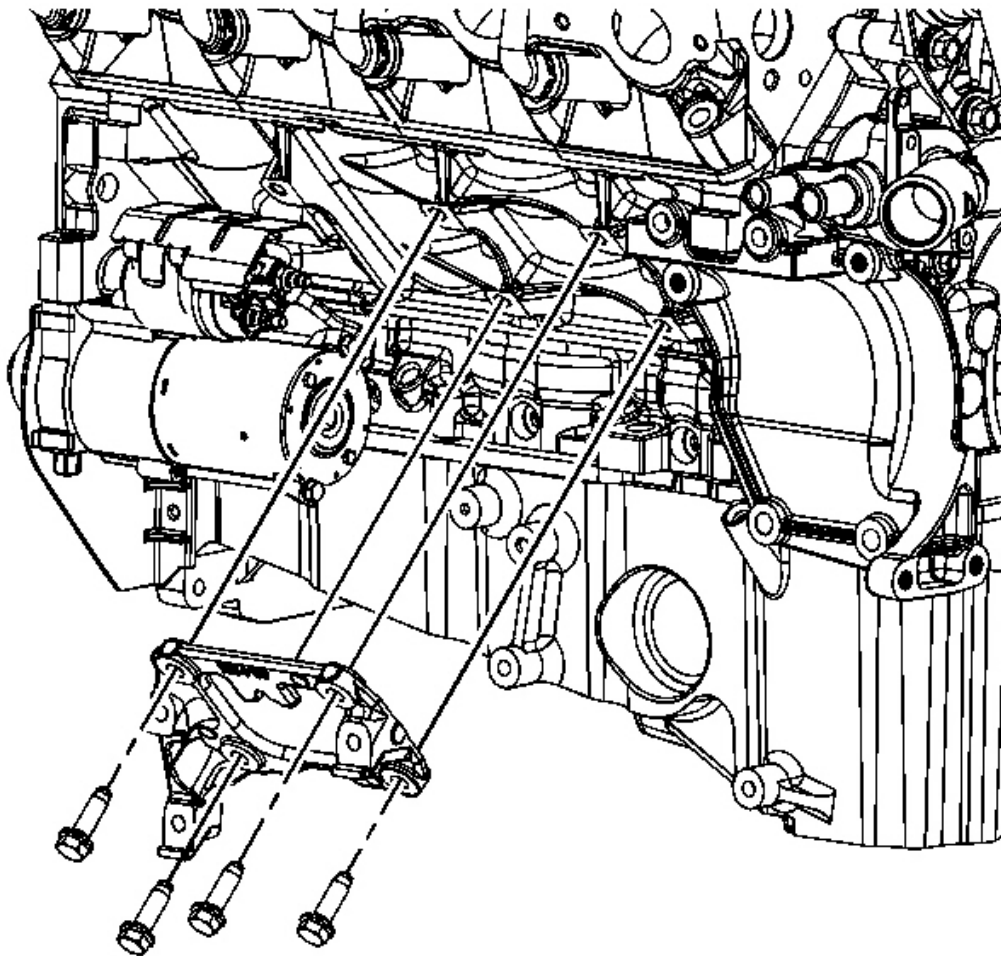


Fig. 49: View Of Engine Mounting Bracket
Courtesy of GENERAL MOTORS CORP.

14. Remove the engine mount bracket spacer if damaged.

Installation Procedure

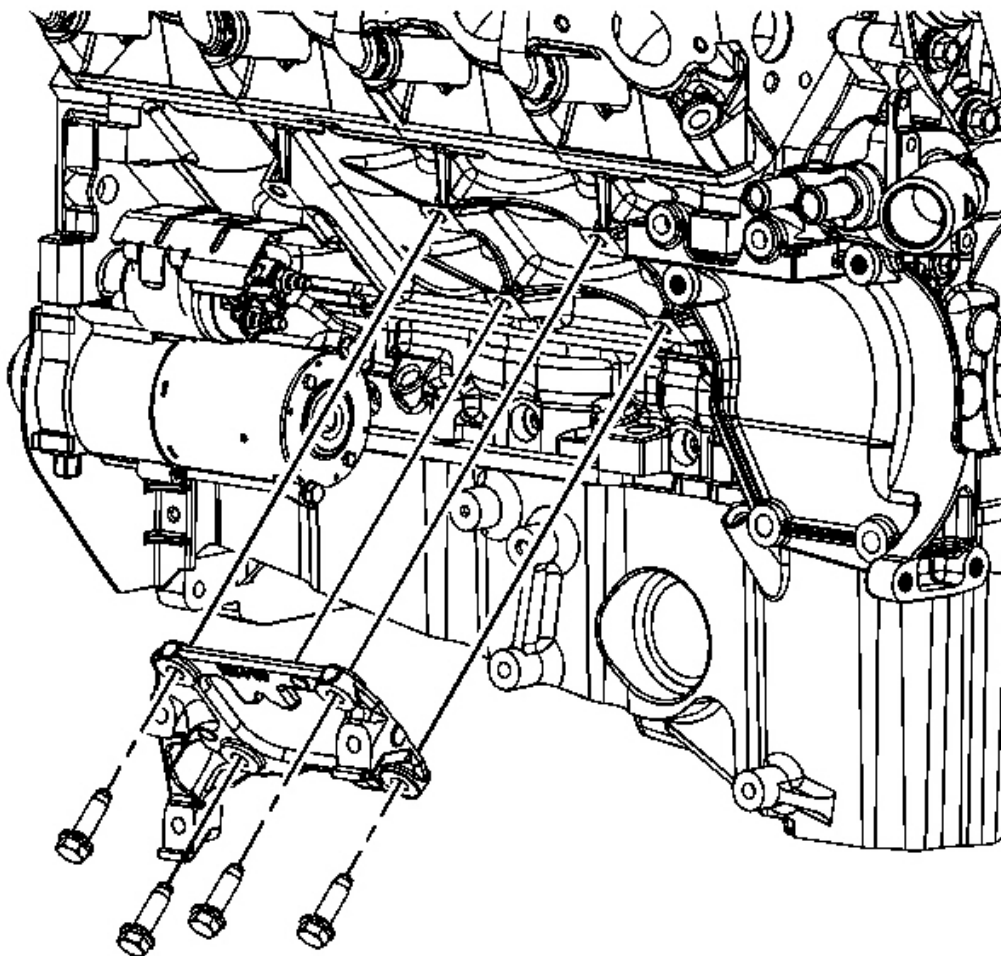


Fig. 50: View Of Engine Mounting Bracket
Courtesy of GENERAL MOTORS CORP.

NOTE: Refer to Fastener Notice .

1. Install the engine mount bracket spacer if necessary.

Tighten: Tighten the spacer bolts to 50 N.m (37 lb ft).

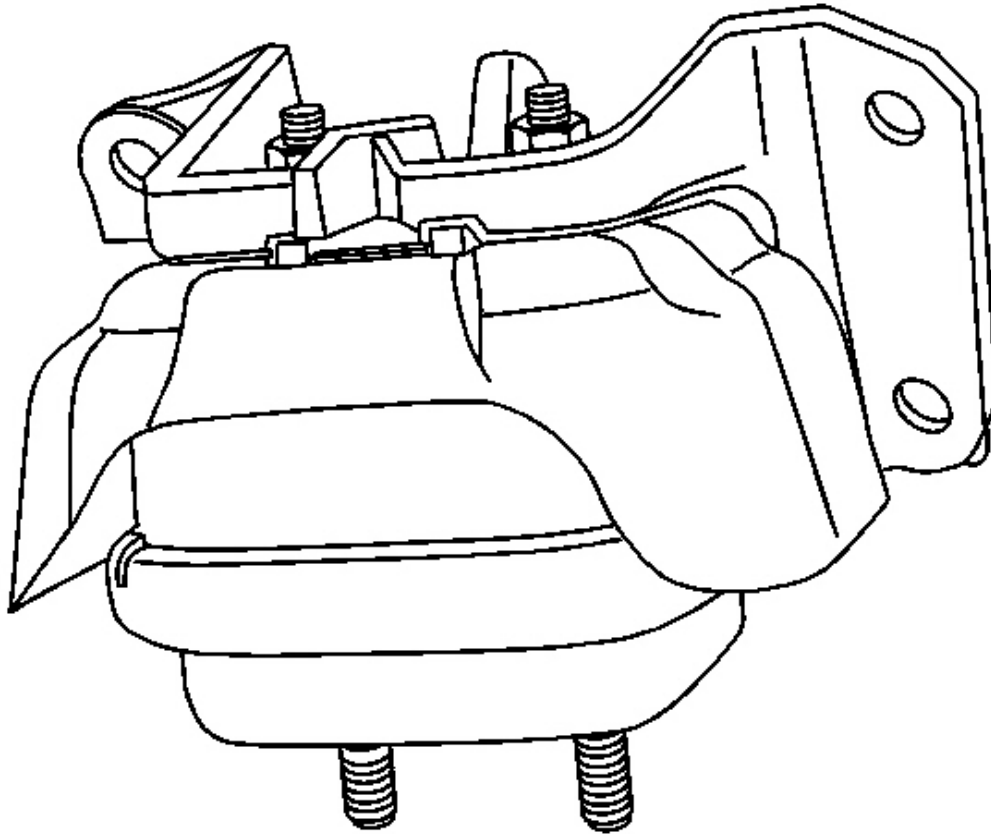


Fig. 51: View Of Engine Mount

Courtesy of GENERAL MOTORS CORP.

IMPORTANT: Verify that the cut out side of the engine mount shield is positioned away from the engine.

2. Install the engine mount to the upper engine mount bracket.

Tighten: Tighten the engine mount nuts to 50 N.m (37 lb ft).

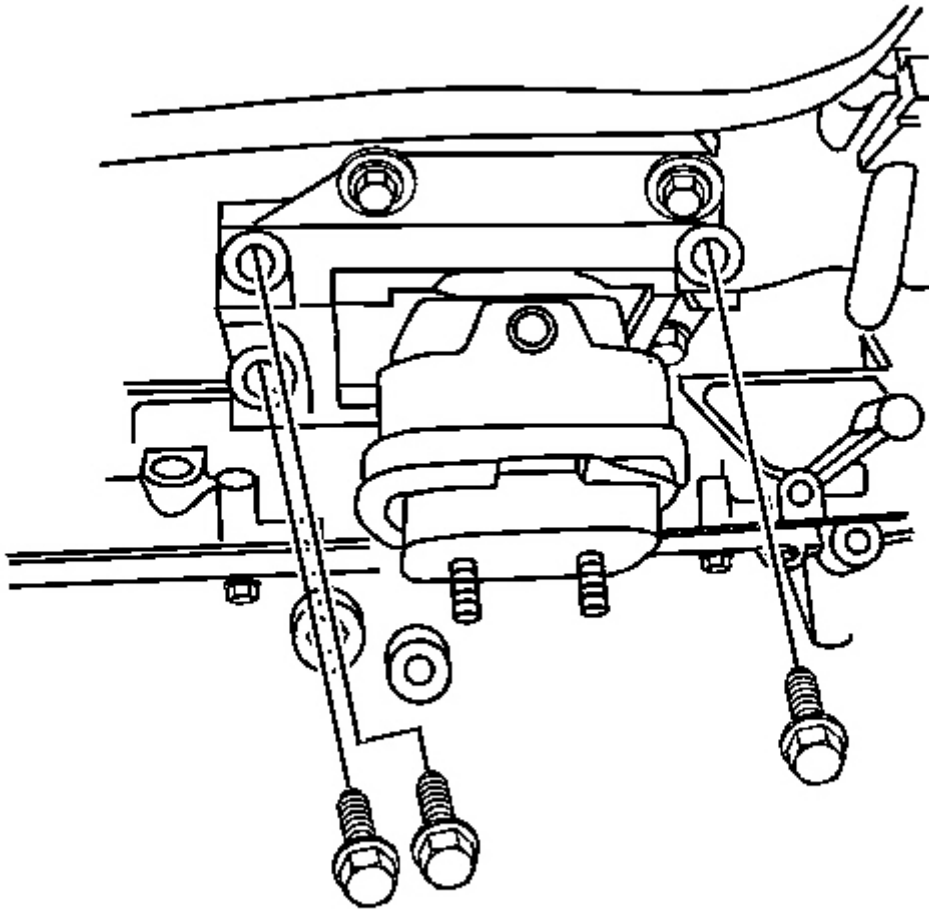


Fig. 52: Identifying Upper Engine Mount Assembly
Courtesy of GENERAL MOTORS CORP.

3. Install the engine mount to the engine.

Tighten: Tighten the engine mount bolts to 50 N.m (37 lb ft).

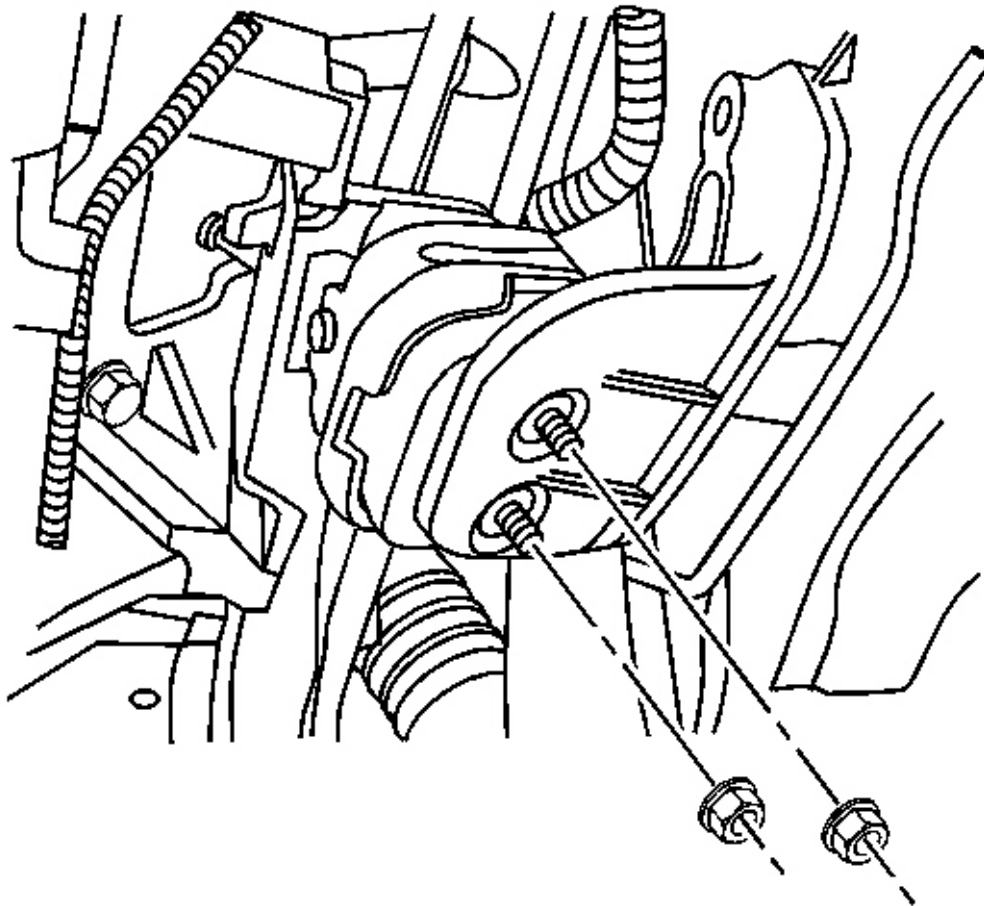


Fig. 53: View Of Left Lower Engine Mount
Courtesy of GENERAL MOTORS CORP.

4. Install the engine mount frame bracket to the frame.
5. Install the retaining bolts to the engine mount frame bracket.
6. Install the left side engine mount frame bracket.
7. Install the retaining bolts to the left side engine mount frame bracket.

Tighten: Tighten the bolts to 100 N.m (74 lb ft).

8. Lower the engine, aligning the engine mount studs with the holes in the frame bracket.
9. Remove the pole jack and block of wood.

2007 Chevrolet TrailBlazer

2007 ENGINE Engine Mechanical - 6.0L - TrailBlazer

10. Tighten the engine mount nuts.

Tighten: Tighten the nuts to 50 N.m (37 lb ft).

11. Install the shock module. Refer to **Shock Module Replacement** .
12. Install the engine protection shield. Refer to **Engine Protection Shield Replacement** .
13. Install the front tire and wheels. Refer to **Tire and Wheel Removal and Installation** .
14. Lower the vehicle. Refer to **Lifting and Jacking the Vehicle** .

ENGINE MOUNT REPLACEMENT - RIGHT SIDE (FOUR-WHEEL DRIVE)

Removal Procedure

1. Raise and support the vehicle. Refer to **Lifting and Jacking the Vehicle** .
2. Remove the front tire and wheels. Refer to **Tire and Wheel Removal and Installation** .
3. Remove the engine protection shield. Refer to **Engine Protection Shield Replacement** .
4. Remove the shock module. Refer to **Shock Module Replacement** .
5. Remove the left side wheel drive shaft. Refer to **Wheel Drive Shaft Replacement** .
6. Remove the front differential carrier. Refer to **Differential Carrier Assembly Replacement (4.2L In-Line Six Cylinder)** or **Differential Carrier Assembly Replacement (V8)** .

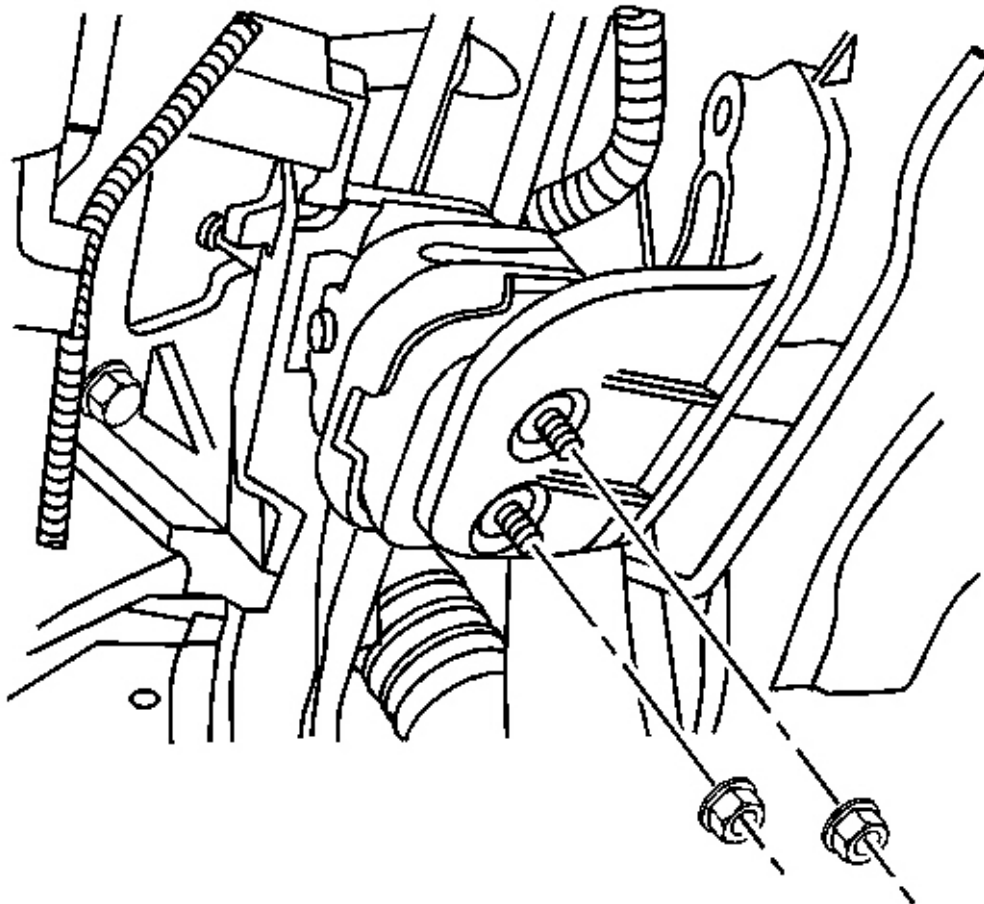


Fig. 54: View Of Left Lower Engine Mount
Courtesy of GENERAL MOTORS CORP.

7. Remove the lower engine mount retaining nuts from the engine mount frame bracket.

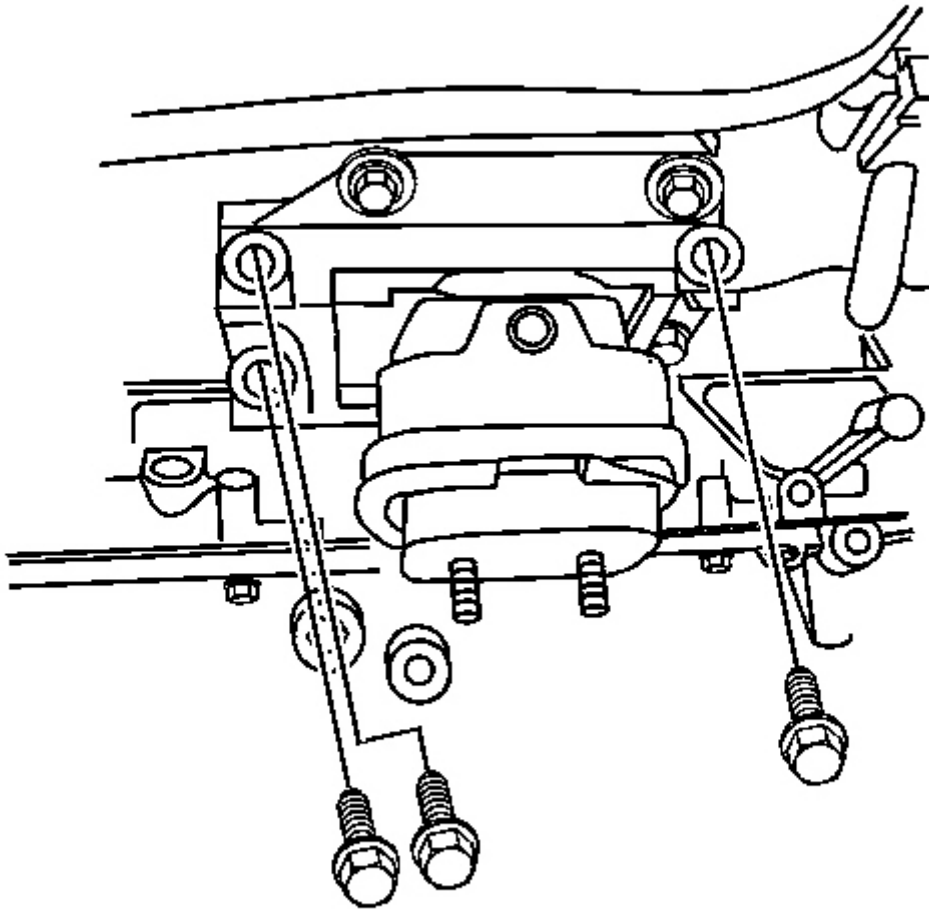


Fig. 55: Identifying Upper Engine Mount Assembly
Courtesy of GENERAL MOTORS CORP.

8. Remove the 3 mounting bolts that secure the upper engine mount bracket to the engine block bracket.

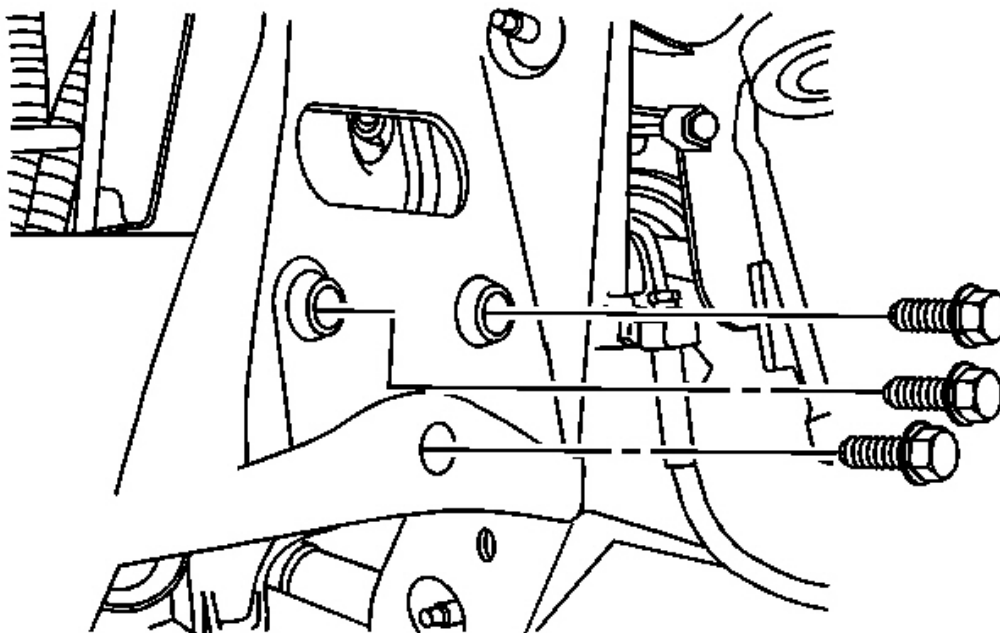


Fig. 56: View Of Frame Engine Mount Bracket Bolt Locations
Courtesy of GENERAL MOTORS CORP.

9. Remove the 3 retaining bolts from the frame engine mount bracket.

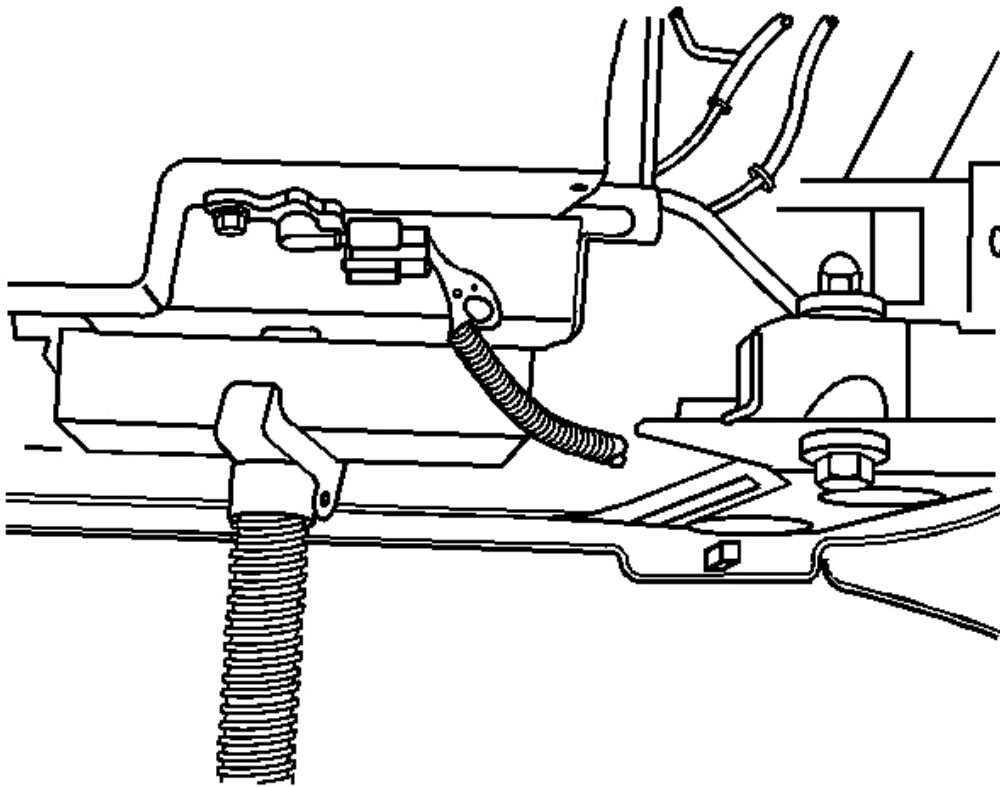


Fig. 57: View Of Wood Block Between Engine Oil Pan & Pole Jack
Courtesy of GENERAL MOTORS CORP.

10. Install a pole jack underneath the oil pan.
11. Insert a block of wood between the oil pan and the pole jack.

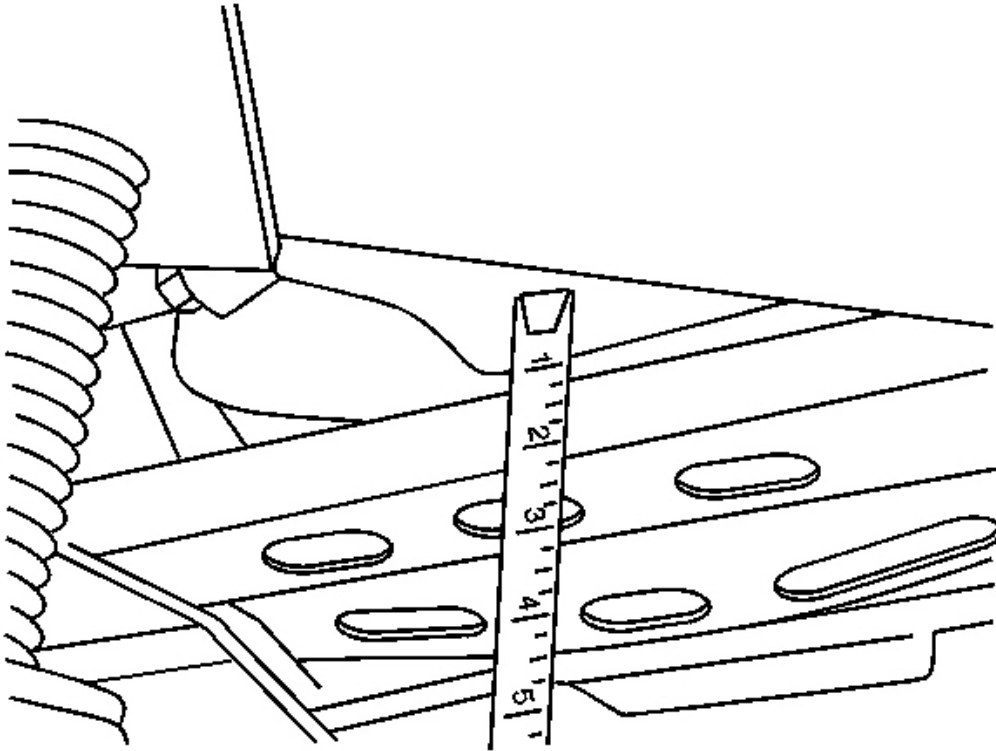


Fig. 58: Measuring Engine Elevation
Courtesy of GENERAL MOTORS CORP.

12. Raise the engine $2\frac{1}{4}$ inches measuring from the bottom of the oil pan to the front edge of the transmission support crossmember.
13. Shift the engine towards the left side of the frame.

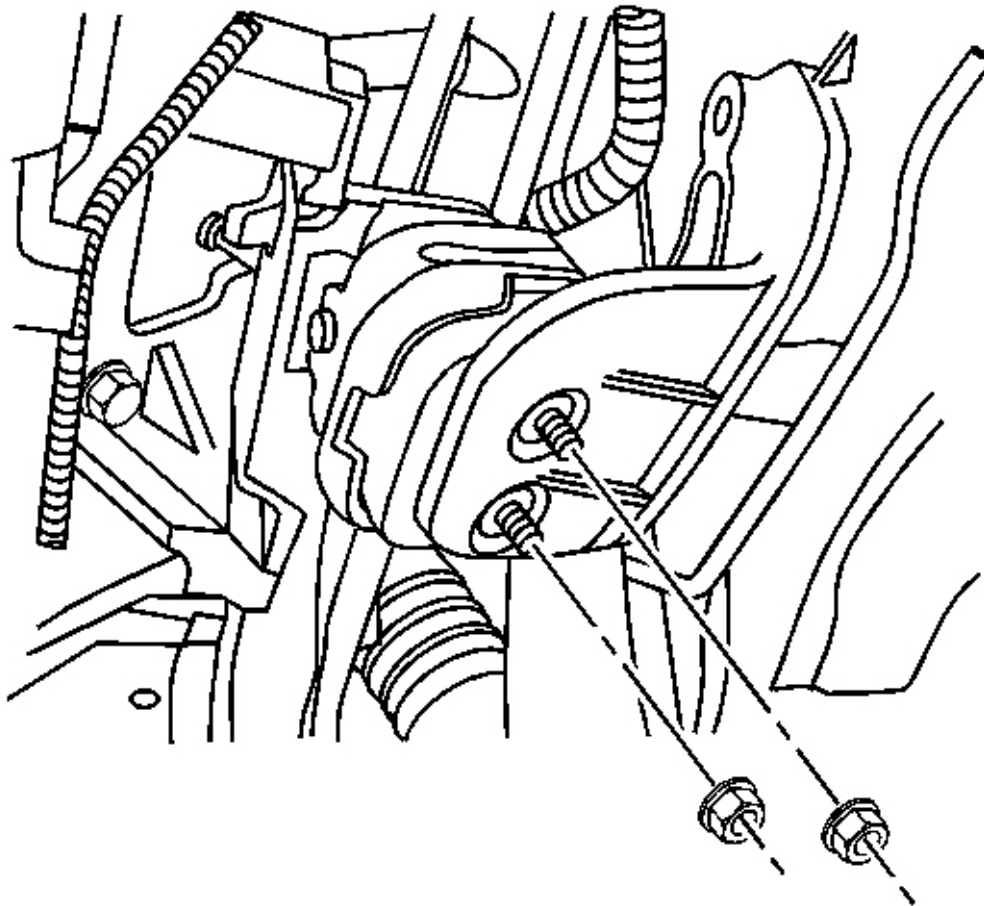


Fig. 59: View Of Left Lower Engine Mount
Courtesy of GENERAL MOTORS CORP.

14. Remove the engine mount frame bracket from the frame.

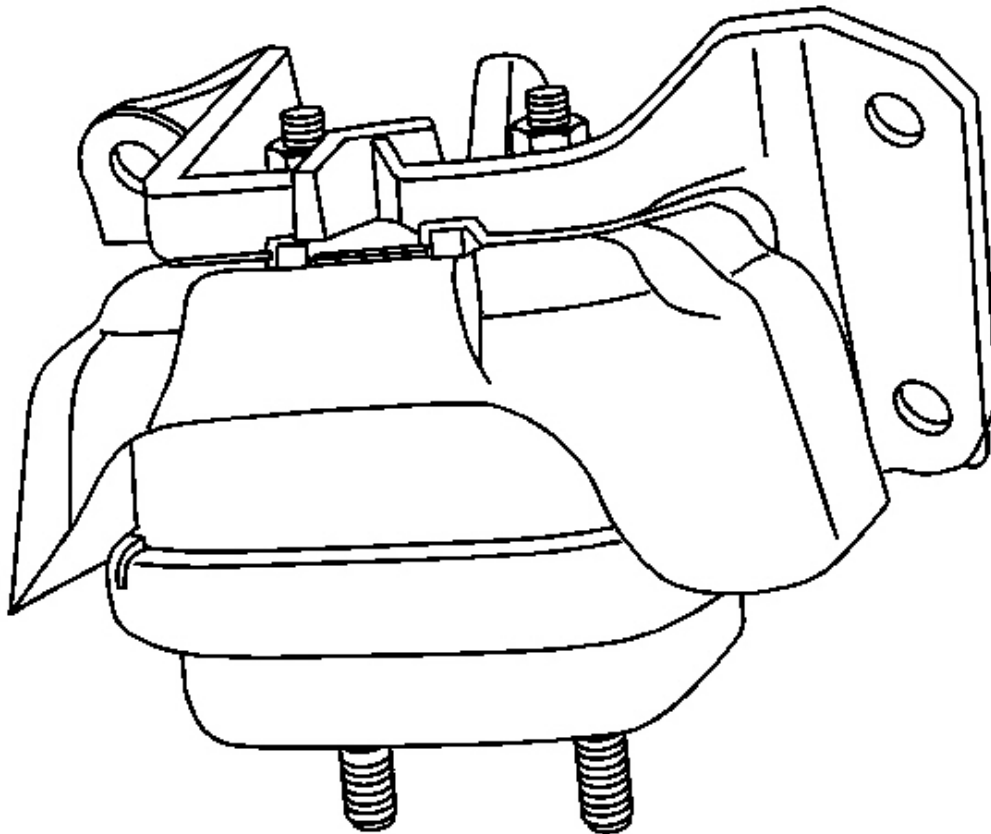


Fig. 60: View Of Engine Mount

Courtesy of GENERAL MOTORS CORP.

15. Remove the engine mount with the upper engine mount bracket as an assembly.
16. Separate the engine mount from the upper engine mount bracket.

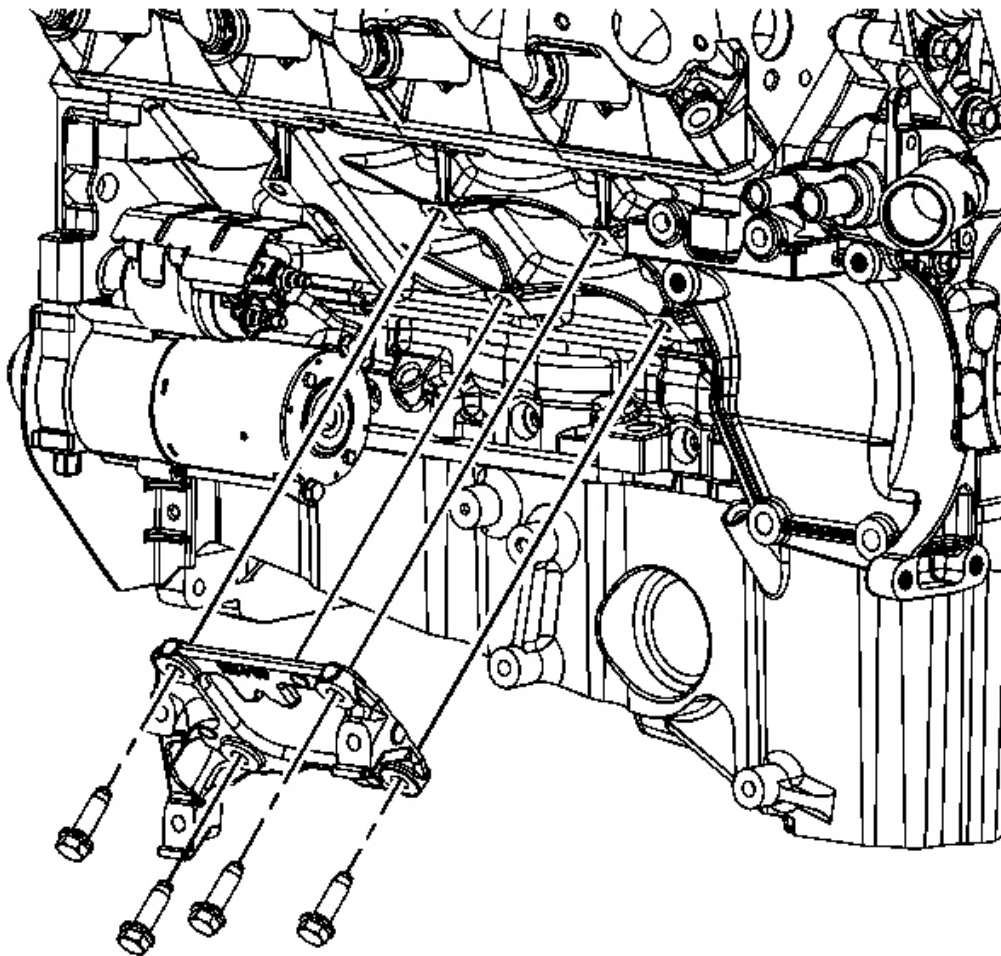


Fig. 61: View Of Engine Mounting Bracket
Courtesy of GENERAL MOTORS CORP.

17. Remove the engine mount bracket spacer if damaged.

Installation Procedure

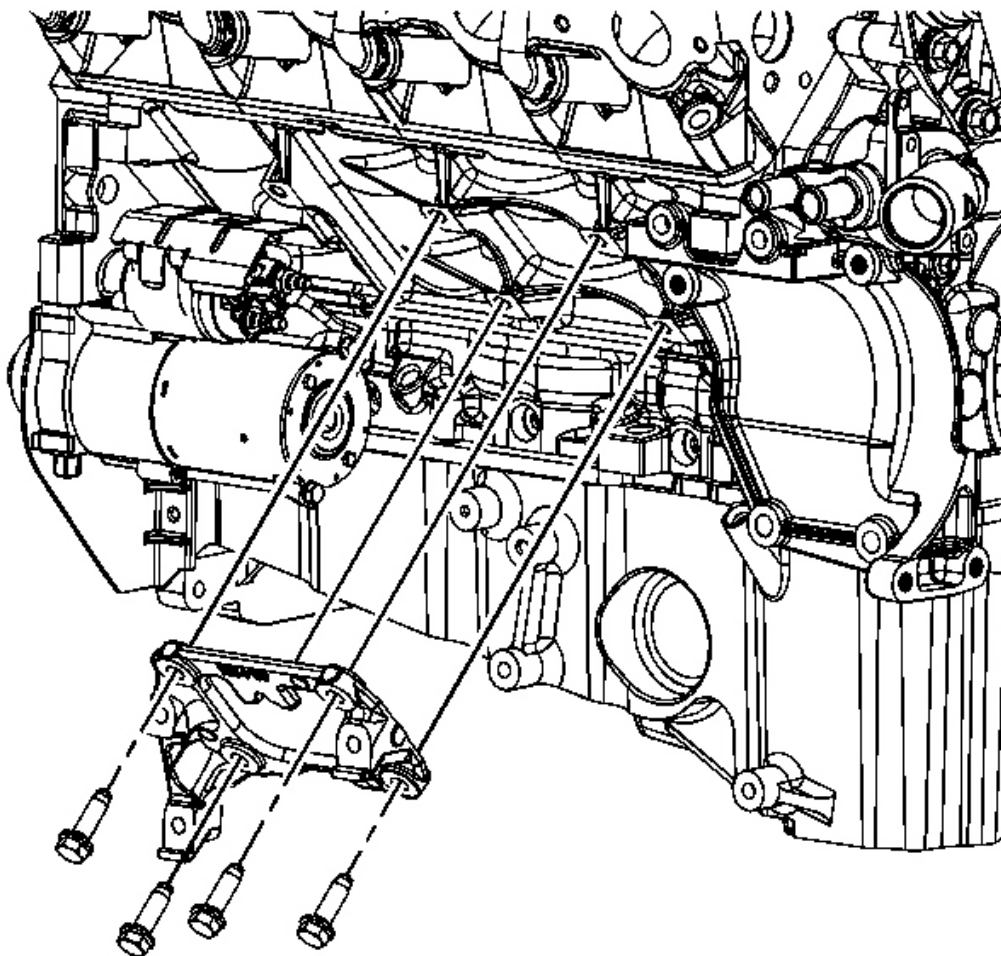


Fig. 62: View Of Engine Mounting Bracket
Courtesy of GENERAL MOTORS CORP.

NOTE: Refer to Fastener Notice .

1. Install the engine mount bracket spacer if necessary.

Tighten: Tighten the spacer bolts to 50 N.m (37 lb ft).

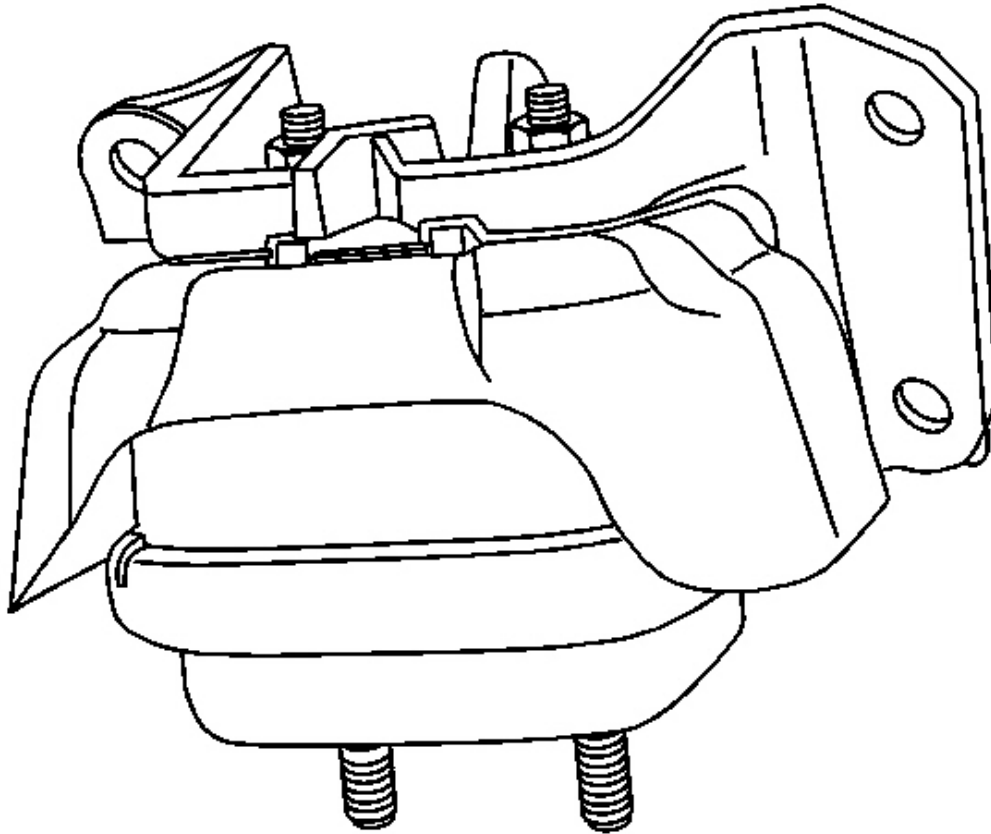


Fig. 63: View Of Engine Mount

Courtesy of GENERAL MOTORS CORP.

IMPORTANT: Verify that the cut out side of the engine mount shield is positioned away from the engine.

2. Install the engine mount to the upper engine mount bracket.

Tighten: Tighten the engine mount nuts to 50 N.m (37 lb ft).

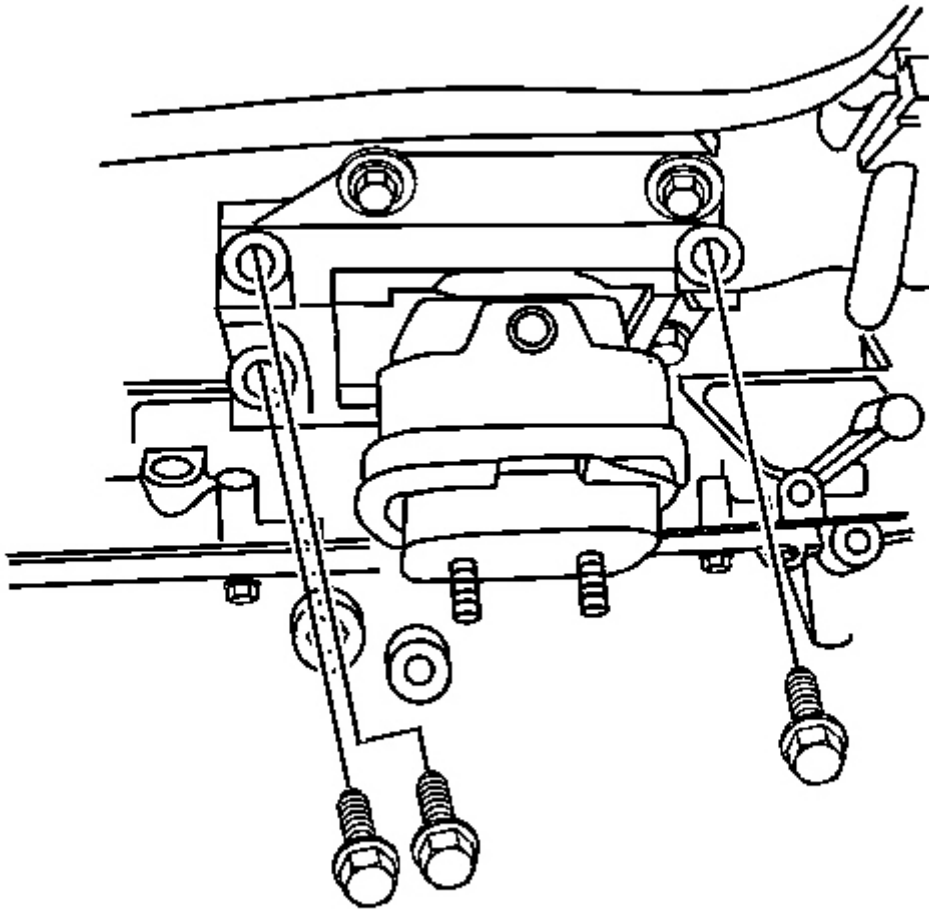


Fig. 64: Identifying Upper Engine Mount Assembly
Courtesy of GENERAL MOTORS CORP.

3. Install the engine mount to engine.

Tighten: Tighten the engine mount bolts to 50 N.m (37 lb ft).

4. Install the engine mount frame bracket to the frame.
5. Install the engine mount frame bracket retaining bolts.

Tighten: Tighten the bolts to 100 N.m (74 lb ft).

6. Shift the engine back towards the right side of the frame.

7. Install the left side engine mount frame bracket.
8. Install the left side engine mount frame bracket retaining bolts.

Tighten: Tighten the bolts to 100 N.m (74 lb ft).

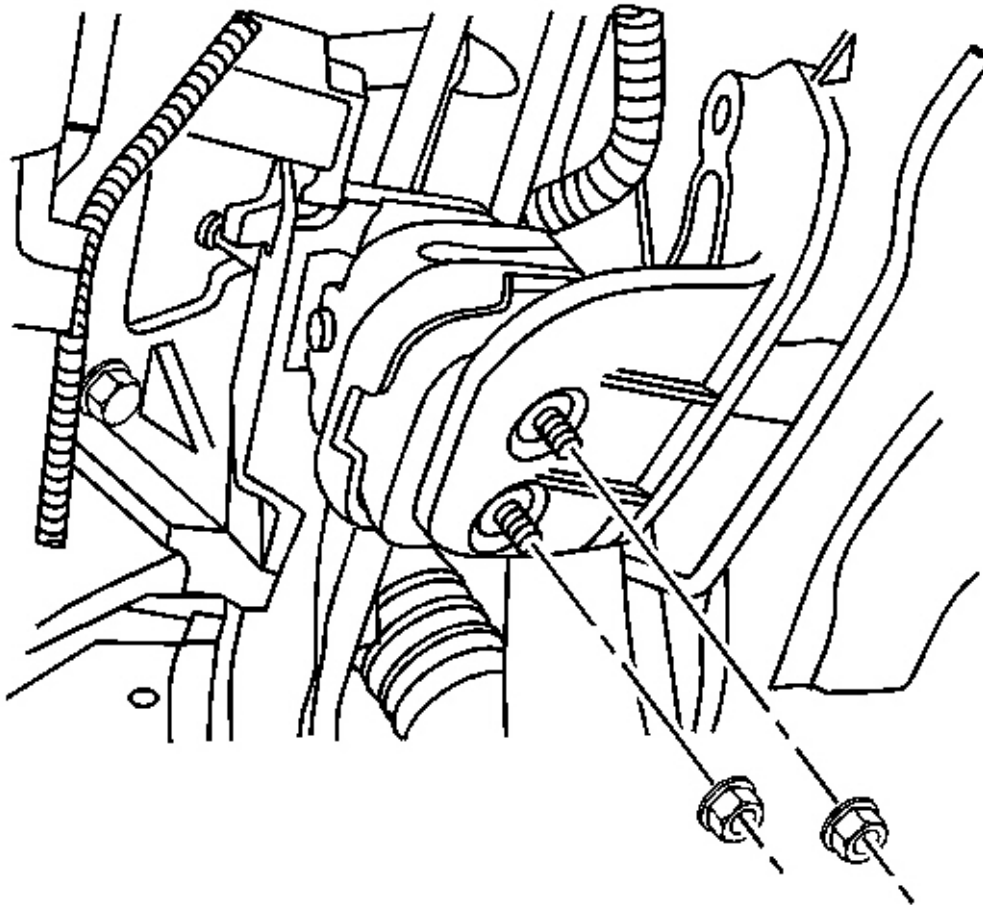


Fig. 65: View Of Left Lower Engine Mount
Courtesy of GENERAL MOTORS CORP.

9. Lower the engine, aligning the engine mount studs with the holes in the frame bracket.
10. Remove the pole jack and block of wood.
11. Tighten the engine mount nuts.

Tighten: Tighten the nuts to 50 N.m (37 lb ft).

2007 Chevrolet TrailBlazer

2007 ENGINE Engine Mechanical - 6.0L - TrailBlazer

12. Install the shock module. Refer to **Shock Module Replacement** .
13. Install the front differential carrier. Refer to **Differential Carrier Assembly Replacement (4.2L In-Line Six Cylinder)** or **Differential Carrier Assembly Replacement (V8)** .
14. Install the left side wheel drive shaft. Refer to **Wheel Drive Shaft Replacement** .
15. Install the engine protection shield. Refer to **Engine Protection Shield Replacement** .
16. Install the front tire and wheels. Refer to **Tire and Wheel Removal and Installation** .
17. Lower the vehicle. Refer to **Lifting and Jacking the Vehicle** .

ENGINE MOUNT REPLACEMENT - RIGHT SIDE (TWO-WHEEL DRIVE)

Removal Procedure

1. Raise and support the vehicle. Refer to **Lifting and Jacking the Vehicle** .
2. Remove the front tire and wheels. Refer to **Tire and Wheel Removal and Installation** .
3. Remove the engine protection shield. Refer to **Engine Protection Shield Replacement** .
4. Remove the shock module. Refer to **Shock Module Replacement** .

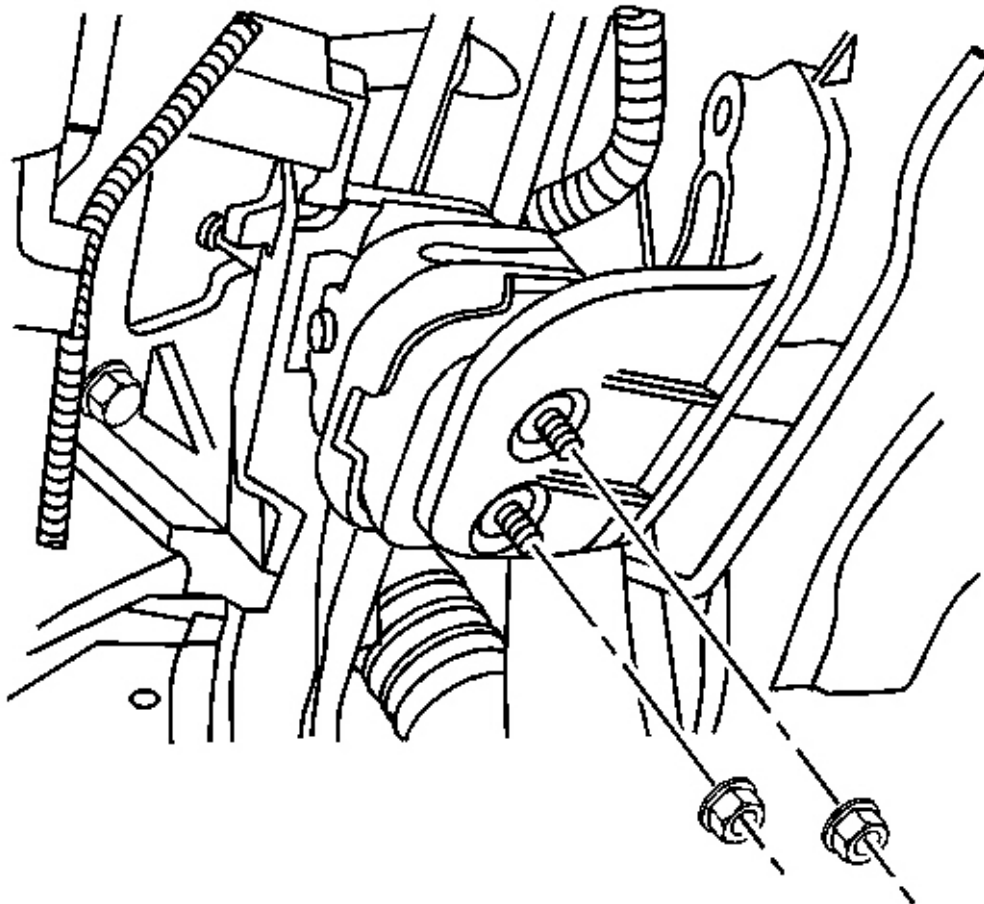


Fig. 66: View Of Left Lower Engine Mount
Courtesy of GENERAL MOTORS CORP.

5. Remove the lower engine mount retaining nuts from the engine mount frame bracket.

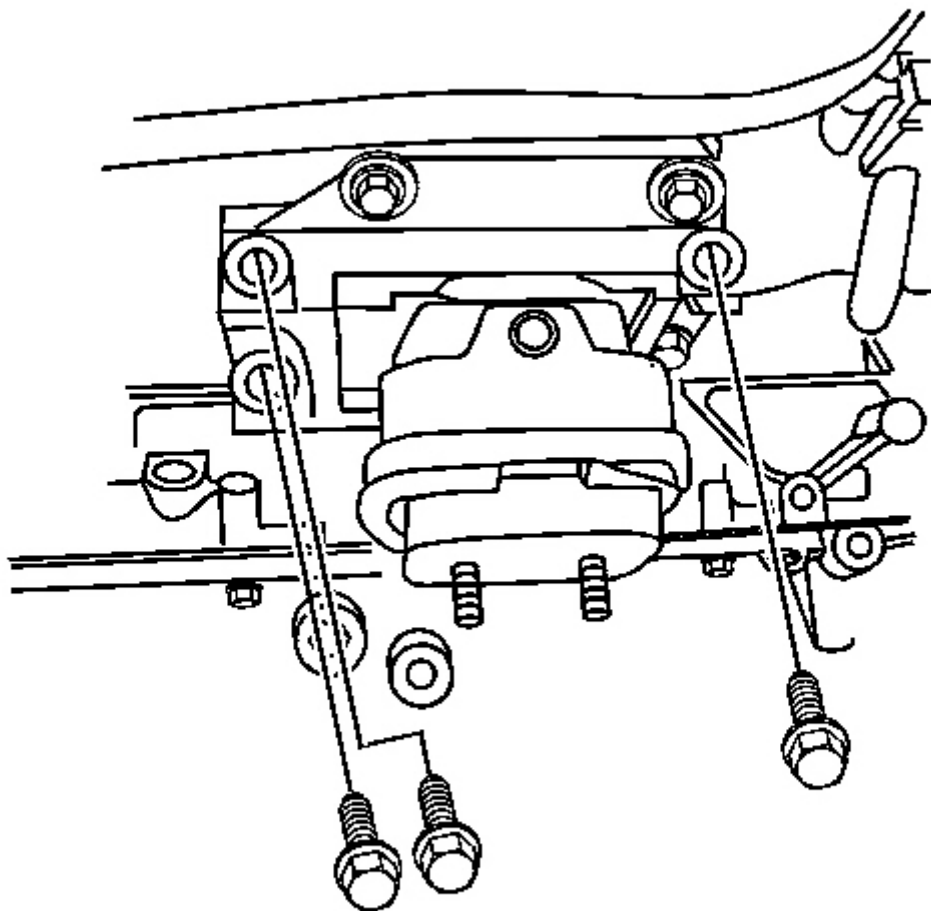


Fig. 67: Identifying Upper Engine Mount Assembly
Courtesy of GENERAL MOTORS CORP.

6. Remove the 3 mounting bolts that secure the upper engine mount bracket to the engine block bracket.

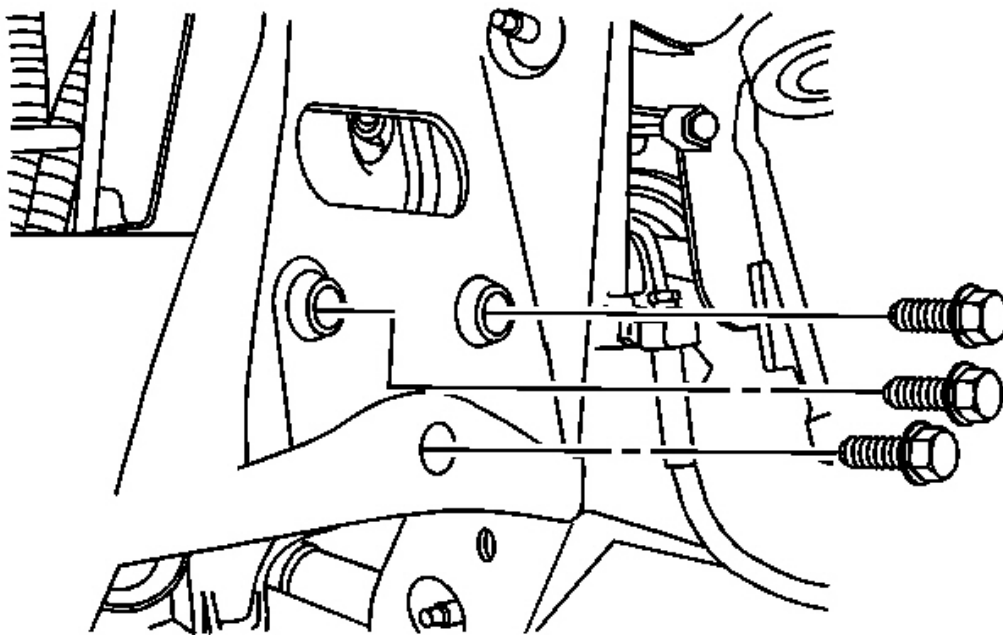


Fig. 68: View Of Frame Engine Mount Bracket Bolt Locations
Courtesy of GENERAL MOTORS CORP.

7. Remove the 3 bracket retaining bolts from the frame engine mount.

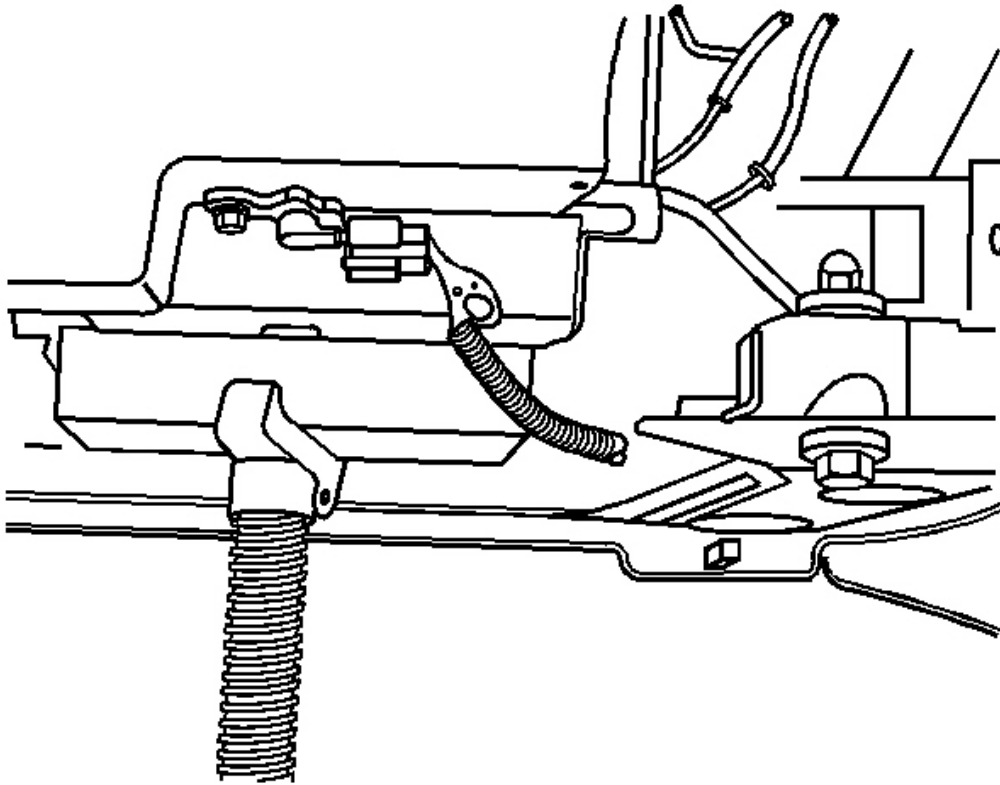


Fig. 69: View Of Wood Block Between Engine Oil Pan & Pole Jack
Courtesy of GENERAL MOTORS CORP.

8. Install a pole jack underneath the oil pan.
9. Insert a block of wood between the oil pan and the pole jack.

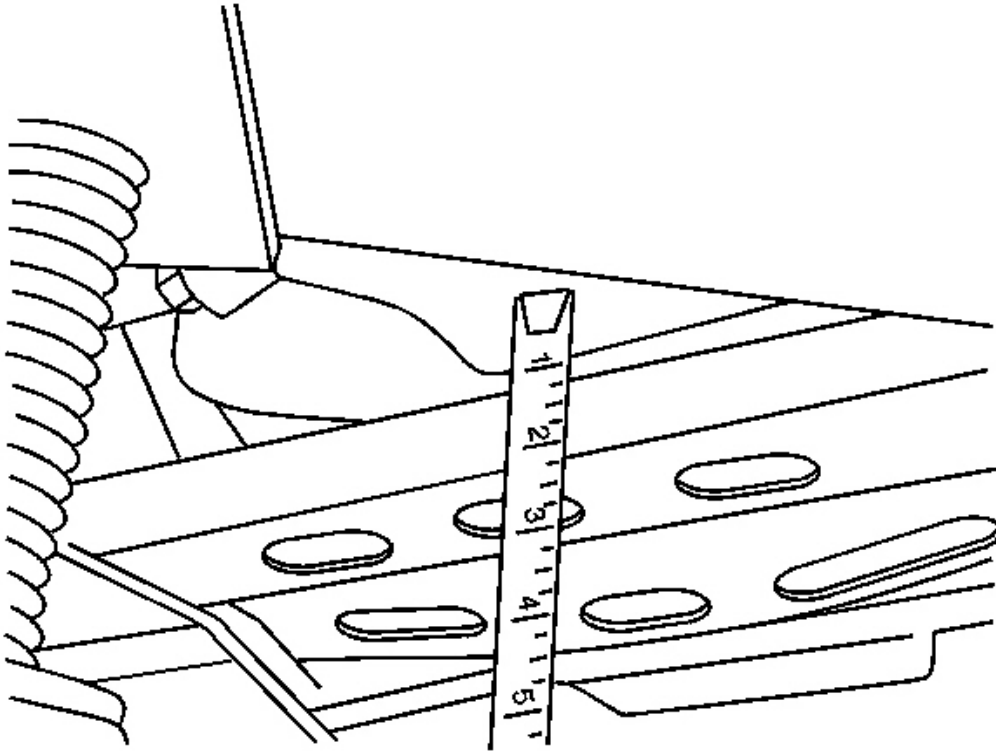


Fig. 70: Measuring Engine Elevation
Courtesy of GENERAL MOTORS CORP.

10. Raise the engine $2\frac{1}{4}$ inches measuring from the bottom of the oil pan to the front edge of the transmission support crossmember.
11. Shift the engine towards the left side of the frame.

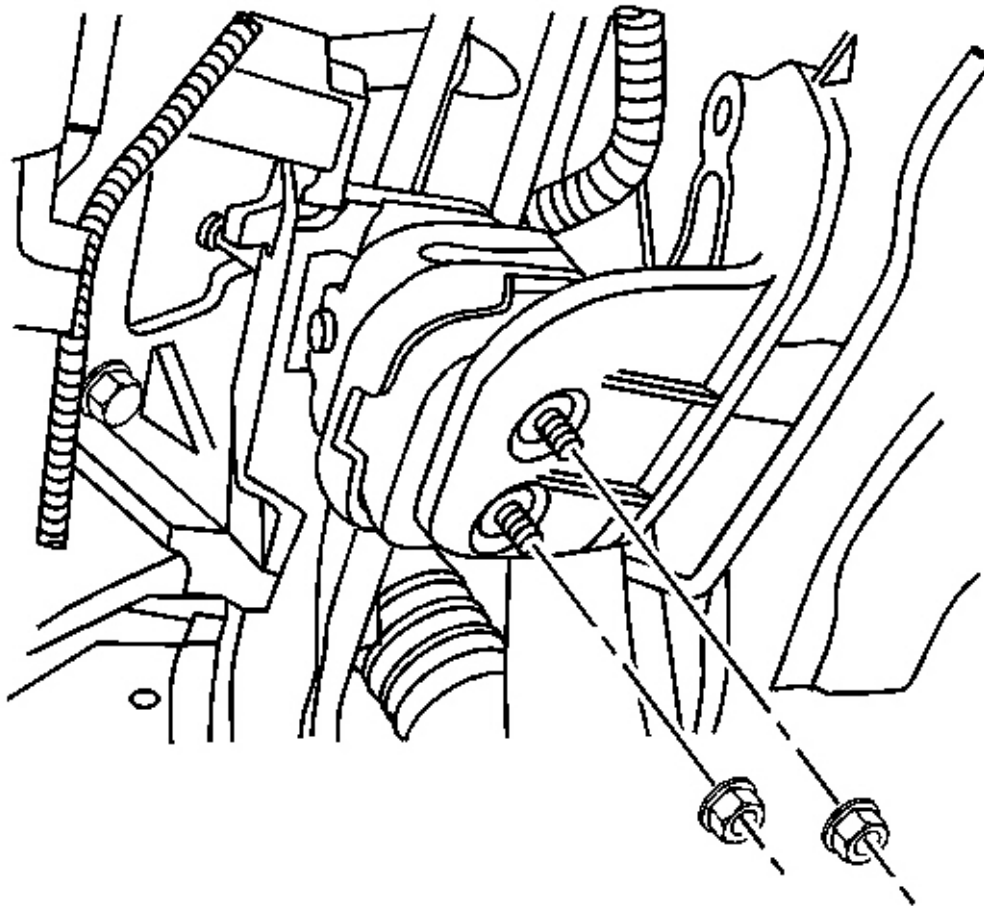


Fig. 71: View Of Left Lower Engine Mount
Courtesy of GENERAL MOTORS CORP.

12. Remove the engine mount frame bracket from the frame.

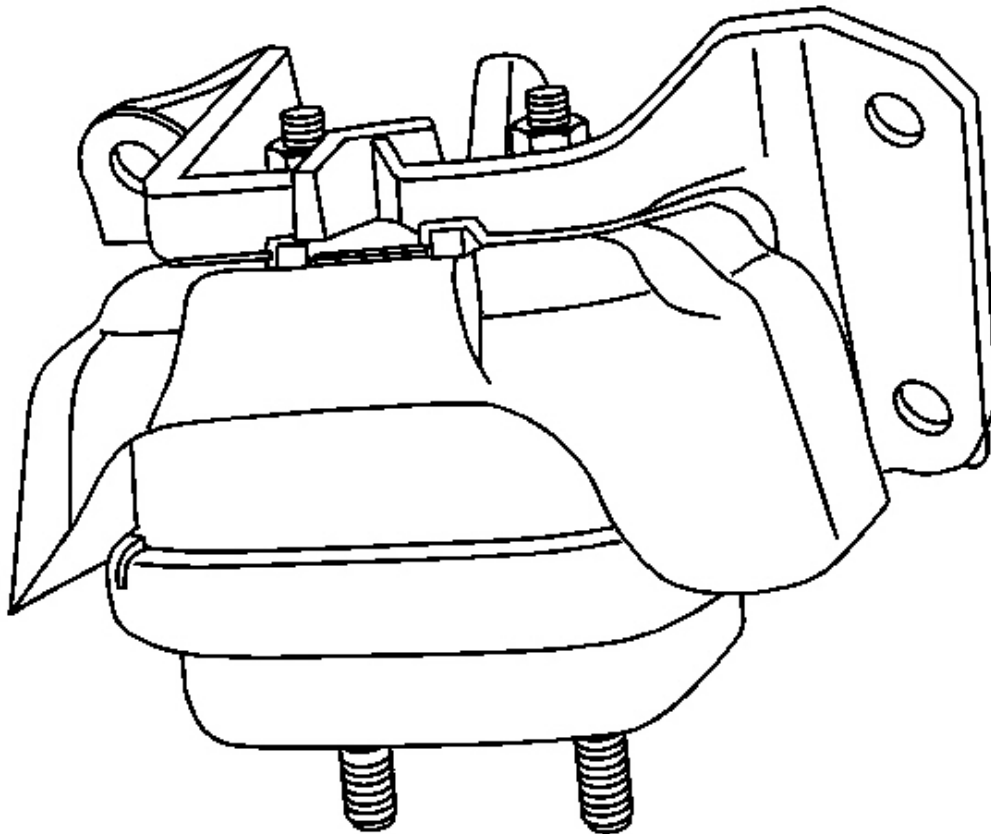


Fig. 72: View Of Engine Mount

Courtesy of GENERAL MOTORS CORP.

13. Remove the engine mount with the upper engine mount bracket as an assembly.
14. Separate the engine mount from the upper engine mount bracket.

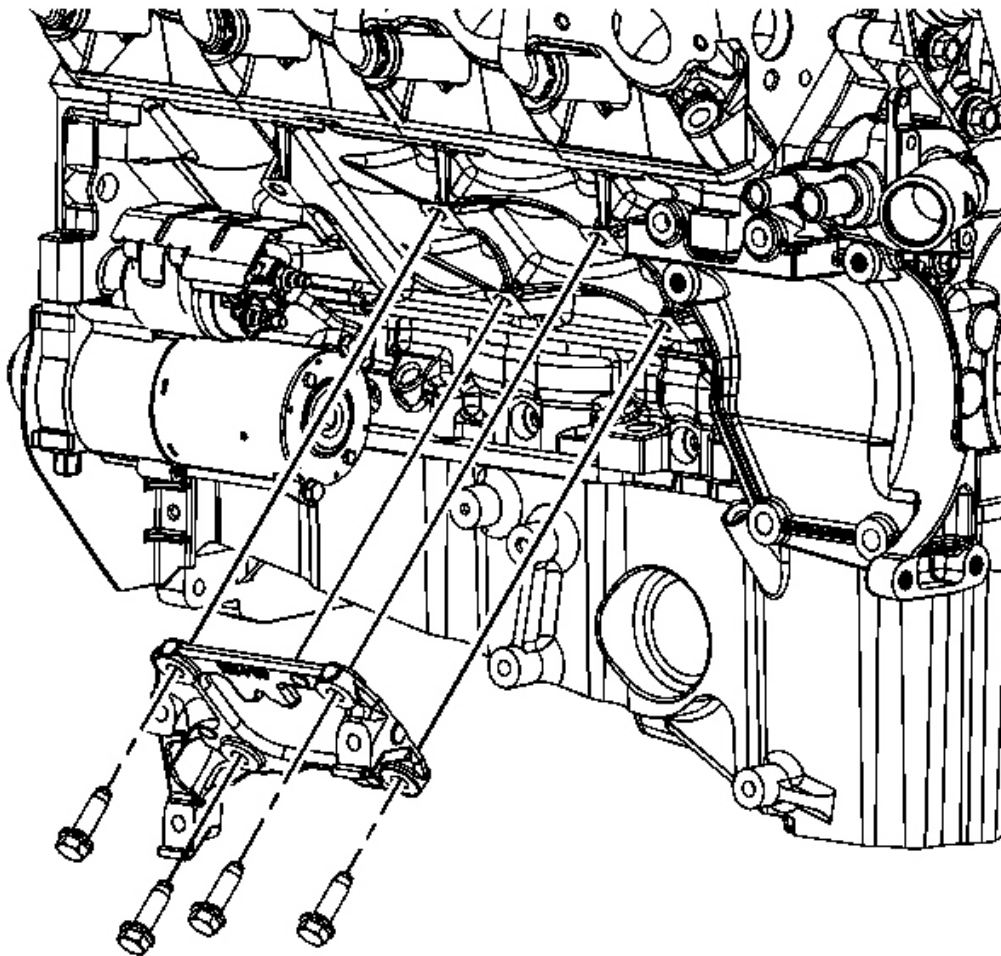


Fig. 73: View Of Engine Mounting Bracket
Courtesy of GENERAL MOTORS CORP.

15. Remove the engine mount bracket spacer if damaged.

Installation Procedure

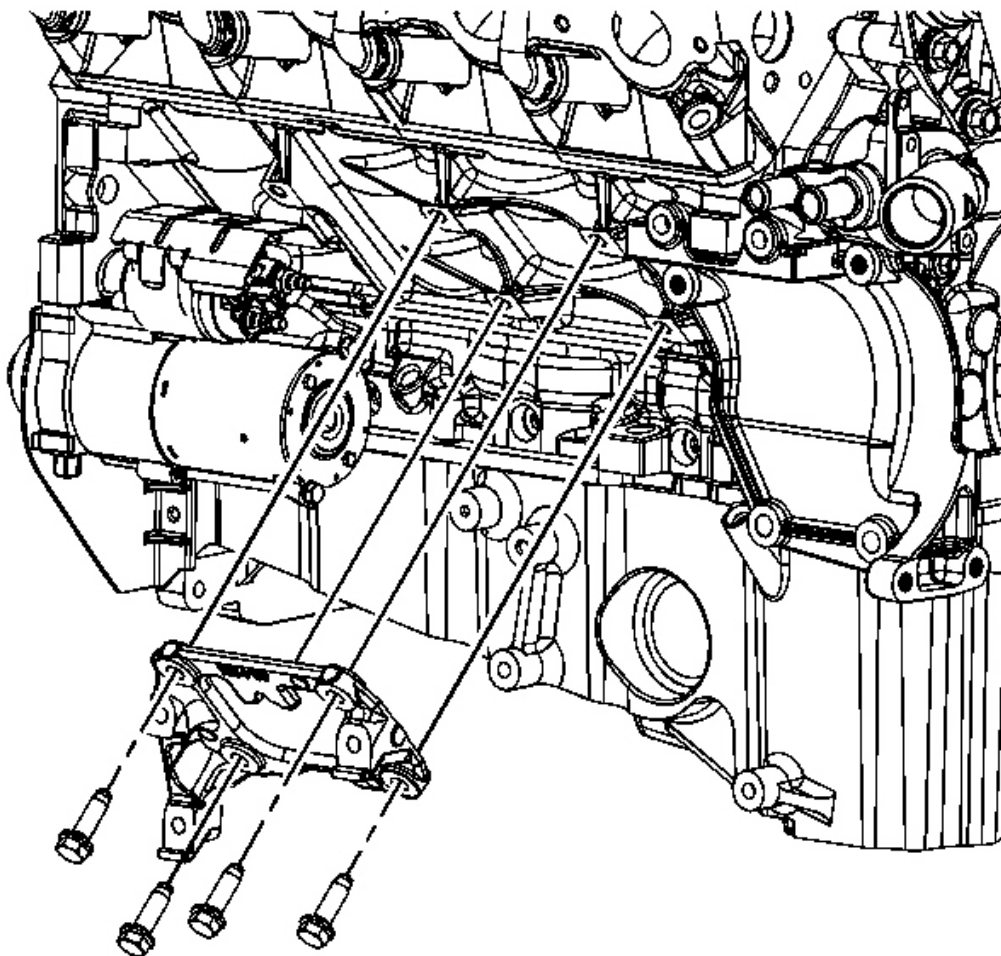


Fig. 74: View Of Engine Mounting Bracket
Courtesy of GENERAL MOTORS CORP.

NOTE: Refer to Fastener Notice .

1. Install the engine mount bracket spacer if it has been replaced.

Tighten: Tighten the bolts to 50 N.m (37 lb ft).

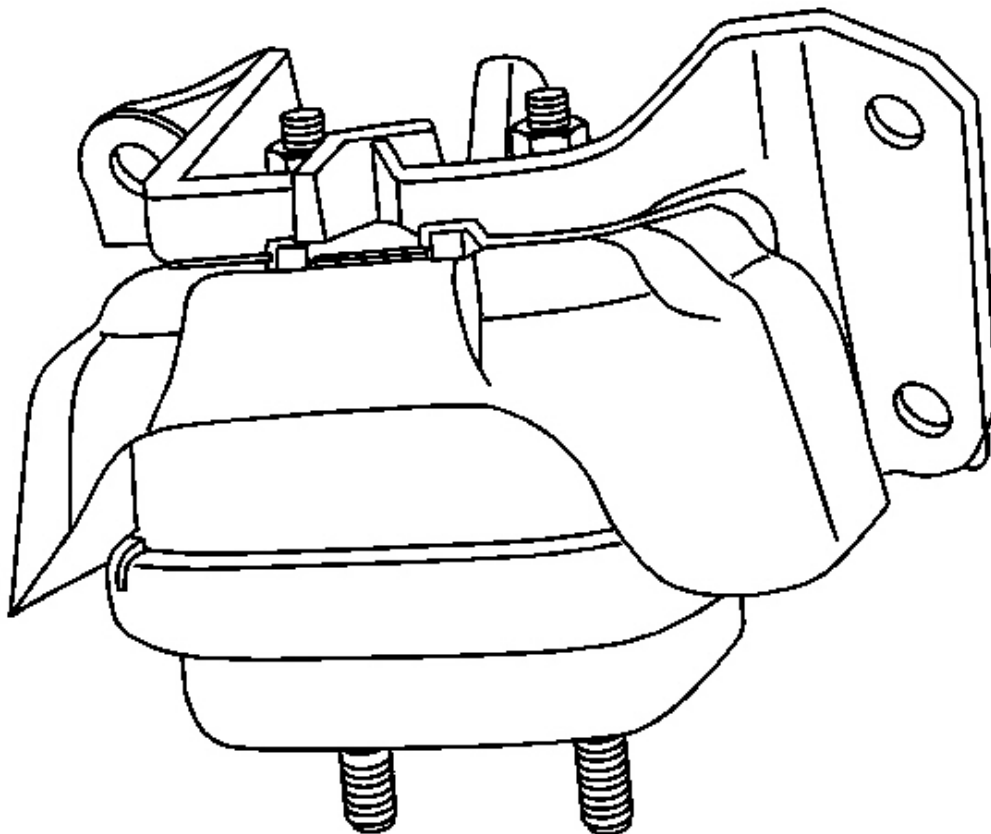


Fig. 75: View Of Engine Mount

Courtesy of GENERAL MOTORS CORP.

IMPORTANT: Make sure that the cut out side of the engine mount shield is positioned away from the engine.

2. Install the engine mount to the upper engine mount bracket.

Tighten: Tighten the engine mount nuts to 50 N.m (37 lb ft).

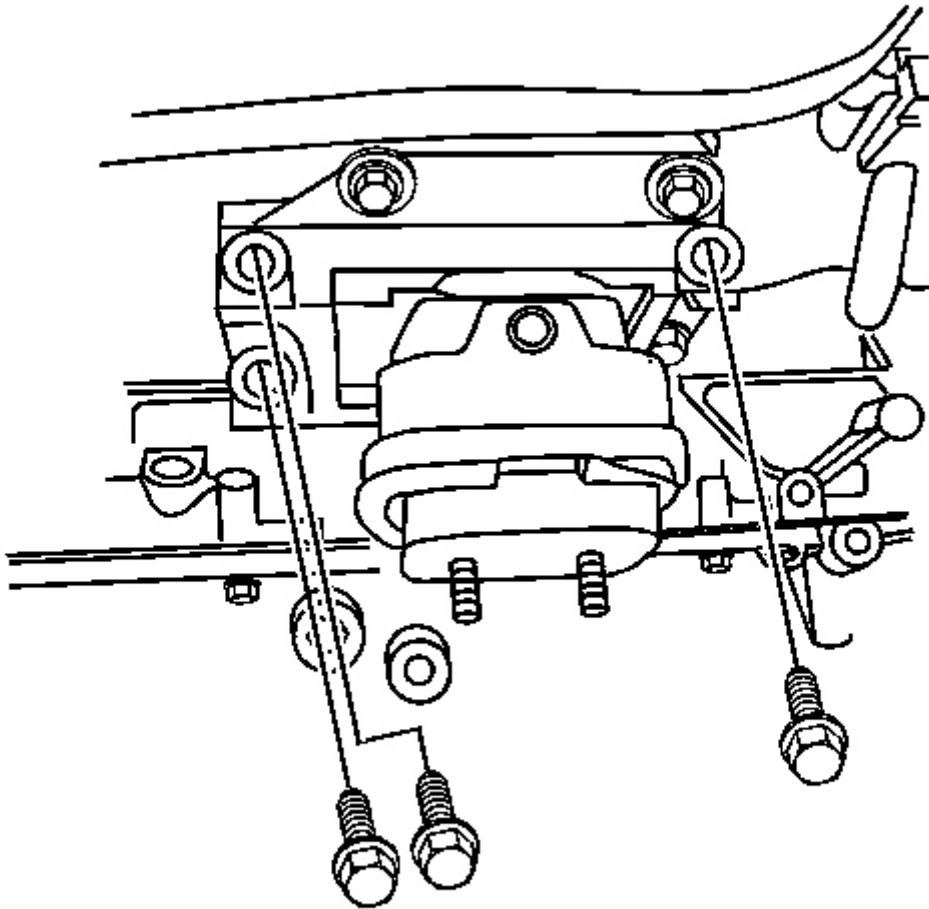


Fig. 76: Identifying Upper Engine Mount Assembly
Courtesy of GENERAL MOTORS CORP.

3. Install the engine mount to engine.

Tighten: Tighten the engine mount bolts to 50 N.m (37 lb ft).

4. Install the engine mount frame bracket to the frame.
5. Install the engine mount frame bracket retaining bolts.

Tighten: Tighten the bolts to 100 N.m (74 lb ft).

6. Shift engine back to the right side of the frame.

7. Install the left side engine mount frame bracket.
8. Install the retaining bolts to the left side of the engine mount frame bracket.

Tighten: Tighten the bolts to 100 N.m (74 lb ft).

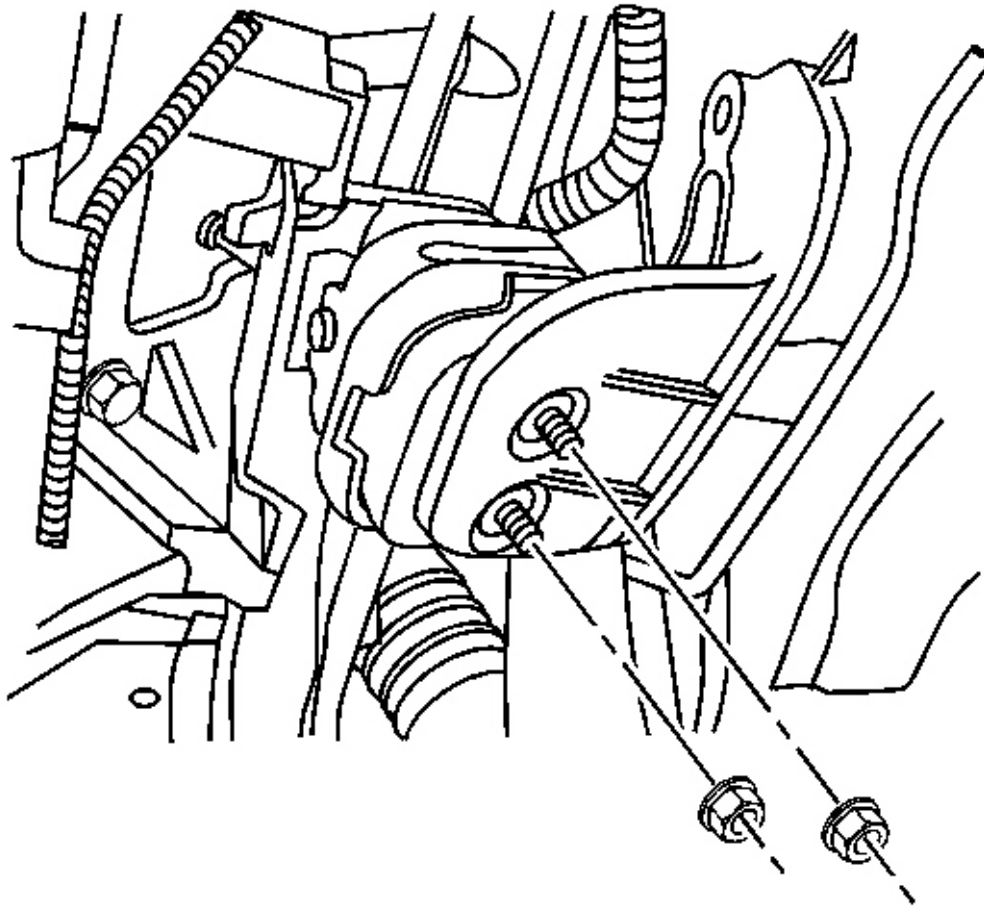


Fig. 77: View Of Left Lower Engine Mount
Courtesy of GENERAL MOTORS CORP.

9. Lower the engine, aligning the engine mount studs with the holes in the frame bracket.
10. Remove the pole jack and the block of wood.
11. Tighten the engine mount nuts.

Tighten: Tighten the nuts to 50 N.m (37 lb ft).

12. Install the shock module. Refer to **Shock Module Replacement** .
13. Install the engine protection shield. Refer to **Engine Protection Shield Replacement** .
14. Install the front tire and wheels. Refer to **Tire and Wheel Removal and Installation** .
15. Lower the vehicle. Refer to **Lifting and Jacking the Vehicle** .

UPPER INTAKE MANIFOLD SIGHT SHIELD REPLACEMENT

Removal Procedure

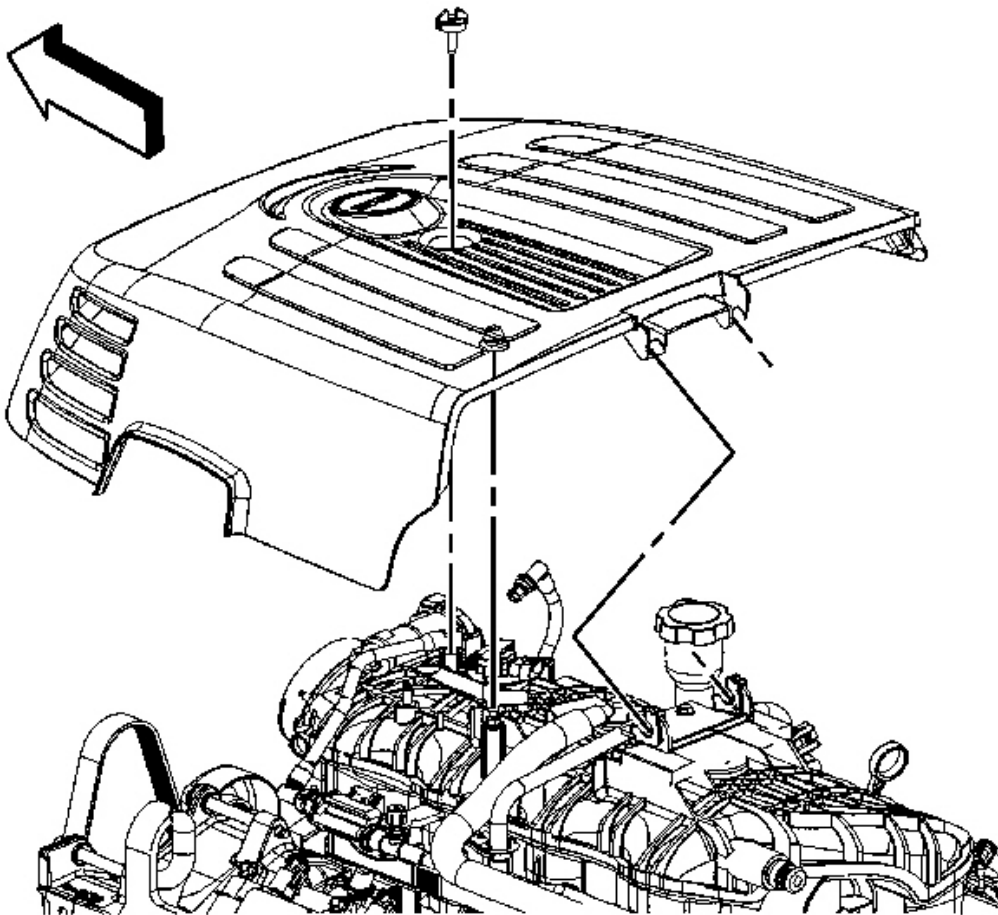


Fig. 78: View Of Intake Manifold Sight Shield
Courtesy of GENERAL MOTORS CORP.

1. Loosen intake manifold sight shield wing nut.

2. Gently lift up in order to disengage the sight shield from the ball stud.
3. Remove the sight shield from the sight shield retainer.

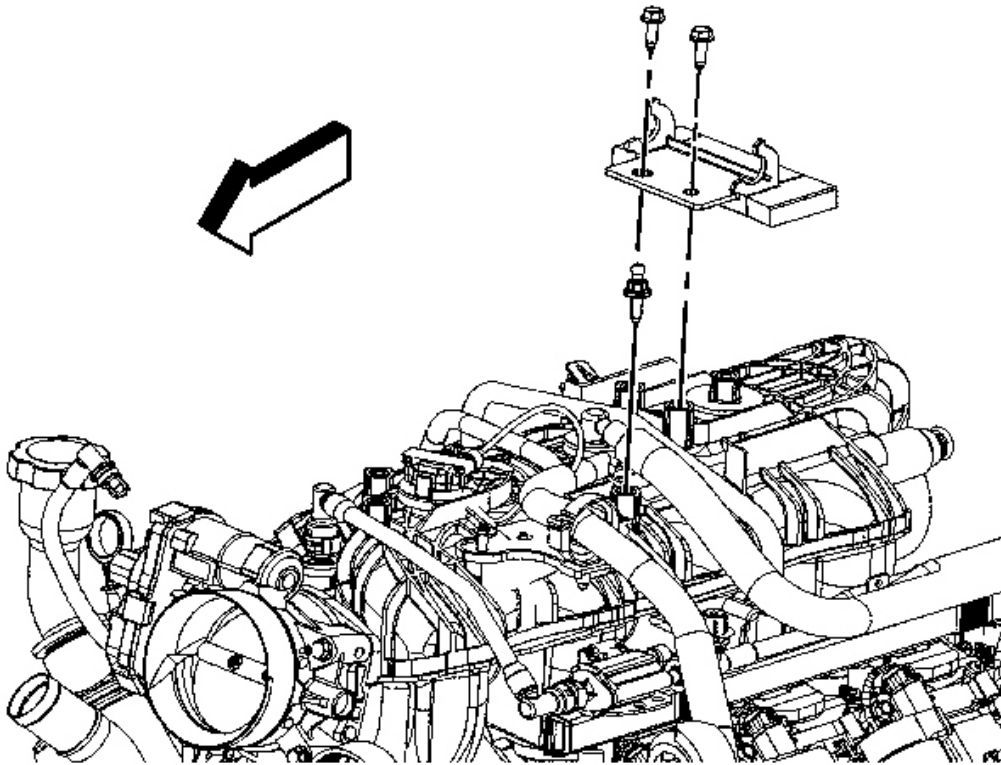


Fig. 79: Identifying Sight Shield Retainer Bolts & Retainer
Courtesy of GENERAL MOTORS CORP.

4. Remove the sight shield retainer bolts and the retainer, if required.
5. Remove the sight shield ball stud, if required.

Installation Procedure

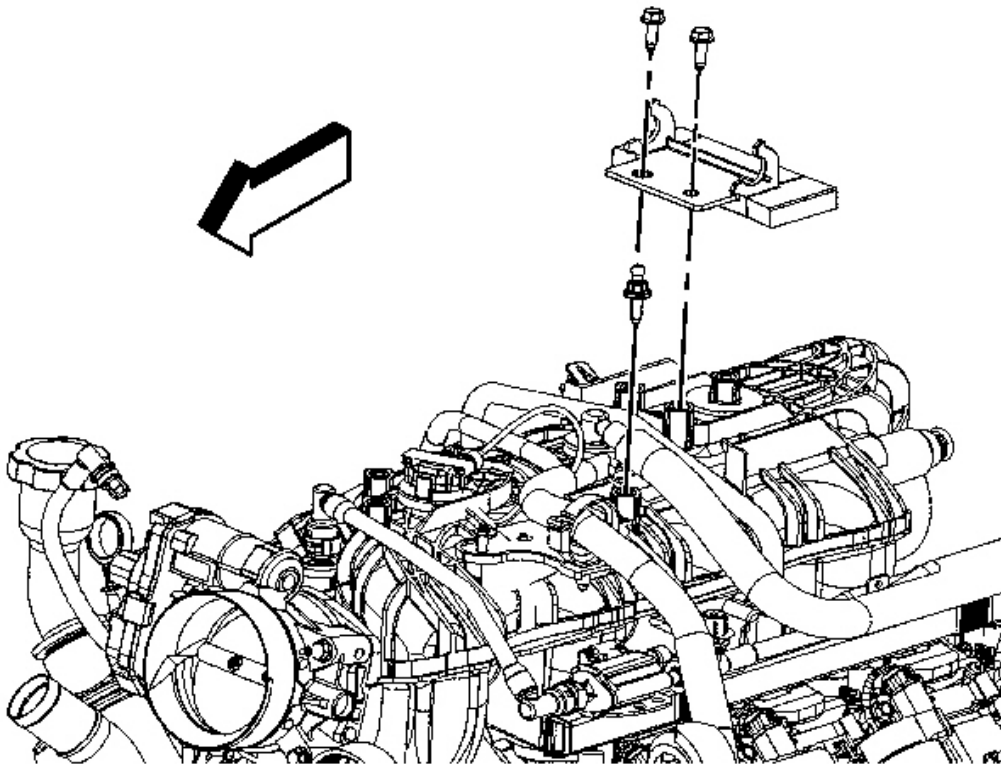


Fig. 80: Identifying Sight Shield Retainer Bolts & Retainer
Courtesy of GENERAL MOTORS CORP.

NOTE: Refer to Fastener Notice .

1. Install the sight shield ball stud, if required.

Tighten: Tighten the stud to 5 N.m (44 lb in).

2. Position the sight shield retainer to the intake manifold and install the bolts, if required.

Tighten: Tighten the bolts to 5 N.m (44 lb in).

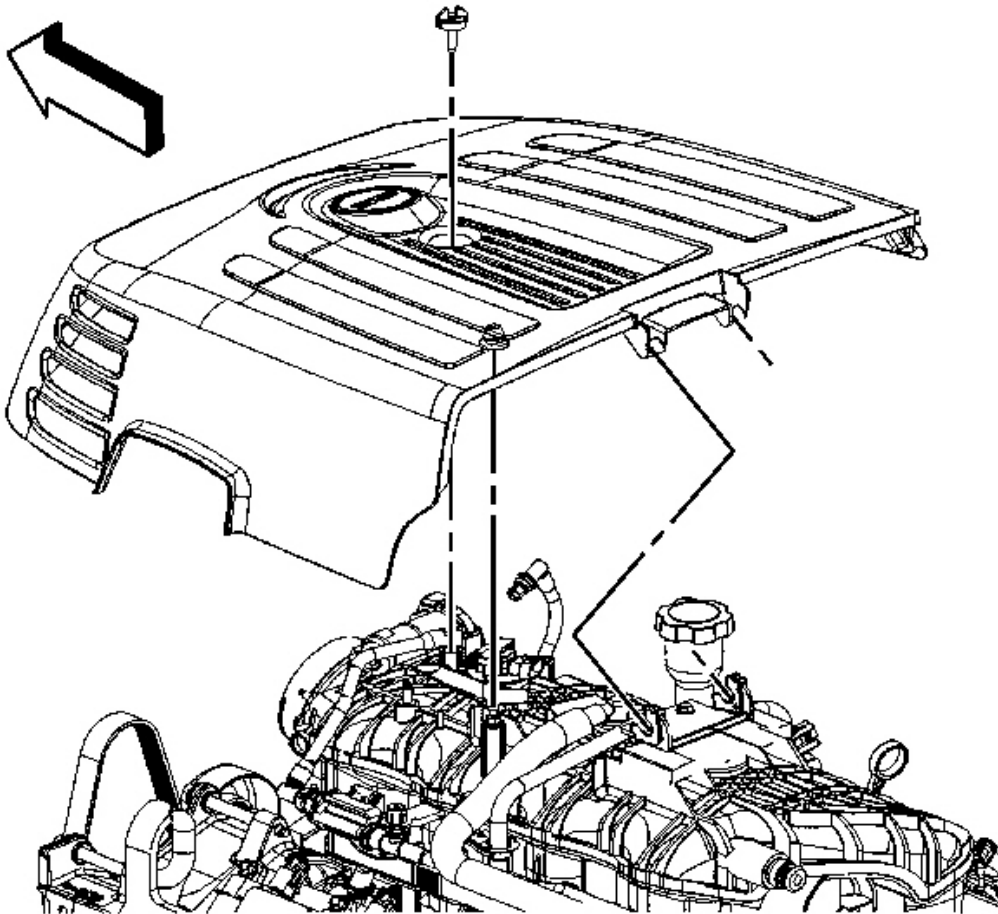


Fig. 81: View Of Intake Manifold Sight Shield
Courtesy of GENERAL MOTORS CORP.

NOTE: Use care when installing the engine sight shield to avoid contacting the manifold absolute pressure (MAP) sensor wire harness connector. Loss of engine performance or engine damage may result.

3. Install the sight shield to the sight shield retainer.
4. Seat the sight shield onto the ball stud and press down over the stud in order to secure the sight shield.
5. Tighten intake manifold sight shield wing nut until snug.

CRANKCASE VENTILATION HOSES/PIPES REPLACEMENT

Removal Procedure

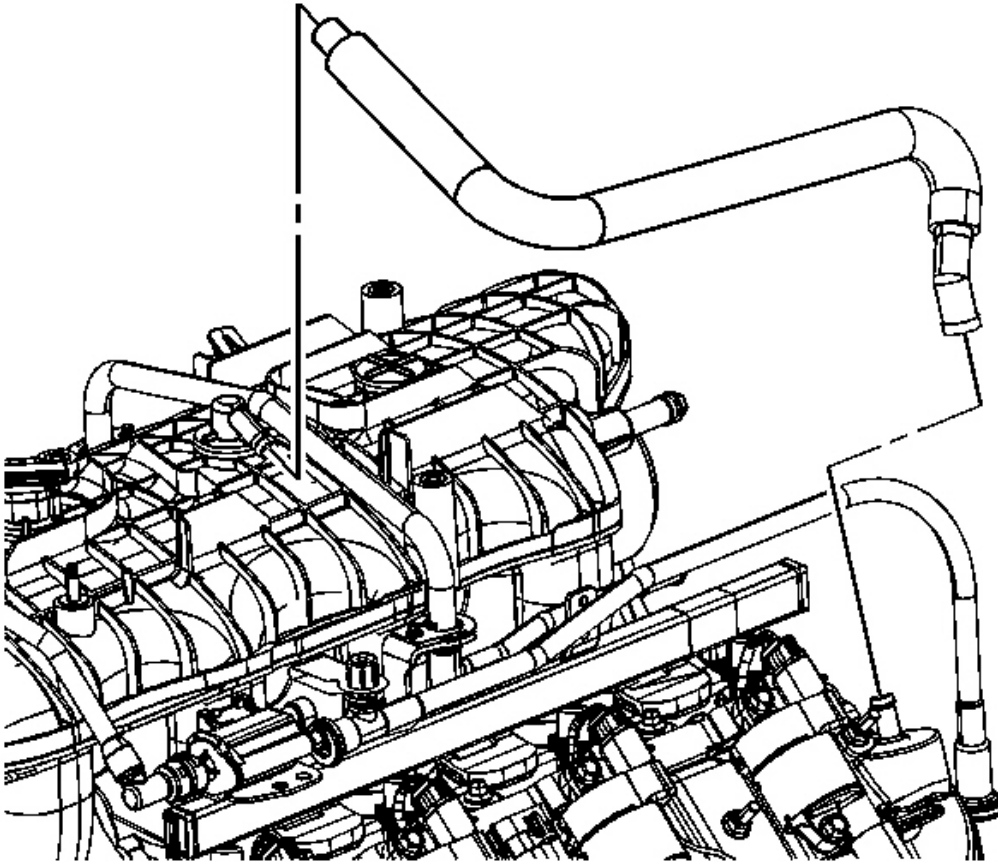


Fig. 82: Identifying Positive Crankcase Ventilation (PCV) Foul Air Hose
Courtesy of GENERAL MOTORS CORP.

1. Remove the intake manifold sight shield. Refer to **Upper Intake Manifold Sight Shield Replacement**.
2. Remove the positive crankcase ventilation (PCV) foul air hose from the intake manifold and valve rocker arm cover.

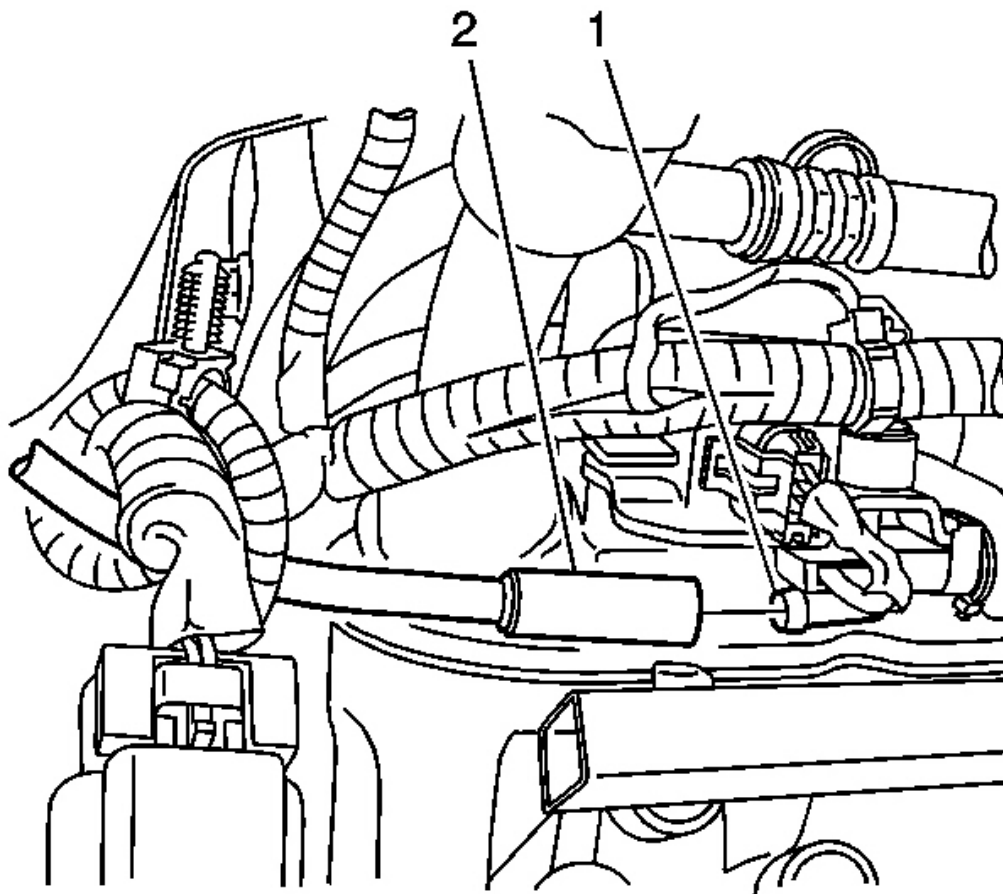


Fig. 83: Identifying PCV Fresh Air Hose
Courtesy of GENERAL MOTORS CORP.

3. Remove the PCV fresh air hose (2) from the valve rocker arm cover (1).

Installation Procedure

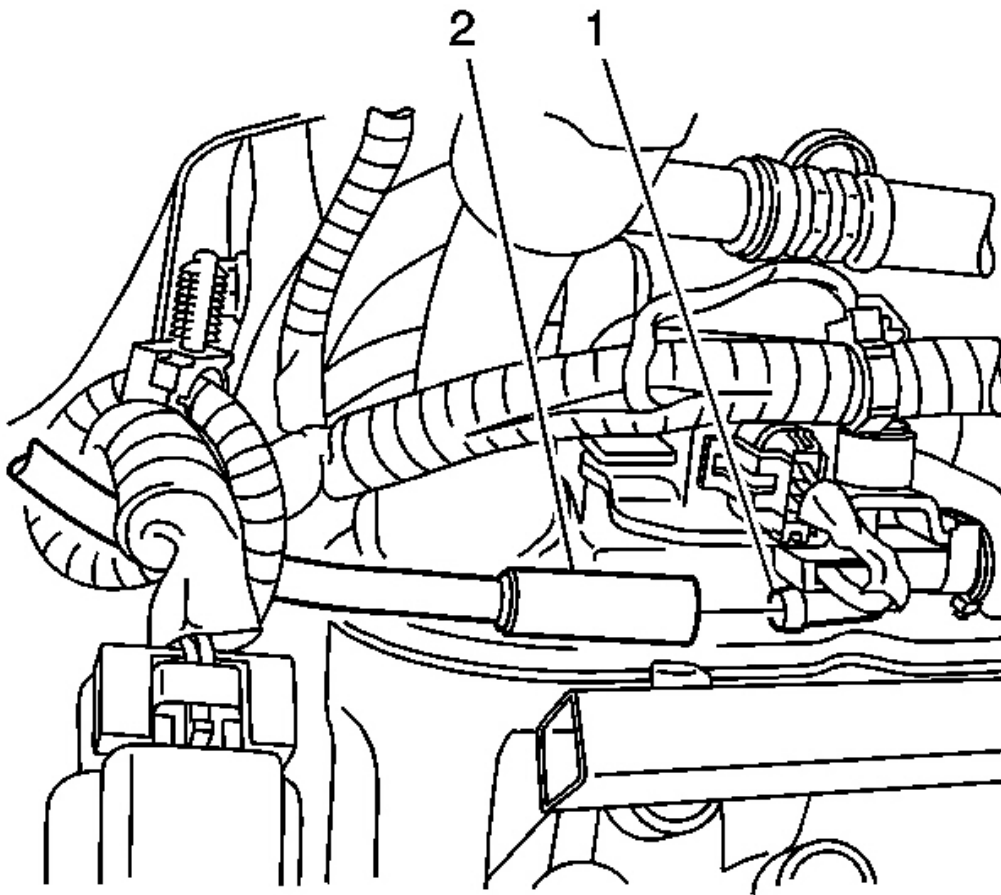


Fig. 84: Identifying PCV Fresh Air Hose
Courtesy of GENERAL MOTORS CORP.

1. Install the PCV fresh air hose (2) to the valve rocker arm cover (1).

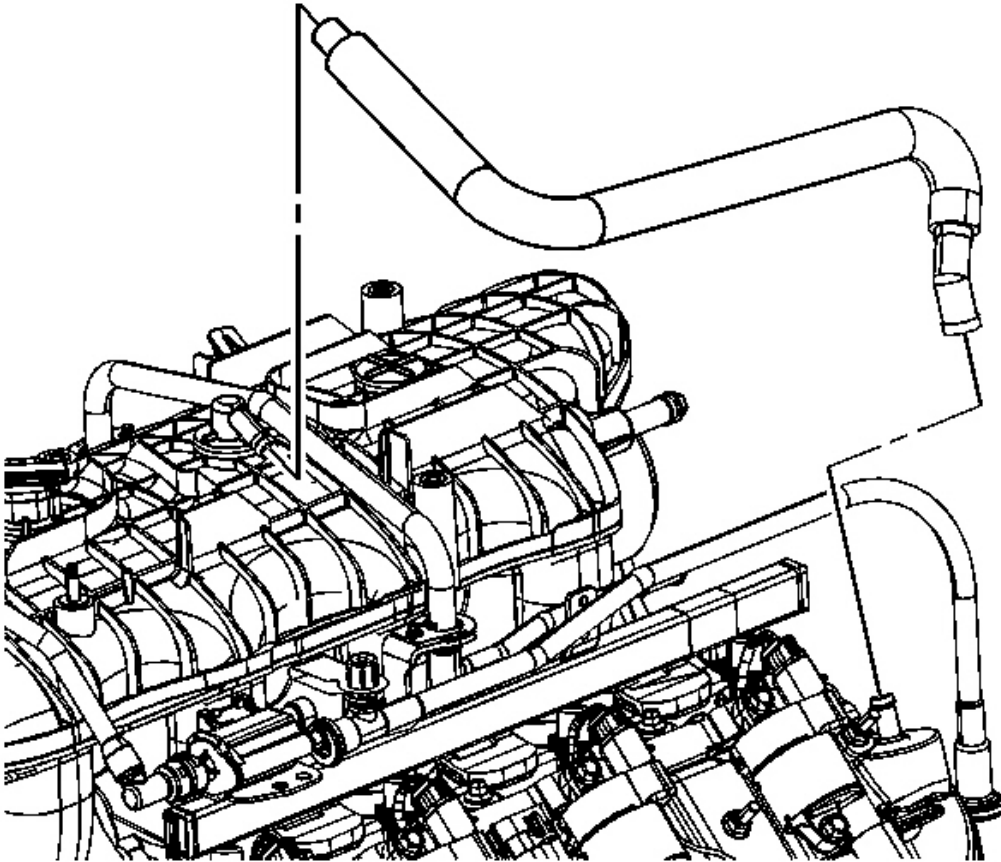


Fig. 85: Identifying Positive Crankcase Ventilation (PCV) Foul Air Hose
Courtesy of GENERAL MOTORS CORP.

2. Install the PCV foul air hose to the intake manifold and valve rocker arm cover.
3. Install the intake manifold sight shield. Refer to **Upper Intake Manifold Sight Shield Replacement**.

INTAKE MANIFOLD REPLACEMENT

Removal Procedure

IMPORTANT: The intake manifold, throttle body, fuel rail and injectors may be removed as an assembly. If not servicing the individual components, remove the manifold as a complete assembly.

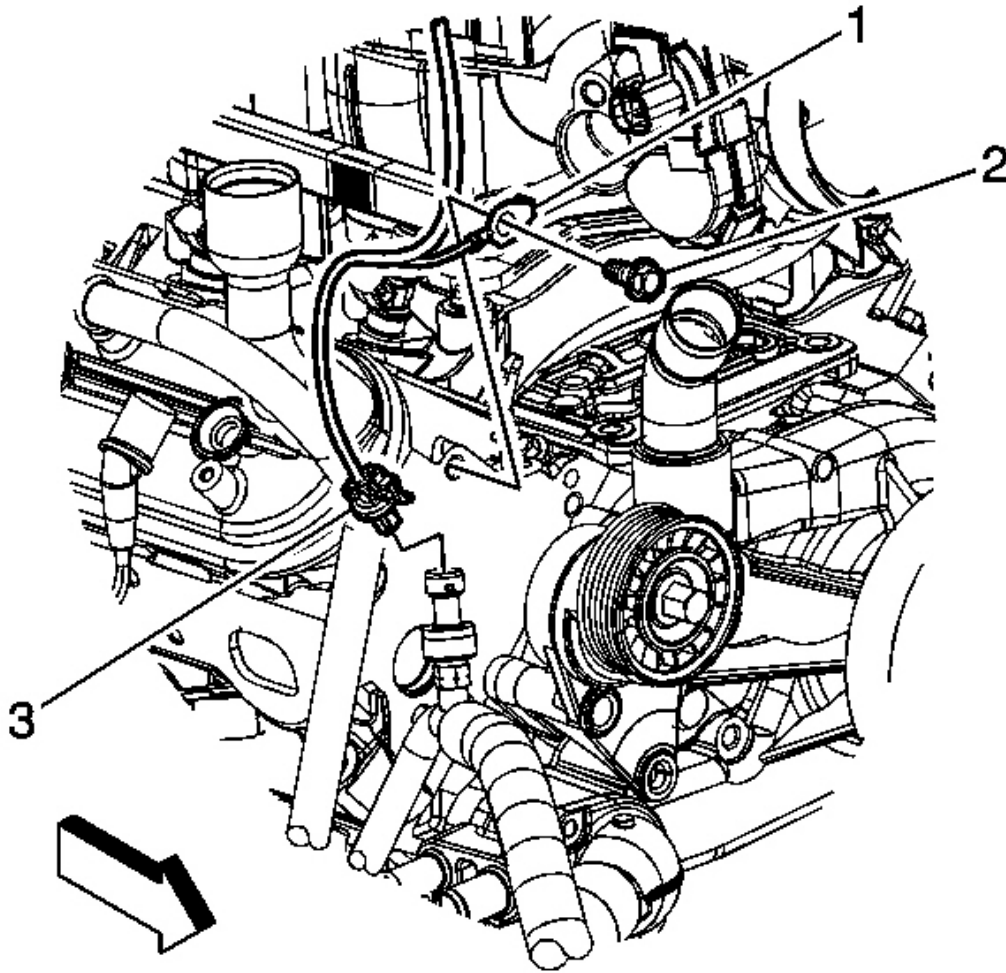


Fig. 86: Identifying Battery Cables
Courtesy of GENERAL MOTORS CORP.

1. Disconnect the negative battery cable. Refer to **Battery Negative Cable Disconnection and Connection** .
2. Relieve the fuel system pressure. Refer to **Fuel Pressure Relief** .
3. Disconnect the engine wiring harness electrical connector (3) from the air conditioning (A/C) compressor pressure switch.

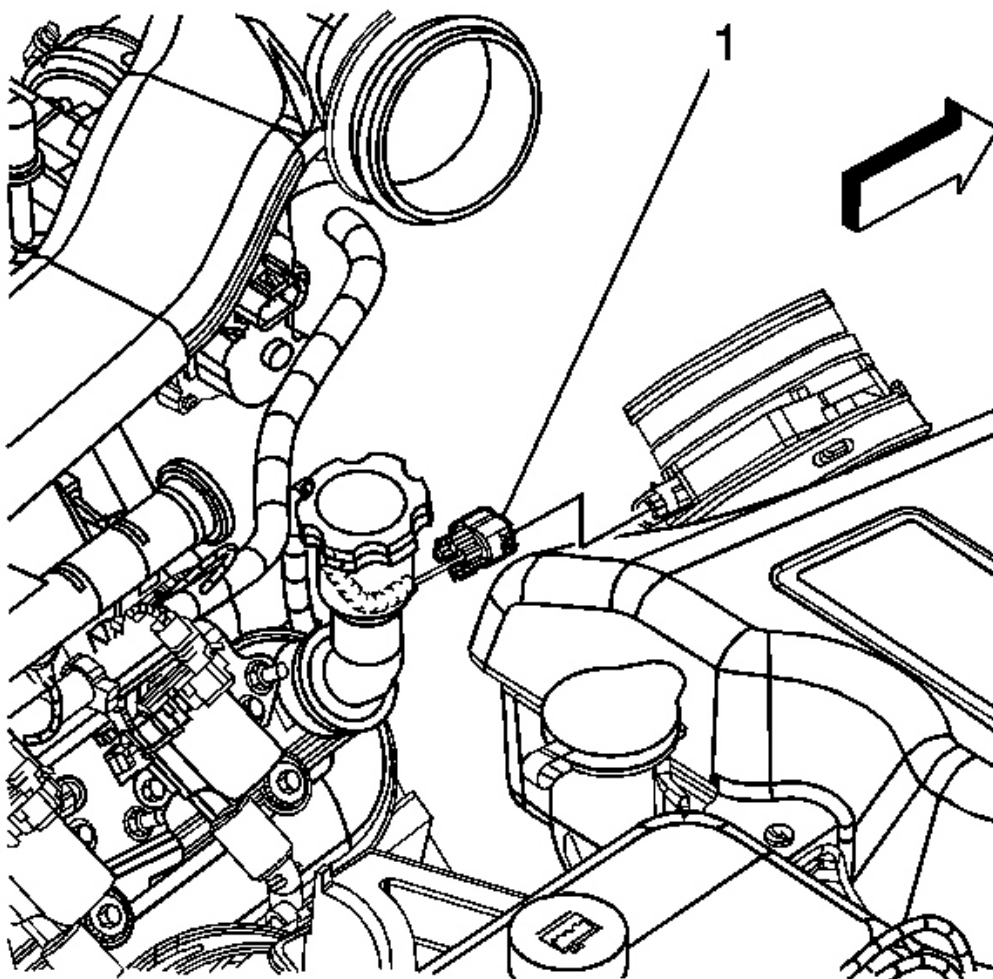


Fig. 87: View Of MAF/IAT Sensor Electrical Connector

Courtesy of GENERAL MOTORS CORP.

4. Disconnect the engine harness wiring harness electrical connector (1) from the mass air flow (MAF) intake air temperature (IAT) sensor.

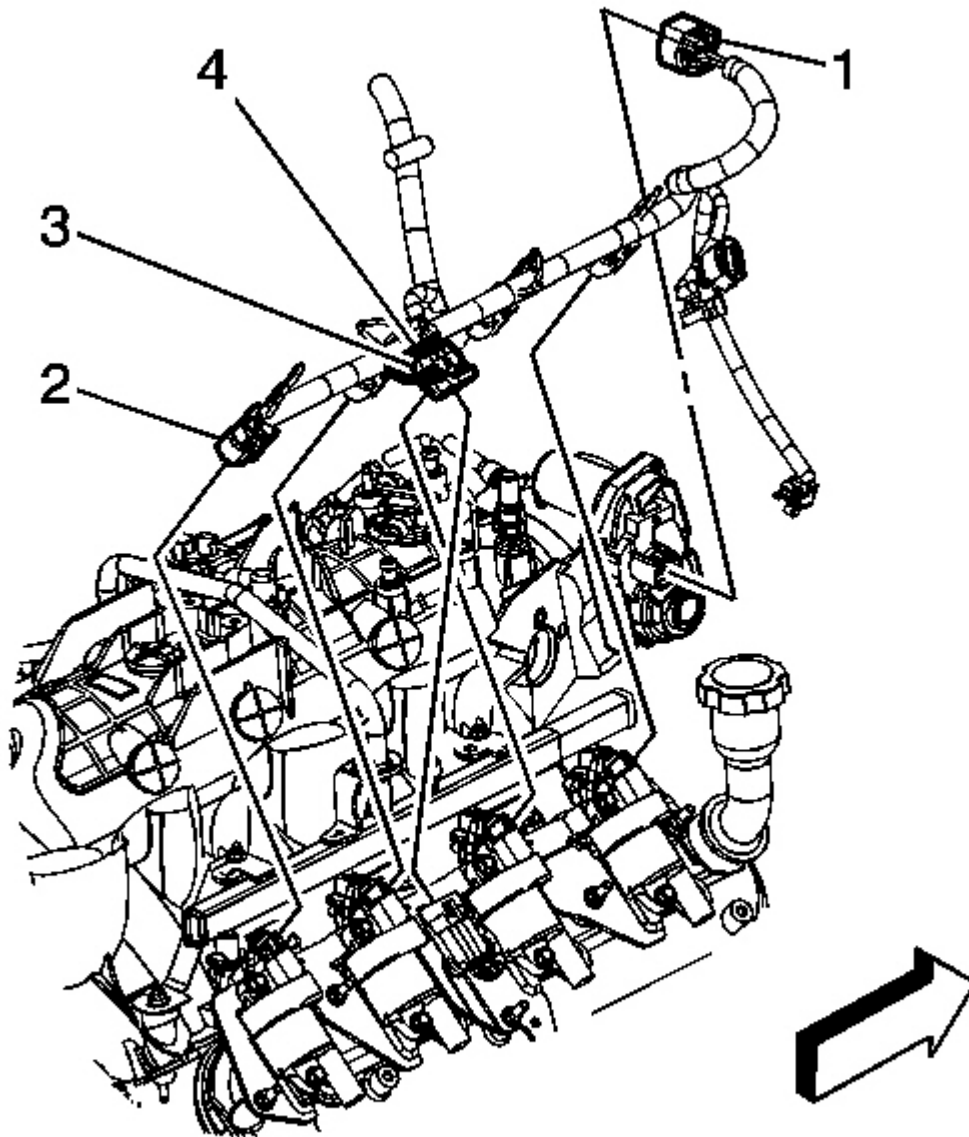


Fig. 88: View Of Engine Wiring Harness
Courtesy of GENERAL MOTORS CORP.

5. Disconnect the engine wiring harness electrical connector (1) from the electronic throttle control (ETC).
6. Remove the right side connector position assurance (CPA) retainer (4) from the engine wiring harness main ignition coil electrical connector.
7. Disconnect the right side engine wiring harness electrical connector (3) from the main ignition coil

electrical connector.

8. Disconnect the right side engine wiring harness electrical connectors (2) from the fuel injectors.

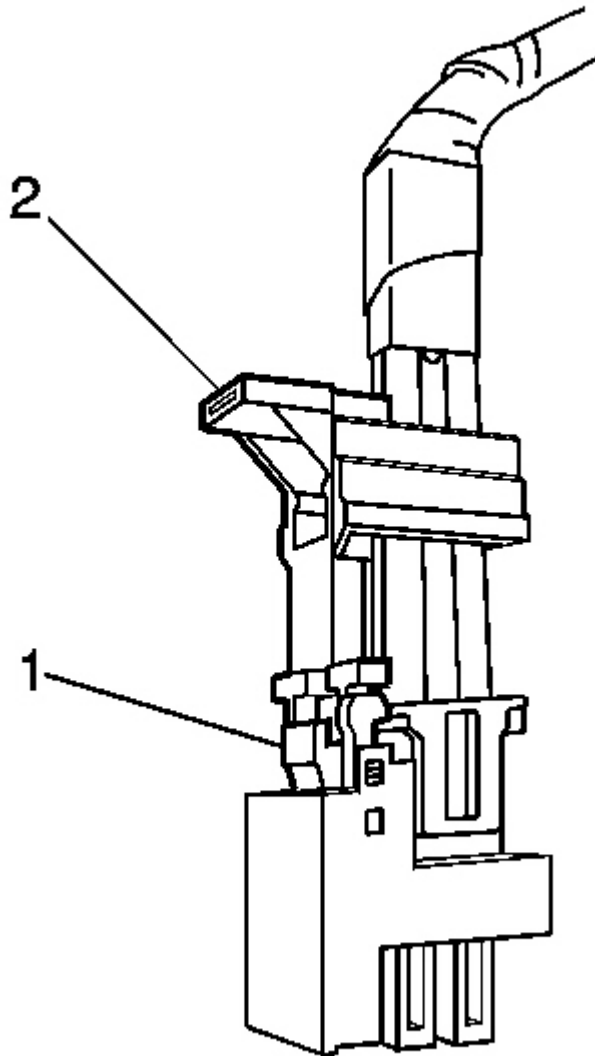


Fig. 89: View Of CPA Retainer & Tab
Courtesy of GENERAL MOTORS CORP.

9. Perform the following steps in order to disconnect the fuel injector electrical connectors.
 1. Mark the connectors to their corresponding injectors to ensure correct reassembly.

2007 Chevrolet TrailBlazer

2007 ENGINE Engine Mechanical - 6.0L - TrailBlazer

2. Pull the connector position assurance (CPA) retainer (2) on the connector up one click.
3. Push the tab (1) on the connector in.
4. Disconnect the fuel injector electrical connector.
5. Repeat the steps for each injector electrical connector.

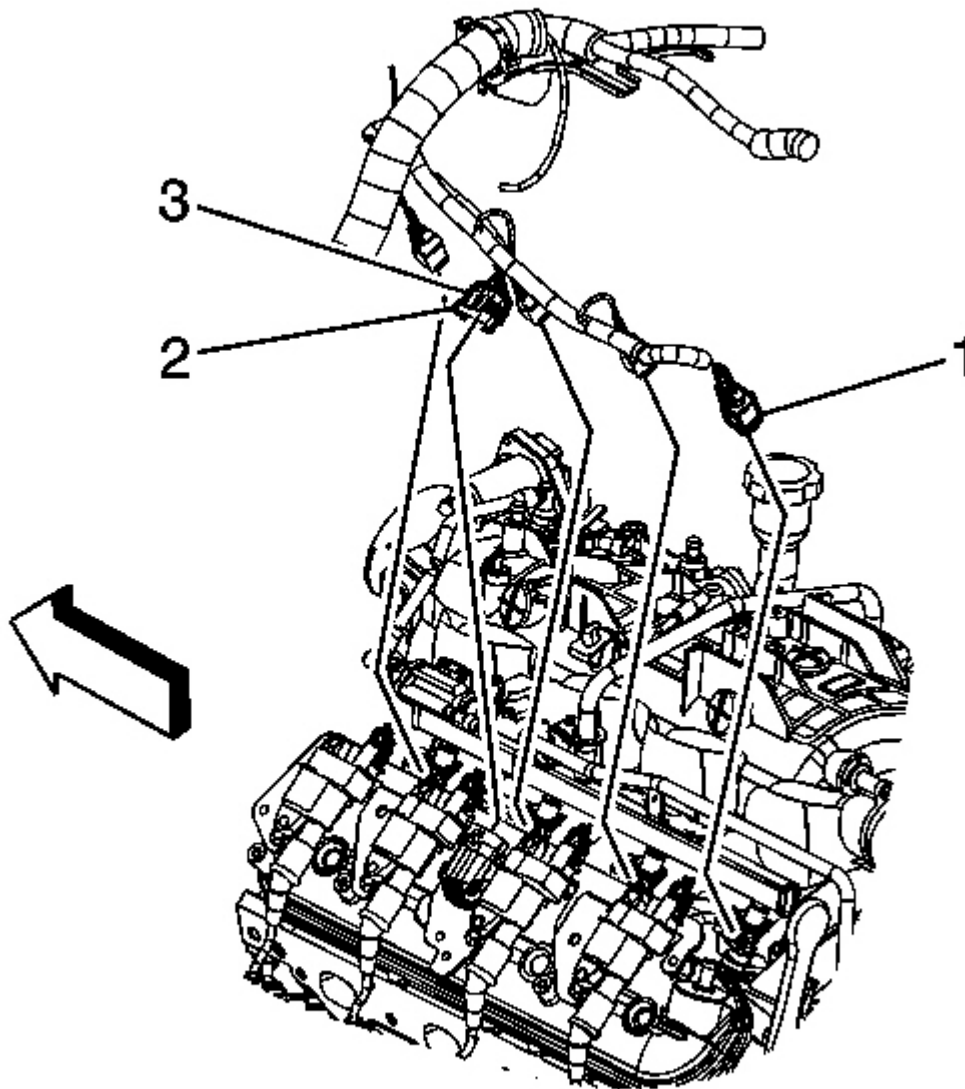


Fig. 90: View Of Engine Wiring Harness Main Ignition Coil Electrical Connector
Courtesy of GENERAL MOTORS CORP.

2007 Chevrolet TrailBlazer

2007 ENGINE Engine Mechanical - 6.0L - TrailBlazer

10. Remove the left side CPA retainer (3) from the engine wiring harness main ignition coil electrical connector.
11. Disconnect the left side engine wiring harness electrical connector (2) from the main ignition coil electrical connector.
12. Disconnect the left side engine wiring harness electrical connectors (1) from the fuel injectors.

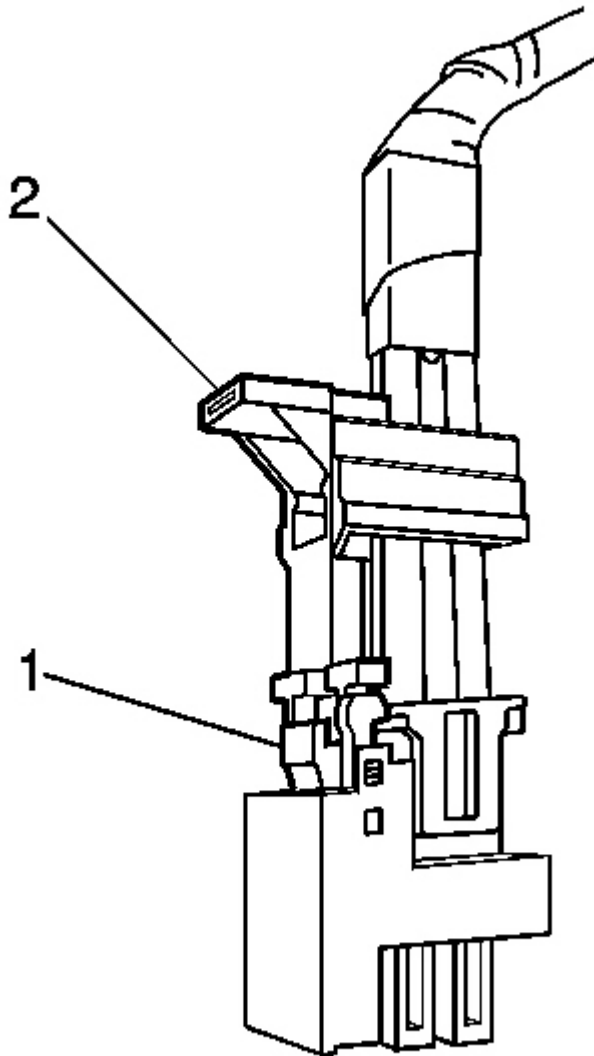


Fig. 91: View Of CPA Retainer & Tab
Courtesy of GENERAL MOTORS CORP.

13. Perform the following steps in order to disconnect the fuel injector electrical connectors.
 1. Mark the connectors to their corresponding injectors to ensure correct reassembly.
 2. Pull the connector position assurance (CPA) retainer (2) on the connector up one click.
 3. Push the tab (1) on the connector in.
 4. Disconnect the fuel injector electrical connector.
 5. Repeat the steps for each injector electrical connector.

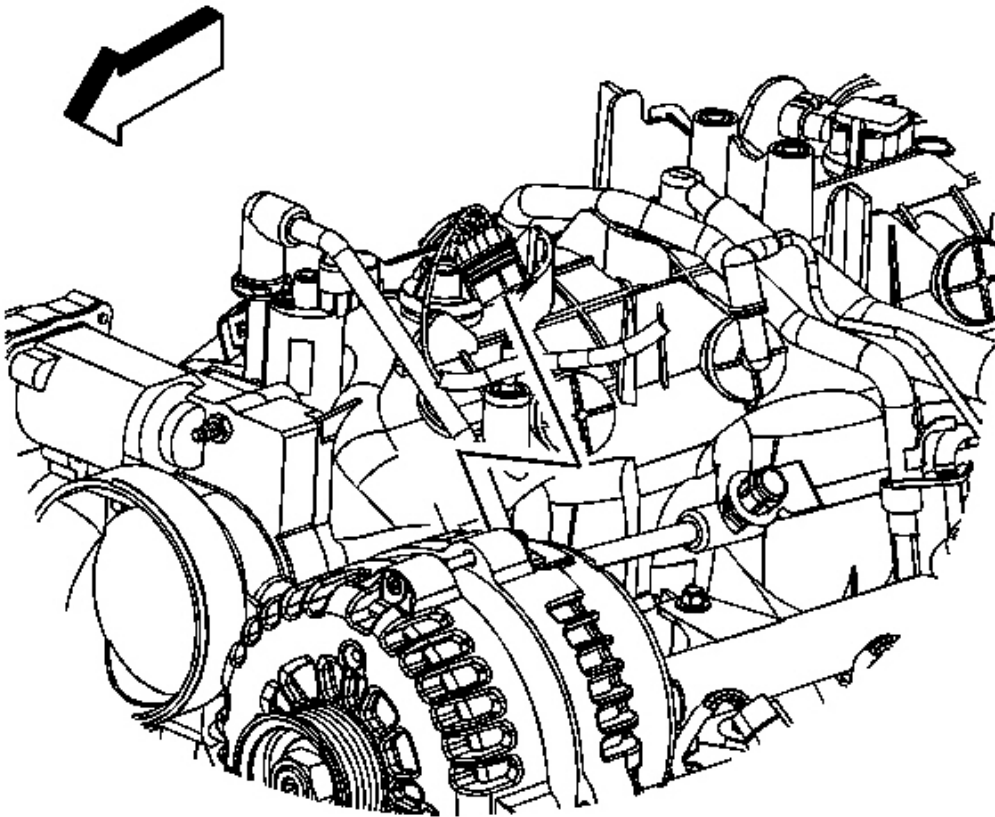


Fig. 92: View Of Engine Wiring Harness Generator Electrical Connector
Courtesy of GENERAL MOTORS CORP.

14. Disconnect the engine wiring harness electrical connector from the generator.

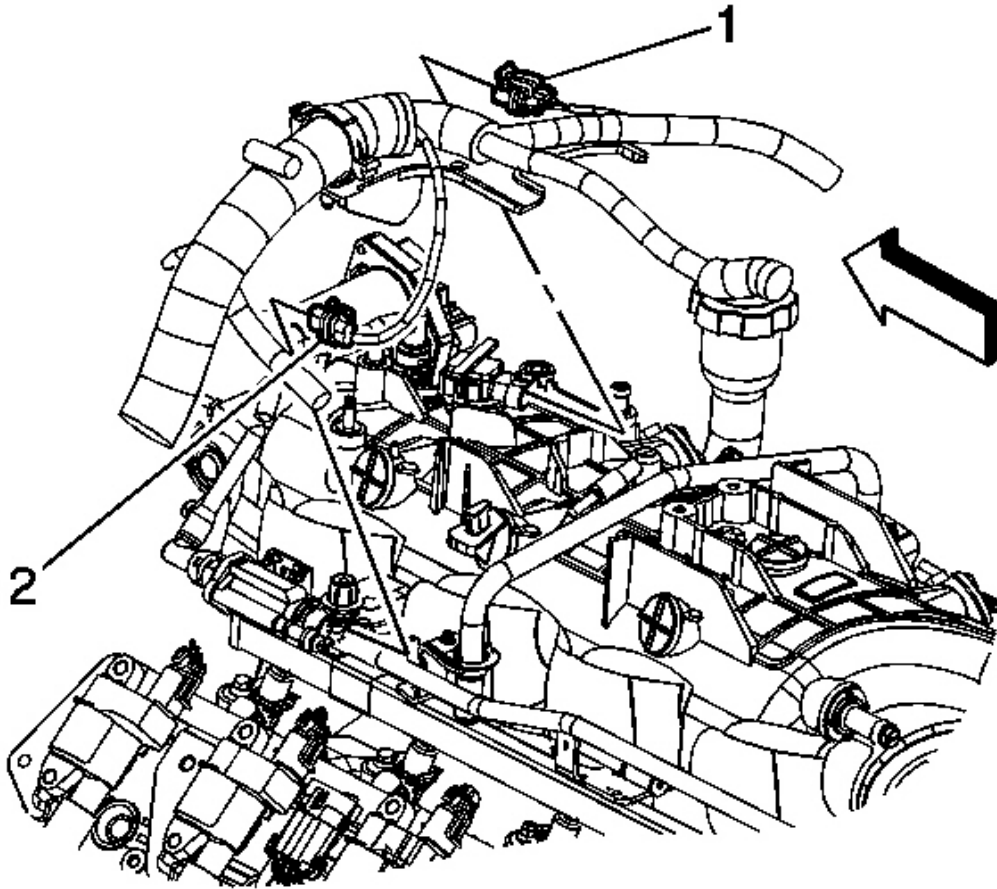


Fig. 93: View Of Engine Wiring Harness MAP Sensor Electrical Connector
Courtesy of GENERAL MOTORS CORP.

15. Disconnect the engine wiring harness electrical connector (1) from the manifold absolute pressure (MAP) sensor.
16. Disconnect the engine wiring harness electrical connector (2) from the evaporative emission (EVAP) canister purge solenoid valve.

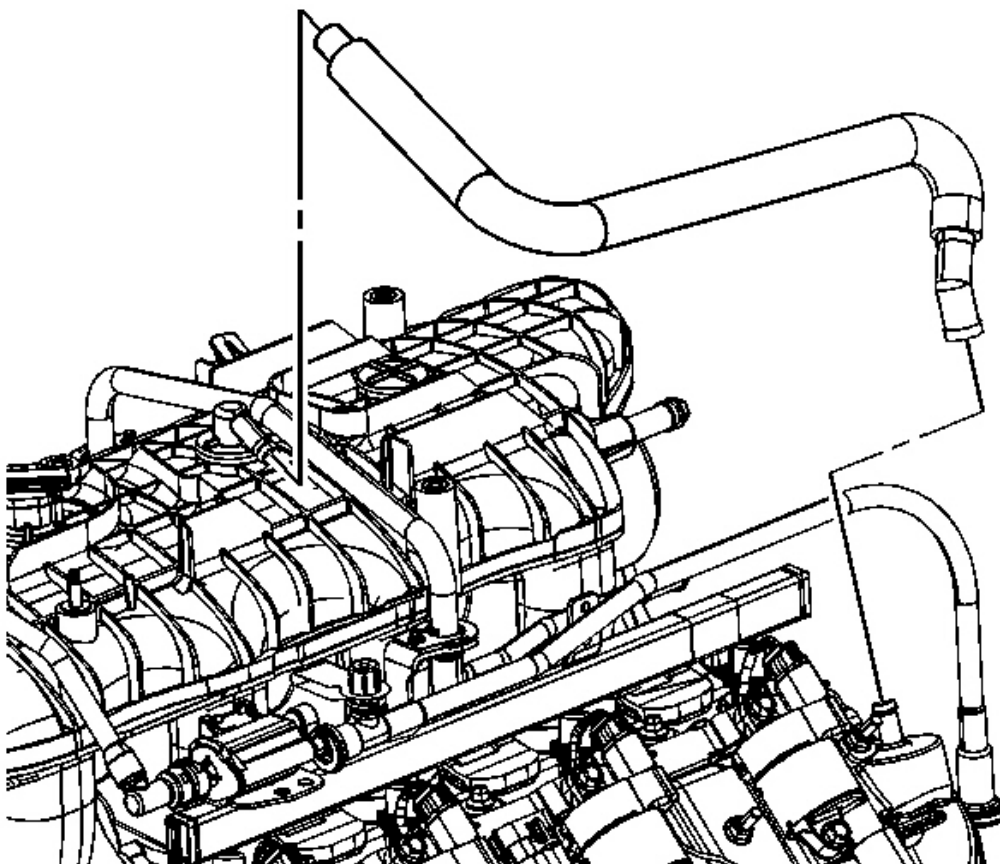


Fig. 94: Identifying Positive Crankcase Ventilation (PCV) Foul Air Hose
Courtesy of GENERAL MOTORS CORP.

17. Remove the positive crankcase ventilation (PCV) hose.

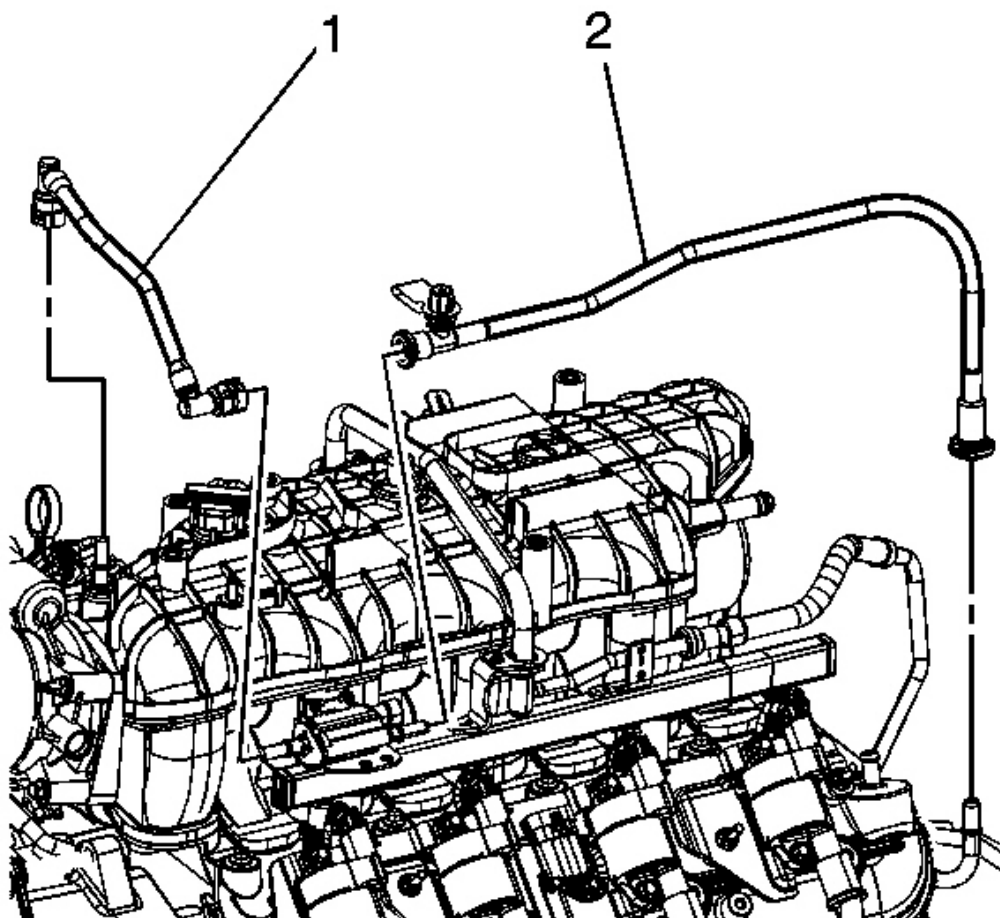


Fig. 95: EVAP Purge Solenoid Vent Tubes
Courtesy of GENERAL MOTORS CORP.

18. Remove the EVAP purge solenoid vent tubes (1, 2). Refer to **Plastic Collar Quick Connect Fitting Service** .

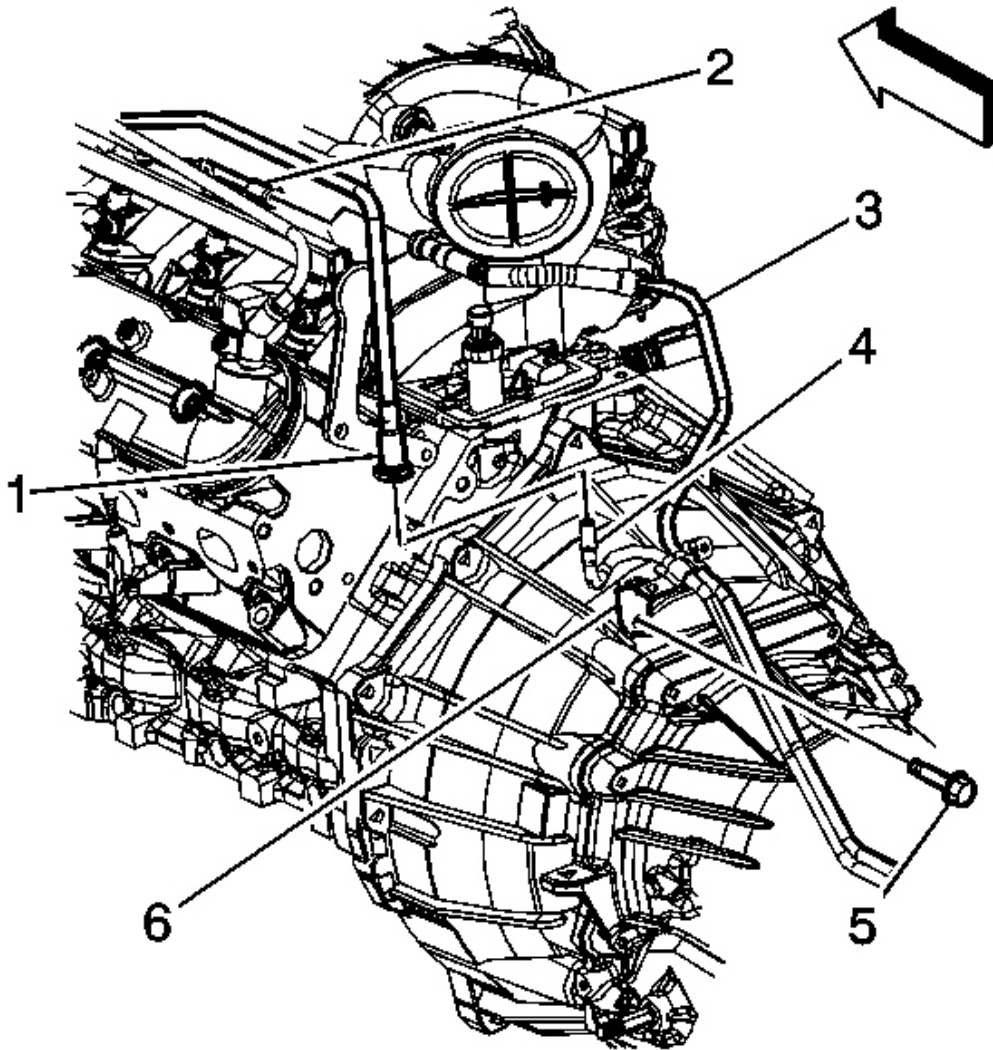


Fig. 96: Fuel Feed Pipe From/To Fuel Rail
Courtesy of GENERAL MOTORS CORP.

19. Disconnect the fuel feed pipe (3) from the fuel rail (2). Refer to **Metal Collar Quick Connect Fitting Service** .
20. Reposition the vacuum brake booster hose clamp at the brake booster.
21. Remove the vacuum brake booster hose from the brake booster.

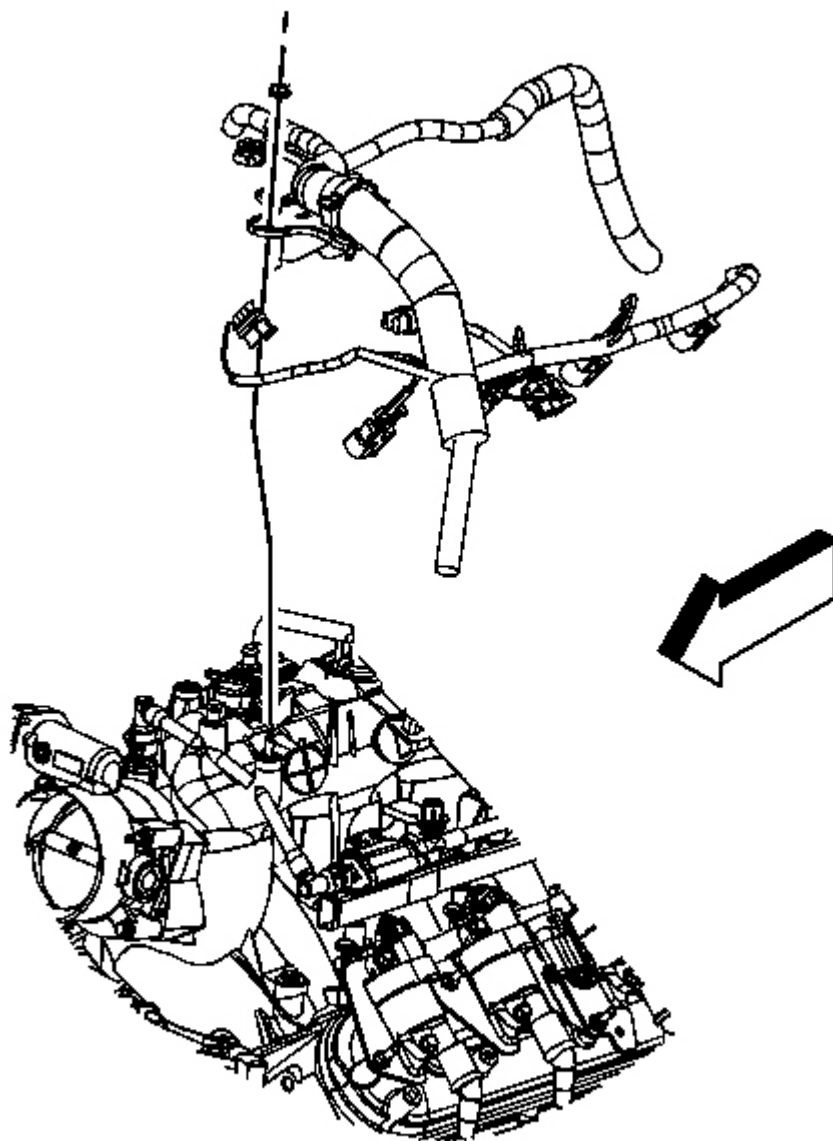


Fig. 97: View Of Engine Wiring Harness
Courtesy of GENERAL MOTORS CORP.

22. Remove the engine wire harness retainer nut.
23. Reposition the upper engine wire harness aside.

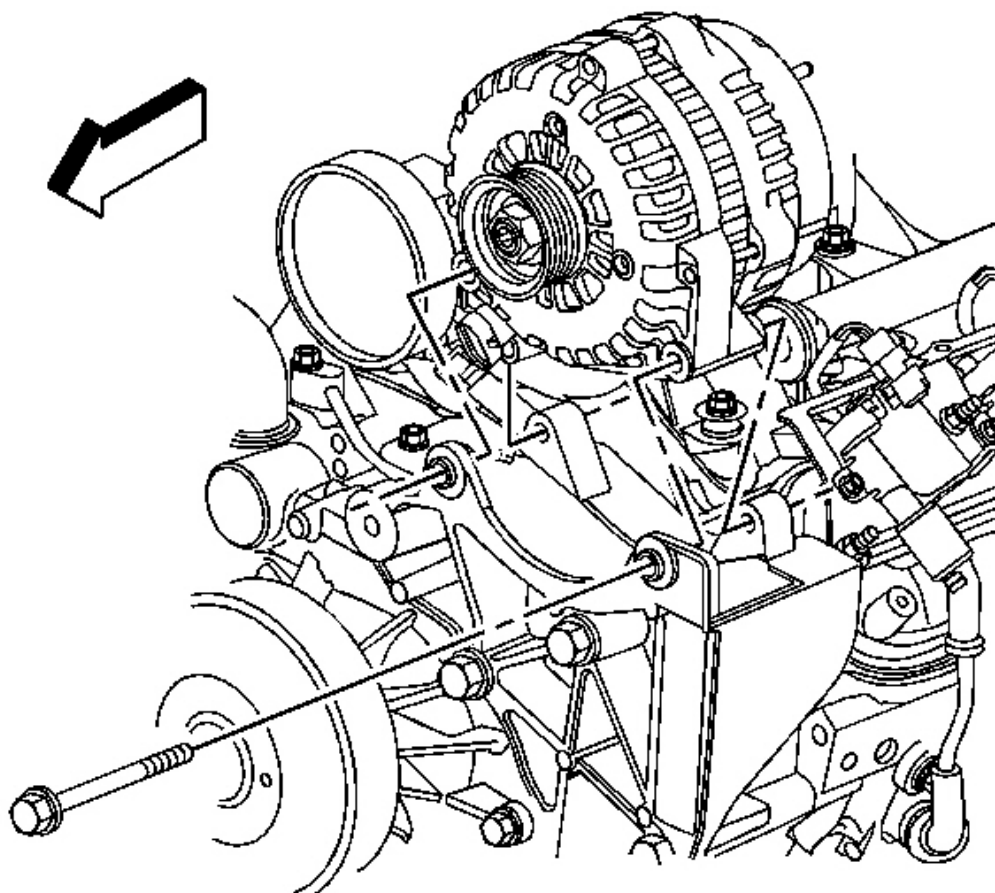


Fig. 98: View Of Generator & Bolts (5.3L)
Courtesy of GENERAL MOTORS CORP.

24. Remove the drive belt. Refer to **Drive Belt Replacement - Accessory.**
25. Remove the right generator bolt.
26. Loosen the left generator bolt and reposition the generator to the left.

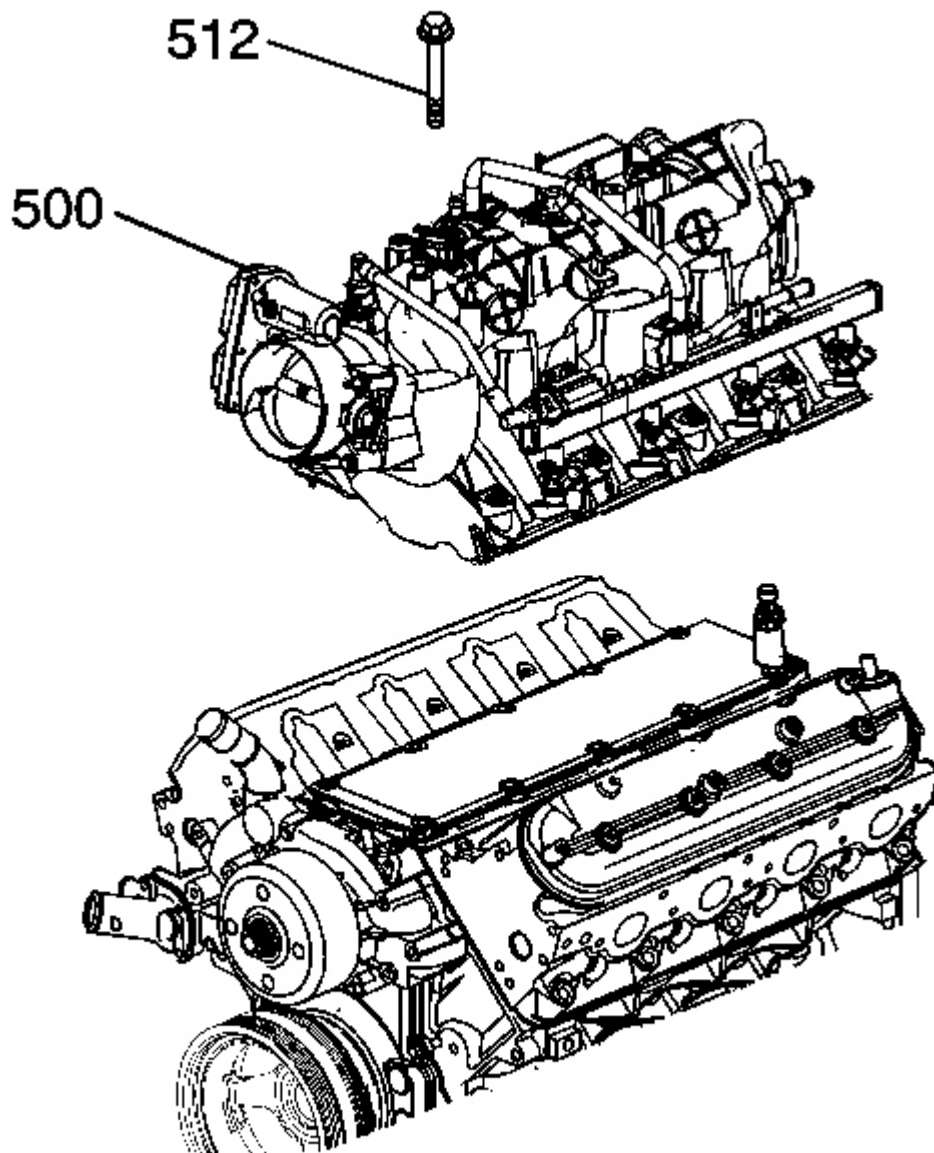


Fig. 99: Identifying Intake Manifold Bolts
Courtesy of GENERAL MOTORS CORP.

27. Remove the intake manifold bolts (512).
28. Remove the intake manifold.

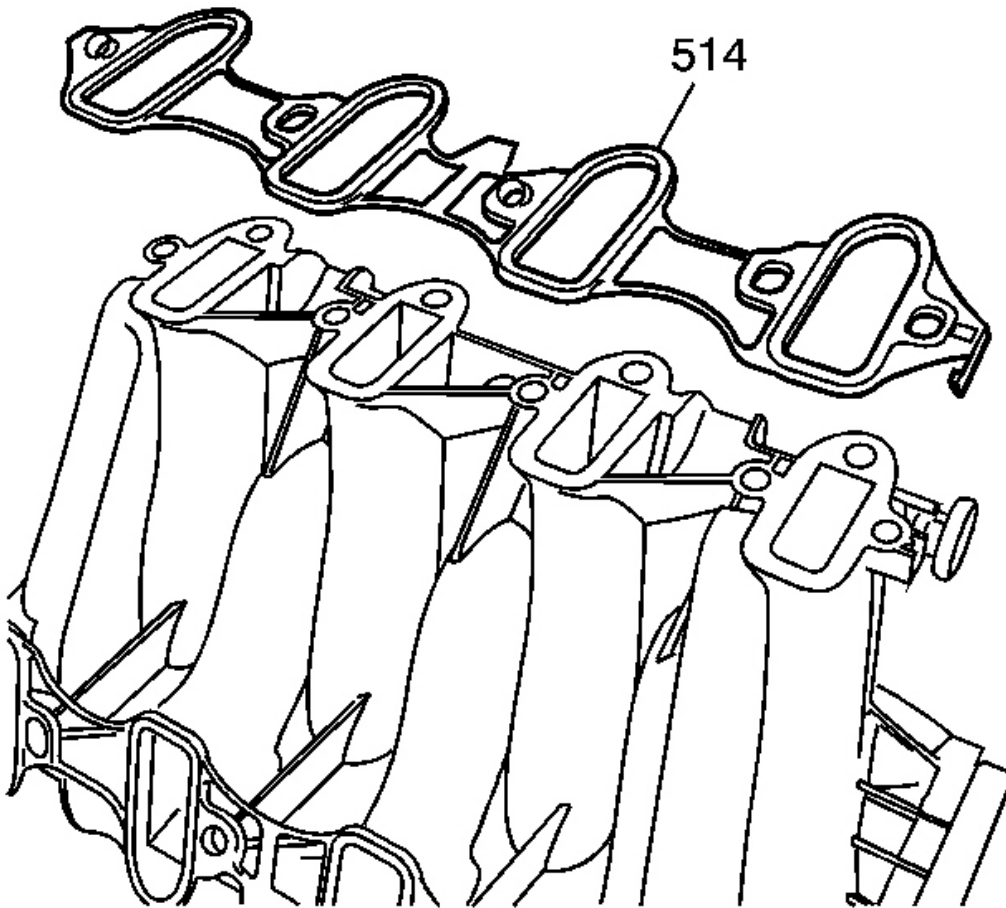


Fig. 100: View Of Intake Manifold-To-Cylinder Head Gasket
Courtesy of GENERAL MOTORS CORP.

29. Remove the intake manifold gaskets (514) from the intake manifold.
30. Discard the old intake manifold gaskets.
31. If necessary, clean and inspect the intake manifold. Refer to **Intake Manifold Cleaning and Inspection** .

Installation Procedure

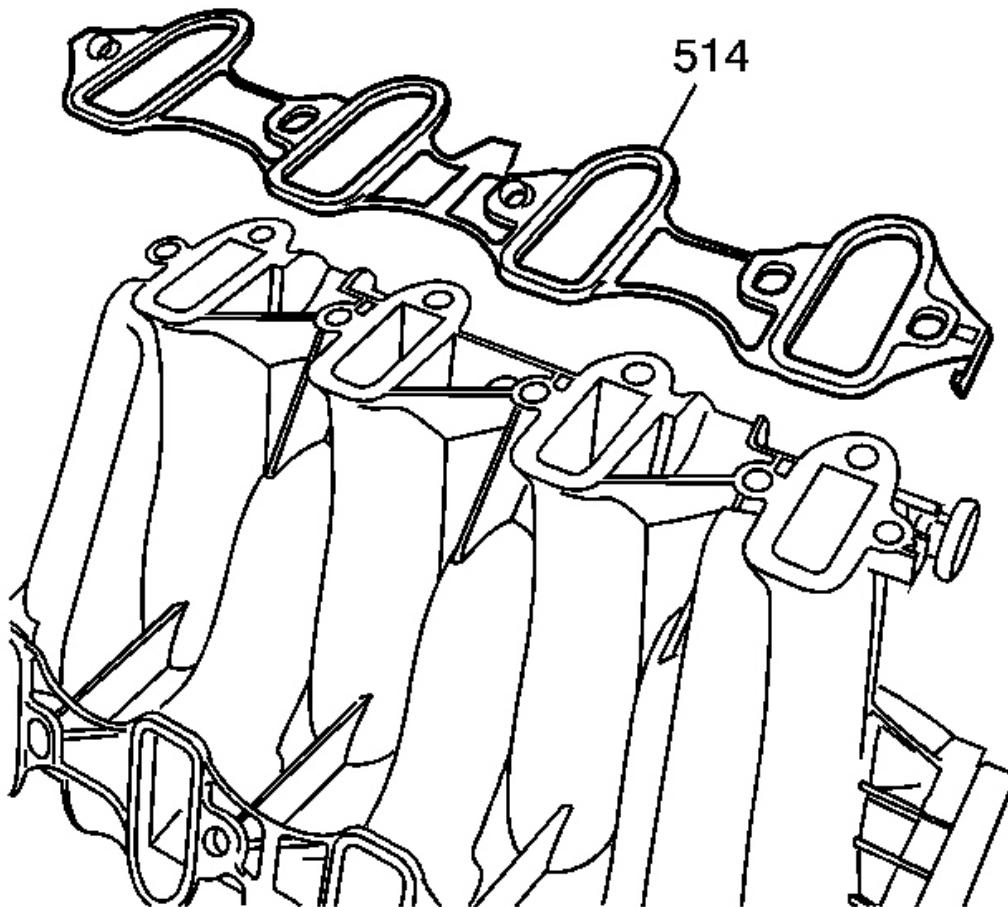


Fig. 101: View Of Intake Manifold-To-Cylinder Head Gasket
Courtesy of GENERAL MOTORS CORP.

1. Install NEW intake manifold gaskets (514) to the intake manifold.

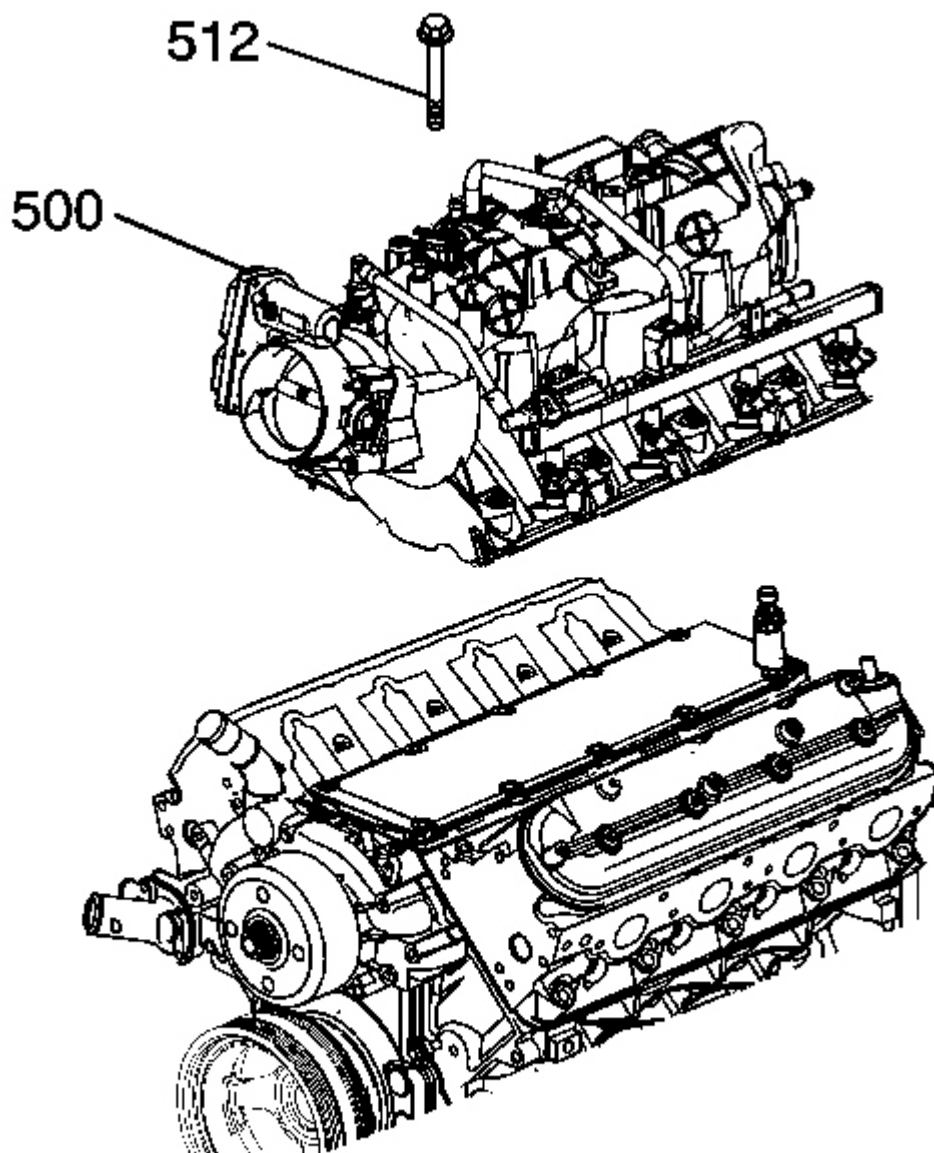


Fig. 102: Identifying Intake Manifold Bolts
Courtesy of GENERAL MOTORS CORP.

2. Install the intake manifold.
3. Apply a 5 mm (0.2 in) bead threadlock to the threads of the intake manifold bolts. Refer to **Sealers, Adhesives and Lubricants** .

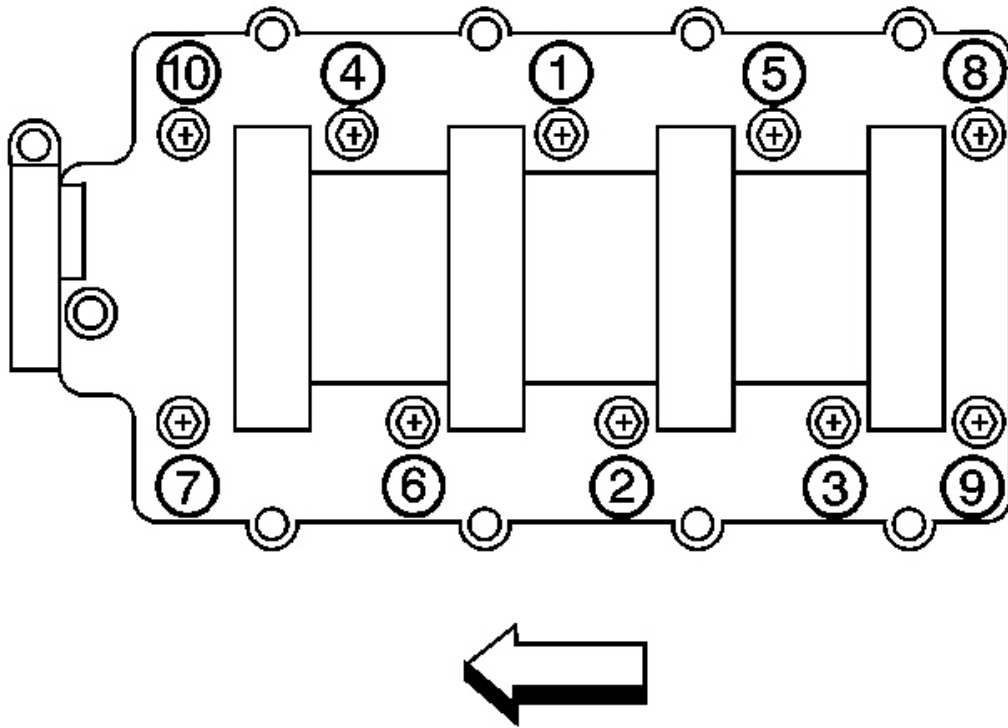


Fig. 103: Identifying Intake Manifold Bolt Tightening Sequence
Courtesy of GENERAL MOTORS CORP.

NOTE: Refer to Fastener Notice .

4. Install the intake manifold bolts.

Tighten:

1. Tighten the bolts a first pass in sequence to 5 N.m (44 lb in).
2. Tighten the bolts a final pass in sequence to 10 N.m (89 lb in).

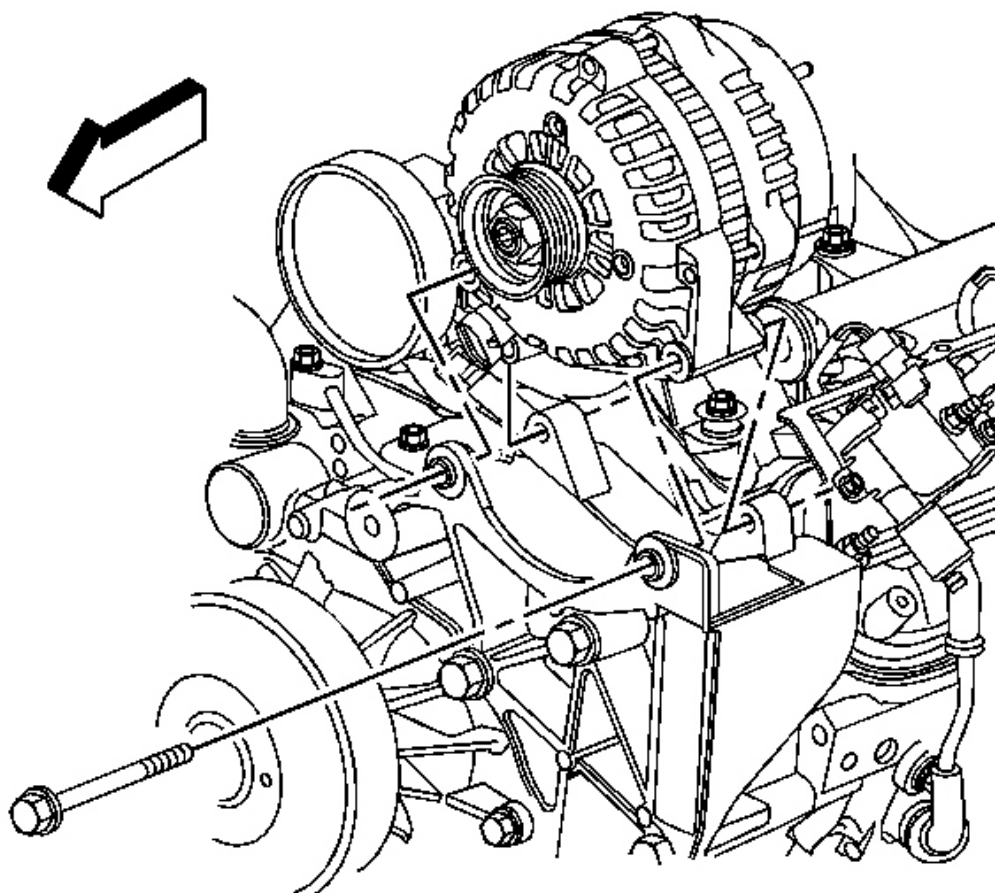


Fig. 104: View Of Generator & Bolts (5.3L)
Courtesy of GENERAL MOTORS CORP.

5. Position the generator and install the right generator bolt.
6. Tighten the left generator bolt.

Tighten: Tighten the bolts to 50 N.m (37 lb ft).

7. Install the drive belt. Refer to **Drive Belt Replacement - Accessory.**

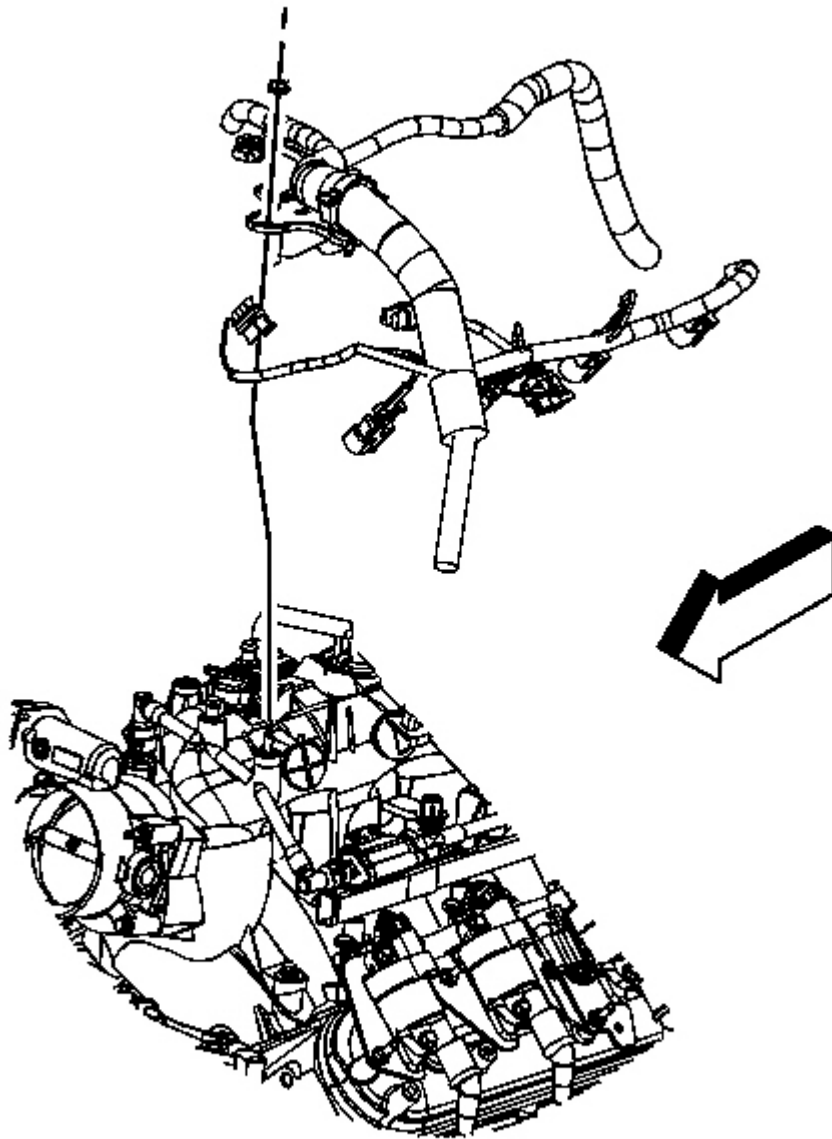


Fig. 105: View Of Engine Wiring Harness
Courtesy of GENERAL MOTORS CORP.

8. Route the electrical harness into position over the engine.
9. Install the engine harness bracket nut.

Tighten: Tighten the nut to 10 N.m (89 lb in).

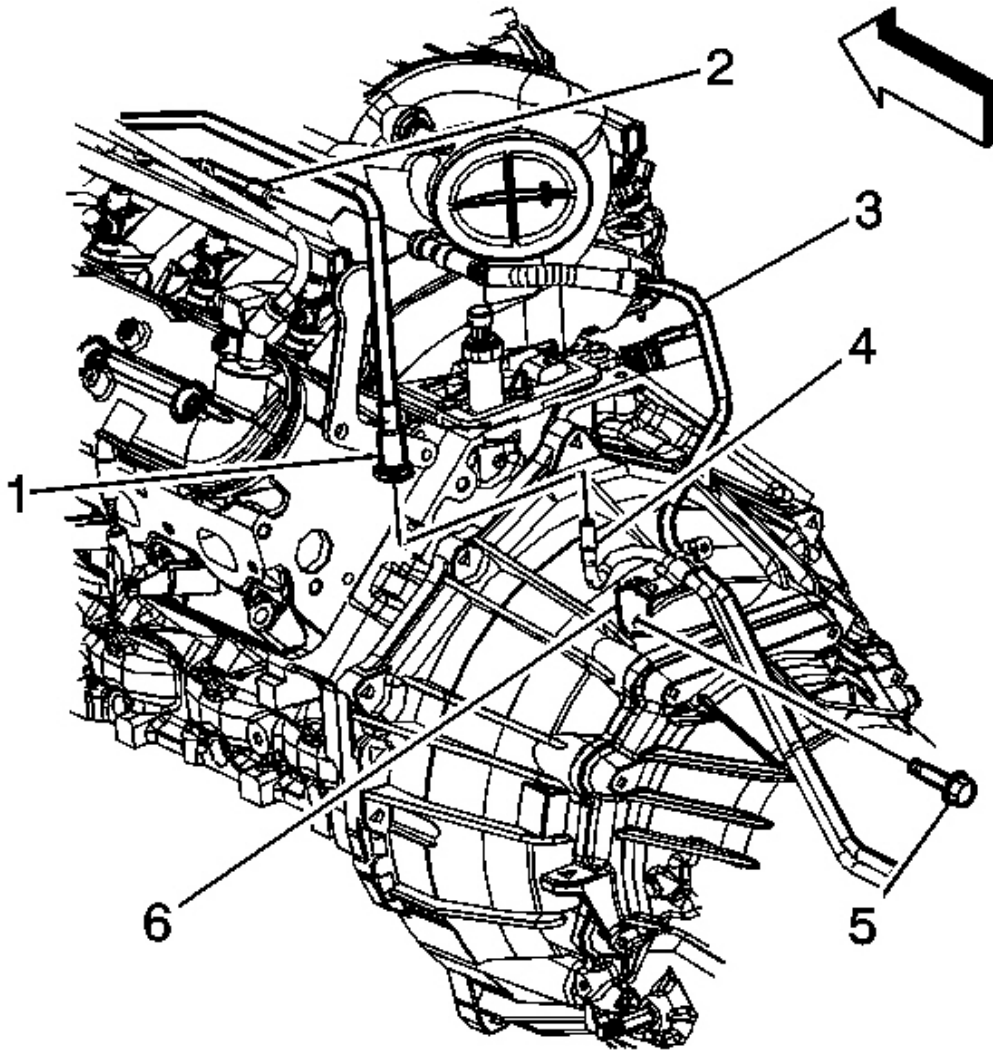


Fig. 106: Fuel Feed Pipe From/To Fuel Rail
Courtesy of GENERAL MOTORS CORP.

10. Install the vacuum brake booster hose to the brake booster.
11. Position the vacuum brake booster hose clamp at the brake booster.
12. Connect the fuel feed pipe (3) to the fuel rail (2). Refer to **Metal Collar Quick Connect Fitting Service** .

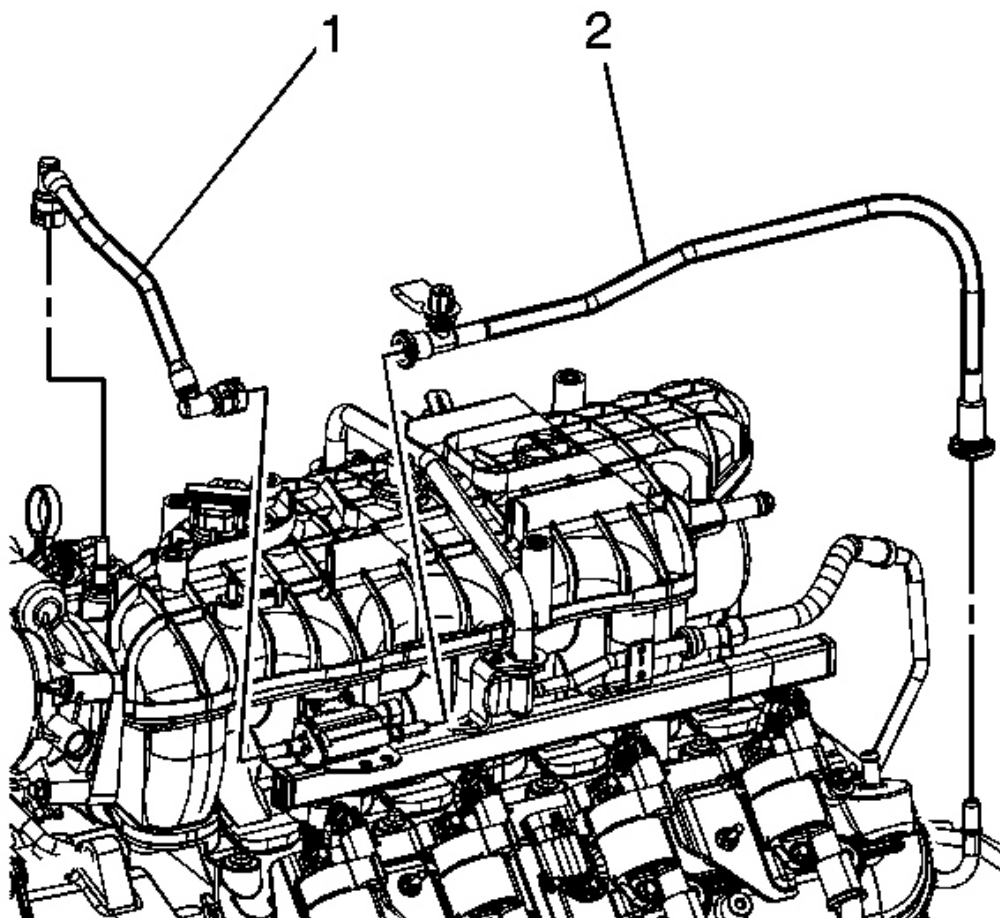


Fig. 107: EVAP Purge Solenoid Vent Tubes
Courtesy of GENERAL MOTORS CORP.

13. Install the EVAP purge solenoid vent tubes (1, 2). Refer to **Plastic Collar Quick Connect Fitting Service** .

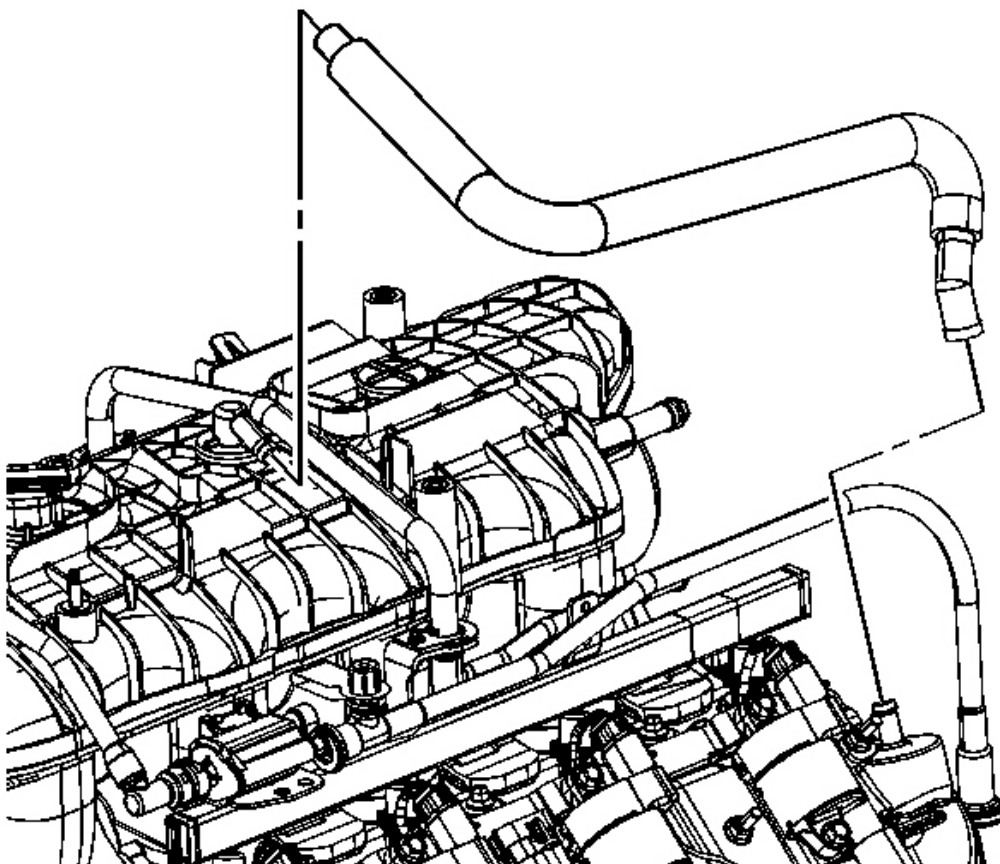


Fig. 108: Identifying Positive Crankcase Ventilation (PCV) Foul Air Hose
Courtesy of GENERAL MOTORS CORP.

14. Install the PCV hose.

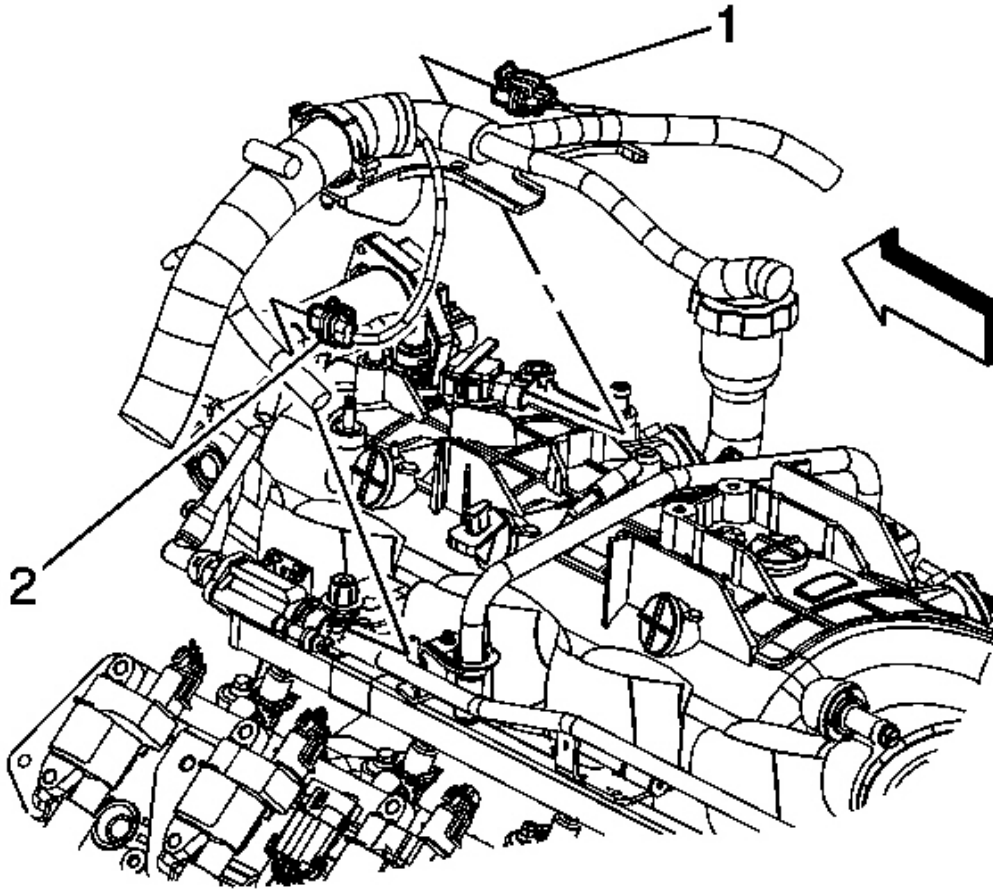


Fig. 109: View Of Engine Wiring Harness MAP Sensor Electrical Connector
Courtesy of GENERAL MOTORS CORP.

15. Connect the engine wiring harness electrical connector (1) to the MAP sensor.
16. Connect the engine wiring harness electrical connector (2) to the EVAP canister purge solenoid valve.

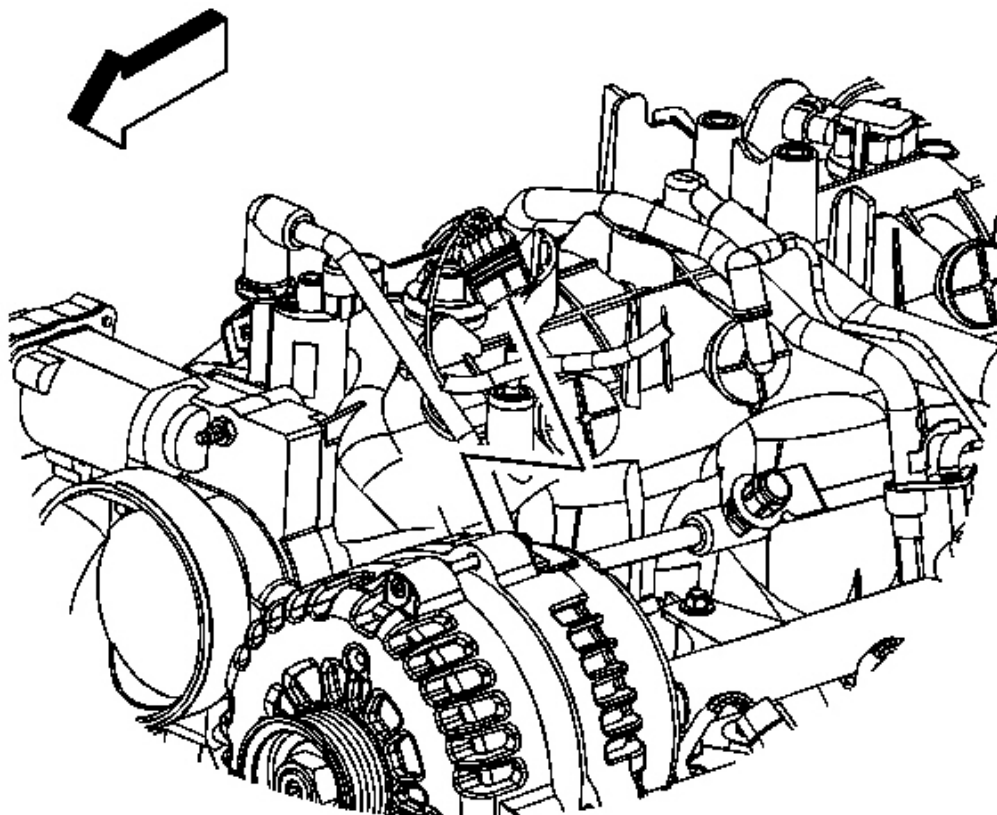


Fig. 110: View Of Engine Wiring Harness Generator Electrical Connector
Courtesy of GENERAL MOTORS CORP.

17. Connect the engine wiring harness electrical connector to the generator.

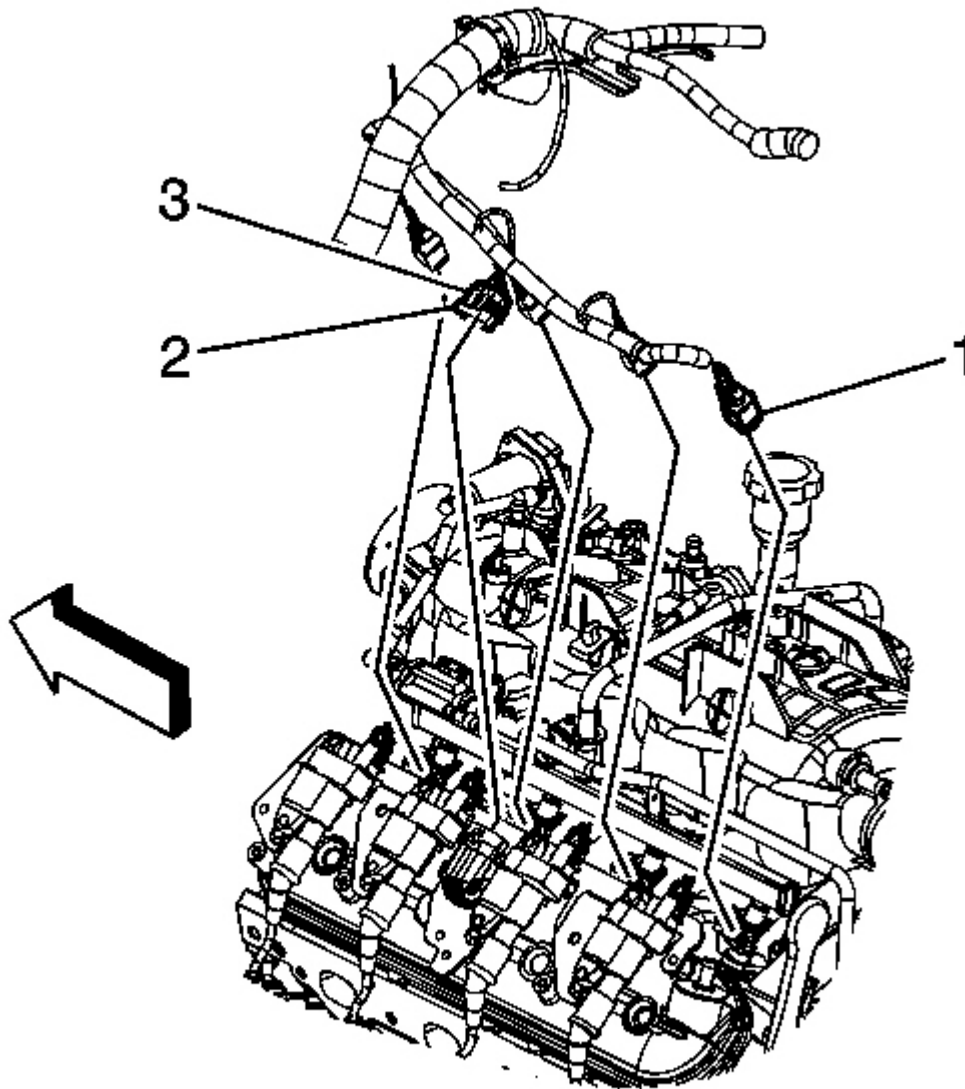


Fig. 111: View Of Engine Wiring Harness Main Ignition Coil Electrical Connector
Courtesy of GENERAL MOTORS CORP.

18. Connect the left side engine wiring harness electrical connector (2) to the main ignition coil electrical connector.
19. Install the left side CPA retainer (3) to the engine wiring harness main ignition coil electrical connector.
20. Connect the left side engine wiring harness electrical connectors (1) to the fuel injectors.

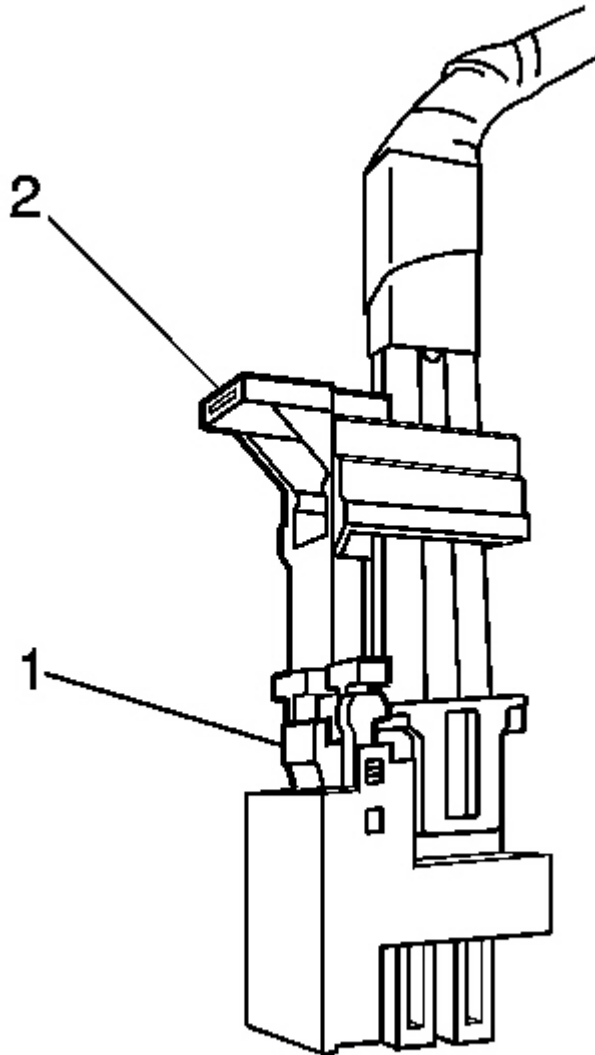


Fig. 112: View Of CPA Retainer & Tab
Courtesy of GENERAL MOTORS CORP.

21. Perform the following steps in order to connect the fuel injector electrical connectors:
 1. Install the connectors to their corresponding injectors to ensure correct reassembly.
 2. Connect the fuel injector electrical connector.
 3. Push the CPA retainer (2) on the connector in one click.
 4. Repeat the steps for each injector electrical connector.

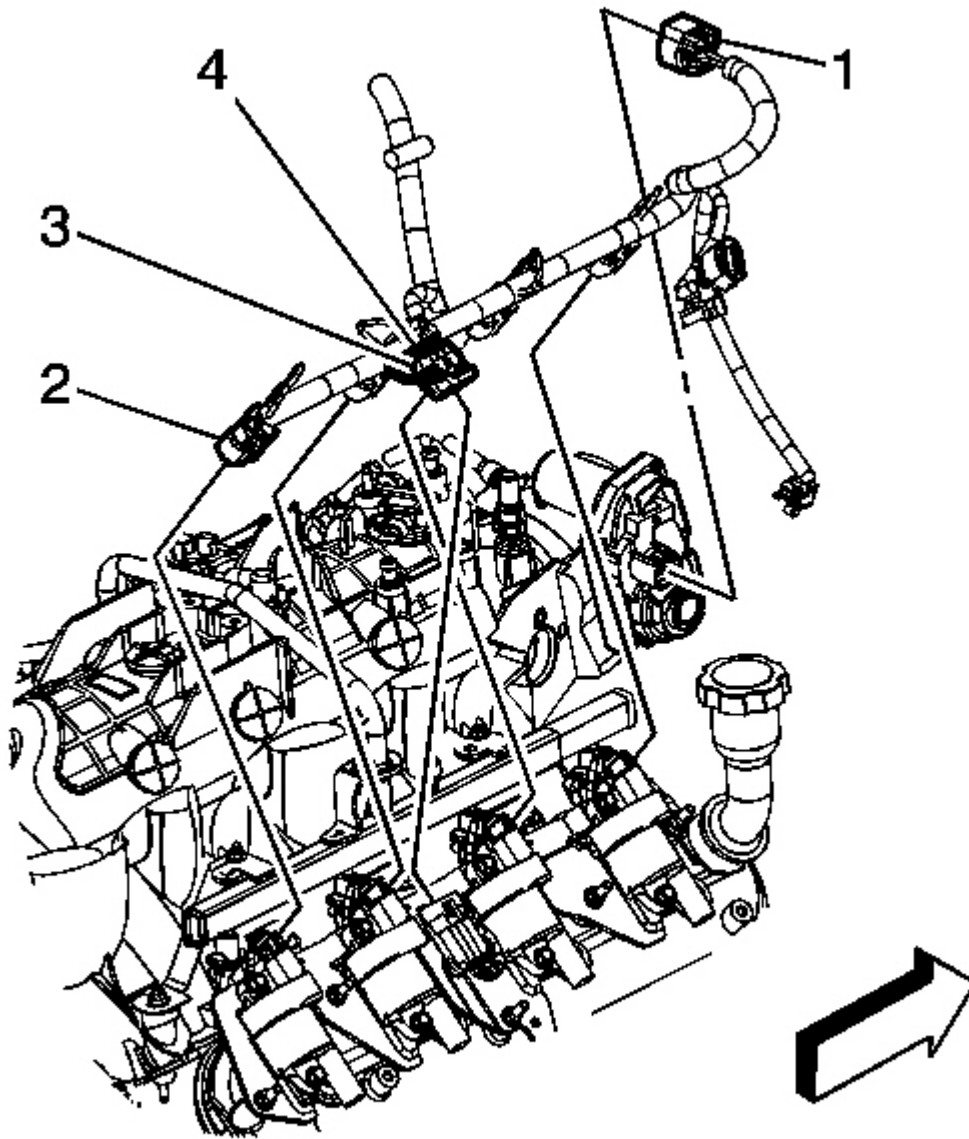


Fig. 113: View Of Engine Wiring Harness
Courtesy of GENERAL MOTORS CORP.

22. Connect the engine wiring harness electrical connector (1) to the ETC.
23. Connect the right side engine wiring harness electrical connector (3) to the main ignition coil electrical connector.
24. Install the right side CPA retainer (4) to the engine wiring harness main ignition coil electrical connector.

25. Connect the right side engine wiring harness electrical connectors (2) to the fuel injectors.

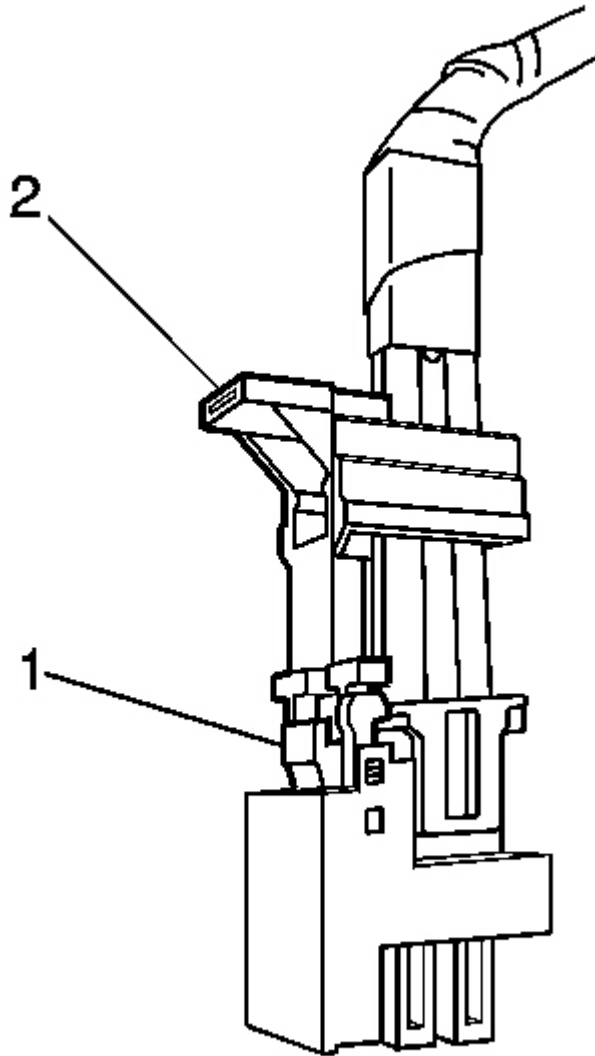


Fig. 114: View Of CPA Retainer & Tab
Courtesy of GENERAL MOTORS CORP.

26. Perform the following steps in order to connect the fuel injector electrical connectors:
1. Install the connectors to their corresponding injectors to ensure correct reassembly.
 2. Connect the fuel injector electrical connector.

3. Push the CPA retainer (2) on the connector in one click.
4. Repeat the steps for each injector electrical connector.

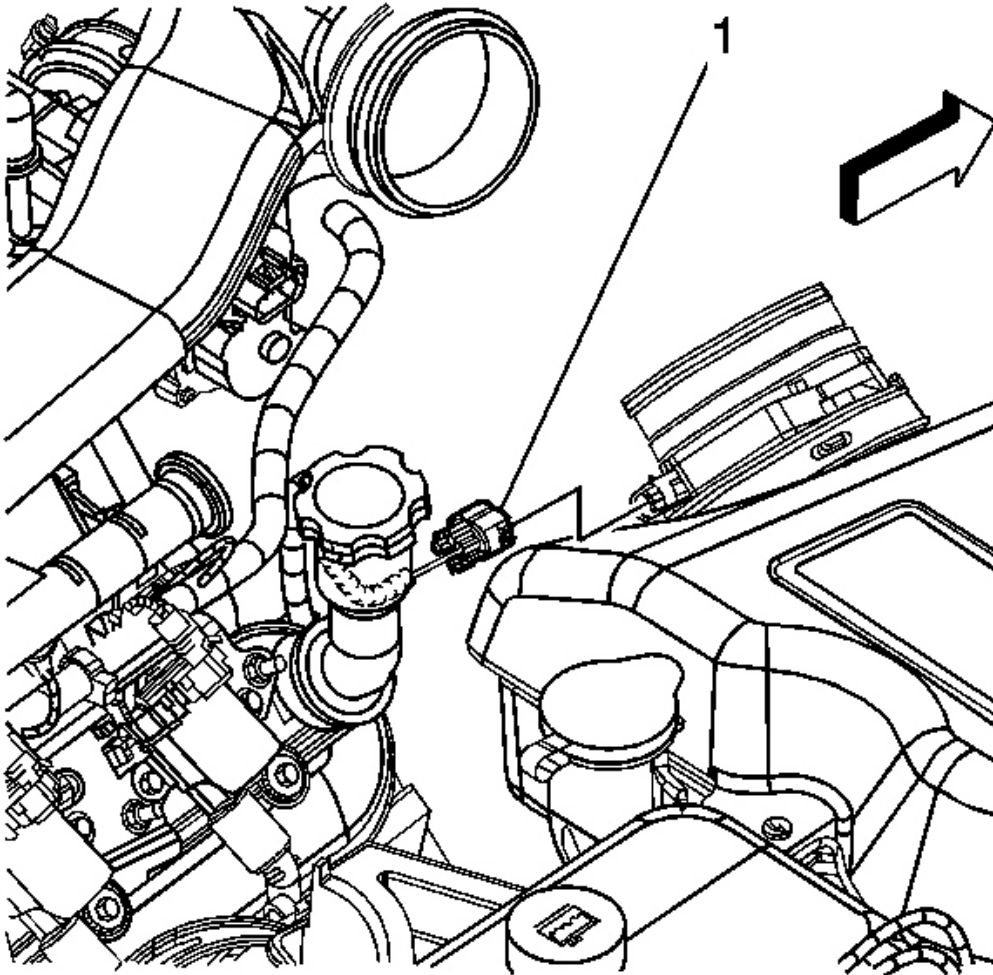


Fig. 115: View Of MAF/IAT Sensor Electrical Connector
Courtesy of GENERAL MOTORS CORP.

27. Connect the engine harness wiring harness electrical connector (1) to the MAF/IAT sensor.

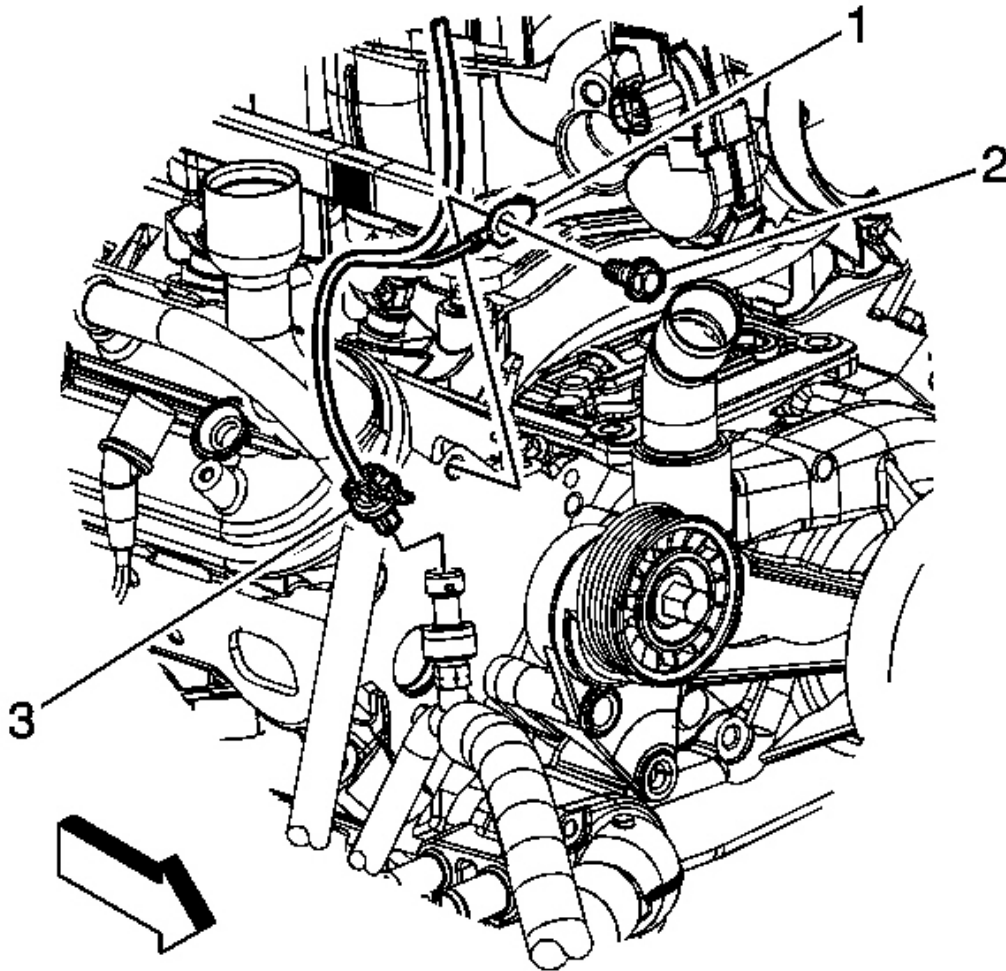


Fig. 116: Identifying Battery Cables
Courtesy of GENERAL MOTORS CORP.

28. Connect the engine wiring harness electrical connector (3) to the A/C compressor pressure switch.
29. Install the fuel fill cap.
30. Connect the negative battery cable. Refer to **Battery Negative Cable Disconnection and Connection** .
31. Use the following procedure in order to inspect for leaks:
 1. Turn the ignition ON, with the engine OFF, for 2 seconds.
 2. Turn the ignition OFF for 10 seconds.
 3. Turn the ignition ON, with the engine OFF.
 4. Inspect for fuel leaks.

ENGINE VALLEY COVER REPLACEMENT

Removal Procedure

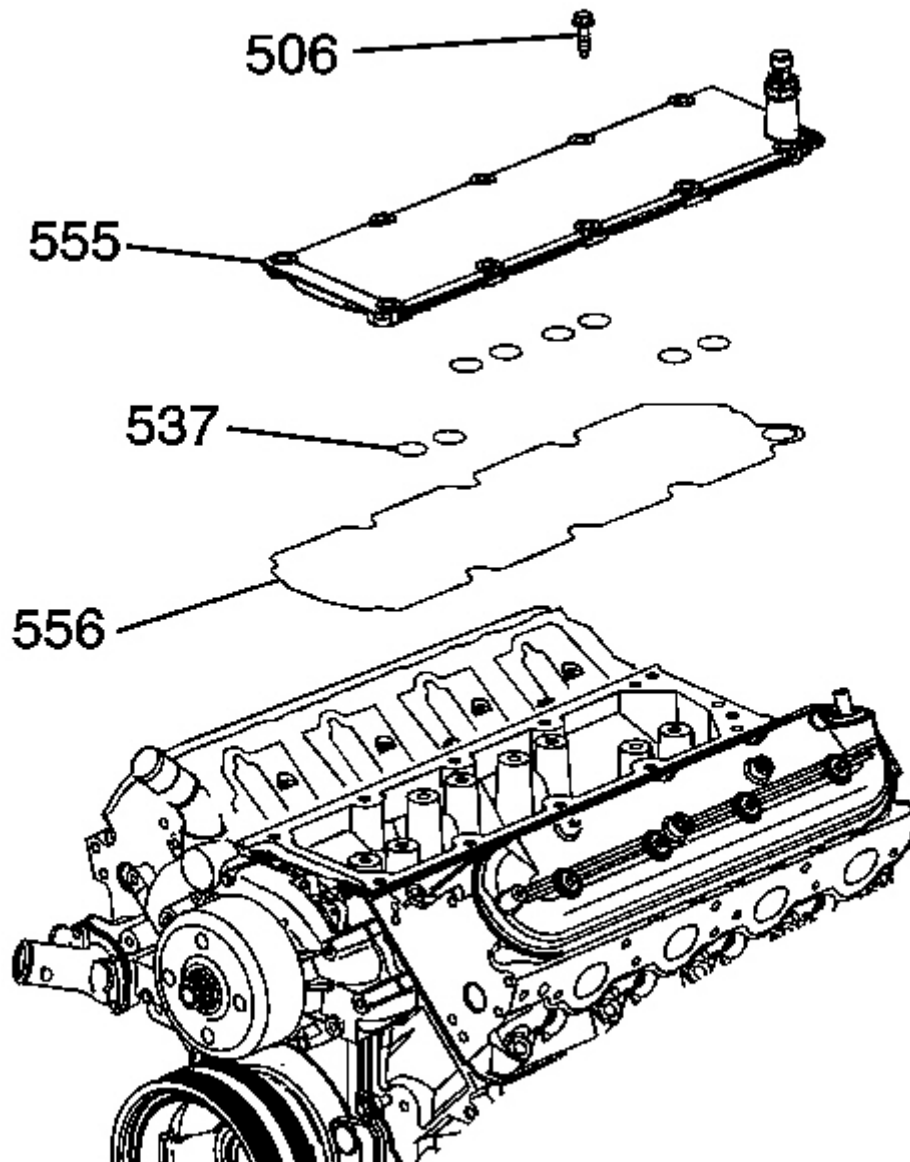


Fig. 117: View Of Engine Valley Cover & Gasket
Courtesy of GENERAL MOTORS CORP.

2007 Chevrolet TrailBlazer

2007 ENGINE Engine Mechanical - 6.0L - TrailBlazer

1. Remove the intake manifold. Refer to **Intake Manifold Replacement**.
2. Remove the valley cover bolts (506).
3. Remove the valley cover (555) and gasket (556).
4. Remove the O-ring seals (537) from the cover.

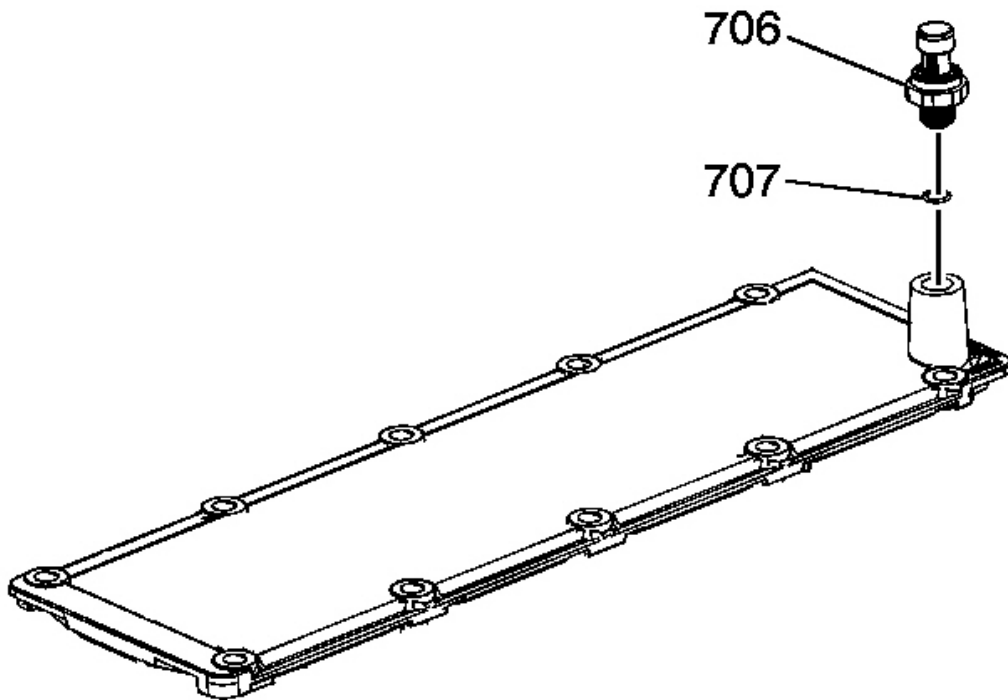


Fig. 118: Identifying Oil Pressure Sensor & Washer
Courtesy of GENERAL MOTORS CORP.

5. Remove the oil pressure sensor (706) and washer (707), as required.

Installation Procedure

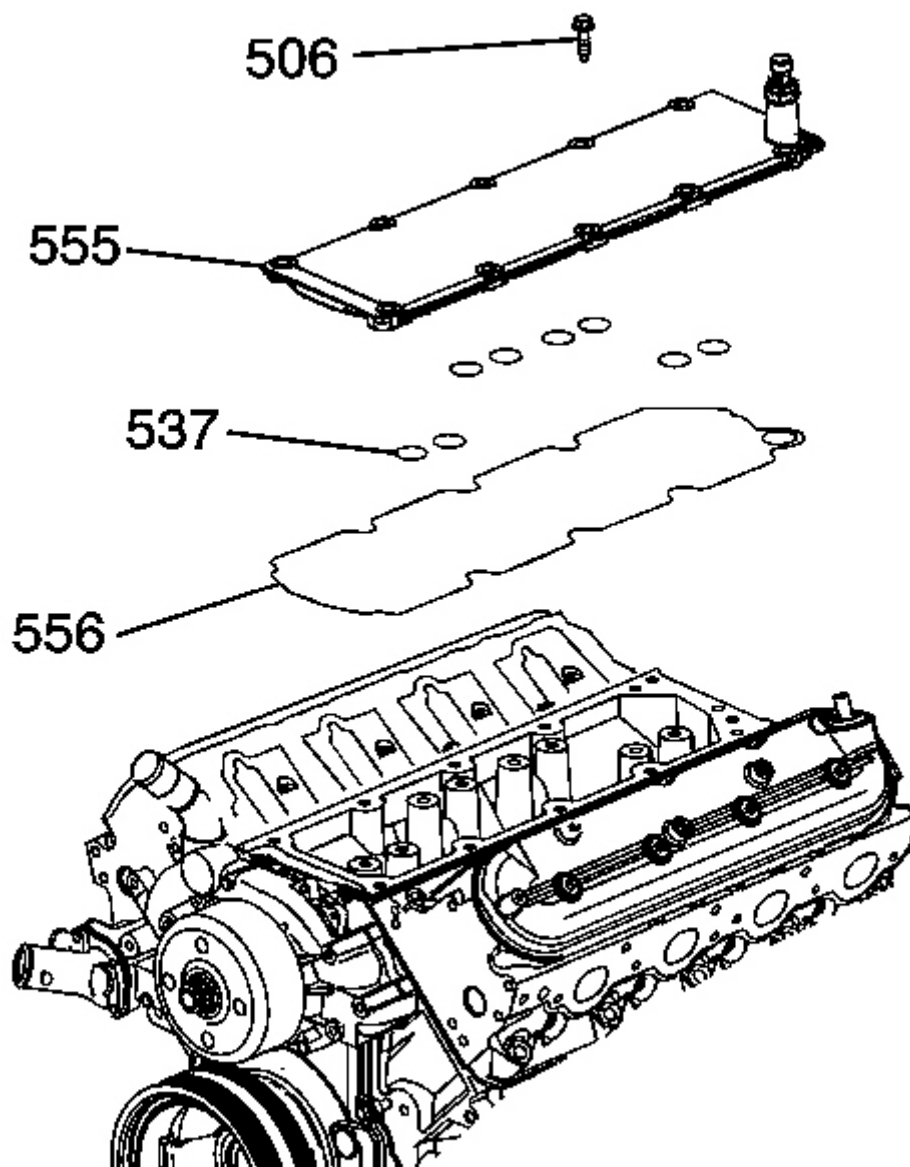


Fig. 119: View Of Engine Valley Cover & Gasket
Courtesy of GENERAL MOTORS CORP.

IMPORTANT: All gasket surfaces should be free of oil or other foreign material during assembly.

1. Lubricate the O-ring seals with clean engine oil.
2. Install the O-ring seals (537) to the cover (555).

NOTE: Refer to Fastener Notice .

3. Install the cover (555), gasket (556) and bolts (506).

Tighten: Tighten the manifold bolts to 25 N.m (18 lb ft).

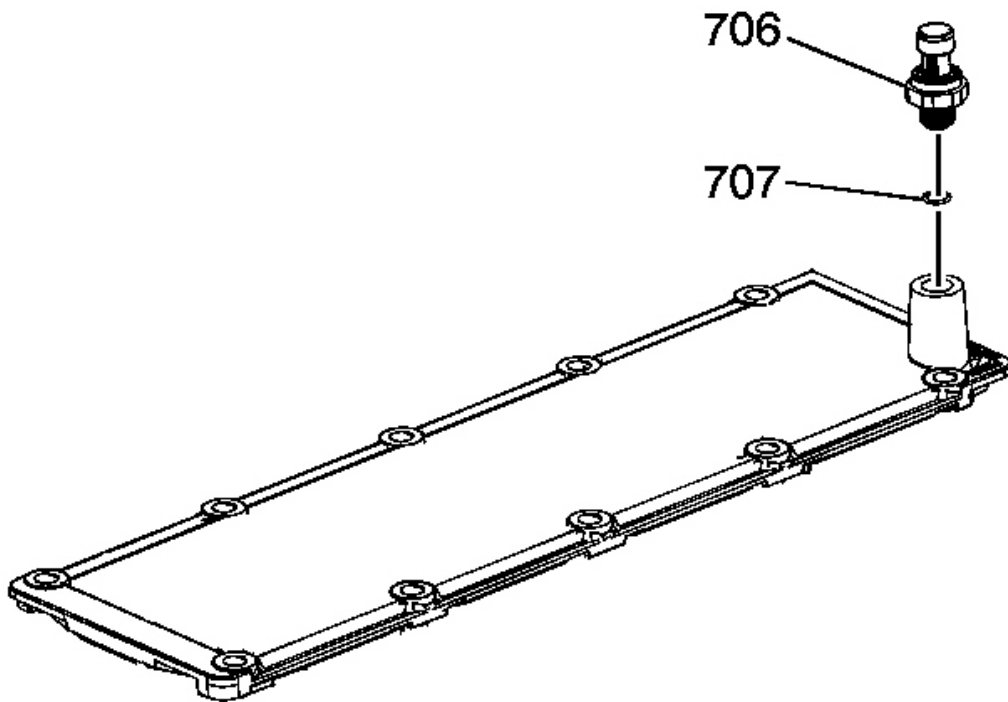


Fig. 120: Identifying Oil Pressure Sensor & Washer
Courtesy of GENERAL MOTORS CORP.

4. Apply sealant to the threads of the sensor. Refer to Sealers, Adhesives and Lubricants for the correct part number.
5. Install the oil pressure sensor (706) and sealing washer (707).

Tighten: Tighten the sensor to 35 N.m (26 lb ft).

6. Install the intake manifold. Refer to Intake Manifold Replacement.

VALVE ROCKER ARM COVER REPLACEMENT - LEFT SIDE

Removal Procedure

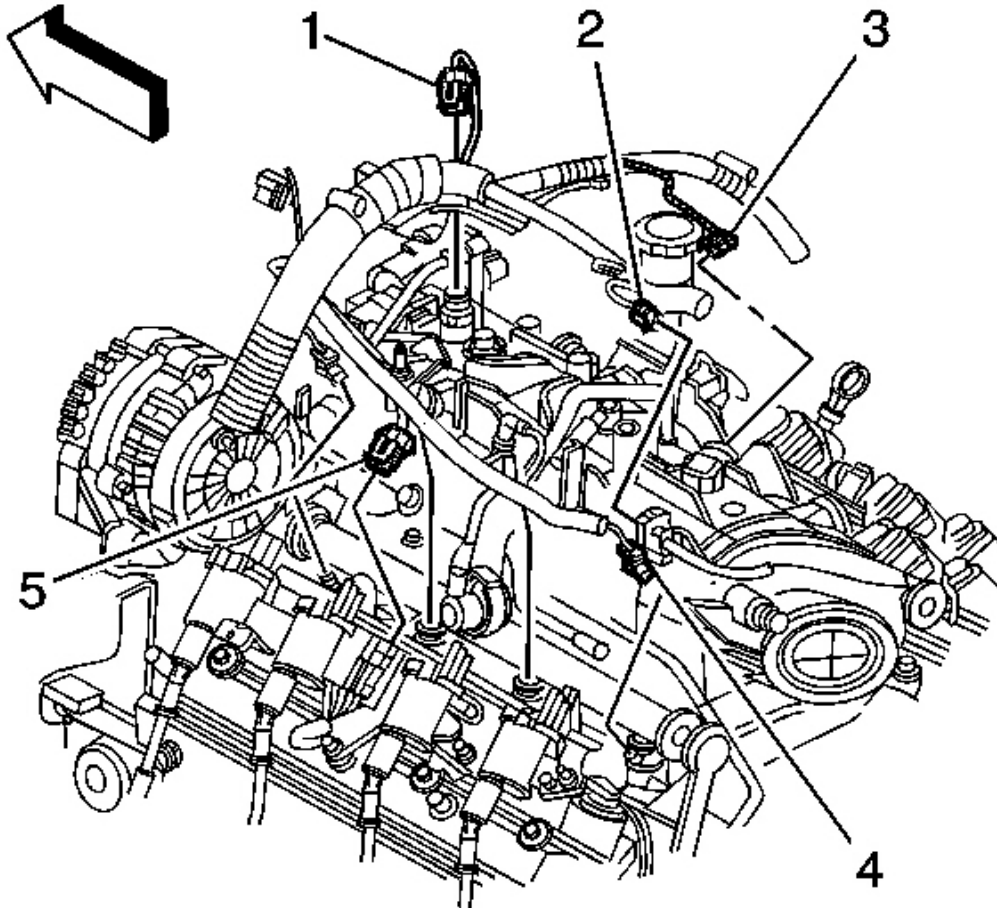


Fig. 121: Top Of Engine Wiring Harness View
Courtesy of GENERAL MOTORS CORP.

1. Remove the intake manifold sight shield. Refer to **Upper Intake Manifold Sight Shield Replacement**.
2. Remove the connector position assurance (CPA) lock.
3. Disconnect the main electrical connector (5) to the ignition coil wire harness.
4. Remove the harness clips.
5. Reposition the engine harness, if necessary.
6. Remove the spark plug wires from the ignition coils.

- Twist each plug wire 1/2 turn.
- Pull only on the boot in order to remove the wire from the ignition coil.

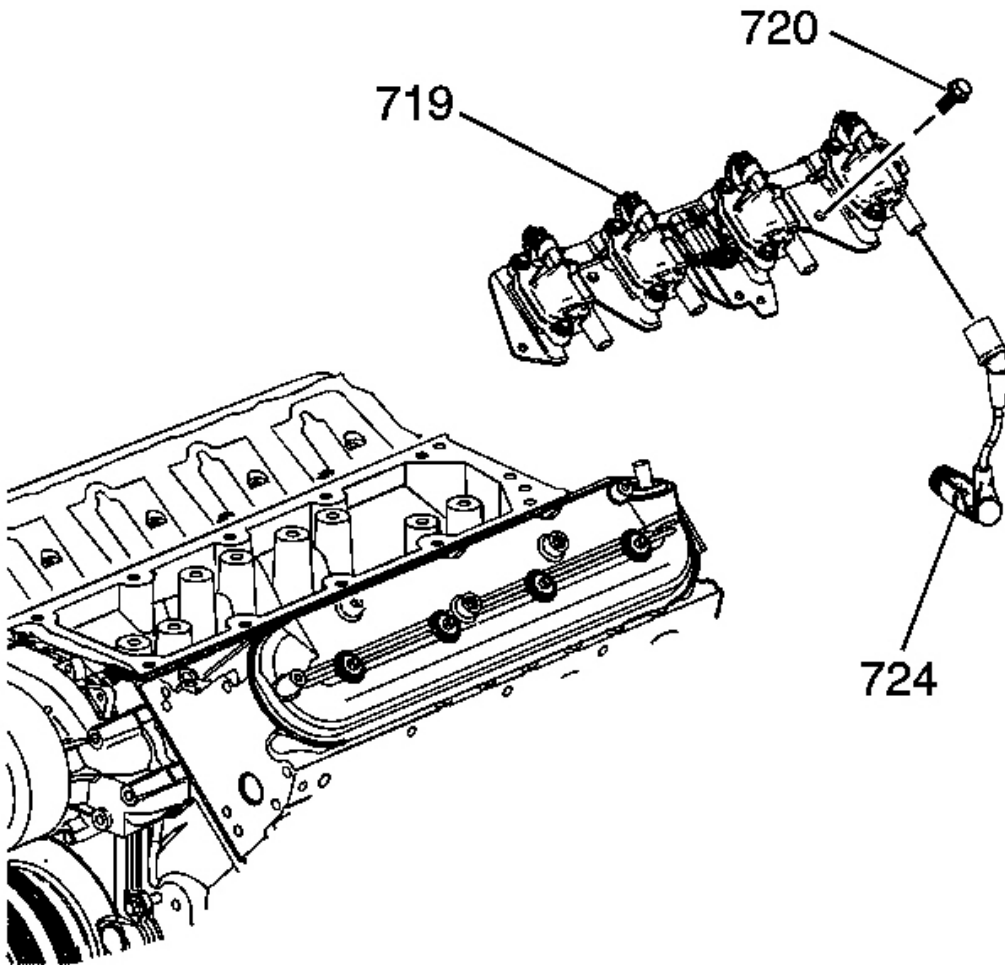


Fig. 122: View Of Left Rocker Arm Cover Components
Courtesy of GENERAL MOTORS CORP.

7. If necessary, remove the ignition coil bracket studs from the rocker arm cover.
8. If necessary, remove the ignition coils and bracket from the rocker arm cover.

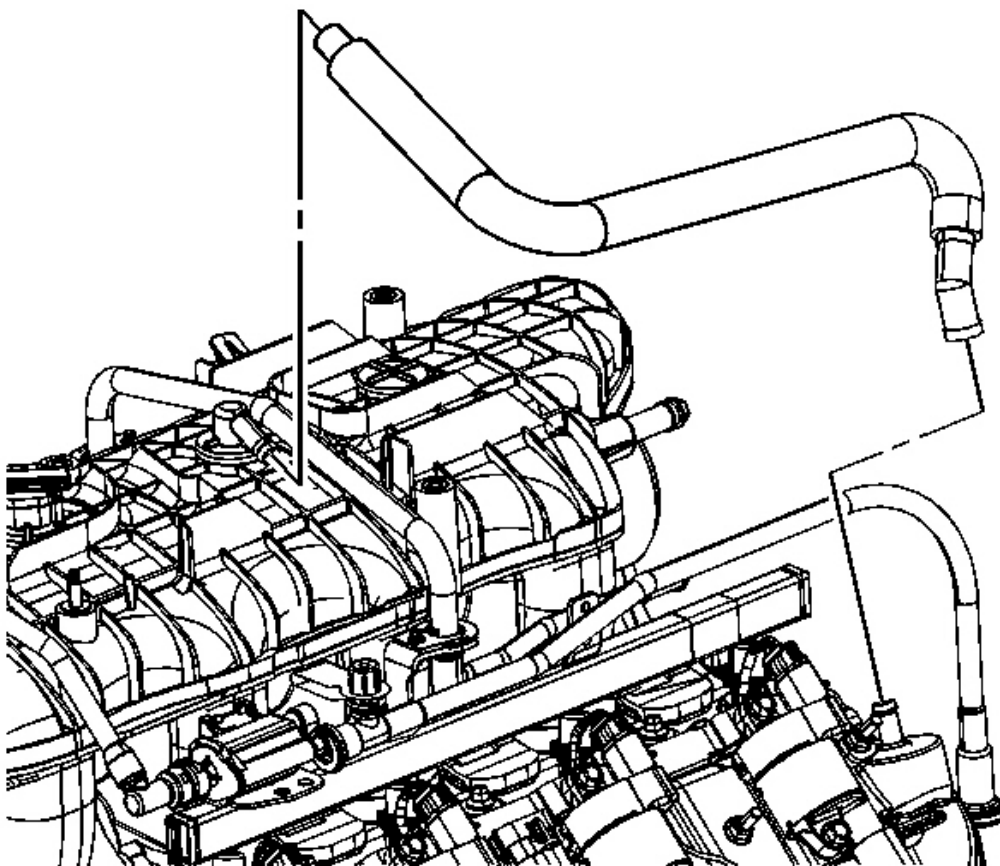


Fig. 123: Identifying Positive Crankcase Ventilation (PCV) Foul Air Hose
Courtesy of GENERAL MOTORS CORP.

9. Remove the positive crankcase ventilation (PCV) hose from the rocker arm cover.

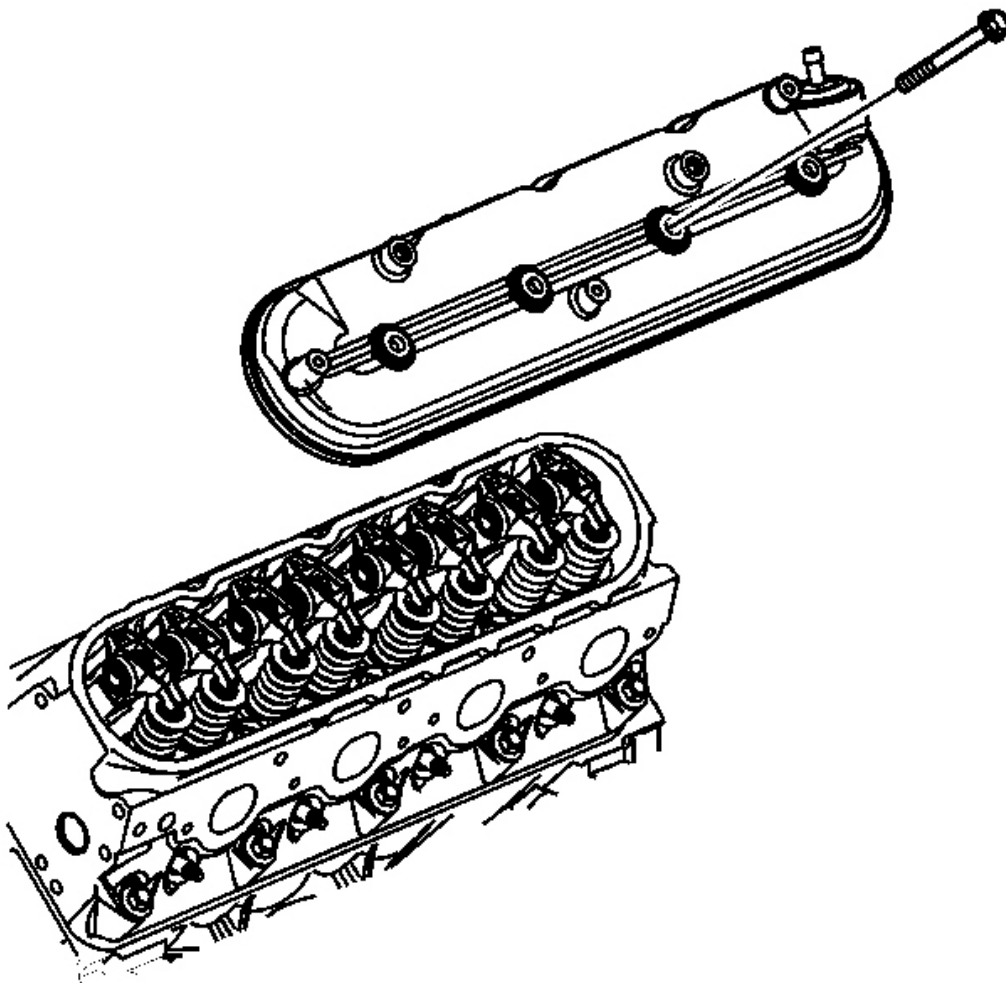


Fig. 124: View Of Valve Rocker Arm Cover
Courtesy of GENERAL MOTORS CORP.

10. Remove the valve rocker arm cover bolts.
11. Remove the valve rocker arm cover.

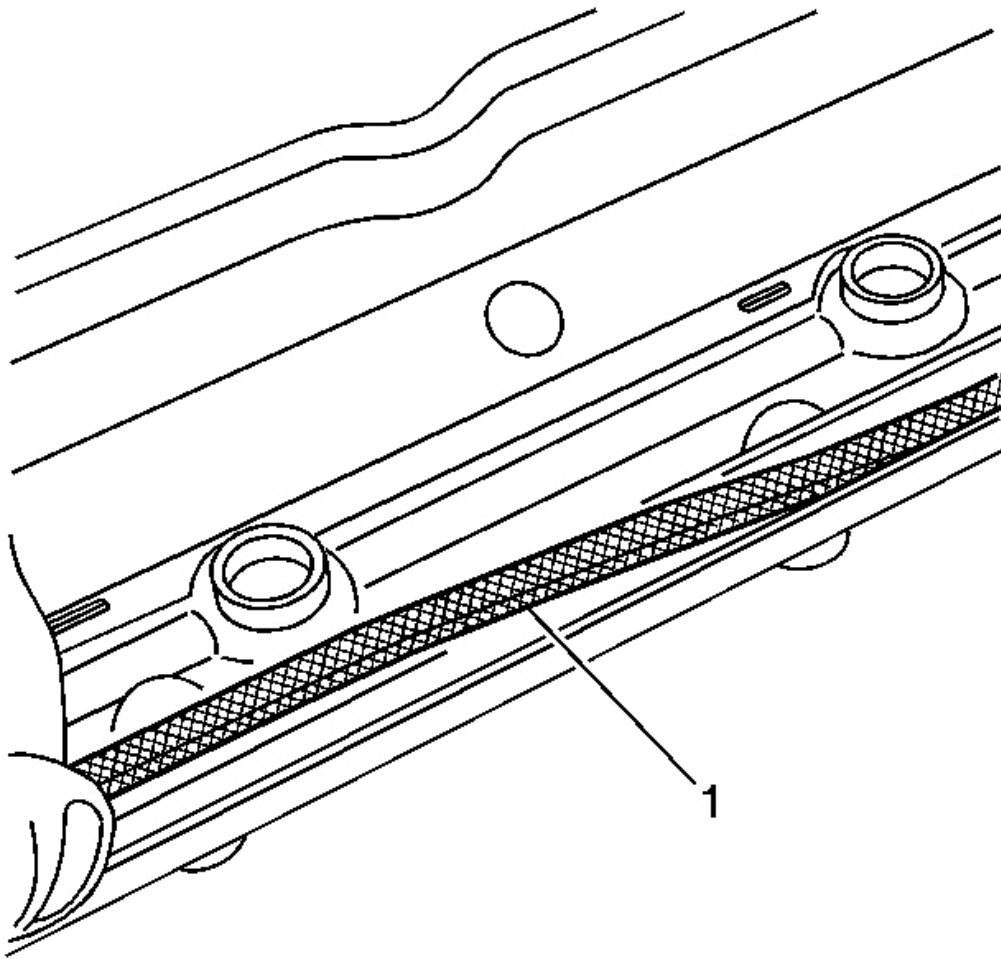


Fig. 125: View Of Valve Rocker Arm Cover Gasket
Courtesy of GENERAL MOTORS CORP.

12. Remove the gasket (1) from the rocker cover.
13. Discard the OLD gasket.

Installation Procedure

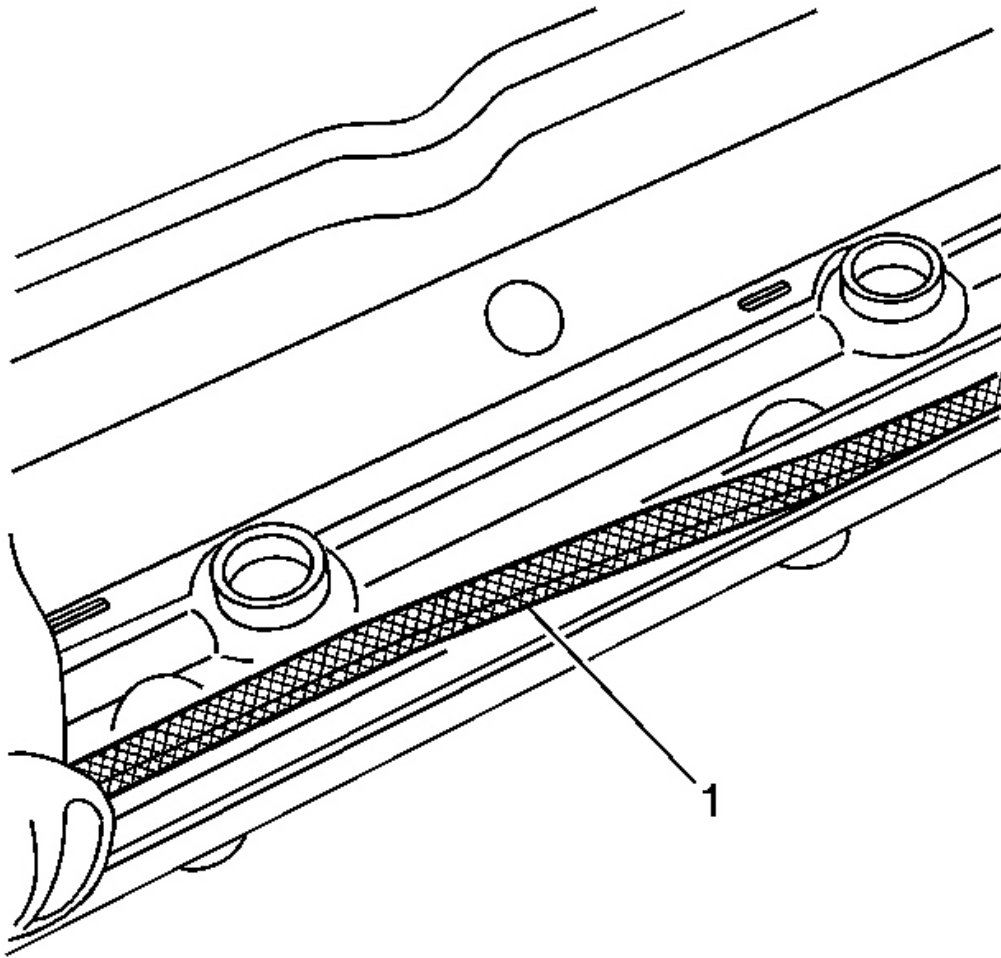


Fig. 126: View Of Valve Rocker Arm Cover Gasket
Courtesy of GENERAL MOTORS CORP.

IMPORTANT:

- All gasket surfaces should be free of oil an/or other foreign material during assembly.
- DO NOT reuse the valve rocker arm cover gasket.
- The valve rocker arm cover bolt grommets may be reused.
- If the PCV valve grommet has been removed from the rocker cover, install a NEW grommet during assembly.

1. Install a NEW rocker cover gasket (1) into the groove of the valve rocker arm cover.

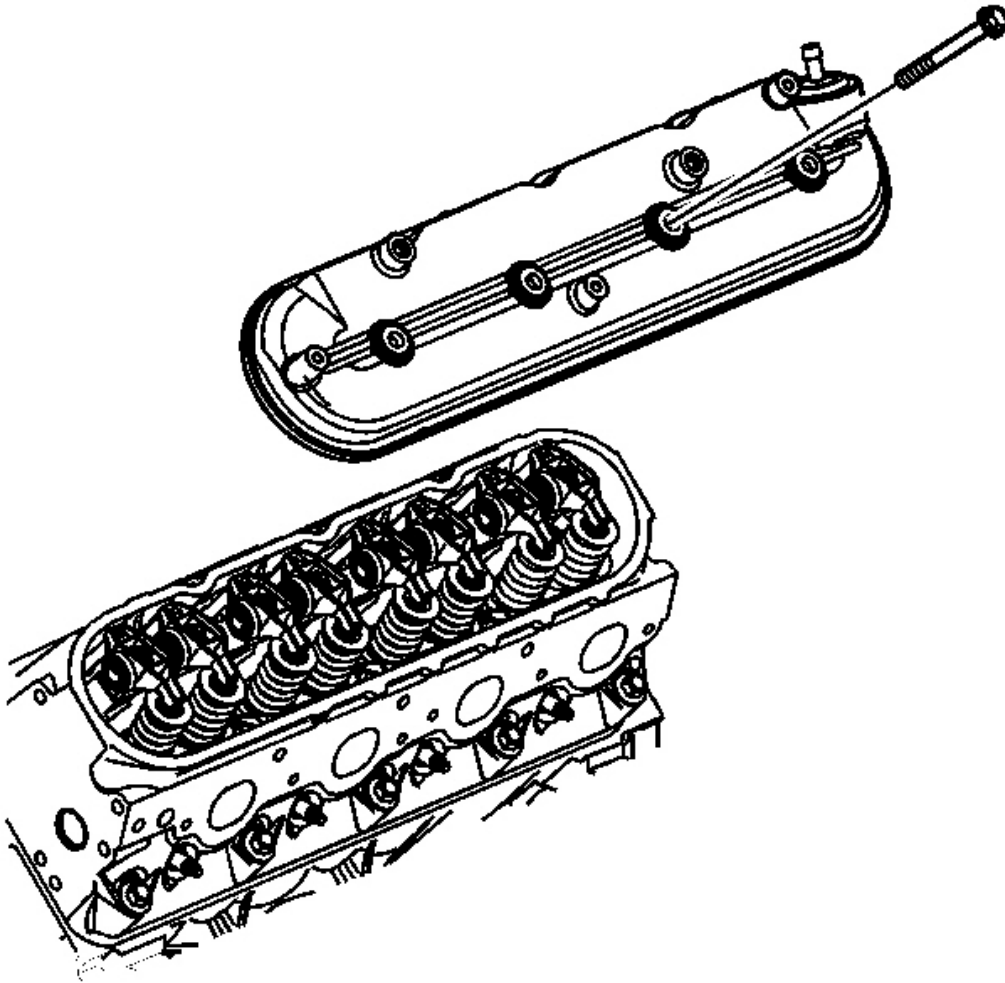


Fig. 127: View Of Valve Rocker Arm Cover
Courtesy of GENERAL MOTORS CORP.

2. Install the valve rocker arm cover onto the cylinder head.
3. Install new rocker arm cover grommets, if necessary.

NOTE: Refer to Fastener Notice .

4. Install the rocker arm cover bolts.

Tighten: Tighten the bolts to 12 N.m (106 lb in).

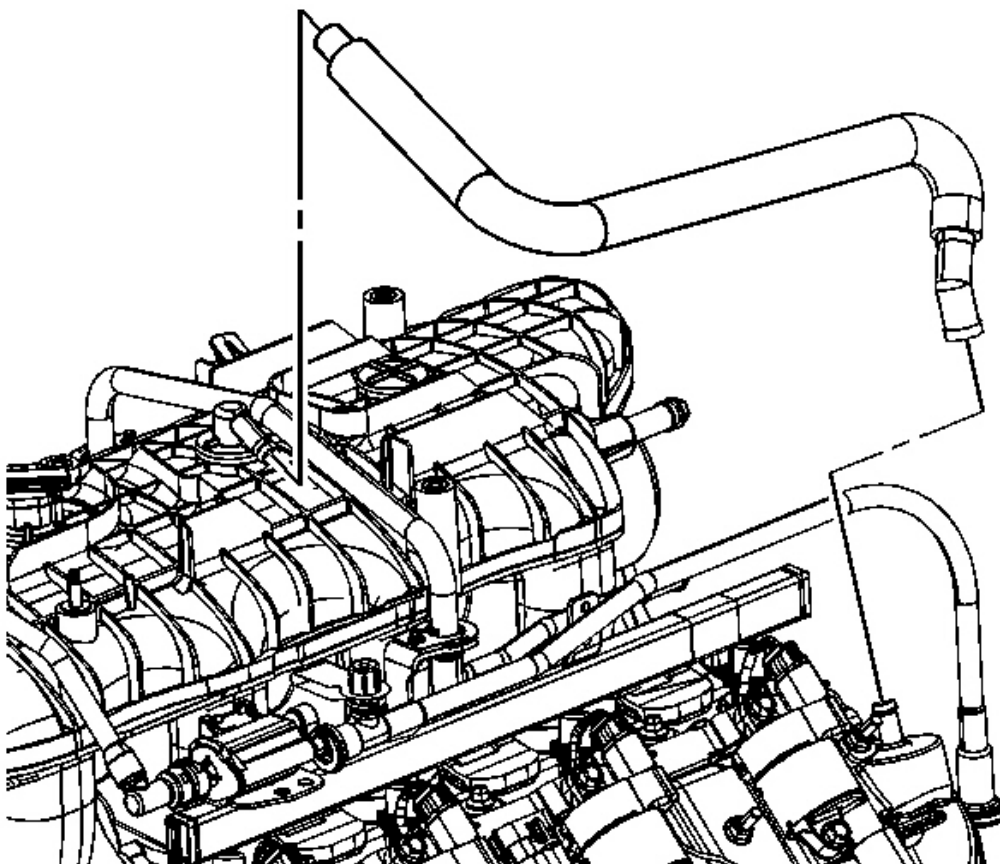


Fig. 128: Identifying Positive Crankcase Ventilation (PCV) Foul Air Hose
Courtesy of GENERAL MOTORS CORP.

5. Install the PCV hose to the rocker arm cover.

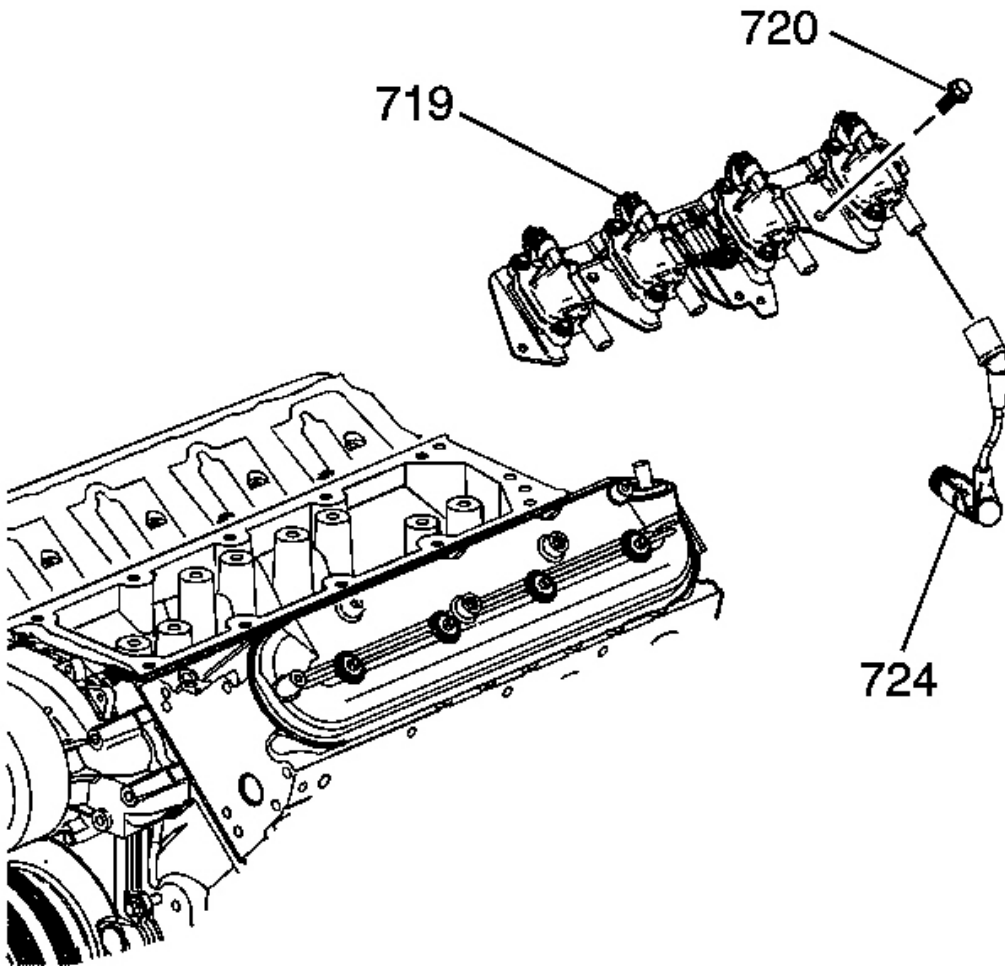


Fig. 129: View Of Left Rocker Arm Cover Components
Courtesy of GENERAL MOTORS CORP.

6. Apply threadlock to the threads of the bracket bolts. Refer to **Sealers, Adhesives and Lubricants** .
7. If necessary, install the ignition coils and bracket to the rocker arm cover.
8. If necessary, install the ignition coil bracket studs to the rocker arm cover.

Tighten: Tighten the studs to 12 N.m (106 lb in).

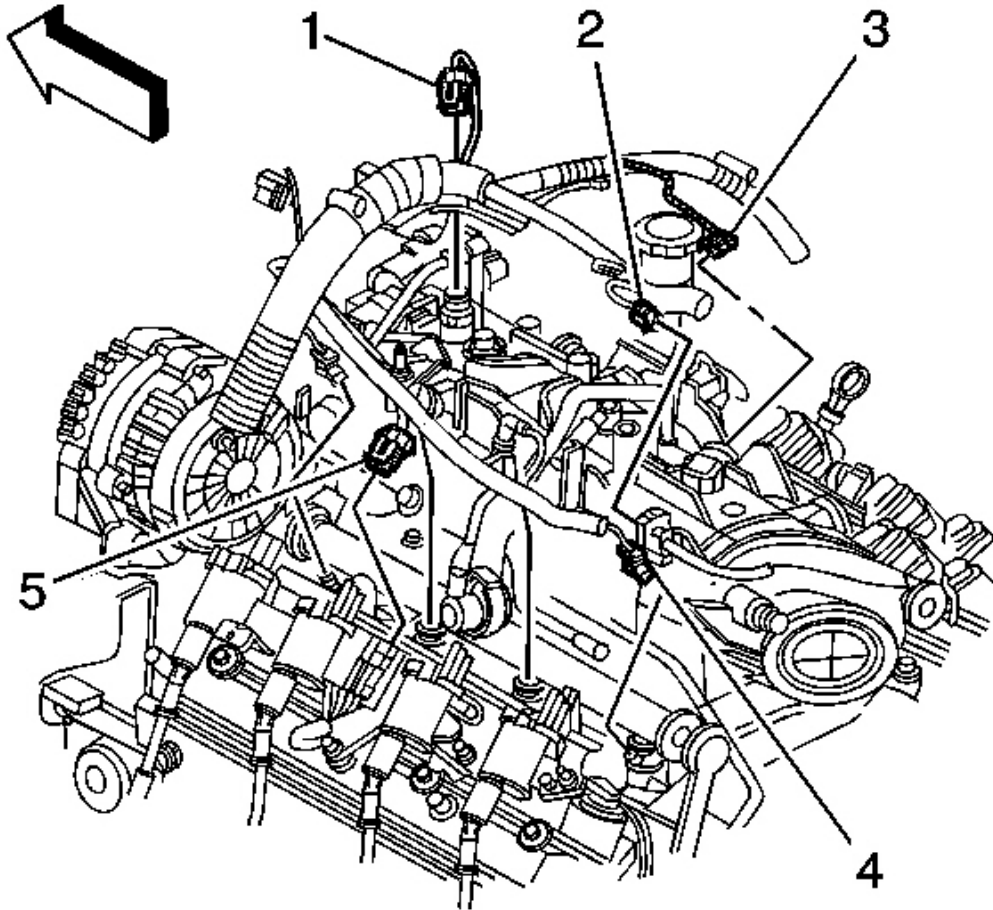


Fig. 130: Top Of Engine Wiring Harness View
Courtesy of GENERAL MOTORS CORP.

9. Install the spark plug wires to the ignition coils.
10. Position the engine harness, if necessary.
11. Install the harness clips.
12. Connect the main electrical connector (5) to the ignition coil wire harness.
13. Install the CPA lock.
14. Install the intake manifold sight shield. Refer to **Upper Intake Manifold Sight Shield Replacement**.

VALVE ROCKER ARM COVER REPLACEMENT - RIGHT SIDE

Removal Procedure

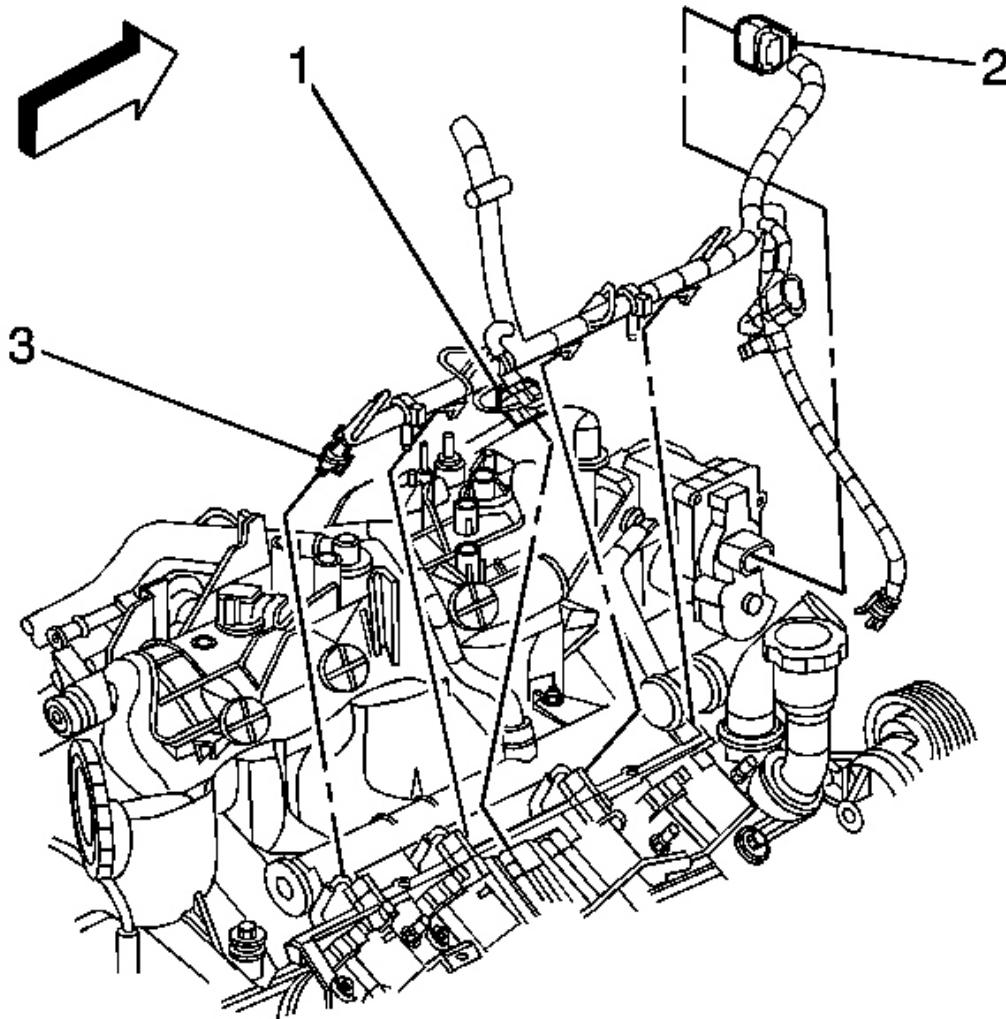


Fig. 131: Locating Electrical Components At Top Of Engine
Courtesy of GENERAL MOTORS CORP.

1. Remove the intake manifold sight shield. Refer to **Upper Intake Manifold Sight Shield Replacement**.
2. Remove the air conditioning (A/C) compressor hose. Refer to **Compressor Hose Assembly Replacement (LH6, LS2)** or **Compressor Hose Assembly Replacement (LL8)** .
3. Remove the connector position assurance (CPA) lock.
4. Disconnect the main electrical connector (1) to the ignition coil wire harness.
5. Remove the harness clips.
6. Reposition the engine harness, if necessary.

7. Remove the spark plug wires from the ignition coils.
 - Twist each plug wire 1/2 turn.
 - Pull only on the boot in order to remove the wire from the ignition coil.

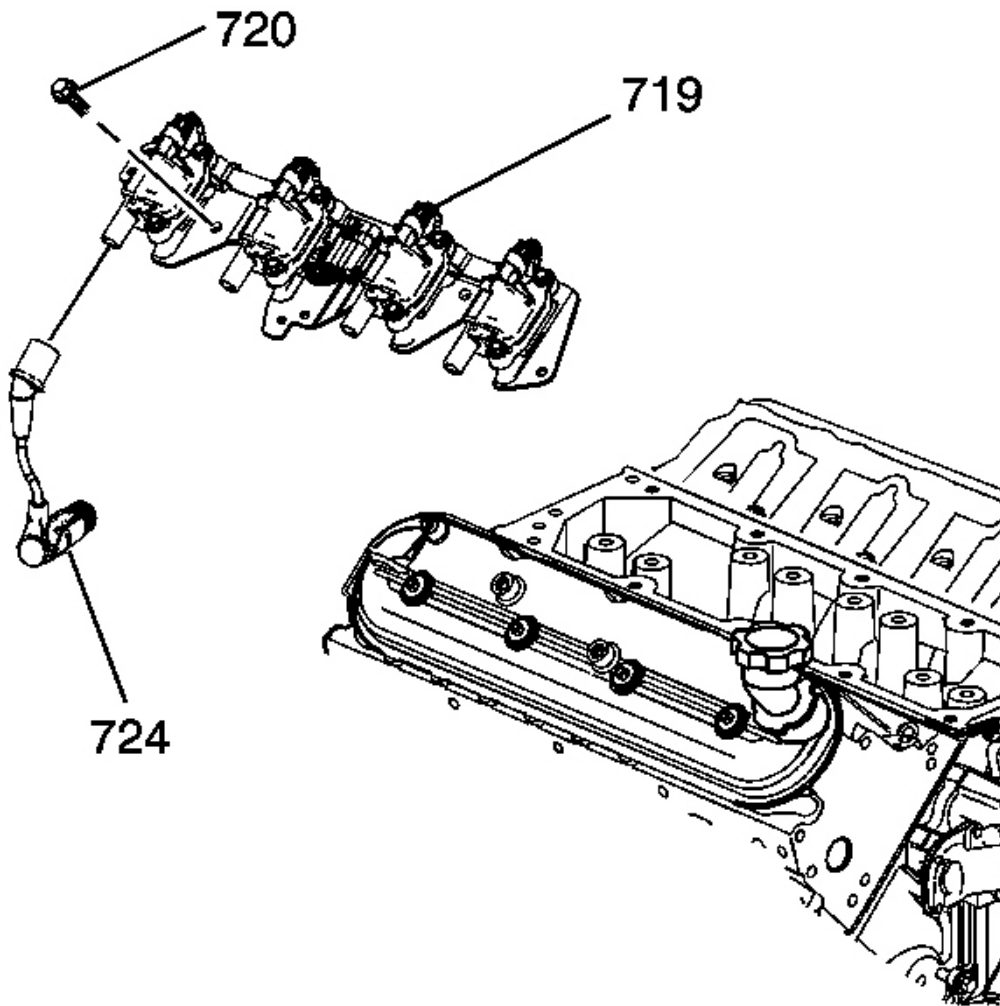


Fig. 132: View Of Right Rocker Arm Cover Components
Courtesy of GENERAL MOTORS CORP.

8. If necessary, remove the ignition coil bracket studs from the rocker arm cover.
9. If necessary, remove the ignition coils and bracket from the rocker cover.

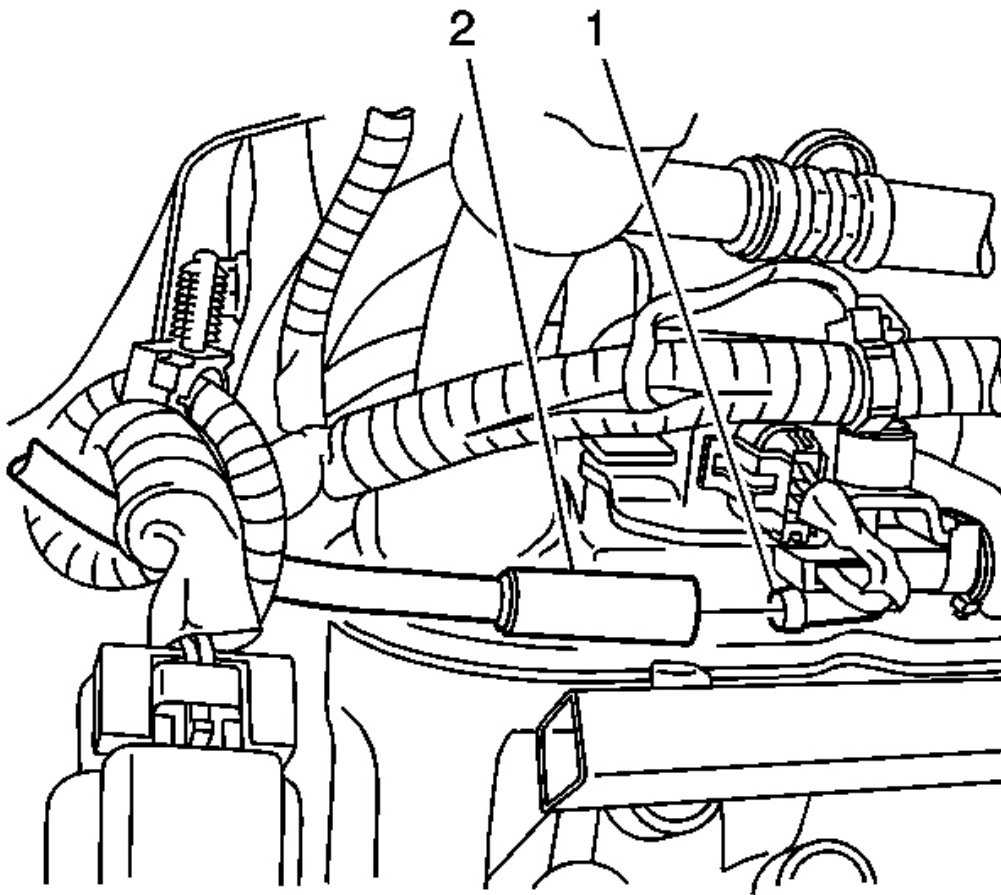


Fig. 133: Identifying PCV Fresh Air Hose
Courtesy of GENERAL MOTORS CORP.

10. Remove the vent hose (2) from the valve rocker arm cover (1).

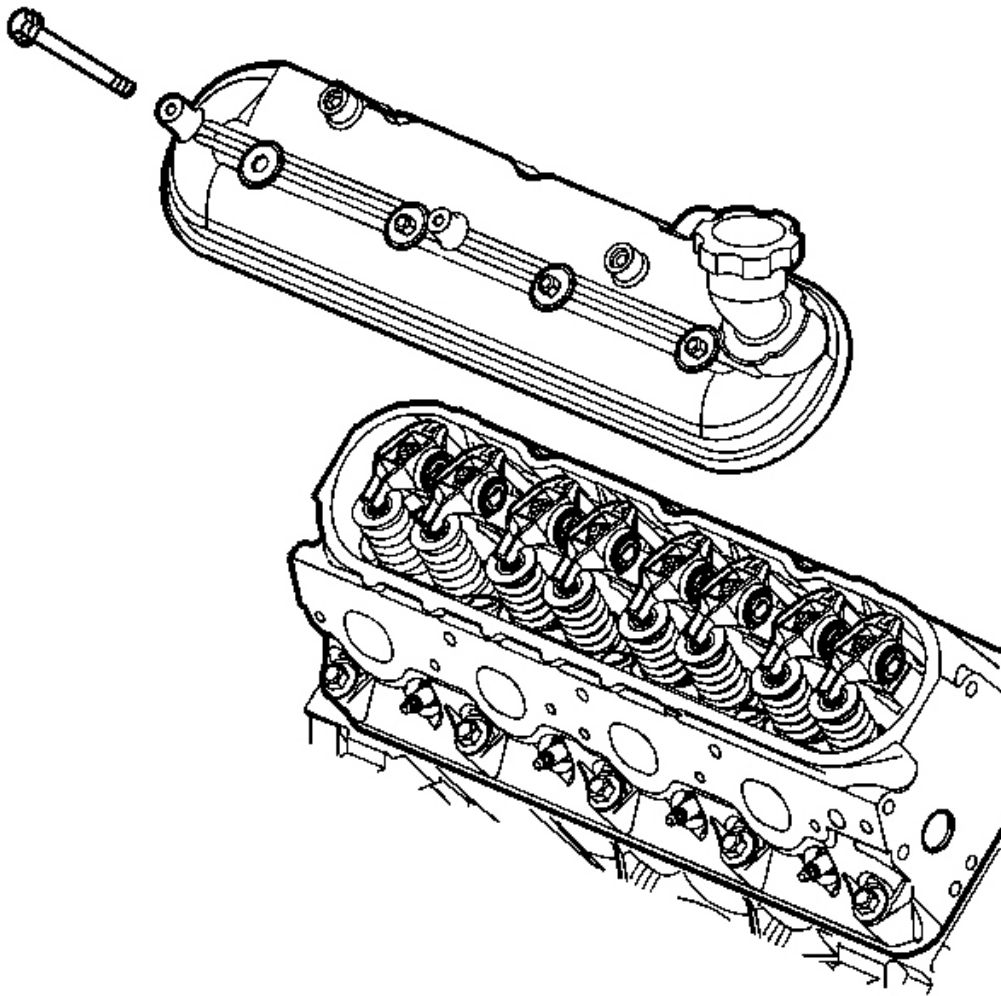


Fig. 134: View Of Valve Rocker Arm Cover & Bolts (Right)
Courtesy of GENERAL MOTORS CORP.

11. Remove the valve rocker arm cover bolts.
12. Remove the valve rocker arm cover.

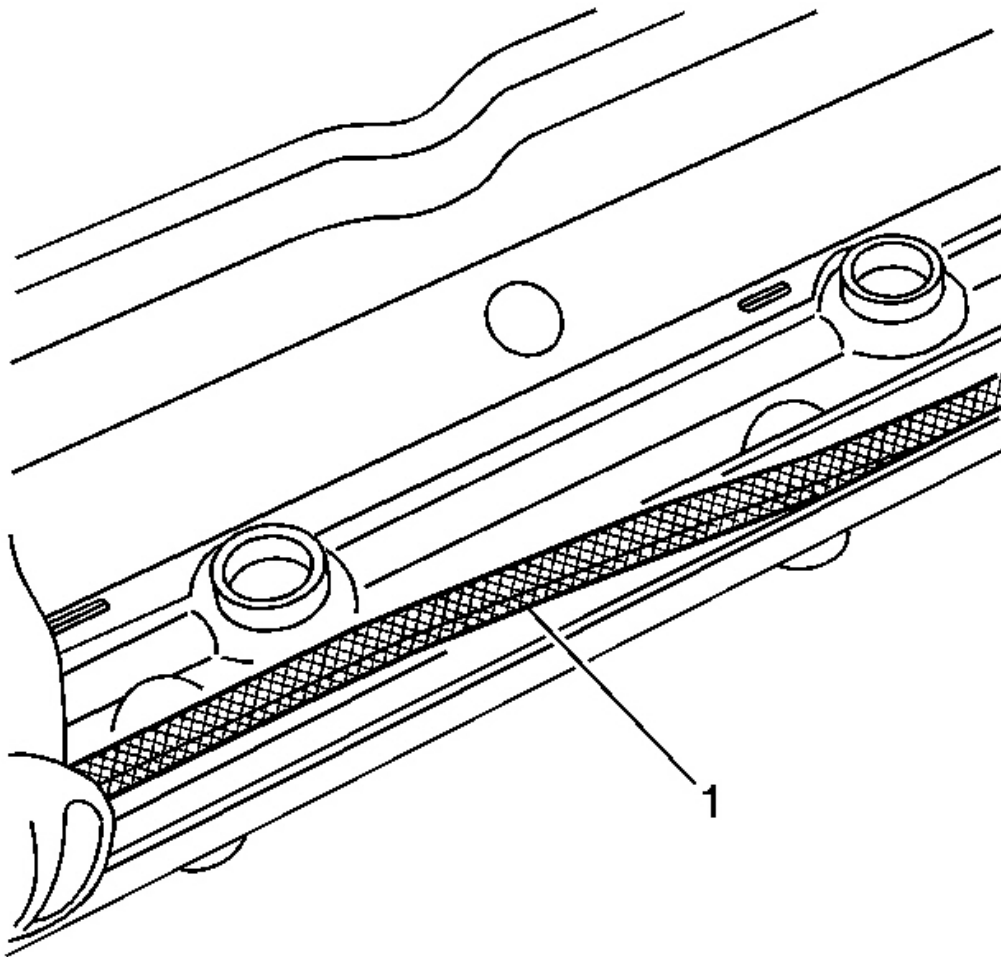


Fig. 135: View Of Valve Rocker Arm Cover Gasket
Courtesy of GENERAL MOTORS CORP.

13. Remove the gasket (1) from the rocker cover.
14. Discard the OLD gasket.

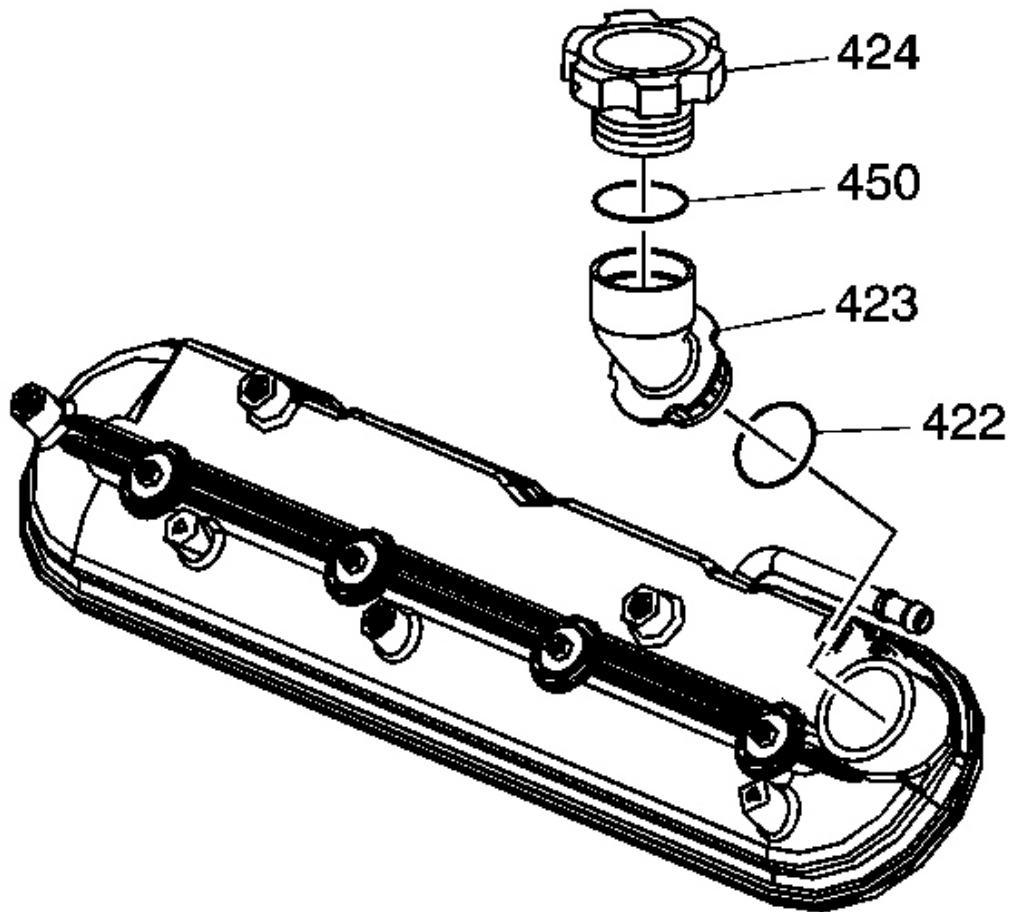


Fig. 136: Identifying Oil Fill Cap & Oil Fill Tube
Courtesy of GENERAL MOTORS CORP.

15. Remove the oil fill cap from the oil fill tube.
16. Remove the oil fill tube from the rocker cover, if required.
17. Discard the oil fill tube.

Installation Procedure

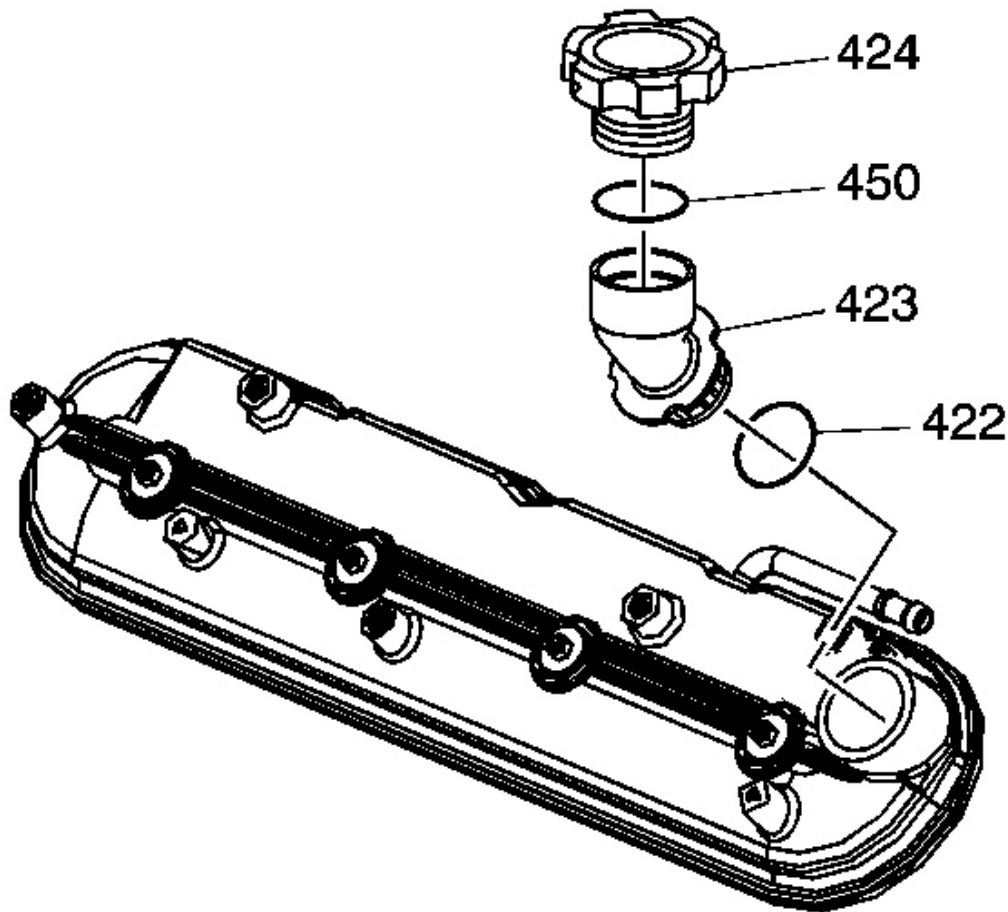


Fig. 137: Identifying Oil Fill Cap & Oil Fill Tube
Courtesy of GENERAL MOTORS CORP.

IMPORTANT:

- All gasket surfaces should be free of oil or other foreign material during assembly.
- DO NOT reuse the valve rocker arm cover gasket.
- The valve rocker arm cover bolt grommets may be reused.
- If the oil fill tube has been removed from the rocker arm cover, install a NEW fill tube during assembly.

1. Lubricate the O-ring seal of the NEW oil fill tube with clean engine oil.
2. Insert the NEW oil fill tube into the rocker arm cover.

Rotate the tube clockwise until locked in the proper position.

3. Install the oil fill cap into the tube.

Rotate the cap clockwise until locked in the proper position.

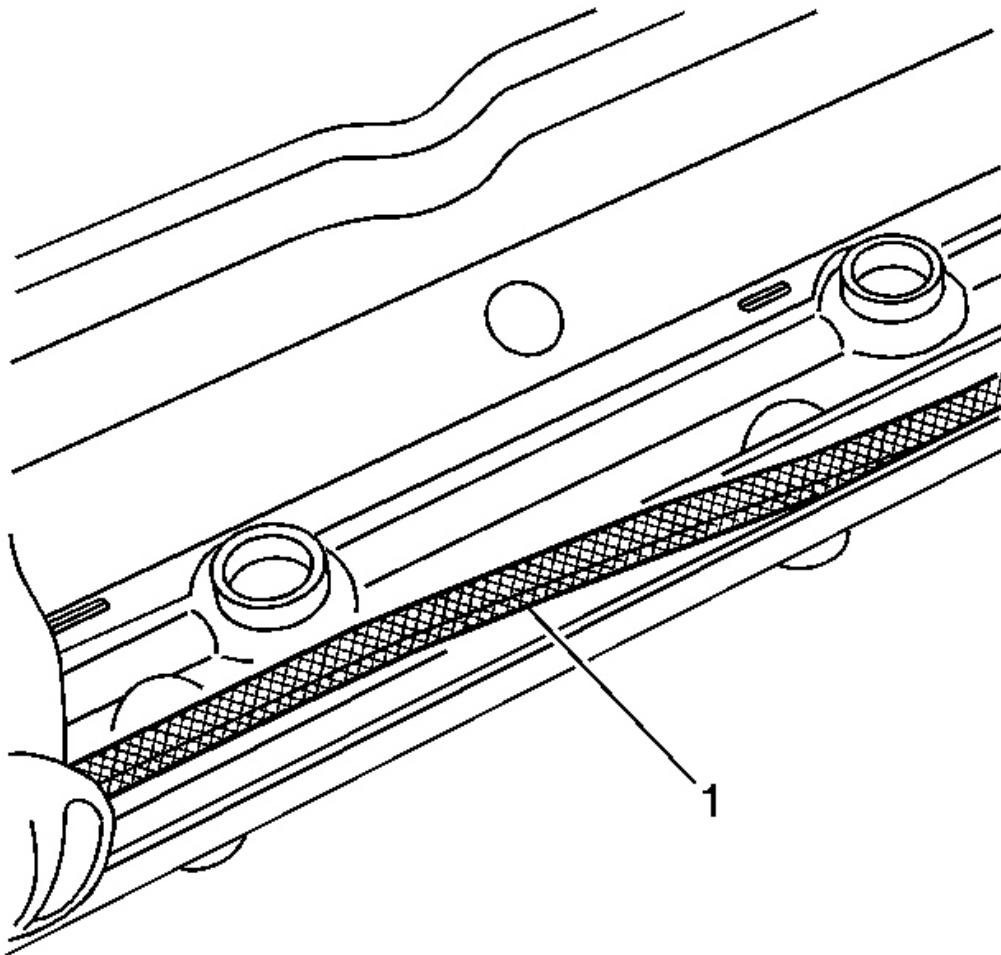


Fig. 138: View Of Valve Rocker Arm Cover Gasket
Courtesy of GENERAL MOTORS CORP.

4. Install a NEW rocker cover gasket (1) into the valve rocker arm cover.

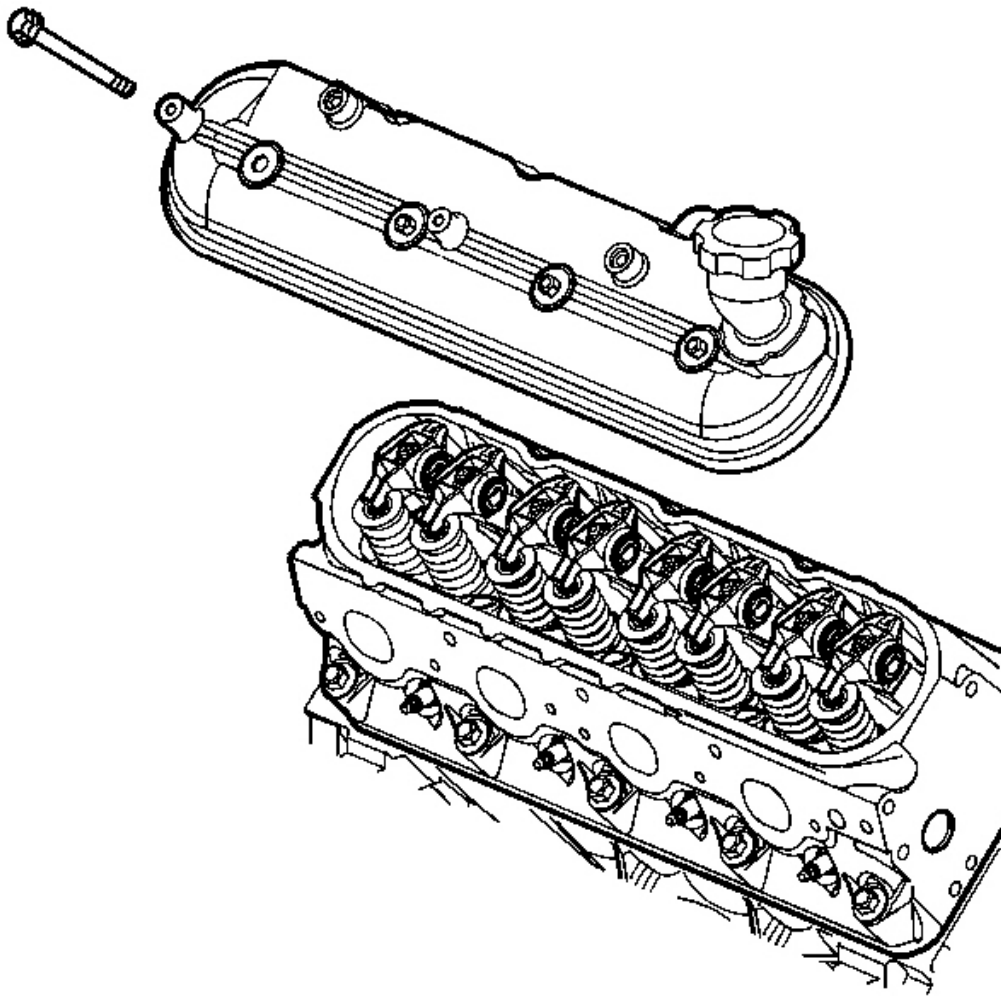


Fig. 139: View Of Valve Rocker Arm Cover & Bolts (Right)
Courtesy of GENERAL MOTORS CORP.

5. Install the valve rocker arm cover onto the cylinder head.
6. Install new rocker arm cover grommets, if necessary.

NOTE: Refer to **Fastener Notice** .

7. Install the rocker arm cover bolts and grommets.

Tighten: Tighten the bolts to 12 N.m (106 lb in).

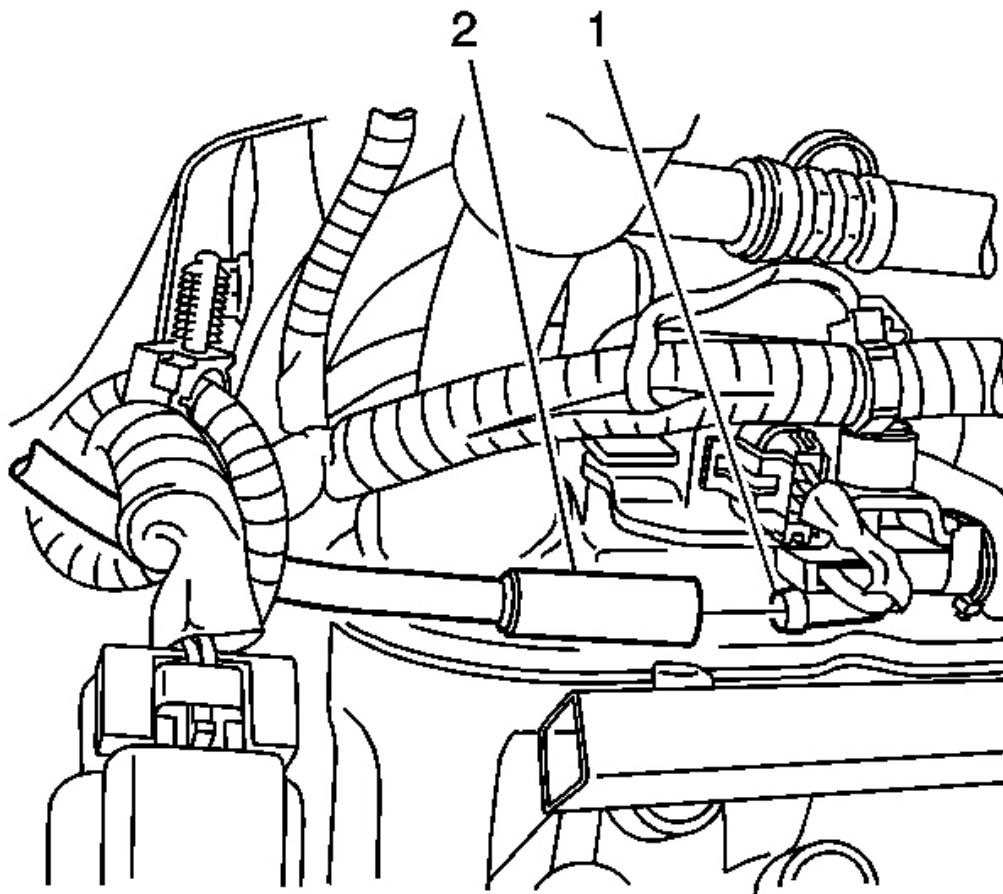


Fig. 140: Identifying PCV Fresh Air Hose
Courtesy of GENERAL MOTORS CORP.

8. Install the vent hose (2) to the valve rocker arm cover (1).

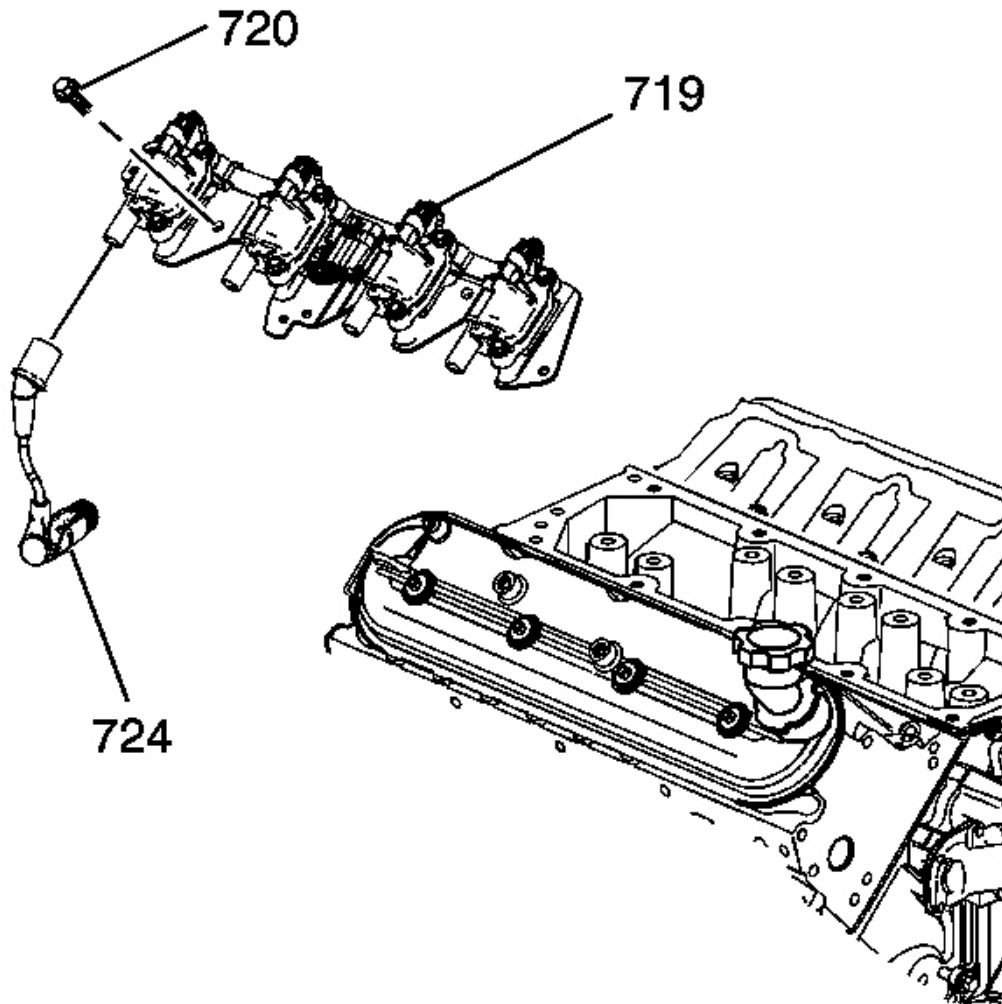


Fig. 141: View Of Right Rocker Arm Cover Components
Courtesy of GENERAL MOTORS CORP.

9. Apply threadlock to the threads of the bracket bolts. Refer to **Sealers, Adhesives and Lubricants** .
10. If necessary, install the ignition coils and bracket to the rocker arm cover.
11. If necessary, install the ignition coil bracket studs to the rocker cover.

Tighten: Tighten the studs to 12 N.m (106 lb in).

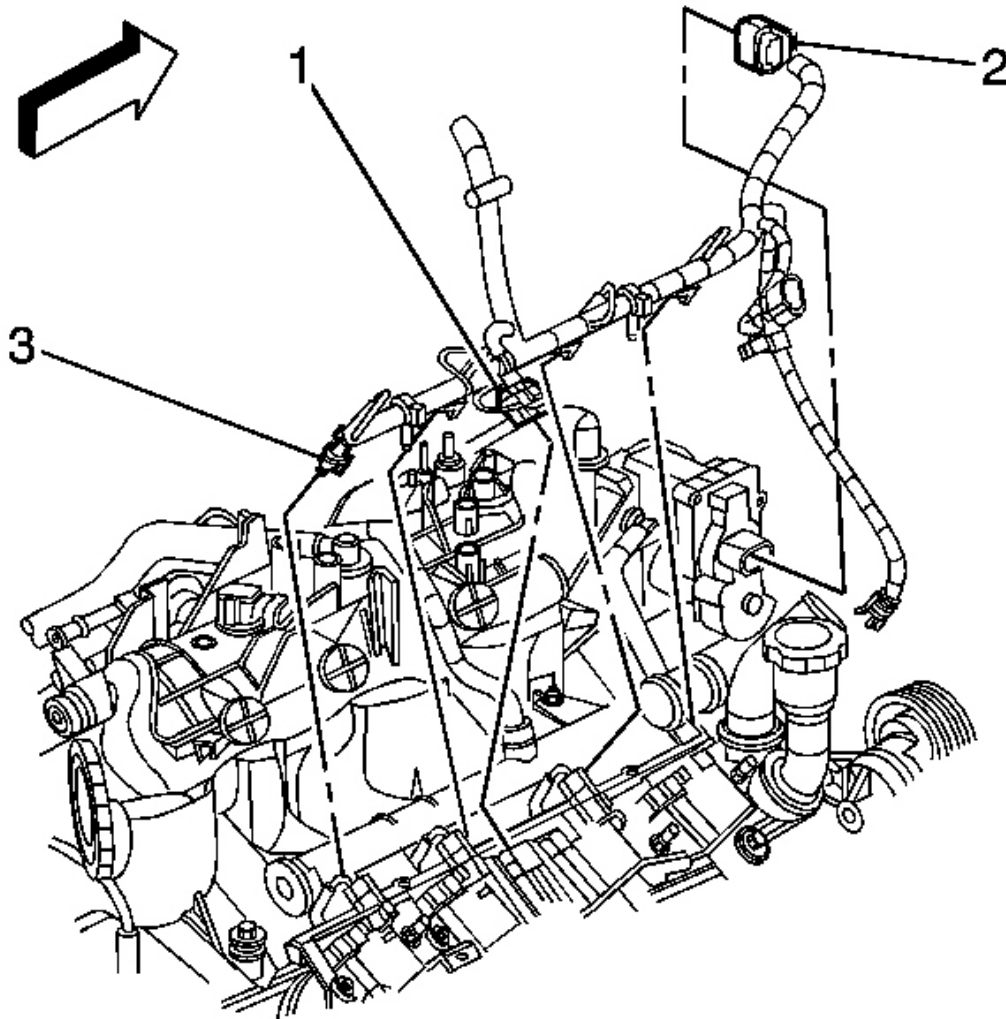


Fig. 142: Locating Electrical Components At Top Of Engine
Courtesy of GENERAL MOTORS CORP.

12. Install the spark plug wires to the ignition coils.
13. Position the engine harness, if necessary.
14. Install the harness clips.
15. Connect the main electrical connector (1) feeding the ignition coils.
16. Install the CPA lock.
17. Install the A/C compressor hose. Refer to **Compressor Hose Assembly Replacement (LH6, LS2)** or **Compressor Hose Assembly Replacement (LL8)** .

18. Install the intake manifold sight shield. Refer to **Upper Intake Manifold Sight Shield Replacement**.

VALVE ROCKER ARM AND PUSH ROD REPLACEMENT

Removal Procedure

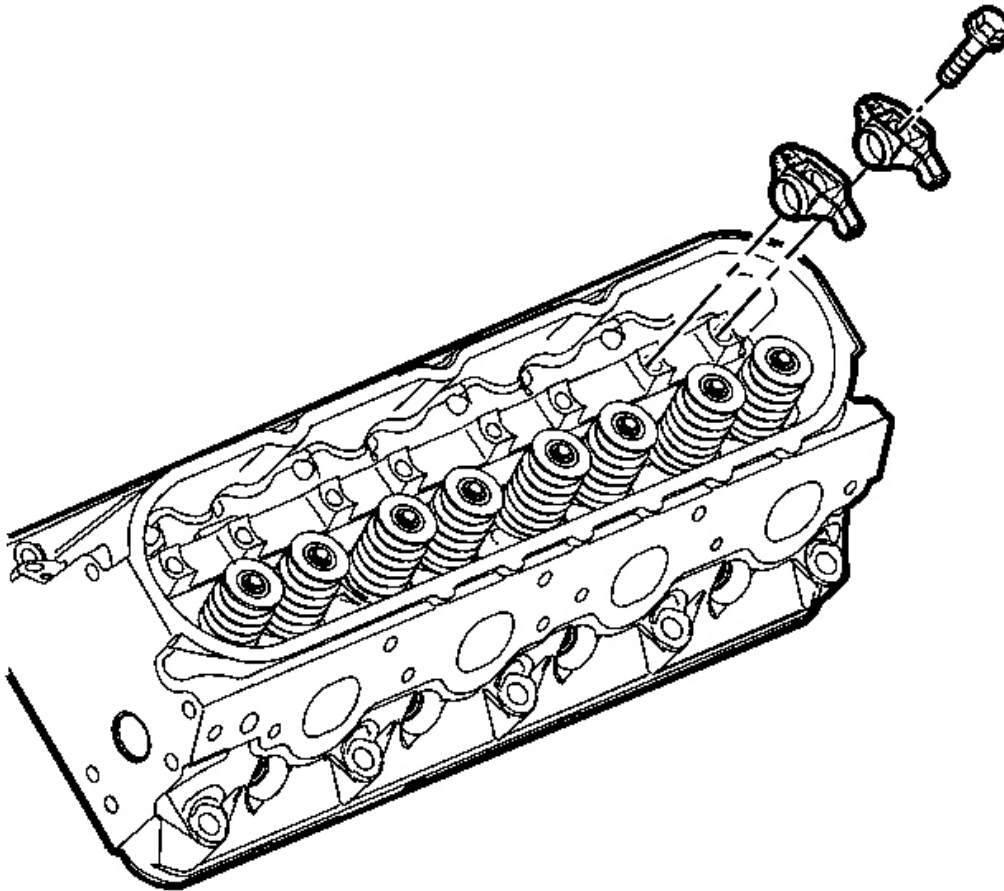


Fig. 143: View Of Rocker Arms & Bolts
Courtesy of GENERAL MOTORS CORP.

IMPORTANT: Place the valve rocker arms, push rods and pivot support, in a rack so that the can be installed in the same location from which they were removed.

1. Remove the valve rocker arm cover. Refer to **Valve Rocker Arm Cover Replacement - Left Side** or to **Valve Rocker Arm Cover Replacement - Right Side**.

2. Remove the valve rocker arm bolts.
3. Remove the valve rocker arms.

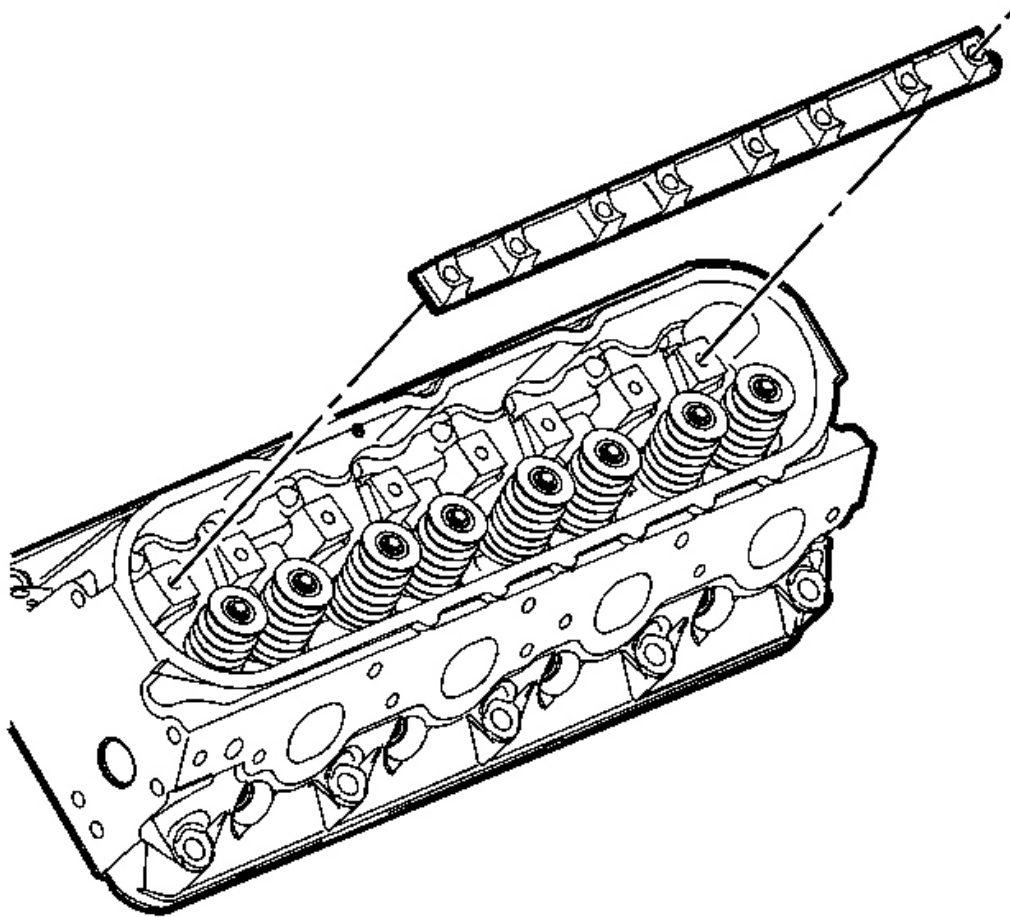


Fig. 144: View Of Valve Rocker Arm Pivot Support
Courtesy of GENERAL MOTORS CORP.

4. Remove the valve rocker arm pivot support.

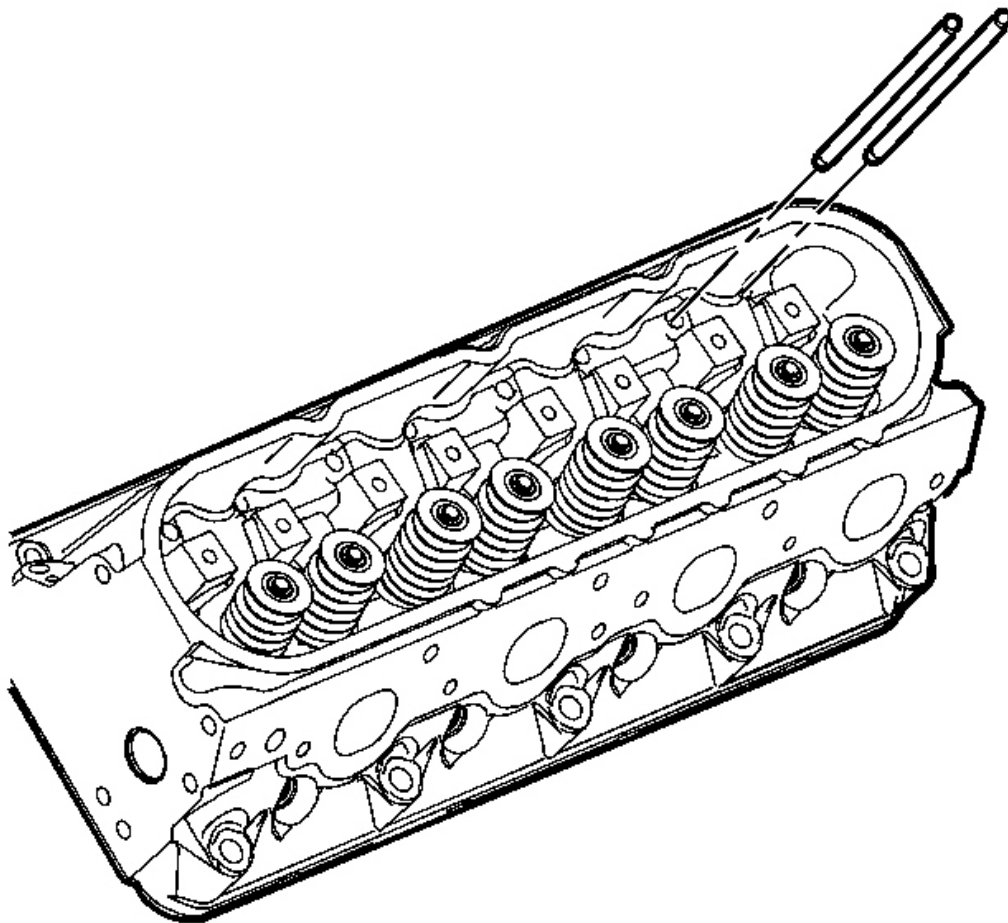


Fig. 145: View Of Pushrods

Courtesy of GENERAL MOTORS CORP.

5. Remove the pushrods.
6. Clean and inspect the valve rocker arms and pushrods. Refer to **Valve Rocker Arm and Push Rods Cleaning and Inspection** .

Installation Procedure

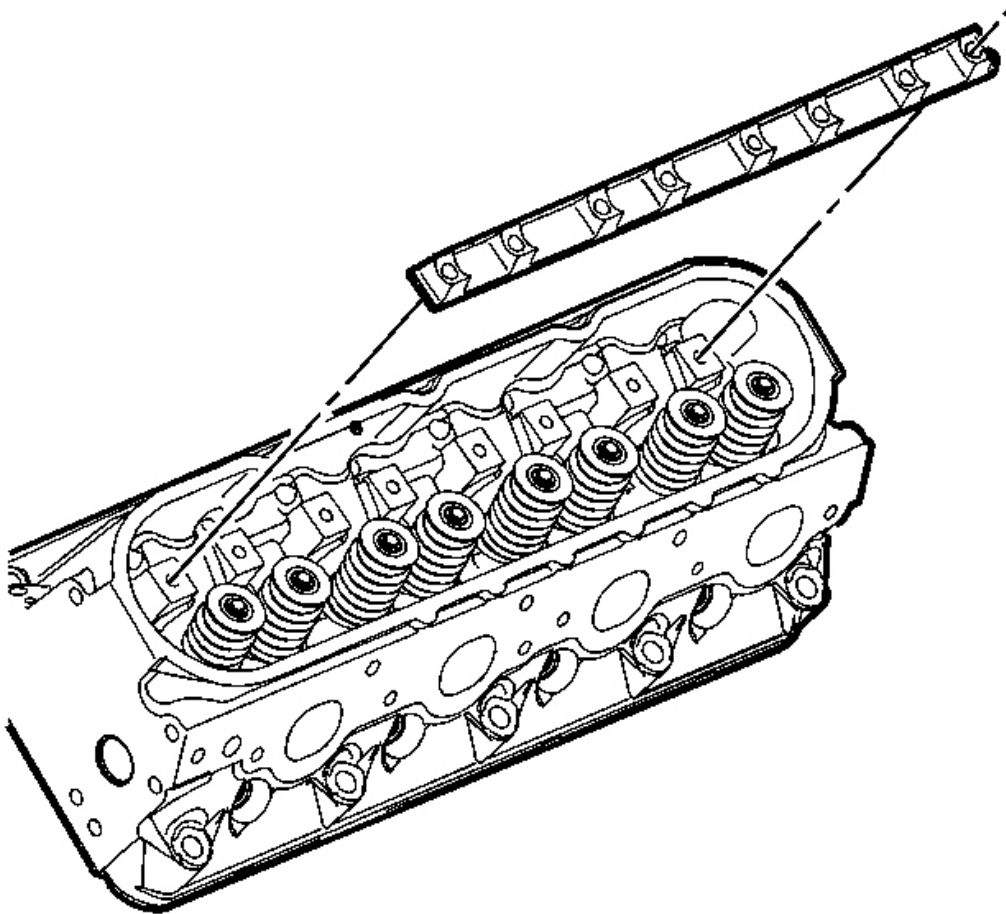


Fig. 146: View Of Valve Rocker Arm Pivot Support
Courtesy of GENERAL MOTORS CORP.

IMPORTANT: When reusing the valve train components, always install the components to the original location and position.
The valve lash is net build, no valve adjustment is required.

1. Lubricate the valve rocker arms and pushrods with clean engine oil.
2. Lubricate the flange of the valve rocker arm bolts with clean engine oil.
3. Lubricate the flange or washer surface of the bolt that will contact the valve rocker arm.
4. Install the valve rocker arm pivot support.

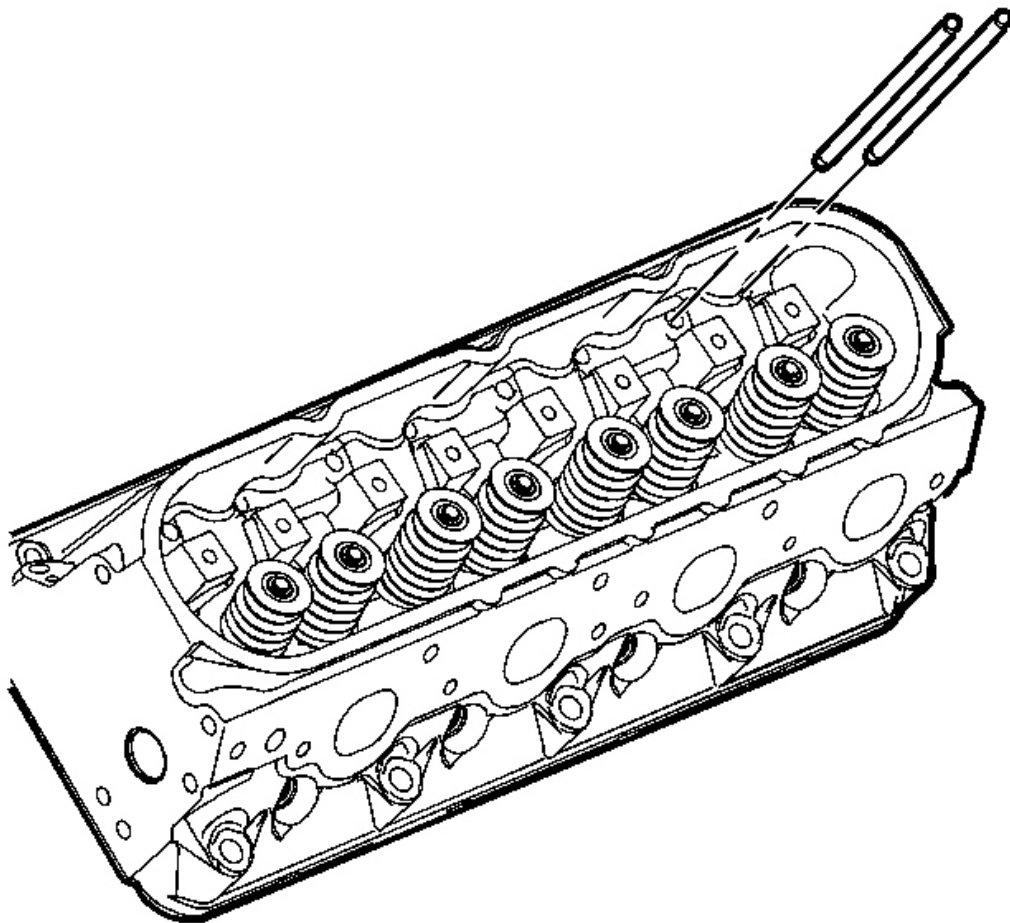


Fig. 147: View Of Pushrods

Courtesy of GENERAL MOTORS CORP.

IMPORTANT: Make sure that the pushrods seat properly to the valve lifter sockets.

5. Install the pushrods.

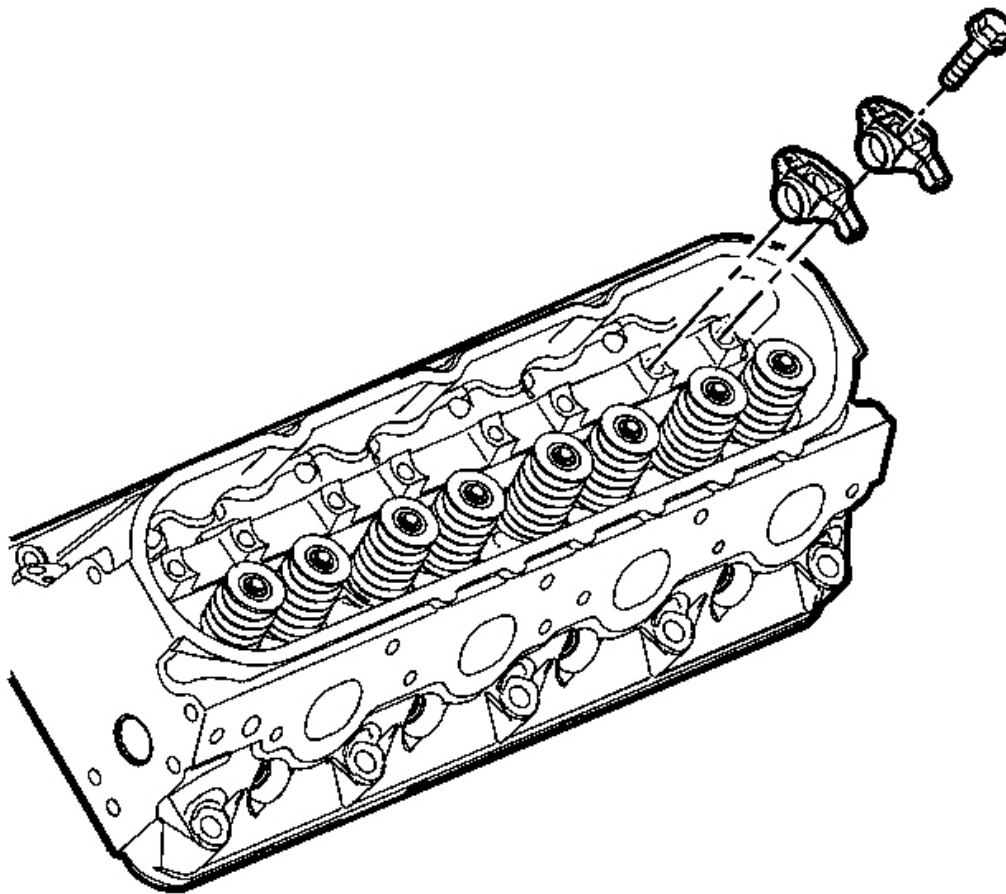


Fig. 148: View Of Rocker Arms & Bolts
Courtesy of GENERAL MOTORS CORP.

IMPORTANT: Verify that the pushrods seat properly to the ends of the rocker arms. **DO NOT** tighten the rocker arm bolts at this time.

6. Install the rocker arms and bolts.

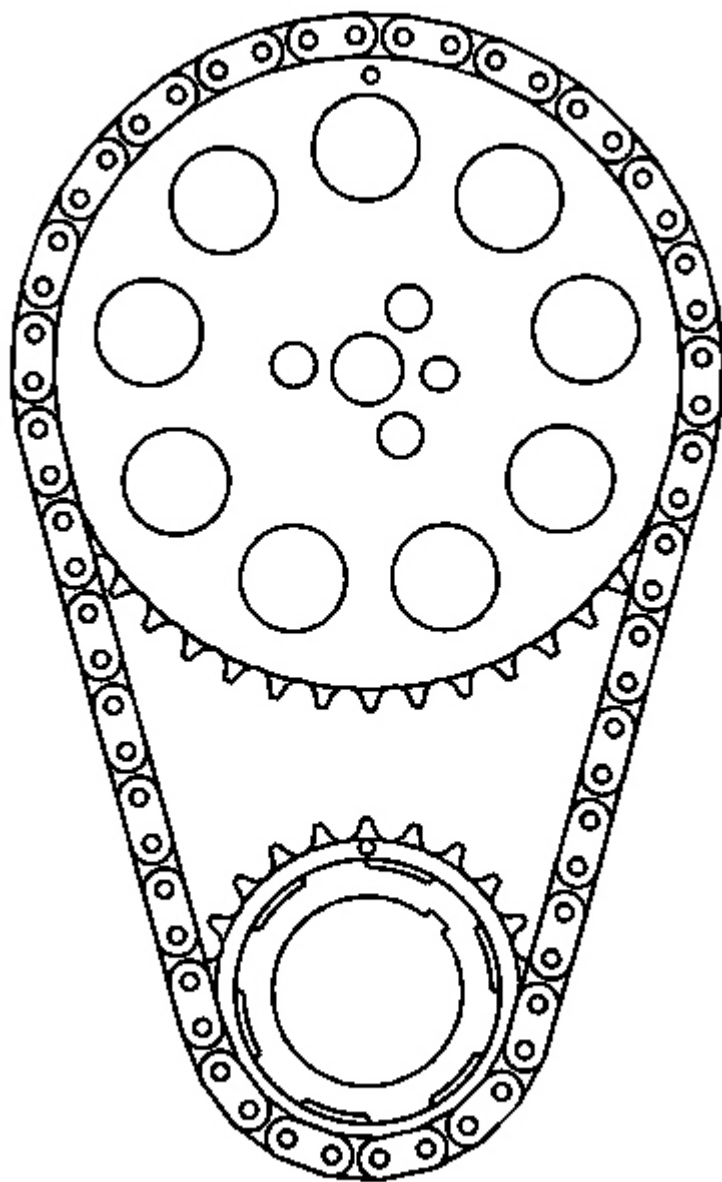


Fig. 149: View of Crankshaft/Camshaft In Position For Number 1 Piston At TDC
Courtesy of GENERAL MOTORS CORP.

NOTE: Refer to Fastener Notice .

7. Rotate the crankshaft until the number one piston is at top dead center (TDC) of the compression stroke.

2007 Chevrolet TrailBlazer

2007 ENGINE Engine Mechanical - 6.0L - TrailBlazer

In this position, cylinder number one rocker arms will be off lobe lift and the crankshaft sprocket key will be at the 1:30 position.

The engine firing order is 1, 8, 7, 2, 6, 5, 4, 3.

Cylinders 1, 3, 5 and 7 are the left bank.

Cylinder 2, 4, 6 and 8 are the right bank.

8. With the engine in the number one firing position, tighten the following valve rocker arm bolts:

Tighten:

- Tighten cylinders 1, 2, 7 and 8 exhaust valve rocker arm bolts to 30 N.m (22 lb ft).
- Tighten cylinders 1, 3, 4 and 5 intake valve rocker arm bolts to 30 N.m (22 lb ft).

9. Rotate the crankshaft 360 degrees.

10. Tighten the following valve rocker arm bolts:

Tighten:

- Tighten cylinders 3, 4, 5 and 6 exhaust valve rocker arm bolts to 30 N.m (22 lb ft).
- Tighten cylinders 2, 6, 7 and 8 intake valve rocker arm bolts to 30 N.m (22 lb ft).

11. Install the valve rocker arm cover. Refer to **Valve Rocker Arm Cover Replacement - Left Side** or to **Valve Rocker Arm Cover Replacement - Right Side**.

VALVE STEM OIL SEAL AND VALVE SPRING REPLACEMENT

Tools Required

- **J 22794** Spark Plug Port Adapter
- **J 38606** Valve Spring Compressor

Removal Procedure

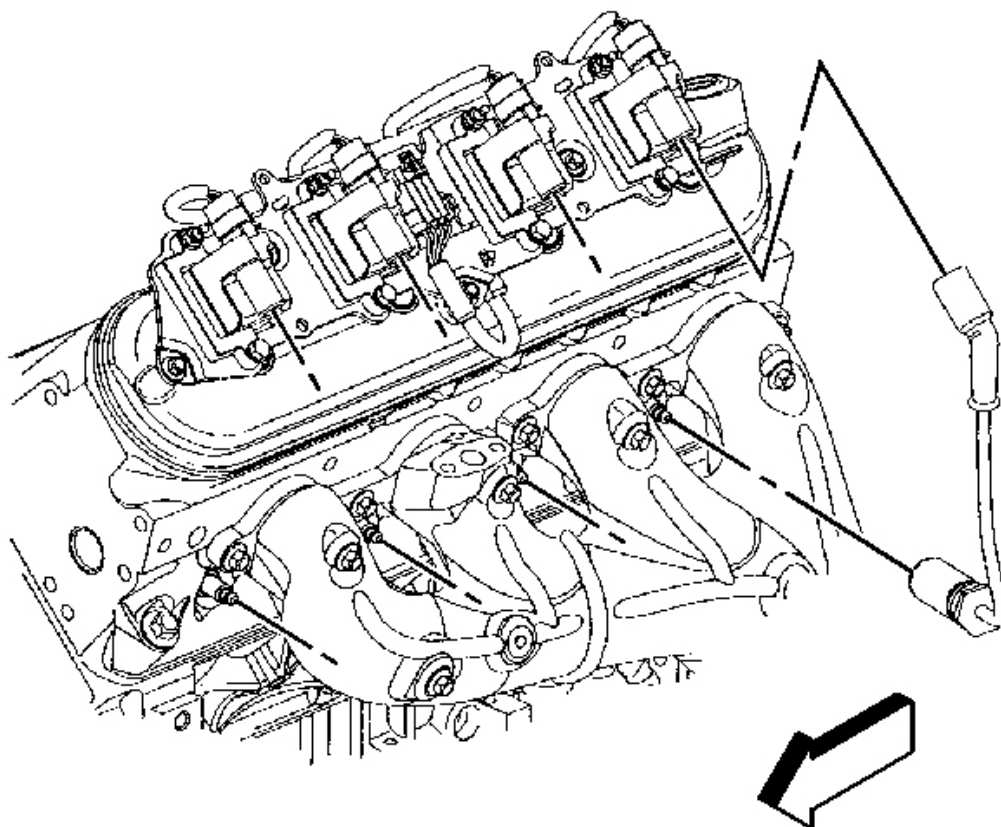


Fig. 150: View Of Spark Plug Wire & Boot
Courtesy of GENERAL MOTORS CORP.

1. Remove the valve rocker arm. Refer to **Valve Rocker Arm and Push Rod Replacement**.
2. Disconnect the spark plug wire at the spark plug.
 - Twist each plug wire boot 1/2 turn.
 - Pull only on the boot in order to remove the wire from the spark plug.

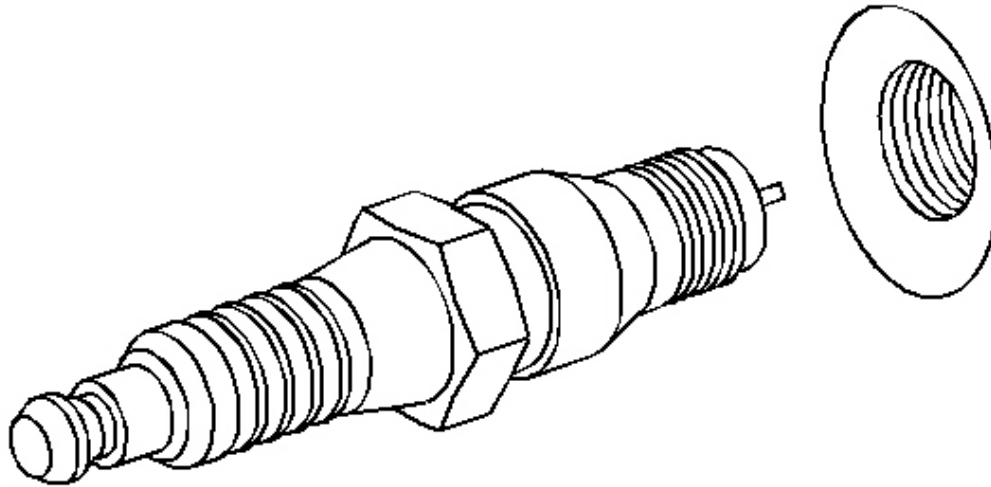


Fig. 151: View Of Spark Plug And Sparkplug Seat
Courtesy of GENERAL MOTORS CORP.

IMPORTANT: Remove the spark plugs from the cylinder head with the engine at room temperature.

3. Loosen the spark plug 1-2 turns.
4. Brush or air blast away any dirt or debris from around the spark plug.
5. Remove the spark plug.

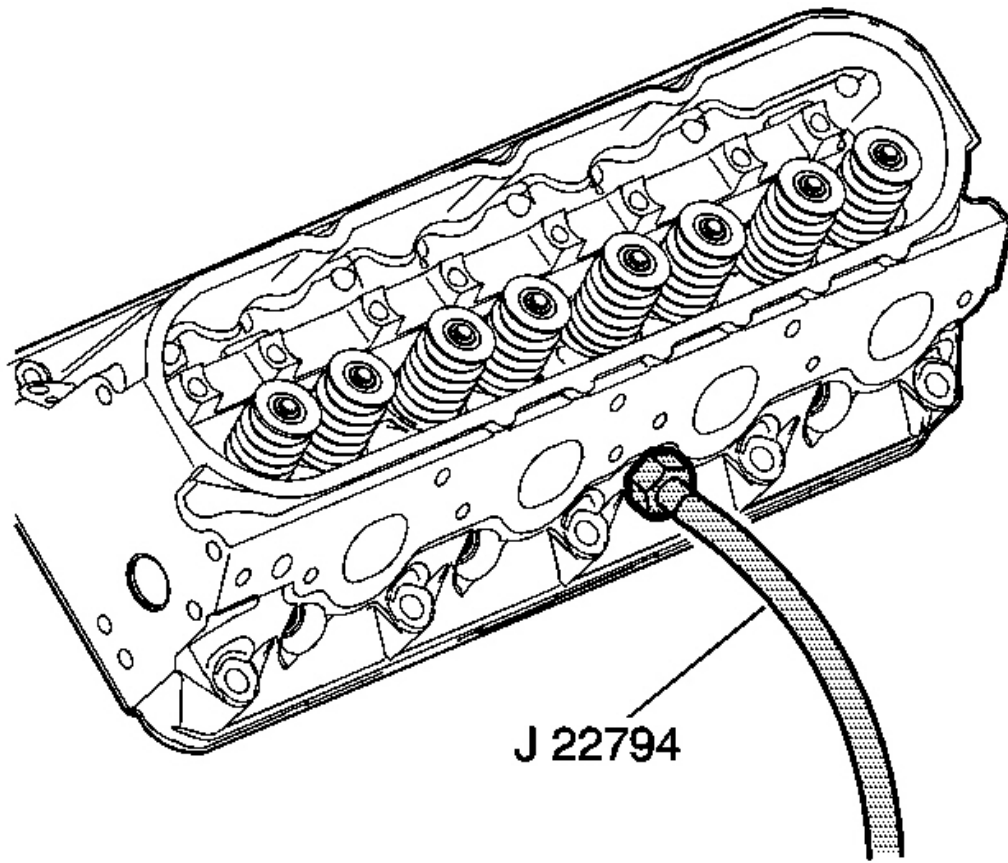


Fig. 152: View Of J 22794

Courtesy of GENERAL MOTORS CORP.

6. Install **J 22794** into the spark plug hole.
7. Attach an air hose to **J 22794**.
8. Apply compressed air to **J 22794** in order to hold the valves in place.

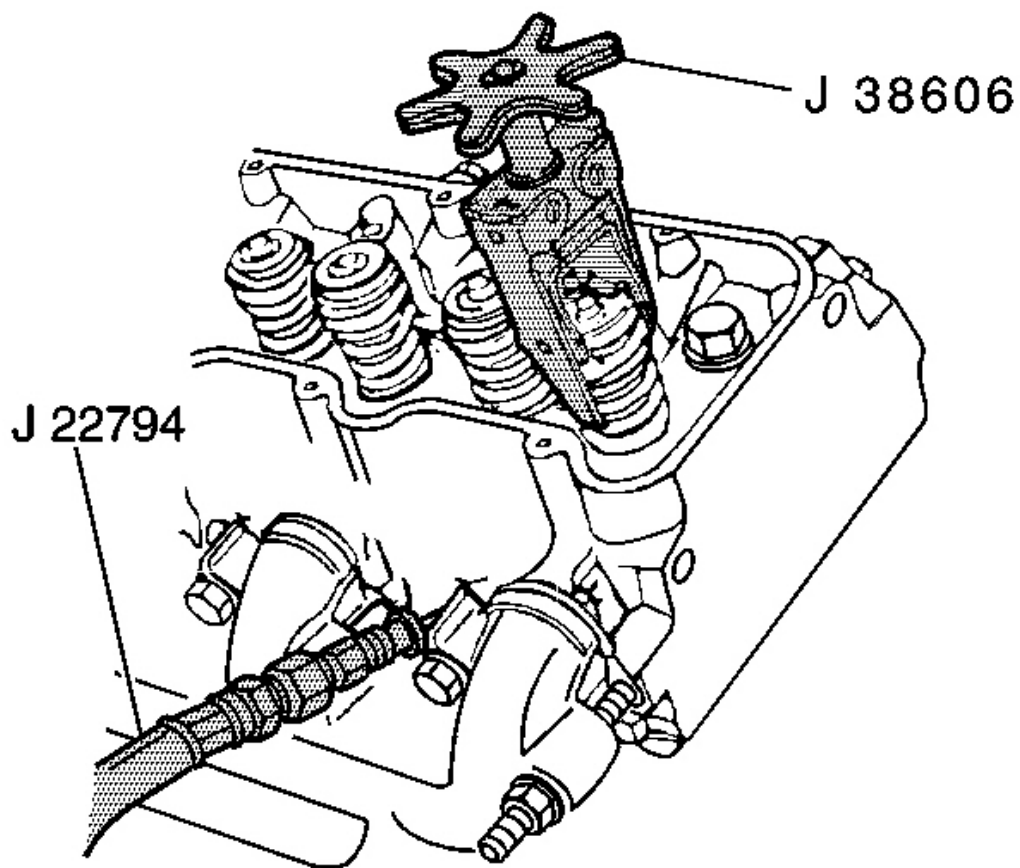


Fig. 153: View Of J 38606 & J 5892-D Compressing Valve Spring
Courtesy of GENERAL MOTORS CORP.

9. Use **J 38606** in order to compress the valve spring.

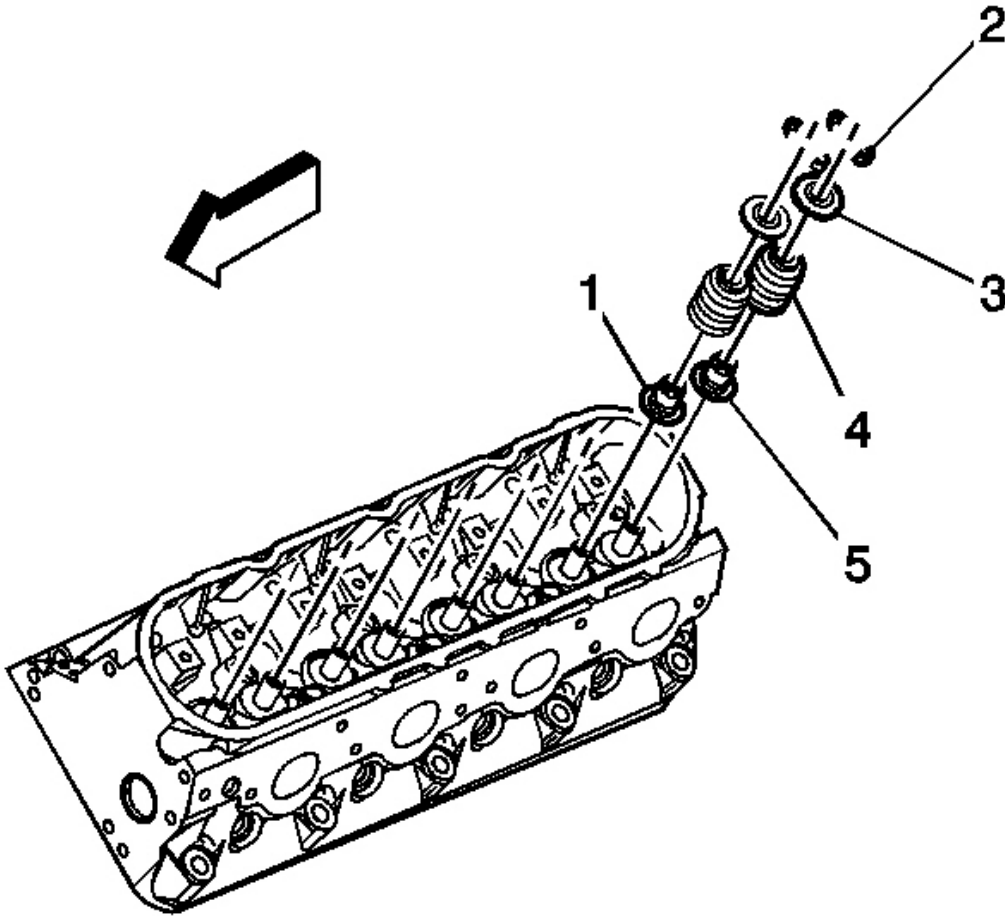


Fig. 154: View Of Valve Stem & Valve Spring Components
Courtesy of GENERAL MOTORS CORP.

10. Remove the valve stem keys (2).
11. Carefully release the valve spring tension.
12. Remove **J 38606** .
13. Remove the valve spring cap (3).
14. Remove the valve spring (4).
15. Remove the valve stem oil seal/shim assembly (1, 5).

Installation Procedure

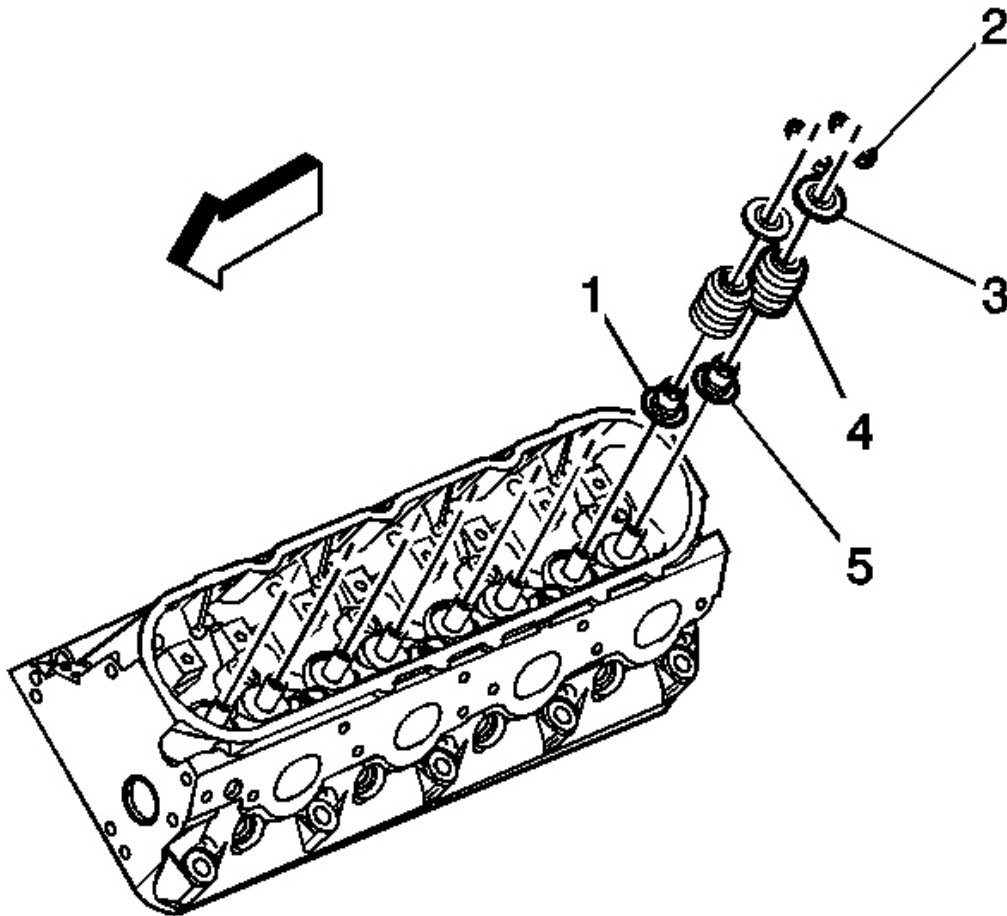


Fig. 155: View Of Valve Stem & Valve Spring Components
Courtesy of GENERAL MOTORS CORP.

1. Clean the cylinder head valve spring seat and/or shim area.
2. Lubricate the valve guide and valve stem oil seal with clean engine oil.
3. Install the valve stem oil seal/shim assembly (1, 5).
4. Install the valve spring (4).
5. Install the valve spring cap (3).

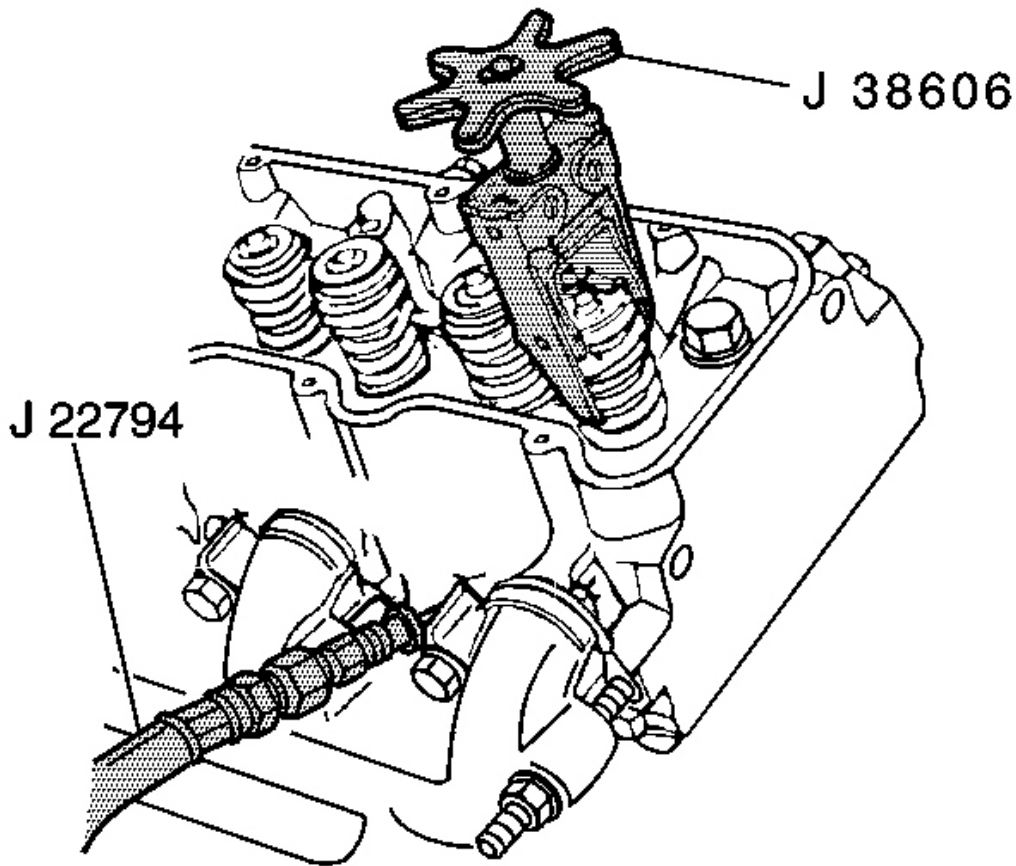


Fig. 156: View Of J 38606 & J 5892-D Compressing Valve Spring
Courtesy of GENERAL MOTORS CORP.

6. Compress the valve spring using the **J 38606** .
7. Install the valve keys.
 1. Use grease in order to hold the valve keys in place.
 2. Make sure the keys seat properly in the groove of the valve stem.
 3. Carefully release the valve spring pressure, making sure the valve keys stay in place.
 4. Remove **J 38606** .
 5. Tap the end of the valve stem with a plastic faced hammer to seat the keys (if necessary).

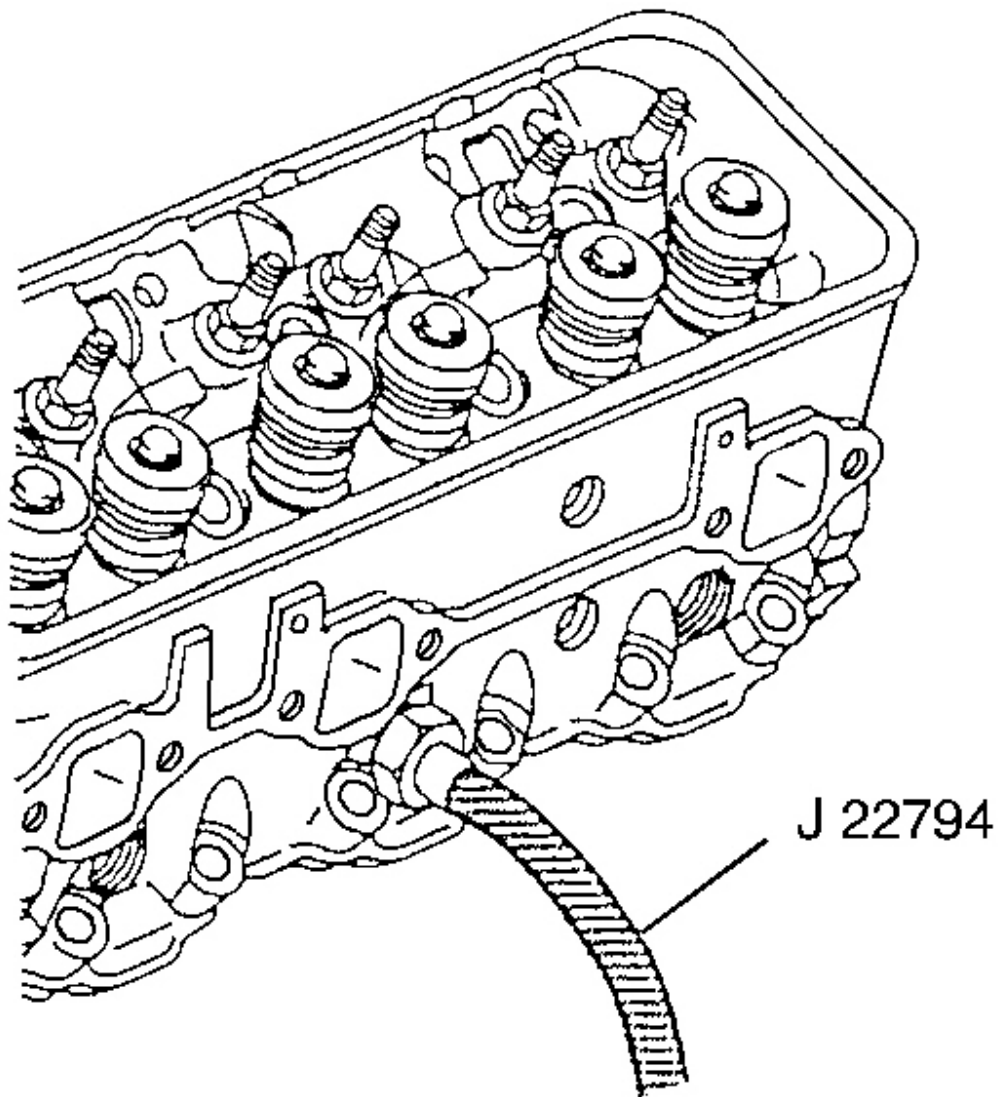


Fig. 157: View Of J 22794

Courtesy of GENERAL MOTORS CORP.

8. Remove **J 22794** from the spark plug port.

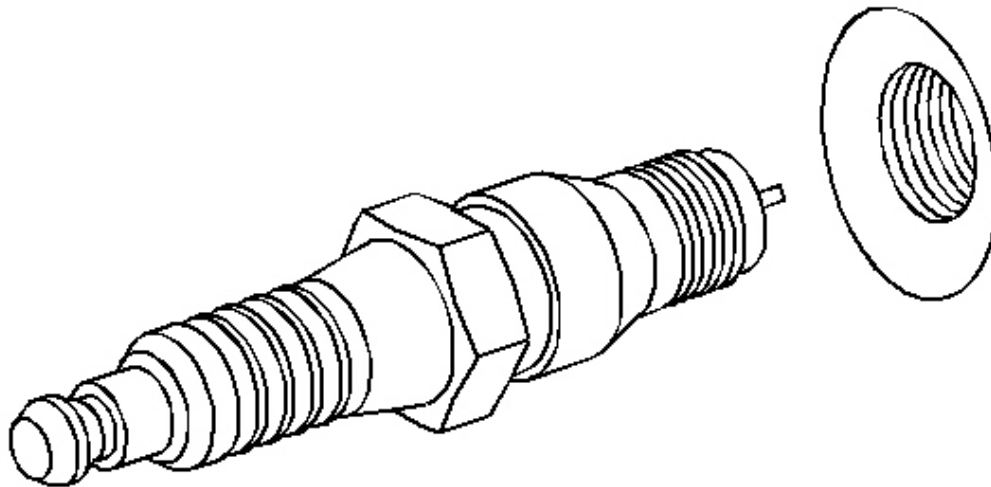


Fig. 158: View Of Spark Plug And Sparkplug Seat
Courtesy of GENERAL MOTORS CORP.

NOTE: Refer to Fastener Notice .

9. Hand start the spark plug.

Tighten: Tighten the spark plug to 15 N.m (11 lb ft).

10. Install the spark plug wires at the ignition coil.
11. Install the spark plug wire to the spark plug.
12. Inspect the wires for proper installation:
 - Push sideways on each boot in order to check for proper installation.
 - Reinstall any loose boot.
13. Install the valve rocker arm. Refer to Valve Rocker Arm and Push Rod Replacement.

OIL LEVEL INDICATOR AND TUBE REPLACEMENT

Removal Procedure

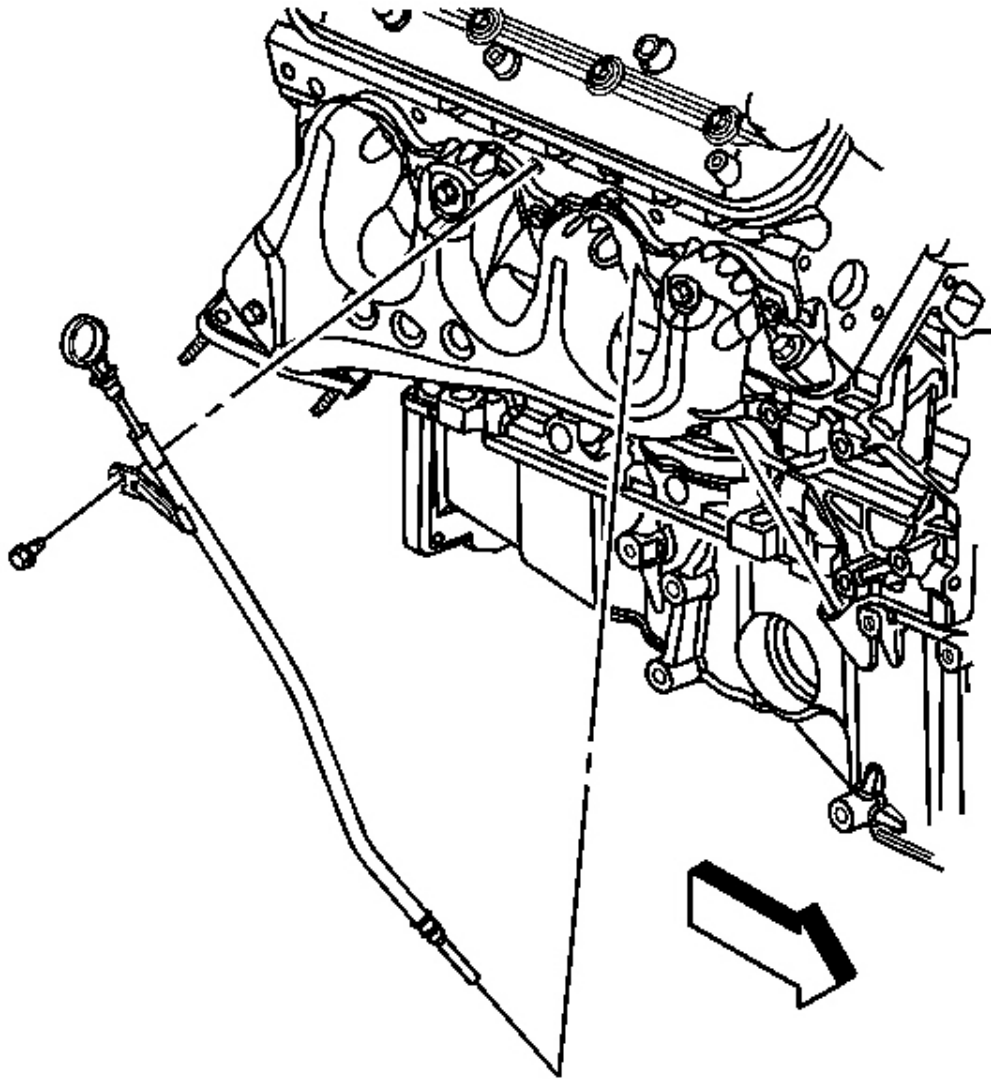


Fig. 159: View Of Oil Level Indicator Tube
Courtesy of GENERAL MOTORS CORP.

1. Remove the cylinder number 2 spark plug and wire. Refer to **Spark Plug Replacement** .
2. Remove the oil level indicator from the tube.
3. Remove the oil level indicator tube bolt.
4. Remove the oil level indicator tube from the engine block.

IMPORTANT: The O-ring seal may be reused if not cut or damaged.

5. Inspect the O-ring seal for cuts or damage.
6. Remove the O-ring seal from the tube, if required.

Installation Procedure

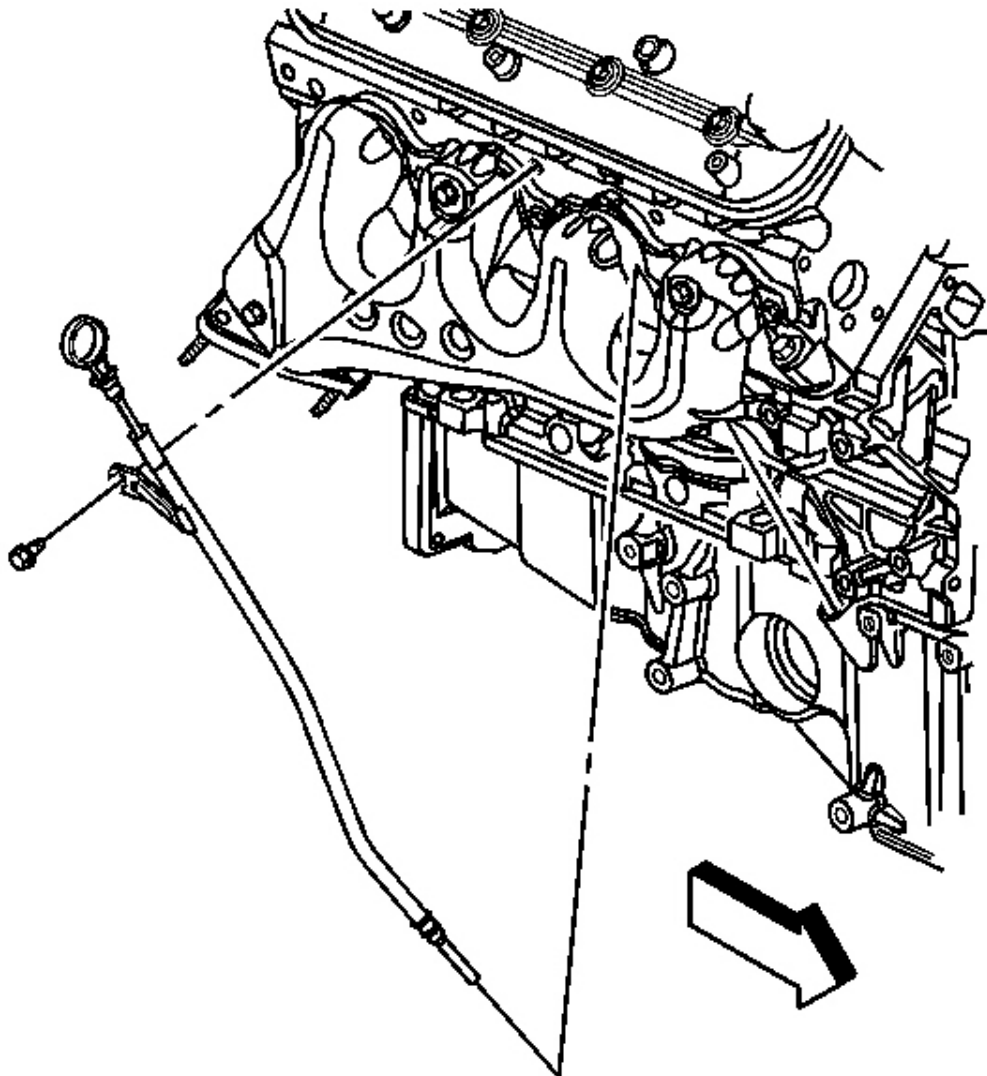


Fig. 160: View Of Oil Level Indicator Tube
Courtesy of GENERAL MOTORS CORP.

2007 Chevrolet TrailBlazer

2007 ENGINE Engine Mechanical - 6.0L - TrailBlazer

1. Lubricate the O-ring seal with clean engine oil.
2. Install the O-ring seal onto the oil level indicator tube.
3. Install the oil level indicator tube behind the exhaust manifold.
4. Raise and suitably support the vehicle. Refer to **Lifting and Jacking the Vehicle** .
5. Install the oil level indicator tube into the block. Install the tube with the collar flush to the block.
6. Lower the vehicle.

NOTE: Refer to **Fastener Notice** .

7. Install the oil level indicator tube bolt

Tighten: Tighten the bolt to 25 N.m (18 lb ft).

8. Install the oil level indicator to the tube.
9. Install the cylinder number 2 spark plug and wire. Refer to **Spark Plug Replacement** .

CYLINDER HEAD REPLACEMENT - LEFT SIDE

Removal Procedure

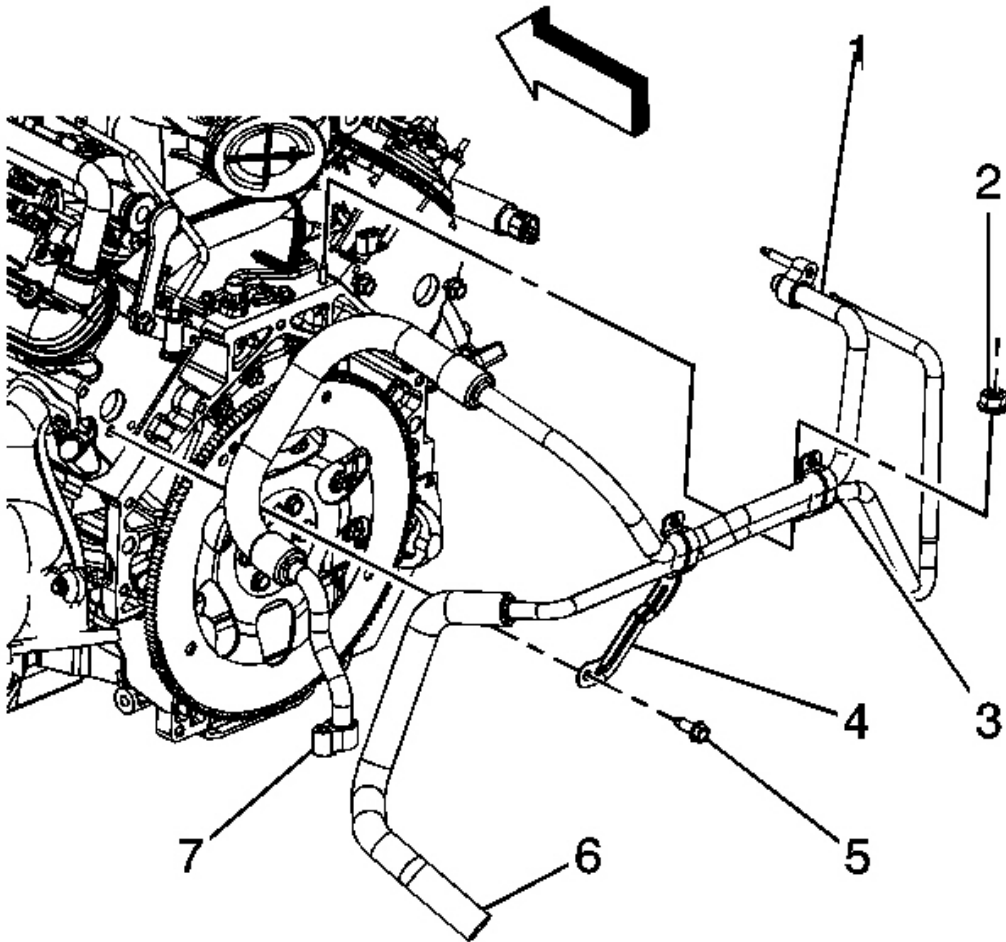


Fig. 161: View Of Rear A/C Lines
Courtesy of GENERAL MOTORS CORP.

1. Remove the generator bracket. Refer to **Generator Bracket Replacement (5.3L and 6.0L Engines)** .
2. Remove the coolant air bleed pipe. Refer to **Coolant Air Bleed Pipe Assembly Replacement (5.3L and 6.0L Engines)** .
3. Remove the left exhaust manifold. Refer to **Exhaust Manifold Replacement - Left Side** .
4. Remove the pushrods. Refer to **Valve Rocker Arm and Push Rod Replacement** .
5. If equipped, remove the auxiliary air conditioning (A/C) bracket bolt (5).
6. Remove the cylinder head. Refer to **Cylinder Head Removal - Left Side** .
7. Clean and inspect the cylinder head. Refer to **Fastener Notice Cylinder Head Cleaning and Inspection** .

Installation Procedure

1. Install the cylinder head. Refer to Cylinder Head Installation - Left Side.

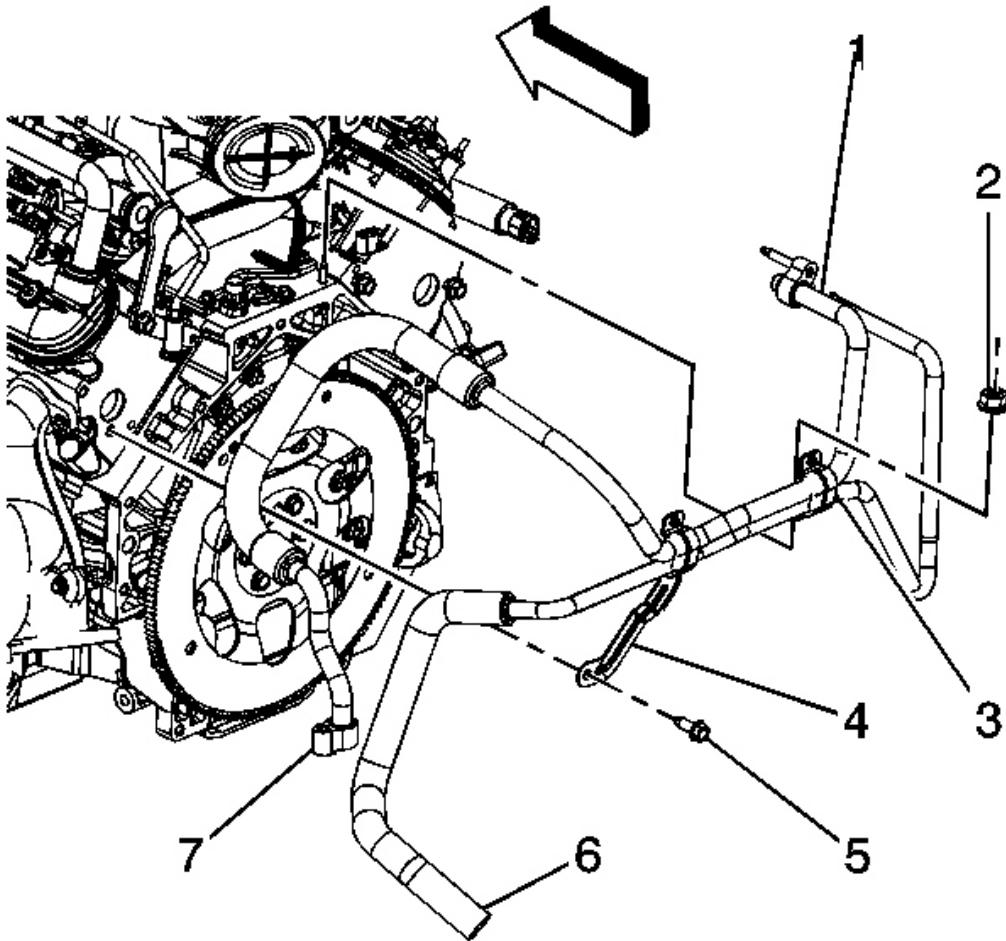


Fig. 162: View Of Rear A/C Lines
Courtesy of GENERAL MOTORS CORP.

NOTE: Refer to Fastener Notice .

2. If equipped, install the auxiliary A/C bracket bolt (5).

Tighten: Tighten the bolt to 20 N.m (15 lb ft).

3. Install the pushrods. Refer to Valve Rocker Arm and Push Rod Replacement.
4. Install the left exhaust manifold. Refer to Exhaust Manifold Replacement - Left Side.
5. Install the coolant air bleed pipe. Refer to Coolant Air Bleed Pipe Assembly Replacement (5.3L and 6.0L Engines).
6. Install the generator bracket. Refer to Generator Bracket Replacement (5.3L and 6.0L Engines).

CYLINDER HEAD REPLACEMENT - RIGHT SIDE

Removal Procedure

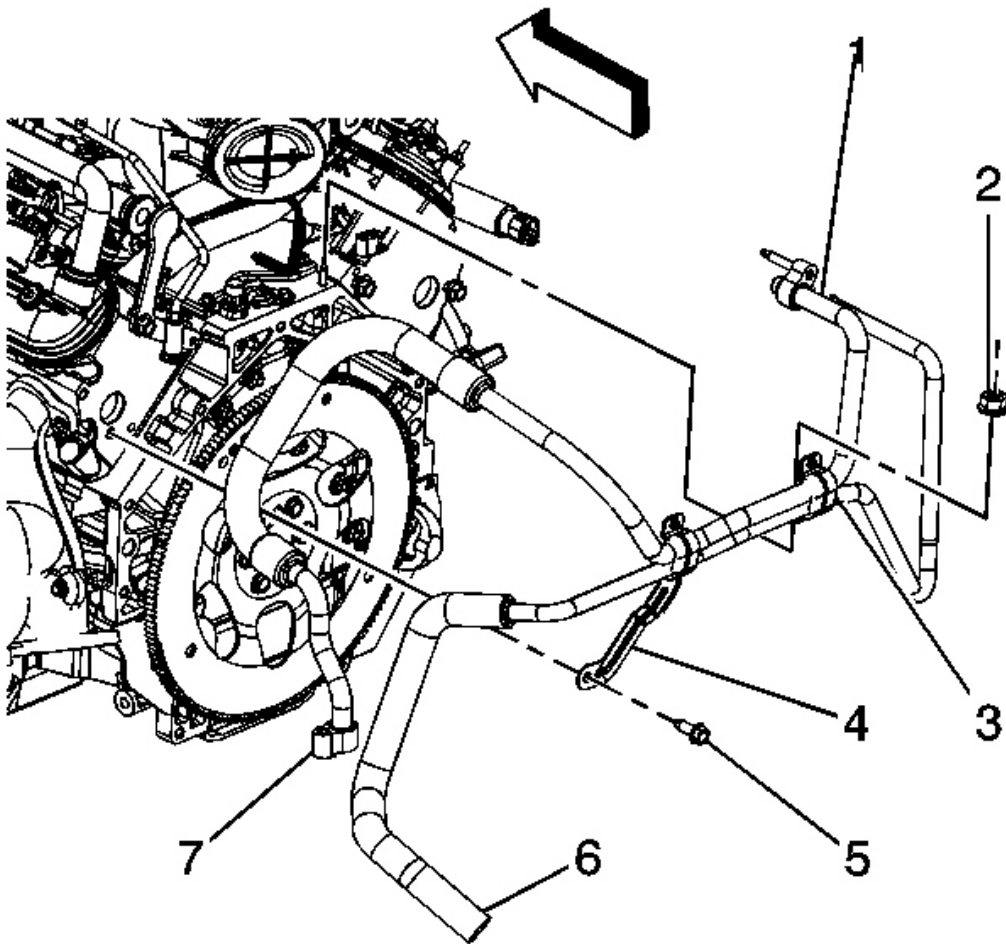


Fig. 163: View Of Rear A/C Lines
Courtesy of GENERAL MOTORS CORP.

2007 Chevrolet TrailBlazer

2007 ENGINE Engine Mechanical - 6.0L - TrailBlazer

1. Remove the oil level indicator. Refer to **Oil Level Indicator and Tube Replacement**.
2. Remove the coolant air bleed pipe. Refer to **Coolant Air Bleed Pipe Assembly Replacement (5.3L and 6.0L Engines)** .
3. Remove the right exhaust manifold. Refer to **Exhaust Manifold Replacement - Right Side** .
4. Remove the pushrods. Refer to **Valve Rocker Arm and Push Rod Replacement**.
5. If equipped, remove the auxiliary air conditioning (A/C) bracket nut (2).
6. Remove the cylinder head. Refer to **Cylinder Head Removal - Right Side** .
7. Clean and inspect the cylinder head. Refer to **Cylinder Head Cleaning and Inspection**.

Installation Procedure

1. Install the cylinder head. Refer to **Cylinder Head Installation - Right Side**.

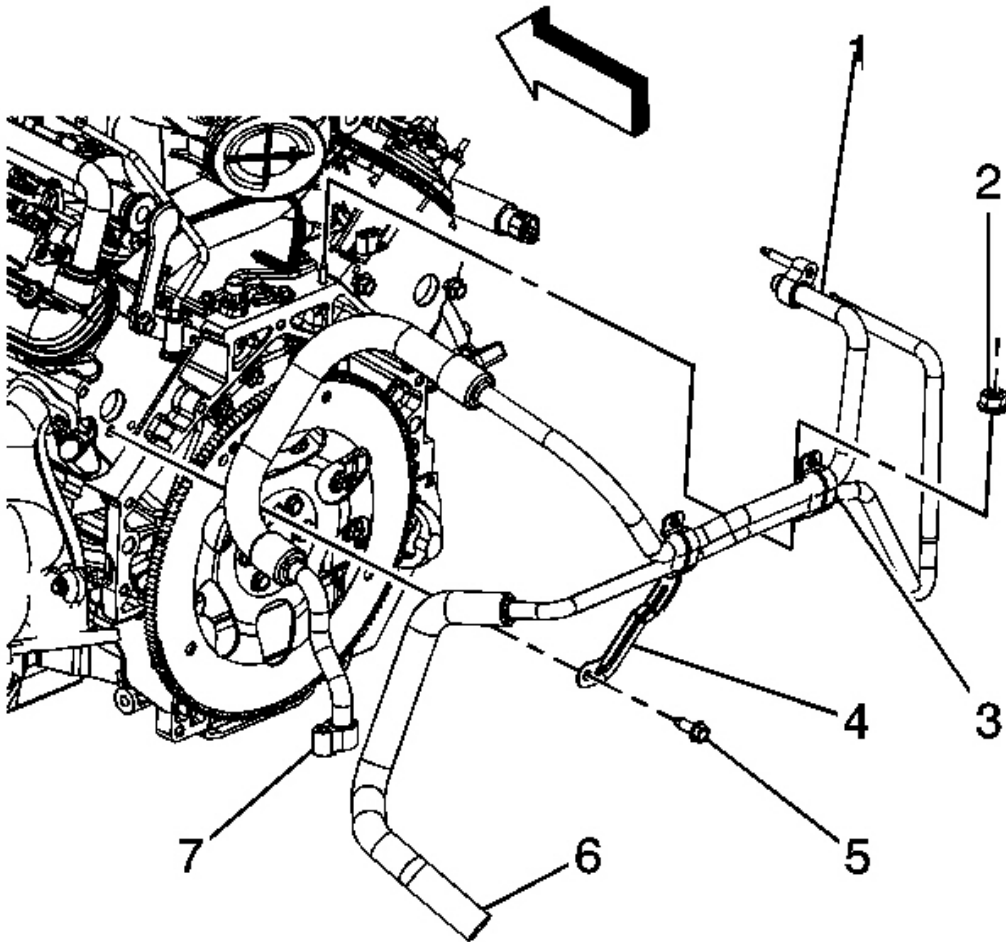


Fig. 164: View Of Rear A/C Lines
Courtesy of GENERAL MOTORS CORP.

NOTE: Refer to Fastener Notice .

2. If equipped, install the auxiliary air conditioning (A/C) bracket nut (2).

Tighten: Tighten the nut to 20 N.m (15 lb ft).

3. Install the pushrods. Refer to Valve Rocker Arm and Push Rod Replacement.
4. Install the right exhaust manifold. Refer to Exhaust Manifold Replacement - Right Side .
5. Install the coolant air bleed pipe. Refer to Coolant Air Bleed Pipe Assembly Replacement (5.3L and 6.0L Engines) .

6. Install the oil level indicator. Refer to **Oil Level Indicator and Tube Replacement.**

VALVE LIFTER REPLACEMENT

Tools Required

J 3049-A Valve Lifter Remover

Removal Procedure

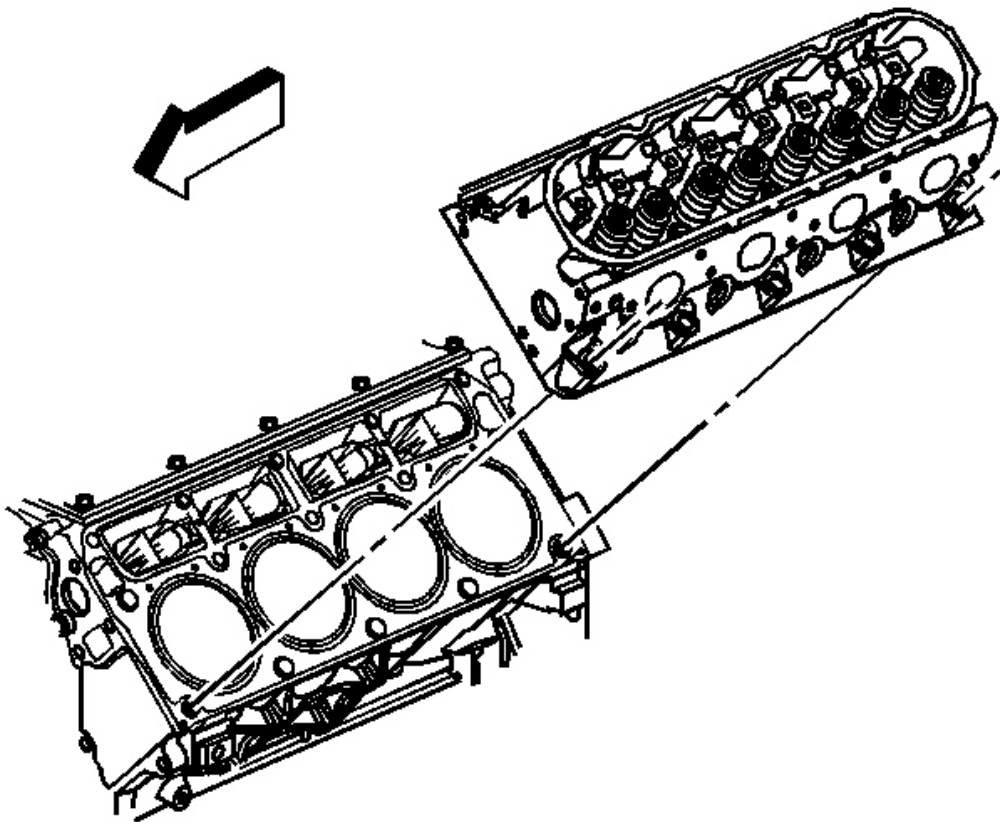


Fig. 165: View Of Cylinder Head (Left)
Courtesy of GENERAL MOTORS CORP.

1. Remove the cylinder head and gasket. Refer to **Cylinder Head Replacement - Left Side** or to **Cylinder Head Replacement - Right Side.**

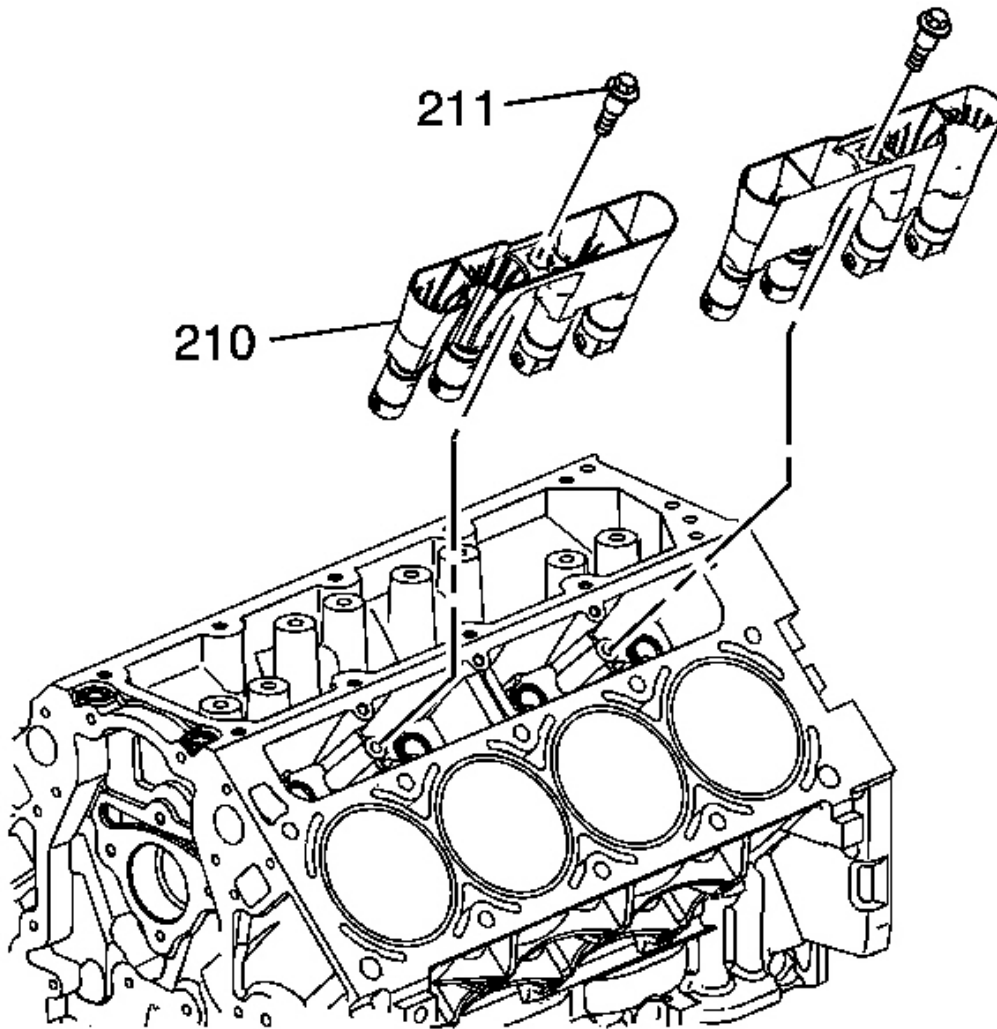


Fig. 166: View Of Lifter Guides & Lifters
Courtesy of GENERAL MOTORS CORP.

2. Remove the valve lifter. Refer to **Valve Lifter Removal**.
3. Clean and inspect the valve lifters. Refer to **Valve Lifters and Guides Cleaning and Inspection**.

Installation Procedure

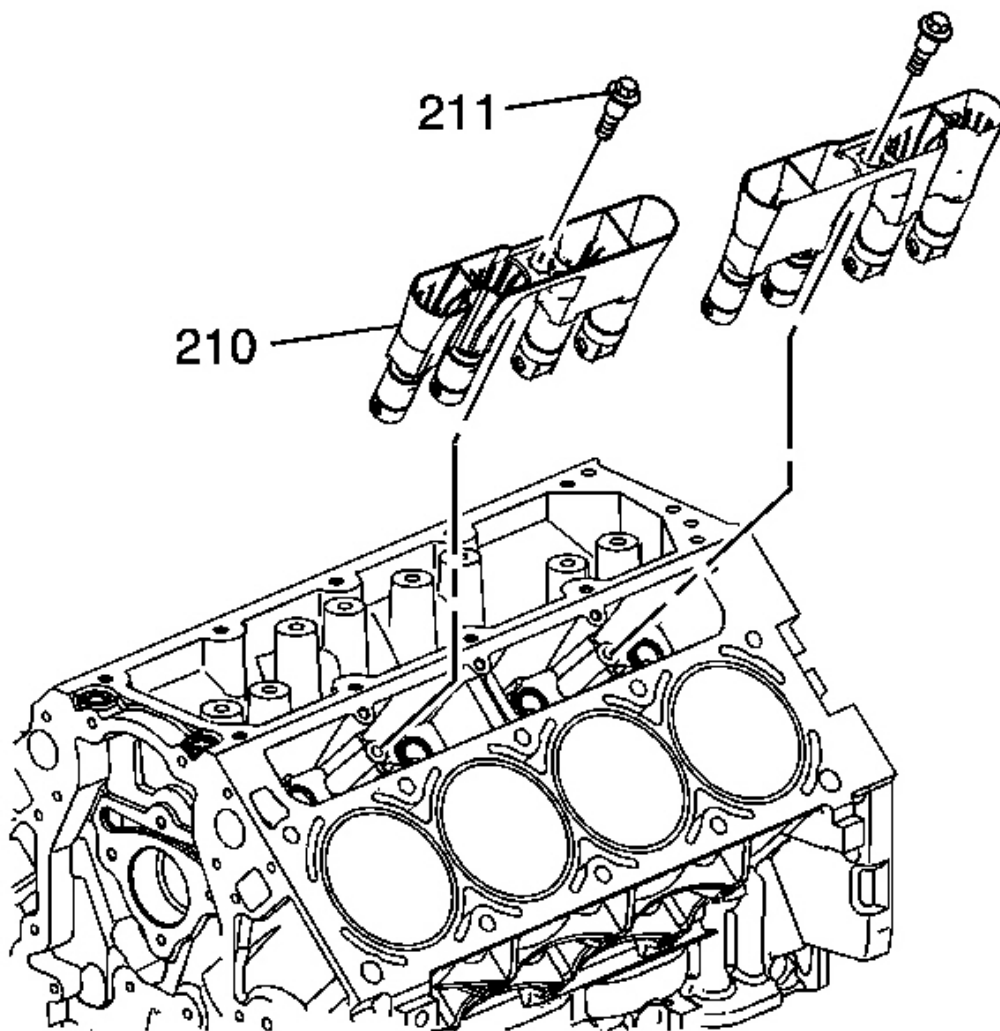


Fig. 167: View Of Lifter Guides & Lifters
Courtesy of GENERAL MOTORS CORP.

1. Install the valve lifter. Refer to **Valve Lifter Installation**.

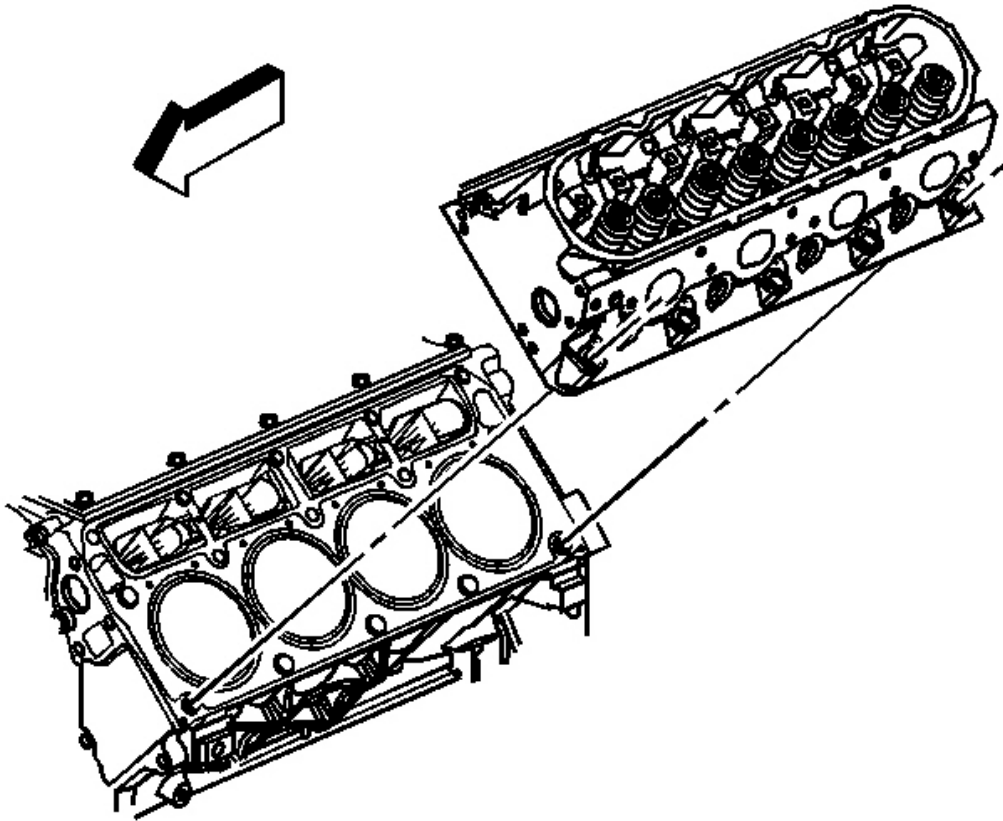


Fig. 168: View Of Cylinder Head (Left)
Courtesy of GENERAL MOTORS CORP.

2. Install the cylinder head and gasket. Refer to Cylinder Head Replacement - Left Side or to Cylinder Head Replacement - Right Side.

CRANKSHAFT BALANCER REPLACEMENT

Tools Required

- **J 41816** Crankshaft Balancer Remover
- **J 41816-2** Crankshaft End Protector
- **J 42386-A** Flywheel Holding Tool
- **J 41665** Crankshaft Balancer and Sprocket Installer
- **J 45059** Angle Meter

Removal Procedure

1. Remove the accessory drive belt. Refer to **Drive Belt Replacement - Accessory**.
2. Remove the air conditioning (A/C) drive belt, if equipped. Refer to **Drive Belt Replacement - Air Conditioning**.
3. Remove the fan shroud. Refer to **Cooling Fan and Shroud Replacement**.
4. Remove the starter motor. Refer to **Starter Motor Replacement (4.2L Engine)** or **Starter Motor Replacement (5.3L and 6.0L Engines)**.

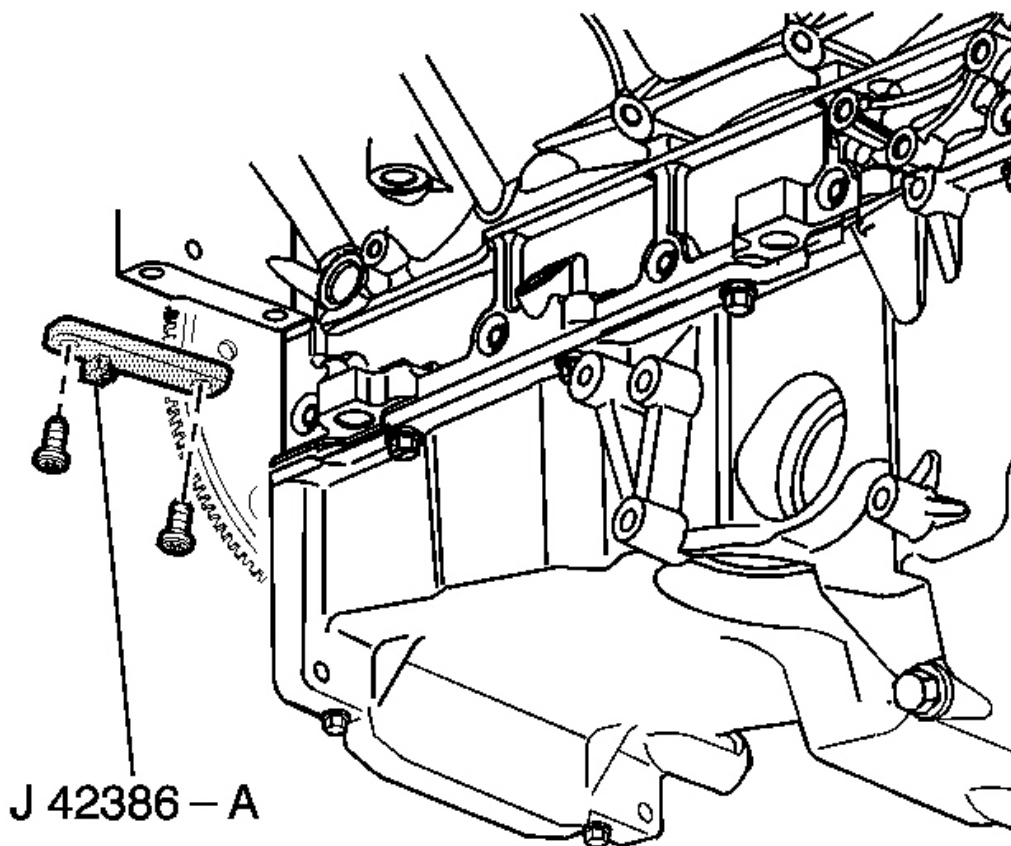


Fig. 169: View Of J 42386-A Flywheel Tool
Courtesy of GENERAL MOTORS CORP.

IMPORTANT:

- Ensure that the teeth of J 42386-A mesh with the teeth of the engine flywheel.

- The crankshaft balancer is balanced as an individual component. It is not necessary to mark the balancer prior to removal.

NOTE: Refer to Fastener Notice .

5. Install **J 42386-A** and bolts.

Use one M10-1.5 x 120 mm and one M10-1.5 x 45 mm bolt for proper tool operation.

Tighten: Tighten **J 42386-A** bolts to 50 N.m (37 lb ft).

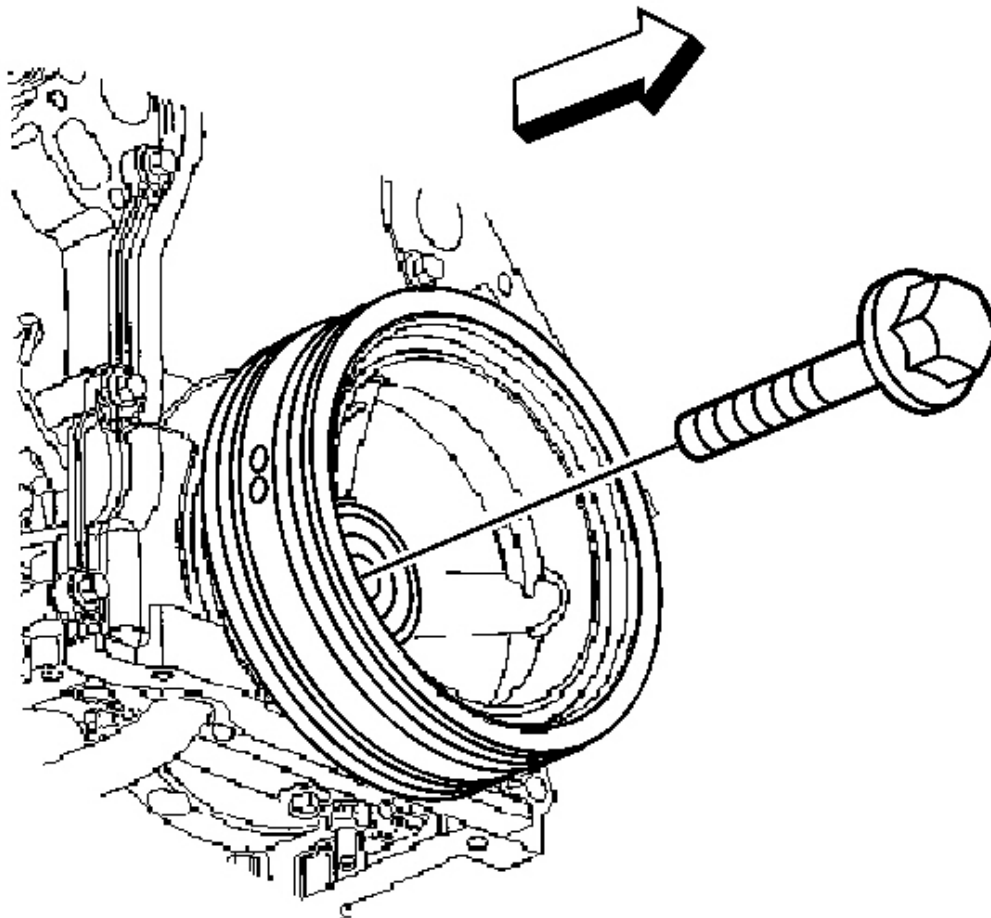


Fig. 170: View Of Crankshaft Balancer Bolt
Courtesy of GENERAL MOTORS CORP.

6. Remove the crankshaft balancer bolt.

Do not discard the crankshaft balancer bolt. The balancer bolt will be used during the balancer installation procedure.

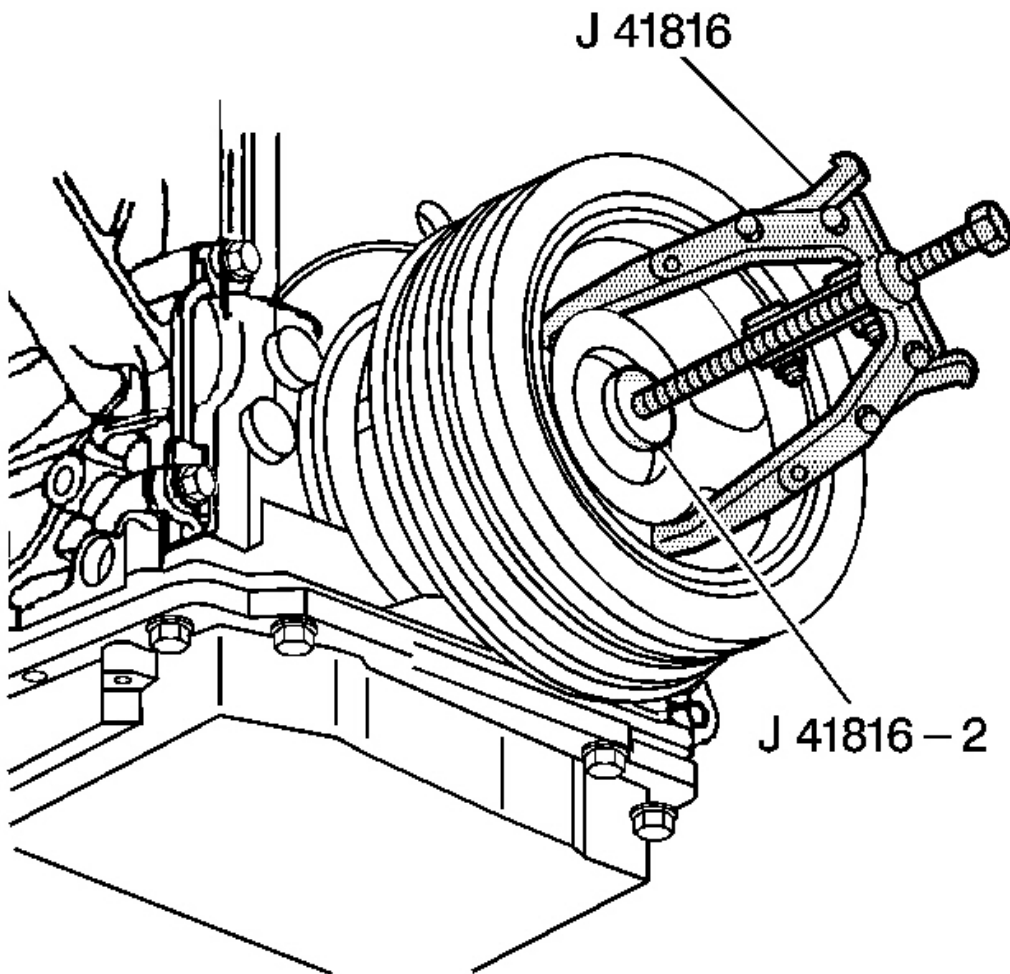


Fig. 171: View Of Crankshaft Balancer, J 41816 & J 41816-2
Courtesy of GENERAL MOTORS CORP.

7. Use **J 41816** and **J 41816-2** in order to remove the crankshaft balancer.
8. Remove **J 41816** and **J 41816-2** from the crankshaft balancer.
9. Clean and inspect the crankshaft balancer. Refer to **Crankshaft Balancer Cleaning and Inspection** .

Installation Procedure

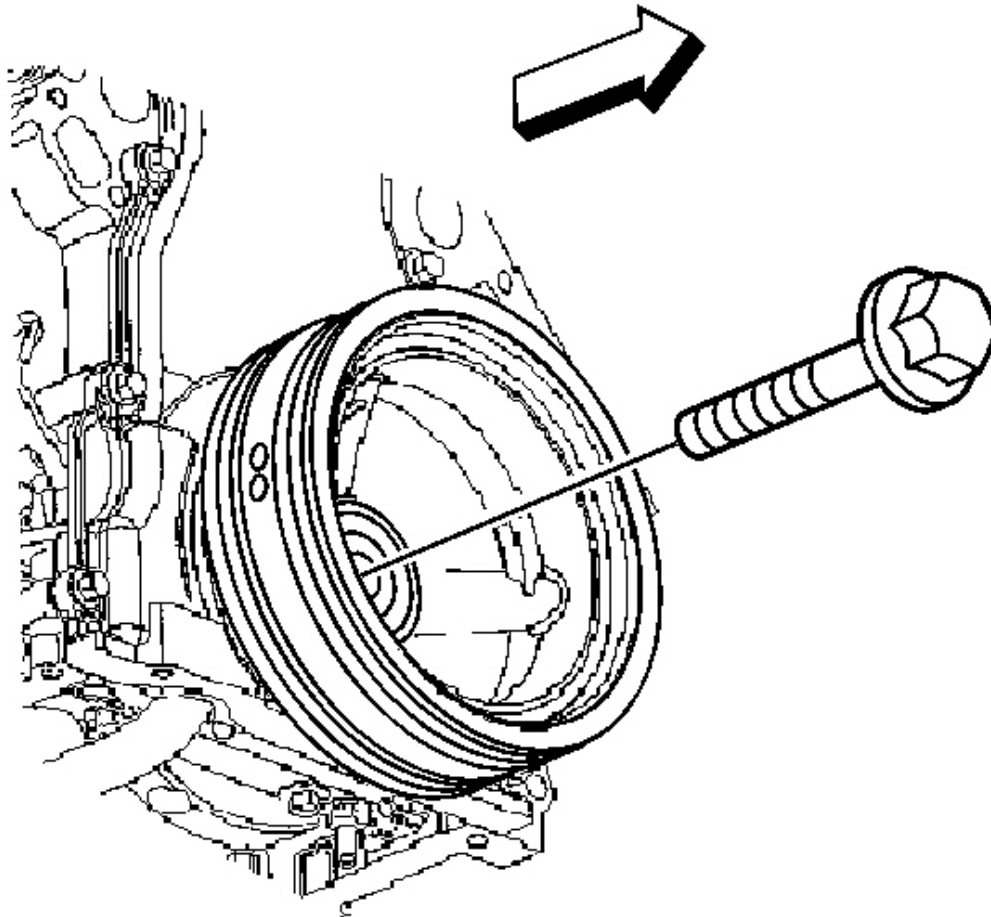


Fig. 172: View Of Crankshaft Balancer Bolt
Courtesy of GENERAL MOTORS CORP.

IMPORTANT:

- Ensure that the teeth of J 42386-A mesh with the teeth of the engine flywheel.
- The used crankshaft balancer bolt will be used only during the first pass of the balancer installation procedure. Install a NEW bolt and tighten as described in the second pass of the balancer bolt tightening procedure.
- The crankshaft balancer installation and bolt tightening involves a 4-stage tightening process. The first pass ensures that the balancer is

installed completely onto the crankshaft. The second, third and forth passes tighten the new bolt to the proper torque.

IMPORTANT: Position the balancer onto the end of the crankshaft as straight as possible prior to tool installation.

1. Install the crankshaft balancer onto the end of the crankshaft.

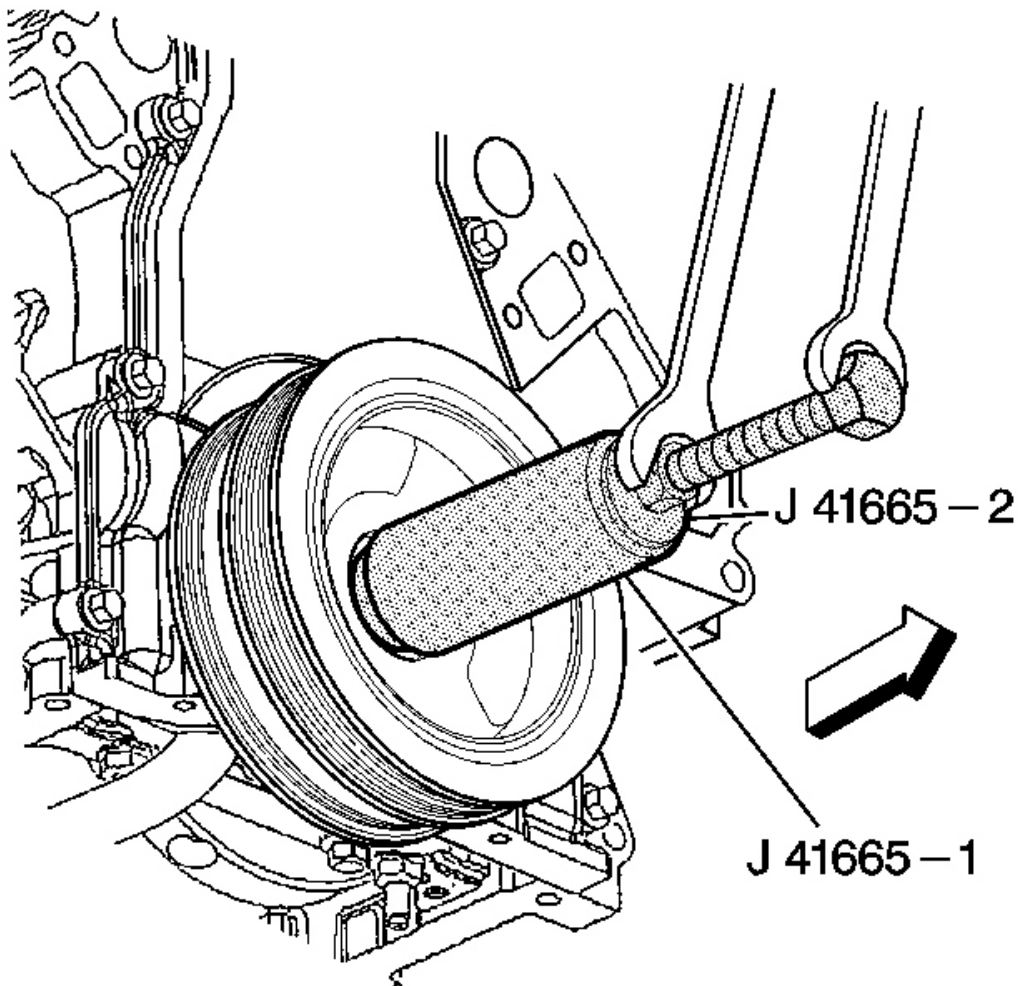


Fig. 173: View Of J 41665 Installing Balancer
Courtesy of GENERAL MOTORS CORP.

2. Use **J 41665** in order to install the crankshaft balancer.

2007 Chevrolet TrailBlazer

2007 ENGINE Engine Mechanical - 6.0L - TrailBlazer

1. Assemble the threaded rod, nut, washer and installer.

Insert the smaller end of the installer into the front of the balancer.

2. Use a wrench and hold the hex end of the threaded rod.
3. Use a second wrench and rotate the installation tool nut clockwise until the balancer is started onto the crankshaft.
4. Remove the tool and reverse the installation tool.

Position the larger end of the installer against the front of the balancer.

5. Use a wrench and hold the hex end of the threaded rod.
6. Use a second wrench and rotate the installation tool nut clockwise until the balancer is installed onto the crankshaft.
7. Remove the balancer installation tool.

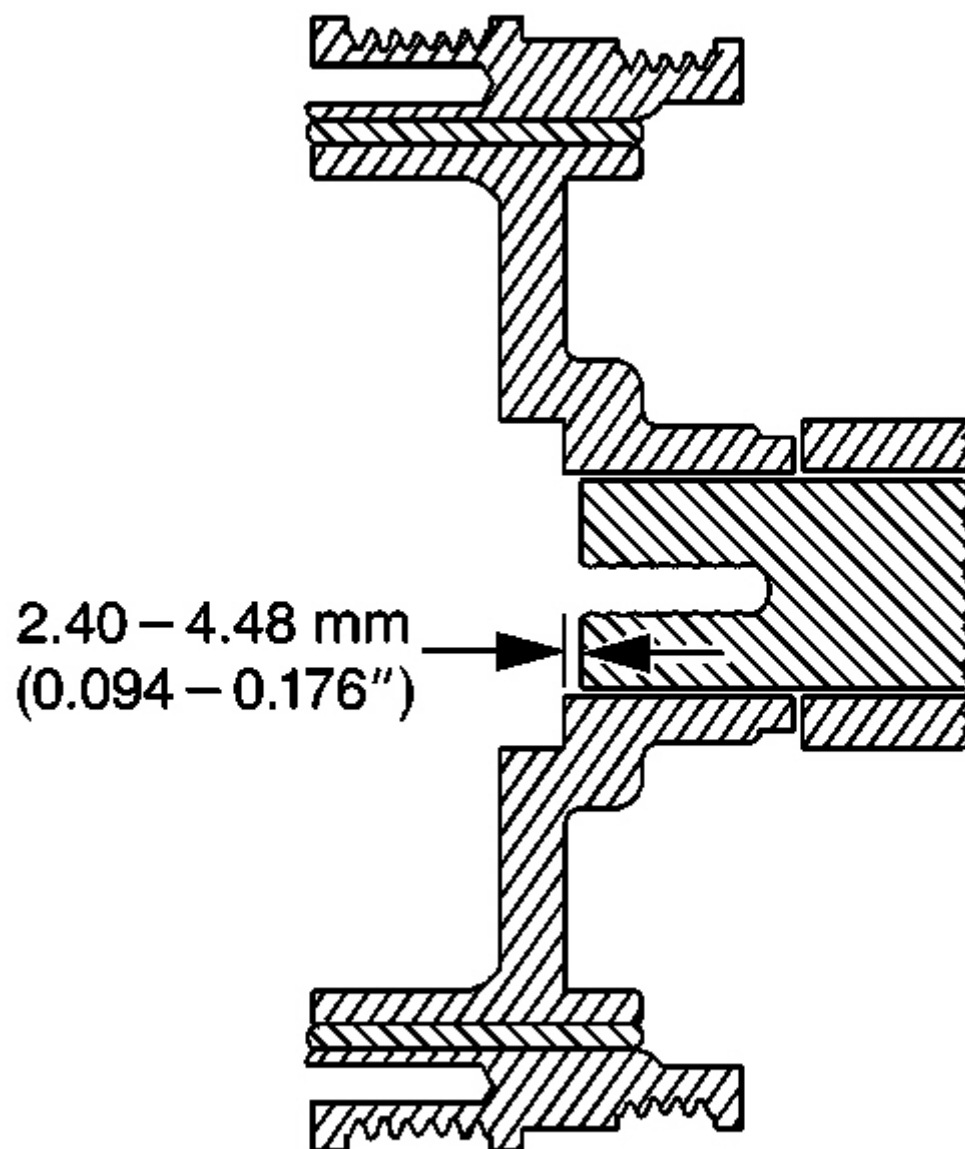


Fig. 174: Identifying Hub To Crankshaft Distance
Courtesy of GENERAL MOTORS CORP.

NOTE: Refer to Fastener Notice .

3. Install the used crankshaft balancer bolt.

2007 Chevrolet TrailBlazer

2007 ENGINE Engine Mechanical - 6.0L - TrailBlazer

Tighten: Tighten the USED bolt to 330 N.m (240 lb ft).

4. Remove the used crankshaft balancer bolt.

IMPORTANT: Recess the nose of the crankshaft 2.4-4.48 mm (0.094-0.176 in) into the balancer bore.

5. Measure for a correctly installed balancer.

If the balancer is not installed to the proper dimensions, install **J 41665** and repeat the installation procedure.

6. Install a NEW crankshaft balancer bolt.

Tighten:

1. Tighten the bolt a first pass to 50 N.m (37 lb ft).
 2. Tighten the bolt a final pass to 140 degrees using **J 45059**.
7. Remove **J 42386-A** and bolts.
 8. Install the starter motor. Refer to **Starter Motor Replacement (4.2L Engine)** or **Starter Motor Replacement (5.3L and 6.0L Engines)**.
 9. Install the fan shroud. Refer to **Cooling Fan and Shroud Replacement**.
 10. Install the A/C drive belt, if equipped. Refer to **Drive Belt Replacement - Air Conditioning**.
 11. Install the accessory drive belt. Refer to **Drive Belt Replacement - Accessory**.
 12. Perform the crankshaft position (CKP) system variation learn procedure. Refer to **Crankshaft Position System Variation Learn**.

CRANKSHAFT FRONT OIL SEAL REPLACEMENT

Tools Required

J 41478 Crankshaft Front Oil Seal Installer

Removal Procedure

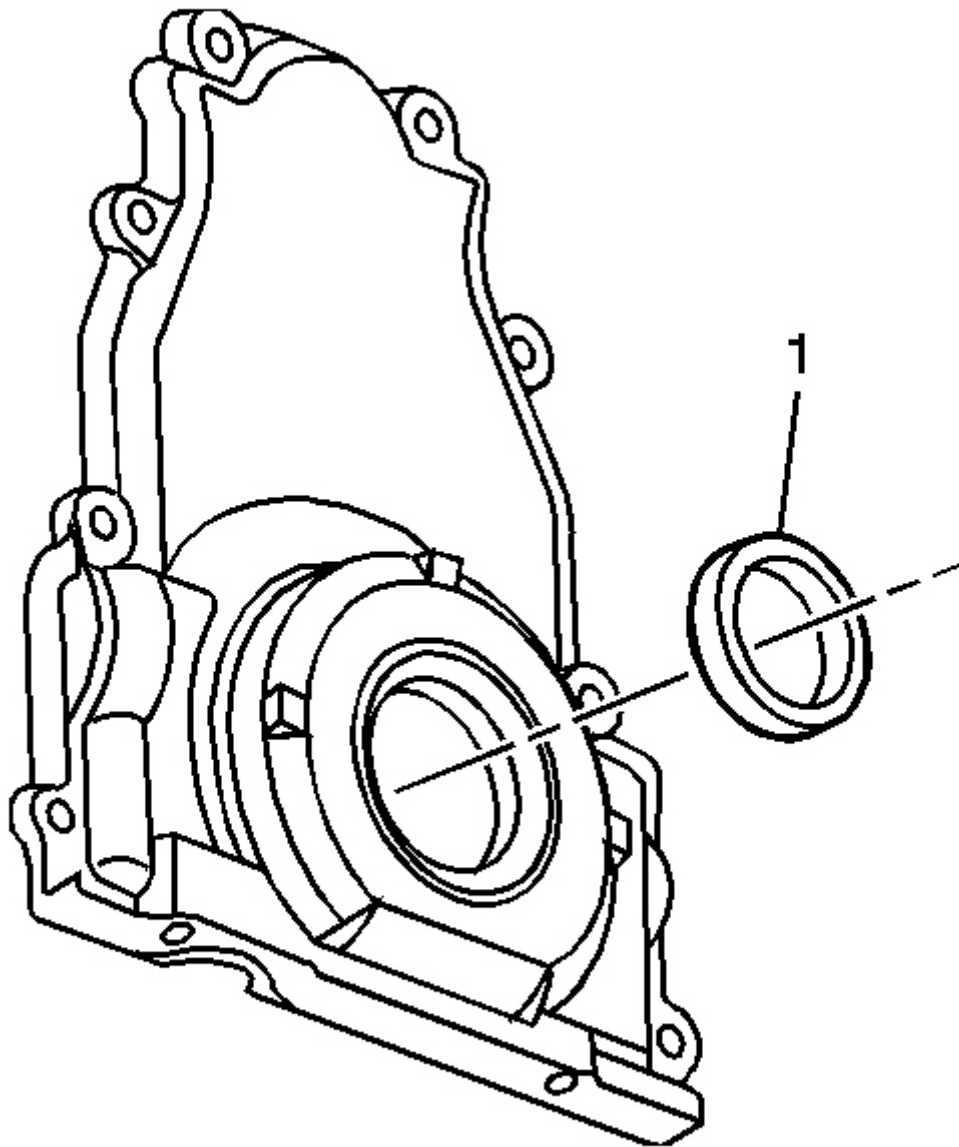


Fig. 175: View Of Crankshaft Front Oil Seal
Courtesy of GENERAL MOTORS CORP.

1. Remove the radiator. Refer to **Radiator Replacement (LH6, Ls2)** or **Radiator Replacement (LL8)** .
2. Remove the crankshaft balancer. Refer to **Crankshaft Balancer Replacement**.
3. Remove the crankshaft oil seal (1) from the front cover.

Installation Procedure

IMPORTANT:

- Do not lubricate the oil seal sealing surface.
- Do not reuse the crankshaft oil seal.

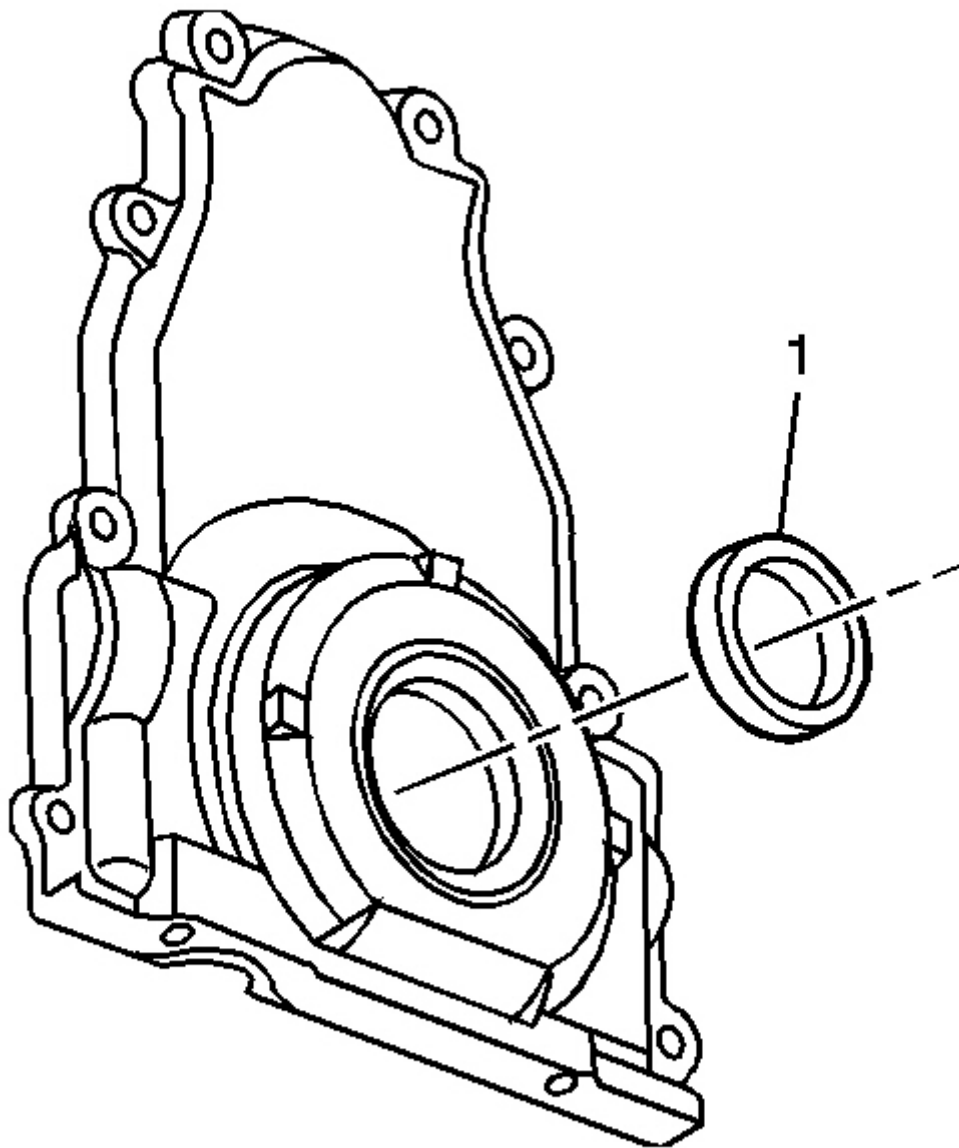


Fig. 176: View Of Crankshaft Front Oil Seal

Courtesy of GENERAL MOTORS CORP.

1. Lubricate the outer edge of the oil seal (1) with clean engine oil.
2. Lubricate the front cover oil seal bore with clean engine oil.

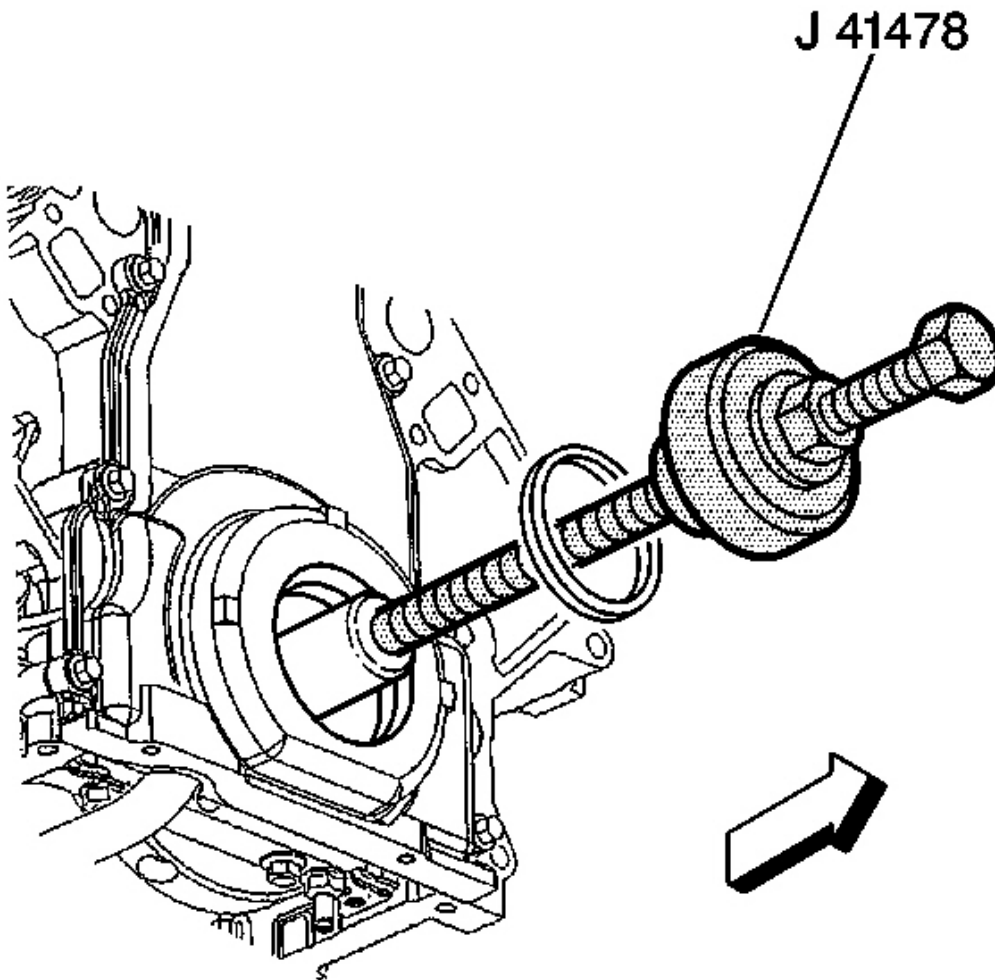


Fig. 177: View Of J 41478 Oil Seal Installer
Courtesy of GENERAL MOTORS CORP.

3. Install the crankshaft front oil seal onto the **J 41478** guide.
4. Install **J 41478** threaded rod with nut, washer, guide and oil seal into the end of the crankshaft.
5. Use **J 41478** in order to install the oil seal into the cover bore.

2007 Chevrolet TrailBlazer

2007 ENGINE Engine Mechanical - 6.0L - TrailBlazer

1. Use a wrench and hold the hex on the installer bolt.
2. Use a second wrench and rotate the installer nut clockwise until the seal bottoms in the cover bore.
3. Remove **J 41478** .
4. Inspect the oil seal for proper installation.

The oil seal should be installed evenly and completely into the front cover bore.

6. Install the crankshaft balancer. Refer to **Crankshaft Balancer Replacement**.
7. Install the radiator. Refer to **Radiator Replacement (LH6, Ls2)** or **Radiator Replacement (LL8)** .

ENGINE FRONT COVER REPLACEMENT

Tools Required

J 41476 Front and Rear Cover Alignment Tool (at crankshaft seal area)

Removal Procedure

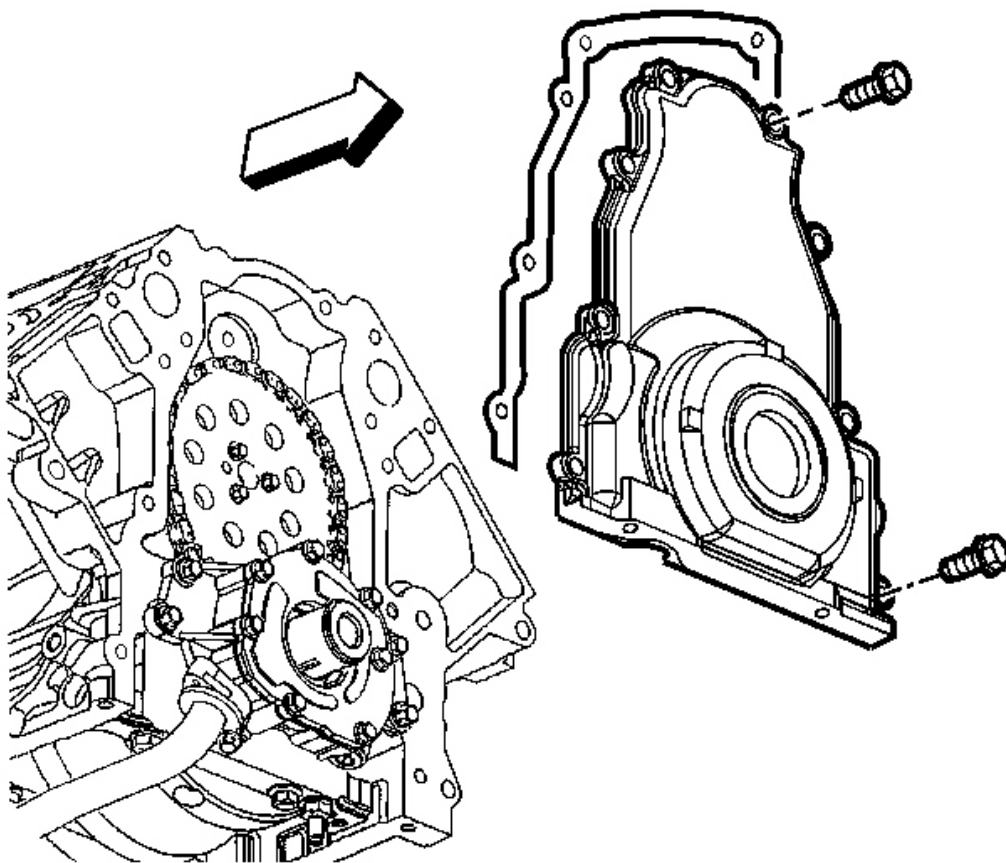


Fig. 178: View Of Front Cover & Gasket
Courtesy of GENERAL MOTORS CORP.

1. Remove the air conditioning (A/C) compressor and bracket. Refer to **Compressor Replacement (LH6, LS2)** or **Compressor Replacement (LL8)** .
2. Remove the water pump. Refer to **Water Pump Replacement (LH6 and LS2)** .
3. Remove the crankshaft balancer. Refer to **Crankshaft Balancer Replacement**.
4. Remove the oil pan-to-front cover bolts.
5. Remove the front cover bolts.
6. Remove the front cover and gasket.
7. Discard the front cover gasket.
8. Clean and inspect the engine front cover. Refer to **Engine Front Cover Cleaning and Inspection**.

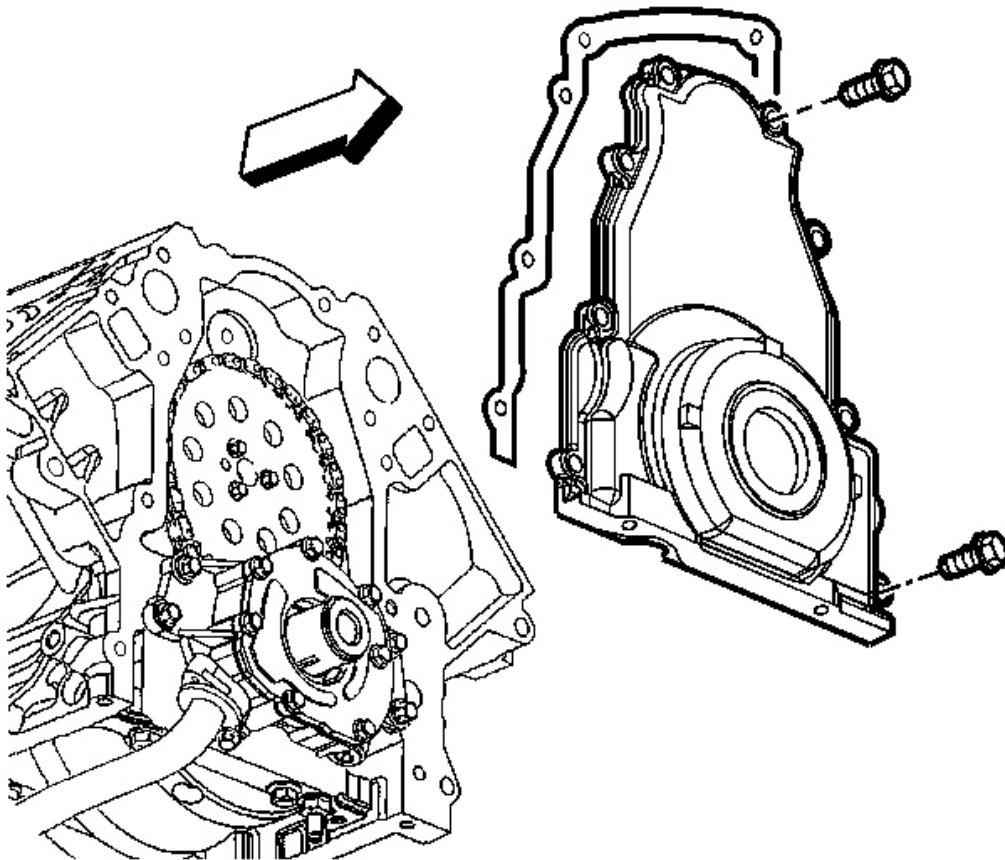


Fig. 179: View Of Front Cover & Gasket
Courtesy of GENERAL MOTORS CORP.

IMPORTANT:

- Do not reuse the crankshaft oil seal or front cover gasket.
- Do not apply any type of sealant to the front cover gasket, unless specified.
- The special tool in this procedure is used to properly center the front crankshaft front oil seal.
 - All gasket surfaces should be free of oil or other foreign material during assembly.
 - The crankshaft front oil seal **MUST** be centered in relation to the crankshaft.
 - An improperly aligned front cover may cause premature front oil seal wear and/or engine oil leaks.

2007 Chevrolet TrailBlazer

2007 ENGINE Engine Mechanical - 6.0L - TrailBlazer

1. Apply a 5 mm (0.2 in) bead of sealant 20 mm (0.8 in) long to the junction of the oil pan and the engine block. Refer to **Sealers, Adhesives and Lubricants** for the correct part number.
2. Install the front cover gasket and cover.
3. Install the front cover bolts until snug. Do not over tighten.
4. Install the oil pan-to-front cover bolts until snug. Do not over tighten.

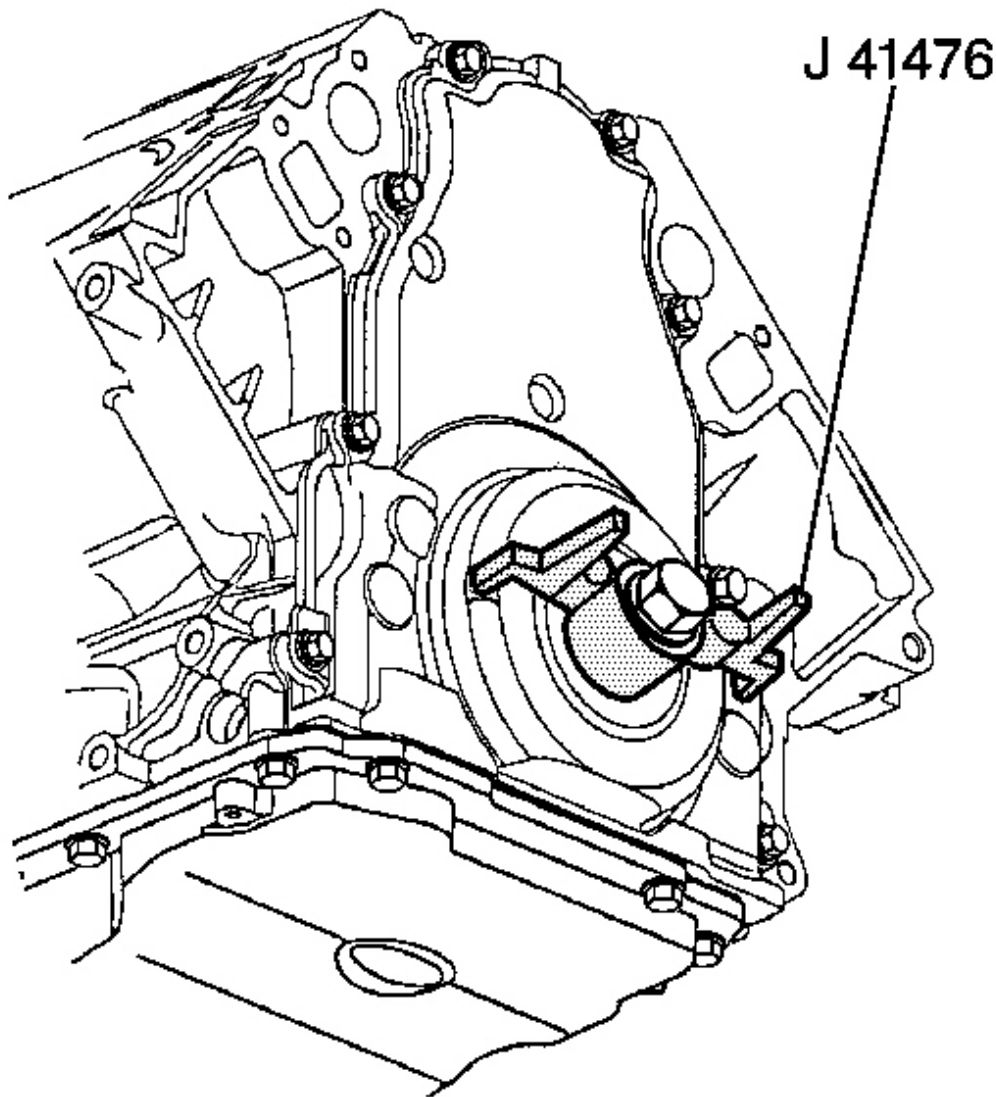


Fig. 180: View of J 41476 Installed To Front Cover

2007 Chevrolet TrailBlazer

2007 ENGINE Engine Mechanical - 6.0L - TrailBlazer

Courtesy of GENERAL MOTORS CORP.

5. Install **J 41476** to the front cover.
6. Align the tapered legs of **J 41476** with the machined alignment surfaces on the front cover.

NOTE: Refer to **Fastener Notice** .

7. Install the crankshaft balancer bolt until snug. Do NOT over tighten.

Tighten:

1. Tighten the oil pan to front cover bolts to 25 N.m (18 lb ft).
 2. Tighten the engine front cover bolts to 25 N.m (18 lb ft).
8. Remove **J 41476** .
 9. Install a NEW crankshaft front oil seal. Refer to **Crankshaft Front Oil Seal Installation** .
 10. Install the water pump. Refer to **Water Pump Replacement (LH6 and LS2)** .
 11. Install the A/C compressor and bracket. Refer to **Compressor Replacement (LH6, LS2)** or **Compressor Replacement (LL8)** .

CRANKSHAFT REAR OIL SEAL REPLACEMENT

Tools Required

J 41479 Crankshaft Rear Oil Seal Installer

Removal Procedure

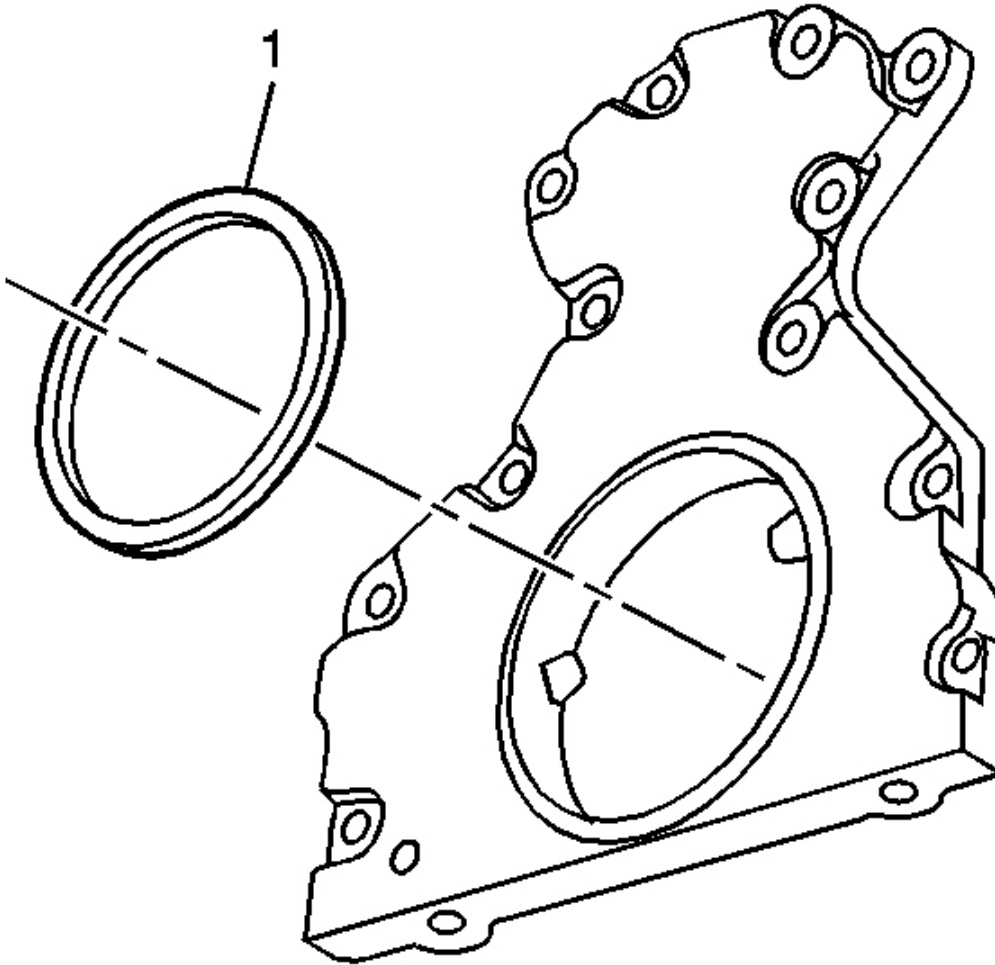


Fig. 181: View Of Crankshaft Rear Oil Seal
Courtesy of GENERAL MOTORS CORP.

1. Remove the engine flywheel. Refer to **Engine Flywheel Replacement** .
2. Remove the crankshaft rear oil seal (1) from the rear cover.

Installation Procedure

IMPORTANT:

- Remove the flywheel spacer, if applicable, prior to oil seal installation.
- Do not lubricate the oil seal inside diameter or the crankshaft surface.
- Do not reuse the crankshaft rear oil seal.

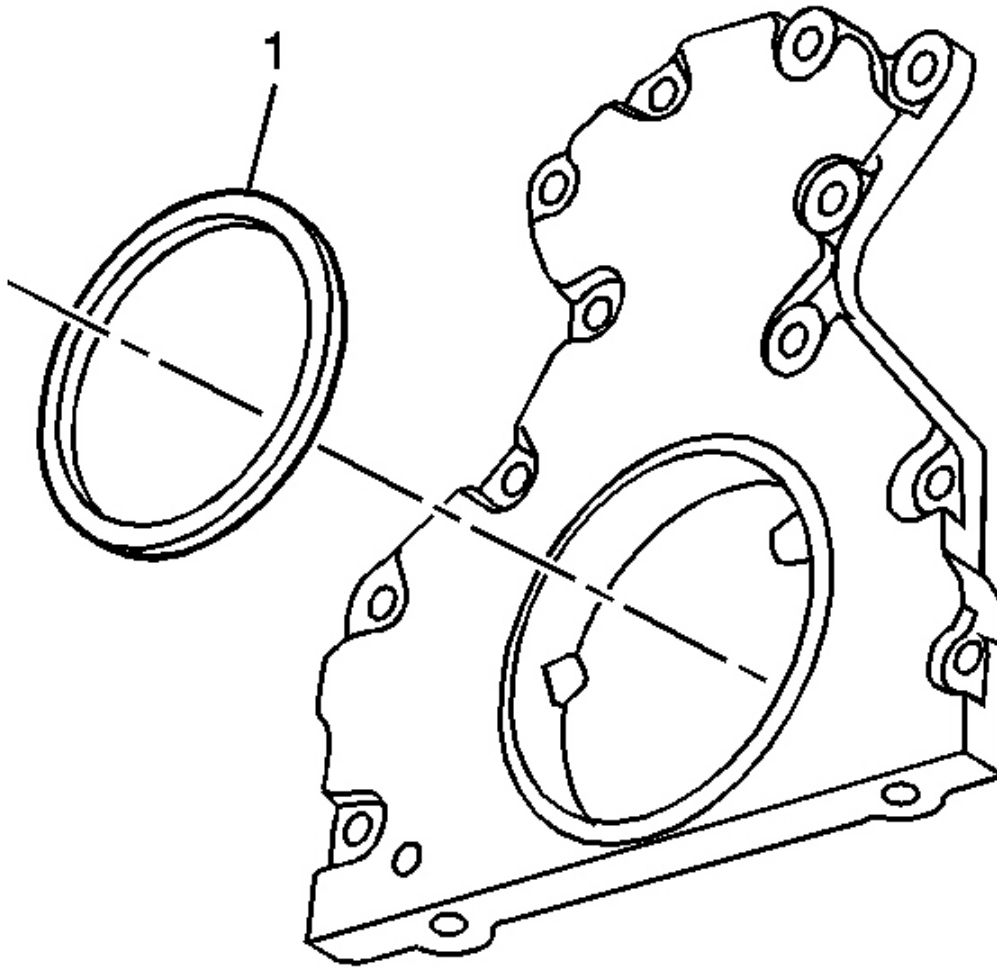


Fig. 182: View Of Crankshaft Rear Oil Seal
Courtesy of GENERAL MOTORS CORP.

1. Lubricate the outside diameter of the oil seal (1) with clean engine oil.

DO NOT allow oil or other lubricants to contact the seal surface.

2. Lubricate the rear cover oil seal bore with clean engine oil.

DO NOT allow oil or other lubricants to contact the crankshaft surface.

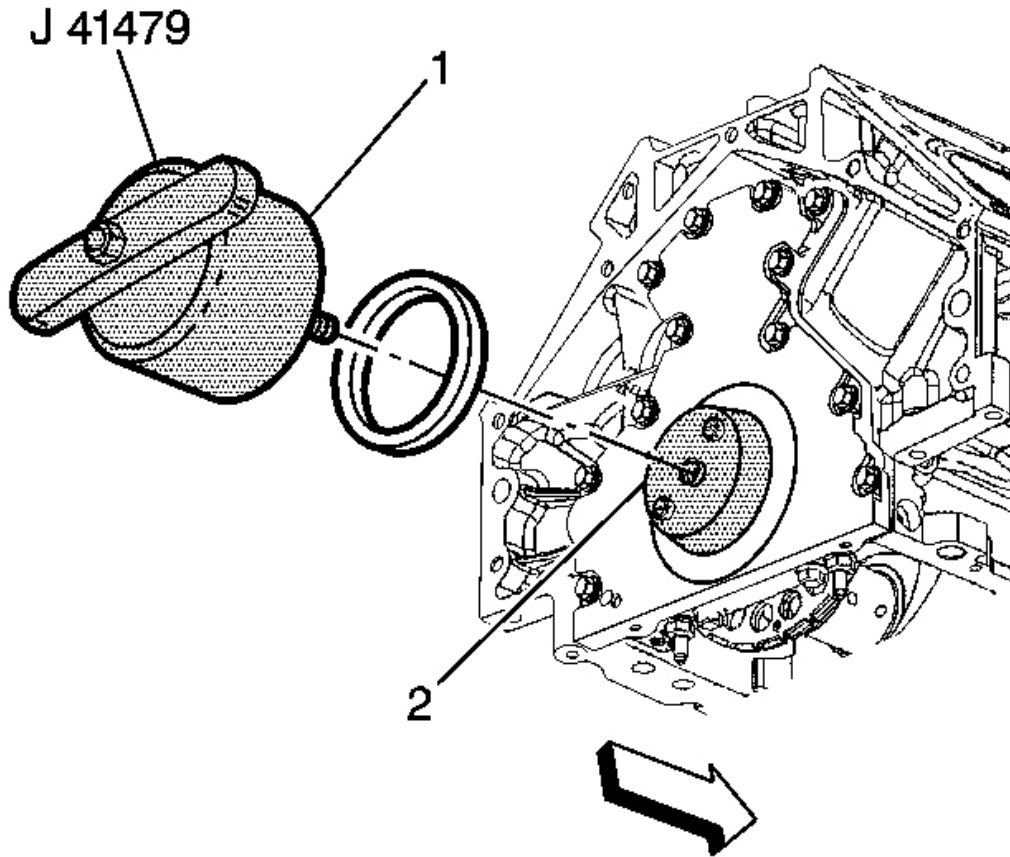


Fig. 183: View Of J 41479 Cone & Bolts
Courtesy of GENERAL MOTORS CORP.

3. Install **J 41479** tapered cone (2) and bolts onto the rear of the crankshaft.
4. Tighten the bolts until snug. Do not overtighten.
5. Install the rear oil seal onto the tapered cone (2) and push the seal to the rear cover bore.
6. Thread **J 41479** threaded rod into the tapered cone until the tool (1) contacts the oil seal.
7. Align the oil seal into the tool (1).
8. Rotate the handle of the tool (1) clockwise until the seal enters the rear cover and bottoms into the cover bore.
9. Remove **J 41479**.
10. Install the engine flywheel. Refer to **Engine Flywheel Replacement**.

ENGINE REAR COVER REPLACEMENT

Tools Required

J 41476 Front and Rear Cover Alignment Tool at crankshaft seal area

Removal Procedure

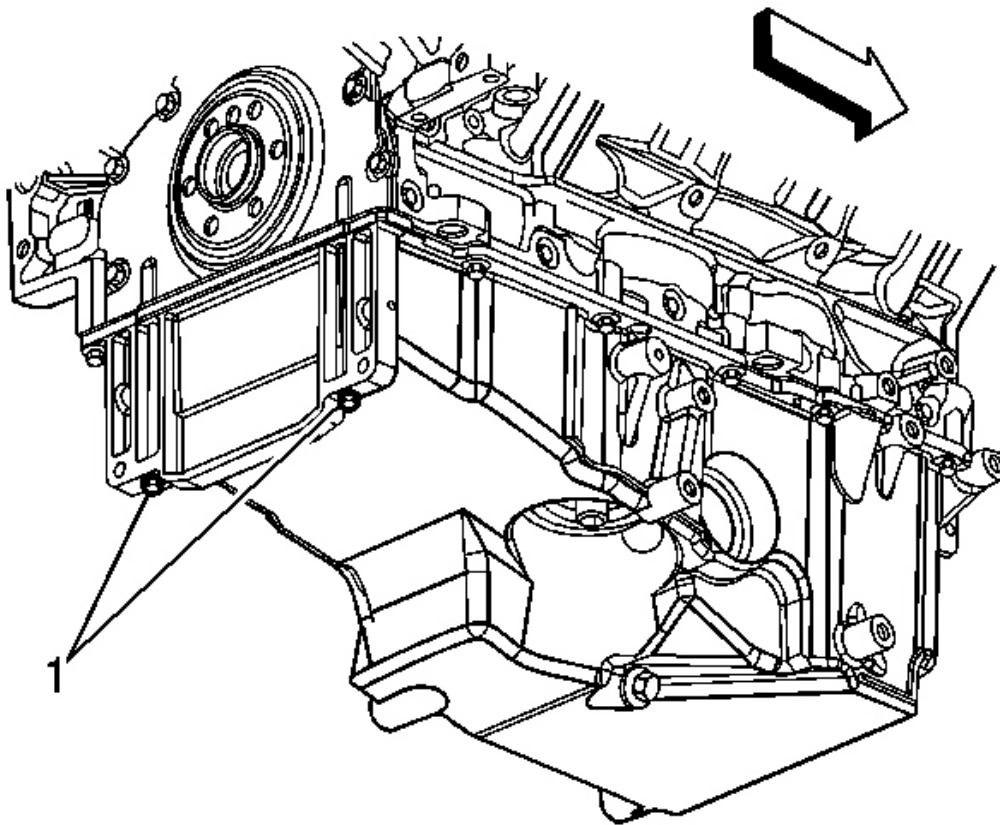


Fig. 184: View Of Oil Pan-To-Rear Cover Bolts
Courtesy of GENERAL MOTORS CORP.

1. Remove the engine flywheel. Refer to **Engine Flywheel Replacement** .
2. Remove the oil pan-to-rear cover bolts (1).

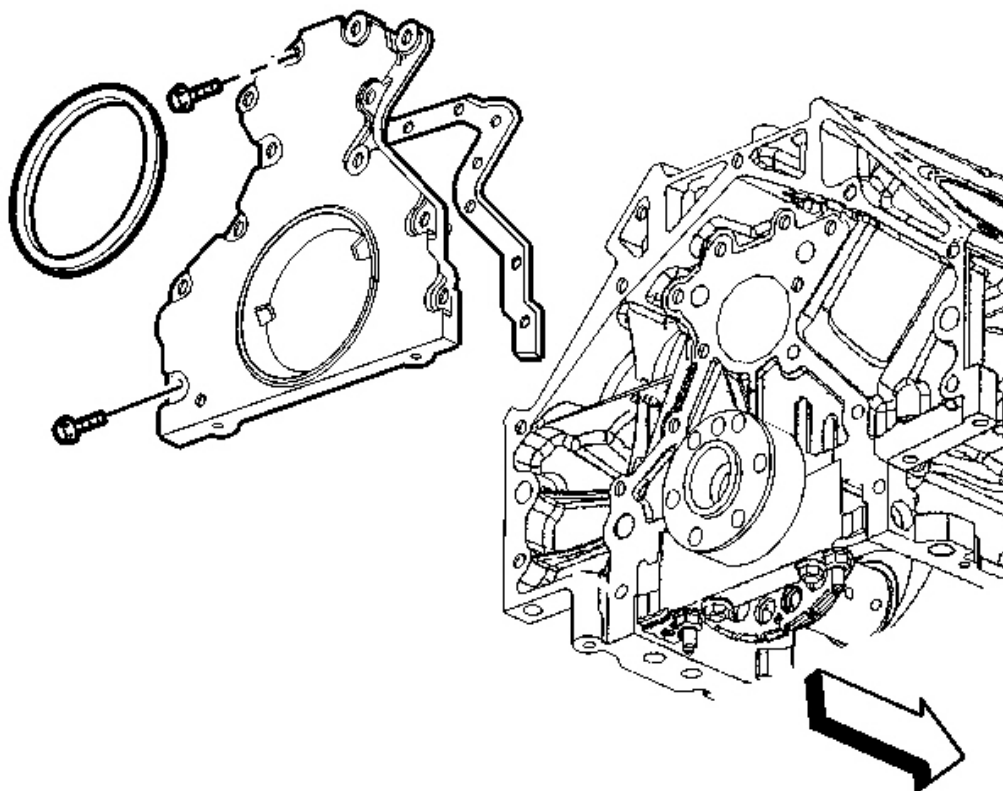


Fig. 185: View Of Rear Cover, Bolts & Gasket
Courtesy of GENERAL MOTORS CORP.

3. Remove the rear cover bolts.
4. Remove the rear cover and gasket.
5. Discard the rear cover gasket.
6. Clean and inspect the rear cover. Refer to **Crankshaft Rear Oil Seal Housing Cleaning and Inspection.**

Installation Procedure

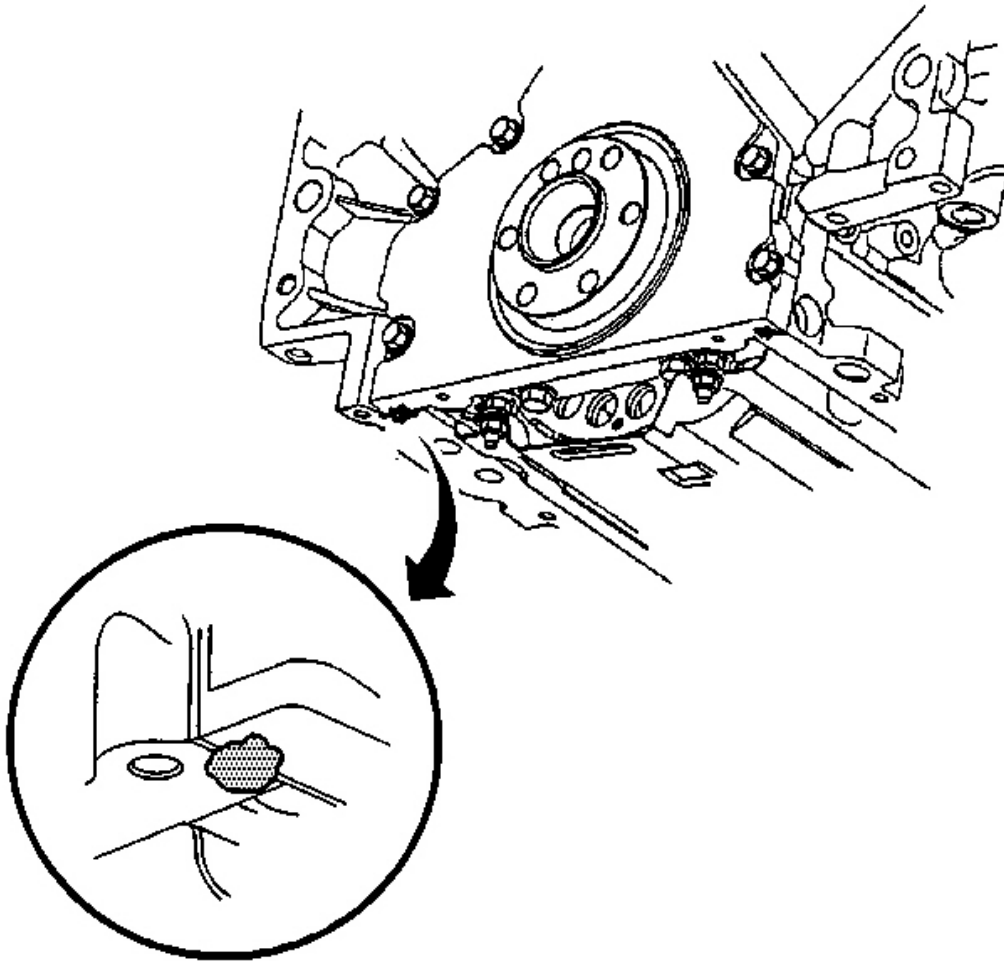


Fig. 186: View Of Sealant Applied To Rear Oil Pan-To-Engine Block Junction
Courtesy of GENERAL MOTORS CORP.

IMPORTANT:

- Do not reuse the crankshaft oil seal or rear cover gasket.
- Do not apply any type of sealant to the rear cover gasket unless specified.
- The special tool in this procedure is used to properly center the crankshaft rear oil seal.
- Install the crankshaft rear oil seal after the rear cover has been installed and aligned.

Install the rear cover without the crankshaft oil seal.

- All gasket surfaces should be free of oil or other foreign material during assembly.
 - Center the crankshaft rear oil seal in relation to the crankshaft.
 - An improperly aligned rear cover may cause premature rear oil seal wear and/or engine assembly oil leaks.
1. Apply a 5 mm (0.2 in) bead of sealant 20 mm (0.8 in) long to the oil pan to engine block junction. Refer to **Sealers, Adhesives and Lubricants** for the correct part number.

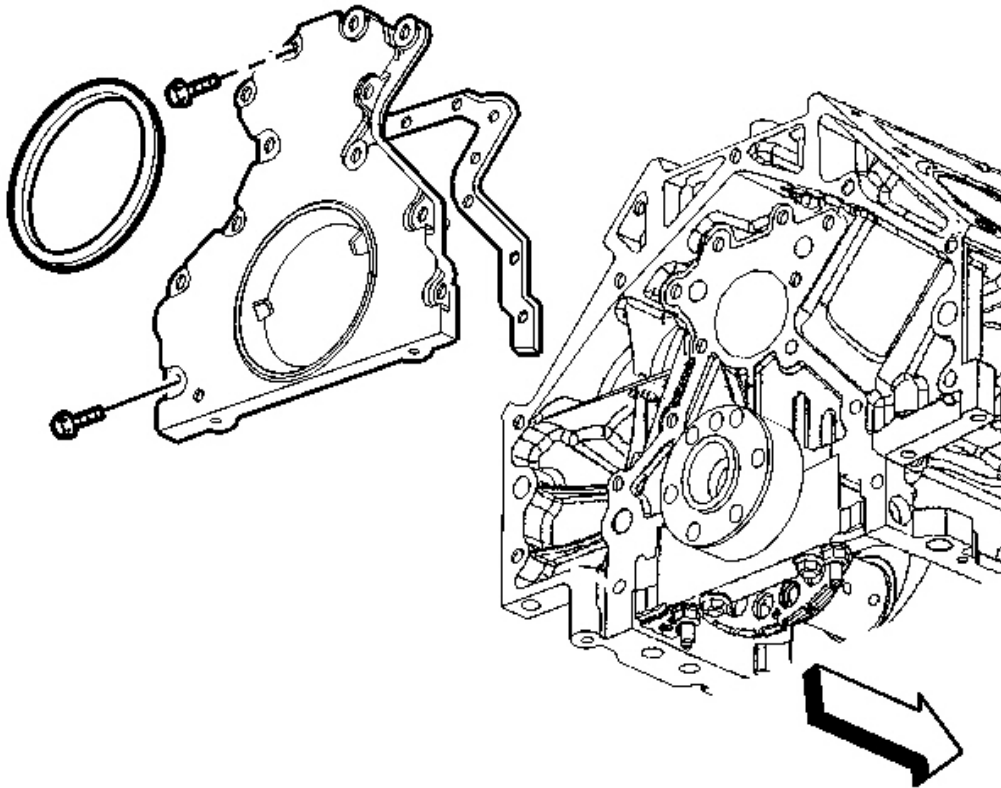


Fig. 187: View Of Rear Cover, Bolts & Gasket
Courtesy of GENERAL MOTORS CORP.

2. Install the rear cover gasket and cover.
3. Install the rear cover bolts until snug. Do NOT over tighten.

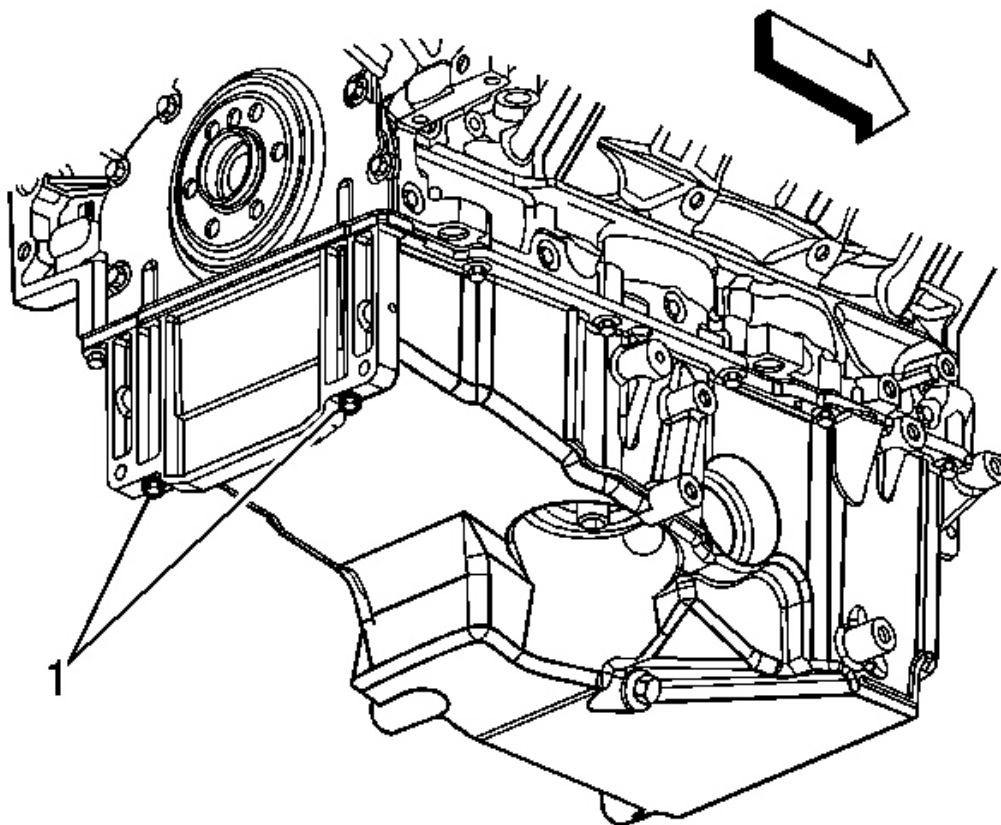


Fig. 188: View Of Oil Pan-To-Rear Cover Bolts
Courtesy of GENERAL MOTORS CORP.

4. Install the oil pan-to-rear cover bolts (1) until snug. Do not over tighten.

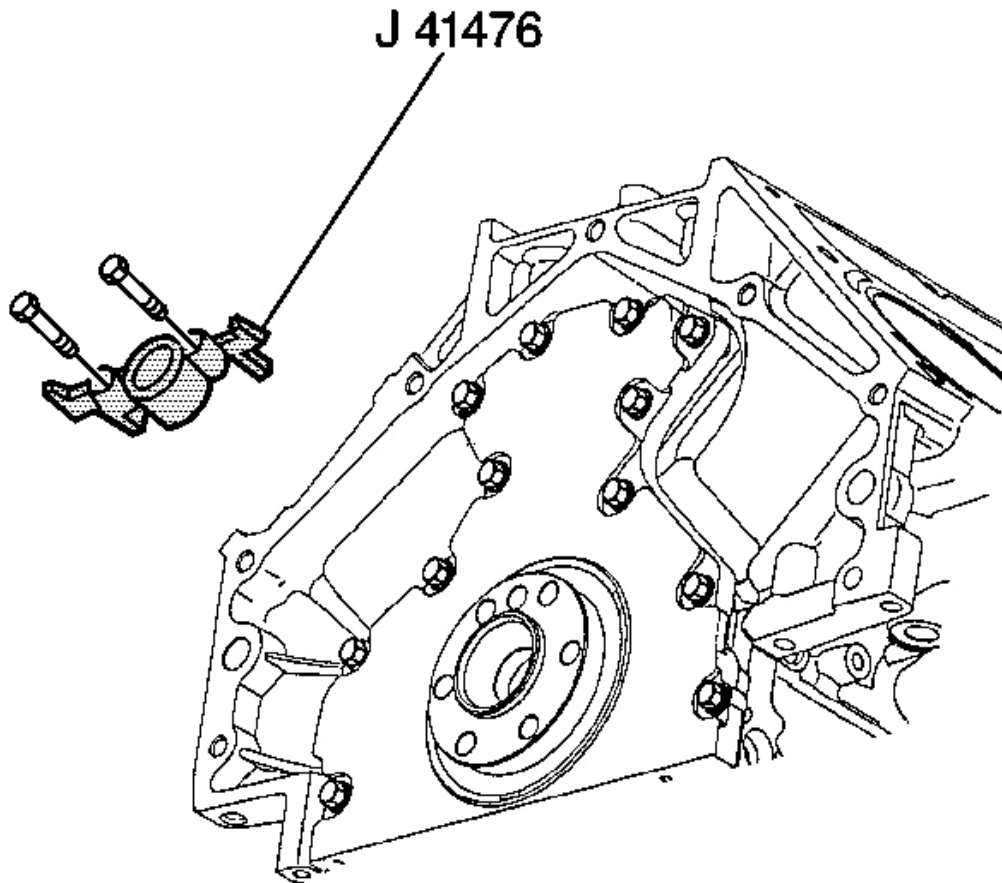


Fig. 189: View Of J 41476

Courtesy of GENERAL MOTORS CORP.

IMPORTANT: The tapered legs of the alignment tool must enter the rear cover oil seal bore.

5. Rotate the crankshaft until 2 opposing flywheel bolt holes are parallel to the oil pan surface.
6. Install **J 41476** and bolts onto the rear of the crankshaft.

NOTE: Refer to Fastener Notice .

7. Tighten **J 41476** mounting bolts until snug. Do not overtighten.

Tighten:

2007 Chevrolet TrailBlazer

2007 ENGINE Engine Mechanical - 6.0L - TrailBlazer

1. Tighten the oil pan-to-rear cover bolts to 12 N.m (106 lb in).
2. Tighten the engine rear cover bolts to 30 N.m (22 lb ft).
8. Remove **J 41476** .
9. Install a NEW crankshaft rear oil seal. Refer to **Crankshaft Rear Oil Seal Replacement** .
10. Install the engine flywheel. Refer to **Engine Flywheel Replacement** .

OIL FILTER ADAPTER REPLACEMENT

Removal Procedure

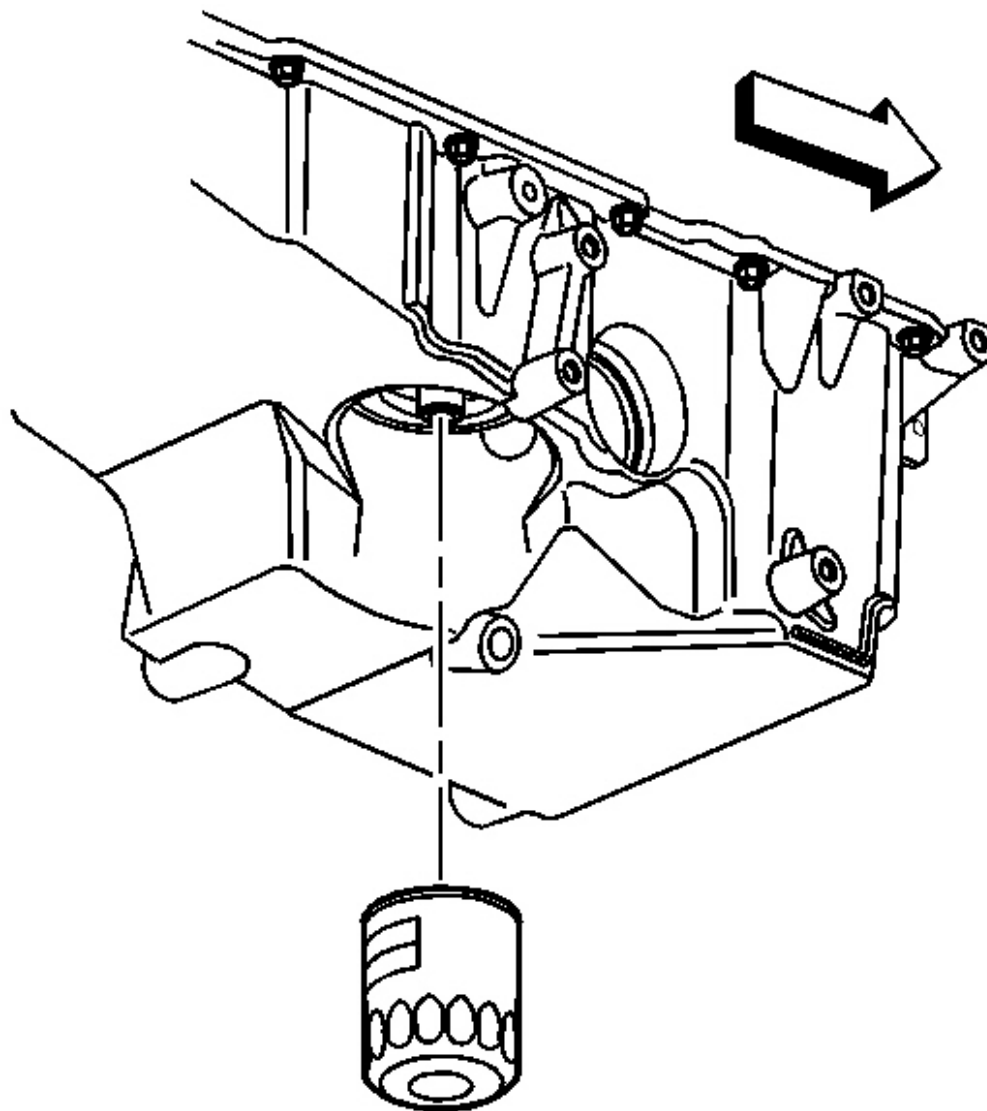


Fig. 190: Locating Oil Filter

Courtesy of GENERAL MOTORS CORP.

1. Remove the oil filter. Refer to **Engine Oil and Oil Filter Replacement** .

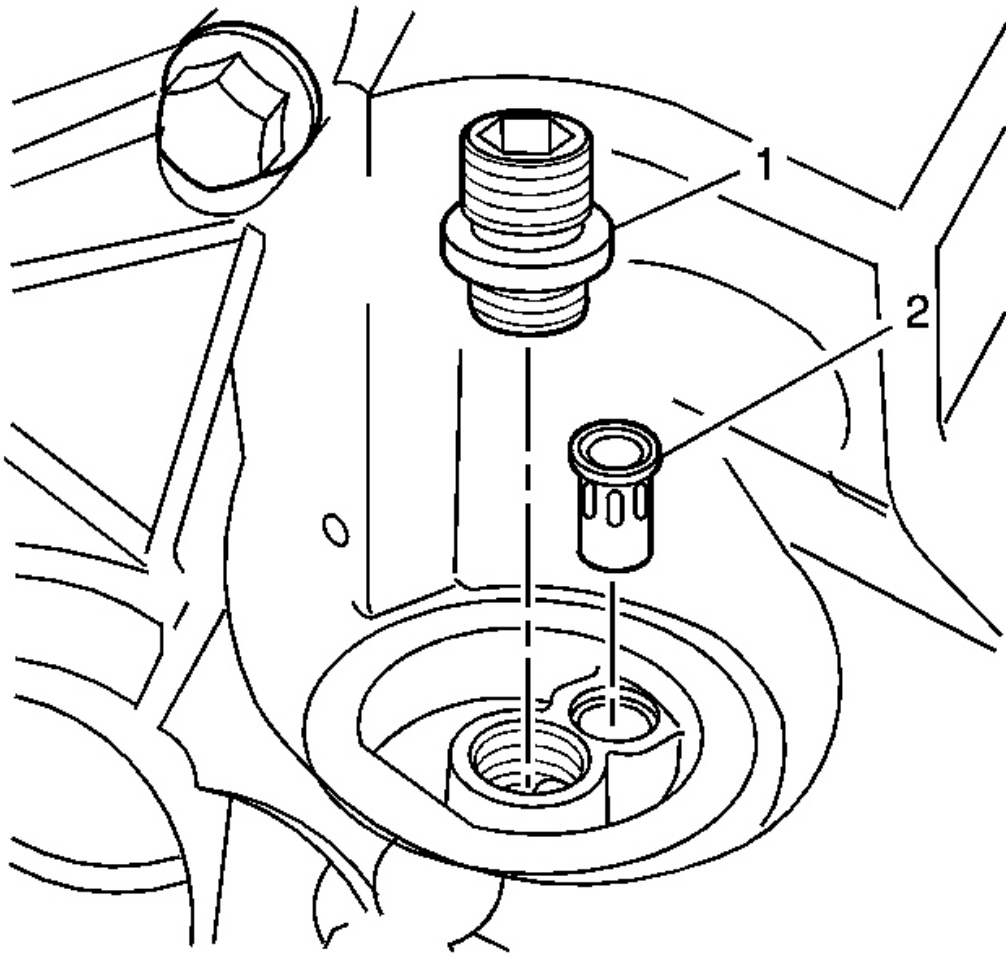


Fig. 191: View Of Oil Filter Adapter & Bypass Valve
Courtesy of GENERAL MOTORS CORP.

2. Remove the oil filter adapter (1).

Installation Procedure

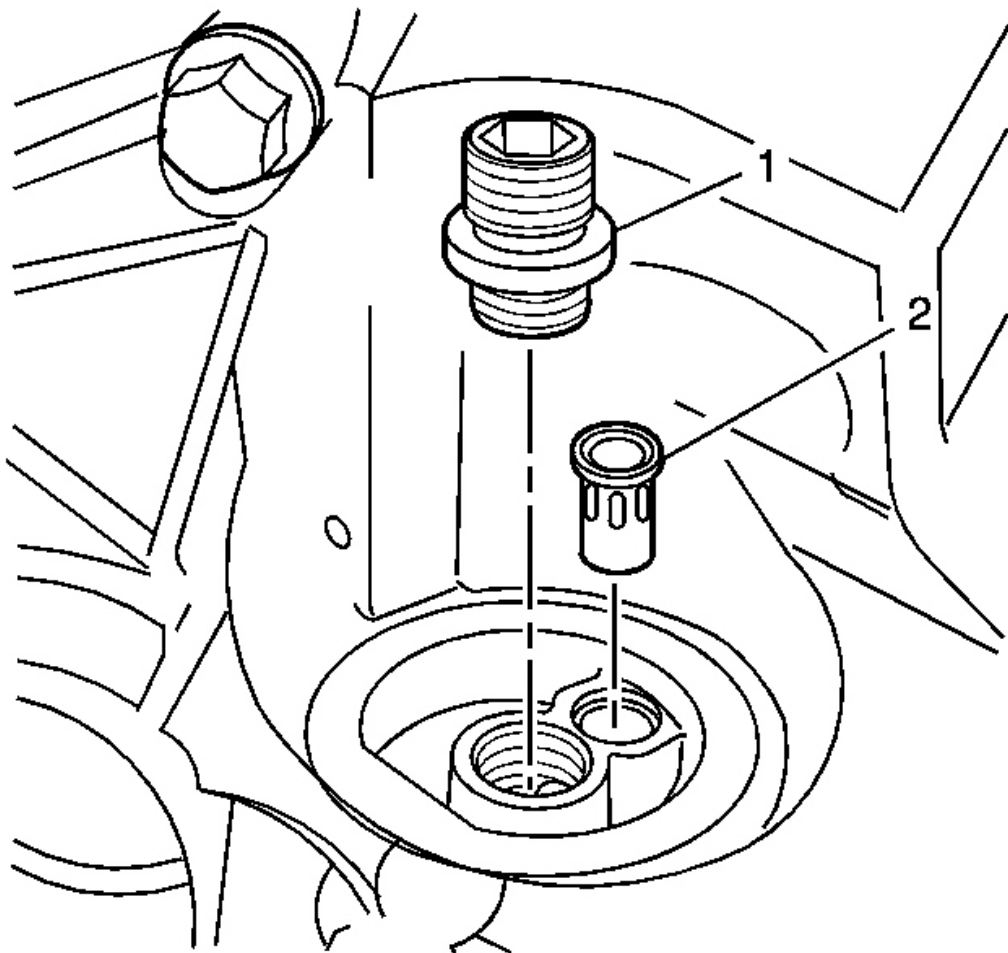


Fig. 192: View Of Oil Filter Adapter & Bypass Valve
Courtesy of GENERAL MOTORS CORP.

NOTE: Refer to Fastener Notice .

1. Install the oil filter adapter (1).

Tighten: Tighten the adapter to 55 N.m (40 lb ft).

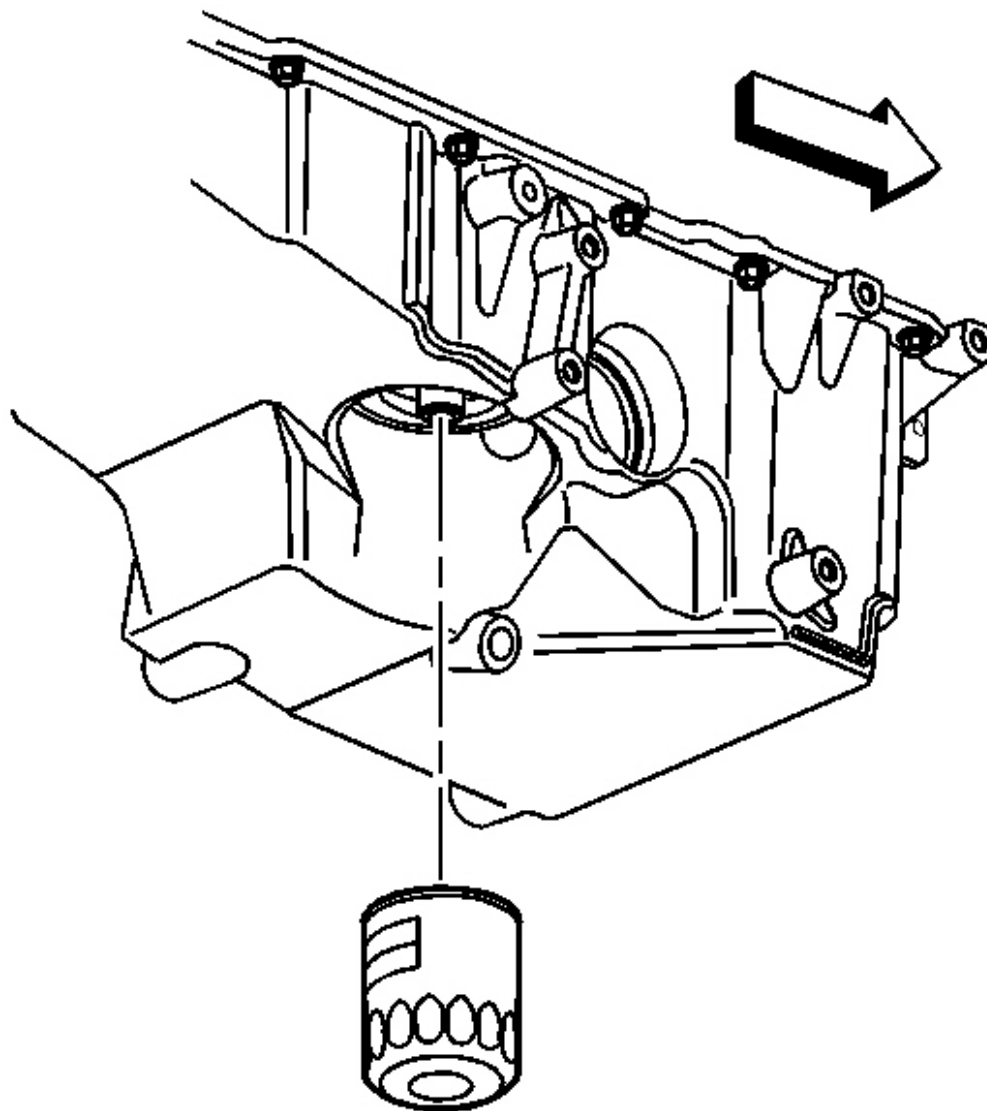


Fig. 193: Locating Oil Filter

Courtesy of GENERAL MOTORS CORP.

2. Install the oil filter. Refer to **Engine Oil and Oil Filter Replacement** .

OIL FILTER BYPASS VALVE REPLACEMENT

Removal Procedure

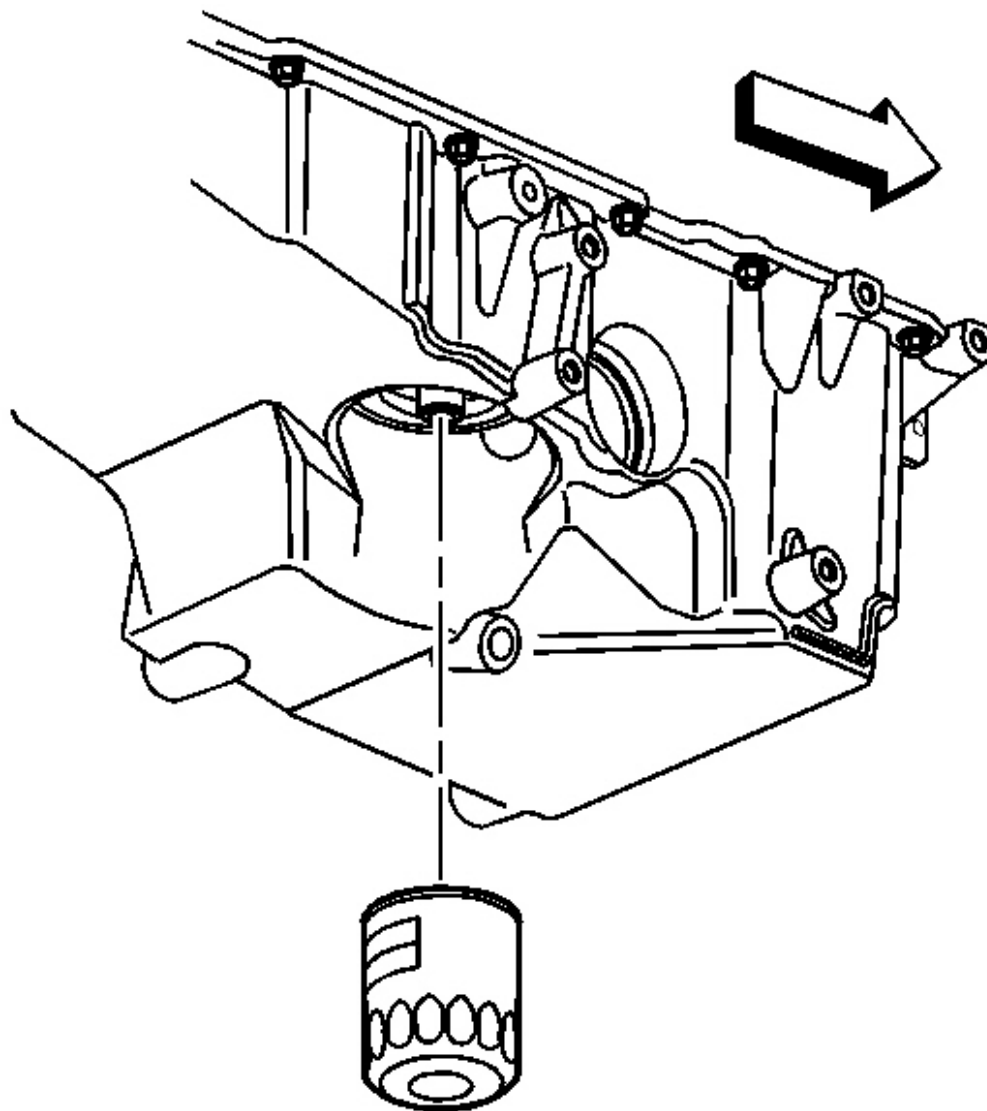


Fig. 194: Locating Oil Filter

Courtesy of GENERAL MOTORS CORP.

1. Remove the oil filter.

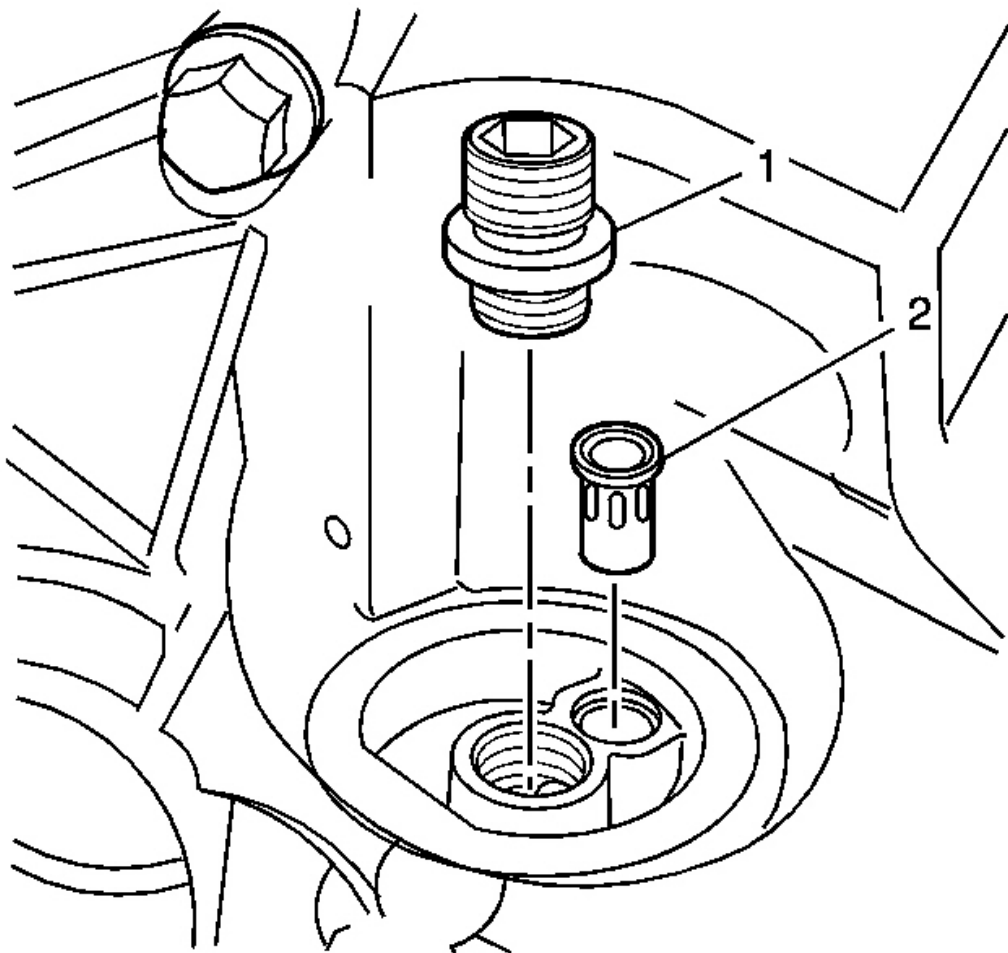


Fig. 195: View Of Oil Filter Adapter & Bypass Valve
Courtesy of GENERAL MOTORS CORP.

2. Remove the oil filter adapter (1).
3. Remove the oil filter bypass valve (2).

Installation Procedure

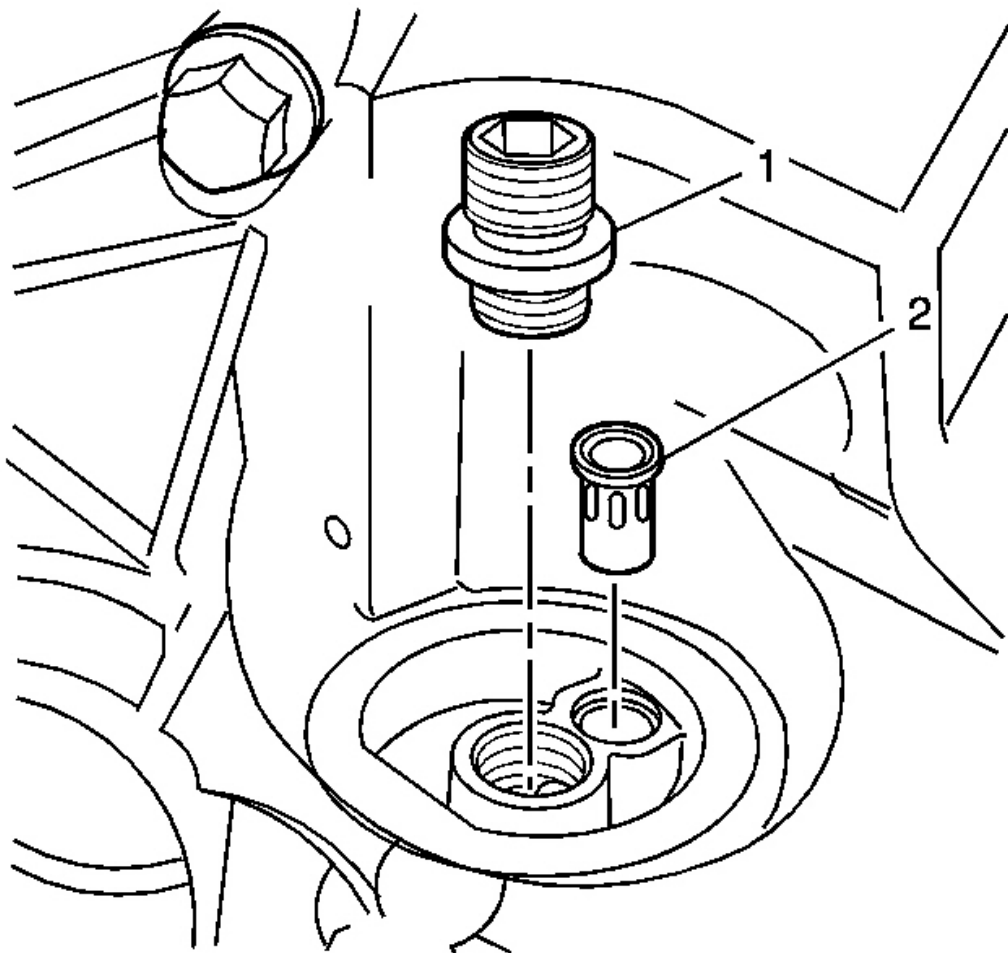


Fig. 196: View Of Oil Filter Adapter & Bypass Valve
Courtesy of GENERAL MOTORS CORP.

NOTE: Refer to Fastener Notice .

1. Install the oil filter bypass valve (2).
2. Install the oil filter adapter (1).

Tighten: Tighten the adapter to 55 N.m (40 lb ft).

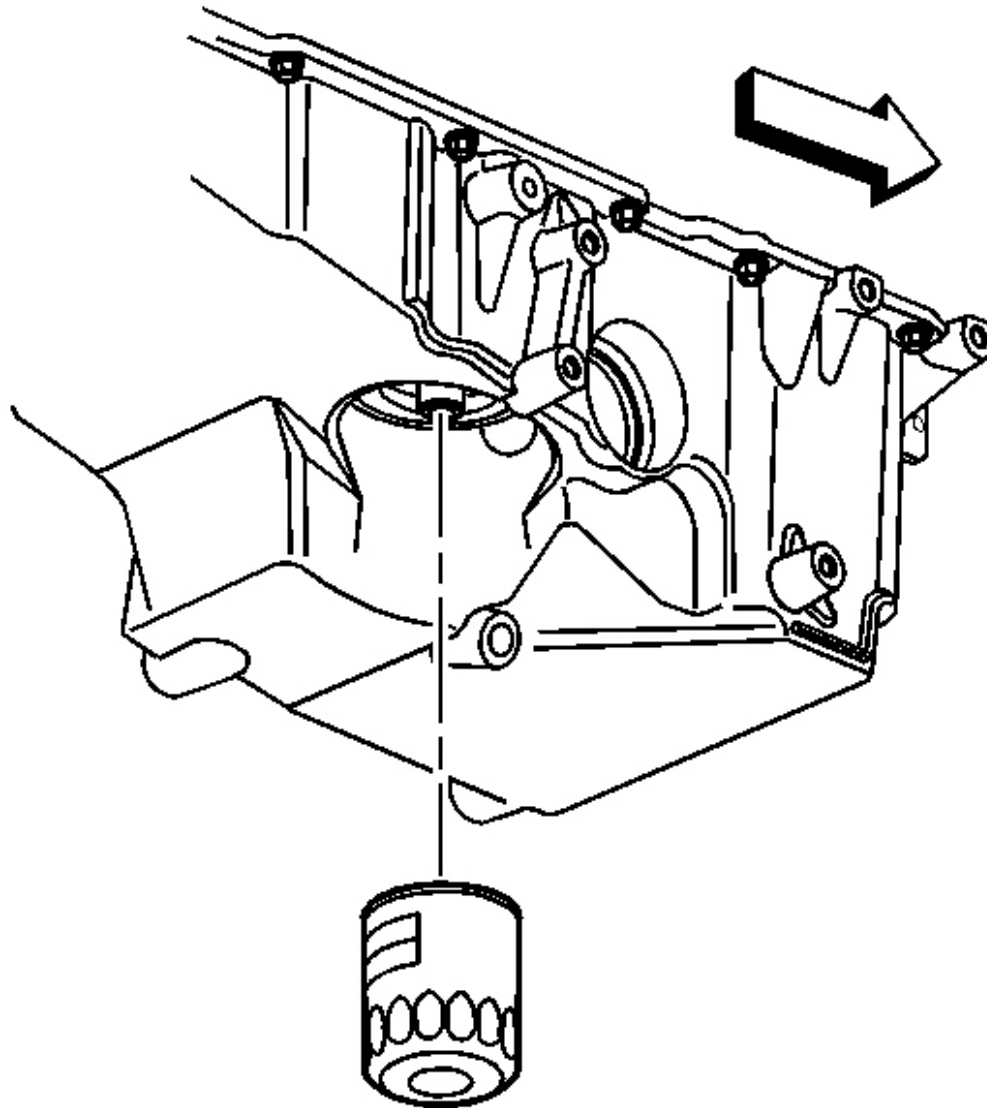


Fig. 197: Locating Oil Filter

Courtesy of GENERAL MOTORS CORP.

3. Install the oil filter.

Tighten: Tighten the filter to 30 N.m (22 lb ft).

4. Refill the engine oil if necessary. Refer to **Capacities - Approximate Fluid** or to **Fluid and Lubricant**

Recommendations .

OIL PAN REPLACEMENT

Removal Procedure

1. Disconnect the negative battery cable. Refer to **Battery Negative Cable Disconnection and Connection .**
2. Remove the oil level indicator tube. Refer to **Oil Level Indicator and Tube Replacement.**

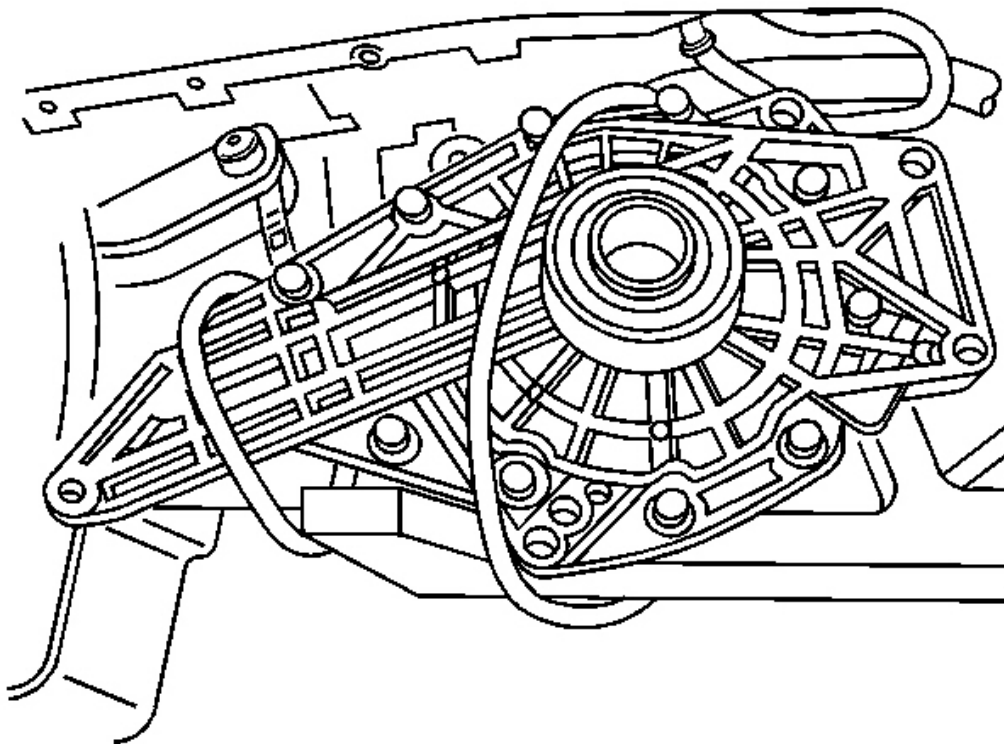


Fig. 198: Securing Front Differential To Frame
Courtesy of GENERAL MOTORS CORP.

3. If equipped with four-wheel drive, remove the front differential and secure to the frame. Refer to **Differential Carrier Assembly Replacement (4.2L In-Line Six Cylinder)** or **Differential Carrier Assembly Replacement (V8) .**
4. Drain the engine oil. Refer to **Engine Oil and Oil Filter Replacement .**

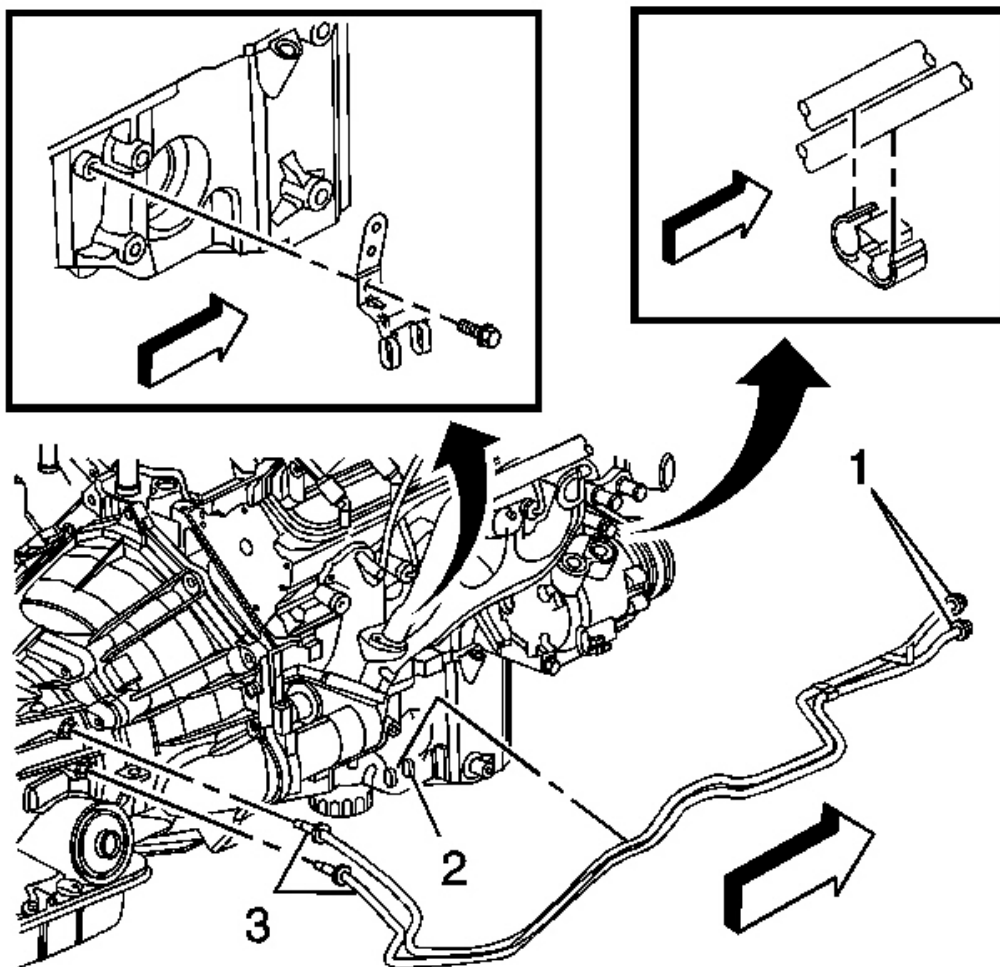


Fig. 199: View Of Transmission Oil Cooler Lines
Courtesy of GENERAL MOTORS CORP.

5. Remove the transmission oil cooler lines (1) from the retainer (2).

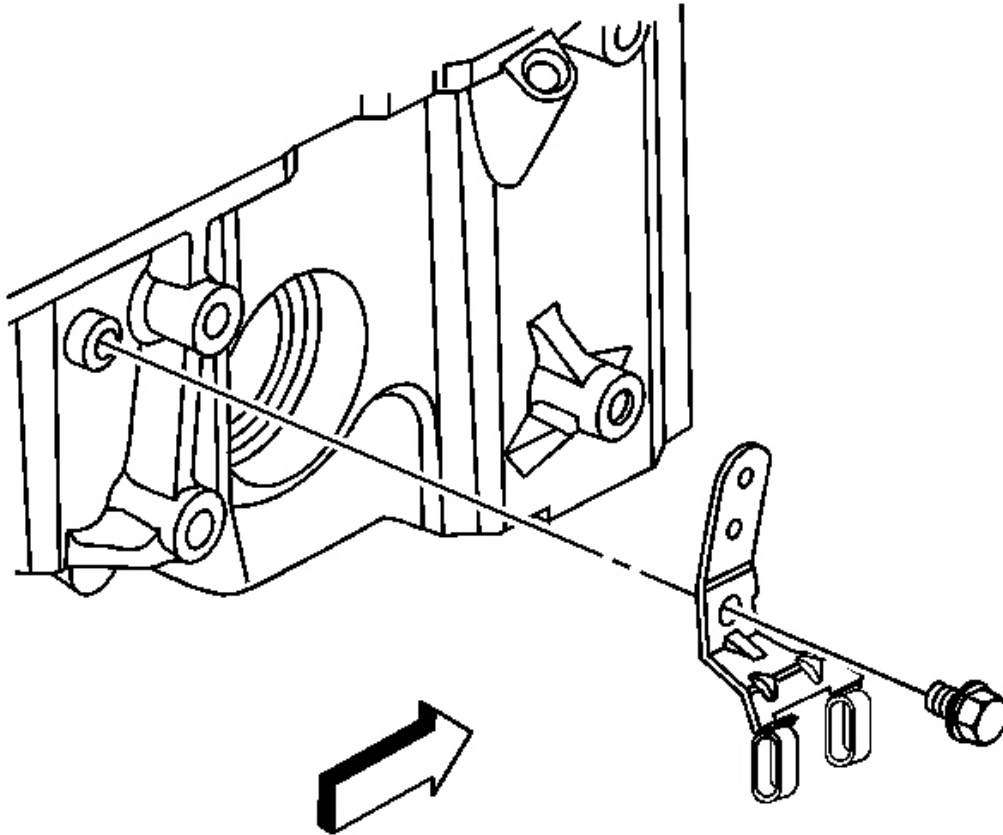


Fig. 200: View Of Transmission Oil Cooler Line Retaining Bracket & Bolt
Courtesy of GENERAL MOTORS CORP.

6. Remove the transmission oil cooler line retaining bracket bolt and bracket.
7. Remove the starter. Refer to **Starter Motor Replacement (4.2L Engine)** or **Starter Motor Replacement (5.3L and 6.0L Engines)** .
8. Remove the flywheel inspection cover from the left side of the transmission.

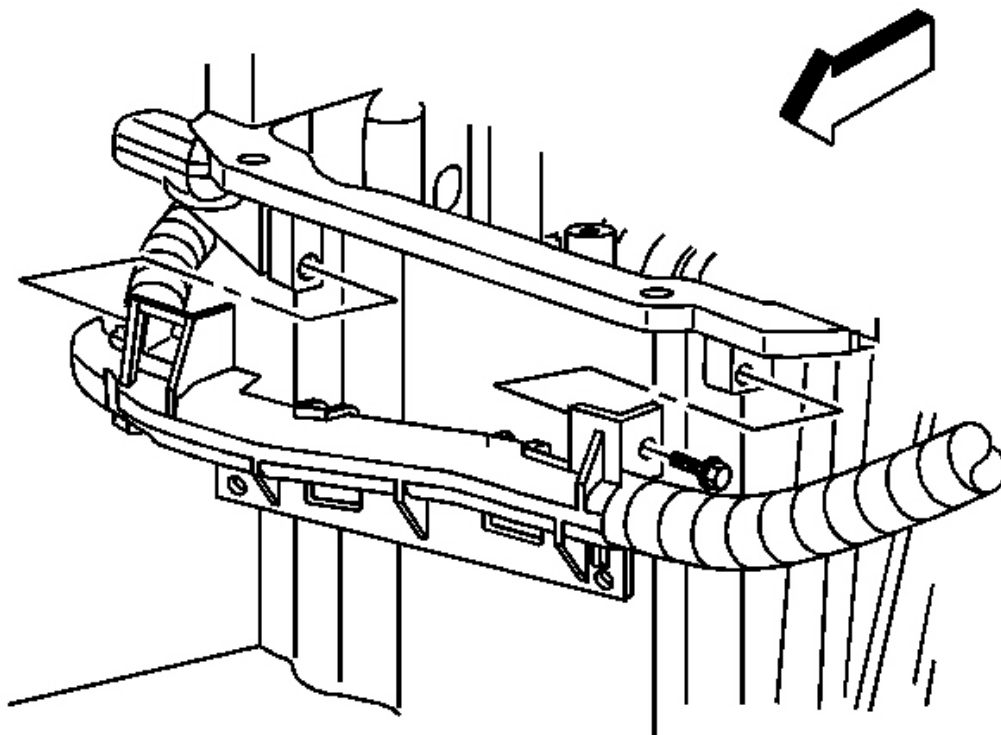


Fig. 201: View Of Battery Cable Channel & Bolt
Courtesy of GENERAL MOTORS CORP.

9. Remove the battery cable channel bolt from the front of the oil pan.
10. Remove the battery cable channel from the oil pan.

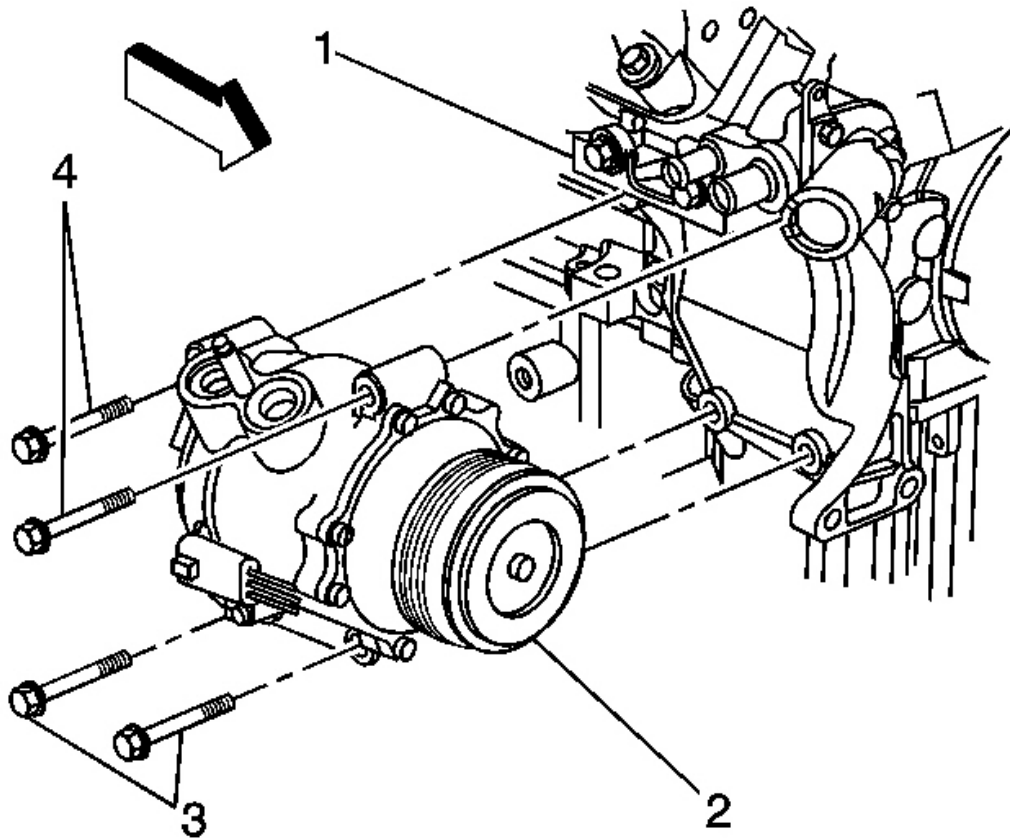


Fig. 202: View Of A/C Compressor Bracket Bolts
Courtesy of GENERAL MOTORS CORP.

11. Loosen the 2 upper air conditioning (A/C) compressor bracket bolts (4).
12. Remove the 2 lower A/C compressor bracket bolts (3).

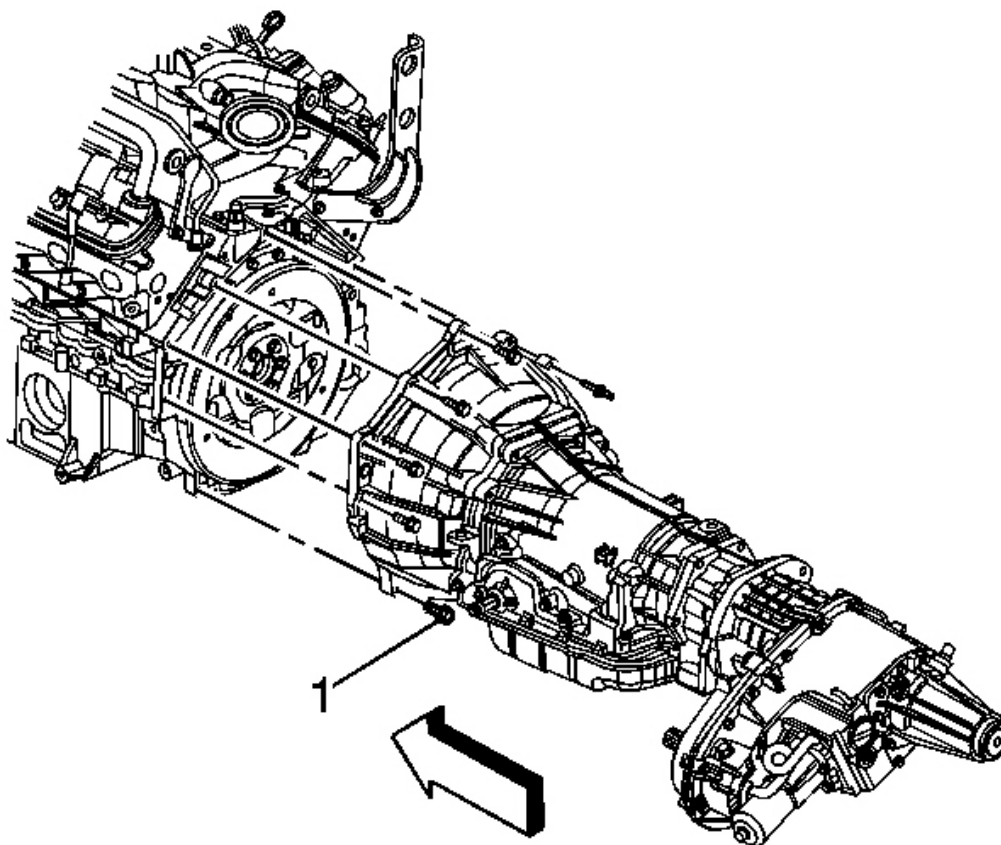


Fig. 203: View Of Lower Bellhousing Bolts
Courtesy of GENERAL MOTORS CORP.

13. Remove the 2 lower bellhousing bolts.

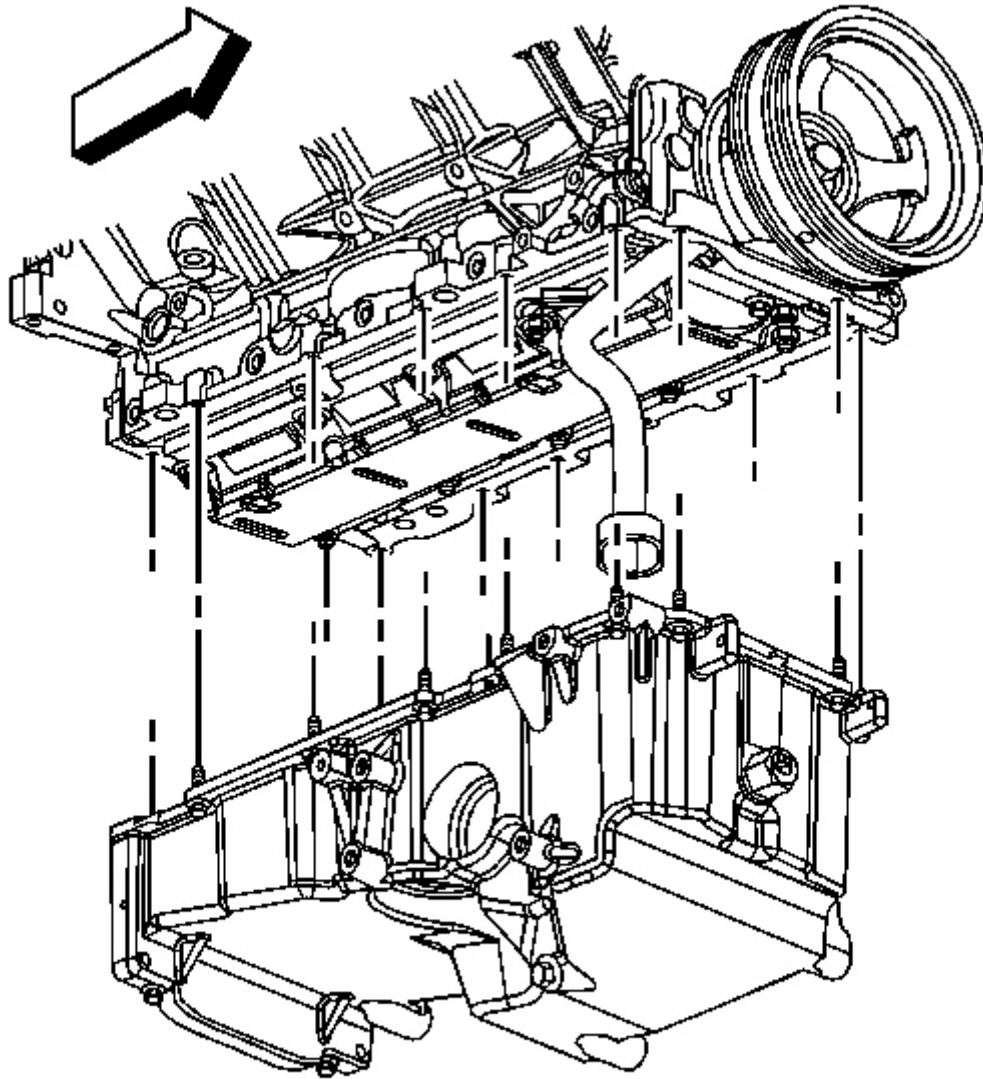


Fig. 204: View Of Oil Pan & Bolts
Courtesy of GENERAL MOTORS CORP.

14. Remove the oil pan bolts.
15. Remove the oil pan by tilting the rear of the oil pan down to clear the transmission, pull the oil pan rearward past the front wire harness, then lower the oil pan clear of the vehicle.

IMPORTANT: • The oil pan gasket is reusable. It is NOT necessary to remove the oil

pan gasket unless damaged.

- **DO NOT** allow foreign material to enter the oil passages of the oil pan, cap or cover the openings as required.

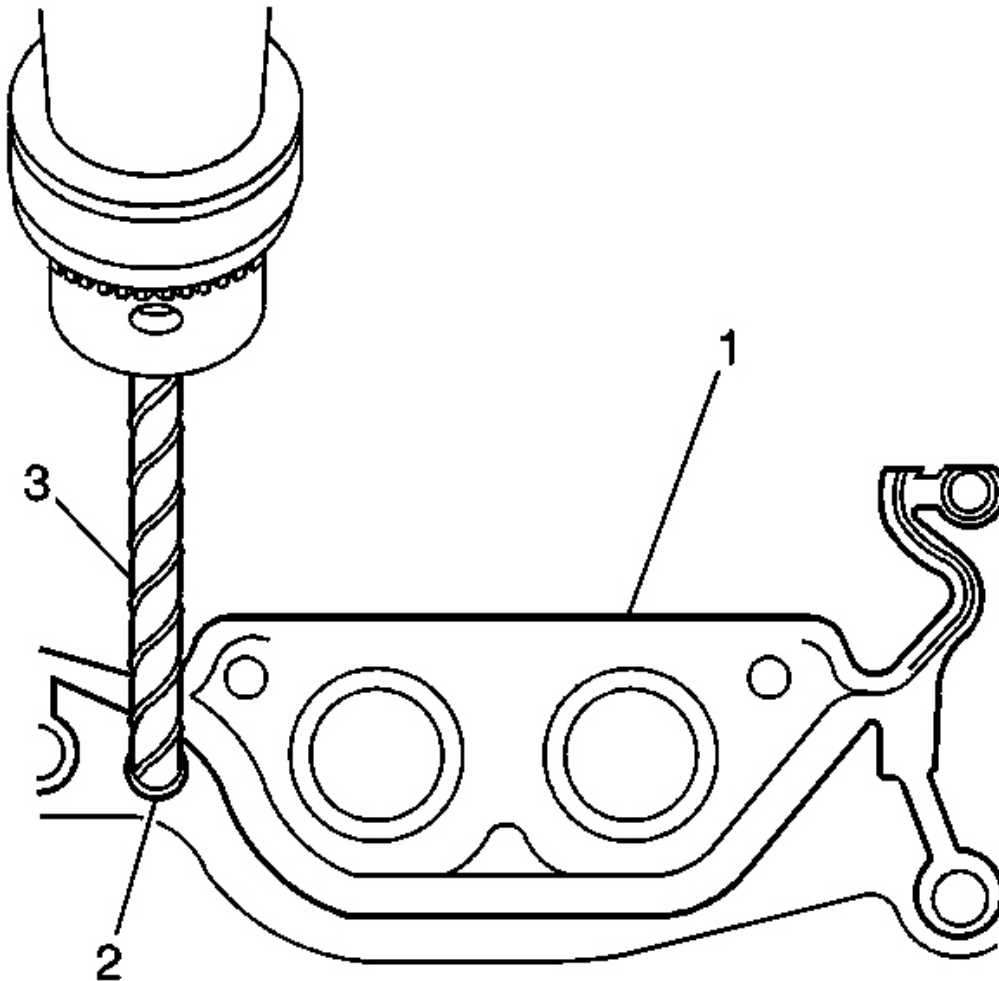


Fig. 205: View Of Oil Pan Gasket, Retaining Rivets & Drill
Courtesy of GENERAL MOTORS CORP.

16. Drill out the oil pan gasket retaining rivets (2), if required.
17. Remove the gasket (1) from the pan.
18. Discard the gasket and rivets.
19. Clean and inspect the oil pan. Refer to **Oil Pan Cleaning and Inspection** .

Installation Procedure

IMPORTANT:

- The alignment of the structural oil pan is critical. The rear bolt hole locations of the oil pan provide mounting points for the transmission bellhousing. To ensure the rigidity of the powertrain and correct transmission alignment, it is important that the rear of the block and the rear of the oil pan must **NEVER** protrude beyond the engine block and transmission bellhousing plane.
- If replacing the oil pan gasket it is not necessary to rivet the **NEW** gasket to the oil pan.

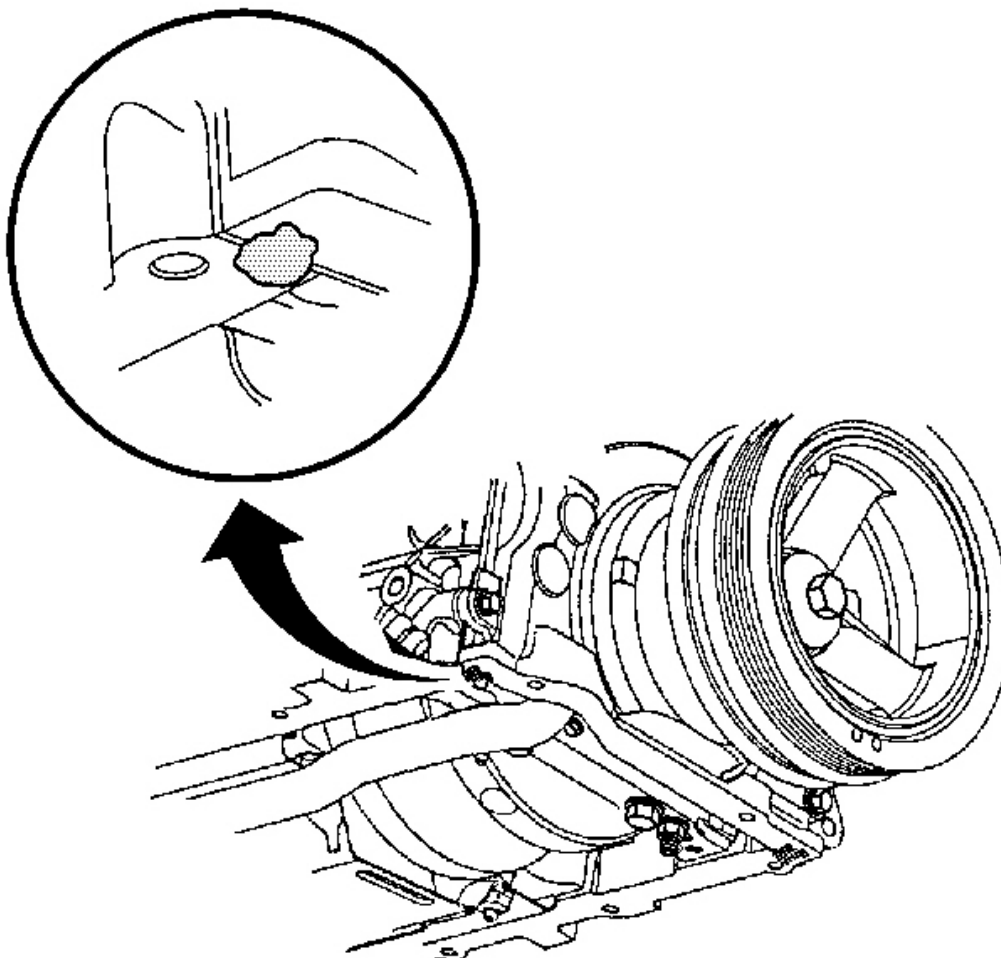


Fig. 206: View Of Sealant Applied To Front Oil Pan-To-Engine Block Junction
Courtesy of GENERAL MOTORS CORP.

1. Apply a 5 mm (0.20 in) bead of 20 mm (0.80 in) long to the engine block. Refer to **Sealers, Adhesives and Lubricants** for the correct part number. Apply the sealant directly onto the tabs of the front cover gasket that protrudes into the oil pan surface.

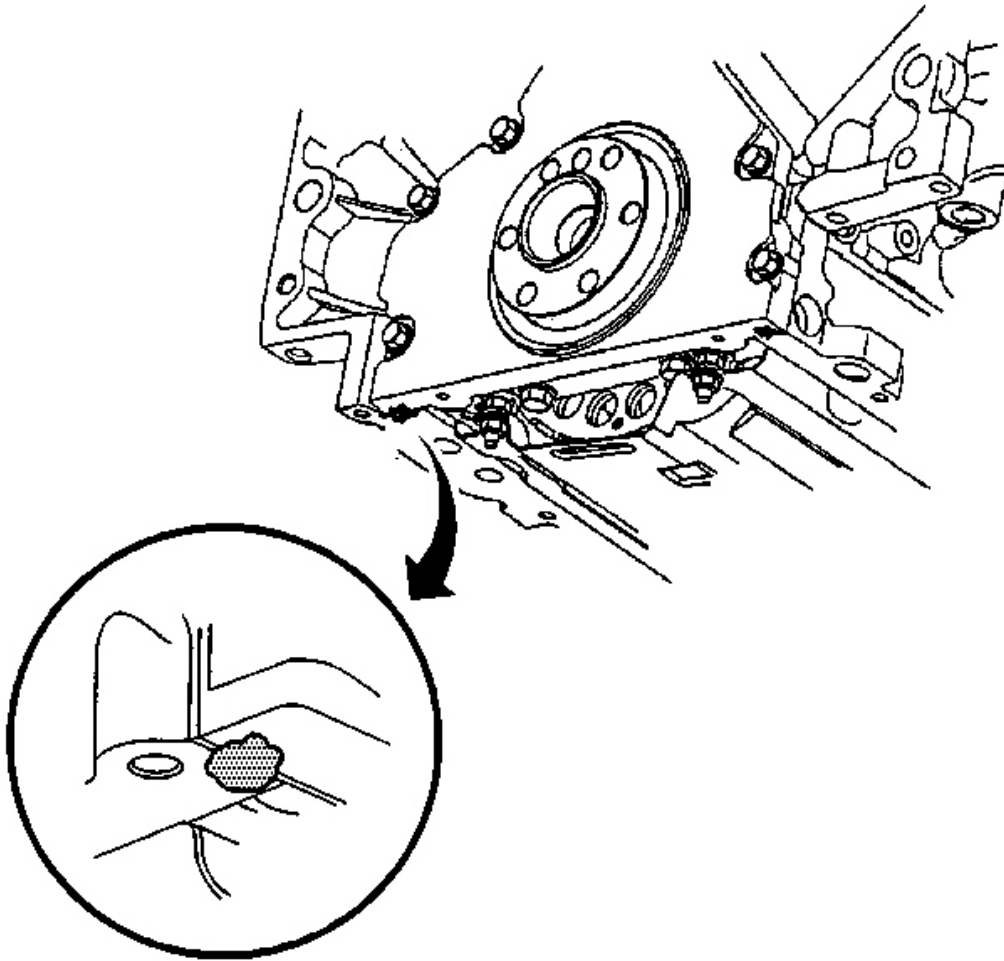


Fig. 207: View Of Sealant Applied To Rear Oil Pan-To-Engine Block Junction
Courtesy of GENERAL MOTORS CORP.

2. Apply a 5 mm (0.20 in) bead of sealant 20 mm (0.80 in) long to the engine block. Refer to **Sealers, Adhesives and Lubricants** for the correct part number. Apply the sealant directly onto the tabs of the rear cover gasket that protrudes into the oil pan surface.

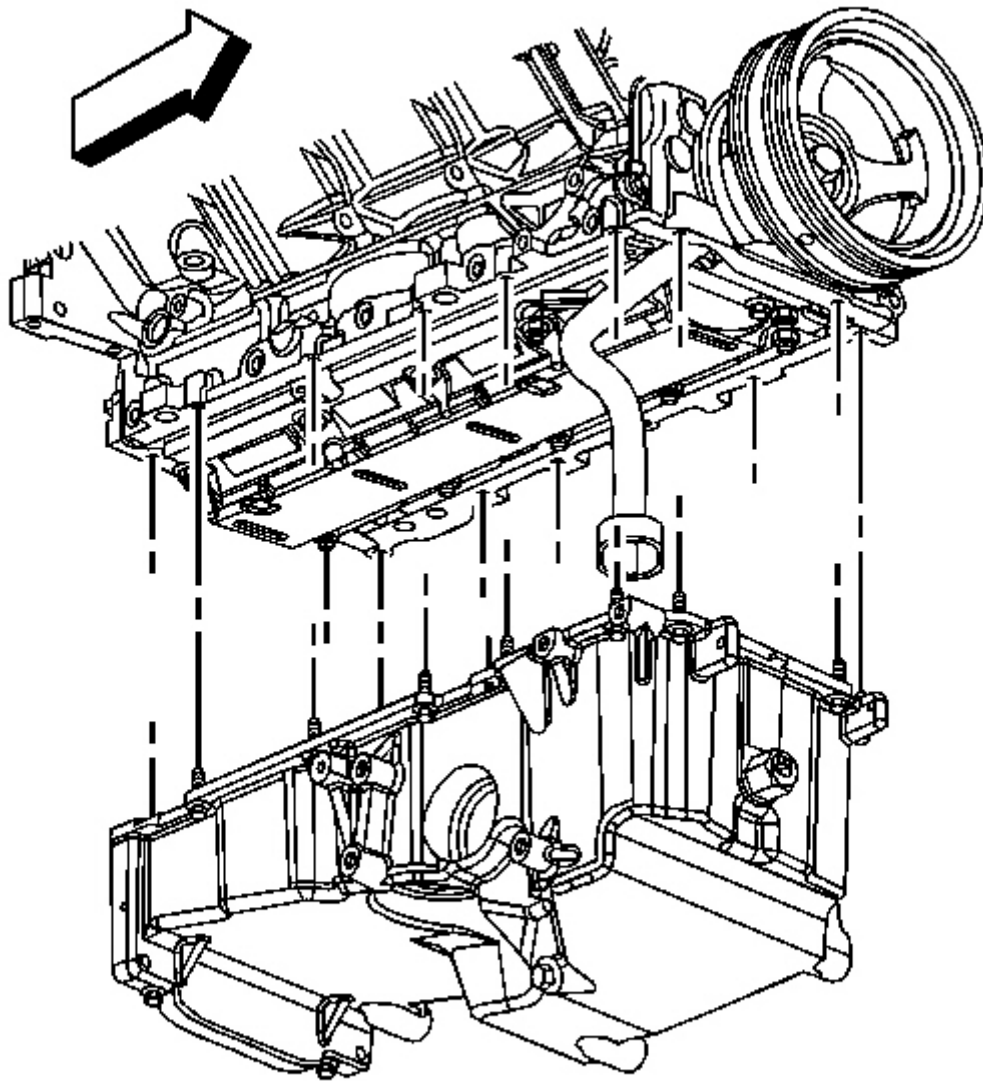


Fig. 208: View Of Oil Pan & Bolts
Courtesy of GENERAL MOTORS CORP.

3. Pre-assemble the oil pan gasket and bolts to the pan.
 - Install the gasket onto the pan.
 - Install the oil pan bolts to the pan and through the gasket.
4. Install the oil pan, oil pan gasket and bolts to the engine block as an assembly.
5. Hand thread the oil pan bolts into the engine block until snug. Do not tighten at this time.

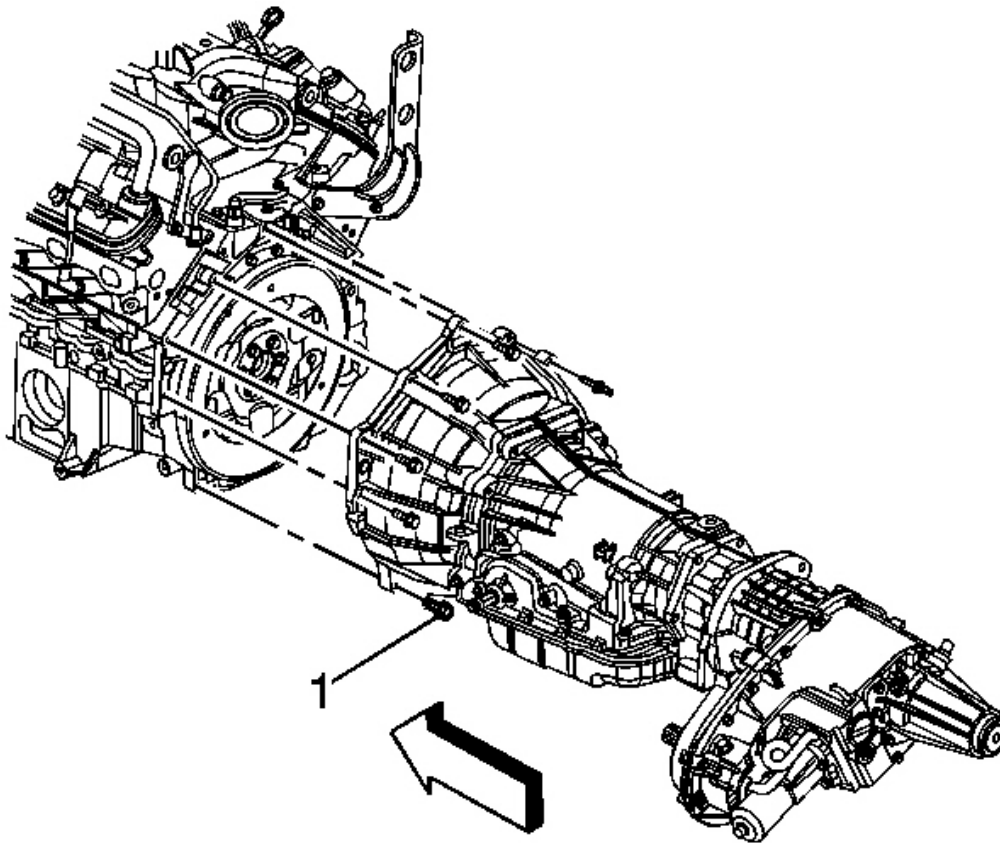


Fig. 209: View Of Lower Bellhousing Bolts
Courtesy of GENERAL MOTORS CORP.

NOTE: Refer to Fastener Notice .

6. Install the 2 lower bellhousing bolts.

Tighten:

1. Tighten the lower bellhousing bolts to 50 N.m (37 lb ft).
2. Tighten the 2 rear oil pan to rear cover bolts to 12 N.m (106 lb in).
3. Tighten the remaining oil pan bolts to 25 N.m (18 lb ft).

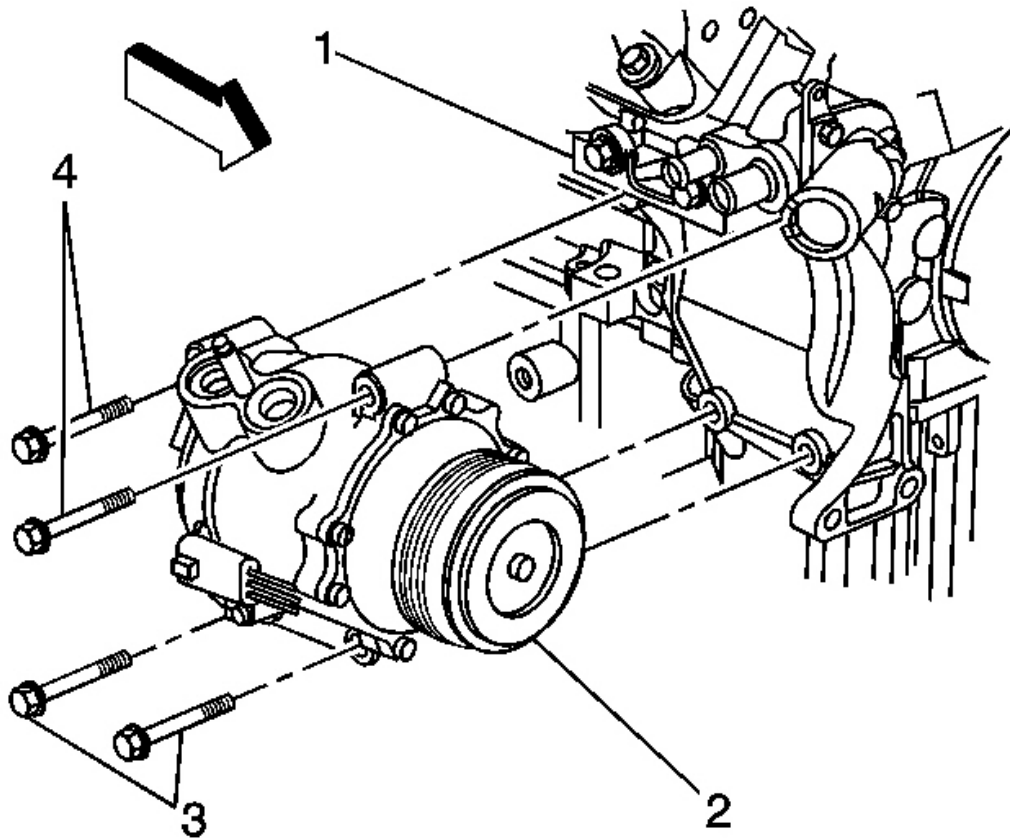


Fig. 210: View Of A/C Compressor Bracket Bolts
Courtesy of GENERAL MOTORS CORP.

7. Install the 2 lower A/C compressor bracket bolts (3).

Tighten: Tighten the bolts to 50 N.m (37 lb ft).

8. Tighten the 2 upper A/C compressor bracket bolts (4).

Tighten: Tighten the bolts to 50 N.m (37 lb ft).

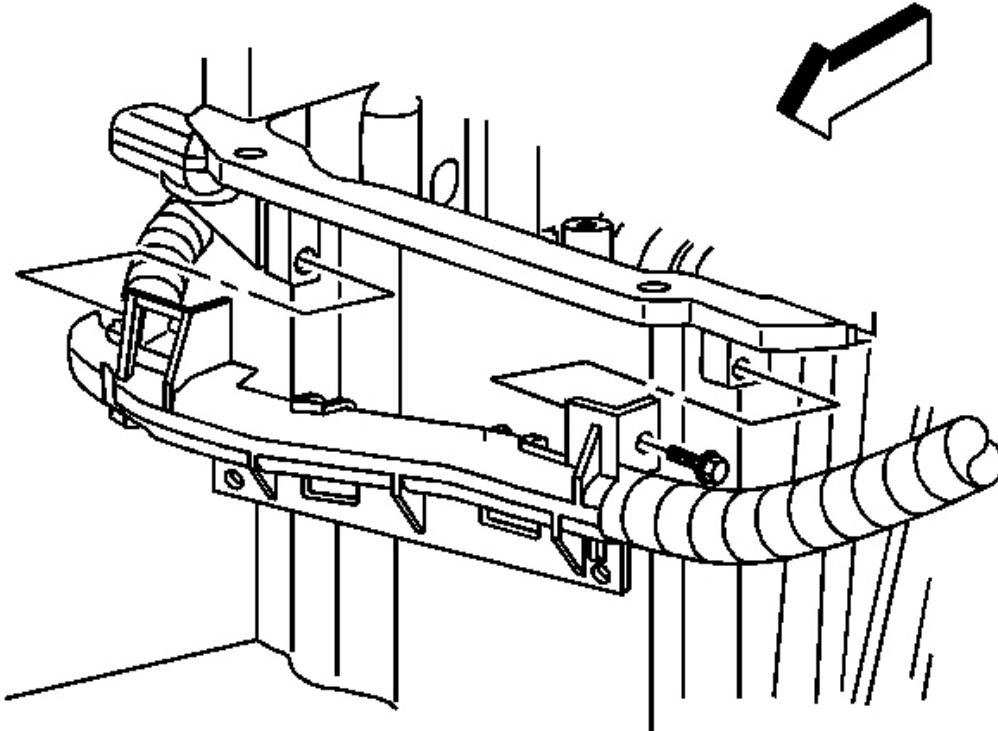


Fig. 211: View Of Battery Cable Channel & Bolt
Courtesy of GENERAL MOTORS CORP.

9. Install the battery cable channel to the oil pan.
10. Install the battery cable channel bolt to the oil pan.

Tighten: Tighten the bolt to 12 N.m (106 lb in).

11. Install the flywheel inspection cover to the left side of the transmission.

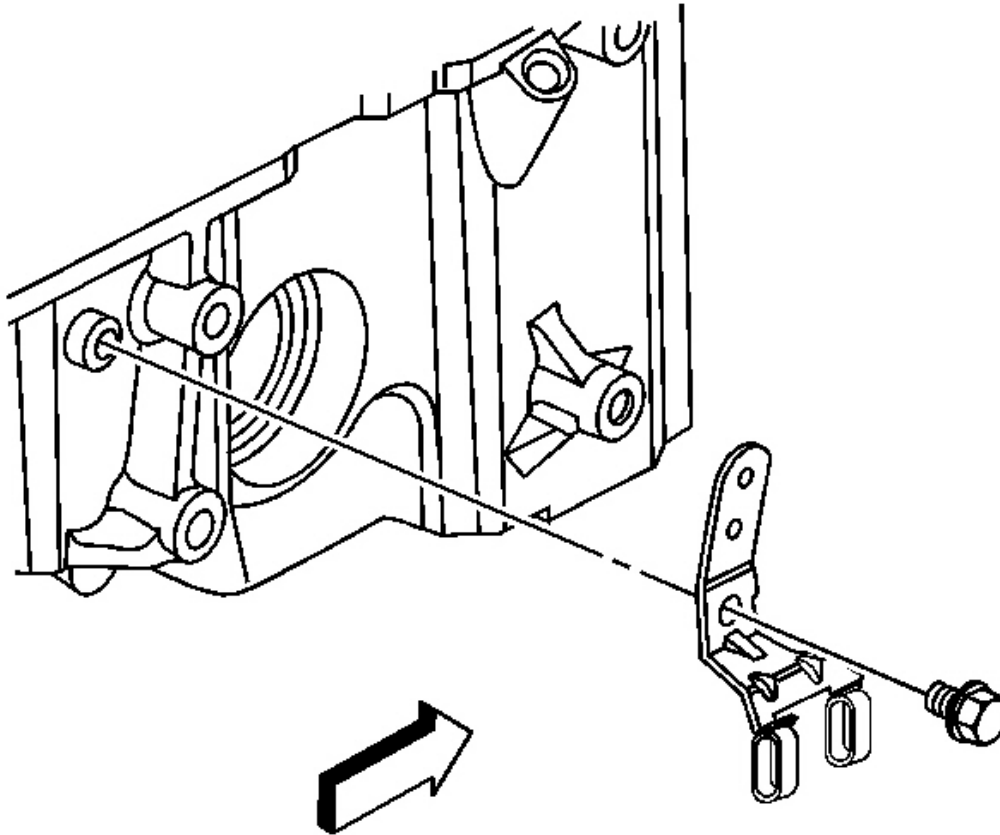


Fig. 212: View Of Transmission Oil Cooler Line Retaining Bracket & Bolt
Courtesy of GENERAL MOTORS CORP.

12. Install the starter. Refer to **Starter Motor Replacement (4.2L Engine)** or **Starter Motor Replacement (5.3L and 6.0L Engines)** .
13. If equipped with four-wheel drive, install the inner axle shaft. Refer to **Inner Axle Shaft Replacement - Front Drive Axle** .
14. Install the transmission oil cooler line retaining bracket and bolt.

Tighten: Tighten the bolt to 9 N.m (80 lb in).

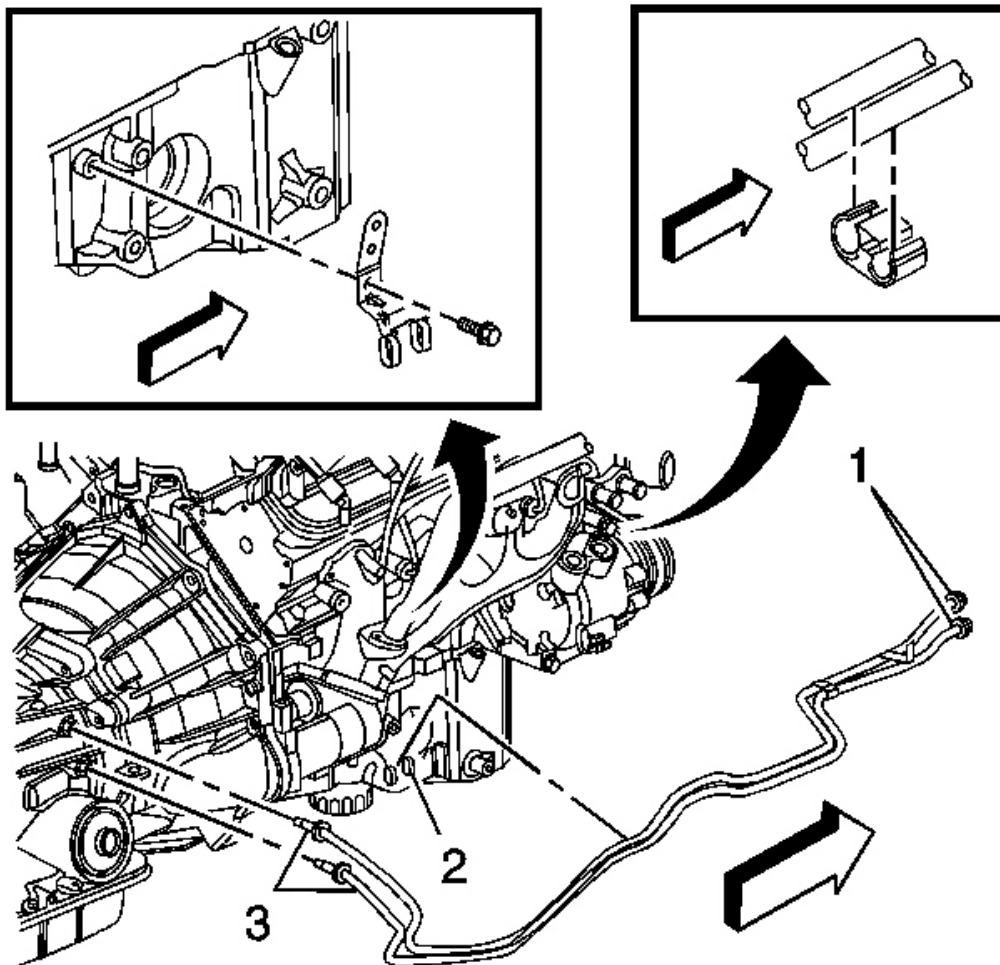


Fig. 213: View Of Transmission Oil Cooler Lines
Courtesy of GENERAL MOTORS CORP.

15. Install the transmission oil cooler lines (1) to the retainer (2).
16. Install the oil level indicator tube. Refer to **Oil Level Indicator and Tube Replacement**.
17. Fill the engine with oil. Refer to **Engine Oil and Oil Filter Replacement**.

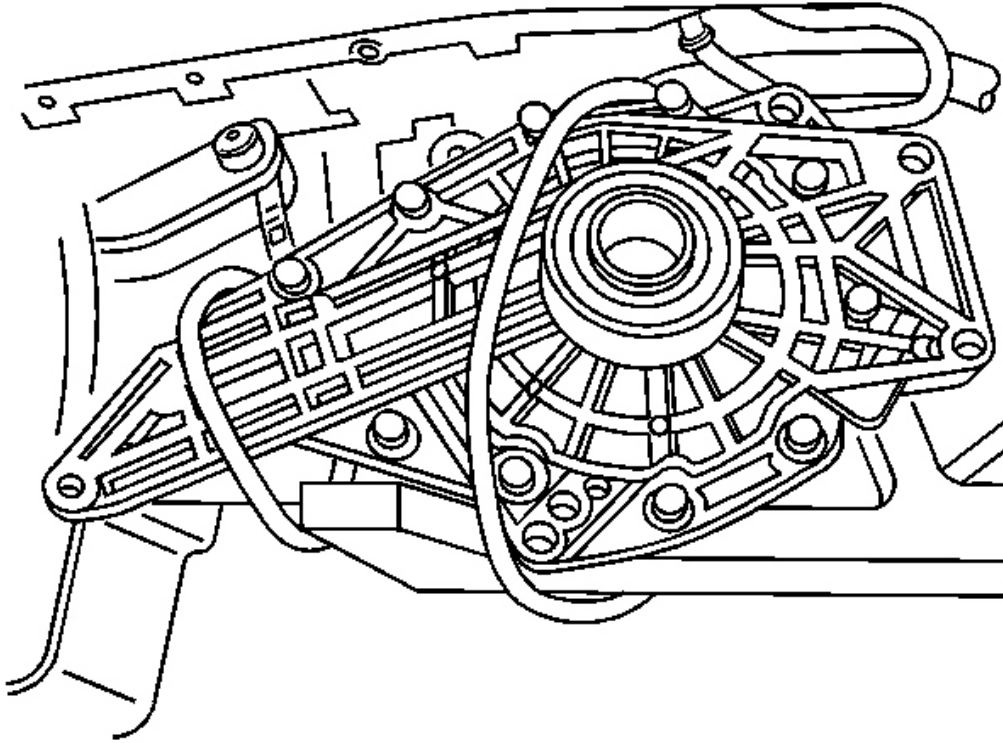


Fig. 214: Securing Front Differential To Frame
Courtesy of GENERAL MOTORS CORP.

18. Install the front differential. Refer to **Differential Carrier Assembly Replacement (4.2L In-Line Six Cylinder)** or **Differential Carrier Assembly Replacement (V8)** .
19. Connect the negative battery cable. Refer to **Battery Negative Cable Disconnection and Connection** .

ENGINE OIL PRESSURE SENSOR AND/OR SWITCH REPLACEMENT

Tools Required

J 41712 Oil Pressure Switch Socket

Removal Procedure

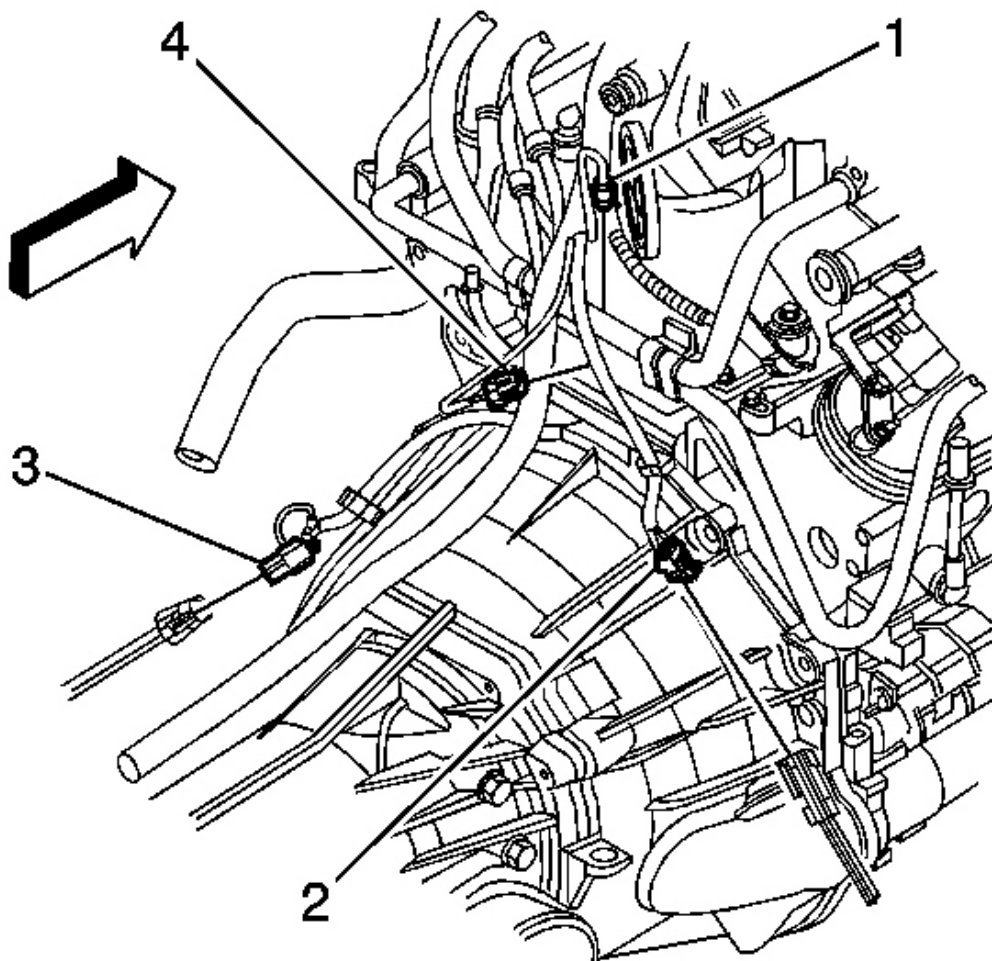


Fig. 215: Locating Components Connectors At Rear Of Engine
Courtesy of GENERAL MOTORS CORP.

1. Remove the intake manifold. Refer to **Intake Manifold Replacement**.
2. Disconnect the oil pressure sensor electrical connector (1).

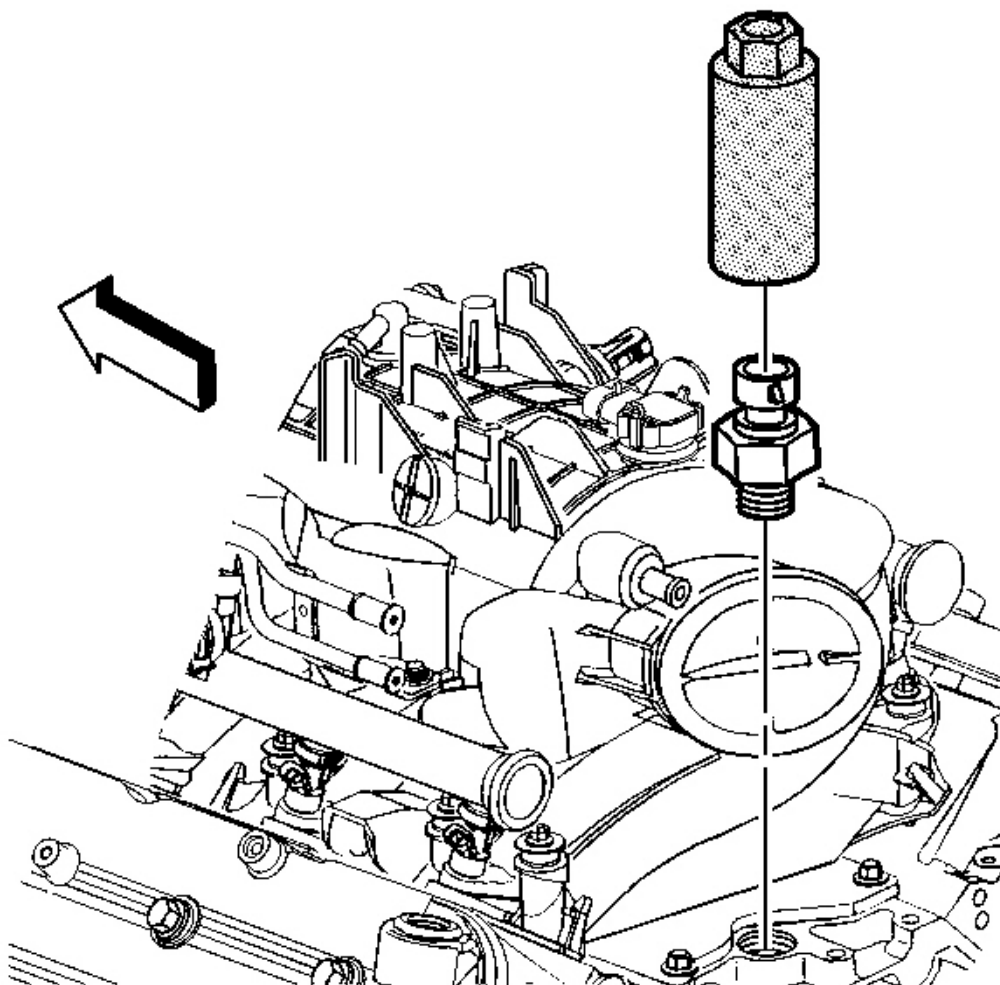


Fig. 216: View Of Oil Pressure Sensor & J 41712
Courtesy of GENERAL MOTORS CORP.

3. Using **J 41712** or equivalent, remove the oil pressure sensor.

Installation Procedure

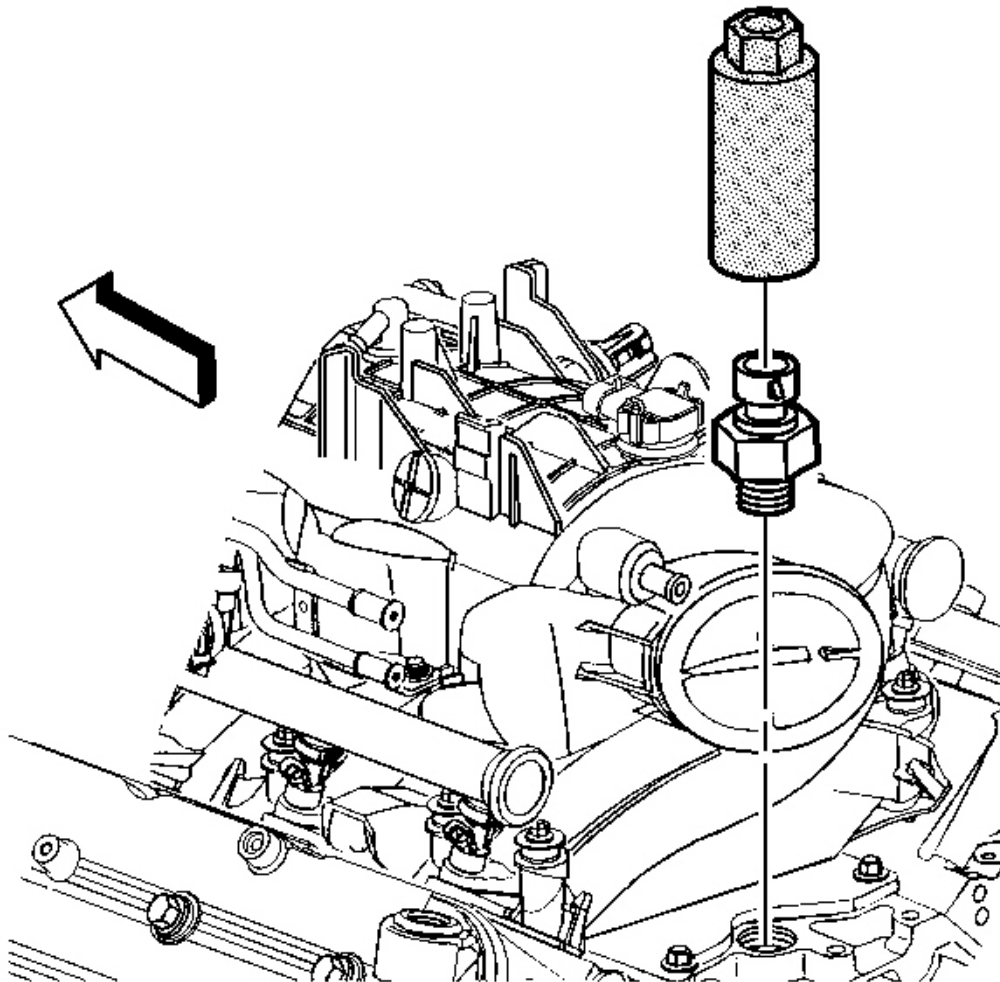


Fig. 217: View Of Oil Pressure Sensor & J 41712

Courtesy of GENERAL MOTORS CORP.

NOTE: Refer to Fastener Notice .

1. Apply sealant to the threads of the oil pressure sensor. Refer to Sealers, Adhesives and Lubricants for the correct part number.
2. Using **J 41712** or equivalent, install the oil pressure sensor.

Tighten: Tighten the sensor to 20 N.m (15 lb ft).

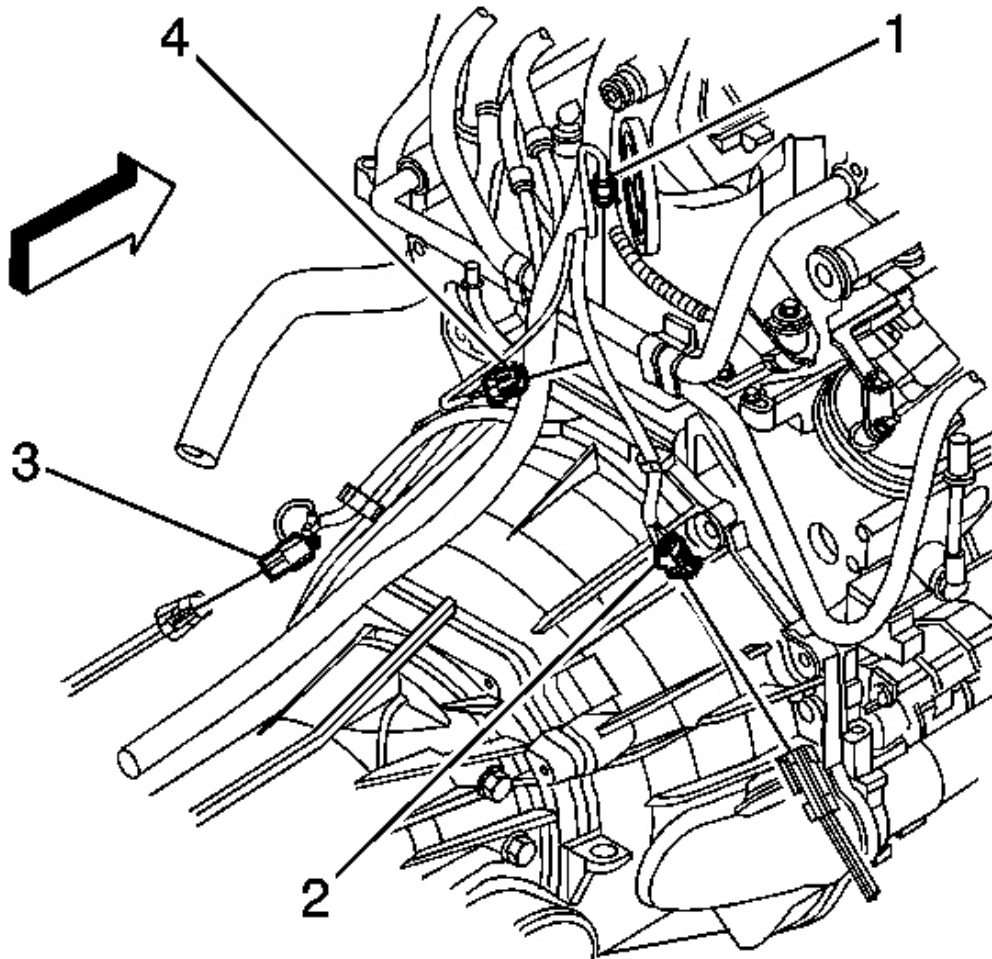


Fig. 218: Locating Components Connectors At Rear Of Engine
Courtesy of GENERAL MOTORS CORP.

3. Connect the oil pressure sensor electrical connector (1).
4. Install the intake manifold. Refer to **Intake Manifold Replacement**.

OIL PUMP, SCREEN AND CRANKSHAFT OIL DEFLECTOR REPLACEMENT

Removal Procedure

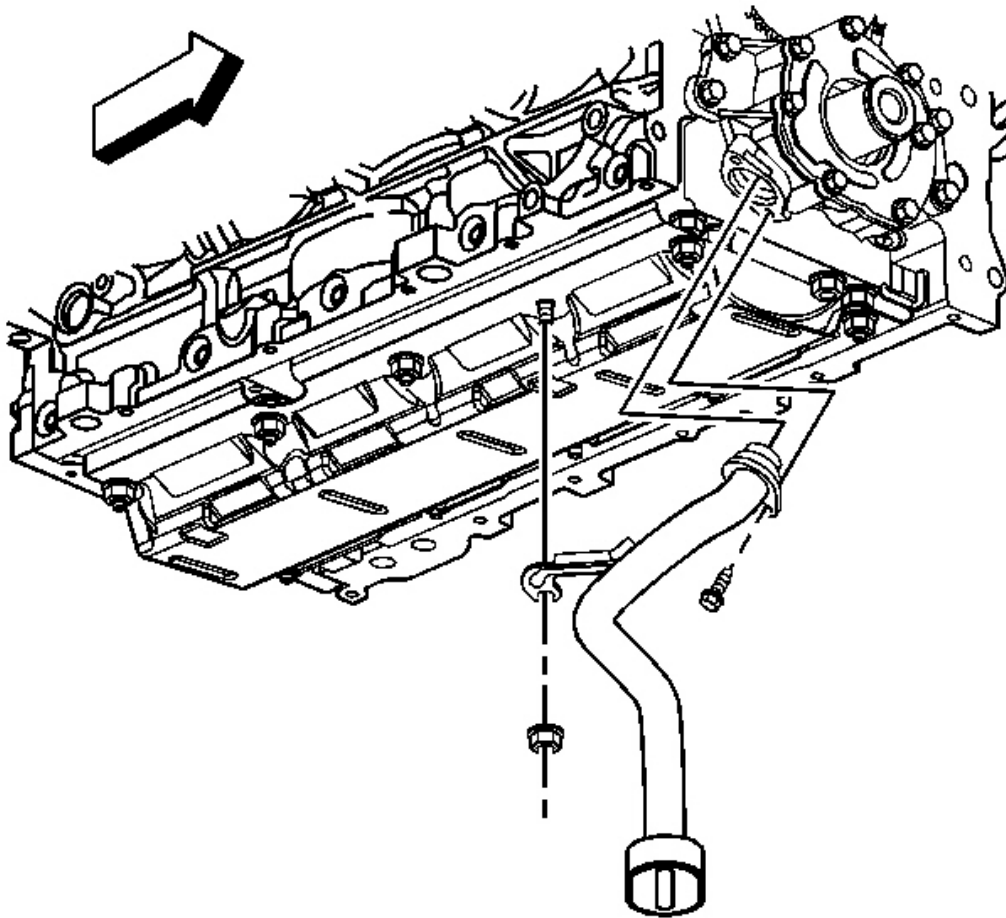


Fig. 219: View Of Oil Pump, Screen & Components
Courtesy of GENERAL MOTORS CORP.

1. Remove the oil pan. Refer to **Oil Pan Replacement**.
2. Remove the engine front cover. Refer to **Engine Front Cover Replacement**.
3. Remove the oil pump screen bolt and nuts.
4. Remove the oil pump screen with O-ring seal.
5. Remove the O-ring seal from the pump screen.
6. Discard the O-ring seal.

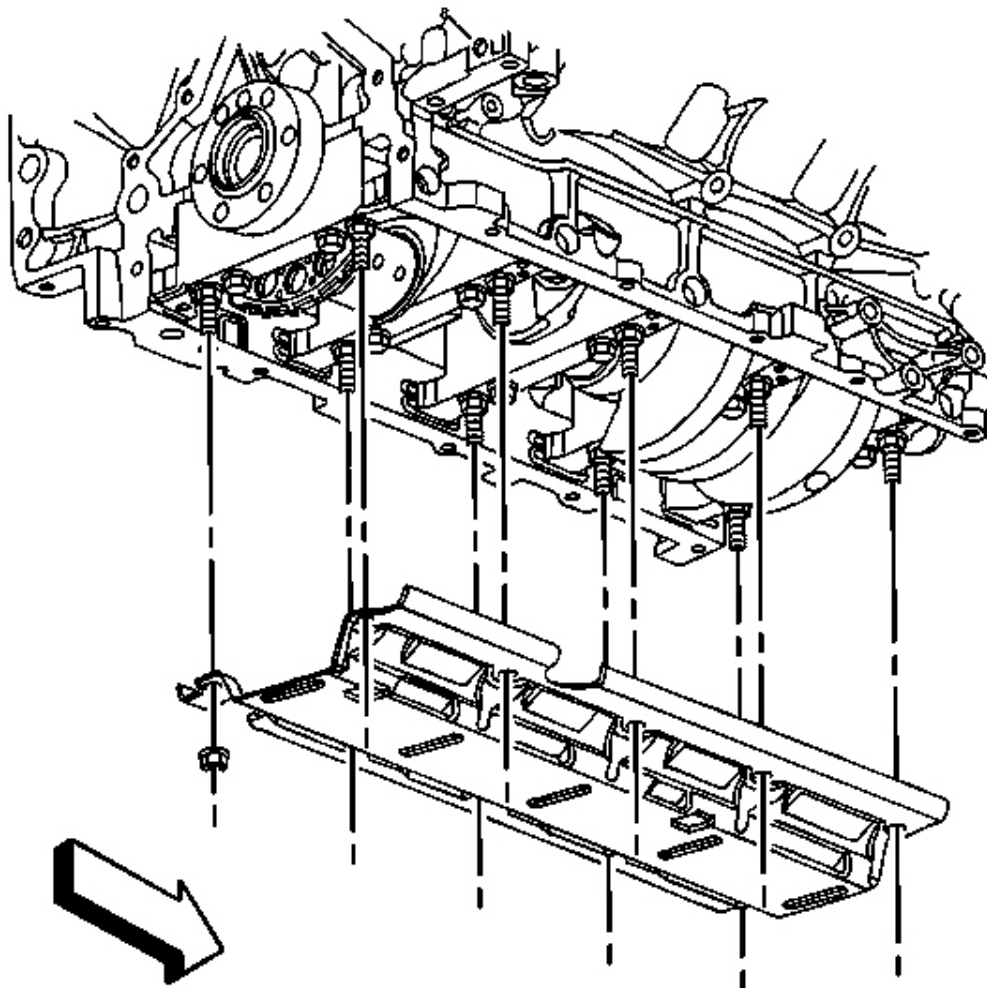


Fig. 220: View Of Crankshaft Oil Deflector & Nuts
Courtesy of GENERAL MOTORS CORP.

7. Remove the remaining crankshaft oil deflector nuts.
8. Remove the crankshaft oil deflector.

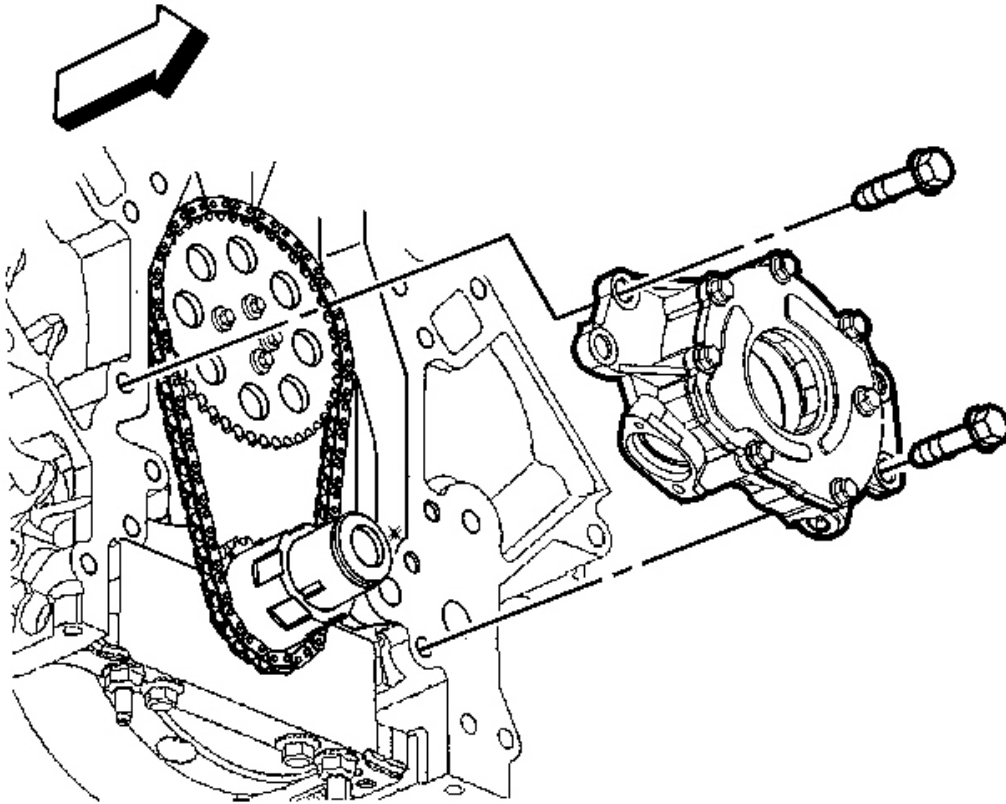


Fig. 221: View Of Oil Pump & Bolt
Courtesy of GENERAL MOTORS CORP.

9. Remove the oil pump bolts.

IMPORTANT: Do not allow dirt or debris to enter the oil pump assembly, cap end as necessary.

10. Remove the oil pump.
11. Clean and inspect the oil pump. Refer to **Oil Pump Cleaning and Inspection** .

Installation Procedure

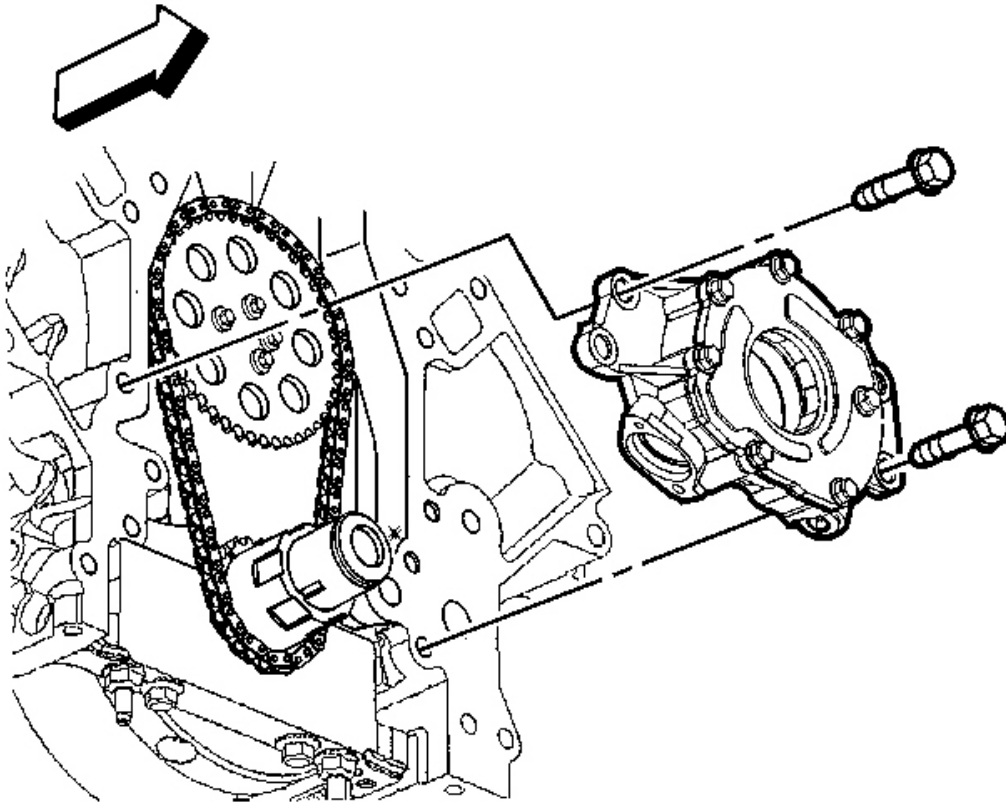


Fig. 222: View Of Oil Pump & Bolt
Courtesy of GENERAL MOTORS CORP.

1. Align the splined surfaces of the crankshaft sprocket and the oil pump drive gear and install the oil pump.
2. Install the oil pump onto the crankshaft sprocket until the pump housing contacts the face of the engine block.

NOTE: Refer to Fastener Notice .

3. Install the oil pump bolts.

Tighten: Tighten the bolts to 25 N.m (18 lb ft).

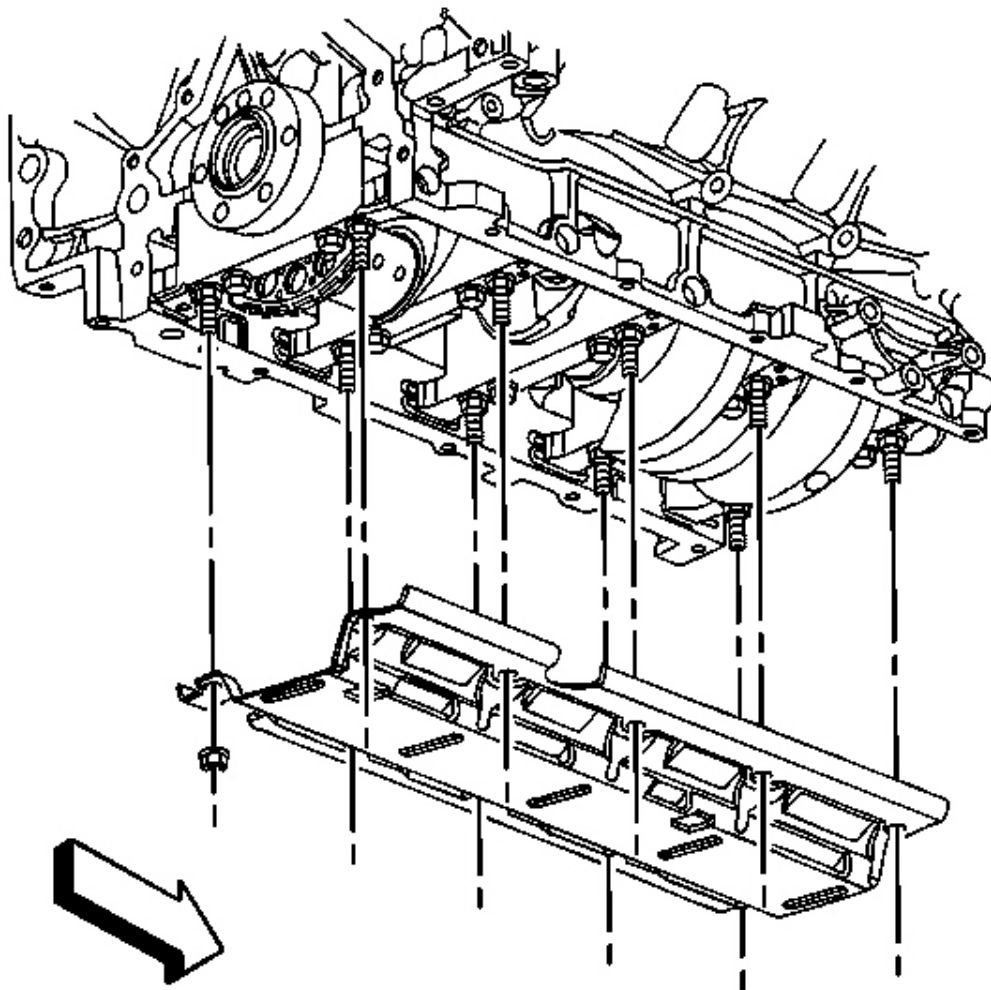


Fig. 223: View Of Crankshaft Oil Deflector & Nuts
Courtesy of GENERAL MOTORS CORP.

4. Install the crankshaft oil deflector and nuts until snug.

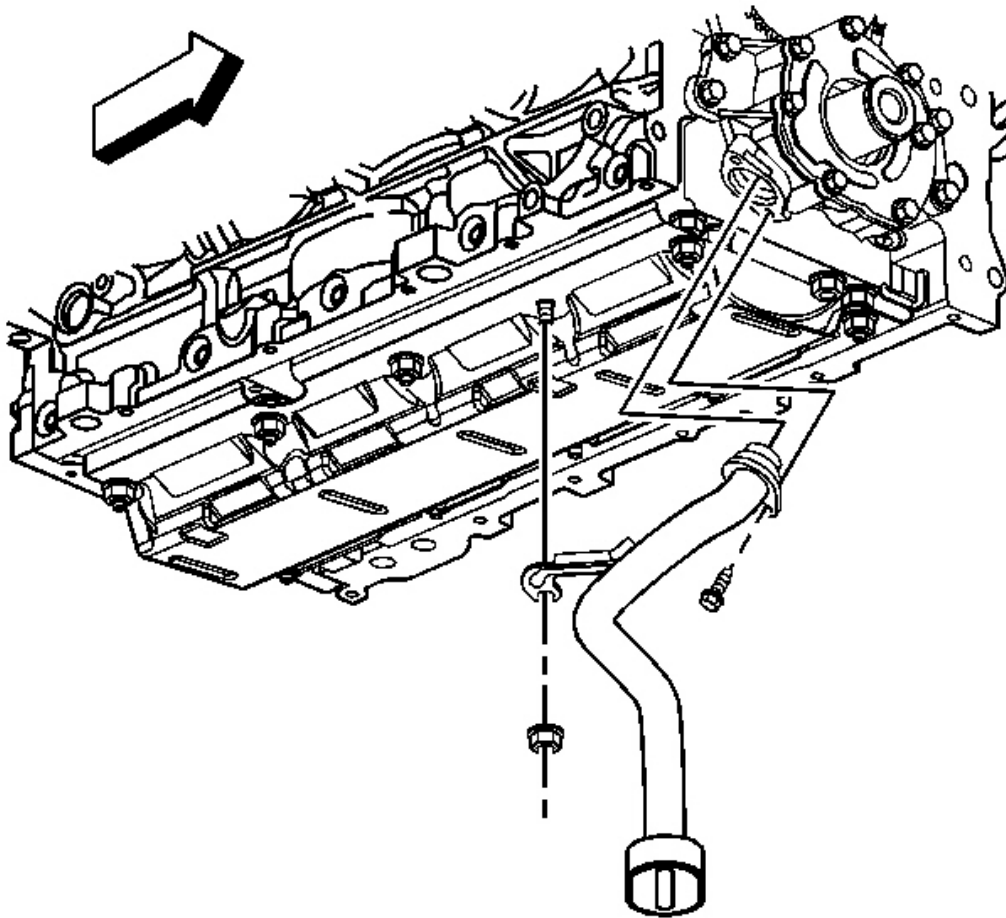


Fig. 224: View Of Oil Pump, Screen & Components
Courtesy of GENERAL MOTORS CORP.

5. Lubricate a NEW oil pump screen O-ring seal with clean engine oil.
6. Install the NEW O-ring seal onto the oil pump screen.

IMPORTANT: Push the oil pump screen tube completely into the oil pump prior to tightening the bolt. Do not allow the bolt to pull the tube into the pump.

7. Align the oil pump screen mounting brackets with the correct crankshaft bearing cap studs.
8. Install the oil pump screen.
9. Install the oil pump screen bolt and nuts.

2007 Chevrolet TrailBlazer

2007 ENGINE Engine Mechanical - 6.0L - TrailBlazer

Tighten:

- Tighten the bolt to 12 N.m (106 lb in).
- Tighten the nuts to 25 N.m (18 lb ft).

10. Install the engine front cover. Refer to **Engine Front Cover Replacement**.

11. Install the oil pan. Refer to **Oil Pan Replacement**.

TIMING CHAIN AND SPROCKETS REPLACEMENT

Tools Required

- **J 8433-1** Puller Bar
- **J 41558** Crankshaft Sprocket Remover
- **J 41665** Crankshaft Balancer and Sprocket Installer
- **J 41816-2** Crankshaft End Protector

Removal Procedure

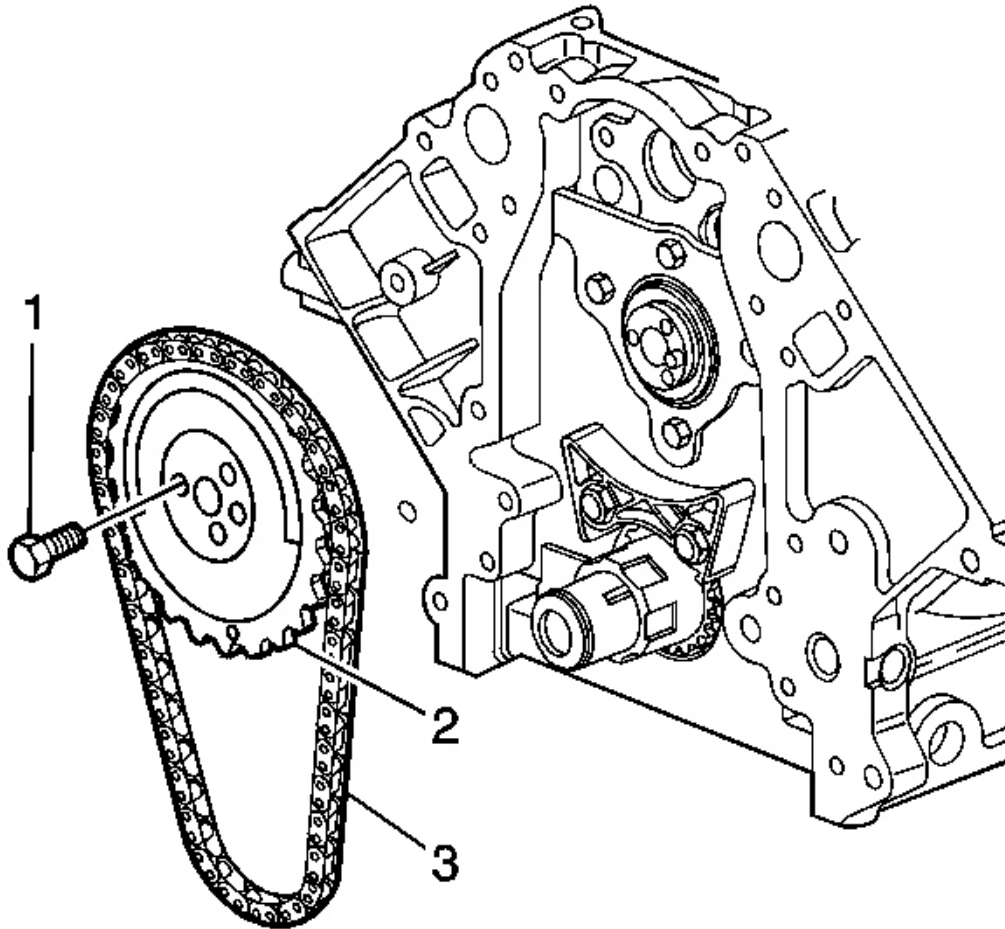


Fig. 225: View Of Timing Chain & Sprocket Assembly
Courtesy of GENERAL MOTORS CORP.

1. Remove the oil pump. Refer to **Oil Pump, Screen and Crankshaft Oil Deflector Replacement**.

NOTE: Do not turn the crankshaft assembly after the timing chain has been removed in order to prevent damage to the piston assemblies or the valves.

2. Rotate the crankshaft until the timing marks on the crankshaft and the camshaft sprockets are aligned.
3. Remove the camshaft sprocket bolts (1).
4. Remove the camshaft sprocket (2) and timing chain (3).

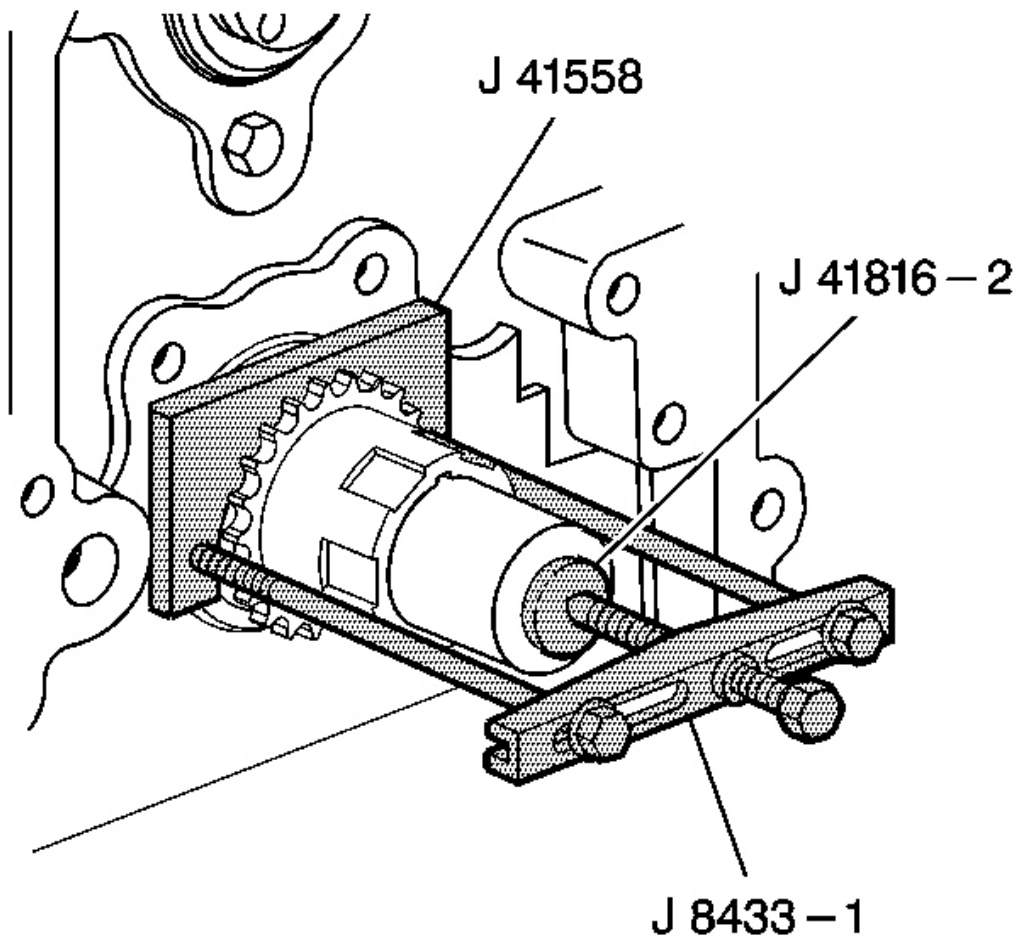


Fig. 226: View Of J 8433-1, J 41816-2 & J 41558
Courtesy of GENERAL MOTORS CORP.

5. Use **J 8433-1** , **J 41816-2** and **J 41558** in order to remove the crankshaft sprocket.

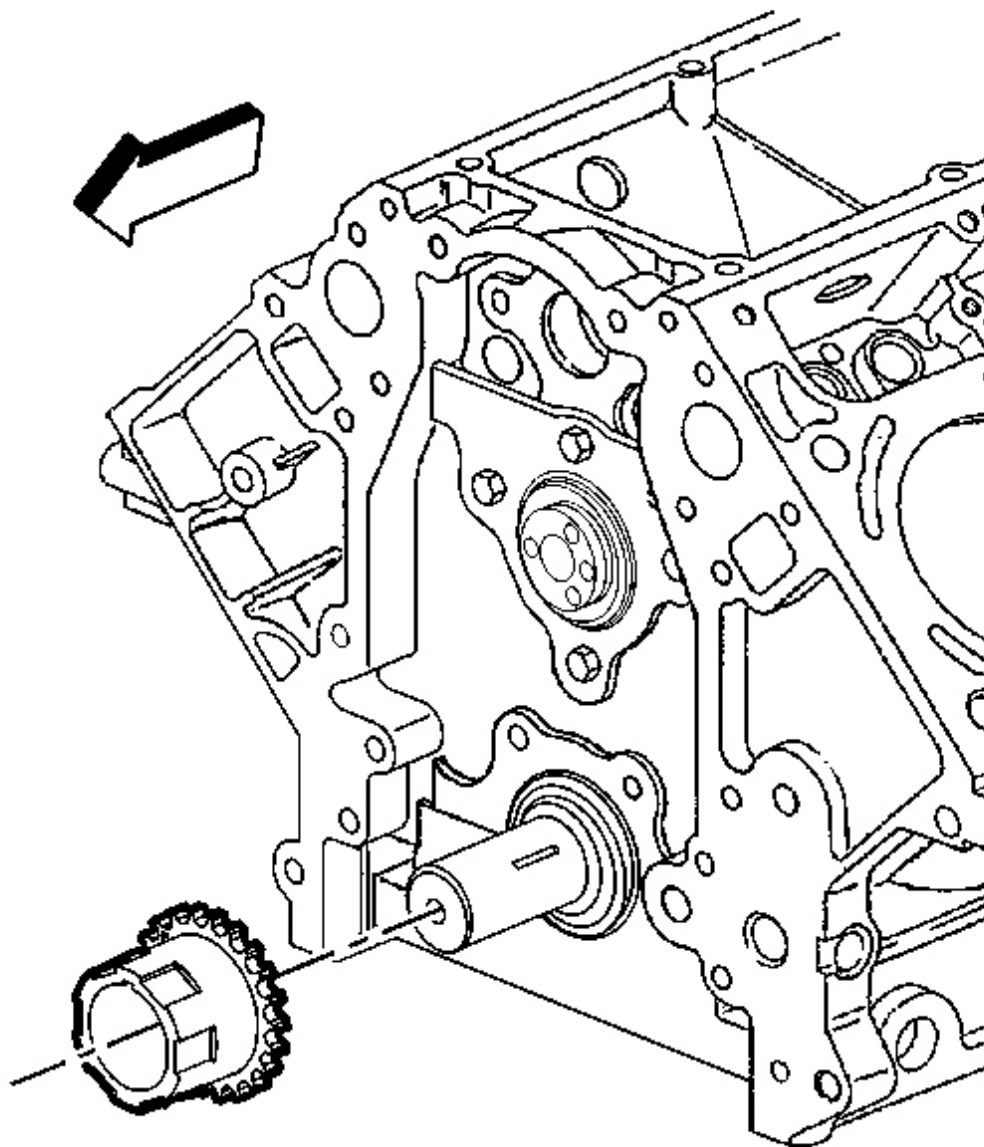


Fig. 227: View Of Crankshaft Sprocket
Courtesy of GENERAL MOTORS CORP.

6. Remove the crankshaft sprocket.

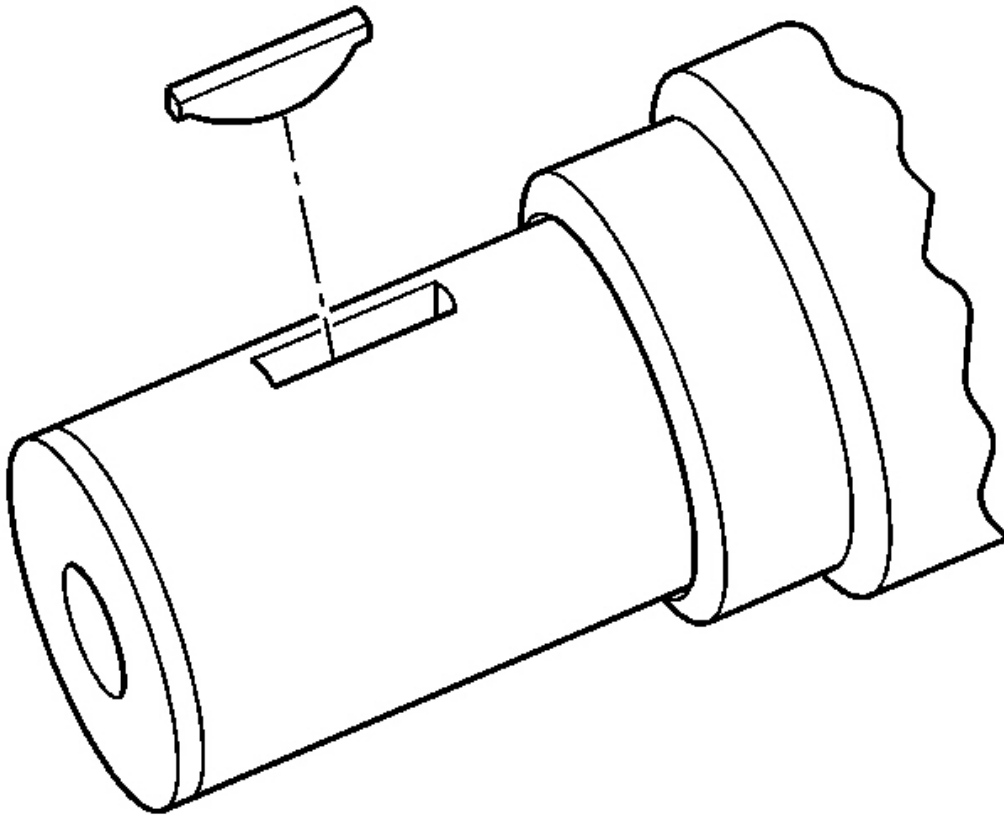


Fig. 228: View Of Crankshaft Key & Keyway
Courtesy of GENERAL MOTORS CORP.

7. Remove the crankshaft sprocket key, if required.
8. Clean and inspect the timing chain and sprockets. Refer to **Timing Chain and Sprockets Cleaning and Inspection** .

Installation Procedure

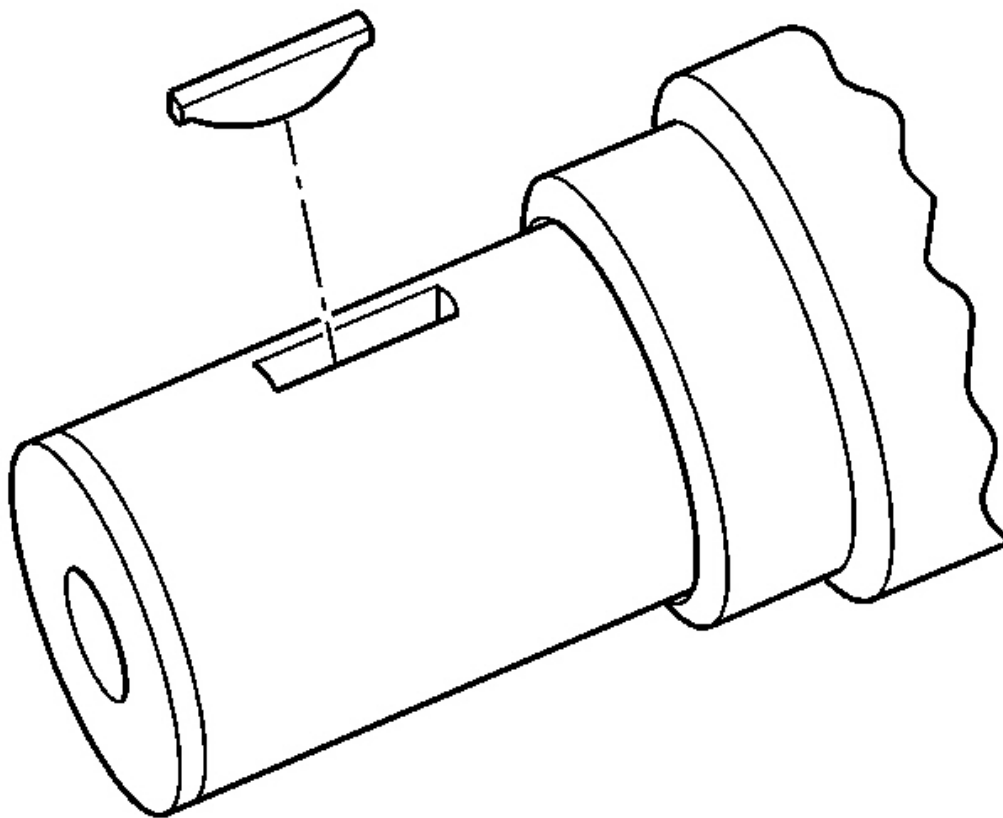


Fig. 229: View Of Crankshaft Key & Keyway
Courtesy of GENERAL MOTORS CORP.

1. Install the key into the crankshaft keyway, if previously removed.

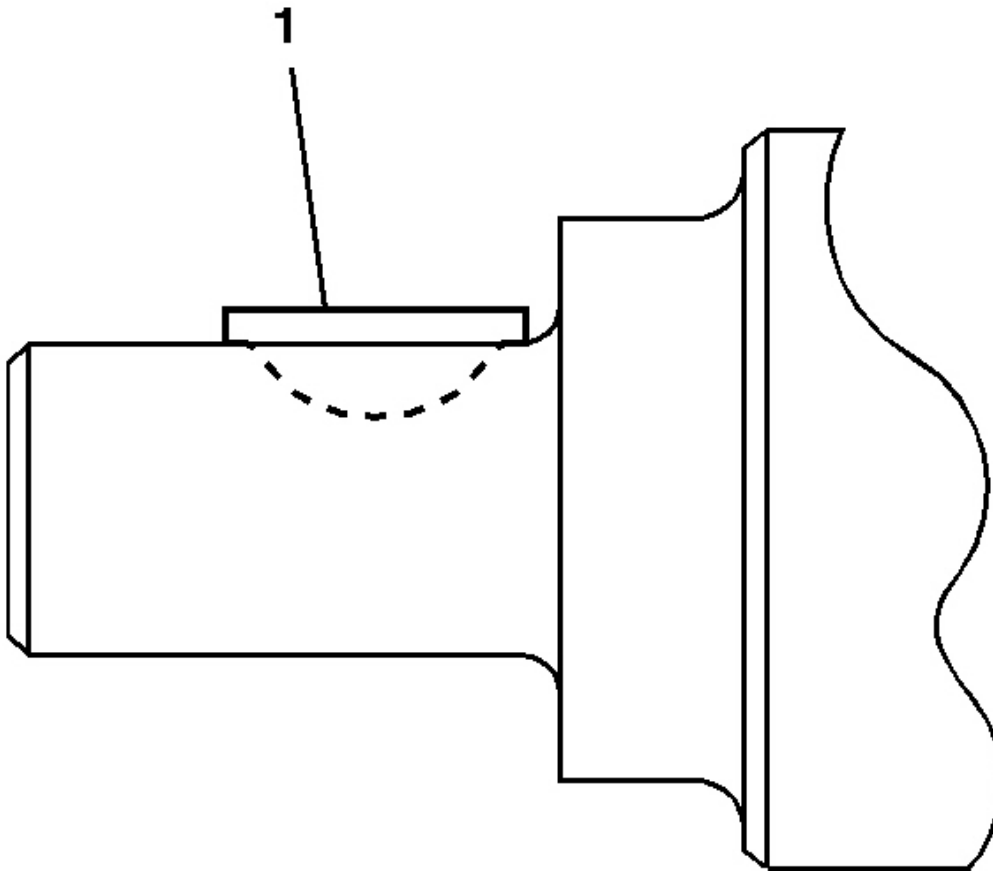


Fig. 230: View Of Crankshaft Sprocket Key Installation Position
Courtesy of GENERAL MOTORS CORP.

2. Tap the key (1) into the keyway until both ends of the key bottom onto the crankshaft.

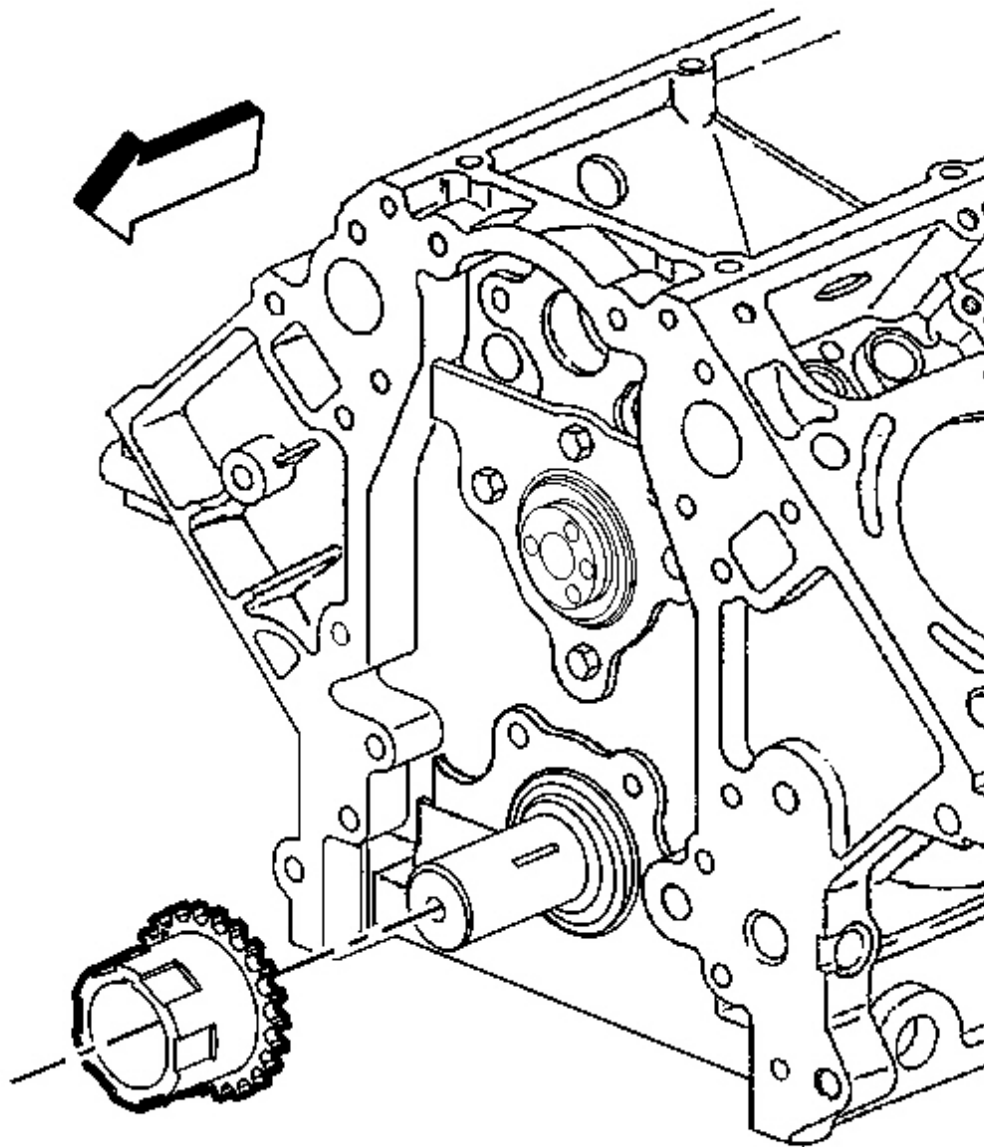


Fig. 231: View Of Crankshaft Sprocket
Courtesy of GENERAL MOTORS CORP.

3. Install the crankshaft sprocket onto the front of the crankshaft. Align the crankshaft key with the crankshaft sprocket keyway.

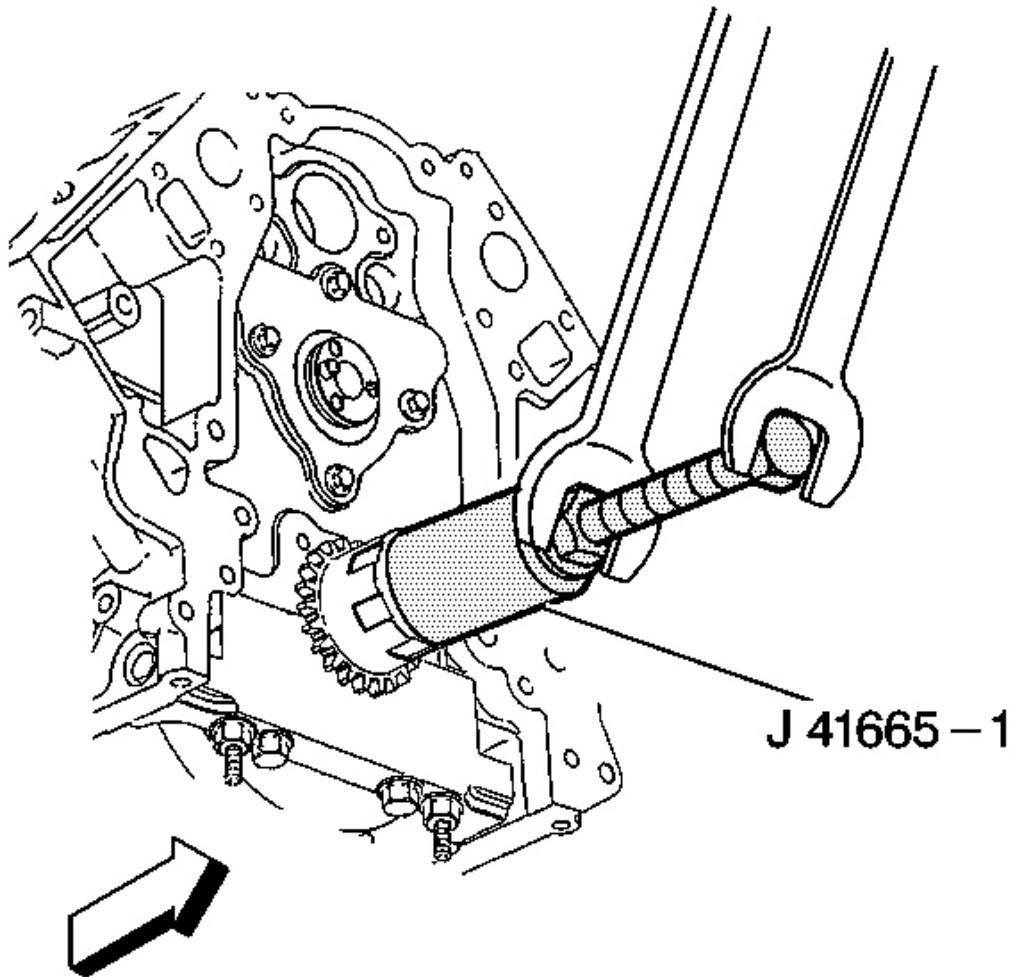


Fig. 232: View Of J 41665 Installing The Crankshaft Sprocket
Courtesy of GENERAL MOTORS CORP.

4. Use **J 41665** in order to install the crankshaft sprocket.

Install the sprocket onto the crankshaft until fully seated against the crankshaft flange.

5. Rotate the crankshaft sprocket until the alignment mark is in the 12 o'clock position.

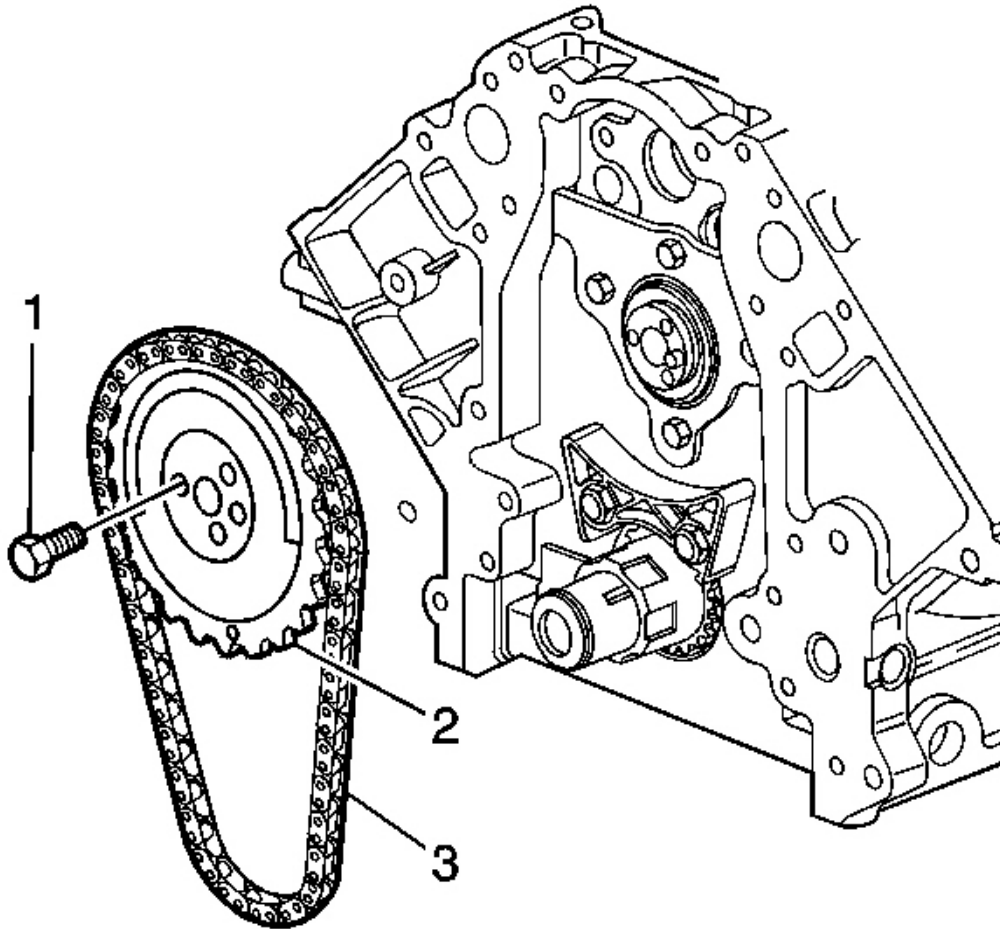


Fig. 233: View Of Timing Chain & Sprocket Assembly
Courtesy of GENERAL MOTORS CORP.

IMPORTANT:

- Properly locate the camshaft sprocket locating pin with the camshaft sprocket alignment hole.
- The sprocket teeth and timing chain must mesh.
- The camshaft and the crankshaft sprocket alignment marks **MUST** be aligned properly.

Locate the camshaft sprocket alignment mark in the 6 o'clock position.

6. Install the camshaft sprocket (2) and timing chain (3).

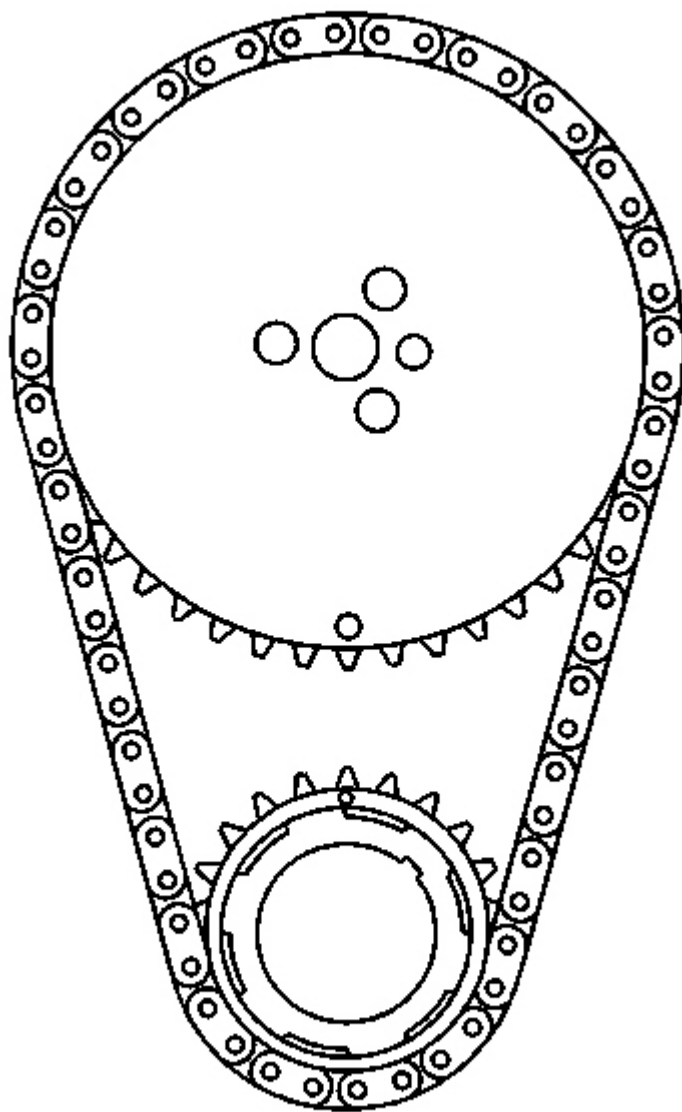


Fig. 234: View Of Timing Chain & Sprockets
Courtesy of GENERAL MOTORS CORP.

NOTE: Refer to Fastener Notice .

7. If necessary, rotate the camshaft or crankshaft sprockets in order to align the timing marks.
8. Install the camshaft sprocket bolts.

2007 Chevrolet TrailBlazer

2007 ENGINE Engine Mechanical - 6.0L - TrailBlazer

Tighten: Tighten the bolts to 35 N.m (26 lb ft).

9. Install the oil pump. Refer to **Oil Pump, Screen and Crankshaft Oil Deflector Replacement**.

CAMSHAFT REPLACEMENT

Removal Procedure

1. Remove the condenser. Refer to **Condenser Replacement** .
2. Remove the valve lifters from both cylinder heads. Refer to **Valve Lifter Replacement**.

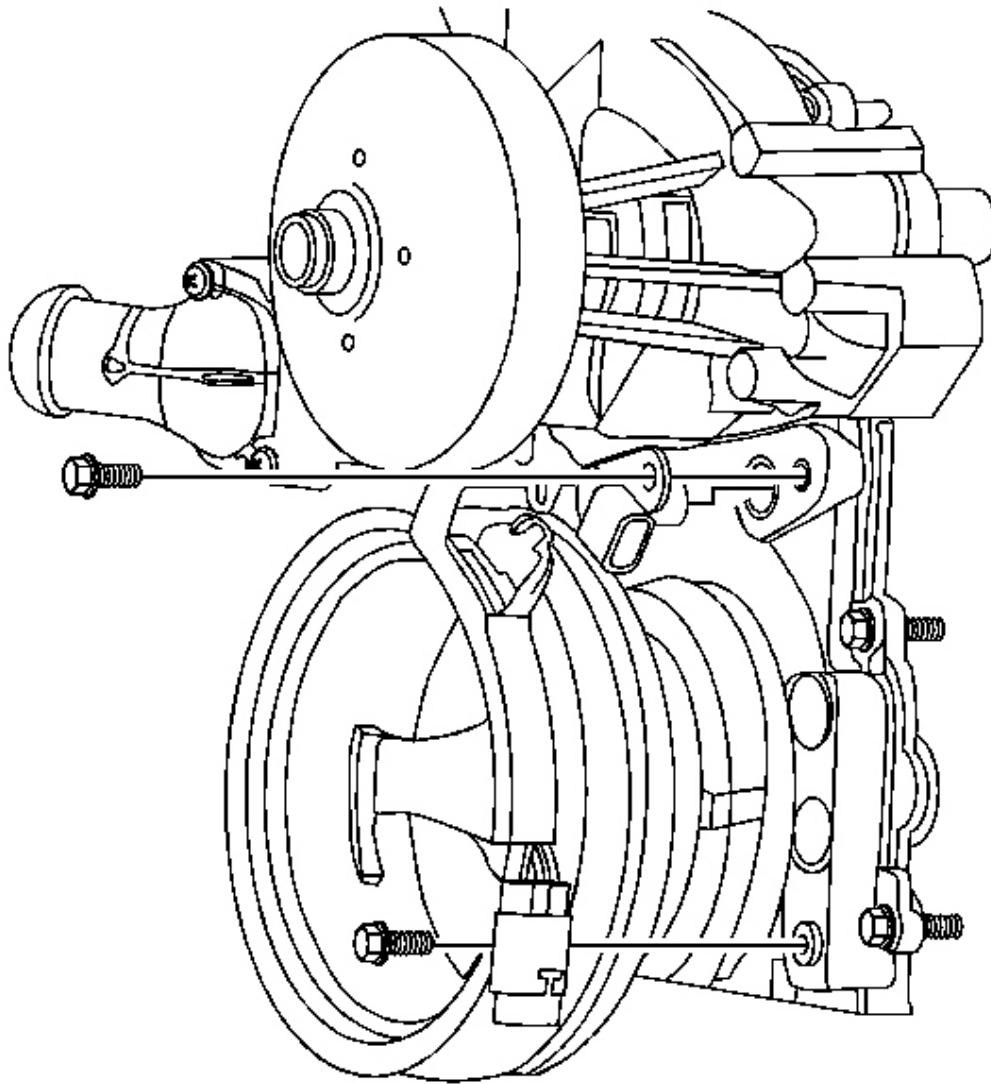


Fig. 235: View Of Camshaft Sensor Bolt & Sensor
Courtesy of GENERAL MOTORS CORP.

3. Remove the camshaft sensor bolt and sensor.

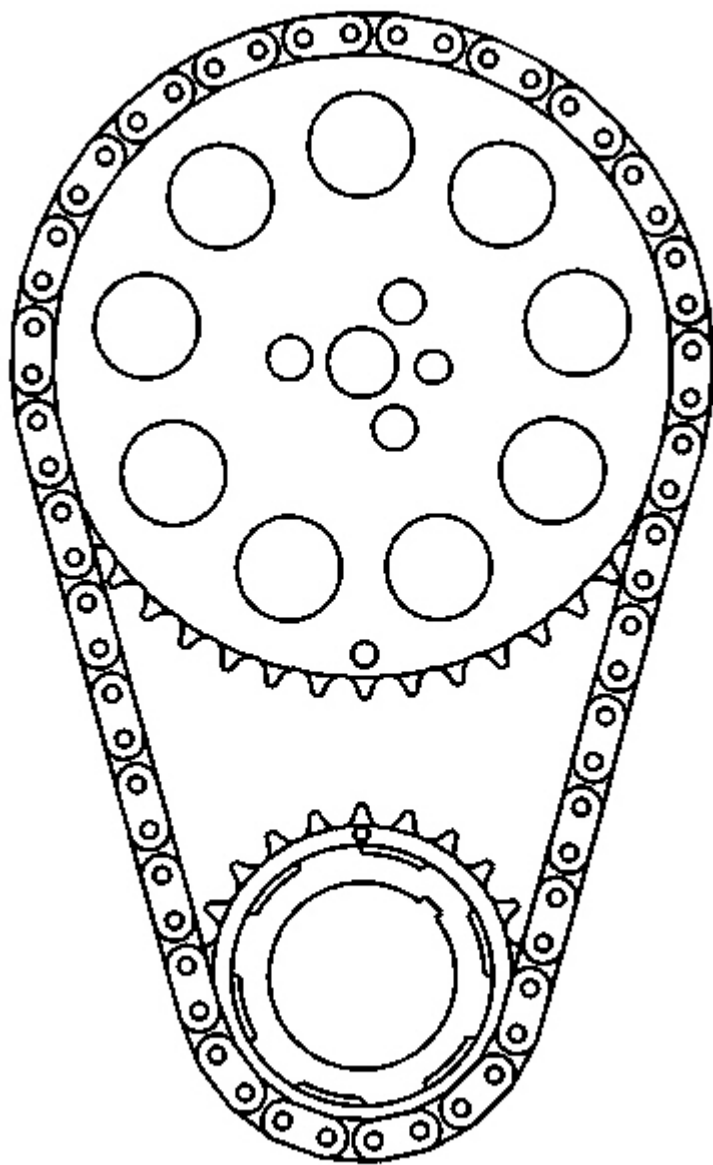


Fig. 236: View Of Camshaft & Crankshaft Sprockets Timing Marks Aligned
Courtesy of GENERAL MOTORS CORP.

4. Rotate the crankshaft until the timing marks on the crankshaft and camshaft sprockets are aligned.

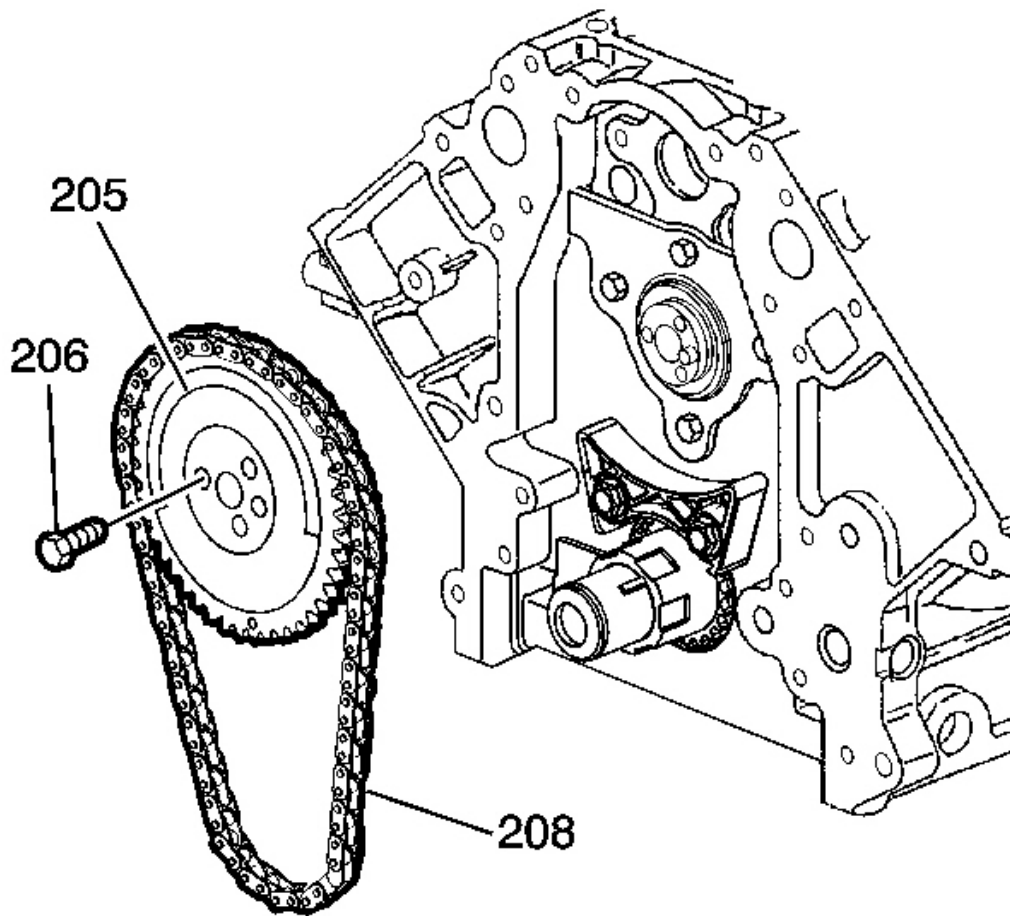


Fig. 237: View Of Camshaft Sprocket, Bolts & Timing Chain
Courtesy of GENERAL MOTORS CORP.

5. Remove the camshaft sprocket bolts (206).

NOTE: Do not turn the crankshaft assembly after the timing chain has been removed in order to prevent damage to the piston assemblies or the valves.

6. Remove the camshaft sprocket (205) and reposition the timing chain (208).

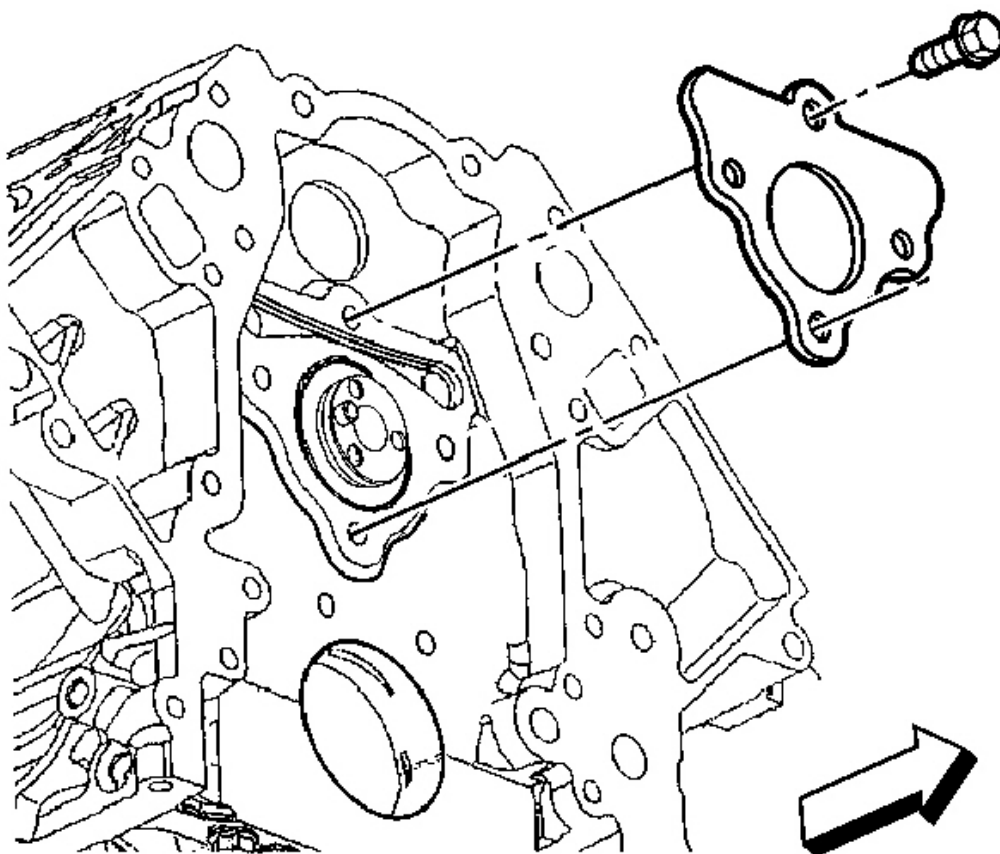


Fig. 238: View Of Camshaft Retainer Plate
Courtesy of GENERAL MOTORS CORP.

7. Remove the camshaft retainer bolts and retainer.

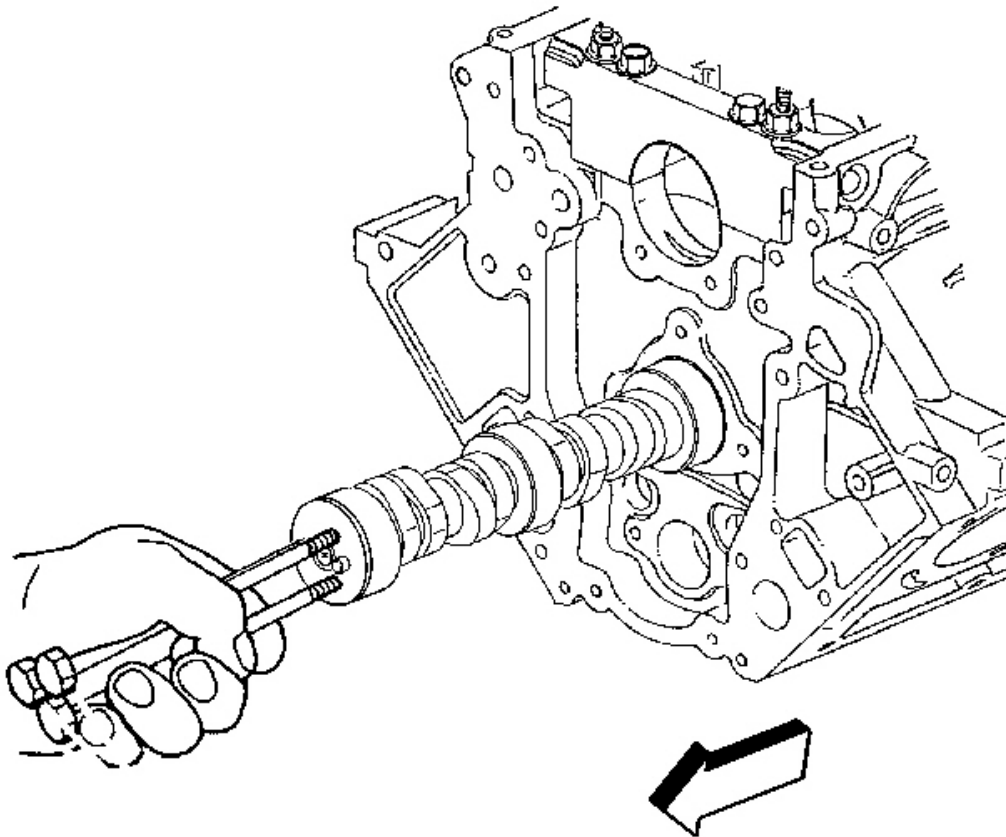


Fig. 239: View Of Bolts installed In Camshaft Front Bolt Holes
Courtesy of GENERAL MOTORS CORP.

NOTE: All camshaft journals are the same diameter, so care must be used in removing or installing the camshaft to avoid damage to the camshaft bearings.

8. Remove the camshaft.
 1. Install three M8-1.25 x 100 mm (M8-1.25 x 4.0 in) bolts to the bolt holes in the front of the camshaft.
 2. Using the bolts as a handle, carefully rotate and pull the camshaft out of the engine block.
 3. Remove the three bolts from the camshaft.
9. Clean and inspect the camshaft and bearings. Refer to **Camshaft and Bearings Cleaning and Inspection.**

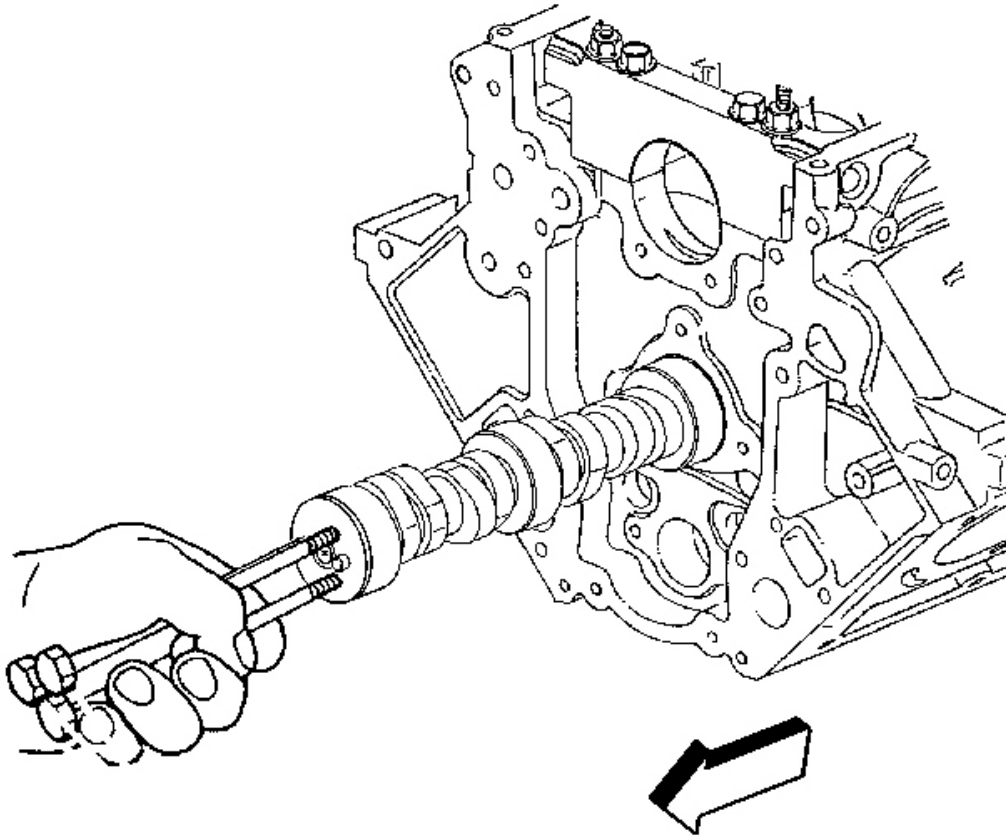


Fig. 240: View Of Bolts installed In Camshaft Front Bolt Holes
Courtesy of GENERAL MOTORS CORP.

IMPORTANT: If camshaft replacement is required, the valve lifters must also be replaced.

1. Lubricate the camshaft journals and the bearings with clean engine oil.

NOTE: All camshaft journals are the same diameter, so care must be used in removing or installing the camshaft to avoid damage to the camshaft bearings.

2. Install three M8-1.25 x 100 mm (M8-1.25 x 4.0 in) bolts to the bolt holes in the front of the camshaft.
3. Using the bolts as a handle, carefully install the camshaft into the engine block.
4. Remove the three bolts from the front of the camshaft.

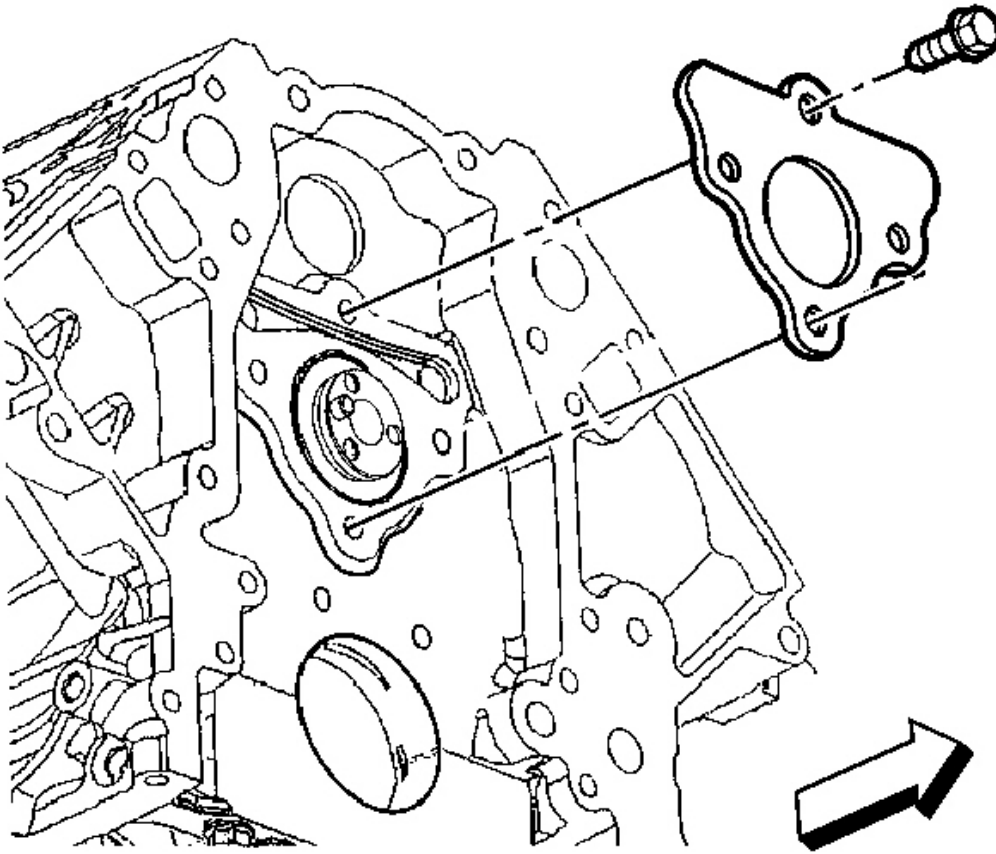


Fig. 241: View Of Camshaft Retainer Plate
Courtesy of GENERAL MOTORS CORP.

IMPORTANT: Install the retainer plate with the sealing gasket facing the engine block. The gasket surface on the engine block should be clean and free of dirt and/or debris.

NOTE: Refer to Fastener Notice .

5. Install the camshaft retainer and bolts.

Tighten: Tighten the bolts to 25 N.m (18 lb ft).

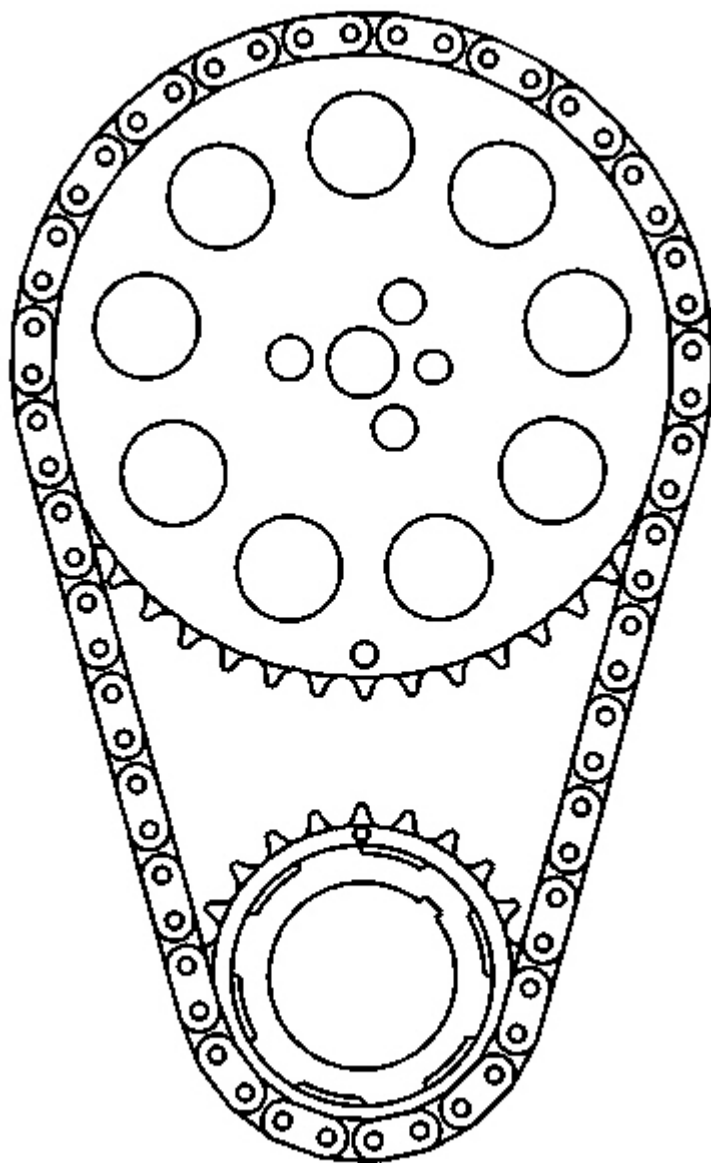


Fig. 242: View Of Camshaft & Crankshaft Sprockets Timing Marks Aligned
Courtesy of GENERAL MOTORS CORP.

IMPORTANT:

- Properly locate the camshaft sprocket locating pin with the camshaft sprocket alignment hole.
- The sprocket teeth and timing chain must mesh.

- The camshaft and the crankshaft sprocket alignment marks **MUST** be aligned properly. Locate the camshaft sprocket alignment mark in the 6 o'clock position.

6. If necessary, rotate the camshaft or crankshaft sprockets in order to align the timing marks.

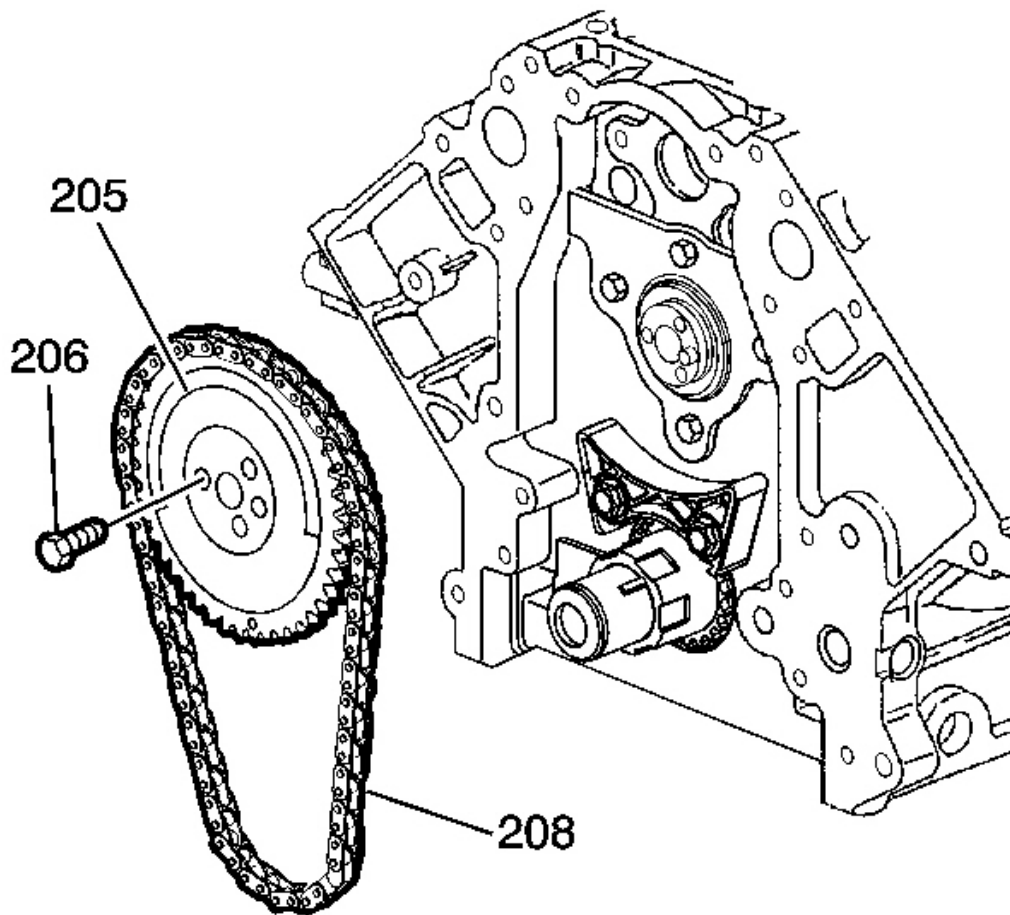


Fig. 243: View Of Camshaft Sprocket, Bolts & Timing Chain
Courtesy of GENERAL MOTORS CORP.

7. Install the camshaft sprocket (205) and the timing chain (208).
8. Install the camshaft sprocket bolts (206).

Tighten: Tighten the bolts to 35 N.m (26 lb ft).

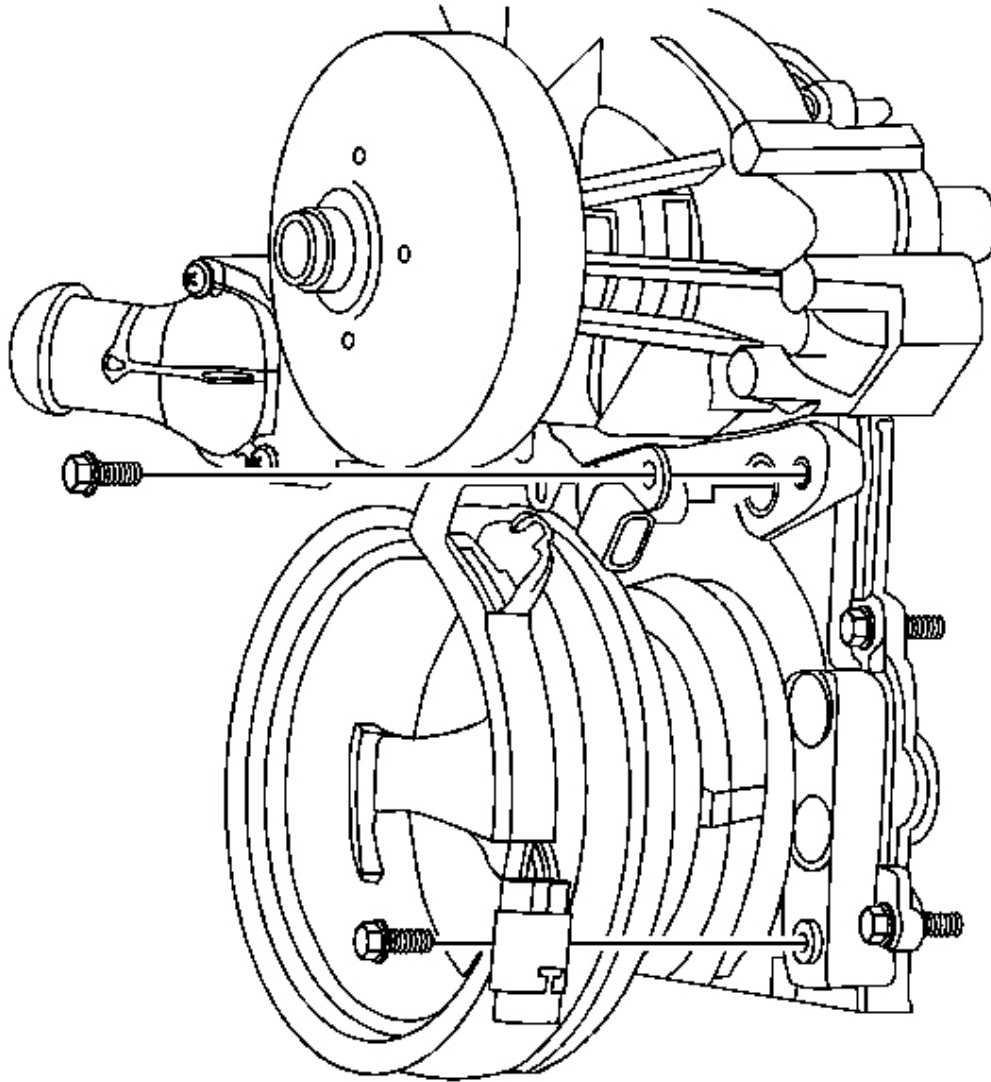


Fig. 244: View Of Camshaft Sensor Bolt & Sensor
Courtesy of GENERAL MOTORS CORP.

9. Inspect the camshaft sensor O-ring seal. If the O-ring seal is not cut or damaged, it may be reused.
10. Lubricate the O-ring seal with clean engine oil.
11. Install the camshaft sensor and bolt.

Tighten: Tighten the bolt to 25 N.m (18 lb ft).

12. Install the valve lifters. Refer to **Valve Lifter Replacement**.
13. Install the condenser. Refer to **Condenser Replacement**.

ENGINE FLYWHEEL REPLACEMENT

Removal Procedure

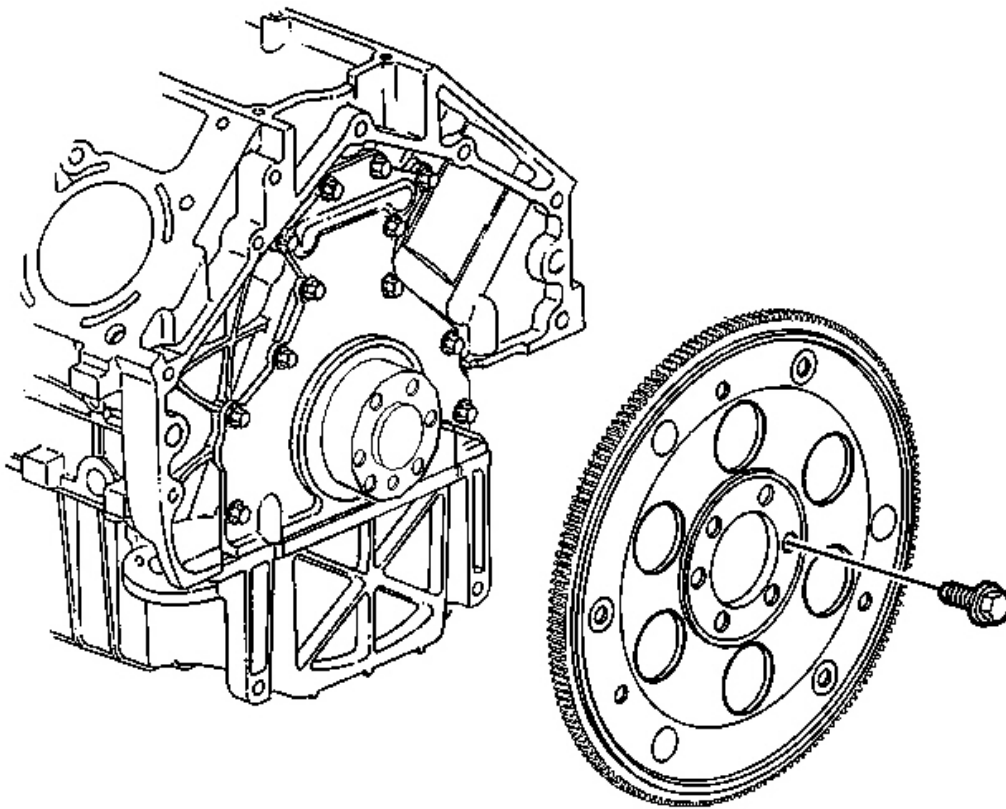


Fig. 245: View Of Engine Flywheel & Bolt
Courtesy of GENERAL MOTORS CORP.

IMPORTANT: Note the position and direction of the engine flywheel before removal.

1. Remove the transmission. Refer to **Transmission Replacement (LL8)** or **Transmission Replacement (LM4, LS2)**.
2. Remove the engine flywheel bolts.
3. Remove the engine flywheel.

4. Clean and inspect the engine flywheel. Refer to Engine Flywheel Cleaning and Inspection .

Installation Procedure

IMPORTANT: The flywheel does not use a locating pin for alignment and will not initially seat against the crankshaft flange, but will be pulled onto the crankshaft by the engine flywheel bolts. This procedure requires a three stage tightening process.

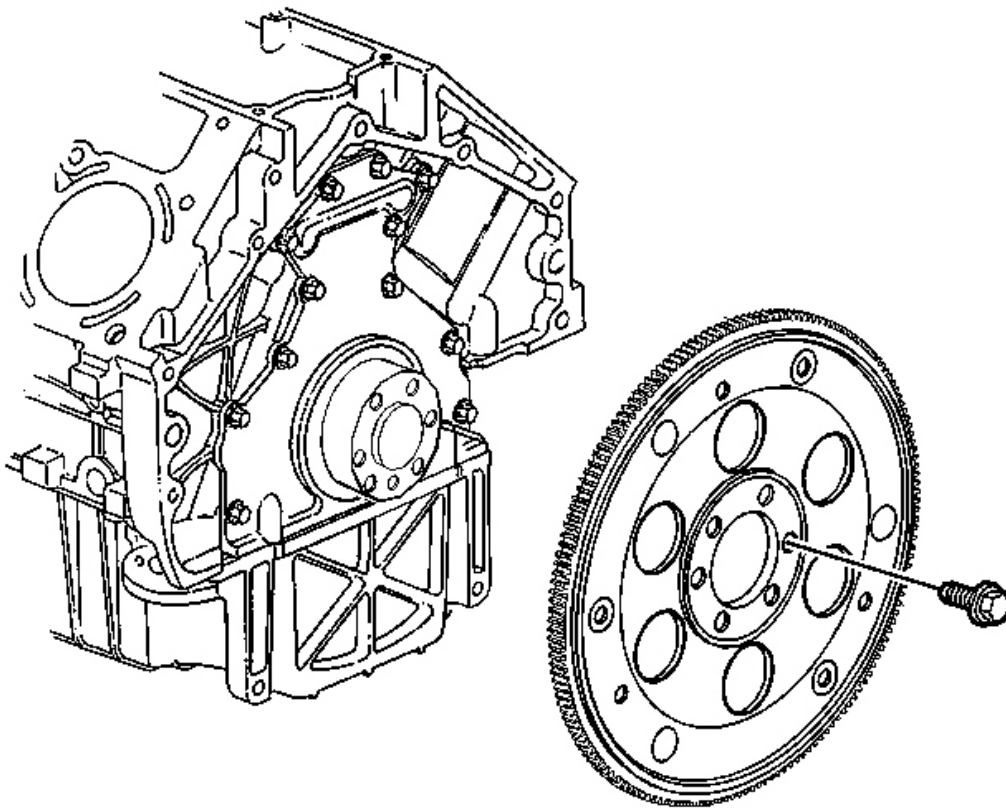


Fig. 246: View Of Engine Flywheel & Bolt
Courtesy of GENERAL MOTORS CORP.

1. Install the engine flywheel to the crankshaft.
2. Apply threadlock to the threads of the flywheel bolts. Refer to Sealers, Adhesives and Lubricants for the correct part number.

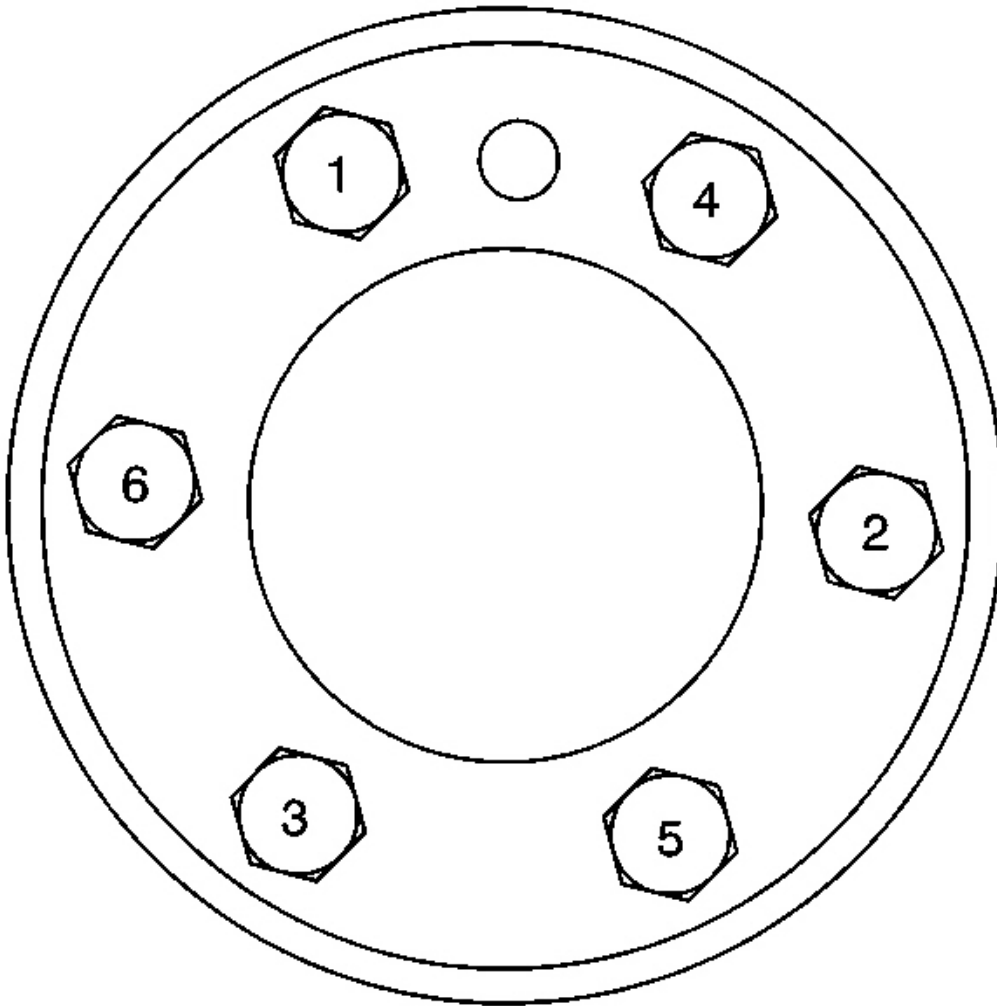


Fig. 247: Identifying Flywheel Bolt Tightening Sequence
Courtesy of GENERAL MOTORS CORP.

NOTE: Refer to Fastener Notice .

3. Install the engine flywheel bolts.

Tighten:

1. Tighten the bolts a first pass in sequence to 20 N.m (15 lb ft).
2. Tighten the bolts a second pass in sequence to 50 N.m (37 lb ft).
3. Tighten the bolts a final pass in sequence to 100 N.m (74 lb ft).

2007 Chevrolet TrailBlazer

2007 ENGINE Engine Mechanical - 6.0L - TrailBlazer

4. Install the transmission. Refer to **Transmission Replacement (LL8)** or **Transmission Replacement (LM4, LS2)** .

ENGINE REPLACEMENT

Tools Required

- **J 41798** Engine Lift Bracket. See **Special Tools**.
- **J 21366** Converter Holding Strap
- **J 38185** Hose Clamp Pliers

Removal Procedure

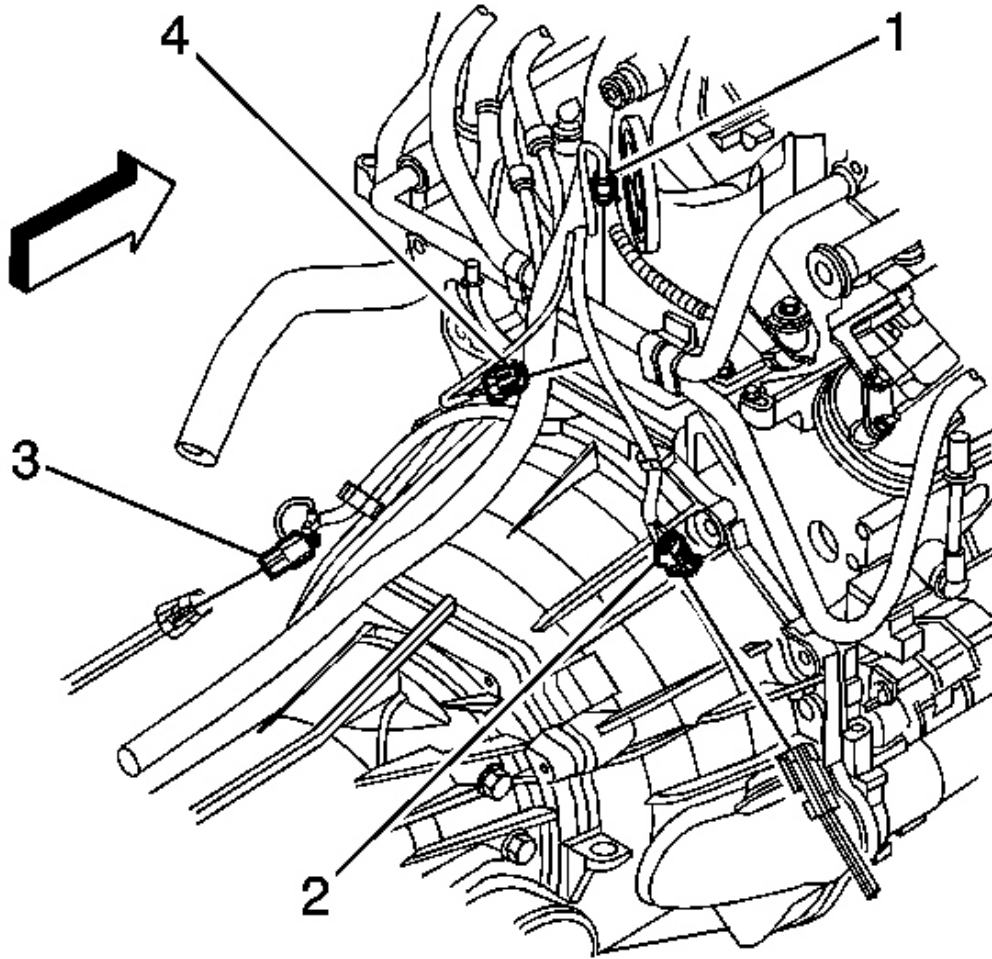


Fig. 248: Locating Components Connectors At Rear Of Engine
Courtesy of GENERAL MOTORS CORP.

1. Remove the hood. Refer to **Hood Replacement** .
2. Disconnect the negative battery cable. Refer to **Battery Negative Cable Disconnection and Connection** .
3. Remove the intake manifold sight shield. Refer to **Upper Intake Manifold Sight Shield Replacement**.
4. Recover the refrigerant. Refer to **Refrigerant Recovery and Recharging** .
5. Remove the radiator. Refer to **Radiator Replacement (LH6, Ls2)** or **Radiator Replacement (LL8)** .
6. Remove the radiator support brace. Refer to **Radiator Support Diagonal Brace Replacement** .
7. Remove the front differential drive axle, if equipped with 4-wheel drive (4WD). Refer to **Differential**

Carrier Assembly Replacement (4.2L In-Line Six Cylinder) or Differential Carrier Assembly Replacement (V8) .

8. Remove the wheel drive shafts, if equipped with 4-wheel drive. Refer to **Wheel Drive Shaft Replacement** .
9. Remove the intake manifold. Refer to **Intake Manifold Replacement**.
10. Disconnect the following electrical connectors:
 - Oil pressure sensor (1)
 - Oxygen sensors (2, 3)
 - Camshaft position (CMP) sensor (4)

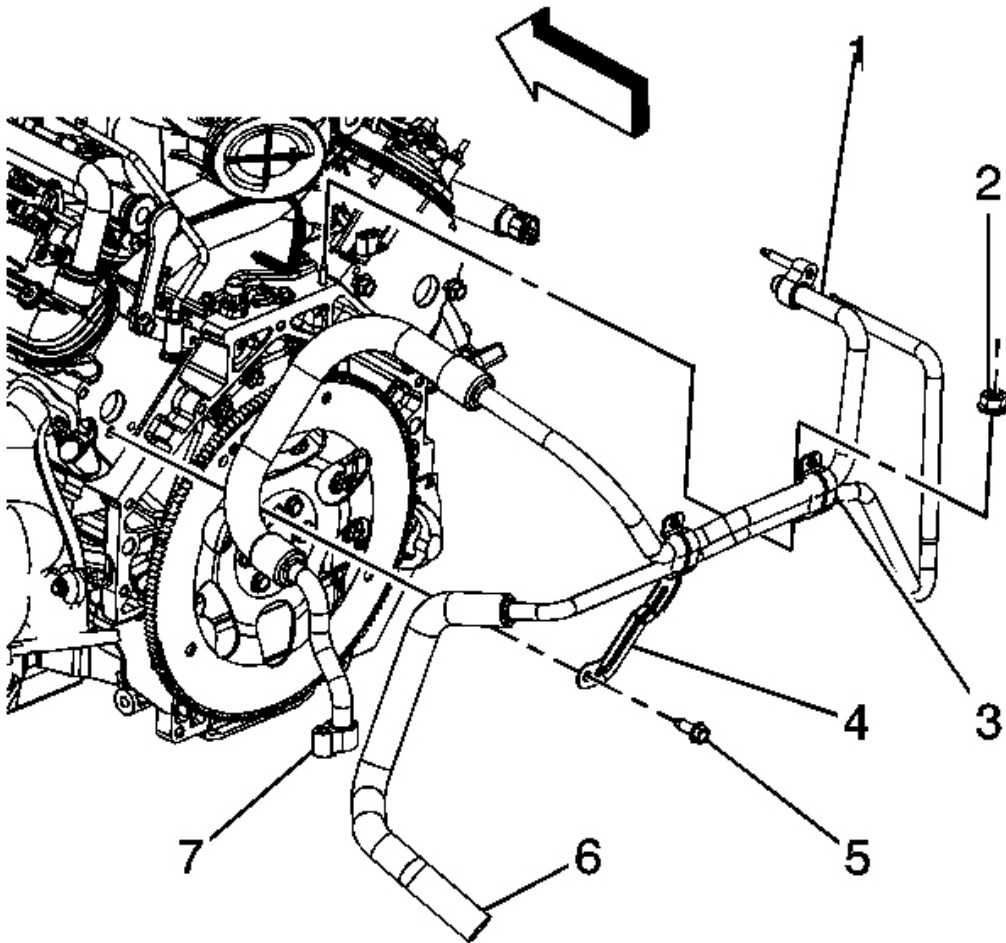


Fig. 249: View Of Rear A/C Lines
Courtesy of GENERAL MOTORS CORP.

11. Remove the air conditioning (A/C) compressor hose. Refer to **Compressor Hose Assembly Replacement (LH6, LS2)** or **Compressor Hose Assembly Replacement (LL8)**.
12. Disconnect the rear auxiliary A/C compressor pipe fitting (7).
13. Remove the rear auxiliary A/C compressor pipe nut and bolt (2, 5).
14. Tie the pipe assembly out of the way.

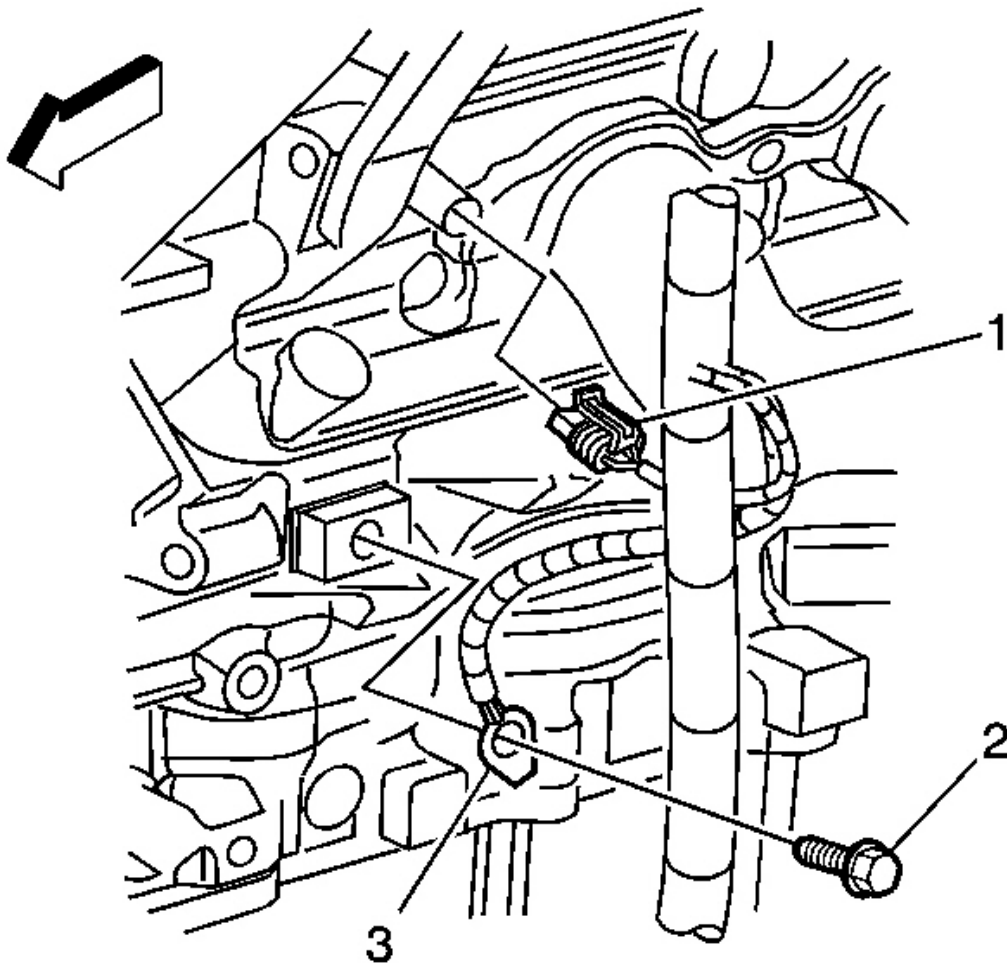


Fig. 250: View Of ECT Sensor Electrical Connector And Ground
Courtesy of GENERAL MOTORS CORP.

15. Disconnect the engine coolant temperature (ECT) sensor (1).
16. Remove the ground terminal bolt (2).

17. Remove the retaining clips from the brackets.

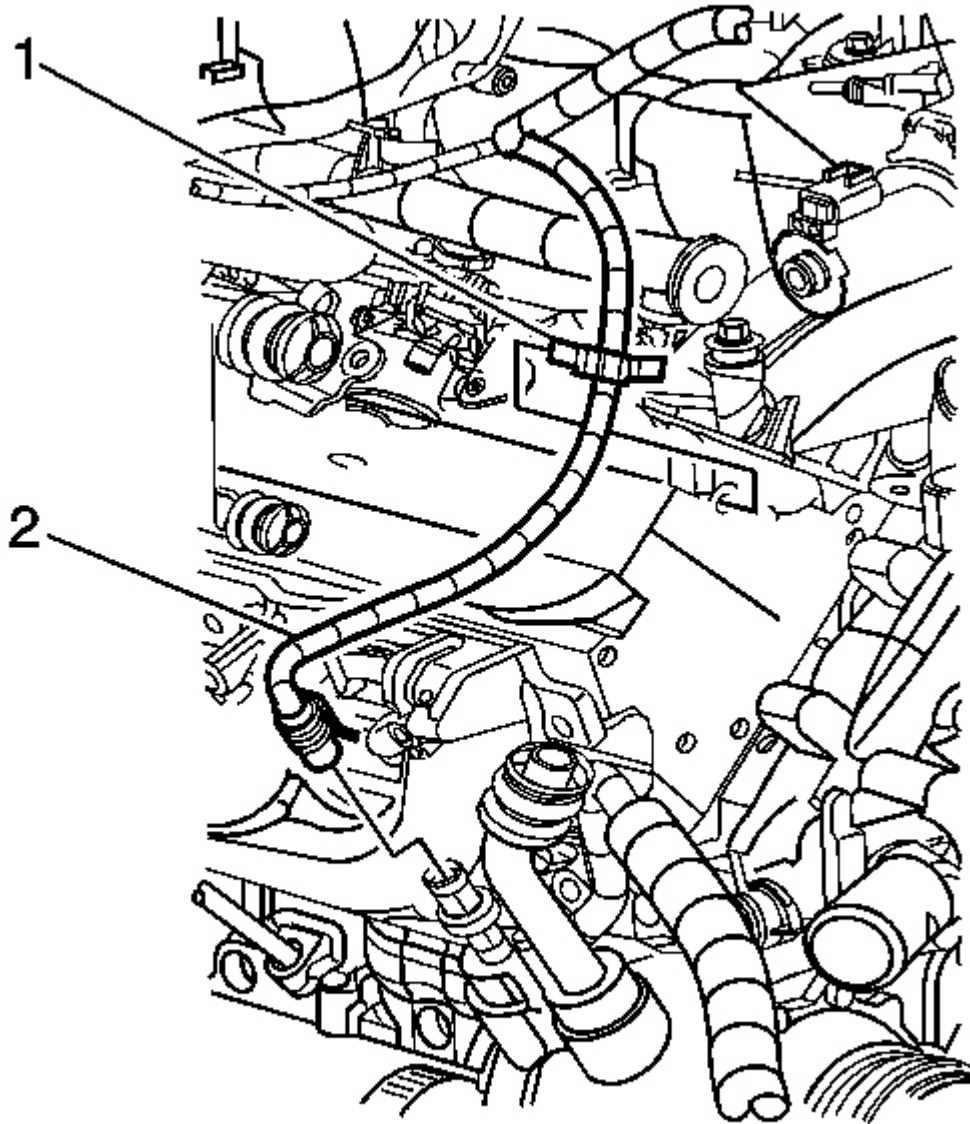


Fig. 251: View Of A/C Compressor Pressure Switch Electrical Connector & Retaining Clip
Courtesy of GENERAL MOTORS CORP.

18. Disconnect the A/C pressure switch electrical connector (2).
19. Remove the retaining clip (1) from the cylinder head.

20. Raise and suitably support the vehicle. Refer to **Lifting and Jacking the Vehicle** .

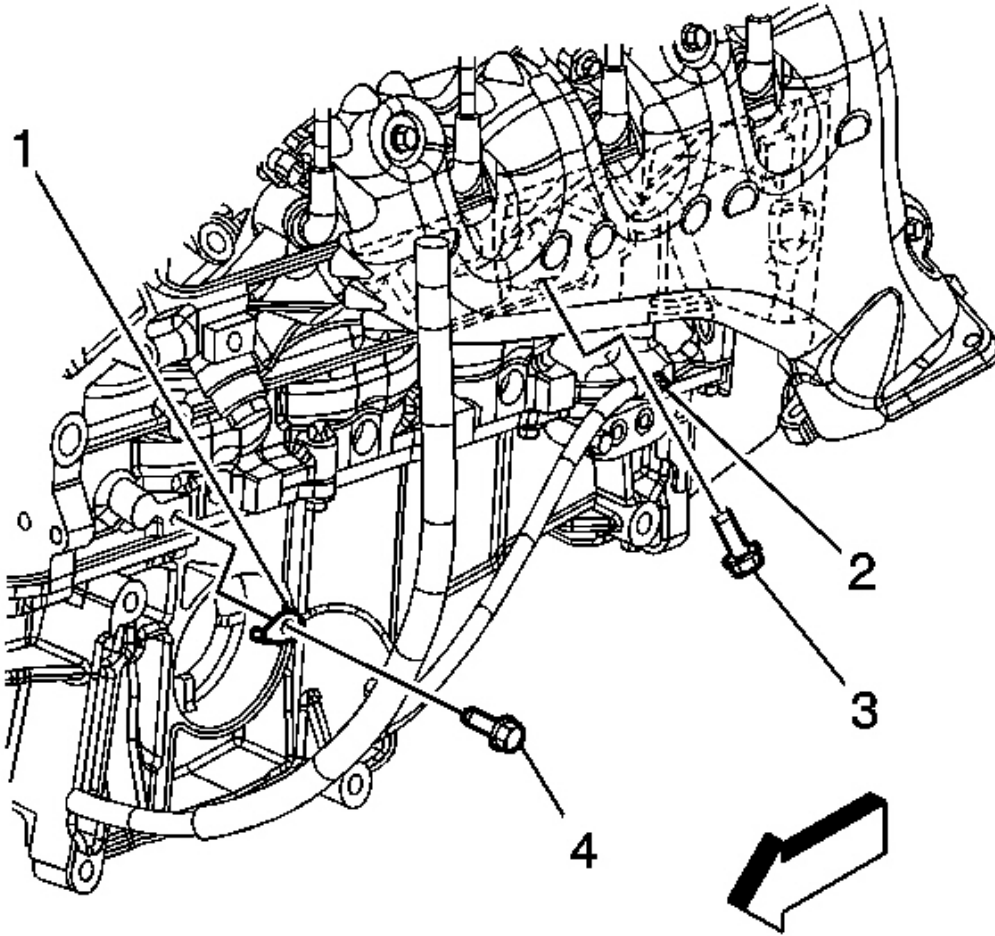


Fig. 252: View Of Ground Terminal Bolts
Courtesy of GENERAL MOTORS CORP.

21. Remove the ground terminal bolts (2, 4).
22. Remove the starter. Refer to **Starter Motor Replacement (4.2L Engine)** or **Starter Motor Replacement (5.3L and 6.0L Engines)** .

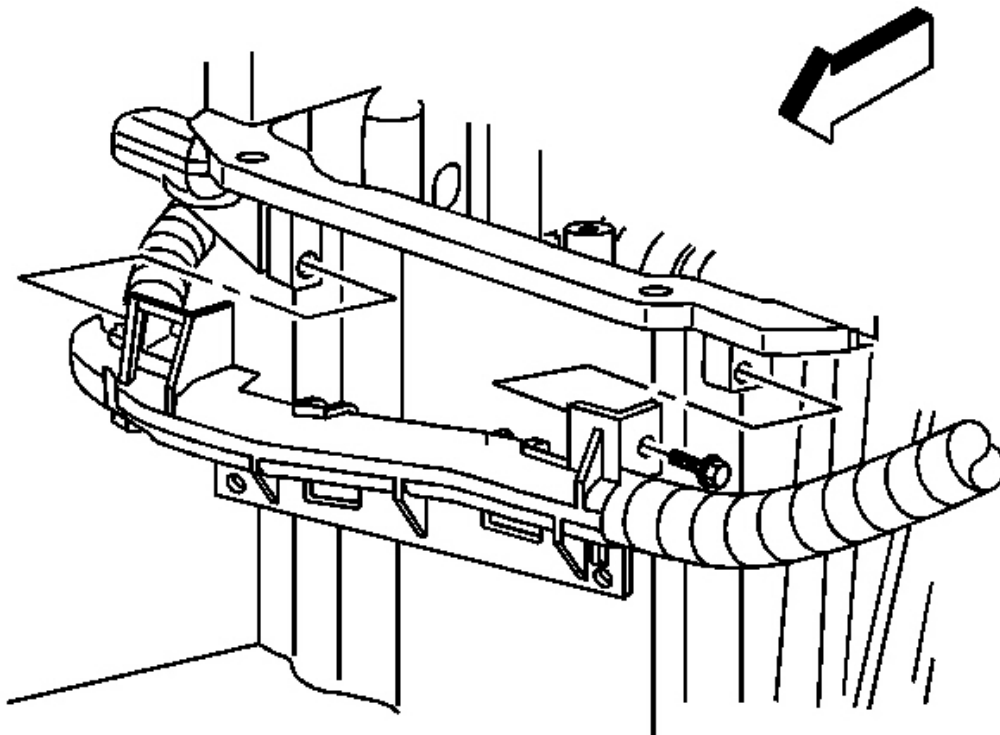


Fig. 253: View Of Battery Cable Channel & Bolt
Courtesy of GENERAL MOTORS CORP.

23. Remove the battery cable channel bolt.
24. Remove the battery cable channel from the oil pan.

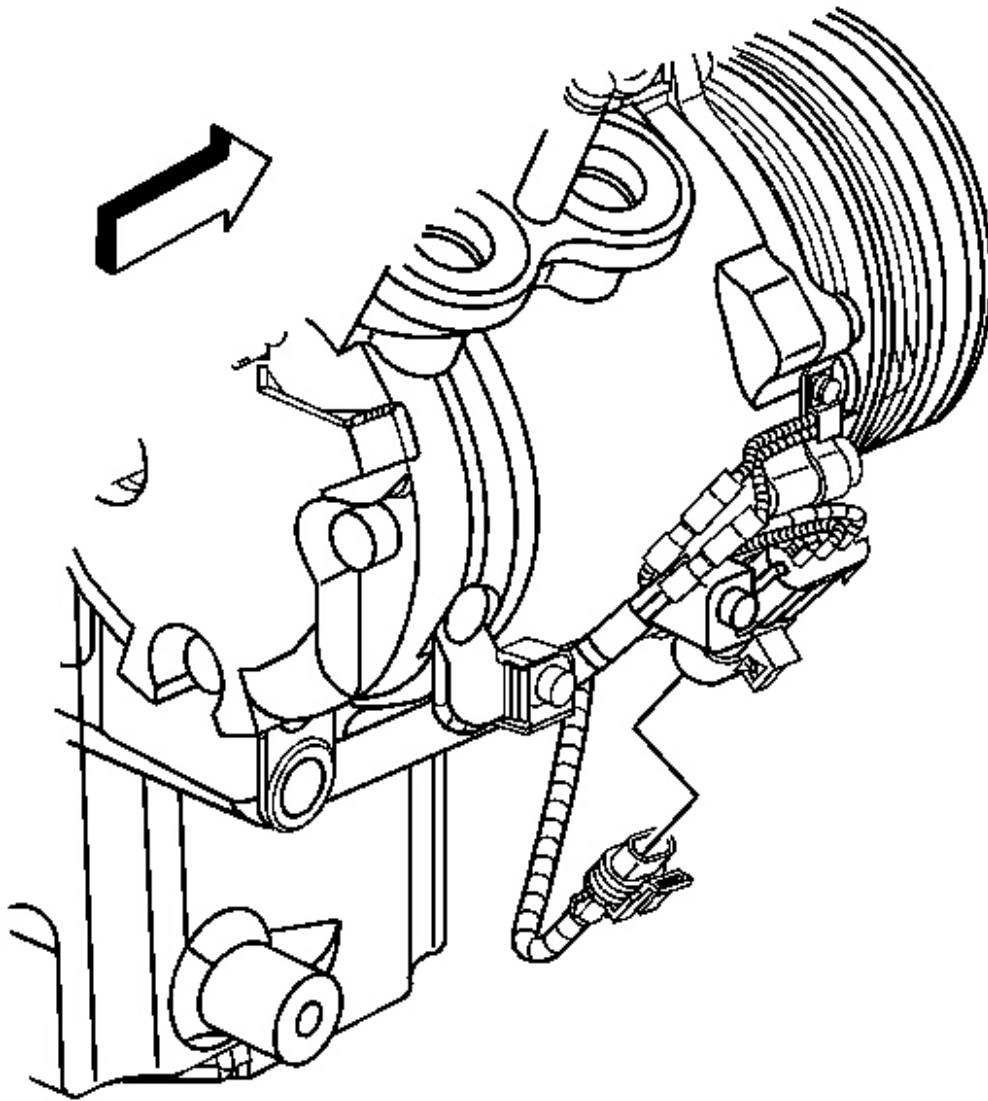


Fig. 254: View Of A/C Compressor Electrical Connector
Courtesy of GENERAL MOTORS CORP.

25. Disconnect the A/C compressor electrical connector.
26. Lower the vehicle.
27. Gather all branches of the engine wiring harness and reposition the harness off to the side.

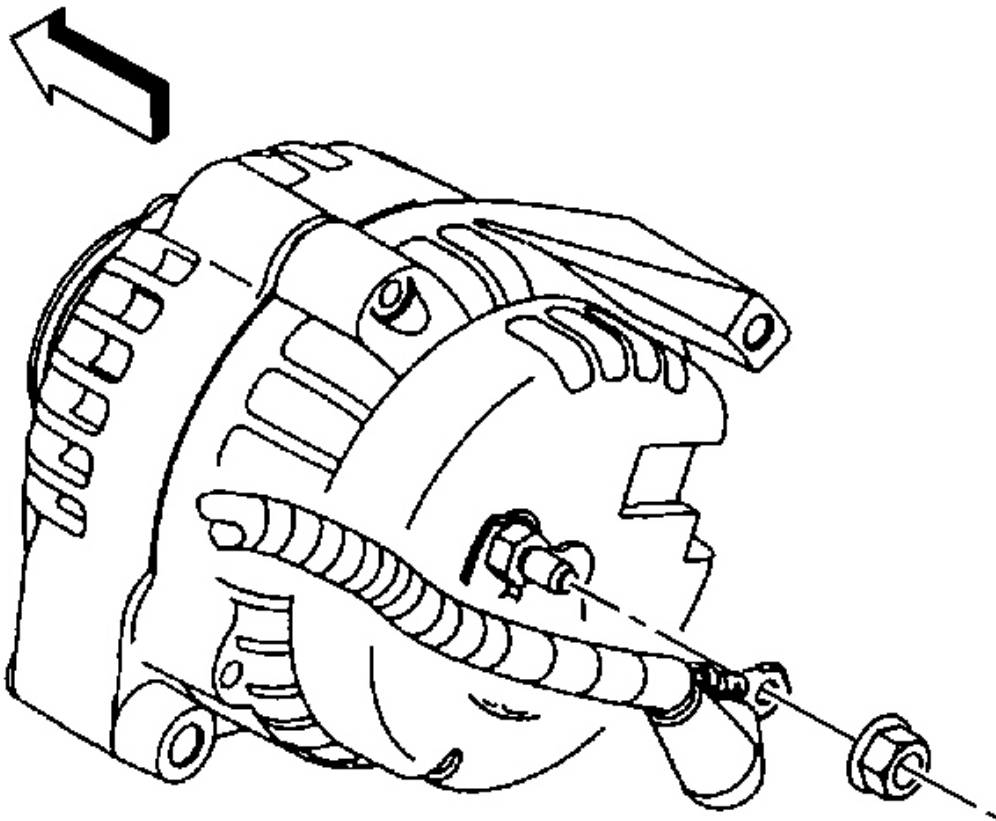


Fig. 255: View Of Generator Cable & Nut
Courtesy of GENERAL MOTORS CORP.

28. Remove the generator cable from the generator. Perform the following:
 1. Slide the boot down revealing the terminal stud.
 2. Remove the generator cable nut from the terminal stud.
 3. Remove the generator cable.

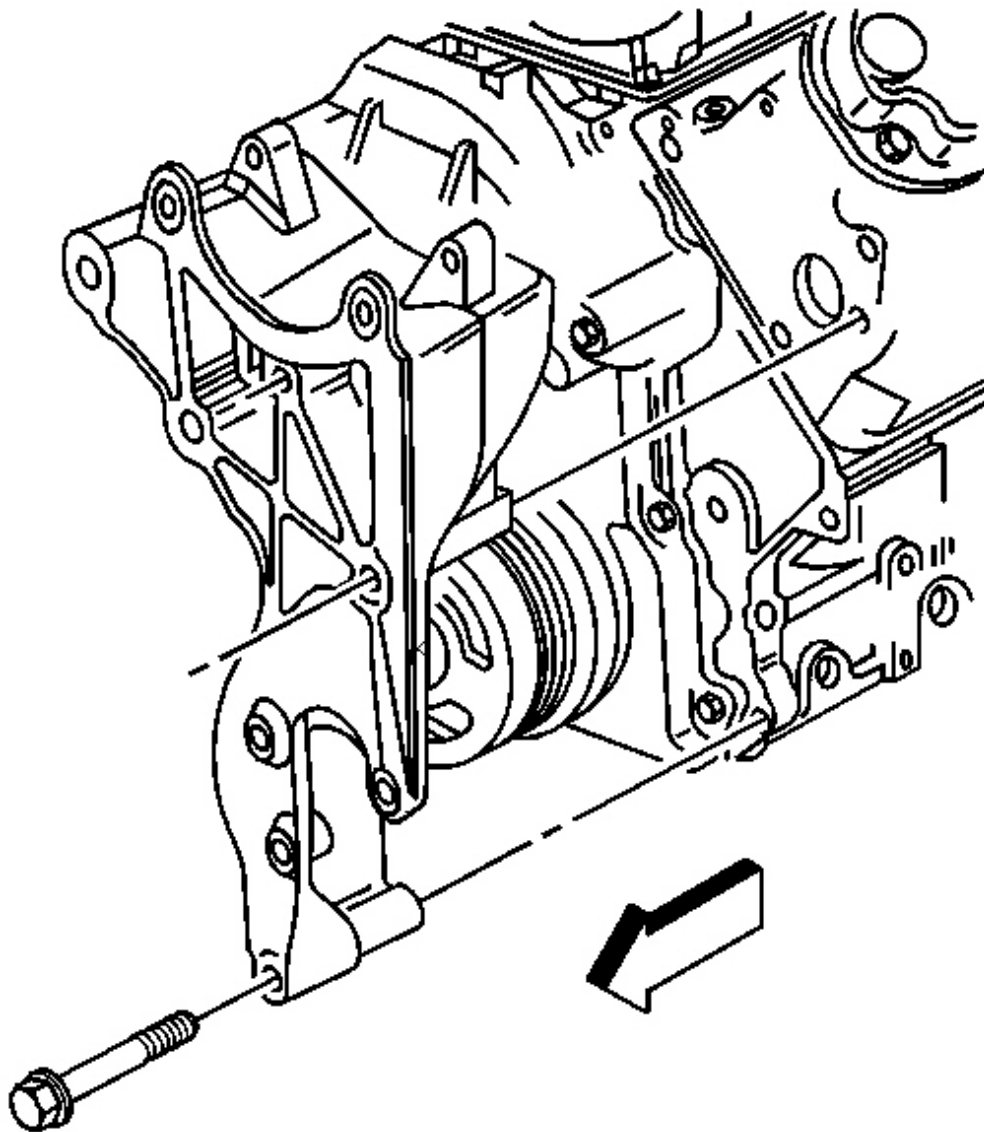


Fig. 256: View Of Generator Bracket & Bolts
Courtesy of GENERAL MOTORS CORP.

29. Remove the generator bracket bolts.
30. Position the bracket with generator aside.

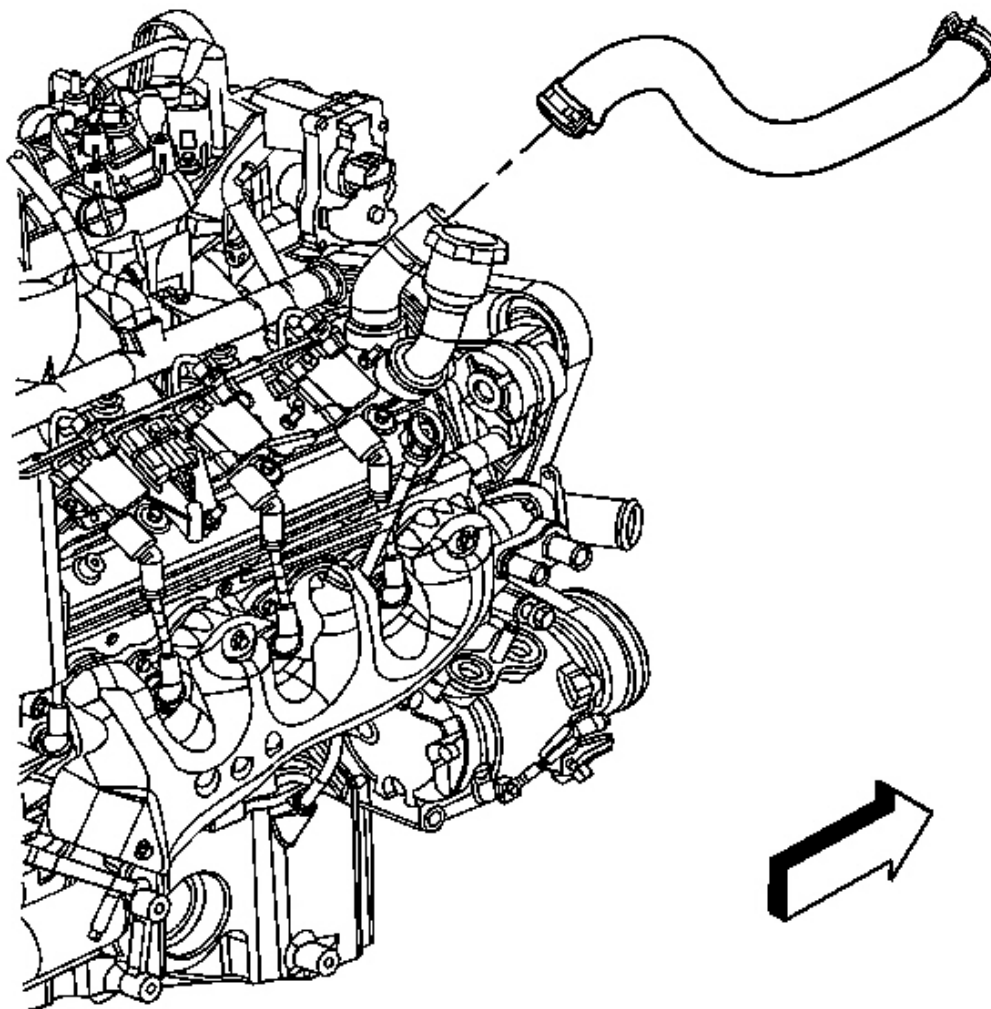


Fig. 257: View Of Inlet Hose
Courtesy of GENERAL MOTORS CORP.

31. Using the **J 38185** , remove the inlet hose from the water outlet.

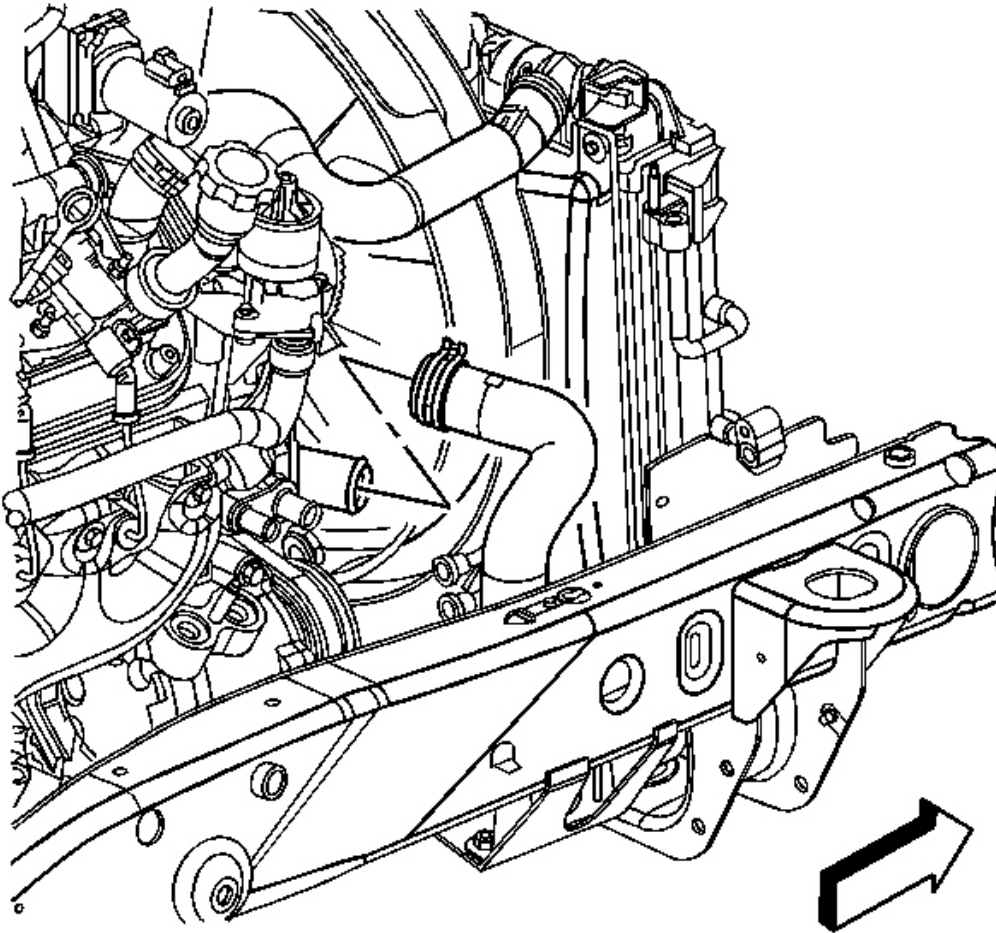


Fig. 258: View Of Outlet Hose
Courtesy of GENERAL MOTORS CORP.

32. Using the **J 38185** , remove the outlet hose from the water outlet.

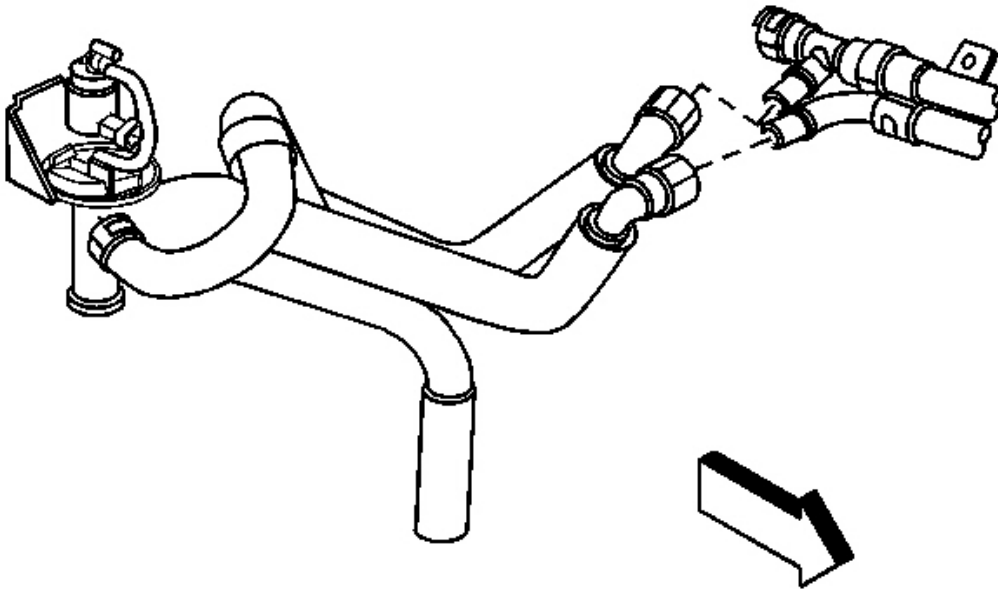


Fig. 259: View Of Auxiliary Heater Inlet & Outlet Hose/Pipe Assembly
Courtesy of GENERAL MOTORS CORP.

33. Disconnect the auxiliary heater inlet and outlet hose/pipe assembly from the heater water shutoff valve pipes.

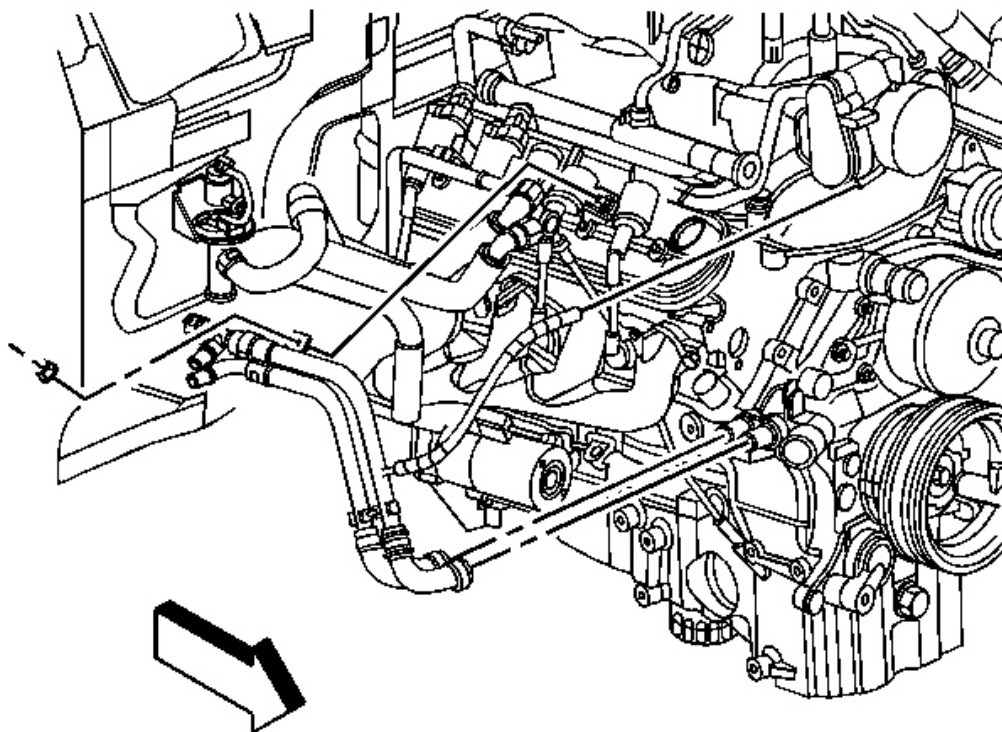


Fig. 260: View Of Auxiliary Heater Inlet & Outlet Hoses/Pipes
Courtesy of GENERAL MOTORS CORP.

34. Using the **J 38185** , remove the auxiliary heater inlet and outlet hoses/pipes from the water pump

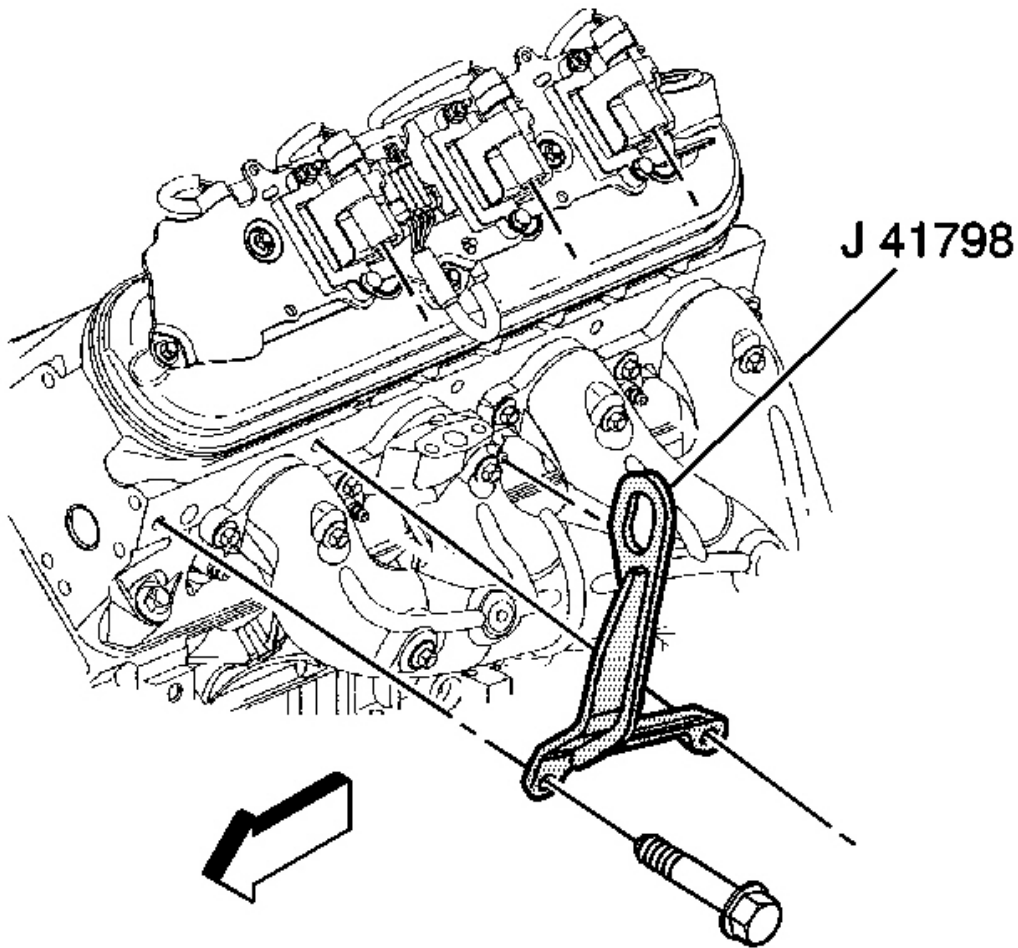


Fig. 261: View Of J 41798

Courtesy of GENERAL MOTORS CORP.

35. Remove the ignition coils as required for the proper fit of **J 41798** . See Special Tools. Refer to Ignition Coil Replacement .

NOTE: Refer to Fastener Notice .

36. Install **J 41798** . See Special Tools.

Tighten:

- Tighten the M8 bolts to 25 N.m (18 lb ft).
- Tighten the M10 bolts to 50 N.m (37 lb ft).

37. Raise the vehicle.
38. Remove the catalytic converter. Refer to **Catalytic Converter Replacement (4.2L Engine)** or **Catalytic Converter Replacement (5.3L and 6.0L Engines)** .

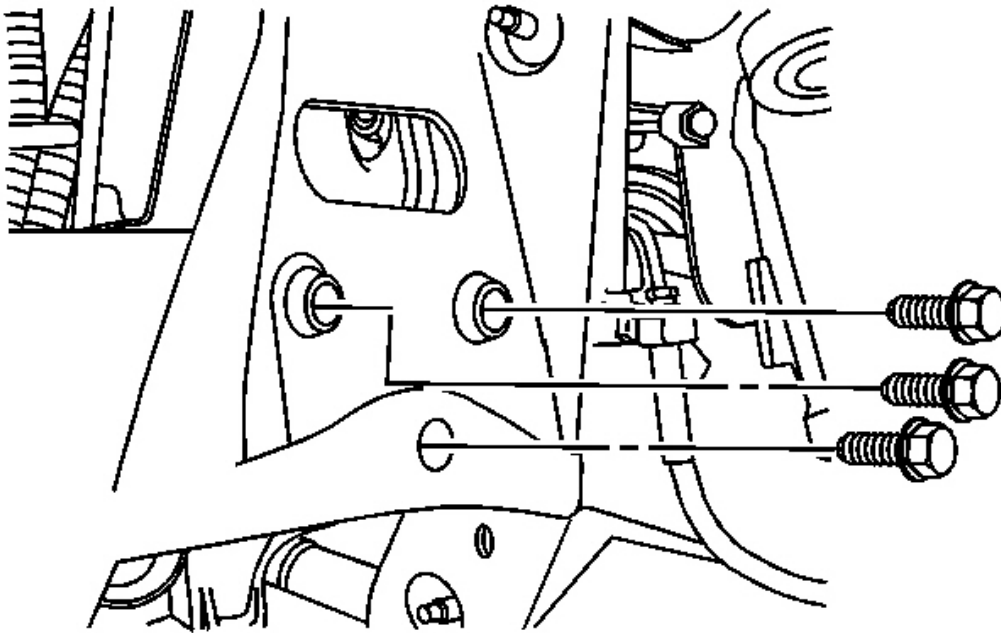


Fig. 262: View Of Frame Engine Mount Bracket Bolt Locations
Courtesy of GENERAL MOTORS CORP.

39. Remove the 3 bracket bolts from both the right and the left sides of the frame engine mount.

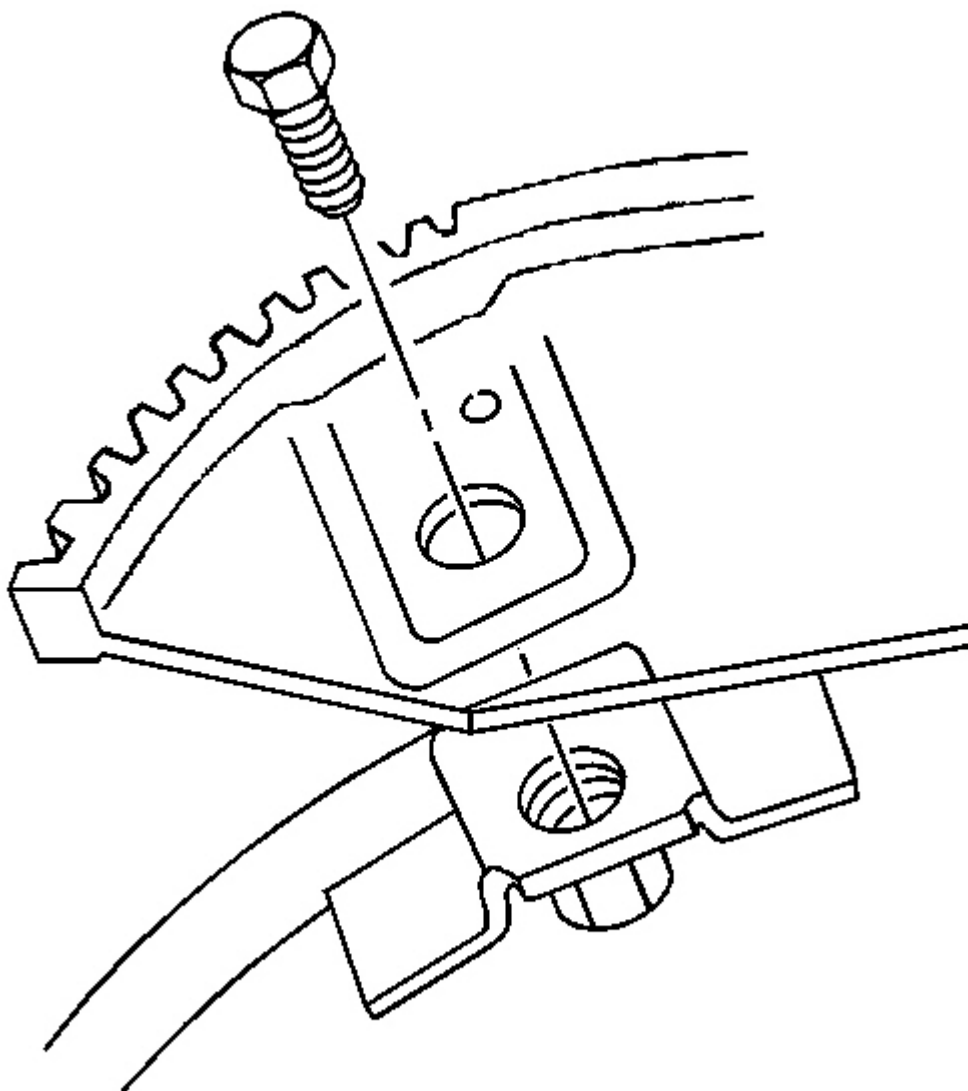


Fig. 263: Identifying Flywheel-To-Torque Converter Bolts
Courtesy of GENERAL MOTORS CORP.

40. Remove the torque converter bolts.

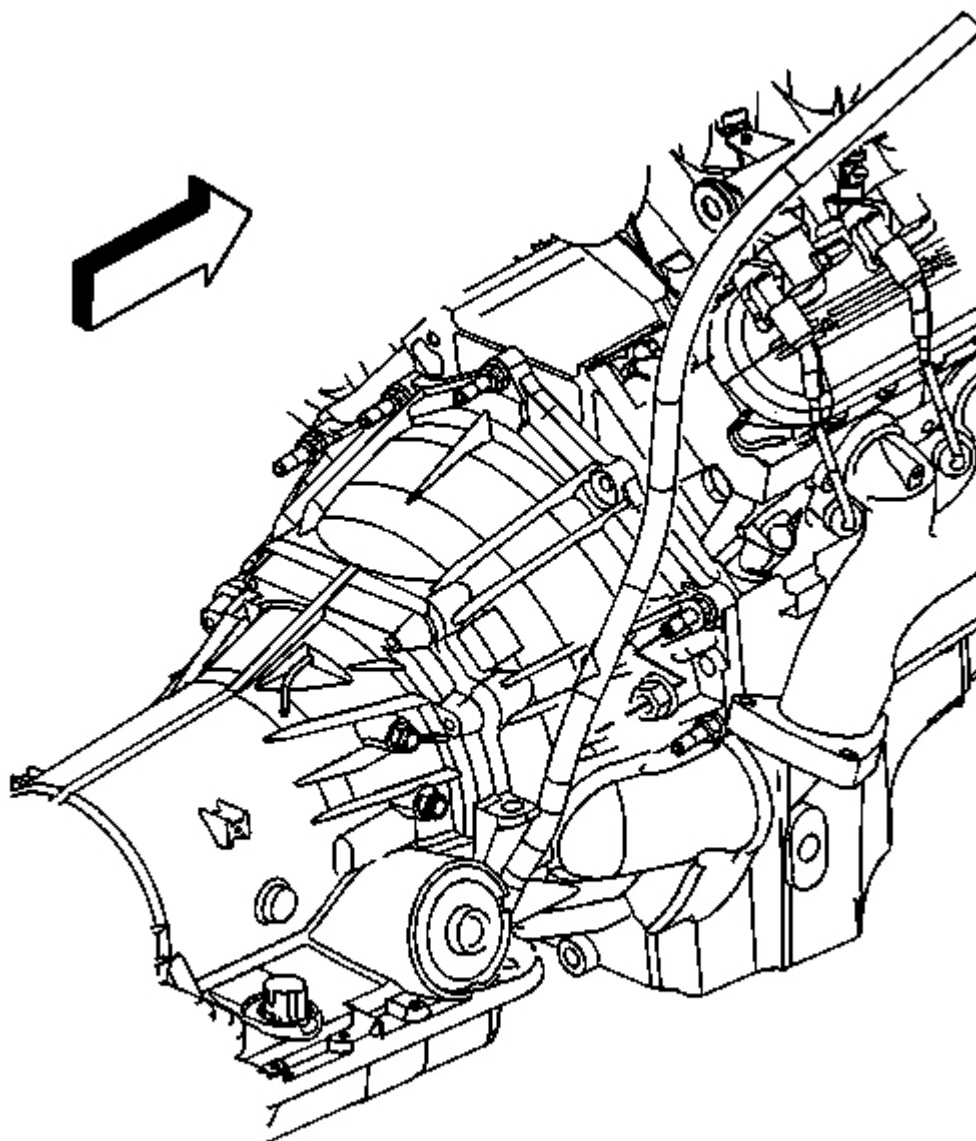


Fig. 264: View Of Oil Level Indicator Tube Nut
Courtesy of GENERAL MOTORS CORP.

41. Remove the transmission oil level indicator tube nut.

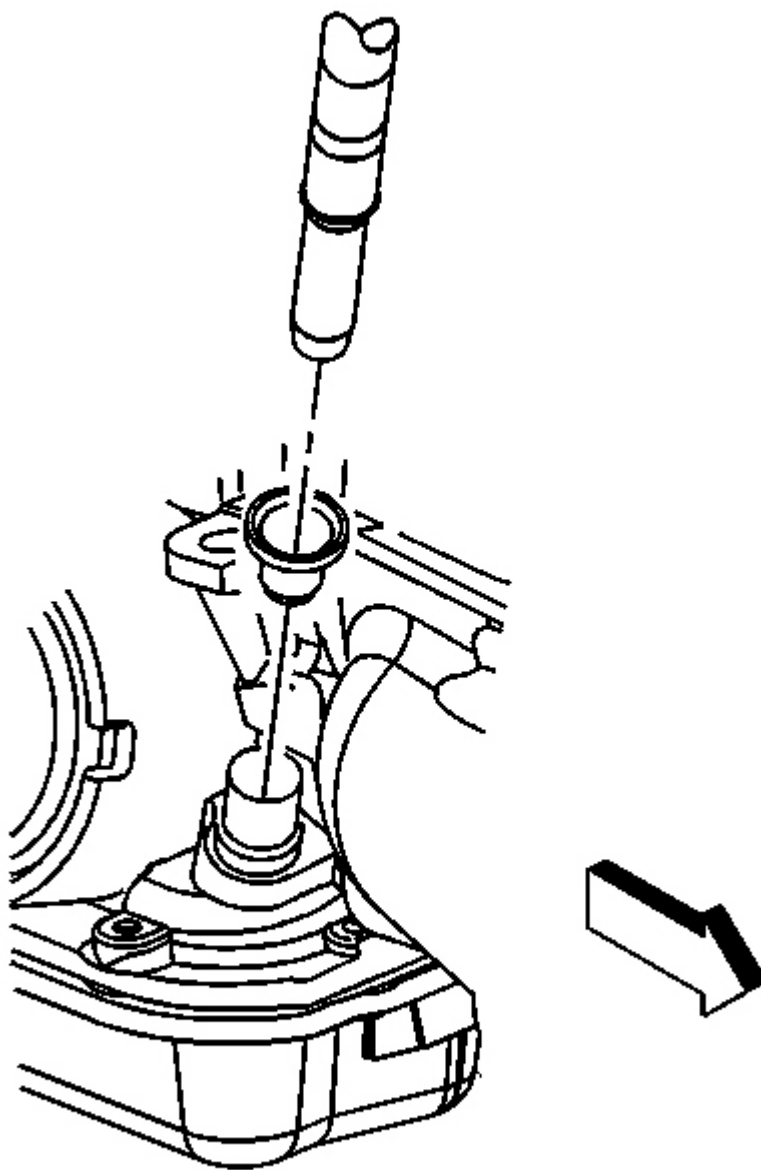


Fig. 265: View Of Oil Level Indicator Tube & Seal
Courtesy of GENERAL MOTORS CORP.

42. Remove the transmission oil level indicator tube.

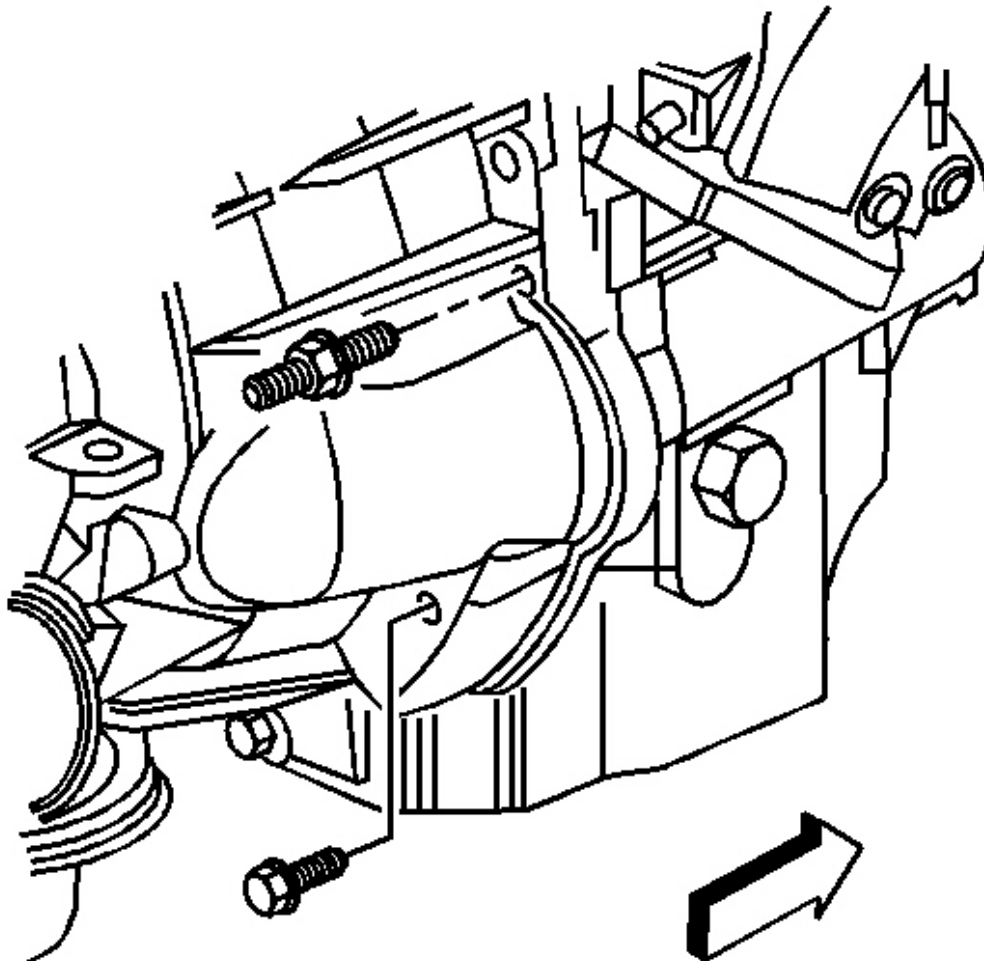


Fig. 266: View of Transmission Bolt & Stud (4L60-E)
Courtesy of GENERAL MOTORS CORP.

43. Remove the transmission bolt and stud on the right side.

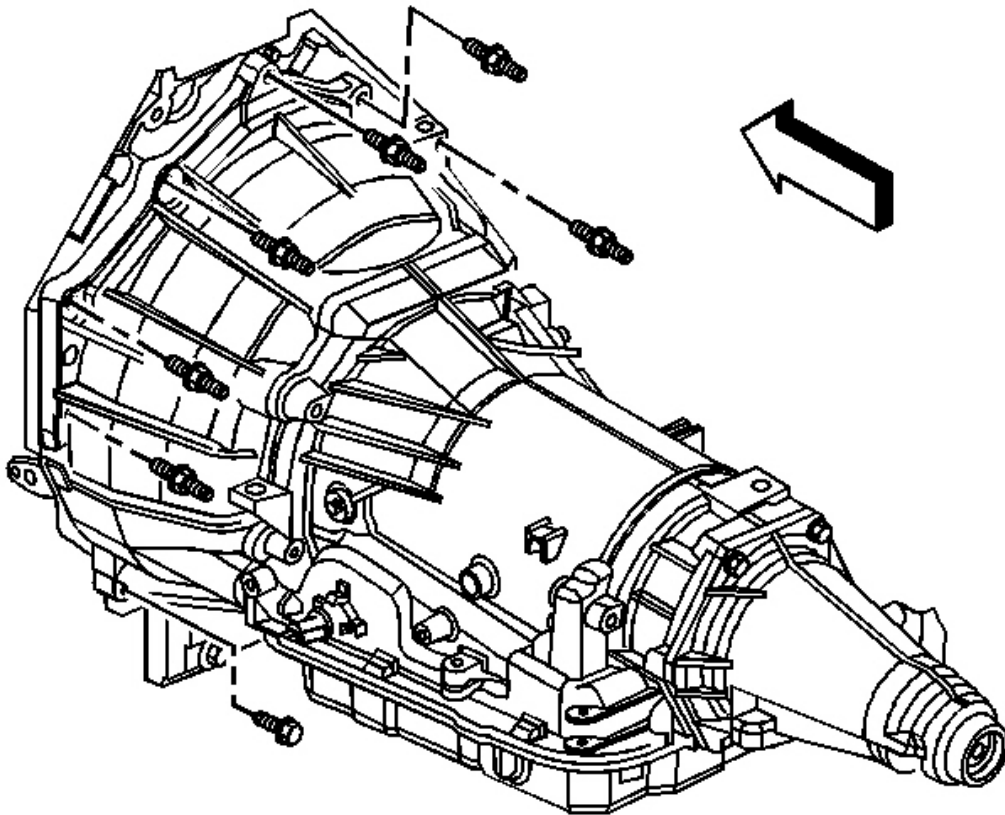


Fig. 267: View Of Automatic Transmission Bolt/Studs (4.8L, 5.3L and 6.0L Engines)
Courtesy of GENERAL MOTORS CORP.

44. Remove the lower transmission bolt/studs.
45. Lower the vehicle.
46. Remove the 3 upper transmission bolts/studs.
47. Install an engine hoist to the **J 41798** . See **Special Tools**.
48. Install a floor jack under the transmission for support.
49. Separate the engine from the transmission.
50. Remove the engine.
51. Install the engine to an engine stand.
52. Install the **J 21366** .

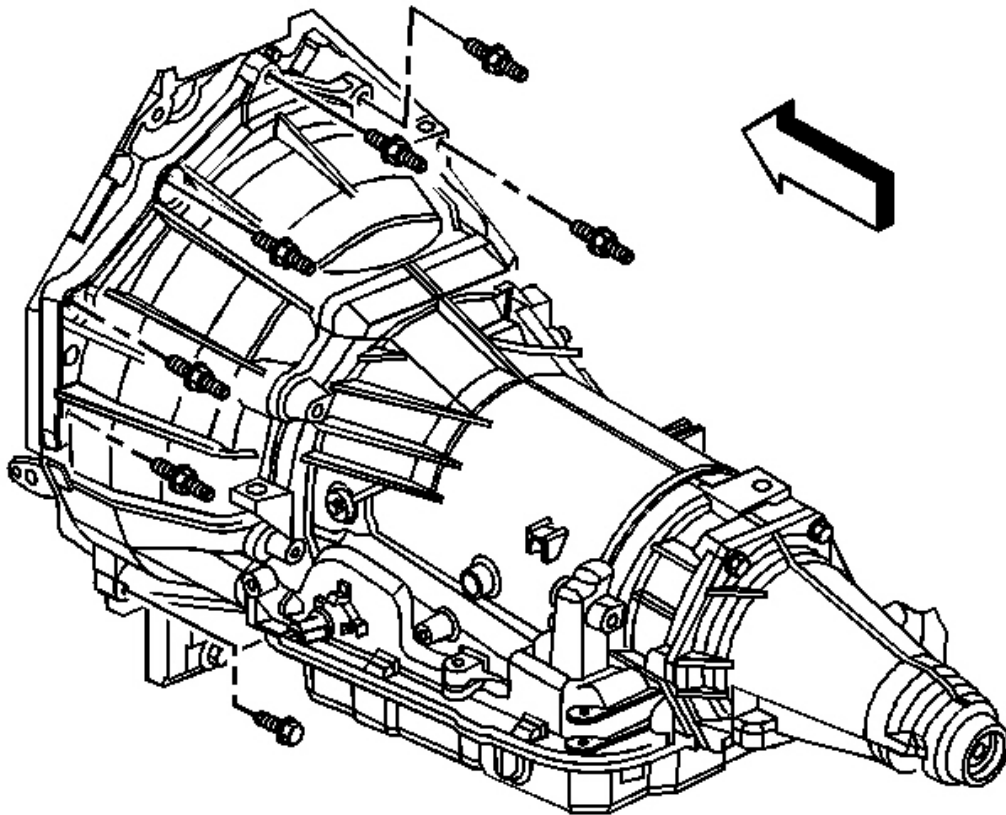


Fig. 268: View Of Automatic Transmission Bolt/Studs (4.8L, 5.3L and 6.0L Engines)
Courtesy of GENERAL MOTORS CORP.

1. Remove the **J 21366** .
2. Install an engine hoist to the **J 41798** . See **Special Tools**.
3. Remove the engine from the engine stand.
4. Install the engine.
5. Mate the engine to the transmission.
6. Remove the floor jack from under the transmission for support.

NOTE: Refer to **Fastener Notice** .

7. Install the 3 upper transmission bolts/studs.

Tighten: Tighten the bolts/studs to 50 N.m (37 lb ft).

8. Raise the vehicle.
9. Install the lower transmission bolt/studs.

Tighten: Tighten the bolts/studs to 50 N.m (37 lb ft).

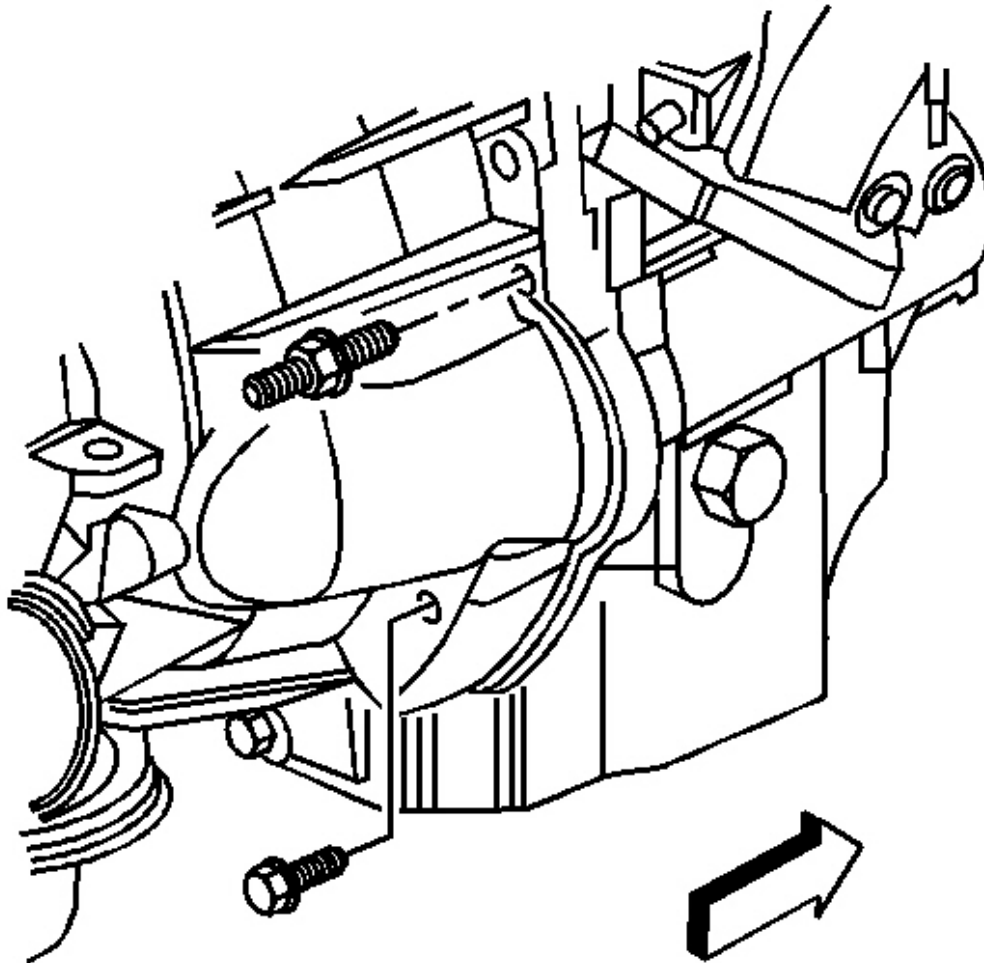


Fig. 269: View of Transmission Bolt & Stud (4L60-E)
Courtesy of GENERAL MOTORS CORP.

10. Install the transmission bolt and stud on the right side.

Tighten: Tighten the bolts/studs to 50 N.m (37 lb ft).

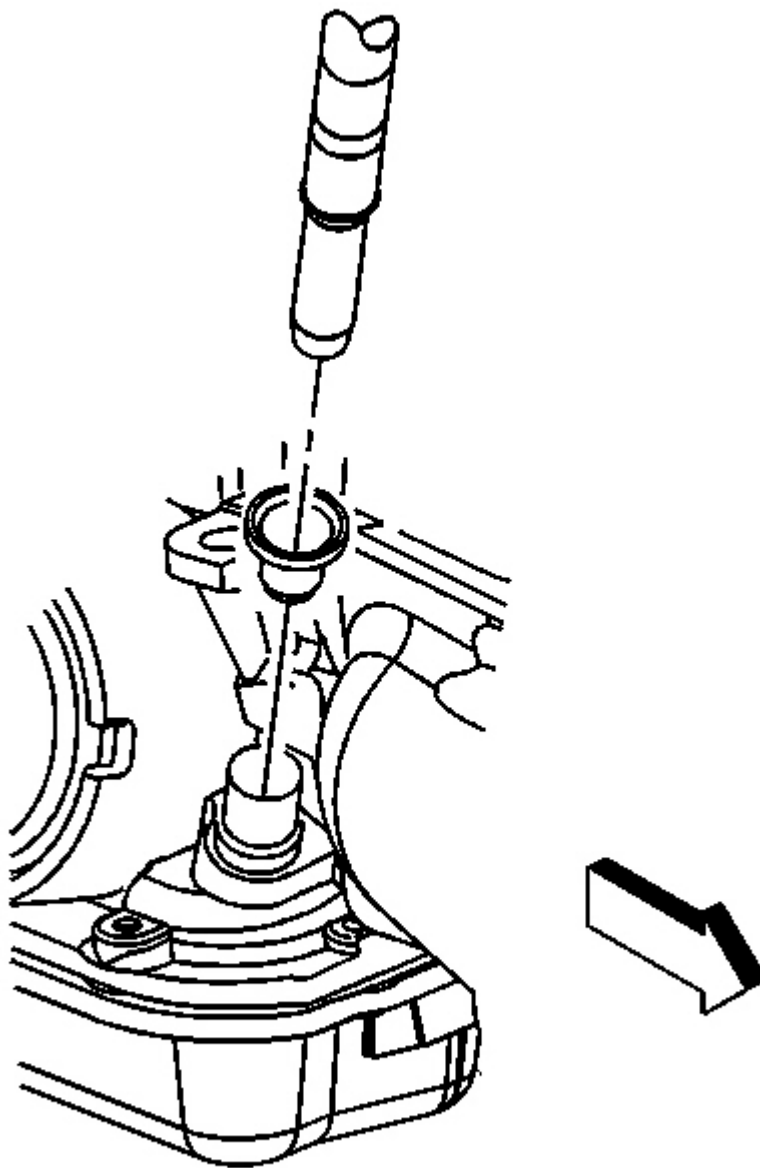


Fig. 270: View Of Oil Level Indicator Tube & Seal
Courtesy of GENERAL MOTORS CORP.

11. Install the transmission oil level indicator tube.

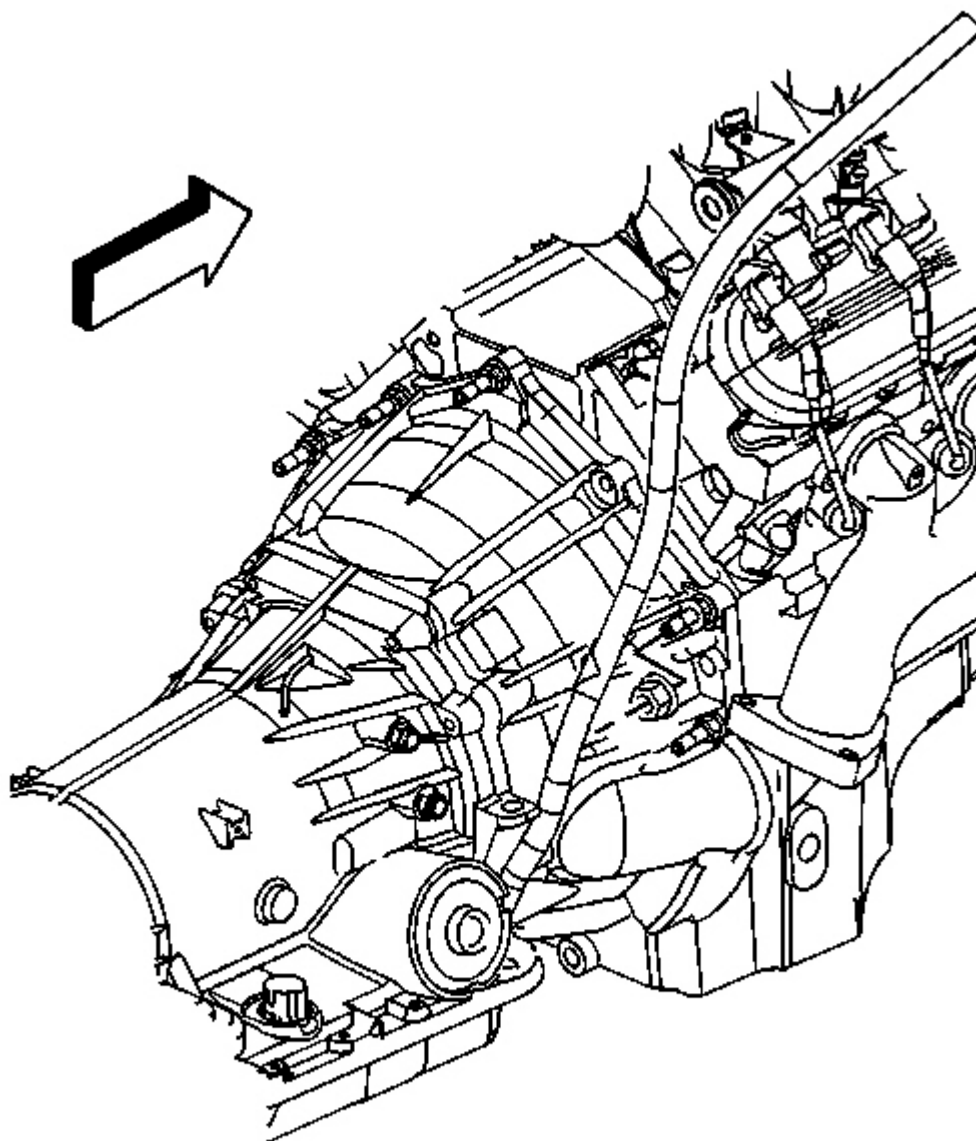


Fig. 271: View Of Oil Level Indicator Tube Nut
Courtesy of GENERAL MOTORS CORP.

12. Install the transmission oil level indicator tube nut.

Tighten: Tighten the nut to 10 N.m (89 lb ft).

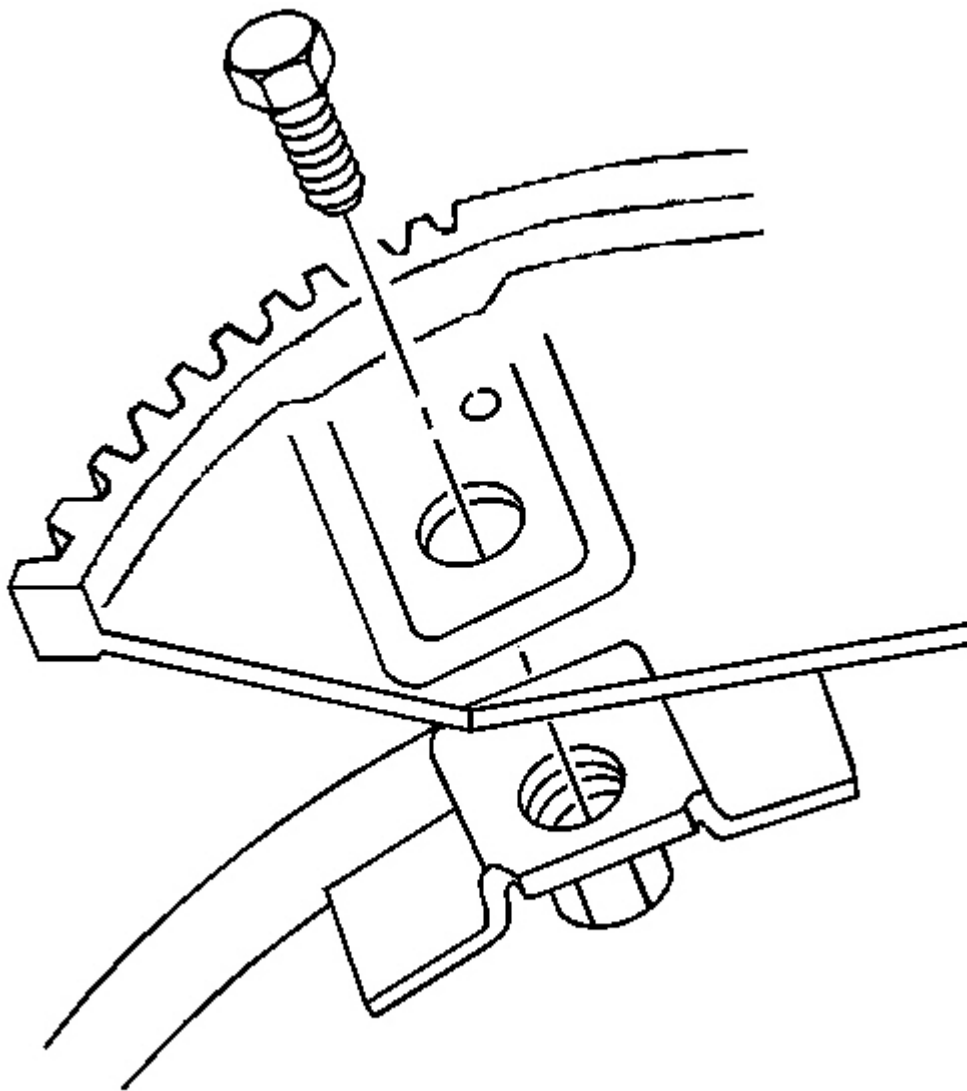


Fig. 272: Identifying Flywheel-To-Torque Converter Bolts
Courtesy of GENERAL MOTORS CORP.

13. Install the torque converter bolts.

Tighten: Tighten the bolts to 60 N.m (44 lb ft).

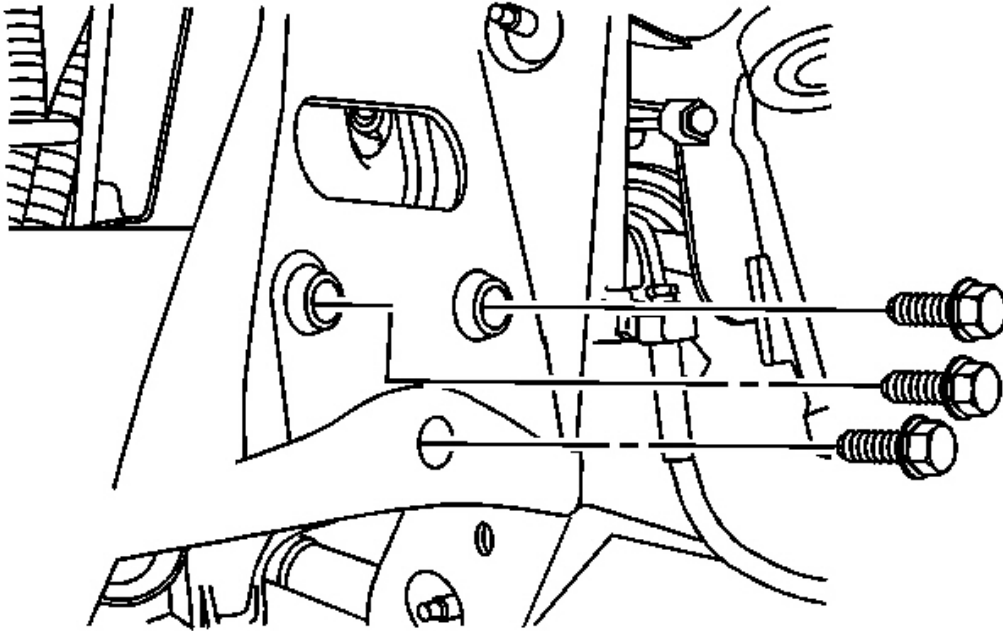


Fig. 273: View Of Frame Engine Mount Bracket Bolt Locations
Courtesy of GENERAL MOTORS CORP.

14. Install the 3 bracket bolts to both the right and the left sides of the frame engine mount.

Tighten: Tighten the bolts to 50 N.m (37 lb ft).

15. Install the catalytic converter. Refer to **Catalytic Converter Replacement (4.2L Engine)** or **Catalytic Converter Replacement (5.3L and 6.0L Engines)** .
16. Lower the vehicle.

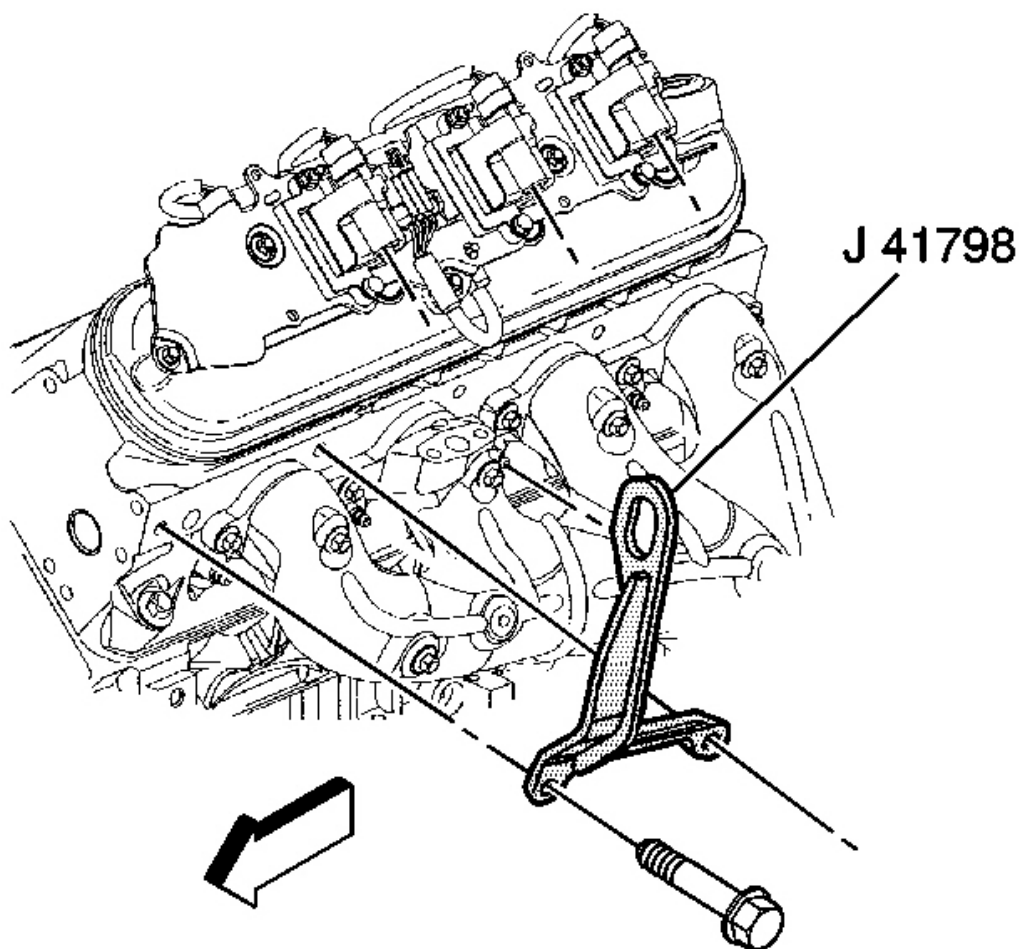


Fig. 274: View Of J 41798

Courtesy of GENERAL MOTORS CORP.

17. Remove **J 41798** . See **Special Tools**.
18. Install the ignition coils, as required. Refer to **Ignition Coil Replacement** .

Tighten: Tighten the bolts to 8 N.m (71 lb in).

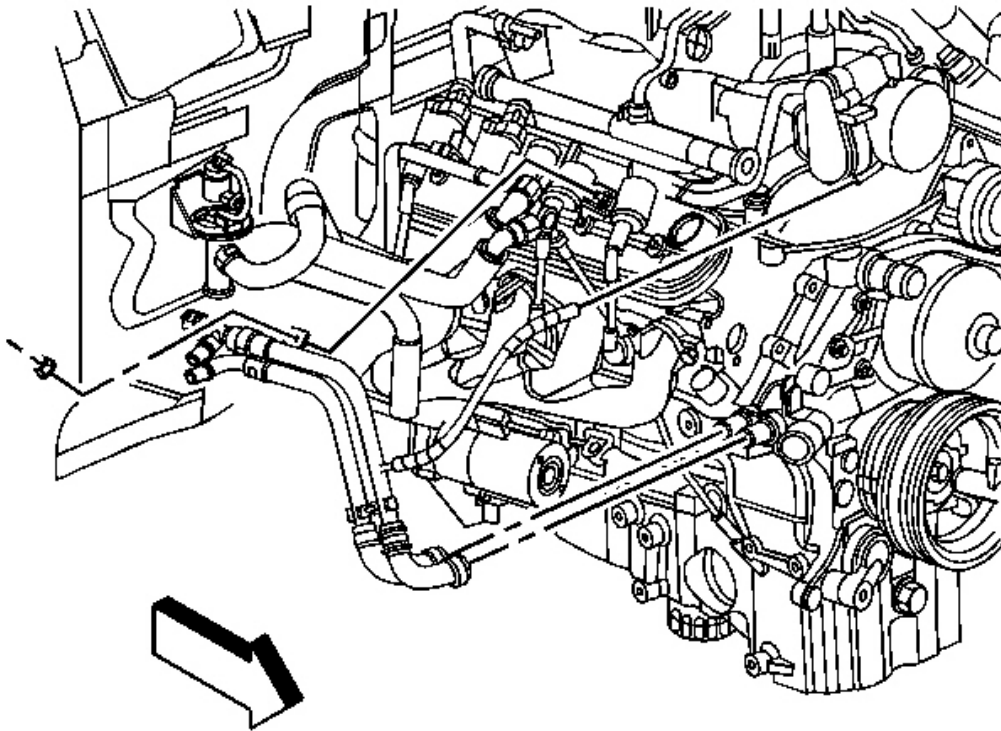


Fig. 275: View Of Auxiliary Heater Inlet & Outlet Hoses/Pipes
Courtesy of GENERAL MOTORS CORP.

19. Install the auxiliary heater inlet and outlet hoses/pipes to the water pump using the **J 38185** .

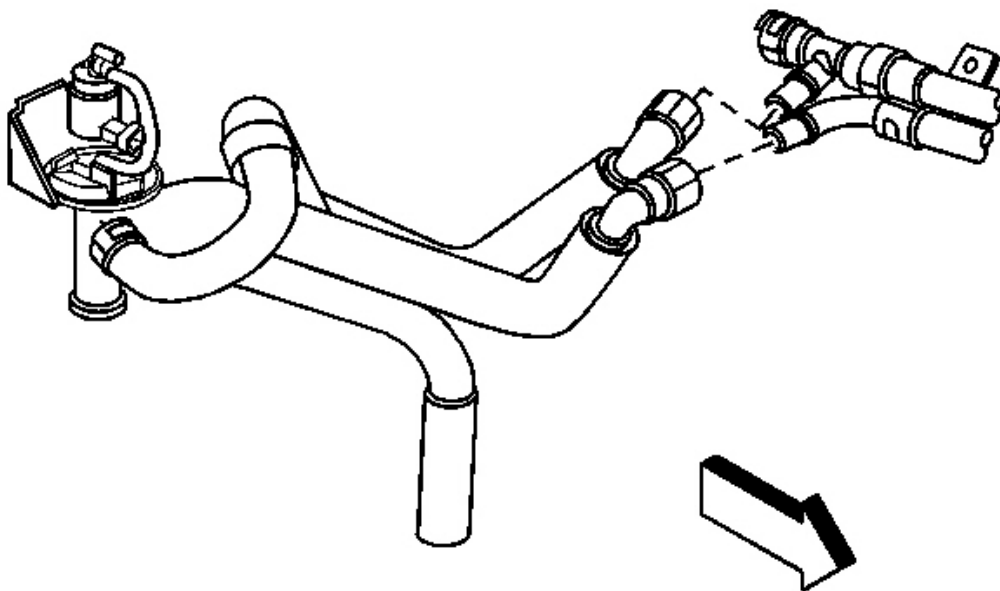


Fig. 276: View Of Auxiliary Heater Inlet & Outlet Hose/Pipe Assembly
Courtesy of GENERAL MOTORS CORP.

20. Connect the auxiliary heater inlet and outlet hose/pipe assembly to the heater water shutoff valve pipes.

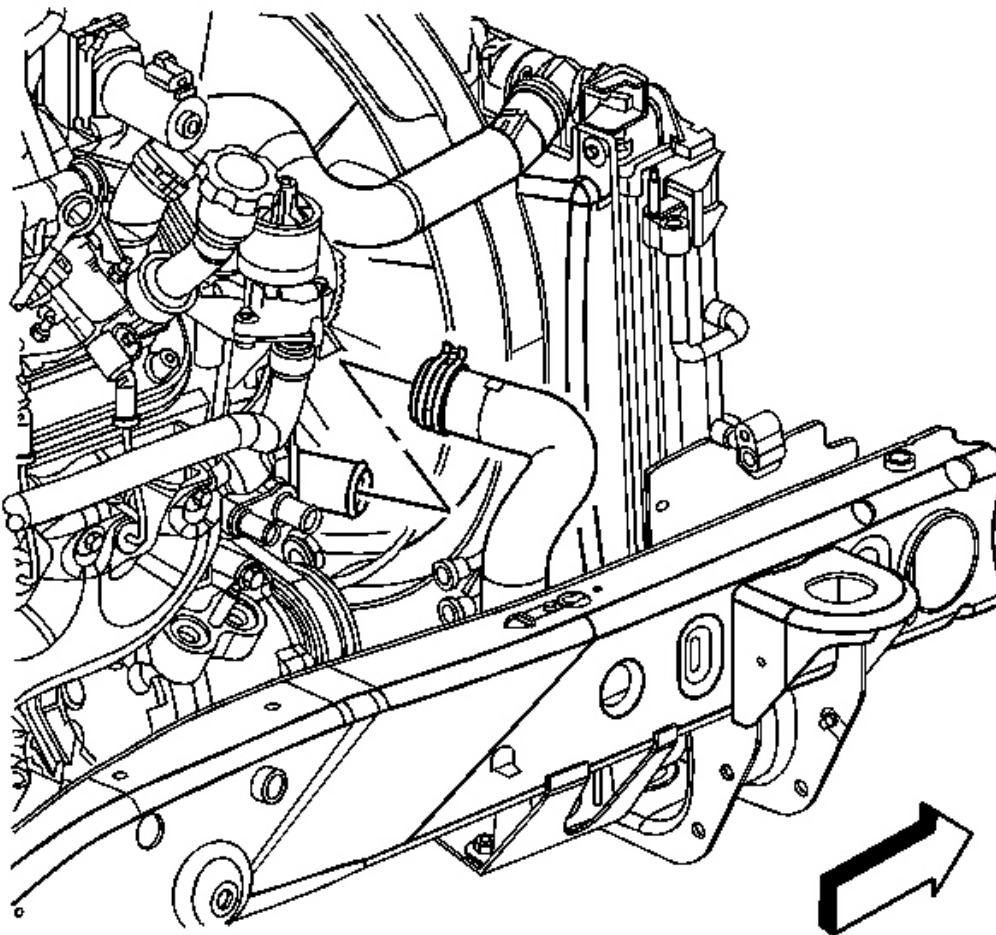


Fig. 277: View Of Outlet Hose
Courtesy of GENERAL MOTORS CORP.

21. Install the outlet hose to the water outlet using the **J 38185** .

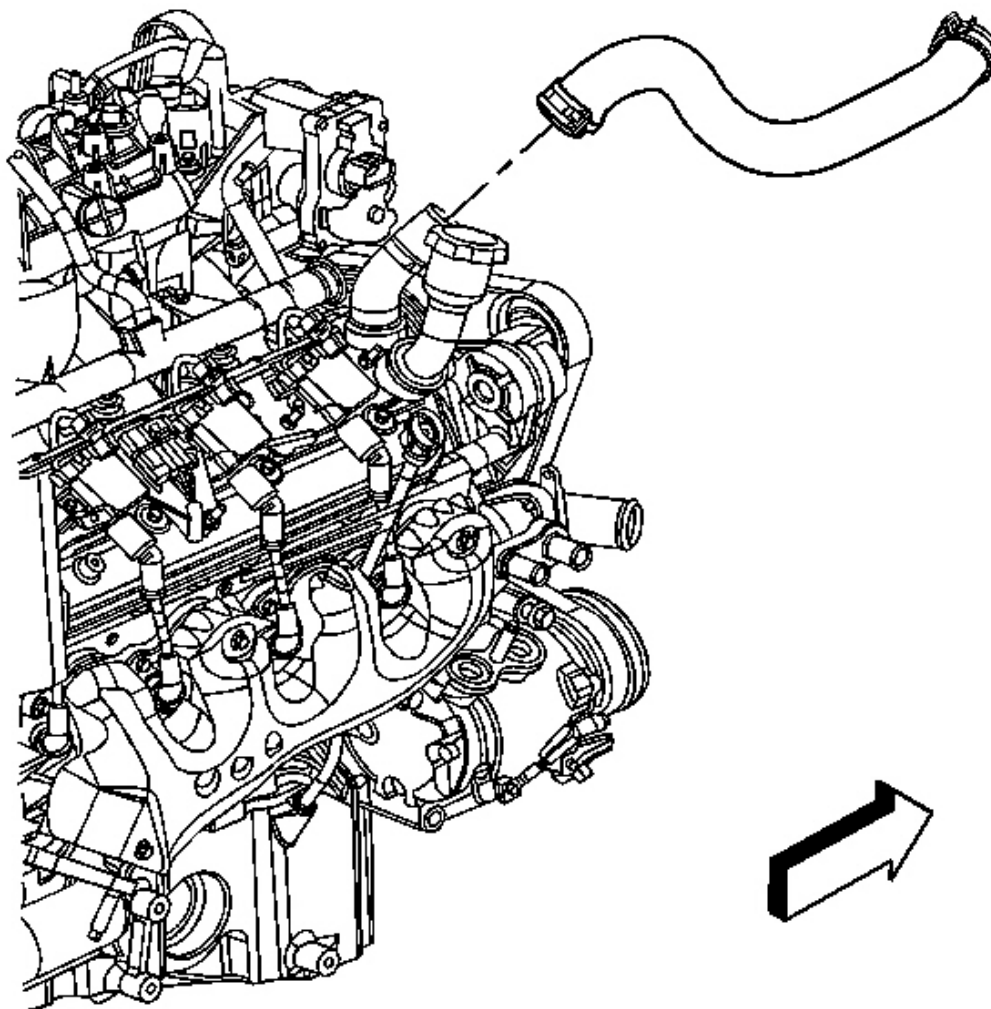


Fig. 278: View Of Inlet Hose
Courtesy of GENERAL MOTORS CORP.

22. Install the inlet hose to the water outlet using the **J 38185** .

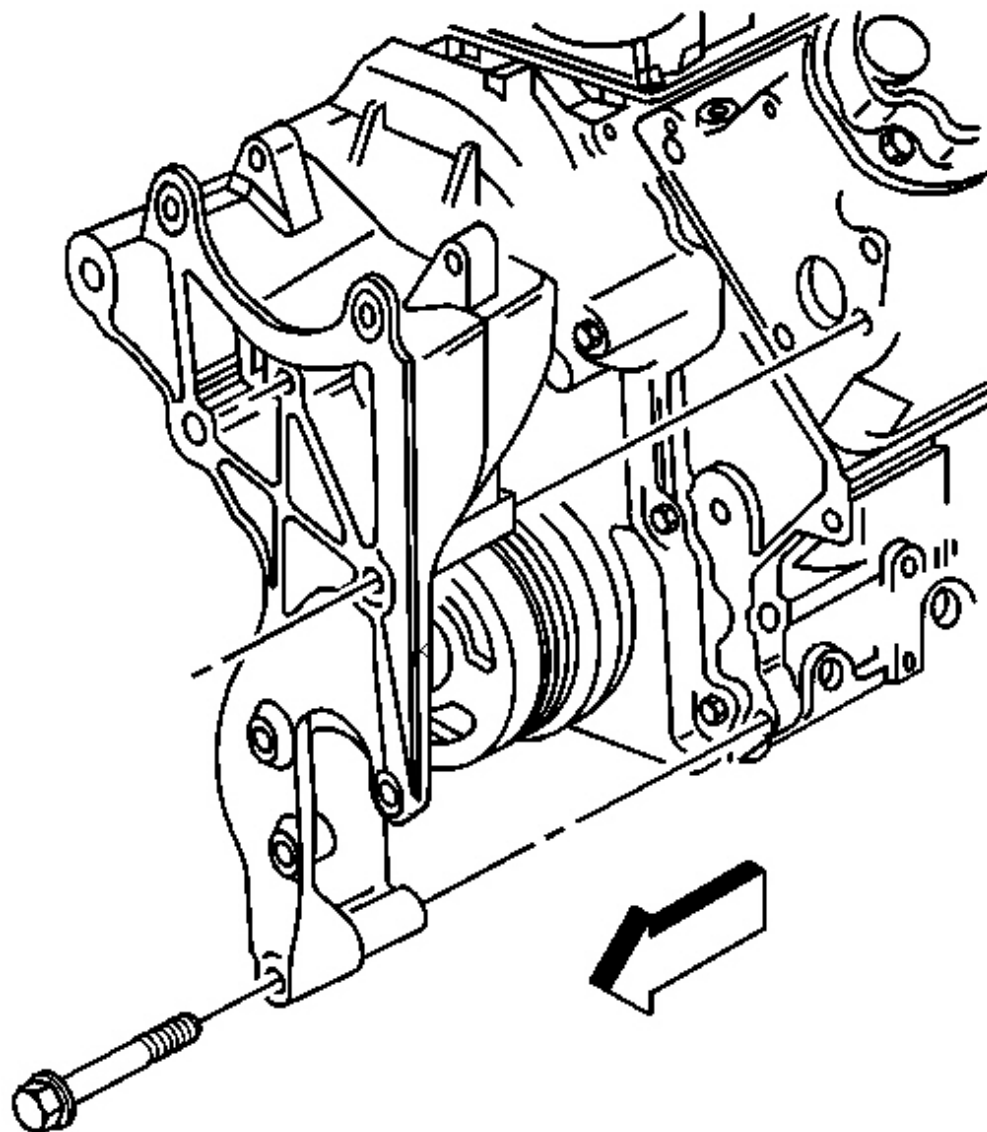


Fig. 279: View Of Generator Bracket & Bolts
Courtesy of GENERAL MOTORS CORP.

23. Position the bracket with generator to the engine.
24. Install the generator bracket bolts.

Tighten: Tighten the bolts to 50 N.m (37 lb ft).

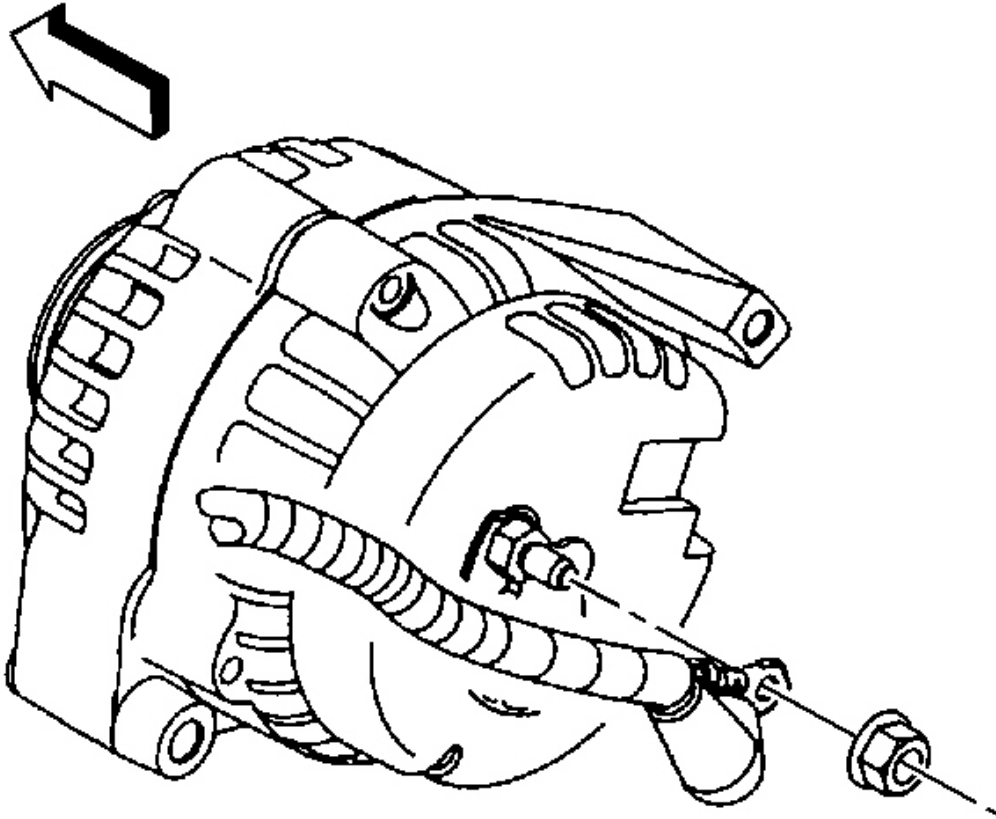


Fig. 280: View Of Generator Cable & Nut
Courtesy of GENERAL MOTORS CORP.

25. Install the generator cable to the generator, perform the following procedure:
 1. Install the generator cable.
 2. Install the generator cable nut to the terminal stud.

Tighten: Tighten the nut to 9 N.m (80 lb in).
 3. Slide the boot down covering the terminal stud.

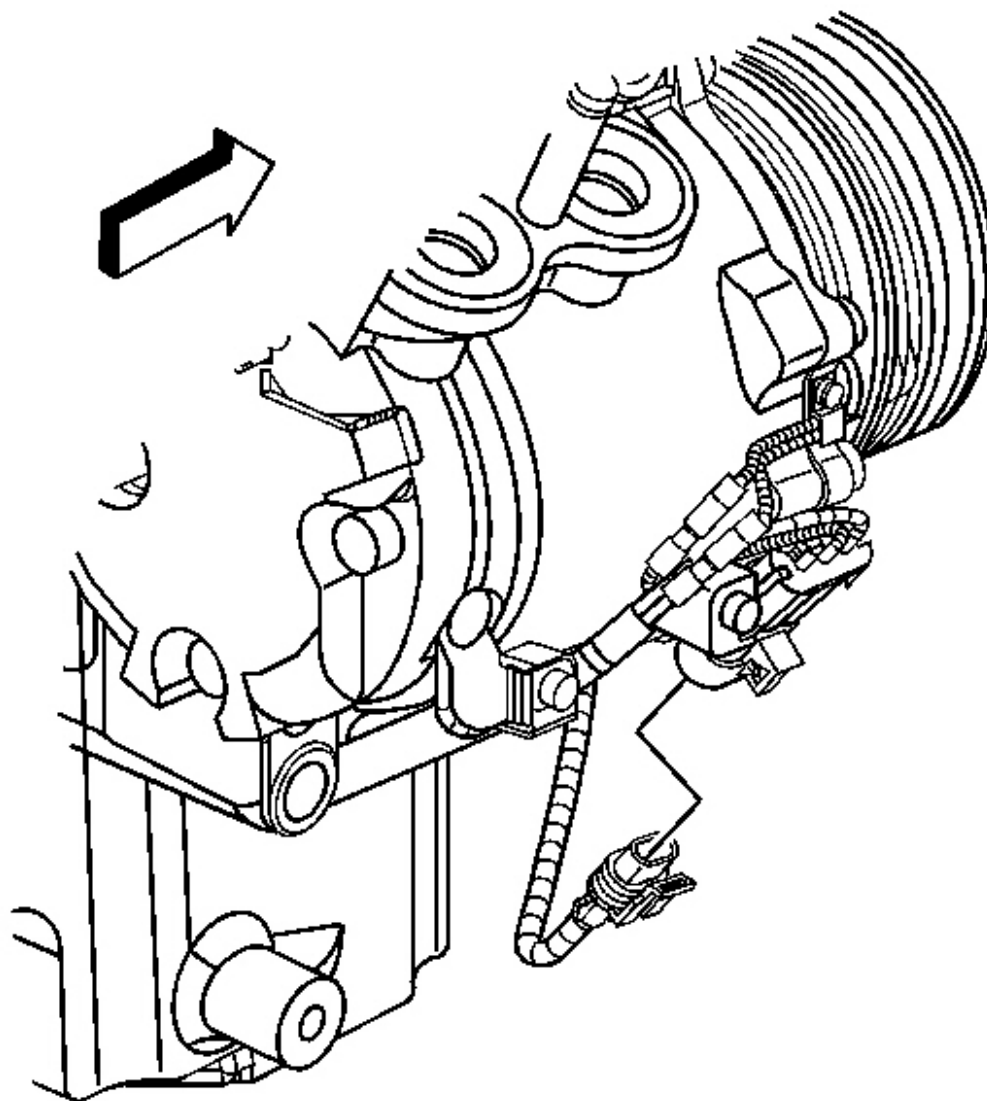


Fig. 281: View Of A/C Compressor Electrical Connector
Courtesy of GENERAL MOTORS CORP.

26. Gather all branches of the engine wiring harness and position the harness over the engine.
27. Raise the vehicle.
28. Connect the A/C compressor electrical connector.

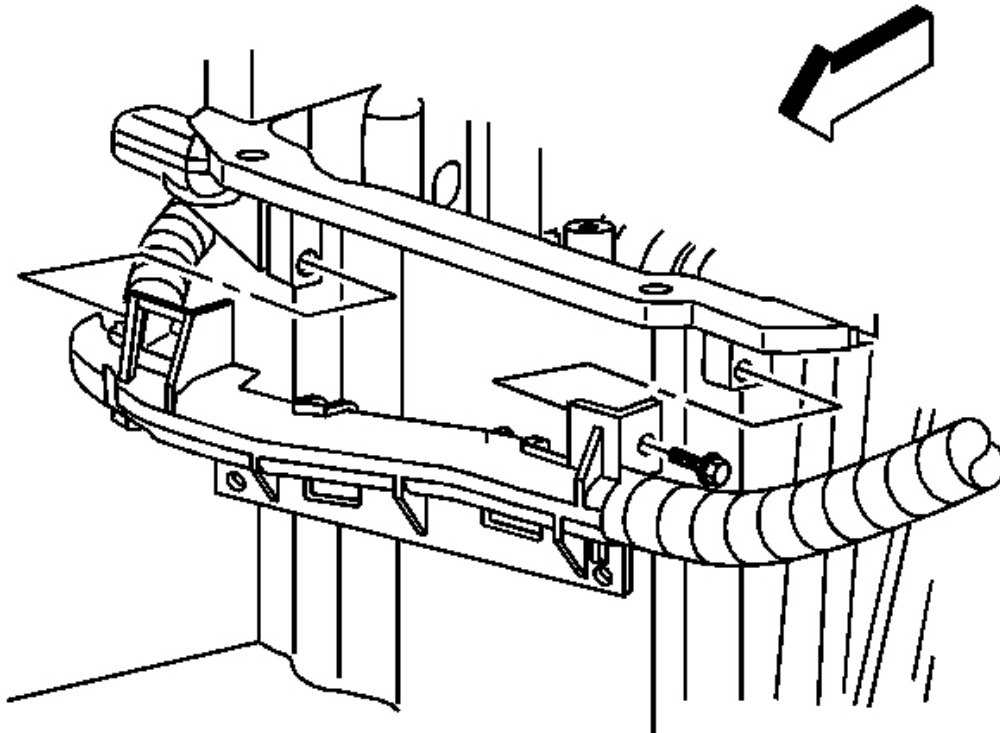


Fig. 282: View Of Battery Cable Channel & Bolt
Courtesy of GENERAL MOTORS CORP.

29. Install the battery cable channel to the oil pan.
30. Install the battery cable channel bolt.

Tighten: Tighten the bolt to 12 N.m (106 lb in).

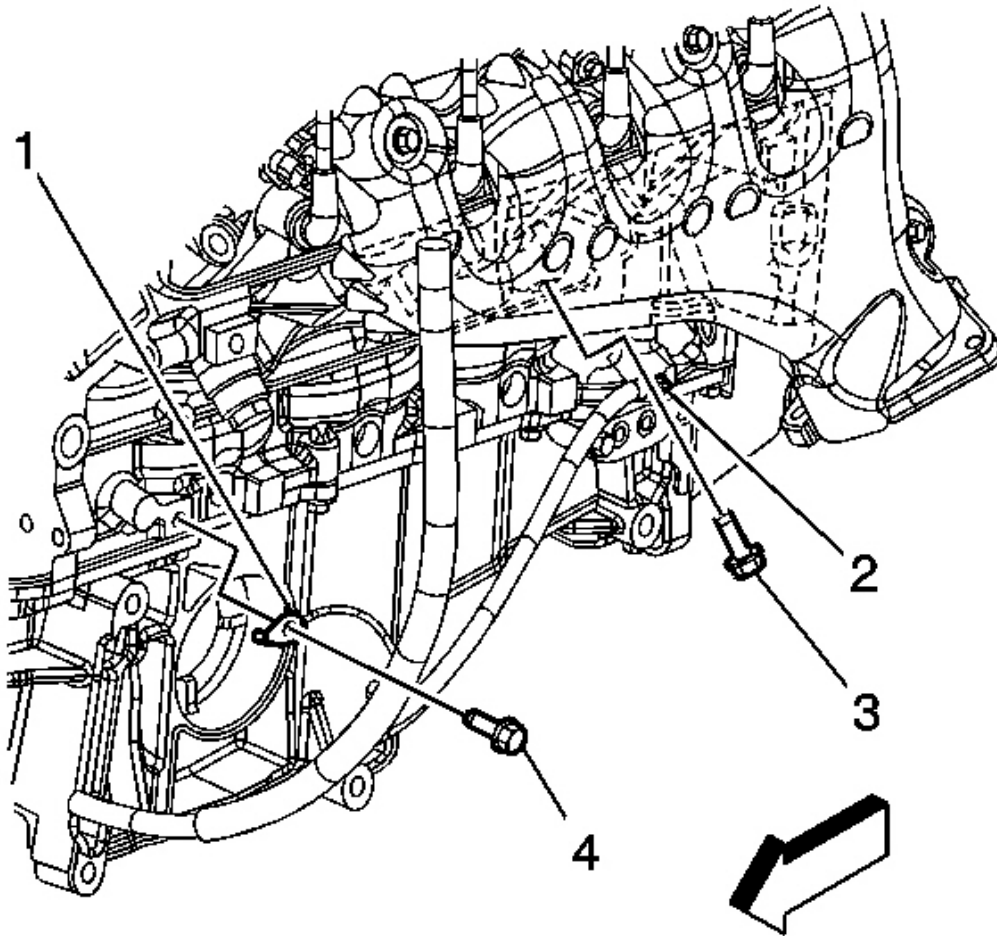


Fig. 283: View Of Ground Terminal Bolts
Courtesy of GENERAL MOTORS CORP.

31. Install the starter. Refer to **Starter Motor Replacement (4.2L Engine)** or **Starter Motor Replacement (5.3L and 6.0L Engines)** .
32. Install the ground terminal bolts (2, 4).

Tighten: Tighten the bolt to 25 N.m (18 lb ft).

33. Lower the vehicle.

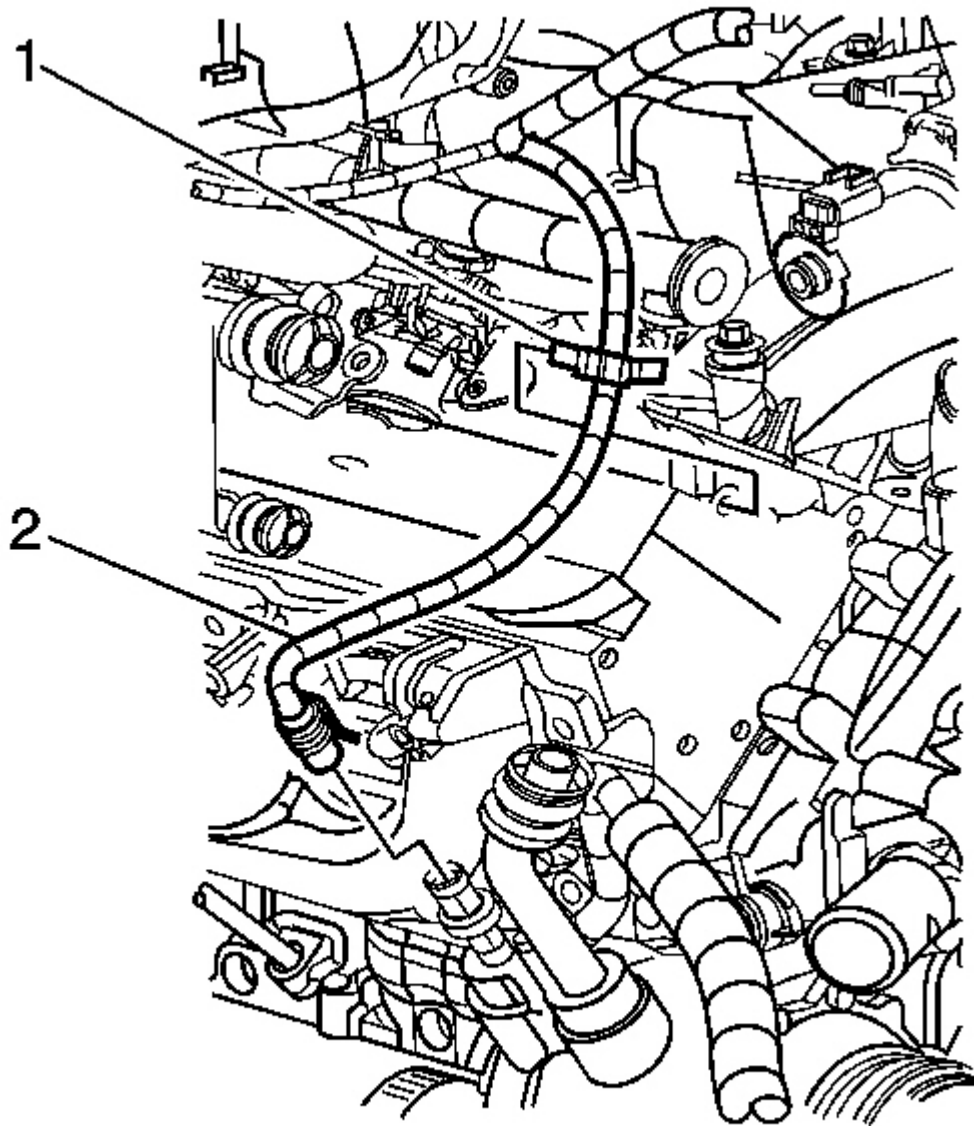


Fig. 284: View Of A/C Compressor Pressure Switch Electrical Connector & Retaining Clip
Courtesy of GENERAL MOTORS CORP.

34. Install the retaining clip (1) to the cylinder head.
35. Connect the A/C pressure switch electrical connector (2).

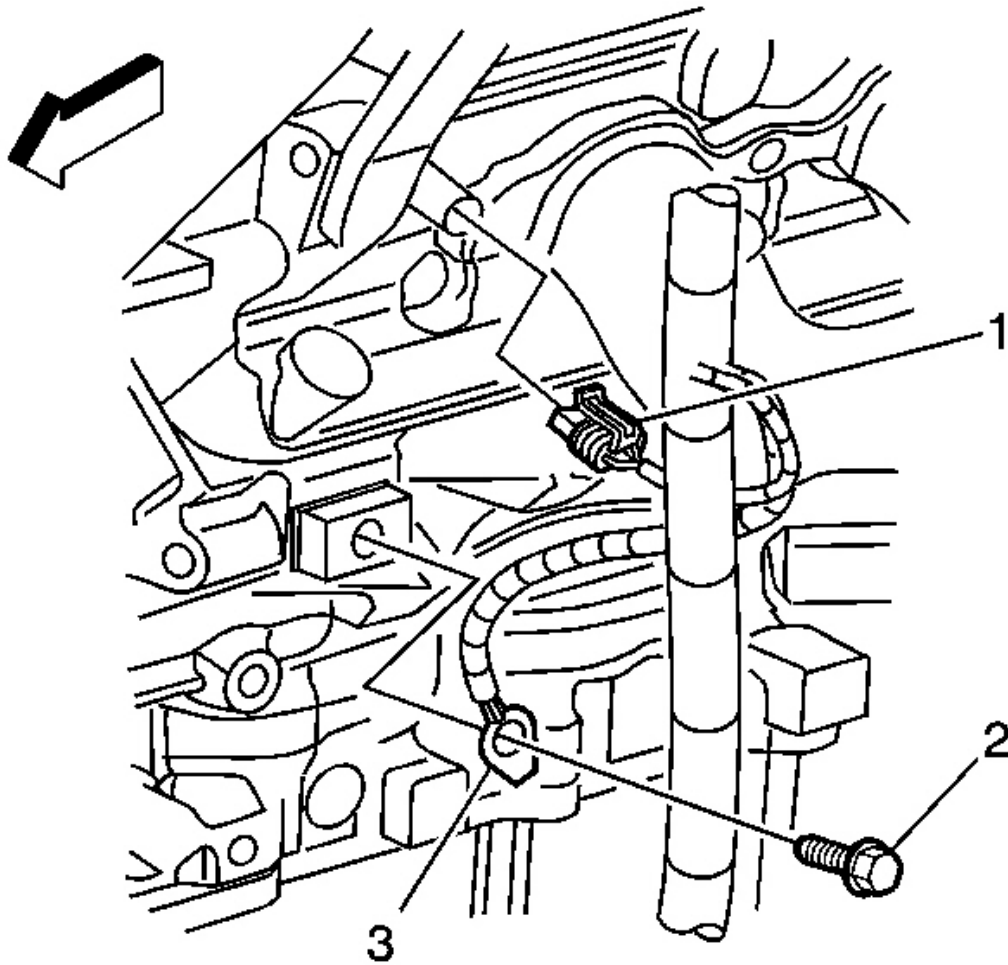


Fig. 285: View Of ECT Sensor Electrical Connector And Ground
Courtesy of GENERAL MOTORS CORP.

36. Install the retaining clips to the brackets.
37. Install the ground terminal bolt (2).

Tighten: Tighten the bolt to 25 N.m (18 lb ft).

38. Connect the ECT sensor (1).

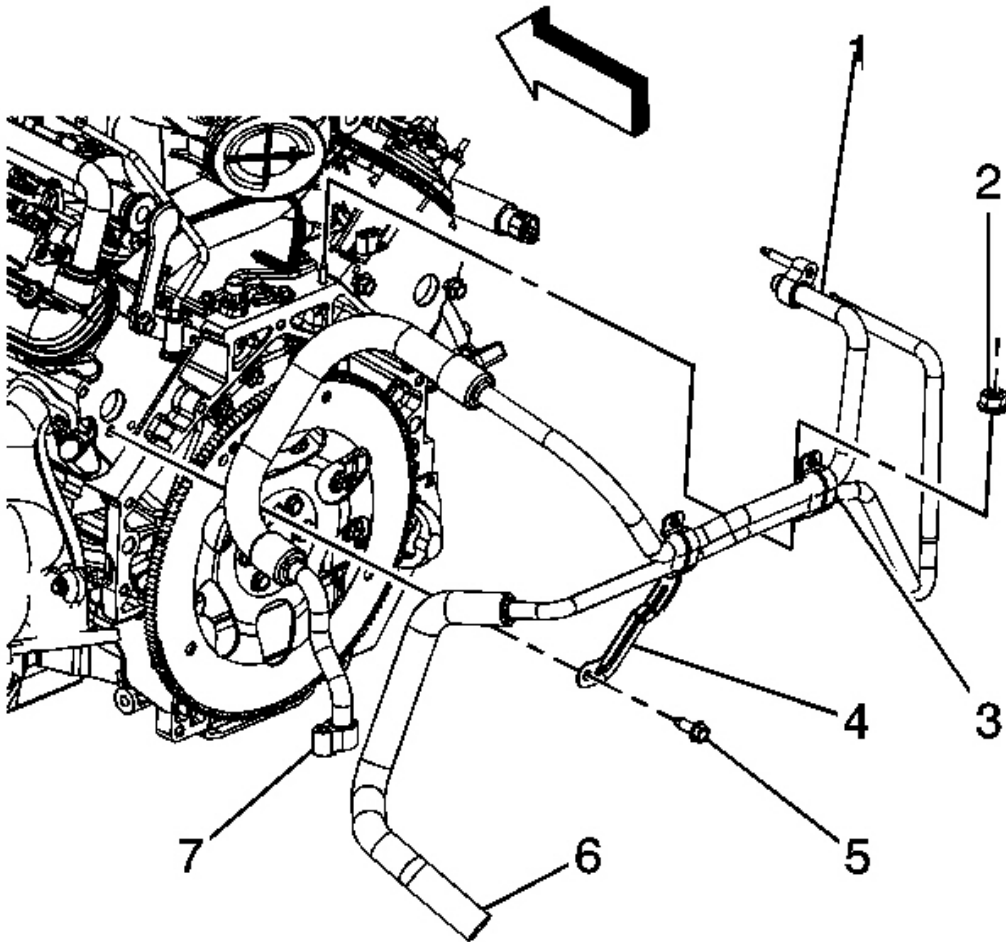


Fig. 286: View Of Rear A/C Lines
Courtesy of GENERAL MOTORS CORP.

39. Install the rear auxiliary A/C compressor pipe nut and bolt (2, 5).

Tighten: Tighten the nut/bolt to 20 N.m (15 lb ft).

40. Connect the rear auxiliary A/C compressor pipe fitting (7).

Tighten: Tighten the nut to 16 N.m (12 lb ft).

41. Install the A/C compressor hose. Refer to **Compressor Hose Assembly Replacement (LH6, LS2)** or **Compressor Hose Assembly Replacement (LL8)** .

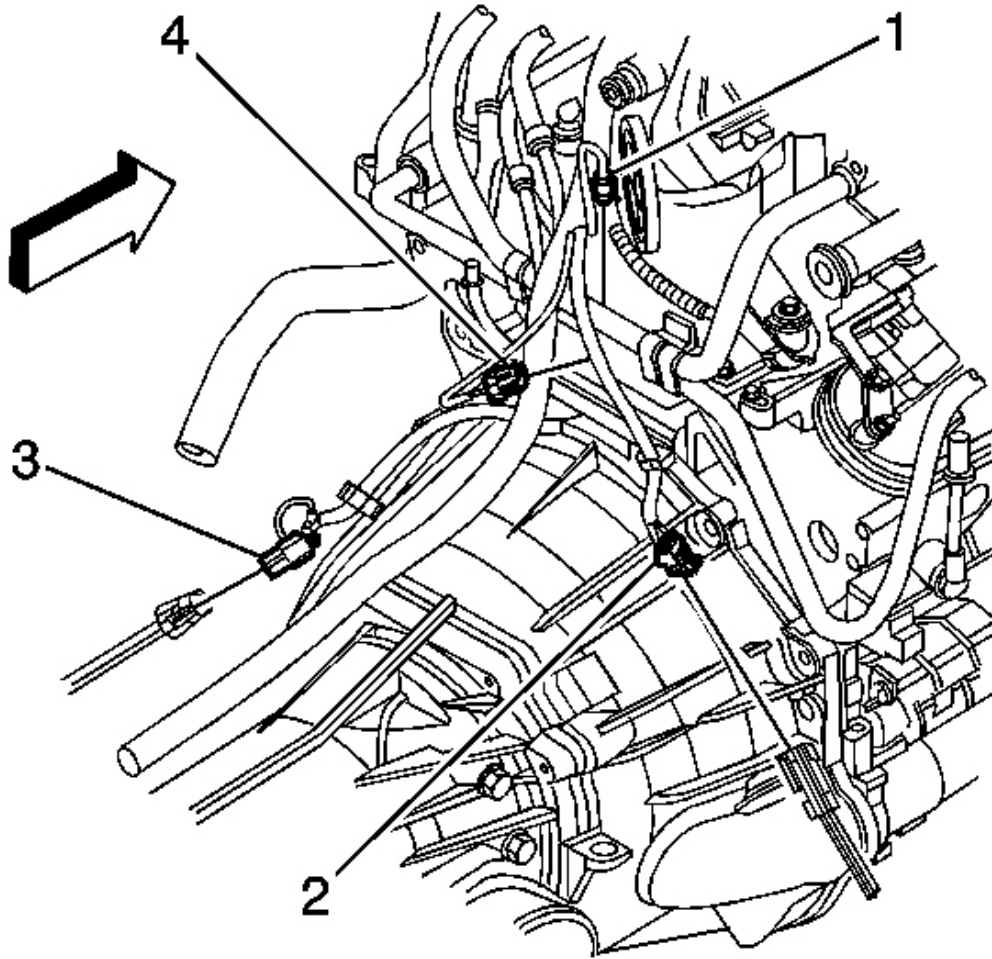


Fig. 287: Locating Components Connectors At Rear Of Engine
Courtesy of GENERAL MOTORS CORP.

42. Connect the following electrical connectors:
 - Oil pressure sensor (1)
 - Oxygen sensors (2, 3)
 - Camshaft position (CMP) sensor (4)
43. Install the intake manifold. Refer to **Intake Manifold Replacement**.
44. Install the wheel drive shafts. Refer to **Wheel Drive Shaft Replacement**.
45. Install the front differential drive axle, if equipped with 4WD. Refer to **Differential Carrier Assembly Replacement (4.2L In-Line Six Cylinder)** or **Differential Carrier Assembly Replacement (V8)**.

2007 Chevrolet TrailBlazer

2007 ENGINE Engine Mechanical - 6.0L - TrailBlazer

46. Install the radiator support brace. Refer to **Radiator Support Diagonal Brace Replacement** .
47. Install the radiator. Refer to **Radiator Replacement (LH6, Ls2)** or **Radiator Replacement (LL8)** .
48. Recharge the refrigerant. Refer to **Refrigerant Recovery and Recharging** .
49. Connect the negative battery cable. Refer to **Battery Negative Cable Disconnection and Connection** .
50. Prelube the engine. Refer to **Engine Prelubing** .
51. Perform the CKP system variation learn procedure. Refer to **Crankshaft Position System Variation Learn** .
52. Install the hood. Refer to **Hood Replacement** .

IMPORTANT: After an overhaul, the engine should be tested. Use the following procedure after the engine is installed in the vehicle.

53. Test the vehicle using the following procedure:
 1. Disable the ignition system.
 2. Crank the engine several times. Listen for any unusual noises or evidence that parts are binding.
 3. Enable the ignition system.
 4. Start the engine and listen for unusual noises.
 5. Check the vehicle oil pressure gauge or light and confirm that the engine has acceptable oil pressure.
 6. Run the engine speed at about 1,000 RPM until the engine has reached normal operating temperature.
 7. Inspect for fuel, oil and/or coolant leaks while the engine is running.
54. Install the intake manifold sight shield. Refer to **Upper Intake Manifold Sight Shield Replacement**.

ENGINE OIL AND OIL FILTER REPLACEMENT

Removal Procedure

IMPORTANT: In order to completely drain the oil from the oil pan internal baffling, the bottom of the oil pan must be level during the oil drain procedure.

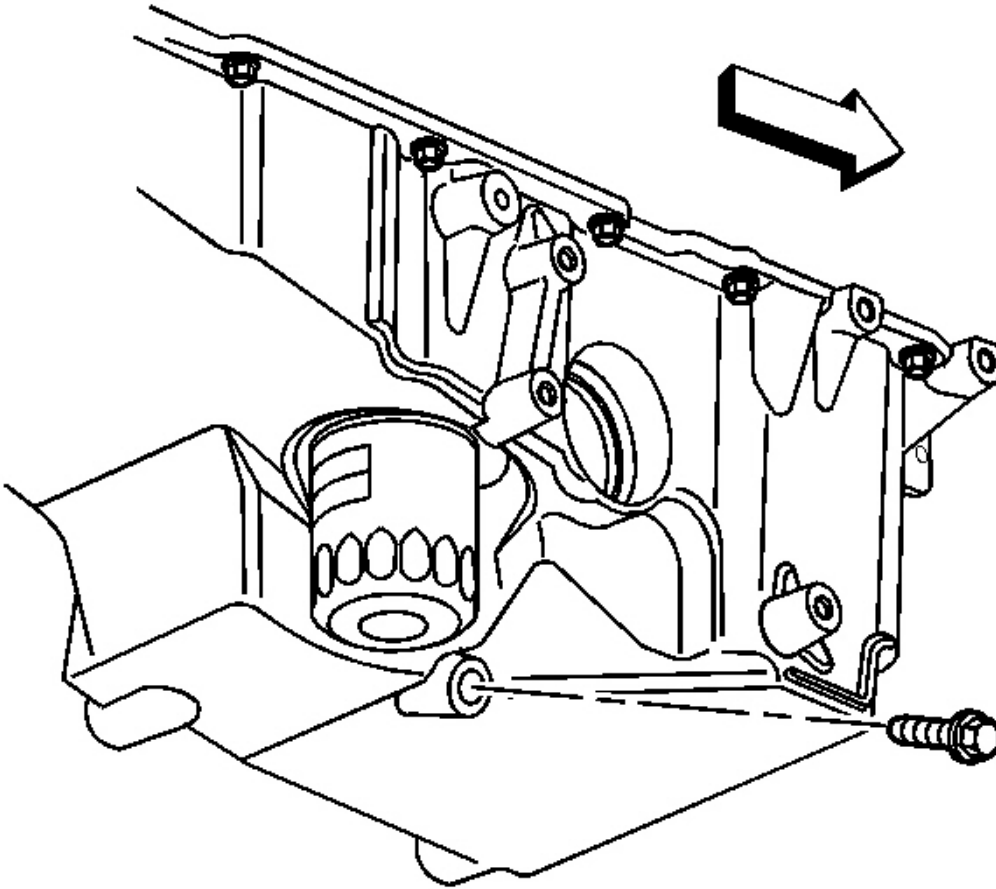


Fig. 288: View Of Oil Pan Drain Plug
Courtesy of GENERAL MOTORS CORP.

1. Open the hood.
2. Remove the intake manifold sight shield. Refer to **Upper Intake Manifold Sight Shield Replacement**.
3. Remove the oil fill cap.
4. Raise and support the vehicle. Refer to **Lifting and Jacking the Vehicle** .
5. Position a suitable drain pan under the oil pan drain plug.
6. Remove the oil pan drain plug.
7. Allow the oil to drain completely.
8. Clean and inspect the oil pan drain plug, replace if necessary.
9. Clean and inspect the oil pan drain plug sealing surface, replace the oil pan if necessary.
10. Wipe any remaining oil from the drain plug hole and reinstall the oil pan drain plug until snug.

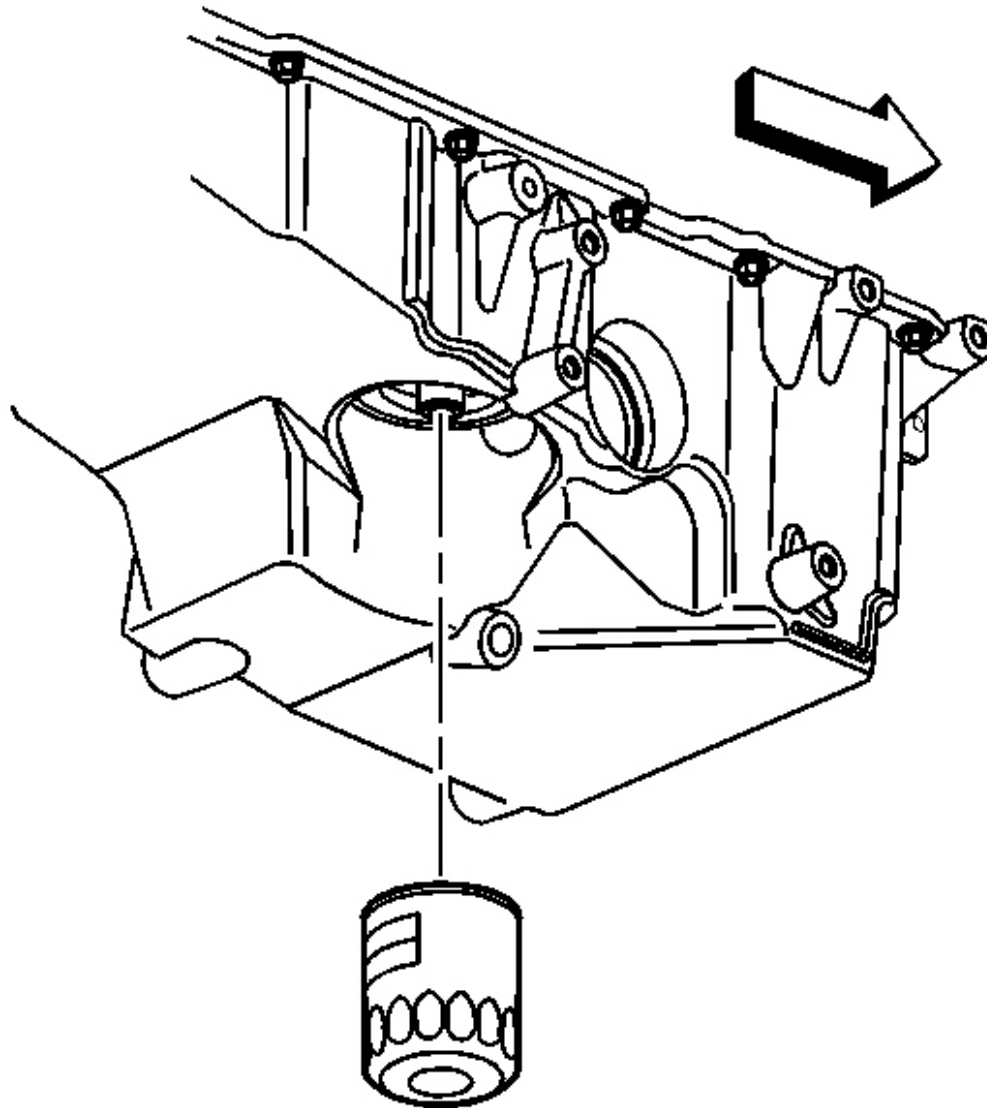


Fig. 289: Locating Oil Filter

Courtesy of GENERAL MOTORS CORP.

11. Position a suitable drain pan under the oil filter.
12. Remove the oil filter.
13. Ensure that the oil filter gasket is still on the old filter, if not remove the oil filter gasket from the oil pan.

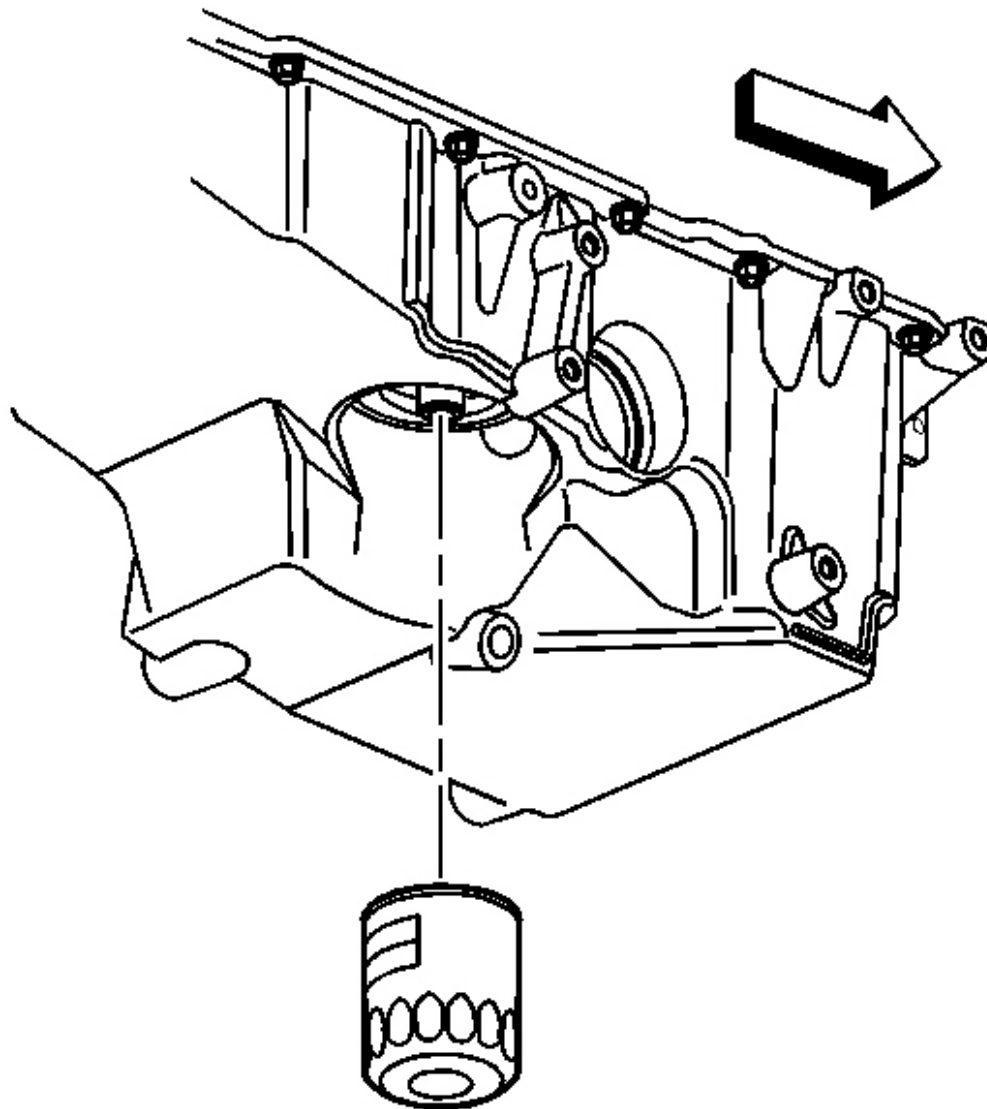


Fig. 290: Locating Oil Filter

Courtesy of GENERAL MOTORS CORP.

1. Apply clean engine oil to the NEW oil filter gasket.

NOTE: Refer to Fastener Notice .

2. Install the NEW oil filter.

Tighten: Tighten the filter to 30 N.m (22 lb ft).

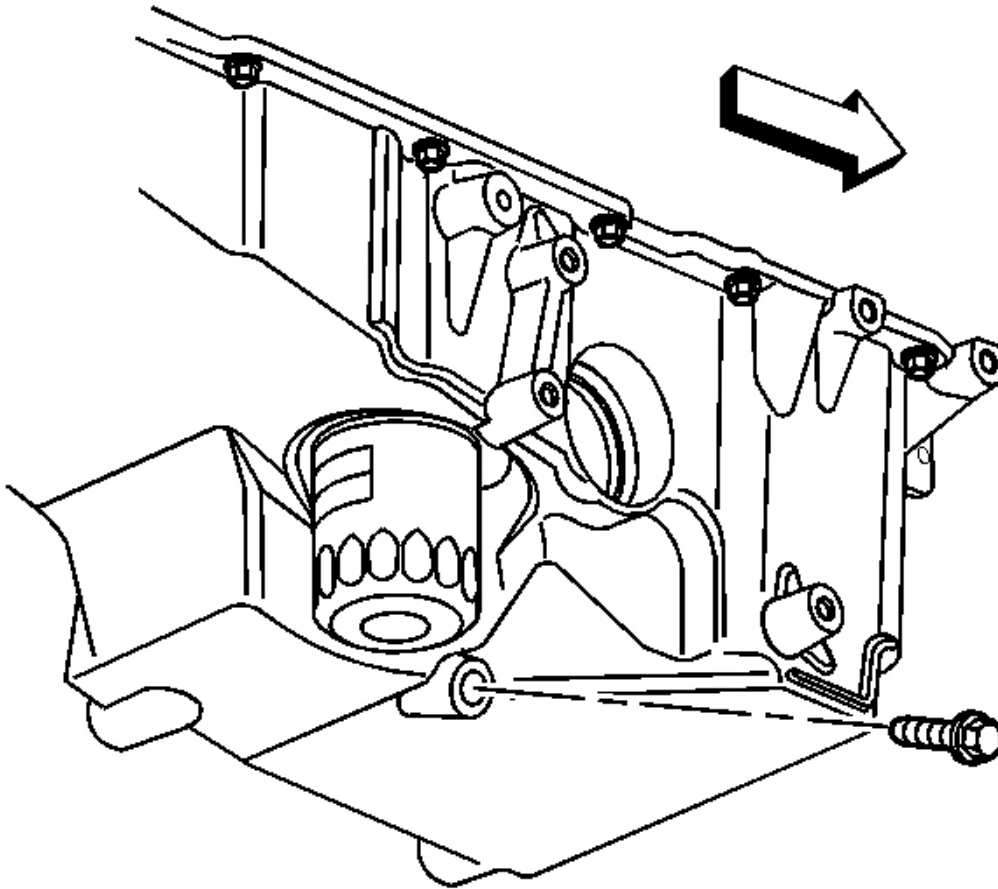


Fig. 291: View Of Oil Pan Drain Plug
Courtesy of GENERAL MOTORS CORP.

3. Tighten the oil drain plug.

Tighten: Tighten the drain plug to 25 N.m (18 lb ft).

4. Remove the oil drain pan from under the vehicle.
5. Lower the vehicle.
6. Fill the crankcase with new engine oil. Refer to Capacities - Approximate Fluid and Fluid and Lubricant Recommendations .
7. Start the engine.

2007 Chevrolet TrailBlazer

2007 ENGINE Engine Mechanical - 6.0L - TrailBlazer

8. Inspect for oil leaks after engine start up.
9. Turn off the engine and allow the oil a few minutes to drain back into the oil pan.
10. Remove the oil level indicator from the oil indicator tube.
11. Clean off the indicator end of the oil level indicator with a clean paper towel or cloth.
12. Install the oil level indicator into the oil level indicator tube until the oil level indicator handle contacts the top of the oil level indicator tube.
13. Again, remove the oil level indicator from the oil level indicator tube keeping the tip of the oil level indicator down.
14. Check the level of the engine oil on the oil level indicator.
15. If necessary, adjust the oil level by adding or draining oil.
16. Check for oil leaks.
17. Install the intake manifold sight shield. Refer to **Upper Intake Manifold Sight Shield Replacement**.
18. Close the hood.

DRAINING FLUIDS AND OIL FILTER REMOVAL

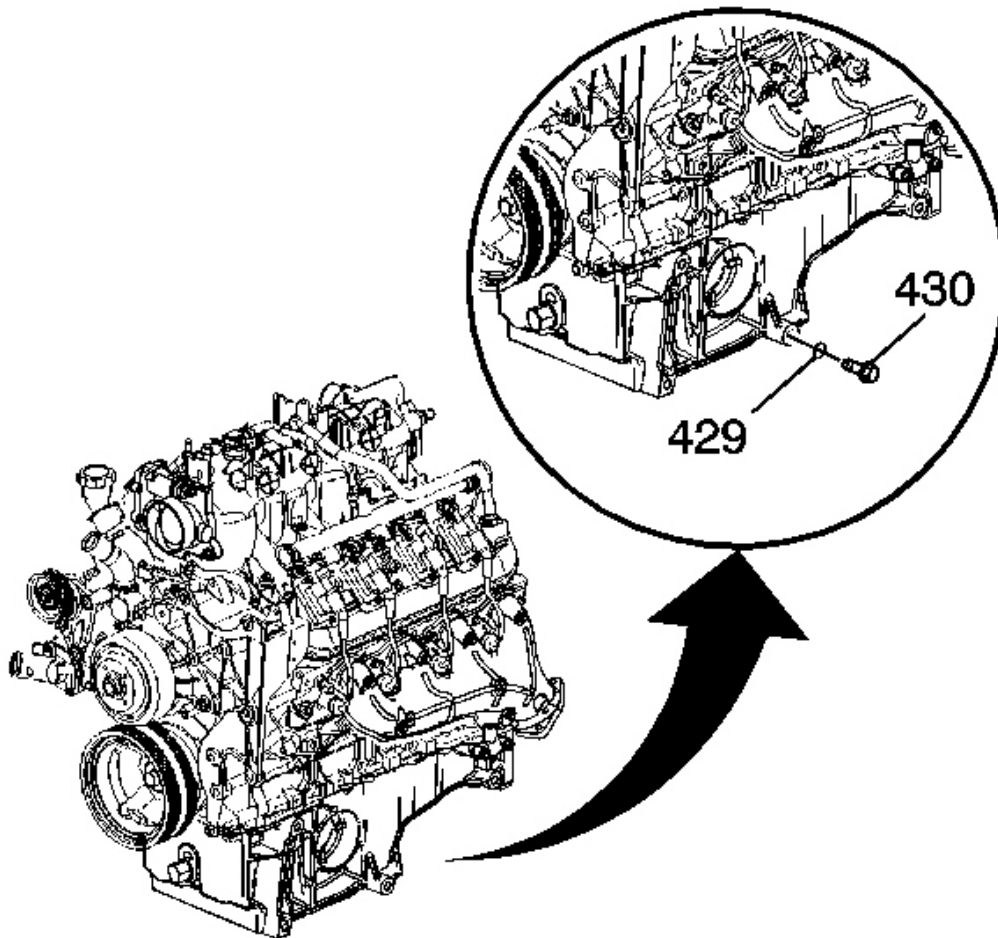


Fig. 292: Identifying Oil Pan Drain Plug
Courtesy of GENERAL MOTORS CORP.

1. Remove the oil pan drain plug (430) and O-ring (429).

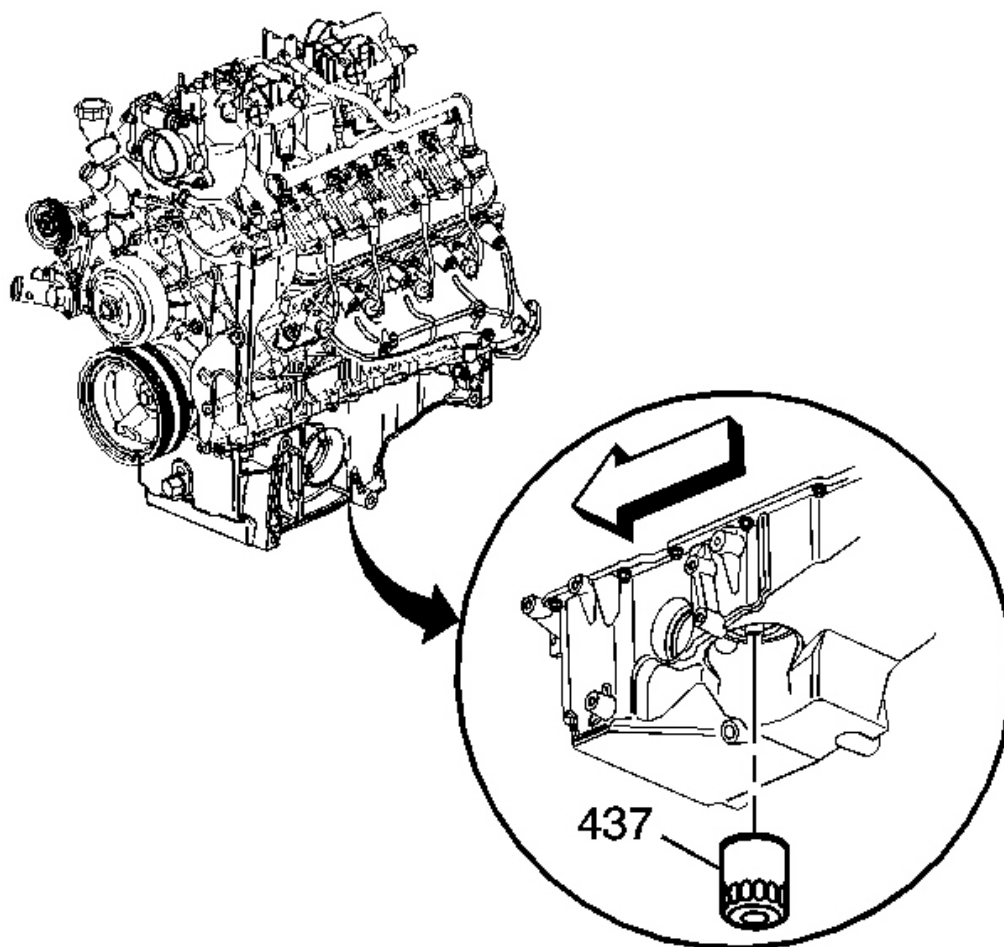


Fig. 293: Identifying Engine Oil Filter
Courtesy of GENERAL MOTORS CORP.

2. Remove the engine oil filter (437).

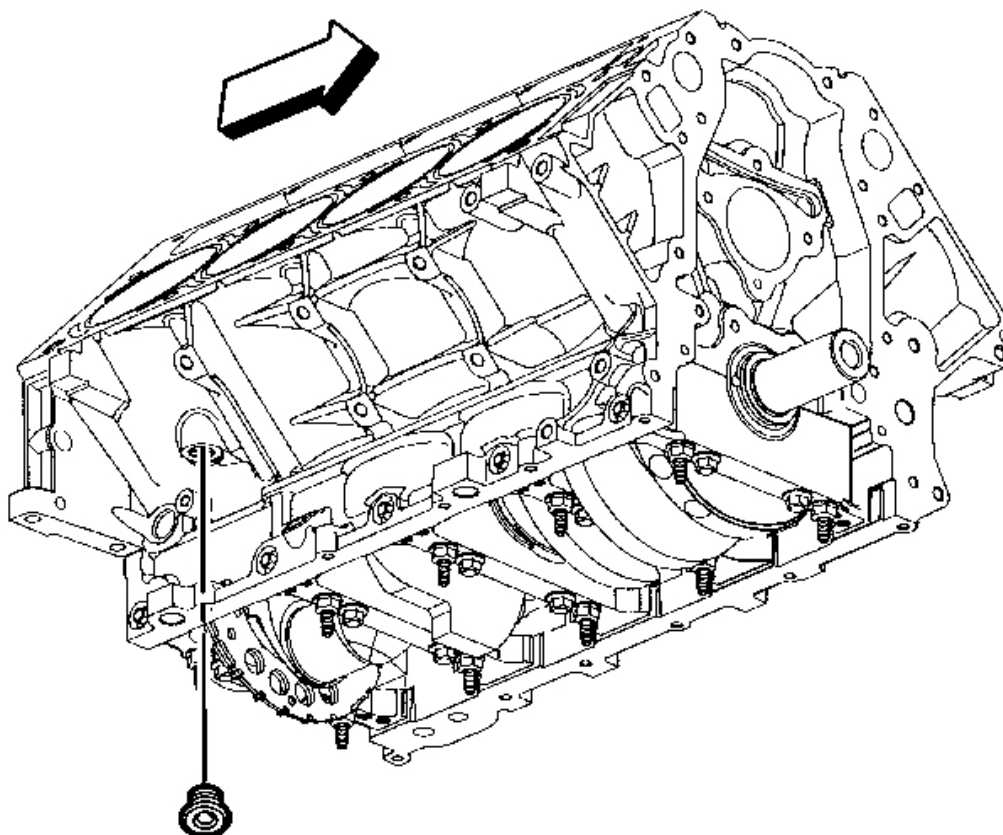


Fig. 294: Identifying Plug Location On Underside Of Block
Courtesy of GENERAL MOTORS CORP.

3. Remove the engine block coolant drain hole plug and washer.

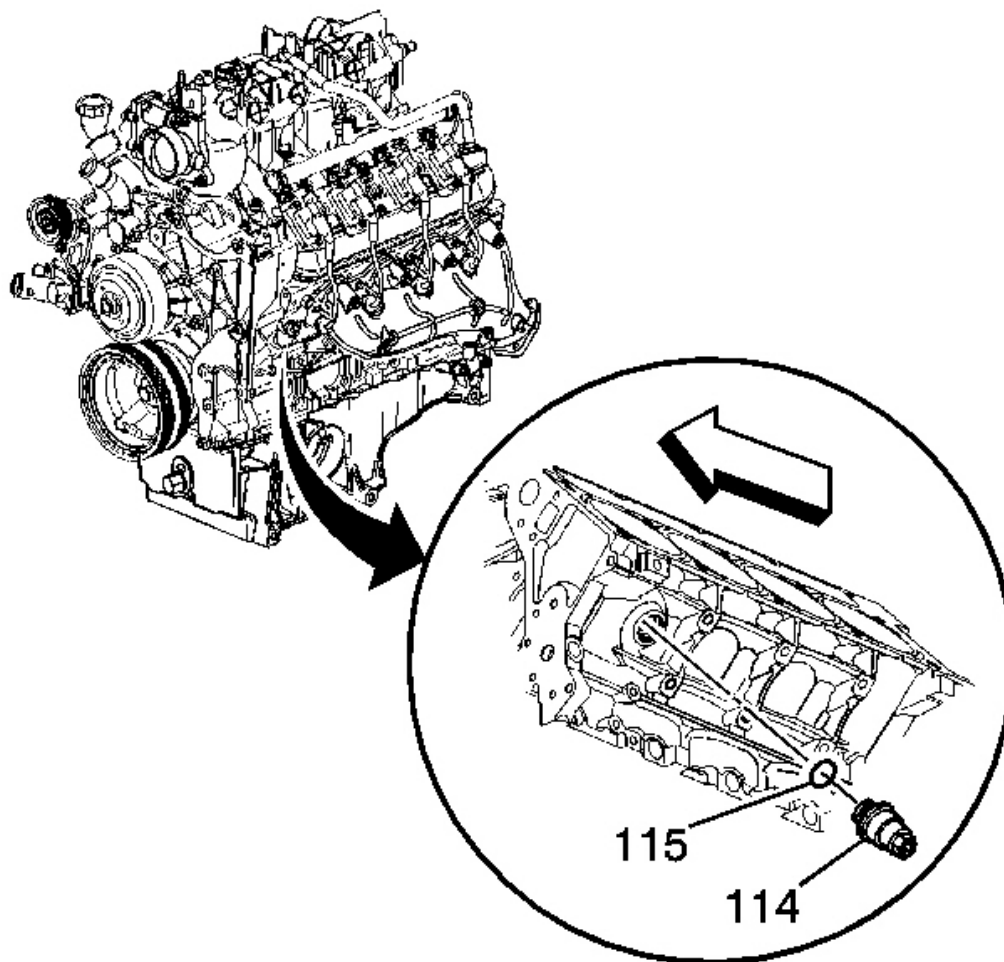


Fig. 295: Identifying Engine Block Coolant Heater
Courtesy of GENERAL MOTORS CORP.

4. Remove the engine block coolant heater (114) and washer (115).

CRANKSHAFT BALANCER REMOVAL

Tools Required

- **J 41816-A** Crankshaft Balancer Remover
- **J 41816-2** Crankshaft End Protector
- **J 42386-A** Flywheel Holding Tool

Removal Procedure

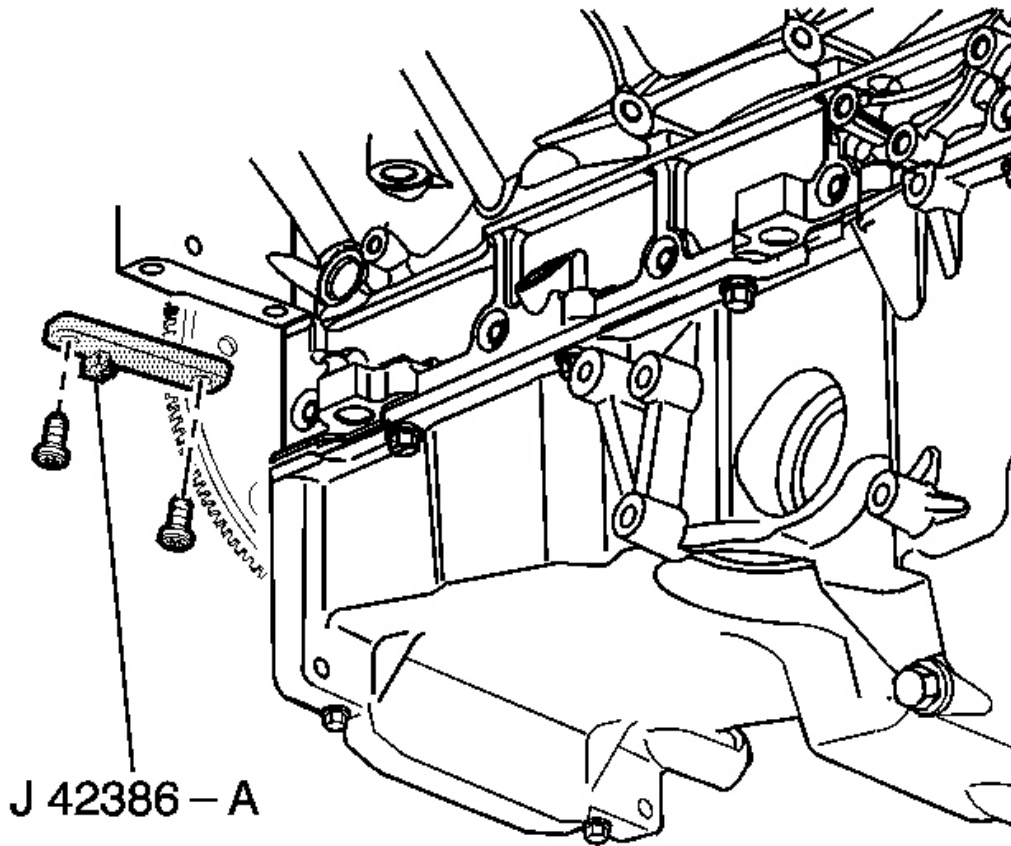


Fig. 296: View Of J 42386-A Flywheel Tool
Courtesy of GENERAL MOTORS CORP.

NOTE: Refer to Fastener Notice .

IMPORTANT: Do not use the crankshaft balancer bolt again. Install a **NEW** crankshaft balancer bolt during final assembly.

1. Install the **J 42386-A** and bolts.

Use 1 M10 - 1.5 x 120 mm and 1 M10 - 1.5 x 45 mm bolt for proper tool operation.

Tighten: Tighten the **J 42386-A** bolts to 50 N.m (37 lb ft).

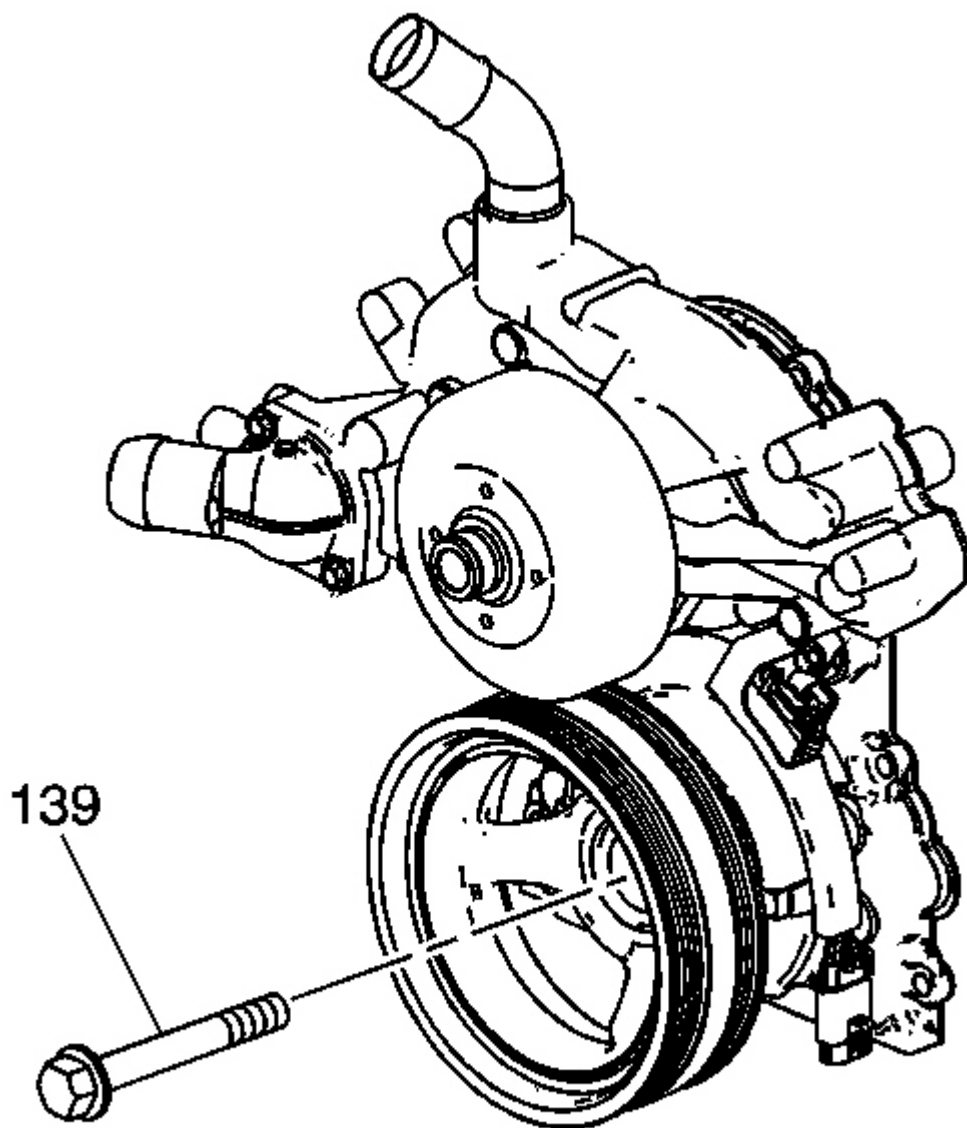


Fig. 297: Identifying Crankshaft Balancer Bolt
Courtesy of GENERAL MOTORS CORP.

2. Remove the crankshaft balancer bolt (139).

Do not discard the crankshaft balancer bolt. The balancer bolt will be used during the balancer installation procedure.

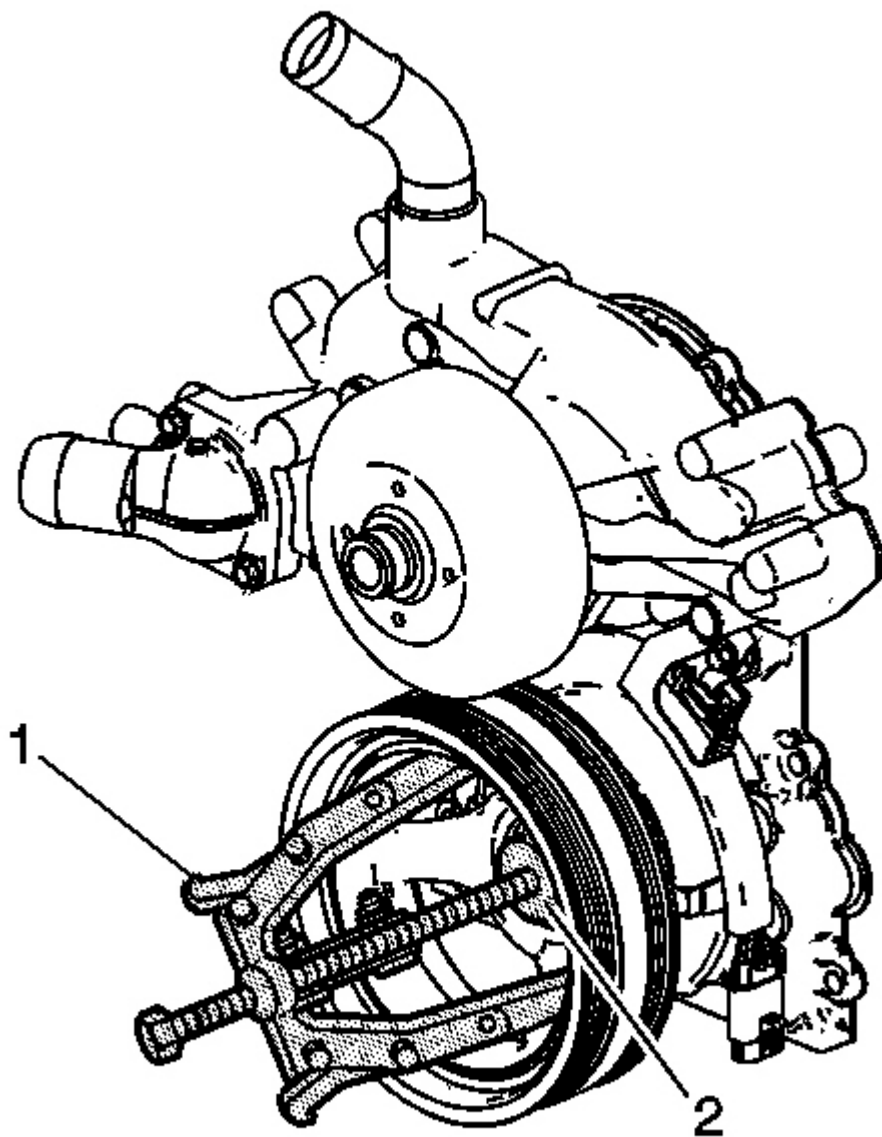


Fig. 298: View Of Crankshaft Balancer With J 41816 & J 41816-2 Removal Tools
Courtesy of GENERAL MOTORS CORP.

3. Use the **J 41816-A** (1) and the **J 41816-2** (2) in order to remove the crankshaft balancer.

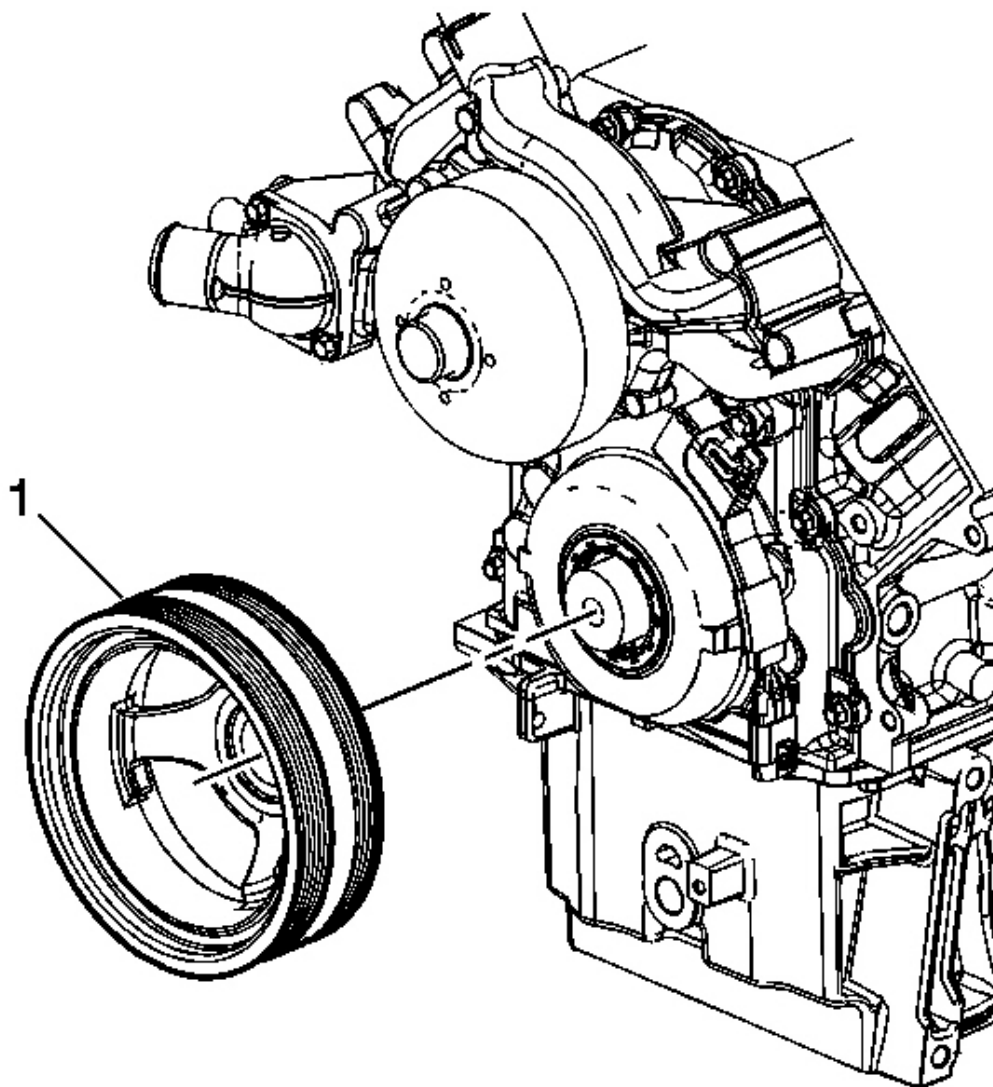


Fig. 299: View Of Crankshaft Balancer
Courtesy of GENERAL MOTORS CORP.

4. Remove the balancer (1).

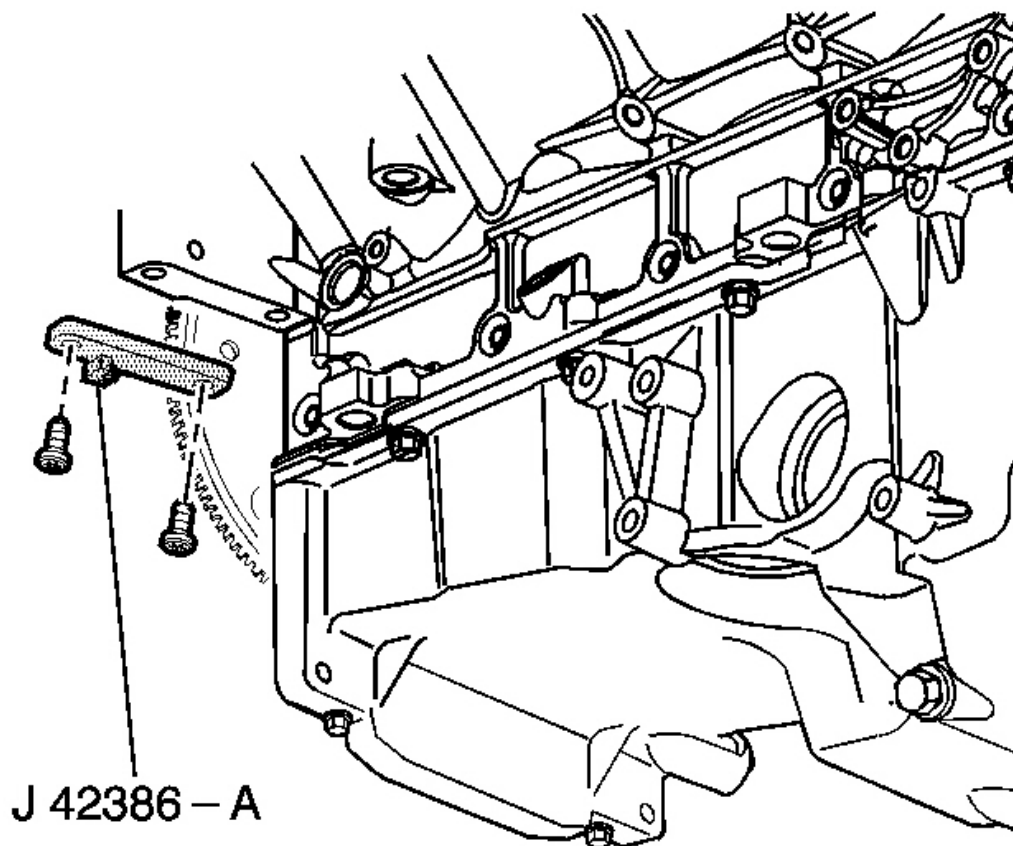


Fig. 300: View Of J 42386-A Flywheel Tool
Courtesy of GENERAL MOTORS CORP.

5. Remove the **J 42386-A** and bolts.

ENGINE FLYWHEEL REMOVAL

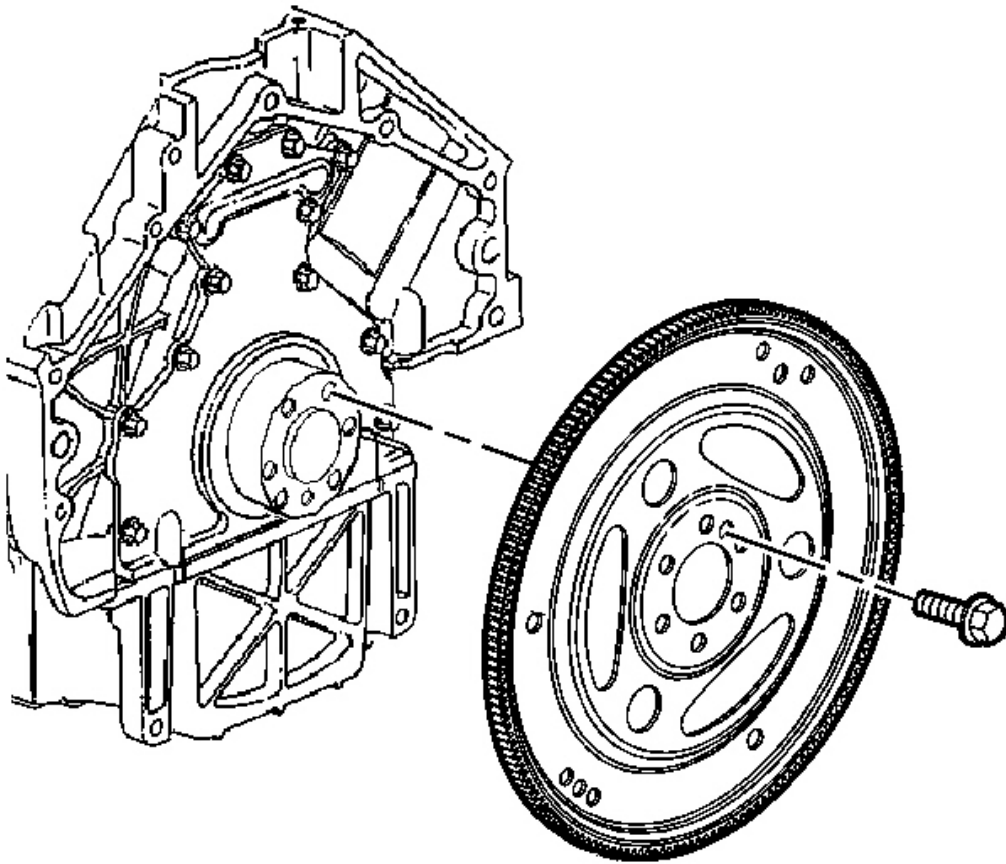


Fig. 301: View Of Flywheel

Courtesy of GENERAL MOTORS CORP.

IMPORTANT: The flywheel and flex plate do not use a locating pin for alignment and will not initially seat against the crankshaft flange, but will be pulled onto the crankshaft by the bolts. This procedure requires a 3 stage tightening process.

1. Remove the flex plate bolts.
2. Remove the automatic transmission flex plate.

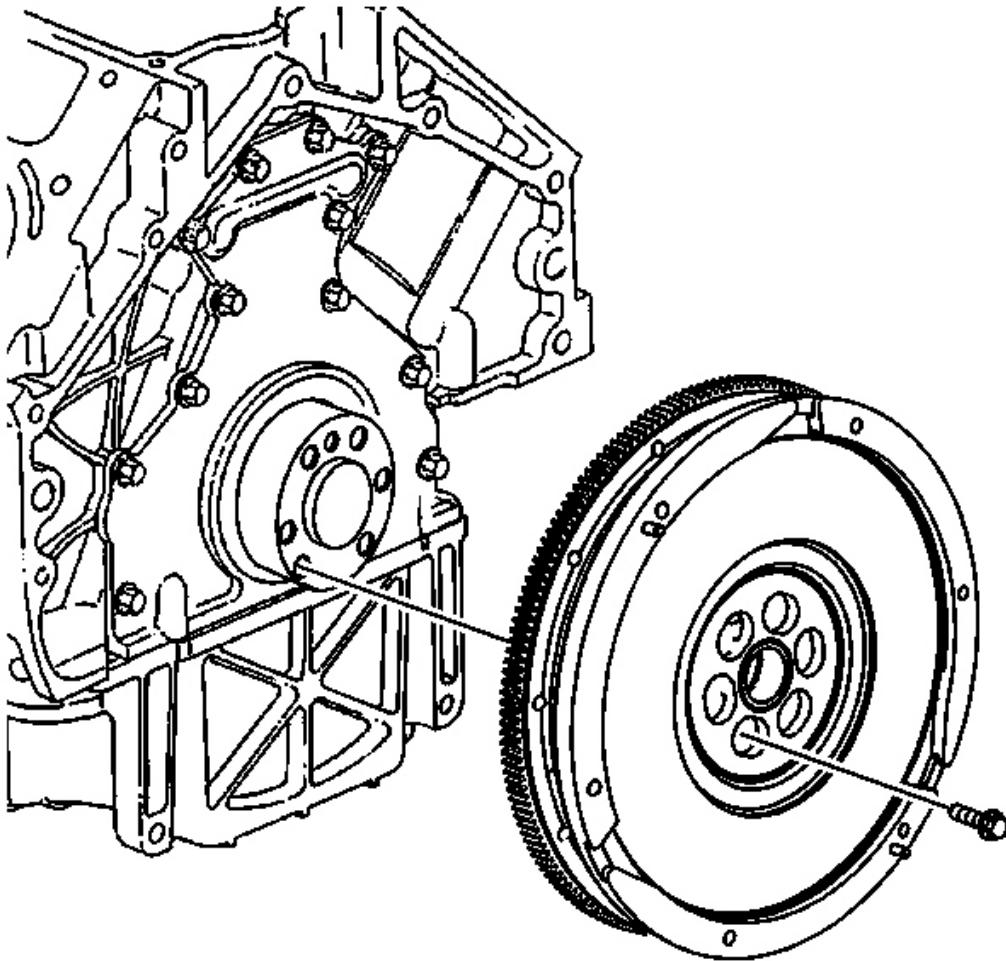


Fig. 302: View Of Manual Transmission Engine Flywheel
Courtesy of GENERAL MOTORS CORP.

3. Remove the manual transmission flywheel.

OIL LEVEL INDICATOR AND TUBE REMOVAL

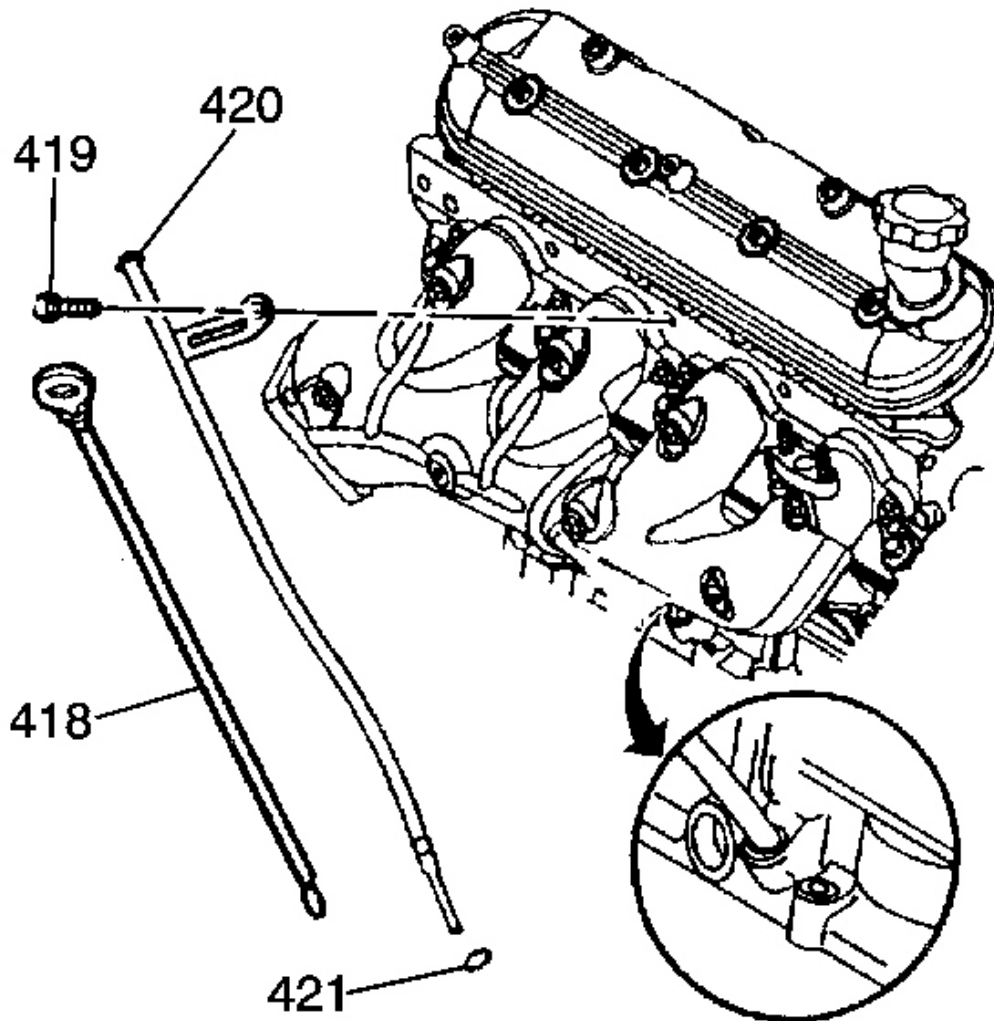


Fig. 303: Identifying Oil Level Indicator & Tube
Courtesy of GENERAL MOTORS CORP.

1. Remove the oil level indicator (418) from the tube.
2. Remove the oil level indicator tube bolt (419).
3. Remove the oil level indicator tube (420) from the engine block.

IMPORTANT: Inspect the O-ring for cuts or damage. The O-ring seal may be used again if it is not cut or damaged.

4. Remove the O-ring (421) from the tube, as required.

EXHAUST MANIFOLD REMOVAL - LEFT SIDE

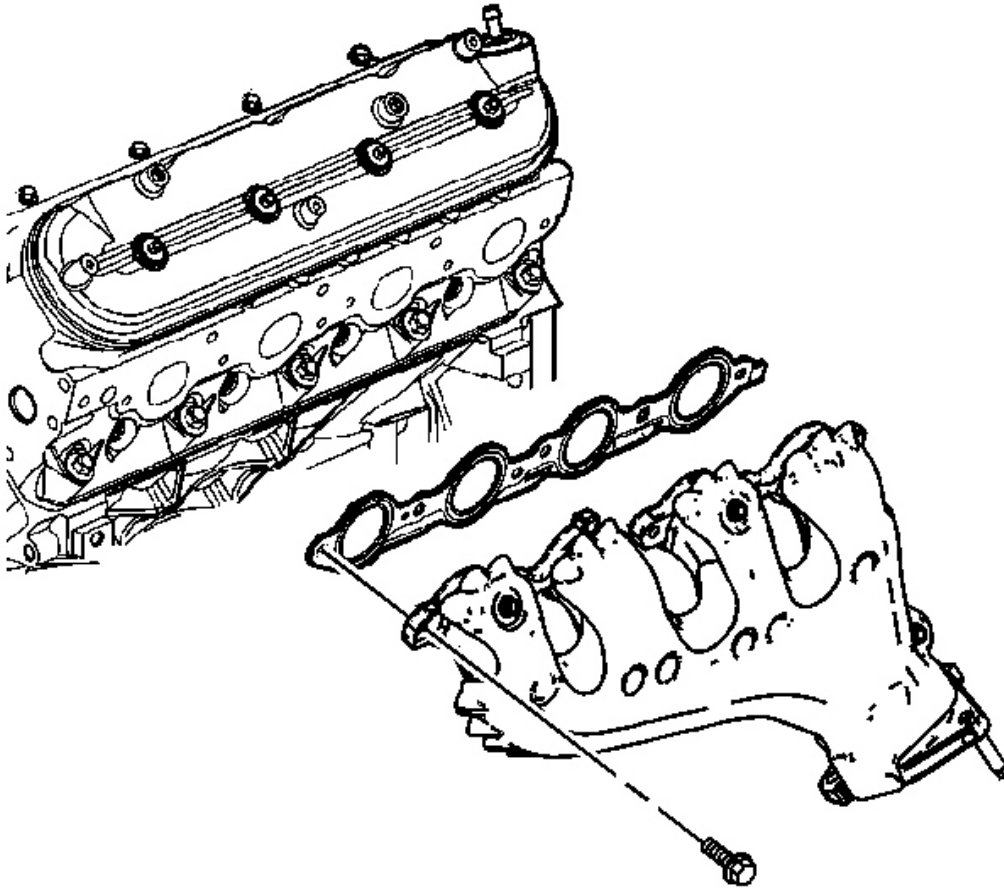


Fig. 304: View Of Left Exhaust Manifold & Gasket
Courtesy of GENERAL MOTORS CORP.

1. Remove the spark plug wires from the spark plugs.
2. Remove the exhaust manifold, bolts and gasket.
3. Discard the gasket.

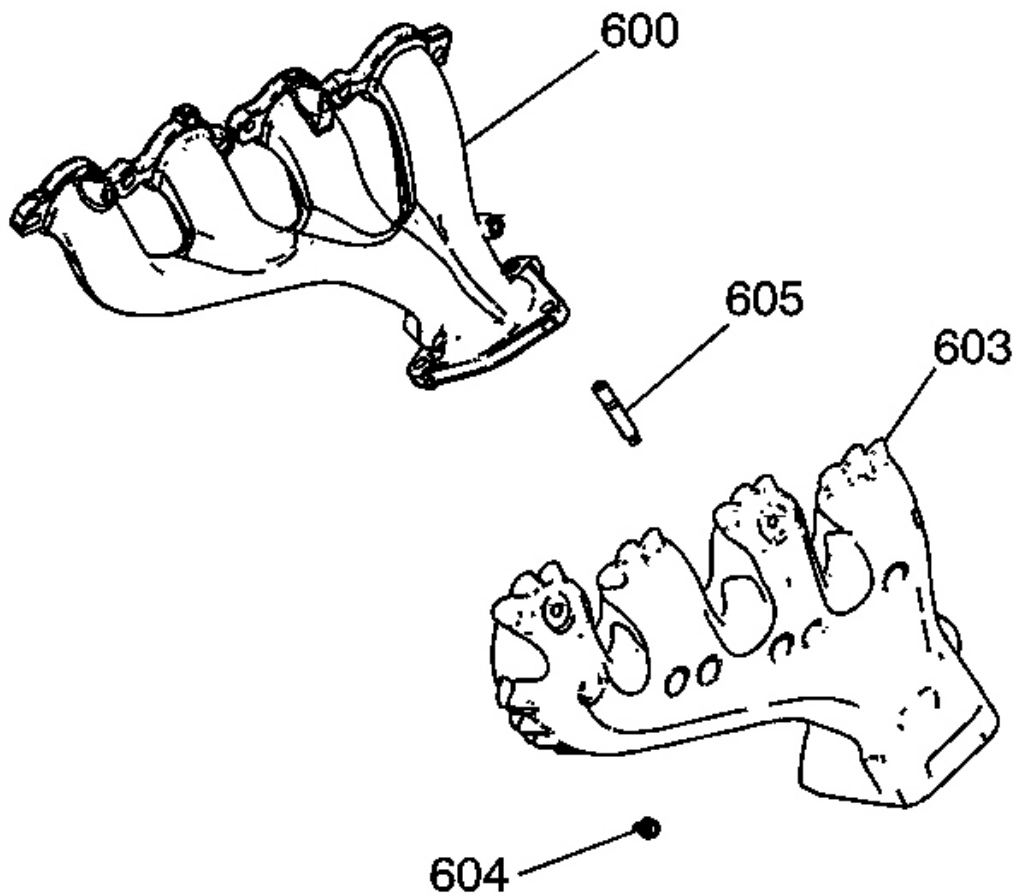


Fig. 305: View Of Exhaust Manifold

Courtesy of GENERAL MOTORS CORP.

4. Remove the heat shield (603) and bolts (604) from the manifold (600), as required.
5. Remove the studs (605), as required.

EXHAUST MANIFOLD REMOVAL - RIGHT SIDE

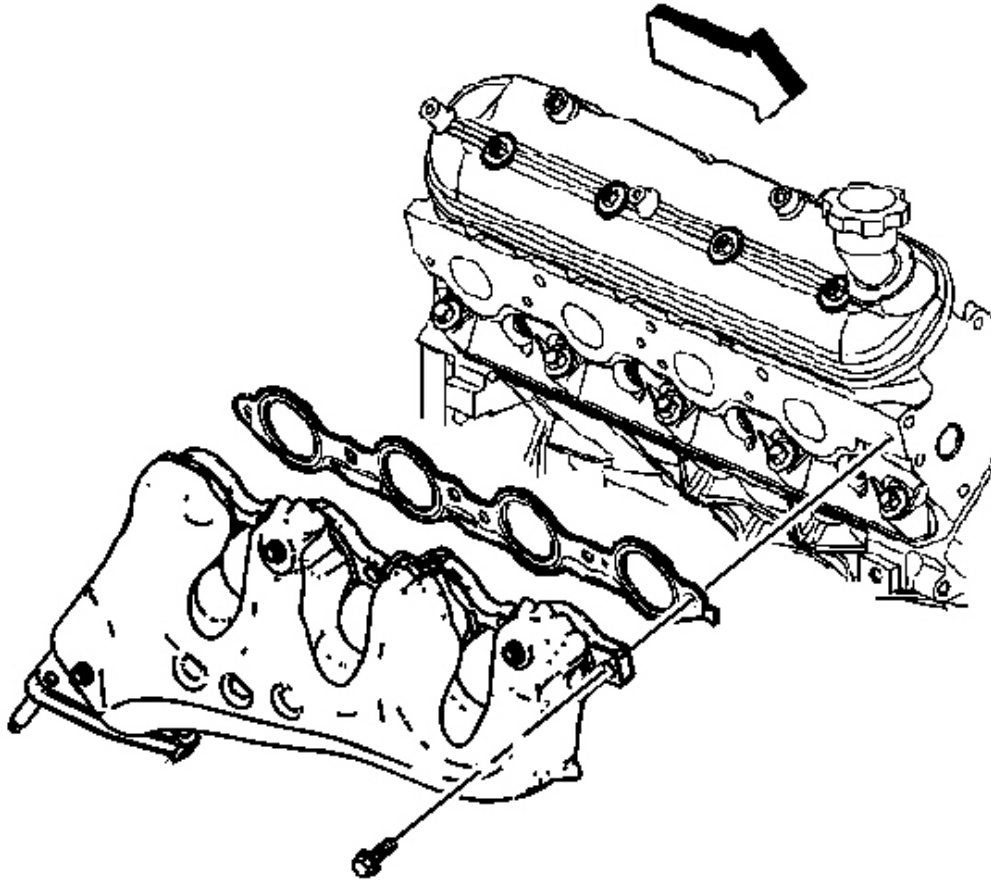


Fig. 306: View Of Right Exhaust Manifold & Gasket
Courtesy of GENERAL MOTORS CORP.

1. Remove the spark plug wires from the spark plugs.
2. Remove the exhaust manifold, bolts and gasket.
3. Discard the gasket.

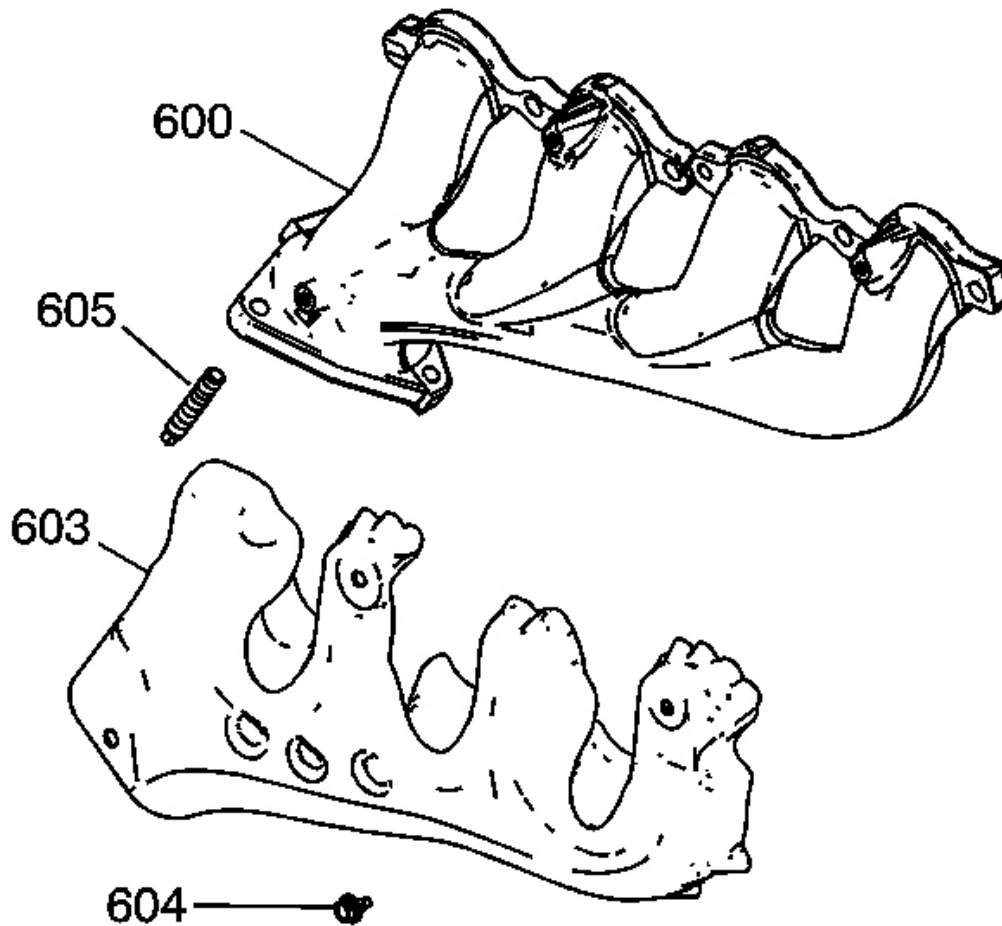


Fig. 307: View Of Right Exhaust Manifold & Heat Shield
Courtesy of GENERAL MOTORS CORP.

4. Remove the heat shield (603) and bolts (604) from the manifold (600), as required.
5. Remove the studs (605), as required.

WATER PUMP REMOVAL

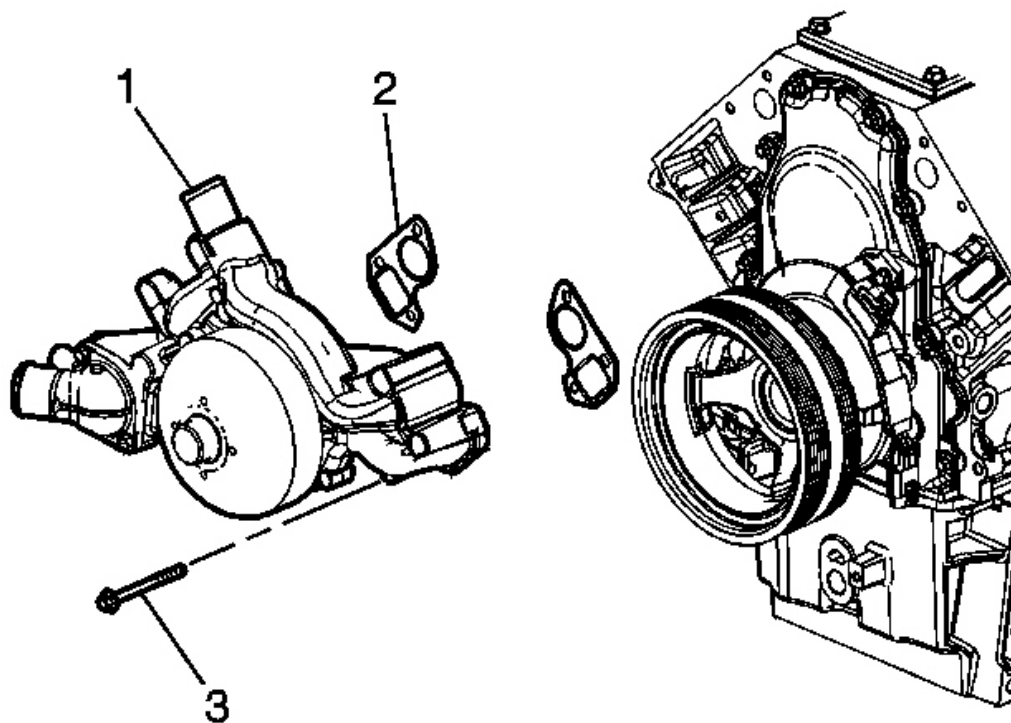


Fig. 308: View Of Water Pump
Courtesy of GENERAL MOTORS CORP.

1. Remove the water pump bolts (3).
2. Remove the water pump (1) and gaskets (2).
3. Discard the water pump gaskets.

THROTTLE BODY REMOVAL

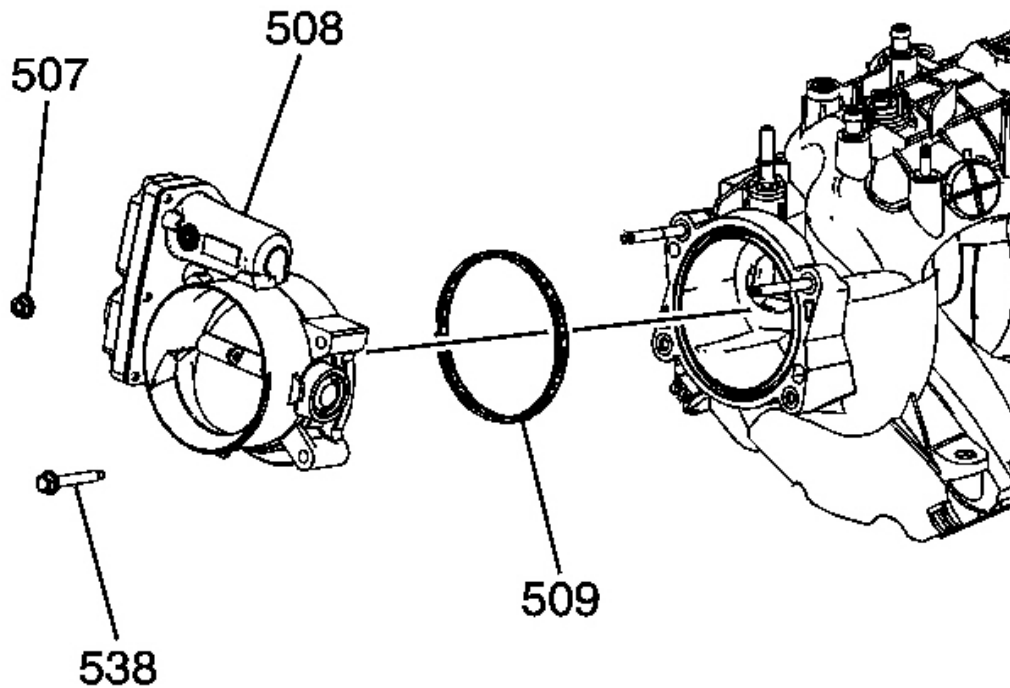


Fig. 309: View Of Throttle Body
Courtesy of GENERAL MOTORS CORP.

IMPORTANT: The intake manifold, throttle body, fuel injection rail and fuel injectors may be removed as an assembly. If not servicing the individual components, remove the manifold as a complete assembly.

1. Remove the electrical wire harness connectors from the throttle body.
2. Remove the throttle body nuts (507) and bolts (538).
3. Remove the throttle body (508).
4. Remove the throttle body gasket (509).
5. Discard the gasket.

FUEL RAIL AND INJECTORS REMOVAL

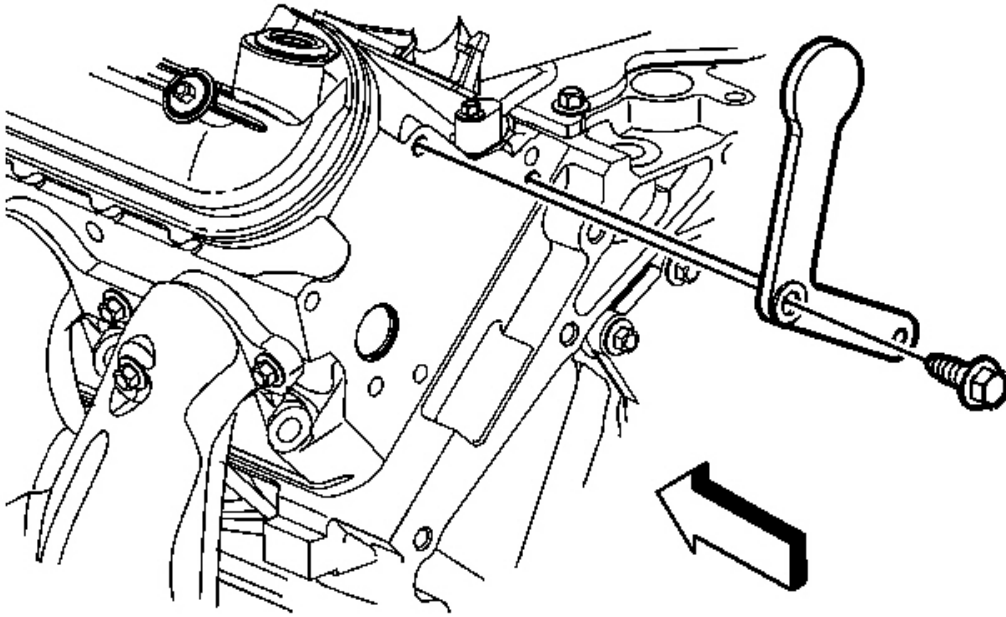


Fig. 310: View Of Fuel Rail Stop Bracket & Bolt
Courtesy of GENERAL MOTORS CORP.

CAUTION: Refer to Fuel Rail Stop Bracket Installation Caution in Cautions and Notices.

IMPORTANT: The intake manifold, throttle body, fuel injection rail and fuel injectors may be removed as an assembly. If not servicing the individual components, remove the intake manifold as a complete assembly.

1. Remove the fuel rail stop bracket and bolt, as required.

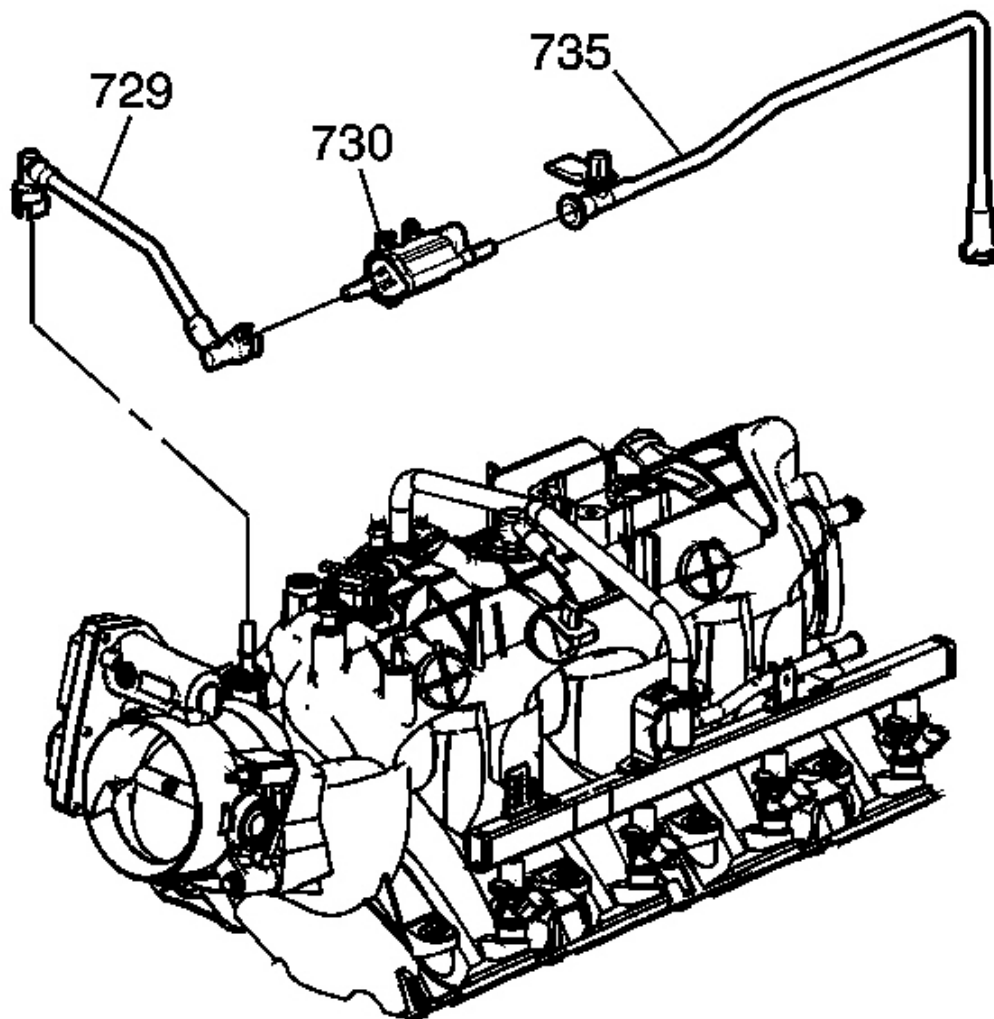


Fig. 311: View Of EVAP Purge Valve & Tubes
Courtesy of GENERAL MOTORS CORP.

2. Remove the evaporative emission (EVAP) canister purge solenoid valve (730) and tubes (729, 735).

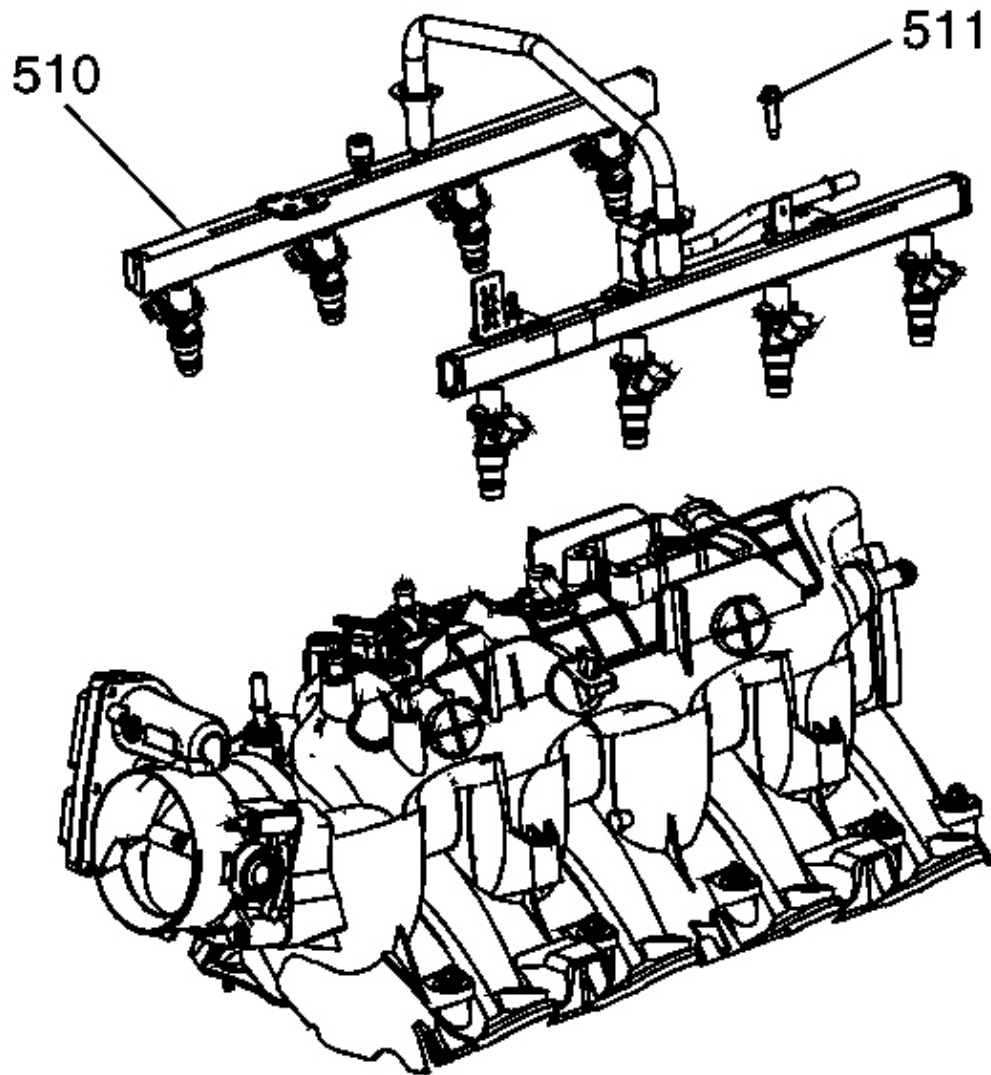


Fig. 312: Identifying Fuel Rail

Courtesy of GENERAL MOTORS CORP.

3. Remove the fuel rail bolts (511).

IMPORTANT:

- Do not separate the fuel injectors from the fuel rail, unless component service is required.
- Use cleanliness and care when handling the fuel system

components.

- **Do not allow dirt or debris to enter the fuel injectors or fuel rail components. Cap ends, as necessary.**

4. Remove the fuel rail (510) with injectors. Lift evenly on both sides of the fuel rail until all the injectors have left their bores.

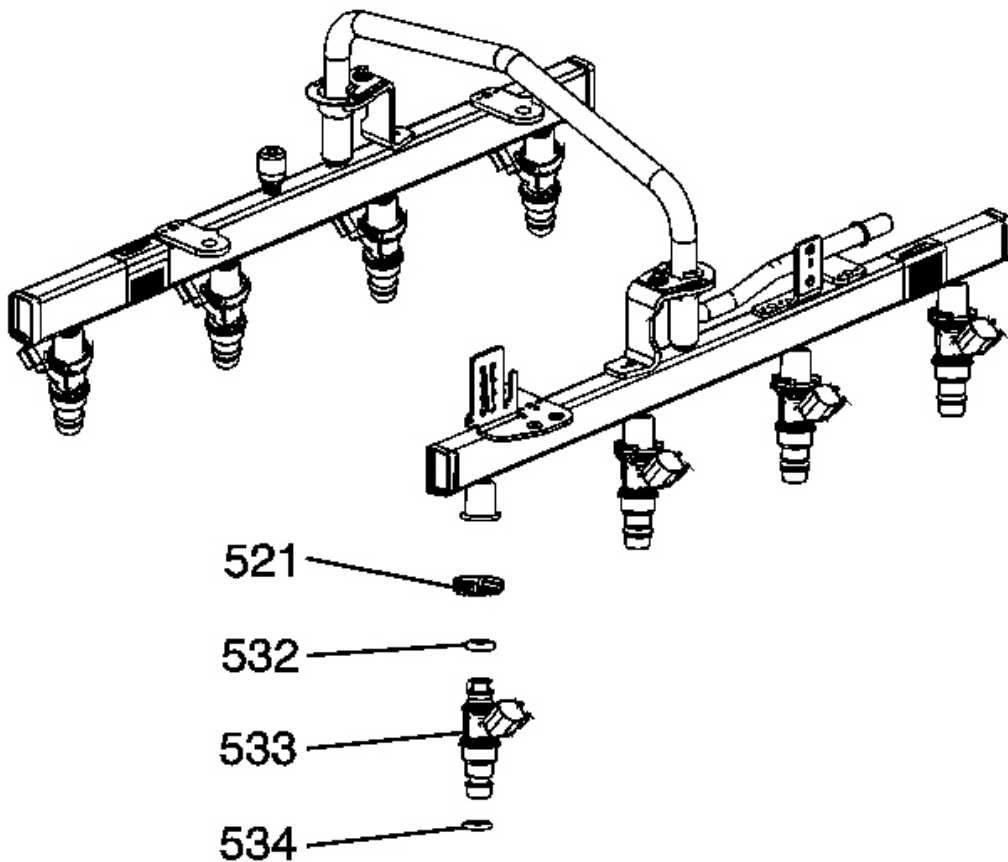


Fig. 313: View Of Fuel Rail & Injectors
Courtesy of GENERAL MOTORS CORP.

5. Remove the fuel injector retainers (521) and fuel injectors (533), as required.
6. Remove the O-rings (532, 534) from the injectors, as required.

INTAKE MANIFOLD REMOVAL

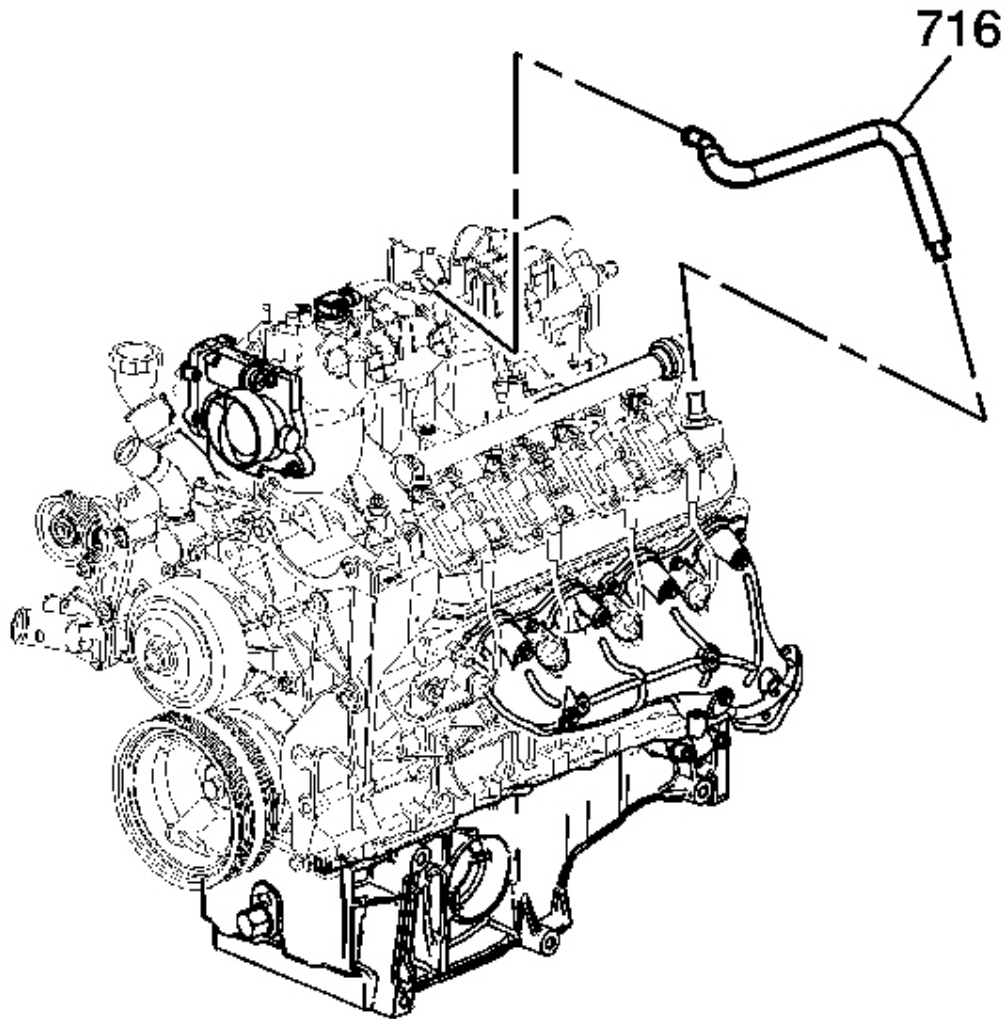


Fig. 314: View Of PVC Hose

Courtesy of GENERAL MOTORS CORP.

IMPORTANT:

- The intake manifold, throttle body, fuel injection rail and fuel injectors may be removed as an assembly. If not servicing the individual components, remove the manifold as a complete assembly.
- **DO NOT** use the intake manifold-to-cylinder head gaskets again.

1. Remove the positive crankcase ventilation (PCV) hose - dirty air (716).

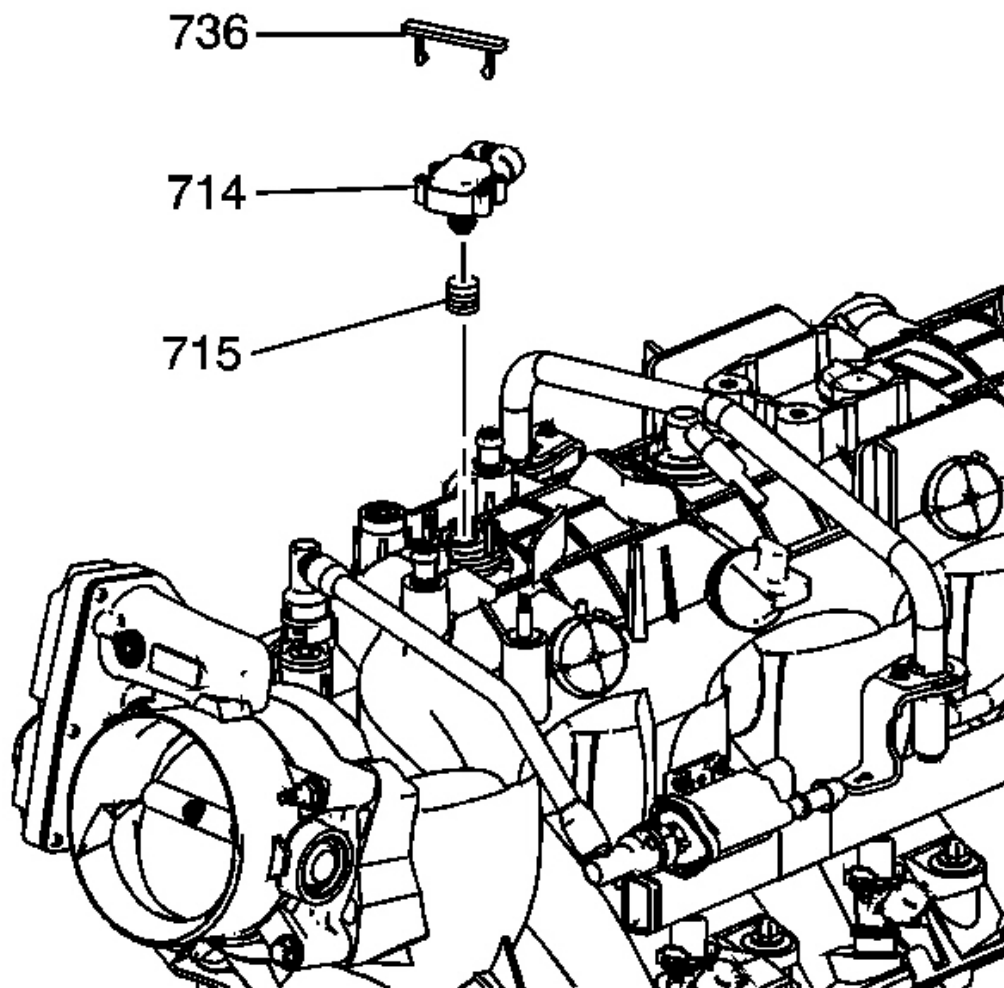


Fig. 315: View Of MAP Sensor
Courtesy of GENERAL MOTORS CORP.

2. Remove the manifold absolute pressure (MAP) sensor (714) and retainer (736), as required.
3. Remove the seal (715) from the sensor, as required.

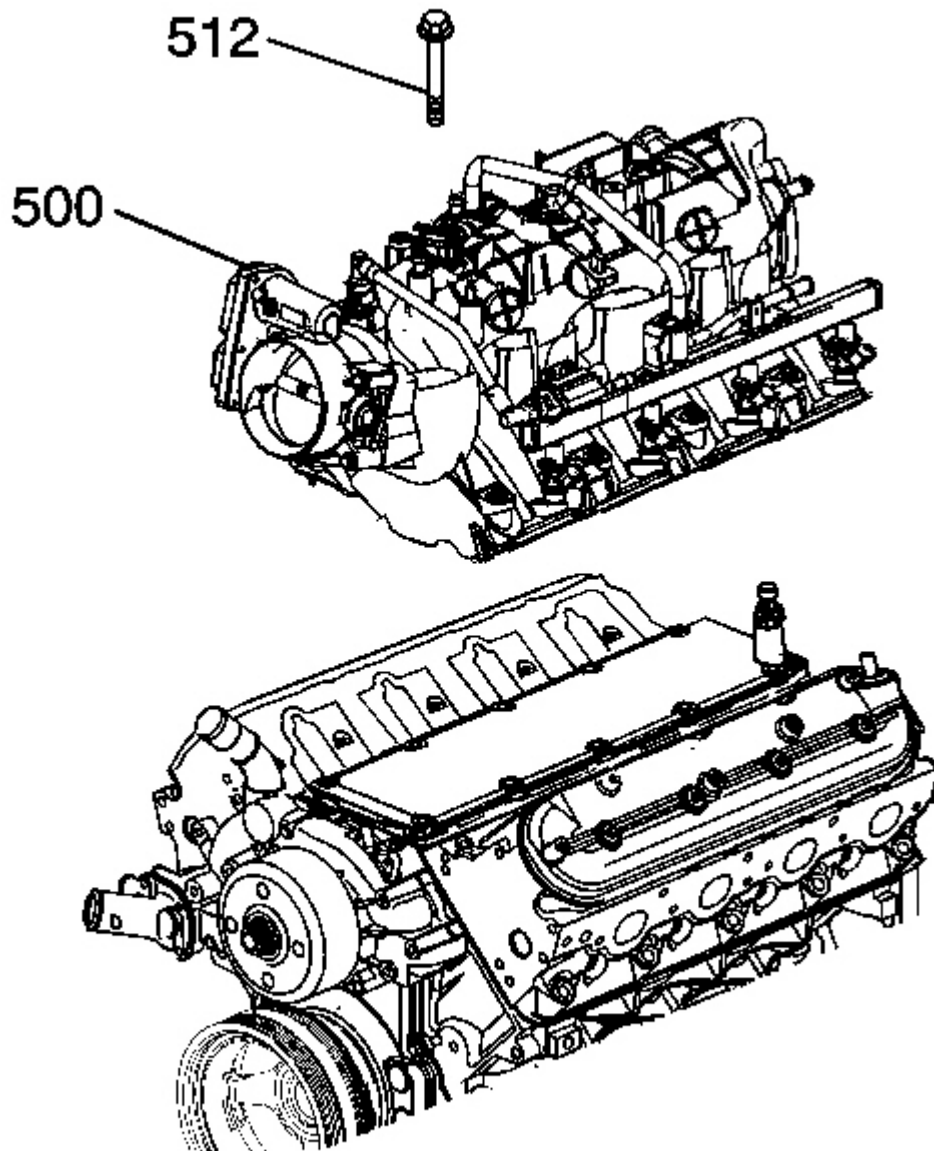


Fig. 316: Identifying Intake Manifold Bolts
Courtesy of GENERAL MOTORS CORP.

4. Remove the intake manifold bolts (512).
5. Remove the intake manifold (500) with gaskets.

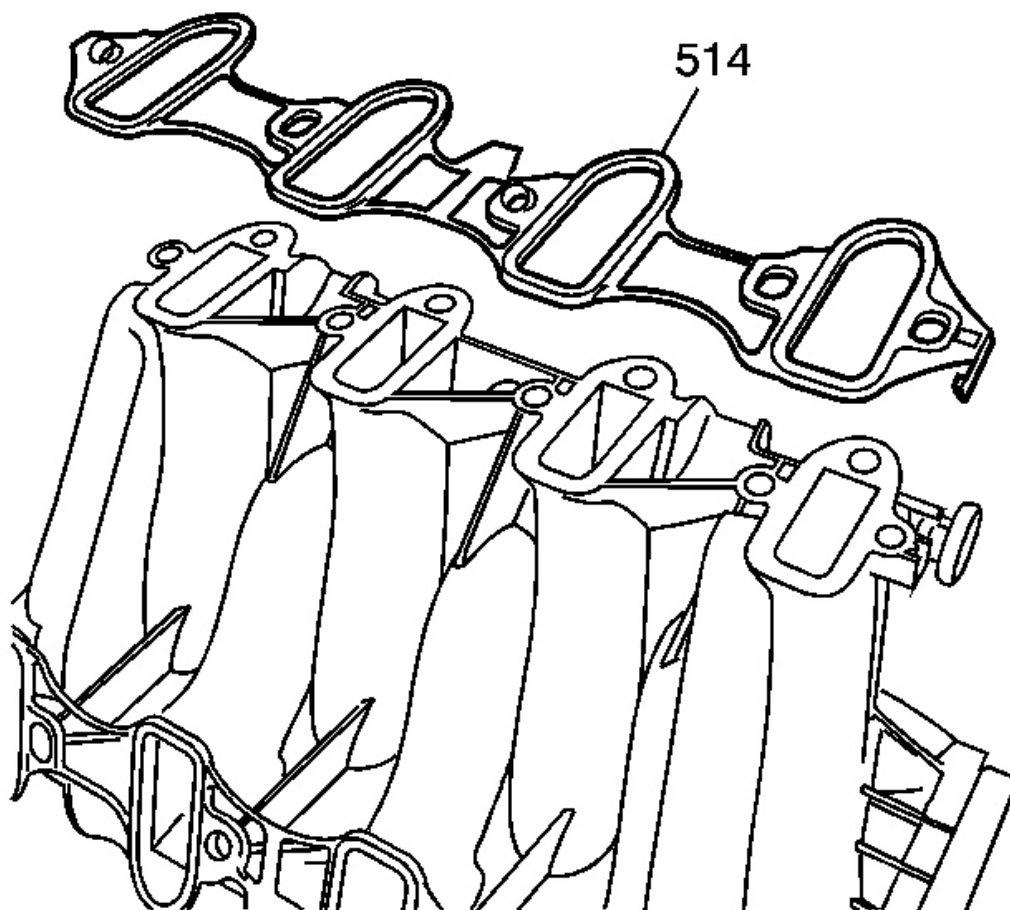


Fig. 317: View Of Intake Manifold-To-Cylinder Head Gasket
Courtesy of GENERAL MOTORS CORP.

6. Remove the intake manifold gaskets (514).
7. Discard the intake manifold gaskets.

COOLANT AIR BLEED PIPE REMOVAL

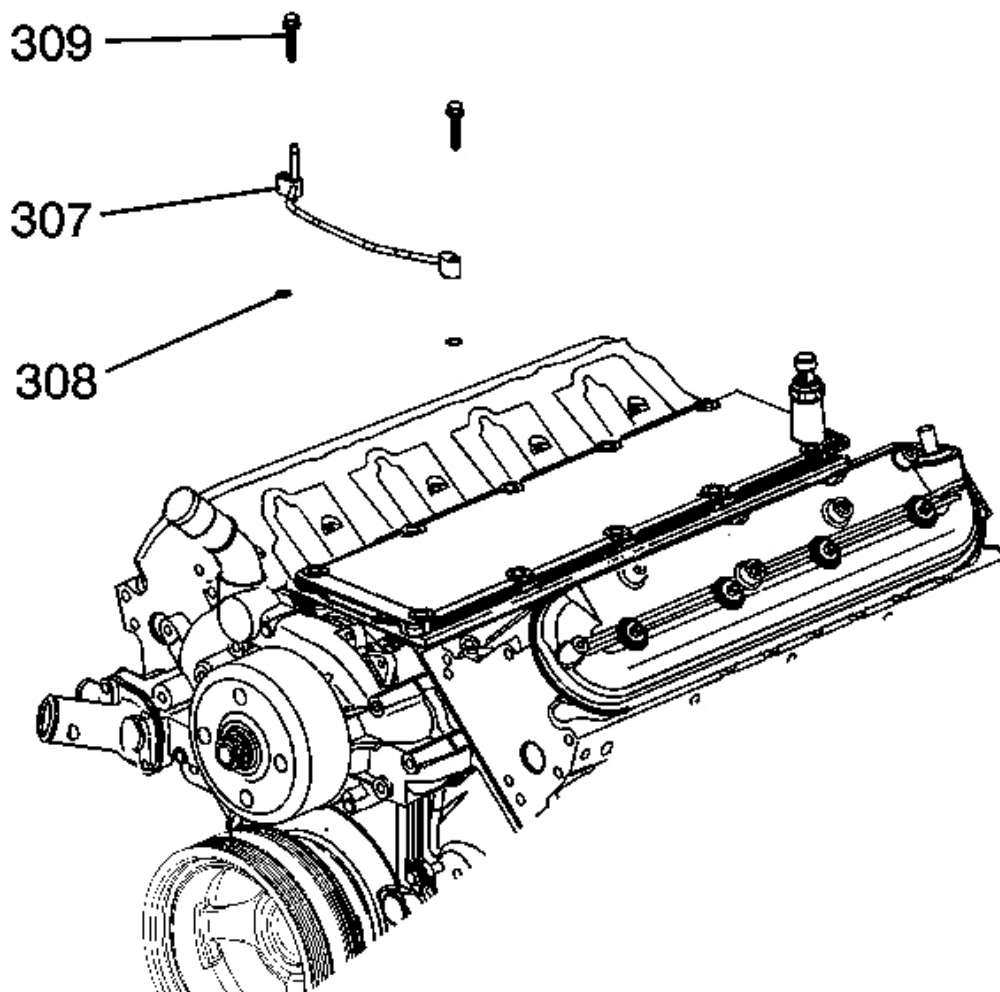


Fig. 318: Identifying Engine Coolant Air Bleed Pipe
Courtesy of GENERAL MOTORS CORP.

1. Remove the engine coolant air bleed pipe bolts (309).
2. Remove the pipe (307) with seals (308).

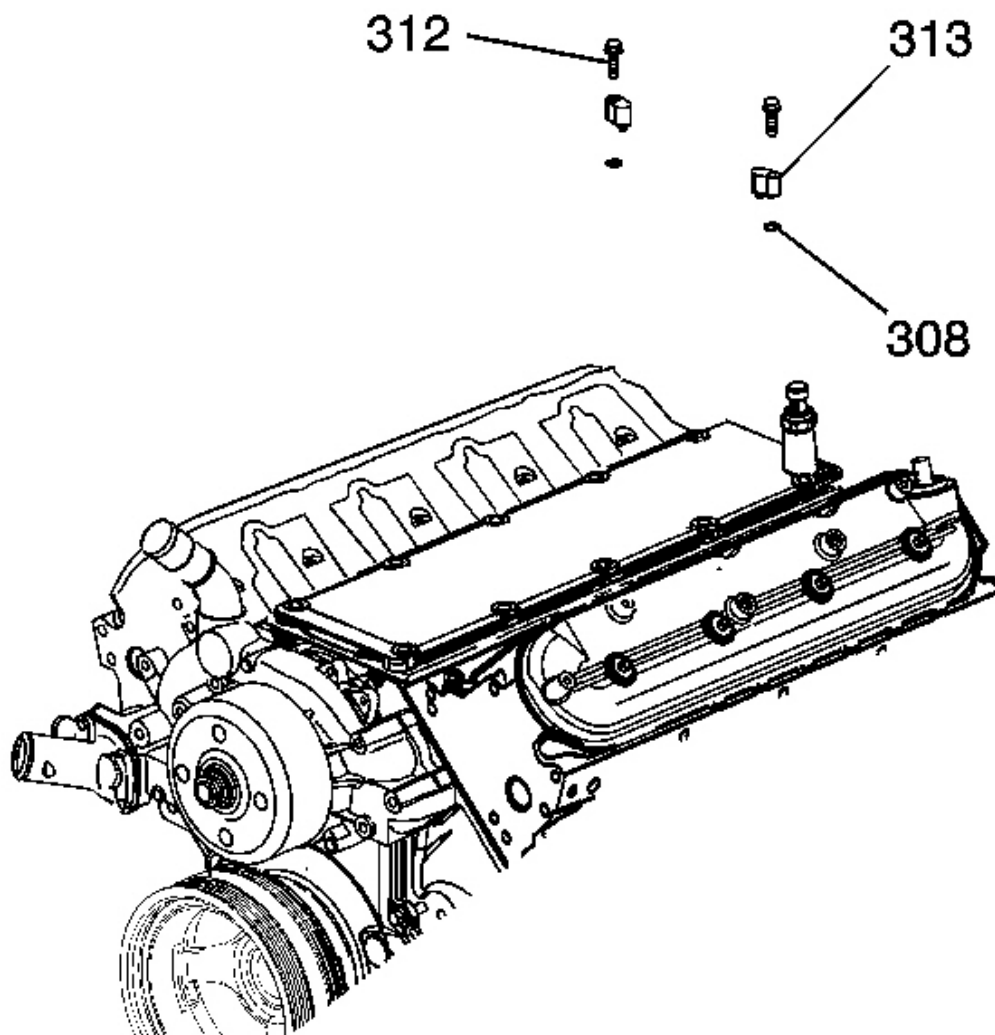


Fig. 319: Identifying Coolant Air Bleed Cover Bolts
Courtesy of GENERAL MOTORS CORP.

3. Remove the engine coolant air bleed cover bolts (312).
4. Remove the covers (313) with seals (308).

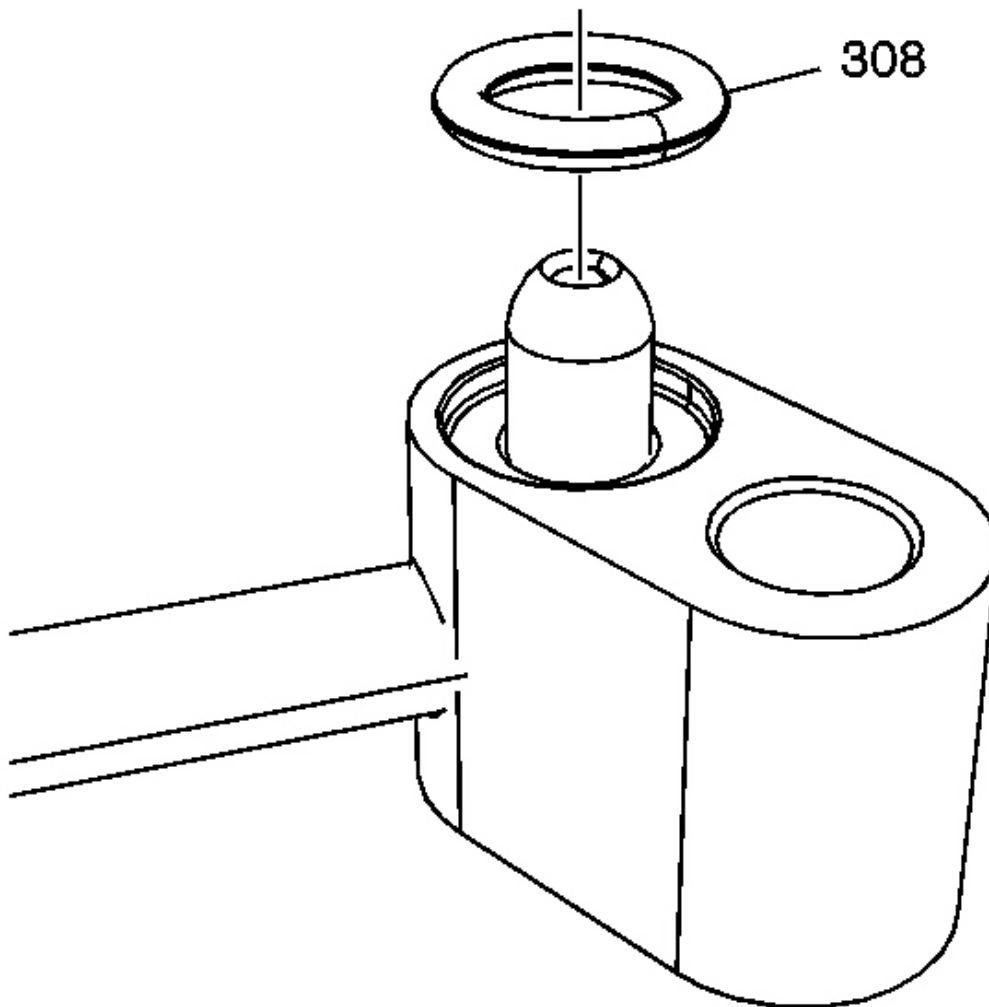


Fig. 320: View Of Coolant Air Bleed Pipe Seal
Courtesy of GENERAL MOTORS CORP.

5. Remove the seals (308) from the pipe and covers.
6. Discard the seals.

ENGINE VALLEY COVER REMOVAL

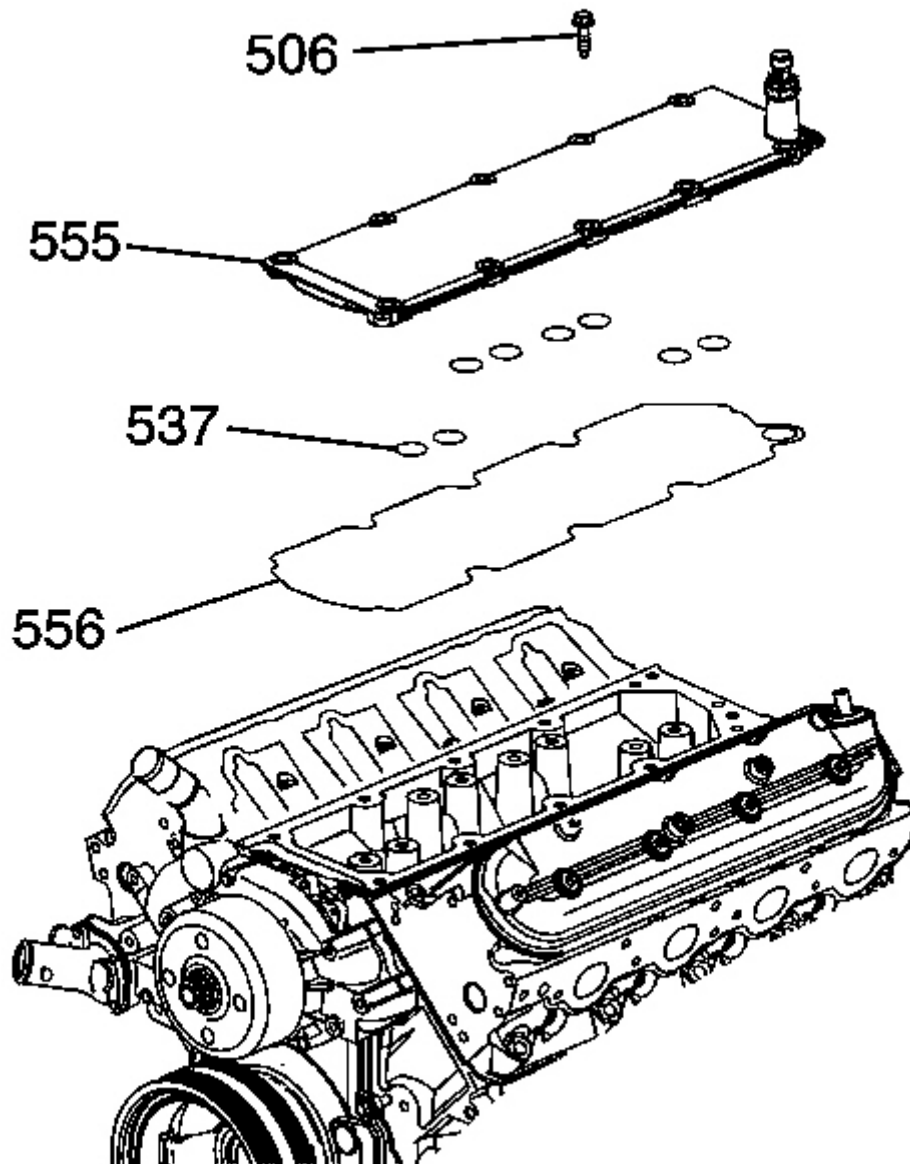


Fig. 321: View Of Engine Valley Cover & Gasket
Courtesy of GENERAL MOTORS CORP.

1. Remove the valley cover bolts (506).
2. Remove the valley cover (555) and gasket (556).
3. Remove the O-ring seals (537) from the cover.

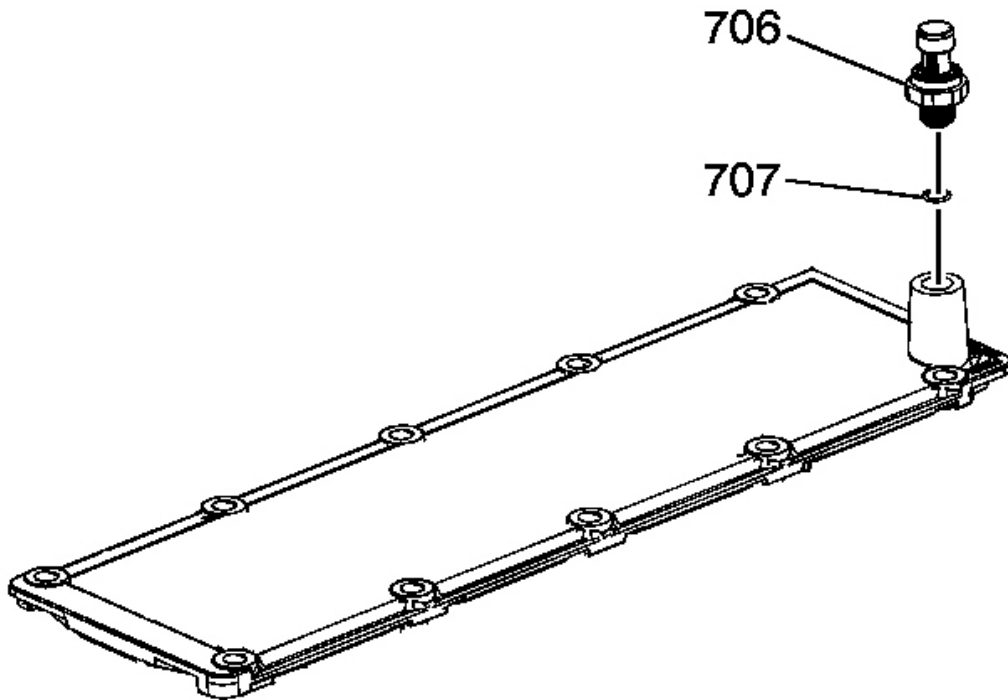


Fig. 322: Identifying Oil Pressure Sensor & Washer
Courtesy of GENERAL MOTORS CORP.

4. Remove the oil pressure sensor (706) and washer (707), as required.

VALVE ROCKER ARM COVER REMOVAL - LEFT SIDE

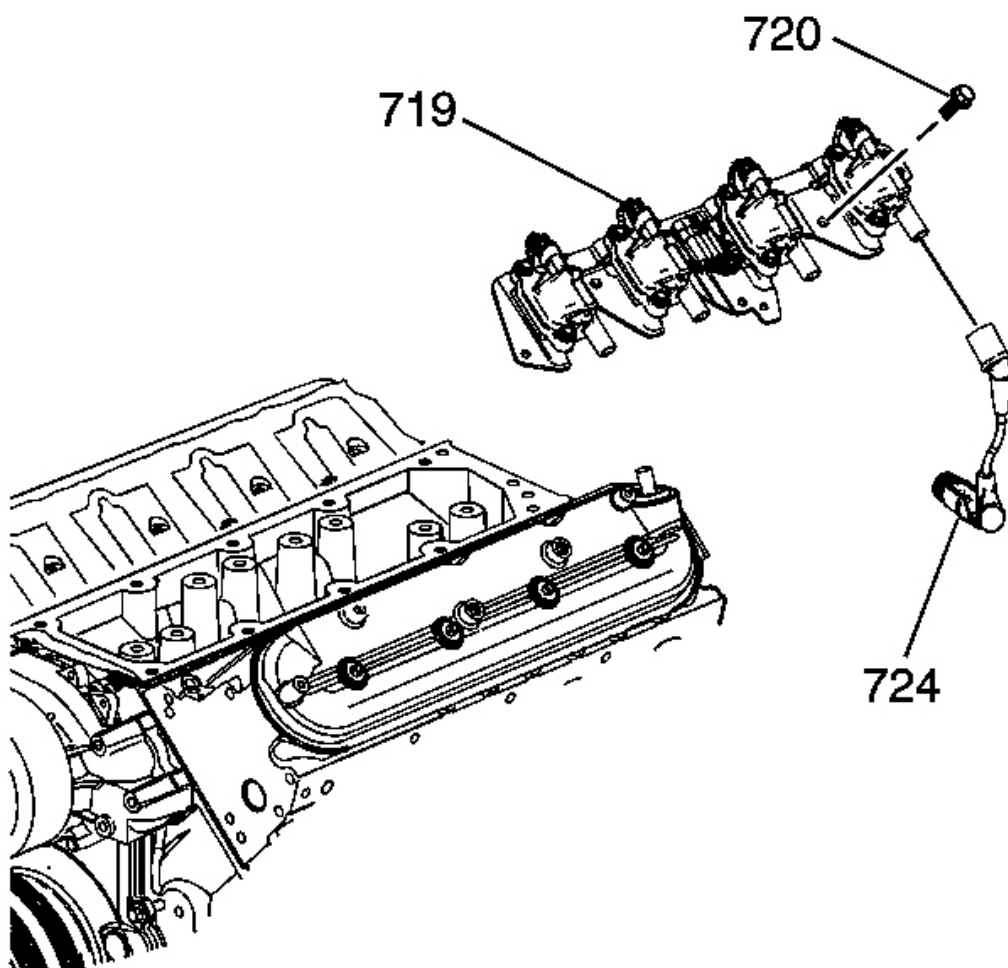


Fig. 323: View Of Left Rocker Arm Cover Components
Courtesy of GENERAL MOTORS CORP.

1. Remove the spark plug wires (724).
2. Remove the ignition coil bracket studs (720).
3. Remove the ignition coil and bracket assembly (719).

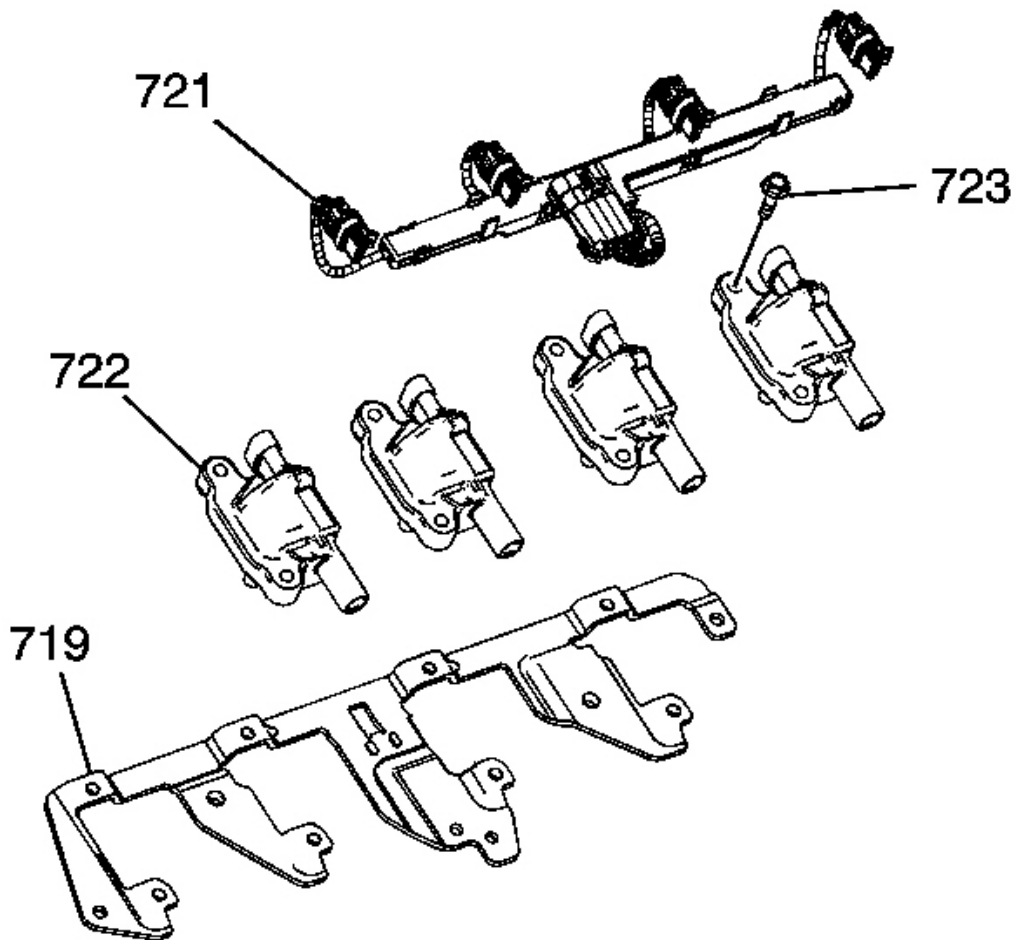


Fig. 324: View Of Bracket, Bolts, Coils & Wire Harness
Courtesy of GENERAL MOTORS CORP.

4. Disconnect the ignition coil electrical connectors.
5. Remove the bolts (723), coils (722) and wire harness (721) from the bracket (719), as required.

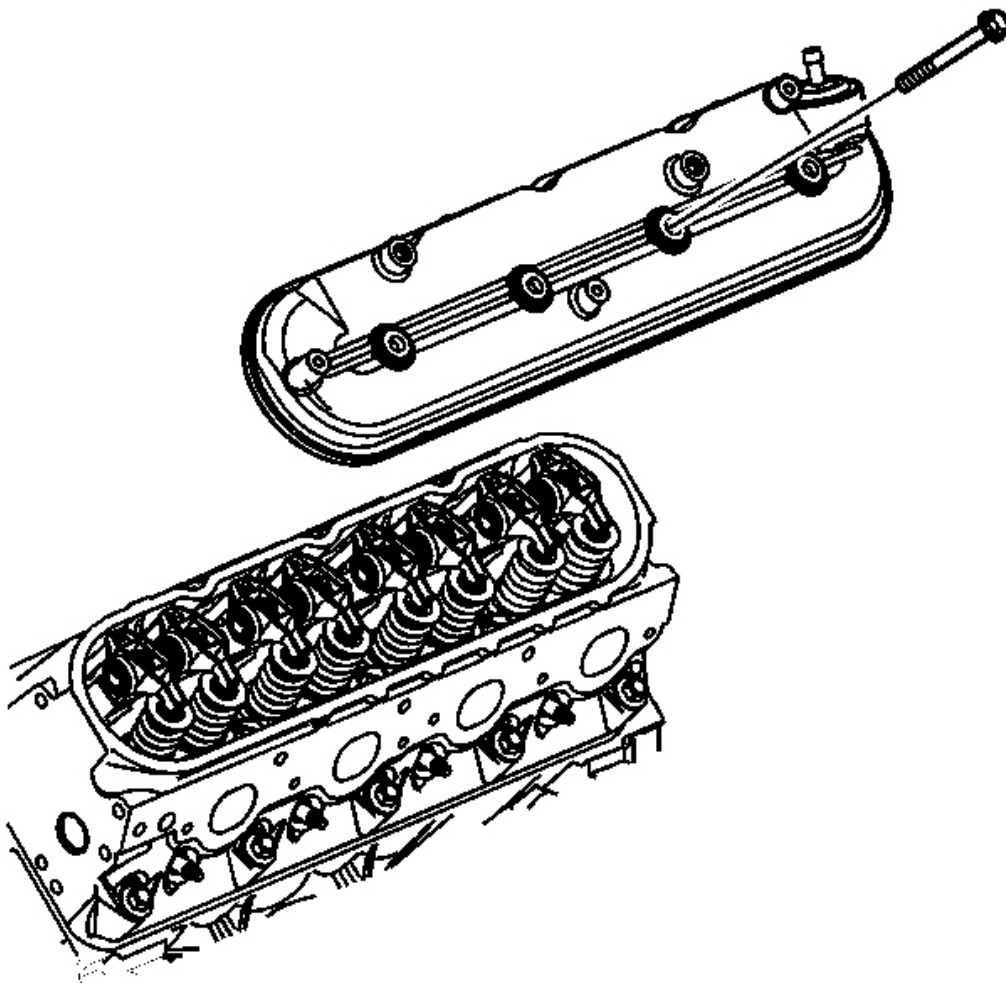


Fig. 325: View Of Valve Rocker Arm Cover
Courtesy of GENERAL MOTORS CORP.

6. Remove the valve rocker arm cover bolts and cover.

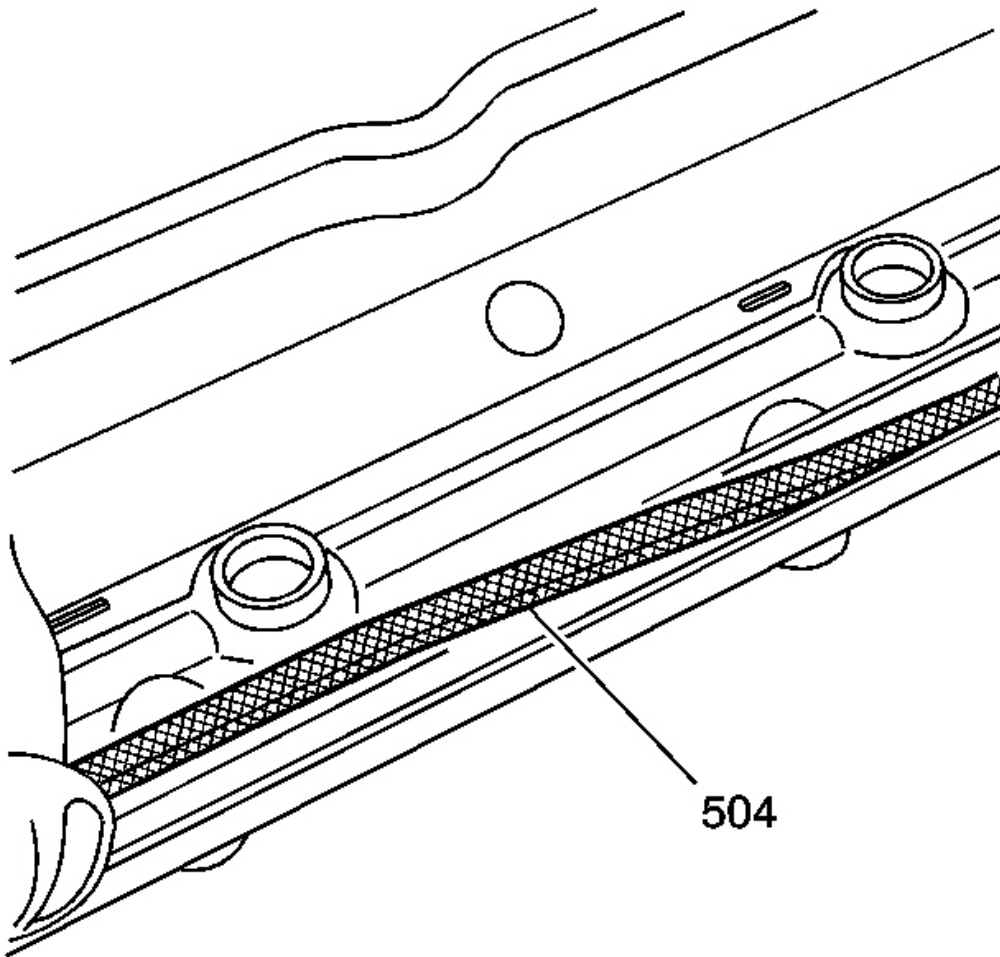


Fig. 326: View Of Valve Rocker Arm Cover Gasket
Courtesy of GENERAL MOTORS CORP.

7. Remove the gasket (504) from the cover.

VALVE ROCKER ARM COVER REMOVAL - RIGHT SIDE

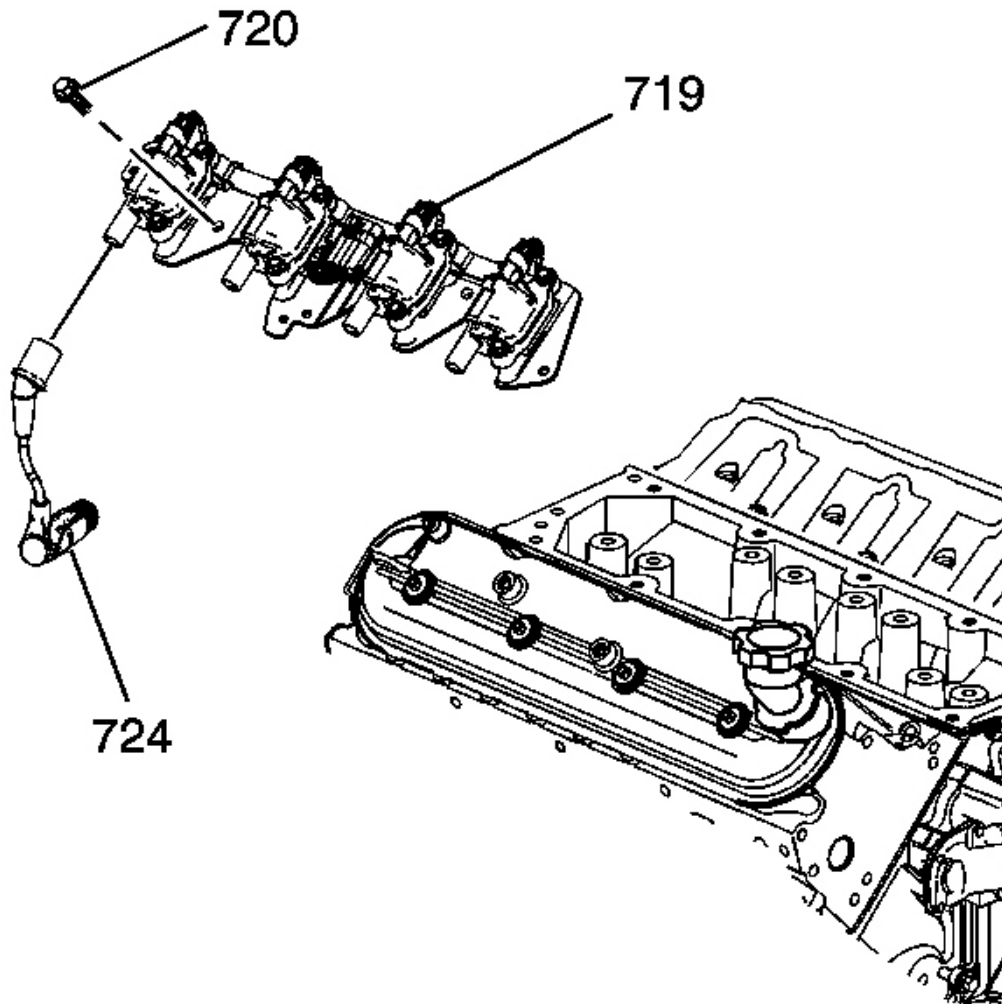


Fig. 327: View Of Right Rocker Arm Cover Components
Courtesy of GENERAL MOTORS CORP.

IMPORTANT: Do not remove the oil fill tube from the cover, unless service is required. If the oil fill tube has been removed from the cover, install a NEW tube during assembly.

1. Remove the spark plug wires (724).
2. Remove the ignition coil bracket studs (720).
3. Remove the ignition coil and bracket assembly (719).

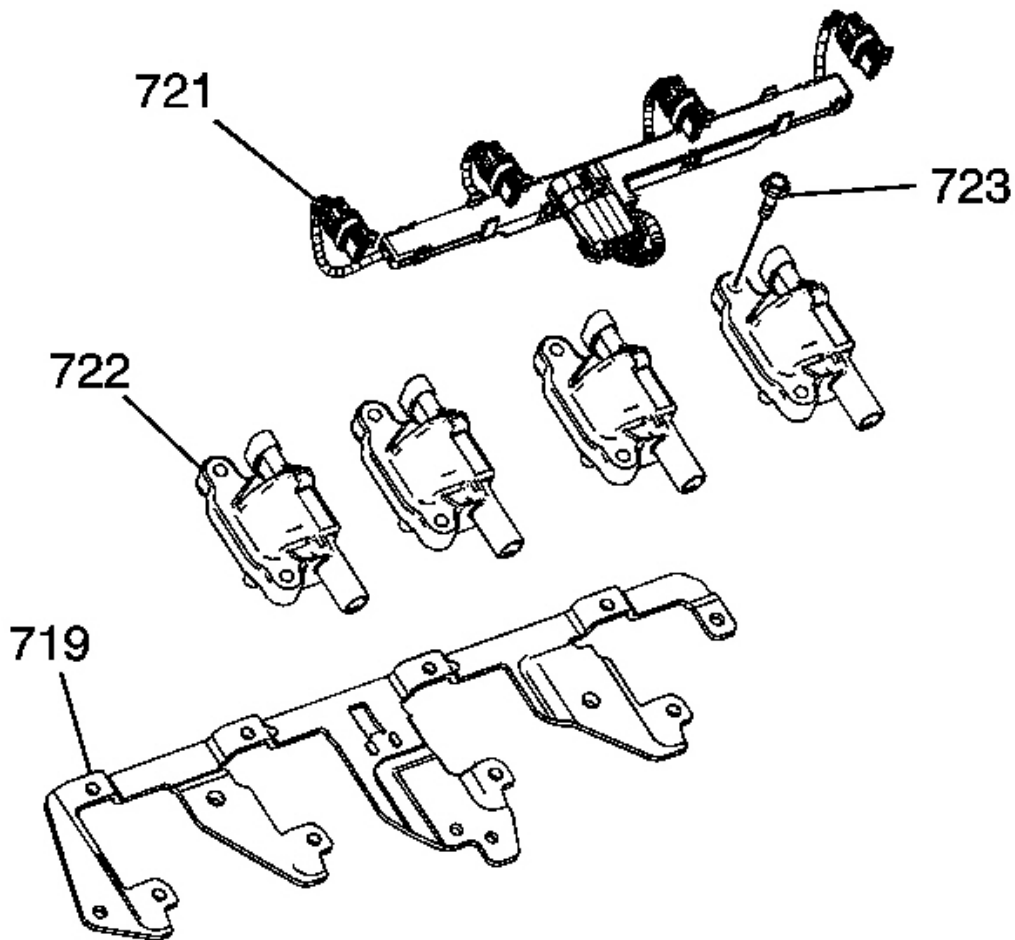


Fig. 328: View Of Bracket, Bolts, Coils & Wire Harness
Courtesy of GENERAL MOTORS CORP.

4. Disconnect the ignition coil electrical connectors.
5. Remove the bolts (723), coils (722) and wire harness (721) from the bracket (719), as required.

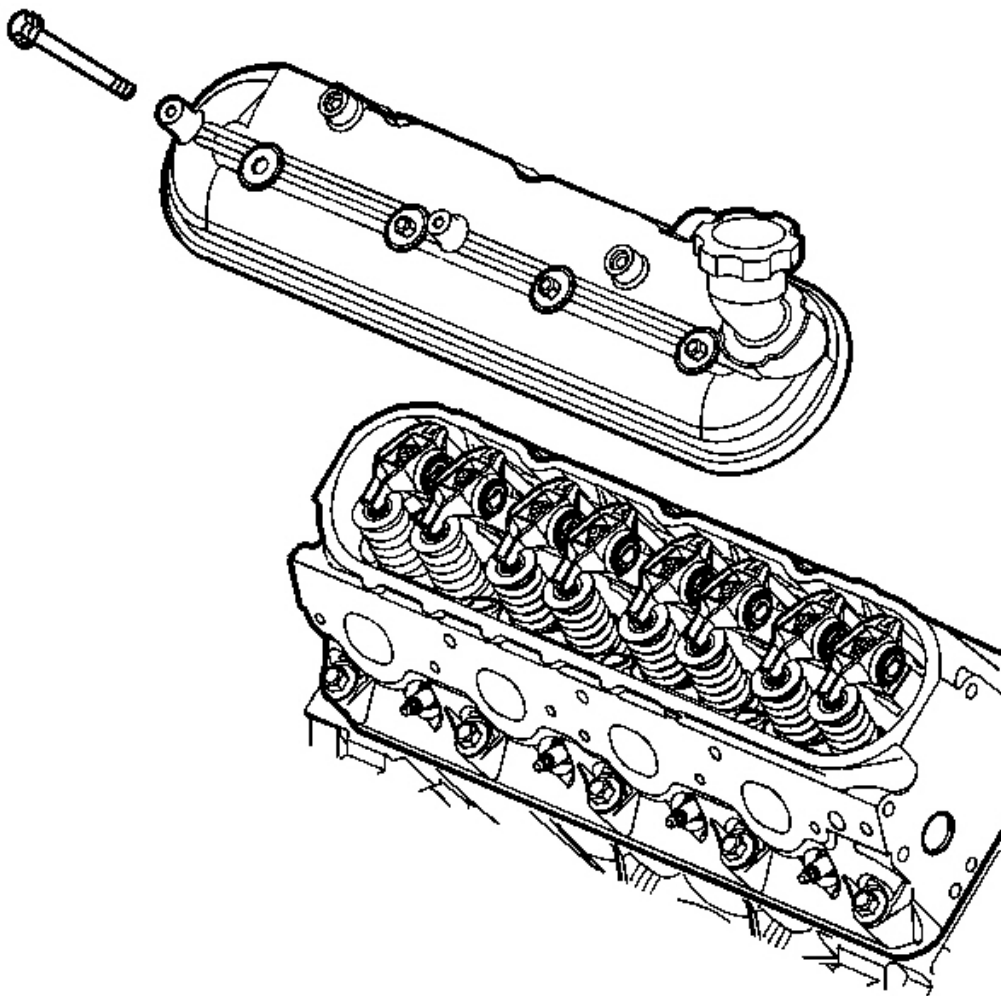


Fig. 329: View Of Valve Rocker Arm Cover & Bolts (Right)
Courtesy of GENERAL MOTORS CORP.

6. Remove the valve rocker arm cover bolts and cover.

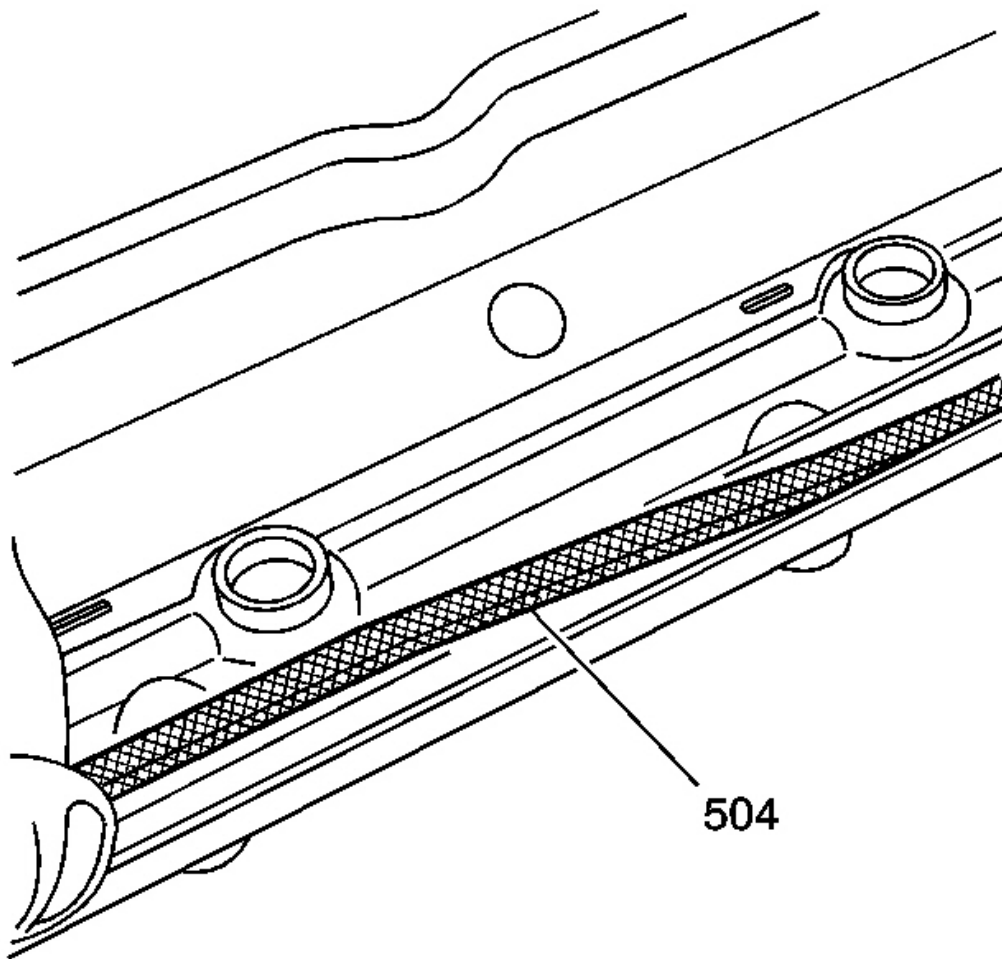


Fig. 330: View Of Valve Rocker Arm Cover Gasket
Courtesy of GENERAL MOTORS CORP.

7. Remove the gasket (504) from the cover.

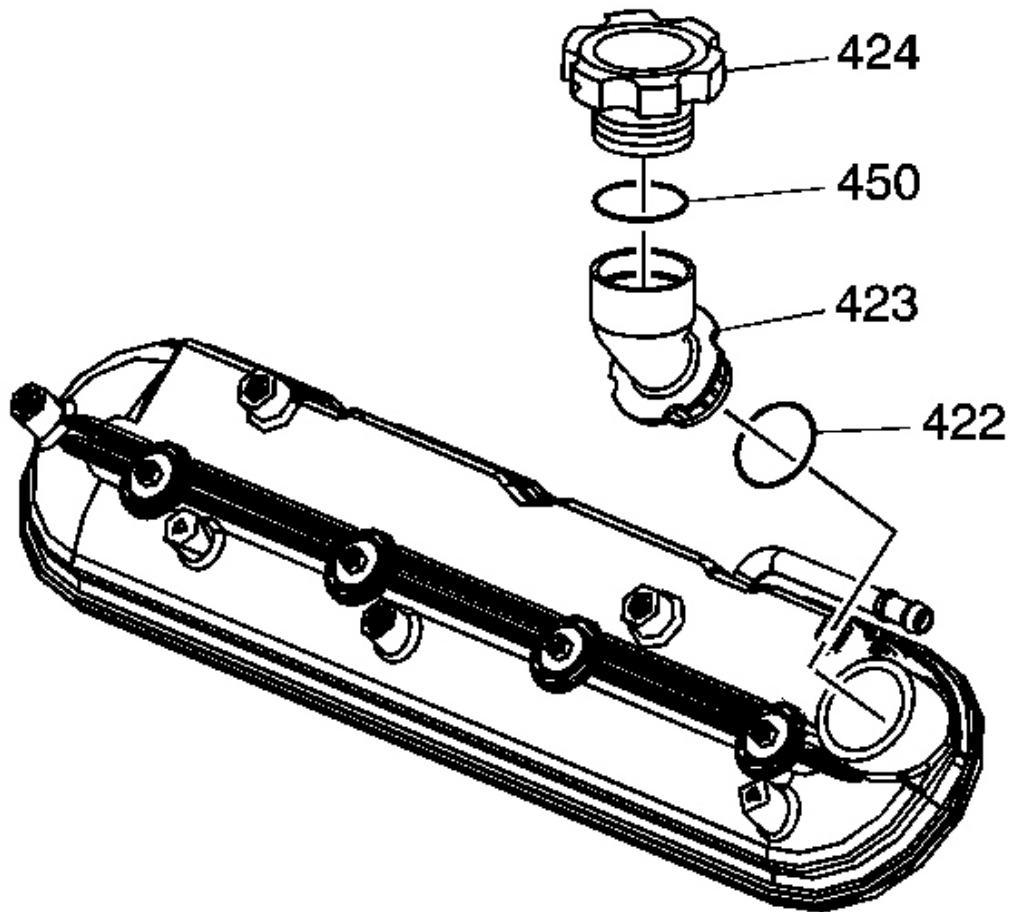


Fig. 331: Identifying Oil Fill Cap & Oil Fill Tube
Courtesy of GENERAL MOTORS CORP.

8. Remove the oil fill cap (424) from the oil fill tube (423).
9. Remove the oil fill tube, as required.
10. Discard the oil fill tube.

VALVE ROCKER ARM AND PUSH ROD REMOVAL

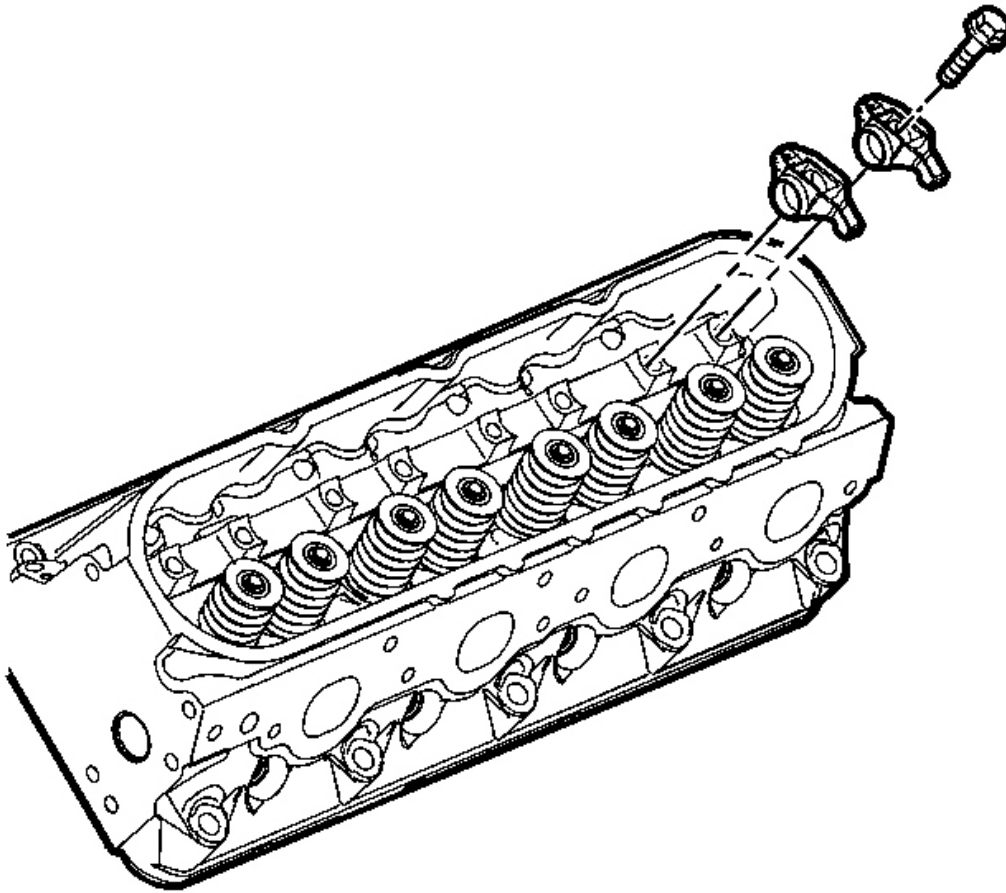


Fig. 332: View Of Rocker Arms & Bolts
Courtesy of GENERAL MOTORS CORP.

IMPORTANT: Place the valve rocker arms, valve pushrods and pivot support, in a rack so they can be installed in the same location from which they were removed.

1. Remove the valve rocker arm bolts.
2. Remove the valve rocker arms.

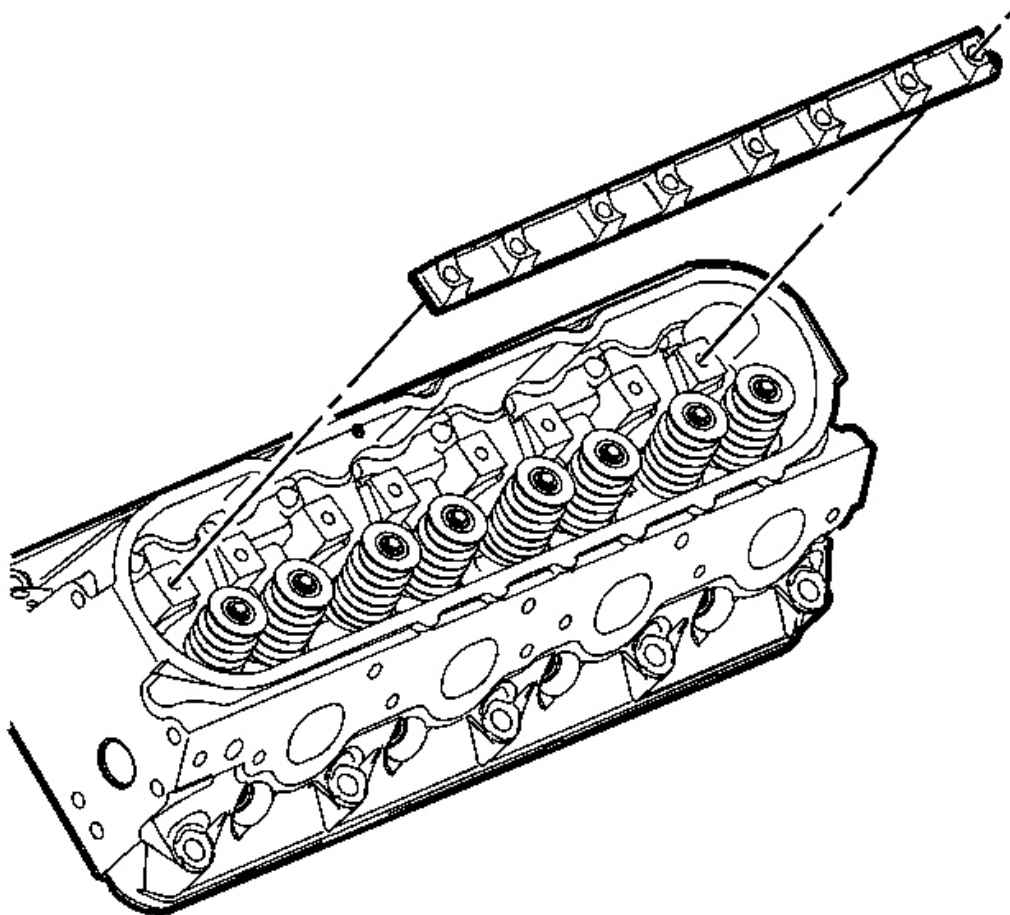


Fig. 333: View Of Valve Rocker Arm Pivot Support
Courtesy of GENERAL MOTORS CORP.

3. Remove the valve rocker arm pivot support.

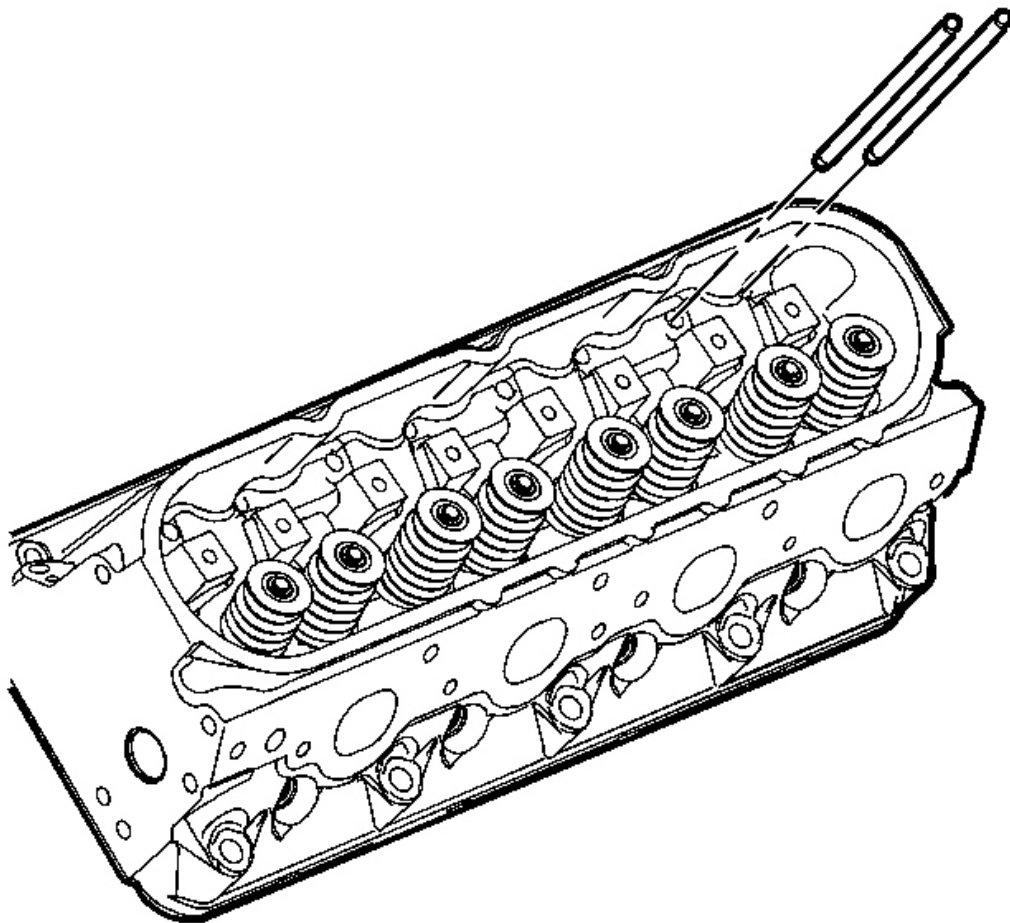


Fig. 334: View Of Pushrods

Courtesy of GENERAL MOTORS CORP.

4. Remove the pushrods.

CYLINDER HEAD REMOVAL - LEFT SIDE

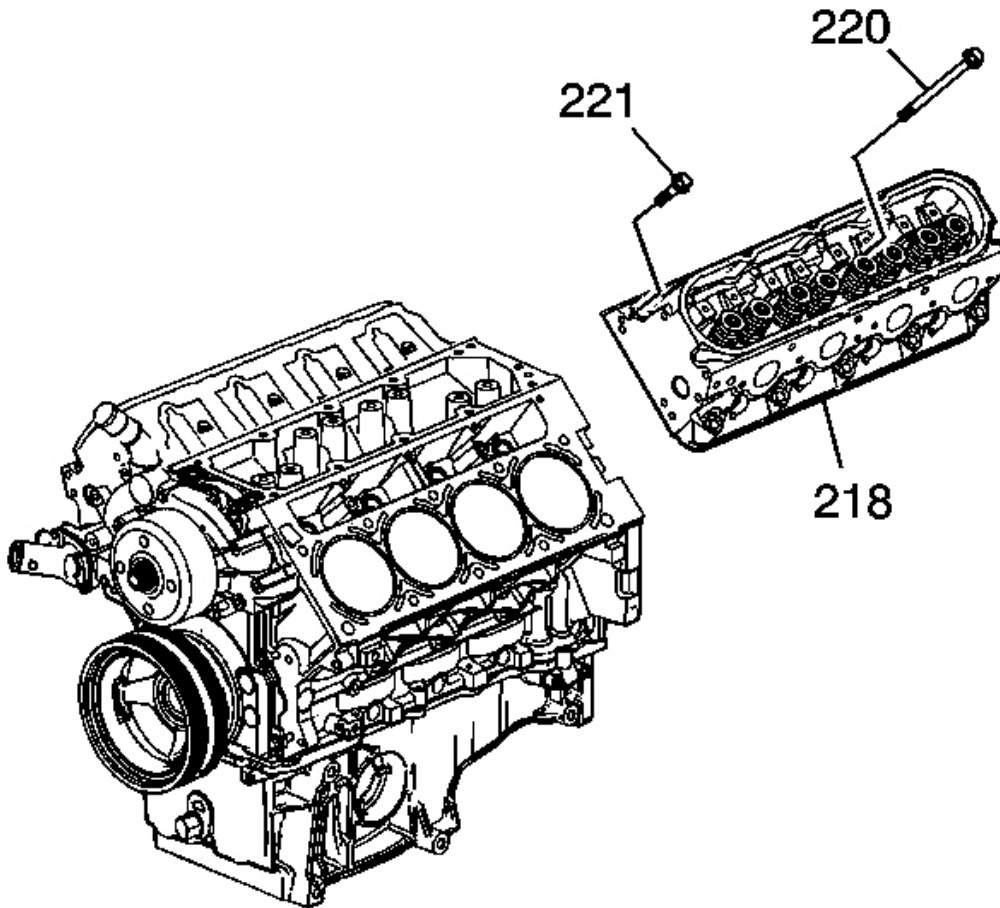


Fig. 335: View Of Left Cylinder Head
Courtesy of GENERAL MOTORS CORP.

IMPORTANT: The cylinder head bolts are of a torque-to-yield design and are NOT to be used again. Install NEW cylinder head bolts during assembly.

1. Remove the cylinder head bolts (220, 221).

NOTE: After removal, place the cylinder head on 2 wood blocks in order to prevent damage to the sealing surfaces.

2. Remove the cylinder head (218).

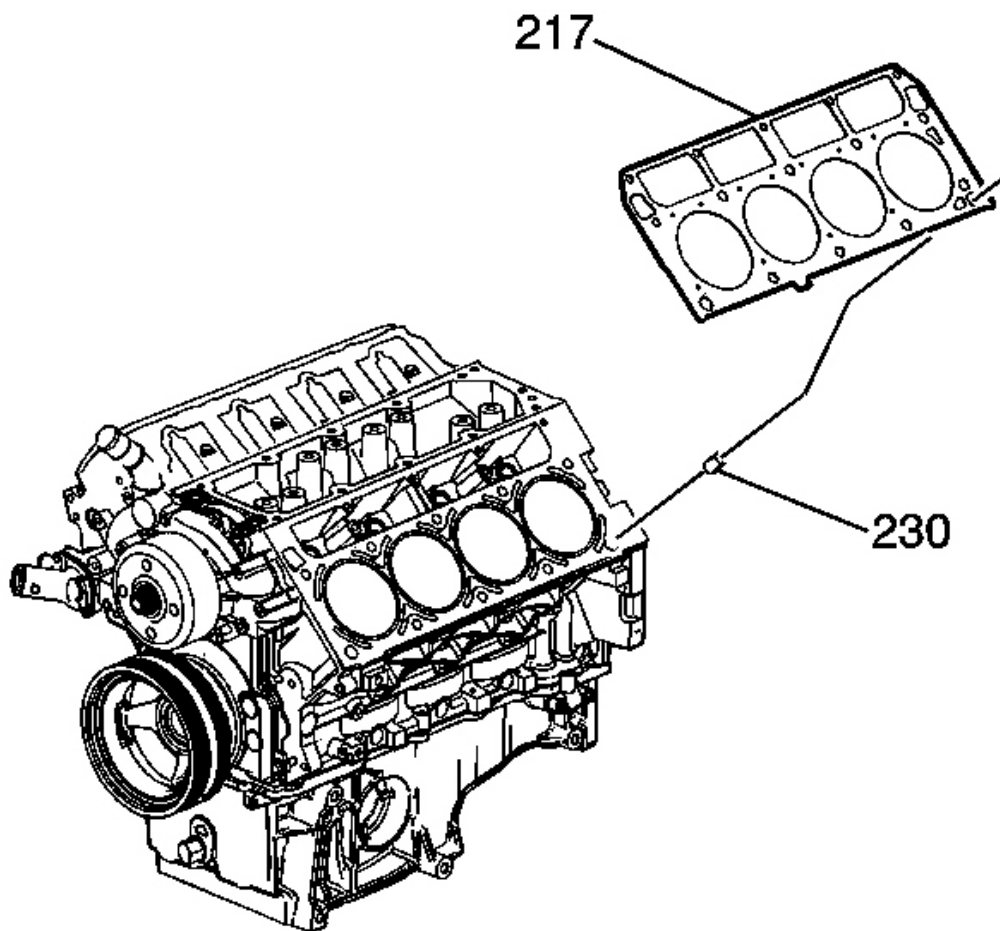


Fig. 336: Identifying Left Cylinder Head Gasket
Courtesy of GENERAL MOTORS CORP.

3. Remove the gasket (217) and locating pins (230).
4. Discard the gasket and cylinder head bolts.

CYLINDER HEAD REMOVAL - RIGHT SIDE

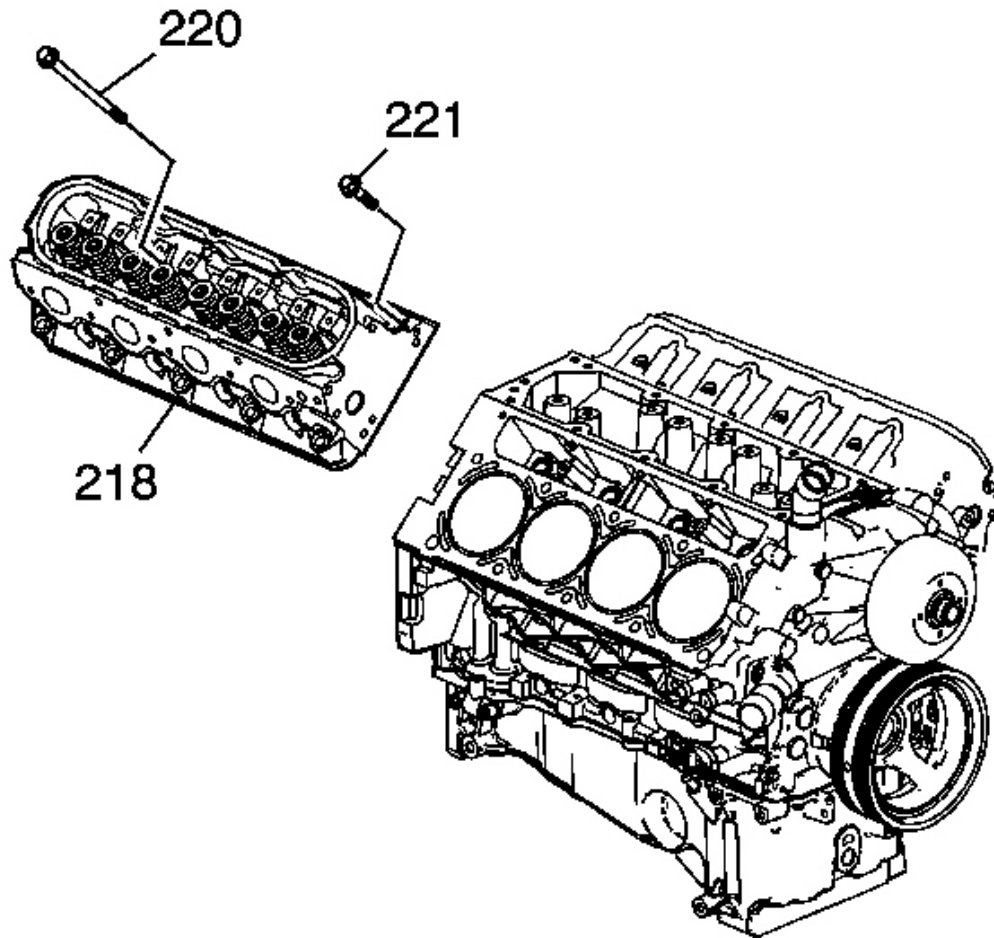


Fig. 337: View Of Right Cylinder Head
Courtesy of GENERAL MOTORS CORP.

IMPORTANT: The cylinder head bolts are of a torque-to-yield design and are NOT to be used again. Install NEW cylinder head bolts during assembly.

1. Remove the cylinder head bolts (220, 221).

NOTE: After removal, place the cylinder head on 2 wood blocks in order to prevent damage to the sealing surfaces.

2. Remove the cylinder head (218).

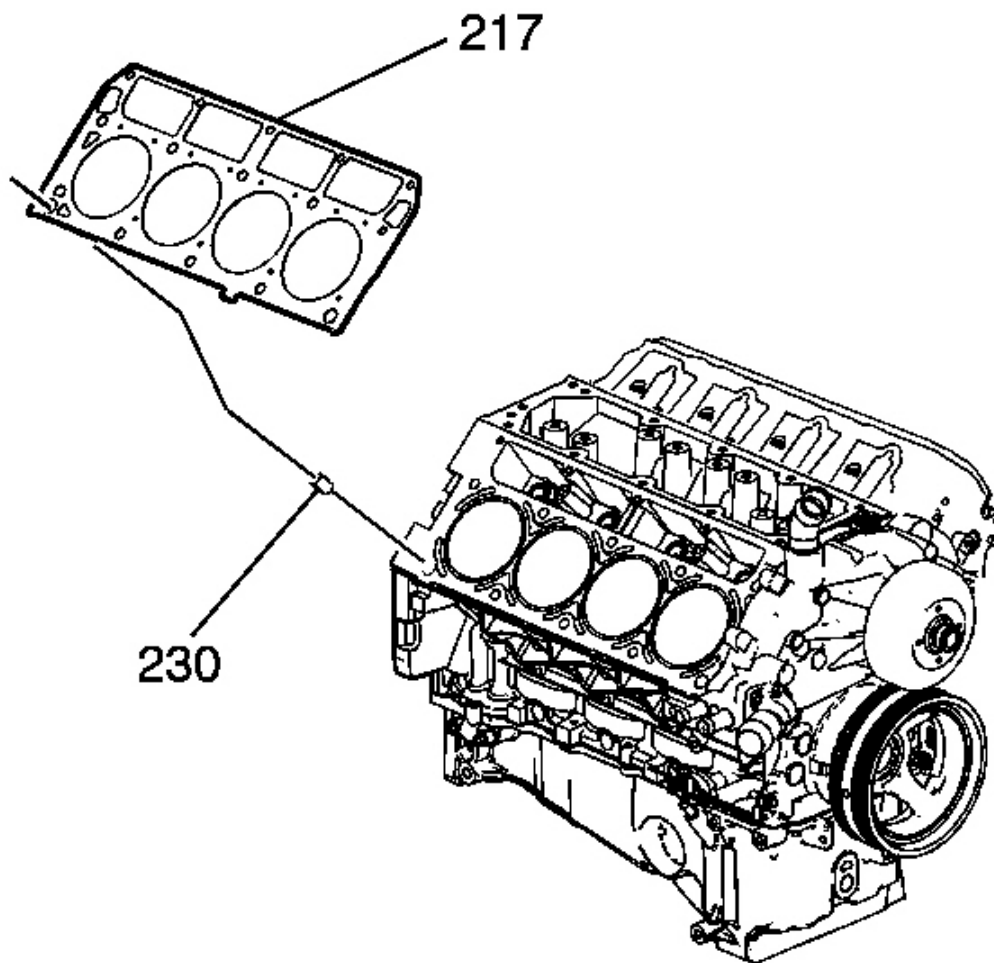


Fig. 338: Identifying Right Cylinder Head Gasket
Courtesy of GENERAL MOTORS CORP.

3. Remove the gasket (217) and locating pins (230).
4. Discard the gasket and cylinder head bolts.

VALVE LIFTER REMOVAL

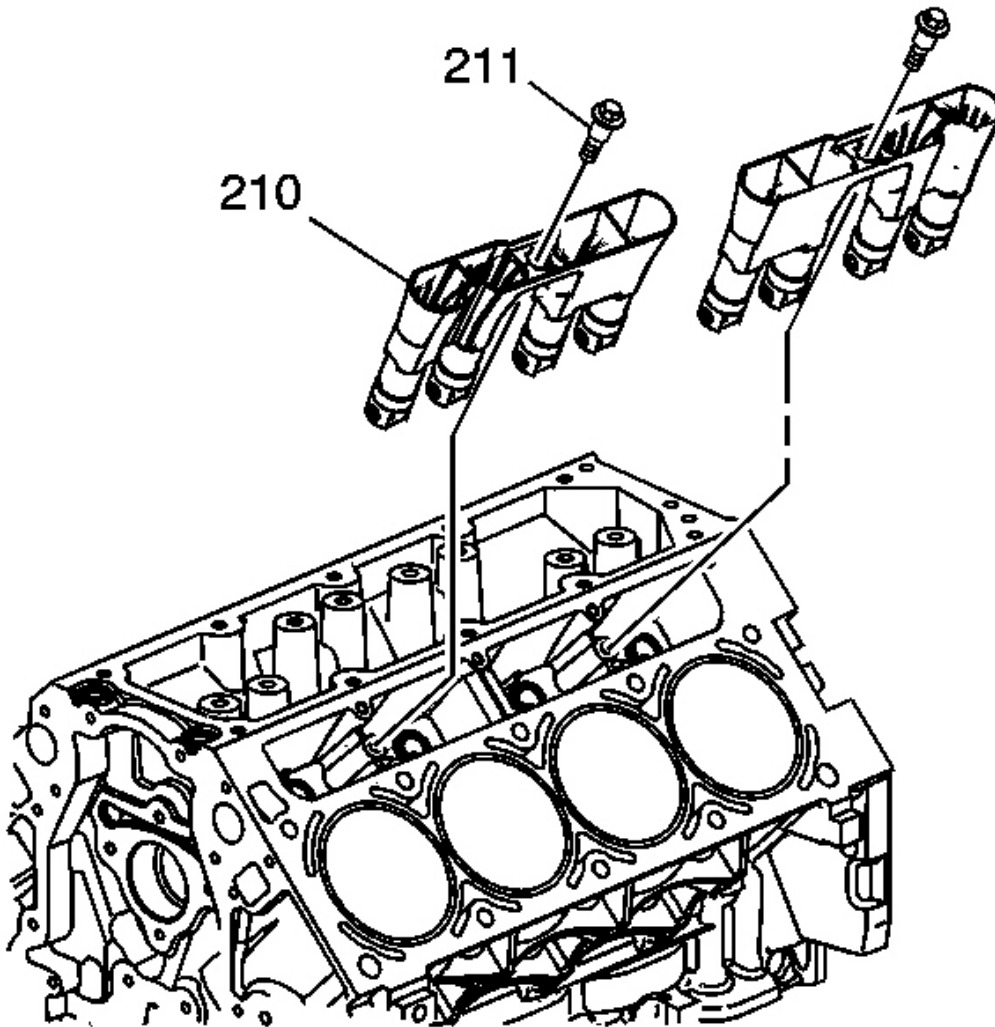


Fig. 339: View Of Valve Lifter Guides, Cylinder Head & Bolts
Courtesy of GENERAL MOTORS CORP.

1. Remove the guide bolts (211).
2. Remove the guides (210) with lifters.

Note the installed position of the guides. The notched area of the guide is to align with the locating tab on the block.

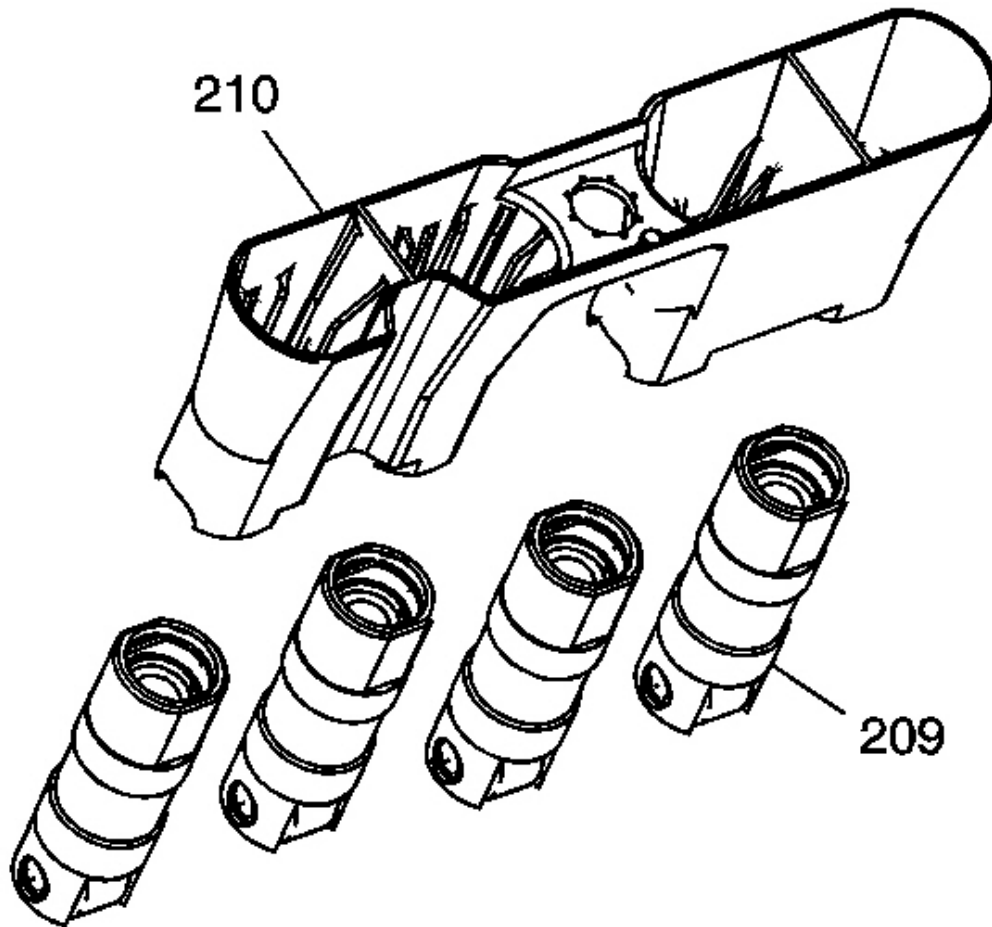


Fig. 340: View Of Valve Lifter Guides & Bolts
Courtesy of GENERAL MOTORS CORP.

3. Remove the valve lifters (209) from the guide (210).
4. Organize or mark the components so they can be installed in the same location from which they were removed. Refer to **Separating Parts** .

OIL FILTER AND ADAPTER REMOVAL

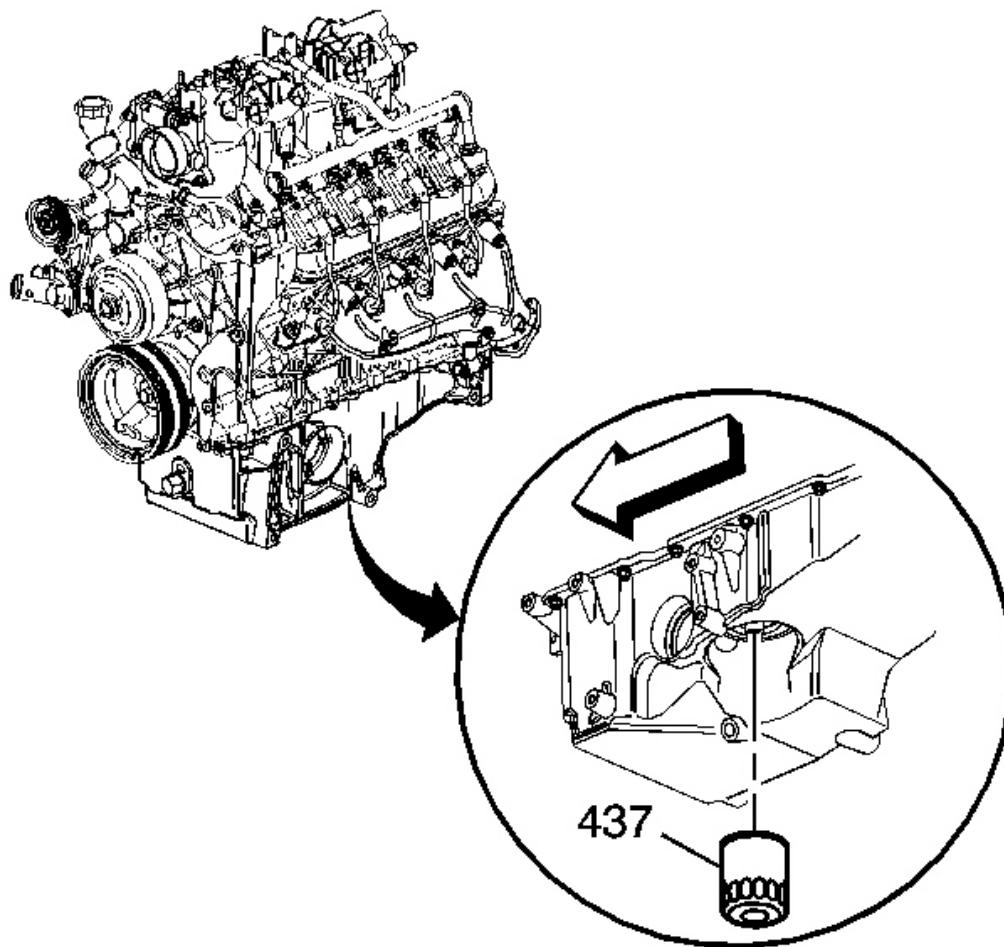


Fig. 341: Identifying Engine Oil Filter
Courtesy of GENERAL MOTORS CORP.

1. Remove the oil filter (437).

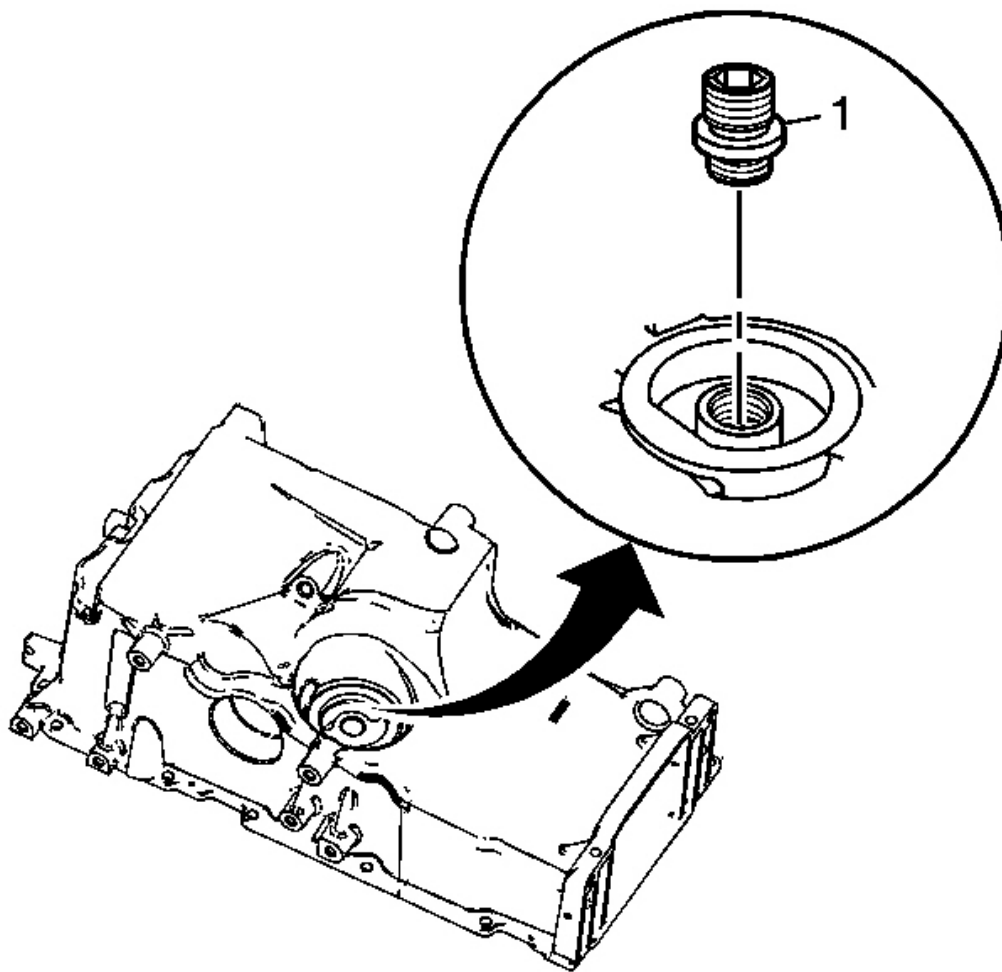


Fig. 342: View Of Oil Filter Fitting
Courtesy of GENERAL MOTORS CORP.

2. Remove the oil filter fitting (1), as required.

OIL PAN REMOVAL

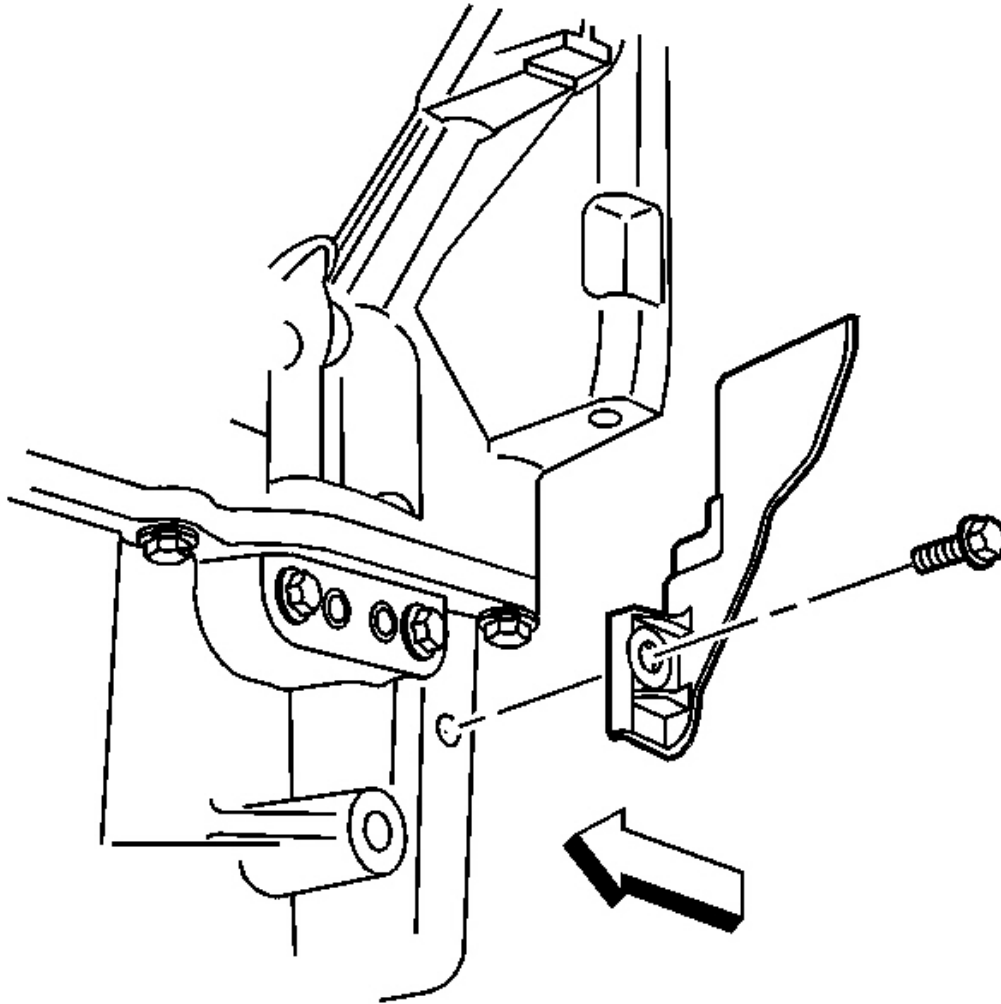


Fig. 343: View Of Left Closeout Cover & Bolt
Courtesy of GENERAL MOTORS CORP.

IMPORTANT:

- The original oil pan gasket is retained and aligned to the oil pan by rivets. When installing a new gasket, it is not necessary to install new oil pan gasket rivets.
- **DO NOT** use the oil pan gasket again. When installing the oil pan, install a **NEW** oil pan gasket.

1. Remove the left closeout cover and bolt.

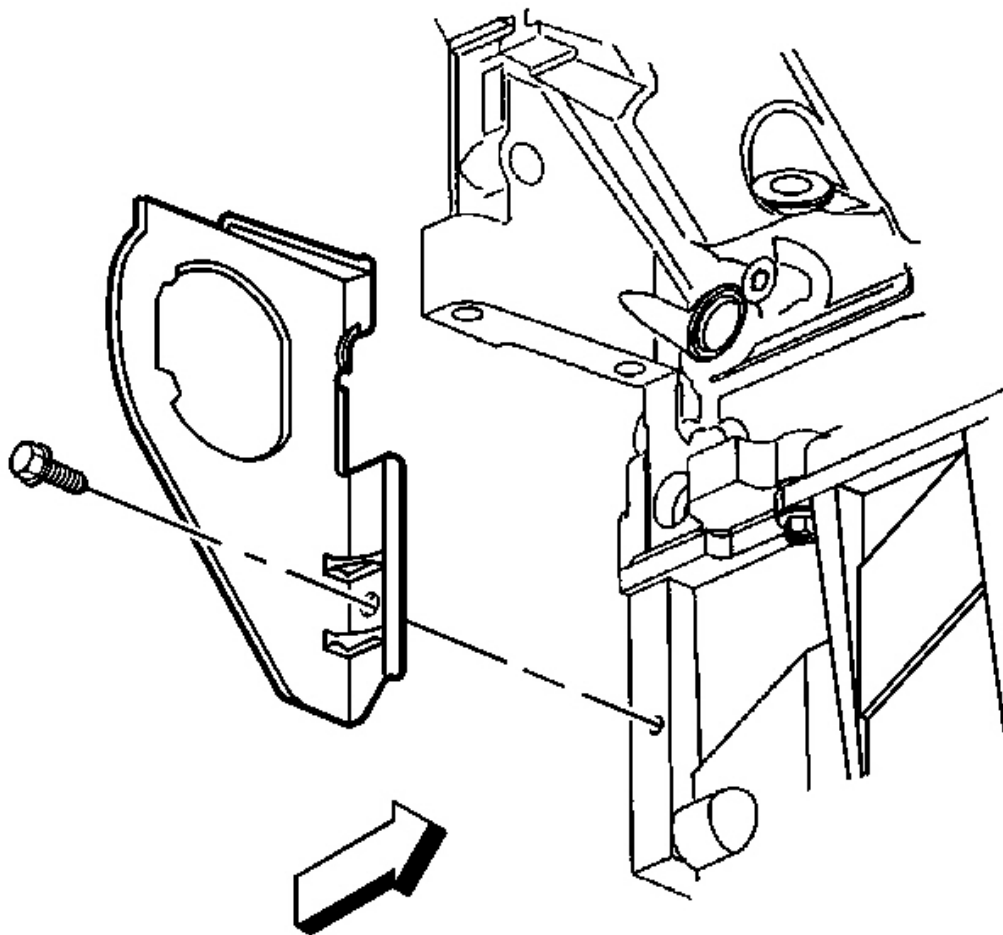


Fig. 344: View Of Right Transmission Closeout Cover & Bolt
Courtesy of GENERAL MOTORS CORP.

2. Remove the right closeout cover and bolt.

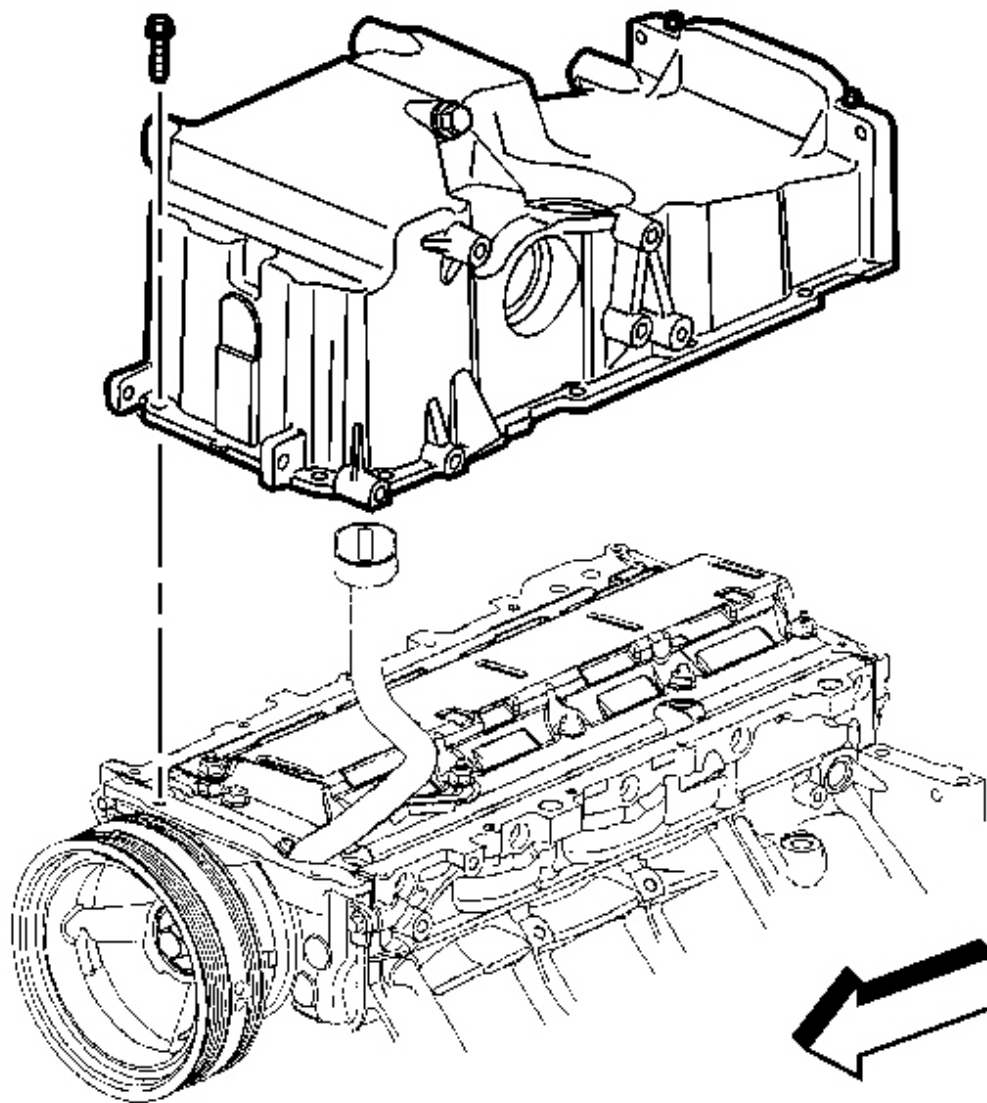


Fig. 345: View Of Oil Pan & Bolts
Courtesy of GENERAL MOTORS CORP.

3. Remove the oil pan bolts.
4. Remove the oil pan.

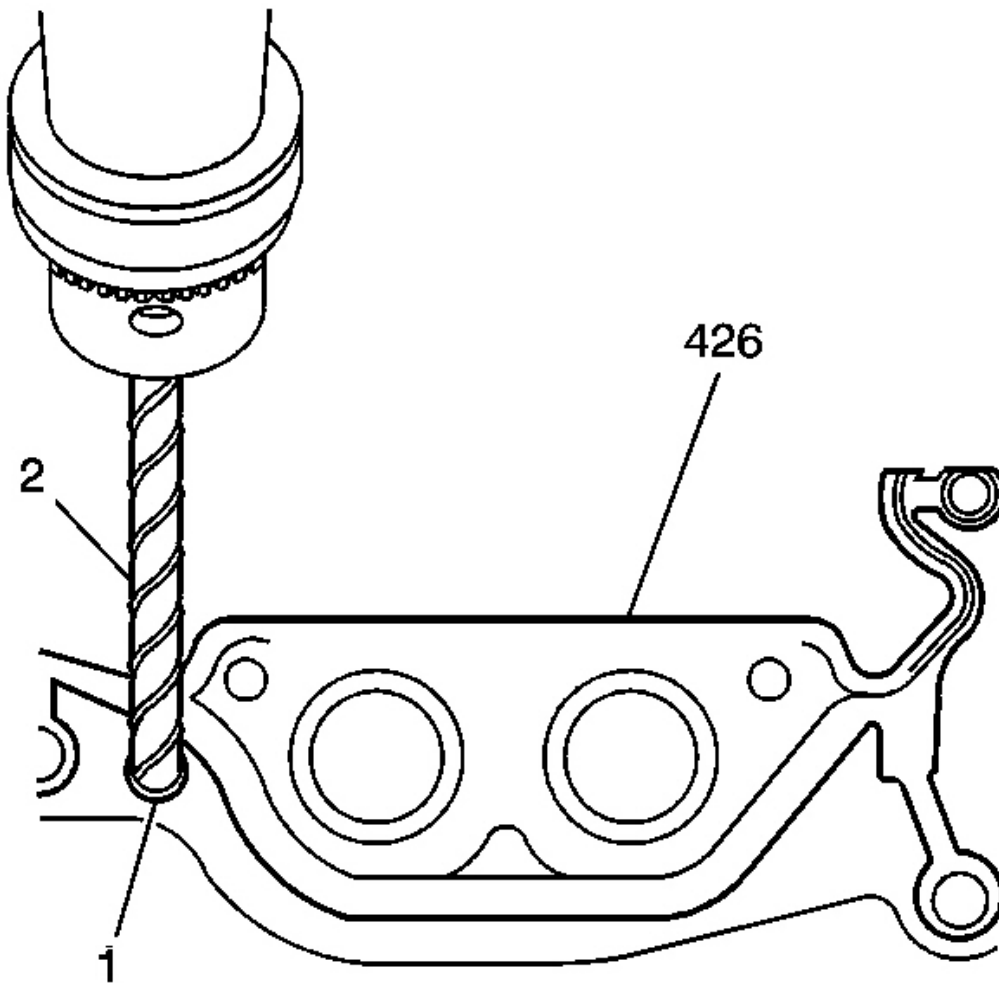


Fig. 346: View Of Oil Pan Gasket Retaining Rivets & Drill
Courtesy of GENERAL MOTORS CORP.

IMPORTANT:

- **DO NOT** allow foreign material to enter the oil passages of the oil pan. Cap or cover the openings, as required.
- Use care not to gouge, score or damage the oil pan sealing surface.

5. Drill (2) out the oil pan gasket retaining rivets (1), if required.
6. Remove the gasket (426) from the pan.
7. Discard the gasket and rivets.
8. Remove the filter tube, baffle and other internal components, as required. Refer to **Oil Pan Cleaning and**

Inspection.

ENGINE FRONT COVER REMOVAL

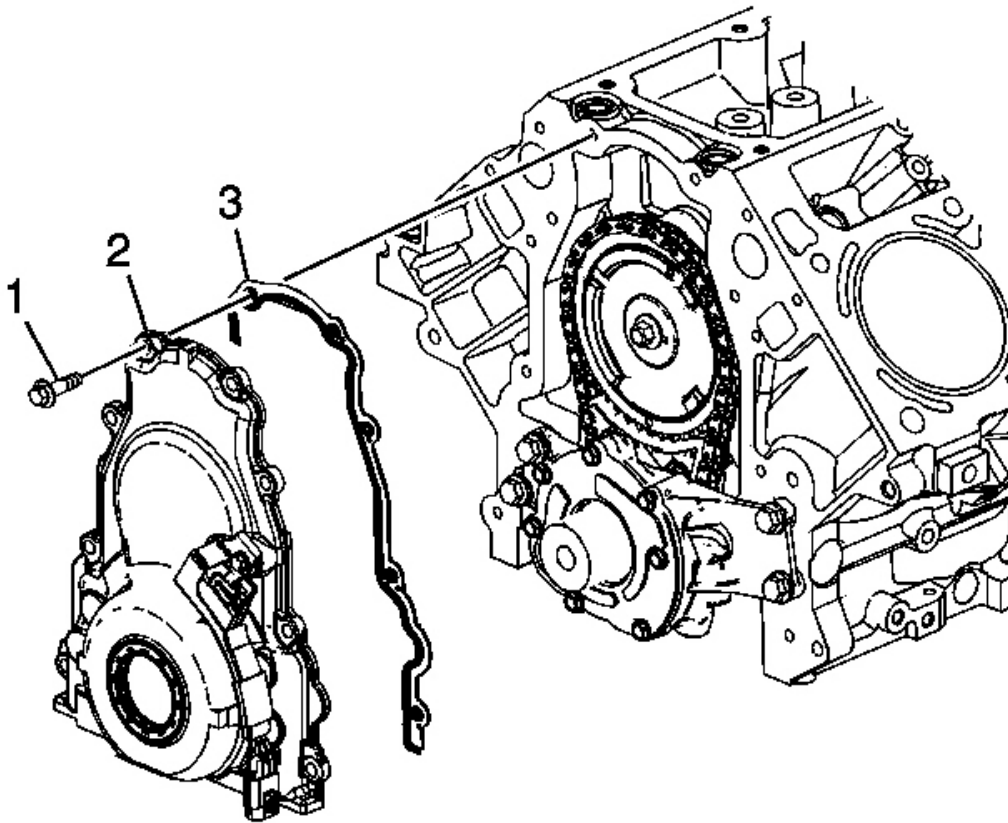


Fig. 347: View Of Front Cover & Gasket
Courtesy of GENERAL MOTORS CORP.

1. Remove the front cover bolts (1).
2. Remove the front cover (2) and gasket (3).
3. Discard the front cover gasket.

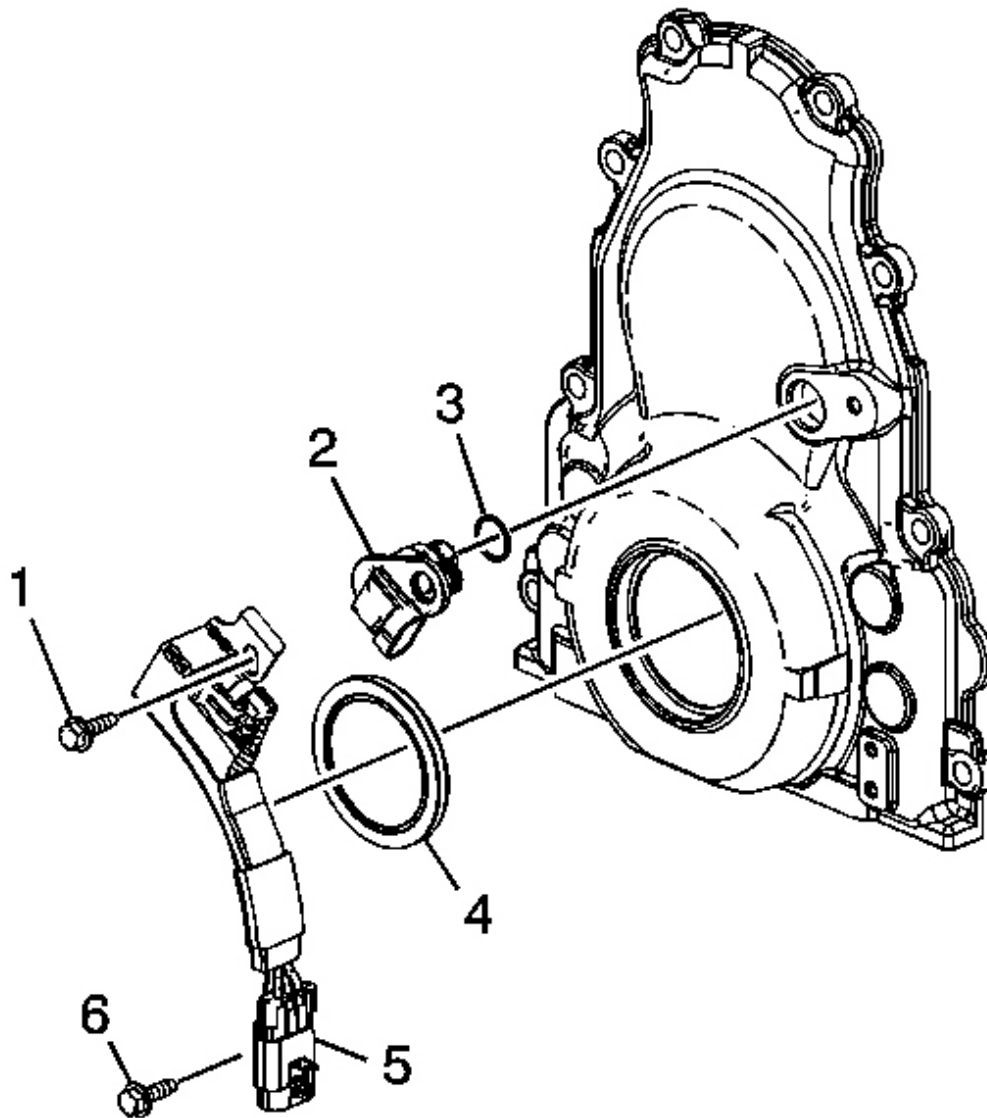


Fig. 348: View Of Front Cover, Oil Seal, Camshaft Position Sensor, Bracket & O Ring
Courtesy of GENERAL MOTORS CORP.

4. Remove the oil seal (4).
5. Remove the bolts (1, 6), camshaft position (CMP) sensor (2) and wire harness (5).
6. Remove the O-ring (3) from the sensor, as required.

CRANKSHAFT REAR OIL SEAL HOUSING REMOVAL

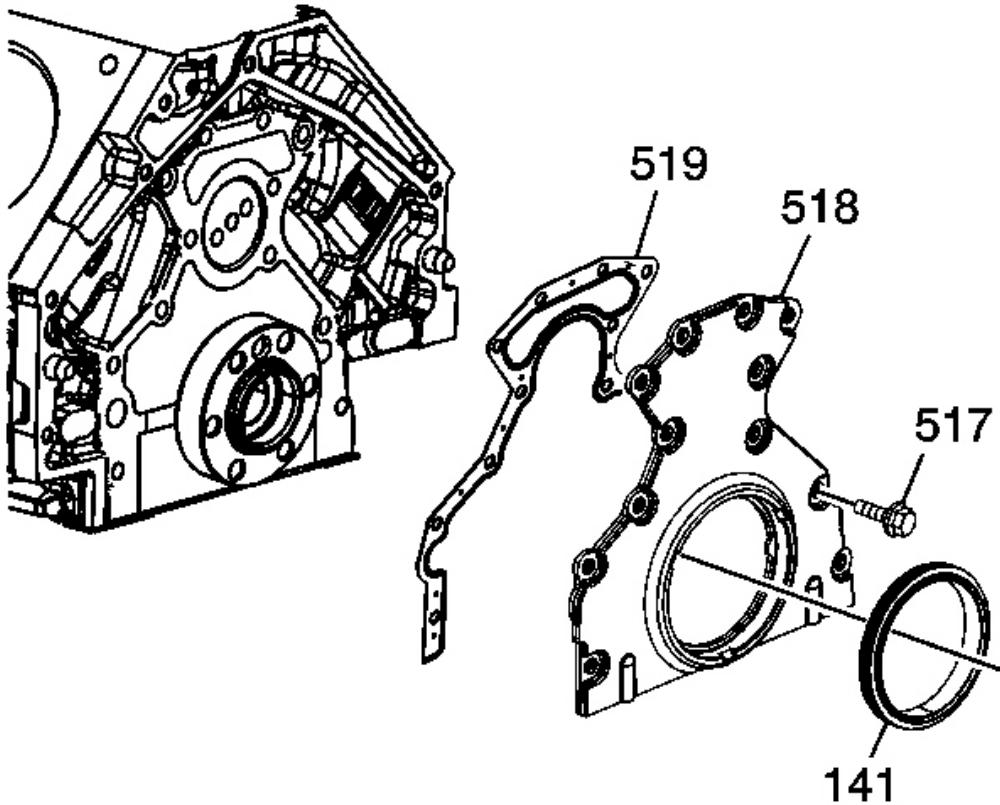


Fig. 349: View of Rear Housing, Gasket & Seal
Courtesy of GENERAL MOTORS CORP.

1. Remove the rear oil seal housing bolts (517).
2. Remove the housing (518) and gasket (519).
3. Remove the rear oil seal (141).

OIL PUMP, SCREEN AND CRANKSHAFT OIL DEFLECTOR REMOVAL

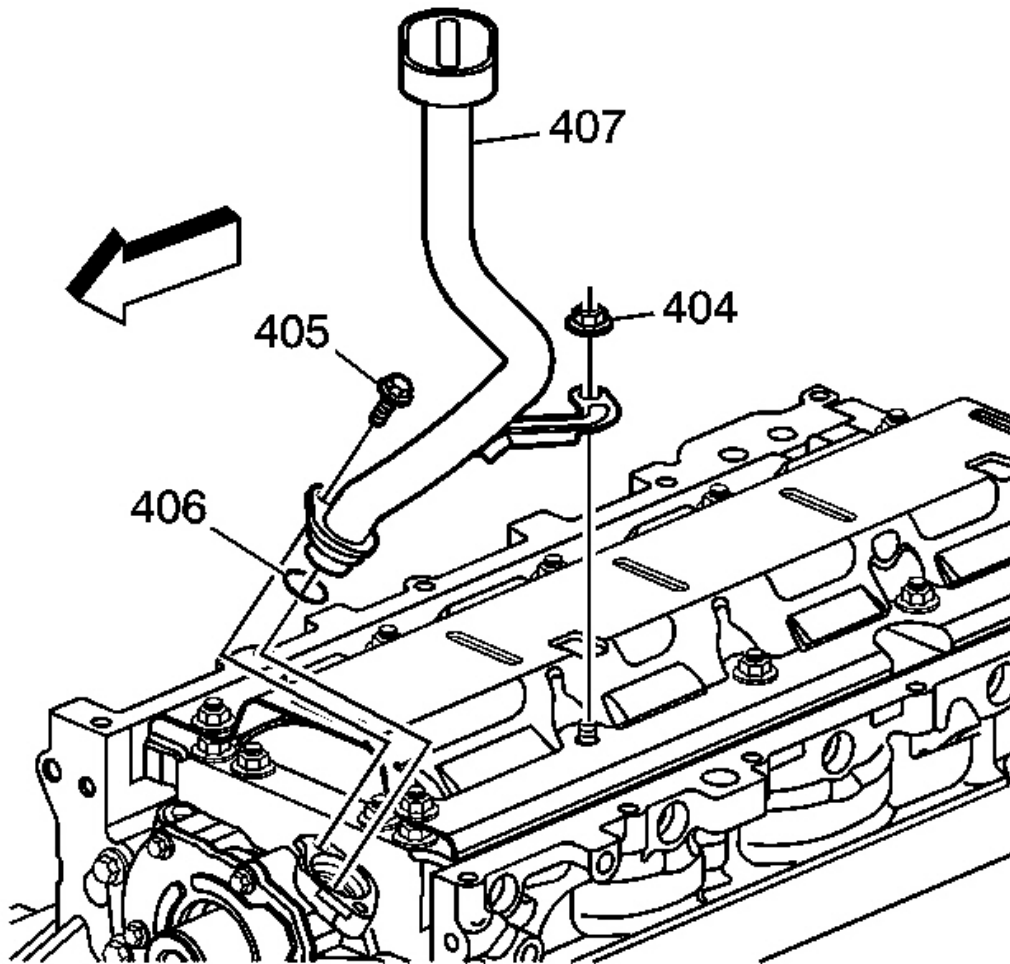


Fig. 350: View Of Oil Pump Screen, Bolt, Nuts & O-Ring Seal
Courtesy of GENERAL MOTORS CORP.

1. Remove the oil pump screen bolt (405) and nut (404).
2. Remove the oil pump screen (407) with O-ring seal.
3. Remove the O-ring seal (406) from the pump screen.
4. Discard the O-ring seal.

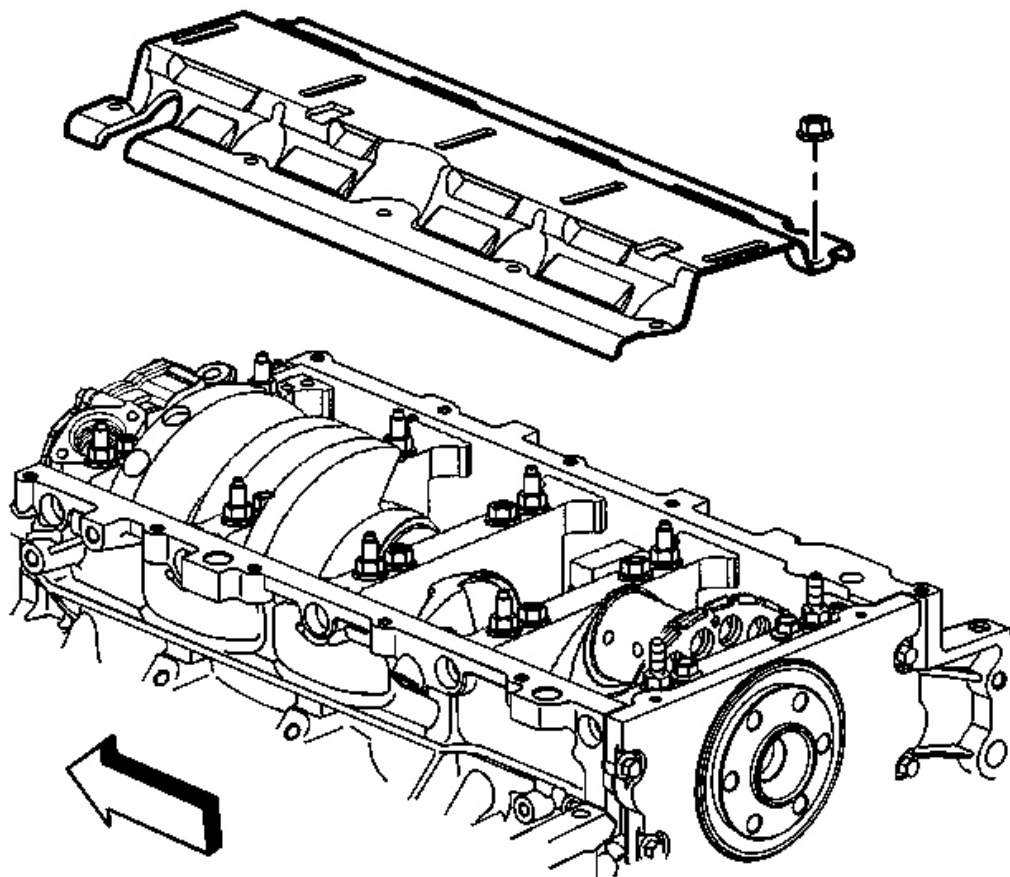


Fig. 351: View Of Crankshaft Oil Deflector
Courtesy of GENERAL MOTORS CORP.

5. Remove the crankshaft oil deflector nuts.
6. Remove the crankshaft oil deflector.

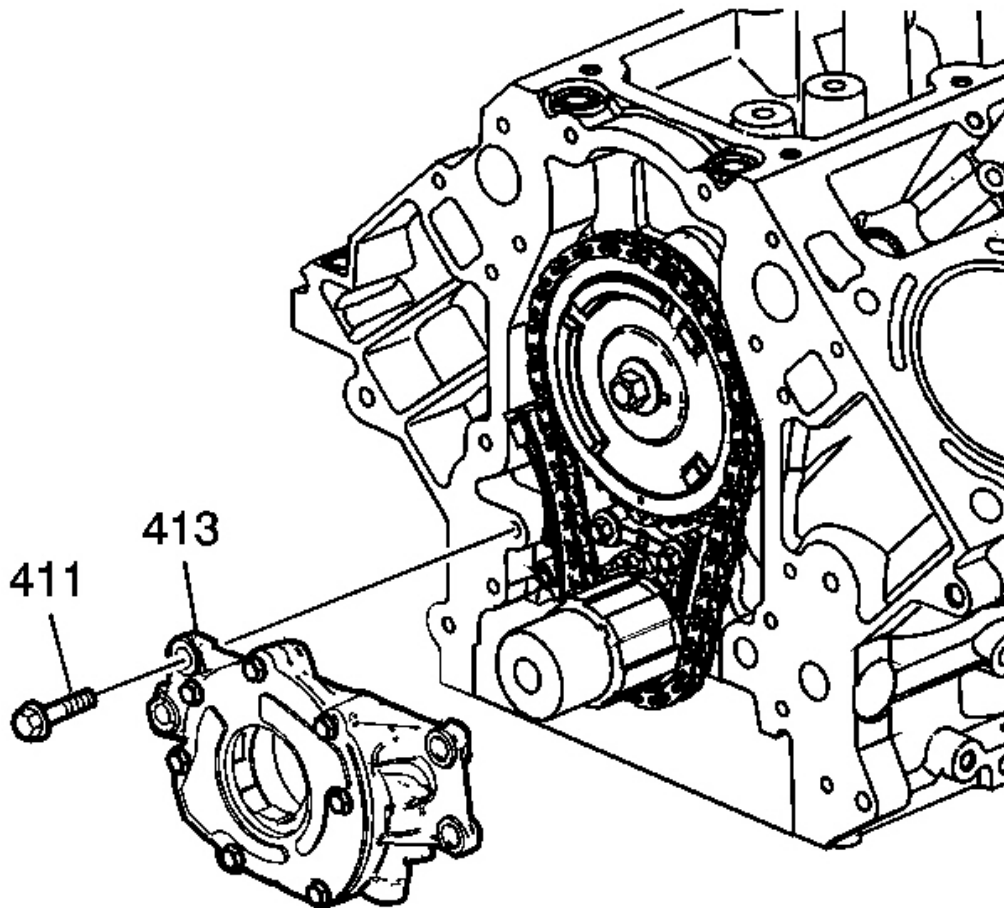


Fig. 352: View Of Oil Pump And Bolts
Courtesy of GENERAL MOTORS CORP.

7. Remove the oil pump bolts (411).

IMPORTANT: Do not allow dirt or debris to enter the oil pump assembly. Cap ends, as necessary.

8. Remove the oil pump (413).

TIMING CHAIN AND SPROCKETS REMOVAL

Tools Required

- **J 8433** Two Jaw Puller
- **J 41558** Crankshaft Sprocket Remover
- **J 41816-2** Crankshaft End Protector

Removal Procedure

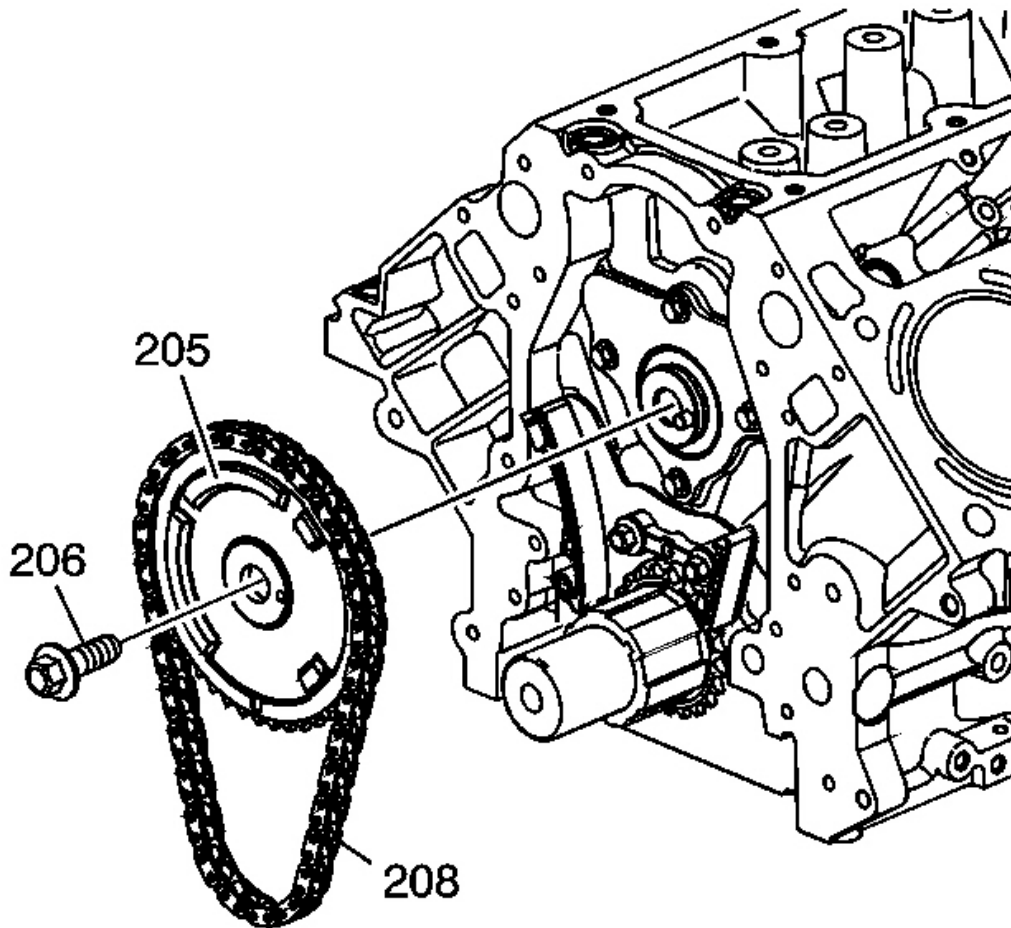


Fig. 353: View Of Camshaft Sprocket, Timing Chain & Sprocket Bolt
Courtesy of GENERAL MOTORS CORP.

NOTE: Do not turn the crankshaft assembly after the timing chain has been removed in order to prevent damage to the piston assemblies or the valves.

1. Remove and discard the camshaft sprocket bolt (206).
2. Remove the camshaft sprocket (205) and timing chain (208).

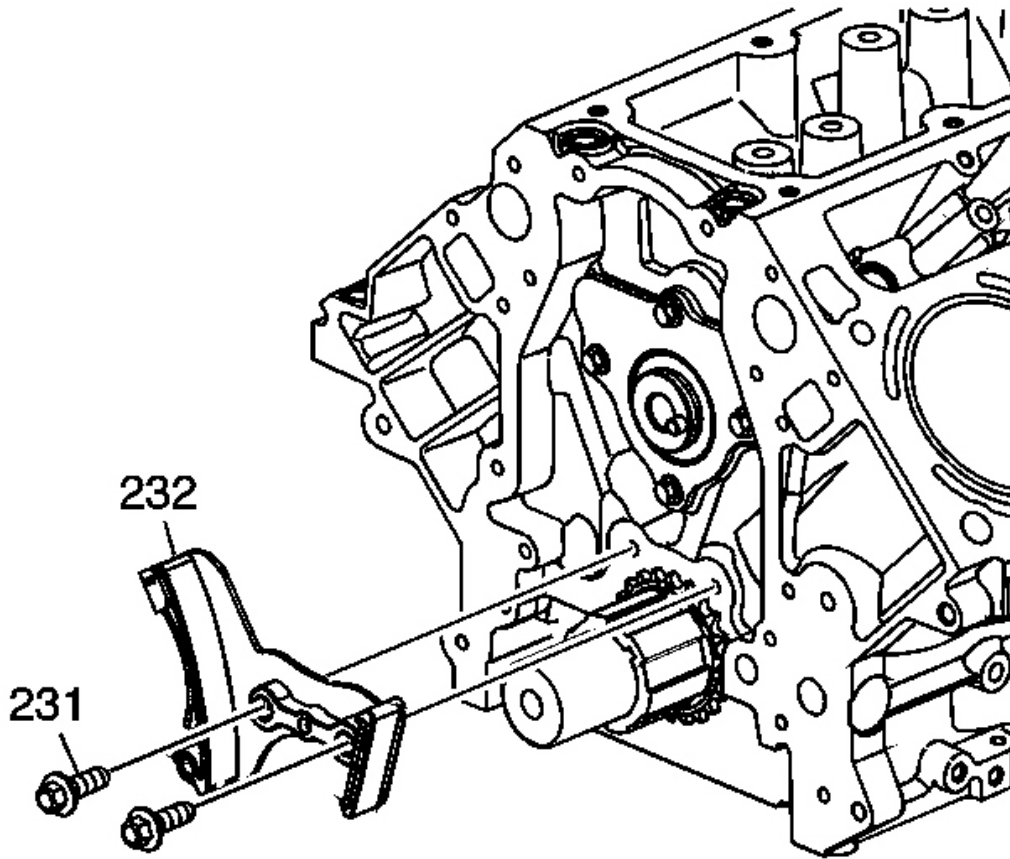


Fig. 354: View Of Timing Chain Tensioner & Bolts
Courtesy of GENERAL MOTORS CORP.

3. Remove the bolts (231) and timing chain tensioner (232).

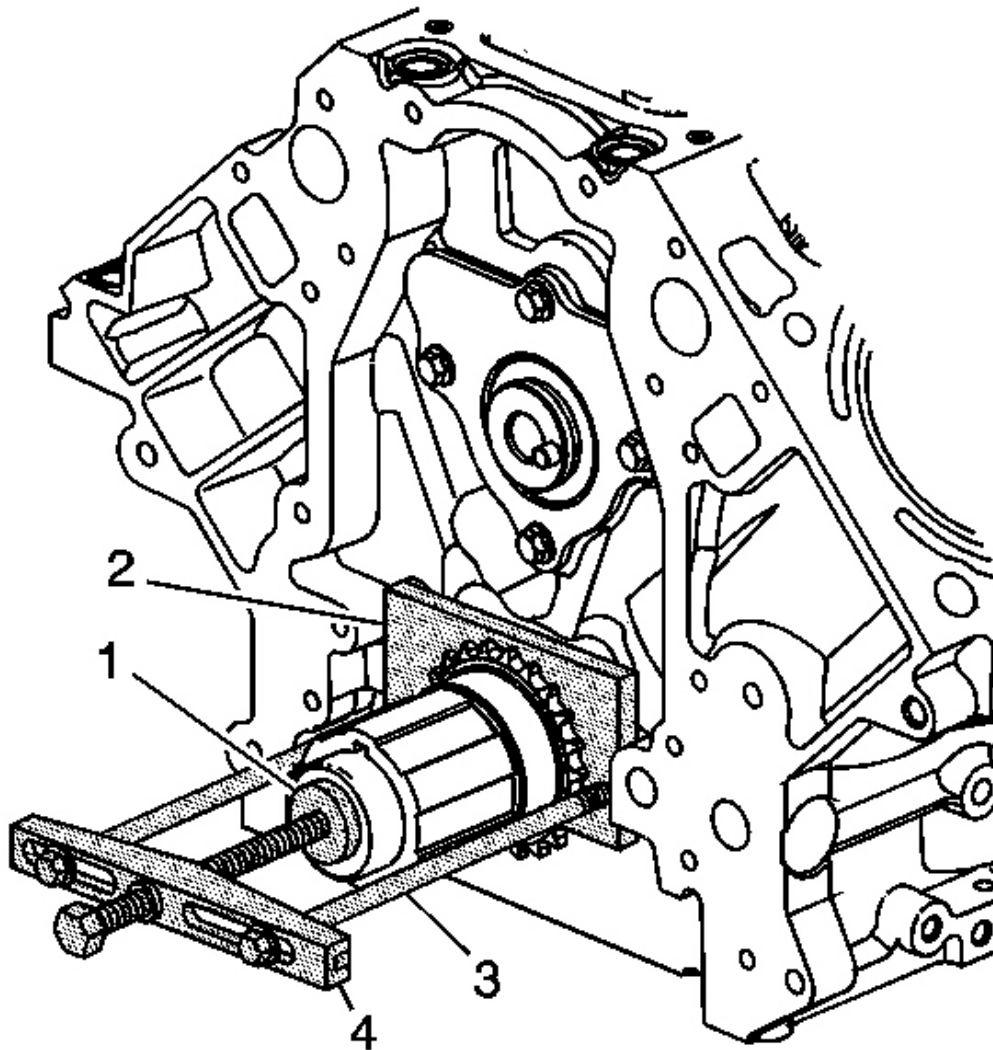


Fig. 355: View Of Crankshaft Sprocket Special Tools
Courtesy of GENERAL MOTORS CORP.

4. Use the **J 41816-2** (1), the **J 41558** (2), bolts (3) and the **J 8433** (4) in order to remove the crankshaft sprocket.

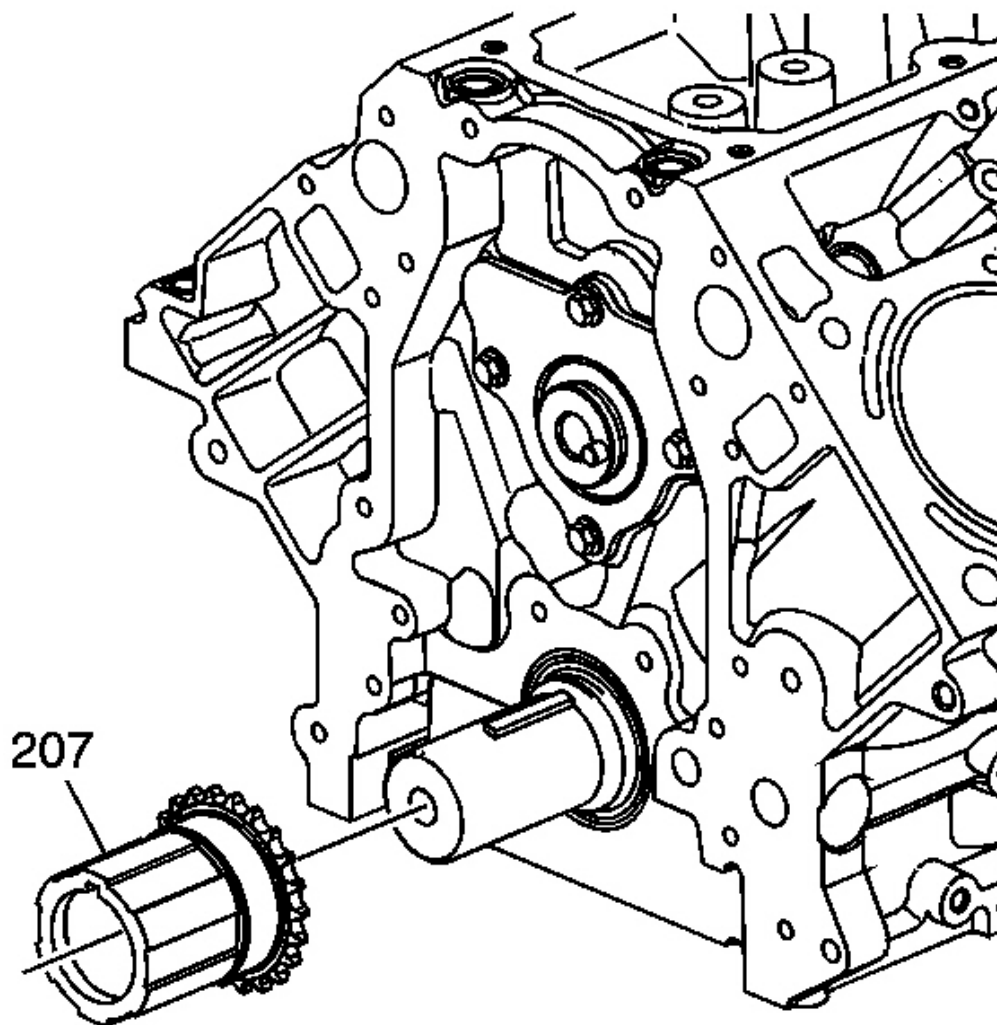


Fig. 356: View Of Crankshaft Sprocket
Courtesy of GENERAL MOTORS CORP.

5. Remove the crankshaft sprocket (207).

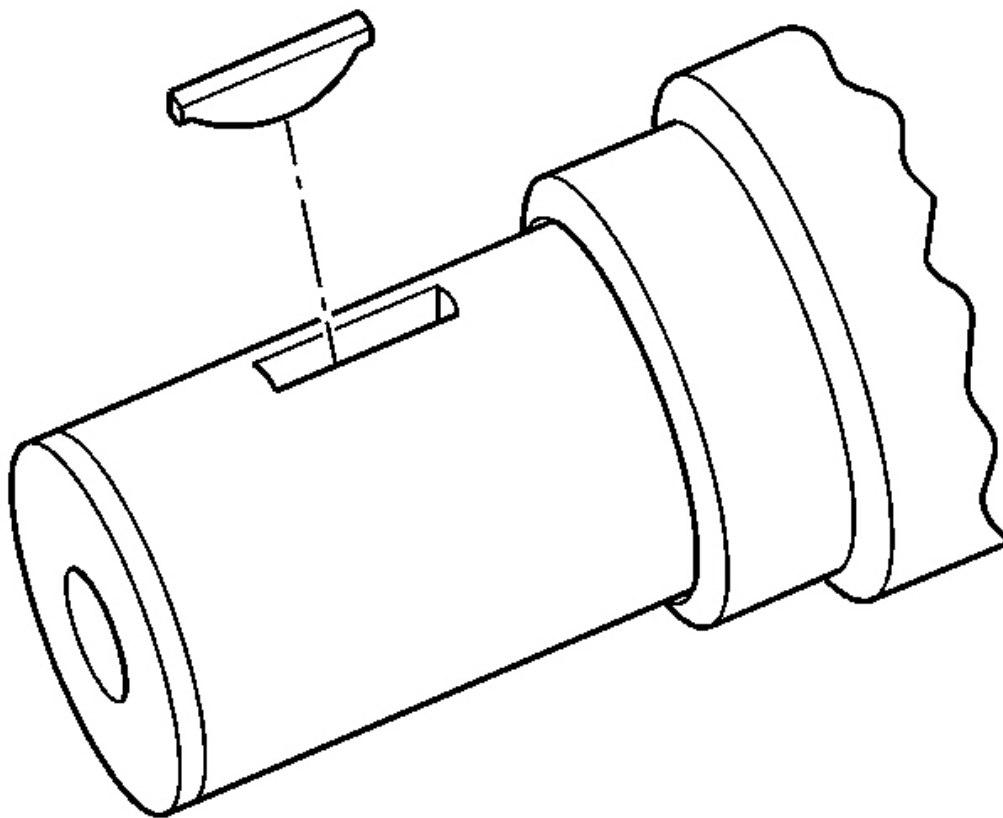


Fig. 357: View Of Crankshaft Key & Keyway
Courtesy of GENERAL MOTORS CORP.

6. Remove the crankshaft sprocket key, as required.

CAMSHAFT REMOVAL

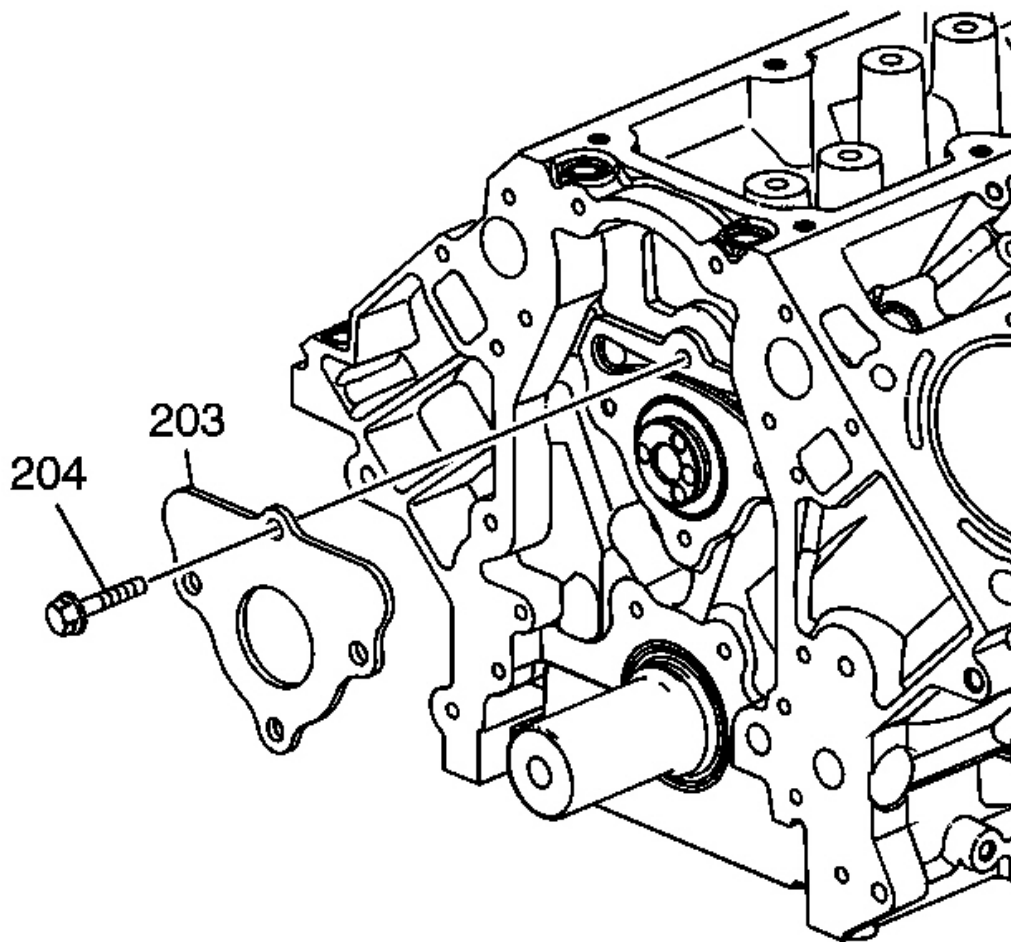


Fig. 358: View Of Camshaft Retainer
Courtesy of GENERAL MOTORS CORP.

1. Remove the camshaft retainer bolts (204) and retainer (203).

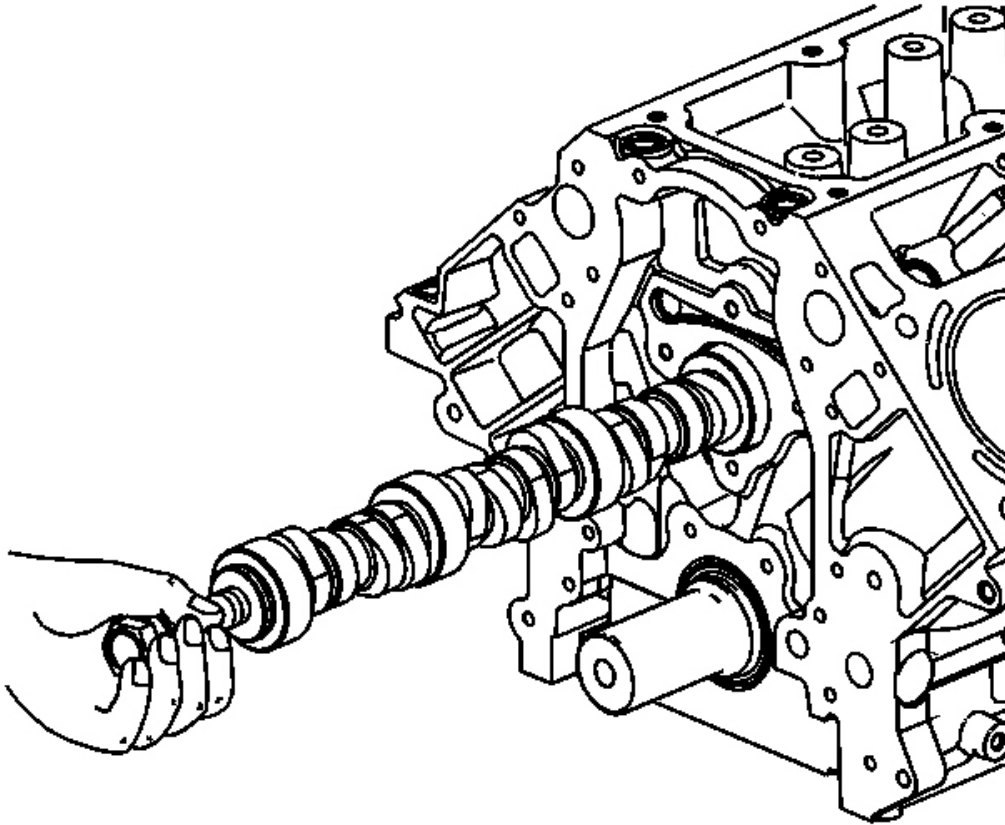


Fig. 359: View Of Camshaft

Courtesy of GENERAL MOTORS CORP.

NOTE: All camshaft journals are the same diameter, so care must be used in removing or installing the camshaft to avoid damage to the camshaft bearings.

2. Remove the camshaft.
 1. Install the camshaft sprocket bolt into the camshaft front bolt hole.
 2. Using the bolt as a handle, carefully rotate and pull the camshaft out of the engine block.
 3. Remove the bolt from the front of the camshaft.

PISTON, CONNECTING ROD AND BEARING REMOVAL

Tools Required

- **J 24270** Cylinder Bore Ridge Reamer
- **J 41556** Connecting Rod Guide

Removal Procedure

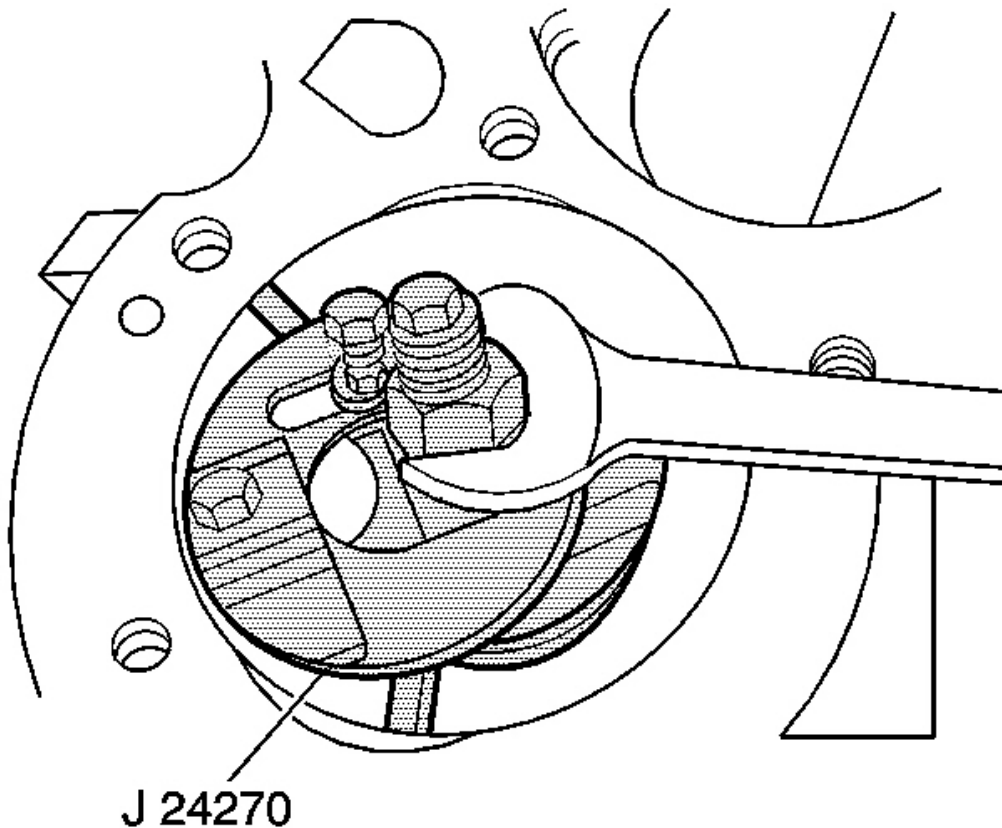


Fig. 360: View Of Removal Of Cylinder Bore Ring Ridge
Courtesy of GENERAL MOTORS CORP.

1. Use the **J 24270** in order to remove the cylinder bore ring ridge, if required.
 1. Turn the crankshaft until the piston is at the bottom of the stroke.
 2. Place a cloth on top of the piston.
 3. Use the **J 24270** or equivalent, in order to remove a cylinder ring ridge.
 4. Turn the crankshaft so the piston is at the top of the stroke.
 5. Remove the cloth.
 6. Remove the cutting debris from the cylinder and piston.

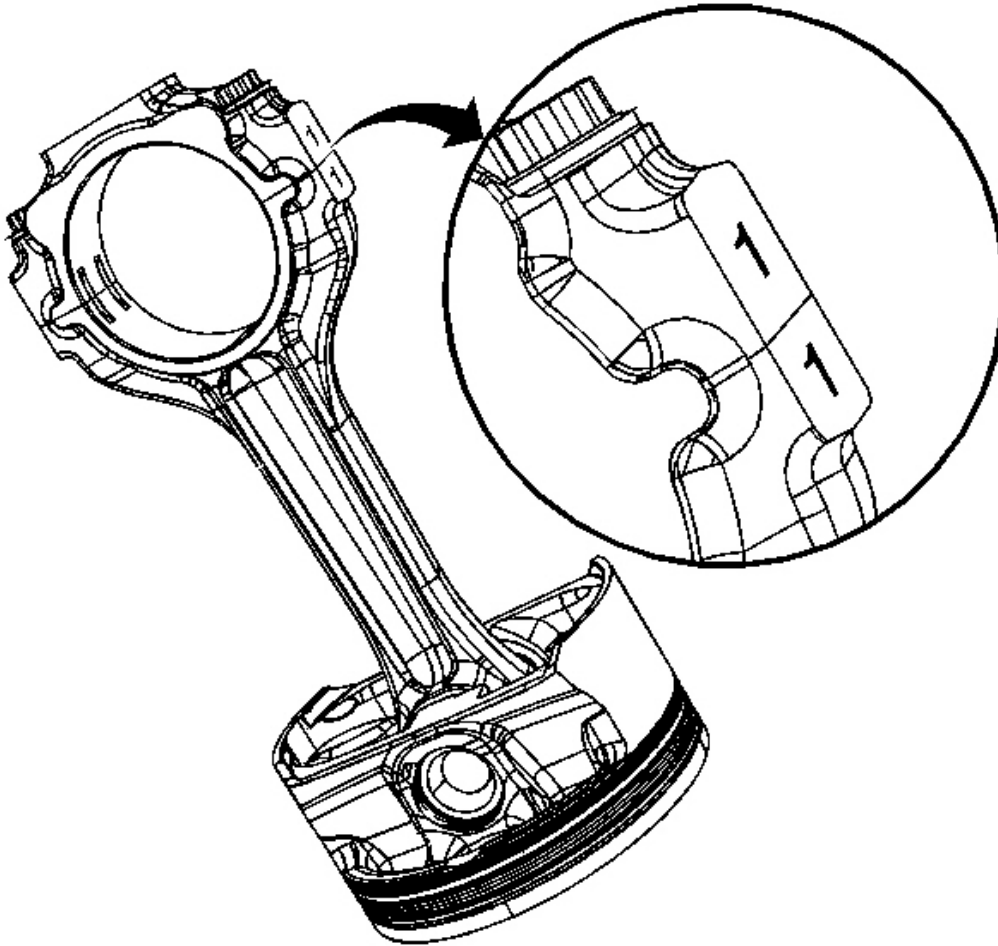


Fig. 361: Identifying Matchmarks On Connecting Rods & Caps
Courtesy of GENERAL MOTORS CORP.

2. Using a paint stick or etching tool, place matchmarks or numbers on the connecting rods and the connecting rod caps. The connecting rods and caps **MUST** be assembled to their original position and direction.
 - A stamping mark on the side of the connecting rod, at the crankshaft journal, may affect component geometry.
 - Mark the top of the piston to the specific cylinder bore.

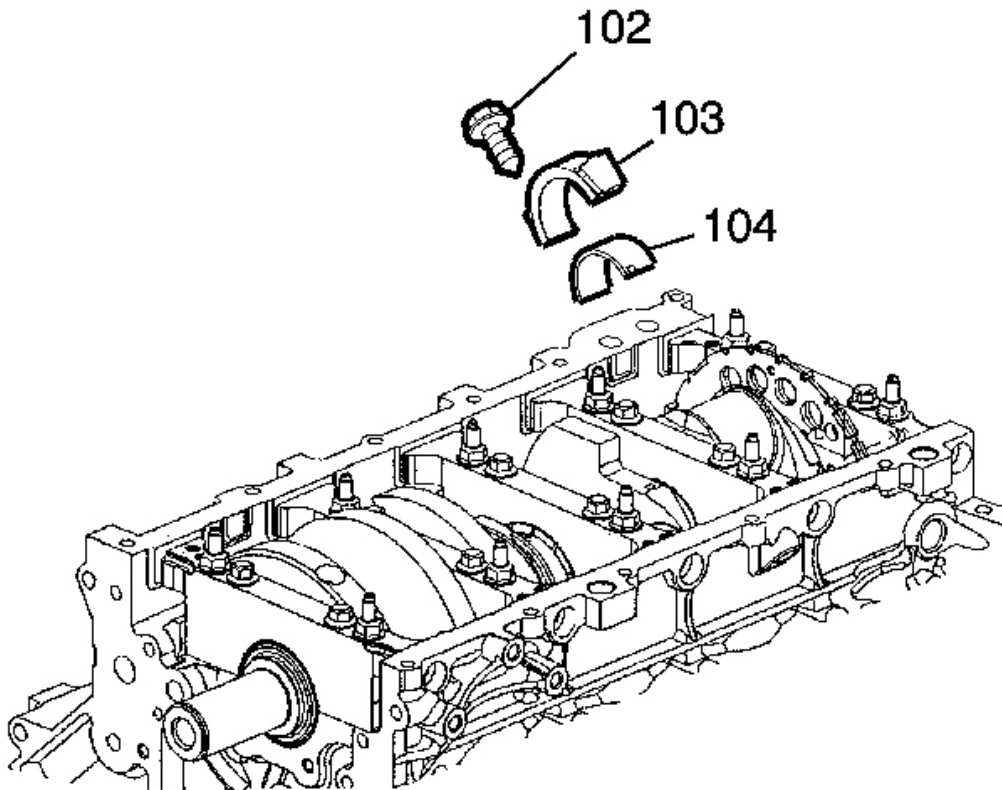


Fig. 362: View Of Connecting Rod Bolt, Cap & Bearing
Courtesy of GENERAL MOTORS CORP.

IMPORTANT: Mark, sort or organize the connecting rod bearings so they may be installed to their original position and location. The connecting rods and the bearing caps are **NOT** interchangeable. Refer to Separating Parts .

3. Remove the connecting rod bolts (102), cap (103) and bearing (104).

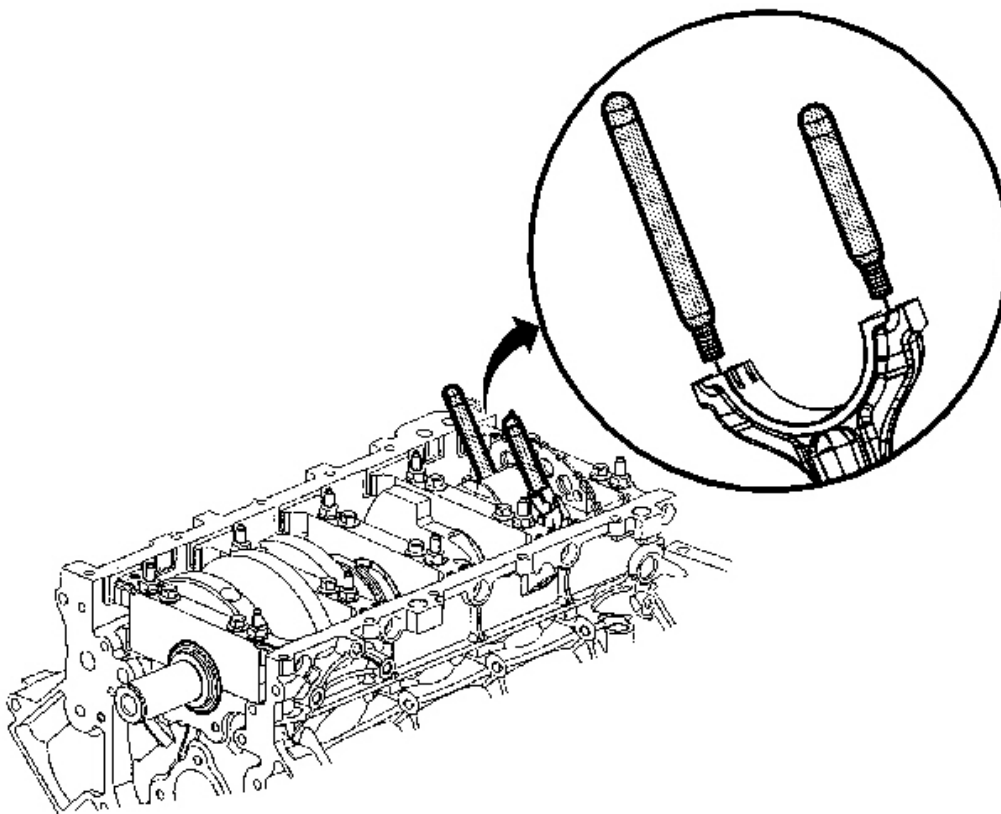


Fig. 363: View Of Piston & Connecting Rod Assembly
Courtesy of GENERAL MOTORS CORP.

4. Install the **J 41556** to the connecting rod.

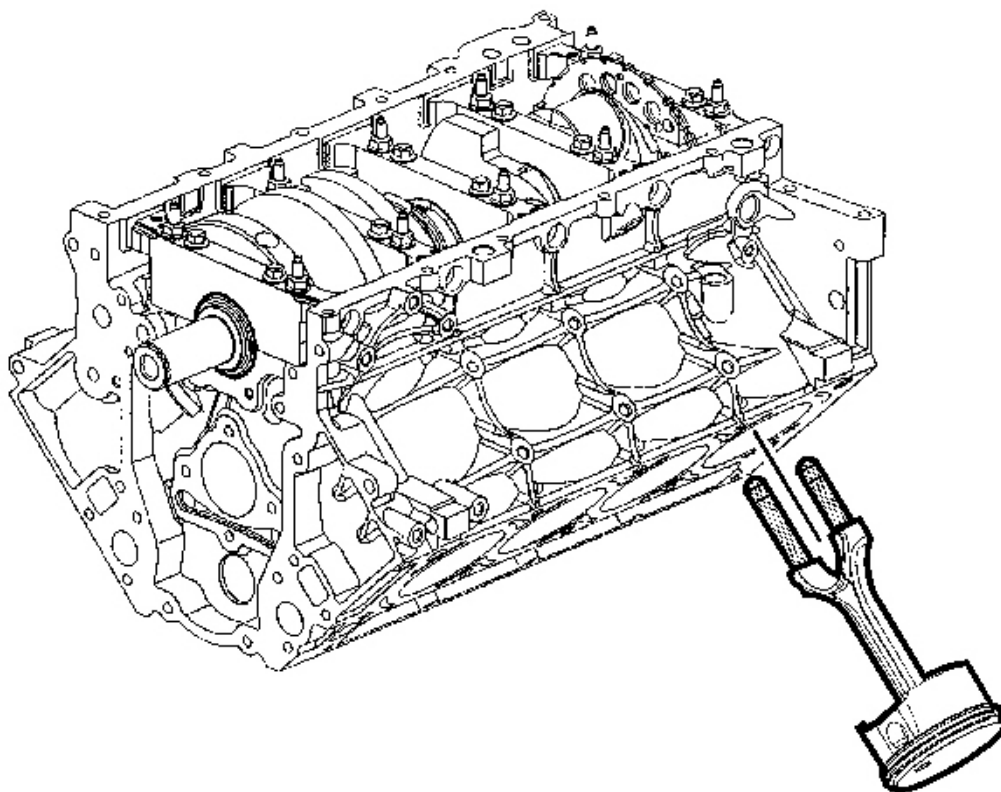


Fig. 364: View Of Piston, Connecting Rod & Cylinder Bore
Courtesy of GENERAL MOTORS CORP.

5. Using a hammer, tap lightly on the end of the **J 41556** in order to remove the piston and connecting rod assembly from the cylinder bore.
6. Remove the **J 41556** .

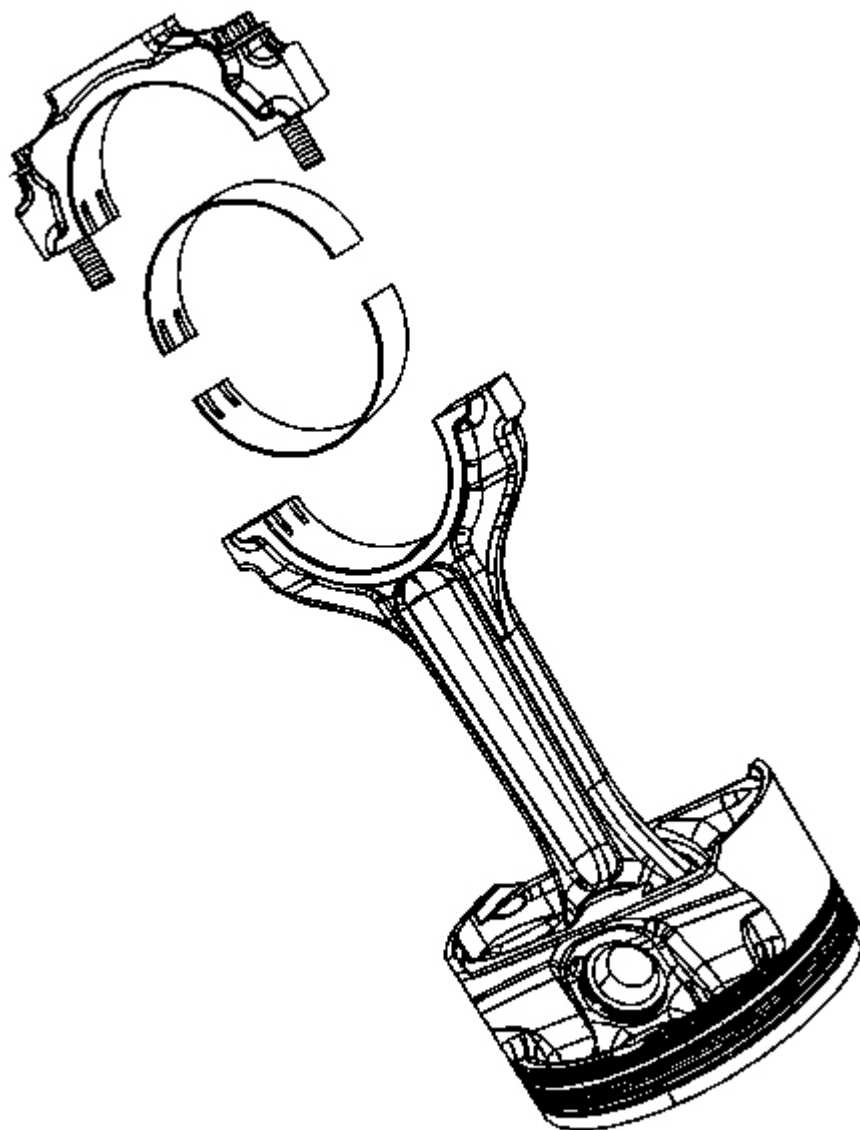


Fig. 365: View Of Piston, Connecting Rod & Bearing Assembly
Courtesy of GENERAL MOTORS CORP.

7. Upon removal of the piston and connecting rod assembly, assemble the connecting rod cap and bolts onto the matching connecting rod.

CRANKSHAFT AND BEARINGS REMOVAL

Tools Required

- **J 6125-1B** Slide Hammer
- **J 41818** Crankshaft Bearing Cap Remover

Removal Procedure

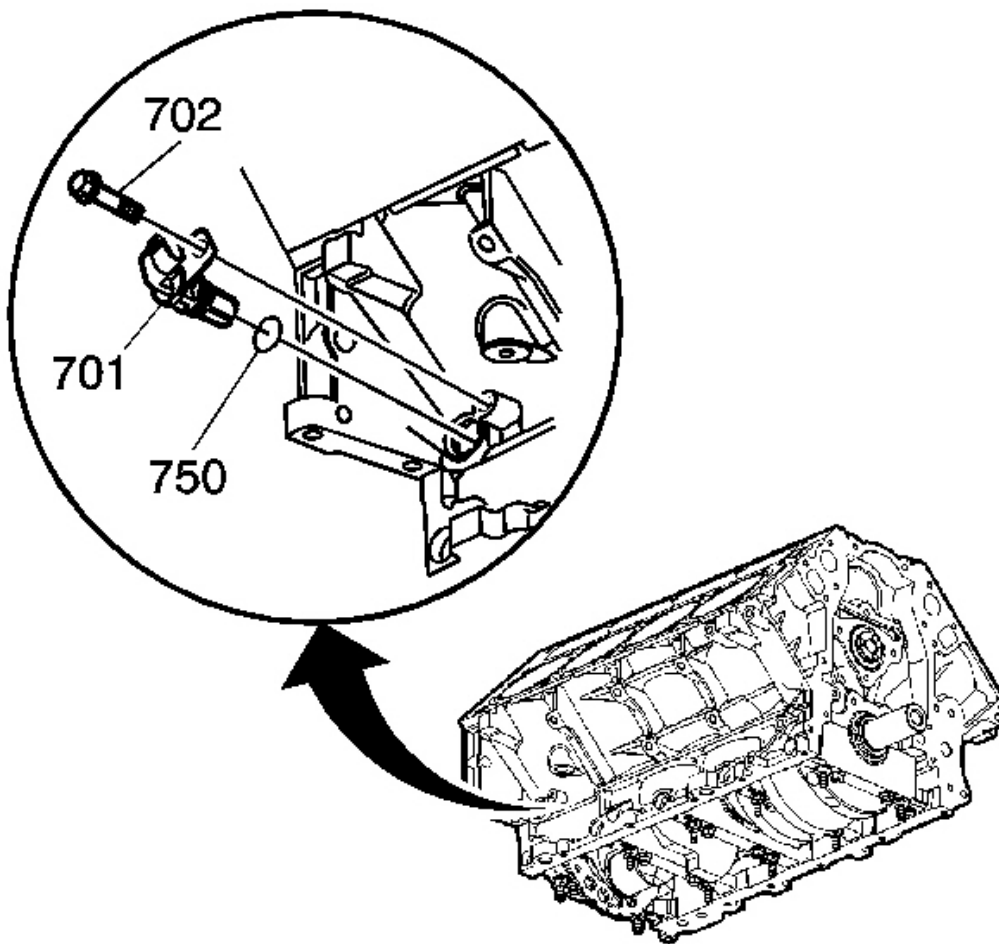


Fig. 366: View Of Crankshaft Position (CKP) Sensor, Bolt & O-Ring
Courtesy of GENERAL MOTORS CORP.

IMPORTANT:

- The crankshaft bearing caps are machined with the engine block, for the proper clearances. Mark or identify each crankshaft bearing cap location and direction before removal. The crankshaft bearing caps

MUST be installed to their original position and direction.

- Do not use the bearing cap M8 side bolts again.

1. Remove the crankshaft position (CKP) sensor bolt (702).
2. Remove the CKP sensor (701).
3. Remove the O-ring (750) from the sensor, as required.

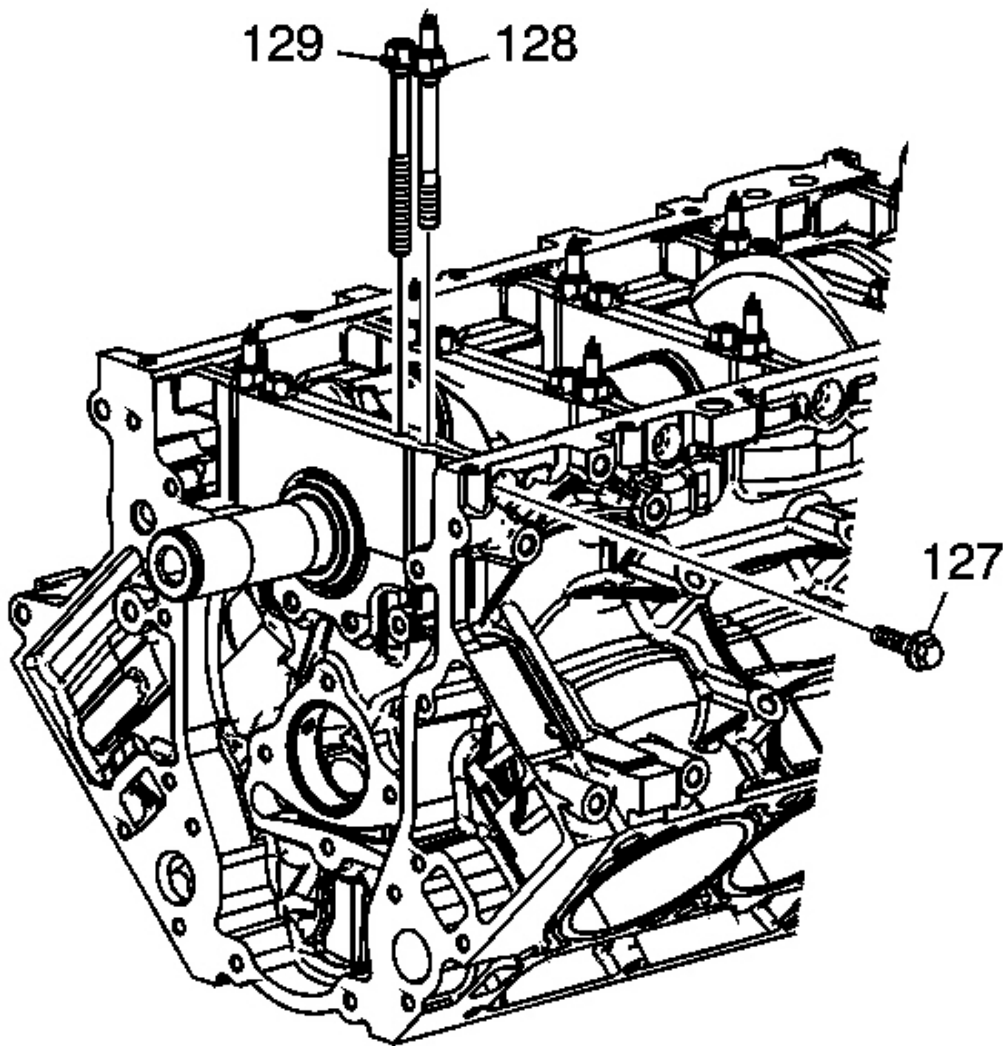


Fig. 367: Identifying Bearing Cap Bolts & Studs
Courtesy of GENERAL MOTORS CORP.

4. Remove the crankshaft bearing cap M8 side bolts (127).
5. Remove the bearing cap M10 bolts (129) and studs (128).

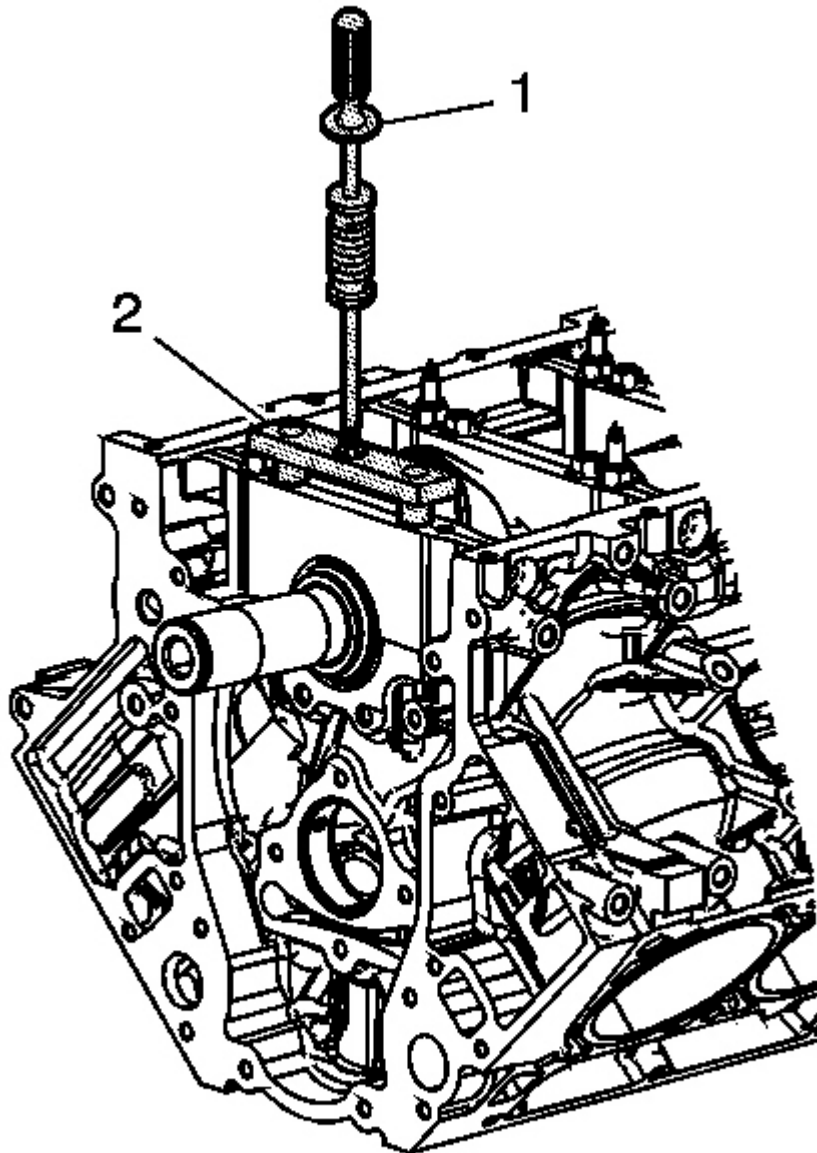


Fig. 368: View Of Crankshaft Bearing Cap Bolts (M10)
Courtesy of GENERAL MOTORS CORP.

NOTE: Refer to Fastener Notice .

6. Install the **J 41818** (2).

Tighten: Tighten the **J 41818** (2) bolts to 11 N.m (100 lb in).

7. Install the **J 6125-1B** (1) to the **J 41818** (2) in order to remove the crankshaft bearing caps.

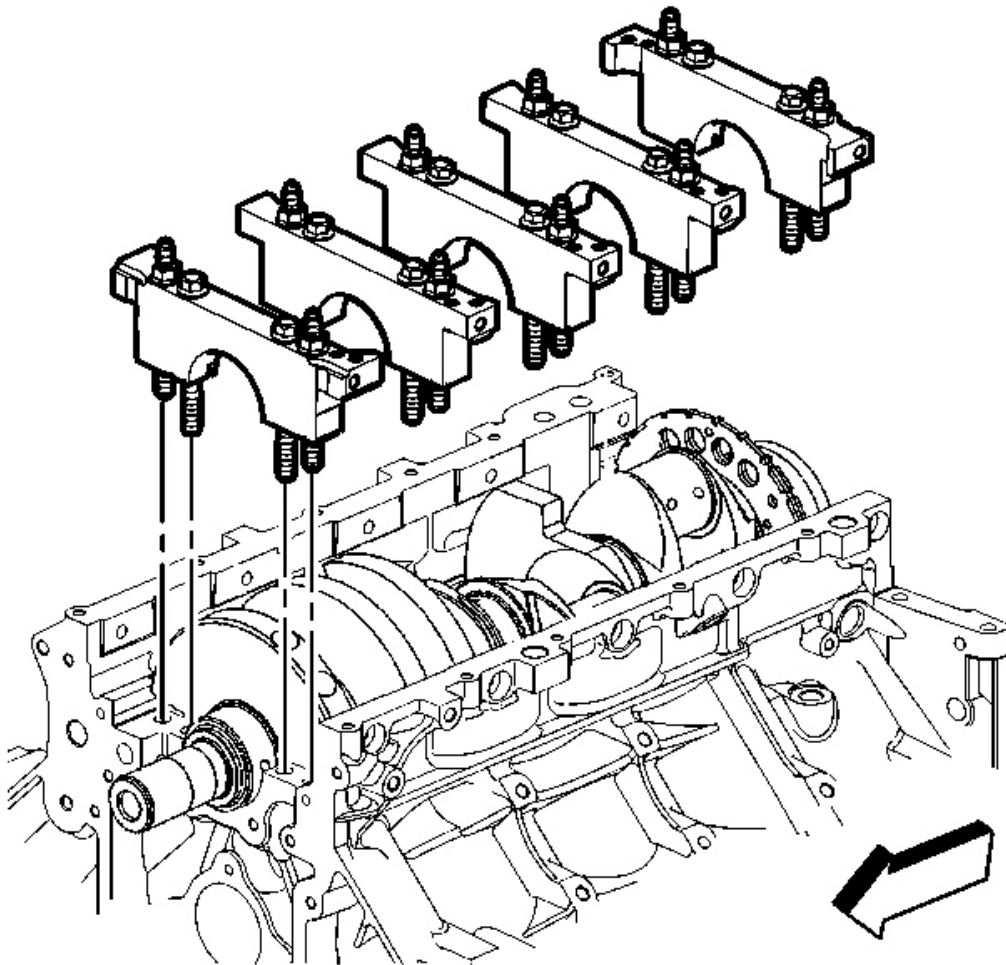


Fig. 369: View Of Crankshaft Main Bearing Caps
Courtesy of GENERAL MOTORS CORP.

8. Remove the bearing caps.

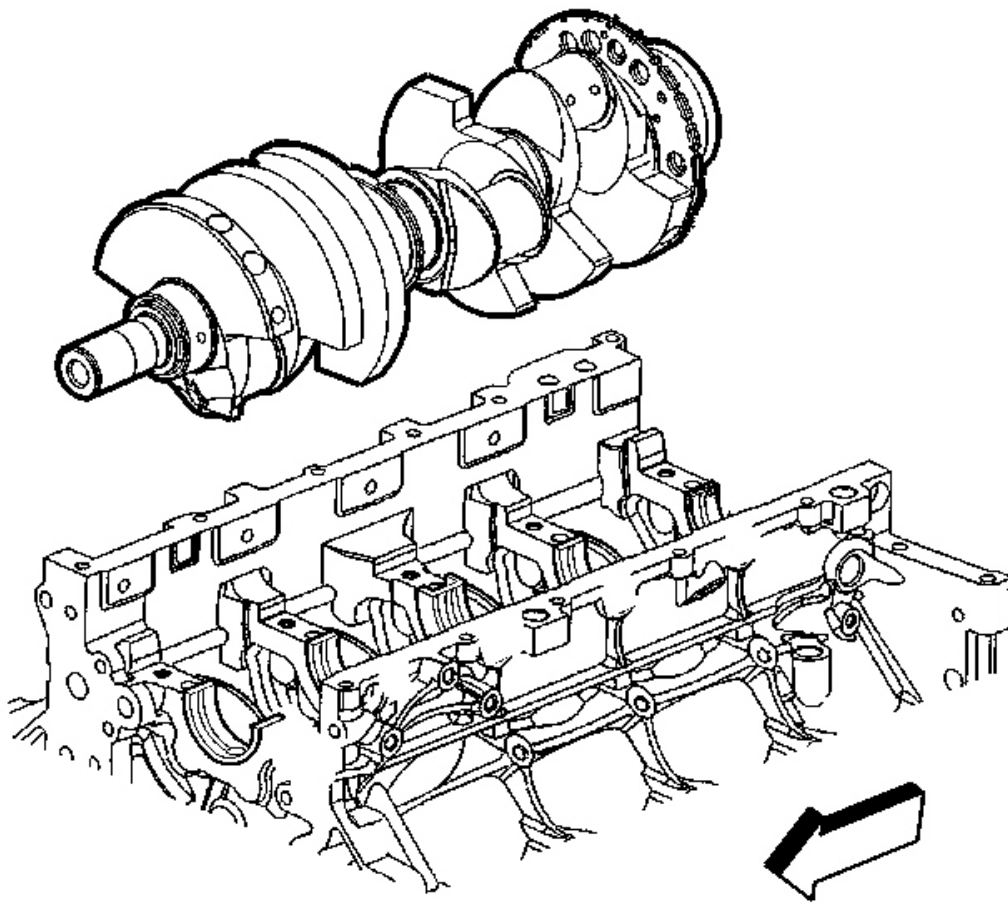


Fig. 370: View Of Crankshaft & Engine Block
Courtesy of GENERAL MOTORS CORP.

9. Remove the crankshaft.

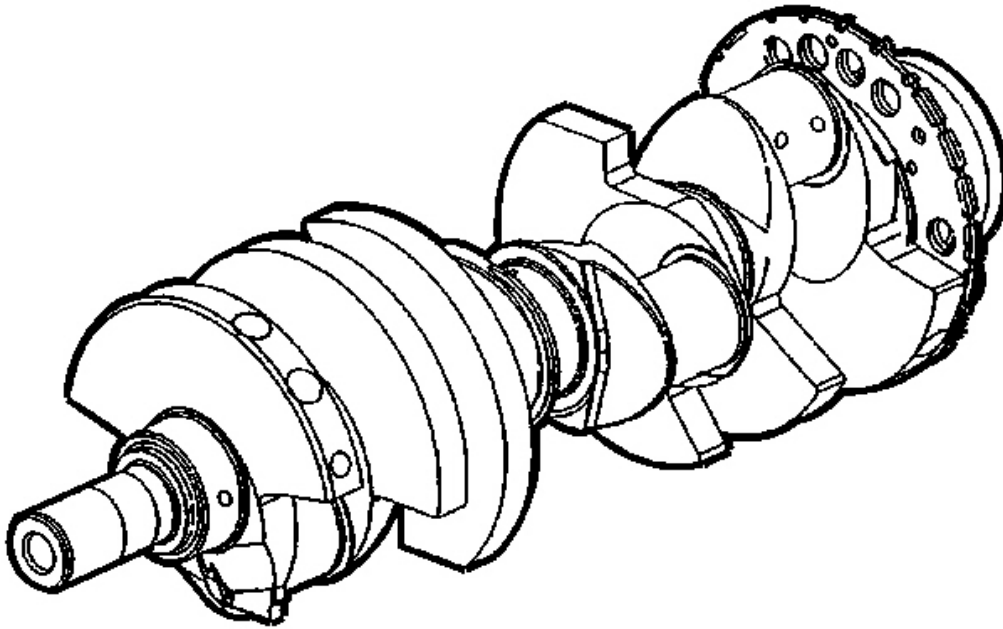


Fig. 371: View Of Camshaft

Courtesy of GENERAL MOTORS CORP.

IMPORTANT: Use care when handling the crankshaft. Avoid damage to the crankshaft position sensor reluctor ring teeth. Nicks, burrs or other damage to the teeth may affect on-board diagnostics (OBD) II system performance.

10. Lay the crankshaft onto 2 wooden V-blocks or other protective surface.

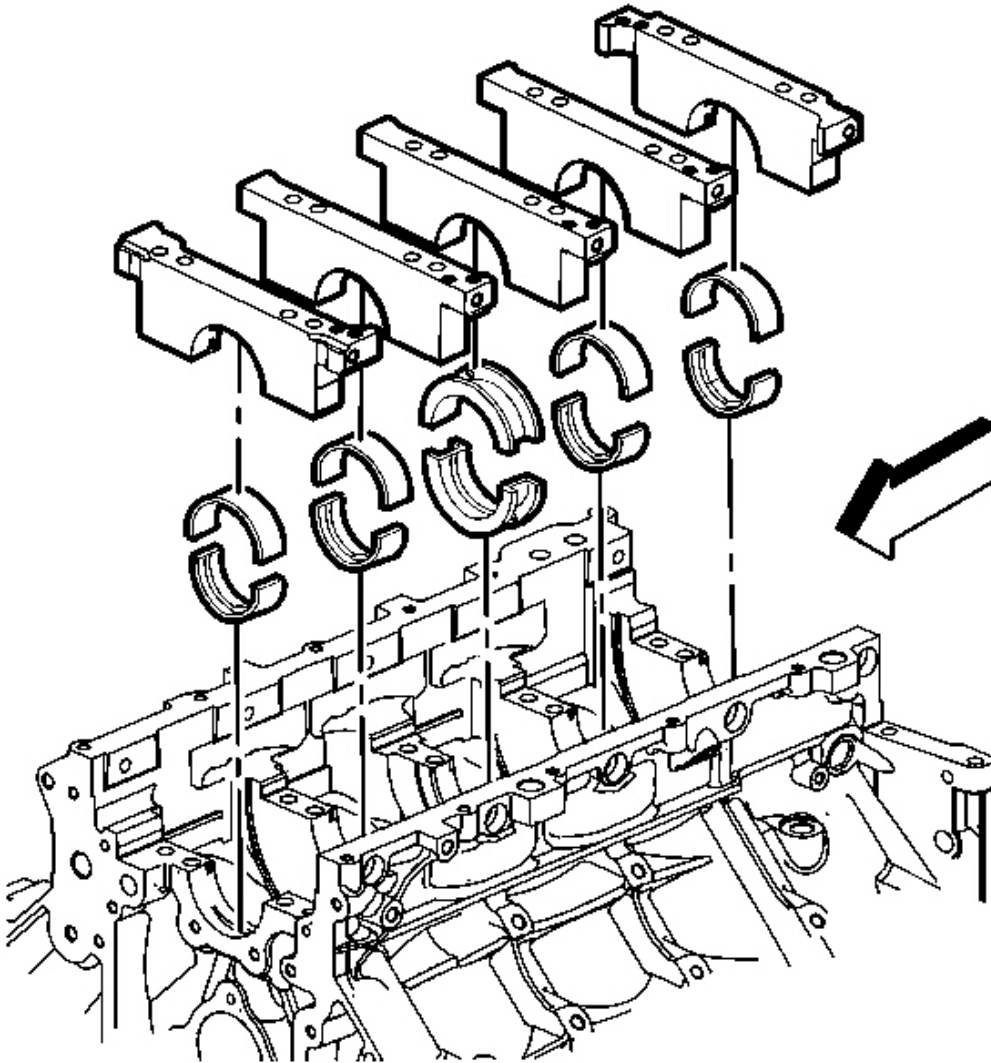


Fig. 372: View Of Crankshaft Bearings & Bearing Caps
Courtesy of GENERAL MOTORS CORP.

11. Remove the crankshaft bearings from the bearing caps and the engine block.
12. Mark, sort or organize the crankshaft bearings so they may be installed to their original position and location. Refer to **Separating Parts** .

ENGINE BLOCK PLUG REMOVAL

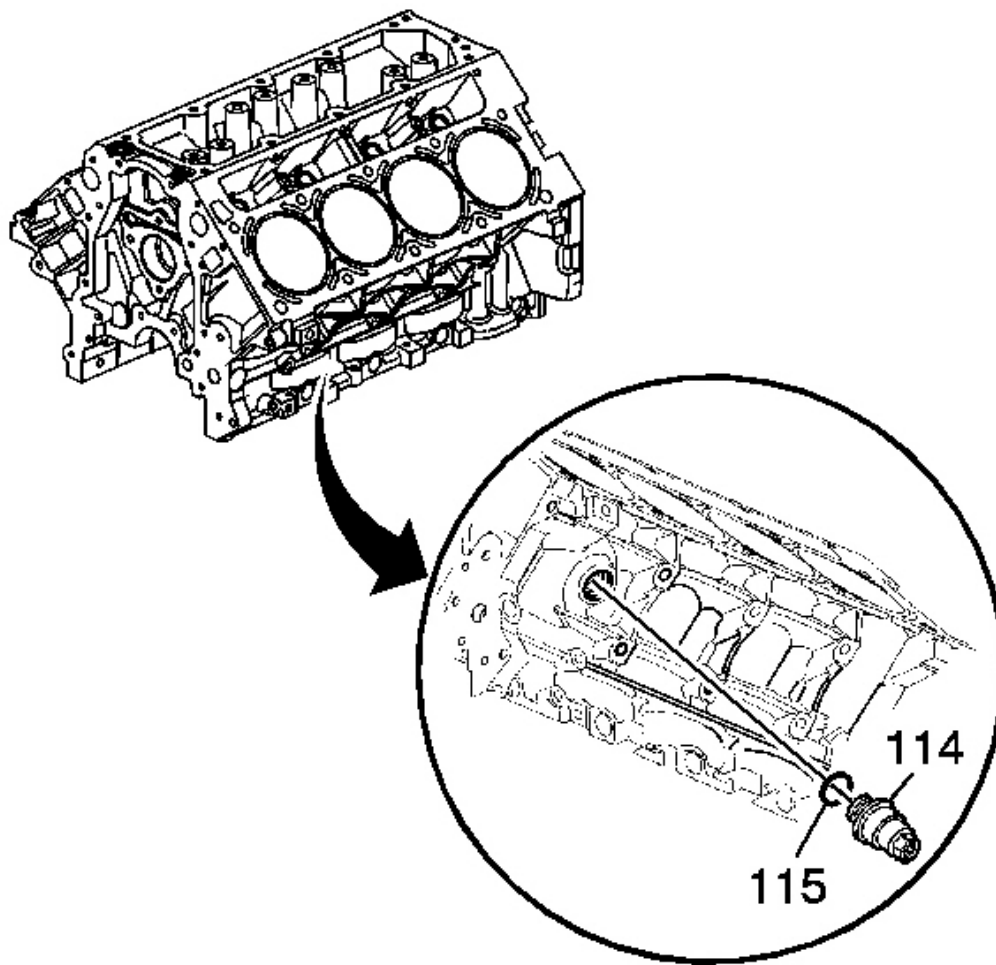


Fig. 373: Identifying Engine Block Coolant Heater
Courtesy of GENERAL MOTORS CORP.

1. Remove the engine block coolant heater (114) and seal (115).

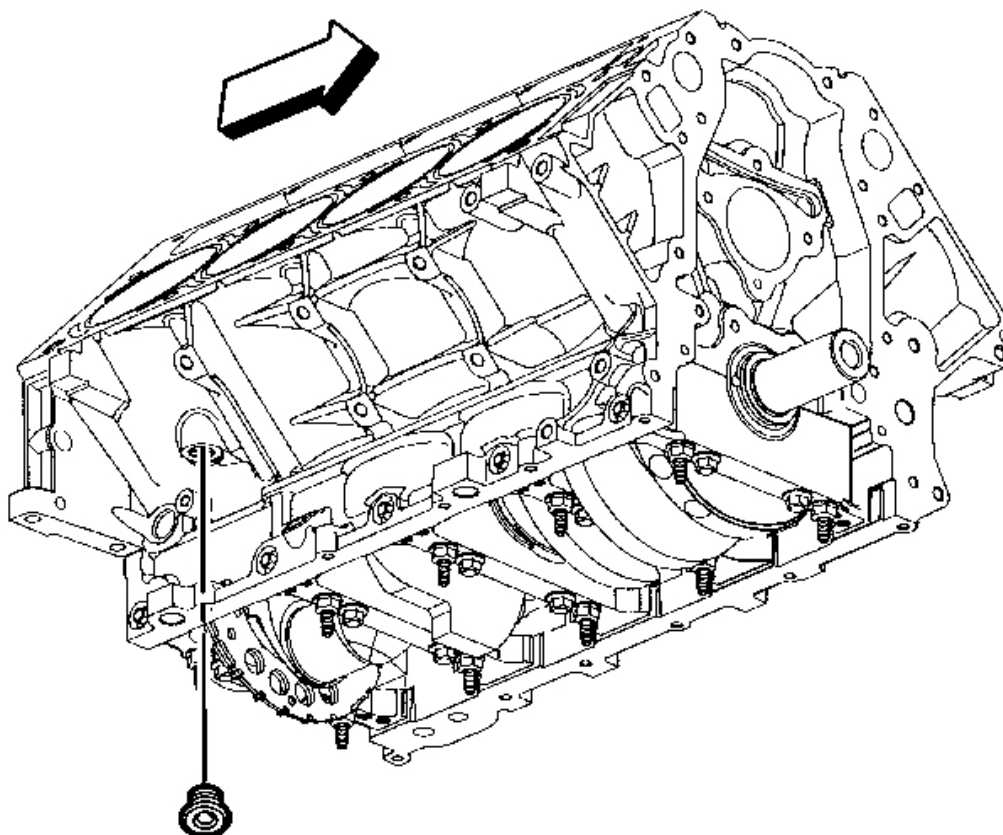


Fig. 374: Identifying Plug Location On Underside Of Block
Courtesy of GENERAL MOTORS CORP.

2. Remove the engine block right rear coolant drain hole plug and seal.

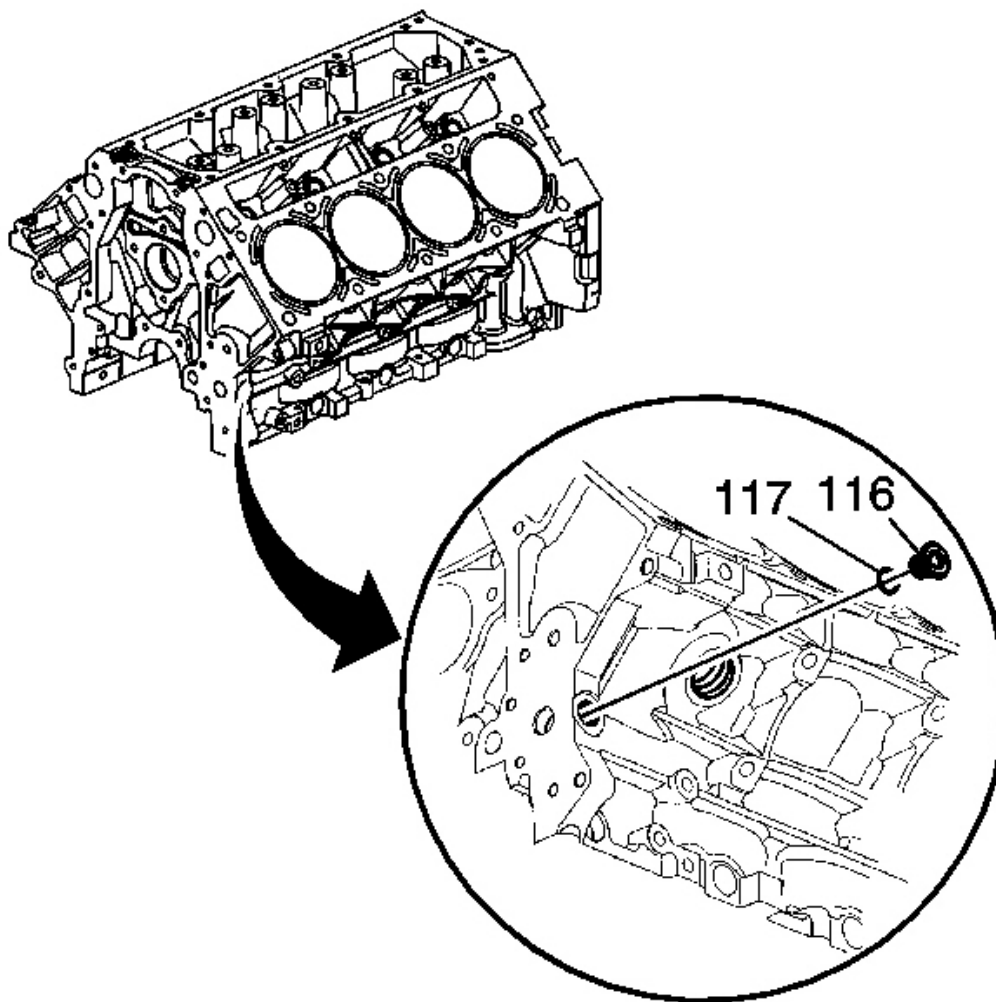


Fig. 375: Locating Engine Block Left Front Oil Gallery Plug & Seal
Courtesy of GENERAL MOTORS CORP.

3. Remove the engine block left front oil gallery plug (116) and seal (117).

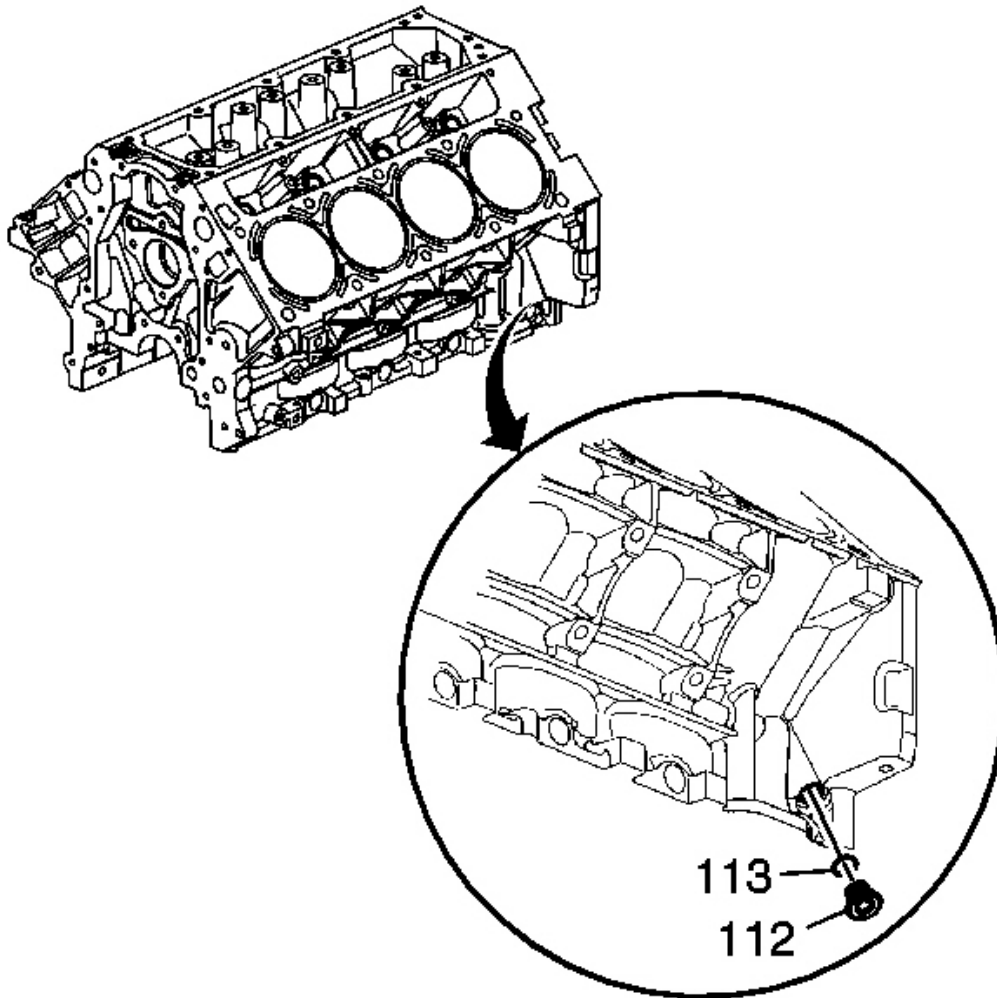


Fig. 376: Locating Engine Block Left Rear Oil Gallery Plug & Seal
Courtesy of GENERAL MOTORS CORP.

4. Remove the engine block left rear oil gallery plug (112) and seal (113).

If the block plug and coolant heater sealing washers are not damaged, they may be used during assembly.

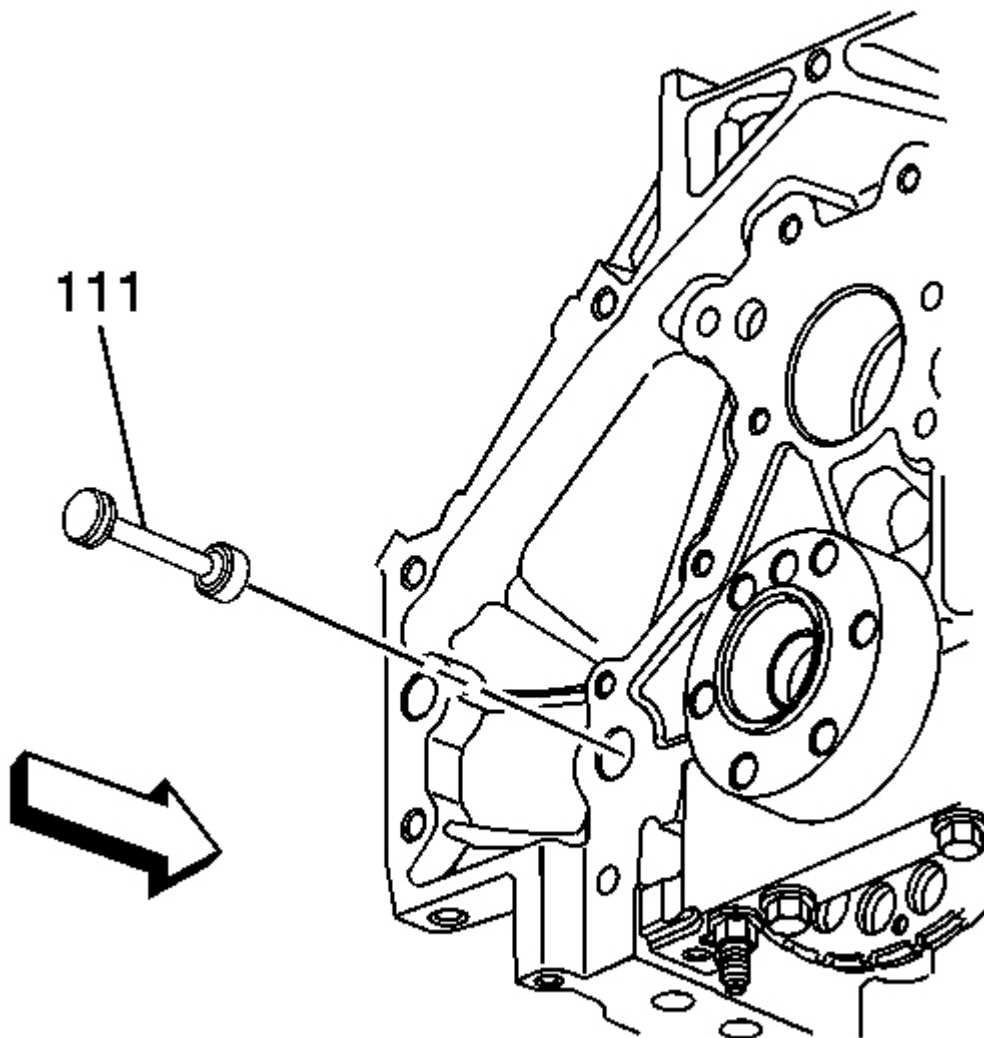


Fig. 377: Identifying Engine Block Rear Oil Gallery Plug & Seal
Courtesy of GENERAL MOTORS CORP.

5. Remove the engine block rear oil gallery plug (111) and seal.
6. Inspect the O-ring seal of the rear oil gallery plug.

If the O-ring seal is not cut or damaged, the plug and O-ring seal may be used during assembly.

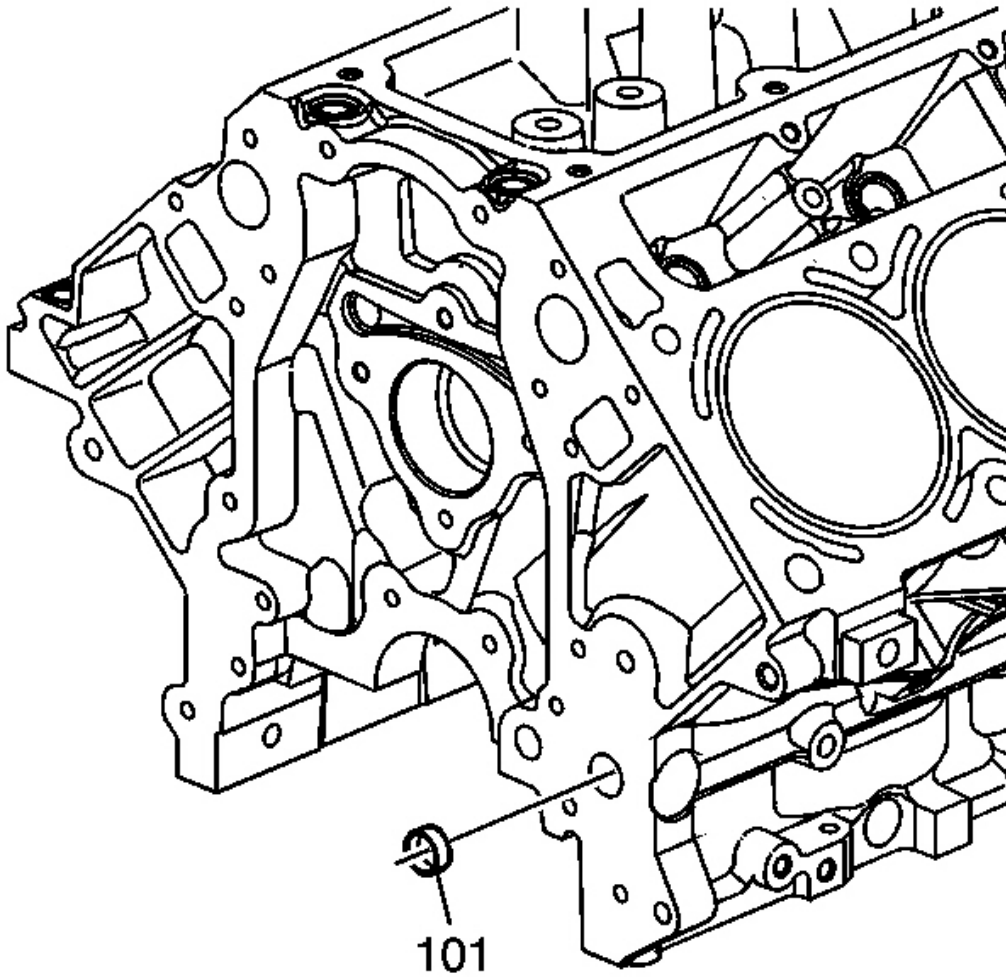


Fig. 378: View Of Engine Block Front Oil Gallery Plug
Courtesy of GENERAL MOTORS CORP.

IMPORTANT: Remove the front oil gallery plug, only if service is required. If the front oil gallery plug is removed, a NEW oil gallery plug must be installed.

7. Remove the engine block front oil gallery plug (101).

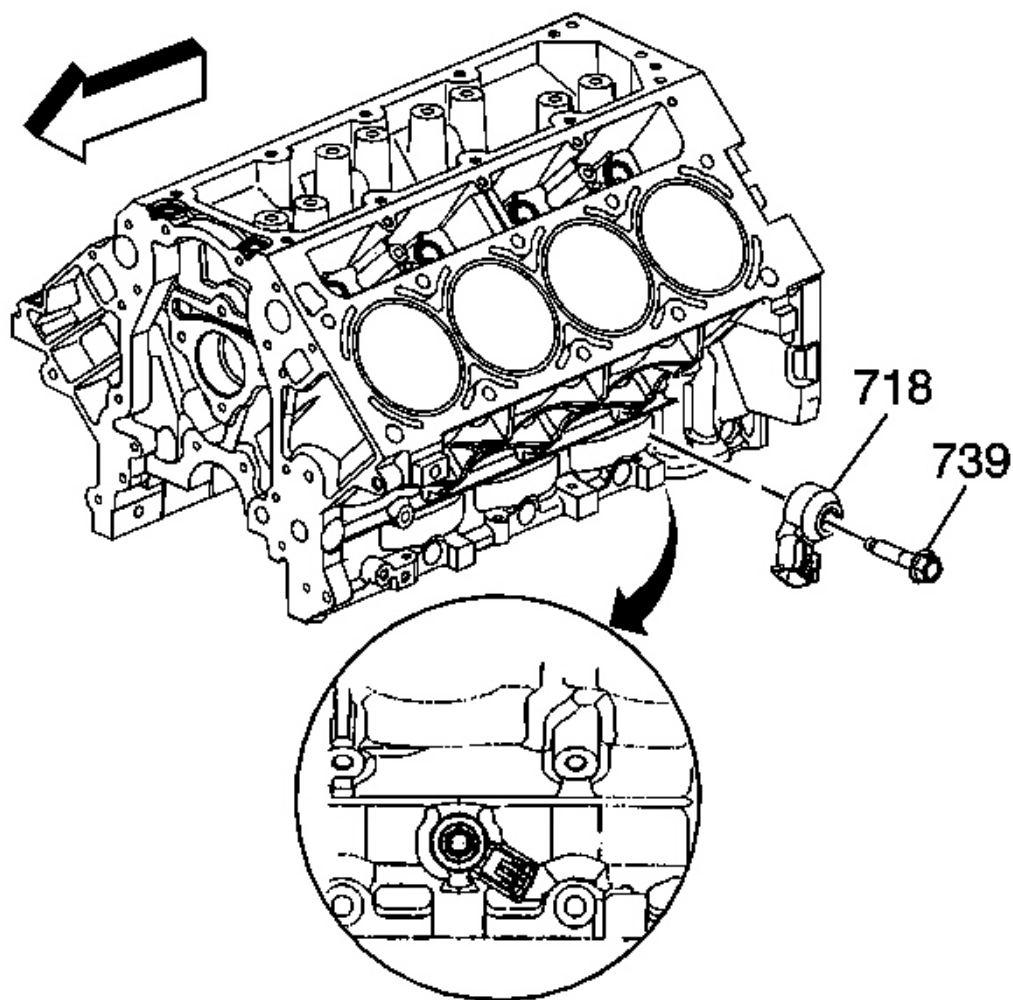


Fig. 379: View Of Left Side Knock Sensor & Bolt
Courtesy of GENERAL MOTORS CORP.

8. Remove the left side knock sensor (718) and bolt (739).

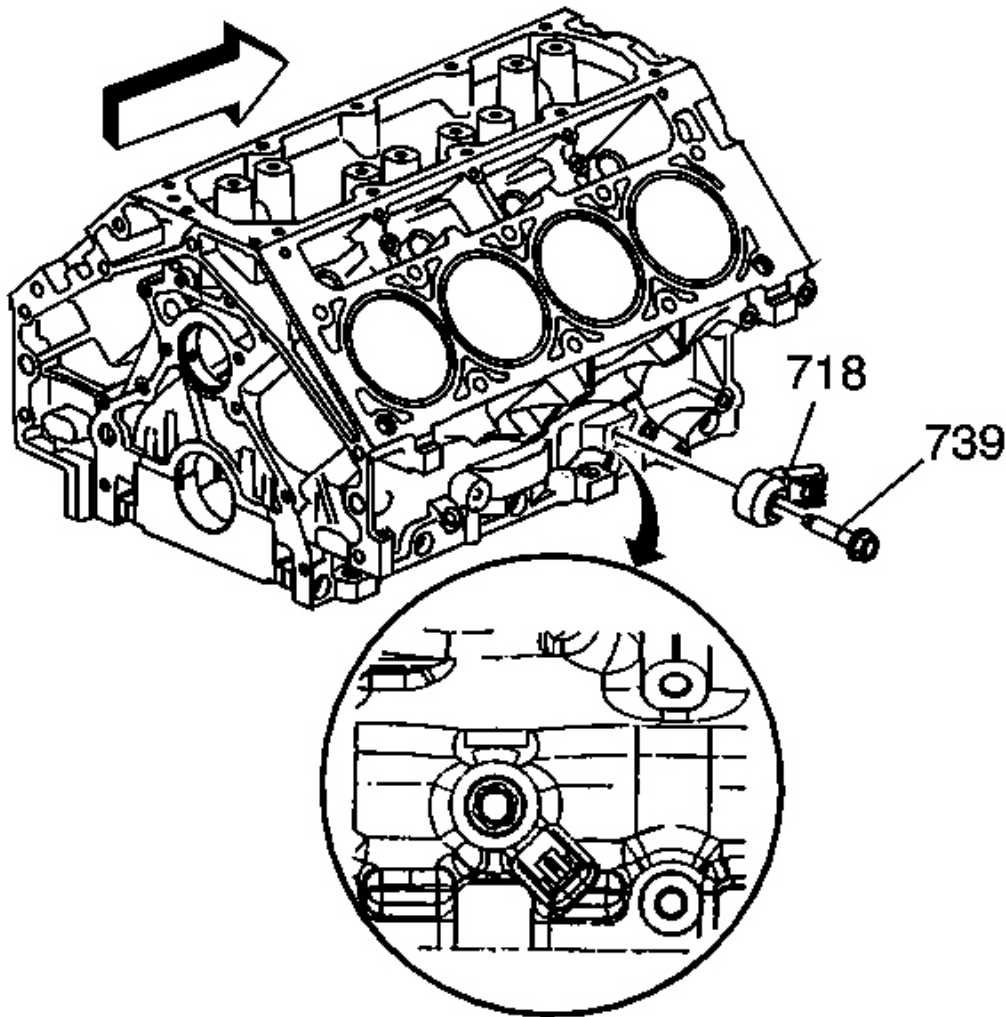


Fig. 380: View Of Right Side Knock Sensor & Bolt
Courtesy of GENERAL MOTORS CORP.

9. Remove the right side knock sensor (718) and bolt (739).

ENGINE BLOCK CLEANING AND INSPECTION

Tools Required

- **J 8087** Cylinder Bore Gage
- **J 42385-100** Head/Main Bolt Thread Repair Kit

Cleaning Procedure

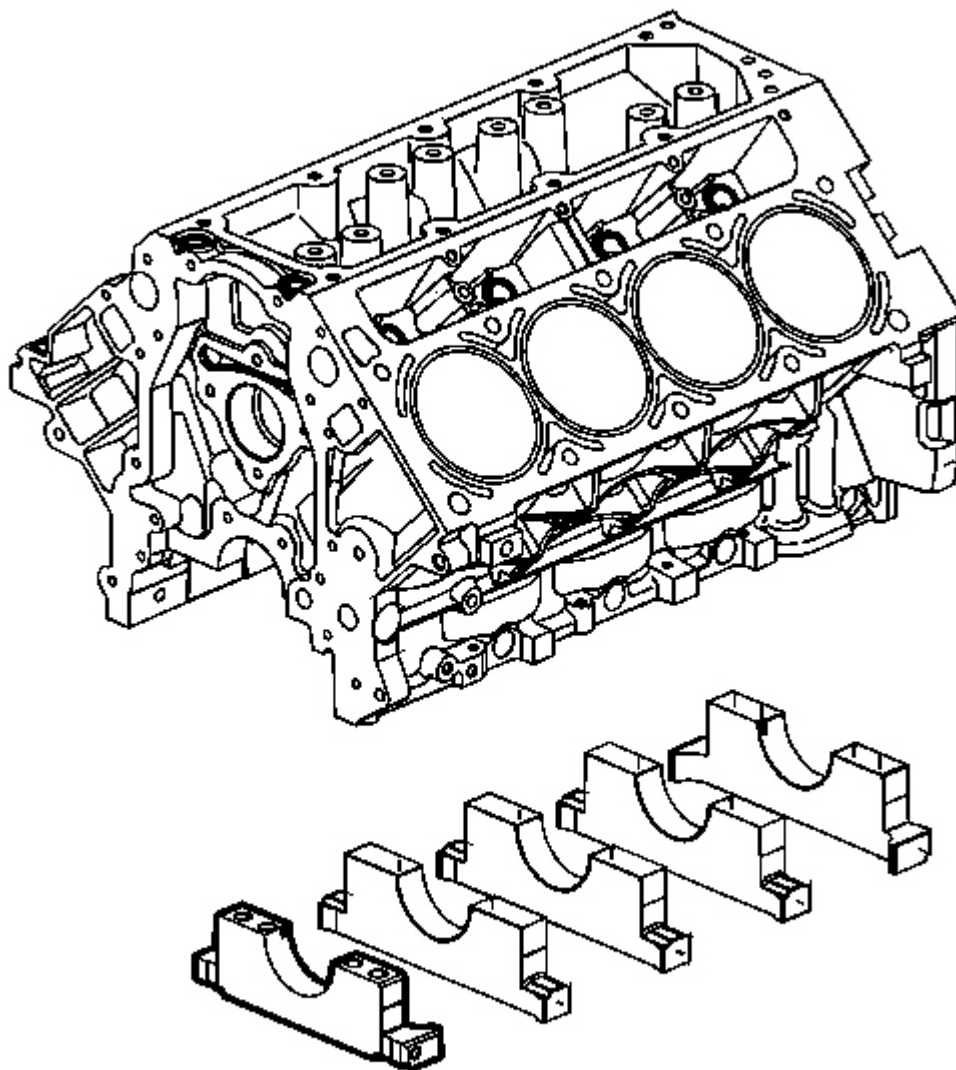


Fig. 381: View Of Engine Block & Main Bearing Caps
Courtesy of GENERAL MOTORS CORP.

NOTE: Do not use a caustic solution to clean the aluminum engine block.

IMPORTANT: When cleaning the engine block in a thermal type oven, do not exceed 232°C

(450°F).

Clean the following components:

- Remove all sludge, dirt or debris using a cleaning solvent or thermal type oven. Refer to **Cleanliness and Care.**
- Gasket surfaces

Refer to **Replacing Engine Gaskets** .

- Coolant passages
- Oil galleries
- Main bearing caps
- Cylinder head bolt holes to remove threadlocking material

Thread repair tool J 42385-107 may be used to clean the threads of any residual threadlocking material.

Inspection Procedure

1. Inspect the following components:

- Cylinder walls for excessive scratches, gouging or ring ridge
- Cylinder bores for excessive ring ridge at the top of the cylinder
- Coolant jacket for cracks
- Valve lifter bores for excessive scoring or wear
- Crankshaft bearing webs for cracks
- Gasket sealing surfaces for excessive scratches or gouging

Refer to **Replacing Engine Gaskets** .

- Oil galleries for restrictions
- Threaded bolt holes for damaged threads
- Cylinder bores for excessive ring ridge at the top of the cylinder

2. Measure the cylinder bores for an oversize condition:

Measuring the Cylinder for Oversize

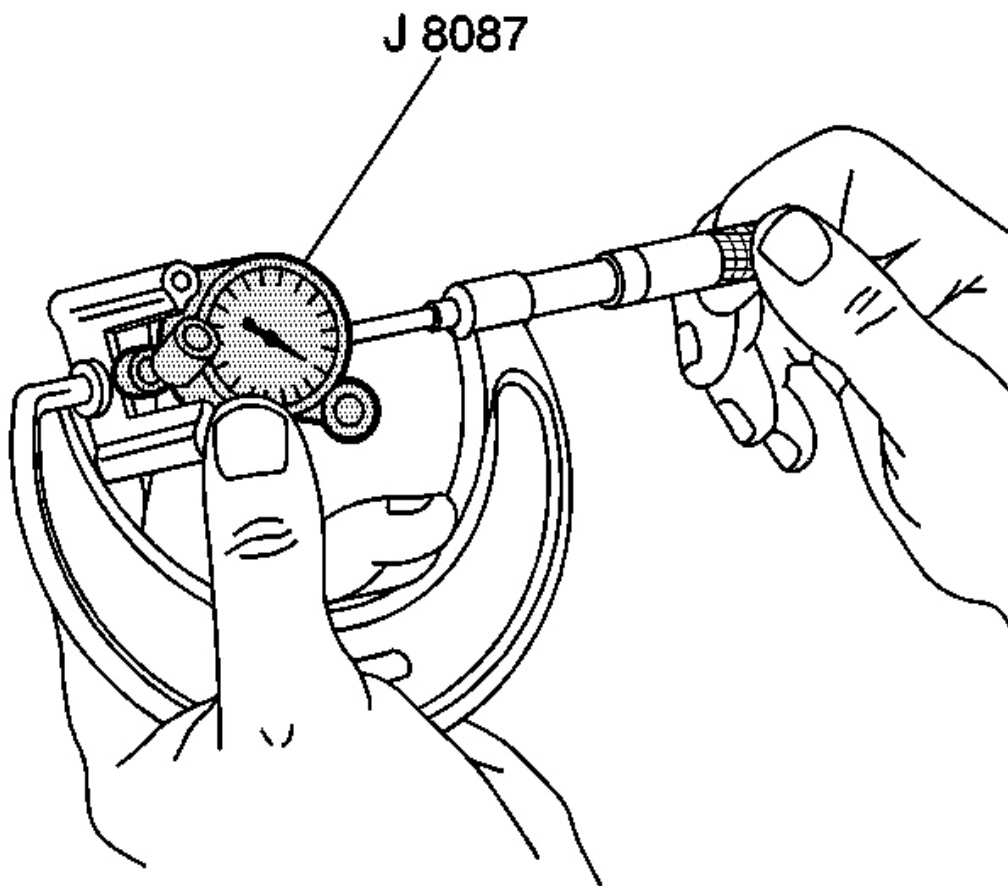


Fig. 382: Measuring Bore Gauge With Micrometer
Courtesy of GENERAL MOTORS CORP.

1. Adjust the micrometer to a dimension slightly smaller than the bore size. Refer to **Engine Mechanical Specifications**.
2. Insert the **J 8087** into the micrometer and zero the bore gage dial.

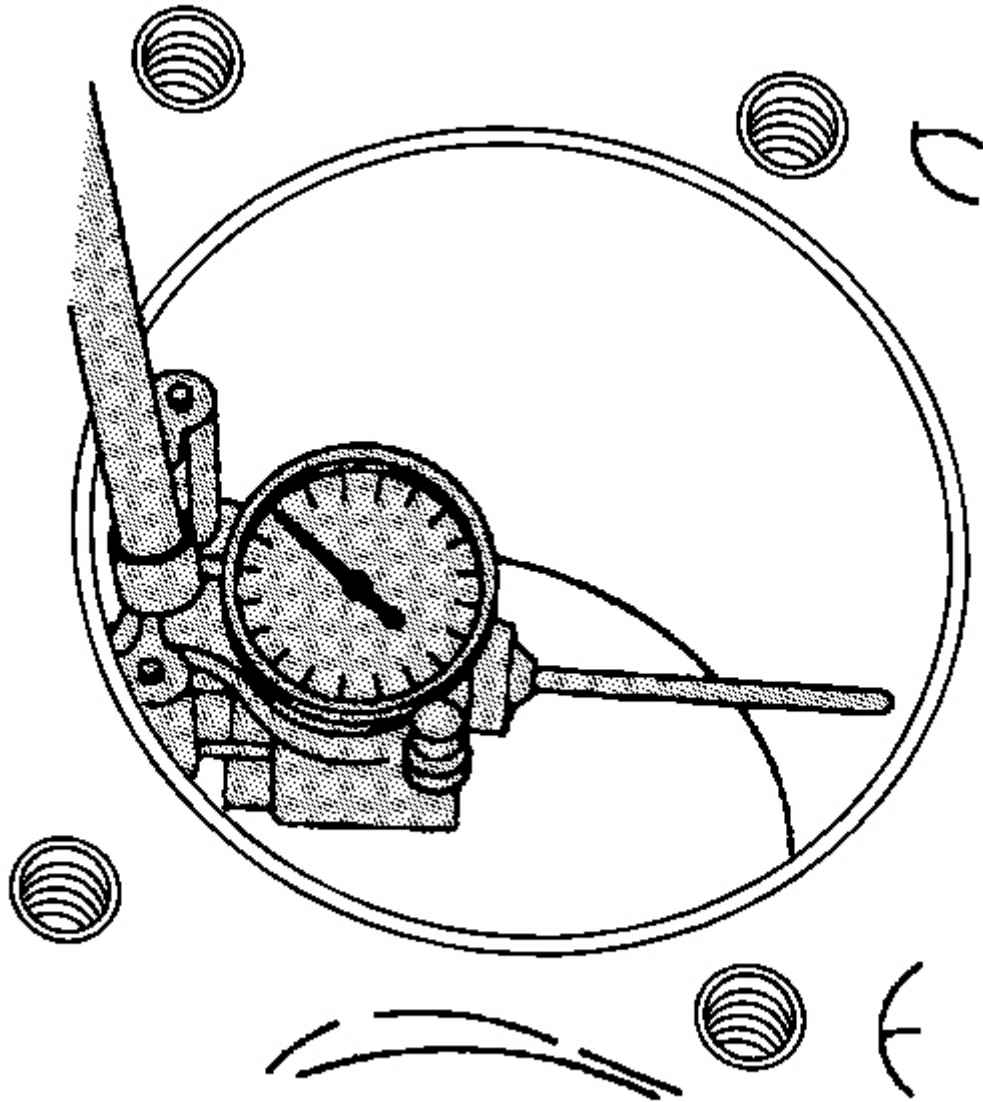


Fig. 383: View Of Cylinder Bore & Special Tool
Courtesy of GENERAL MOTORS CORP.

3. Using the **J 8087** , measure the cylinder bore for oversize.

Slide the bore gage up and down throughout the length of the cylinder bore. Measure the bore, both parallel and perpendicular to the centerline of the crankshaft, at the top, center and bottom of the bore. A cylinder bore that exceeds the maximum diameter must be serviced with an oversized piston. Refer to

Engine Mechanical Specifications.**CYLINDER BORING AND HONING****Boring Procedure**

IMPORTANT: A 0.5 mm (0.02 in) oversize service piston and a piston ring set are available.

1. Measure all pistons with a micrometer to determine the cylinder bore diameter.
2. Before you use any type of boring bar, use a fine file and clean the top of the cylinder block, removing any dirt or burrs. If you do not check the cylinder block, the boring bar may be improperly positioned or tilted and the cylinder bore could be bored at an incorrect angle.
3. Carefully follow the instructions furnished by the manufacturer regarding use of the equipment.
4. When you bore the cylinders, ensure all the crankshaft bearing caps are in place. Tighten the crankshaft bearing caps to the proper torque in order to avoid distortion of the cylinder bores during final assembly.
5. When you take the final cut with a boring bar, leave 0.03 mm (0.001 in) on the cylinder bore diameter for the finish honing and fit of the piston.

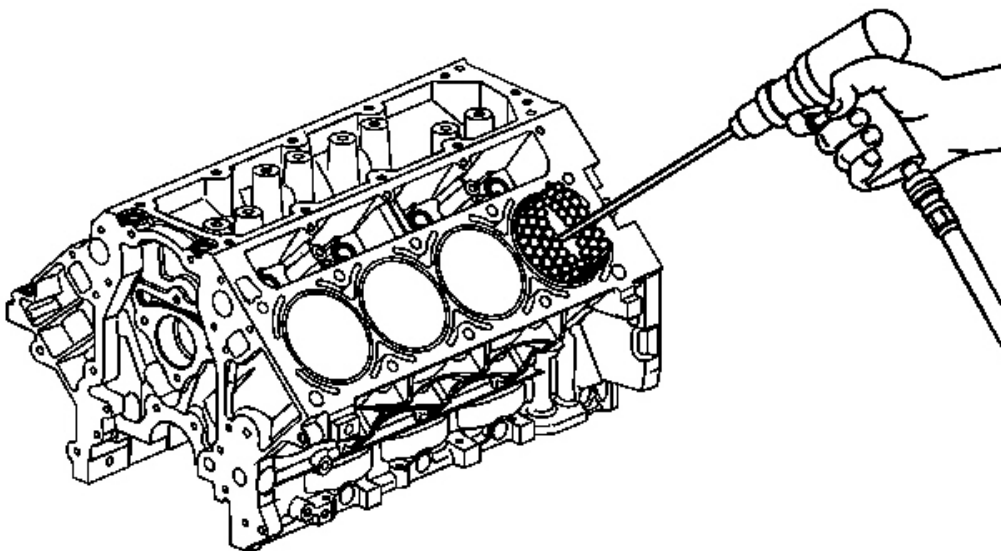
Honing Procedure

Fig. 384: Illustrating Honing Of Cylinders
Courtesy of GENERAL MOTORS CORP.

2007 Chevrolet TrailBlazer

2007 ENGINE Engine Mechanical - 6.0L - TrailBlazer

1. When honing the cylinders, follow the manufacturer's recommendations for equipment use, cleaning and lubrication. Use only clean, sharp stones of the proper grade for the amount of material you remove. Dull, dirty stones cut unevenly and generate excessive heat. Do not hone to final clearance with a coarse or medium-grade stone. Leave sufficient metal so that all stone marks may be removed with fine-grade stones. Perform final honing with a fine-grade stone, honing the cylinder to the proper clearance.
2. During the honing operation, thoroughly clean the cylinder bore. Repeatedly check the cylinder bore for fit with the selected piston.

All measurements of the piston or the cylinder bore should be made with the components at normal room temperature.

3. When honing a cylinder for fit to an oversize piston, first perform the preliminary honing with a 100-grit stone.
4. Perform final cylinder honing with a 240-grit stone and obtain a 45 degree cross hatch pattern.

A 240-grit stone is preferred for final honing. If a 240-grit stone is not available, a 220-grit stone may be used as a substitute.

5. The finish marks should be clean but not sharp. The finish marks should also be free from imbedded particles and torn or folded metal.
6. By measuring the selected piston at the sizing point and by adding the average of the clearance specification, you can determine the final cylinder honing dimension required.
7. After final honing and before the piston is checked for fit, clean the cylinder bores with hot water and detergent. Scrub the bores with a stiff bristle brush and rinse the bores thoroughly with hot water. Do not allow any abrasive material to remain in the cylinder bores. This abrasive material may cause premature wear of the new piston rings and the cylinder bores. Abrasive material will also contaminate the engine oil and may cause premature wear of the bearings. After washing the cylinder bore, dry the bore with a clean rag.
8. Perform final measurements of the piston and the cylinder bore.
9. Permanently mark the top of the piston for the specific cylinder to which it has been fitted.
10. Apply clean engine oil to each cylinder bore in order to prevent rusting.

Deglazing Procedure

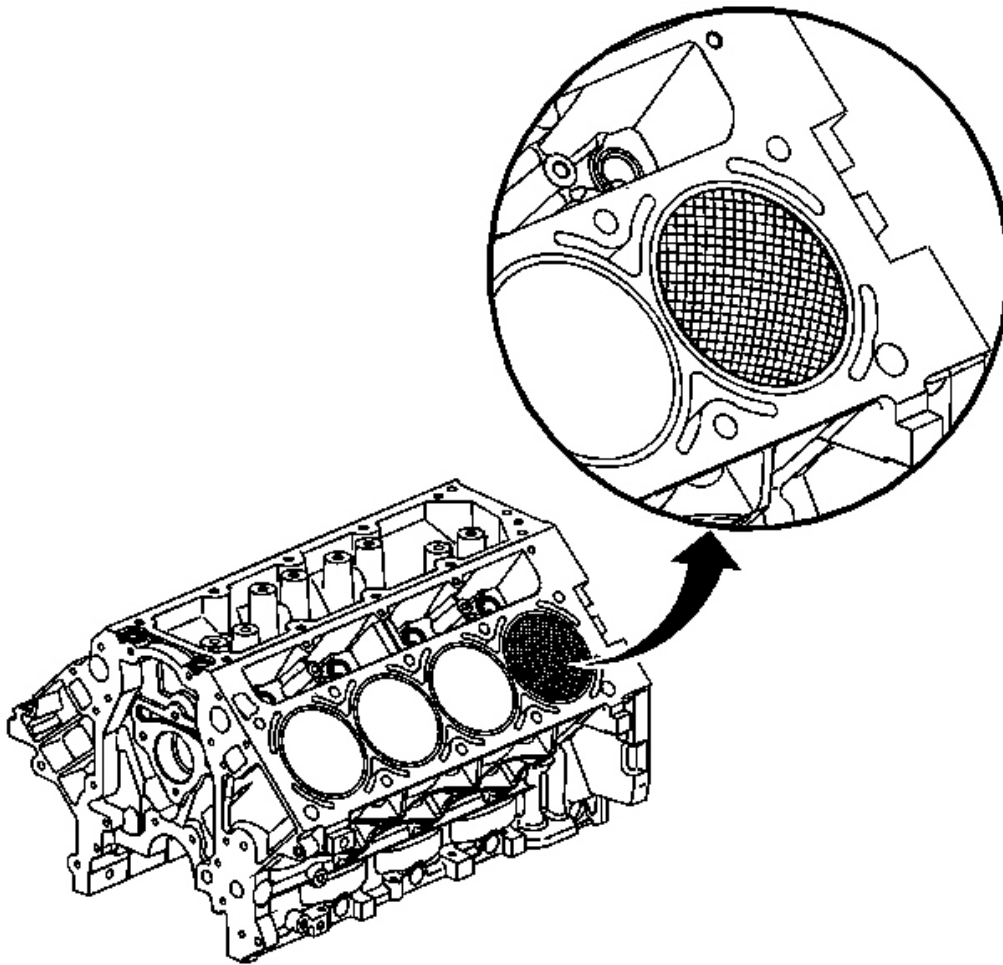


Fig. 385: Illustrating Deglazing Cylinder Bore
Courtesy of GENERAL MOTORS CORP.

Using a ball type or self centering honing tool, deglaze the cylinder bore lightly. Deglazing should be done only to remove any deposits that may have formed. Use a 240-grit stone of silicone carbide or equivalent, material when performing the deglazing procedure.

A 240-grit stone is preferred for final honing. If a 240-grit stone is not available, a 220-grit stone may be used as a substitute.

CRANKSHAFT AND BEARINGS CLEANING AND INSPECTION

Tools Required

- **J 7872** Magnetic Base Dial Indicator Set
- **J 43690** Rod Bearing Checking Tool
- **J 43690-100** Rod Bearing Checking Tool - Adapter Kit

Cleaning Procedure

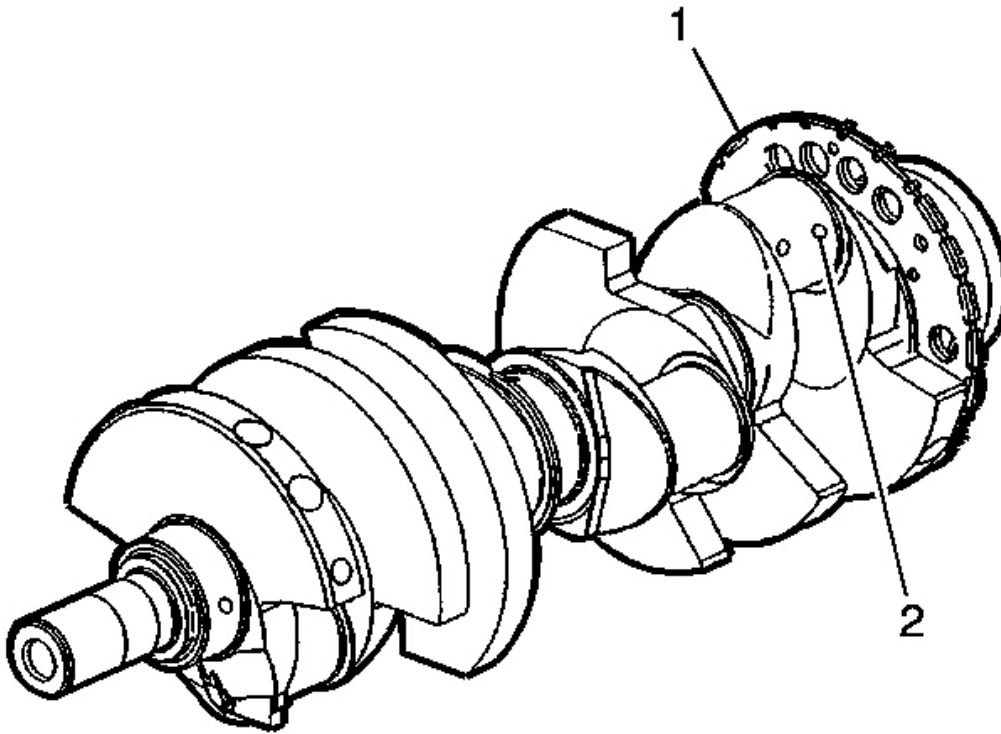


Fig. 386: View Of Oil Passages & Crankshaft Position (CKP) Sensor Reluctor Ring Teeth
Courtesy of GENERAL MOTORS CORP.

IMPORTANT: Use care when handling the crankshaft. Avoid damage to the bearing surfaces or the lobes of the crankshaft position reluctor ring. Damage to the teeth of the crankshaft position reluctor ring may effect on-board diagnostics (OBD) II system performance.

1. Clean the crankshaft with solvent.
2. Thoroughly clean all oil passages (2) and inspect for restrictions or burrs.

CAUTION: Refer to Safety Glasses Caution .

3. Dry the crankshaft with compressed air.

Inspection Procedure

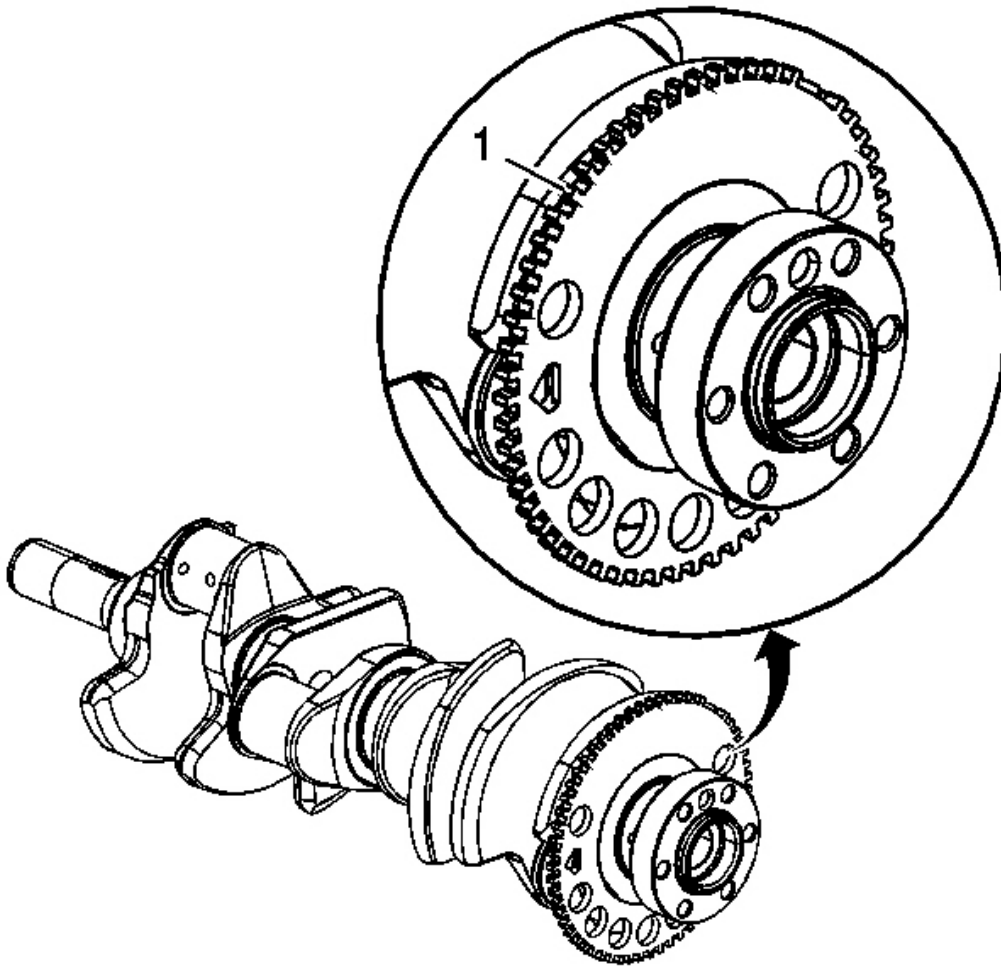


Fig. 387: View Of Reluctor Ring Teeth
Courtesy of GENERAL MOTORS CORP.

IMPORTANT: The reluctor ring teeth should not have imperfections on the rising or falling edges. Imperfections of the reluctor ring teeth may effect OBD II system performance.

1. Inspect the crankshaft position (CKP) reluctor ring teeth (1) for damage.

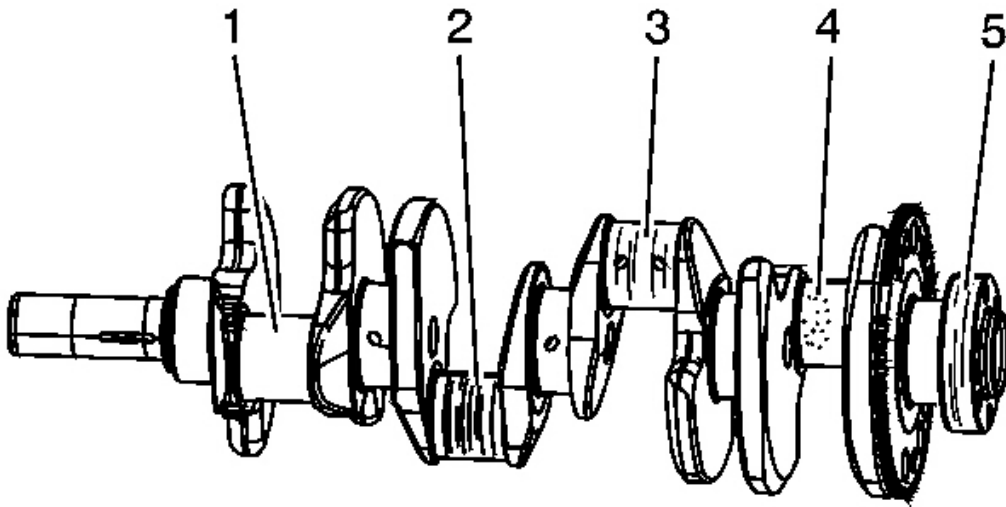


Fig. 388: View Of Crankshaft Journals
Courtesy of GENERAL MOTORS CORP.

2. Inspect the crankshaft journals for wear.

Journals should be smooth (1) with no signs of scoring, wear or damage.

3. Inspect the crankshaft journals for grooves or scoring (2).
4. Inspect the crankshaft journals for scratches or wear (3).
5. Inspect the crankshaft journals for pitting or imbedded bearing material (4).
6. Inspect the crankshaft rear oil seal surface (5) for grooves or scoring.

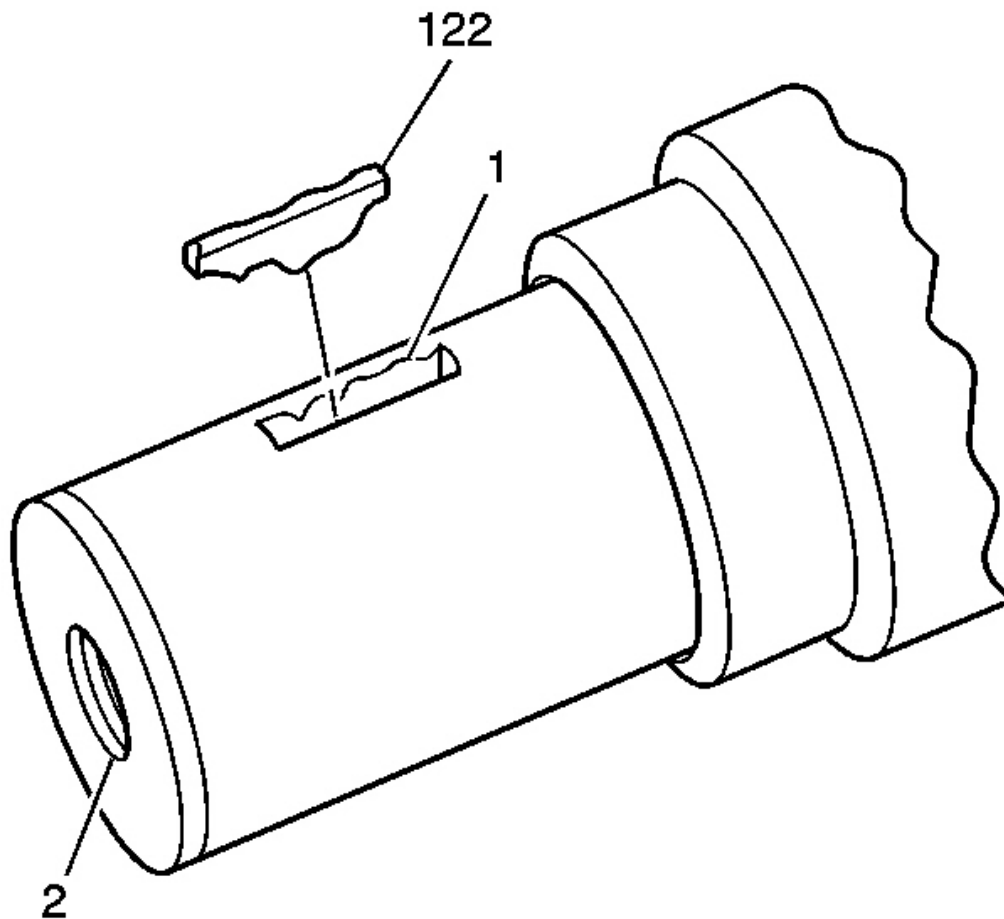


Fig. 389: View Of Crankshaft Key, Keyway & Threaded Hole
Courtesy of GENERAL MOTORS CORP.

7. Inspect the crankshaft key (122), keyway (1) and threaded hole (2) for damage.

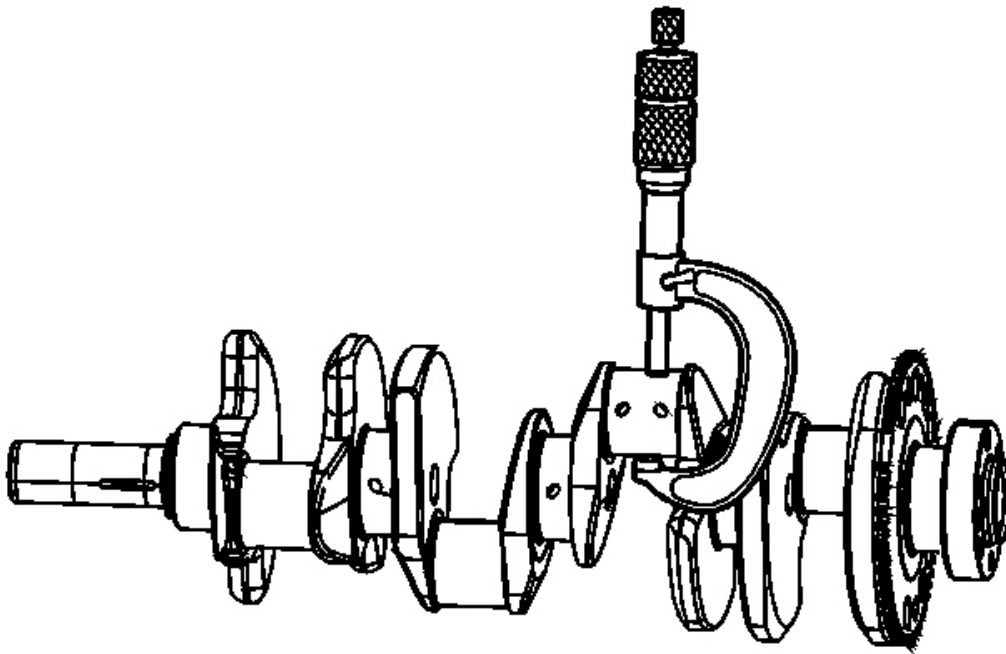


Fig. 390: Measuring Crank Pins For Out-Of-Round
Courtesy of GENERAL MOTORS CORP.

8. Measure the connecting rod journals for out-of-round and taper.

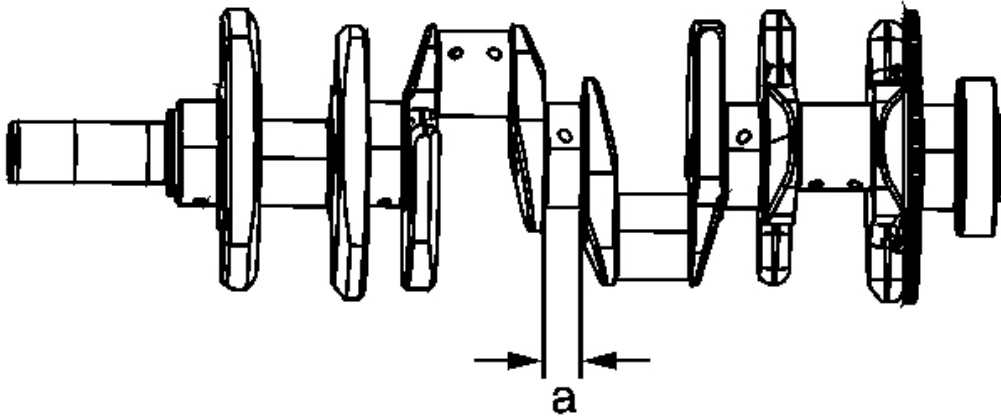


Fig. 391: Measuring Crankshaft Thrust Wall Width
Courtesy of GENERAL MOTORS CORP.

9. Measure the crankshaft thrust wall width.

A crankshaft with a thrust wall width in excess of 26.2 mm (1.0315 in) (a) must be replaced.

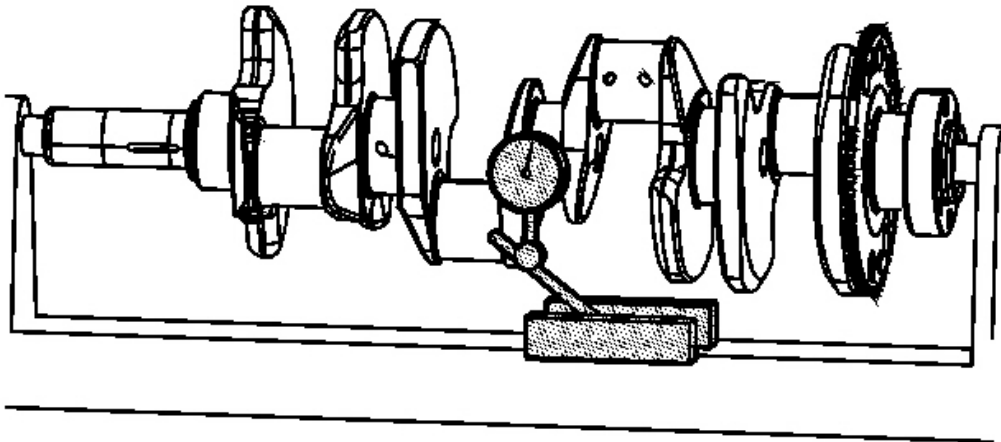


Fig. 392: Measuring Crankshaft Runout
Courtesy of GENERAL MOTORS CORP.

10. Measure the crankshaft runout.

Use wooden V-blocks or a fixture to support the crankshaft on the front and rear journals.

11. Use the **J 7872** in order to measure the crankshaft runout at the front and rear intermediate journals.
12. Use the **J 7872** in order to measure the runout of the crankshaft rear flange.
13. Use the **J 7872** in order to measure the runout of the CKP reluctor ring. Reluctor ring runout should be measured 1.0 mm (0.04 in) below the ring teeth.

If the reluctor ring has runout in excess of 0.7 mm (0.028 in), replace the crankshaft.

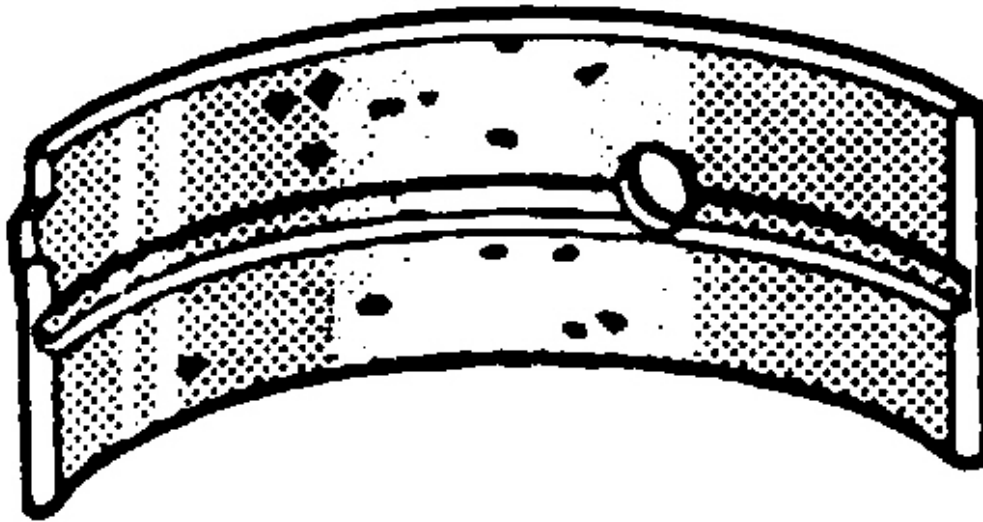


Fig. 393: Identifying Crankshaft Bearing Craters Or Pockets
Courtesy of GENERAL MOTORS CORP.

14. Inspect crankshaft bearings for craters or pockets. Flattened sections on the bearing halves also indicate fatigue.

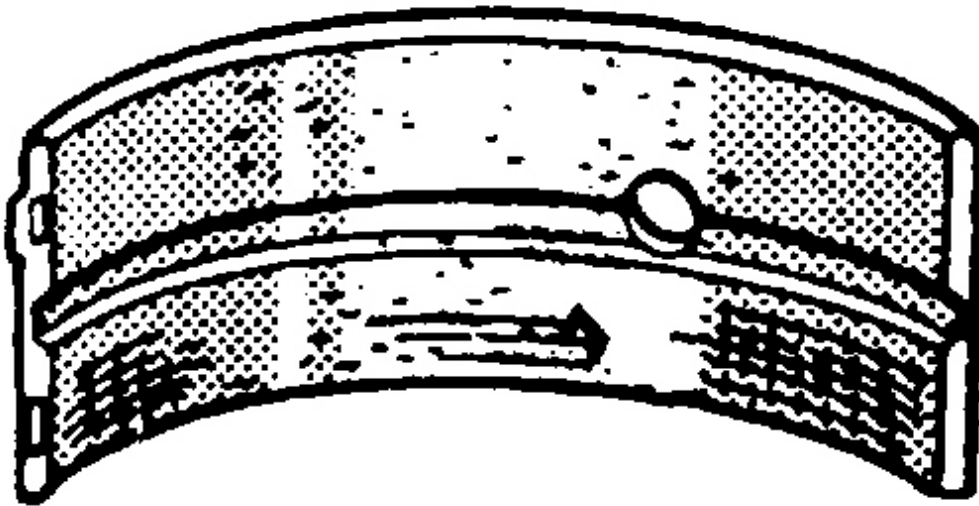


Fig. 394: Identifying Connecting Rod Bearing Scoring Or Discoloration
Courtesy of GENERAL MOTORS CORP.

15. Inspect the crankshaft bearings for excessive scoring or discoloration.
16. Inspect the crankshaft bearings for dirt or debris imbedded into the bearing material.

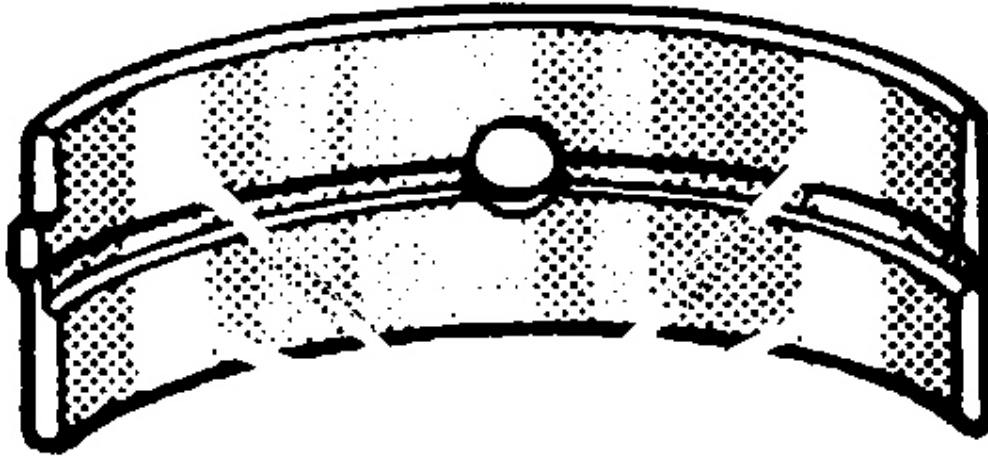


Fig. 395: View Of Improper Seating
Courtesy of GENERAL MOTORS CORP.

17. Inspect the crankshaft bearings for improper seating, indicated by bright, polished sections of the bearing.

If the lower half of the bearing is worn or damaged, both upper and lower halves should be replaced.

Generally, if the lower half is suitable for use, the upper half should also be suitable for use.

Measuring Main Bearing Clearance - Gaging Plastic Method

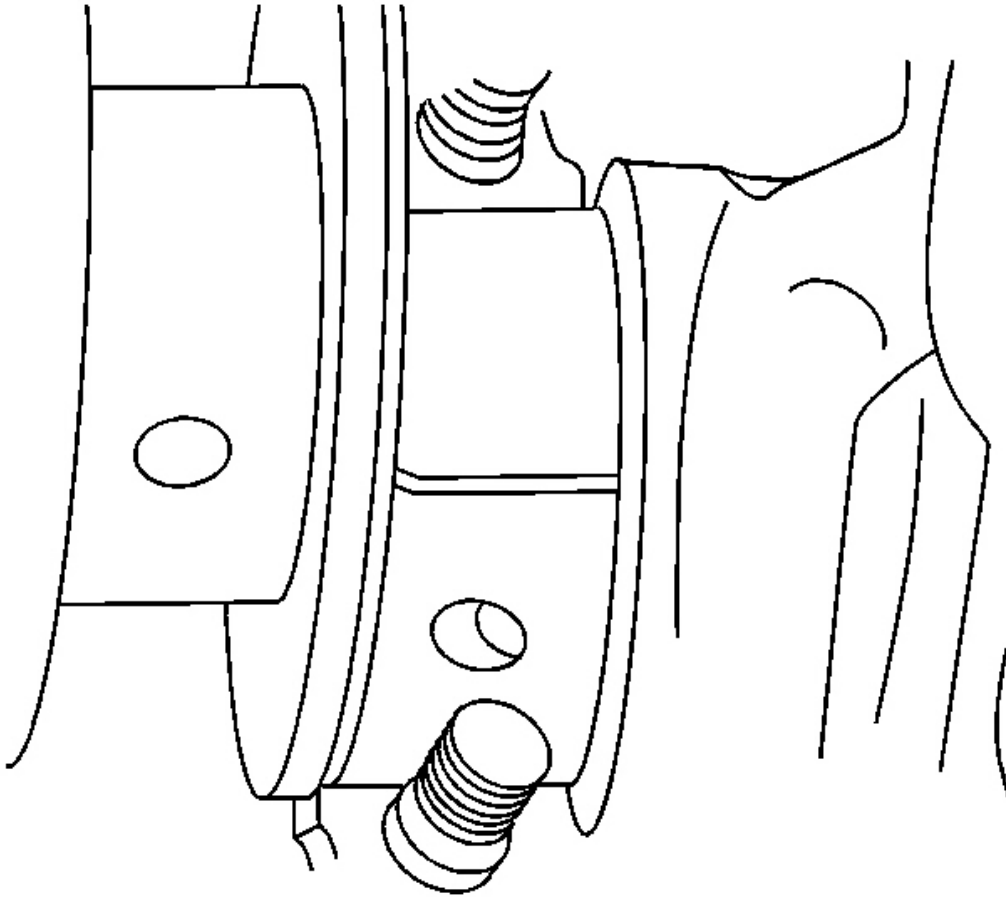


Fig. 396: View Of Gaging Plastic Installed On Crankshaft Journal
Courtesy of GENERAL MOTORS CORP.

IMPORTANT:

- The crankshaft main bearings are a precision insert type. Main bearing caps are machined with the engine block, for proper clearance and cannot be shimmed or filed for bearing fit. If the clearances are found to be excessive, new bearings and/or engine block and cap repair or replacement may be required.
- Do not rotate the crankshaft while gaging plastic is between the crankshaft journal and the bearing surface.
- The crankshaft bearing clearances are critical. Excessive bearing clearance may affect crankshaft position sensor signals and may affect on-board diagnostics (OBD) II system operation.
- Remove the bearing cap side bolts prior to cap removal.

1. Remove the bearing caps, bearing half and bolts. Refer to **Crankshaft and Bearings Removal**.
2. Install gaging plastic onto the crankshaft journal. Install the gaging plastic the full width of the crankshaft bearing journal.
3. Install the bearing caps, bearing half and bolts. Refer to **Crankshaft and Bearings Installation**.
4. Remove the bearing caps, bearing half and bolts. Refer to **Crankshaft and Bearings Removal**.

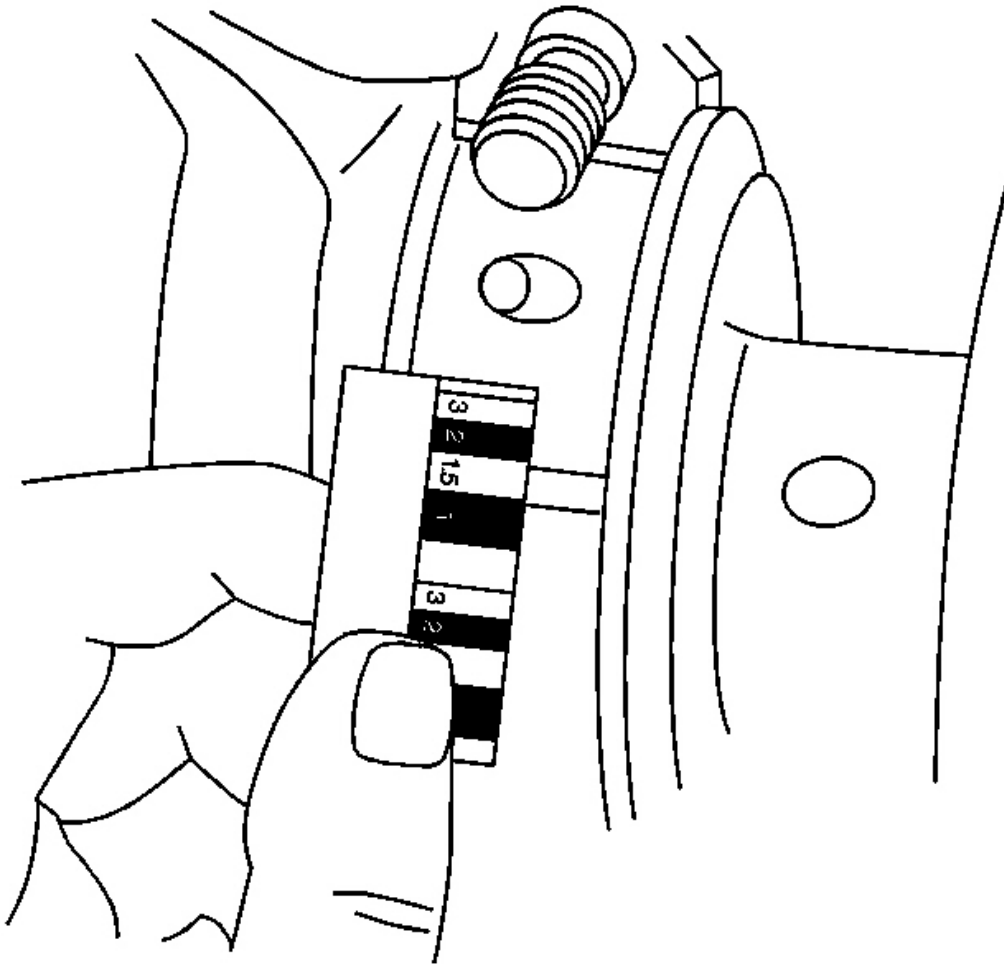


Fig. 397: Measuring Gaging Plastic
Courtesy of GENERAL MOTORS CORP.

5. Using the scale supplied with the plastic gaging kit, measure the gaging plastic at its widest area.
 - If the gaging plastic shows irregularity in the journal, exceeding 0.025 mm (0.001 in), remove the crankshaft and measure the journal with a micrometer.

- If clearance cannot be brought to specifications, replace the crankshaft or engine block, as required. Refer to **Engine Mechanical Specifications**.

Measuring Connecting Rod Bearing Clearance - Gaging Plastic Method

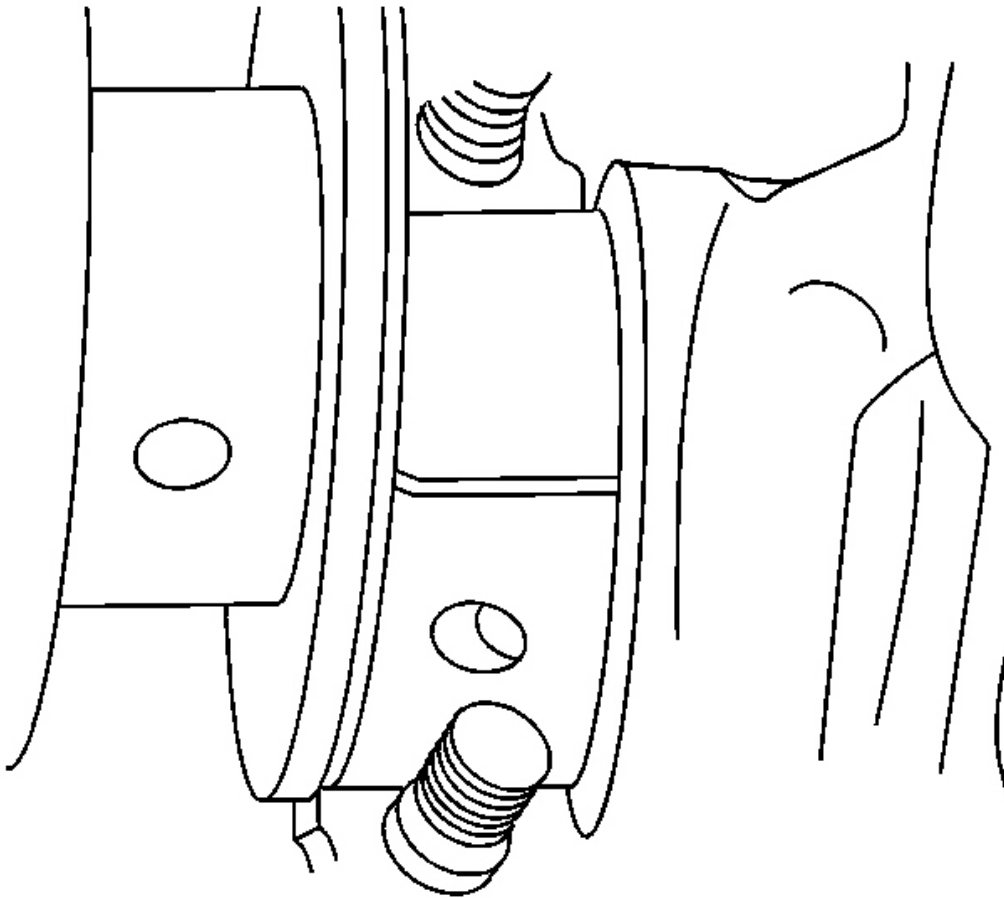


Fig. 398: View Of Gaging Plastic Installed On Crankshaft Journal
Courtesy of GENERAL MOTORS CORP.

IMPORTANT:

- Connecting rod bearings are a precision insert type. Connecting rods are of a powdered metal design and cannot be shimmed or filed for bearing fit. If clearances are found to be excessive, a new bearing and/or connecting rod is required.
- Do not rotate the crankshaft while gaging plastic is between the crankshaft journal and the bearing surface.

1. Remove the bearing cap, bearing half and bolts. Refer to **Piston, Connecting Rod and Bearing Removal**.
2. Install the gaging plastic onto the connecting rod bearing journal. Install the gaging plastic the full width of the journal.
3. Install the bearing cap, bearing half and bolts. Refer to **Piston, Connecting Rod and Bearing Installation**.
4. Remove the bearing cap, bearing half and bolts. Refer to **Piston, Connecting Rod and Bearing Removal**.

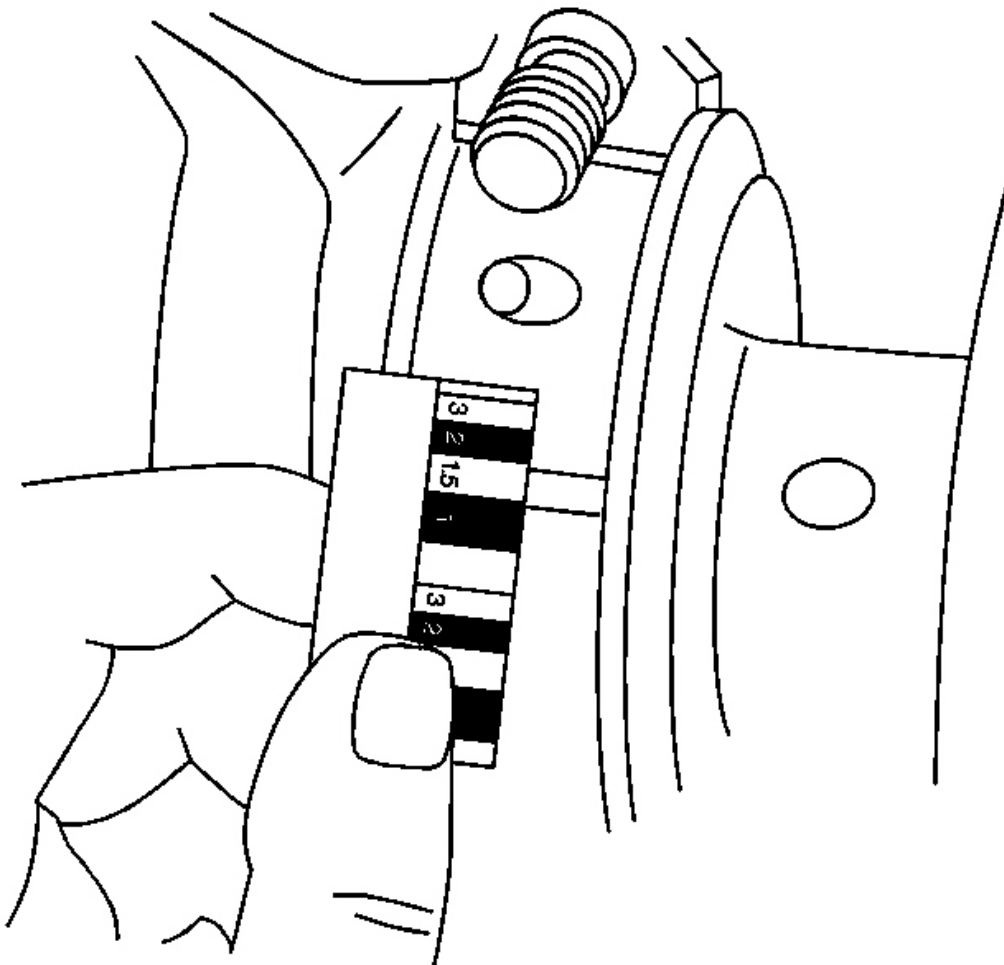


Fig. 399: Measuring Gaging Plastic
Courtesy of GENERAL MOTORS CORP.

5. Using the scale supplied with the plastic gaging kit, measure the gaging plastic at its widest area. Refer to **Engine Mechanical Specifications**.

Measuring Connecting Rod Bearing Clearance - Using J 43690/J 43690-100

J 43690 and **J 43690-100** have been developed as a more accurate method to measure connecting rod bearing clearances. The instructions below provide an overview of tool set-up and usage. For more detailed information, refer to the tool instruction sheets supplied by the tool manufacturer.

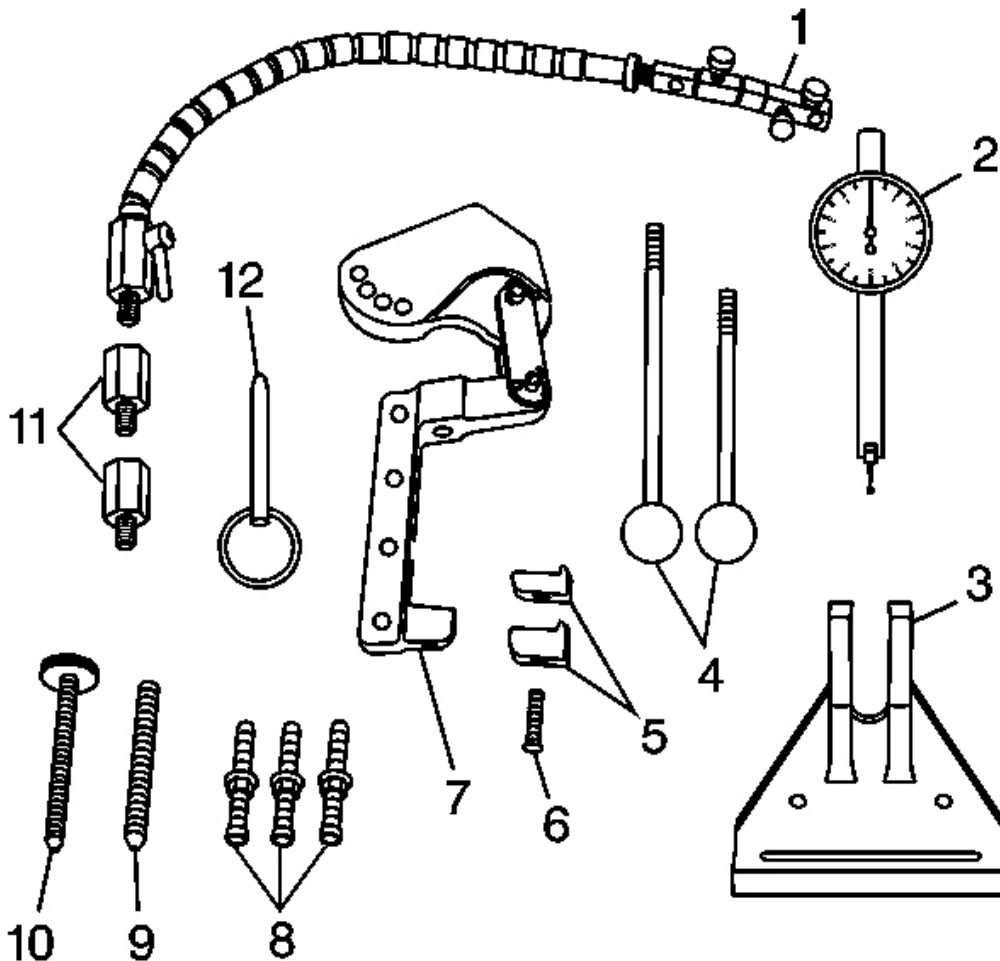


Fig. 400: Identifying Rod Bearing Clearance Checking Tool
Courtesy of GENERAL MOTORS CORP.

2007 Chevrolet TrailBlazer

2007 ENGINE Engine Mechanical - 6.0L - TrailBlazer

- J 43690-20 Swivel Base (1)
- J 43690-19 Dial Indicator (2)
- J 43690-2 Base (3)
- J 43690-5, -6 Handle (4)
- J 43690-10, -11 Foot (5)
- 280307 Screw (6)
- J 43690-1 Pivot Arm Assembly (7)
- J 43690-3, -7, -8 Screws (8)
- 280319 Screw (9)
- 280311 Screw (10)
- J 43690-17, -18 Adapter (11)
- 280310 Pin (12)

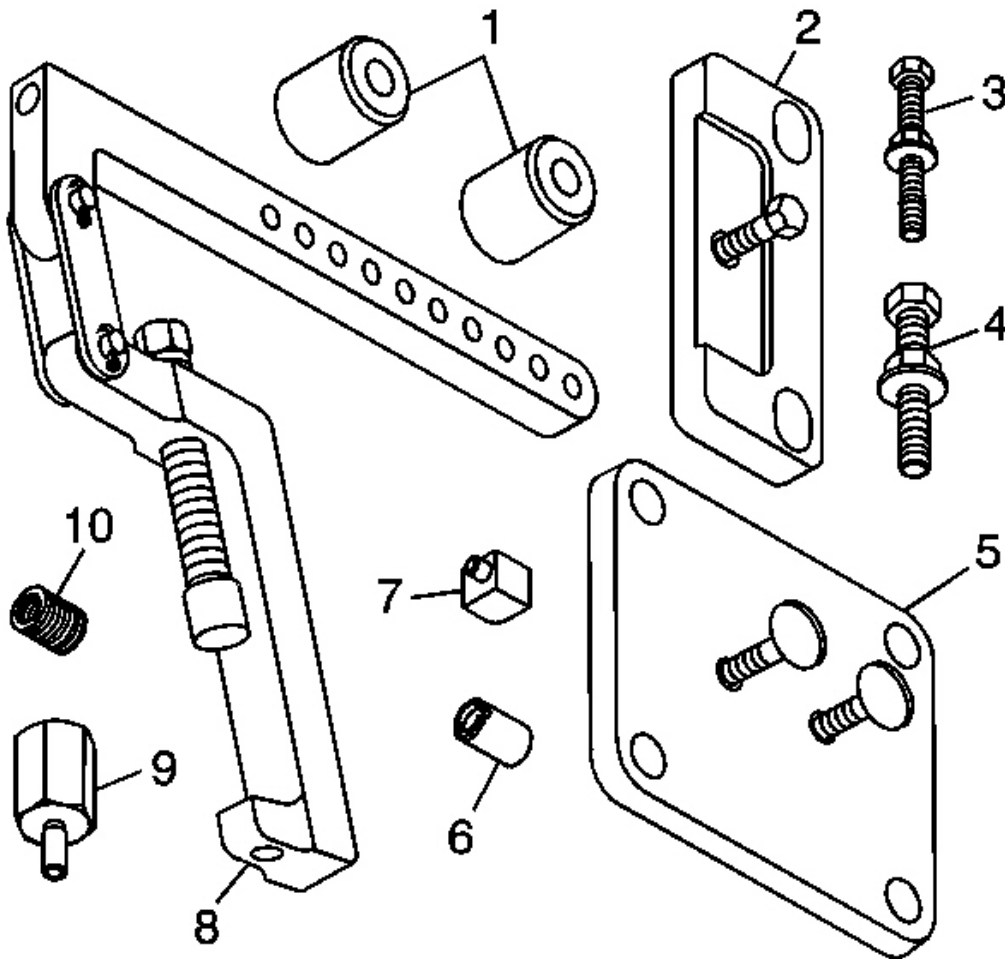


Fig. 401: Identifying Rod Bearing Clearance Tool - Adapter Kit
Courtesy of GENERAL MOTORS CORP.

Rod Bearing Checking Tool - Adapter Kit

- J 43690-104 Spacer (1)
- J 43690-105 Retainer Plate (2)
- 505478 Bolt (3)
- 511341 Bolt (4)
- J 43690-106 Retainer Plate (5)
- J 43690-107 Cap (6)
- J 43690-102 Foot (7)

2007 Chevrolet TrailBlazer

2007 ENGINE Engine Mechanical - 6.0L - TrailBlazer

- J 43690-101 Pivot Arm Assembly (8)
- J 43690-103 Adapter (9)
- 505439 Adapter (10)

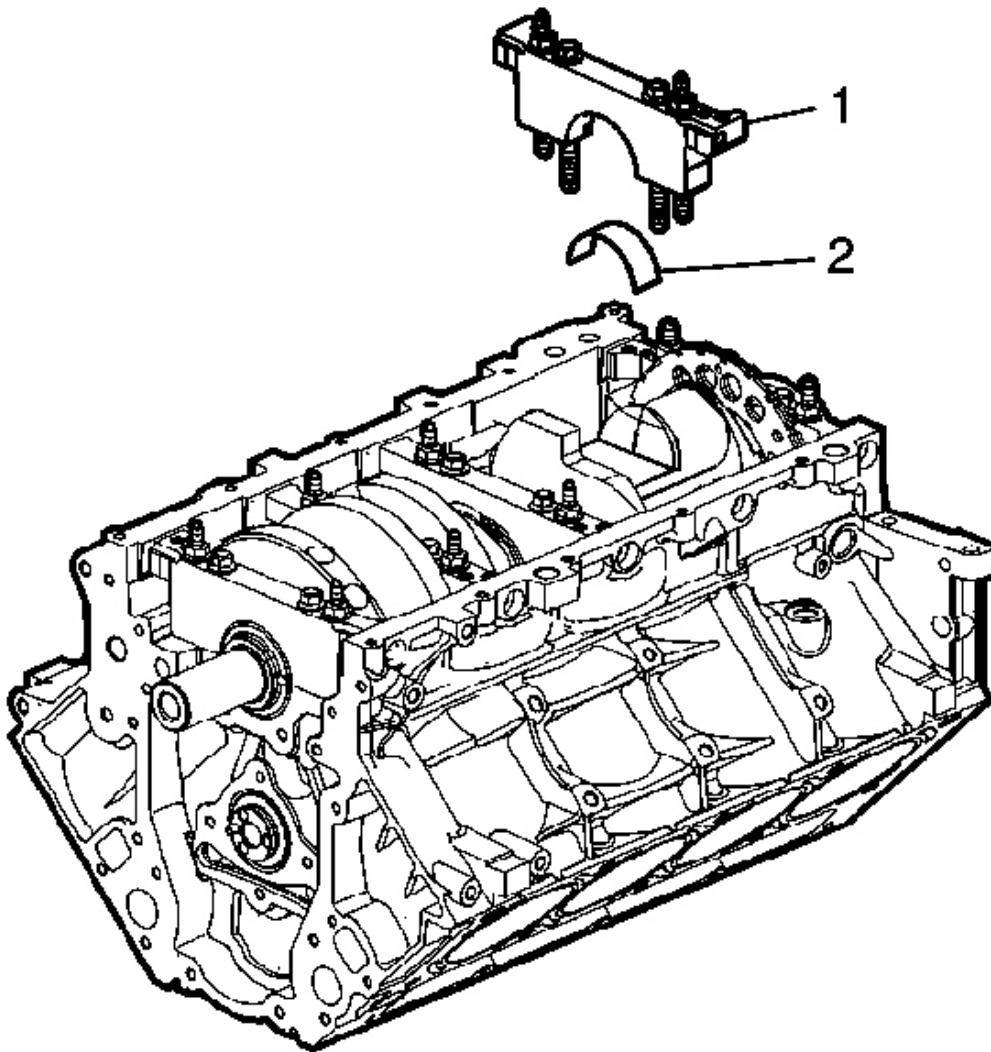


Fig. 402: View Of Bearing Cap, Bolt & Bearing Half
Courtesy of GENERAL MOTORS CORP.

IMPORTANT: The crankshaft must be secure, with no movement or rotation, in order to obtain an accurate reading.

1. Rotate the crankshaft until the journal/connecting rod to be measured is in the 12 o'clock position.
2. Remove a bearing cap and bolts (1).
3. Remove the bearing half (2).
4. Insert a piece of paper card stock onto the crankshaft journal.
5. Install the bearing half (2) and cap and bolts (1). Refer to **Fastener Tightening Specifications**.

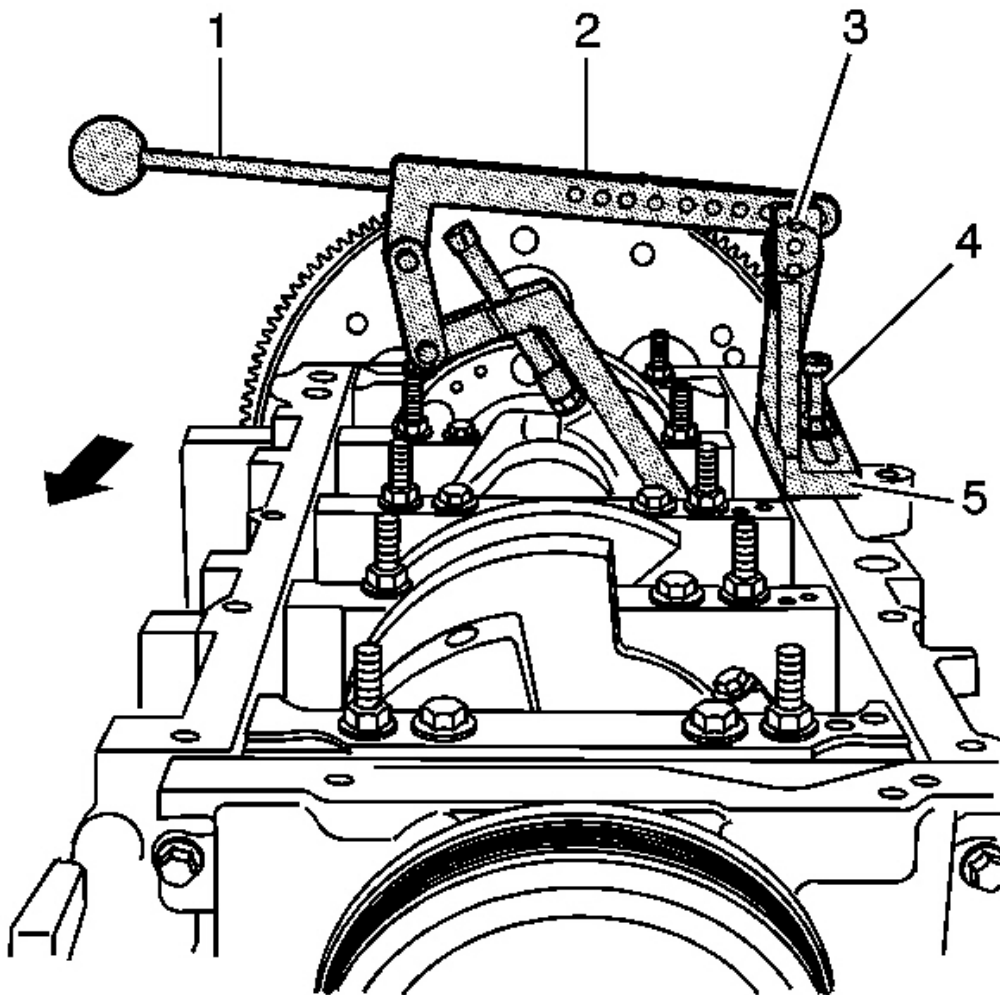


Fig. 403: View Of Special Tool Installed On Engine Block
Courtesy of GENERAL MOTORS CORP.

6. Install the following:

1 J 43690-2 (5)

2. J 43690-3 (4)
3. J 43690-101 (2)
4. 280310 (3)
5. J 43690-5 (1)

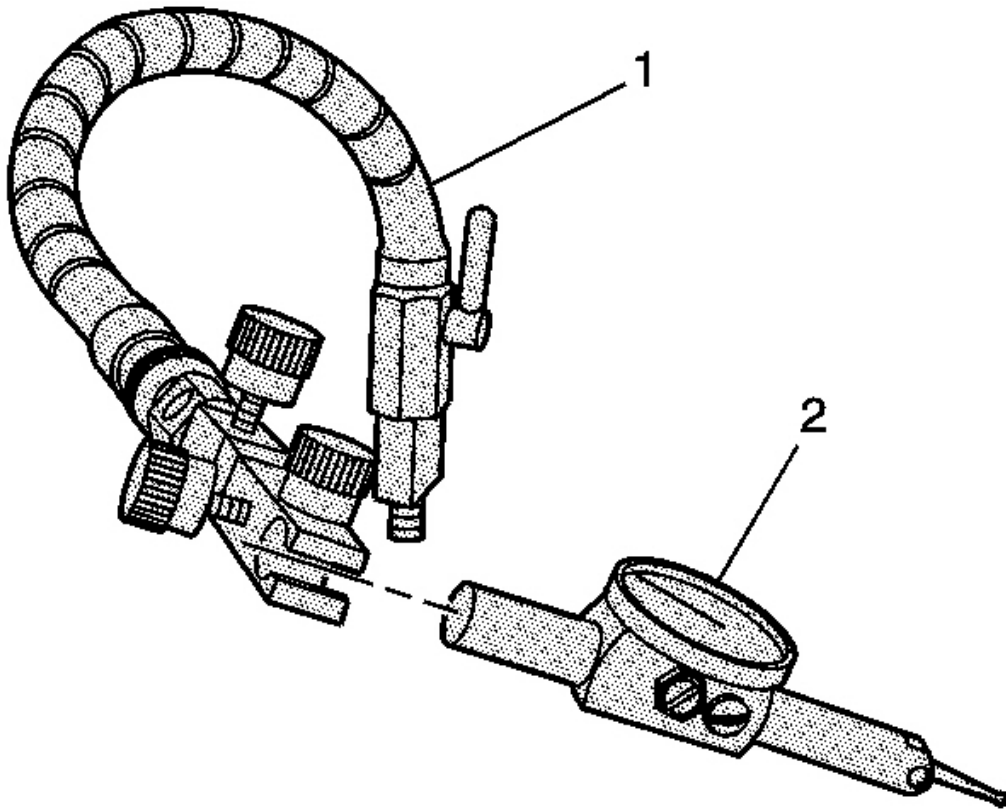


Fig. 404: View Of Swivel Base & Dial Indicator
Courtesy of GENERAL MOTORS CORP.

7. Install the swivel base (1) and dial indicator (2).
8. Adjust per the manufacturers instructions and measure the connecting rod bearing clearance.

A connecting rod with a clearance in excess of 0.076 mm (0.003 in) is considered excessive. Service components, as required.

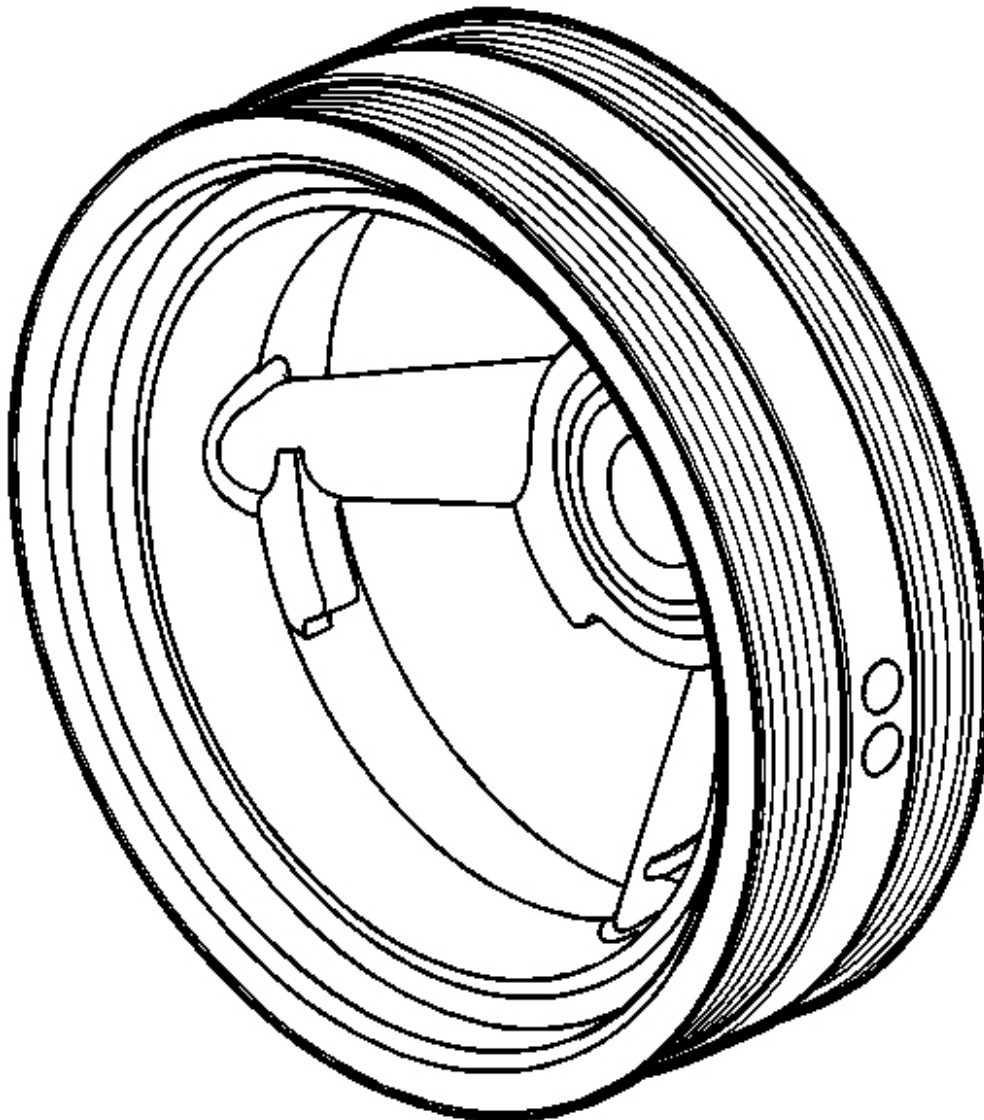


Fig. 405: View Of Crankshaft Balancer
Courtesy of GENERAL MOTORS CORP.

1. Clean the crankshaft balancer in solvent.
2. Clean the belt grooves of all dirt or debris with a wire brush.
3. Dry the crankshaft balancer with compressed air.
4. Inspect the crankshaft balancer for the following conditions:

2007 Chevrolet TrailBlazer

2007 ENGINE Engine Mechanical - 6.0L - TrailBlazer

- Worn, grooved or damaged hub seal surface

A crankshaft balancer hub seal surface with excessive scoring, grooves, rust or other damage must be replaced.

Minor imperfections on the hub seal surface may be removed with polishing compound or fine grade emery cloth.

IMPORTANT: In order for the belt to track properly, the belt grooves should be free of all dirt or debris.

- Dirty or damaged belt grooves

The balancer belt grooves should be free of any nicks, gouges or other damage that may not allow the belt to track properly.

Minor imperfections may be removed with a fine file.

- Worn, chunking or deteriorated rubber between the hub and pulley

ENGINE FLYWHEEL CLEANING AND INSPECTION

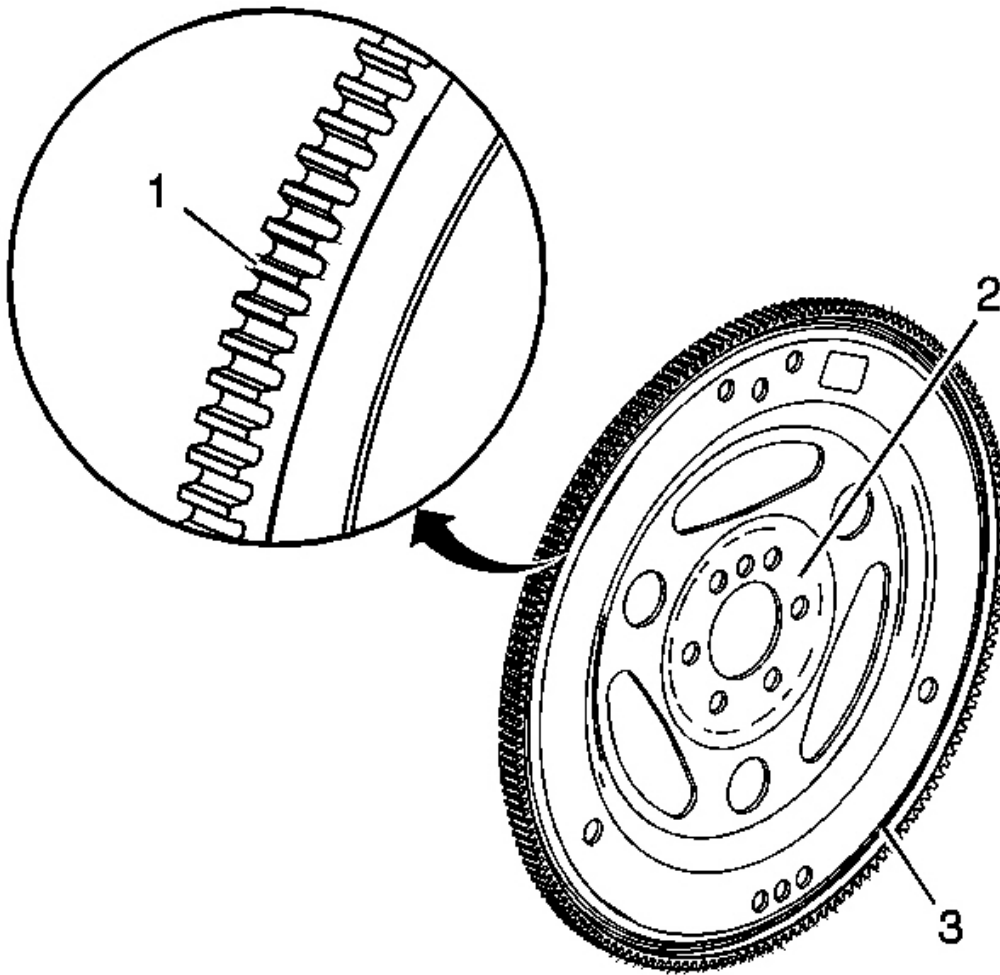


Fig. 406: View Of Ring Gear Teeth
Courtesy of GENERAL MOTORS CORP.

1. Clean the automatic transmission flex plate in solvent.
2. Dry the flex plate with compressed air.
3. Inspect the flex plate for the following conditions:
 - Damaged ring gear teeth (1)
 - Stress cracks around the flex plate-to-crankshaft bolt hole locations (2)

IMPORTANT: Do not attempt to repair the welded areas that retain the ring gear to the flex plate. Install a new flex plate.

- Welded areas (3) that retain the ring gear onto the flex plate for cracking

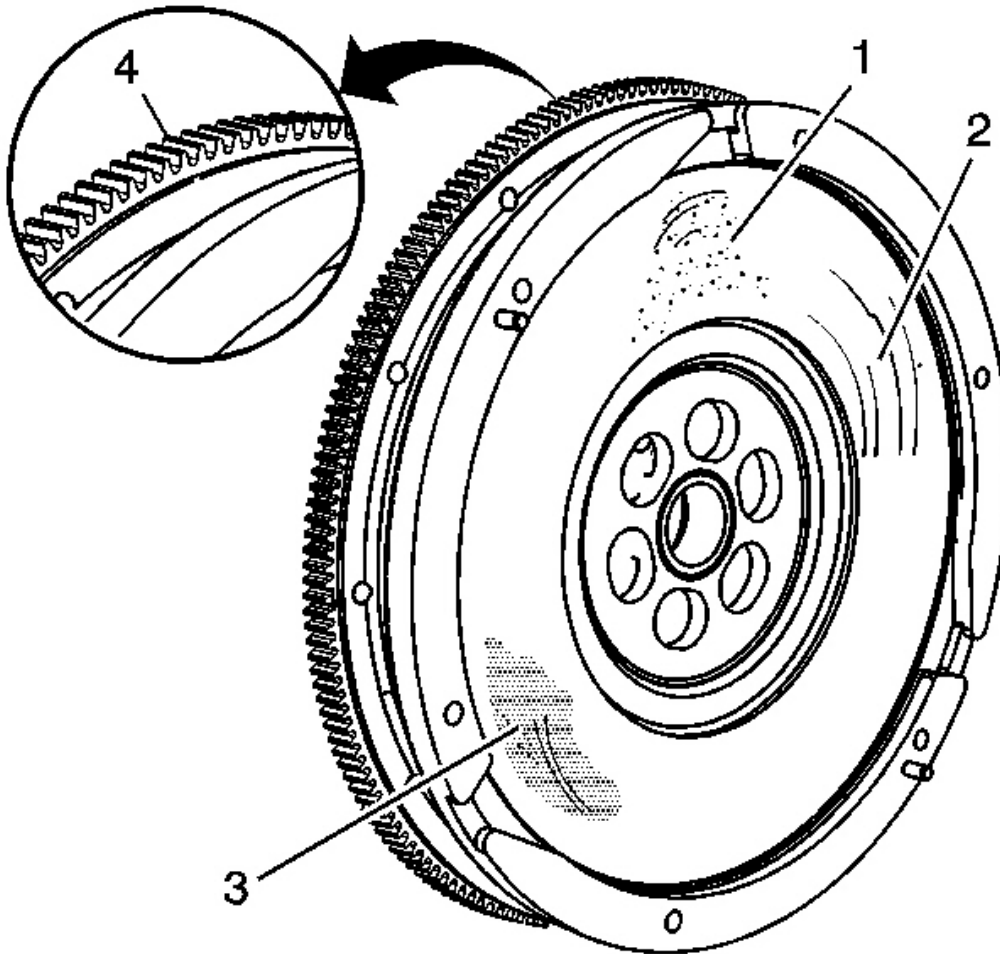


Fig. 407: Identifying Manual Transmission Flywheel Wear & Damage
Courtesy of GENERAL MOTORS CORP.

4. Clean the manual transmission flywheel in solvent.
5. Dry the flywheel with compressed air.
6. Inspect the flywheel for the following conditions:
 - Pitted surface (1)
 - Grooved or scored surface (2)
 - Rusty surface (3)
 - Damaged ring gear teeth (4)

2007 Chevrolet TrailBlazer

2007 ENGINE Engine Mechanical - 6.0L - TrailBlazer

- Loose or improperly positioned ring gear. The ring gear has an interference fit onto the flywheel and should be positioned completely against the flange of the flywheel.
- Missing, bent or damaged pressure plate locating pins. The 2 locating pins are installed into the flywheel and spaced 170 degrees apart to ensure proper orientation of the clutch pressure plate to the engine flywheel during assembly.

PISTON AND CONNECTING ROD DISASSEMBLE

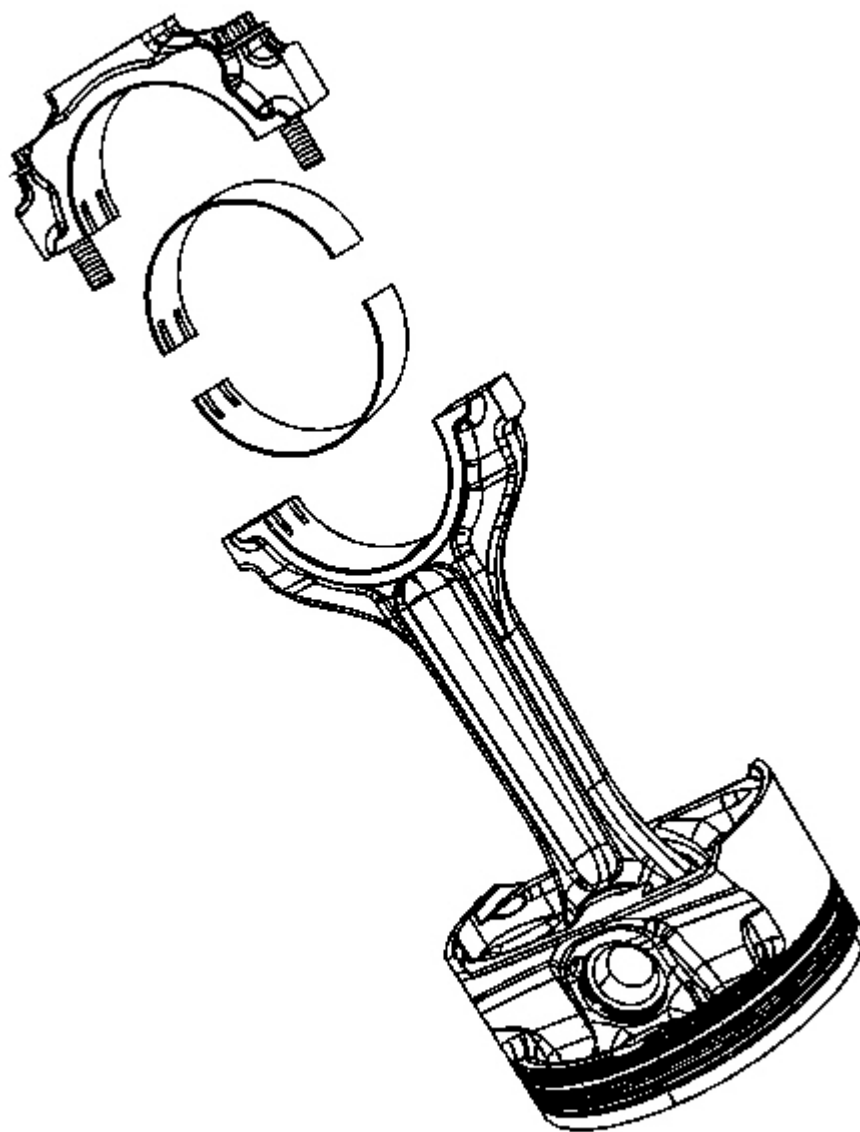


Fig. 408: View Of Piston, Connecting Rod & Bearing Assembly
Courtesy of GENERAL MOTORS CORP.

1. Remove the connecting rod bearings from the rod and cap.

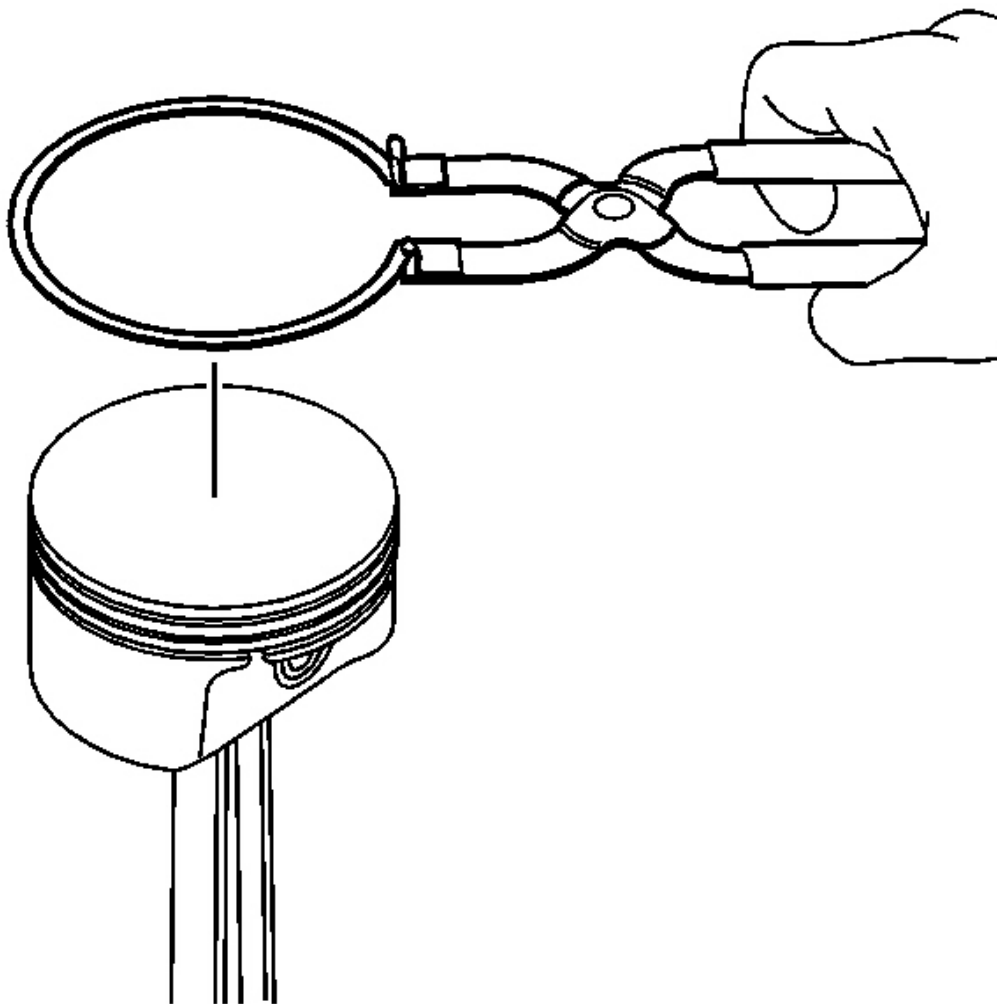


Fig. 409: View Of Piston Rings
Courtesy of GENERAL MOTORS CORP.

2. Using piston ring pliers, remove the piston rings from the piston.

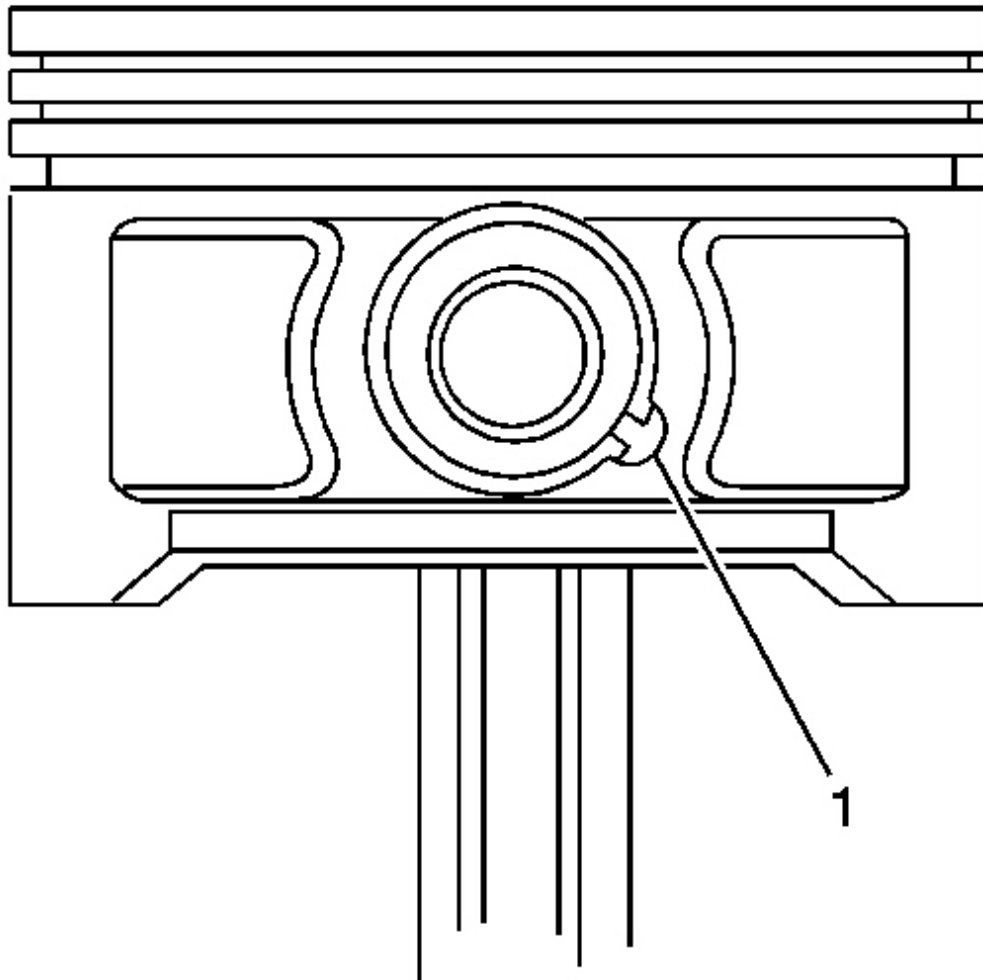


Fig. 410: View Of Piston Pin Retaining Clip & Cutout Area Of Pin Bore
Courtesy of GENERAL MOTORS CORP.

3. Rotate the piston pin retainers until the ring end gaps are positioned in the cutout area (1) of the pin bore.

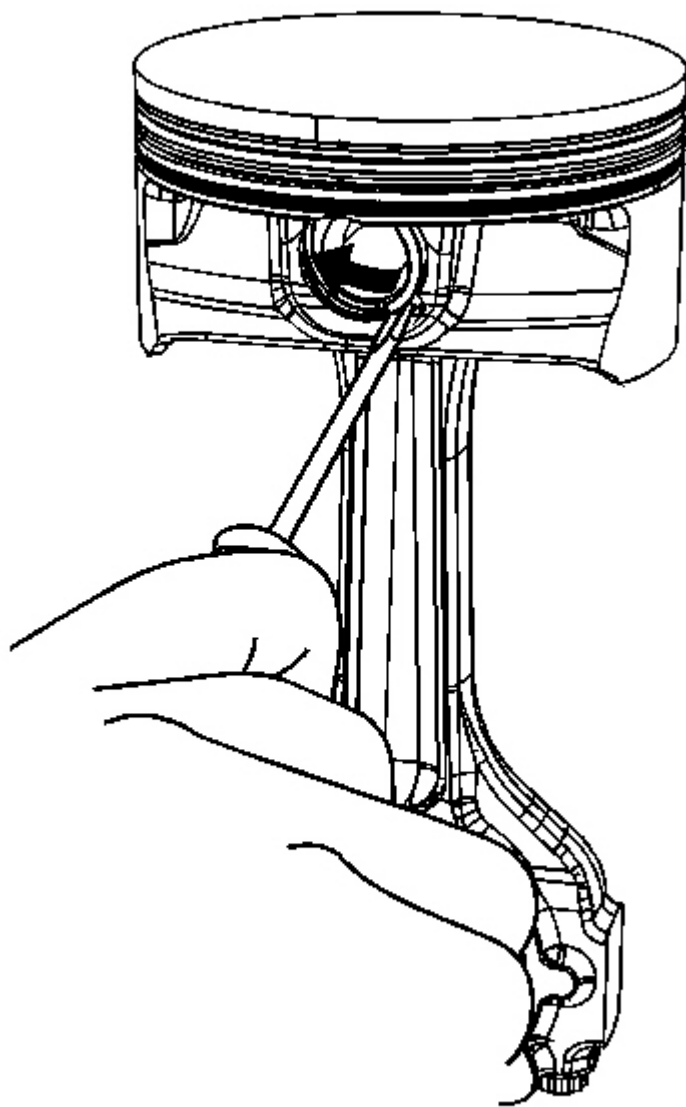


Fig. 411: Identifying Piston Pin Retainer
Courtesy of GENERAL MOTORS CORP.

4. Remove the retainers starting in the cutout area of the pin bore.

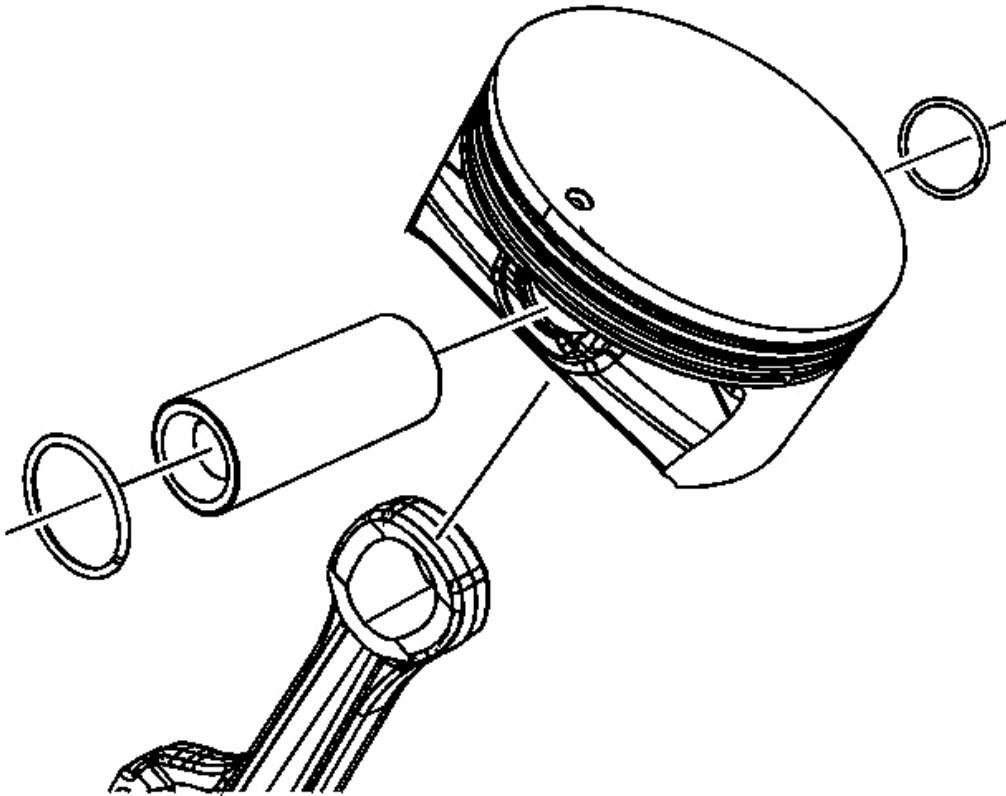


Fig. 412: View Of Piston Pin, Piston & Connecting Rod
Courtesy of GENERAL MOTORS CORP.

5. Remove the pin from the piston and connecting rod.
6. The piston and pin are a matched set and are not to be serviced separately.

Mark, sort or organize the piston and the matching piston pin.

PISTON, CONNECTING ROD AND BEARINGS CLEANING AND INSPECTION

Piston, Pin and Piston Rings

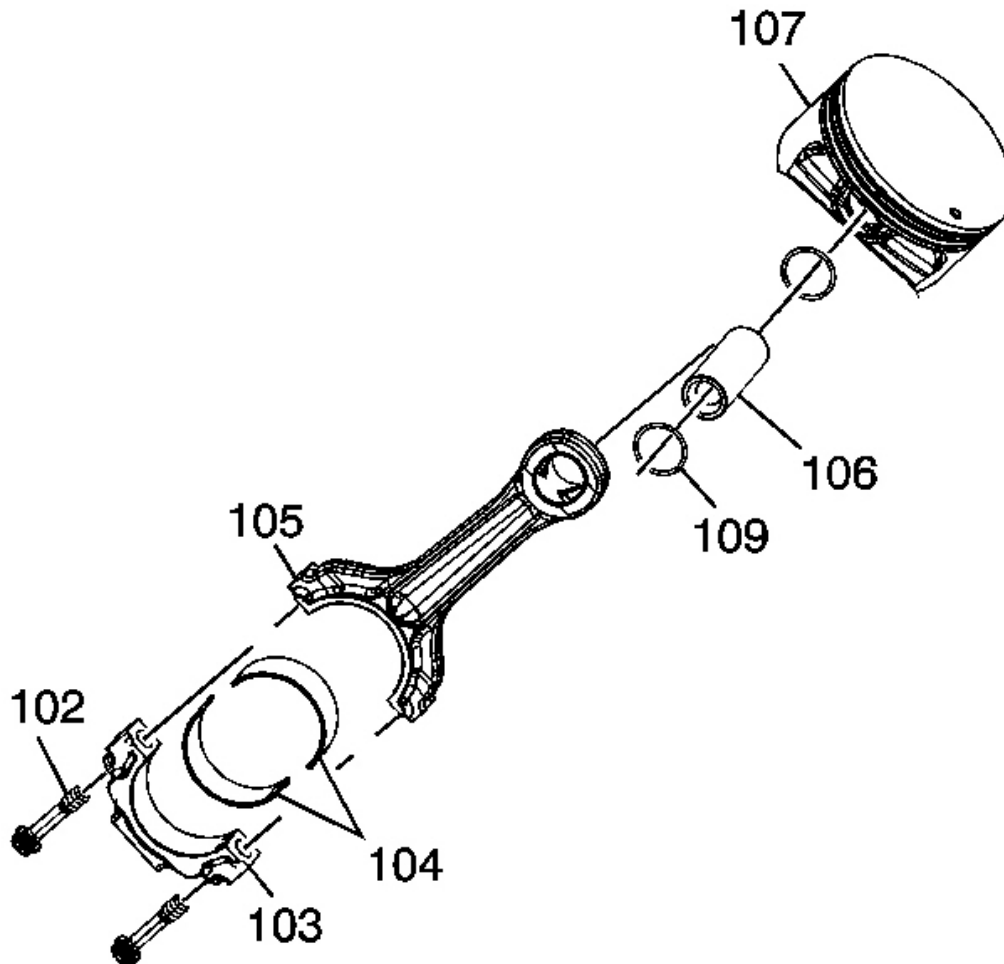


Fig. 413: View Of Piston, Pin & Piston Rings
Courtesy of GENERAL MOTORS CORP.

IMPORTANT:

- Replace pistons, pins and connecting rods that are damaged or show signs of excessive wear.
- The piston and pin are to be serviced as an assembly.
- Do not wire brush any part of the piston.
- Measurement of the components should be taken with the components at normal room temperature.

1. Clean the varnish and carbon from the piston (107) using cleaning solvent.

CAUTION: Refer to Safety Glasses Caution .

2. Dry the components with compressed air.

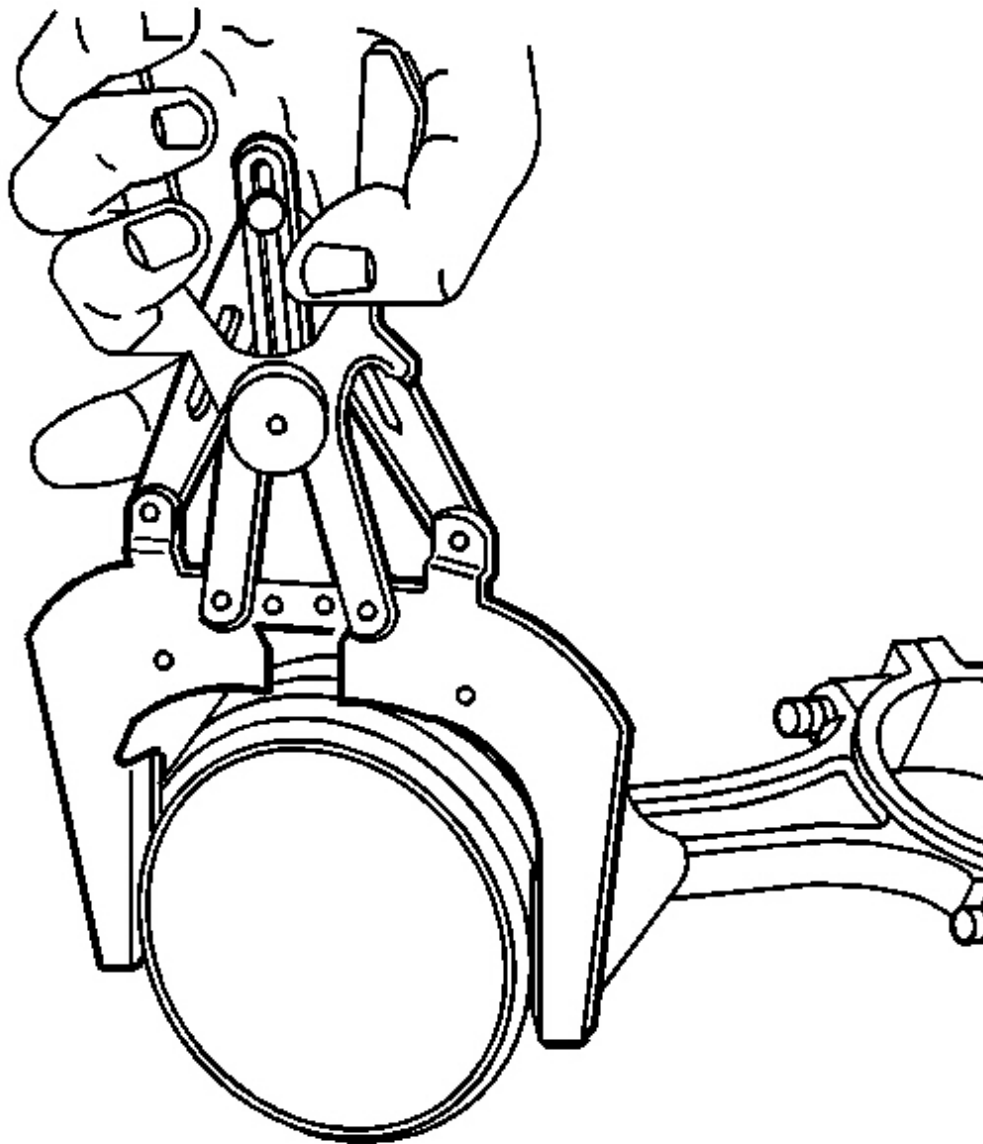


Fig. 414: Cleaning Piston Ring Grooves

Courtesy of GENERAL MOTORS CORP.

3. Clean the piston ring grooves with a suitable ring groove cleaning tool.
4. Clean the oil lubrication holes and slots.

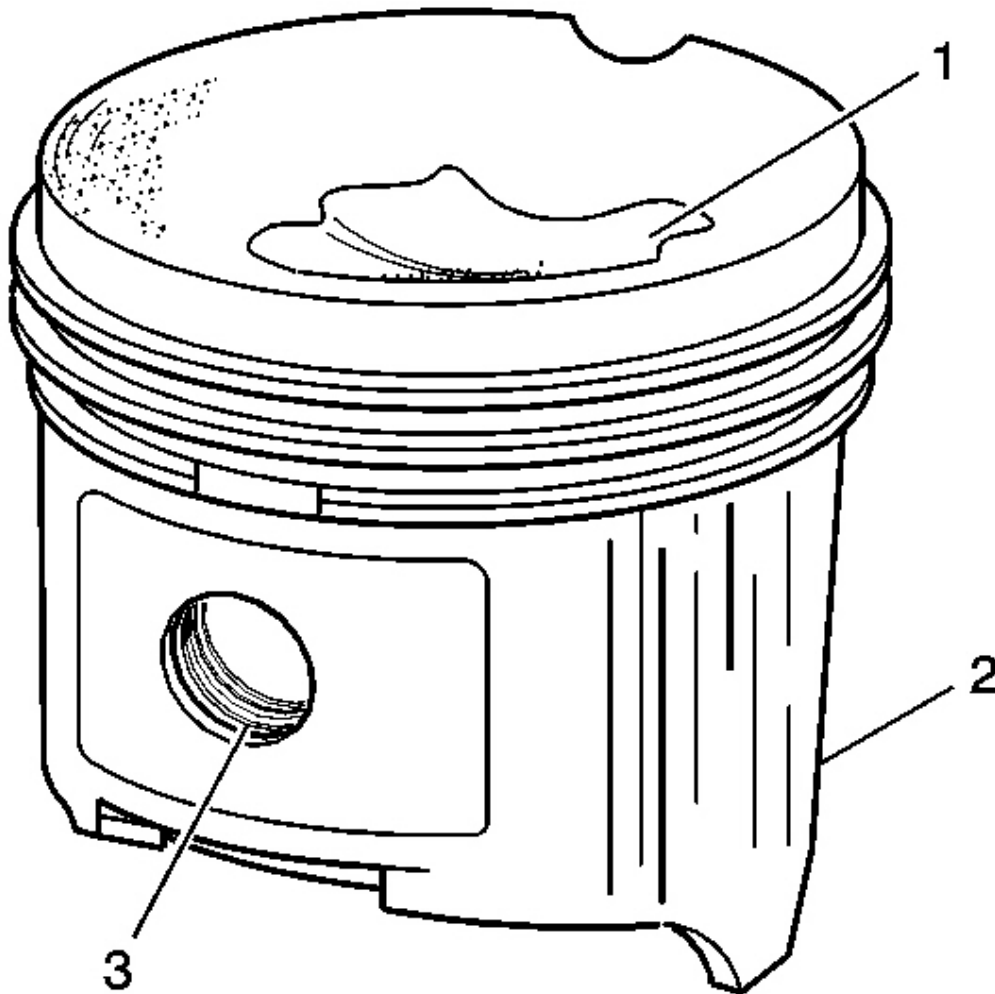


Fig. 415: Identifying Piston Damage Inspection Areas
Courtesy of GENERAL MOTORS CORP.

5. Inspect the piston for the following conditions:
 - Cracks in the piston ring lands, the piston skirt or pin bosses
 - Piston ring grooves for nicks, burrs or warpage which may cause the piston ring to bind

MINOR imperfections may be removed from the piston with a fine file.

- Eroded areas at the top of the piston (1)
- Scuffed or damaged skirts (2)
- Scoring to the piston pin bore (3) or piston pin

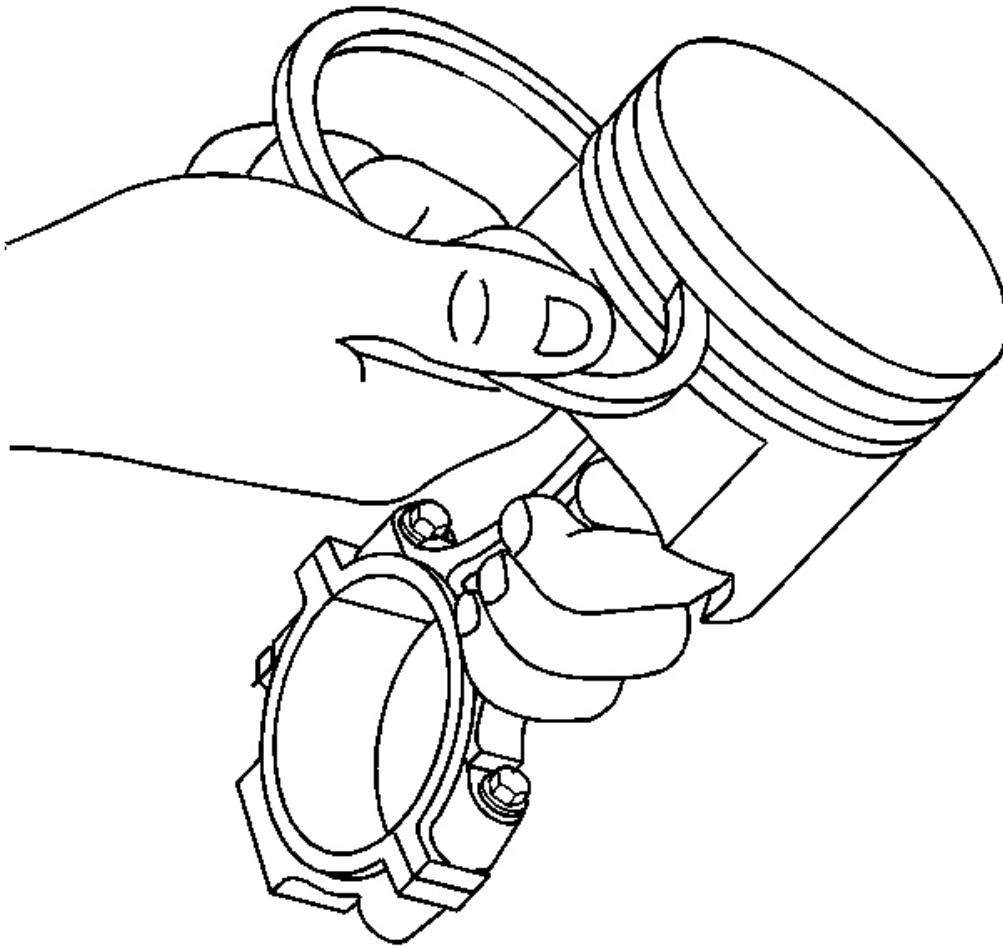


Fig. 416: Measuring Piston Ring To Piston Ring Groove Side Clearance
Courtesy of GENERAL MOTORS CORP.

6. Insert the edge of the piston ring into the piston ring groove.

Roll the piston ring completely around the piston. If binding is caused by a distorted ring groove, MINOR imperfections may be removed with a fine file. If binding is caused by a distorted piston ring, replace the

rings, as required.

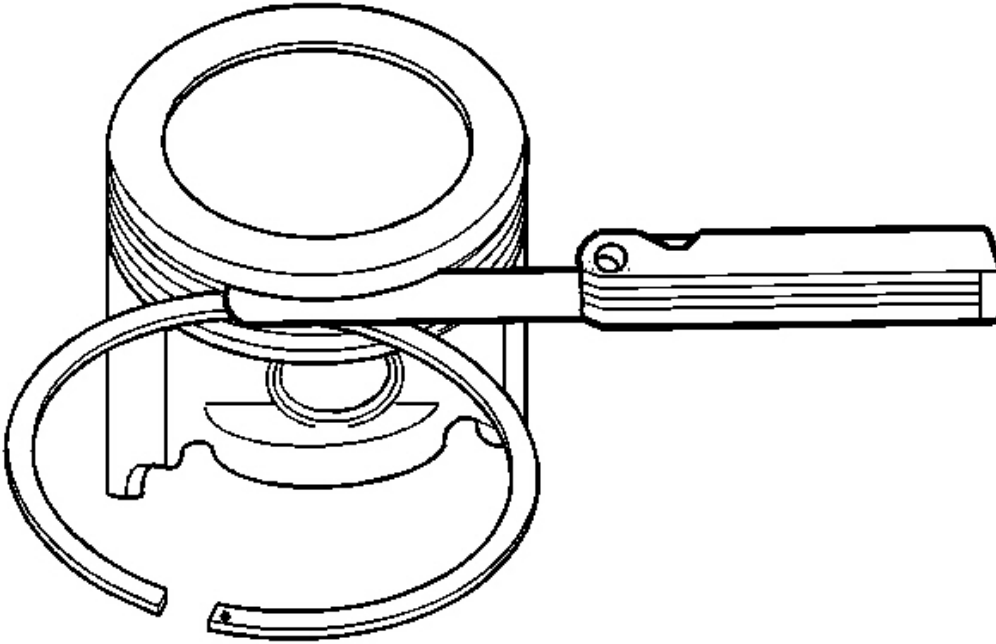


Fig. 417: Measuring Piston Ring Side Clearance
Courtesy of GENERAL MOTORS CORP.

7. Measure the piston ring side clearance with a feeler gage. If side clearance is not within specifications, try another piston ring. If the proper ring-to-groove clearance cannot be obtained, replace the piston and pin as an assembly. Refer to **Engine Mechanical Specifications**.

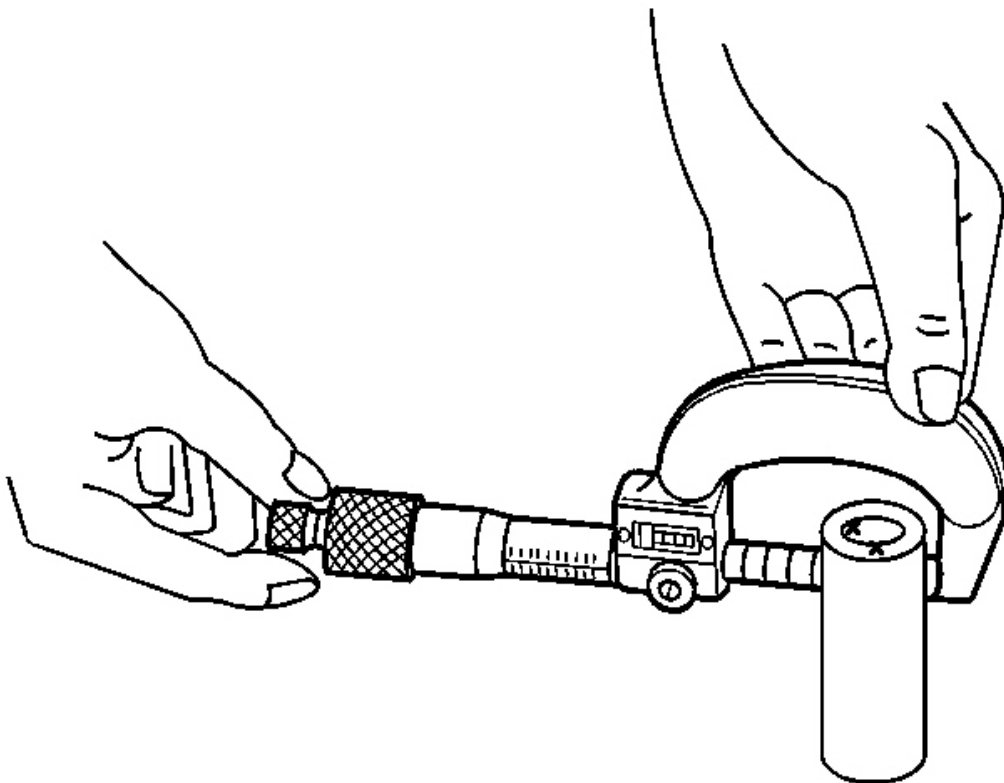


Fig. 418: View Of Piston Pin Diameter
Courtesy of GENERAL MOTORS CORP.

8. To determine piston pin-to-bore clearance, use a micrometer and measure the piston pin outside diameter (OD).

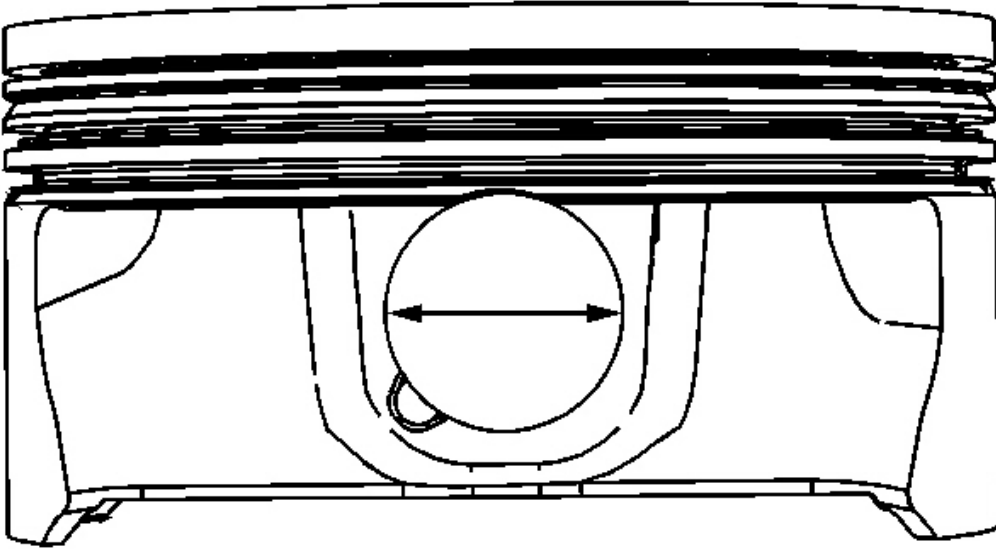


Fig. 419: Measuring Piston Pin-To-Bore Clearance
Courtesy of GENERAL MOTORS CORP.

9. To determine the piston pin-to-bore clearance, use an inside micrometer and measure the piston pin bore inside diameter (ID).
10. Subtract the piston pin OD measurement from the piston pin bore ID measurement to determine pin-to-bore clearance. Refer to **Engine Mechanical Specifications**.

Measuring Piston Ring End Gap

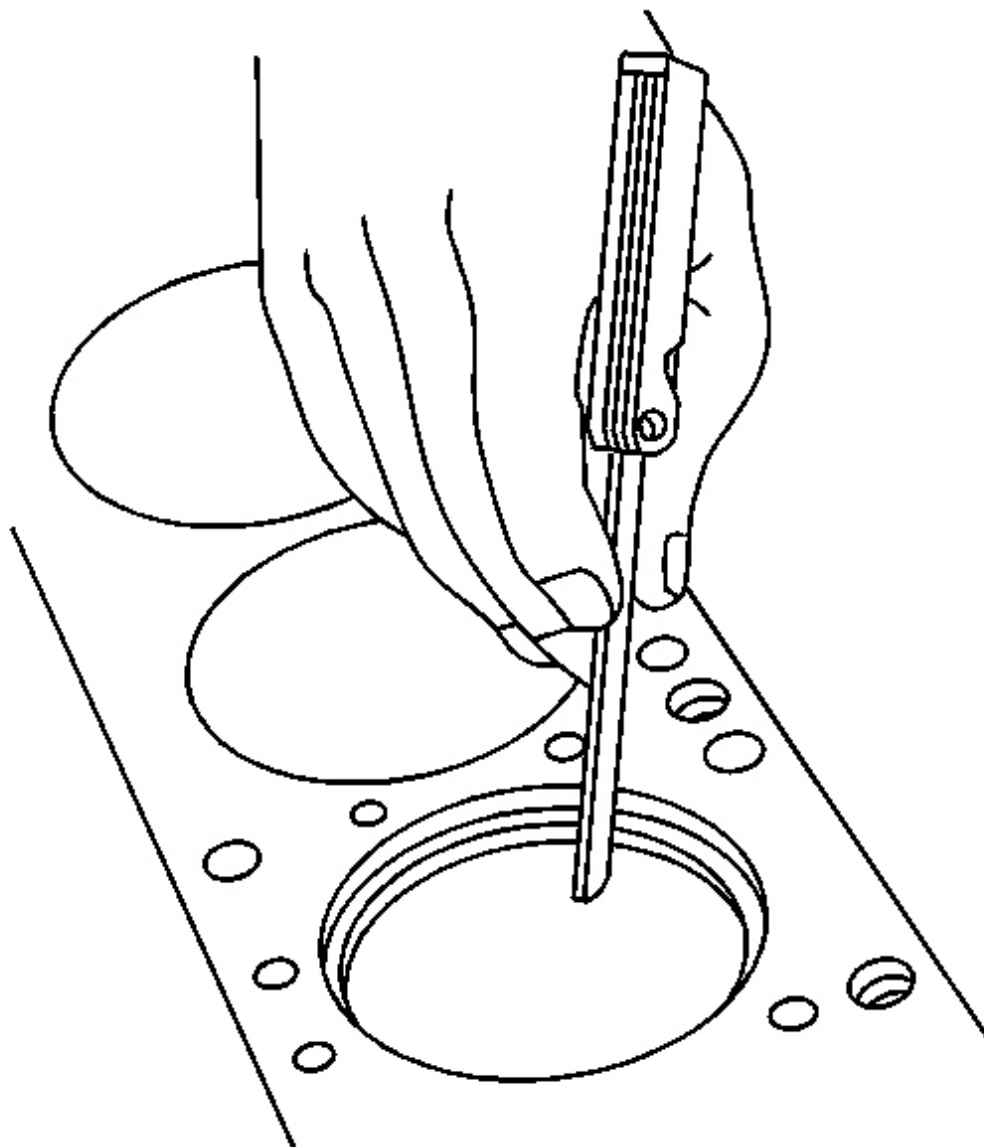


Fig. 420: View Of Piston Ring End Gap
Courtesy of GENERAL MOTORS CORP.

IMPORTANT:

- Do not attempt to file the end of the piston ring to achieve the proper end gap clearance.
- Measure the piston ring in the cylinder in which it will be used.

1. Place the piston ring into the cylinder bore 6.5 mm (0.25 in) below the top of the ring travel area. Both rings should be installed with the orientation marks facing the top of the piston.
2. Insert a feeler gage and measure the piston ring end gap. Refer to **Engine Mechanical Specifications**.

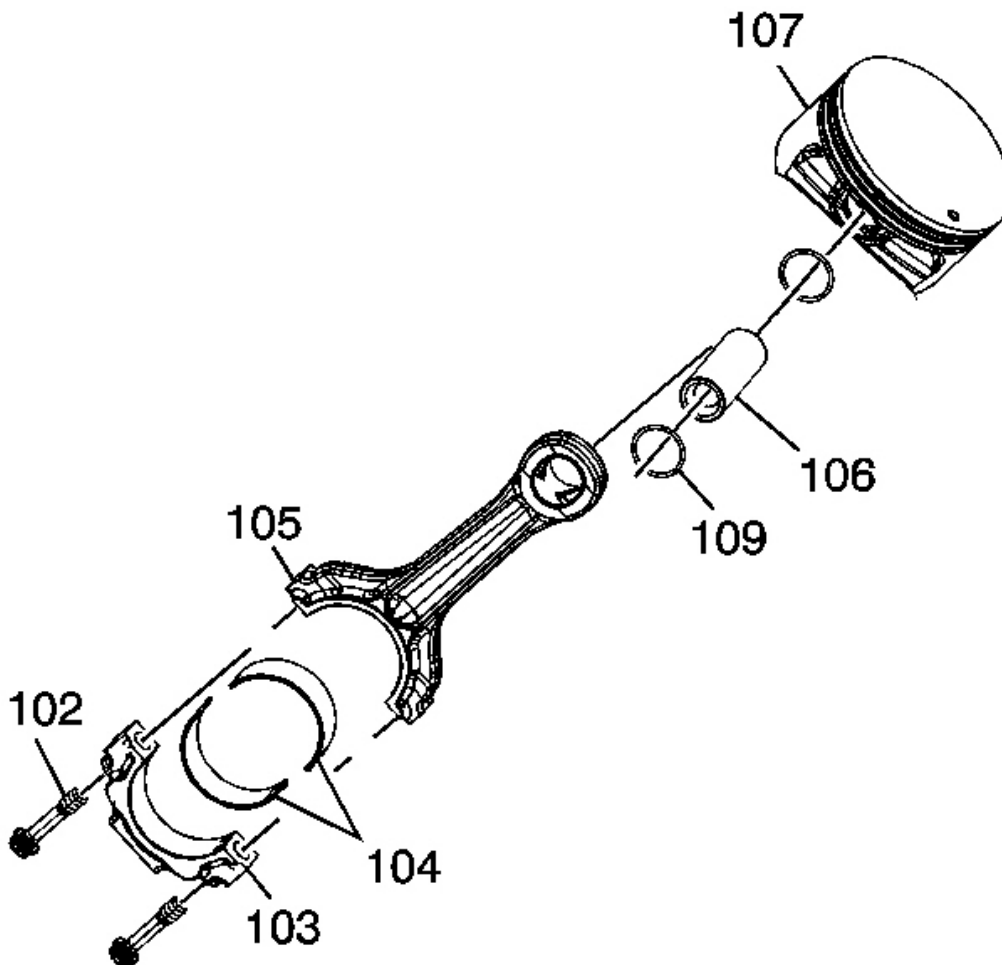
Connecting Rod and Bearings

Fig. 421: View Of Piston, Pin & Piston Rings
Courtesy of GENERAL MOTORS CORP.

IMPORTANT:

- The powdered metal connecting rod and cap are machined for proper clearances. The connecting rod and cap must be used as an assembly with no repair or modifications to either mating surface.

2007 Chevrolet TrailBlazer

2007 ENGINE Engine Mechanical - 6.0L - TrailBlazer

Do not attempt to repair the rod or cap. If service is required, replace the rod and cap as an assembly.

- **Do not attempt to repair the bolt hole threads of the connecting rod.**

1. Clean the connecting rod (105) and cap (103) in solvent.

CAUTION: Refer to Safety Glasses Caution .

2. Dry the components with compressed air.

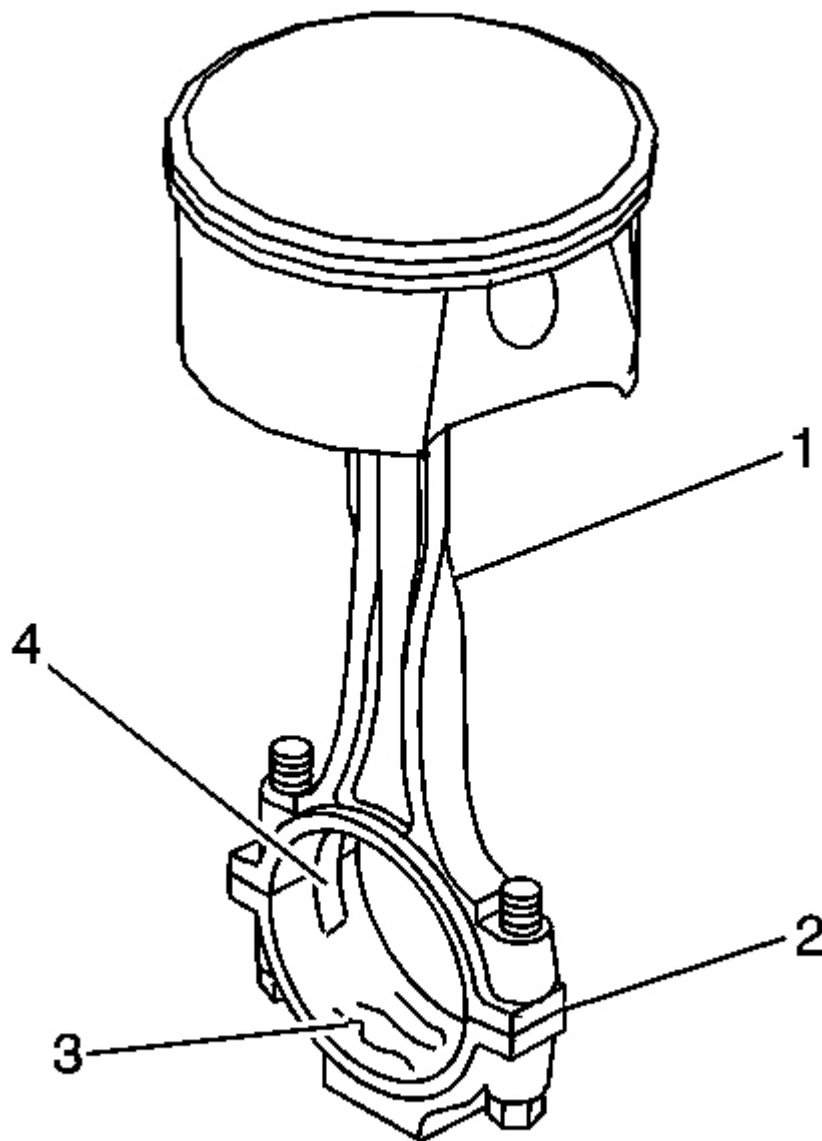


Fig. 422: Identifying Connecting Rod Inspection Areas
Courtesy of GENERAL MOTORS CORP.

3. Inspect the connecting rod for the following conditions:
 - Twisting (1)
 - Proper fit of the connecting rod and cap mating surfaces (2)

- Nicks or gouges in the bearing bore (3)
- Damage to the bearing locating slots (4)

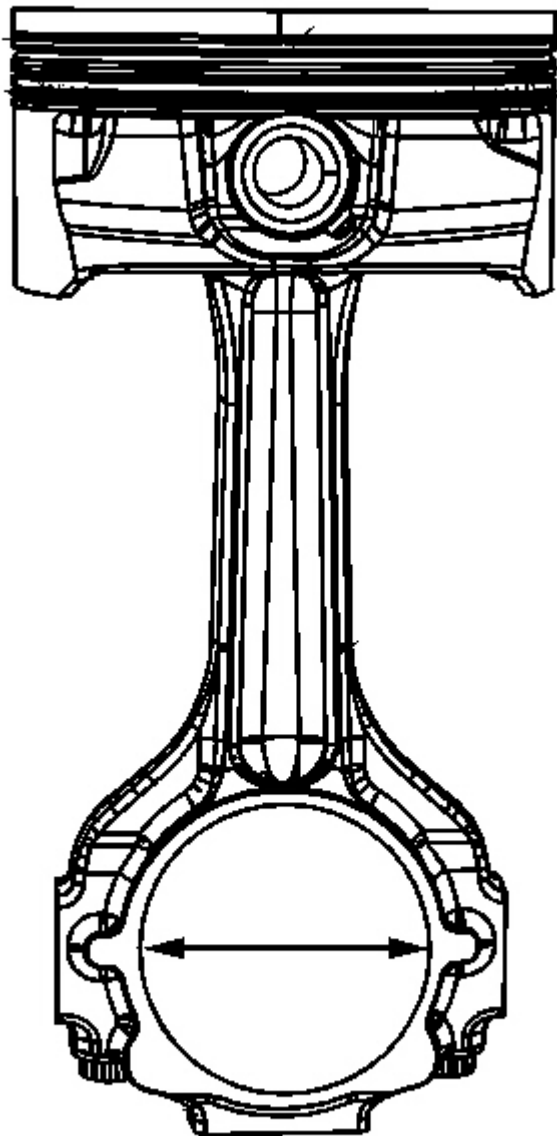


Fig. 423: Identifying Connecting Rod Bearing Bore
Courtesy of GENERAL MOTORS CORP.

4. Measure the connecting rod bearing bore for an out-of-round condition. Refer to **Engine Mechanical Specifications**.

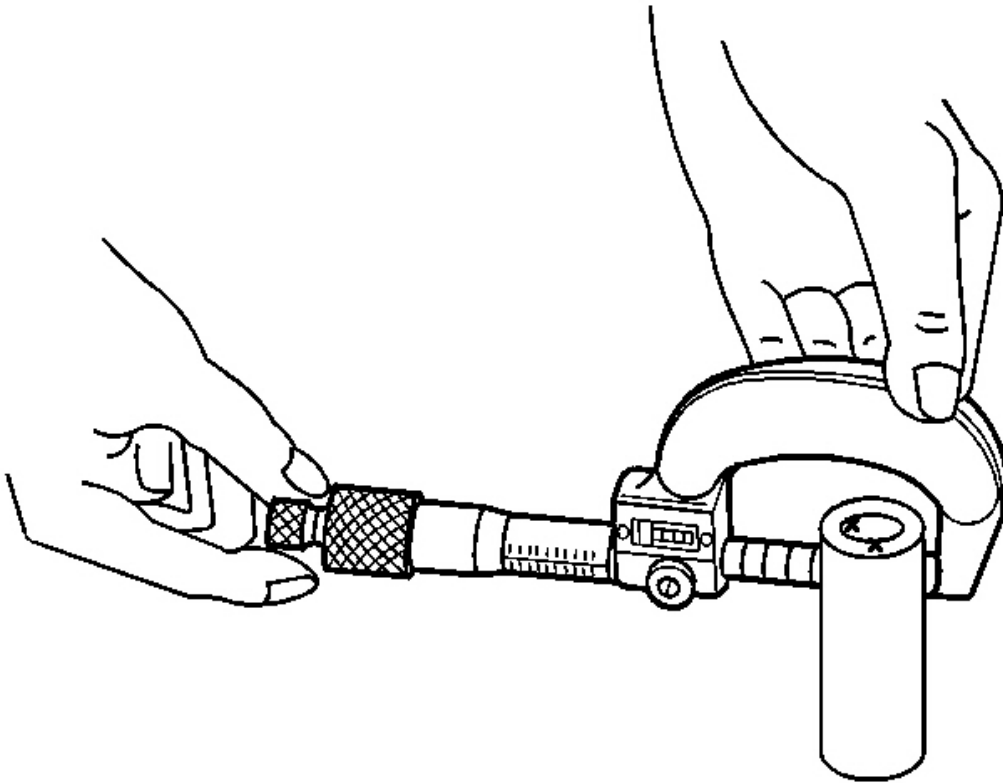


Fig. 424: View Of Piston Pin Diameter
Courtesy of GENERAL MOTORS CORP.

5. To determine piston pin-to-connecting rod bore clearance, use a micrometer and measure the piston pin OD.

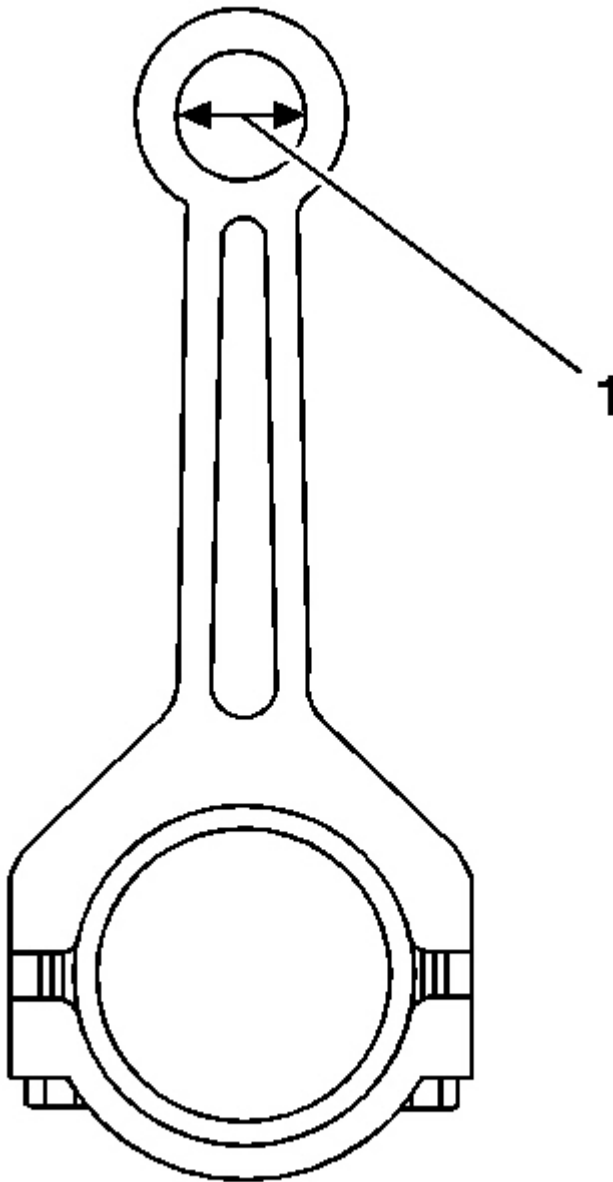


Fig. 425: View Of Connecting Rod Pin Bore
Courtesy of GENERAL MOTORS CORP.

6. To determine the piston pin-to-connecting rod bore clearance, use a micrometer and measure the connecting rod pin bore (1) ID.
7. Subtract the piston pin OD measurement from the connecting rod pin bore ID measurement to determine

pin-to-bore clearance. Refer to **Engine Mechanical Specifications**.

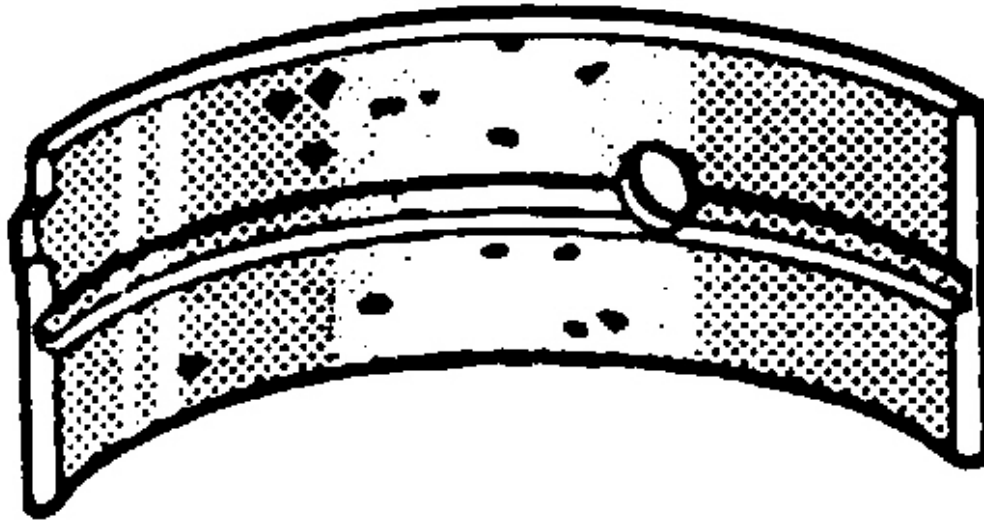


Fig. 426: Identifying Crankshaft Bearing Craters Or Pockets
Courtesy of GENERAL MOTORS CORP.

8. Inspect the connecting rod bearings for craters or pockets. Flattened sections on the bearing halves indicate fatigue.

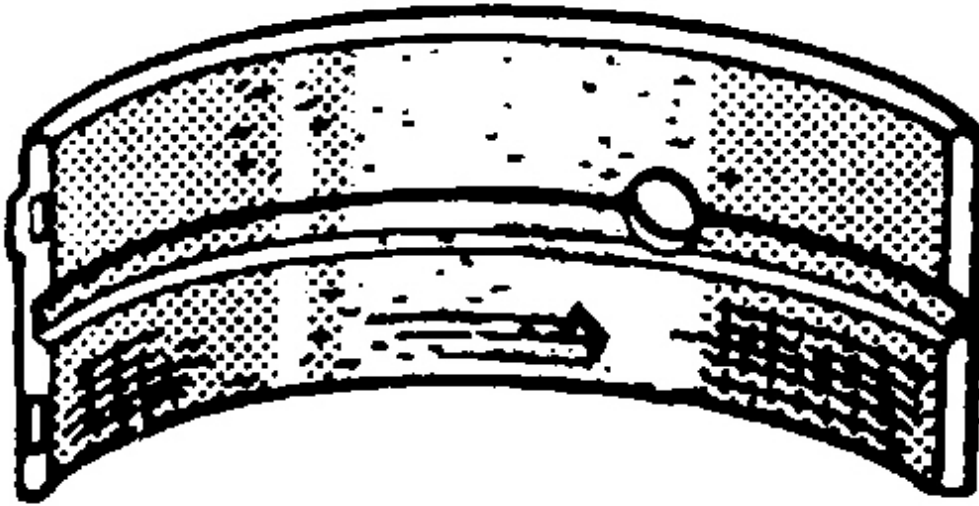


Fig. 427: Identifying Connecting Rod Bearing Scoring Or Discoloration
Courtesy of GENERAL MOTORS CORP.

9. Inspect the connecting rod bearings for excessive scoring or discoloration.
10. Inspect the connecting rod bearings for dirt or debris imbedded into the bearing material.

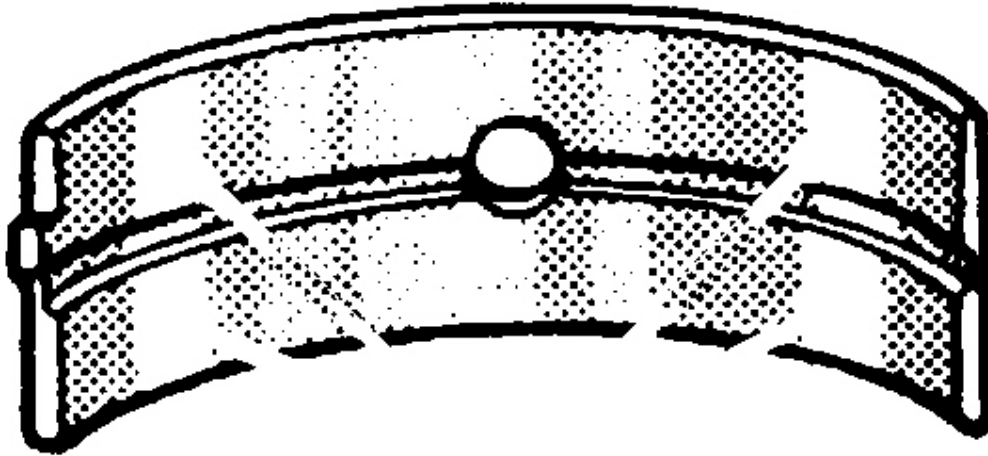


Fig. 428: View Of Improper Seating
Courtesy of GENERAL MOTORS CORP.

11. Inspect the connecting rod bearings for improper seating indicated by bright, polished sections of the bearing surface.
12. To determine the piston pin-to-bore clearance, use an inside micrometer and measure the piston pin bore ID.
13. Subtract the piston pin OD measurement from the piston pin bore ID measurement to determine pin-to-bore clearance. Refer to **Engine Mechanical Specifications**.

PISTON AND CONNECTING ROD ASSEMBLE

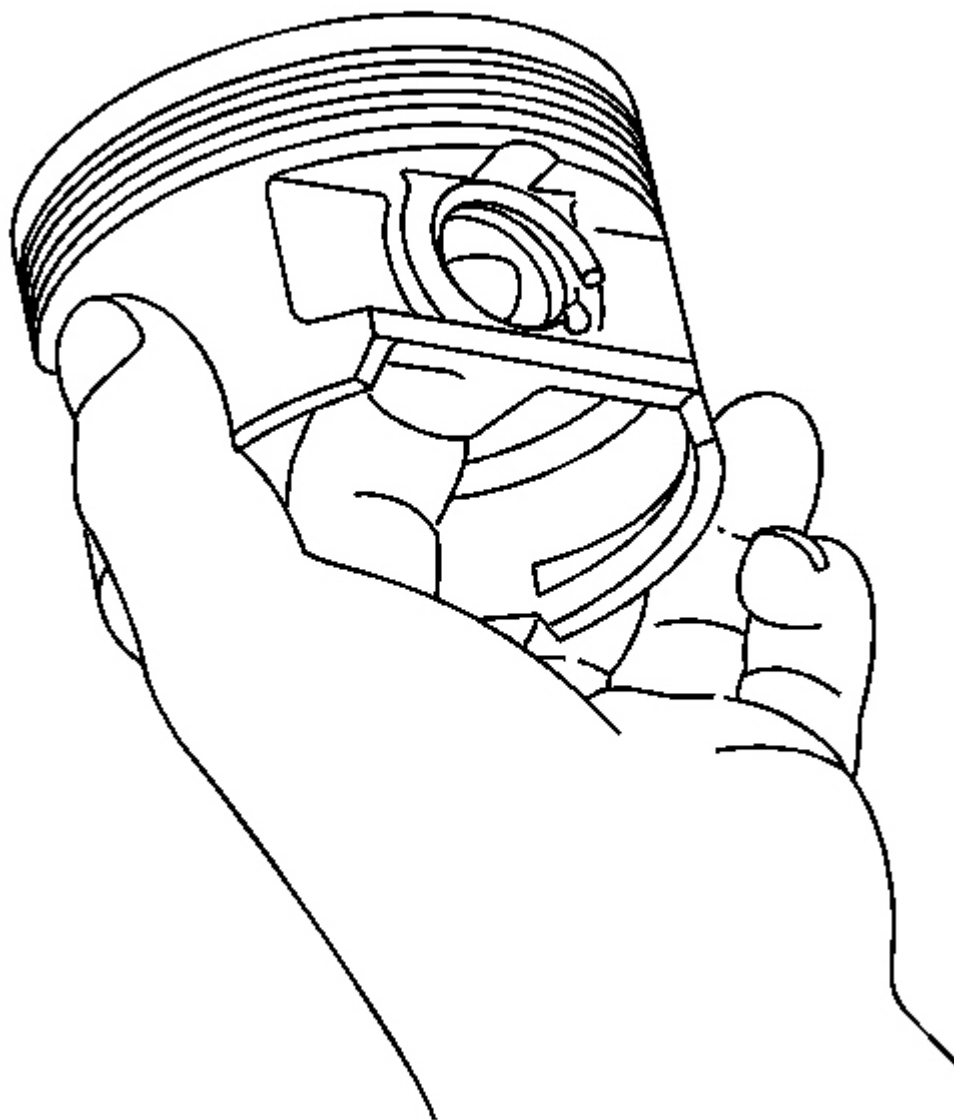


Fig. 429: View Of Retaining Clip In Pin Bore Groove
Courtesy of GENERAL MOTORS CORP.

1. Install the retainer. The retainer should be seated in the groove of the pin bore.

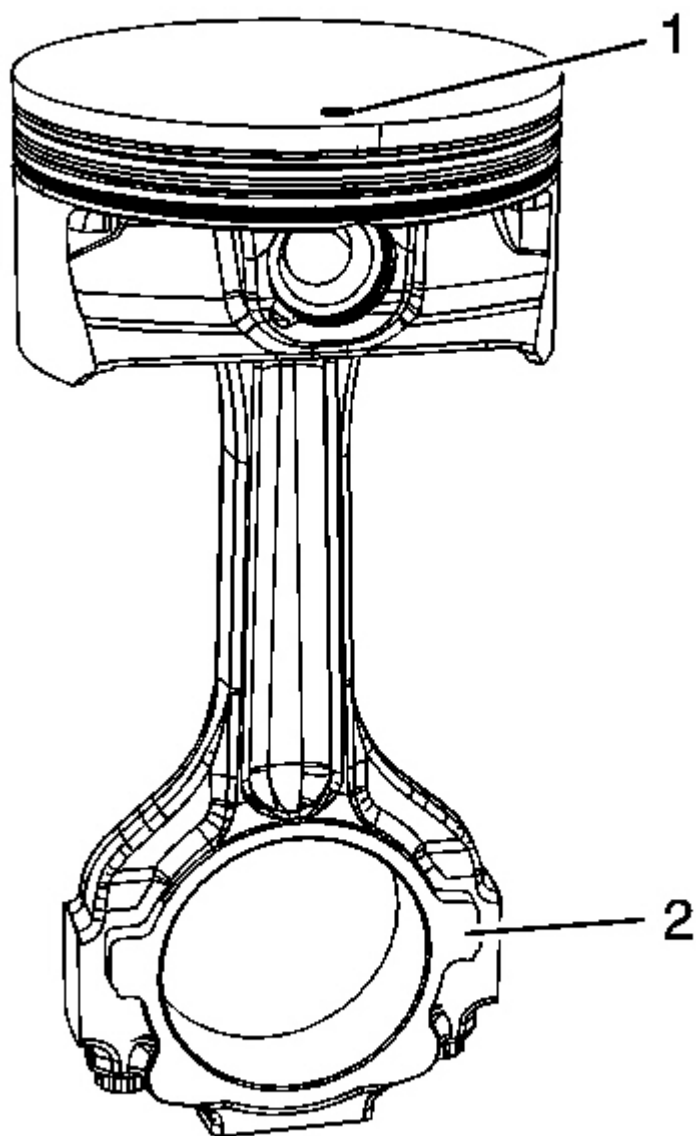


Fig. 430: Locating Mark On Top Of Piston & Connecting Rod Tab
Courtesy of GENERAL MOTORS CORP.

2. Assemble the piston and connecting rod. The mark (1) on the top of the piston and the tab (2) on the side of the connecting rod should be facing the same direction.

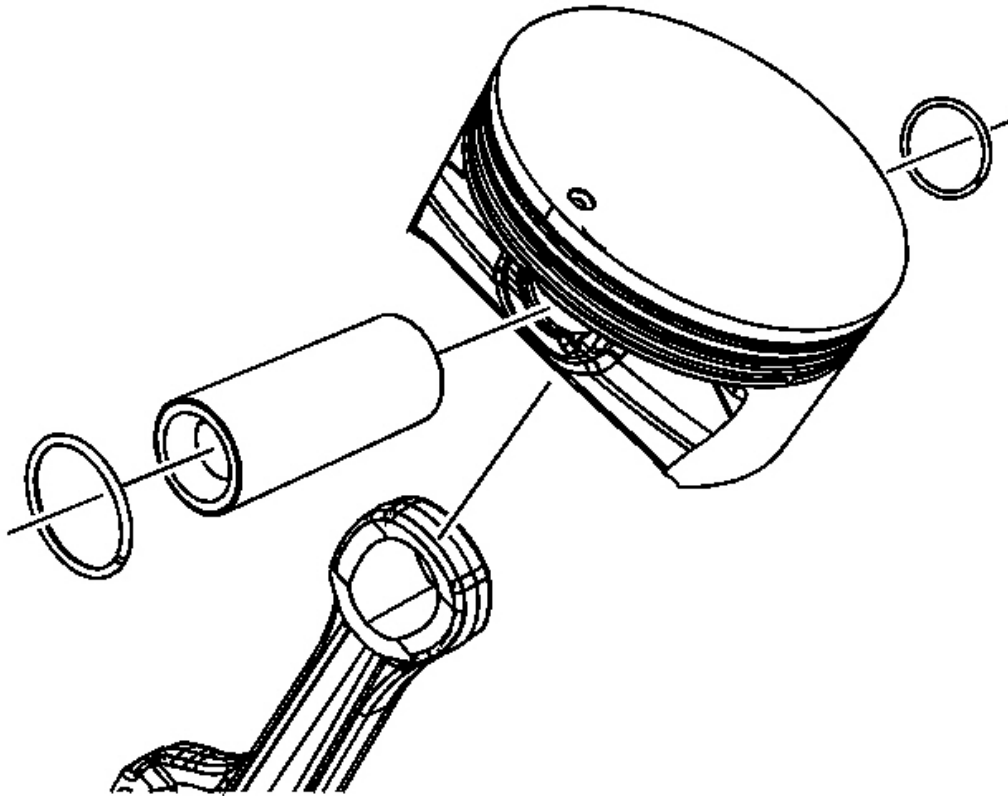


Fig. 431: View Of Piston Pin, Piston & Connecting Rod
Courtesy of GENERAL MOTORS CORP.

3. Install the piston pin to the piston and connecting rod.
4. Install the retainers. The retainers should be seated in the groove of the pin bore.

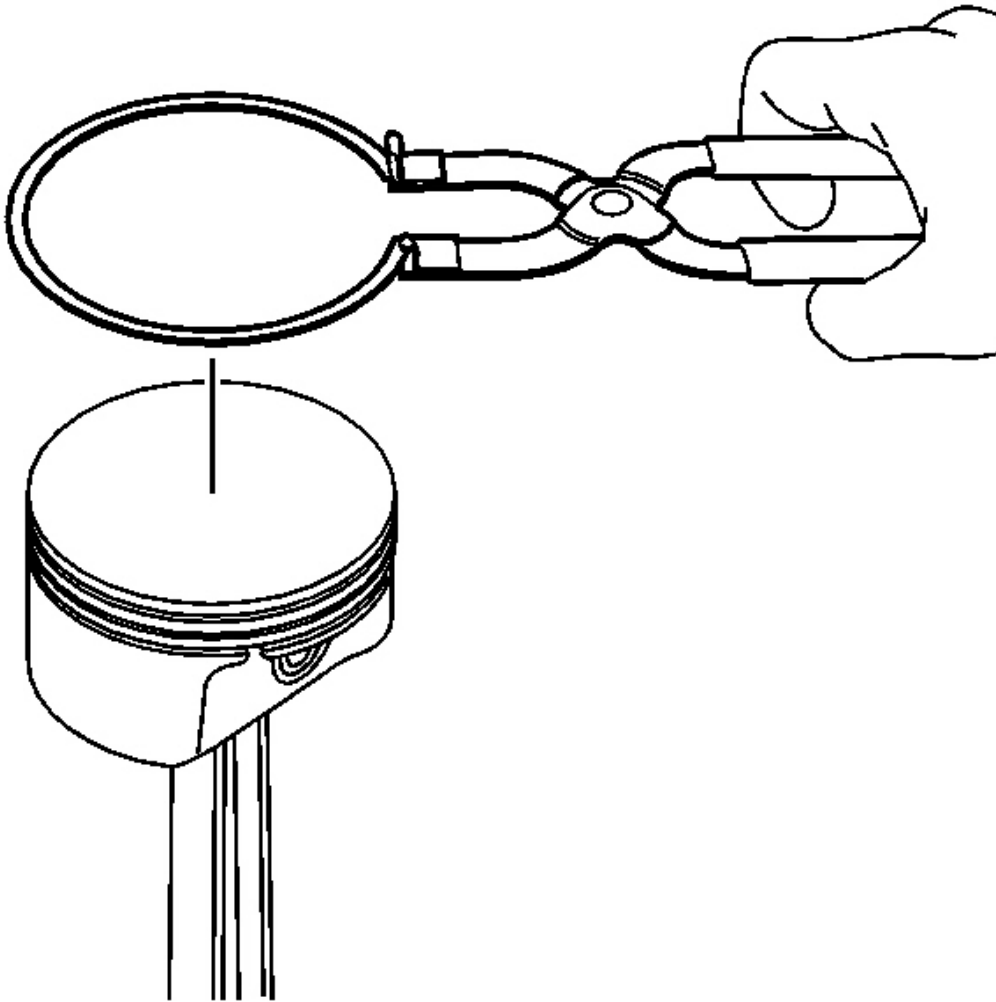


Fig. 432: View Of Piston Rings

Courtesy of GENERAL MOTORS CORP.

IMPORTANT: When installing piston rings, use a ring expander plier type tool. Do not roll the rings into the grooves of the piston. Use caution and care to expand the rings only slightly larger than the outside diameter (OD) of the piston.

5. Using piston ring pliers, install the piston rings onto the piston. The dimple or mark on the piston ring should face the top of the piston.
6. Position the oil control ring end gaps a minimum of 25 mm (1.0 in) from each other.

7. Position the compression ring end gaps 180 degrees opposite each other.

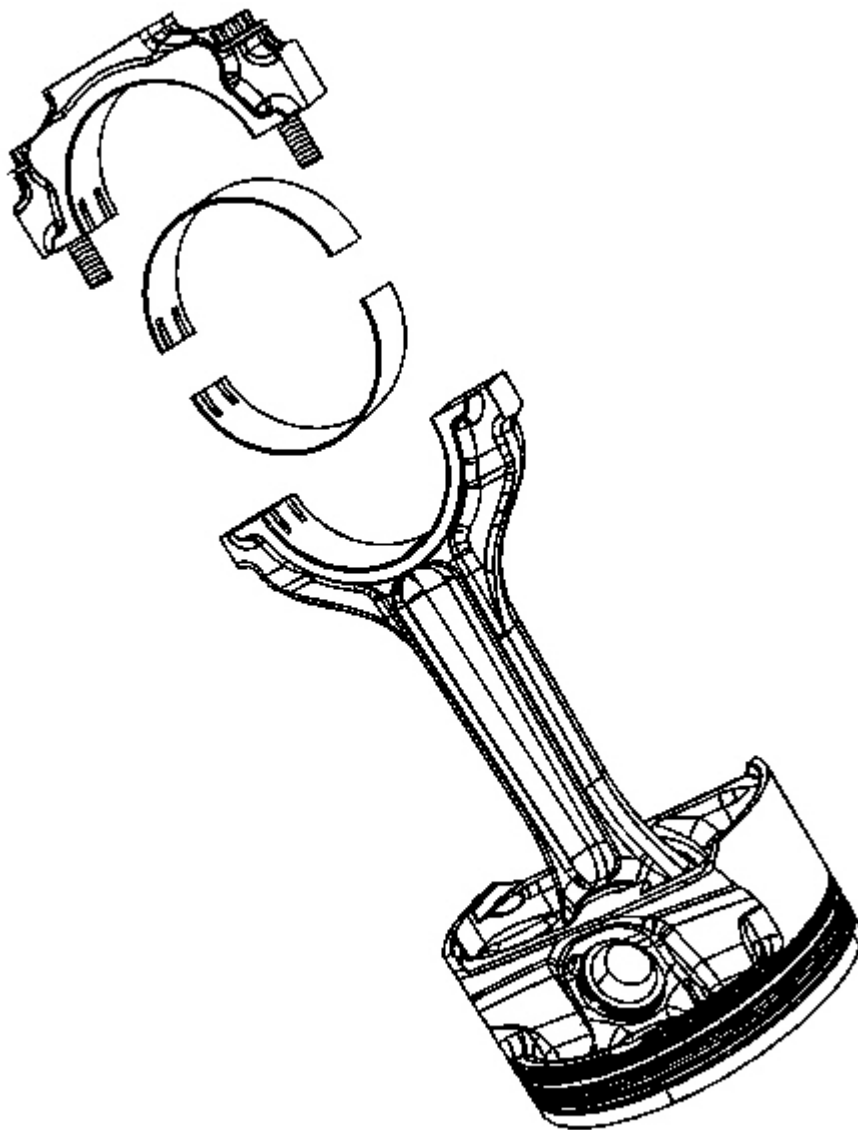


Fig. 433: View Of Piston, Connecting Rod & Bearing Assembly
Courtesy of GENERAL MOTORS CORP.

8. Install the connecting rod bearings to the rod and cap.

CAMSHAFT BEARING REMOVAL

Tools Required

J 33049 Camshaft Bearing Service Set

Preliminary Procedure

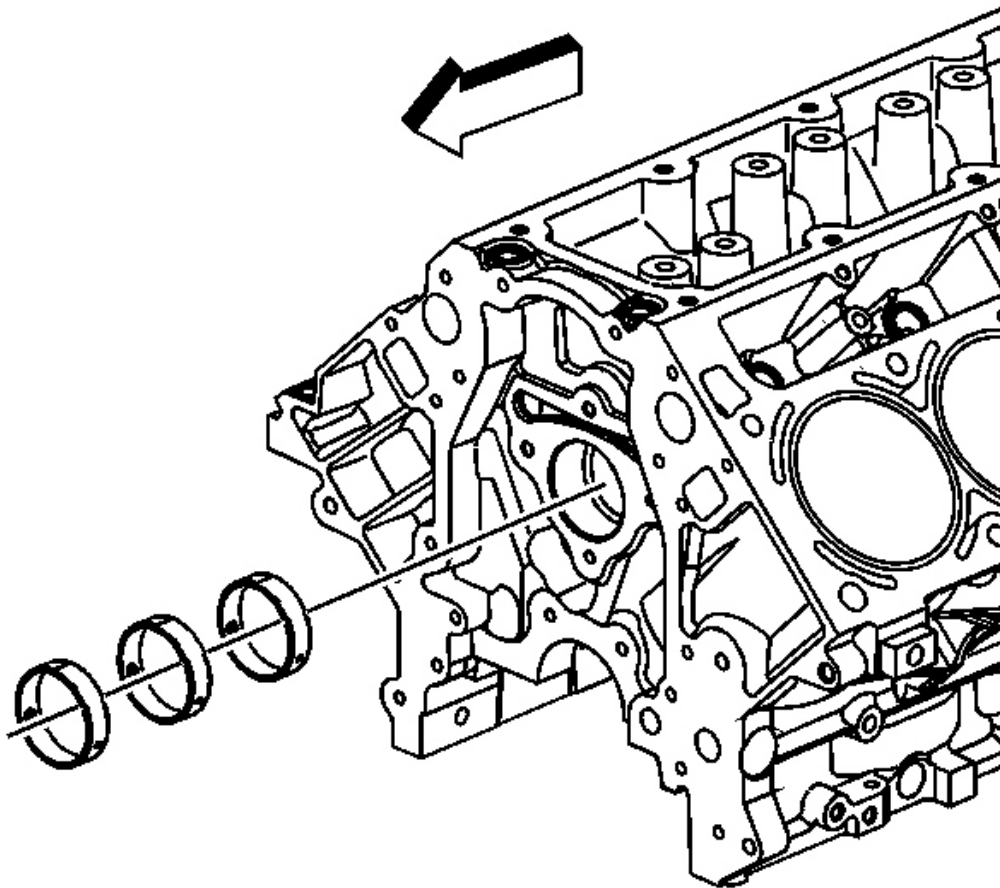


Fig. 434: View Of Camshaft Bearings
Courtesy of GENERAL MOTORS CORP.

IMPORTANT: A loose camshaft bearing may be caused by an enlarged, out of round or damaged engine block bearing bore.

1. Prior to bearing removal, inspect the camshaft bearings for loose fit in the engine block bearing bores.

Refer to **Camshaft and Bearings Cleaning and Inspection.**

2. Repair or replace the components, as required.

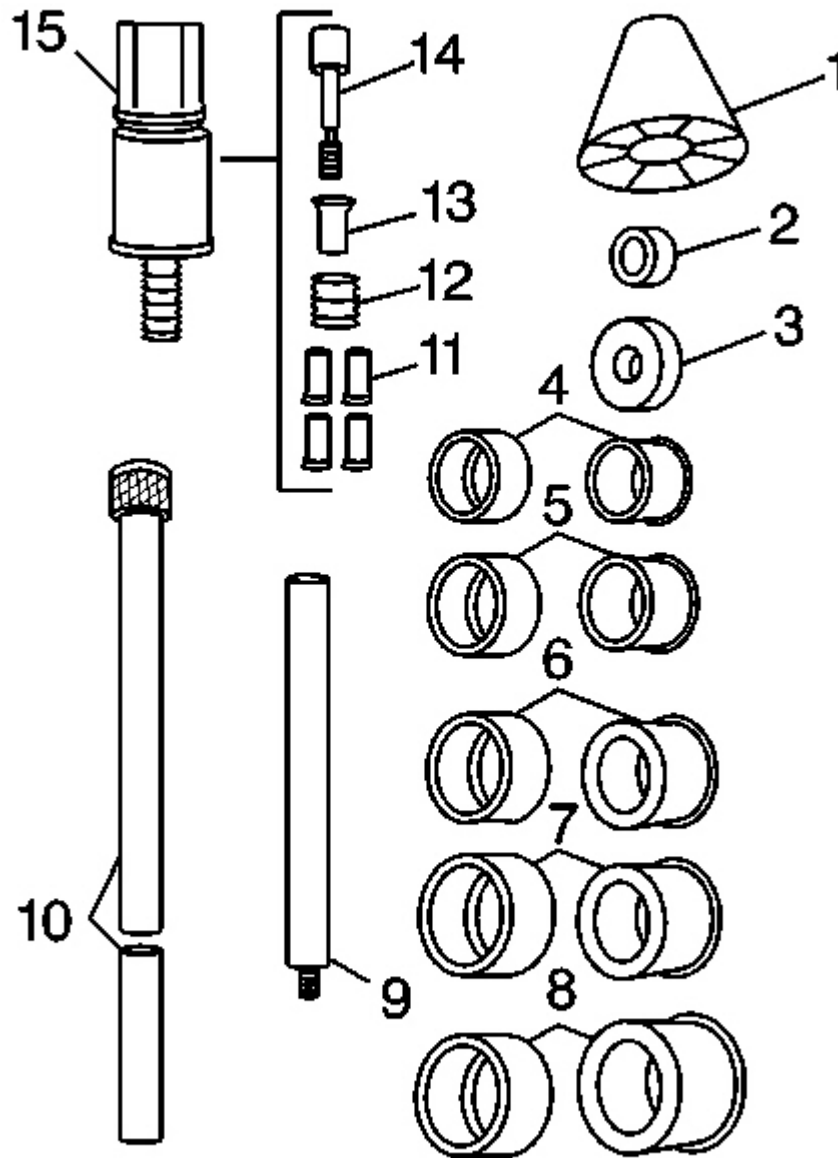


Fig. 435: View Of J 33049 Camshaft Bearing Service Kit Components
 Courtesy of GENERAL MOTORS CORP.

3. Select the expanding driver (4-8) and washer (2 or 3) from the **J 33049** .
4. Assemble the tool.
5. Insert the tool through the front of the engine block and into the bearing.
6. Tighten the expander assembly (15) nut until snug.
7. Push the guide cone (1) into the front camshaft bearing in order to align the tool.

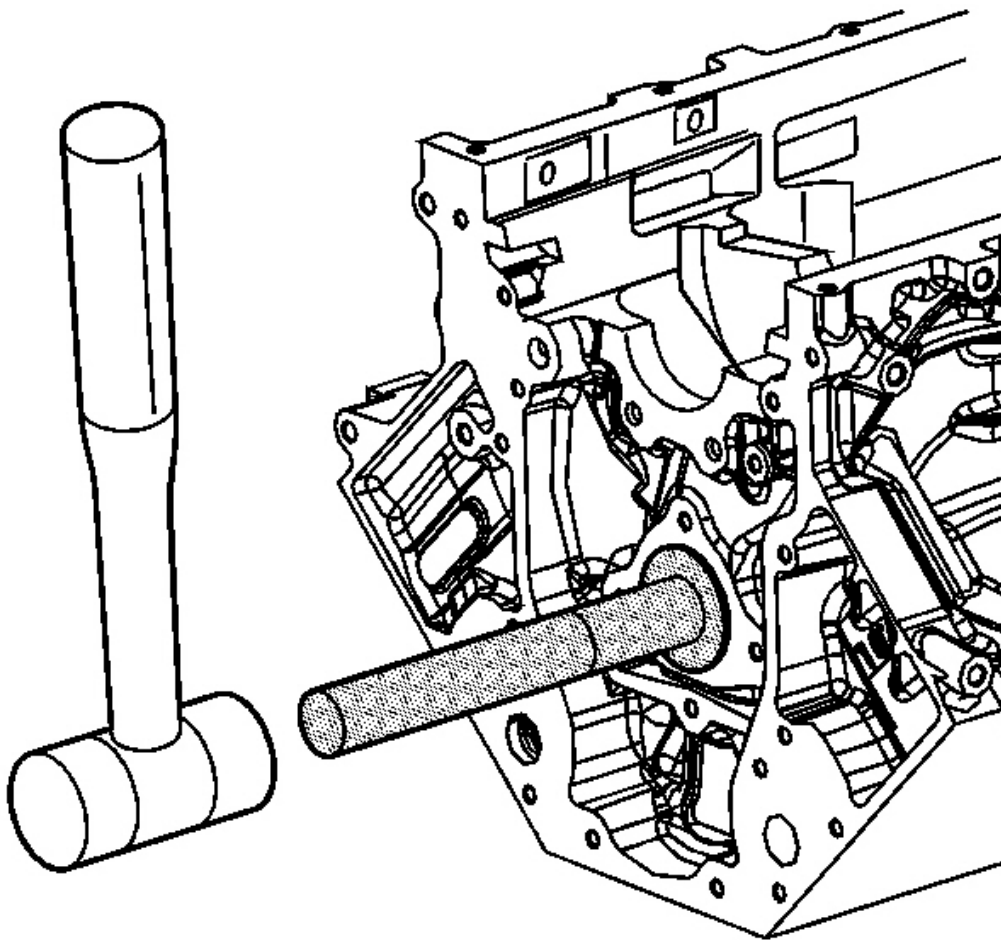


Fig. 436: Driving Bearing Out Of Or Into Engine Block
Courtesy of GENERAL MOTORS CORP.

8. Drive the bearing from the block bore.

IMPORTANT: In order to remove the front camshaft bearing, operate the tool from the

2007 Chevrolet TrailBlazer
2007 ENGINE Engine Mechanical - 6.0L - TrailBlazer

rear of the block, using the guide cone in the rear camshaft bearing bore.

9. Repeat the above procedures in order to remove the remaining bearings.

Tool Usage Information

Bearing, Expander and Expander Driver Information

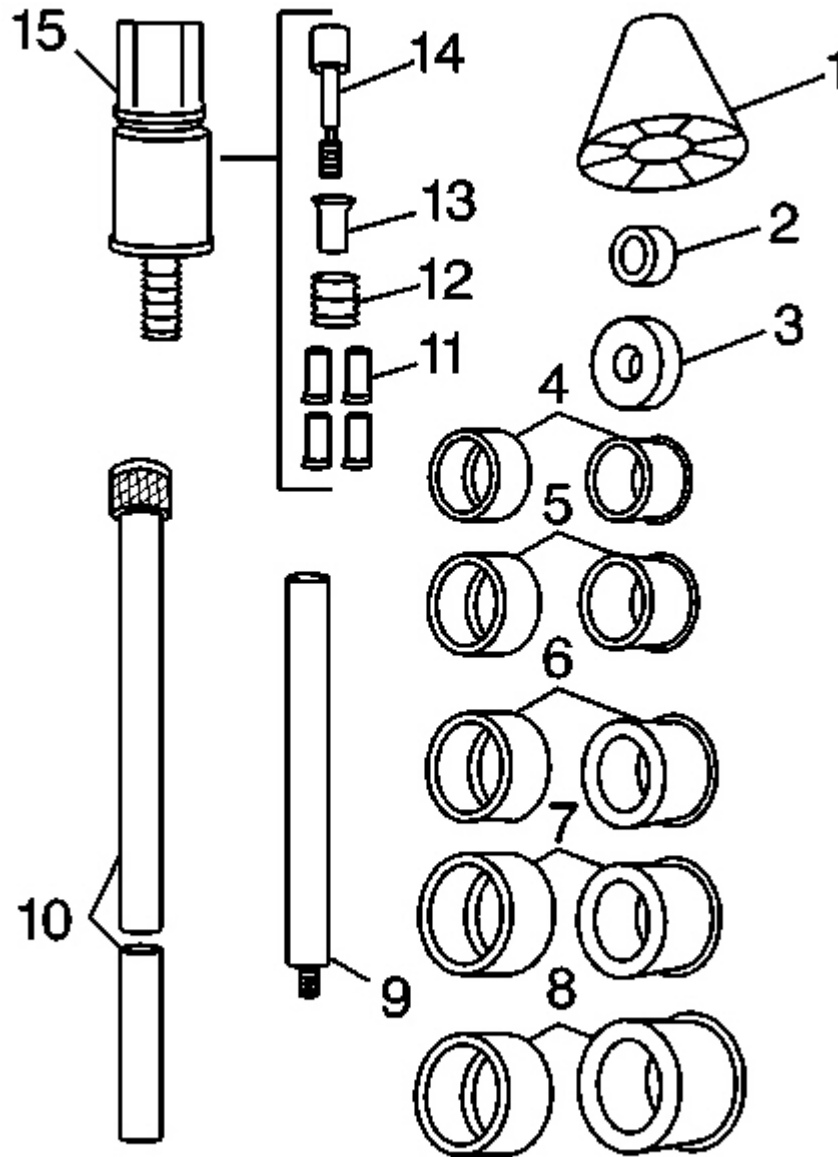


Fig. 437: View Of J 33049 Camshaft Bearing Service Kit Components
 Courtesy of GENERAL MOTORS CORP.

- The tool consists of a guide cone (1), driving washers (2 or 3), expander bearing drivers (4-8), driver bars (9 or 10), expander jaws (11), expander sleeve (12), expander cone (13), expander shaft (14) and expander assembly (15).

2007 Chevrolet TrailBlazer

2007 ENGINE Engine Mechanical - 6.0L - TrailBlazer

- Expander bearing driver number 1 inside diameter is 28.575-37.465 mm (1.125-1.475 in) and is used with the expander assembly and the small washer.
- Expander bearing driver number 2 inside diameter is 37.465-43.18 mm (1.475-1.7 in) and is used with number 1 expanding driver and the small washer.
- Expander bearing driver number 3 inside diameter is 43.18-48.895 mm (1.7-1.925 in) and is used with number 2 expanding driver and the large washer.
- Expander bearing driver number 4 inside diameter is 48.895-54.61 mm (1.925-2.15 in) and is used with number 3 expanding driver and the large washer.
- Expander bearing driver number 5 inside diameter is 54.61-60.325 mm (2.150-2.375 in) and is used with number 4 expanding driver and the large washer.
- Expander bearing driver number 6 inside diameter is 60.325-68.326 mm (2.375-2.69 in) and is used with number 5 expanding driver and the large washer.

Tool Assembly and Operation

1. Select the proper expanding driver and washer from the expanding driver and washer information.

IMPORTANT: To install or remove the expanding driver, always push on or pull from the ends.

Pressure on the outside diameter may cause a bind against the rubber expanding sleeve.

2. Place the expanding driver onto the expander assembly.
3. Ensure the separation lines between the segments of the expanding driver align with the separation lines of the expander assembly.
4. With the small end of the cone facing the driver assembly, place the guide cone over the driving bar.
5. Place the driving washer over the threaded portion of the expander assembly.
6. Screw the expander assembly, with driving washer, onto the driving bar.

For removal of the inner bearings, it may be necessary to install the driver bar extension.

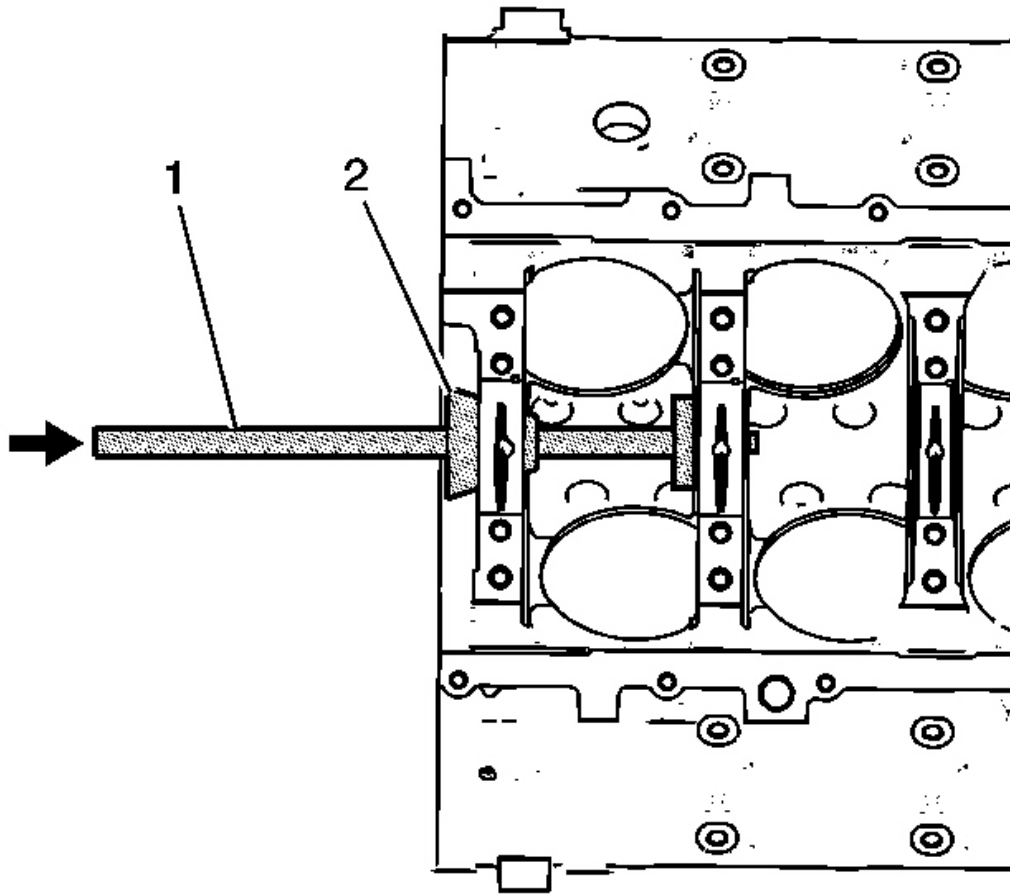


Fig. 438: Driving Bearing Out Of Or Into Engine Block
Courtesy of GENERAL MOTORS CORP.

7. Insert the tool into an inner camshaft bearing and tighten until snug.

Operate the tool from the front or rear of the engine block.

On some engine blocks, the nut on the expander assembly is inaccessible, except from either end. In this case, you must use a socket and extension to enlarge and reduce the expander assembly.

8. Slide the nylon cone (2) into the front or rear camshaft bearing. This will properly align the tool.
9. Drive the bearing out of or into the engine block.
10. Repeat the procedure for the additional inner bearings.

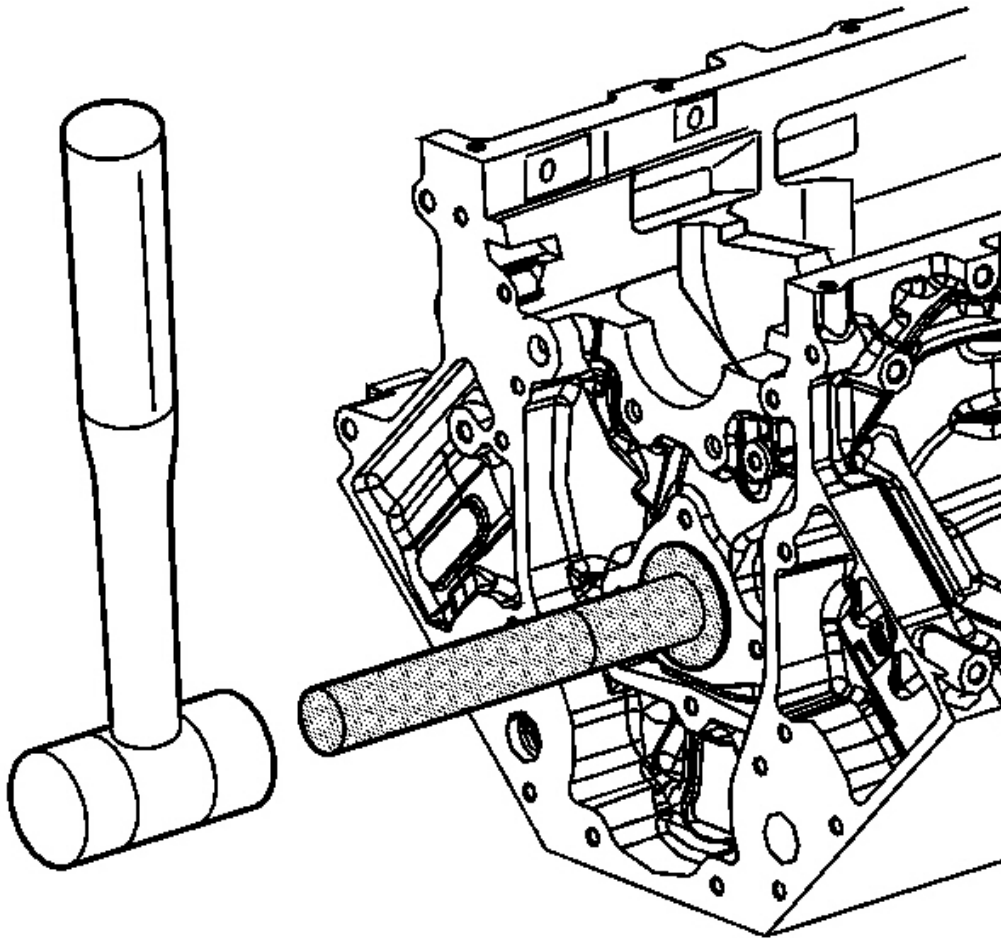


Fig. 439: Driving Bearing Out Of Or Into Engine Block
Courtesy of GENERAL MOTORS CORP.

11. For the 2 end bearings, front and rear, remove the nylon cone and driver bar extension.
12. Drive the bearings out of or into the engine block.

CAMSHAFT AND BEARINGS CLEANING AND INSPECTION

Tools Required

- **J 7872** Magnetic Base Dial Indicator Set
- **J 8520** Camshaft Lobe Lift Indicator

Inspection Procedure

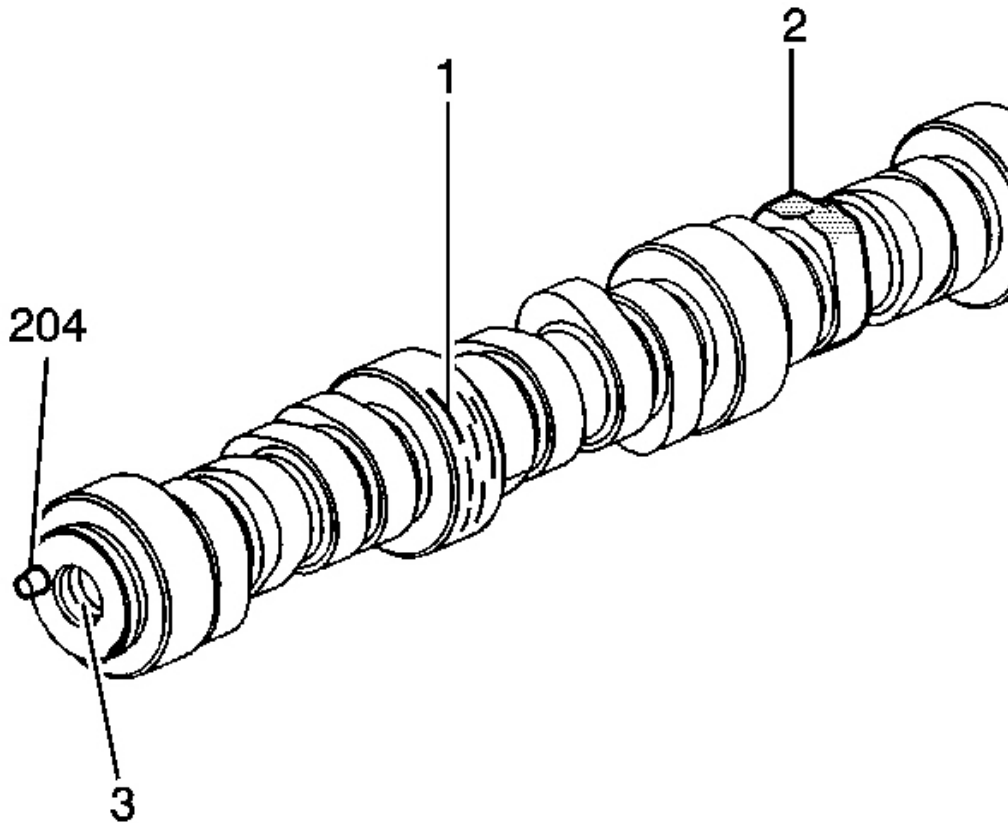


Fig. 440: Identifying Camshaft Inspection Areas
Courtesy of GENERAL MOTORS CORP.

1. Clean the components in solvent.

CAUTION: Refer to Safety Glasses and Compressed Air Caution .

2. Dry the components with compressed air.
3. Inspect the camshaft bearing journals (1) for scoring or excessive wear.
4. Inspect the camshaft valve lifter lobes (2) for scoring or excessive wear.
5. Inspect the threaded bolt hole (3) in the front of the camshaft for damaged threads or debris.
6. Inspect the camshaft sprocket pin (204) for damage.
7. Inspect the camshaft retainer plate for wear or a damaged sealing gasket.

If the camshaft retainer plate sealing gasket is not cut or damaged, it may be used again.

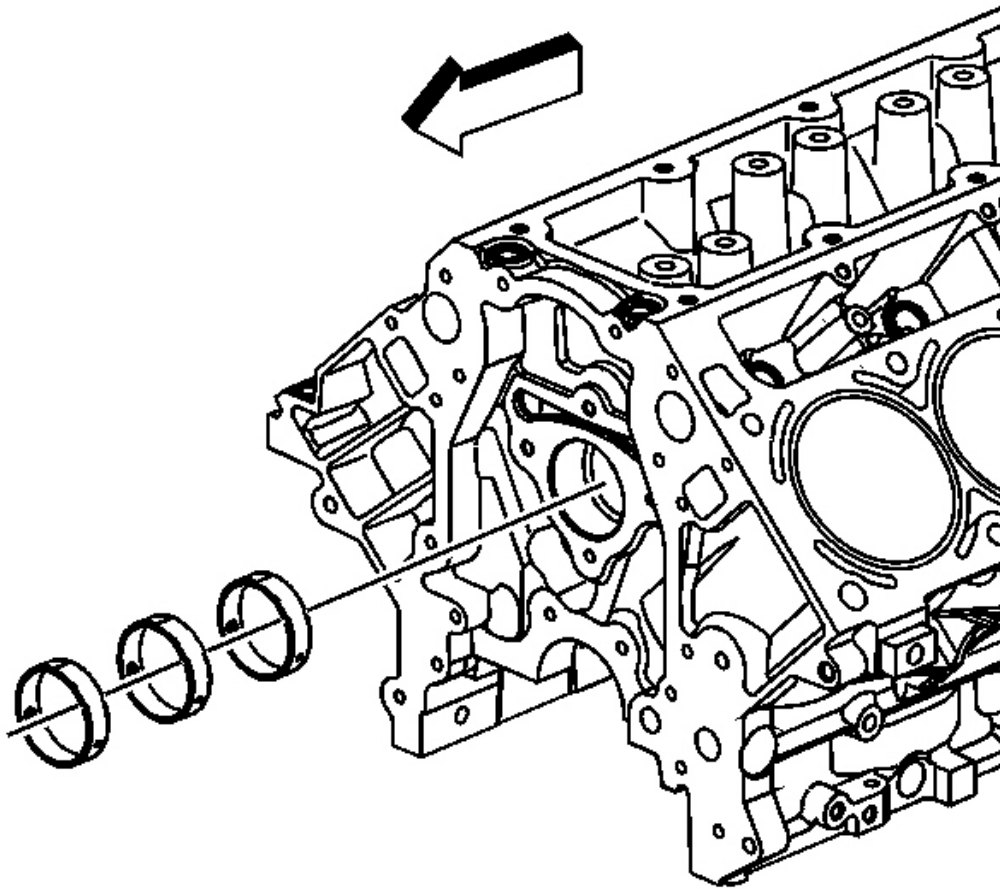


Fig. 441: View Of Camshaft Bearings
Courtesy of GENERAL MOTORS CORP.

8. Inspect the camshaft bearings for proper fit in the engine block. Camshaft bearings have an interference fit to the engine block and should not be loose in the engine block bearing bores.
9. Inspect the camshaft bearings for excessive wear or scoring.

Bearings with excessive scoring or wear must be replaced.

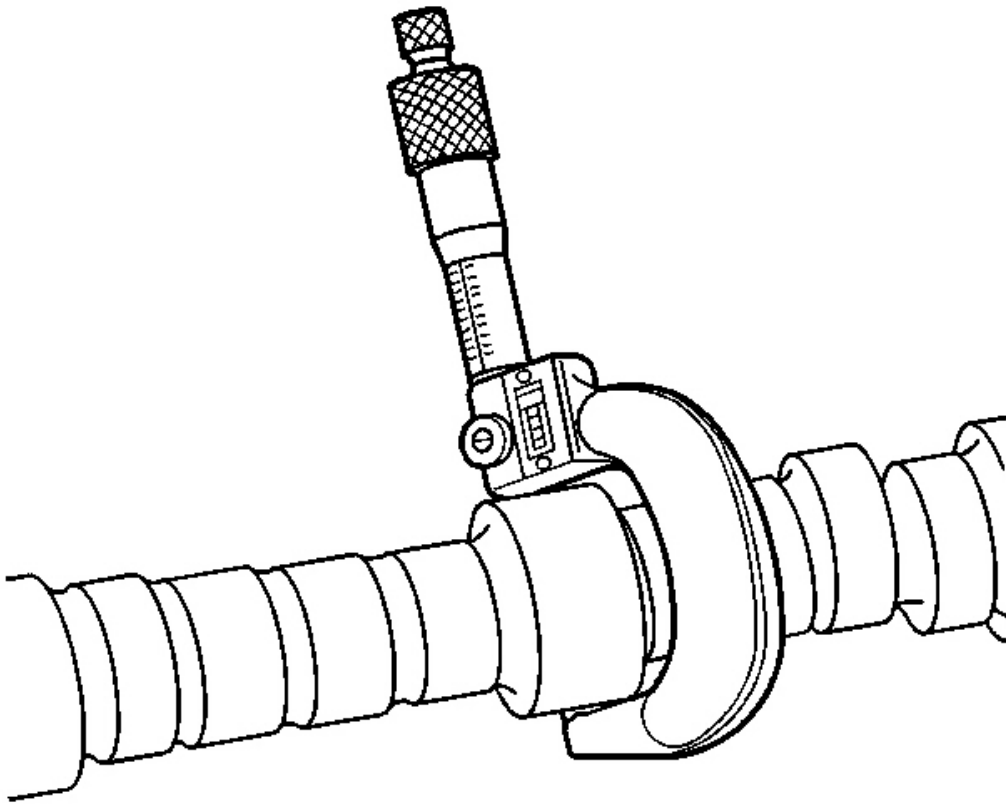


Fig. 442: Measure Camshaft Journals With Micrometer
Courtesy of GENERAL MOTORS CORP.

10. Using a micrometer, measure the camshaft journals for wear and out-of-round.
 - If the camshaft bearing journals are greater than 0.025 mm (0.001 in) out-of-round, replace the camshaft.
 - If the camshaft bearing journal diameter is less than 54.99 mm (2.164 in), replace the camshaft.

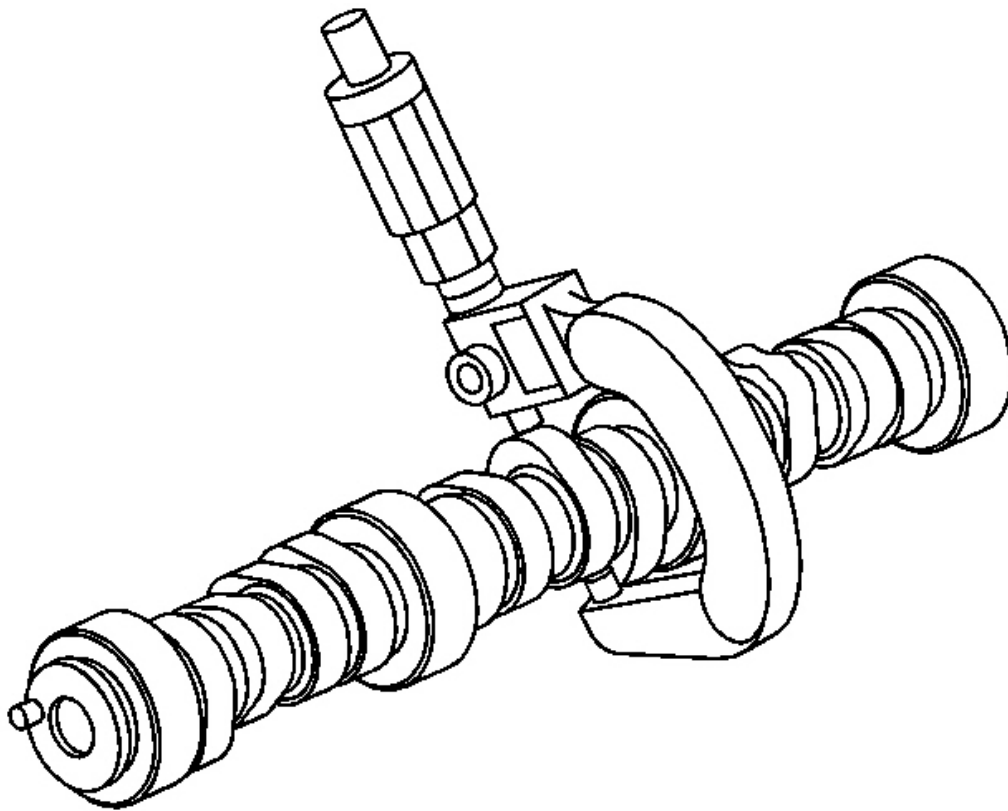


Fig. 443: Measuring Camshaft Lobes
Courtesy of GENERAL MOTORS CORP.

11. Using a micrometer, measure the camshaft lobes for wear. Refer to **Engine Mechanical Specifications**.

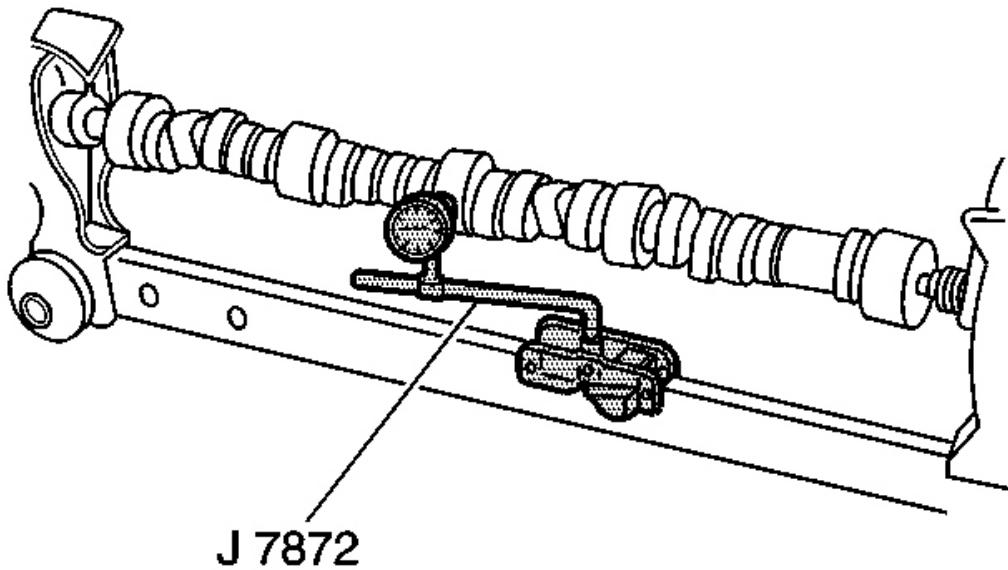


Fig. 444: Measuring Camshaft Runout
Courtesy of GENERAL MOTORS CORP.

12. Measure the camshaft runout.
 1. Mount the camshaft in wooden V-blocks or between centers on a fixture.
 2. Using the **J 7872** , measure the runout of the intermediate camshaft bearing journals.
 3. If camshaft runout exceeds 0.05 mm (0.002 in), the camshaft is bent and should be replaced.

Measuring Camshaft Lobe Lift

2007 Chevrolet TrailBlazer

2007 ENGINE Engine Mechanical - 6.0L - TrailBlazer

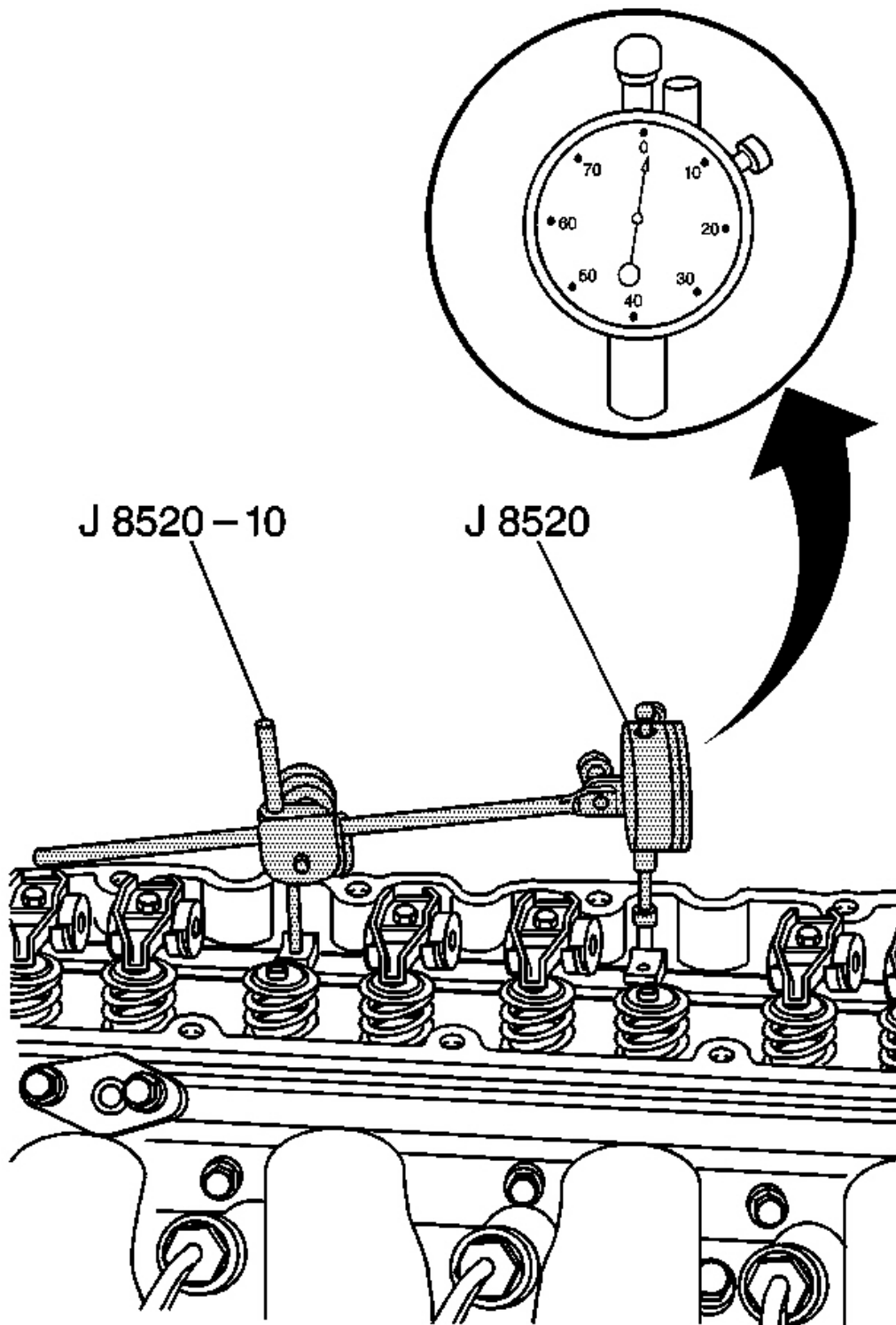


Fig. 445: Measuring Camshaft Lobe Lift
Courtesy of GENERAL MOTORS CORP.

IMPORTANT: Measuring camshaft lobe lift is a procedure used to determine if the camshaft lobes have worn. This test is to be performed prior to engine disassembly and with the camshaft and valve train components installed in the engine.

1. Using the **J 8520** , measure camshaft lobe lift.
2. Remove the valve rocker arms and bolts.
3. Install the dial indicator mounting stud into the valve rocker arm bolt hole.
4. Assemble the components of the **J 8520** and position onto the stud.
5. Position the shaft of the dial indicator onto the end of the pushrod.
6. Rotate the face of the dial indicator to zero.
7. Slowly rotate the crankshaft clockwise, until the dial indicator obtains its highest and lowest readings.
8. Compare the total to specifications. Refer to **Engine Mechanical Specifications**.

CAMSHAFT BEARING INSTALLATION

Tools Required

J 33049 Camshaft Bearing Service Set

Installation Procedure

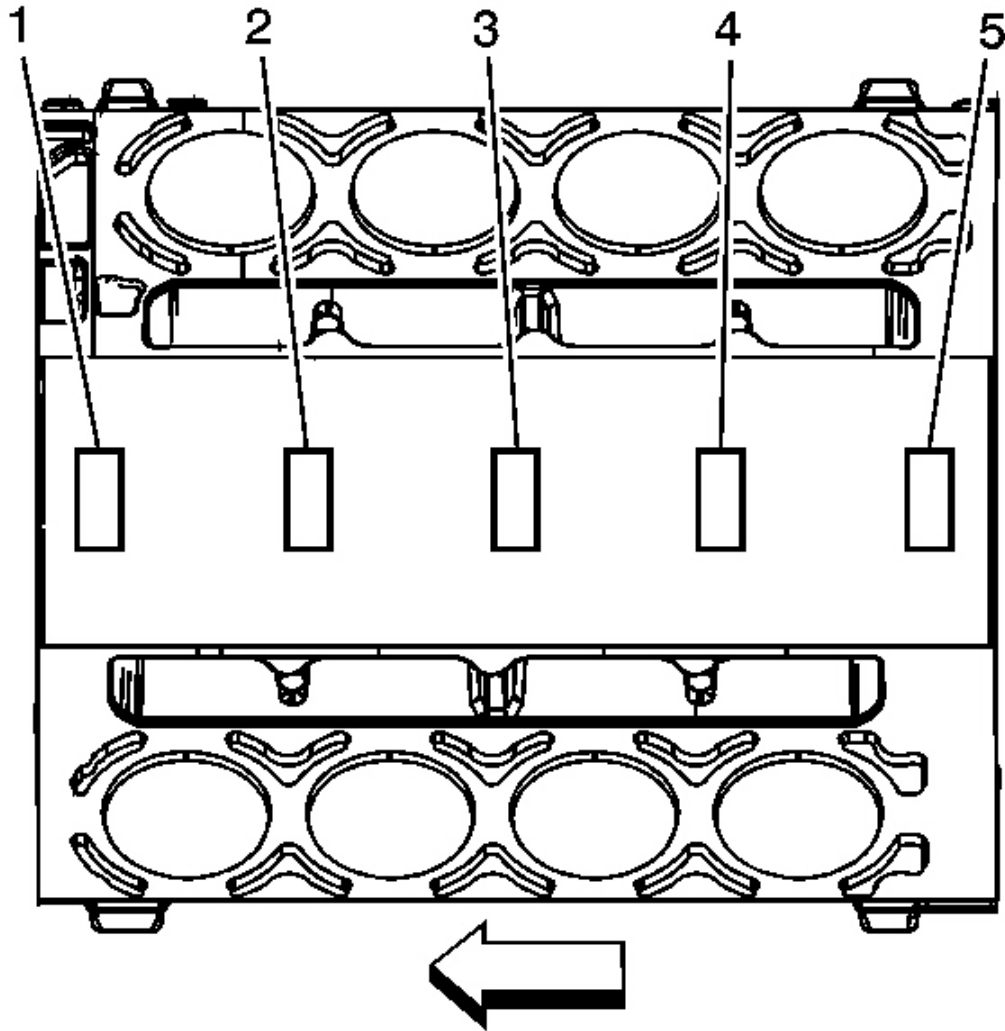


Fig. 446: Identifying Engine Block Camshaft Bearing Bores
 Courtesy of GENERAL MOTORS CORP.

IMPORTANT: The engine block camshaft bearing bores are machined for 3 different outside diameter (OD) size bearings. Position 1 and 5 are the largest diameter bores. Position 3 is the smallest diameter bore. Position 2 and 4 are the intermediate size bores. The inside diameter (ID) for all camshaft bearings is the same size.

1. Measure the engine block camshaft bearing bores (1-5) in order to identify the correct OD size bearing for each position. Refer to **Engine Mechanical Specifications**

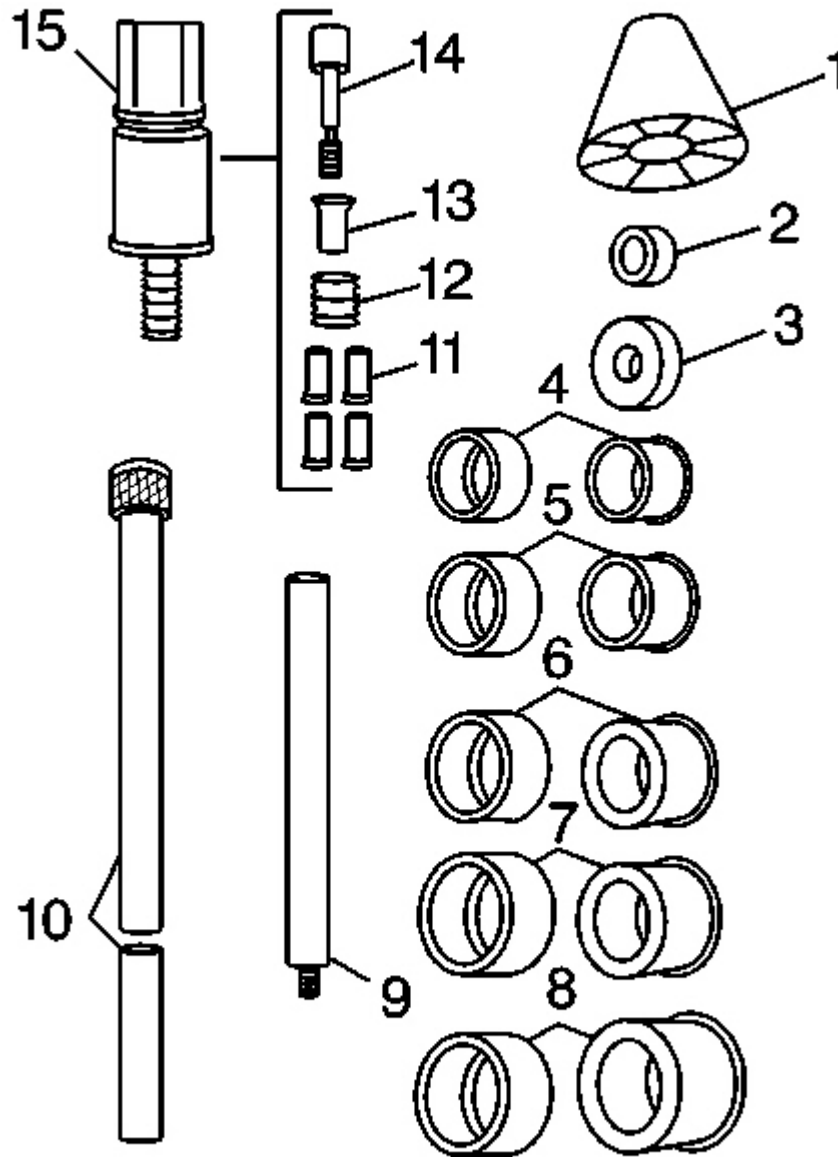


Fig. 447: View Of J 33049 Camshaft Bearing Service Kit Components
Courtesy of GENERAL MOTORS CORP.

2. Select the expanding driver (4-8) and washer (2 or 3) from the **J 33049** . Refer to **Piston and Connecting Rod Assemble** .
3. Assemble the tool.

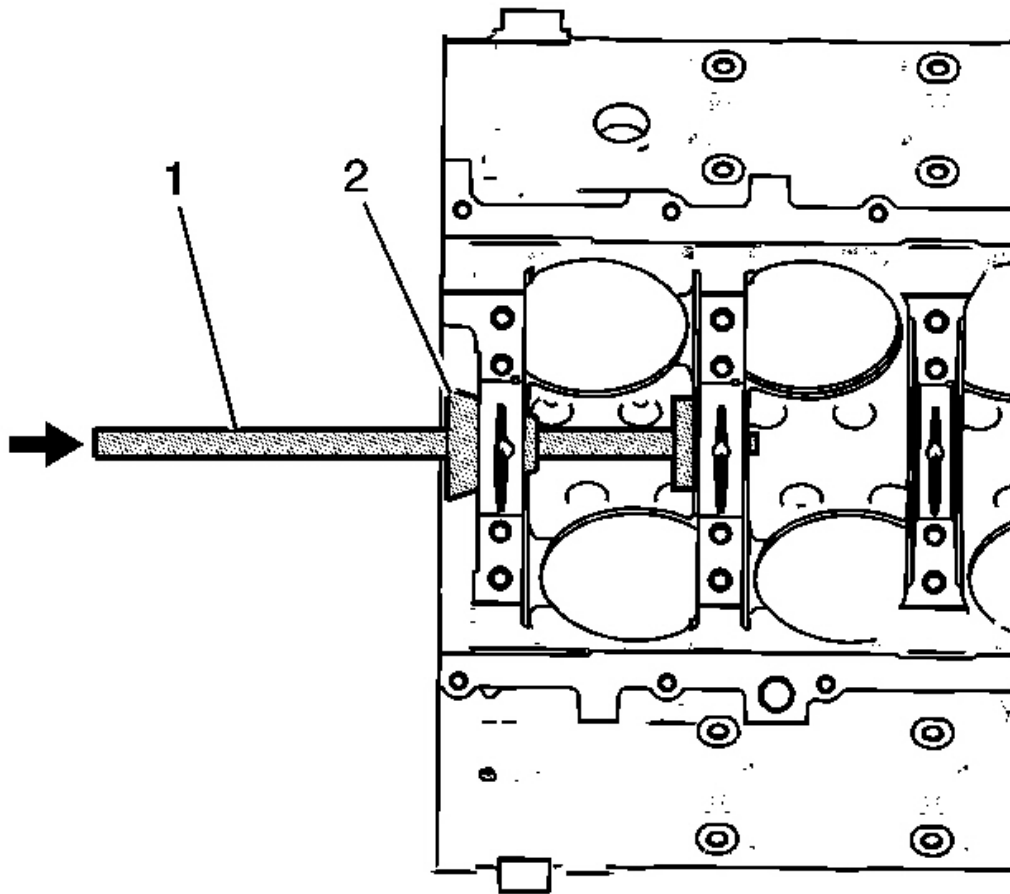


Fig. 448: Driving Bearing Out Of Or Into Engine Block
Courtesy of GENERAL MOTORS CORP.

4. Insert the tool through the front of the engine block and into the bearing.
5. Tighten the expander assembly nut until snug.
6. Push the guide cone (2) into the front camshaft bearing in order to align the tool.
7. Drive the bearing into the block bore.

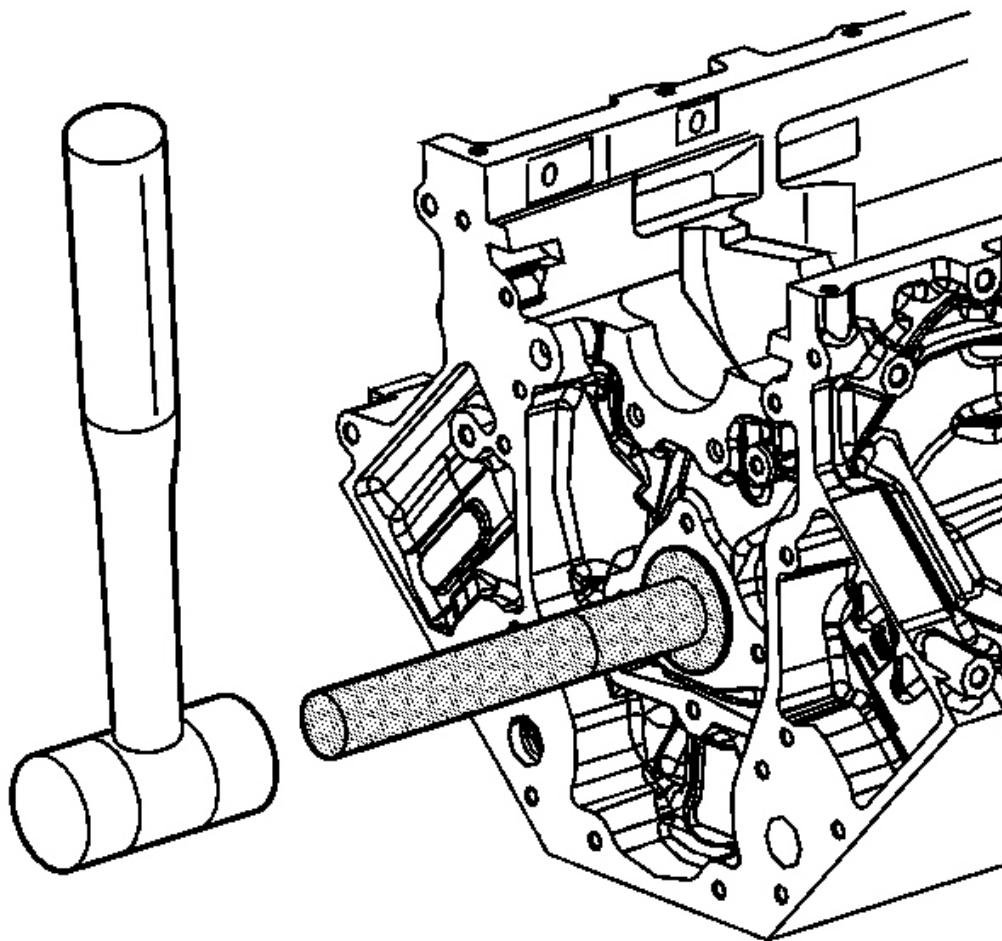


Fig. 449: Driving Bearing Out Of Or Into Engine Block
Courtesy of GENERAL MOTORS CORP.

8. Install the front and rear bearings to the block.

TIMING CHAIN AND SPROCKETS CLEANING AND INSPECTION

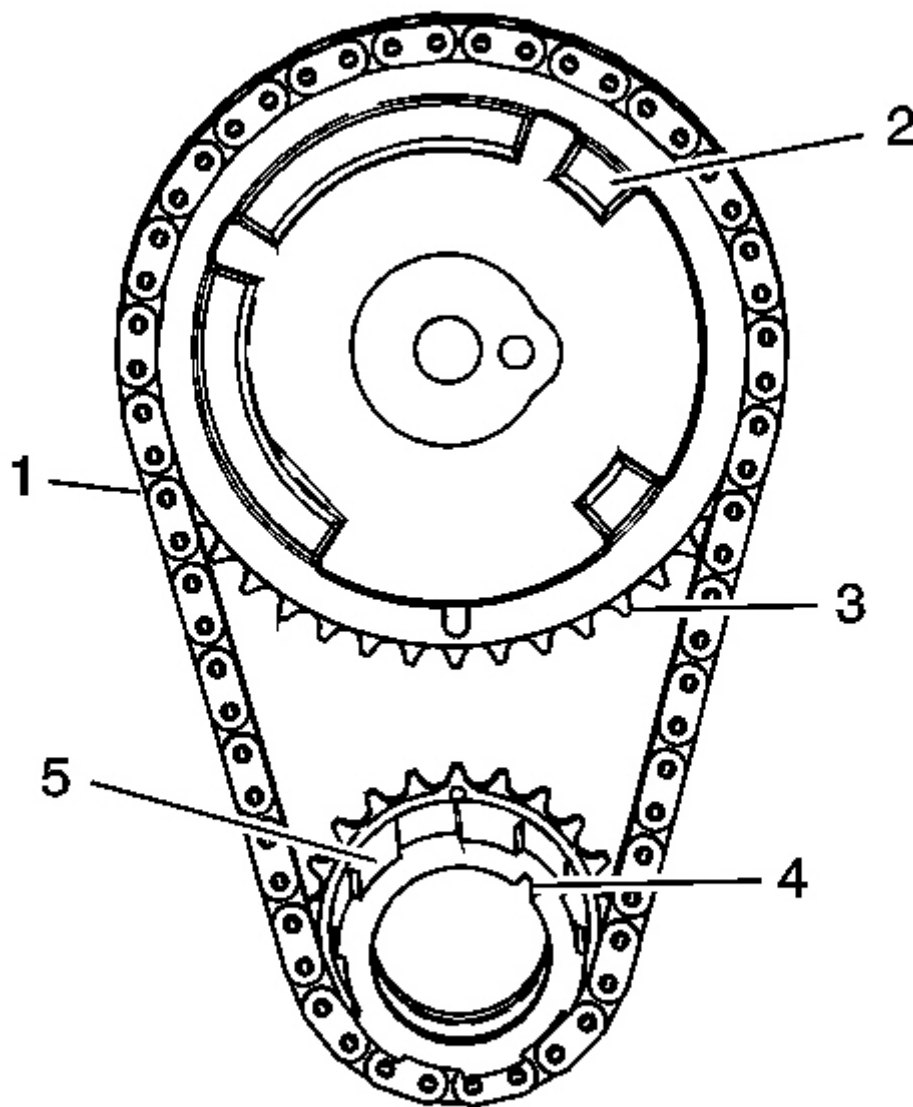


Fig. 450: Identifying Timing Chain and Sprockets Inspection Areas
Courtesy of GENERAL MOTORS CORP.

1. Clean the components with cleaning solvent.

CAUTION: Refer to Safety Glasses Caution .

2. Dry the components with compressed air.
3. Inspect the timing chain (1) for binding or wear.
4. Inspect the camshaft position (CMP) sensor raised areas (2) for nicks or damage.
5. Inspect for worn, damaged or chipped teeth (3).
6. Inspect for a damaged keyway (4).
7. Inspect for worn oil pump drive splines (5).

VALVE ROCKER ARM AND PUSH RODS CLEANING AND INSPECTION

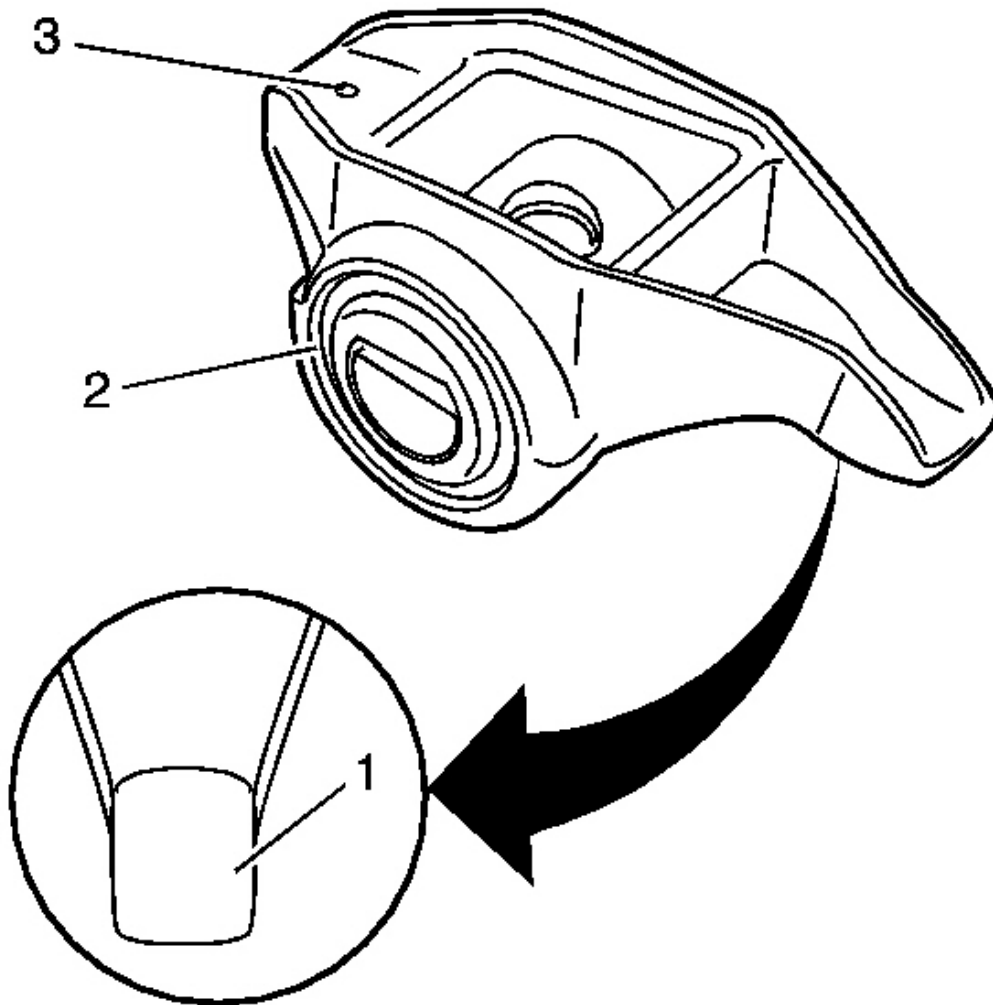


Fig. 451: Identifying Valve Rocker Arm Components

Courtesy of GENERAL MOTORS CORP.

IMPORTANT: Parts that are to be used again must be marked, sorted or organized for assembly.

1. Mark, sort or organize the components for assembly. Refer to Separating Parts .
2. Clean the components with cleaning solvent.

CAUTION: Refer to Safety Glasses Caution .

3. Dry the components with compressed air.
4. Inspect the valve rocker arms bearings (2) for binding or roughness.
5. Inspect the valve rocker arm pushrod sockets (3) and valve stem mating surfaces (1). These surfaces should be smooth with no scoring or exceptional wear.
6. Inspect the pushrods for worn or scored ends. These surfaces should be smooth with no scoring or exceptional wear.
7. Inspect the pushrods for bends. Roll the pushrod on a flat surface to determine if the pushrod is bent.
8. Inspect the pushrod oil passages for restrictions.
9. Inspect the rocker arm pivot supports for cracks, wear or other damage.

VALVE LIFTERS AND GUIDES CLEANING AND INSPECTION

Valve Lifters

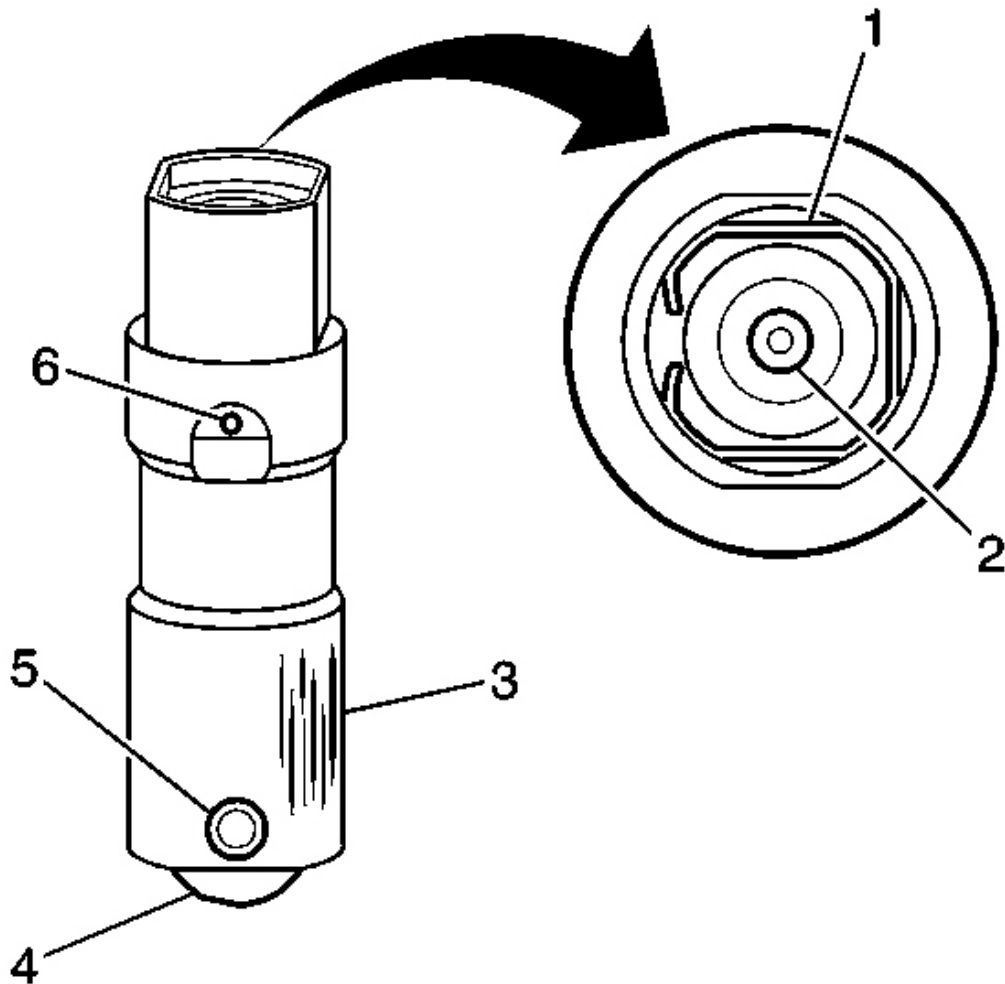


Fig. 452: Inspecting Areas Of Valve Lifters
Courtesy of GENERAL MOTORS CORP.

IMPORTANT: Components that are to be used again must be marked, sorted or organized for assembly.

1. Clean the components in cleaning solvent.

CAUTION: Refer to Safety Glasses Caution .

2007 Chevrolet TrailBlazer

2007 ENGINE Engine Mechanical - 6.0L - TrailBlazer

2. Dry the components with compressed air.
3. Inspect the valve lifters for the following conditions:
 - Bent or broken clip (1)
 - Worn pushrod socket (2)
 - Scuffed or worn sides (3)

If the valve lifter shows wear, inspect the engine block lifter bores for wear or damage.

- Flat spots on the roller (4)
- Loose or damaged pin (5)
- Plugged oil hole (6)
- Worn or damaged roller bearing

The roller should rotate freely with no binding or roughness.

Valve Guides

Inspect the valve lifter guides for the following conditions:

- Cracks or damage
- Excessive wear in the lifter mounting bores

CYLINDER HEAD DISASSEMBLE

Tools Required

J 8062 Valve Spring Compressor - Head Off

Disassembly Procedure

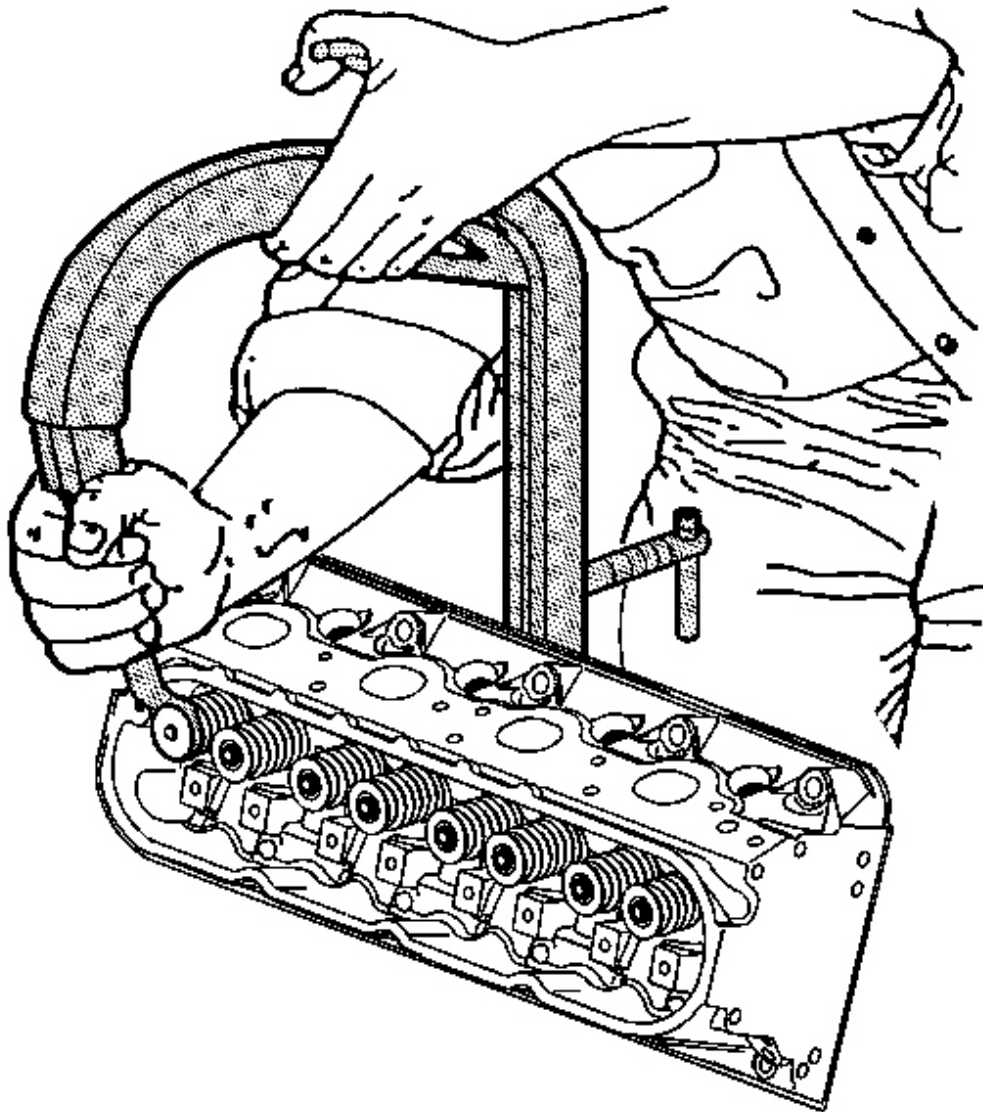


Fig. 453: Compressing Valve Spring Using J 8062
Courtesy of GENERAL MOTORS CORP.

IMPORTANT:

- With the components at room temperature, remove the spark plugs from the cylinder head.
- Mark, organize or sort the cylinder head components for assembly. Return the components to their original location during assembly.

1. Remove the spark plugs from the cylinder heads.
2. Use the **J 8062** in order to compress the valve spring.

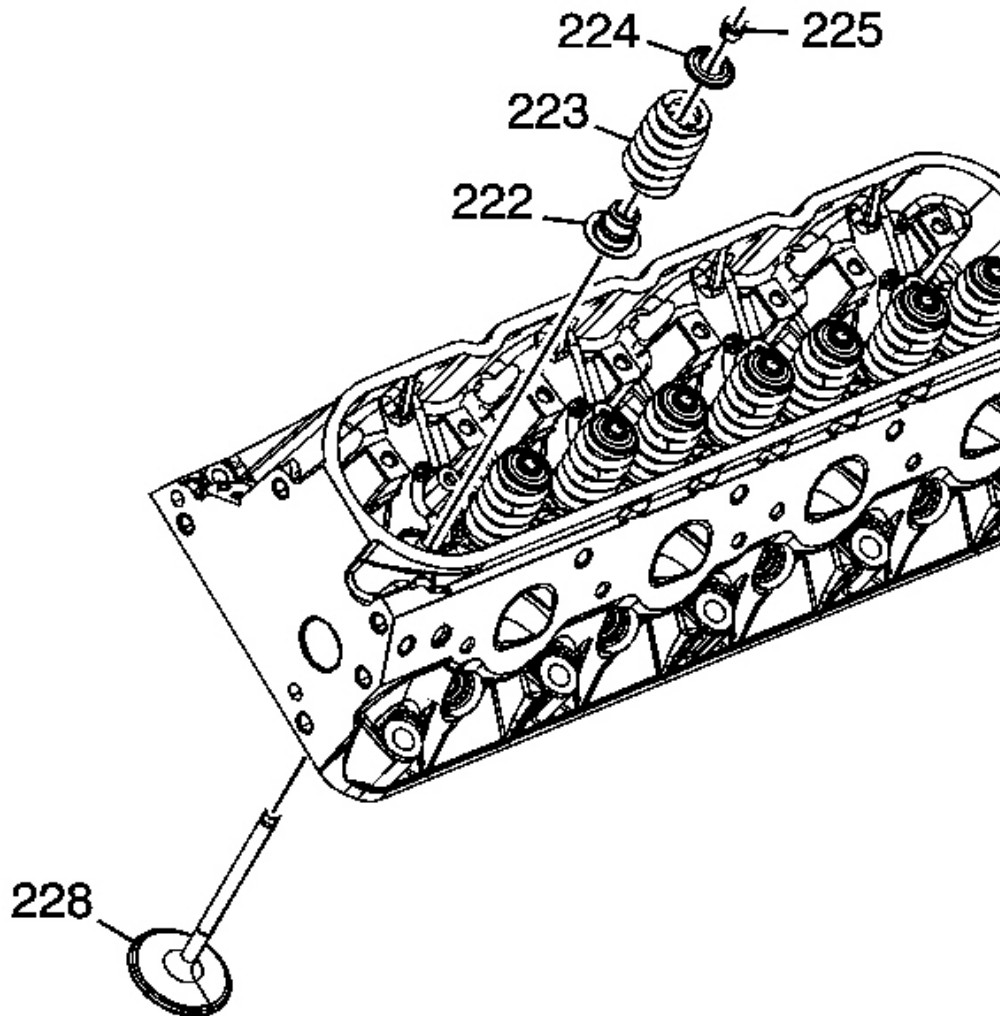


Fig. 454: View Of Valve Components
Courtesy of GENERAL MOTORS CORP.

3. Remove the valve stem keys (225).
4. Remove the valve spring cap (224).
5. Remove the valve spring (223).
6. Remove the valves (228).

7. Remove the valve stem oil seal (222). Refer to **Separating Parts** .

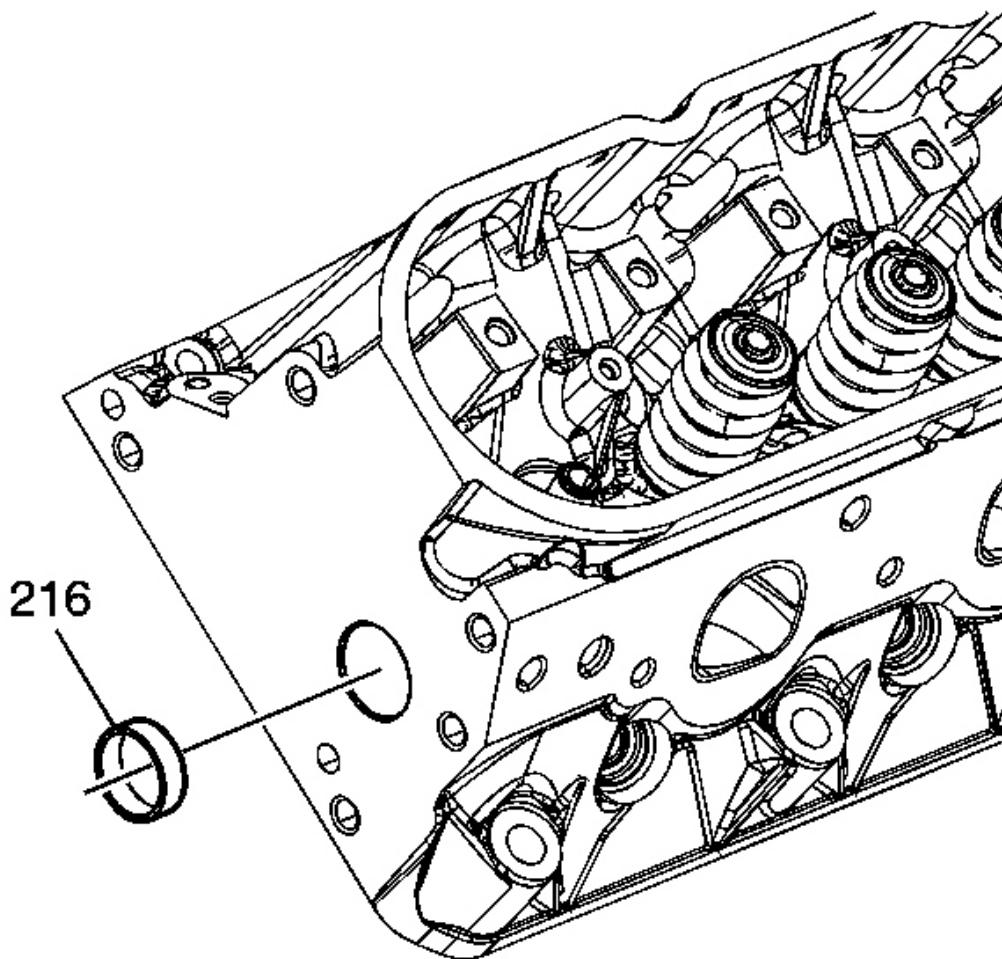


Fig. 455: Locating Cylinder Head Core Hole Plug
Courtesy of GENERAL MOTORS CORP.

8. Remove the cylinder head core hole plugs (216), as required.

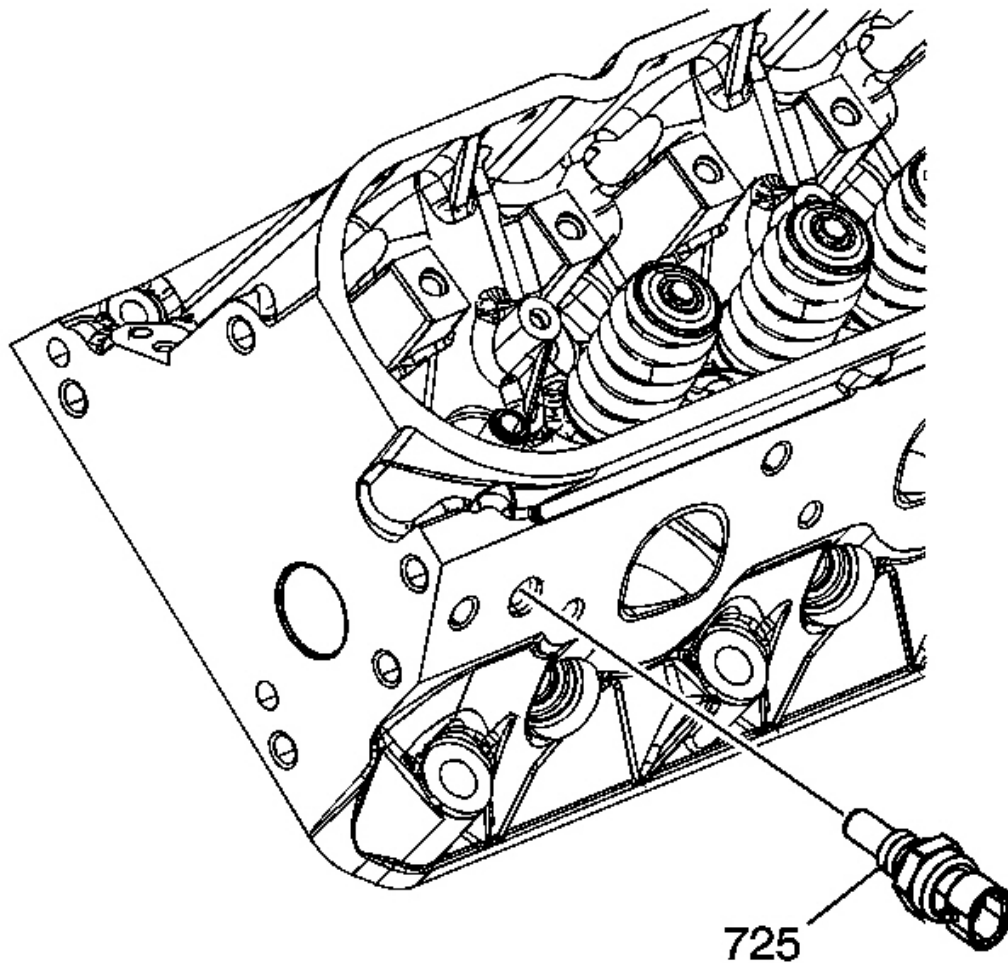


Fig. 456: Locating Coolant Temperature Sensor
Courtesy of GENERAL MOTORS CORP.

9. Remove the coolant temperature sensor (725) from the left cylinder head.

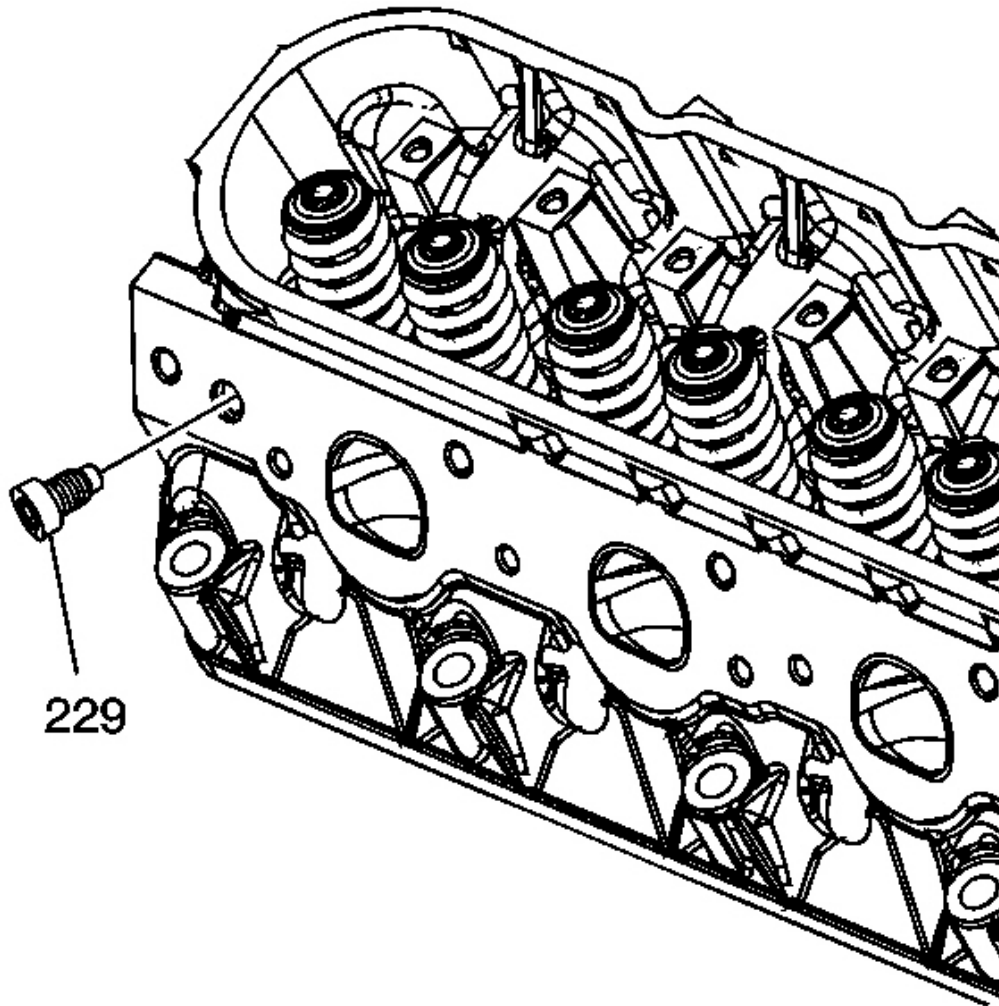


Fig. 457: Locating Coolant Plug
Courtesy of GENERAL MOTORS CORP.

10. Remove the cylinder head plug (229) from the right cylinder head.

CYLINDER HEAD CLEANING AND INSPECTION

Tools Required

- **J 8089** Carbon Removal Brush
- **J 9666** Valve Spring Tester

Inspection Procedure

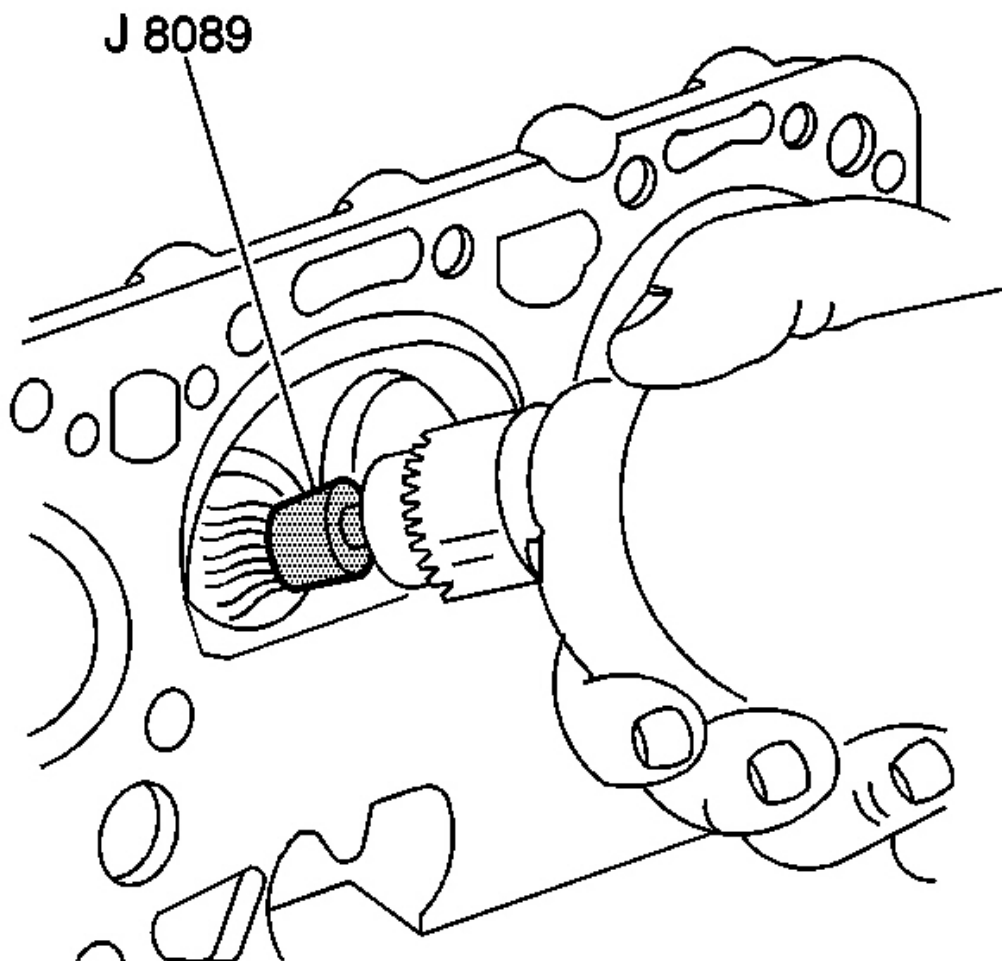


Fig. 458: View Of Carbon Cleaning Using J 8089
Courtesy of GENERAL MOTORS CORP.

CAUTION: Refer to Safety Glasses Caution .

IMPORTANT:

- When cleaning a cylinder head in a thermal type oven, do not exceed 204°C (400°F).
- Be careful not to scuff the chamber.

2007 Chevrolet TrailBlazer

2007 ENGINE Engine Mechanical - 6.0L - TrailBlazer

1. Clean the following components:

- Use the **J 8089** in order to remove the carbon from the combustion chambers.
- Gasket surfaces

Refer to **Replacing Engine Gaskets** .

- Valve stems and heads on a buffing wheel
- Bolt hole threads

Remove all dirt, debris or threadlocking material from the bolt holes.

2. Inspect the cylinder head for the following conditions:

1. Cracks in the exhaust ports and combustion chambers
2. External cracks in the water chambers
3. Gasket surfaces for excessive scratches or gouging

Refer to **Replacing Engine Gaskets** .

4. Bolt hole threads for debris or damaged threads

Refer to **Thread Repair** or **Thread Repair Specifications** .

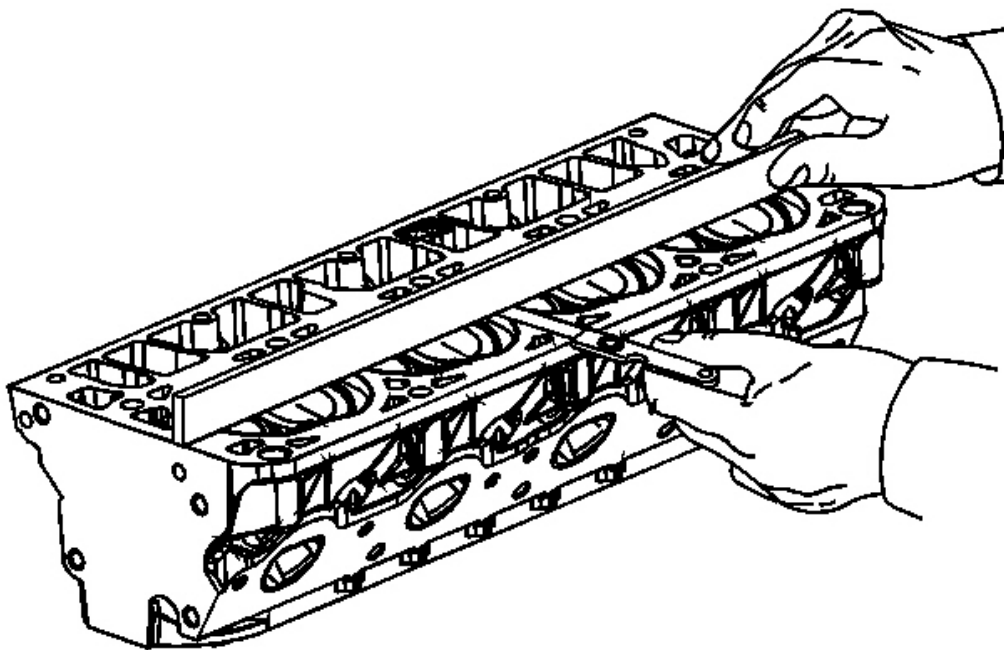


Fig. 459: Inspecting Cylinder Head For Warpage
Courtesy of GENERAL MOTORS CORP.

3. Inspect the cylinder head for warpage. Refer to **Engine Mechanical Specifications**.

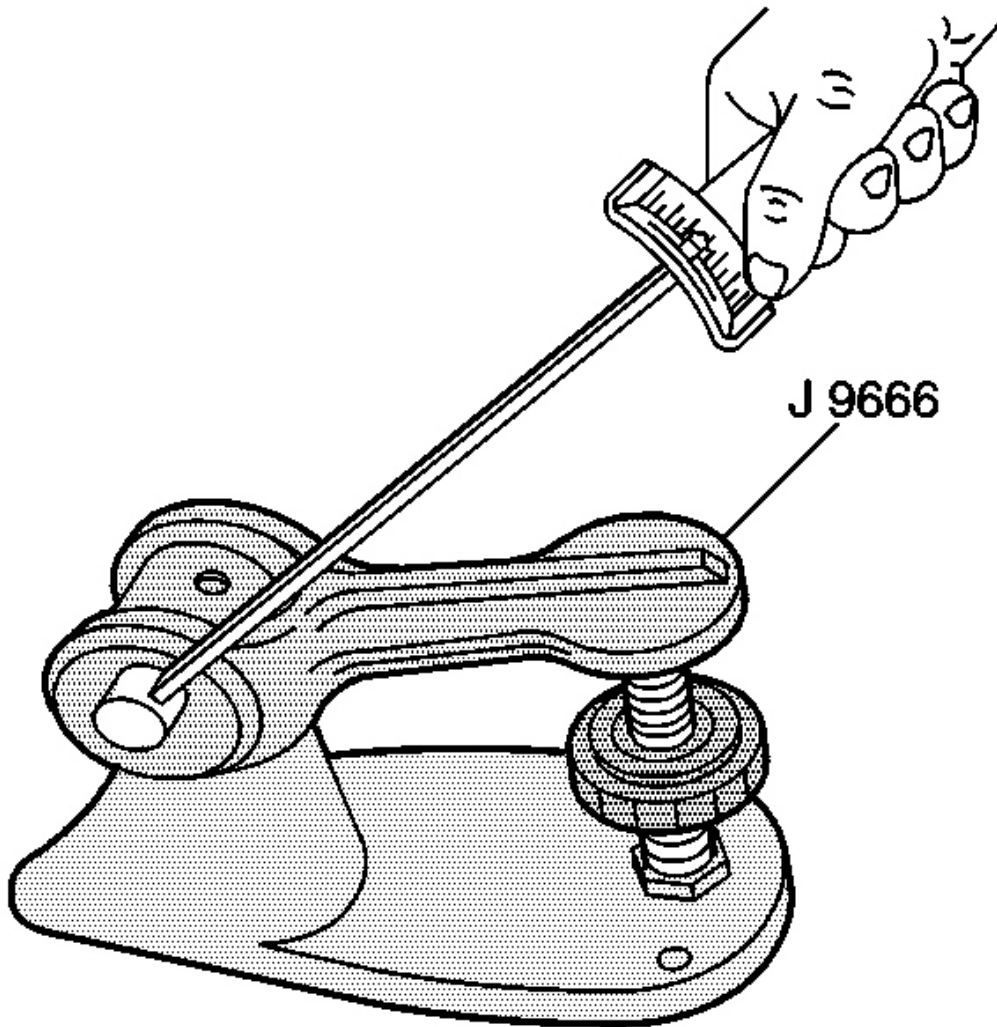


Fig. 460: Measuring Valve Spring Tension
Courtesy of GENERAL MOTORS CORP.

4. Use the **J 9666** in order to measure the valve spring tension. Refer to **Engine Mechanical Specifications**.

VALVE GUIDE REAMING/VALVE AND SEAT GRINDING

Valve Guide Reaming

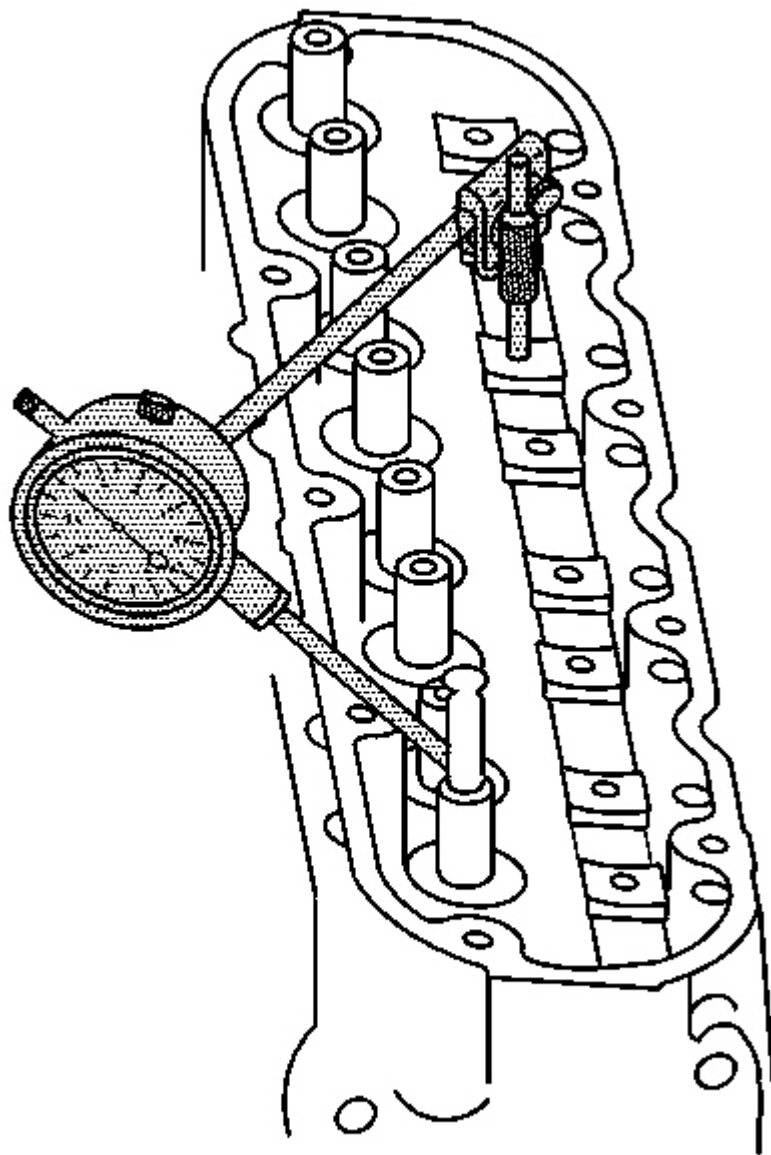


Fig. 461: Measuring Valve Stem-To-Guide Clearance
Courtesy of GENERAL MOTORS CORP.

NOTE: Excessive valve stem-to-guide clearance may cause a noisy valve train, premature valve stem oil seal wear, component damage, and/or excessive engine oil consumption.

2007 Chevrolet TrailBlazer

2007 ENGINE Engine Mechanical - 6.0L - TrailBlazer

NOTE: **Insufficient valve stem-to-guide clearance will result in noisy or sticking valves. Valves that are too tight may disturb engine smoothness or lead to component damage.**

1. Using a dial indicator, measure the valve stem-to-guide clearance. Position the tip of the dial indicator at the top of the valve guide.

Valve stem-to-guide clearance may also be obtained by using a micrometer to measure the valve stem diameter and a ball type measuring gage to measure the guide bore.

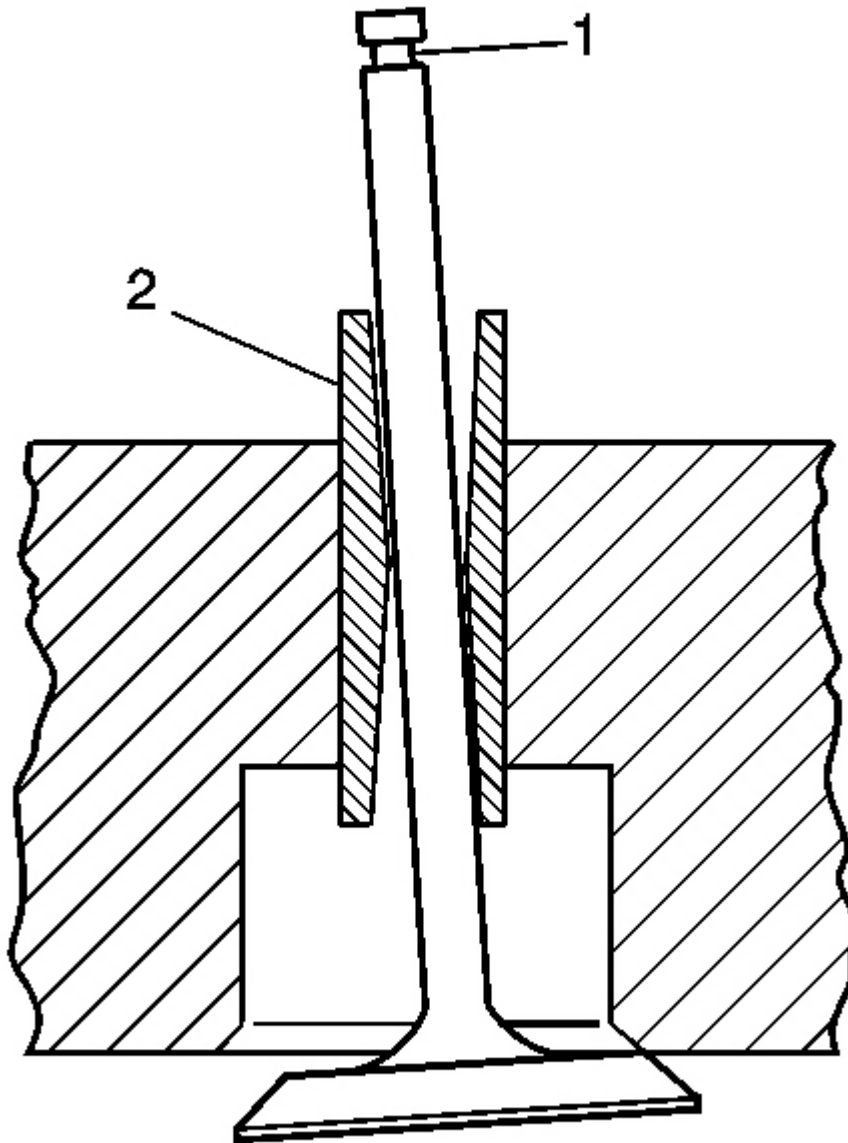


Fig. 462: Inspecting For Excessive Valve Stem To Guide Clearance
Courtesy of GENERAL MOTORS CORP.

2. A valve stem (1) and guide (2), with excessive clearance, must be replaced or the cylinder head replaced. Refer to **Engine Mechanical Specifications**.

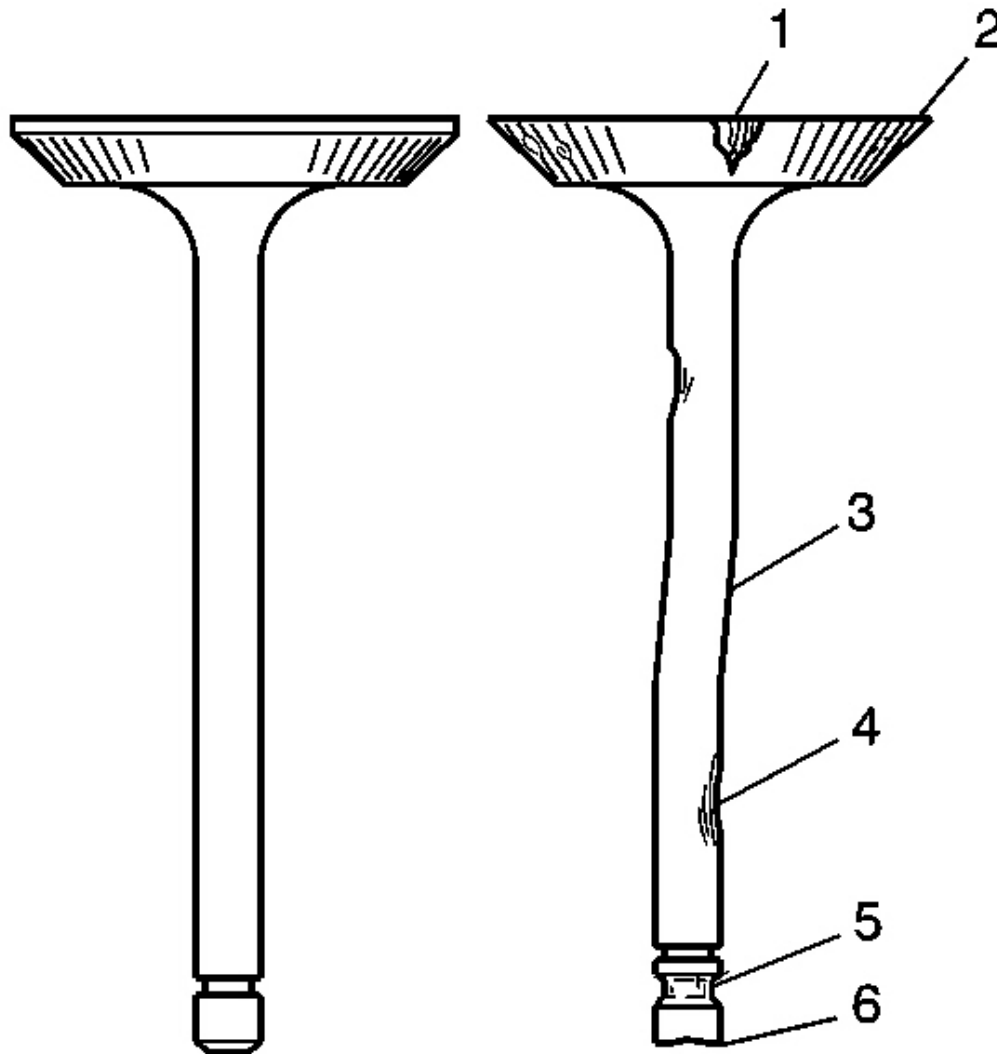


Fig. 463: Identifying Inspection Points For Valves Damage
Courtesy of GENERAL MOTORS CORP.

3. Inspect the valve stems for excessive scoring, wear or warpage.
 - A valve stem that has excessive scoring (3 or 4) or wear (4 or 6) must be replaced.
 - If a valve guide is worn or has excessive stem-to-guide clearance, the cylinder head should be replaced.
4. Measure the valve stem diameter. A valve stem with a diameter less than 7.95 mm (0.313 in) must be replaced.

If the valve stem diameter is within specifications and the stem-to-guide clearance is excessive, the cylinder head must be replaced.

Valve and Seat Grinding

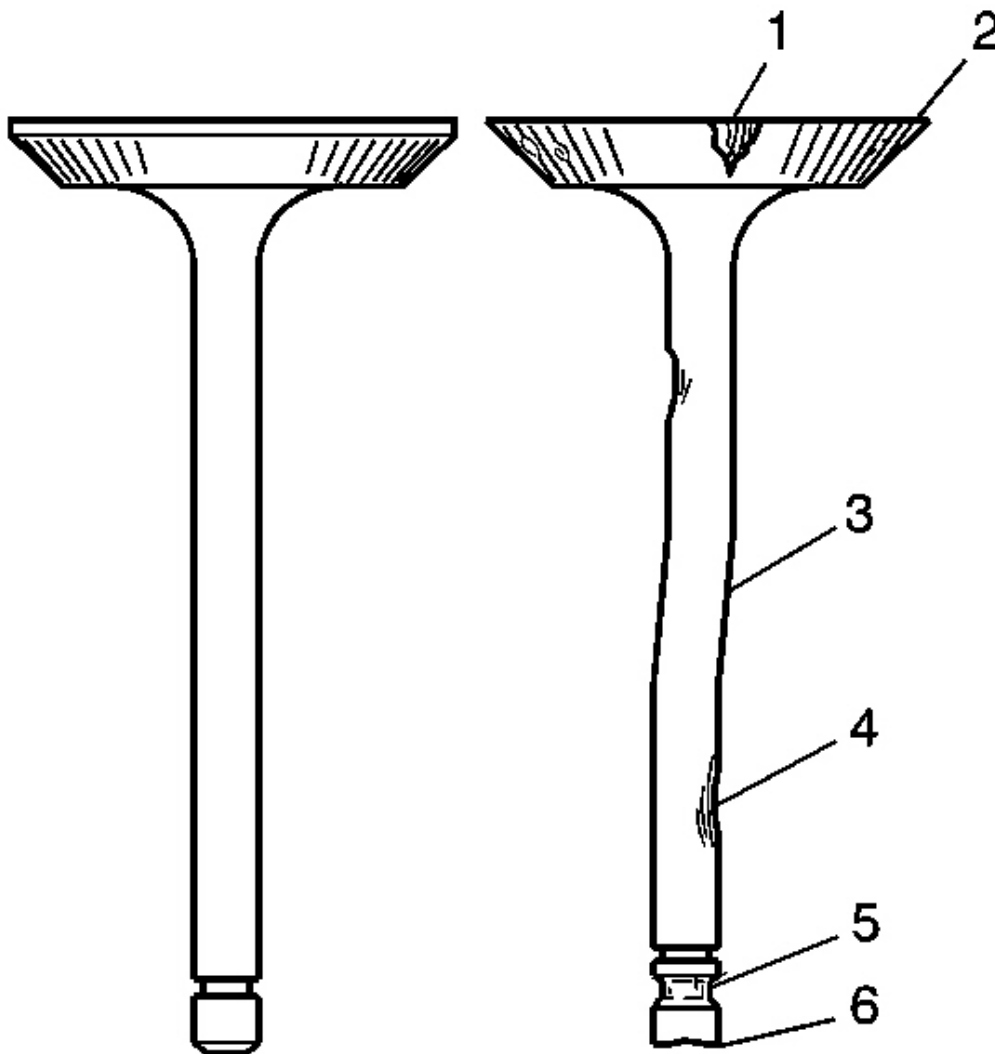


Fig. 464: Identifying Inspection Points For Valves Damage
Courtesy of GENERAL MOTORS CORP.

IMPORTANT: • Reconditioning the valve seats is very important. The seating of the

valves must be perfect for the engine to deliver optimum power and performance. Several different types of equipment are available for grinding valve seats.

- Another important factor is the cooling of the valve head. Good contact between the valve and the seat will ensure that heat will be properly dissipated.
- The recommendations of the equipment manufacturer should be followed carefully to obtain the proper results. Regardless of the type of equipment used, it is essential that valve guide bores be free of carbon or dirt to ensure proper centering of the tool pilot in the guide.
- Valves that are pitted must be refaced to the proper angle. Valve stems that show excessive wear or valves that are warped excessively must be replaced. When a valve head that is warped excessively is refaced, a knife edge may be ground on part or all of the valve head due to the amount of metal that must be removed. Knife edges lead to breakage, burning or pre-ignition due to heat localizing on this knife edge. If the edge of the valve head is less than 1.25 mm (0.05 in) after grinding, replace the valve.
- Several different types of equipment are available for refacing valves. The recommendation of the equipment manufacturer should be carefully followed to obtain the proper results.
- **DO NOT** reface intake valves. Intake valves with excessive wear or damage **MUST** be replaced.

1. Inspect the valve for the following conditions:

- Burnt or eroded areas (1)
- A worn margin (2)
- A bent stem (3)
- A worn or scored stem (4)
- A worn key groove (5)
- A worn stem tip (6)

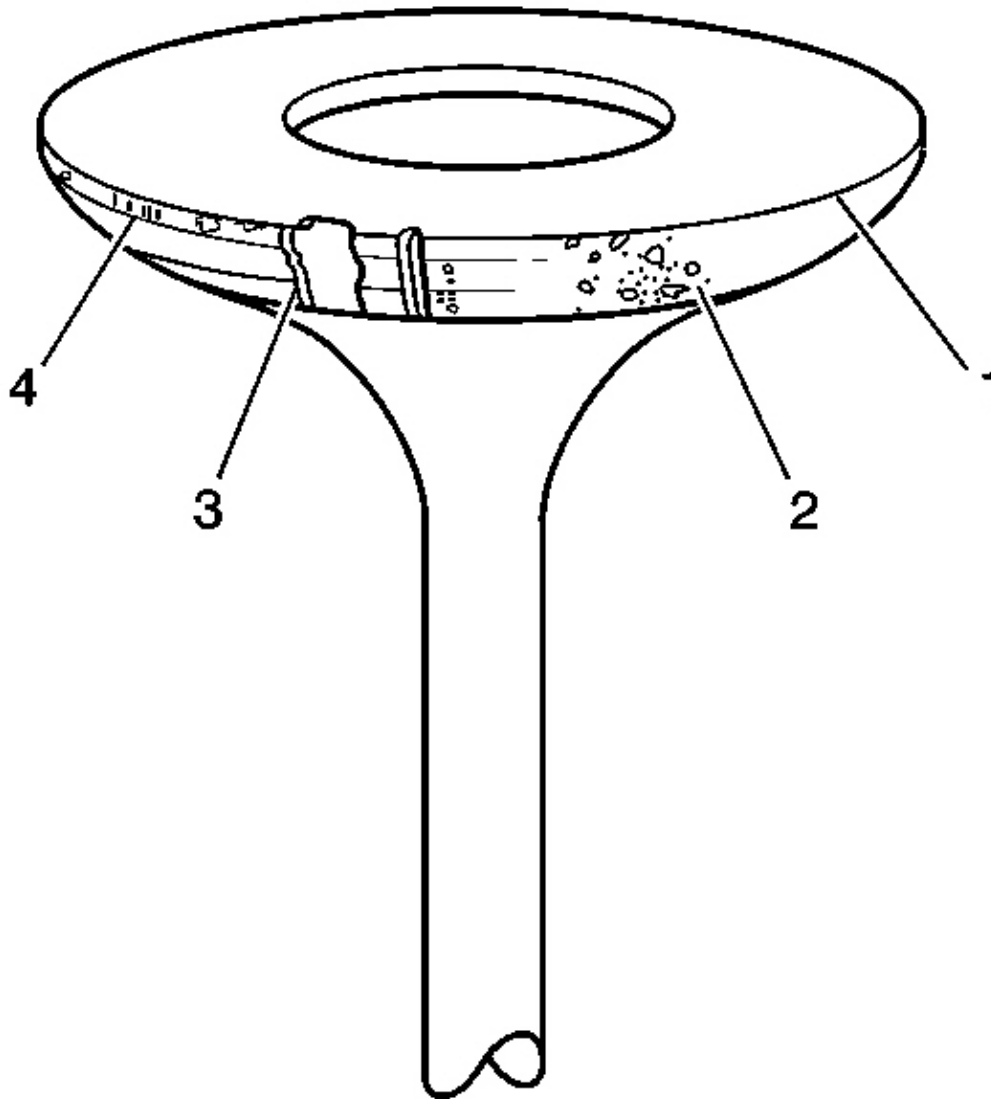


Fig. 465: Inspecting Valve Face For Burning, Pitting & Cracking
Courtesy of GENERAL MOTORS CORP.

2. Inspect the valve face for the following conditions:

- Worn or no margin (1 or 4)
- Pitted surfaces (2)
- Burnt or eroded areas (3)

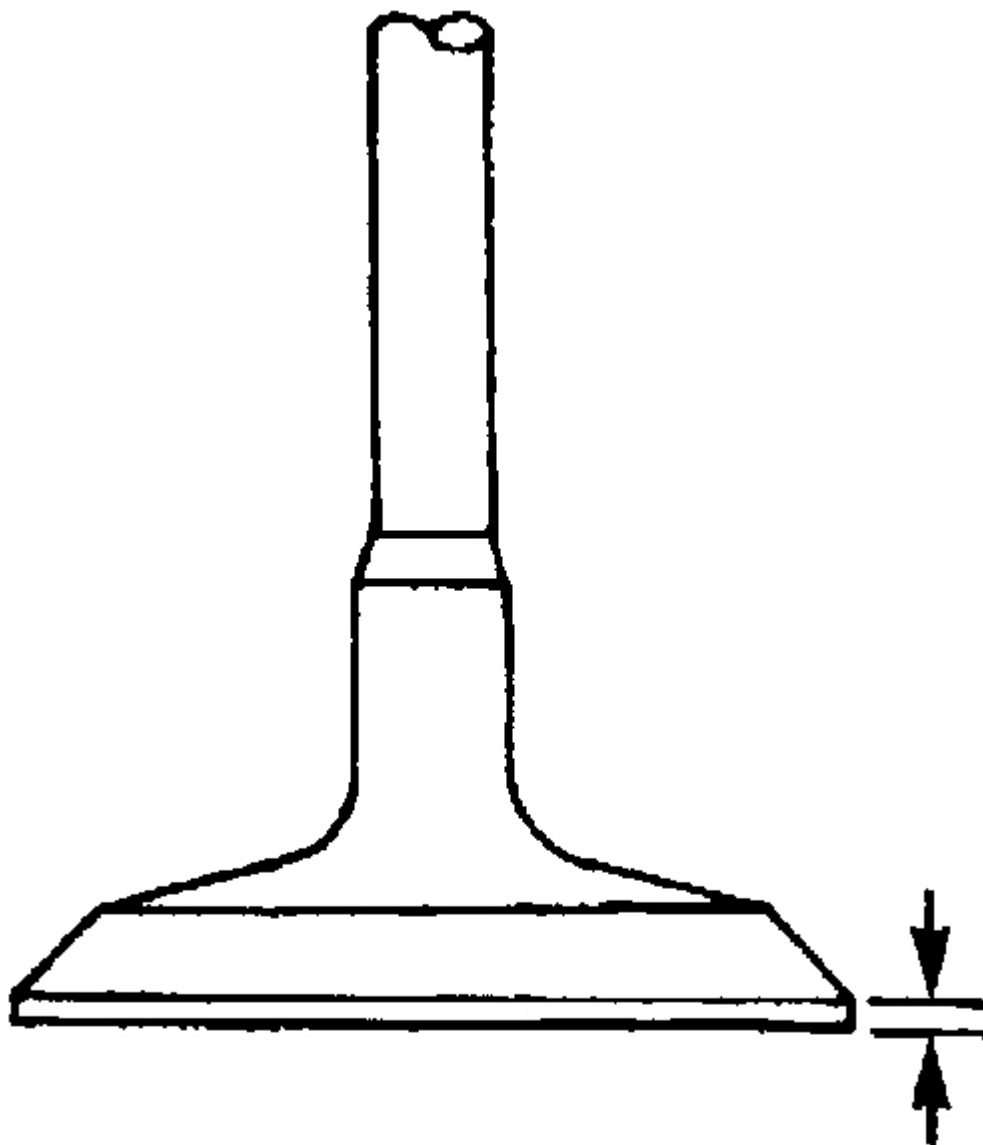


Fig. 466: Inspecting Valve Margin
Courtesy of GENERAL MOTORS CORP.

3. Inspect the valve margin.

The exhaust valve may be refaced if the margin is greater than 1.25 mm (0.05 in) thick before grinding.

2007 Chevrolet TrailBlazer

2007 ENGINE Engine Mechanical - 6.0L - TrailBlazer

4. Reface pitted exhaust valves on a suitable valve refacing machine.
5. Replace the valve if the margin is less than 1.25 mm (0.05 in) thick after grinding.
6. If the valve face has been ground, it may be necessary to shim the valve spring in order to obtain the proper spring installed height. Refer to **Cylinder Head Disassemble**.
7. Inspect for a loose valve seat in the cylinder head. The valve seat has an interference fit to the cylinder head.
8. Clean the valve guide bores with a suitable tool. Remove all carbon or dirt from the bores.

The valve guide must be clean for the seat grinding tool to obtain proper results.

9. Grind the valve seat.

The recommendations of the equipment manufacturer should be followed carefully to obtain the proper results. Regardless of the type of equipment used, it is essential that valve guide bores be free from carbon or dirt to ensure proper centering of the tool pilot in the guide.

10. Inspect the valve seats.
 - The valve seats should be concentric to within 0.05 mm (0.0021 in) total indicator reading.
 - If the valve seat has been ground, it may be necessary to shim the valve spring in order to attain the proper spring installed height. Refer to **Cylinder Head Disassemble**.

CYLINDER HEAD ASSEMBLE

Tools Required

J 8062 Valve Spring Compressor - Head Off

Assembly Procedure

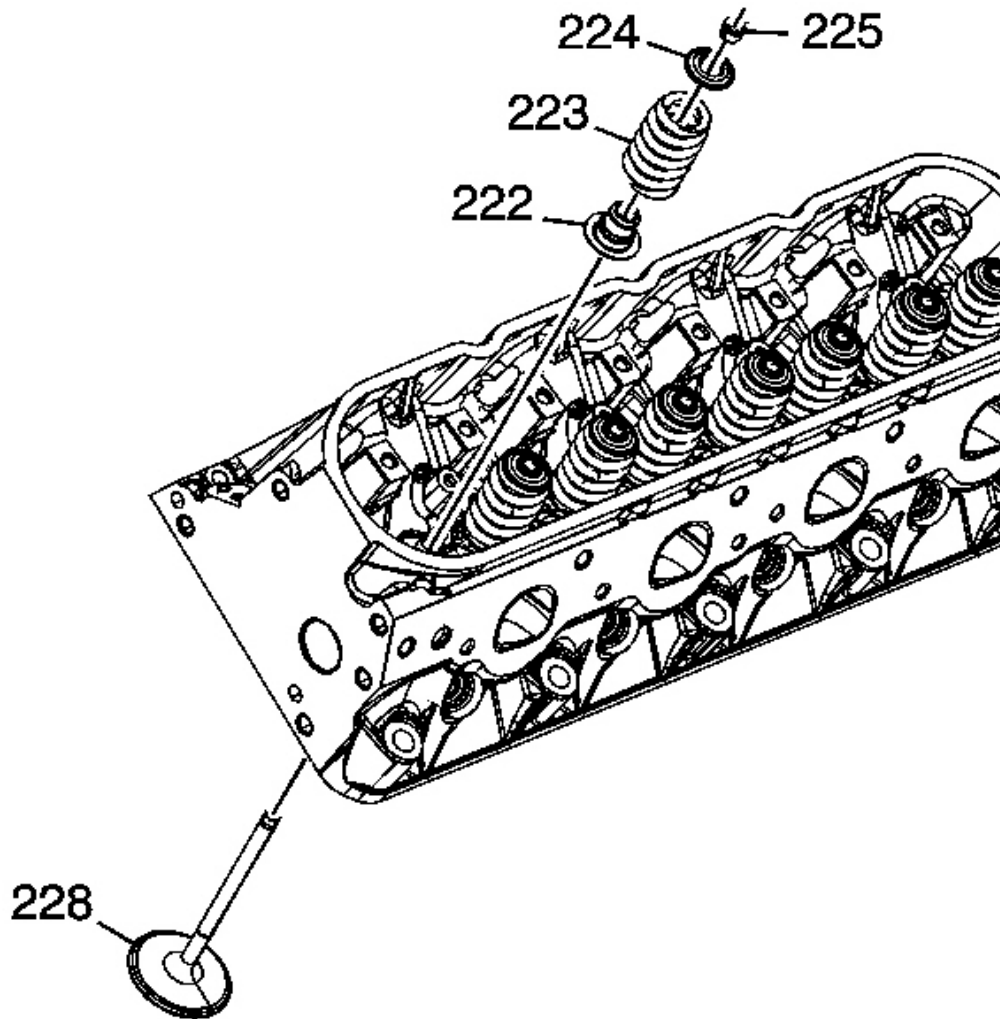


Fig. 467: View Of Valve Components
Courtesy of GENERAL MOTORS CORP.

1. Clean the cylinder head valve spring shim area.

IMPORTANT: When using the valves and related components again, install the parts to their original location.

2. Install the valves (228) into the proper port. Refer to Separating Parts .
3. Install the valve stem oil seal (222).

4. Install the valve spring (223).
5. Install the valve spring cap (224).

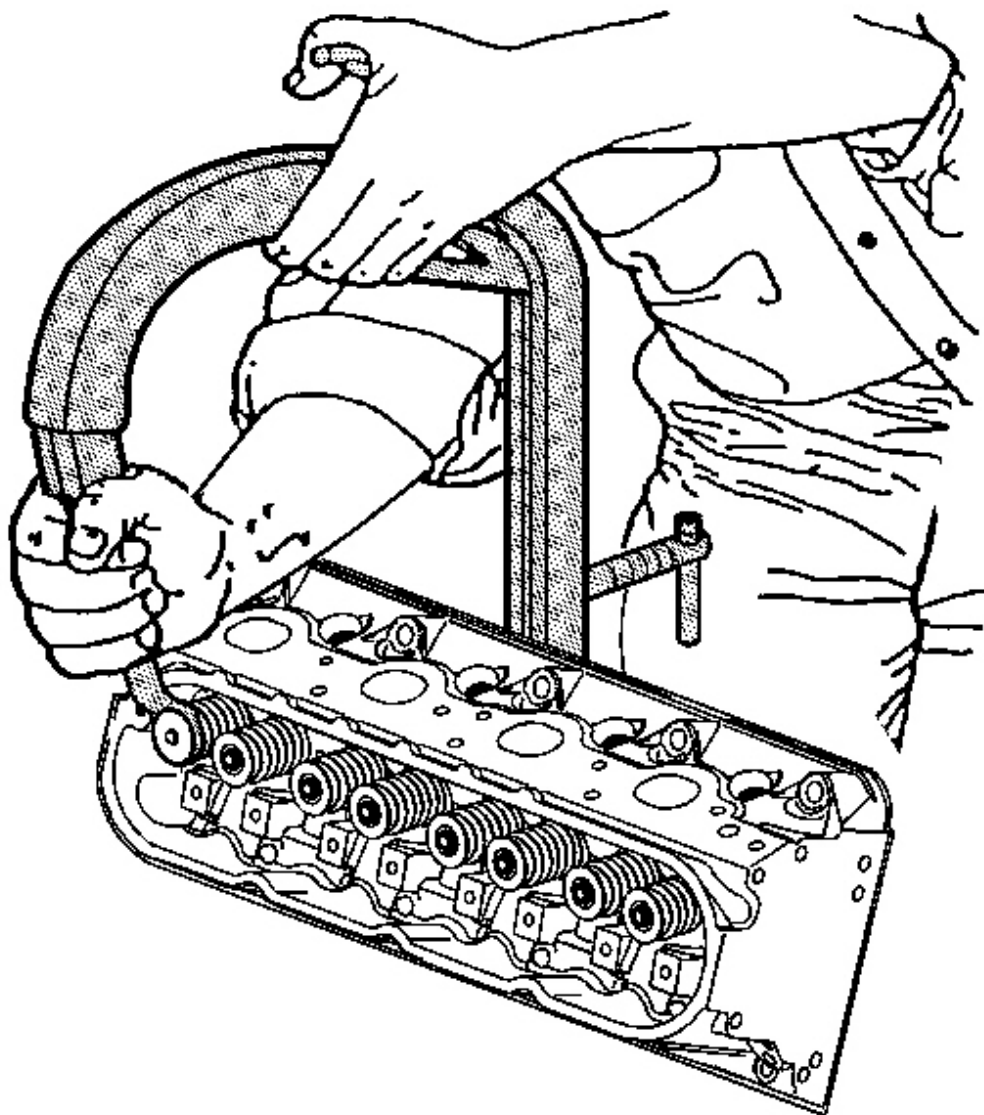


Fig. 468: Compressing Valve Spring Using J 8062
Courtesy of GENERAL MOTORS CORP.

6. Using the **J 8062** , compress the valve spring.

7. Install the valve stem keys.
 1. Use grease in order to hold the keys in place and remove the **J 8062** .
 2. Ensure the keys seat properly in the groove of the valve stem.
 3. Tap the end of the valve stem with a plastic face hammer to seat the keys, if necessary.

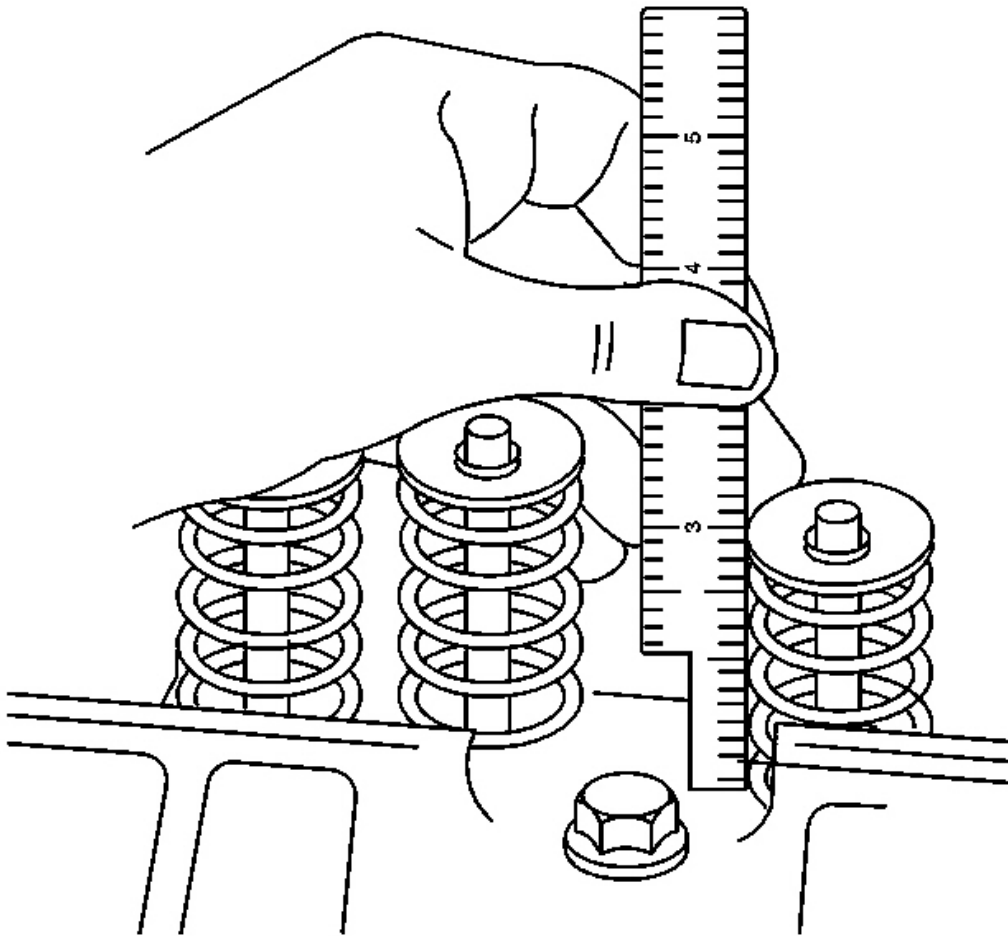


Fig. 469: Measuring Valve Spring Installed Height
Courtesy of GENERAL MOTORS CORP.

8. Using a ruler, measure the valve spring installed height.

Measure from the base of the valve spring to the top of the valve spring.

Specification:

- If the installed height exceeds 46.25 mm (1.82 in), install a valve spring shim of approximately 0.5 mm (0.02 in) thick.
- Do not shim the valve spring to obtain less than the specified height.

Do not assemble the components without a spring shim on the cylinder head.

9. Install the remaining valves, springs and other components.

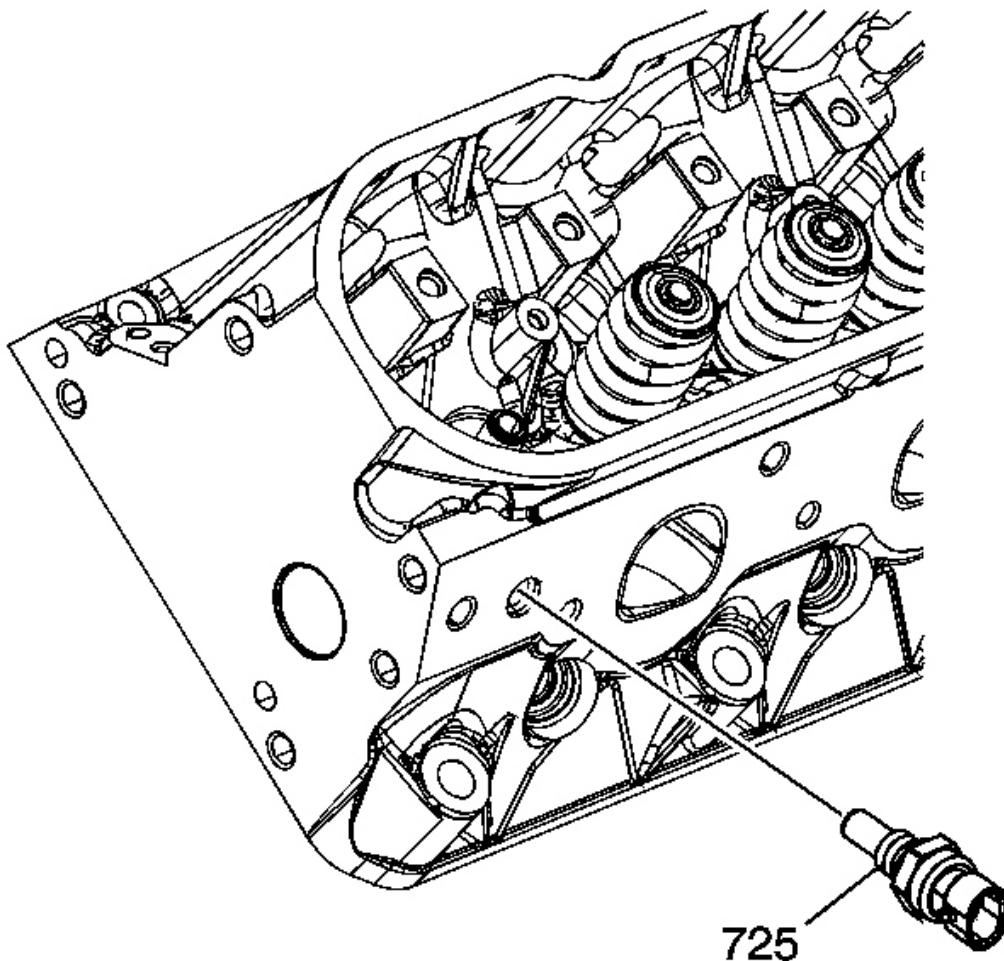


Fig. 470: Locating Coolant Temperature Sensor
Courtesy of GENERAL MOTORS CORP.

10. Install sealant GM P/N 12346004 (Canadian P/N 10953480) or equivalent, to the threads of the coolant temperature sensor (725).

NOTE: Refer to Fastener Notice .

11. Install the coolant temperature sensor into the left cylinder head.

Tighten: Tighten the coolant temperature sensor to 20 N.m (15 lb ft).

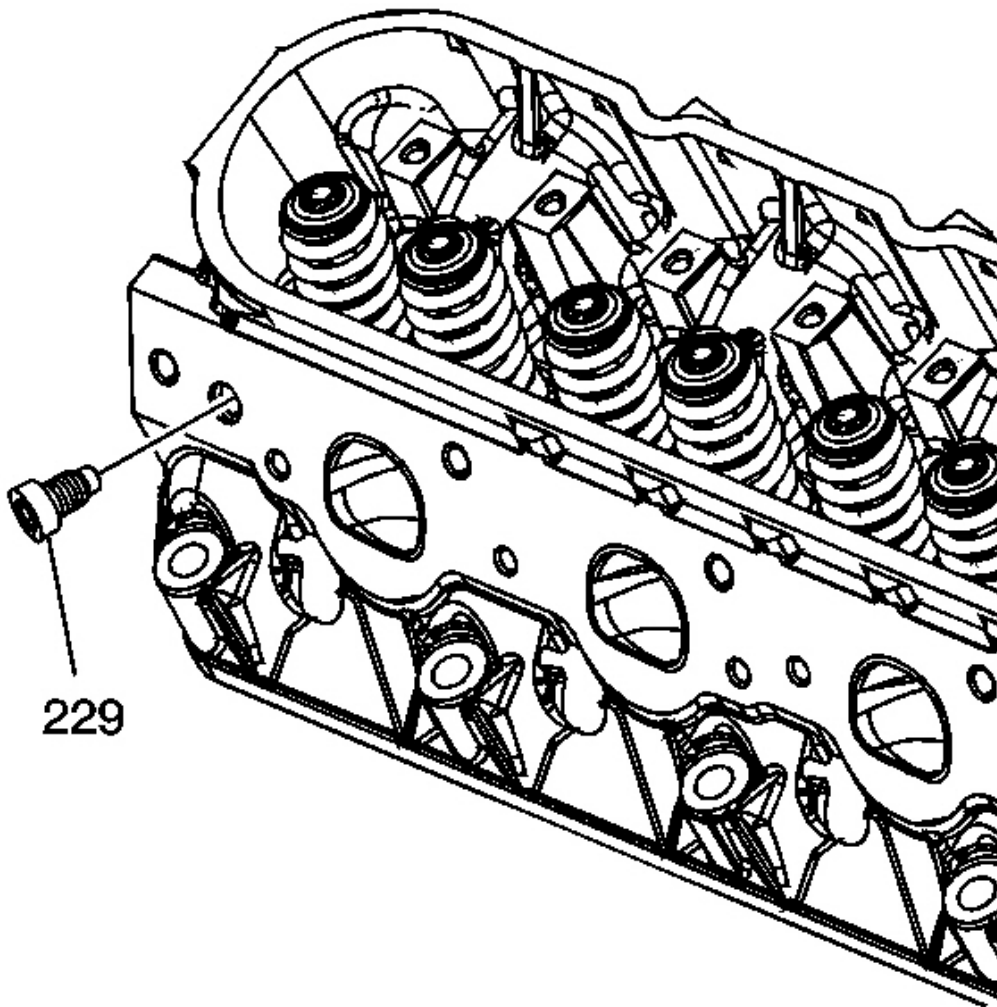


Fig. 471: Locating Coolant Plug
Courtesy of GENERAL MOTORS CORP.

12. Install sealant GM P/N 12346004 (Canadian P/N 10953480) or equivalent, to the threads of the cylinder head plug (229).

13. Install the cylinder head plug to the right cylinder head.

Tighten: Tighten the cylinder head plug to 20 N.m (15 lb ft).

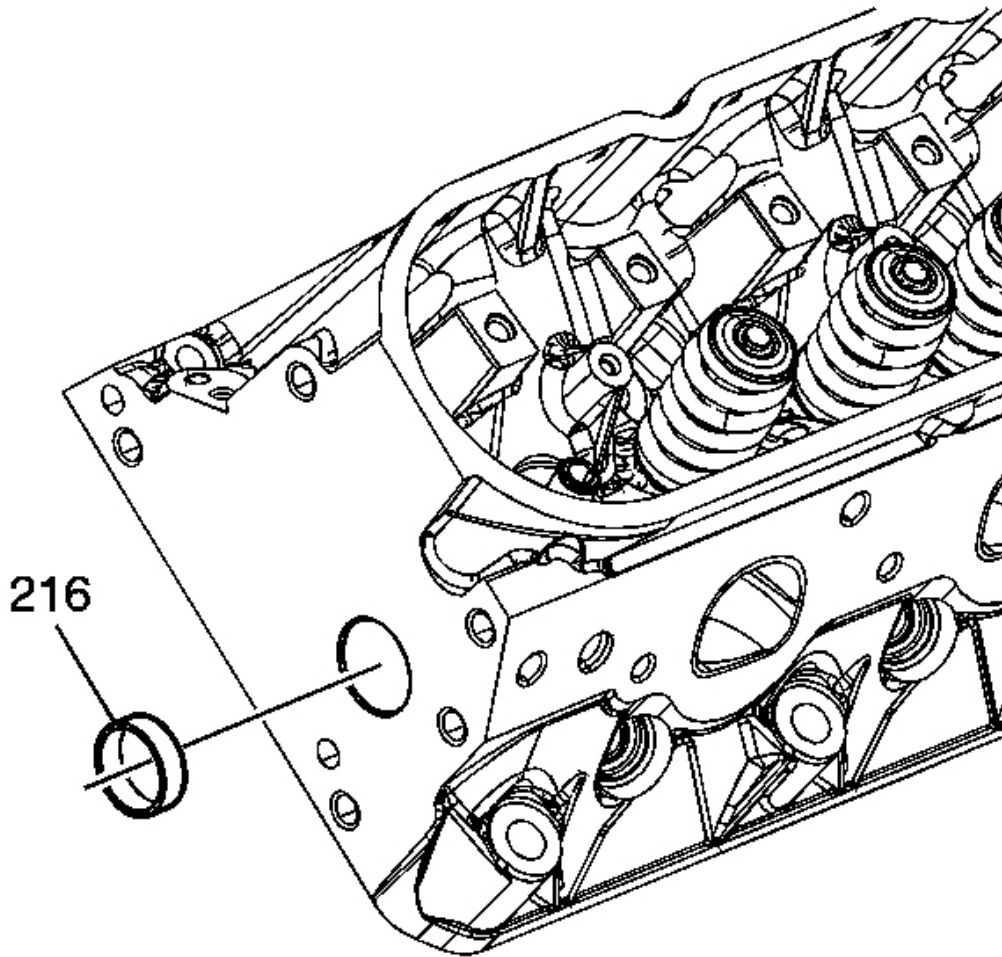


Fig. 472: Locating Cylinder Head Core Hole Plug
Courtesy of GENERAL MOTORS CORP.

14. Apply threadlock GM P/N 12345382 (Canadian P/N 10953489) or equivalent, to the sides of the cylinder head plugs (216).
15. Install the cylinder head plugs into the cylinder head.

A properly installed plug should be installed 2.5 mm (0.1 in) below the end face of the head.

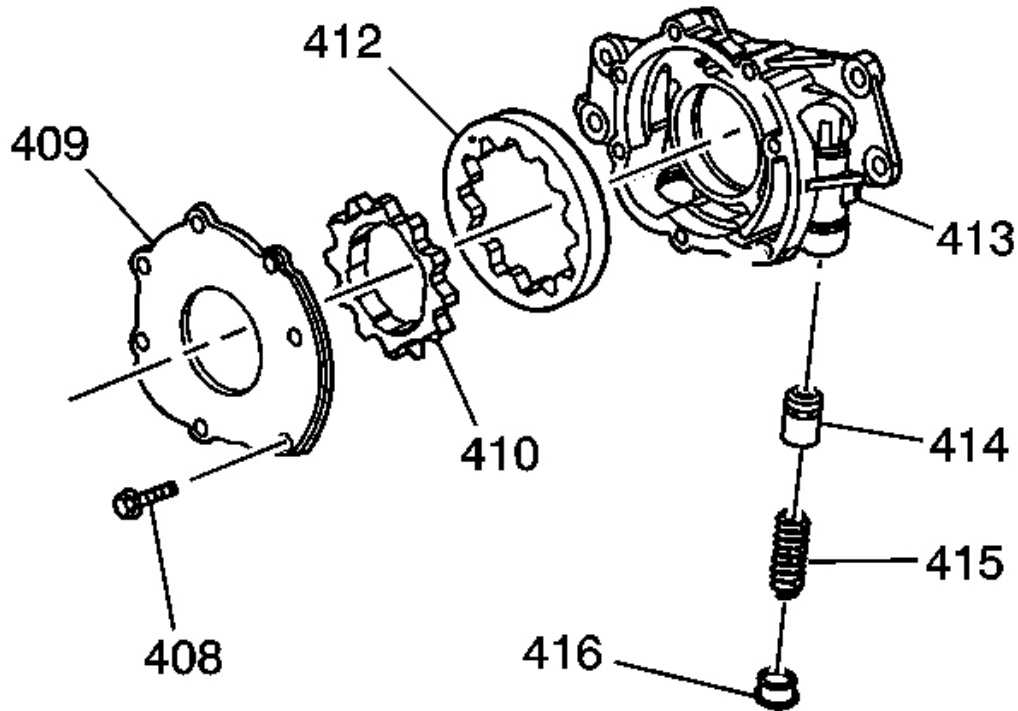
OIL PUMP DISASSEMBLE

Fig. 473: Exploded View Of Oil Pump
Courtesy of GENERAL MOTORS CORP.

IMPORTANT: The internal parts of the oil pump assembly are not serviced separately, excluding the spring. If the oil pump components are worn or damaged, replace the oil pump as an assembly.

1. Remove the oil pump cover bolts (408).
2. Remove the oil pump cover (409).

IMPORTANT: Mark or identify the gears for assembly. Refer to Separating Parts .

3. Remove the drive gear (410).
4. Remove the driven gear (412).
5. Remove the pressure relief valve plug (416).
6. Remove the pressure relief valve spring (415).

7. Remove the pressure relief valve (414).
8. Inspect the oil pump components. Refer to Oil Pump Cleaning and Inspection.

OIL PUMP CLEANING AND INSPECTION

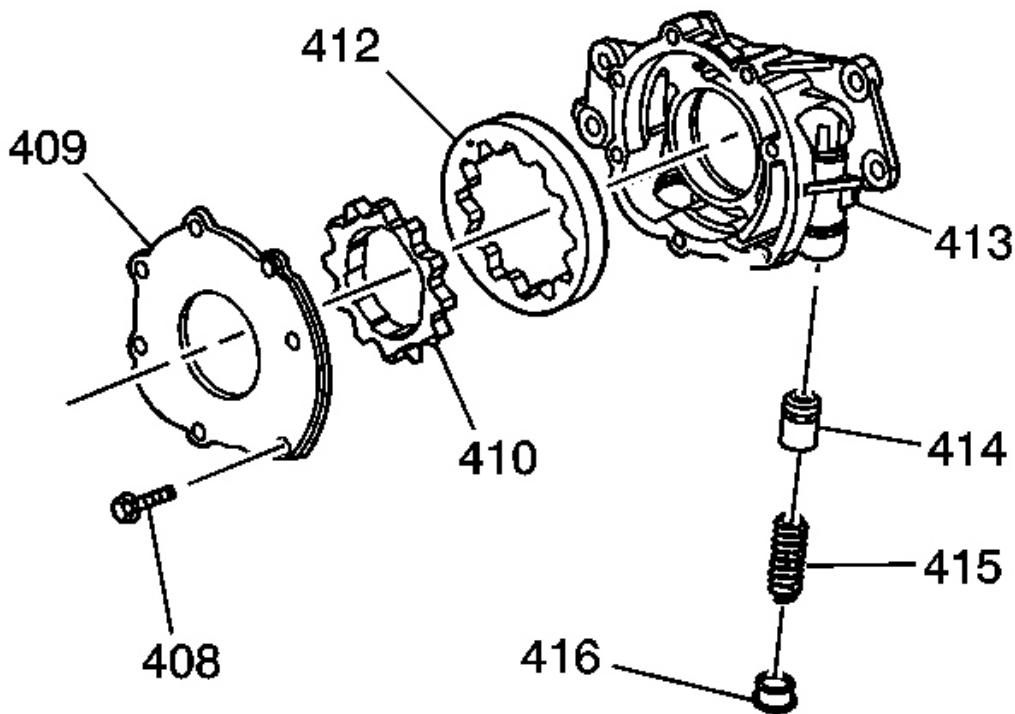


Fig. 474: Exploded View Of Oil Pump
Courtesy of GENERAL MOTORS CORP.

IMPORTANT:

- The internal parts of the oil pump assembly are not serviced separately, excluding the spring. If the oil pump components are worn or damaged, replace the oil pump as an assembly.
- The oil pump pipe and screen are to be serviced as an assembly. Do not attempt to repair the wire mesh portion of the pump and screen assembly.

1. Clean the parts in solvent.

CAUTION: Refer to Safety Glasses Caution in Cautions and Notices.

2007 Chevrolet TrailBlazer

2007 ENGINE Engine Mechanical - 6.0L - TrailBlazer

2. Dry the parts with compressed air.
3. Inspect the oil pump housing (413) and the cover (409) for cracks, excessive wear, scoring or casting imperfections.
4. Inspect the oil pump housing-to-engine block oil gallery surface for scratches or gouging.
5. Inspect the oil pump housing for damaged bolt hole threads.
6. Inspect the relief valve plug (416) and plug bore for damaged threads.
7. Inspect the oil pump internal oil passages for restrictions.
8. Inspect the drive gear (410) and driven gear (412) for chipping, galling or wear.

Minor burrs or imperfections on the gears may be removed with a fine oil stone.

9. Inspect the drive gear splines for excessive wear.
10. Inspect the pressure relief valve (414) and bore for scoring or wear.

The valve must move freely in the bore with no restrictions.

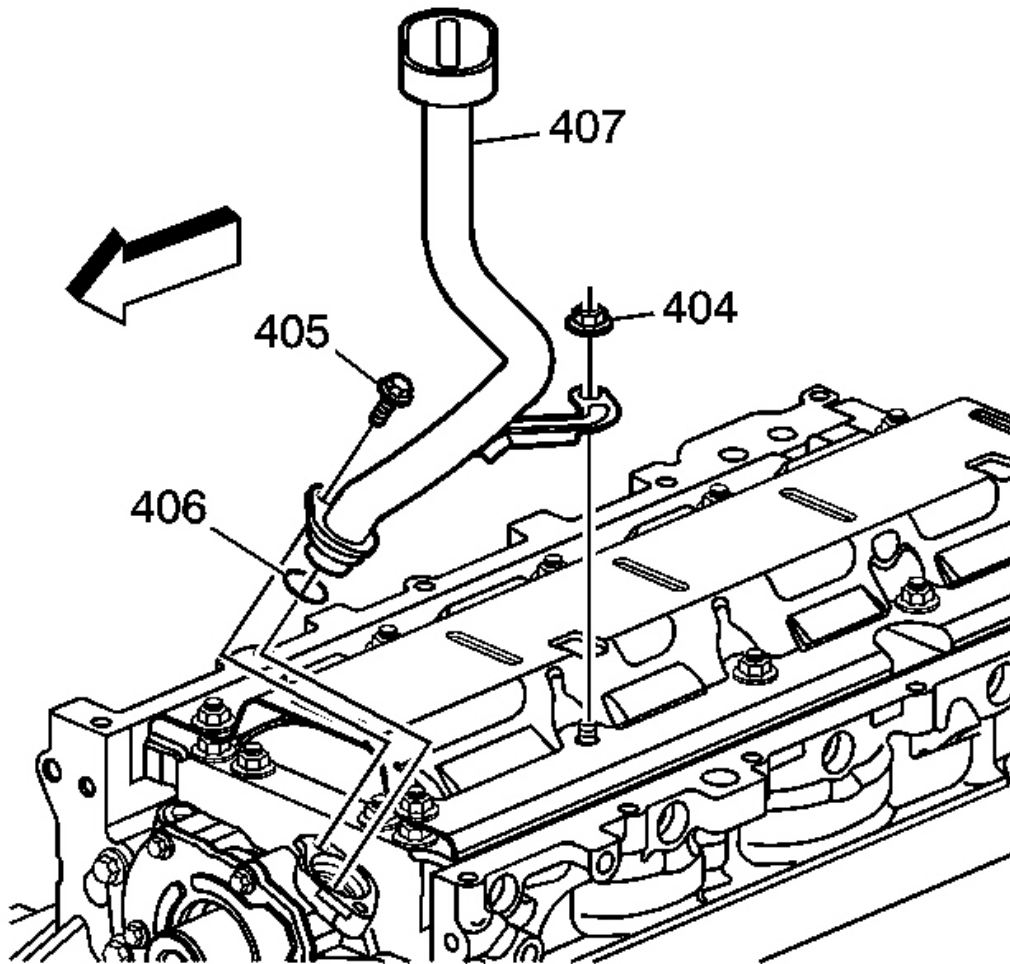


Fig. 475: View Of Oil Pump Screen, Bolt, Nuts & O-Ring Seal
Courtesy of GENERAL MOTORS CORP.

11. Inspect the oil pump screen (407) for debris or restrictions.
12. Inspect the oil pump screen for broken or loose wire mesh.

OIL PUMP ASSEMBLE

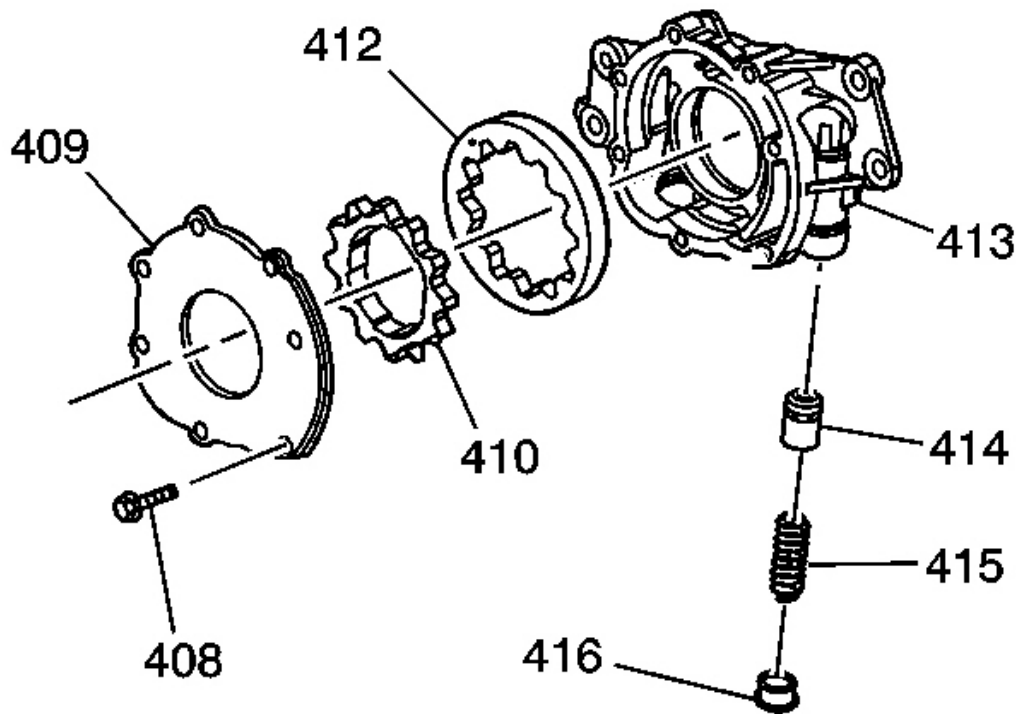


Fig. 476: Exploded View Of Oil Pump
Courtesy of GENERAL MOTORS CORP.

IMPORTANT: Prior to assembling the oil pump, coat all wear or internal surfaces with clean engine oil.

1. Install the driven gear (412) into the pump housing (413).

Install the driven gear with the orientation mark facing the pump cover.

2. Install the drive gear (410) into the pump housing.
3. Install the oil pump cover (409).

NOTE: Refer to Fastener Notice .

4. Install the oil pump cover bolts (408).

Tighten: Tighten the oil pump cover bolts to 12 N.m (106 lb in).

2007 Chevrolet TrailBlazer

2007 ENGINE Engine Mechanical - 6.0L - TrailBlazer

5. Install the relief valve (414).
6. Install the relief valve spring (415).
7. Install the relief valve plug (416).

Tighten: Tighten the relief valve plug to 12 N.m (106 lb in).

8. Inspect the oil pump for smooth operation by rotating the drive gear.

ENGINE FRONT COVER CLEANING AND INSPECTION

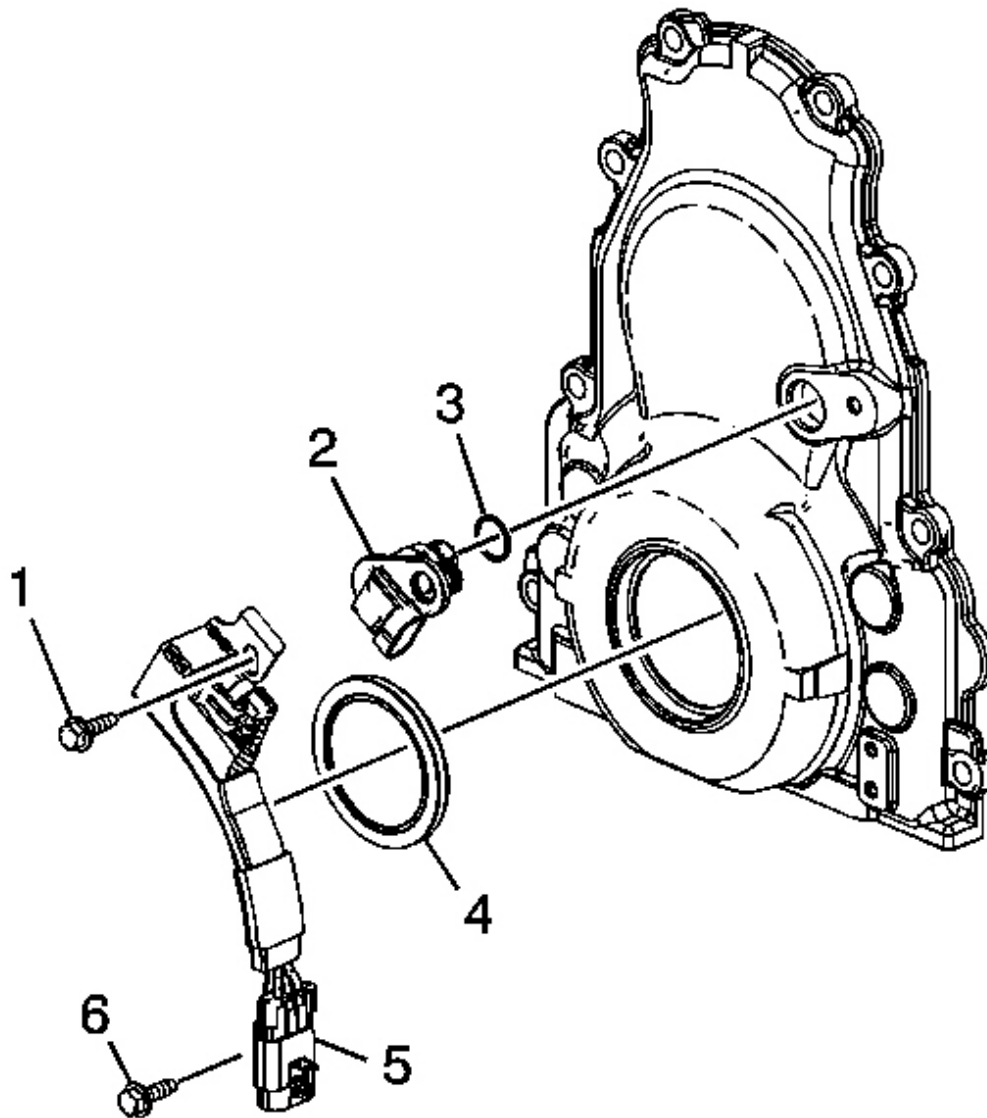


Fig. 477: View Of Front Cover, Oil Seal, Camshaft Position Sensor, Bracket & O Ring
Courtesy of GENERAL MOTORS CORP.

IMPORTANT:

- Do not use the crankshaft oil seal again. Install a **NEW** crankshaft oil seal during assembly.
- Do not use the front cover-to-engine block gasket again. Install a **NEW** gasket during assembly.

2007 Chevrolet TrailBlazer

2007 ENGINE Engine Mechanical - 6.0L - TrailBlazer

1. Remove the crankshaft oil seal (4) from the front cover.
2. Clean the cover in solvent. Remove the sealant from the cover oil pan surface. Refer to **Replacing Engine Gaskets** .

CAUTION: Refer to Safety Glasses Caution .

3. Dry the cover with compressed air.
4. Inspect the gasket sealing surfaces for excessive scratches or gouging.
5. Inspect the threaded bolt holes for damaged threads or debris.
6. Inspect the crankshaft oil seal and camshaft position (CMP) sensor mounting bores for damage.

CRANKSHAFT REAR OIL SEAL HOUSING CLEANING AND INSPECTION

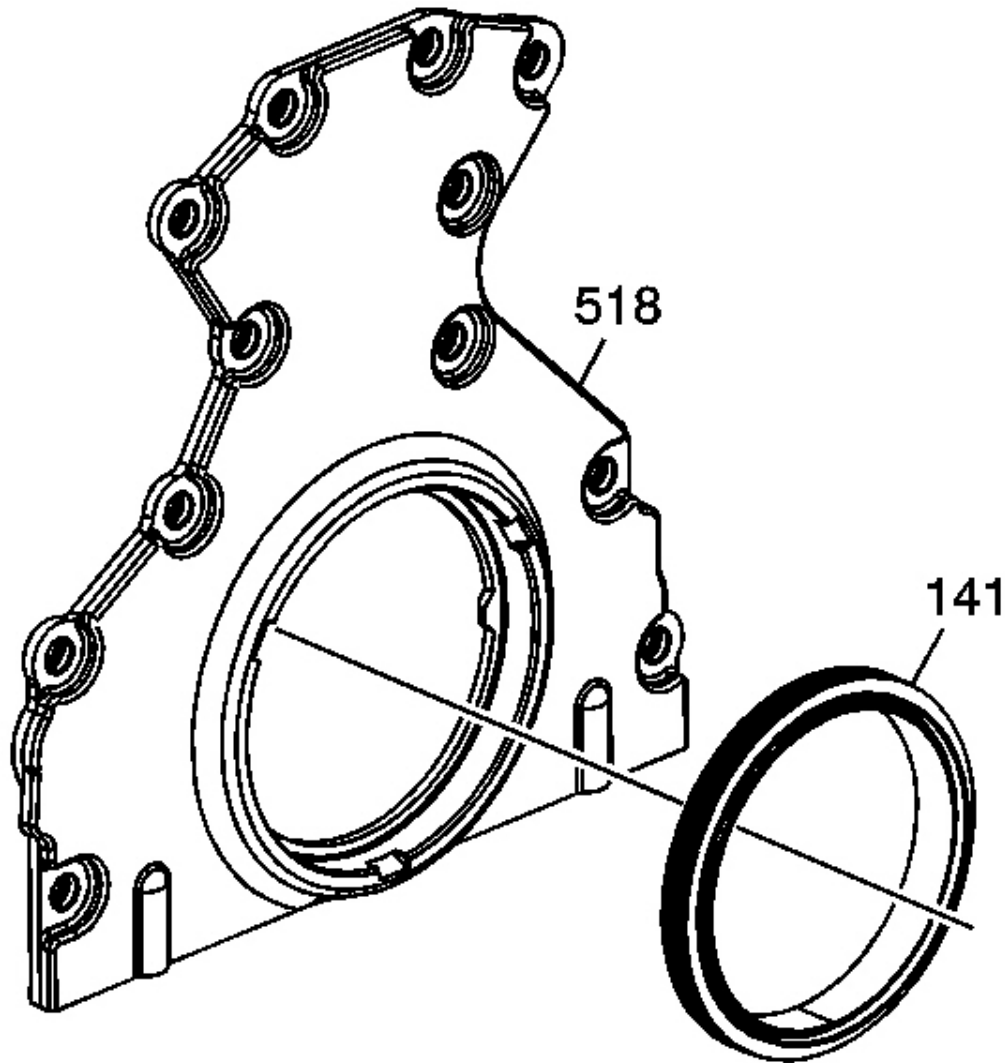


Fig. 478: View Of Crankshaft Rear Oil Seal & Housing
Courtesy of GENERAL MOTORS CORP.

IMPORTANT:

- Do not use the crankshaft rear oil seal again. Install a NEW crankshaft oil seal during assembly.
- Do not use the rear housing-to-engine block gasket again. Install a NEW gasket during assembly.

1. Remove the crankshaft oil seal (141) from the rear housing.

2. Clean the housing in solvent. Remove the sealant from the housing oil pan surface. Refer to **Replacing Engine Gaskets** .

CAUTION: Refer to **Safety Glasses Caution** .

3. Dry the housing with compressed air.
4. Inspect the gasket sealing surfaces for excessive scratches or gouging.
5. Inspect the housing-to-oil pan threaded bolt holes for damaged threads or debris.
6. Inspect the crankshaft oil seal mounting bore for damage.

ENGINE VALLEY COVER CLEANING AND INSPECTION

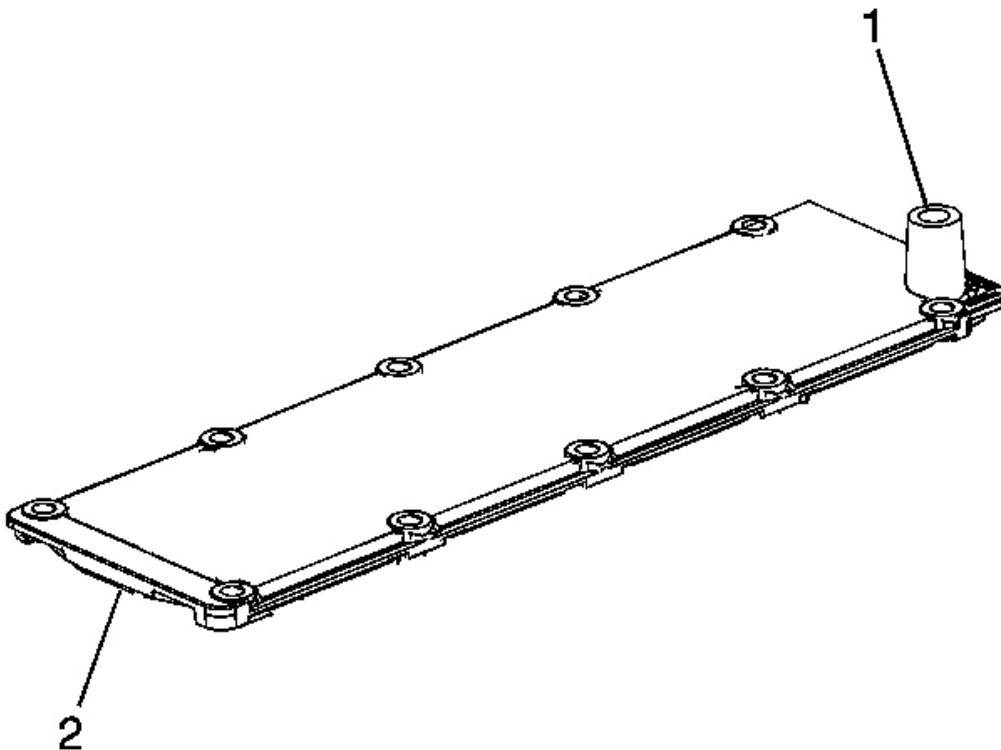


Fig. 479: View Of Engine Valley Cover
Courtesy of GENERAL MOTORS CORP.

1. Clean the valley cover in solvent.

CAUTION: Refer to Safety Glasses Caution in Cautions and Notices.

2. Dry with compressed air.
3. Inspect for damaged threads (1) and damaged sealing surfaces (2).

VALVE ROCKER ARM COVER CLEANING AND INSPECTION

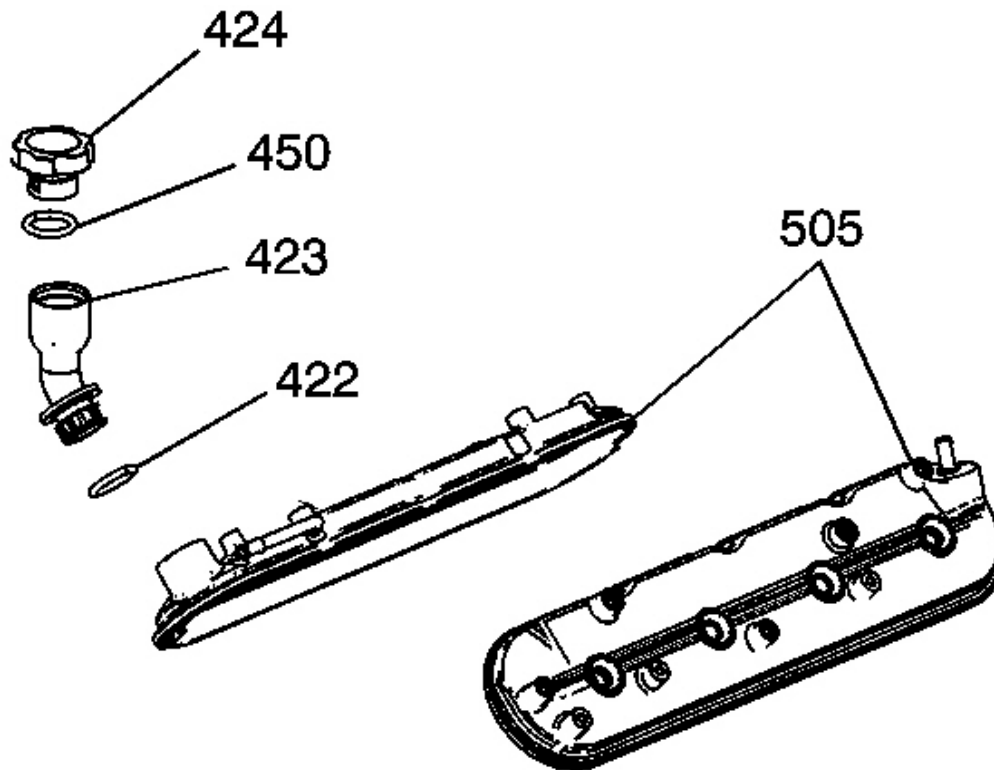


Fig. 480: View Of Valve Rocker Arm Cover
Courtesy of GENERAL MOTORS CORP.

IMPORTANT:

- Do not use the valve rocker arm cover gasket again. Install a NEW gasket during assembly.
- Remove the ignition coils before cleaning the cover in solvent. Do not submerge the ignition coils in solvent.
- Do not remove the oil fill tube from the covers unless service is

required. If the tube is removed from the cover, install a NEW tube (423) and seal (422) during assembly.

1. Inspect the oil fill tube (423) for a loose fit or damage.
2. Inspect the covers (505) for the following conditions:
 - Scoring or damage to the gasket surfaces
 - Ventilation system passages for restrictions
 - Threaded bolt holes for damage or debris

OIL PAN CLEANING AND INSPECTION

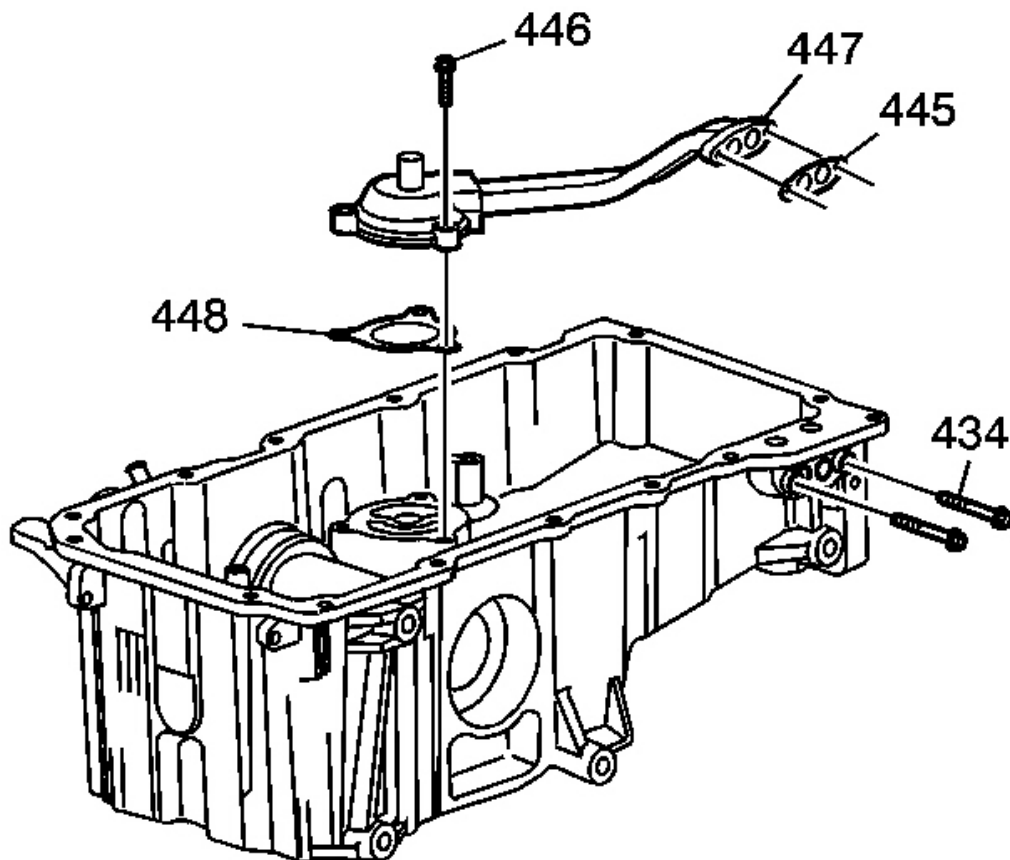


Fig. 481: Identifying Oil Pump Tube & Screen
Courtesy of GENERAL MOTORS CORP.

IMPORTANT: When installing a NEW oil pan gasket, it is not necessary to install the rivets that retain the NEW gasket to the pan.

1. Remove the oil filter tube bolts (435, 446) and gaskets (445, 448).
2. Remove the oil filter tube (447).

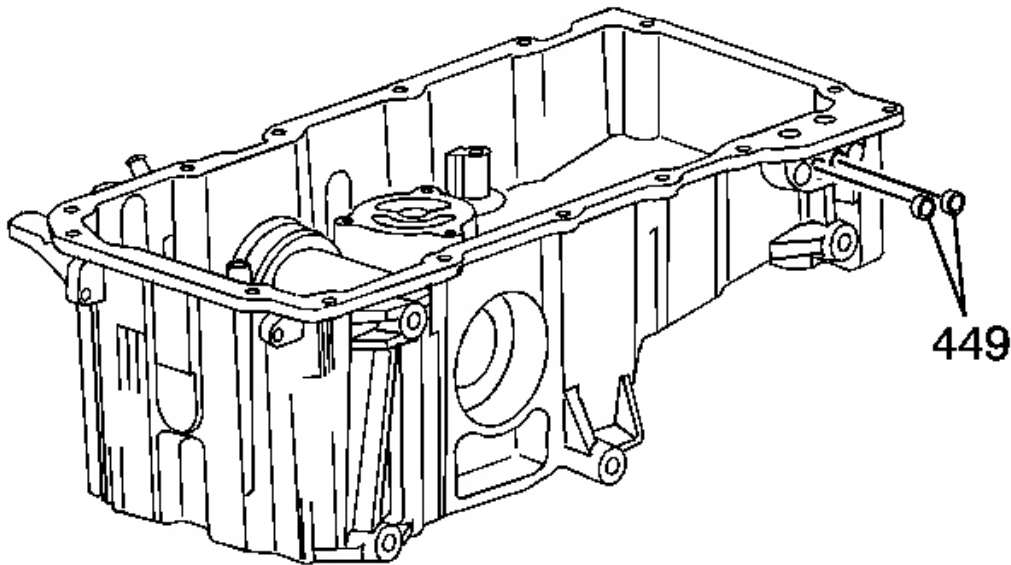


Fig. 482: View Of Oil Gallery Plugs
Courtesy of GENERAL MOTORS CORP.

3. Remove the plugs (449) from the oil galleries.

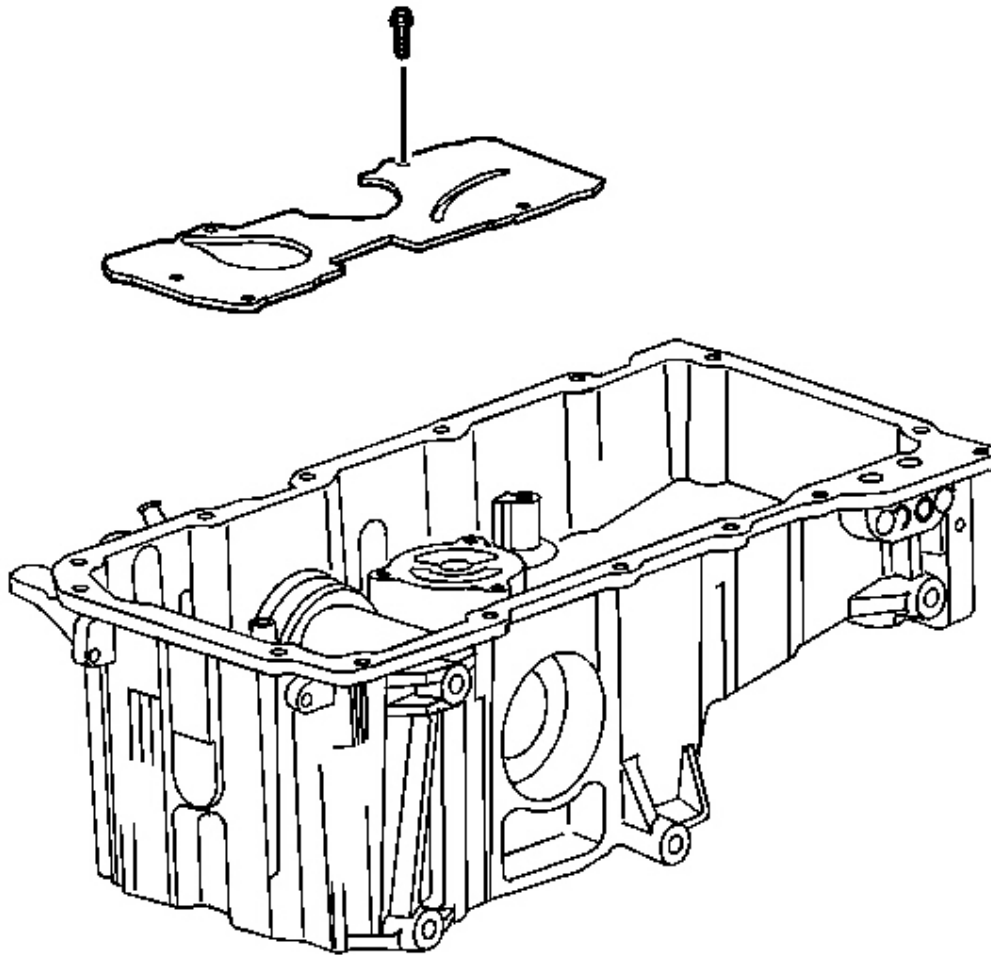


Fig. 483: View Of Oil Baffle & Bolts
Courtesy of GENERAL MOTORS CORP.

4. Remove the oil pan baffle and bolts.
5. Remove the oil filter fitting, as required. Refer to **Oil Filter and Adapter Removal** .
6. Clean the oil pan in solvent. Be sure to thoroughly clean all of the oil passages and recesses of the pan.

CAUTION: Refer to **Safety Glasses Caution** .

7. Dry the oil pan with compressed air.

8. Inspect the oil pan for the following conditions:

- Damaged gasket surfaces
- Restrictions within the oil passages of the pan
- Threaded bolt holes for damage

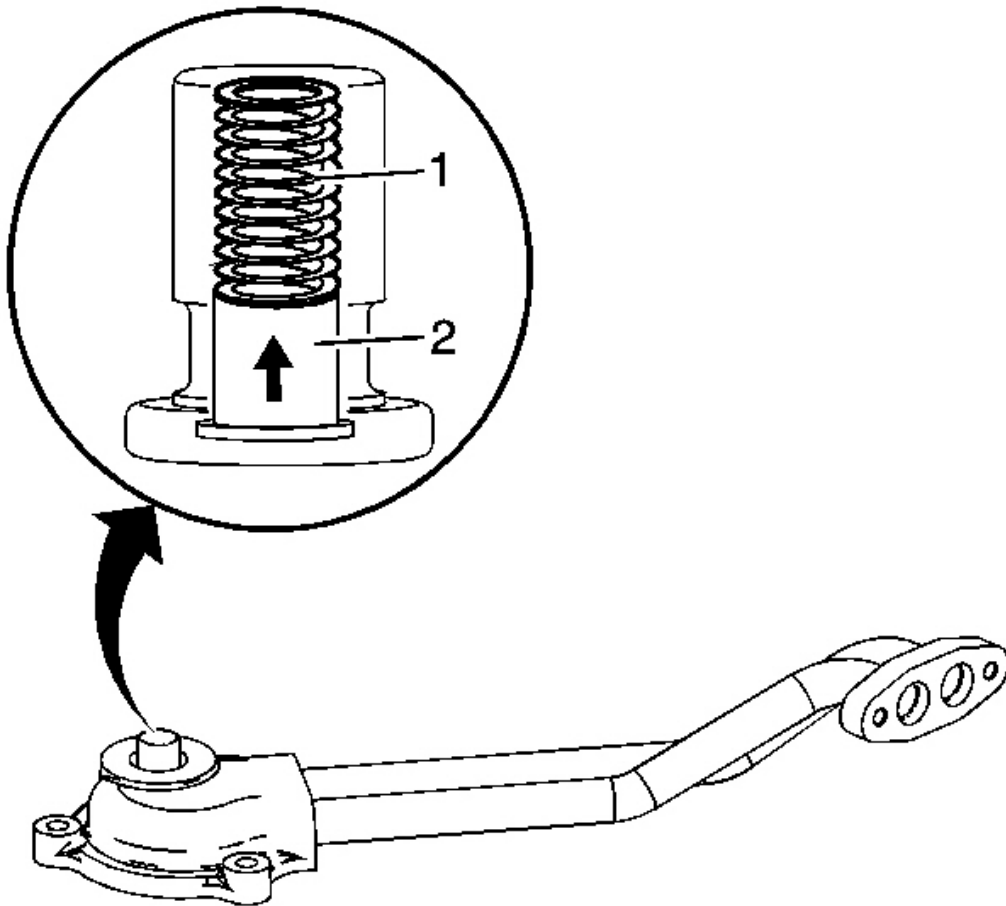


Fig. 484: Identifying Oil Pressure Relief Valve
Courtesy of GENERAL MOTORS CORP.

9. Inspect the oil filter tube for restrictions or damaged gasket surfaces.
10. Inspect the oil pressure relief valve for proper operation.

Lightly depress the valve (2). The valve spring (1) should seat the valve to the proper closed position.

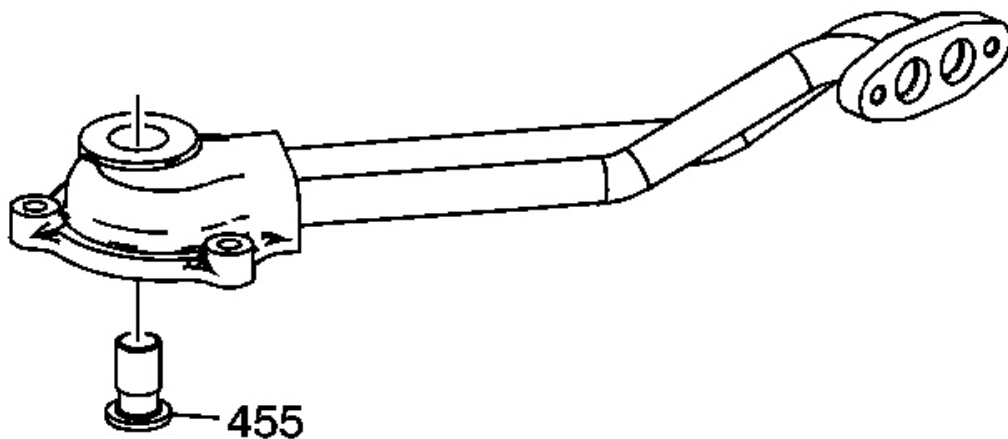


Fig. 485: Identifying Relief Valve
Courtesy of GENERAL MOTORS CORP.

11. The oil pressure relief valve (455) is press-fit into the oil filter tube and is serviceable separately.

INTAKE MANIFOLD CLEANING AND INSPECTION

Cleaning Procedure

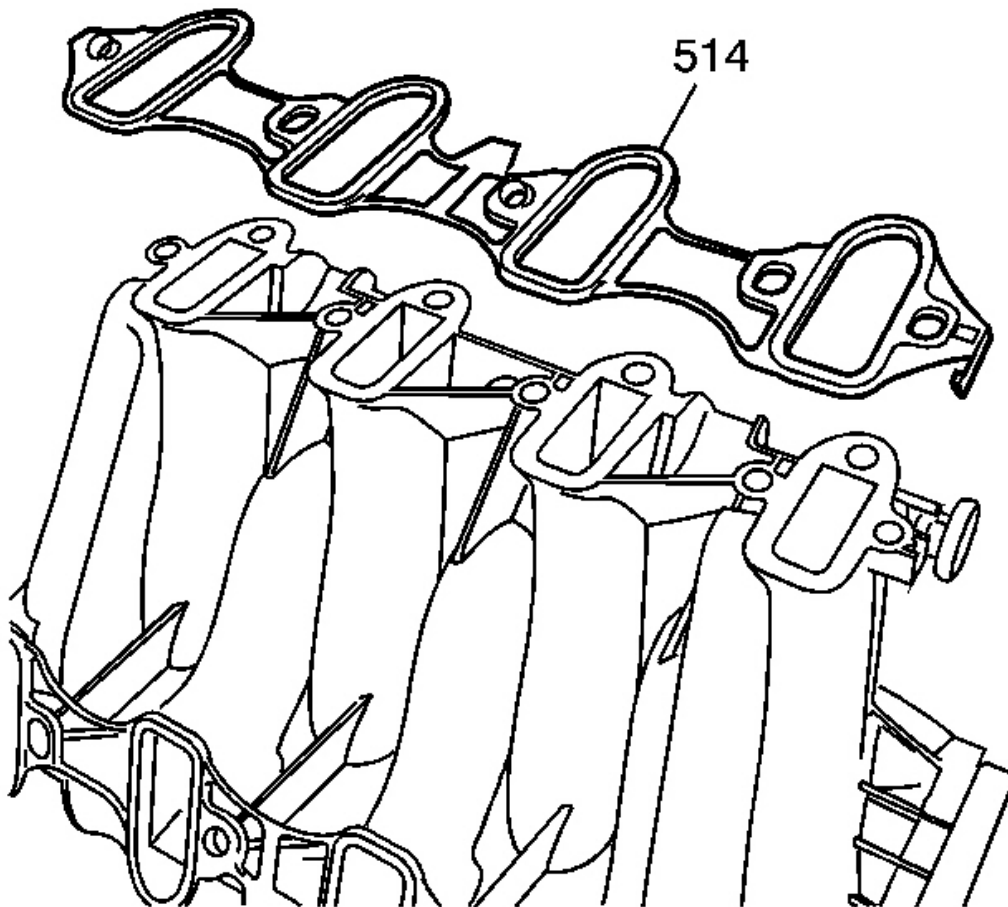


Fig. 486: View Of Intake Manifold-To-Cylinder Head Gasket
Courtesy of GENERAL MOTORS CORP.

1. Remove and discard the intake manifold-to-cylinder head gaskets (514).

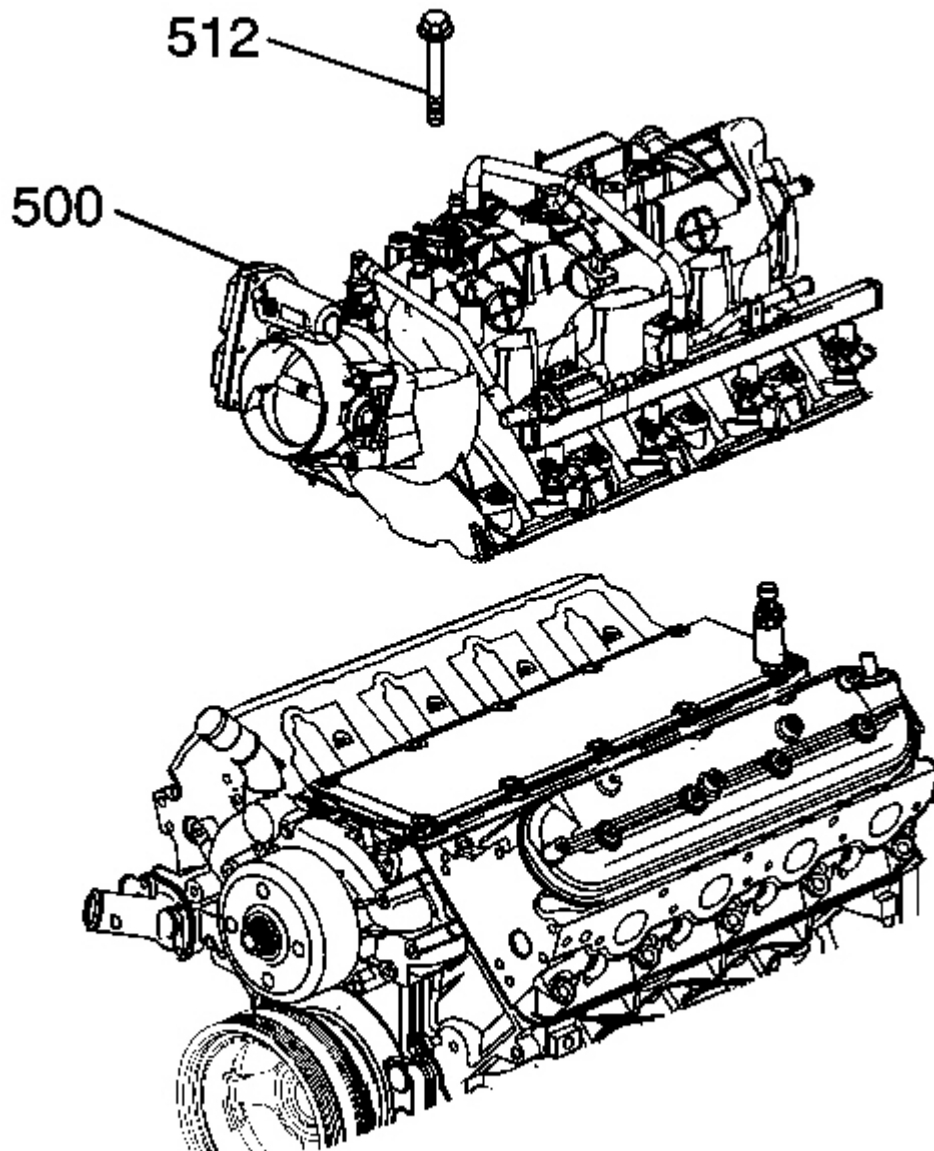


Fig. 487: Identifying Intake Manifold Bolts
Courtesy of GENERAL MOTORS CORP.

2. Remove the manifold absolute pressure (MAP) sensor. Refer to **Intake Manifold Removal**.
3. Remove the evaporative emission (EVAP) canister purge solenoid valve, EVAP tubes and fuel rail with injectors. Refer to **Fuel Rail and Injectors Removal**.

2007 Chevrolet TrailBlazer

2007 ENGINE Engine Mechanical - 6.0L - TrailBlazer

4. Remove the throttle body and gasket. Refer to **Throttle Body Removal** .
5. Clean the intake manifold (500) in solvent.

CAUTION: Refer to **Safety Glasses Caution** in Cautions and Notices.

6. Dry the intake manifold with compressed air.

Inspection Procedure

1. Inspect the manifold for the following conditions:
 - Damaged gasket or sealing surfaces
 - Loose threaded inserts or studs
 - Debris or restrictions within the passages of the manifold
 - Damaged or broken vacuum fittings
 - Inspect the composite intake manifold assembly for cracks or other damage.

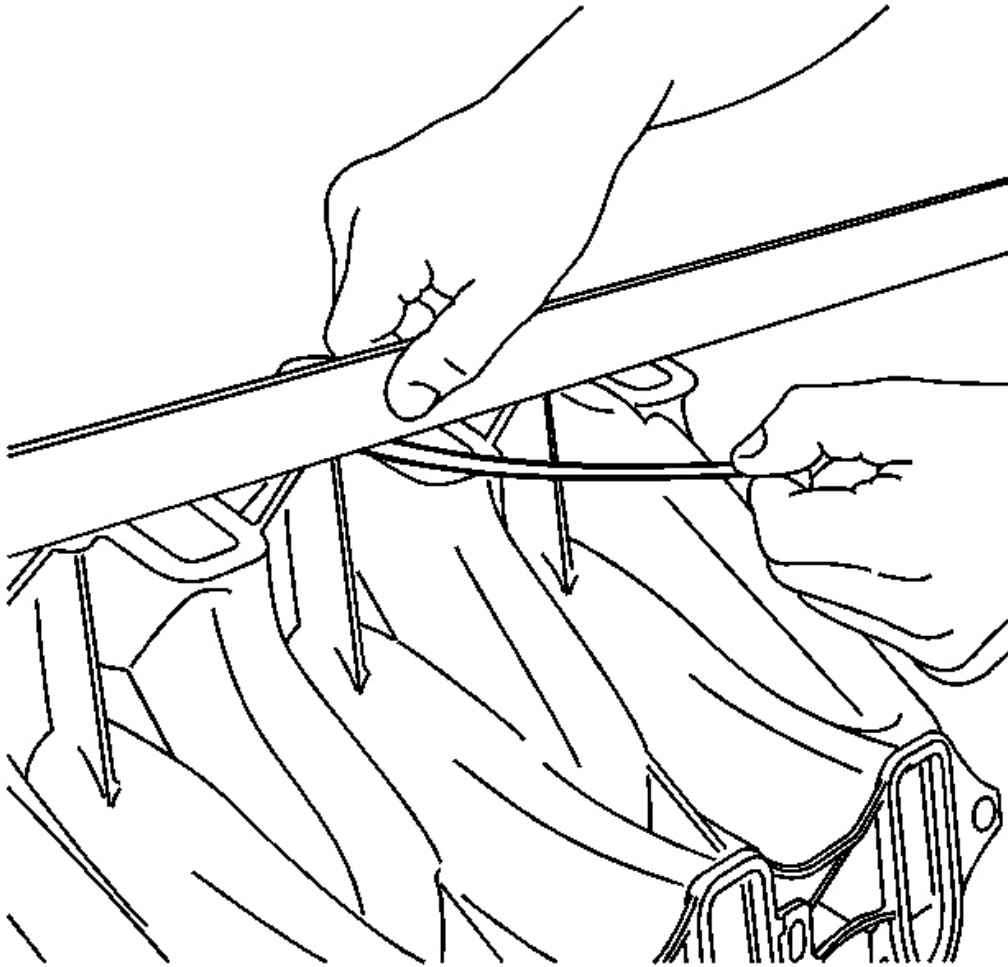


Fig. 488: View of Intake Manifold Cylinder Head Deck
Courtesy of GENERAL MOTORS CORP.

2. Inspect the intake manifold cylinder head deck for warpage.
 1. Locate a straight edge across the intake manifold cylinder head deck surface.

Position the straight edge across a minimum of 2 runner port openings.

2. Insert a feeler gage between the intake manifold and the straight edge.

An intake manifold with warpage in excess of 3 mm (0.118 in) over a 200 mm (7.87 in) area is warped and should be replaced.

EXHAUST MANIFOLD CLEANING AND INSPECTION

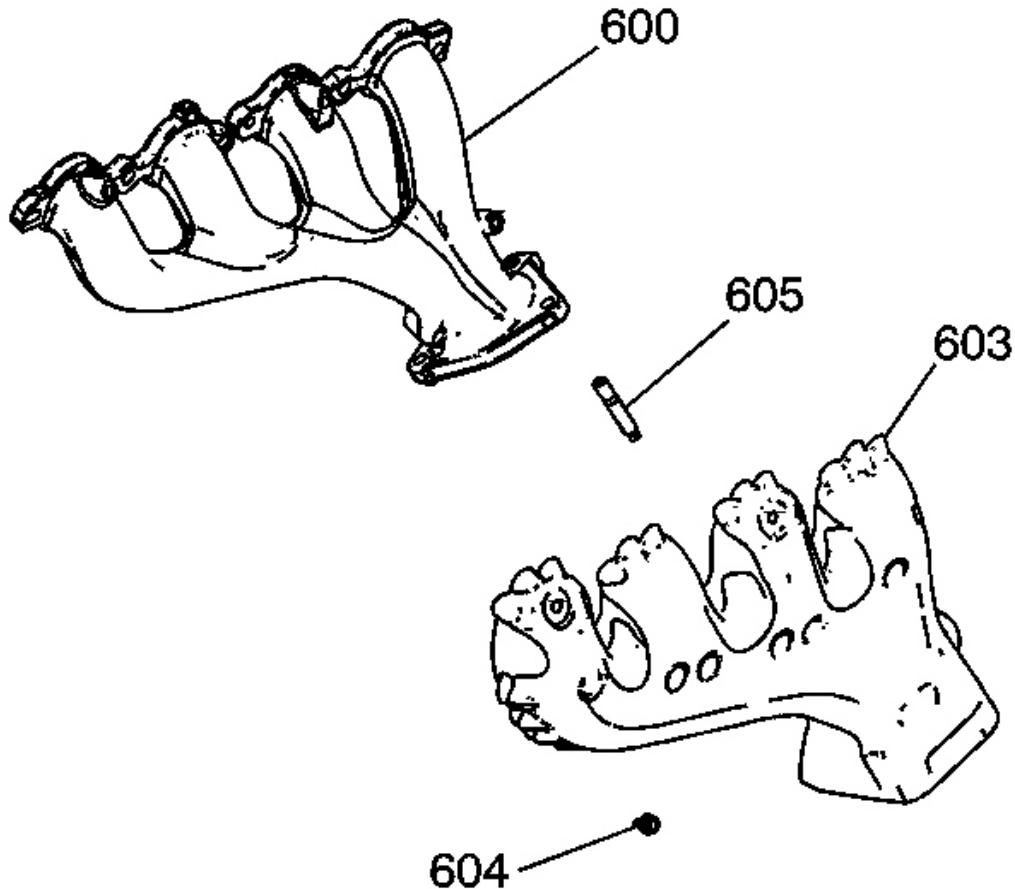


Fig. 489: View Of Exhaust Manifold
Courtesy of GENERAL MOTORS CORP.

IMPORTANT: Do not use the exhaust manifold-to-cylinder head gaskets again. Upon installation of the exhaust manifold, install a **NEW** gasket. An improperly installed gasket or leaking exhaust system may effect on-board diagnostics (OBD) II system performance.

1. Clean the exhaust manifold (600) and heat shield (603) in solvent.

CAUTION: Refer to Safety Glasses Caution in Cautions and Notices.

2. Dry the exhaust manifold with compressed air.
3. Inspect the exhaust manifold-to-cylinder head gasket surface for excessive scratches or gouging.
4. Inspect for a loose, damaged or cracked heat shield (603).
5. Inspect the studs (605) for damaged threads.

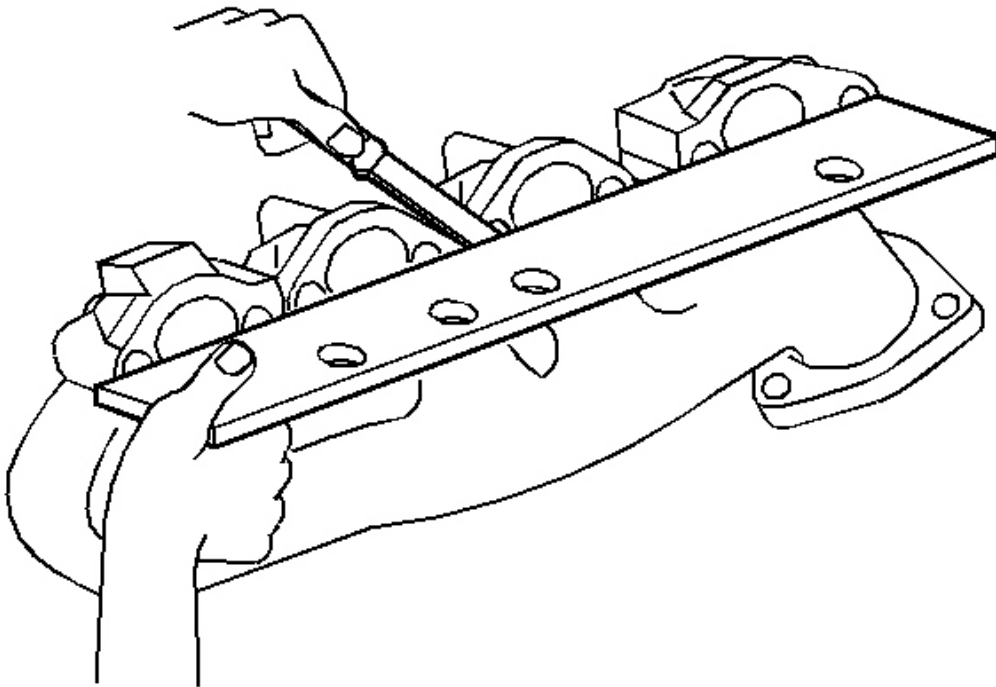


Fig. 490: Measuring Exhaust Manifold To Cylinder Head Surface For Warpage
Courtesy of GENERAL MOTORS CORP.

6. Use a straight edge and a feeler gage and measure the exhaust manifold cylinder head deck for warpage.

An exhaust manifold deck with warpage in excess of 0.25 mm (0.01 in) within the 2 front or 2 rear runners or 0.5 mm (0.02 in) overall, may cause an exhaust leak and may affect OBD II system performance. Exhaust manifolds not within specifications must be replaced.

COOLANT AIR BLEED PIPE CLEANING AND INSPECTION

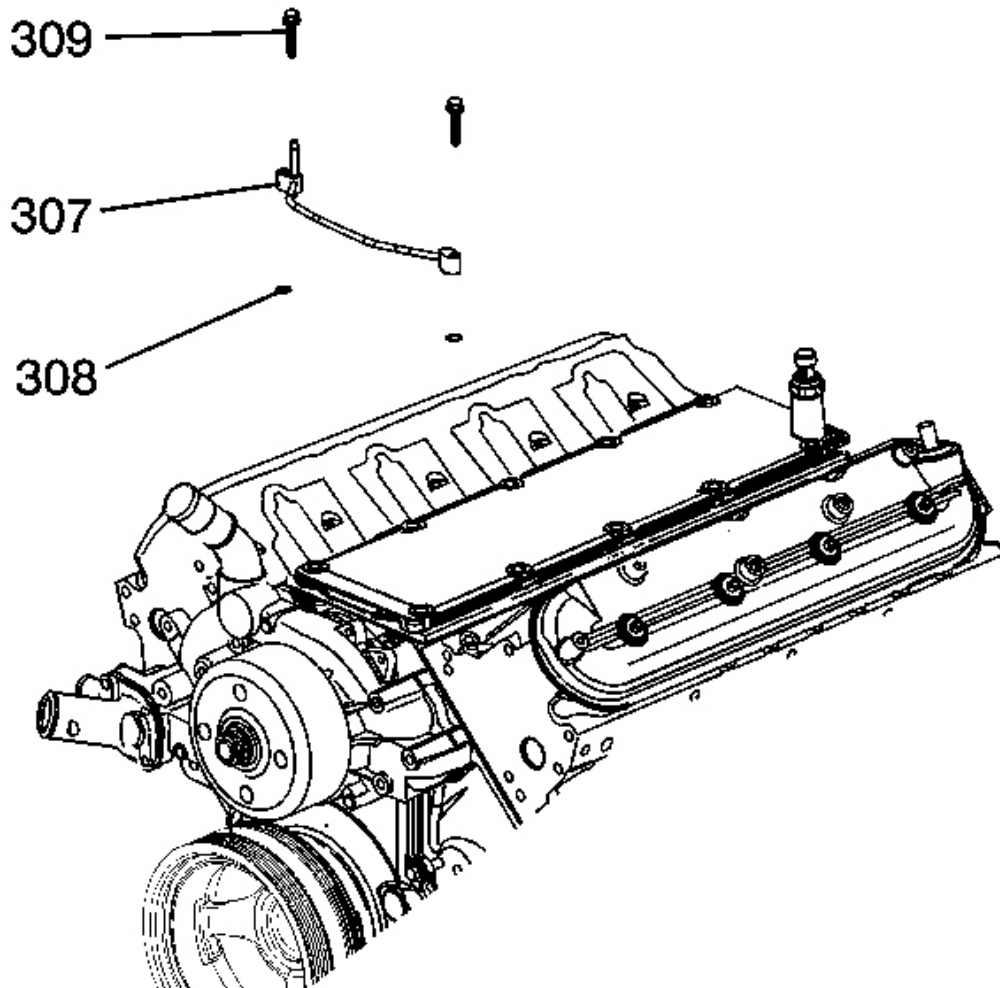


Fig. 491: Identifying Engine Coolant Air Bleed Pipe
Courtesy of GENERAL MOTORS CORP.

IMPORTANT: Do not use the engine coolant air bleed pipe and cover gaskets again.
Upon installation of the pipe and covers, install NEW gaskets.

1. Remove the seals (308) from the pipe (307) and covers.
2. Clean the pipe and covers in solvent.

CAUTION: Refer to Safety Glasses Caution in Cautions and Notices.

3. Dry the pipe and covers with compressed air.
4. Inspect the pipe and covers for damaged sealing surfaces or restrictions within the pipe.

WATER PUMP CLEANING AND INSPECTION

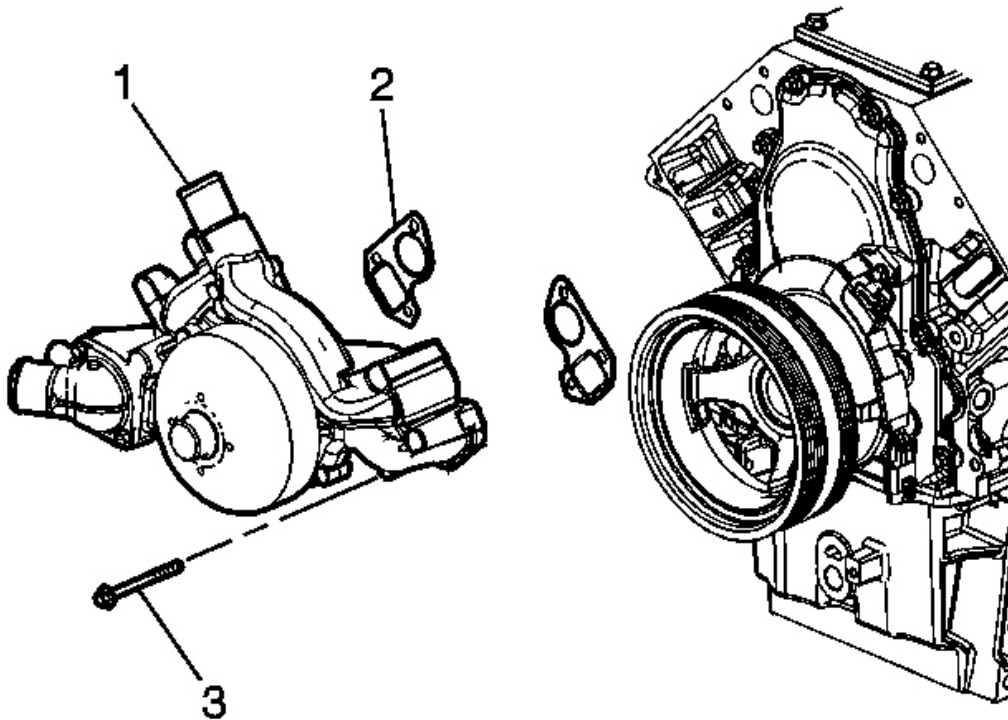


Fig. 492: View Of Water Pump

Courtesy of GENERAL MOTORS CORP.

1. Remove the old gasket from the water pump sealing surfaces. Refer to **Replacing Engine Gaskets**.
2. Clean all excess dirt and debris from the water pump housing.
3. Inspect the water pump (1) for the following conditions:
 - Gasket and hose sealing surfaces for excessive scratches or gouging
 - Restrictions within the internal coolant passages
 - Excessive side-to-side play in the pulley shaft
 - Leakage at the water outlet housing or rear cover gasket
 - Leakage at the water pump vent hole

A stain around the vent hole is acceptable. If leakage, such as dripping, occurs with the engine

running and the cooling system pressurized, replace the water pump.

- Wear or damage in the belt tracking area of the pulley

THREAD REPAIR

Tools Required

- **J 42385-100** Head/Main Bolt Thread Repair Kit
- **J 42385-200** Common Thread Repair Kit
- **J 42385-300** Fixtures and Hardware Kit

General Thread Repair

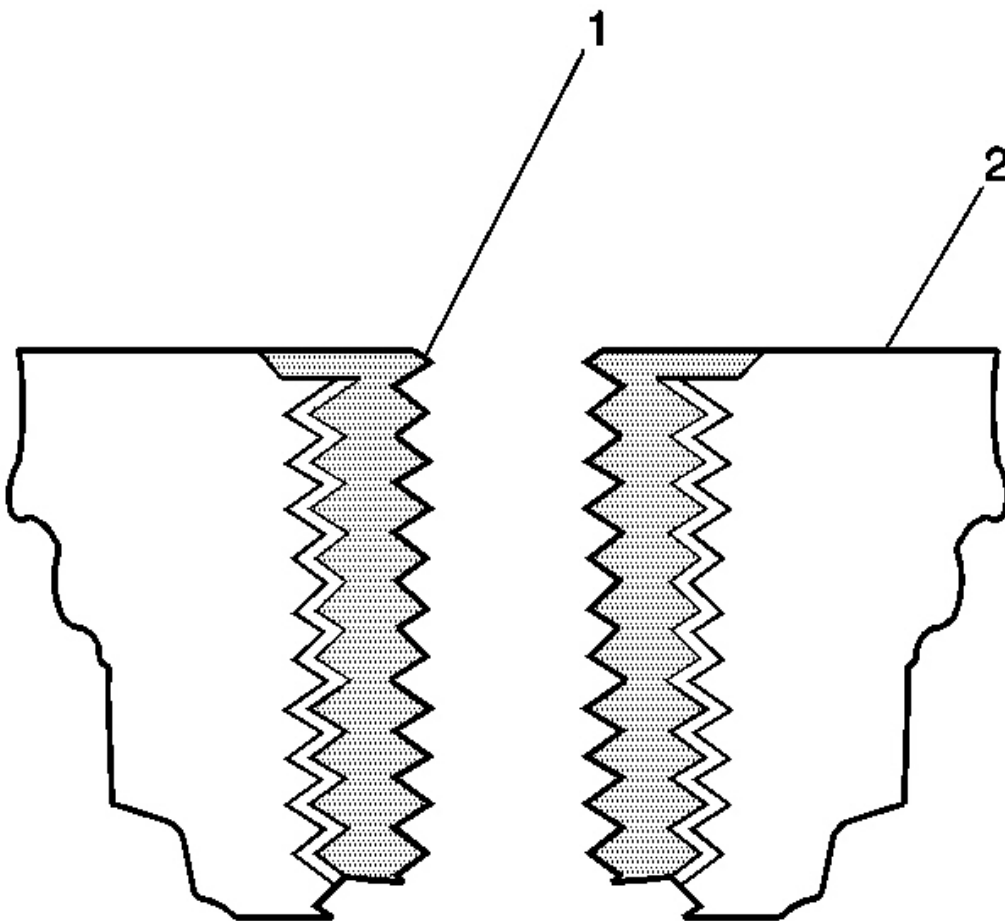


Fig. 493: View Of Bushing Type Insert & Base Material
Courtesy of GENERAL MOTORS CORP.

The thread repair process involves a solid, thin walled, self-locking, carbon steel, bushing type insert (1). During the bushing installation process, the driver tool expands the bottom external threads of the insert into the base material (2). This action mechanically locks the insert in place. Also, when installed to the proper depth, the flange of the insert will be seated against the counterbore of the repaired hole.

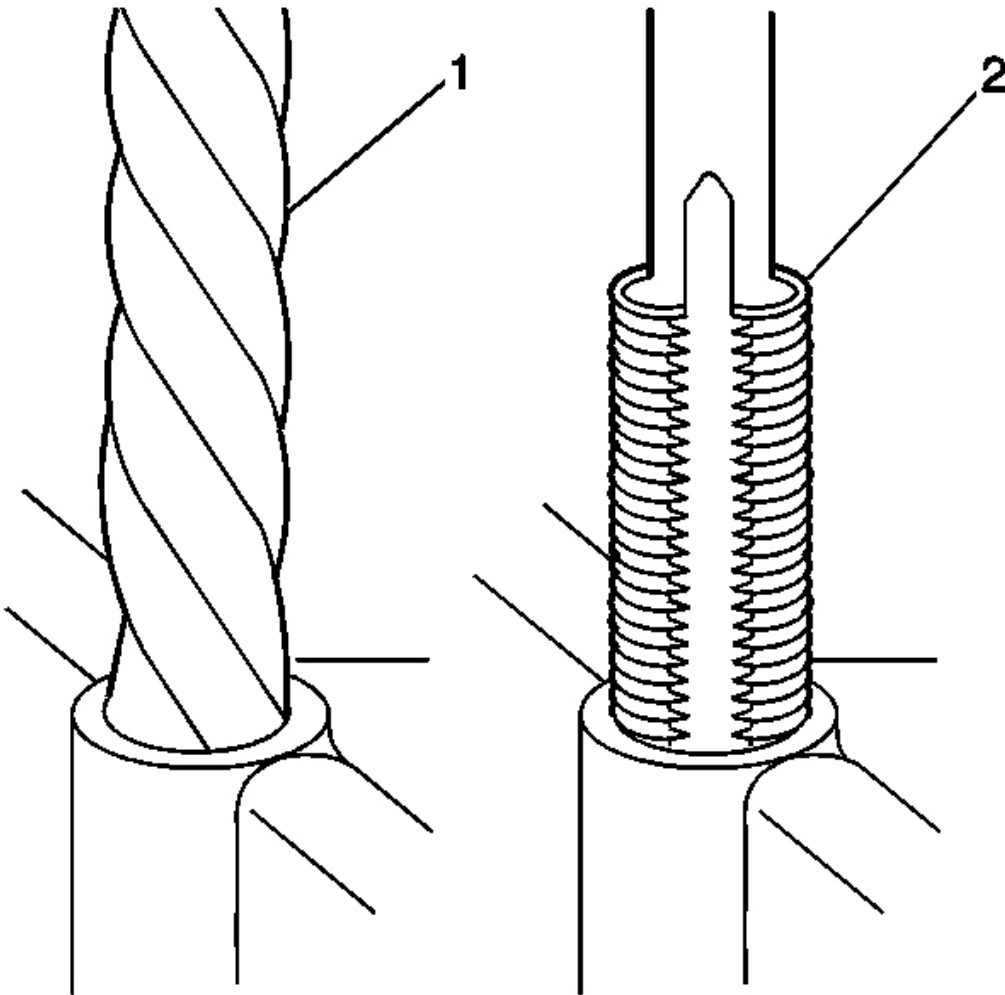


Fig. 494: View Of Drilling & Tapping Threads
Courtesy of GENERAL MOTORS CORP.

CAUTION: Refer to SAFETY GLASSES CAUTION in Cautions and Notices.

2007 Chevrolet TrailBlazer

2007 ENGINE Engine Mechanical - 6.0L - TrailBlazer

IMPORTANT:

- The use of a cutting type fluid GM P/N 1052864 (Canadian P/N 992881), WD 40® or equivalent, is recommended when performing the drilling, counterboring and tapping procedures.
- Driver oil **MUST** be used on the installer driver tool.
- The tool kits are designed for use with either a suitable tap wrench or drill motor.

1. Drill out the threads of the damaged hole (1).
 - M6 inserts require a minimum drill depth of 15 mm (0.59 in).
 - M8 inserts require a minimum drill depth of 20 mm (0.79 in).
 - M10 inserts require a minimum drill depth of 23.5 mm (0.93 in).
2. Using compressed air, clean out any chips.

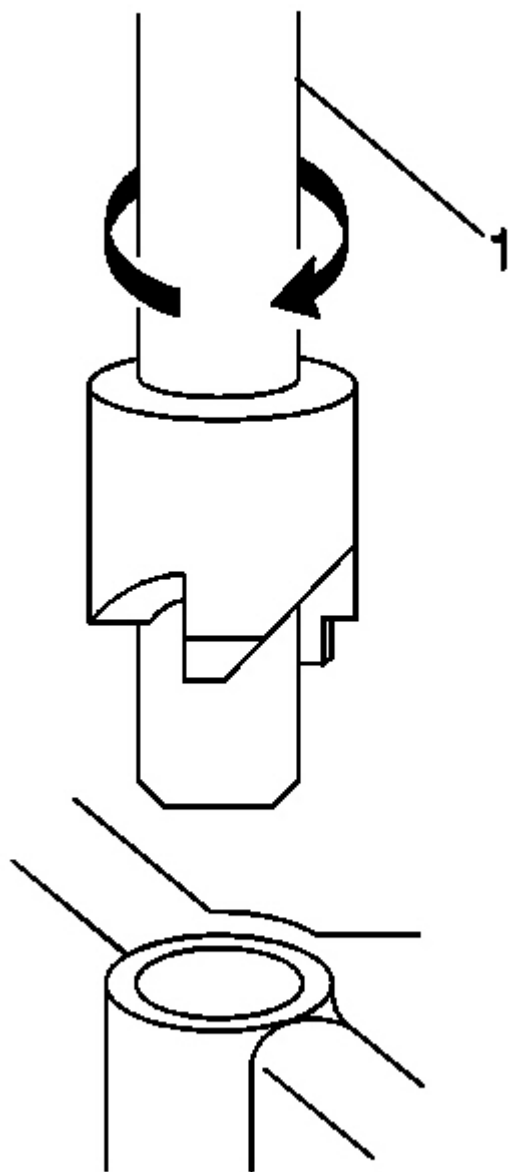


Fig. 495: View Of Counterbore Drill
Courtesy of GENERAL MOTORS CORP.

3. Counterbore the hole to the full depth permitted by the tool (1).
4. Using compressed air, clean out any chips.

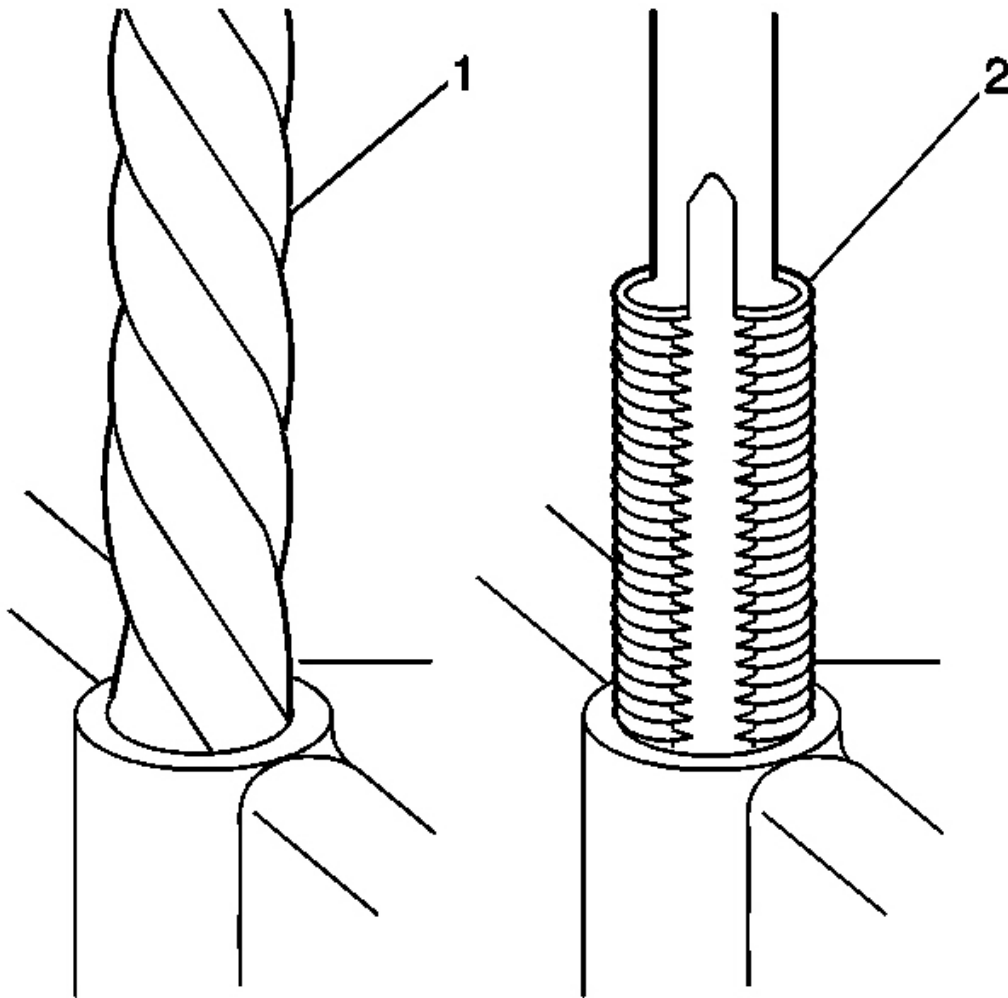


Fig. 496: View Of Drilling And Tapping Threads
Courtesy of GENERAL MOTORS CORP.

5. Using a tap wrench (2), tap the threads of the drilled hole.
 - M6 inserts require a minimum tap depth of 15 mm (0.59 in).
 - M8 inserts require a minimum tap depth of 20 mm (0.79 in).
 - M10 inserts require a minimum tap depth of 23.5 mm (0.93 in).
6. Using compressed air, clean out any chips.
7. Spray cleaner GM P/N 12346139, GM P/N 12377981 (Canadian P/N 10953463) or equivalent, into the hole.
8. Using compressed air, clean any cutting oil and chips out of the hole.

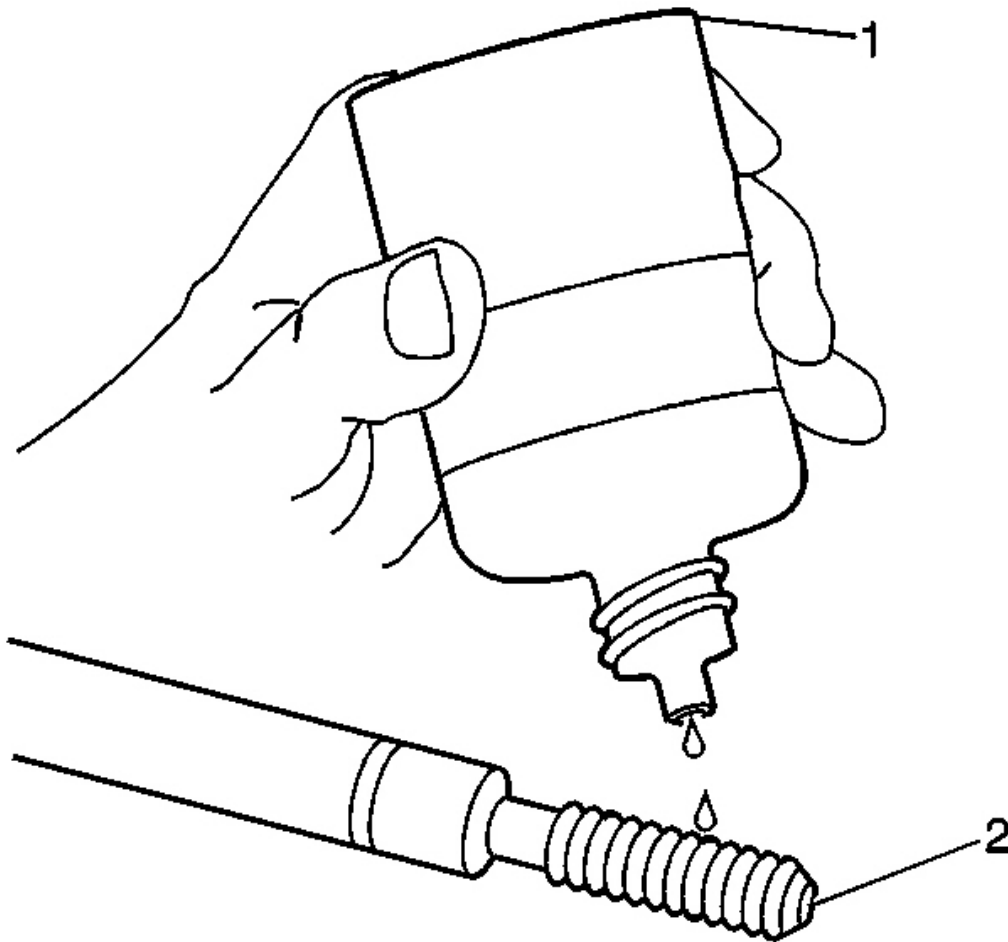


Fig. 497: Lubricating Installer Tool Using Driver Oil
Courtesy of GENERAL MOTORS CORP.

IMPORTANT: Do not allow oil or other foreign material to contact the outside diameter (OD) of the insert.

9. Lubricate the threads of the installer tool (2) with the driver oil (1).

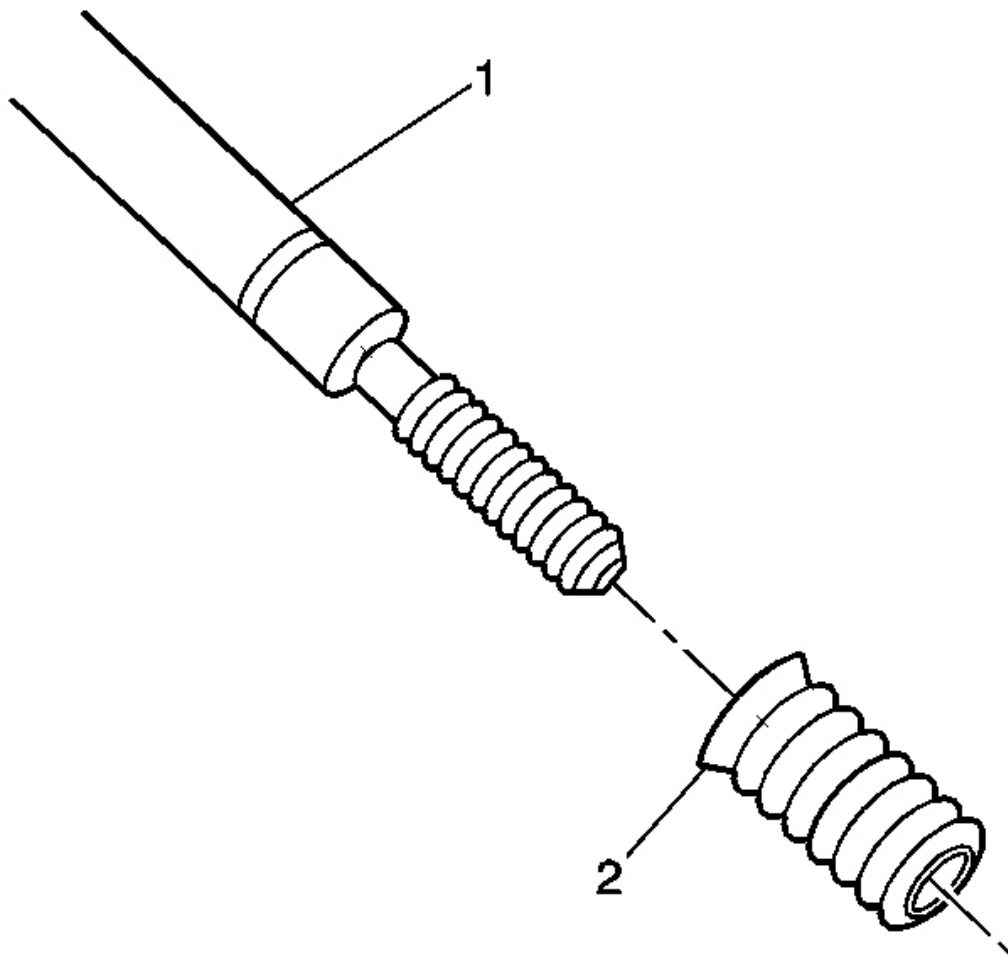


Fig. 498: View of Bushing Type Insert
Courtesy of GENERAL MOTORS CORP.

10. Install the insert (2) onto the driver tool (1).

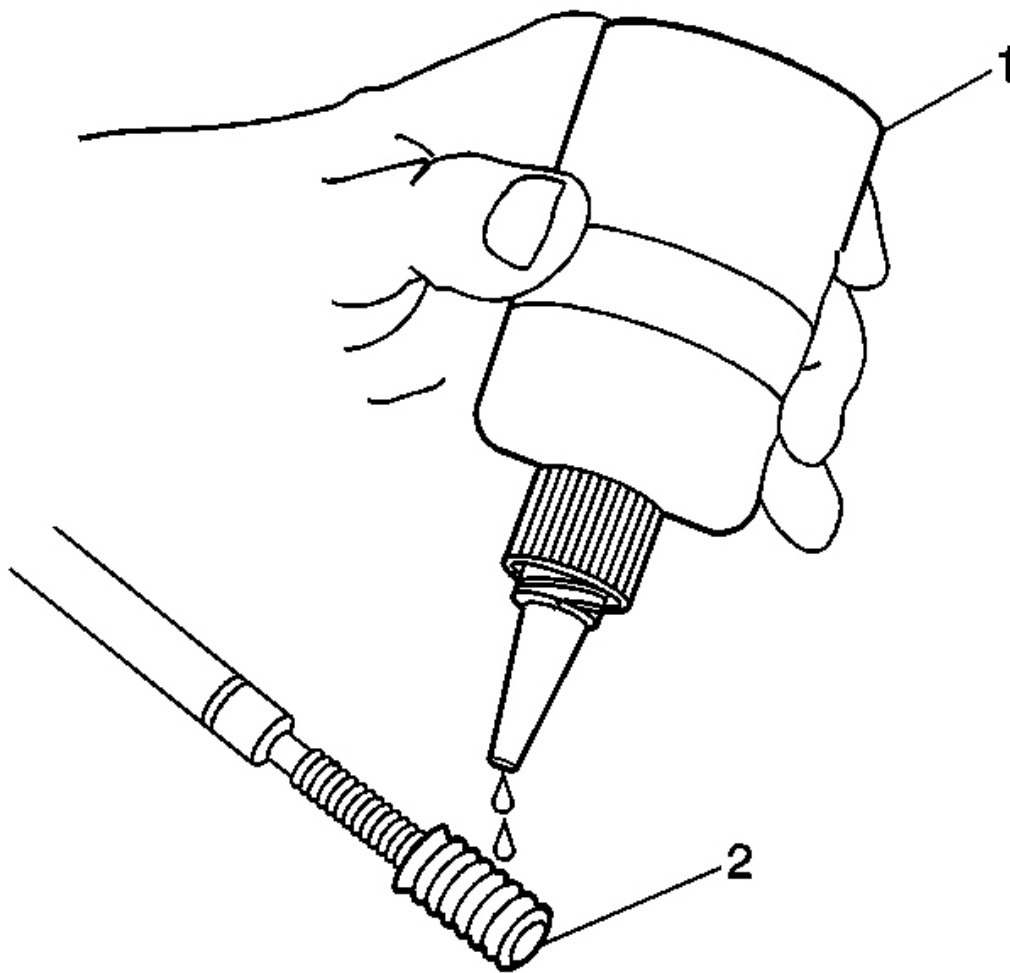


Fig. 499: Applying Threadlock To Insert
Courtesy of GENERAL MOTORS CORP.

11. Apply threadlock LOCTITE™ 277, J 42385-109 (1) or equivalent, to the insert OD threads (2).

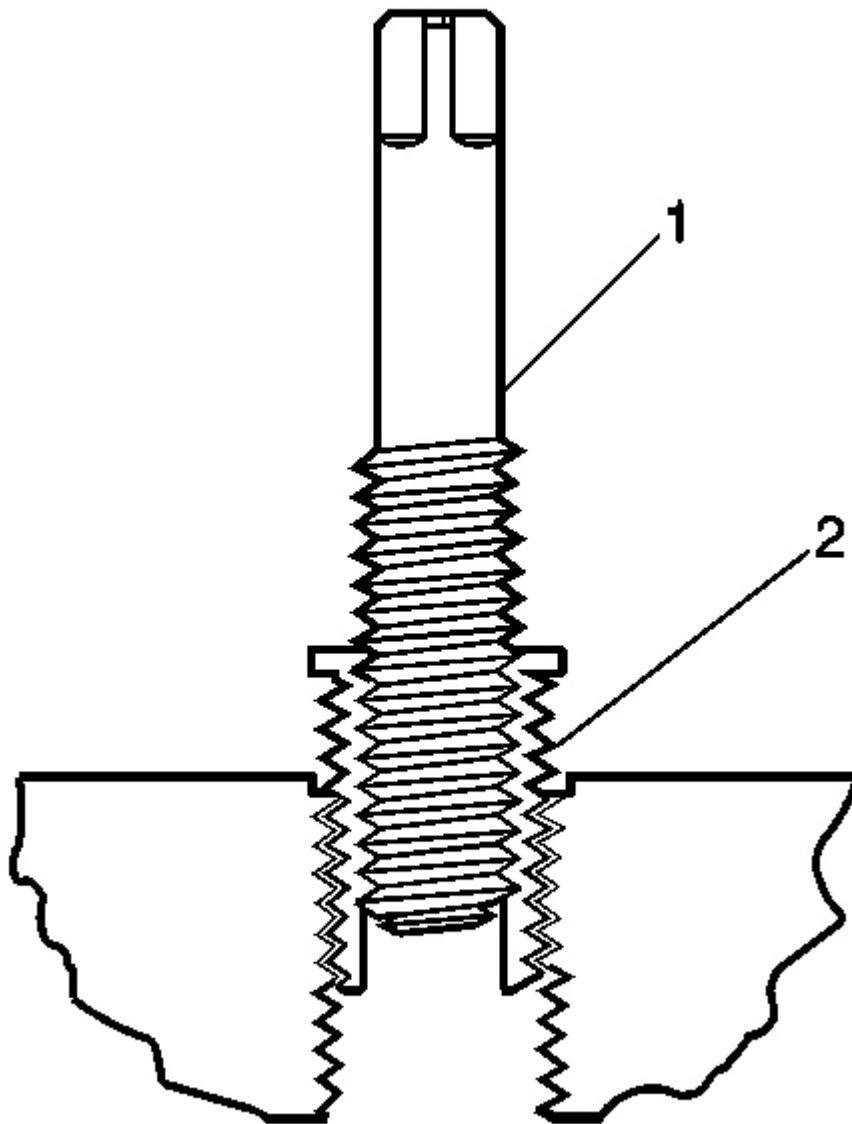


Fig. 500: View Of Insert In Tapped Bolt Hole
Courtesy of GENERAL MOTORS CORP.

12. Install the insert (2) into the hole.

Install the insert until the flange of the insert contacts the counterbored surface. Continue to rotate the installer tool (1) through the insert.

The installer tool will tighten up before screwing completely through the insert. This is acceptable. You are forming the bottom threads of the insert and mechanically locking the insert to the base material threads.

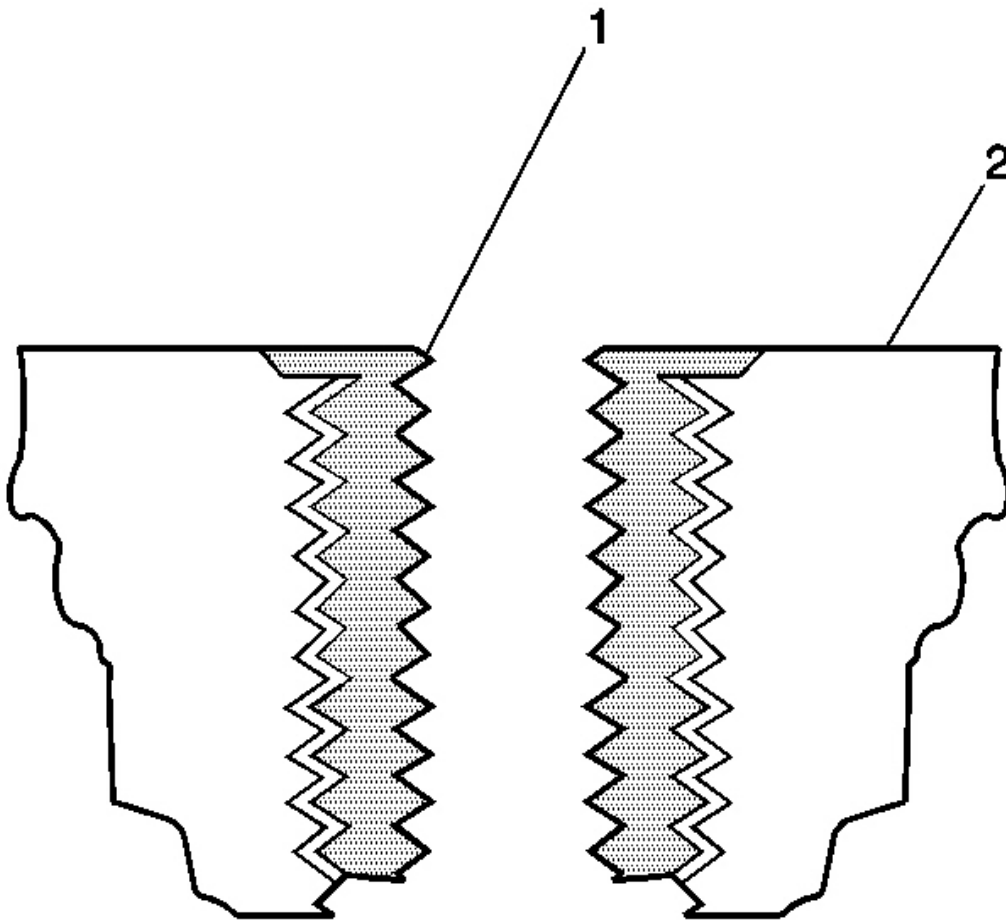


Fig. 501: View Of Bushing Type Insert & Base Material
Courtesy of GENERAL MOTORS CORP.

13. Inspect the insert for proper installation into the hole.

A properly installed insert (1) will be either flush or slightly below flush with the surface of the base material (2).

2007 Chevrolet TrailBlazer

2007 ENGINE Engine Mechanical - 6.0L - TrailBlazer

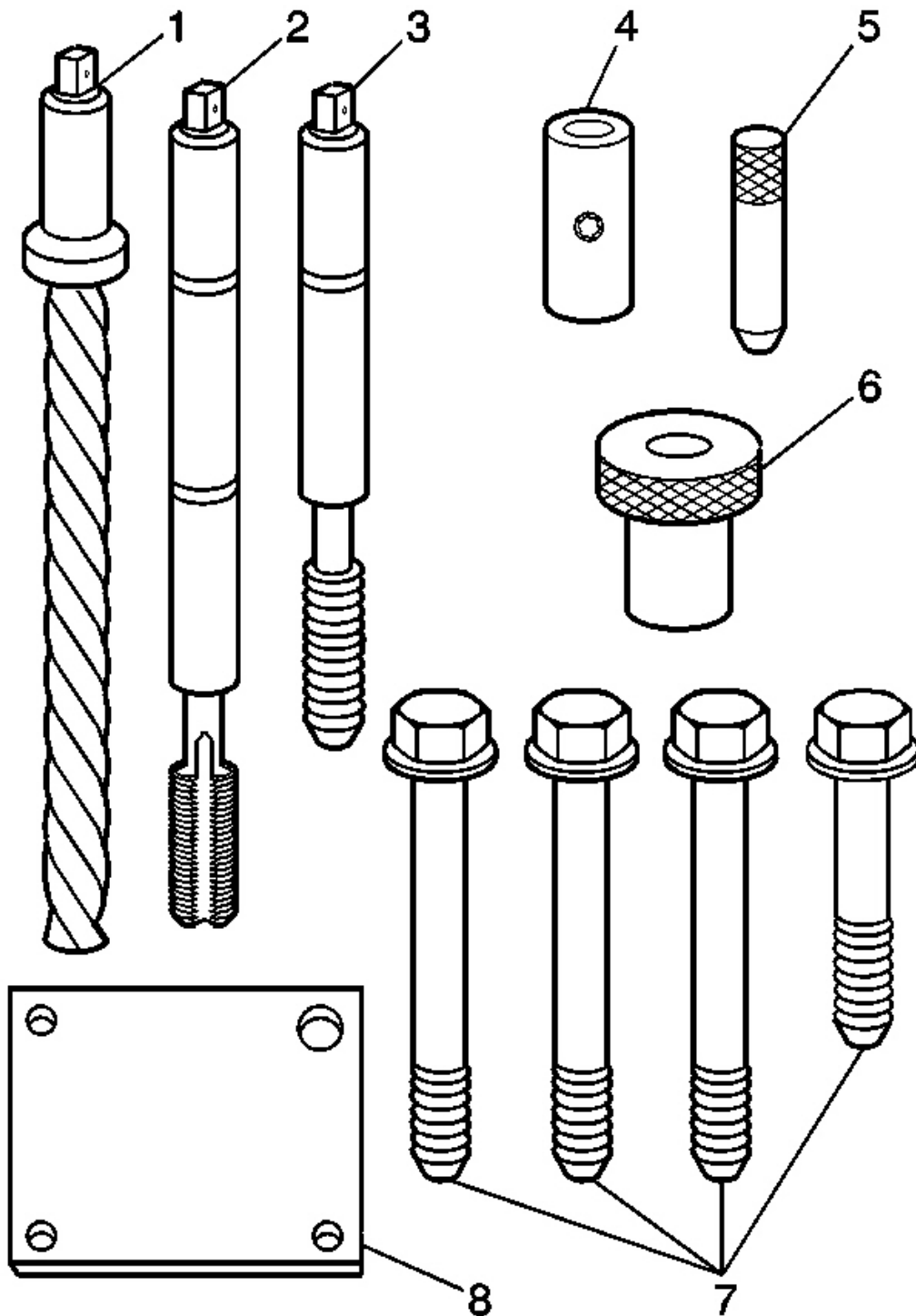


Fig. 502: Identifying Thread Repair Kit Components
Courtesy of GENERAL MOTORS CORP.

1. The cylinder head bolt hole thread repair kit consists of the following items:
 - The drill (1)
 - The tap (2)
 - The installer (3)
 - The sleeve (4)
 - The alignment pin (5)
 - The bushing (6)
 - The bolts (7)
 - The fixture plate (8)

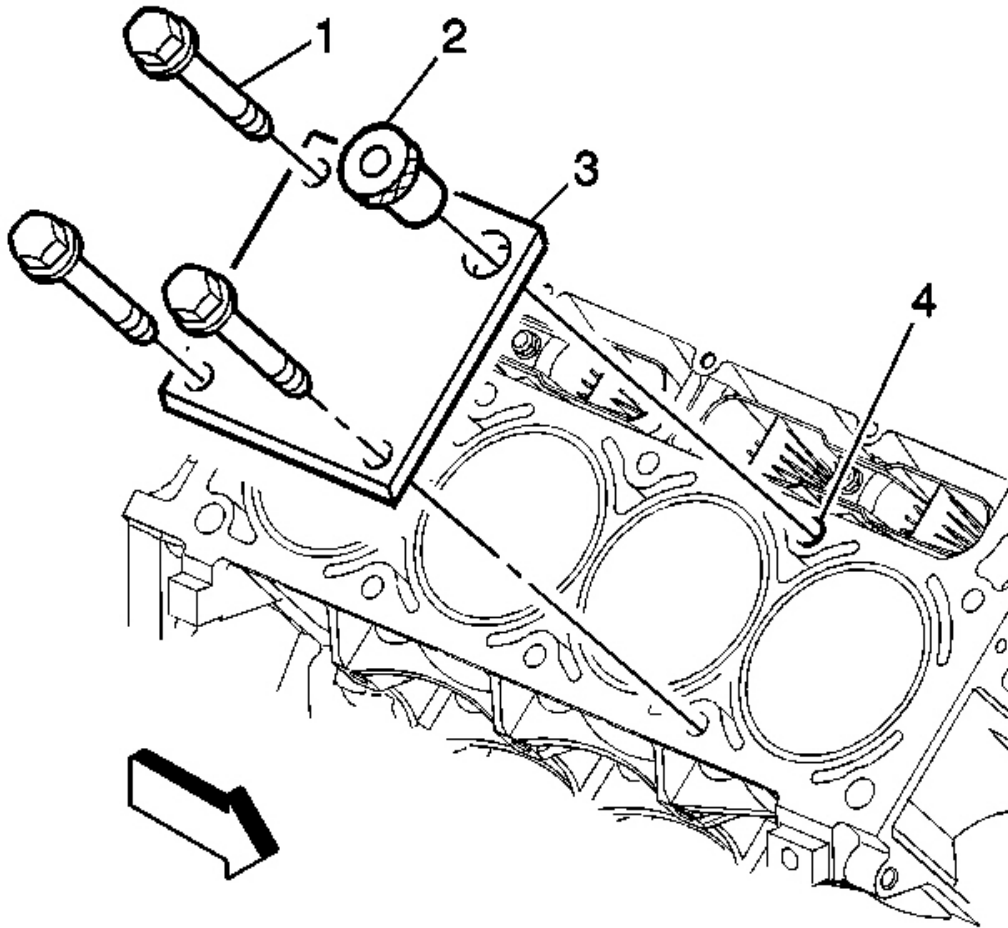


Fig. 503: View Of Fixture Plate, Bolts, Bushing & Cylinder Hole
Courtesy of GENERAL MOTORS CORP.

CAUTION: Refer to SAFETY GLASSES CAUTION in Cautions and Notices.

IMPORTANT:

- The use of a cutting type fluid GM P/N 1052864 (Canadian P/N 992881), WD 40® or equivalent, is recommended when performing the drilling and tapping procedures.
- Driver oil **MUST** be used on the installer driver tool.
- The tool kits are designed for use with either a suitable tap wrench or drill motor.

2. Install the fixture plate (3), bolts (1) and bushing (2) onto the engine block deck.

Position the fixture plate and bushing over the hole that is to be repaired (4).

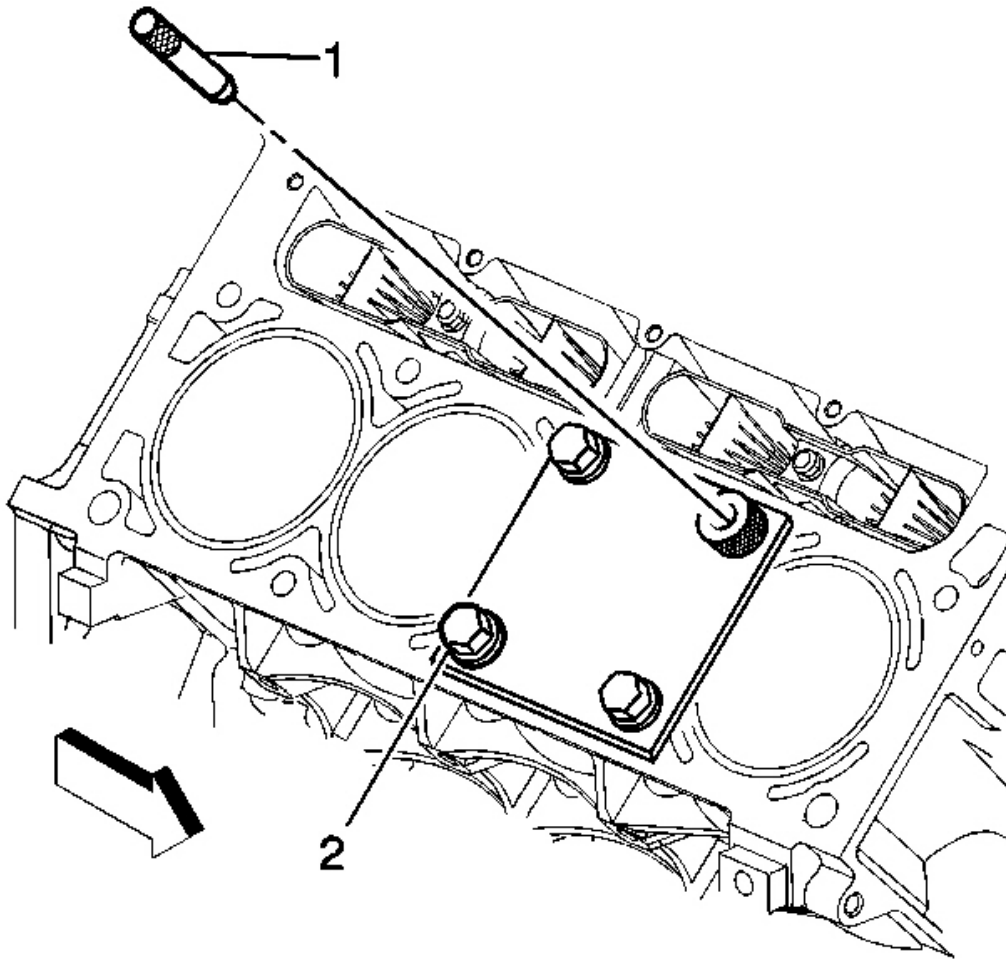


Fig. 504: View Of Alignment Pin & Fixture Retaining Bolts
Courtesy of GENERAL MOTORS CORP.

3. Position the alignment pin (1) through the bushing and into the hole.
4. With the alignment pin in the desired hole, tighten the fixture retaining bolts (2).
5. Remove the alignment pin from the hole.

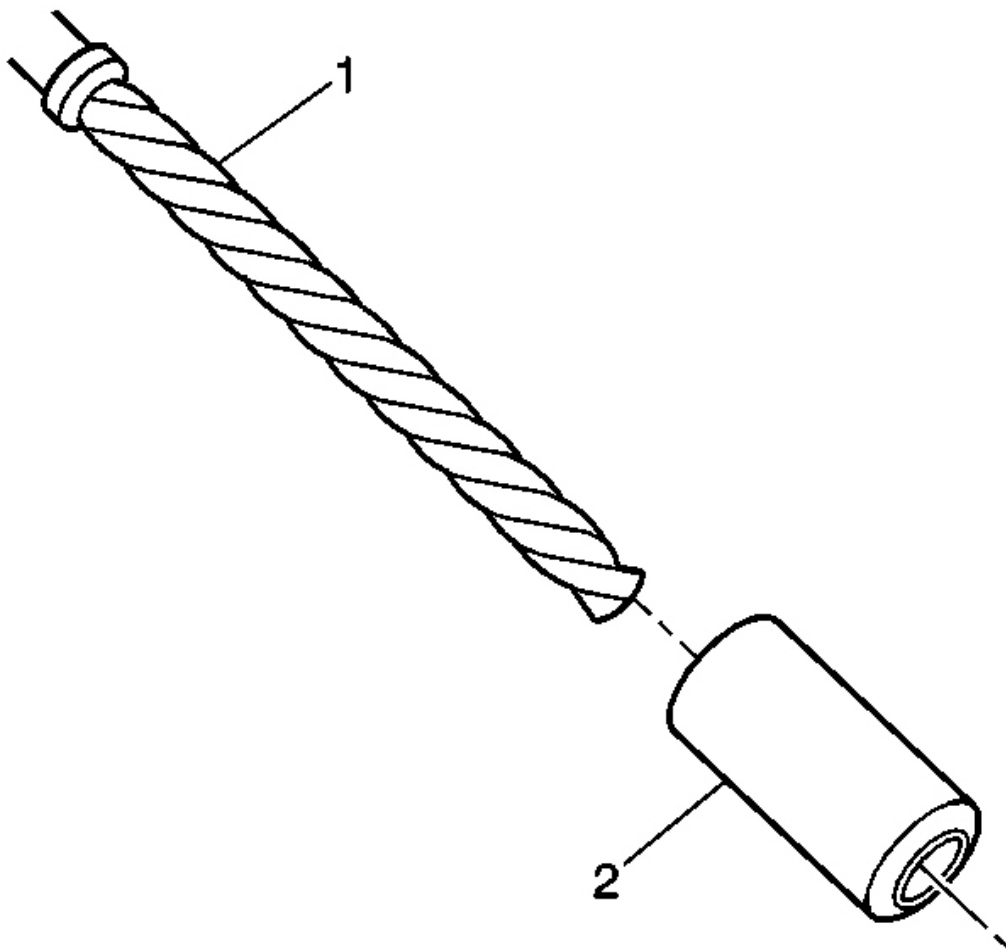


Fig. 505: View Of Stop Collar & Counterbore Drill
Courtesy of GENERAL MOTORS CORP.

6. Install the sleeve (2) onto the drill (1).

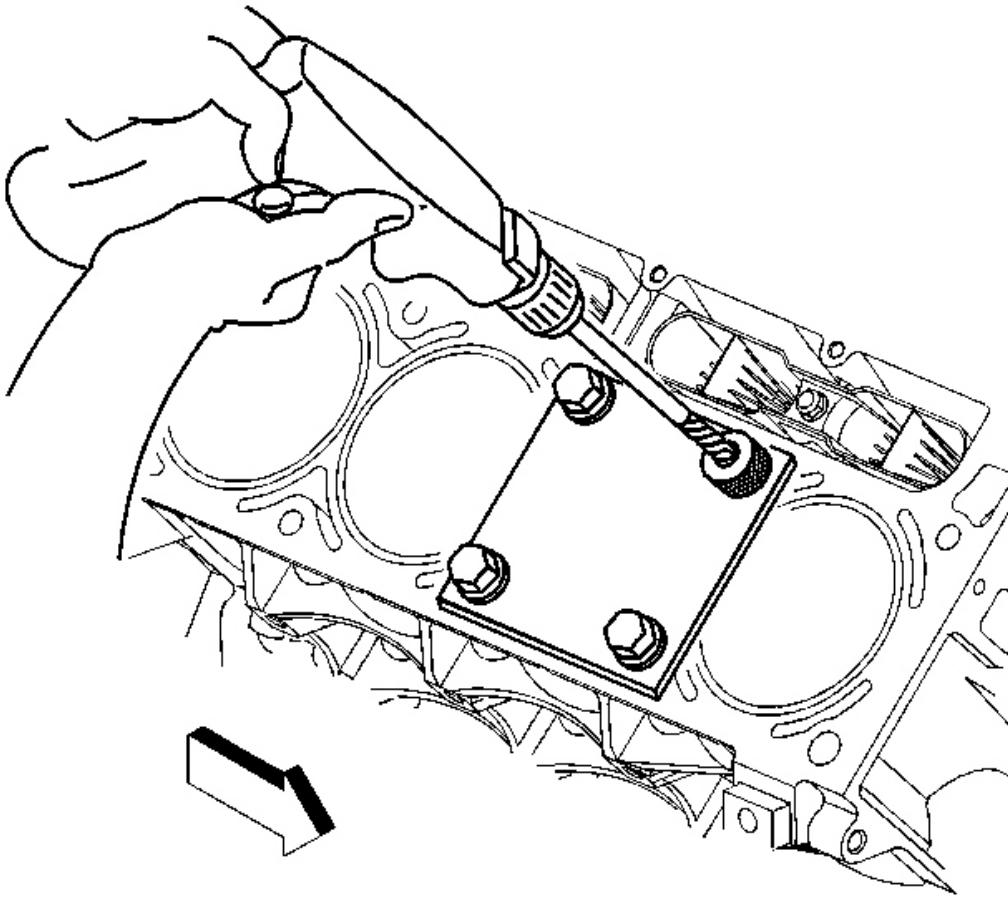


Fig. 506: Drilling Cylinder Head Bolt Hole
Courtesy of GENERAL MOTORS CORP.

IMPORTANT: During the reaming process, it is necessary to repeatedly remove the drill and clean the chips from the hole.

7. Drill out the threads of the damaged hole.

Drill the hole until the stop collar of the drill bit or the sleeve contacts the bushing.

8. Using compressed air, clean out any chips.

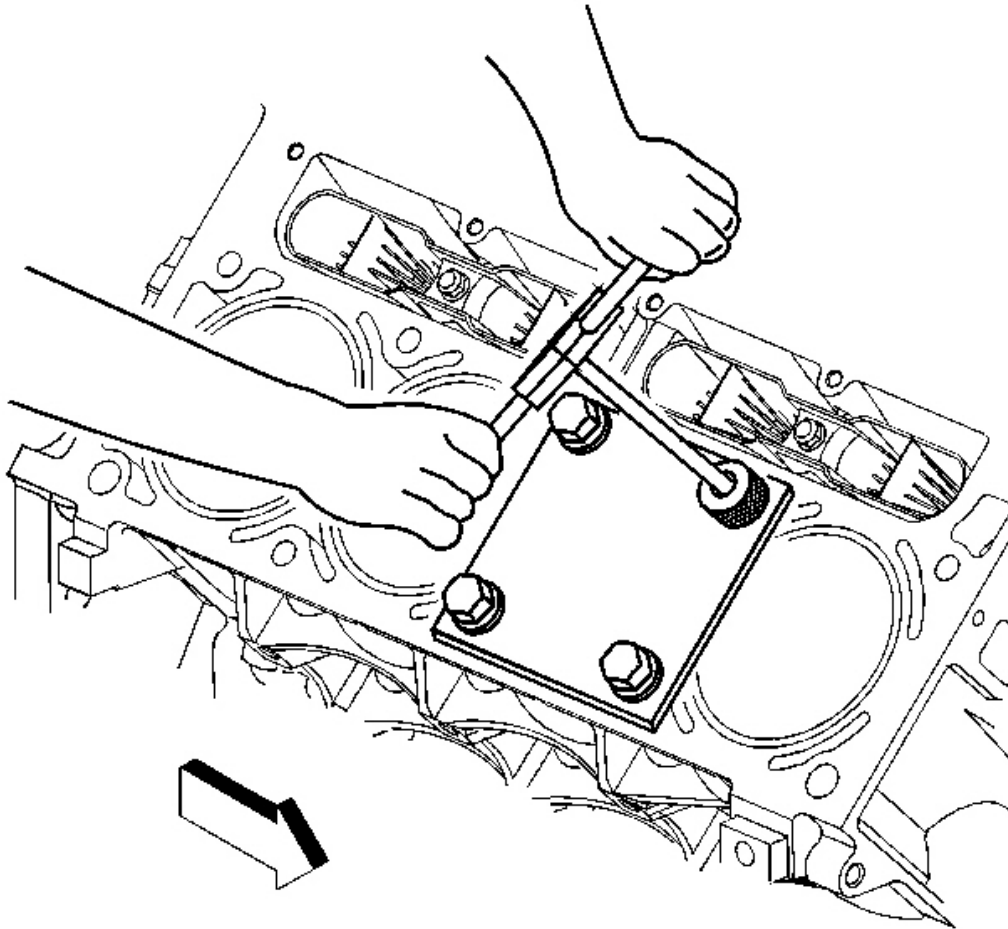


Fig. 507: Tapping Threads Of Drilled Hole Using Tapping Wrench
Courtesy of GENERAL MOTORS CORP.

9. Using a tap wrench, tap the threads of the drilled hole.

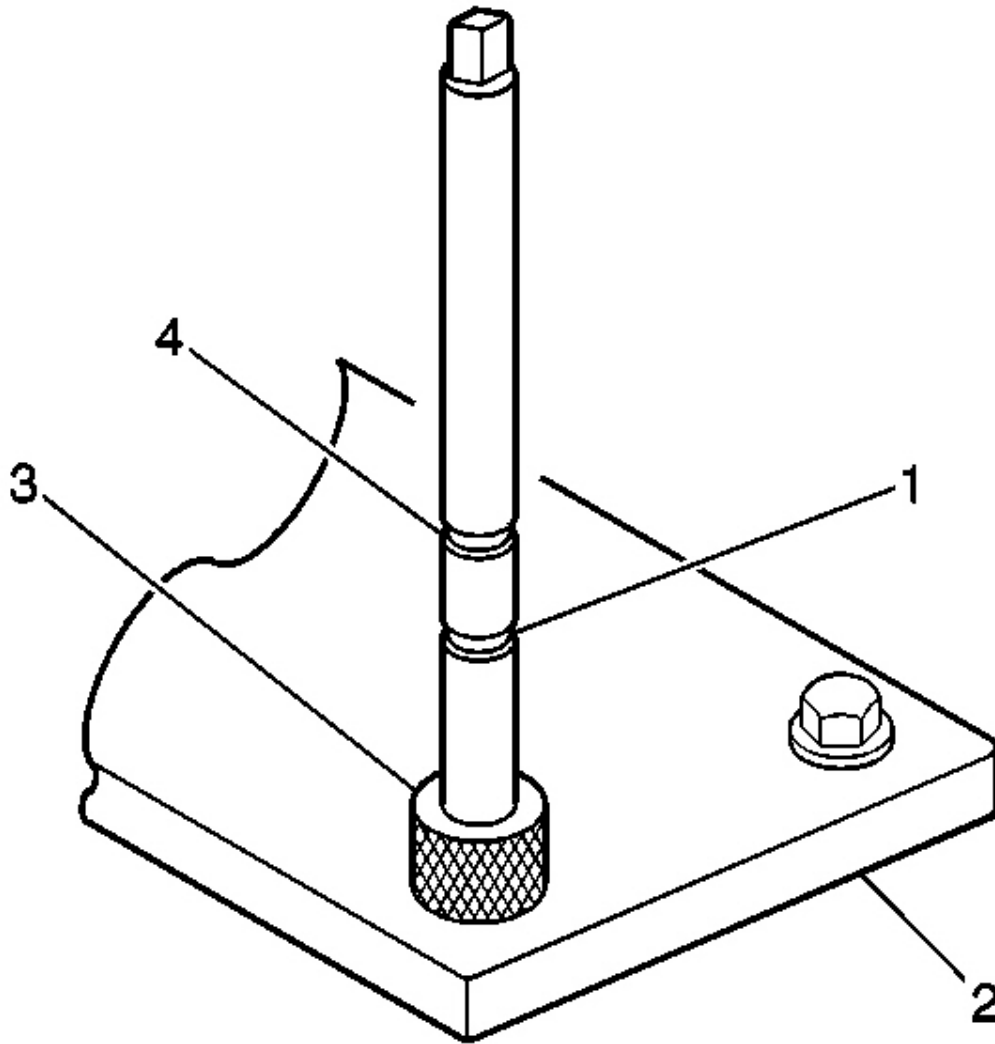


Fig. 508: View Of Tap Upper & Lower Marks, Fixture Plate & Bushing
Courtesy of GENERAL MOTORS CORP.

10. In order to tap the new threads to the proper depth, rotate the tap into the hole until the mark (1) on the tap aligns with the top of the drill bushing (3).
11. Remove the fixture plate (2), bushing (3) and bolts.
12. Using compressed air, clean out any chips.
13. Spray cleaner GM P/N 12346139, GM P/N 12377981 (Canadian P/N 10953463) or equivalent, into the hole.

14. Using compressed air, clean any cutting oil and chips out of the hole.

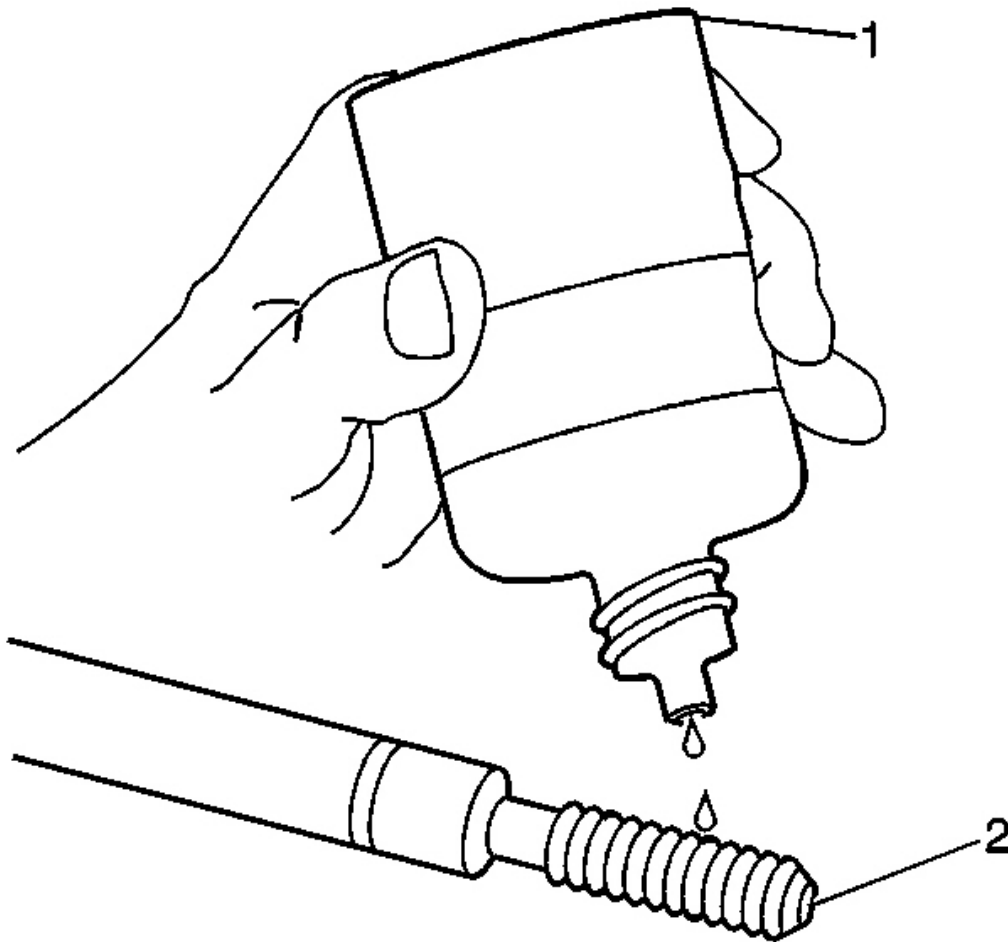


Fig. 509: Lubricating Installer Tool Using Driver Oil
Courtesy of GENERAL MOTORS CORP.

IMPORTANT: Do not allow oil or foreign material to contact the OD of the insert.

15. Lubricate the threads of the installer tool (2) with the driver oil (1).

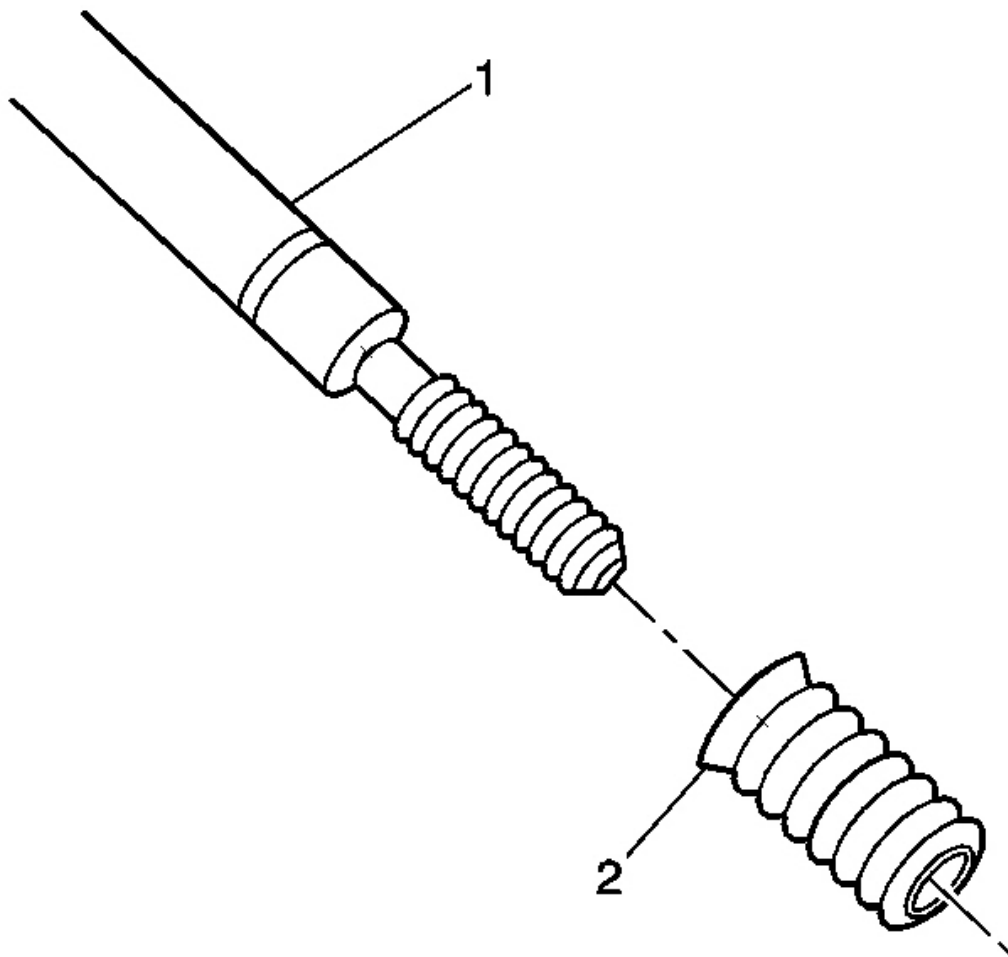


Fig. 510: View of Bushing Type Insert
Courtesy of GENERAL MOTORS CORP.

16. Install the insert (2) onto the driver tool (1).

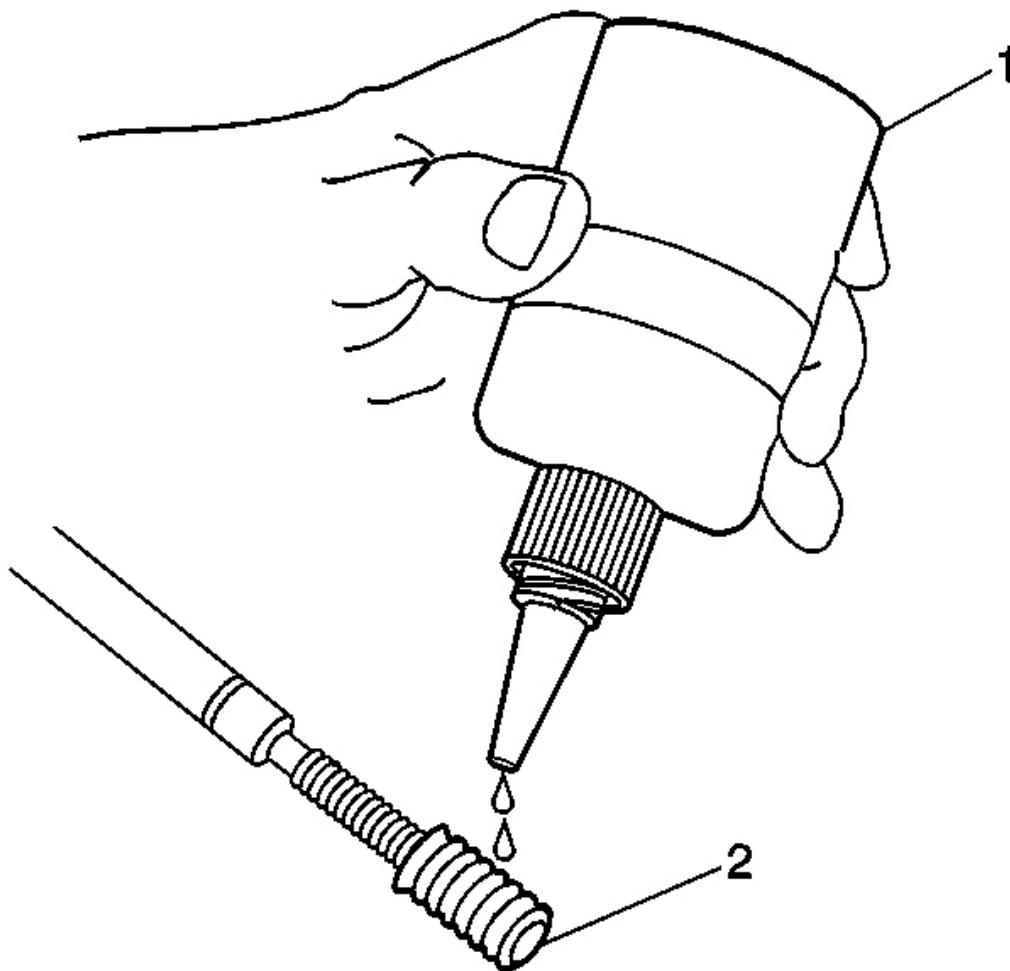


Fig. 511: Applying Threadlock To Insert
Courtesy of GENERAL MOTORS CORP.

17. Apply threadlock LOCTITE™ 277, J 42385-109 (1) or equivalent, to the insert OD threads (2).

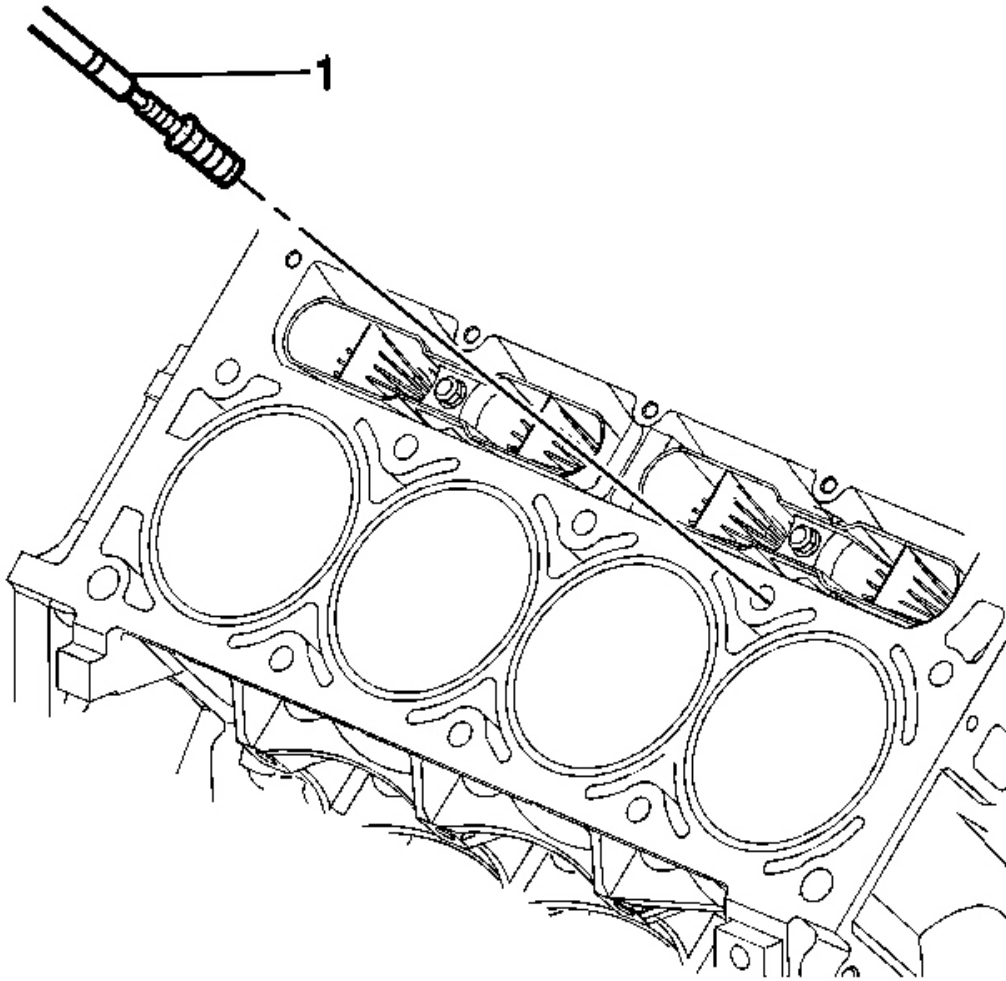


Fig. 512: Installing Insert & Driver Into Cylinder Bolt Hole
Courtesy of GENERAL MOTORS CORP.

18. Install the insert and driver (1) into the hole.

Rotate the driver tool until the mark on the tool aligns with the deck surface of the engine block.

The installer tool will tighten up before screwing completely through the insert. This is acceptable. You are forming the bottom threads of the insert and mechanically locking the insert to the base material threads.

2007 Chevrolet TrailBlazer

2007 ENGINE Engine Mechanical - 6.0L - TrailBlazer

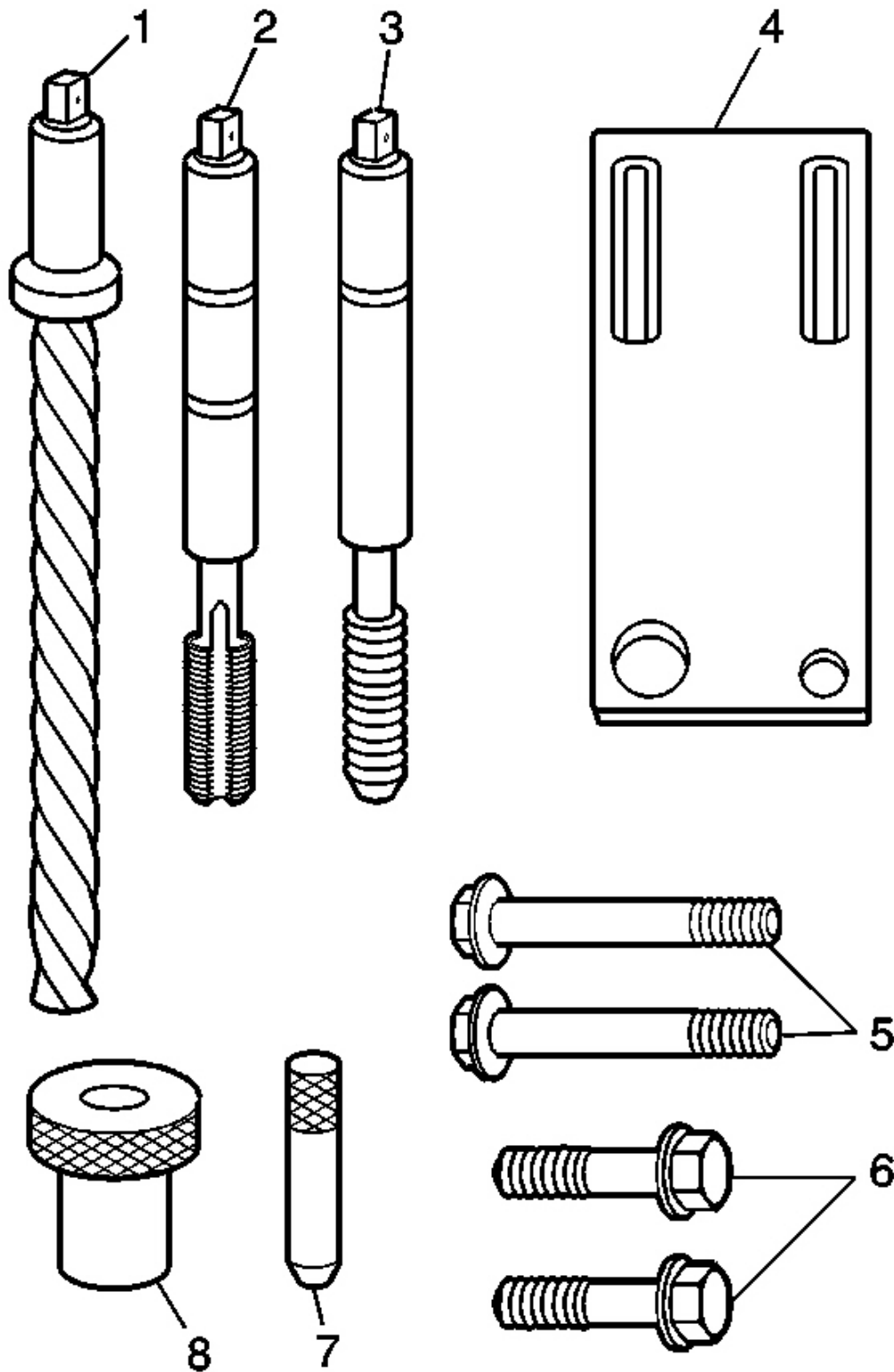


Fig. 513: Identifying Thread Repair Kit Components
Courtesy of GENERAL MOTORS CORP.

1. The main cap bolt hole thread repair kit consists of the following items:
 - The drill (1)
 - The tap (2)
 - The installer (3)
 - The fixture plate (4)
 - The long bolts (5)
 - The short bolts (6)
 - The alignment pin (7)
 - The bushing (8)

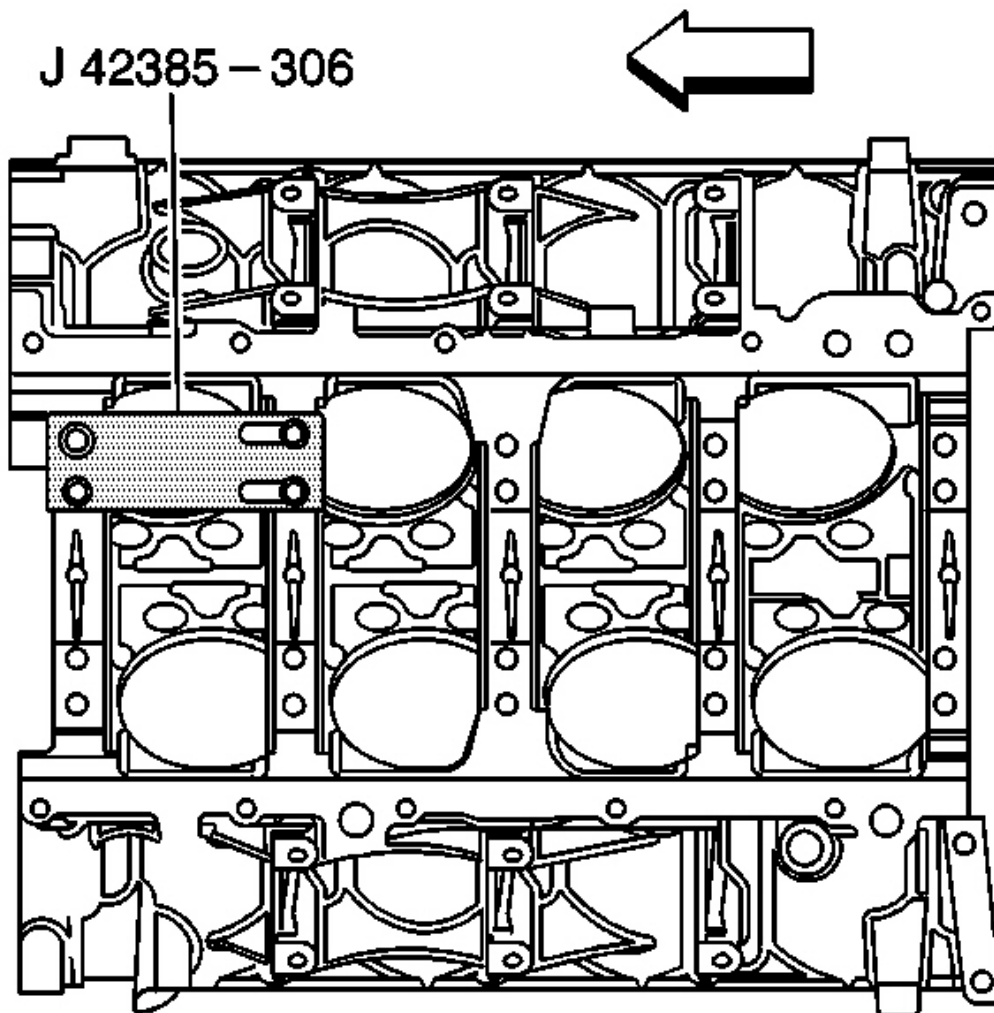


Fig. 514: View Of Fixture Plate, Bolt & Bushing
Courtesy of GENERAL MOTORS CORP.

2. Install the fixture plate, bolt and bushing onto the engine block.

Position the fixture plate and bushing over the hole that is to be repaired.

3. Position the alignment pin in the desired hole and tighten the fixture retaining bolts.

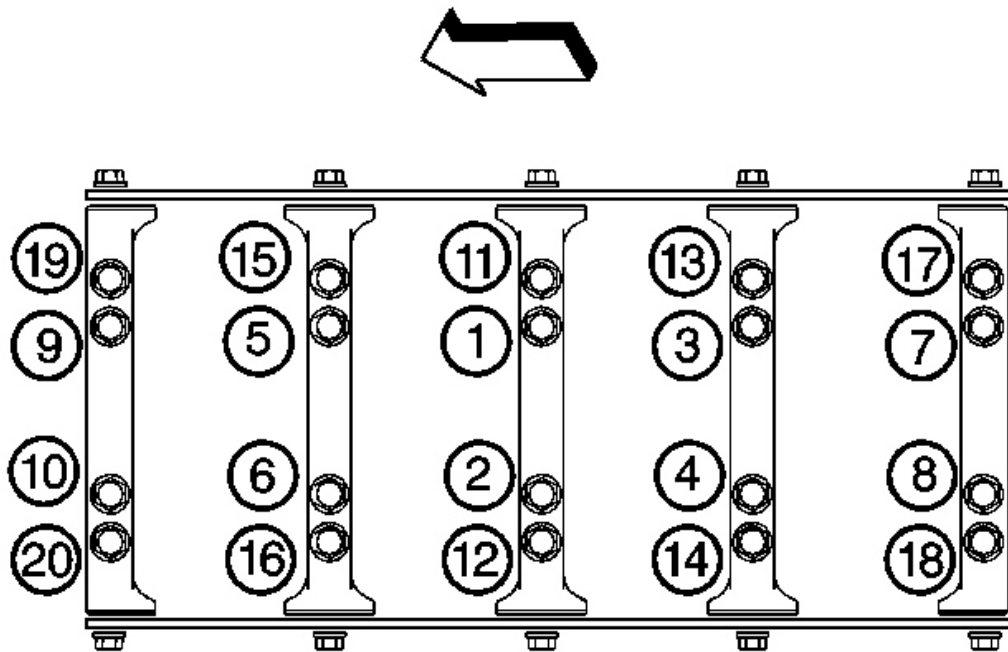


Fig. 515: Identifying Main Cap Bolt Hole Tightening Sequence
Courtesy of GENERAL MOTORS CORP.

4. Drill out the damaged hole.

The outer bolt hole locations 11-20 have the shallower counterbores. Use sleeve J 42385-316 with the drill.

Drill until the stop collar of the drill bit or the sleeve contacts the bushing.

5. Using compressed air, clean out any chips.

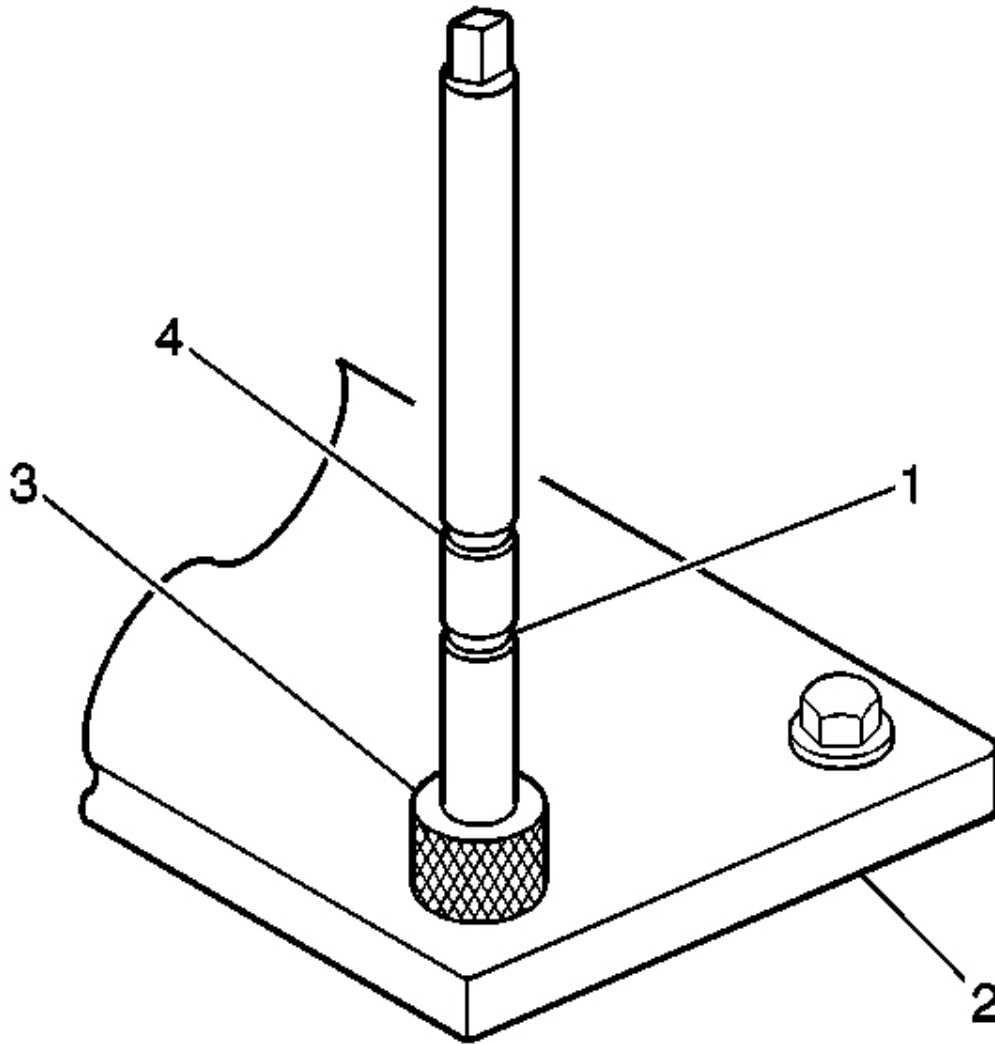


Fig. 516: View Of Tap Upper & Lower Marks, Fixture Plate & Bushing
Courtesy of GENERAL MOTORS CORP.

6. Using a tap wrench, tap the threads of the drilled hole.

In order to tap the new threads to the proper depth, rotate the tap into the hole until the mark on the tap aligns with the top of the bushing.

For the deeper main cap holes 1-10, rotate the tap until the upper mark (4) on the tap aligns with the top of the bushing (3).

For the shallower main cap holes 11-20, rotate the tap until the lower mark (1) on the tap aligns with top of the bushing (3).

7. Using compressed air, clean out any chips.
8. Spray cleaner GM P/N 12346139 (Canadian P/N 10953463) or equivalent, into the hole.
9. Using compressed air, clean any cutting oil and chips out of the hole.

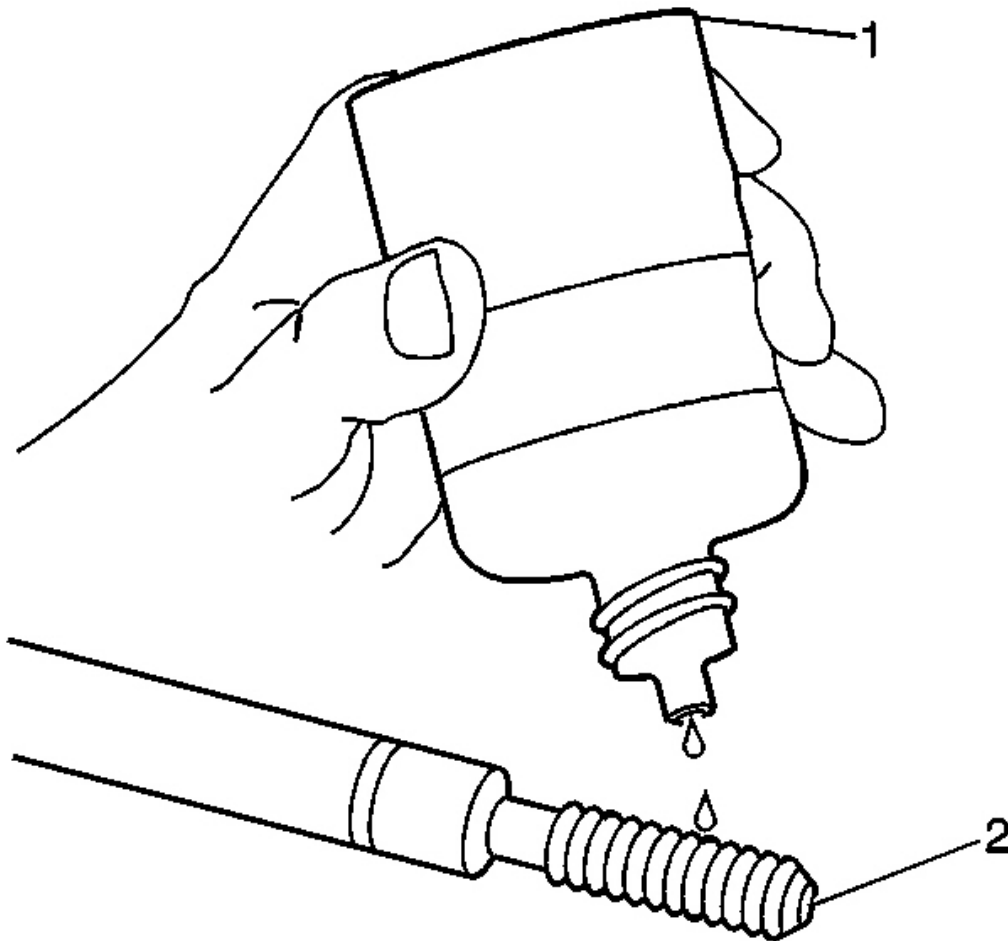


Fig. 517: Lubricating Installer Tool Using Driver Oil
Courtesy of GENERAL MOTORS CORP.

IMPORTANT: Do not allow oil or foreign material to contact the OD of the insert.

10. Lubricate the threads of the installer tool (2) with the driver oil (1).

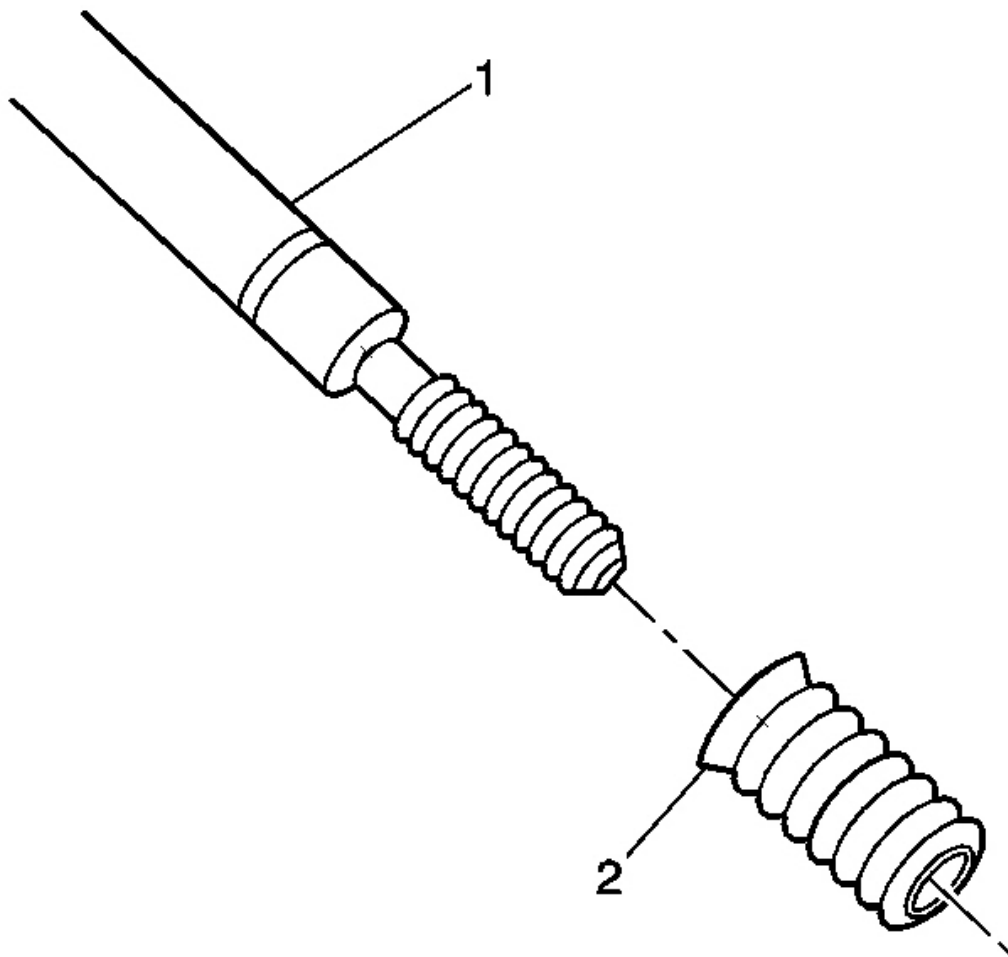


Fig. 518: View of Bushing Type Insert
Courtesy of GENERAL MOTORS CORP.

11. Install the insert (2) onto the driver tool (1).

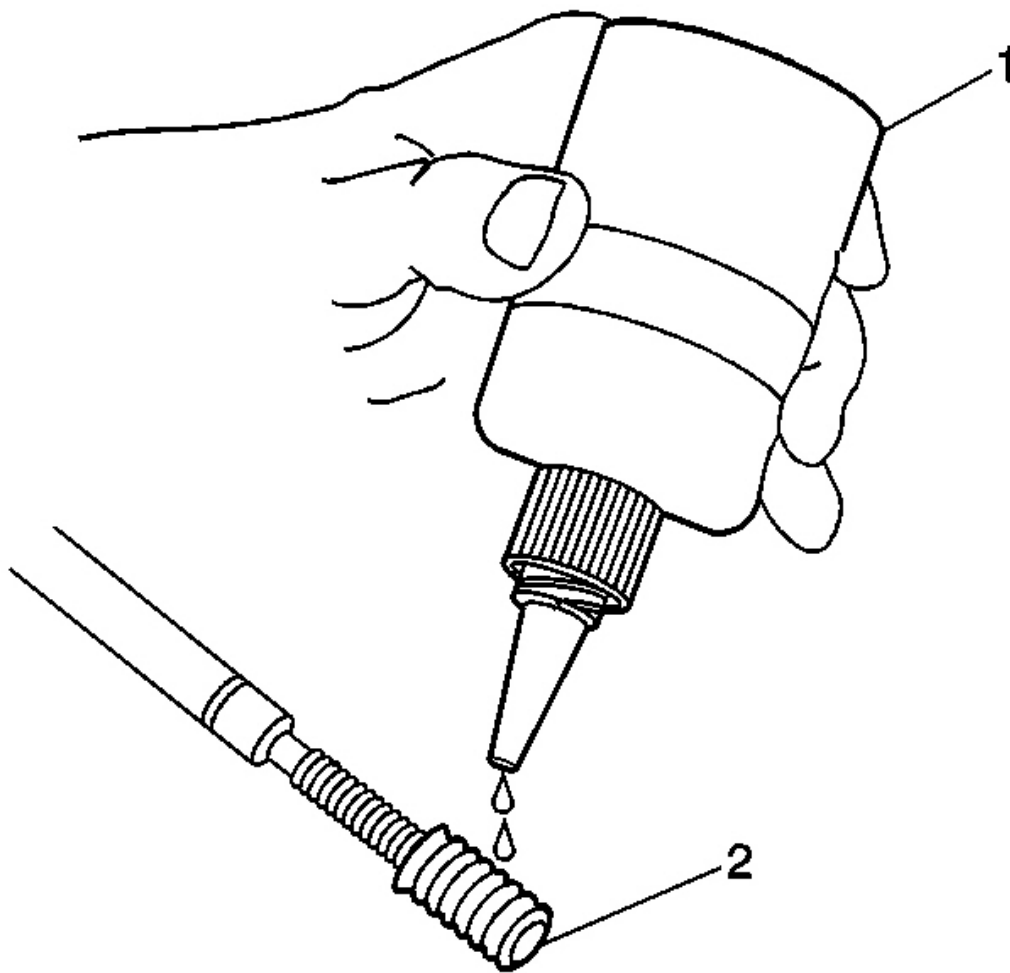


Fig. 519: Applying Threadlock To Insert
Courtesy of GENERAL MOTORS CORP.

12. Apply threadlock LOCTITE™ 277, J 42385-109 (1) or equivalent, to the insert OD threads (2).

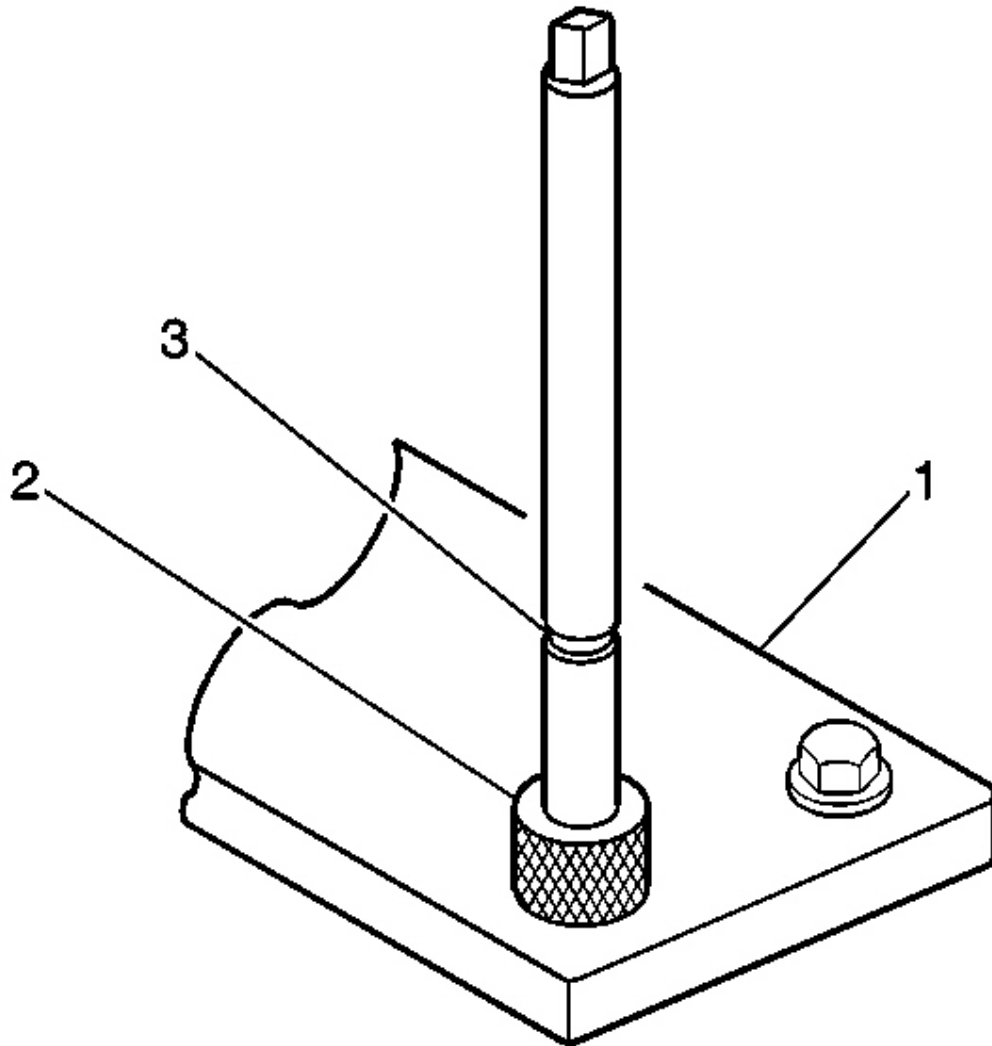


Fig. 520: View Of Fixture Plate, Drill Bushing & Tool Marking
Courtesy of GENERAL MOTORS CORP.

IMPORTANT: The fixture plate and bushing remains installed onto the engine block during the insert installation procedure.

13. Install the insert and driver (1) through the fixture plate and bushing and into the hole.

Rotate the driver tool until the mark on the tool (3) aligns with the top of the bushing (2).

2007 Chevrolet TrailBlazer

2007 ENGINE Engine Mechanical - 6.0L - TrailBlazer

The installer tool will tighten up before screwing completely through the insert. This is acceptable. You are forming the bottom threads of the insert and mechanically locking the insert to the base material threads.

SERVICE PRIOR TO ASSEMBLY

- Dirt or debris will cause premature wear of the rebuilt engine. Clean all components. Refer to **Cleanliness and Care**.
- Use the proper tools to measure components when inspecting for excessive wear. Components that are not within the manufacturers specifications must be repaired or replaced.
- When the components are installed into an engine, return the components to their original location, position and direction. Refer to **Separating Parts**.
- During assembly, lubricate all moving parts with clean engine oil. This provides initial lubrication when the engine is first started.

ENGINE BLOCK PLUG INSTALLATION

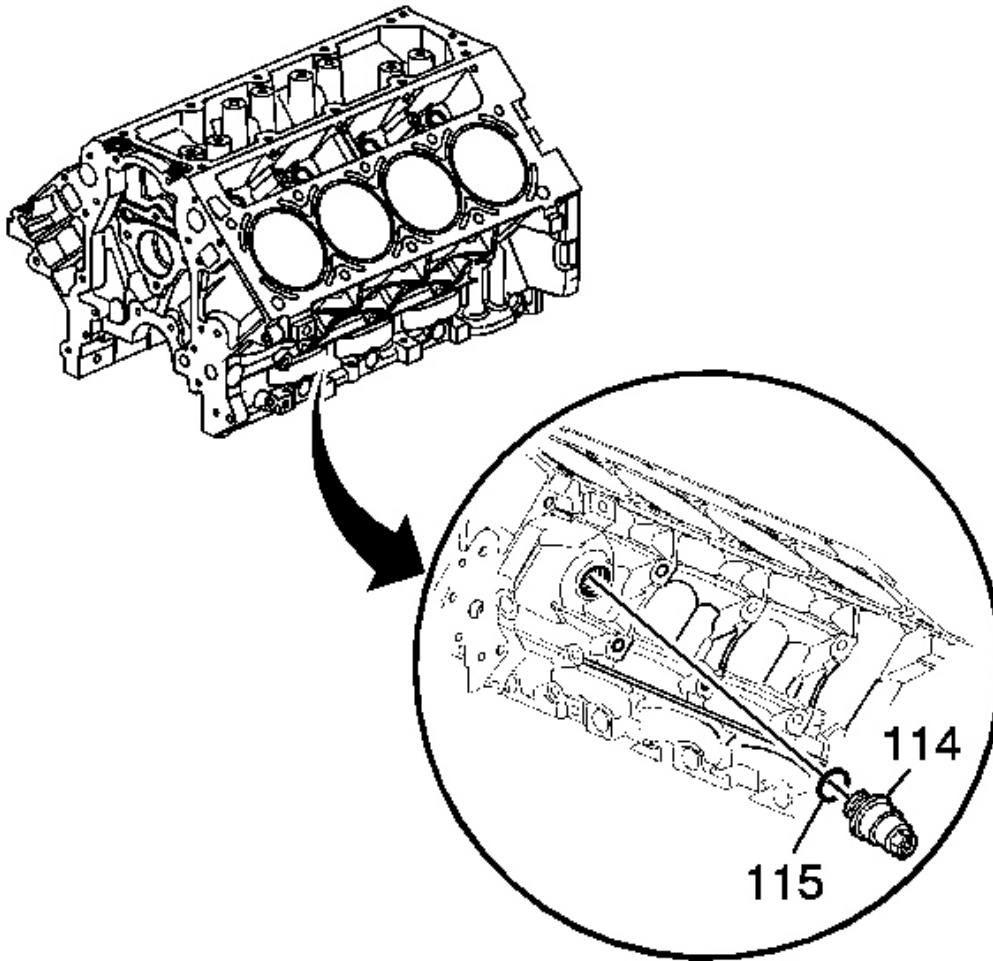


Fig. 521: Identifying Engine Block Coolant Heater
Courtesy of GENERAL MOTORS CORP.

IMPORTANT: Engine block plug, oil gallery and coolant sealing washers may be used again if not bent, scored or otherwise damaged.

1. Apply a 3.175 mm (0.125 in) bead of sealant GM P/N 12346004 (Canadian P/N 10953480) to the engine block coolant heater sealing washer (115), if applicable. Refer to **Sealers, Adhesives and Lubricants** .

NOTE: Refer to **Fastener Notice** .

2. Install the engine block coolant heater (114) to the engine block.

Tighten: Tighten the block coolant heater to 50 N.m (37 lb ft).

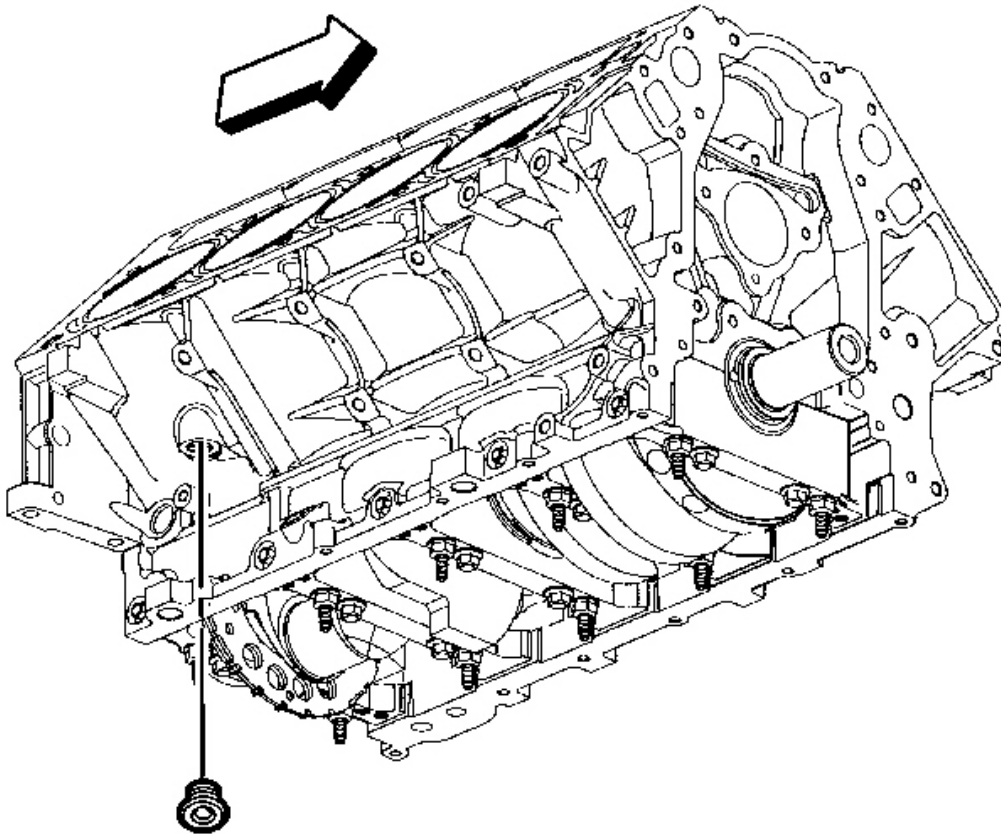


Fig. 522: Identifying Plug Location On Underside Of Block
Courtesy of GENERAL MOTORS CORP.

3. Apply a 3.175 mm (0.125 in) bead of sealant GM P/N 12346004 (Canadian P/N 10953480) to the engine block right rear coolant drain hole plug sealing washer.
4. Install the engine block right rear coolant drain hole plug.

Tighten: Tighten the block right rear coolant drain hole plug to 60 N.m (44 lb ft).

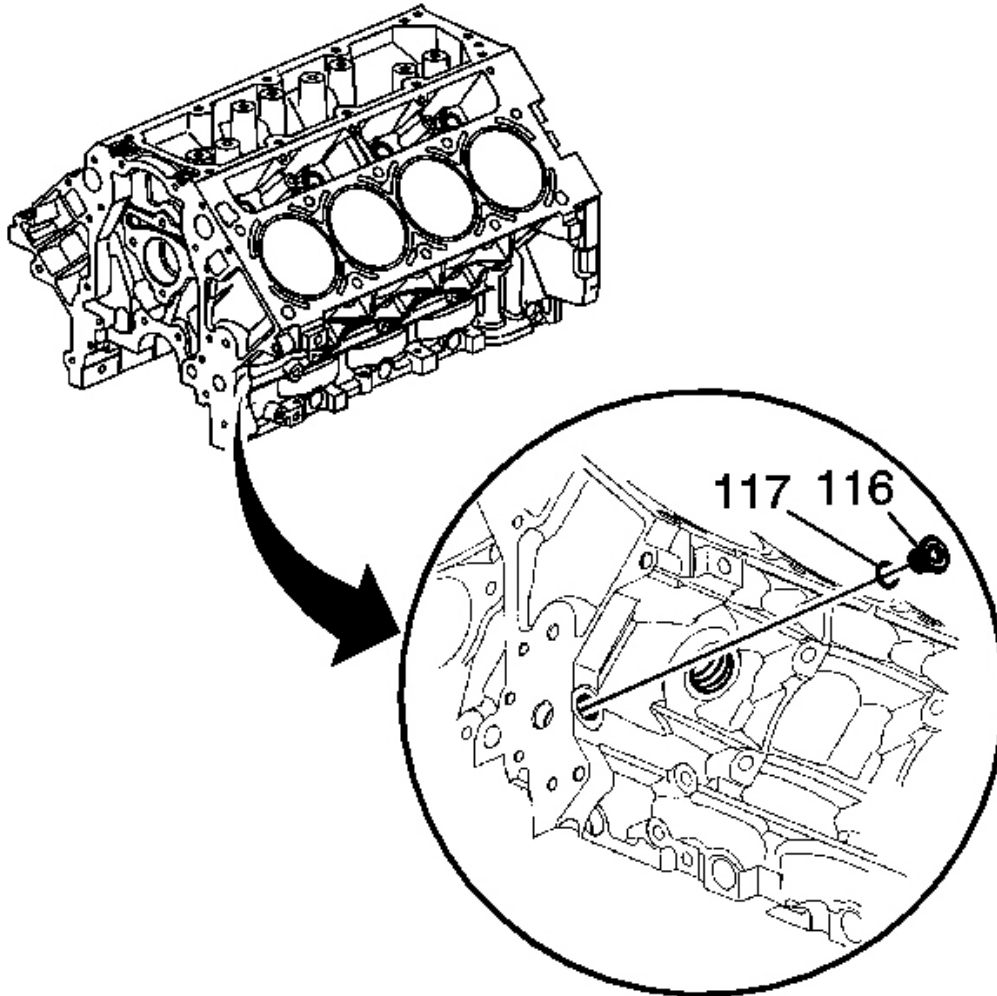


Fig. 523: Locating Engine Block Left Front Oil Gallery Plug & Seal
Courtesy of GENERAL MOTORS CORP.

5. Apply a 3.175 mm (0.125 in) bead of sealant GM P/N 12346004 (Canadian P/N 10953480) to the engine block left front oil gallery plug sealing washer (117).
6. Install the engine block left front oil gallery plug (116).

Tighten: Tighten the block left front oil gallery plug to 60 N.m (44 lb ft).

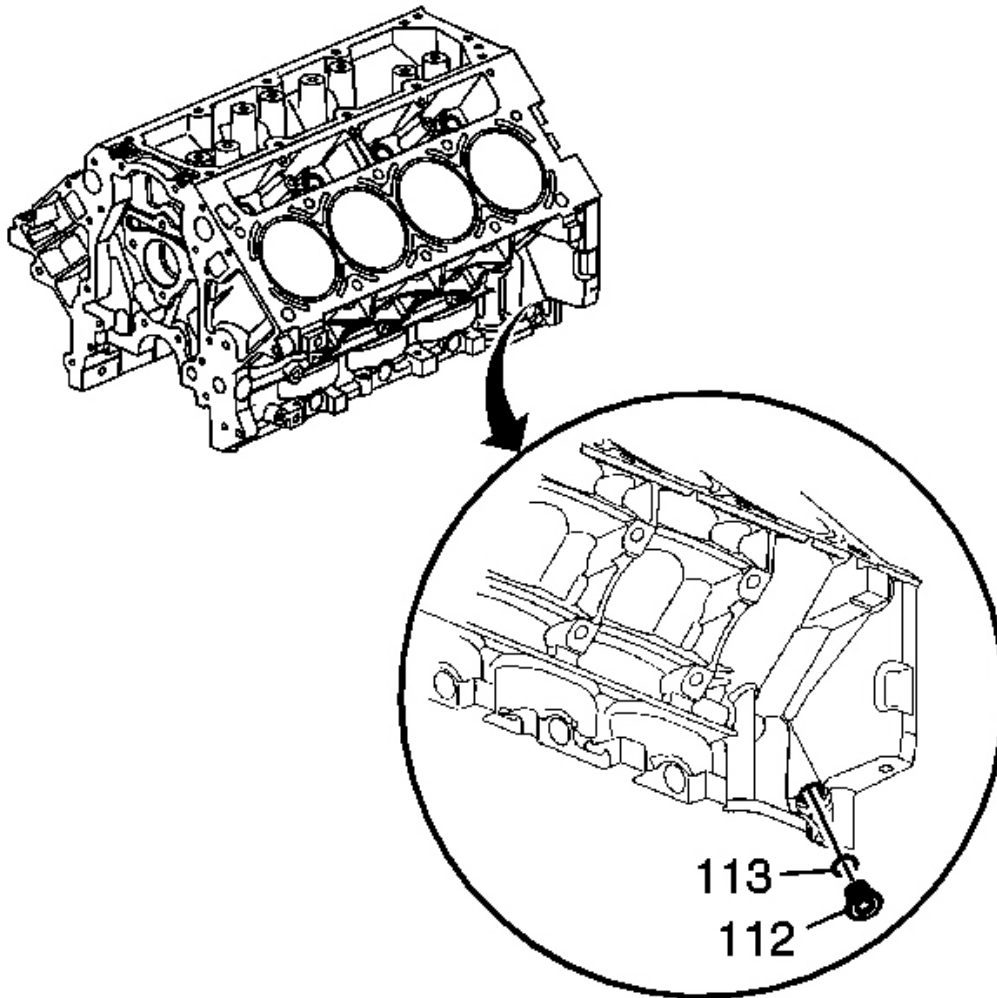


Fig. 524: Locating Engine Block Left Rear Oil Gallery Plug & Seal
Courtesy of GENERAL MOTORS CORP.

7. Apply a 3.175 mm (0.125 in) bead of sealant GM P/N 12346004 (Canadian P/N 10953480) to the engine block left rear oil gallery plug sealing washer (113).
8. Install the engine block left rear oil gallery plug (112).

Tighten: Tighten the block left rear oil gallery plug to 60 N.m (44 lb ft).

2007 Chevrolet TrailBlazer

2007 ENGINE Engine Mechanical - 6.0L - TrailBlazer

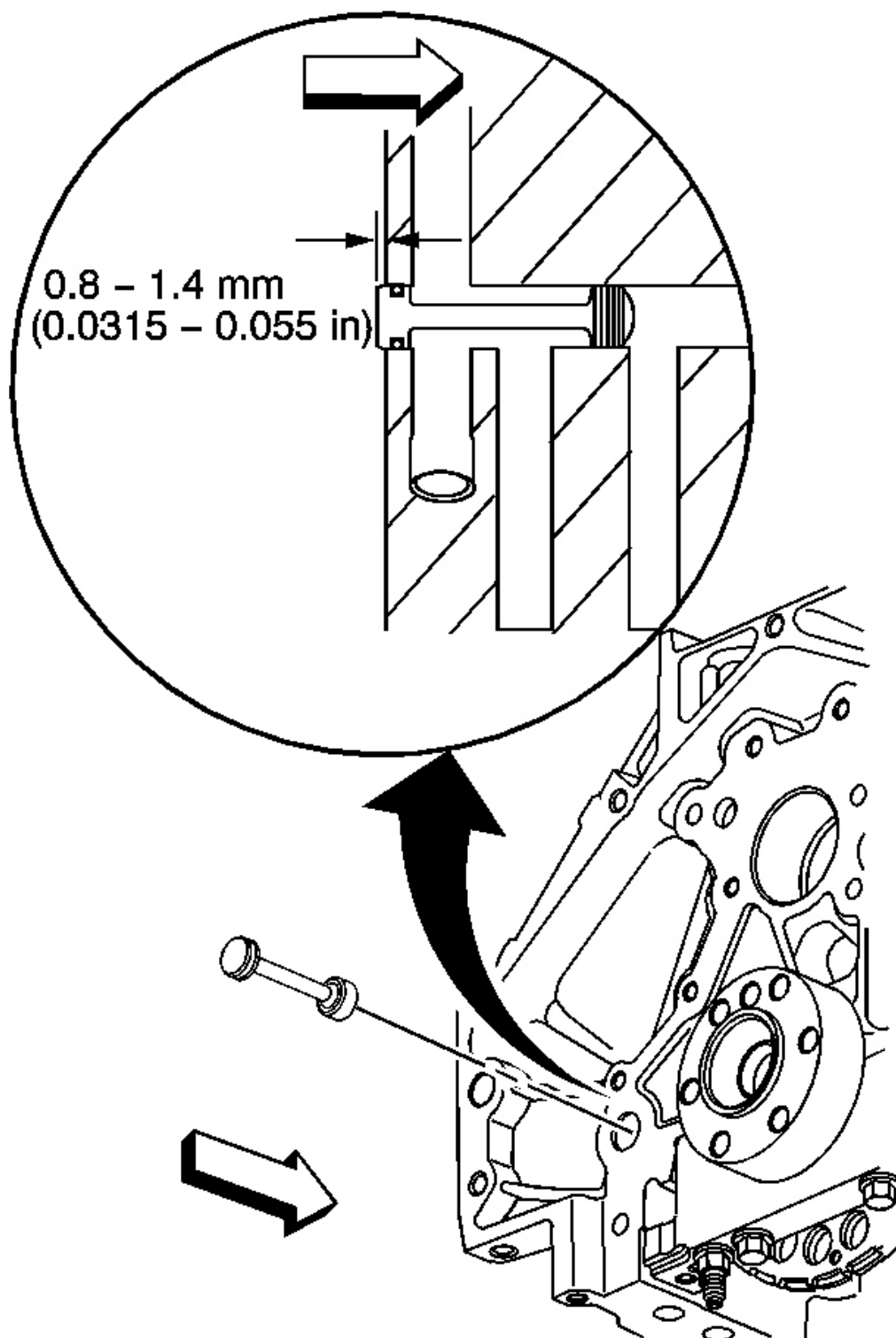


Fig. 525: View Of Engine Block Rear Oil Gallery Plug
Courtesy of GENERAL MOTORS CORP.

9. Inspect the engine block rear oil gallery plug and O-ring seal. If the O-ring seal on the plug is not cut or damaged, the rear oil gallery plug may be used again.
10. Lubricate the O-ring seal with clean engine oil.
11. Install the O-ring seal onto the plug.
12. Install the engine block rear oil gallery plug into the oil gallery bore. A properly installed block plug will protrude 0.8-1.4 mm (0.0315-0.055 in) beyond the rear face of the block.

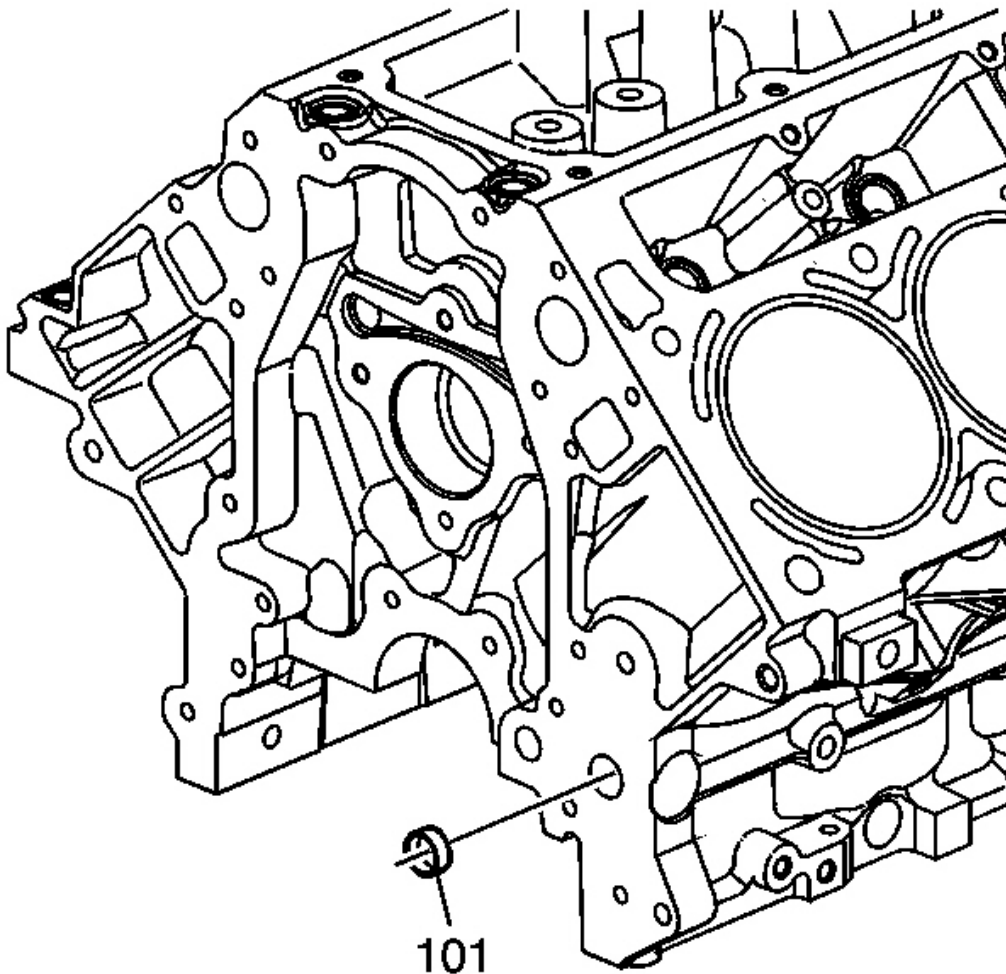


Fig. 526: View Of Engine Block Front Oil Gallery Plug
Courtesy of GENERAL MOTORS CORP.

13. Apply threadlock GM P/N 12345382 (Canadian P/N 10953489) to the sides of the NEW front oil gallery plug (101).

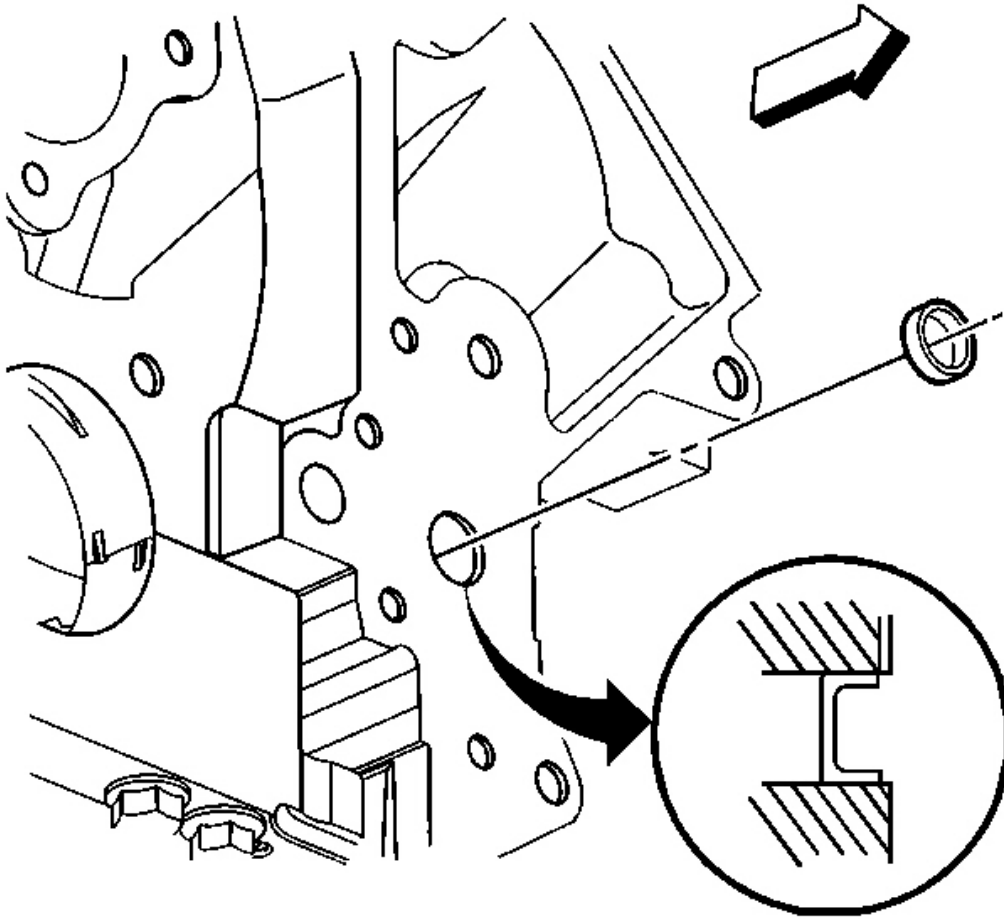


Fig. 527: View Of Engine Block Front Oil Gallery Plug
Courtesy of GENERAL MOTORS CORP.

14. Install a NEW engine block front oil gallery plug. Install the plug into the oil gallery bore 2.2-2.8 mm (0.0086-0.011 in) below flush.

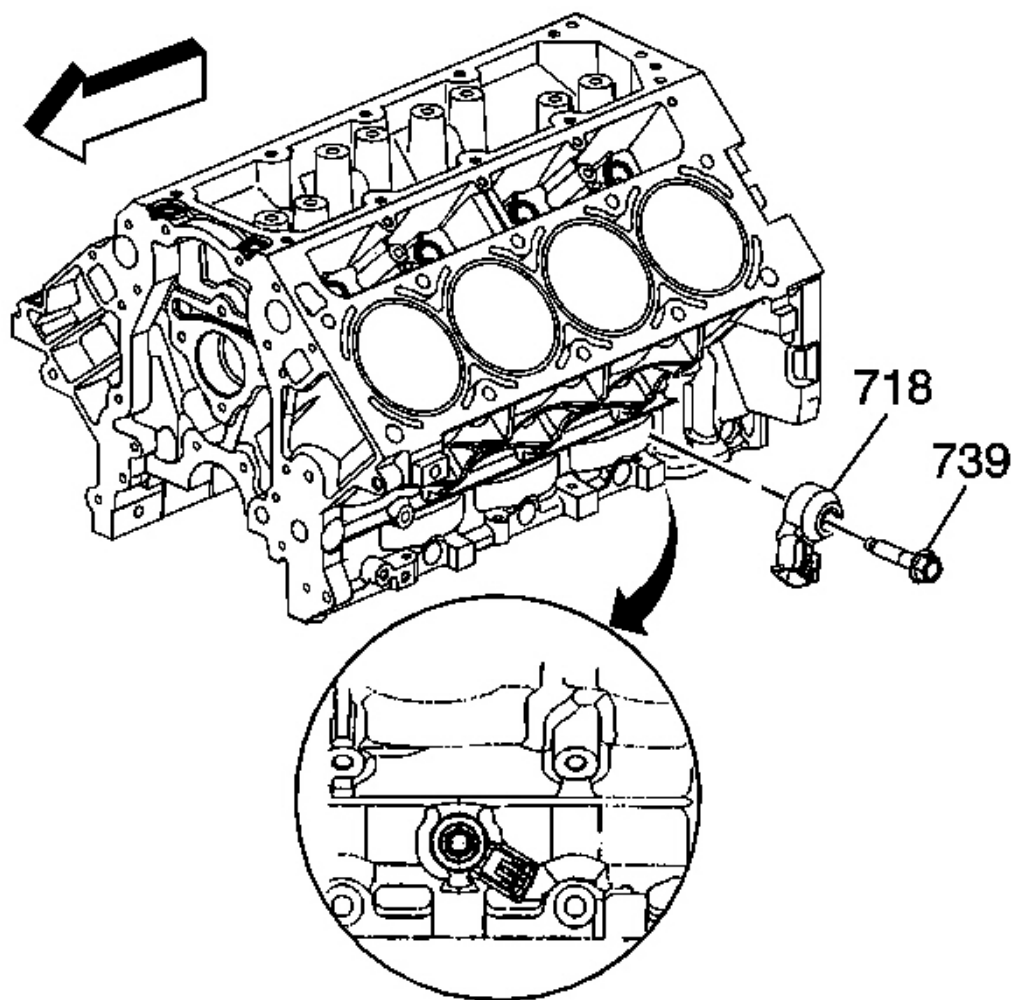


Fig. 528: View Of Left Side Knock Sensor & Bolt
Courtesy of GENERAL MOTORS CORP.

15. Install the left side knock sensor (718) and bolt (739).

Tighten: Tighten the bolt to 20 N.m (15 lb ft).

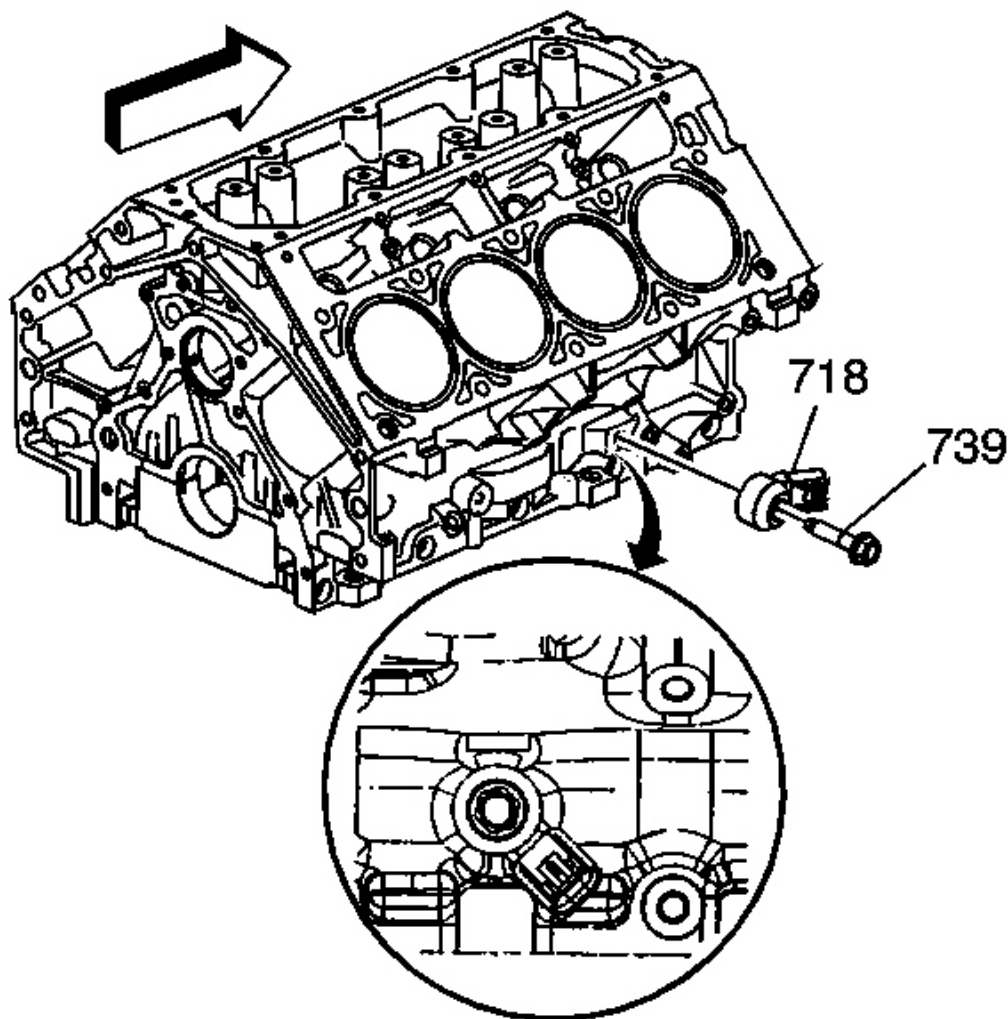


Fig. 529: View Of Right Side Knock Sensor & Bolt
Courtesy of GENERAL MOTORS CORP.

16. Install the right side knock sensor (718) and bolt (739).

Tighten: Tighten the bolt to 20 N.m (15 lb ft).

CRANKSHAFT AND BEARINGS INSTALLATION

Tools Required

J 45059 Angle Meter

Installation Procedure

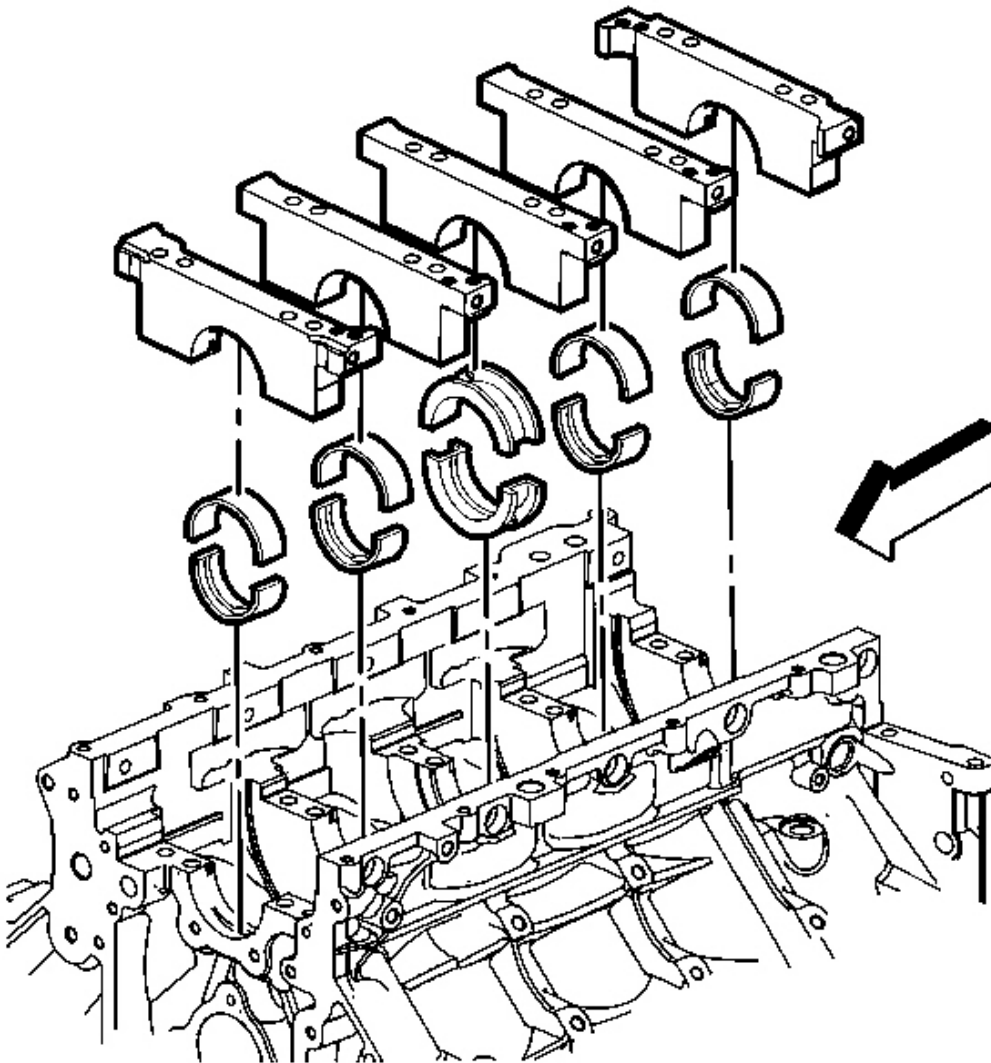


Fig. 530: View Of Crankshaft Bearings & Bearing Caps
Courtesy of GENERAL MOTORS CORP.

IMPORTANT:

- Crankshaft bearing clearances are critical. Excessive crankshaft bearing clearance may affect crankshaft position (CKP) sensor

2007 Chevrolet TrailBlazer

2007 ENGINE Engine Mechanical - 6.0L - TrailBlazer

signals and/or on-board diagnostic (OBD) II system performance.

- **Crankshaft bearing caps must be installed to the proper location and direction.**
- **When installing the crankshaft bearings, align the locating tabs on the bearings with the locating notches in the engine block journal bore and the bearing cap.**
- **Always install crankshaft bearings with their machined partner. Do not file bearings or mix bearing halves.**
- **In order to prevent engine block oil leakage, install NEW M8 crankshaft bearing cap side bolts.**

The crankshaft bearing cap M8 side bolts have a pre-applied sealant patch applied to the bolt flange.

1. Install the crankshaft bearings to the engine block and bearing caps. The thrust bearings are to be installed into center journal.
2. Lubricate the bearing surfaces and crankshaft journals with clean engine oil.

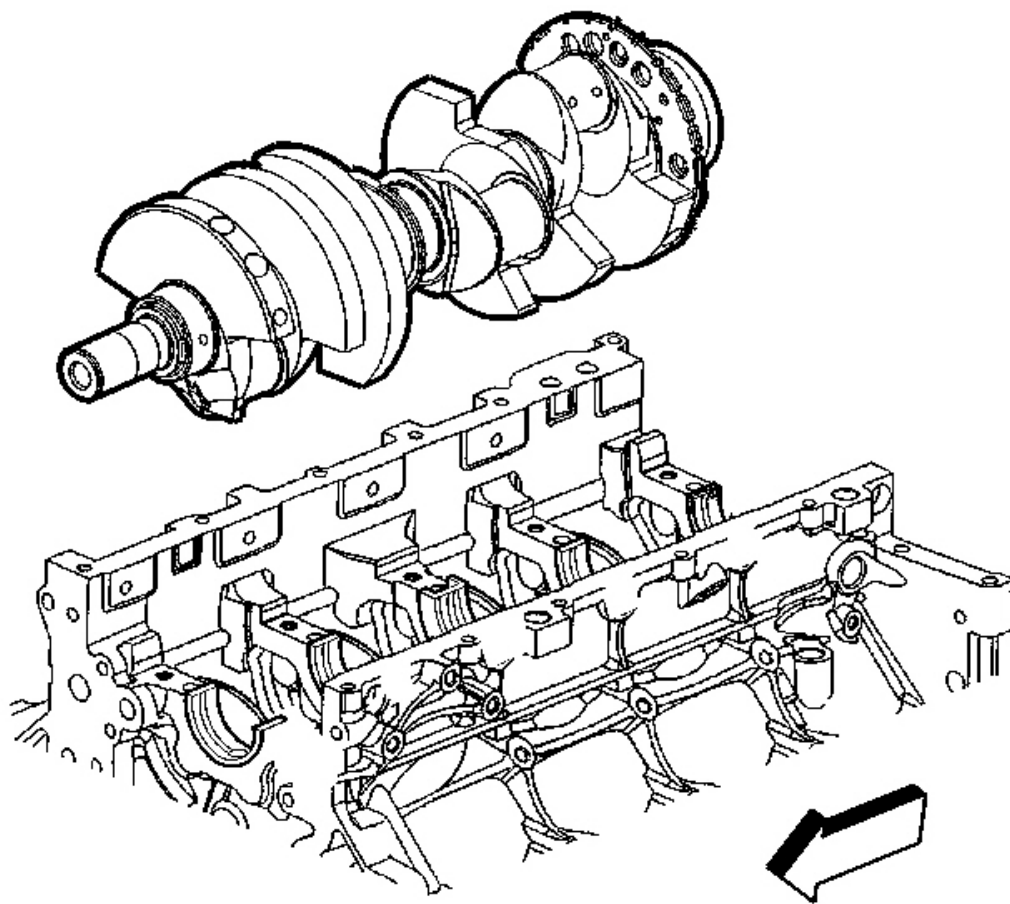


Fig. 531: View Of Crankshaft & Engine Block
Courtesy of GENERAL MOTORS CORP.

NOTE: To maintain proper crankshaft end play, use extreme care during crankshaft installation. Avoid scoring or damaging the thrust bearing.

3. Install the crankshaft.

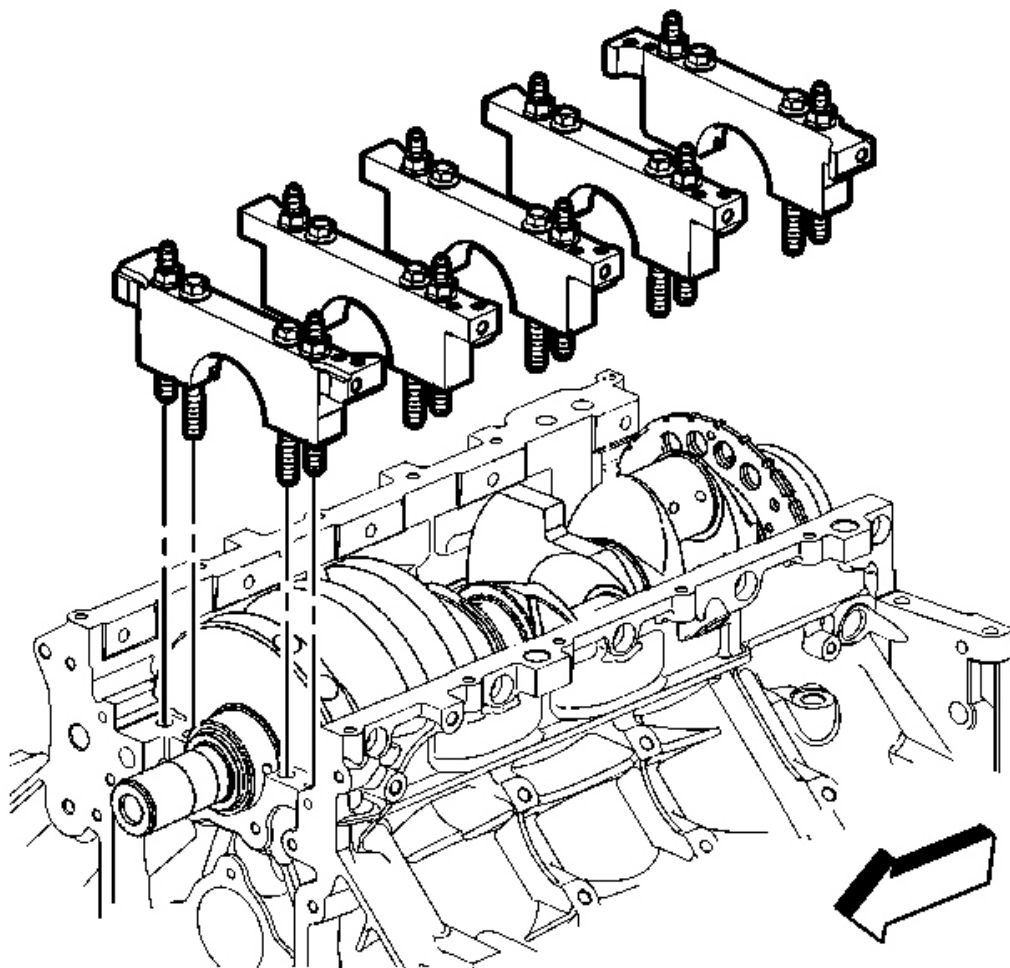


Fig. 532: View Of Crankshaft Main Bearing Caps
Courtesy of GENERAL MOTORS CORP.

IMPORTANT: The bearing caps must be installed in the proper location and direction.

4. Install the crankshaft bearing caps, with bearings, into the engine block.

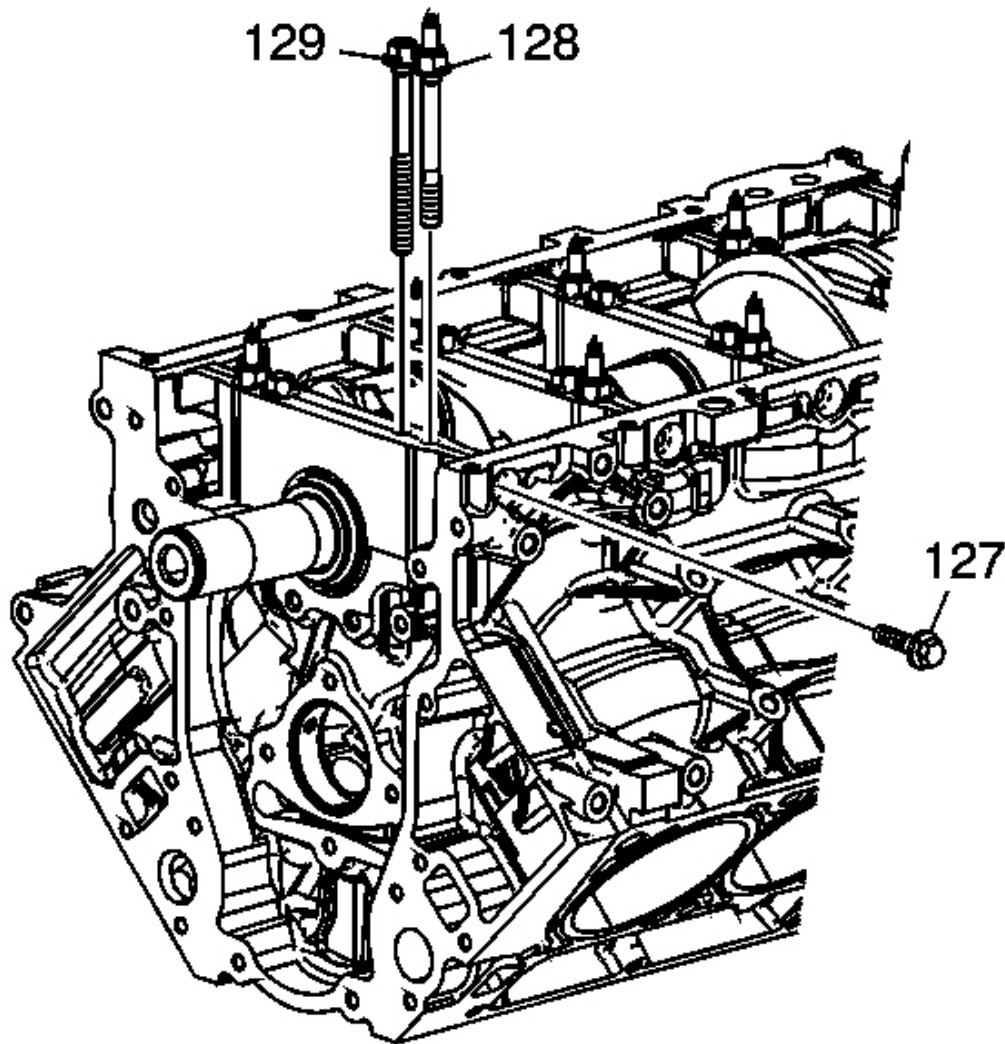


Fig. 533: Identifying Bearing Cap Bolts & Studs
Courtesy of GENERAL MOTORS CORP.

5. Install the M10 bolts (129) and studs (128).
6. Using a plastic-face hammer, tap the bearing caps into place.
7. Install the NEW M8 bearing cap side bolts (127).

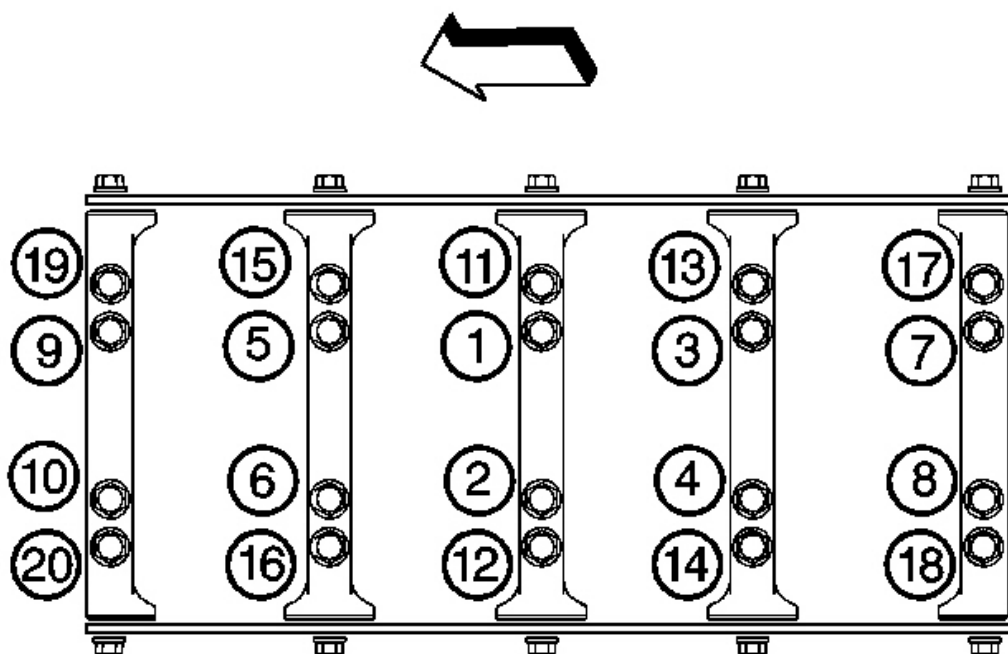


Fig. 534: Identifying Main Cap Bolt Hole Tightening Sequence
 Courtesy of GENERAL MOTORS CORP.

NOTE: Refer to Fastener Notice .

8. Tighten the bearing cap M10 bolts (1-10).

Tighten: Tighten the M10 bearing cap bolts (1-10) a first pass in sequence to 20 N.m (15 lb ft).

IMPORTANT: To properly align the crankshaft thrust bearings, the final thrust of the crankshaft **MUST** be in the forward direction.

9. Using a plastic-face hammer, tap the crankshaft rearward, then forward in order to align the thrust bearings.

Tighten:

1. Tighten the M10 bolts (1-10) a final pass in sequence 80 degrees using the **J 45059** .
2. Tighten the M10 studs (11-20) a first pass in sequence to 20 N.m (15 lb ft).
3. Tighten the M10 studs (11-20) a final pass in sequence 51 degrees using the **J 45059** .
4. Tighten the bearing cap side M8 bolts to 25 N.m (18 lb ft).

Tighten the bolt on 1 side of the bearing cap and then tighten the bolt on the opposite side of the same bearing cap.

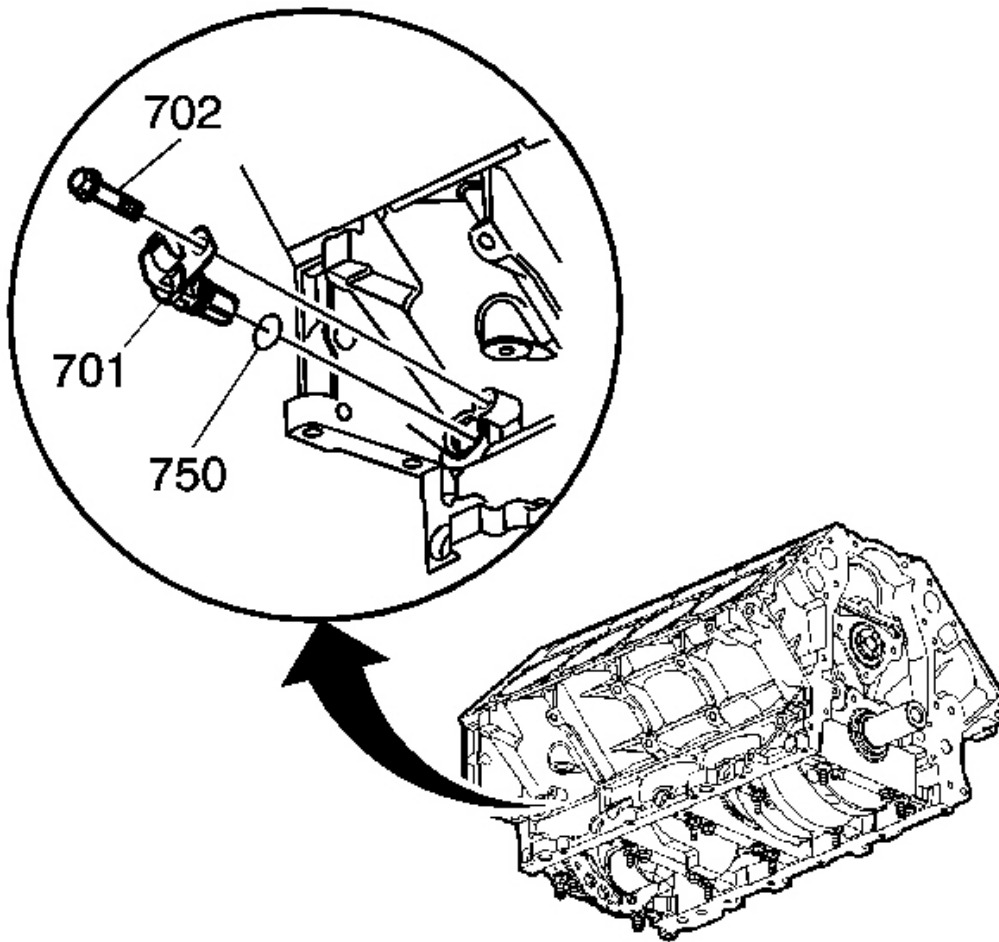


Fig. 535: View Of Crankshaft Position (CKP) Sensor, Bolt & O-Ring
Courtesy of GENERAL MOTORS CORP.

10. Install the CKP sensor.
 1. Inspect the CKP sensor O-ring seal (750). If the O-ring seal is not cut or damaged, it may be used again.
 2. Coat the O-ring seal with clean engine oil.
 3. Install the O-ring onto the sensor.
 4. Install the sensor (701). Rotate the sensor until the locating hole in the bracket aligns with the bolt hole in the block.

5. Install the sensor bolt (702).

Tighten: Tighten the CKP sensor bolt to 25 N.m (18 lb ft).

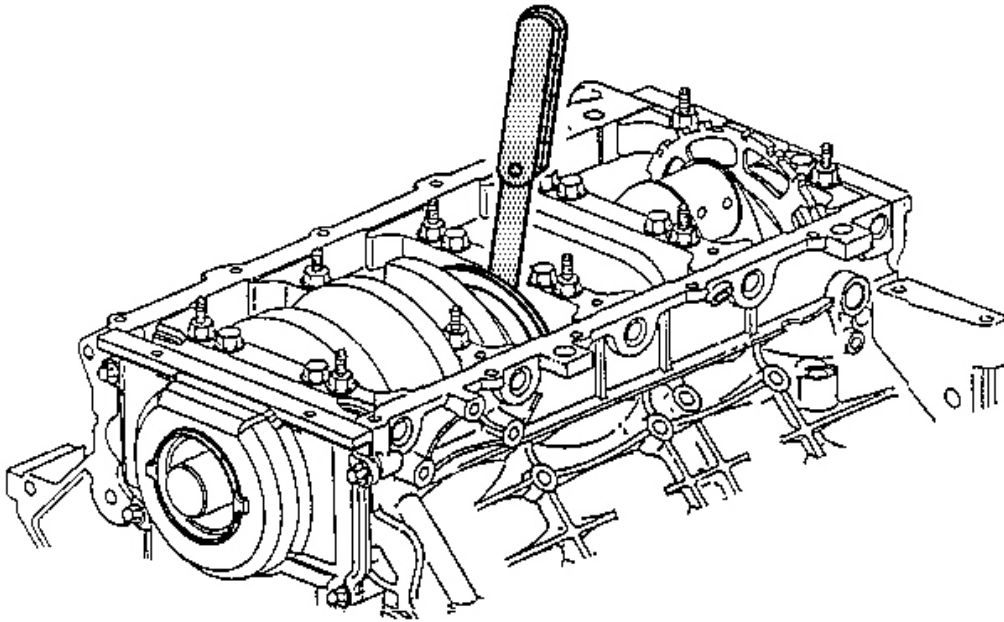


Fig. 536: Measuring Crankshaft End Play
Courtesy of GENERAL MOTORS CORP.

11. Measure the crankshaft end play.
 1. Thrust the crankshaft forward or rearward.
 2. Insert a feeler gage between the center crankshaft bearing and the bearing surface of the crankshaft and measure the bearing clearance.

The proper crankshaft end play clearance is 0.04-0.2 mm (0.0015-0.0078 in).

3. If the bearing clearance is not within specifications, inspect the thrust surfaces for nicks, gouges or raised metal. Minor imperfections may be removed with a fine stone.

PISTON, CONNECTING ROD AND BEARING INSTALLATION

Tools Required

- **J 8037** Piston Ring Compressor

- **J 8087** Cylinder Bore Gage
- **J 41556** Connecting Rod Guide
- **J 45059** Angle Meter

Piston Selection

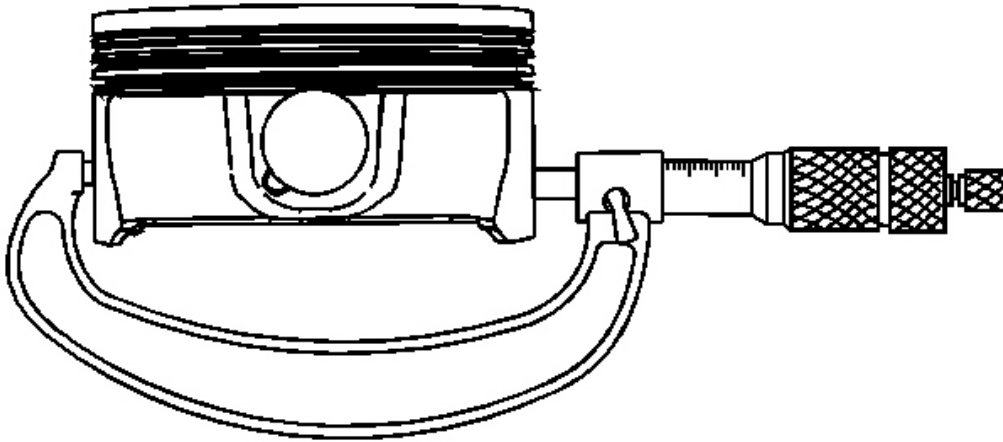


Fig. 537: Measuring Piston

Courtesy of GENERAL MOTORS CORP.

IMPORTANT: Measurements of all components should be taken with the components at normal room temperature. For proper piston fit, the engine block cylinder bores must not have excessive wear or taper. A used piston, pin and connecting rod assembly may be installed if, after inspection is within specifications.

1. With a micrometer at a right angle, measure the piston outside diameter (OD). Measure the diameter 43 mm (1.69 in) from the top of the piston. Refer to **Engine Mechanical Specifications**.
2. Record the piston OD.

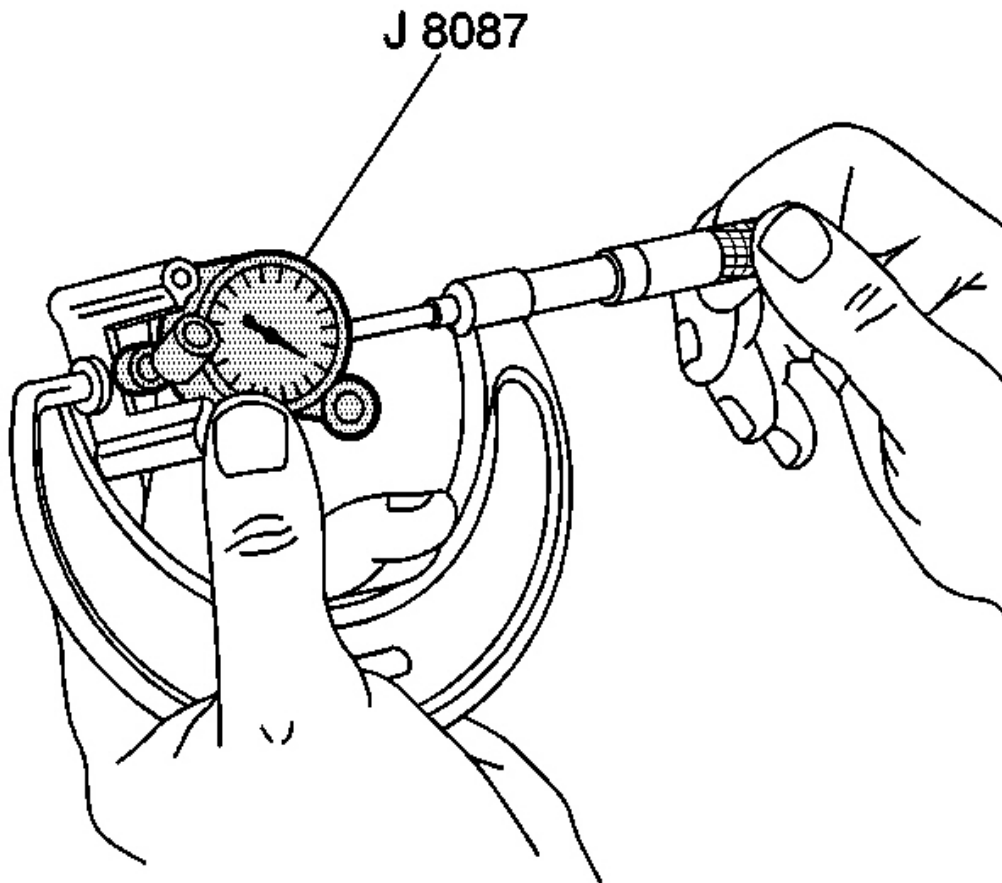


Fig. 538: Measuring Bore Gauge With Micrometer
Courtesy of GENERAL MOTORS CORP.

3. Adjust the micrometer to the recorded piston OD.
4. Insert the **J 8087** into the micrometer and zero the gage dial.

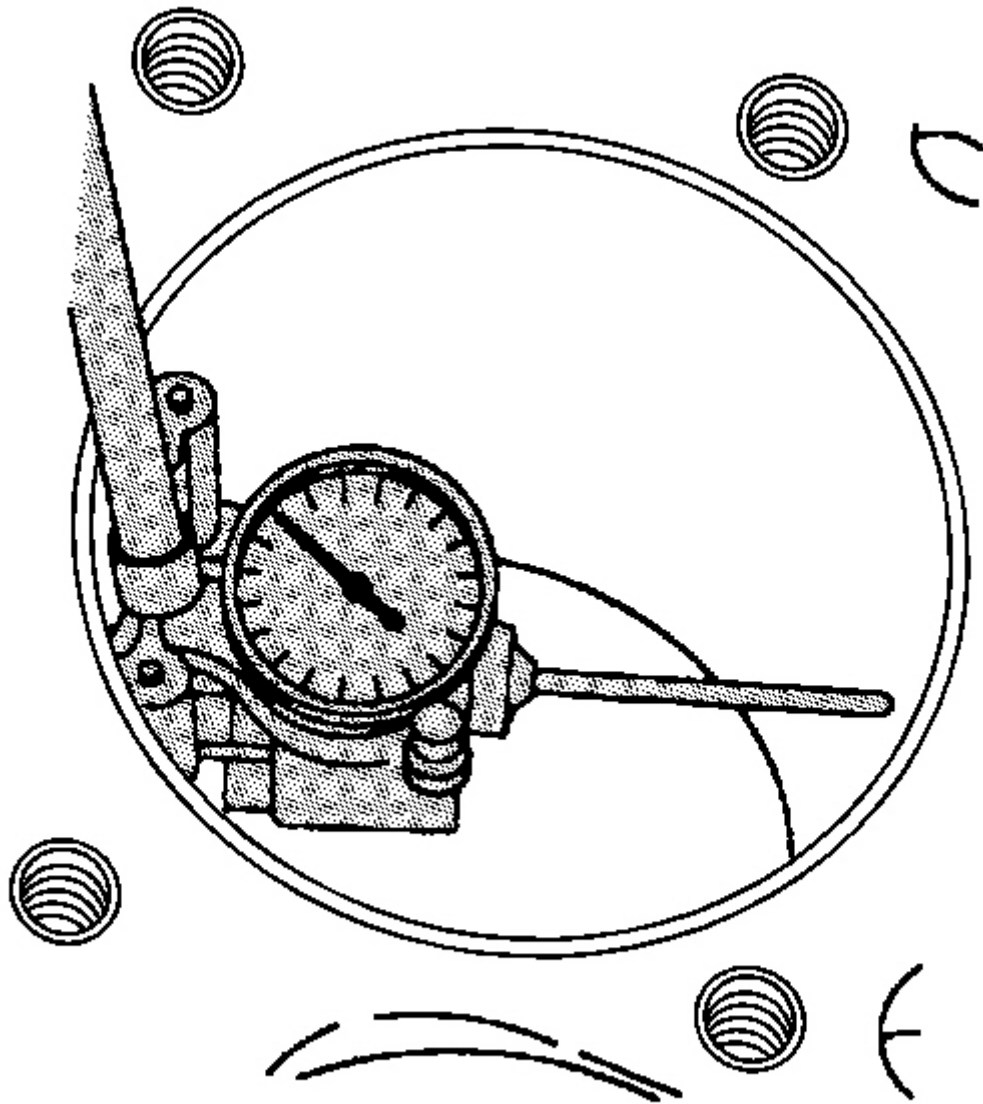


Fig. 539: View Of Cylinder Bore & Special Tool
Courtesy of GENERAL MOTORS CORP.

5. Using the **J 8087** , measure the cylinder bore inside diameter (ID). Measure at a point 64 mm (2.5 in) from the top of the cylinder.
6. Record the cylinder bore ID.
7. Subtract the piston OD from the cylinder bore ID in order to determine the piston-to-bore clearance. Refer to **Engine Mechanical Specifications**.

8. If the proper clearance cannot be obtained, select another piston and pin assembly and measure the clearances again. If the proper fit cannot be obtained, the cylinder bore may require honing for an oversize piston.

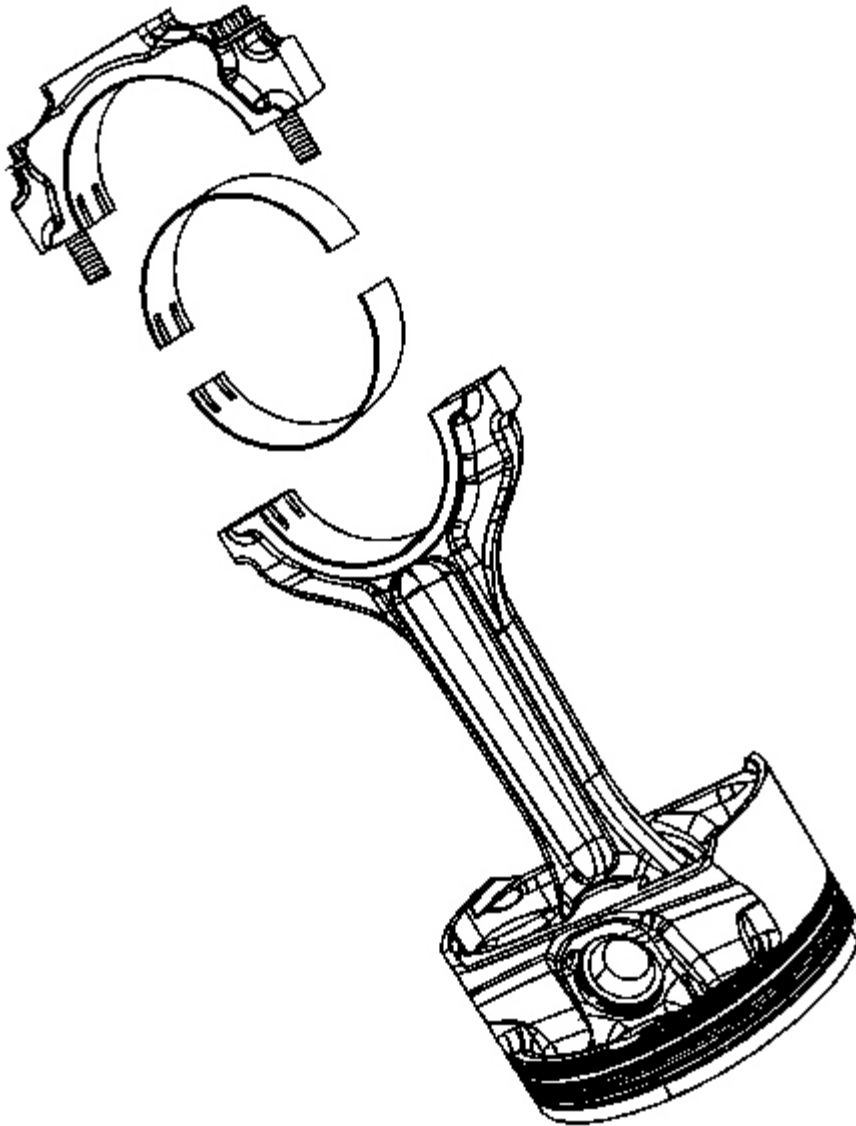
Piston, Pin and Connecting Rod Installation

Fig. 540: View Of Piston, Connecting Rod & Bearing Assembly

Courtesy of GENERAL MOTORS CORP.

1. Lubricate the following components with clean engine oil:
 - Piston
 - Piston rings
 - Cylinder bore
 - Bearings and bearing surfaces
2. Install the bearings to the connecting rod and cap.
3. Position the oil control ring end gaps a minimum of 25 mm (1.0 in) from each other.
4. Position the compression ring end gaps 180 degrees opposite each other.

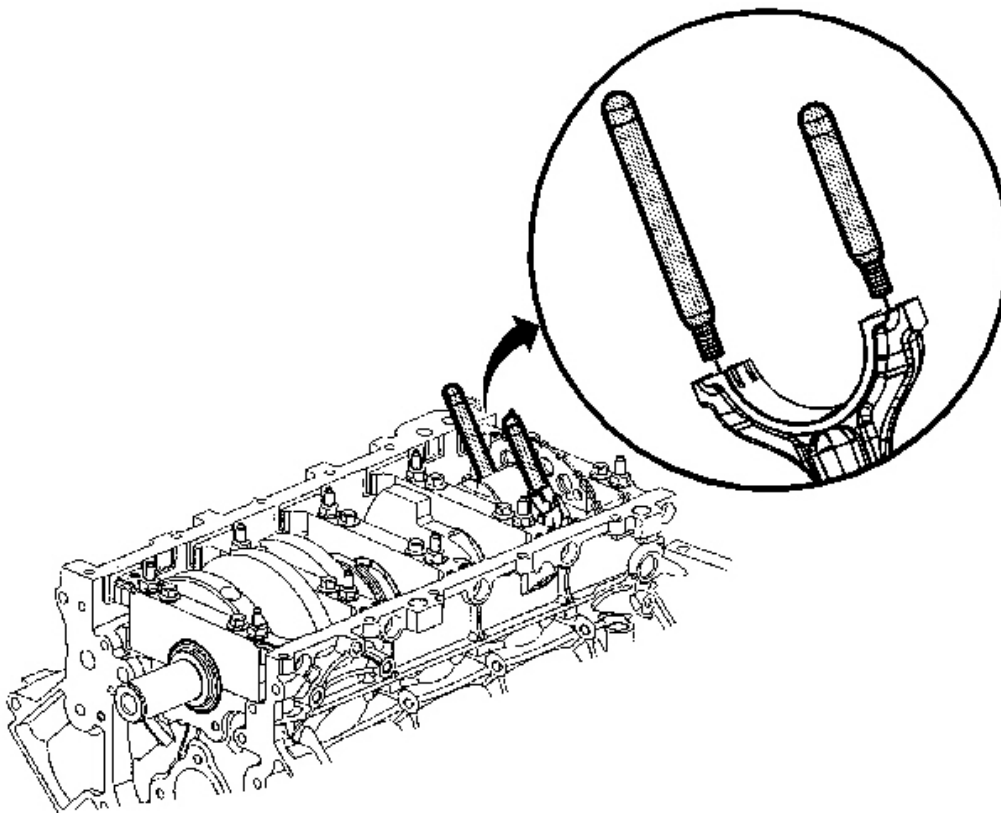


Fig. 541: View Of Piston & Connecting Rod Assembly
Courtesy of GENERAL MOTORS CORP.

5. Install the **J 41556** to the connecting rod.

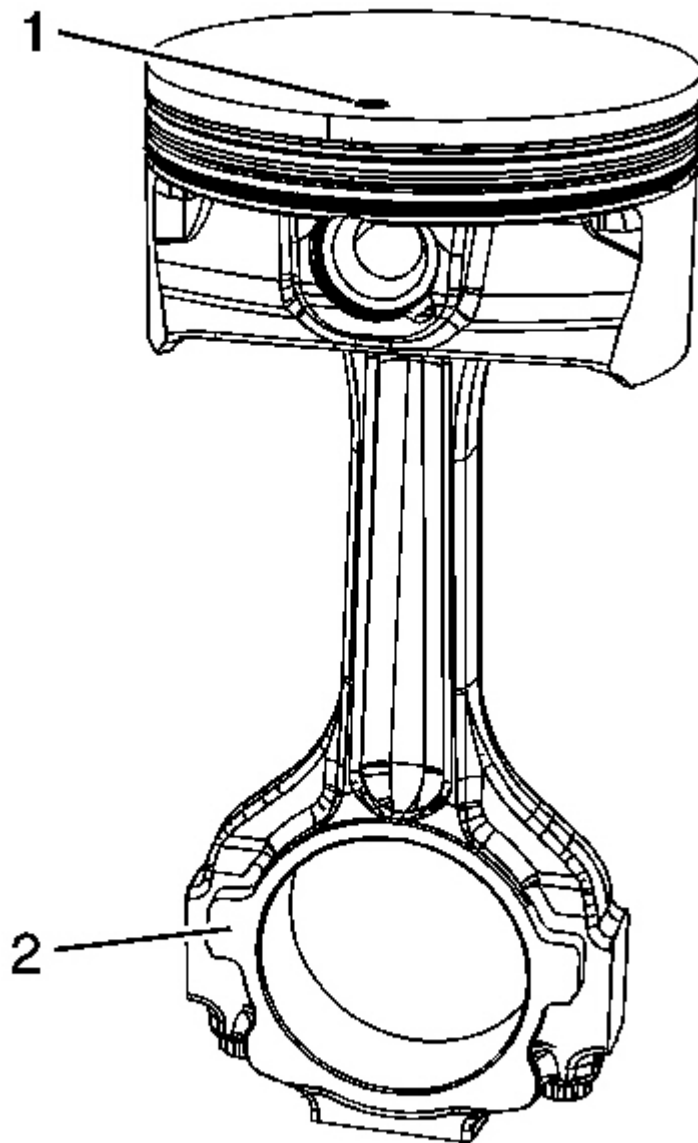


Fig. 542: View of Mark On Top Of Piston & Connecting Rod Tab
Courtesy of GENERAL MOTORS CORP.

6. Identify the proper installation direction of the piston and connecting rod assembly. When installing the piston and connecting rod assembly, the mark on the top of the piston (1) and the tab (2) on the side of the connecting rod should face the front of the engine.

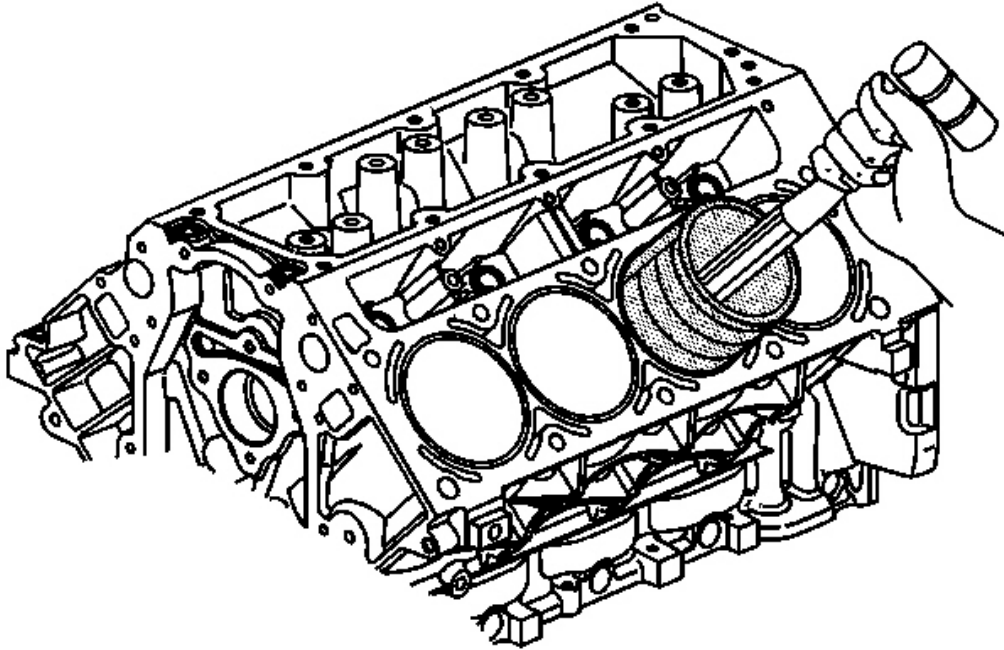


Fig. 543: Illustrating Tapping Piston Into Block Using Wooden Hammer
Courtesy of GENERAL MOTORS CORP.

7. Install the **J 8037** onto the piston and compress the piston rings.

IMPORTANT: The piston alignment mark **MUST** face the front of the engine block.

8. Install the piston, pin and connecting rod assembly into the cylinder bore. Hold the piston ring compressor firmly against the engine block. Using a wooden hammer handle, lightly tap the top of the piston until all piston rings have entered the cylinder bore.
9. Use the **J 41556** to guide the connecting rod onto the crankshaft journal.
10. Remove the **J 41556** from the connecting rod.

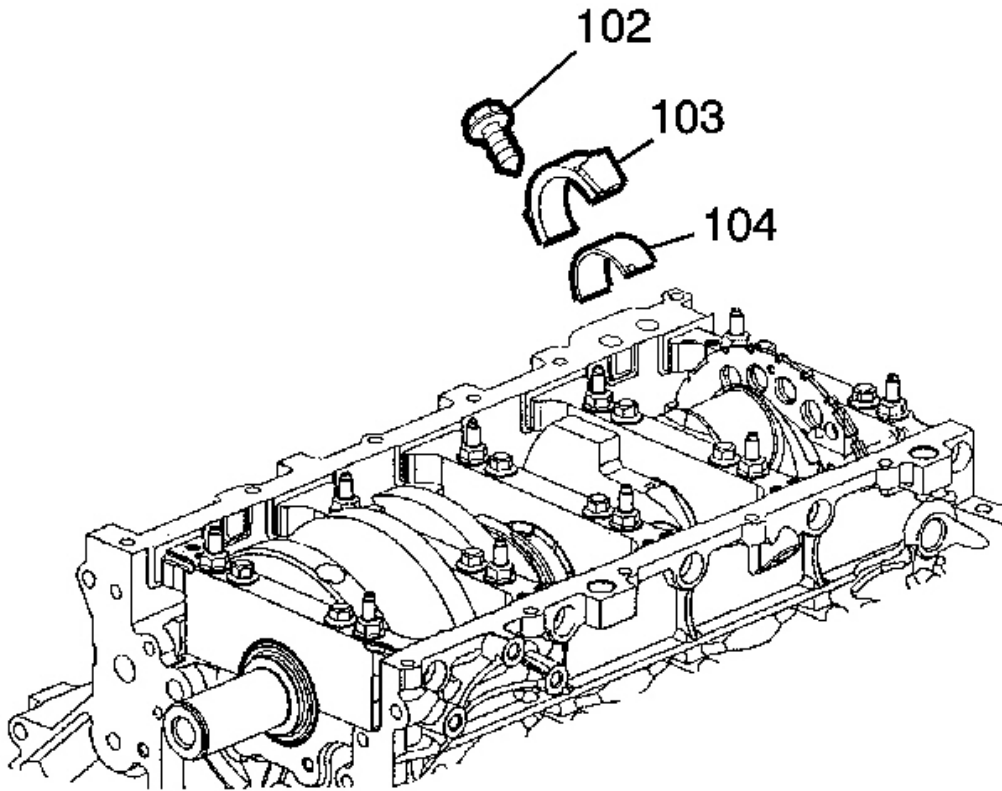


Fig. 544: View Of Connecting Rod Bolt, Cap & Bearing
Courtesy of GENERAL MOTORS CORP.

NOTE: Refer to Fastener Notice .

IMPORTANT: The connecting rod and cap must be assembled with the mating surfaces properly aligned.

11. Install the bearing cap (103), bearing (104) and bolts (102).

Tighten:

1. Tighten the bolts a first pass to 20 N.m (15 lb ft).
2. Tighten the bolts a final pass to 75 degrees using the **J 45059** .

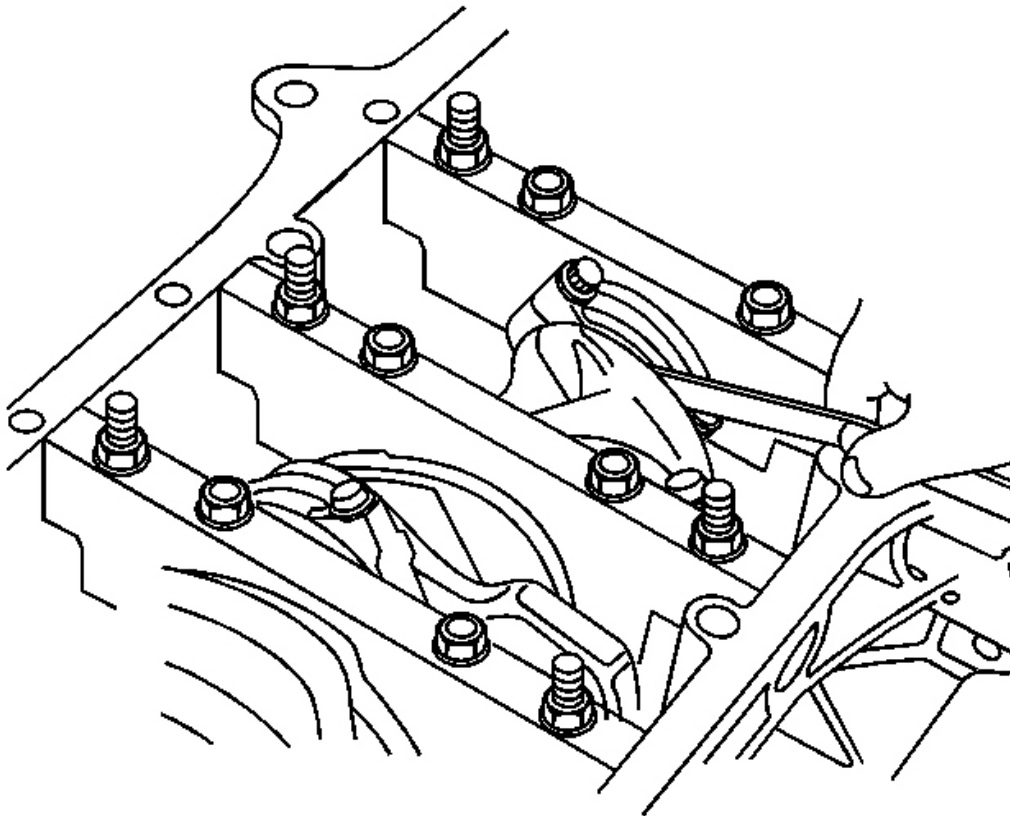


Fig. 545: View Of Connecting Rod Side Clearance
Courtesy of GENERAL MOTORS CORP.

12. Measure the connecting rods for the proper side clearance. Refer to **Engine Mechanical Specifications**.

CAMSHAFT INSTALLATION

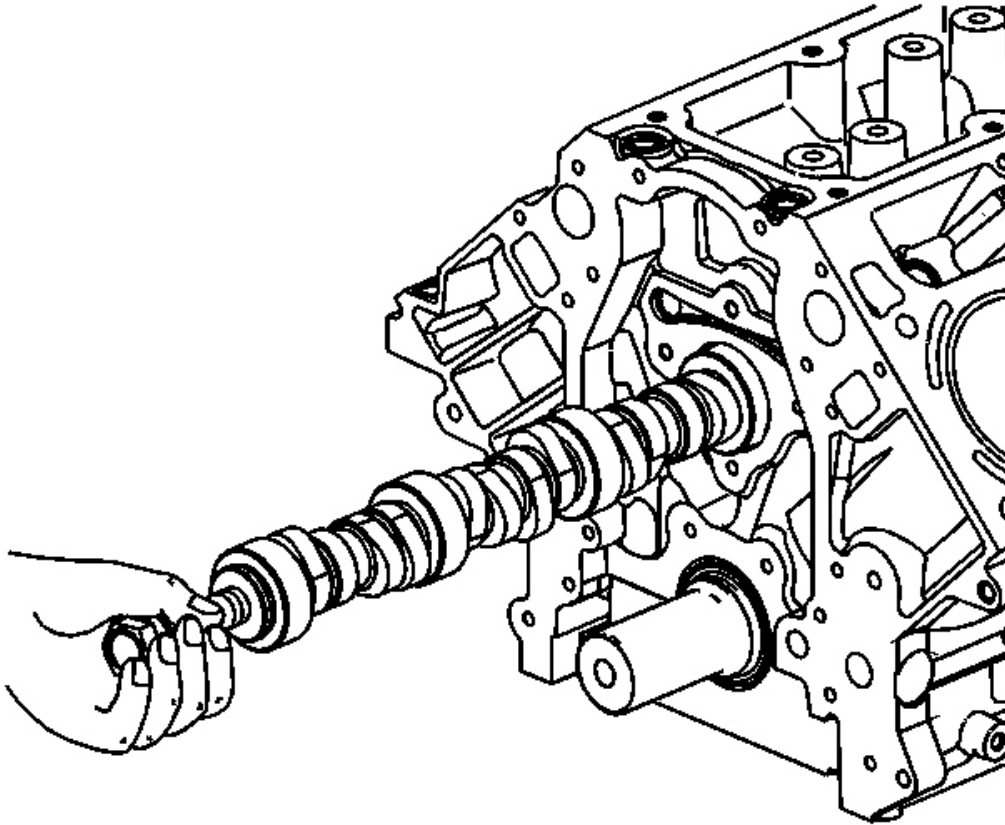


Fig. 546: View Of Camshaft

Courtesy of GENERAL MOTORS CORP.

IMPORTANT: If camshaft replacement is required, the valve lifters must also be replaced.

1. Lubricate the camshaft journals and the bearings with clean engine oil.
2. Install the camshaft sprocket bolt into the camshaft front bolt hole.

NOTE: All camshaft journals are the same diameter, so care must be used in removing or installing the camshaft to avoid damage to the camshaft bearings.

3. Using the bolt as a handle, carefully install the camshaft into the engine block.
4. Remove the bolt from the front of the camshaft.

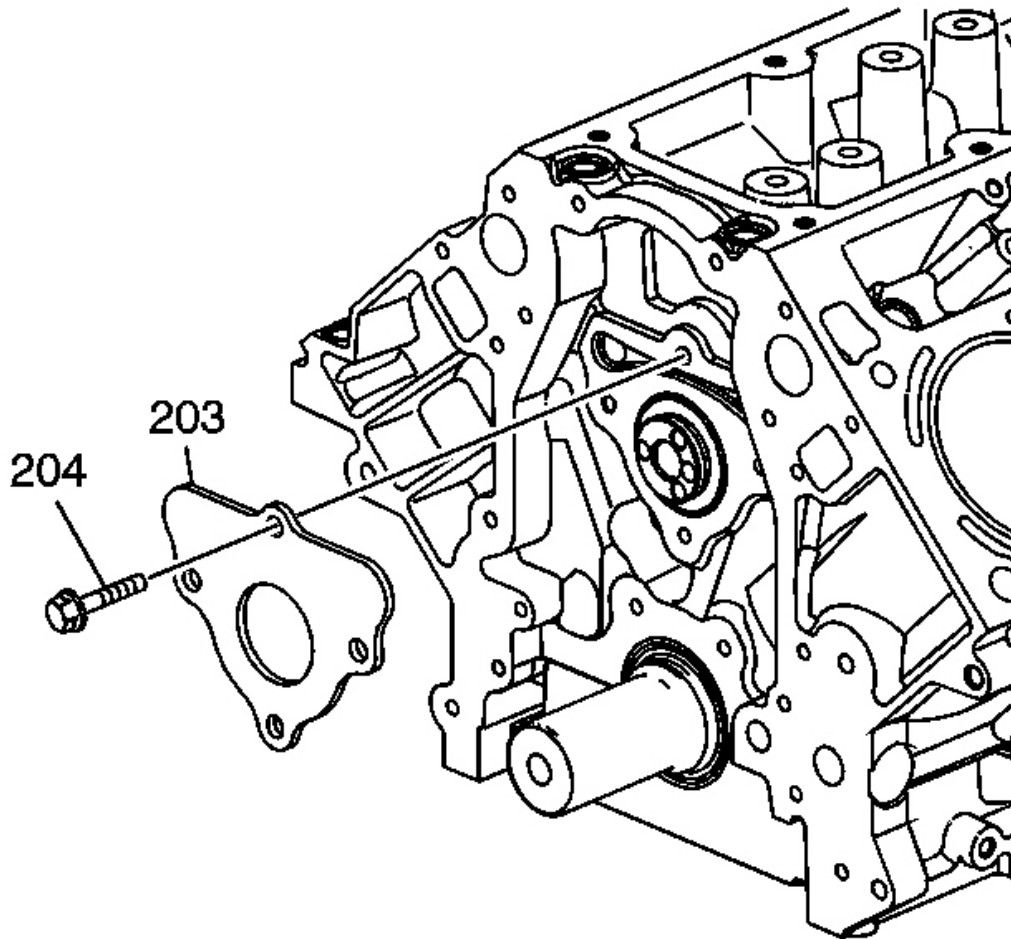


Fig. 547: View Of Camshaft Retainer
Courtesy of GENERAL MOTORS CORP.

IMPORTANT: The gasket surface on the engine block should be clean and free of dirt or debris.

5. Install the camshaft retainer (203) and the bolts (204). Install the retainer with the sealing gasket facing the front of the engine block.

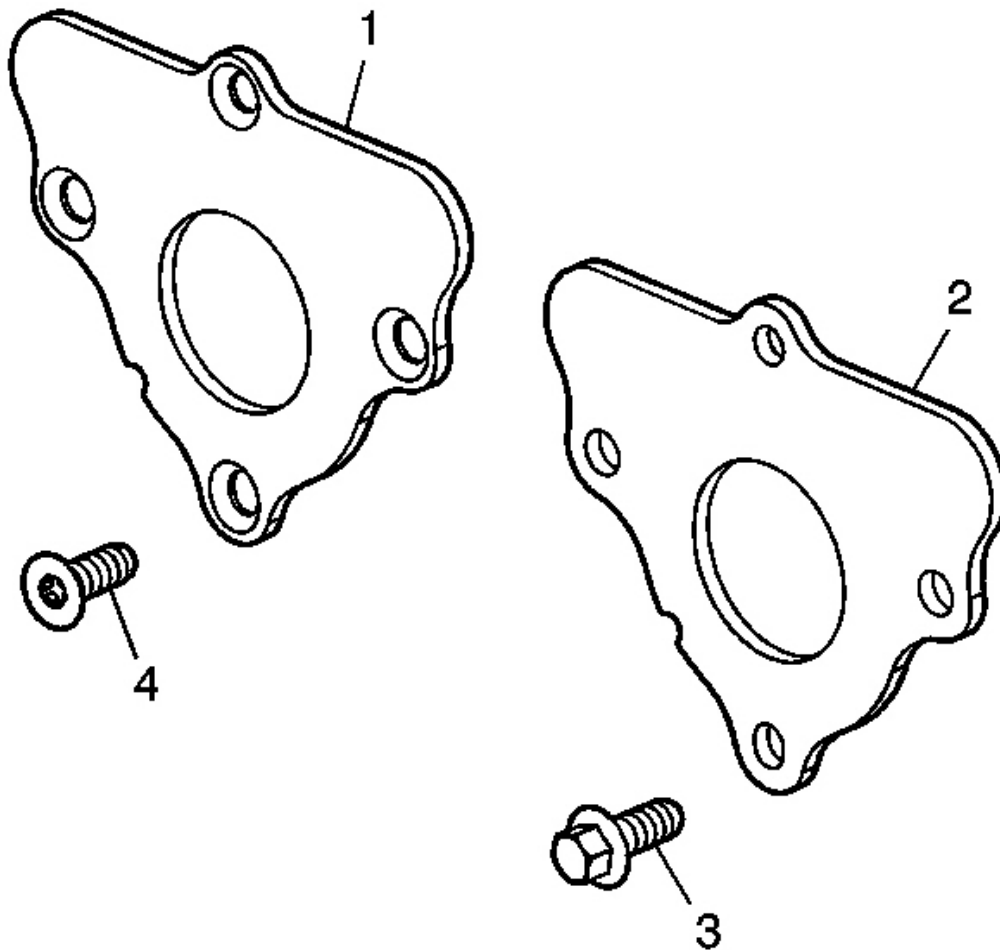


Fig. 548: Identifying Camshaft Retainer Bolts
Courtesy of GENERAL MOTORS CORP.

NOTE: Refer to Fastener Notice .

6. Tighten the camshaft retainer bolts.

Tighten:

- Tighten the first design hex head bolts (3) to 25 N.m (18 lb ft).
- Tighten the second design TORX® head bolts (4) to 15 N.m (11 lb ft).

Tools Required

- **EN 46330** Timing Belt Tensioner Retaining Pin
- **J 41478** Crankshaft Front Oil Seal Installer
- **J 41665** Crankshaft Balancer and Sprocket Installer
- **J 42386-A** Flywheel Holding Tool
- **J 45059** Angle Meter

Installation Procedure

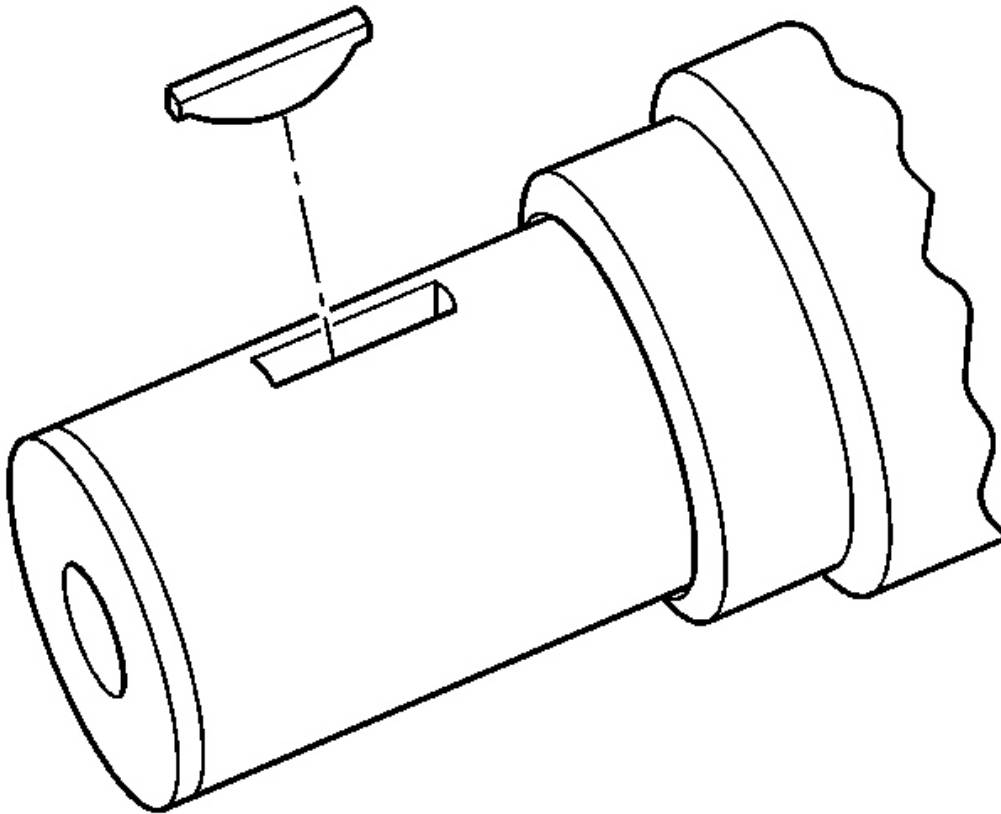


Fig. 549: View Of Crankshaft Key & Keyway
Courtesy of GENERAL MOTORS CORP.

1. Install the key into the crankshaft keyway, if previously removed.

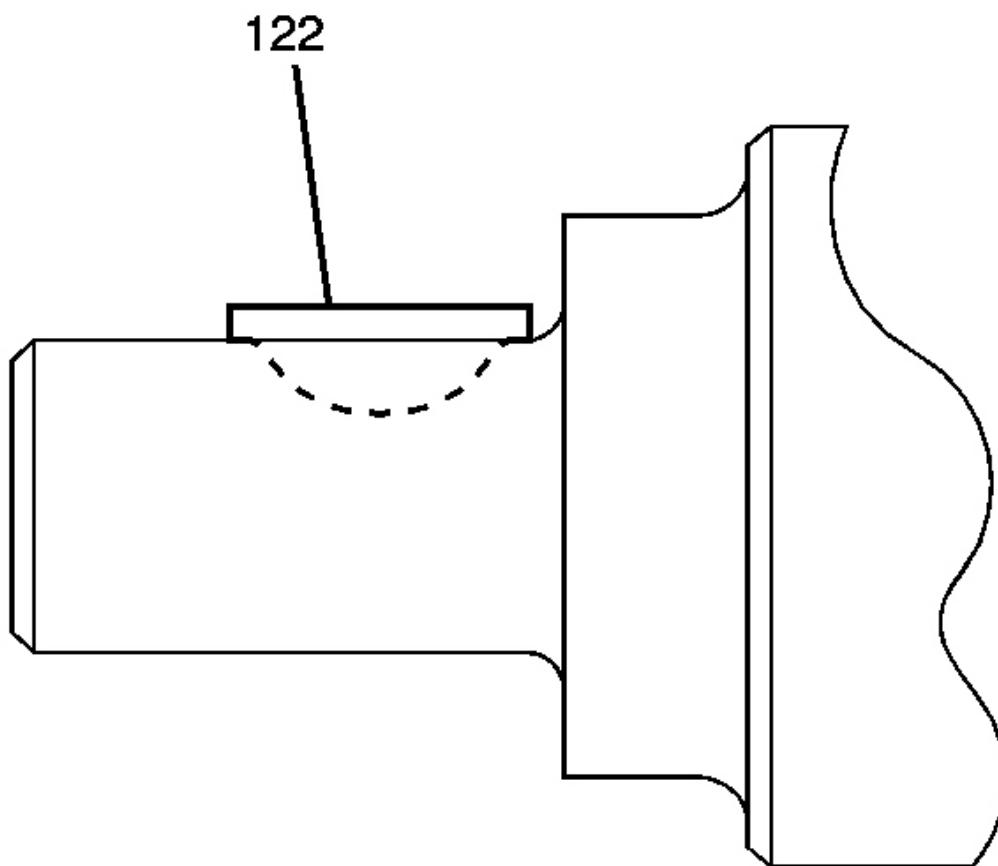


Fig. 550: View Of Installed Crankshaft Key
Courtesy of GENERAL MOTORS CORP.

2. Tap the key (122) into the keyway until both ends of the key bottom onto the crankshaft.

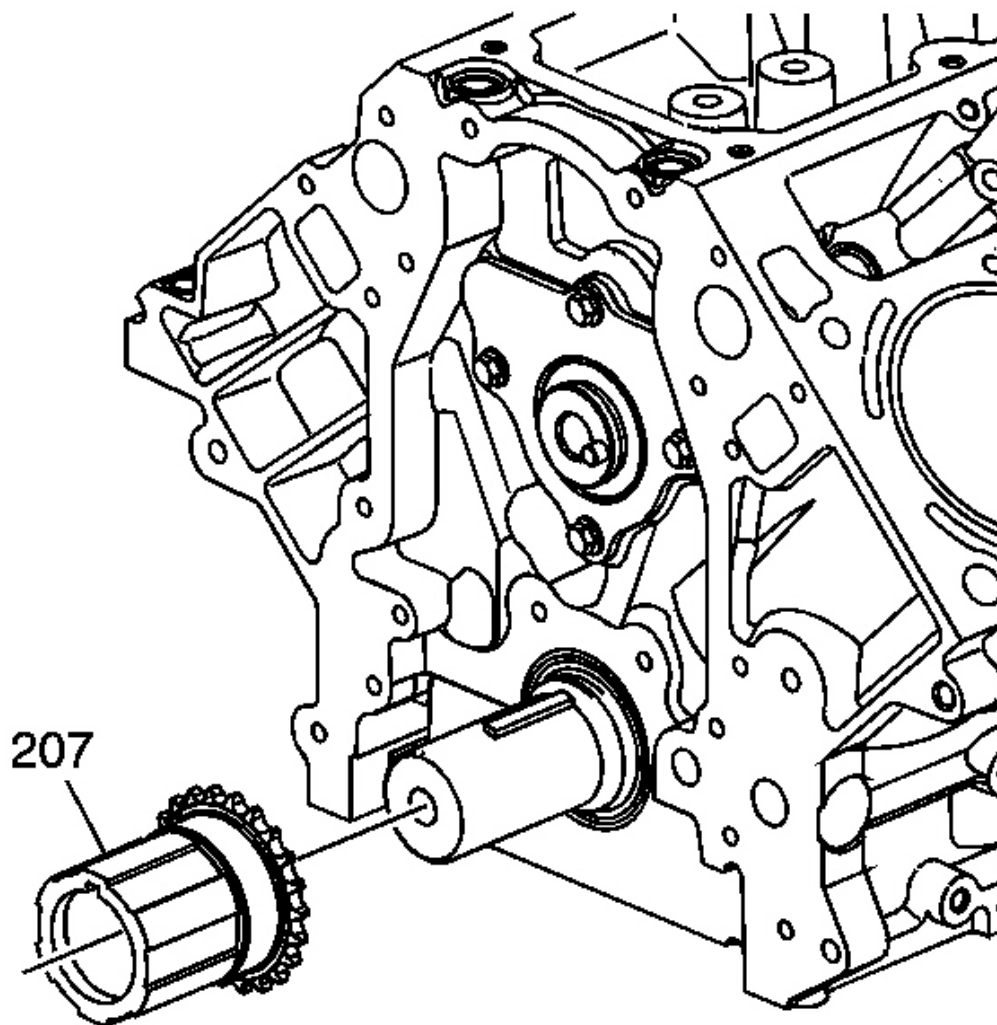


Fig. 551: View Of Crankshaft Sprocket
Courtesy of GENERAL MOTORS CORP.

3. Install the crankshaft sprocket (207) onto the front of the crankshaft. Align the crankshaft key with the crankshaft sprocket keyway.

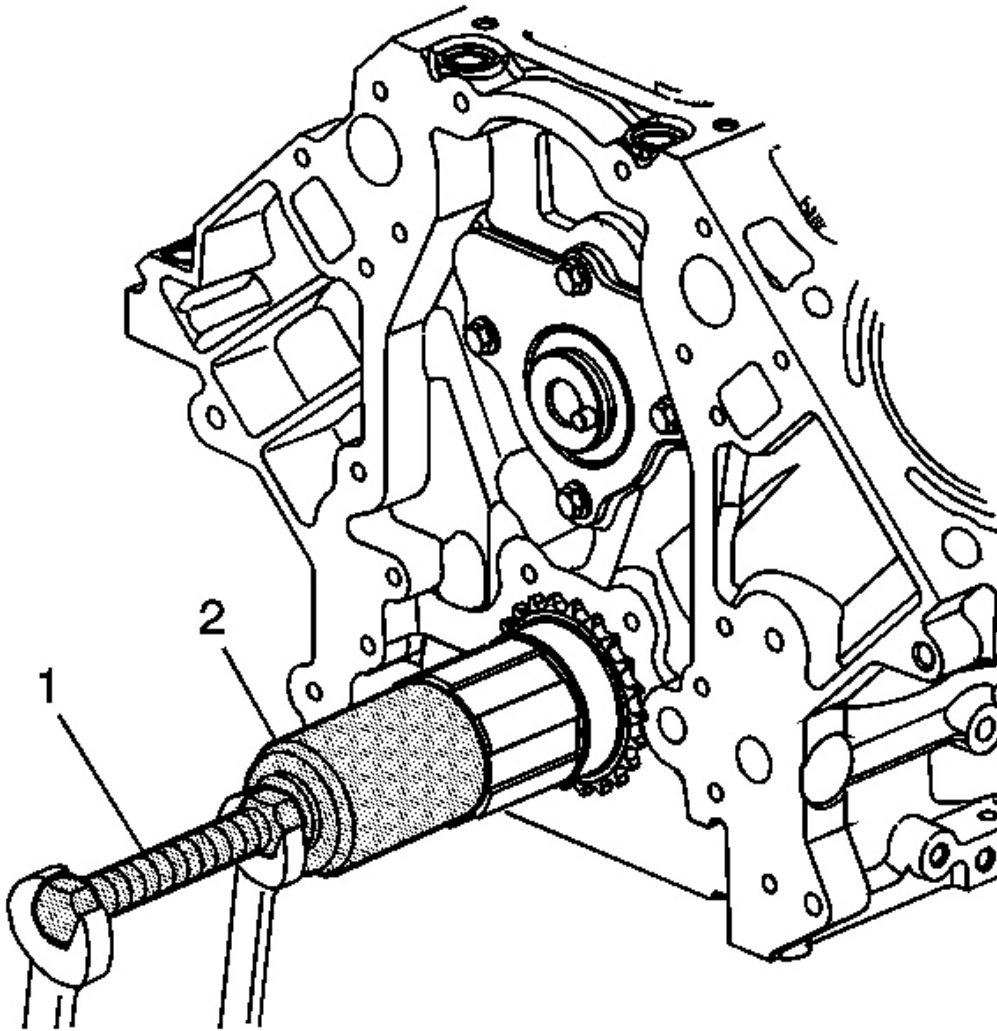


Fig. 552: View Of Crankshaft Sprocket & Installer
Courtesy of GENERAL MOTORS CORP.

4. Use the **J 41478** (1) and the **J 41665** (2) in order to install the crankshaft sprocket.

Install the sprocket onto the crankshaft until fully seated against the crankshaft flange.

5. Rotate the crankshaft sprocket until the alignment mark is in the 12 o'clock position.

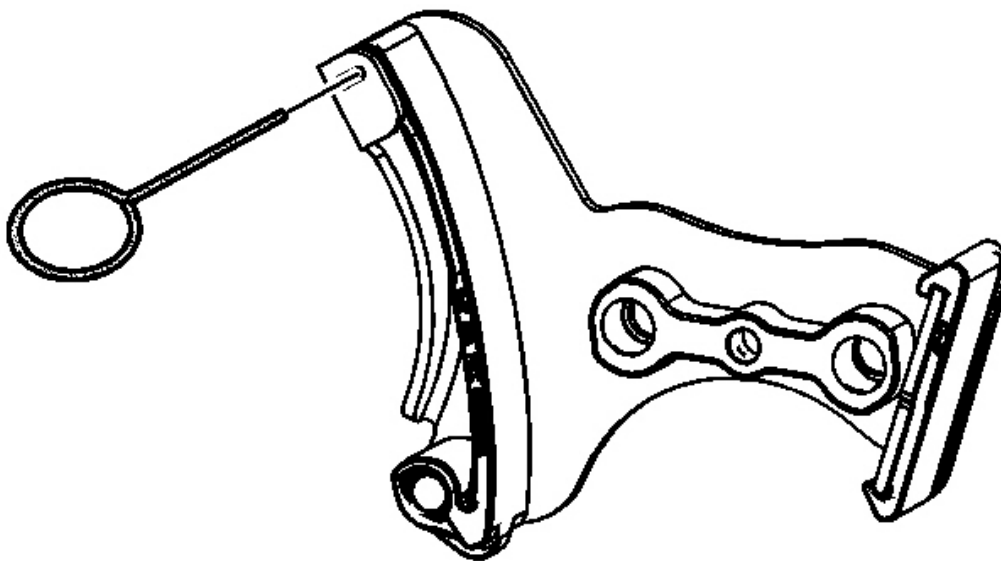


Fig. 553: View Of Compressed Tensioner
Courtesy of GENERAL MOTORS CORP.

6. Compress the timing chain tensioner guide and install the **EN 46330** .

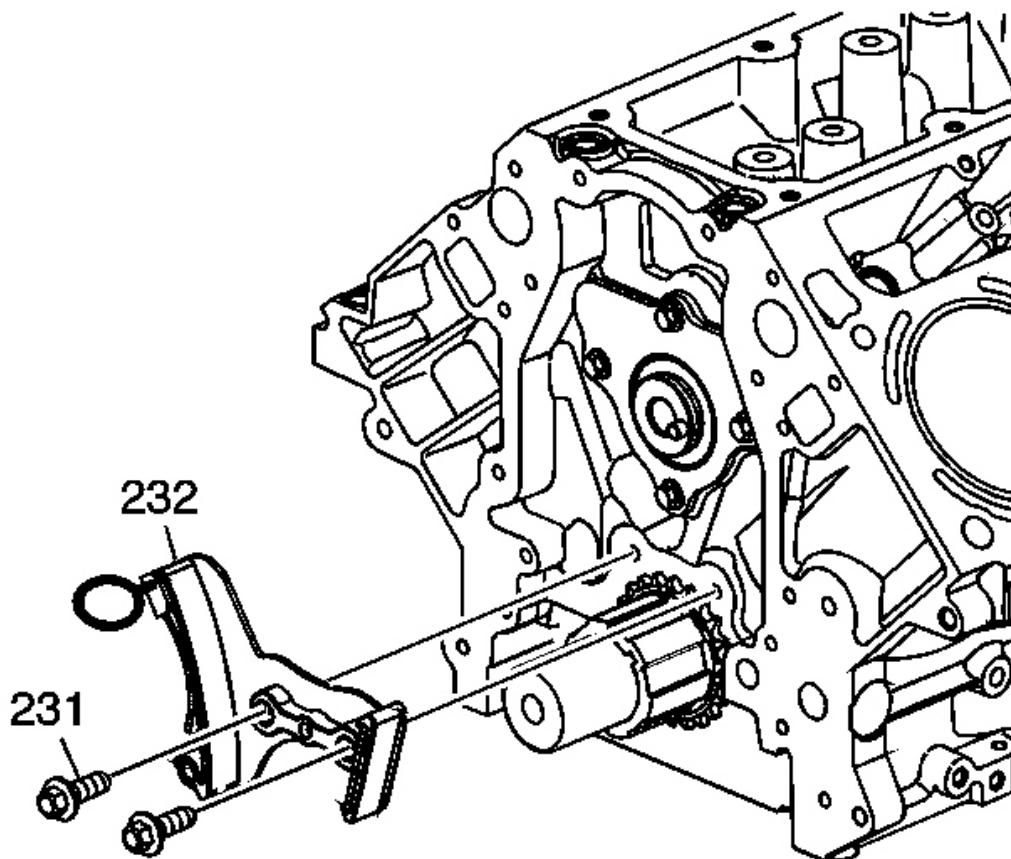


Fig. 554: View Of Timing Chain Tensioner
Courtesy of GENERAL MOTORS CORP.

NOTE: Refer to Fastener Notice .

7. Install the timing chain tensioner (232) and bolts (231).

Tighten: Tighten the timing chain tensioner bolts to 25 N.m (18 lb ft).

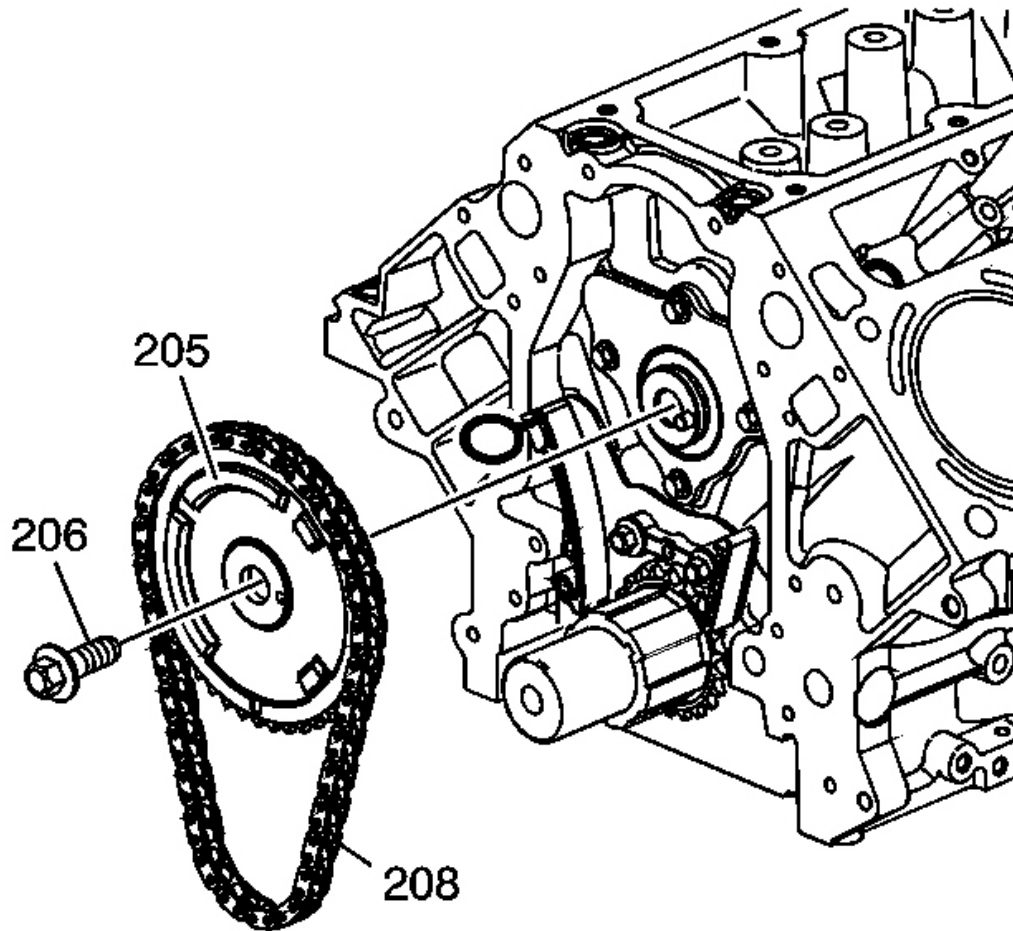


Fig. 555: View Of Camshaft Sprocket & Timing Chain
Courtesy of GENERAL MOTORS CORP.

IMPORTANT:

- The sprocket teeth and timing chain must mesh.
- The camshaft and the crankshaft sprocket alignment marks **MUST** be aligned properly.

8. Install the camshaft sprocket (205), timing chain (208) and bolt (206).

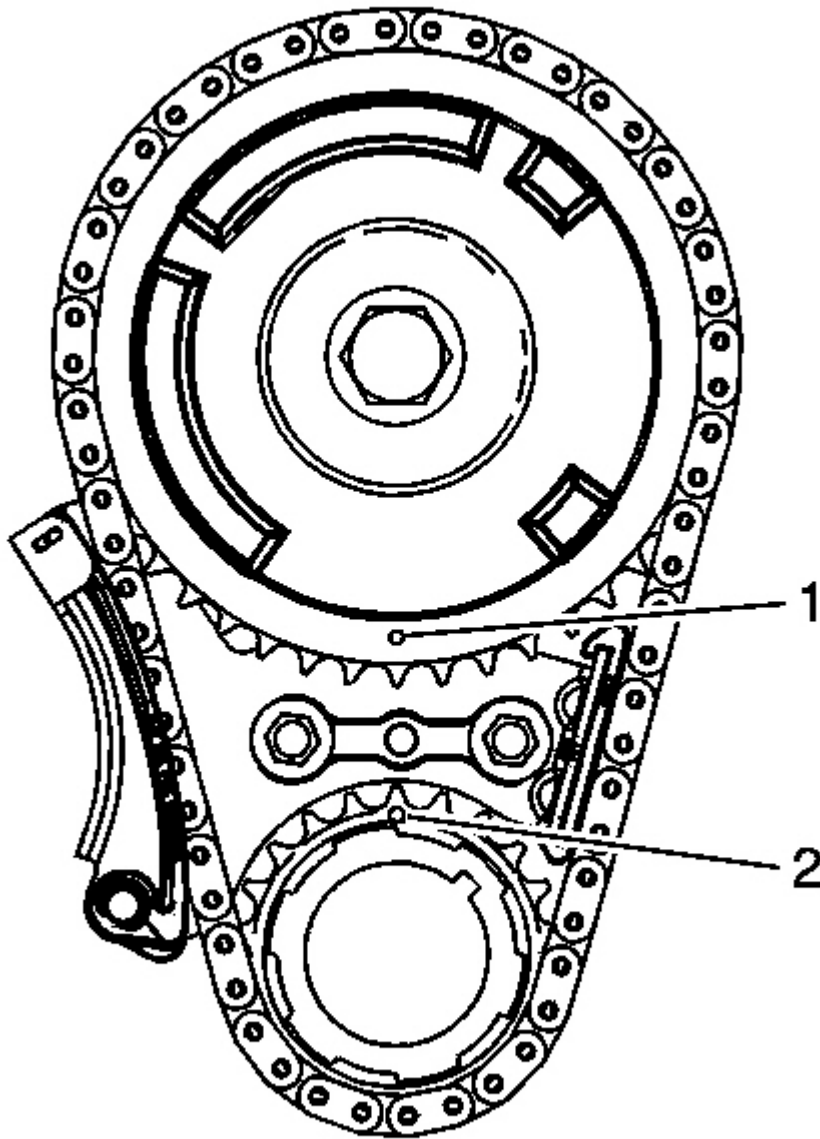


Fig. 556: Aligning Camshaft & Crankshaft Marks
Courtesy of GENERAL MOTORS CORP.

9. Inspect the sprockets for proper alignment. The mark on the camshaft sprocket (1) should be located in the 6 o'clock position and the mark on the crankshaft sprocket (2) should be located in the 12 o'clock position.

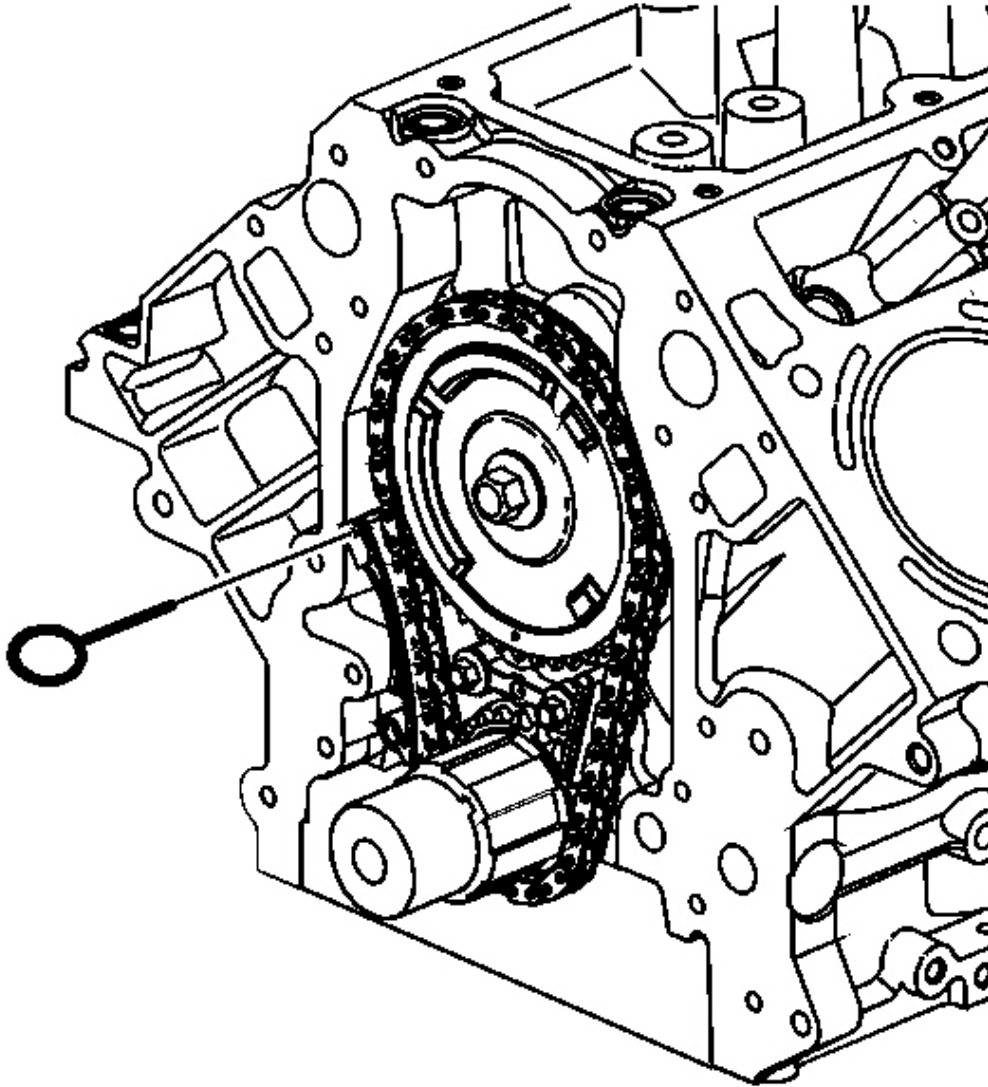


Fig. 557: Locating Tensioner Pin
Courtesy of GENERAL MOTORS CORP.

10. Remove the **EN 46330** .

IMPORTANT: Do not apply threadlock to the flex plate bolts at this time.

11. Temporarily install the automatic transmission flex plate or manual transmission flywheel and bolts.

Refer to Engine Flywheel Installation.

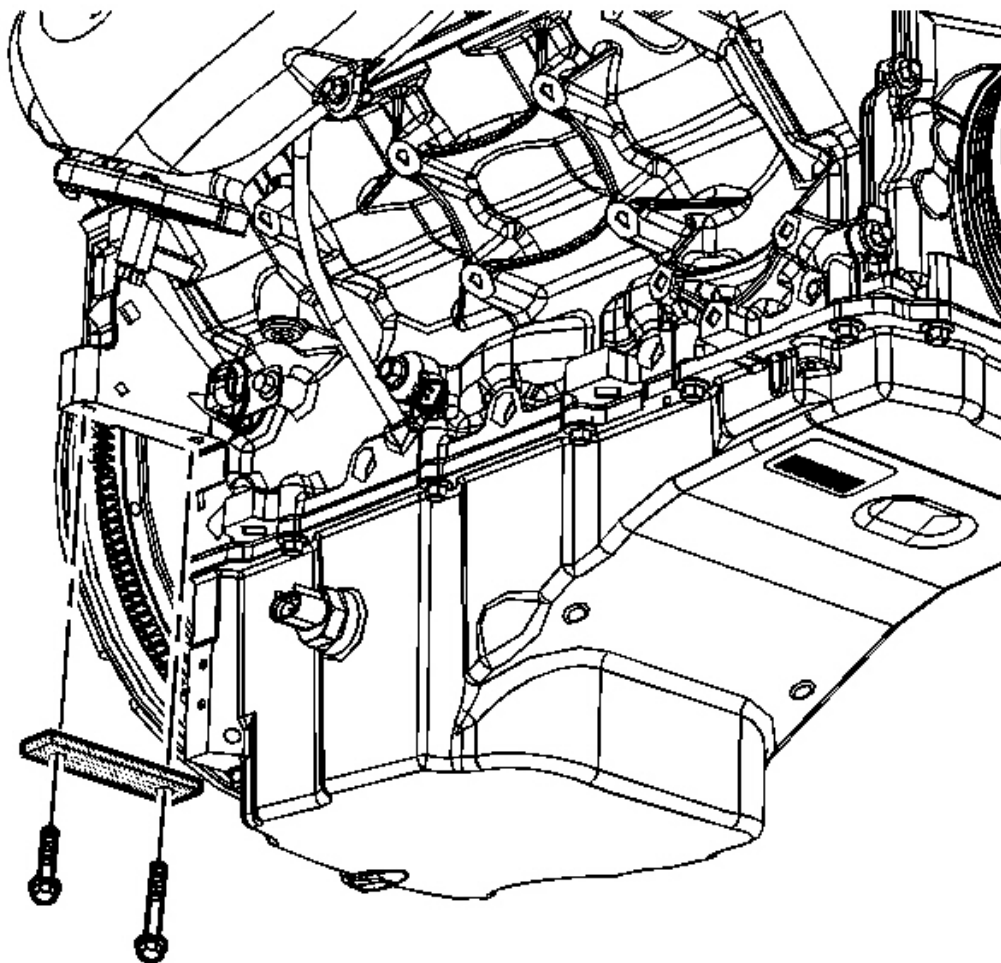


Fig. 558: Identifying J 42386-A Flywheel Holding Tool
Courtesy of GENERAL MOTORS CORP.

12. Install the **J 42386-A** and bolts. Use 1 M10-1.5 x 120 mm bolt and 1 M10-1.5 x 45 mm bolt for proper tool operation.

Tighten: Tighten the **J 42386-A** bolts to 50 N.m (37 lb ft).

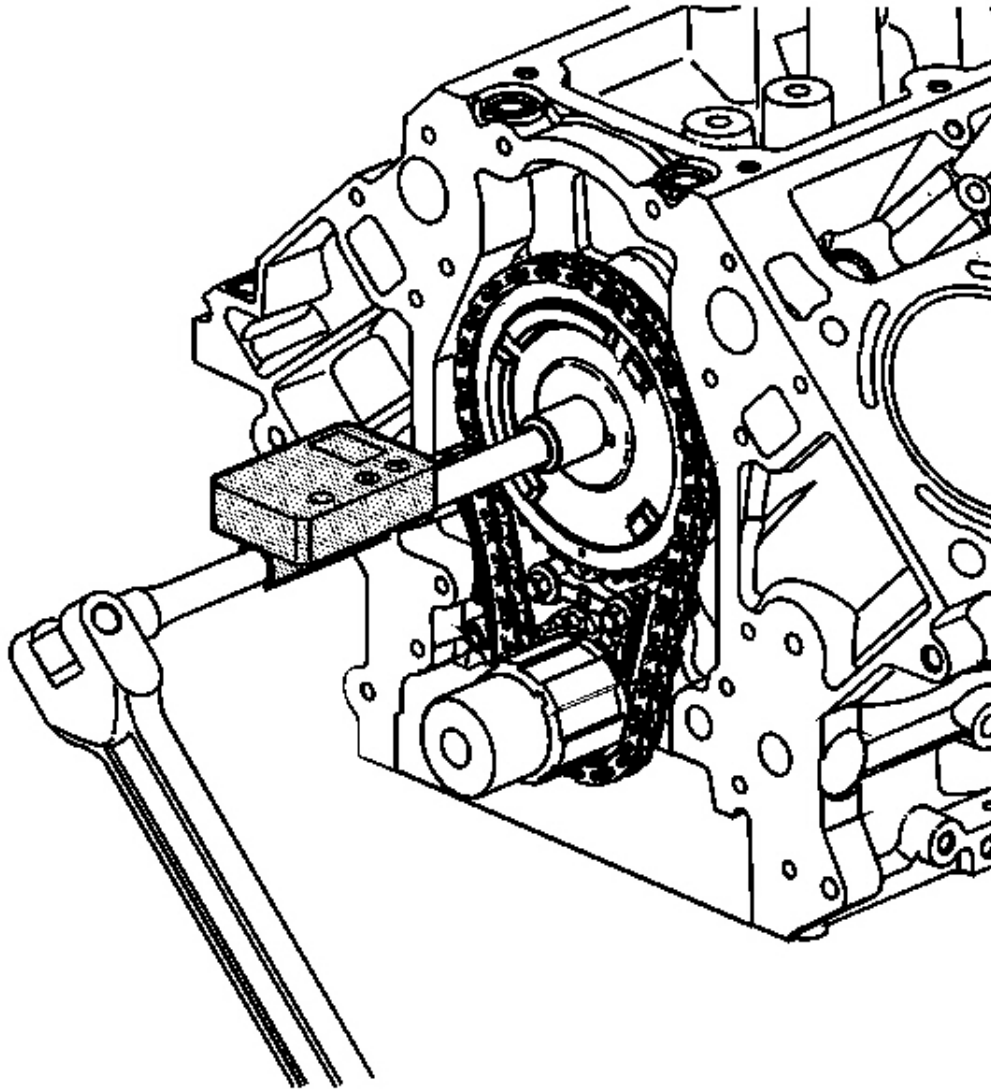


Fig. 559: Identifying Camshaft Sprocket Bolt Tightening Sequence
Courtesy of GENERAL MOTORS CORP.

13. Tighten the camshaft sprocket bolt.

Tighten:

1. Tighten the camshaft sprocket bolt a first pass to 90 N.m (66 lb ft).
2. Tighten the camshaft sprocket bolt a final pass an additional 40 degrees using the **J 45059**.

14. Remove the **J 42386-A** and bolts.
15. Remove the automatic transmission flex plate or manual transmission flywheel and bolts. Refer to **Engine Flywheel Removal**.

OIL PUMP, SCREEN AND CRANKSHAFT OIL DEFLECTOR INSTALLATION

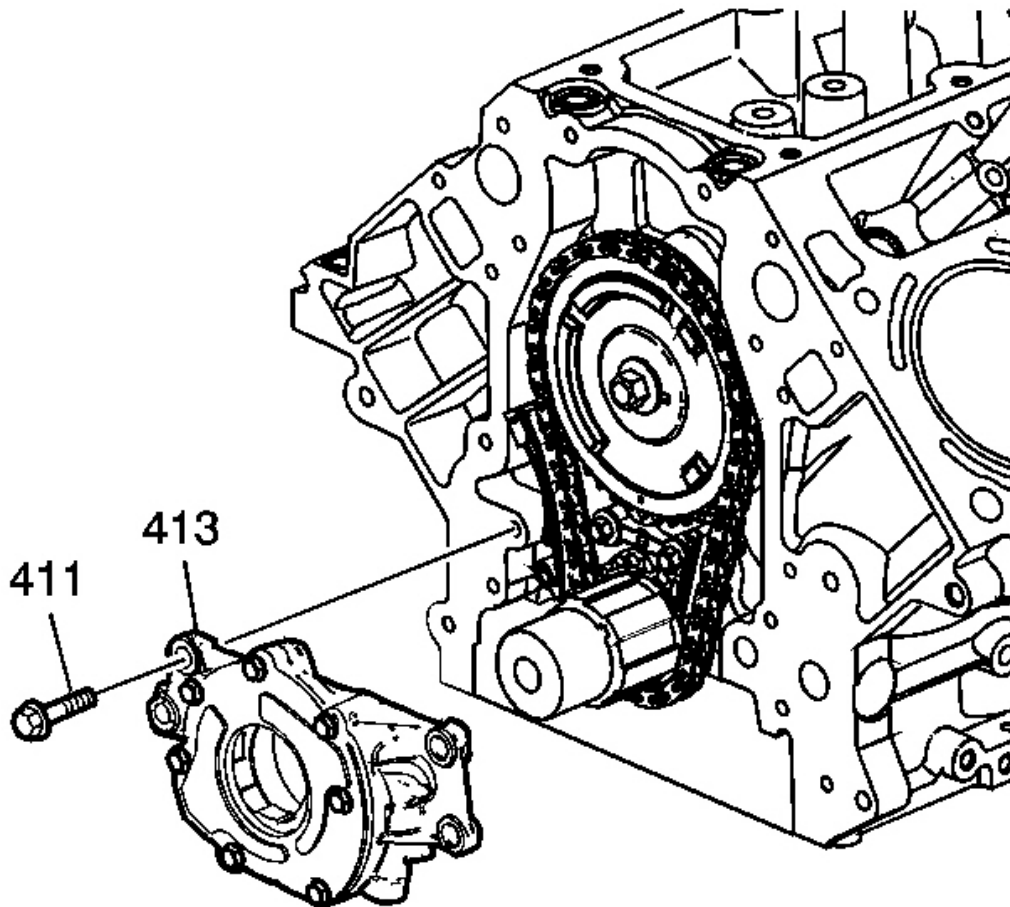


Fig. 560: View Of Oil Pump & Bolts
Courtesy of GENERAL MOTORS CORP.

IMPORTANT: Inspect the oil pump and engine block oil gallery passages. These surfaces must be clear and free of debris or restrictions.

1. Align the splined surfaces of the crankshaft sprocket and the oil pump drive gear and install the oil pump (413).

2. Install the oil pump onto the crankshaft sprocket until the pump housing contacts the face of the engine block.

NOTE: Refer to Fastener Notice .

3. Install the oil pump bolts (411).

Tighten: Tighten the oil pump bolts to 25 N.m (18 lb ft).

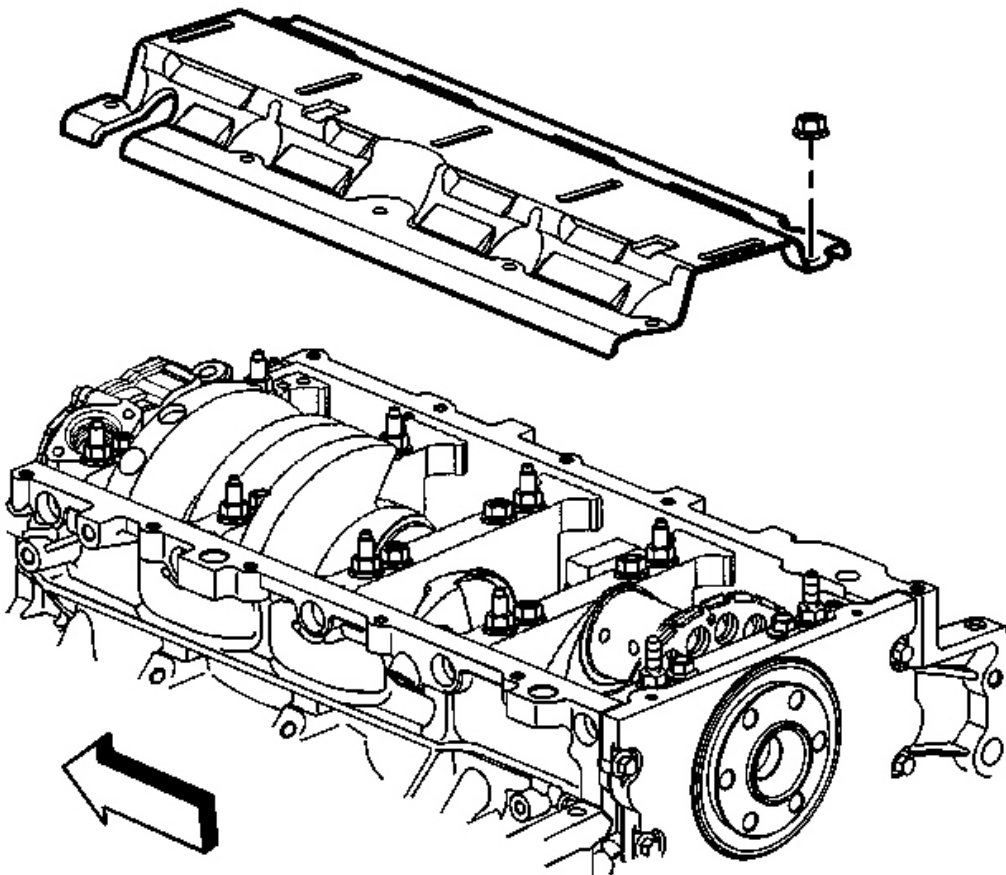


Fig. 561: View Of Crankshaft Oil Deflector
Courtesy of GENERAL MOTORS CORP.

4. Install the crankshaft oil deflector.

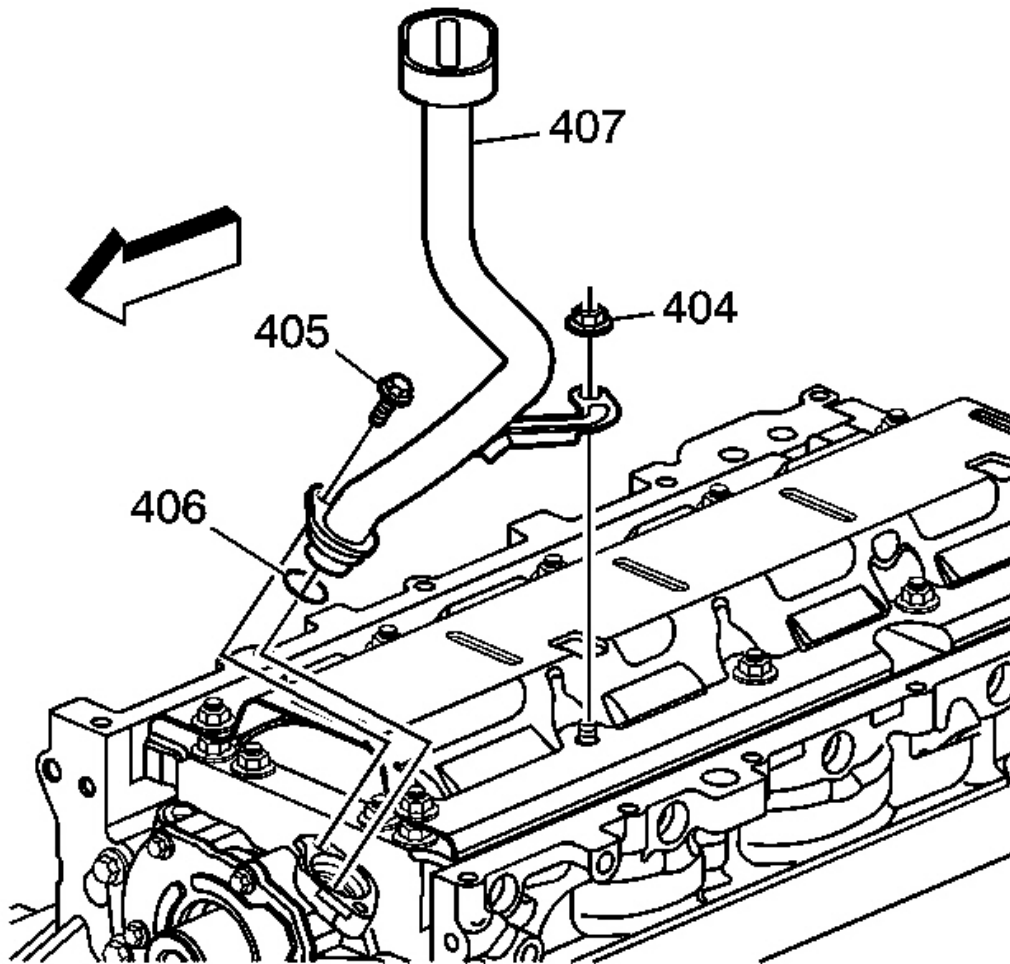


Fig. 562: View Of Oil Pump Screen, Bolt, Nuts & O-Ring Seal
Courtesy of GENERAL MOTORS CORP.

5. Lubricate a NEW oil pump screen O-ring seal (406) with clean engine oil.
6. Install the NEW O-ring seal onto the oil pump screen.

IMPORTANT:

- Push the oil pump screen tube completely into the oil pump prior to tightening the bolt. Do not allow the bolt to pull the tube into the pump.
- Align the oil pump screen mounting brackets with the correct crankshaft bearing cap bolt/studs.

2007 Chevrolet TrailBlazer

2007 ENGINE Engine Mechanical - 6.0L - TrailBlazer

7. Install the oil pump screen (407).
8. Install the oil pump screen bolt (405) and the deflector nut (404).

Tighten:

1. Tighten the oil pump screen bolt to 12 N.m (106 lb in).
2. Tighten the crankshaft oil deflector nut to 25 N.m (18 lb ft).

CRANKSHAFT REAR OIL SEAL HOUSING INSTALLATION

Tools Required

- **J 41476** Front and Rear Cover Alignment Tool
- **J 41480** Front and Rear Cover Alignment

Installation Procedure

2007 Chevrolet TrailBlazer

2007 ENGINE Engine Mechanical - 6.0L - TrailBlazer

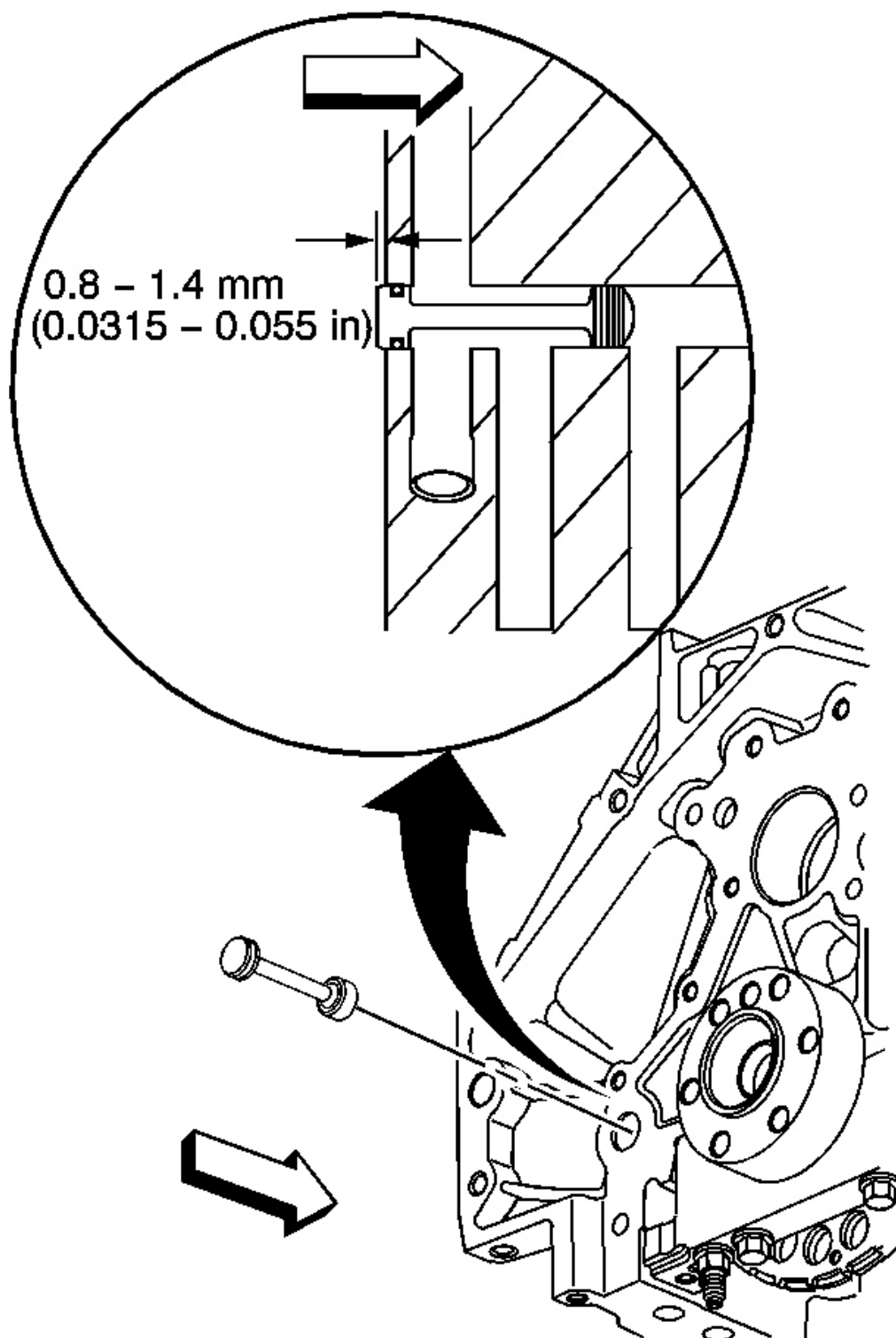


Fig. 563: View Of Engine Block Rear Oil Gallery Plug

Courtesy of GENERAL MOTORS CORP.

IMPORTANT:

- Do not use the crankshaft rear oil seal or the engine rear housing gasket again.
- Do not apply any type of sealant to the rear housing gasket, unless specified.
- The special tools in this procedure are used to properly align the engine rear housing at the oil pan surface and to center the crankshaft rear oil seal.
- The crankshaft rear oil seal will be installed after the rear housing has been installed and aligned. Install the rear housing without the crankshaft oil seal.
 - The crankshaft rear oil seal **MUST** be centered in relation to the crankshaft.
 - The oil pan sealing surface at the rear housing and engine block **MUST** be aligned within specifications.
 - An improperly aligned rear housing may cause premature rear oil seal wear and/or engine assembly oil leaks.

1. Inspect the rear oil gallery plug for proper installation.

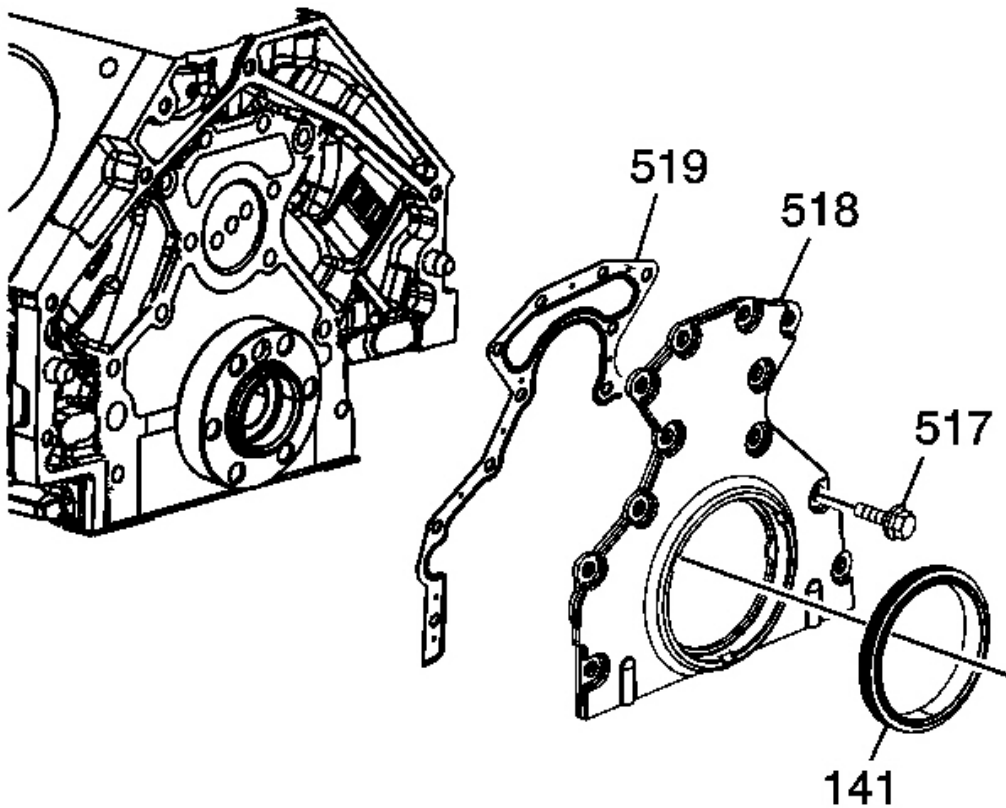


Fig. 564: View of Rear Housing, Gasket & Seal
Courtesy of GENERAL MOTORS CORP.

2. Install the rear housing gasket (519), rear housing (518) and bolts (517).
3. Tighten the bolts finger tight. Do not overtighten.

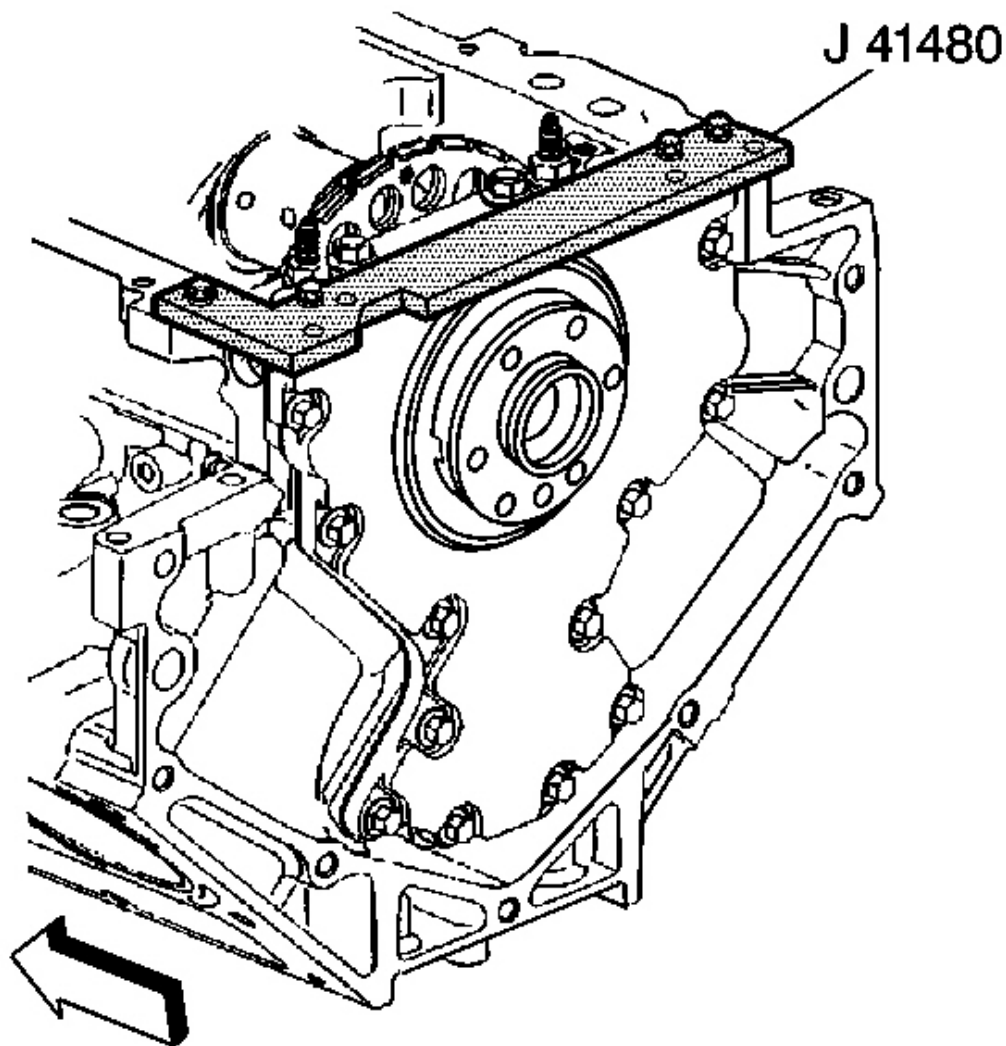


Fig. 565: View Of J 41480 Installed To Engine Block
Courtesy of GENERAL MOTORS CORP.

NOTE: Refer to Fastener Notice .

IMPORTANT: Start the J 41480 tool-to-rear housing bolts. Do not tighten the bolts at this time.

4. Install the **J 41480** and bolts.

Tighten: Tighten the tool-to-engine block bolts to 25 N.m (18 lb ft).

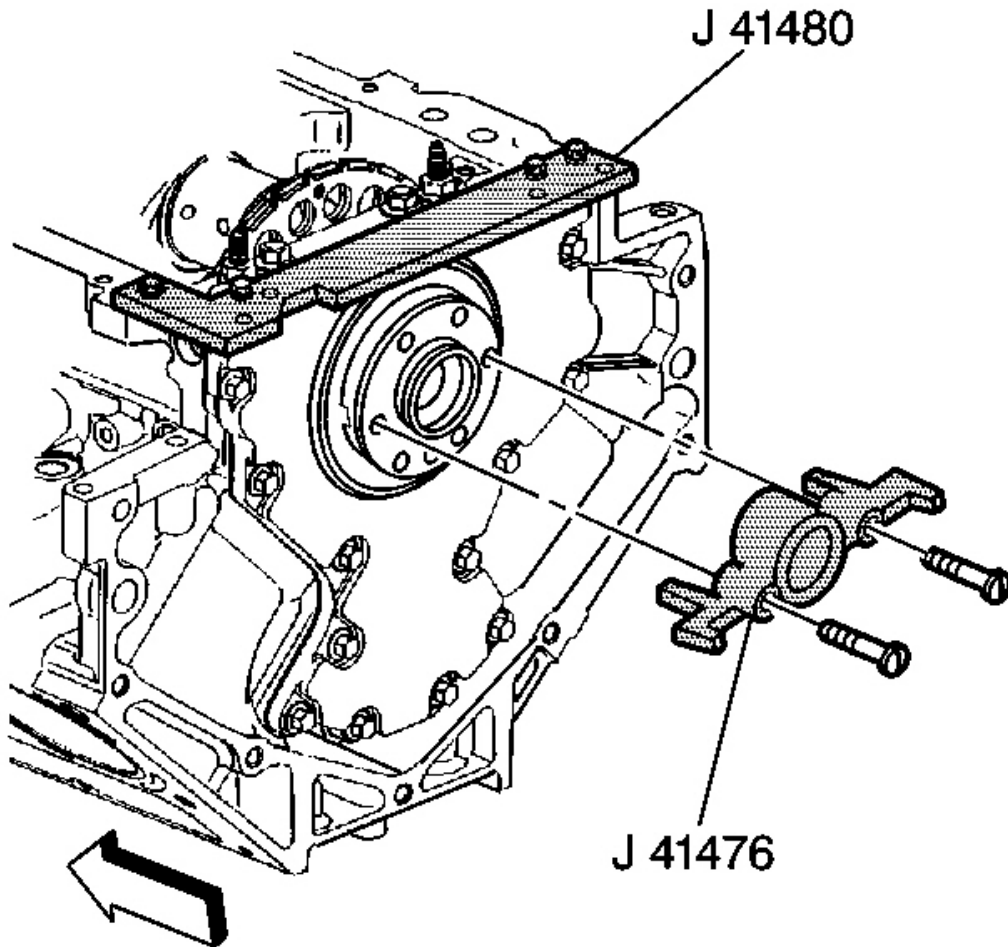


Fig. 566: View Of J 41480 & J 41476
Courtesy of GENERAL MOTORS CORP.

IMPORTANT: To properly align the rear housing, the J 41476 must be installed onto the rear of the crankshaft with the tool mounting bolts parallel to the oil pan surface.

5. Rotate the crankshaft until 2 opposing flywheel bolt holes are parallel to the oil pan surface.

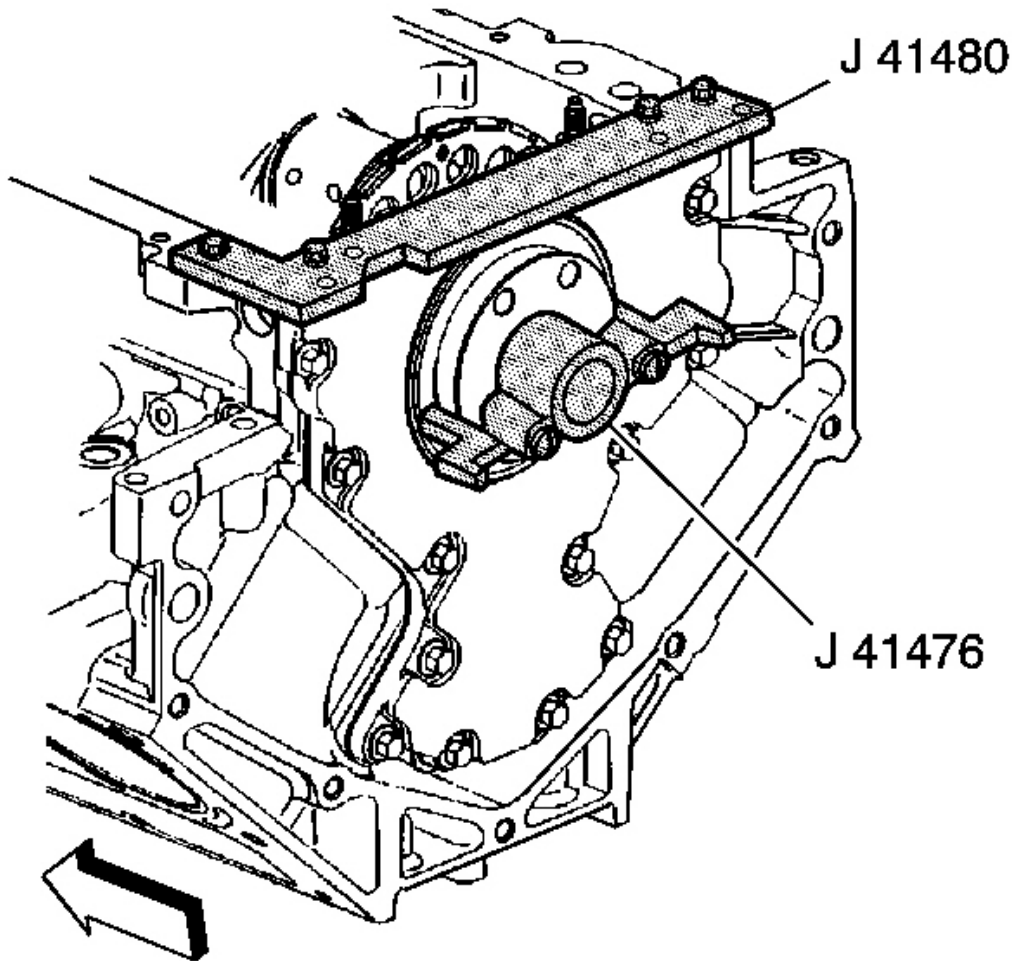


Fig. 567: View Of J 41480 & J 41476 Installed
Courtesy of GENERAL MOTORS CORP.

IMPORTANT: The tapered legs of the alignment tool must enter the rear housing oil seal bore.

6. Install the **J 41476** and bolts onto the rear of the crankshaft.

Tighten:

1. Tighten the tool mounting bolts until snug. Do not overtighten.
2. Tighten the **J 41480** tool-to-rear housing bolts evenly to 12 N.m (106 lb in).
3. Tighten the rear housing bolts to 30 N.m (22 lb ft).

7. Remove the tools.

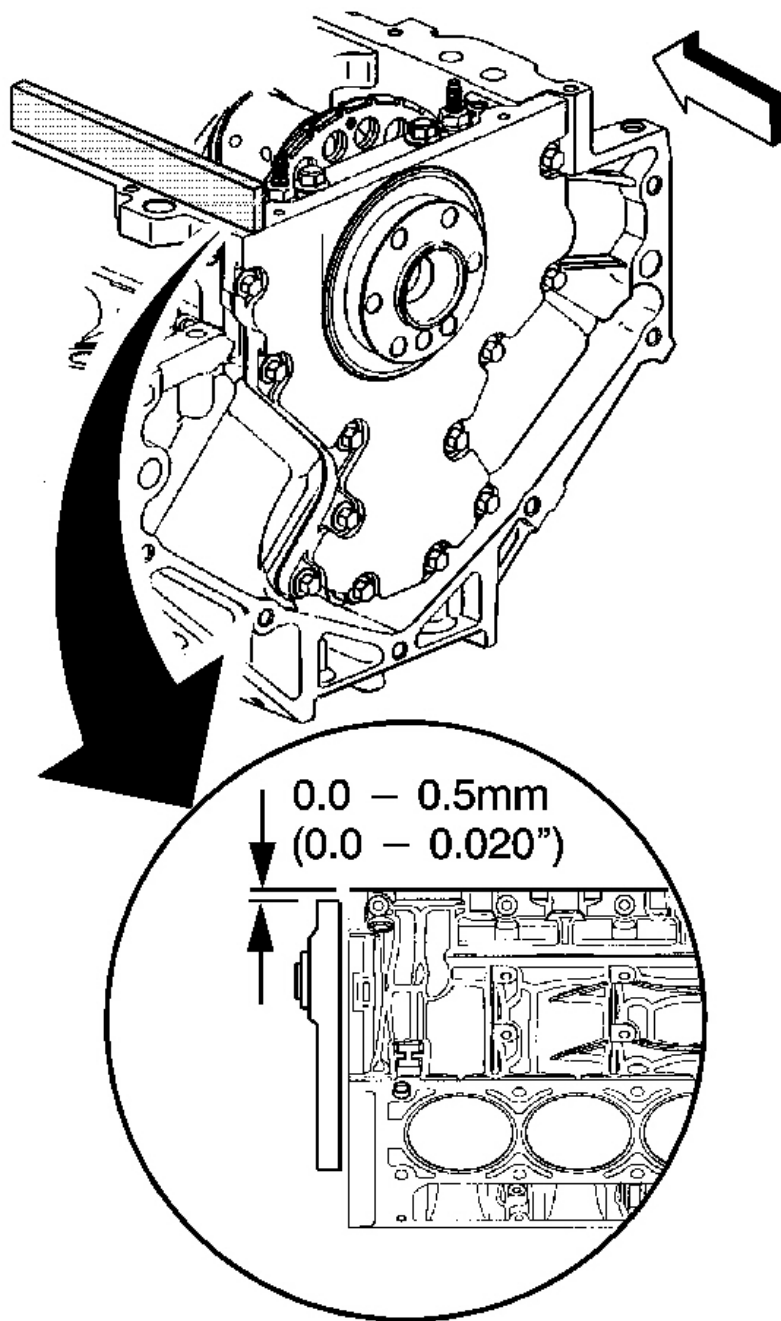


Fig. 568: View Of Rear Cover-To-Engine Block Proper Installation Position
Courtesy of GENERAL MOTORS CORP.

2007 Chevrolet TrailBlazer

2007 ENGINE Engine Mechanical - 6.0L - TrailBlazer

8. Measure the rear housing-to-engine block oil pan surface for flatness.

1. Place a straight edge onto the engine block and rear housing oil pan sealing surfaces.

Avoid contact with the portion of the gasket that protrudes into the oil pan surface.

2. Insert a feeler gage between the rear housing and the straight edge. The housing must be flush with the oil pan or no more than 0.5 mm (0.02 in) below flush.

9. If the rear housing-to-engine block oil pan surface alignment is not within specifications, repeat the housing alignment procedure.

10. If the correct rear housing-to-engine block alignment at the oil pan surface cannot be obtained, replace the rear housing.

CRANKSHAFT REAR OIL SEAL INSTALLATION

Tools Required

- **J 41479** Crankshaft Rear Oil Seal Installer
- **J 41479-2A** Crankshaft Rear Oil Seal Installation Guide. See **Special Tools**.

Installation Procedure

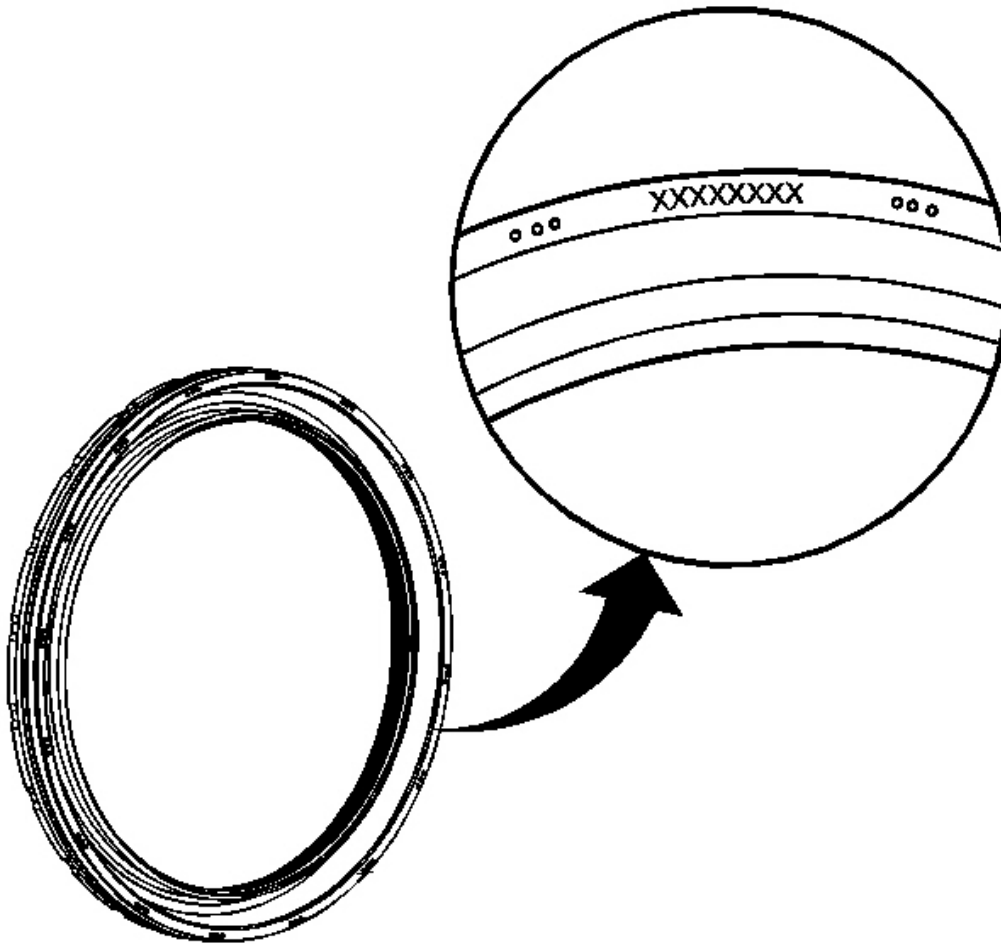


Fig. 569: Identifying Oil Seal

Courtesy of GENERAL MOTORS CORP.

IMPORTANT: For proper orientation, note the installation direction of the oil seal. The oil seal is a reverse-lip design. The part number is applied to the outside face of the seal, as shown.

1. Inspect the seal and identify the part number markings for proper orientation.

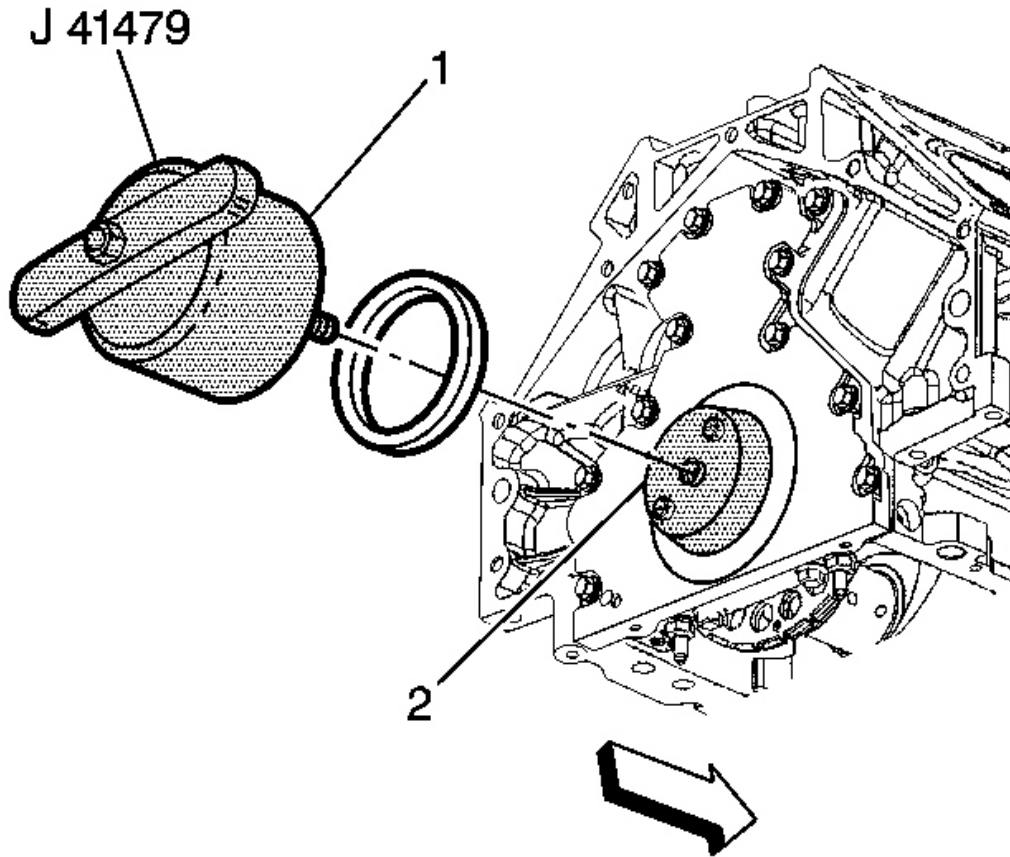


Fig. 570: View Of J 41479 Cone & Bolts
Courtesy of GENERAL MOTORS CORP.

2. Install the **J 41479** or **J 41479-2A** cone (2) and bolts onto the rear of the crankshaft. See **Special Tools**. **J 41479-2A** may be required for manual transmission applications.
3. Tighten the bolts until snug. Do not overtighten.
4. Install the rear oil seal onto the tapered cone (2) and push the seal to the rear seal bore. Install the oil seal with the part number markings facing away from the engine.
5. Thread the **J 41479** threaded rod into the tapered cone until the tool (1) contacts the oil seal.
6. Align the oil seal onto the tool (1).
7. Rotate the handle of the tool (1) clockwise until the seal enters the rear housing and bottoms into the seal bore.
8. Remove the tool.

Tools Required

- **J 41476** Front and Rear Cover Alignment Tool
- **J 41480** Front and Rear Cover Alignment

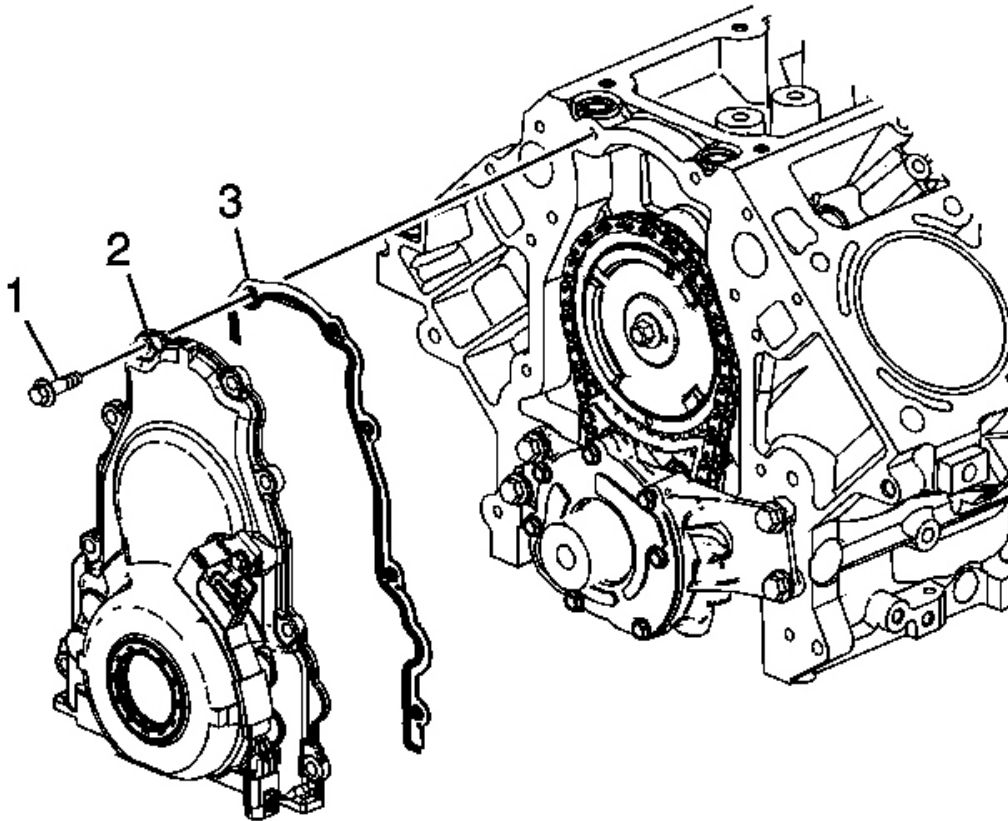
Installation Procedure

Fig. 571: View Of Front Cover & Gasket
Courtesy of GENERAL MOTORS CORP.

IMPORTANT:

- Do not use the crankshaft oil seal or the engine front cover gasket again.
- Do not apply any type of sealant to the front cover gasket, unless specified.
- The special tools in this procedure are used to properly align the engine front cover at the oil pan surface and to center the crankshaft

2007 Chevrolet TrailBlazer

2007 ENGINE Engine Mechanical - 6.0L - TrailBlazer

front oil seal.

- **All gasket surfaces should be free of oil or other foreign material during assembly.**

The crankshaft front oil seal MUST be centered in relation to the crankshaft.

- **The oil pan sealing surface at the front cover and engine block MUST be aligned within specifications.**
- **An improperly aligned front cover may cause premature front oil seal wear and/or engine assembly oil leaks.**

1. Install the front cover gasket (3), front cover (2) and bolts (1).
2. Tighten the cover bolts finger tight. Do not overtighten.

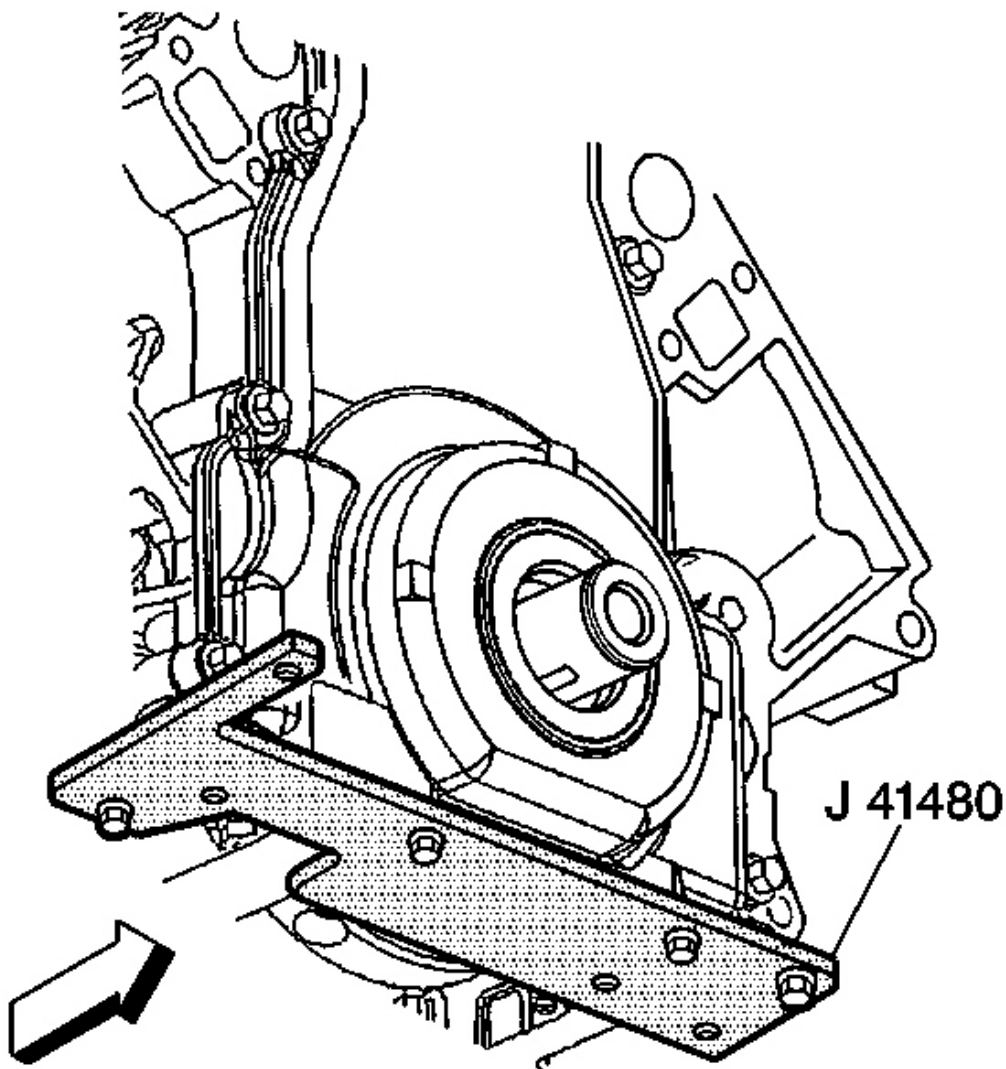


Fig. 572: View Of J 41480 Installed On Engine Block
Courtesy of GENERAL MOTORS CORP.

NOTE: Refer to Fastener Notice .

IMPORTANT: Start the tool-to-front cover bolts. Do not tighten the bolts at this time.

3. Install the J 41480 .

Tighten: Tighten the tool-to-engine block bolts to 25 N.m (18 lb ft).

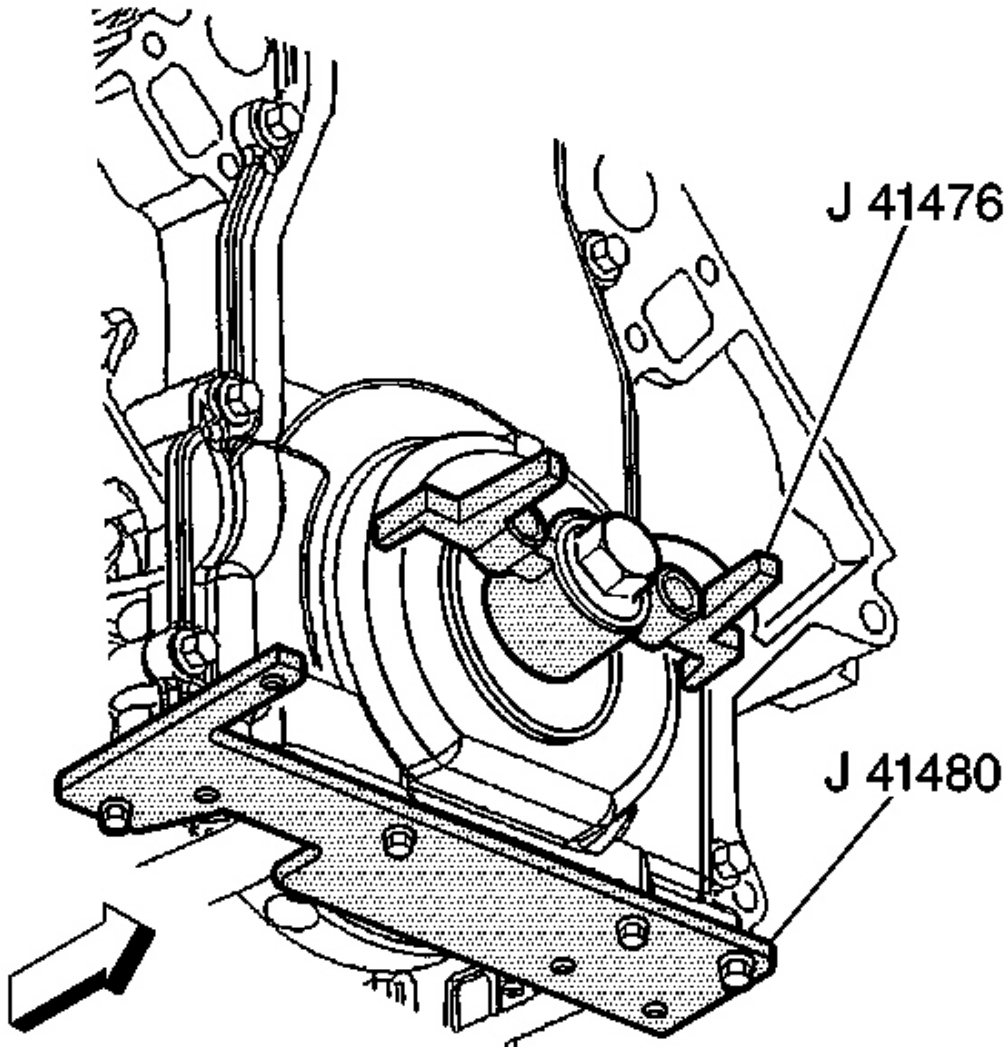


Fig. 573: View Of J 41476 & J 41480 Installed On Engine
Courtesy of GENERAL MOTORS CORP.

IMPORTANT: Align the tapered legs of the tool with the machined alignment surfaces on the front cover.

4. Install the **J 41476** .
5. Install the crankshaft balancer bolt.

2007 Chevrolet TrailBlazer

2007 ENGINE Engine Mechanical - 6.0L - TrailBlazer

Tighten:

1. Tighten the crankshaft balancer bolt by hand until snug. Do not overtighten.
 2. Tighten the **J 41480**.
 3. Tighten the engine front cover bolts to 25 N.m (18 lb ft).
6. Remove the tools.

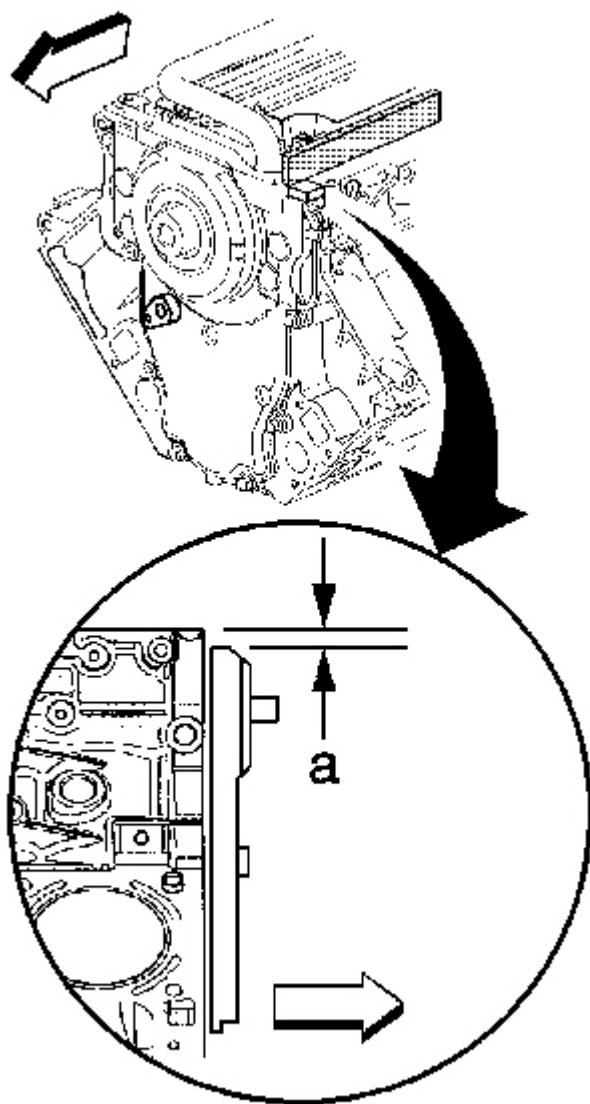


Fig. 574: Measuring Oil Pan Surface Flatness & Front Cover-To-Engine Block
Courtesy of GENERAL MOTORS CORP.

7. Measure the oil pan surface flatness, front cover-to-engine block.
 1. Place a straight edge across the engine block and front cover oil pan sealing surfaces.

Avoid contact with the portion of the gasket that protrudes into the oil pan surface.
 2. Insert a feeler gage between the front cover and the straight edge tool. The cover must be flush with the oil pan surface or no greater than 0.5 mm (0.02 in) (a) below flush.
8. If the front cover-to-engine block oil pan surface alignment is not within specifications, repeat the cover alignment procedure.
9. If the correct front cover-to-engine block alignment cannot be obtained, replace the front cover.

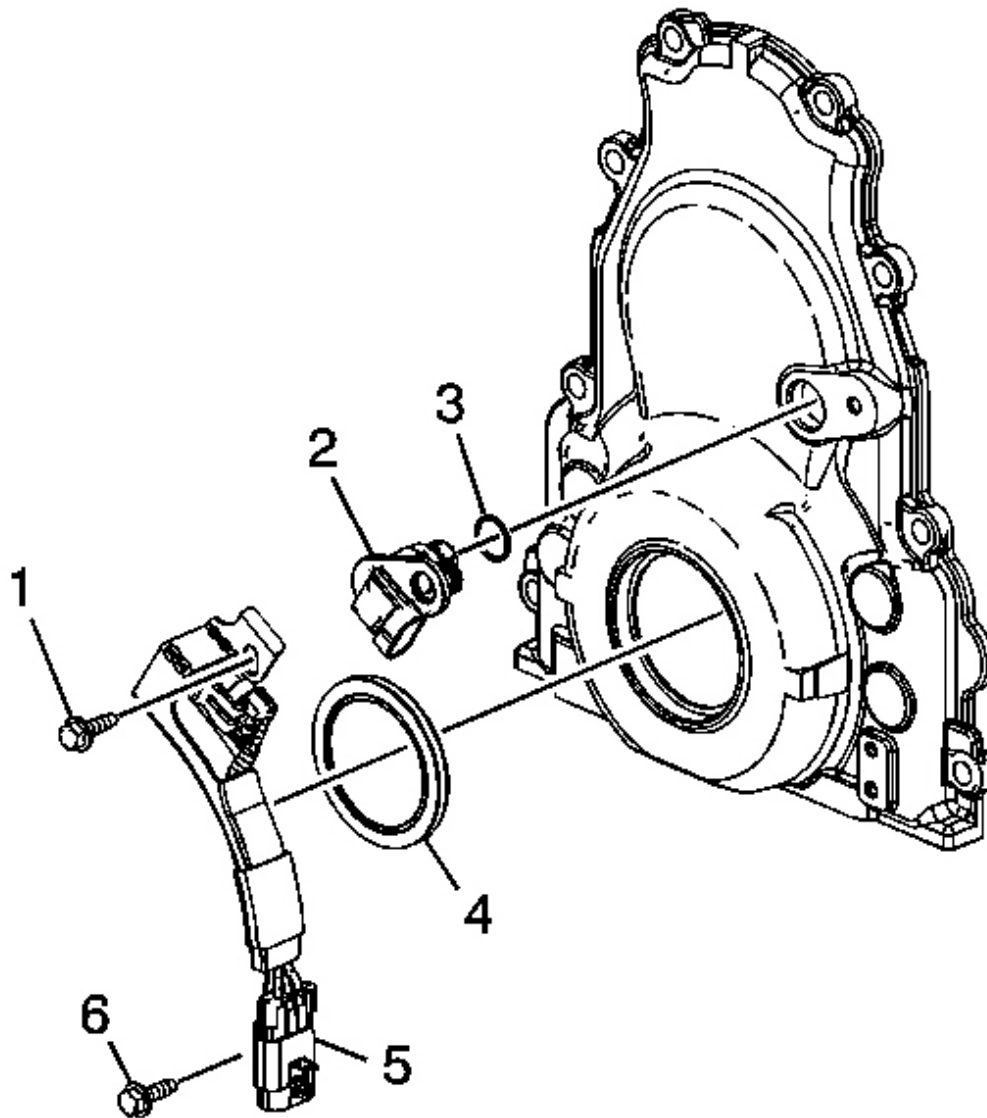


Fig. 575: View Of Front Cover, Oil Seal, Camshaft Position Sensor, Bracket & O Ring
Courtesy of GENERAL MOTORS CORP.

10. Inspect the camshaft position (CMP) sensor O-ring seal (3) for cuts or damage. If the seal is not cut or damaged, it may be used again.
11. Lubricate the O-ring seal with clean engine oil.
12. Install the O-ring seal onto the sensor (2).

2007 Chevrolet TrailBlazer

2007 ENGINE Engine Mechanical - 6.0L - TrailBlazer

13. Install the sensor to the cover.
14. Install the CMP sensor wire harness (5) and bolts (1, 6).

Tighten: Tighten the bolts to 12 N.m (106 lb in).

CRANKSHAFT FRONT OIL SEAL INSTALLATION

Tools Required

J 41478 Crankshaft Front Oil Seal Installer

Installation Procedure

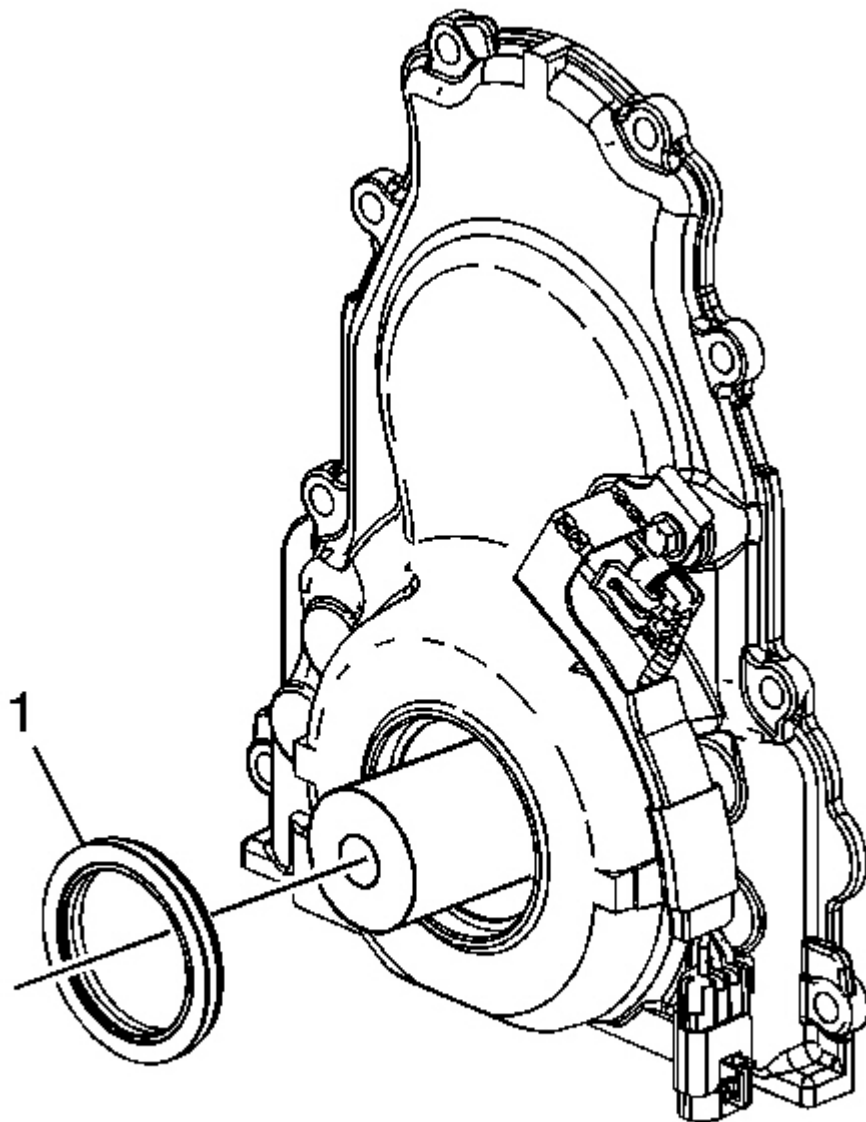


Fig. 576: View Of Crankshaft Front Oil Seal
Courtesy of GENERAL MOTORS CORP.

IMPORTANT:

- Do not lubricate the oil seal sealing surface.
- Do not use the crankshaft front oil seal again.

1. Lubricate the outer edge of the oil seal (1) with clean engine oil.

2. Lubricate the front cover oil seal bore with clean engine oil.

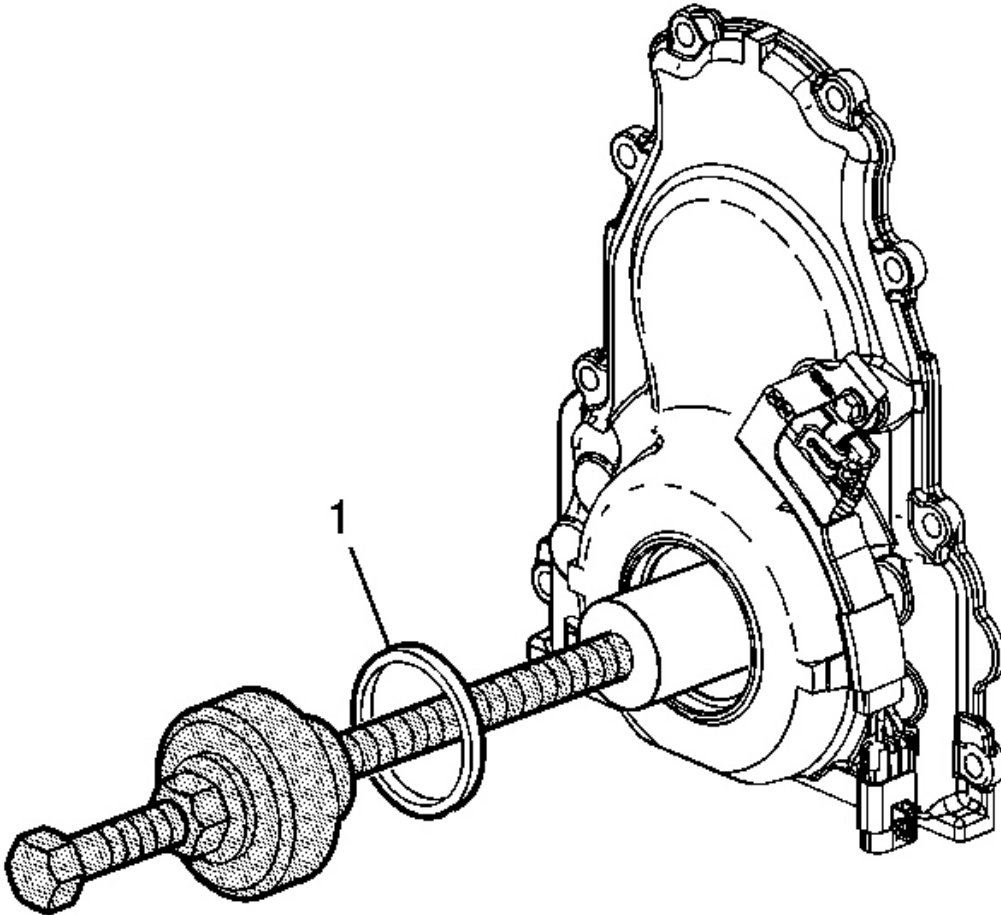


Fig. 577: View Of Crankshaft Front Oil Seal Installation
Courtesy of GENERAL MOTORS CORP.

3. Install the crankshaft front oil seal (1) onto the **J 41478** .
4. Install the **J 41478** threaded rod, with nut, washer, guide and oil seal, into the end of the crankshaft.
5. Use the **J 41478** in order to install the oil seal into the cover bore.
 1. Use a wrench and hold the hex on the installer bolt.
 2. Use a second wrench and rotate the installer nut clockwise until the seal bottoms in the cover bore.
 3. Remove the tool.
 4. Inspect the oil seal for proper installation. The oil seal should be installed evenly and completely

into the front cover bore.

OIL PAN INSTALLATION

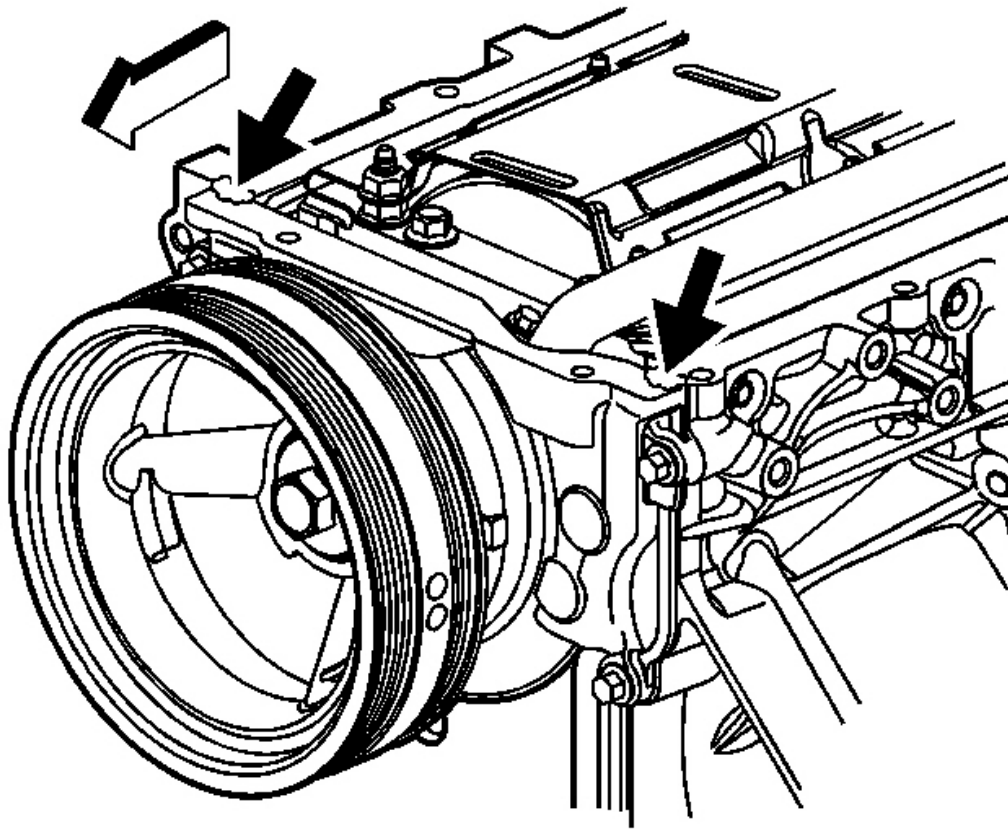


Fig. 578: View Of Sealant On Engine Front Cover Gasket Tabs
Courtesy of GENERAL MOTORS CORP.

IMPORTANT:

- The alignment of the structural oil pan is critical. The rear bolt hole locations of the oil pan provide mounting points for the transmission housing. To ensure the rigidity of the powertrain and correct transmission alignment, it is important that the rear of the block and the rear of the oil pan are flush or even. The rear of the oil pan must **NEVER** protrude beyond the engine block and transmission housing plane.
- Do not use the oil pan gasket again.
- It is not necessary to rivet the **NEW** gasket to the oil pan.

1. Install the oil transfer tube, baffle and other internal components, as required. Refer to **Oil Pan Cleaning and Inspection**.
2. Apply a 5 mm (0.2 in) bead of sealant GM P/N 12378521 (Canadian P/N 88901148) or equivalent, 20 mm (0.8 in) long to the engine block. Apply the sealant directly onto the tabs of the front cover gasket that protrude into the oil pan surface. Refer to **Sealers, Adhesives and Lubricants**.

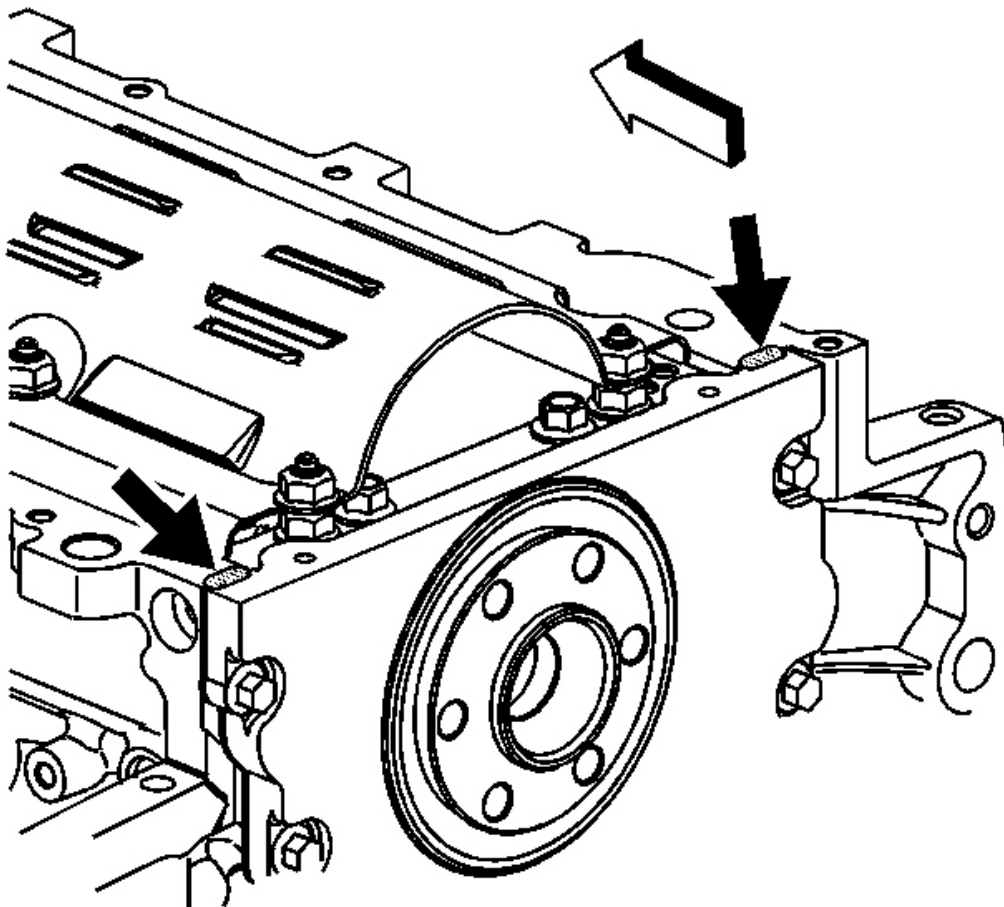


Fig. 579: View Of Sealant On Engine Rear Cover Gasket Tabs
Courtesy of GENERAL MOTORS CORP.

3. Apply a 5 mm (0.2 in) bead of sealant GM P/N 12378521 (Canadian P/N 88901148) or equivalent, 20 mm (0.8 in) long to the engine block. Apply the sealant directly onto the tabs of the rear cover gasket that protrude into the oil pan surface.

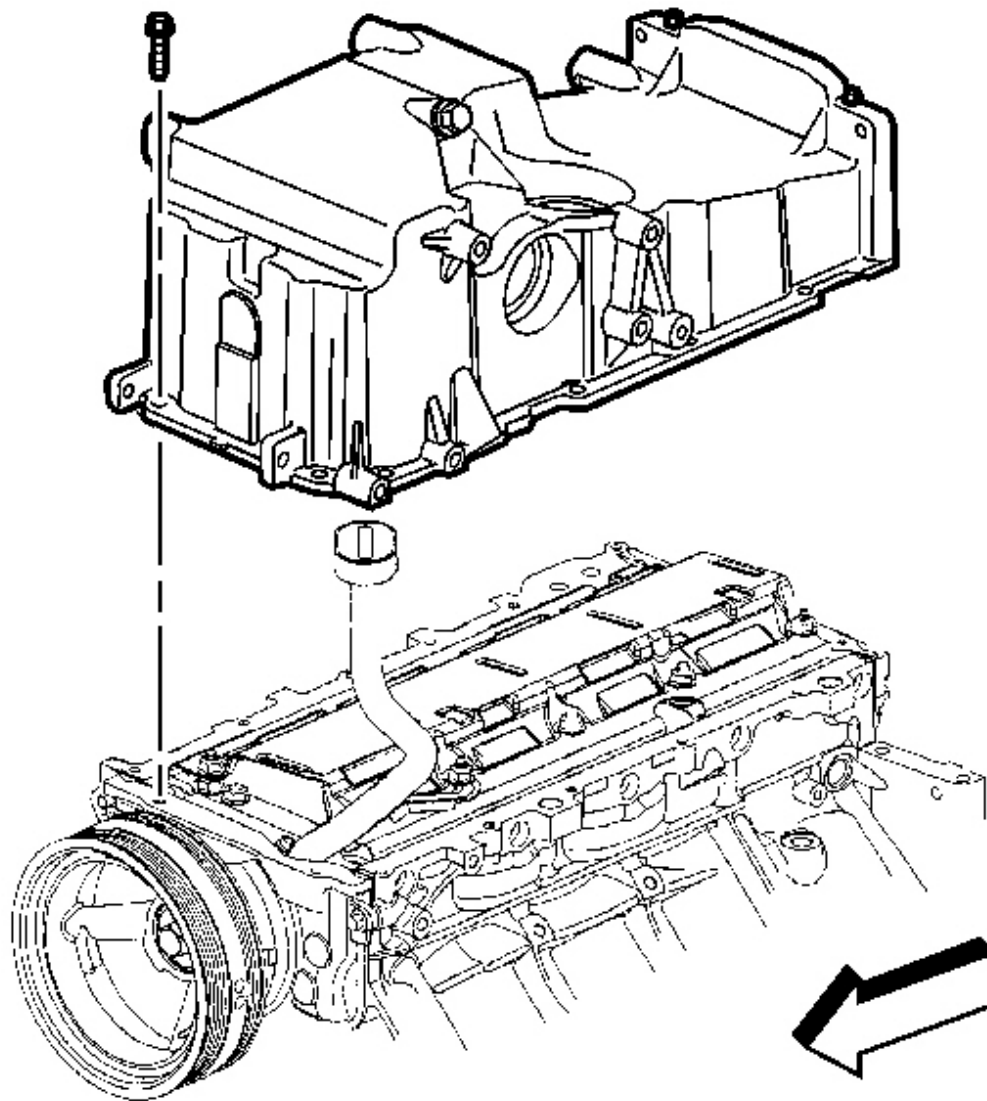


Fig. 580: View Of Oil Pan & Bolts
Courtesy of GENERAL MOTORS CORP.

IMPORTANT: Ensure the oil gallery passages in the oil pan and engine block properly align with the oil pan gasket.

4. Pre-assemble the oil pan gasket to the pan.
 1. Install the gasket onto the oil pan.

2007 Chevrolet TrailBlazer

2007 ENGINE Engine Mechanical - 6.0L - TrailBlazer

2. Install the oil pan bolts to the pan and through the gasket.
5. Install the oil pan, gasket and bolts to the engine block.
6. Tighten bolts finger tight. Do not overtighten.

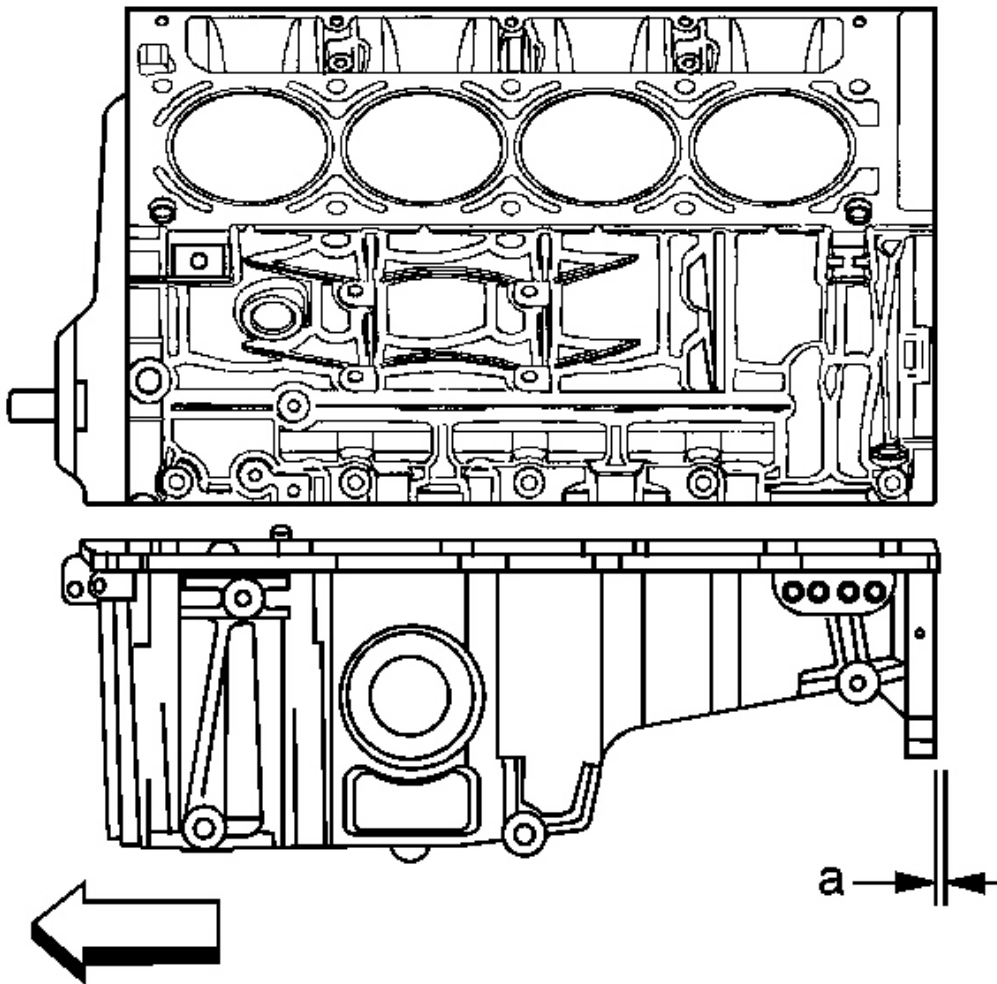


Fig. 581: Aligning Rear Of Oil Pan & Rear Of Engine Block
Courtesy of GENERAL MOTORS CORP.

7. Place a straight edge across the rear of the engine block and the rear of the oil pan at the transmission housing mounting surfaces.

NOTE: Refer to Fastener Notice .

2007 Chevrolet TrailBlazer

2007 ENGINE Engine Mechanical - 6.0L - TrailBlazer

8. Align the oil pan until the rear of engine block and rear of oil pan are flush or even.

Tighten:

1. Tighten the oil pan-to-block and oil pan-to-front cover bolts to 25 N.m (18 lb ft).
2. Tighten the oil pan-to-rear cover bolts to 12 N.m (106 lb in).

9. Measure the oil pan-to-engine block alignment.

1. Place a straight edge across the rear of the engine block and rear of oil pan at the transmission housing mounting surfaces.

IMPORTANT: The rear of the oil pan must NEVER protrude beyond the engine block and transmission housing mounting surfaces.

2. Insert a feeler gage between the straight edge and the oil pan transmission housing mounting surface and inspect to ensure there is no greater than a 0.0-0.1 mm (0.0-0.004 in) gap (a) between the pan and straight edge.
3. If the oil pan alignment is not within specifications, remove the oil pan and repeat the above procedure.

OIL FILTER AND ADAPTER INSTALLATION

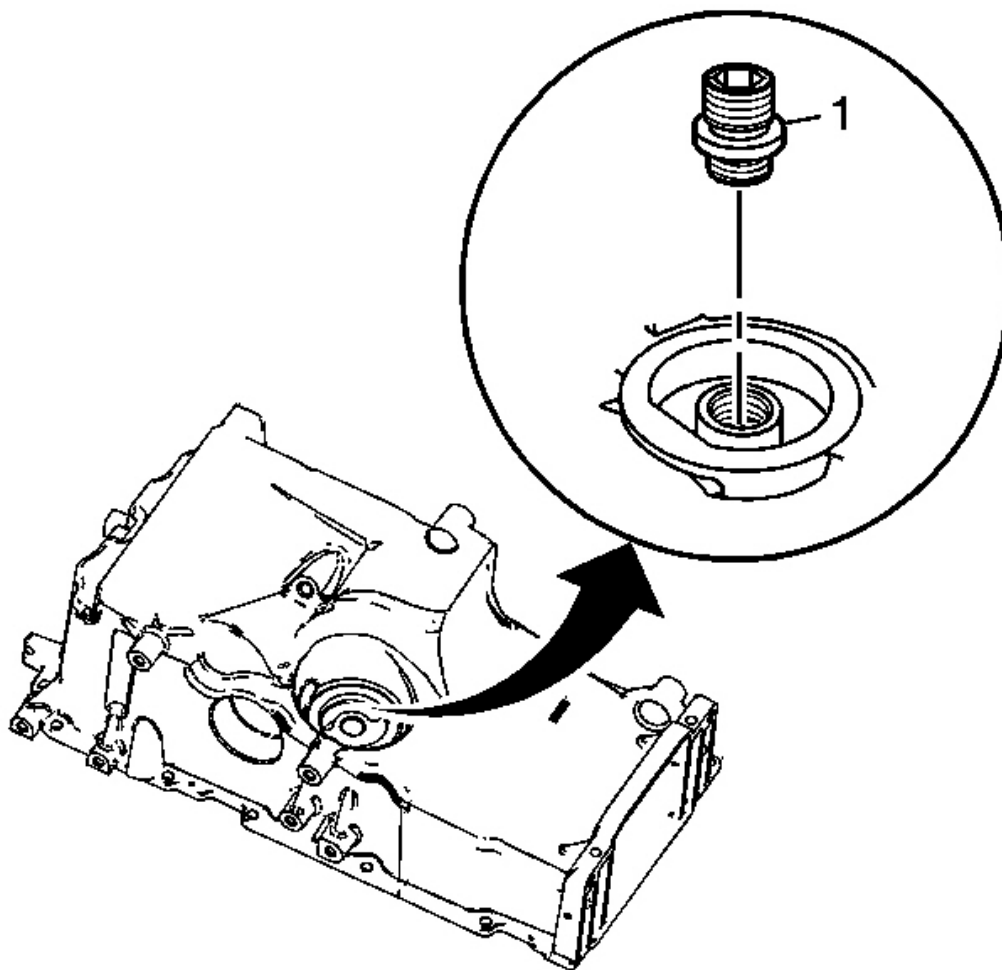


Fig. 582: View Of Oil Filter Fitting
Courtesy of GENERAL MOTORS CORP.

NOTE: Refer to Fastener Notice .

1. Install the oil filter fitting (1).

Tighten: Tighten the oil filter fitting to 55 N.m (40 lb ft).

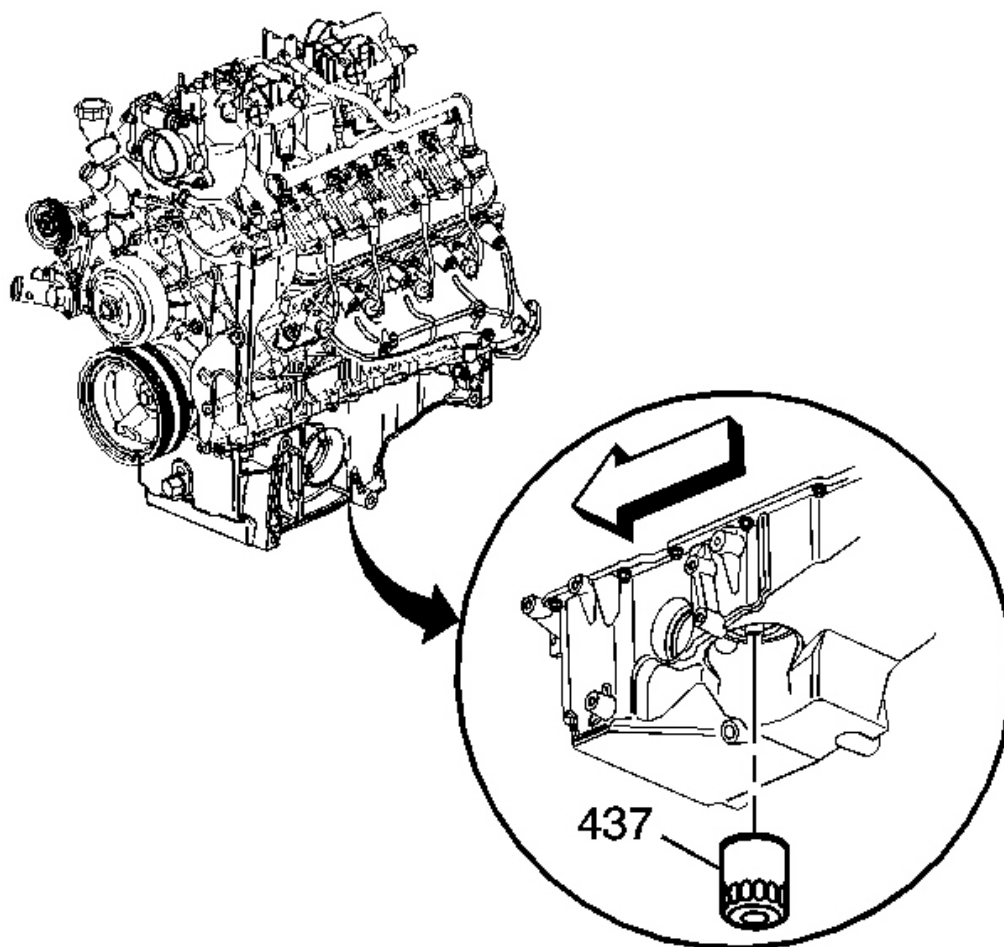


Fig. 583: Identifying Engine Oil Filter
Courtesy of GENERAL MOTORS CORP.

2. Lubricate the oil filter seal with clean engine oil.
3. Install the oil filter (437).

Tighten: Tighten the oil filter to 30 N.m (22 lb ft).

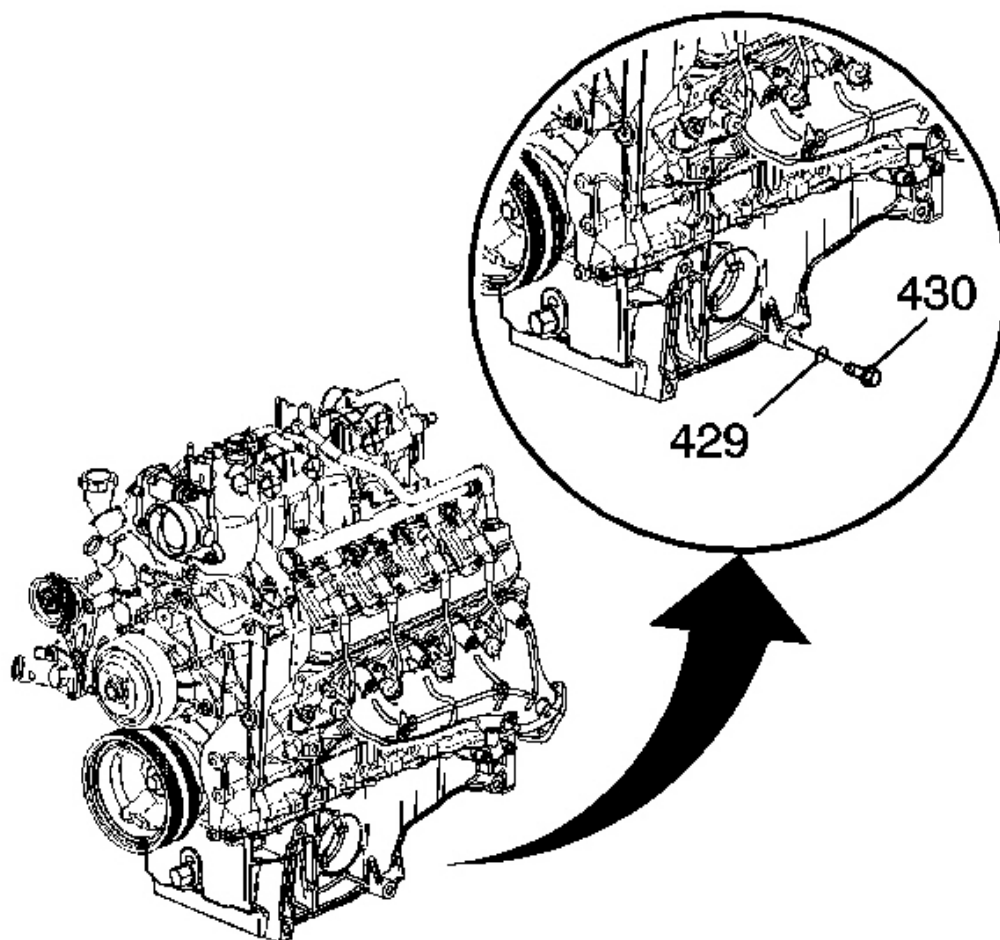


Fig. 584: Identifying Oil Pan Drain Plug
Courtesy of GENERAL MOTORS CORP.

4. Install the oil pan drain plug (430) and O-ring (429).

Tighten: Tighten the oil pan drain plug to 25 N.m (18 lb ft).

VALVE LIFTER INSTALLATION

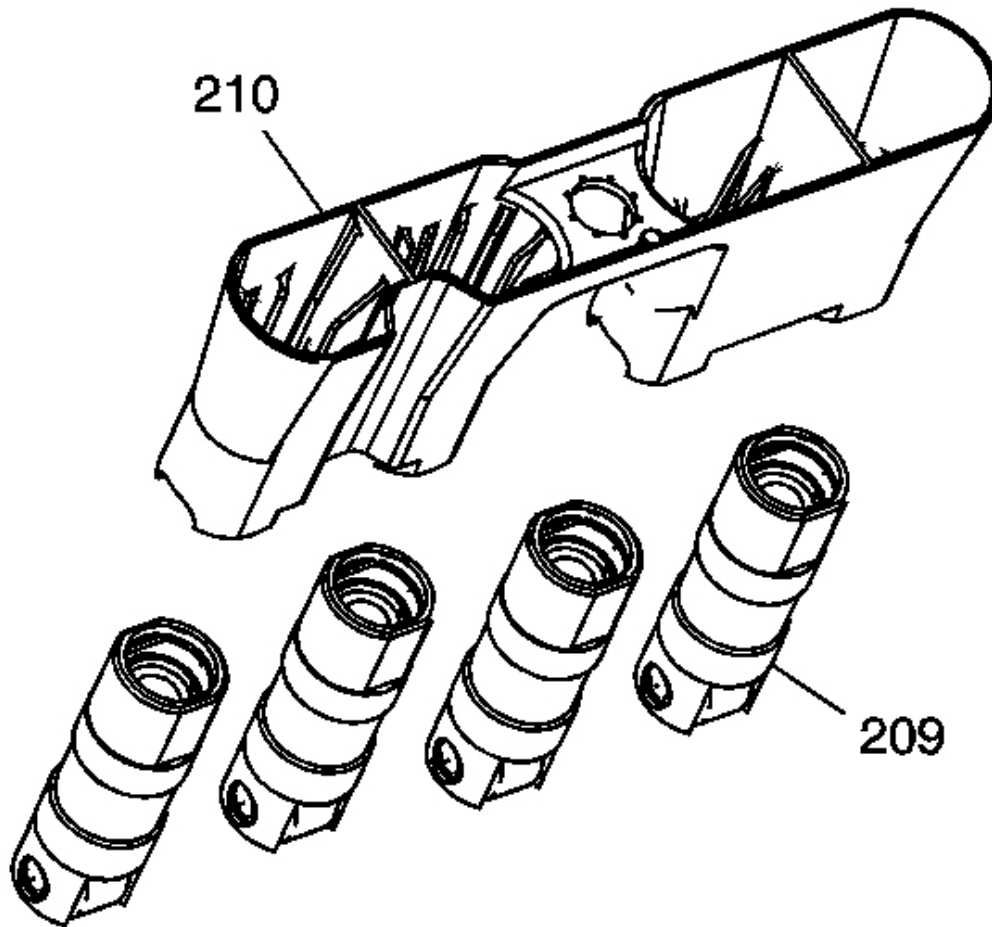


Fig. 585: View Of Valve Lifter Guides & Bolts
Courtesy of GENERAL MOTORS CORP.

IMPORTANT:

- When using the valve lifters again, install the lifters to their original locations.
- If camshaft replacement is required, the valve lifters must also be replaced.

1. Lubricate the valve lifters (209) and engine block valve lifter bores with clean engine oil.
2. Insert the valve lifters into the lifter guides (210).

Align the flat area on the top of the lifter with the flat area in the lifter guide bore. Push the lifter

completely into the guide bore.

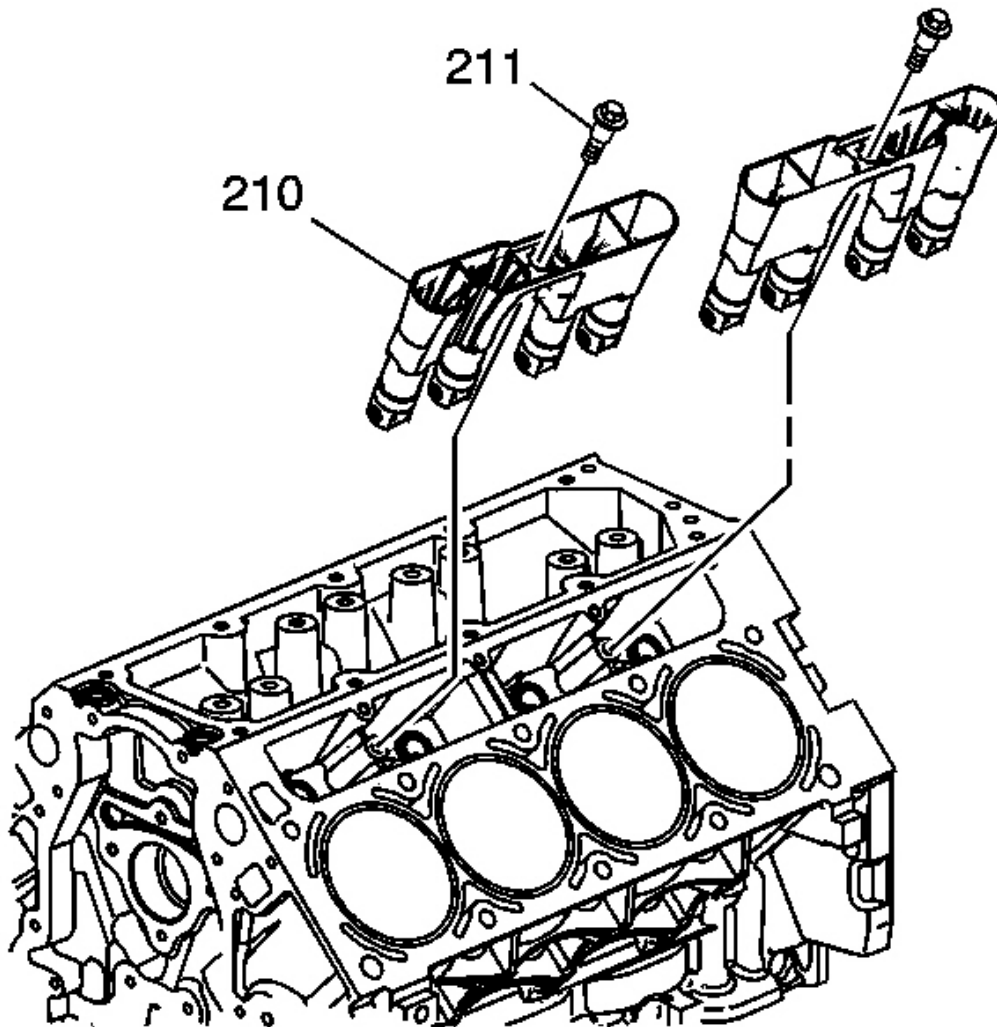


Fig. 586: View Of Valve Lifter Guides, Cylinder Head & Bolts
Courtesy of GENERAL MOTORS CORP.

3. Install the valve lifters and guide assembly (210) to the engine block.

NOTE: Refer to Fastener Notice .

4. Install the valve lifter guide bolts (211).

Tighten: Tighten the valve lifter guide bolts to 12 N.m (106 lb in).

CYLINDER HEAD INSTALLATION - LEFT SIDE

Tools Required

- **J 42385-100** Thread Repair Kit
- **J 45059** Angle Meter

Installation Procedure

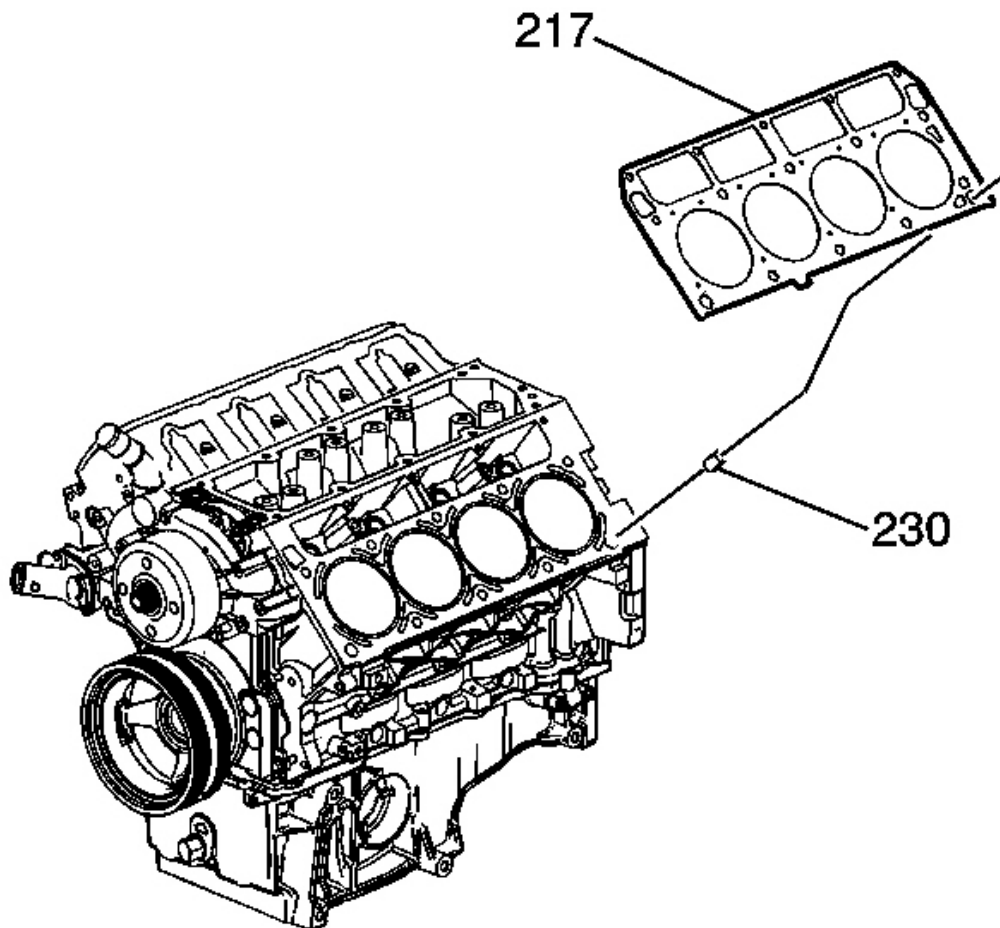


Fig. 587: Identifying Left Cylinder Head Gasket
Courtesy of GENERAL MOTORS CORP.

2007 Chevrolet TrailBlazer

2007 ENGINE Engine Mechanical - 6.0L - TrailBlazer

CAUTION: Refer to Safety Glasses Caution in Cautions and Notices.

NOTE: Clean all dirt, debris and coolant from the engine block cylinder head bolt holes. Failure to remove all foreign material may result in damaged threads, improperly tightened fasteners or damage to components.

IMPORTANT:

- Do not use the cylinder head bolts again. Install NEW cylinder head bolts during assembly.
- Do not use any type of sealant on the cylinder head gasket, unless specified.

1. Clean the engine block cylinder head bolt holes, if required.

Thread repair tool J 42385-107 may be used to clean the threads of old threadlocking material.

2. Spray cleaner GM P/N 12346139 (Canadian P/N 10953463), GM P/N 12377981 (Canadian P/N 10953463) or equivalent, into the hole.
3. Clean the cylinder head bolt holes with compressed air.
4. Install the cylinder head locating pins (230).

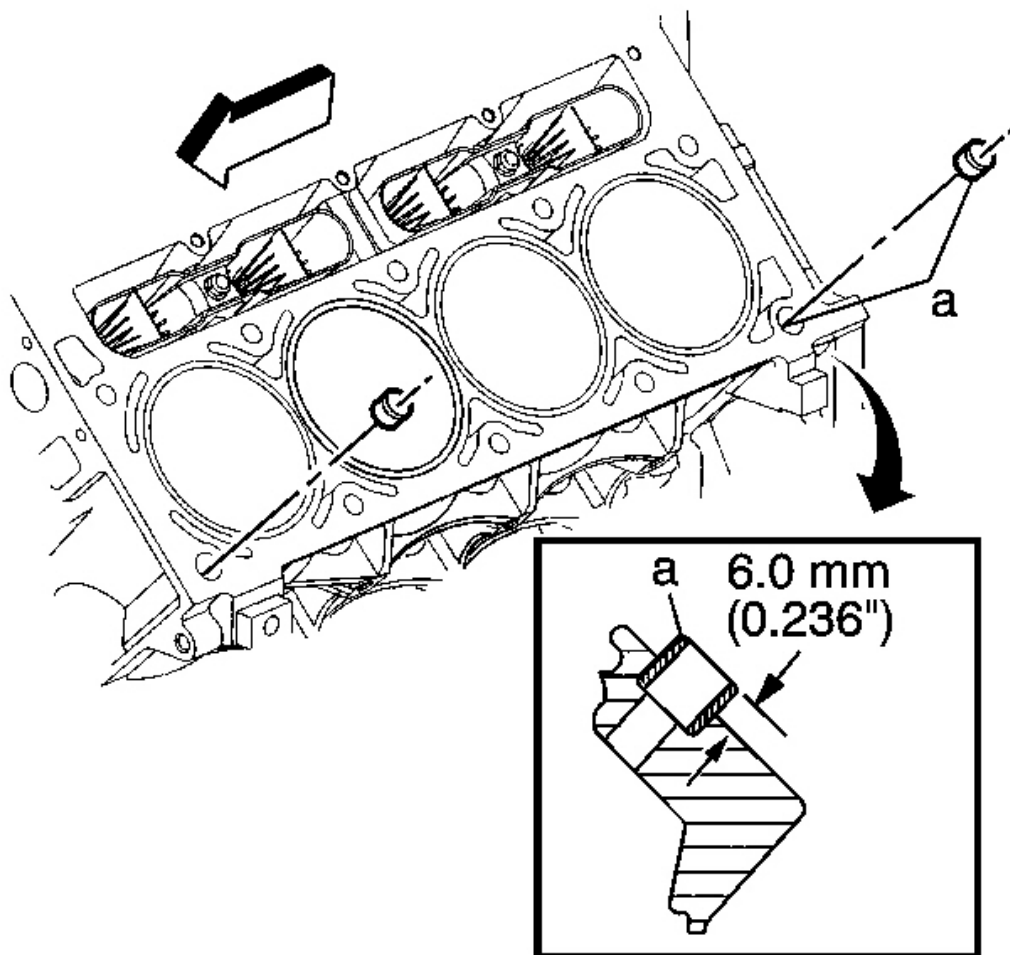


Fig. 588: Identifying Cylinder Head Locating Pins Installation Position
Courtesy of GENERAL MOTORS CORP.

5. Inspect the locating pins for proper installation.

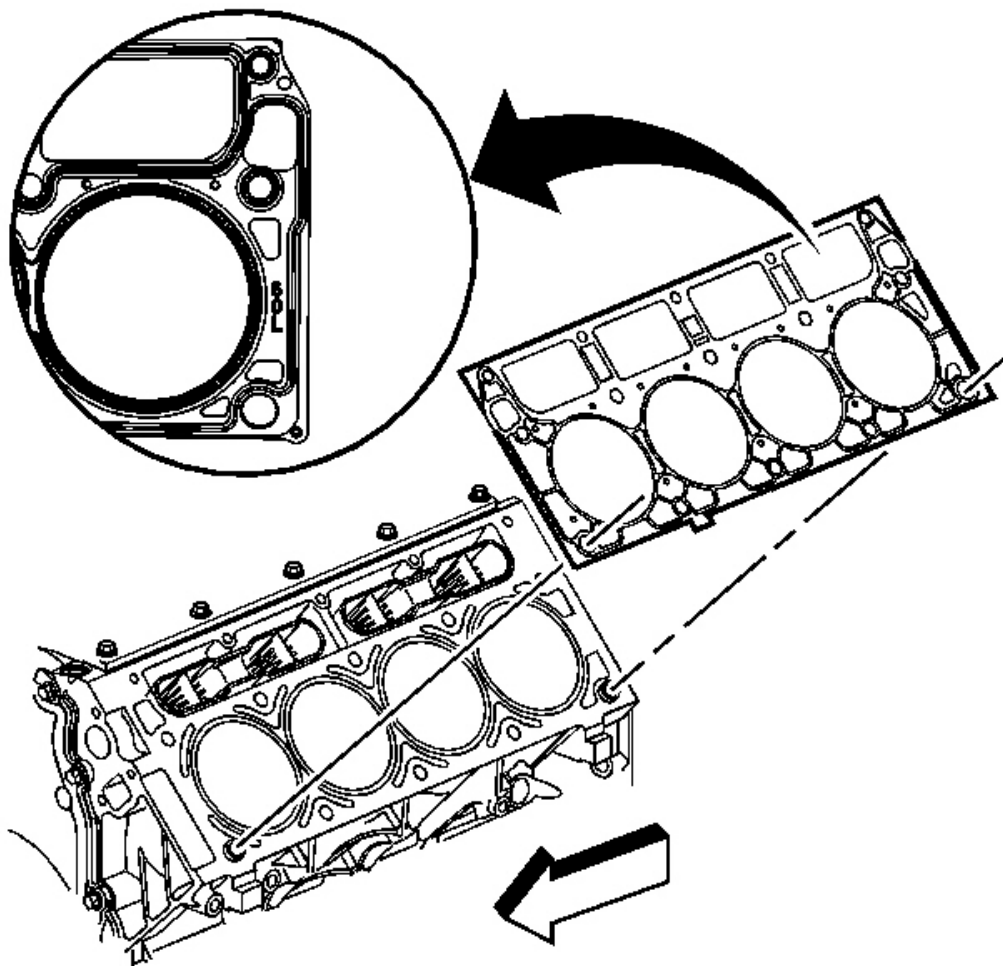


Fig. 589: View Of Gasket Displacement Markings - Left
Courtesy of GENERAL MOTORS CORP.

6. Inspect the displacement markings on the gasket for proper usage.

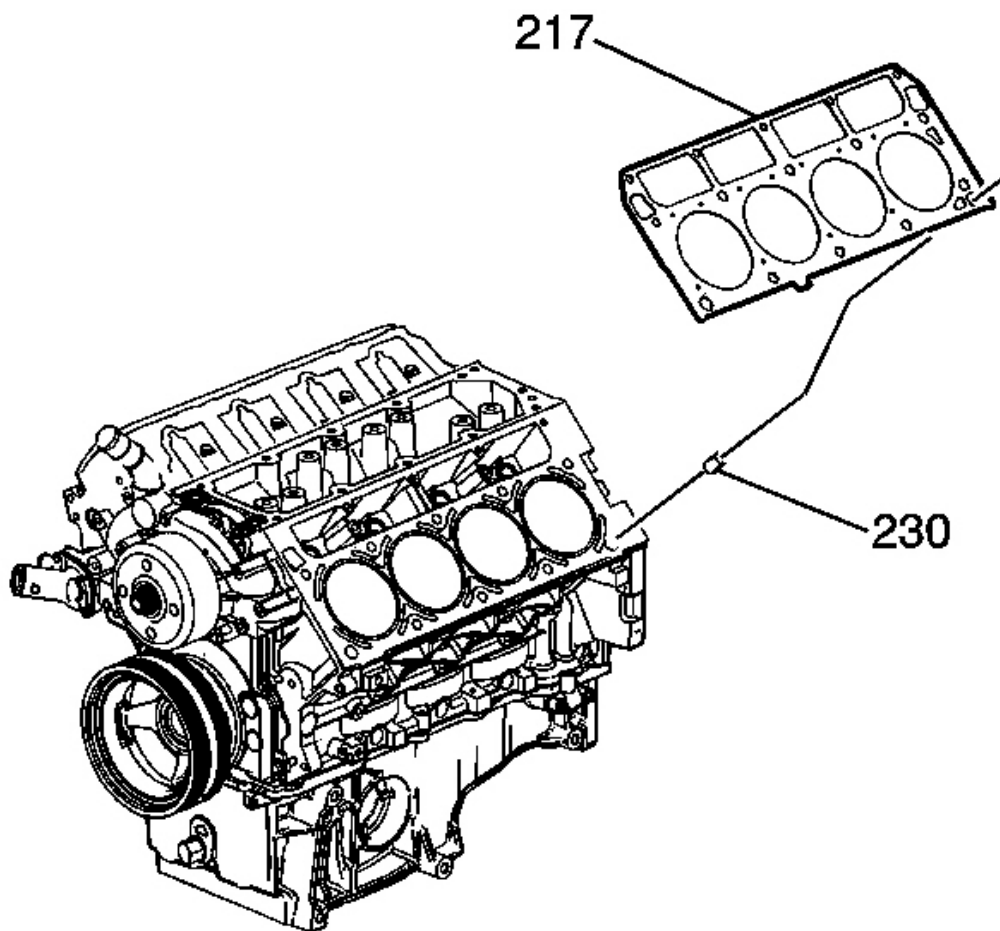


Fig. 590: Identifying Left Cylinder Head Gasket
Courtesy of GENERAL MOTORS CORP.

7. Install the NEW cylinder head gasket (217) onto the locating pins.

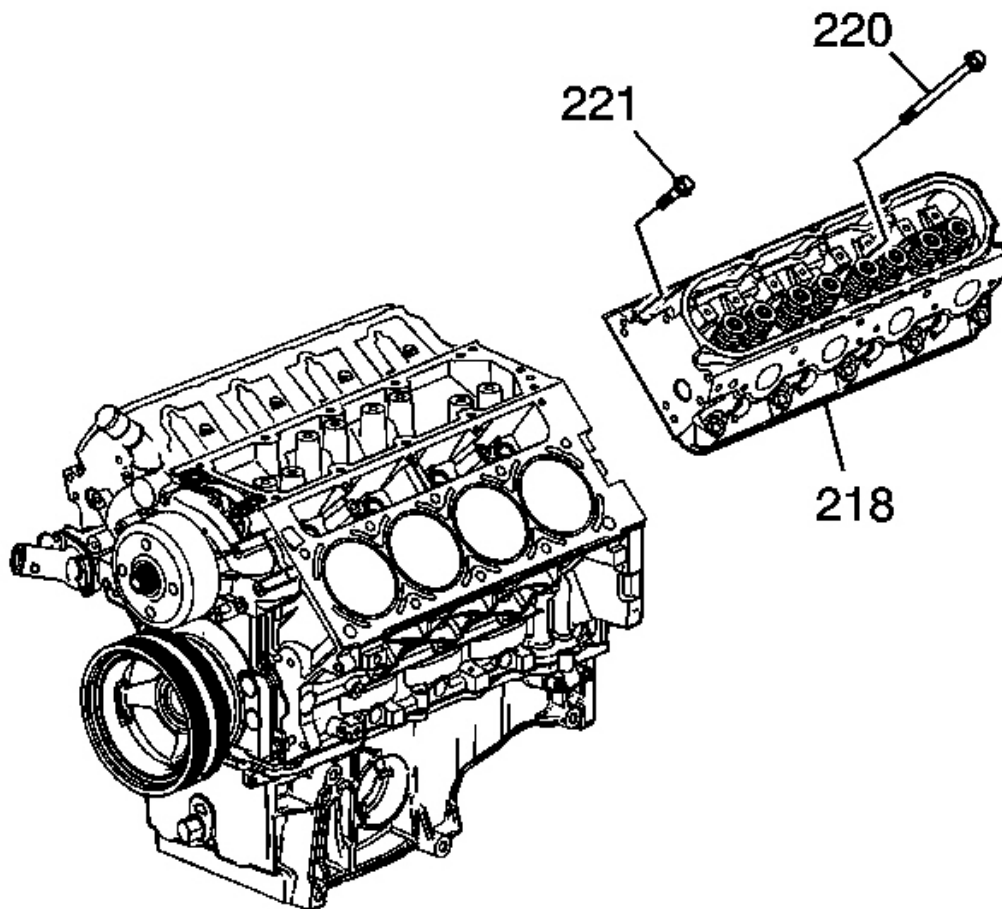


Fig. 591: View Of Left Cylinder Head
Courtesy of GENERAL MOTORS CORP.

8. Install the cylinder head (218) onto the locating pins and the gasket.
9. Install the NEW cylinder head bolts (220, 221).

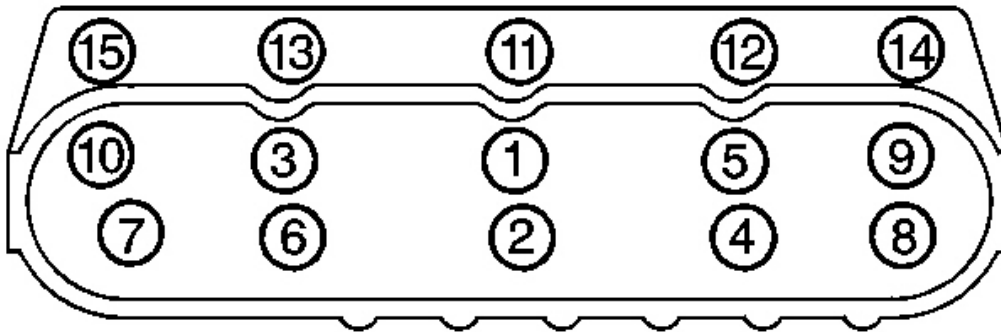


Fig. 592: Identifying Cylinder Head Bolt Tightening Sequence
Courtesy of GENERAL MOTORS CORP.

NOTE: Refer to Fastener Notice in Cautions and Notices.

10. Tighten the cylinder head bolts.

Tighten:

1. Tighten the M11 cylinder head bolts (1-10) a first pass in sequence to 30 N.m (22 lb ft).
2. Tighten the M11 cylinder head bolts (1-10) a second pass in sequence to 90 degrees using the **J 45059**.
3. Tighten the M11 cylinder head bolts (1-10) a final pass in sequence to 70 degrees using the **J 45059**.
4. Tighten the M8 cylinder head bolts (11-15) to 30 N.m (22 lb ft). Begin with the center bolt (11) and alternating side-to-side, work outward tightening all of the bolts.

CYLINDER HEAD INSTALLATION - RIGHT SIDE

Tools Required

- **J 42385-100** Thread Repair Kit
- **J 45059** Angle Meter

Installation Procedure

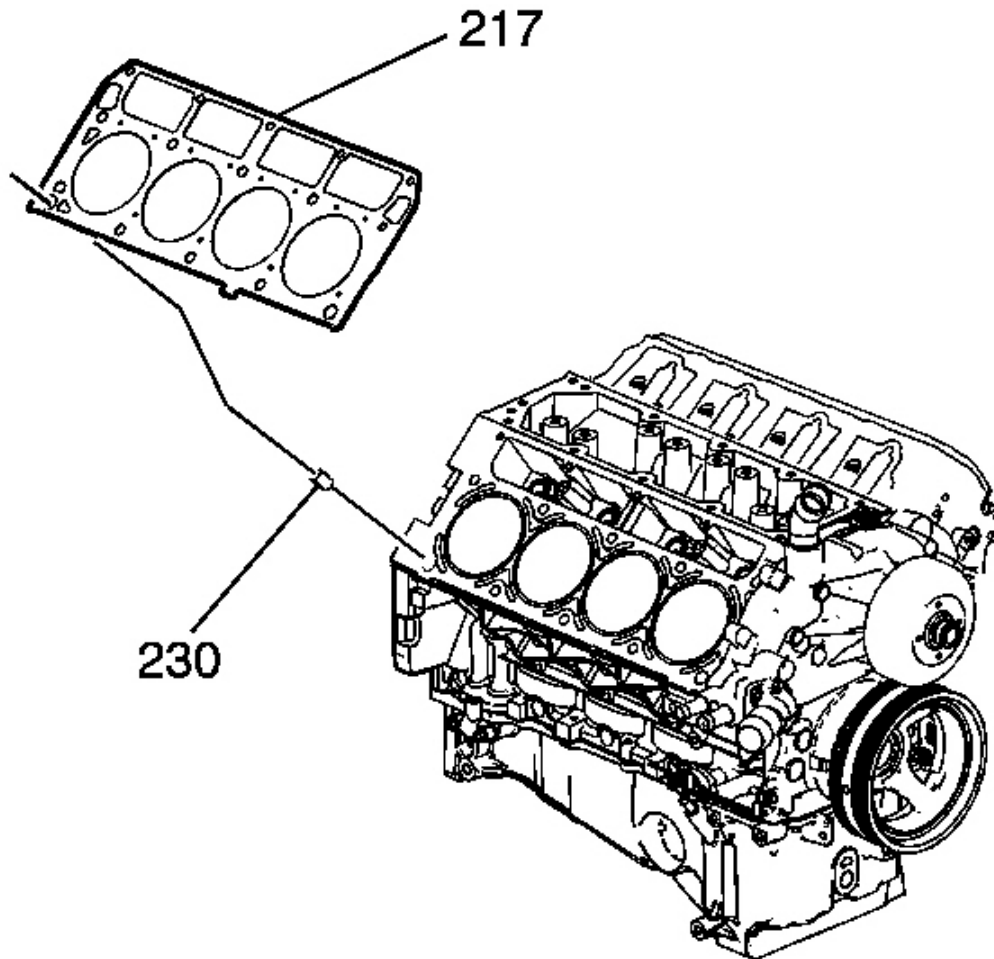


Fig. 593: Identifying Right Cylinder Head Gasket
Courtesy of GENERAL MOTORS CORP.

CAUTION: Refer to Safety Glasses Caution in Cautions and Notices.

NOTE: Clean all dirt, debris and coolant from the engine block cylinder head bolt holes. Failure to remove all foreign material may result in damaged threads, improperly tightened fasteners or damage to components.

IMPORTANT: • Do not use the cylinder head bolts again. Install NEW cylinder head

2007 Chevrolet TrailBlazer

2007 ENGINE Engine Mechanical - 6.0L - TrailBlazer

bolts during assembly.

- **Do not use any type of sealant on the cylinder head gasket, unless specified.**

1. Clean the engine block cylinder head bolt holes, if required.

Thread repair tool J 42385-107 may be used to clean the threads of old threadlocking material.

2. Spray cleaner GM P/N 12346139 (Canadian P/N 10953463), GM P/N 12377981 (Canadian P/N 10953463) or equivalent, into the hole.
3. Clean the cylinder head bolt holes with compressed air.
4. Install the cylinder head locating pins (230).

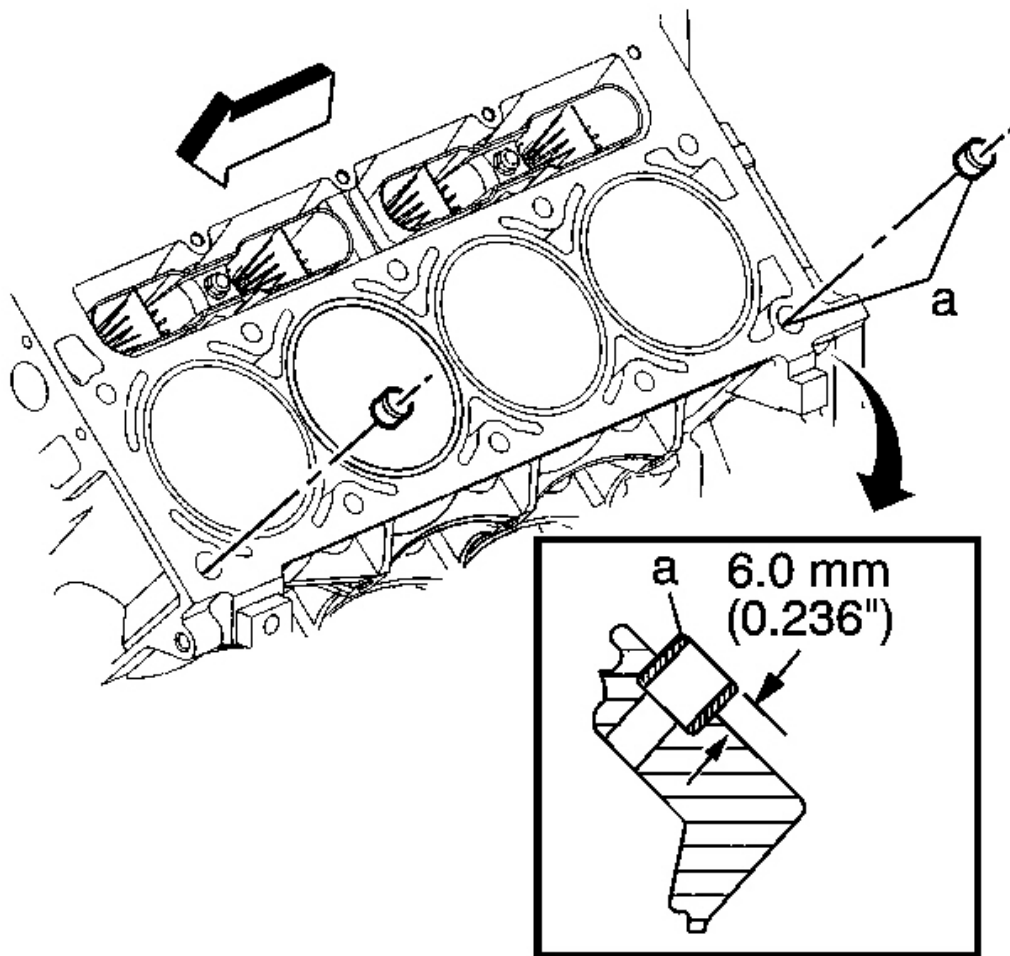


Fig. 594: Identifying Cylinder Head Locating Pins Installation Position
Courtesy of GENERAL MOTORS CORP.

5. Inspect the locating pins for proper installation.

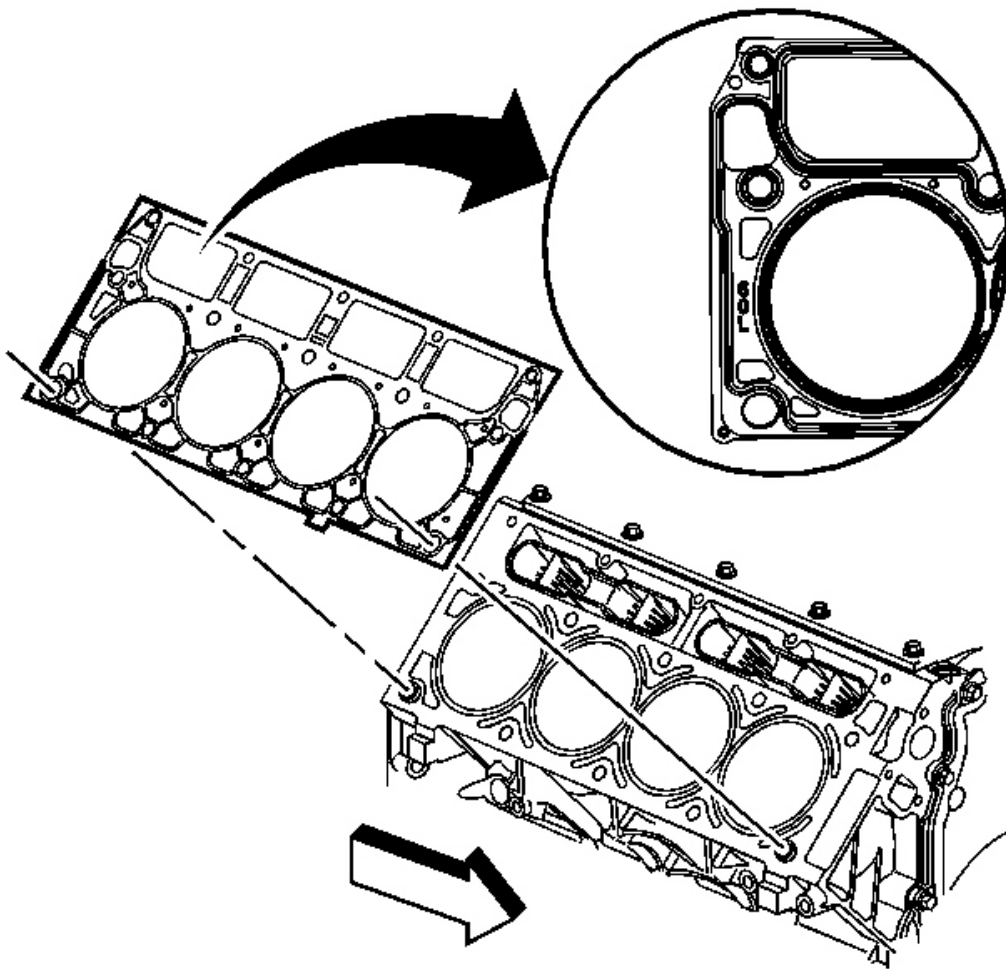


Fig. 595: View Of Gasket Displacement Markings - Right
Courtesy of GENERAL MOTORS CORP.

6. Inspect the displacement markings on the gasket for proper usage.

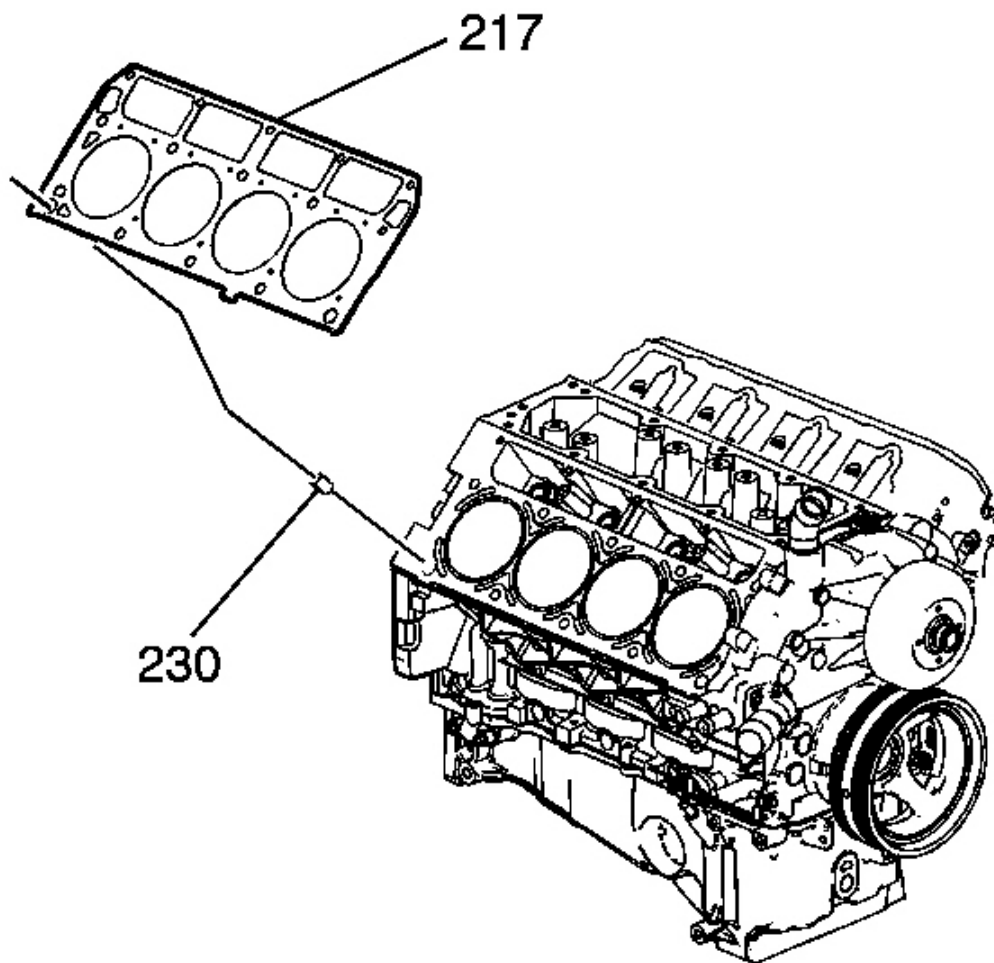


Fig. 596: Identifying Right Cylinder Head Gasket
Courtesy of GENERAL MOTORS CORP.

7. Install the NEW cylinder head gasket (217) onto the locating pins.

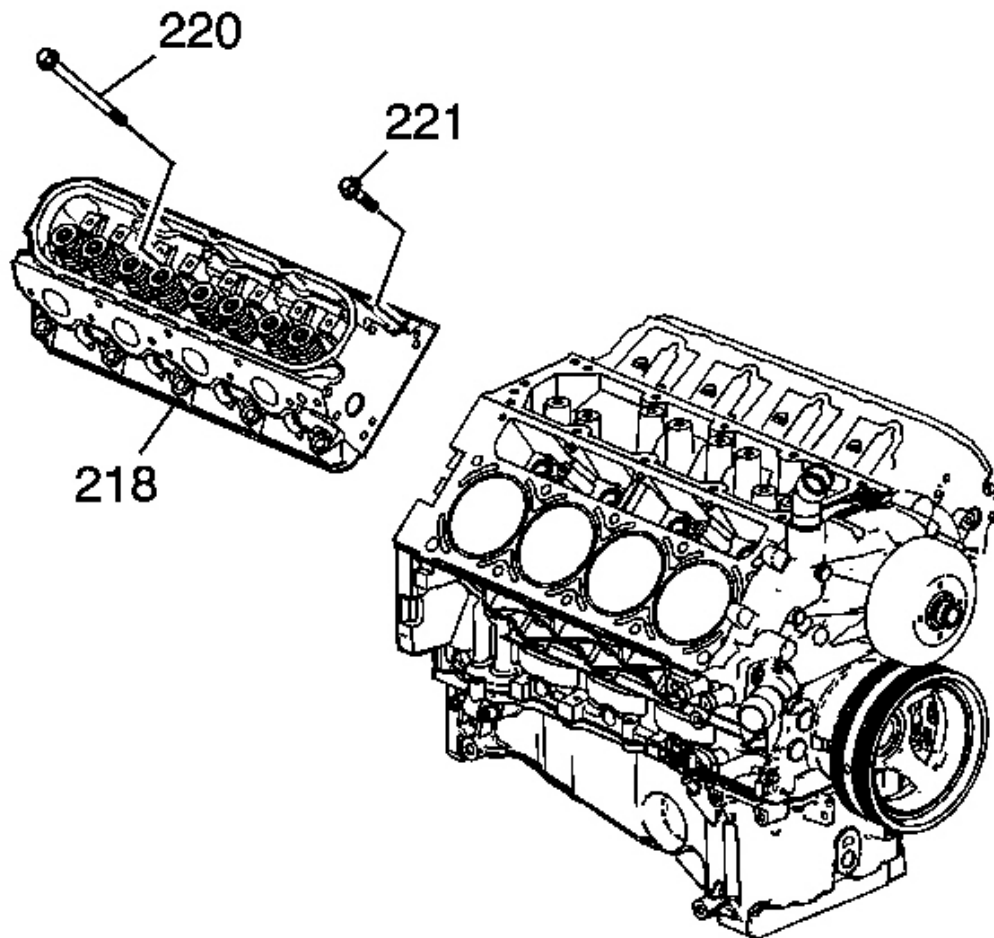


Fig. 597: View Of Right Cylinder Head
Courtesy of GENERAL MOTORS CORP.

8. Install the cylinder head (218) onto the locating pins and the gasket.
9. Install the NEW cylinder head bolts (220, 221).

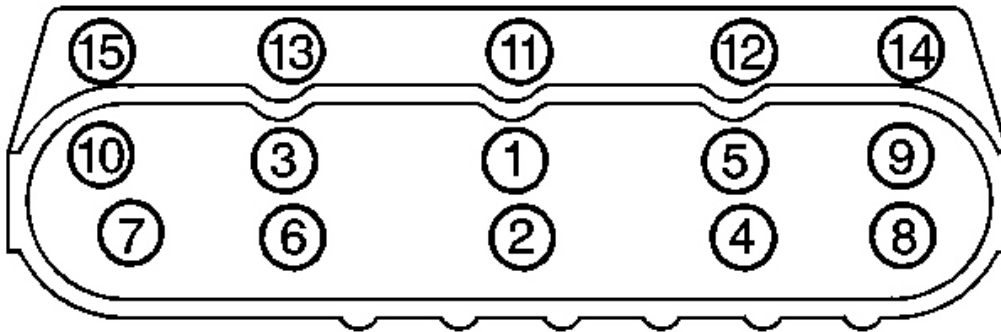


Fig. 598: Identifying Cylinder Head Bolt Tightening Sequence
Courtesy of GENERAL MOTORS CORP.

NOTE: Refer to Fastener Notice in Cautions and Notices.

10. Tighten the cylinder head bolts.

Tighten:

1. Tighten the M11 cylinder head bolts (1-10) a first pass in sequence to 30 N.m (22 lb ft).
2. Tighten the M11 cylinder head bolts (1-10) a second pass in sequence to 90 degrees using the **J 45059**.
3. Tighten the M11 cylinder head bolts (1-10) a final pass in sequence to 70 degrees using the **J 45059**.
4. Tighten the M8 cylinder head bolts (11-15) to 30 N.m (22 lb ft). Begin with the center bolt (11) and alternating side-to-side, work outward tightening all of the bolts.

VALVE ROCKER ARM AND PUSH ROD INSTALLATION

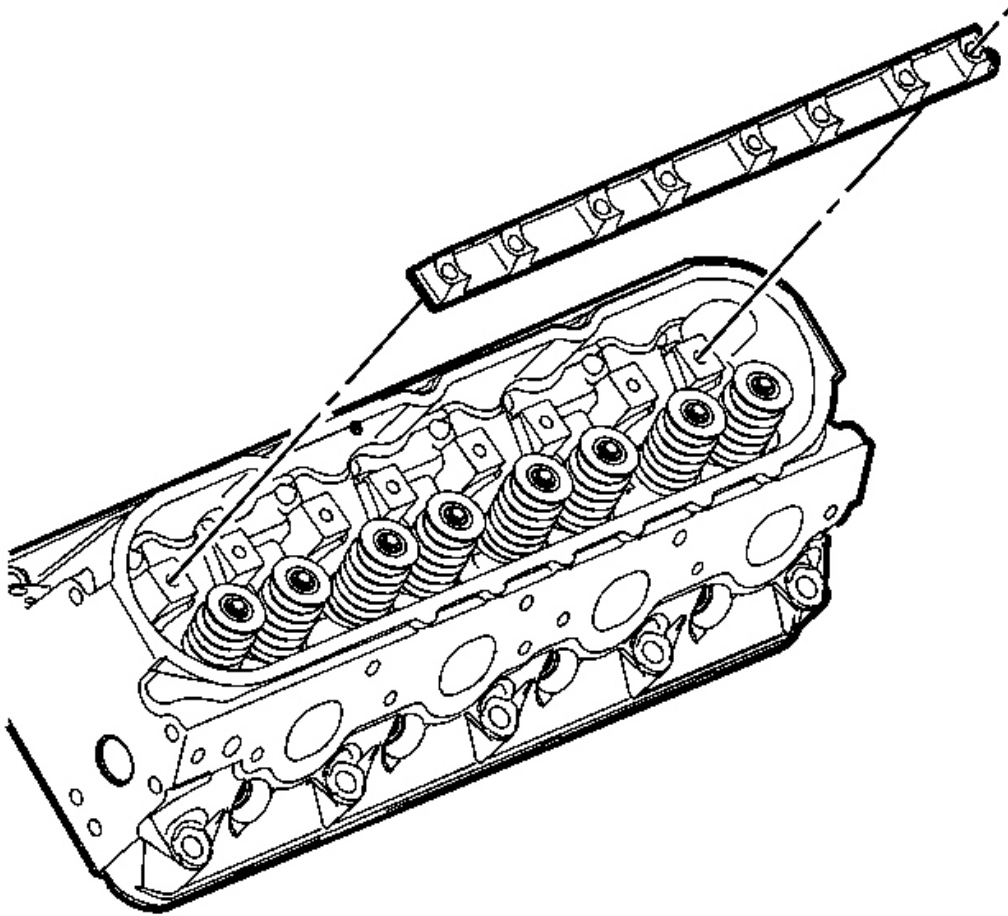


Fig. 599: View Of Valve Rocker Arm Pivot Support
Courtesy of GENERAL MOTORS CORP.

IMPORTANT:

- When using the valve train components again, always install the components to the original location and position.
- Valve lash is net build. No valve adjustment is required.

1. Lubricate the valve rocker arms and pushrods with clean engine oil.
2. Lubricate the flange of the valve rocker arm bolts with clean engine oil.
3. Install the valve rocker arm pivot support.

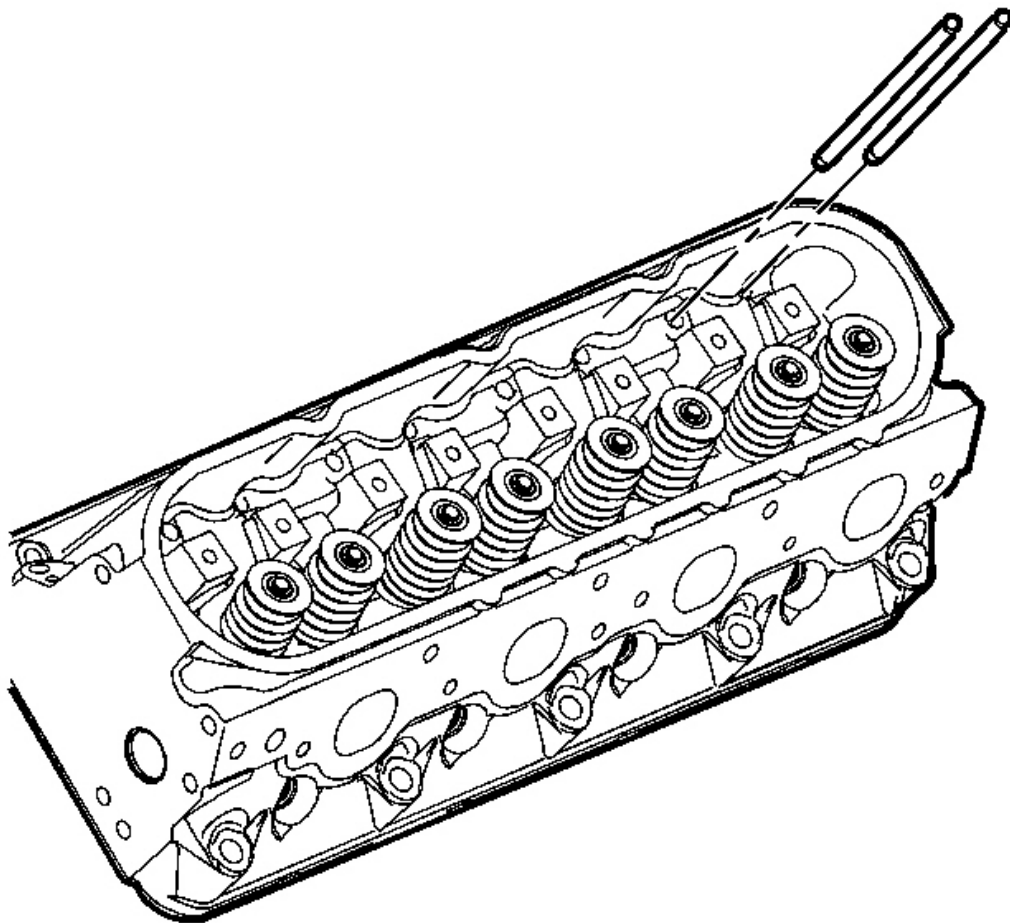


Fig. 600: View Of Pushrods

Courtesy of GENERAL MOTORS CORP.

IMPORTANT: Ensure the pushrods seat properly to the valve lifter sockets.

4. Install the pushrods.

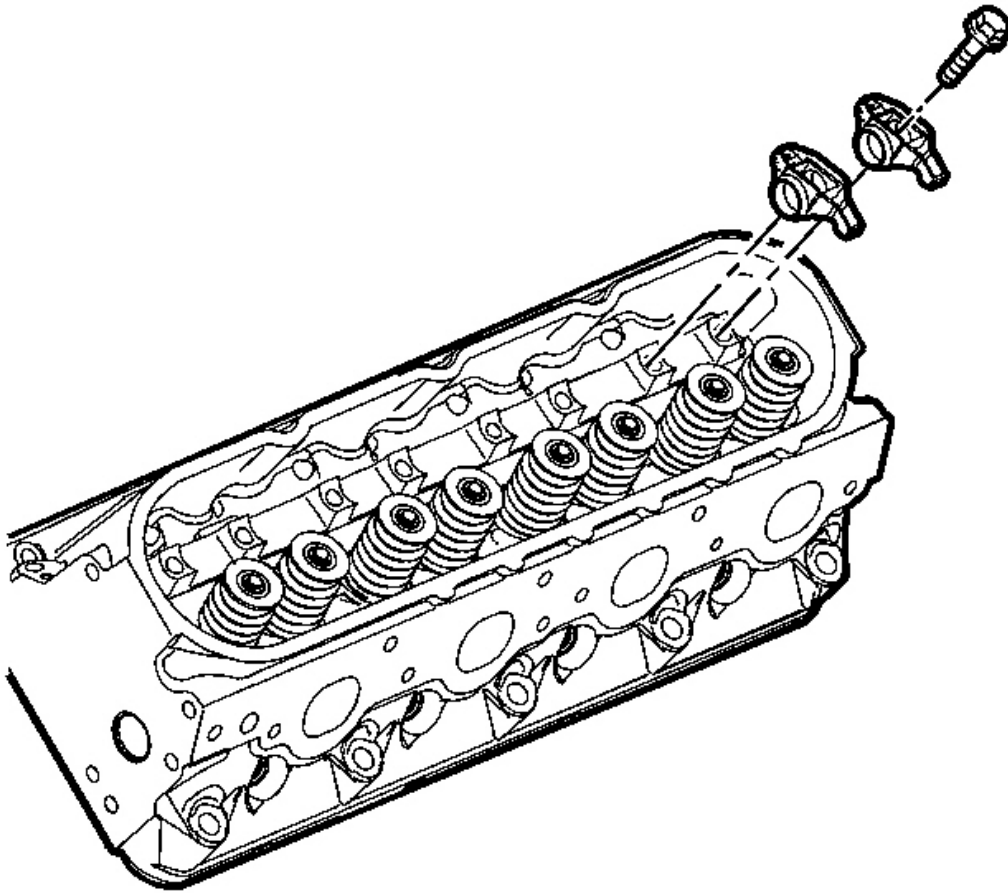


Fig. 601: View Of Rocker Arms & Bolts
Courtesy of GENERAL MOTORS CORP.

IMPORTANT:

- Ensure the pushrods seat properly to the ends of the rocker arms.
- **DO NOT** tighten the rocker arm bolts at this time.

5. Install the rocker arms and bolts.

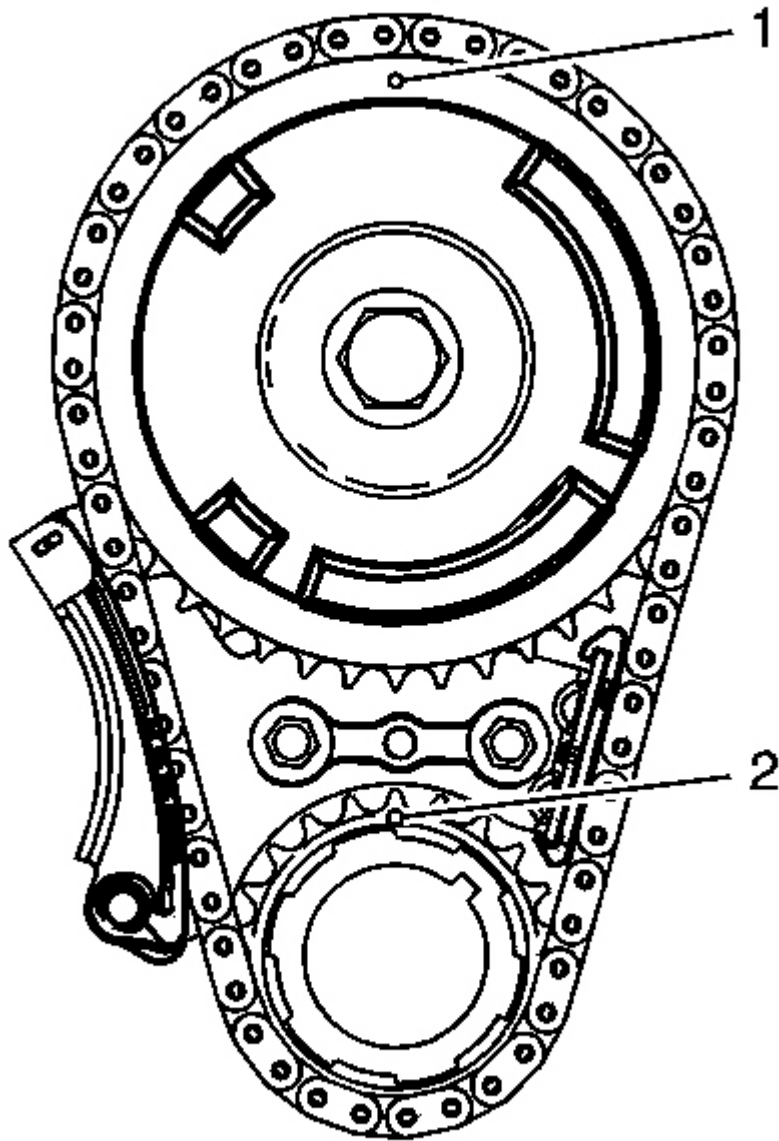


Fig. 602: View Of Camshaft & Crankshaft Sprocket Alignment Marks In 12 O'clock Position
Courtesy of GENERAL MOTORS CORP.

6. Rotate the crankshaft until number 1 piston is at top dead center of compression stroke.

In this position, cylinder number 1 rocker arms will be off lobe lift and the crankshaft sprocket key will be at the 1:30 position. The camshaft and crankshaft sprocket alignment marks (1, 2) will be in the 12

2007 Chevrolet TrailBlazer

2007 ENGINE Engine Mechanical - 6.0L - TrailBlazer

o'clock position. If viewing from the rear of the engine, the additional crankshaft pilot hole, non-threaded, will be in the 10:30 position.

The engine firing order is 1, 8, 7, 2, 6, 5, 4, 3.

Cylinders 1, 3, 5 and 7 are left bank.

Cylinders 2, 4, 6 and 8 are right bank.

NOTE: Refer to **Fastener Notice** .

7. With the engine in the number 1 firing position, tighten the following valve rocker arm bolts:

Tighten:

- Tighten the exhaust valve rocker arm bolts 1, 2, 7 and 8 to 30 N.m (22 lb ft).
- Tighten the intake valve rocker arm bolts 1, 3, 4 and 5 to 30 N.m (22 lb ft).

8. Rotate the crankshaft 360 degrees.
9. Tighten the following valve rocker arm bolts:

Tighten:

- Tighten the exhaust valve rocker arm bolts 3, 4, 5 and 6 to 30 N.m (22 lb ft).
- Tighten the intake valve rocker arm bolts 2, 6, 7 and 8 to 30 N.m (22 lb ft).

VALVE ROCKER ARM COVER INSTALLATION - LEFT SIDE

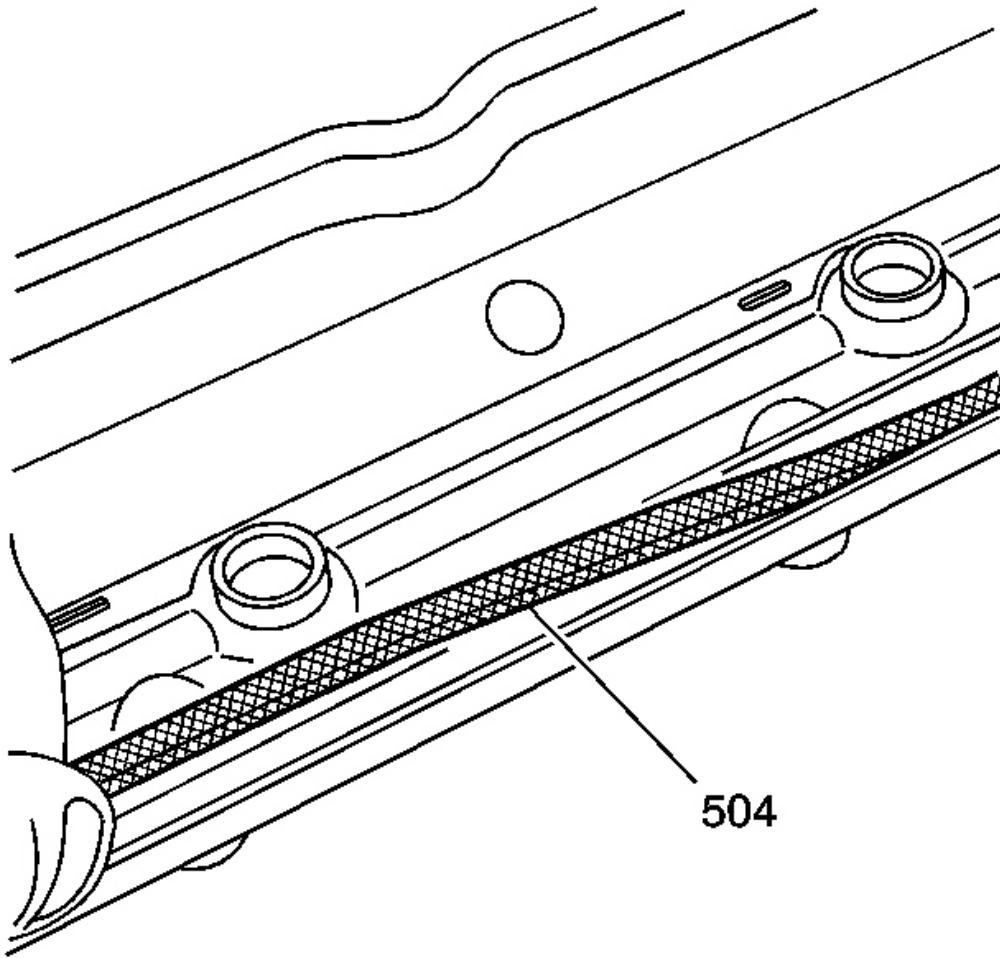


Fig. 603: View Of Valve Rocker Arm Cover Gasket
Courtesy of GENERAL MOTORS CORP.

IMPORTANT:

- All gasket surfaces should be free of oil or other foreign material during assembly.
- **DO NOT** use the valve rocker arm cover gasket again.
- The valve rocker arm cover bolt grommets may be used again if not damaged.

1. Install a NEW gasket (504) into the valve rocker arm cover.

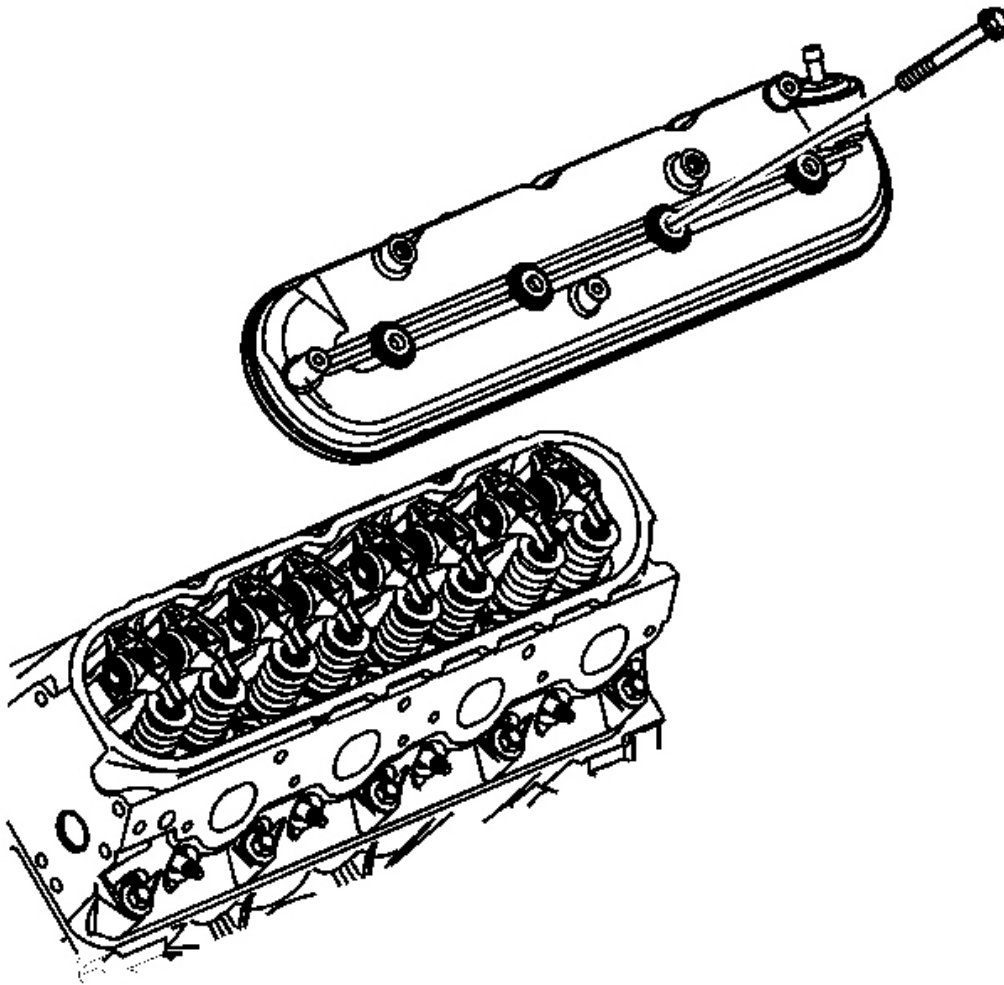


Fig. 604: View Of Valve Rocker Arm Cover
Courtesy of GENERAL MOTORS CORP.

2. Install the valve rocker arm cover onto the cylinder head.

NOTE: Refer to Fastener Notice in Cautions and Notices.

3. Install the cover bolts with grommets.

Tighten: Tighten the valve rocker arm cover bolts to 12 N.m (106 lb in).

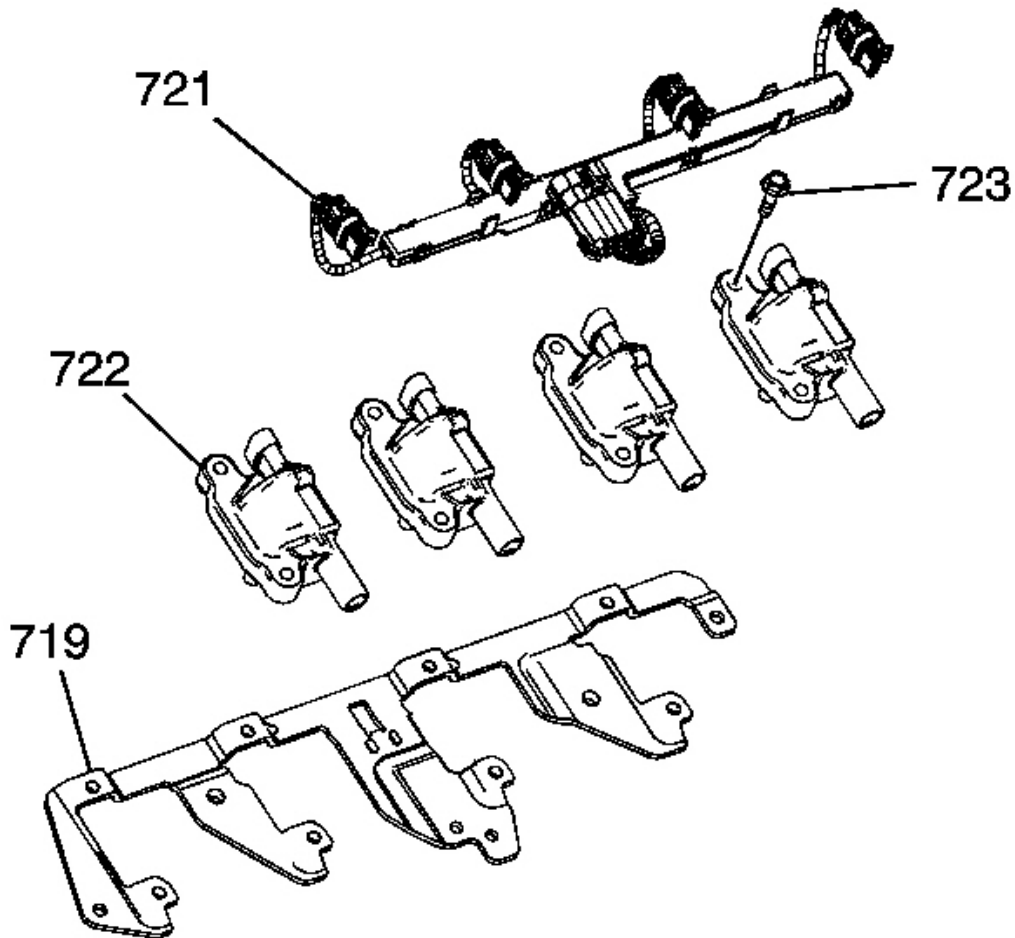


Fig. 605: View Of Bracket, Bolts, Coils & Wire Harness
Courtesy of GENERAL MOTORS CORP.

4. Apply threadlock GM P/N 12345382 (Canadian P/N 10953489) or equivalent, to the threads of the ignition coil bolts (723).
5. Install the ignition coils (722), wire harness (721) and bolts (723) to the bracket (719).

Tighten: Tighten the ignition coil bolts to 10 N.m (89 lb in).

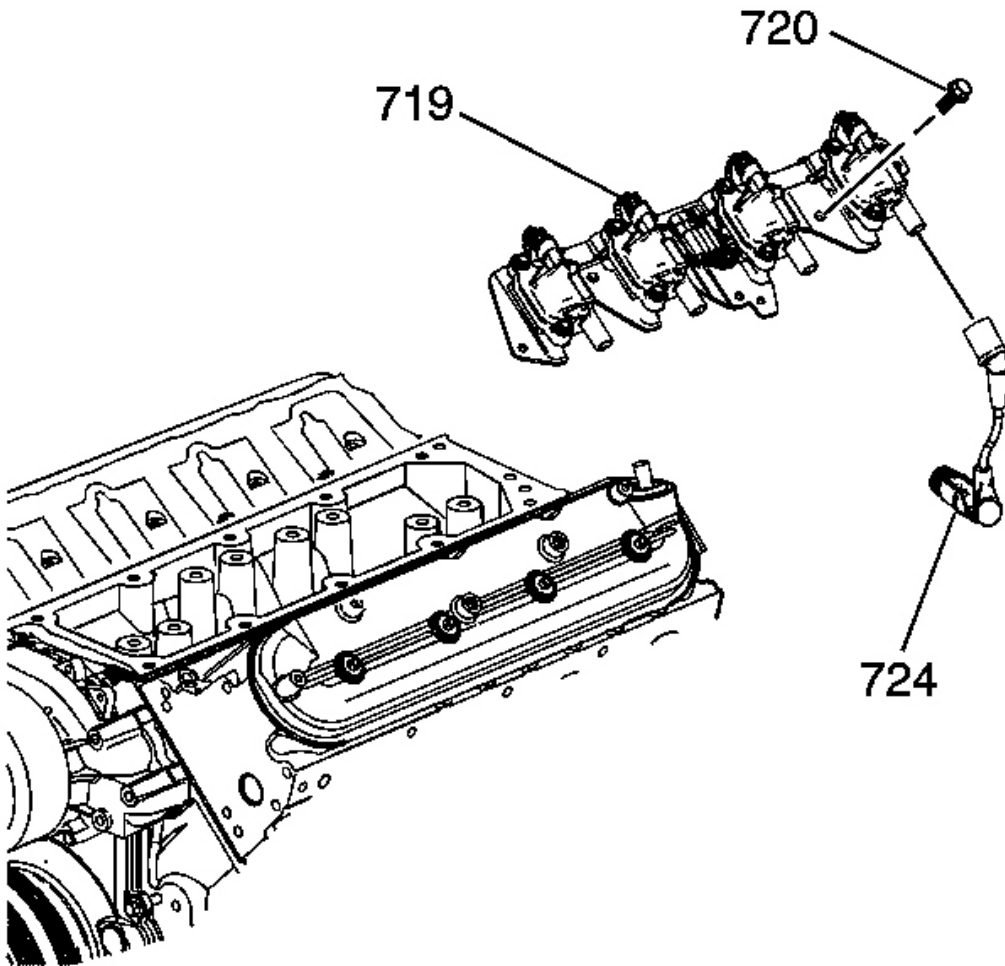


Fig. 606: View Of Left Rocker Arm Cover Components
Courtesy of GENERAL MOTORS CORP.

6. Apply threadlock GM P/N 12345382 (Canadian P/N 10953489) or equivalent, to the threads of the ignition coil bracket studs (720).
7. Install the ignition coil and bracket assembly (719) and studs (720).

Tighten: Tighten the bracket studs to 12 N.m (106 lb in).

VALVE ROCKER ARM COVER INSTALLATION - RIGHT SIDE

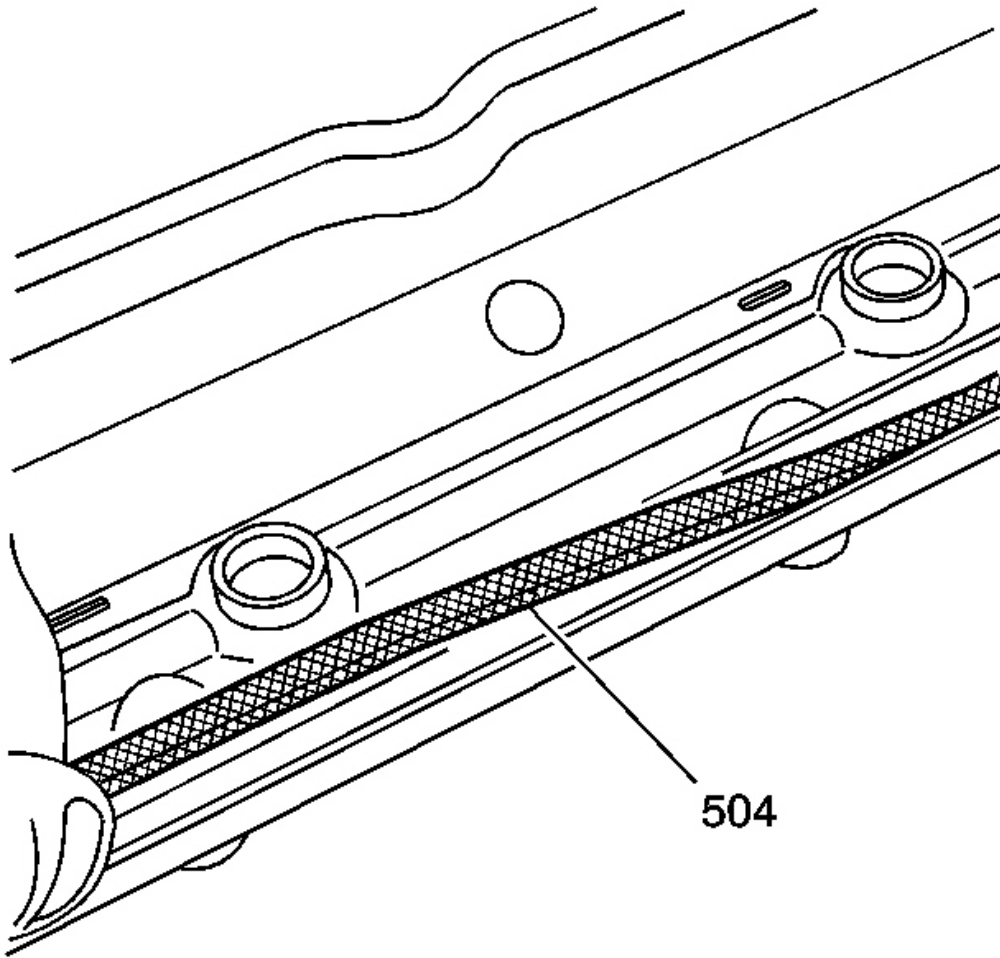


Fig. 607: View Of Valve Rocker Arm Cover Gasket
Courtesy of GENERAL MOTORS CORP.

IMPORTANT:

- All gasket surfaces should be free of oil or other foreign material during assembly.
- DO NOT use the valve rocker arm cover gasket again.
- The valve rocker arm cover bolt grommets may be used again if not damaged.

1. Install a NEW gasket (504) into the valve rocker arm cover.

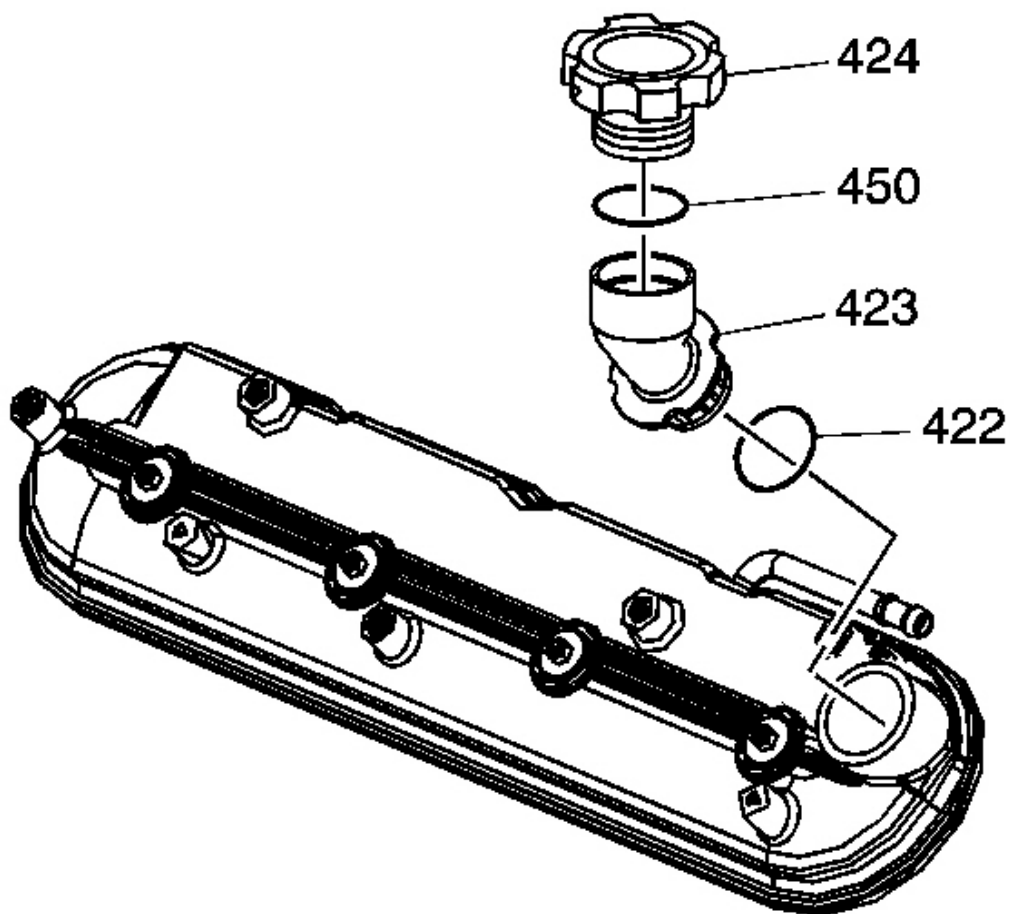


Fig. 608: Identifying Oil Fill Cap & Oil Fill Tube
Courtesy of GENERAL MOTORS CORP.

2. Install a NEW oil fill tube (423) to the valve rocker arm cover.
3. Install the oil fill cap (424).

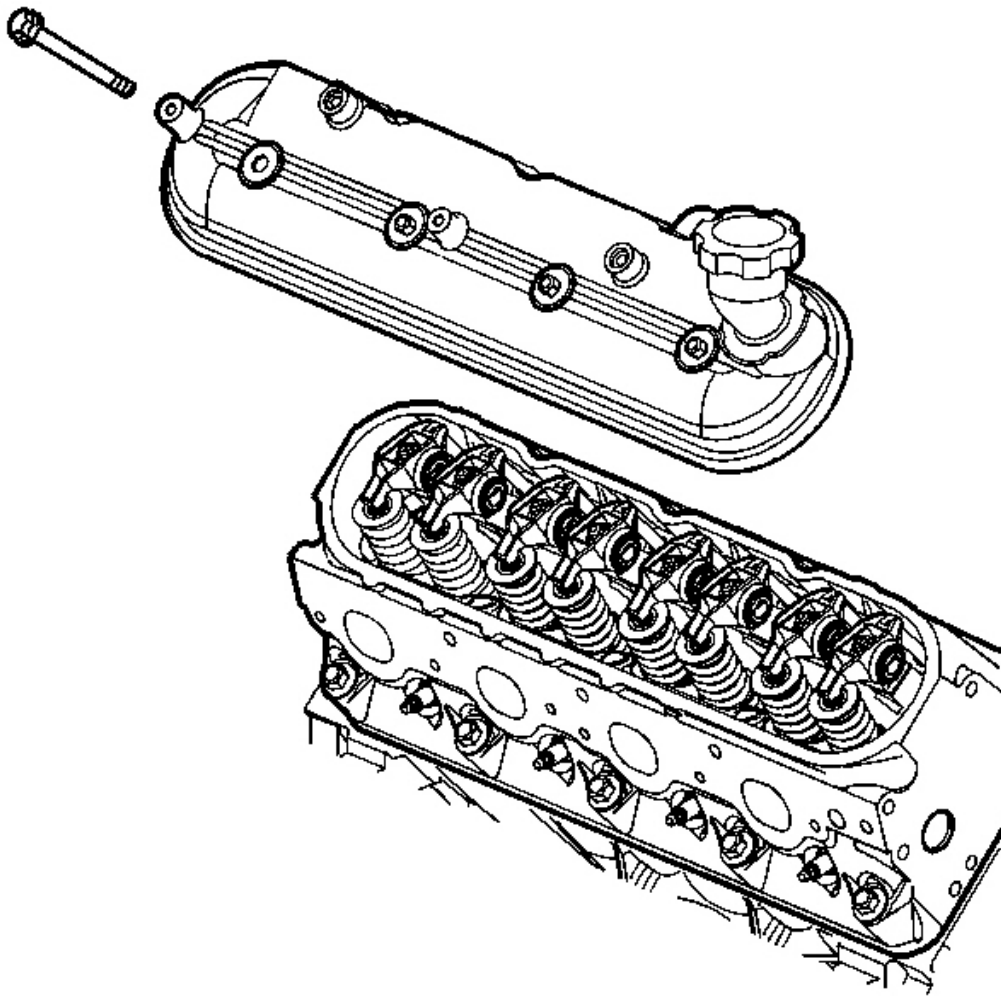


Fig. 609: View Of Valve Rocker Arm Cover & Bolts (Right)
Courtesy of GENERAL MOTORS CORP.

4. Install the valve rocker arm cover onto the cylinder head.

NOTE: Refer to Fastener Notice in Cautions and Notices.

5. Install the cover bolts with grommets.

Tighten: Tighten the valve rocker arm cover bolts to 12 N.m (106 lb in).

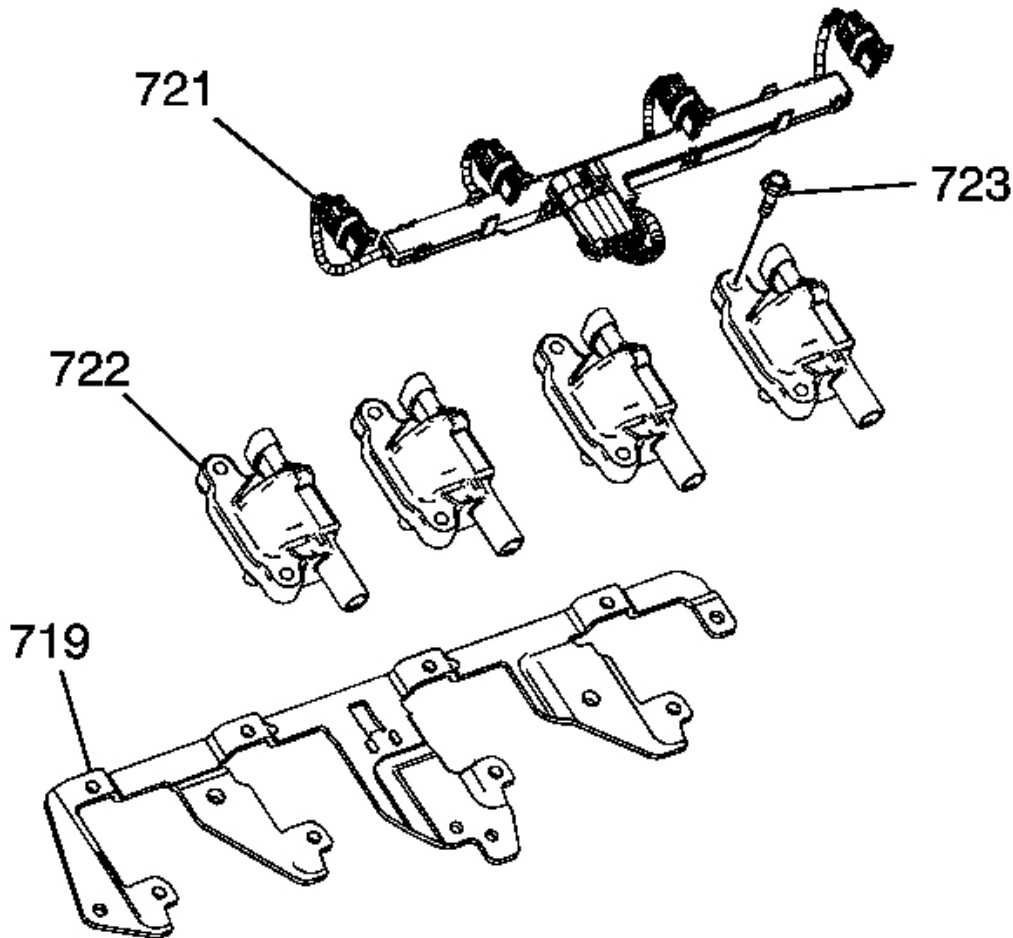


Fig. 610: View Of Bracket, Bolts, Coils & Wire Harness
Courtesy of GENERAL MOTORS CORP.

6. Apply threadlock GM P/N 12345382 (Canadian P/N 10953489) or equivalent, to the threads of the ignition coil bolts (723).
7. Install the ignition coils (722), wire harness (721) and bolts (723) to the bracket (719).

Tighten: Tighten the ignition coil bolts to 10 N.m (89 lb in).

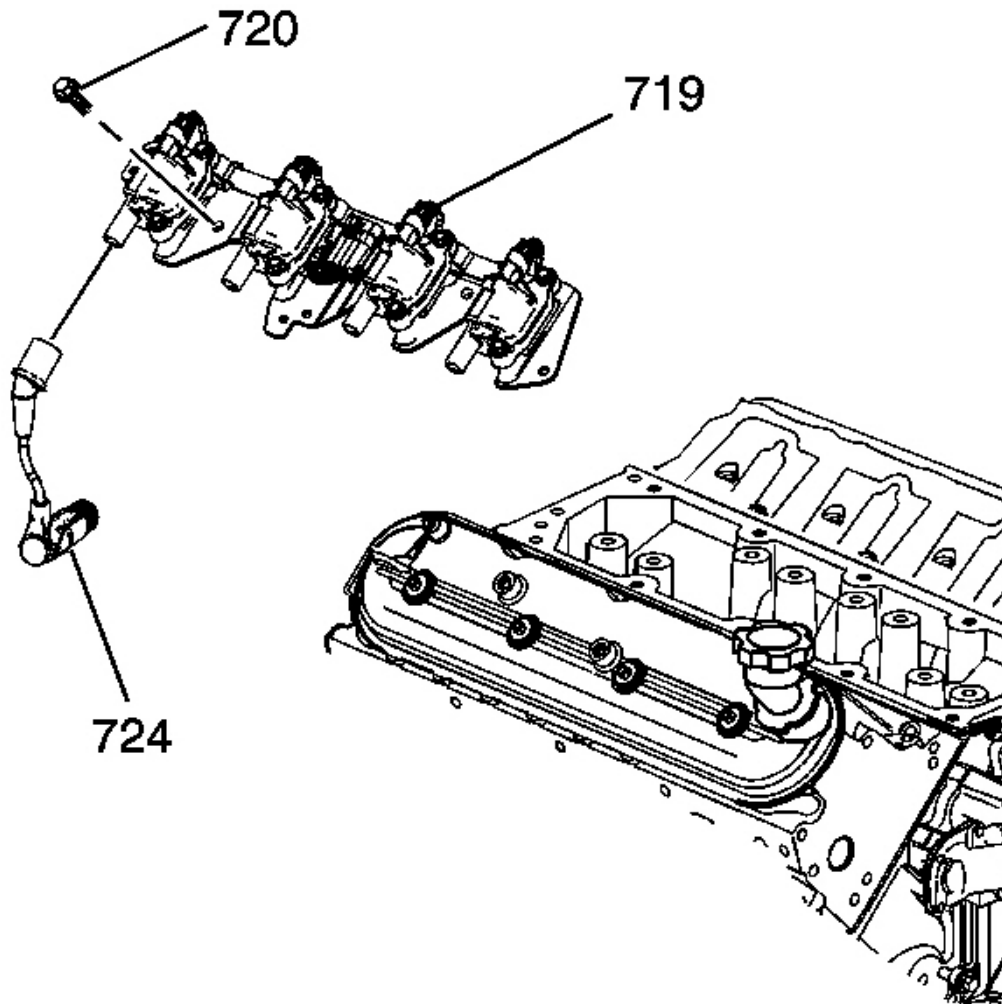


Fig. 611: View Of Right Rocker Arm Cover Components
Courtesy of GENERAL MOTORS CORP.

8. Apply threadlock GM P/N 12345382 (Canadian P/N 10953489) or equivalent, to the threads of the ignition coil bracket studs (720).
9. Install the ignition coil and bracket assembly (719) and studs (720).

Tighten: Tighten the bracket studs to 12 N.m (106 lb in).

ENGINE VALLEY COVER INSTALLATION

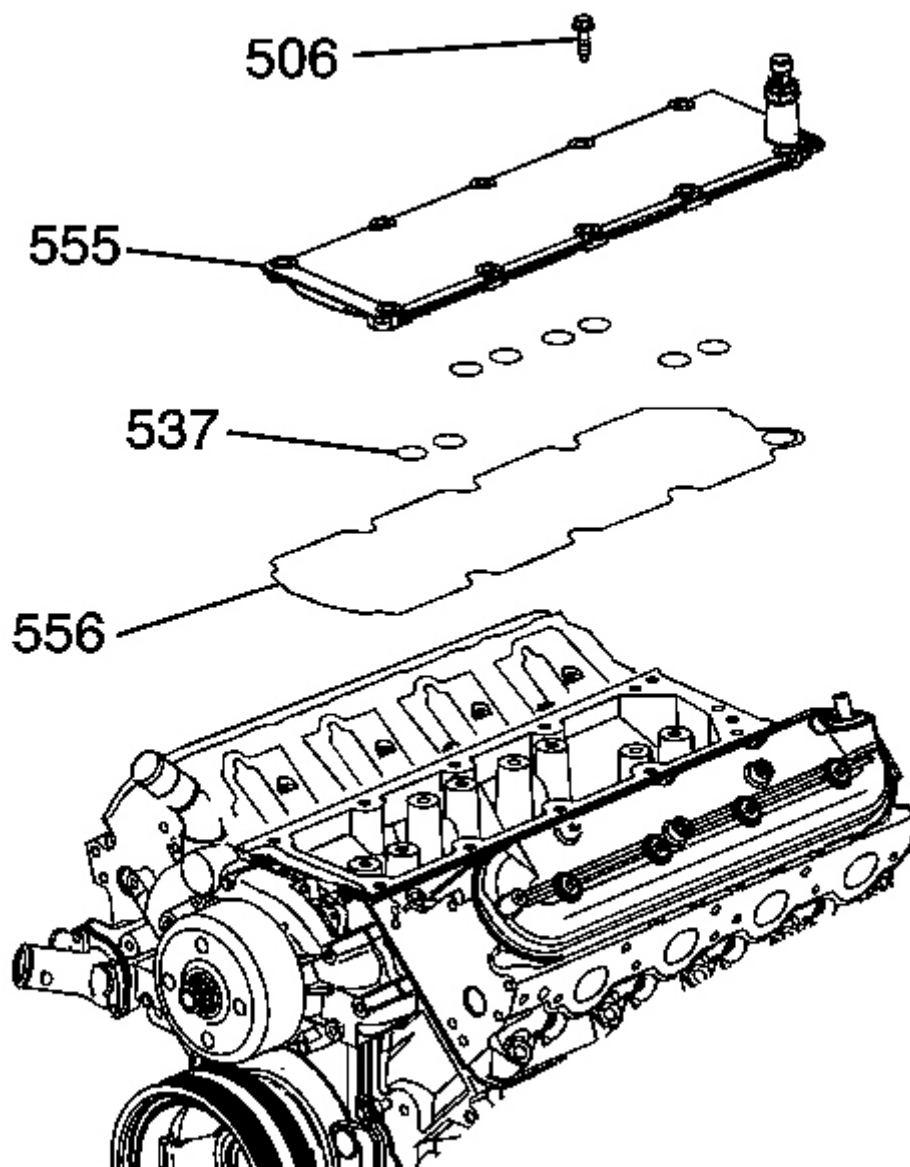


Fig. 612: View Of Engine Valley Cover & Gasket
Courtesy of GENERAL MOTORS CORP.

IMPORTANT: All gasket surfaces should be free of oil or other foreign material during assembly.

1. Lubricate the O-ring seals with clean engine oil.
2. Install the O-ring seals (537) to the cover (555).

NOTE: Refer to Fastener Notice in Cautions and Notices.

3. Install the cover (555), gasket (556) and bolts (506).

Tighten: Tighten the manifold bolts to 25 N.m (18 lb ft).

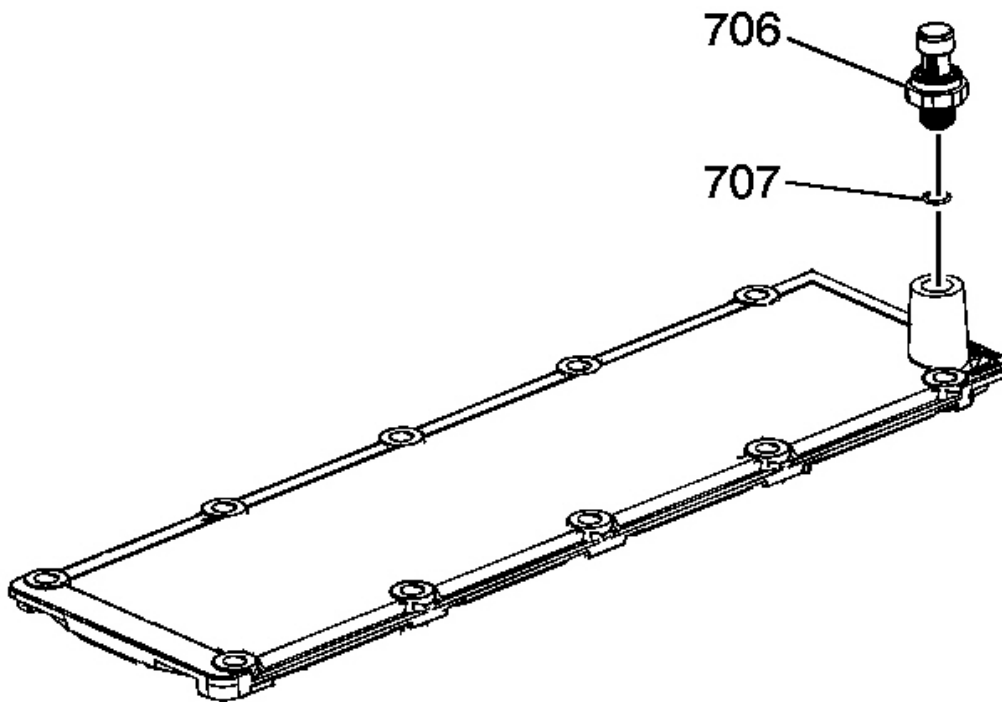


Fig. 613: Identifying Oil Pressure Sensor & Washer
Courtesy of GENERAL MOTORS CORP.

4. Apply sealant GM P/N 12346004 (Canadian P/N 10953480) or equivalent, to the threads of the sensor.
5. Install the oil pressure sensor (706) and sealing washer (707).

Tighten: Tighten the sensor to 35 N.m (26 lb ft).

COOLANT AIR BLEED PIPE INSTALLATION

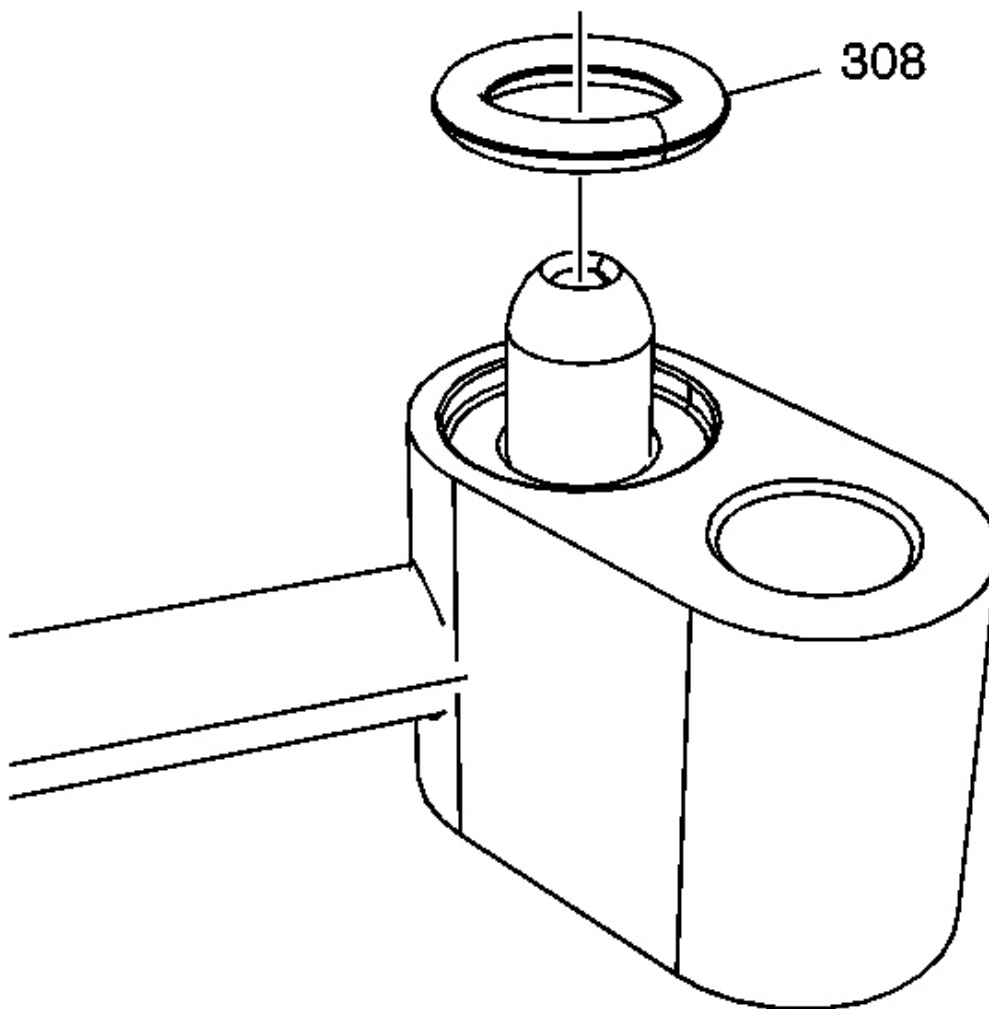


Fig. 614: View Of Coolant Air Bleed Pipe Seal
Courtesy of GENERAL MOTORS CORP.

IMPORTANT: Position the gasket O-ring seal (308) onto the nipple portion of the pipe.

1. Install the seals (308) onto the engine coolant air bleed pipe and covers.

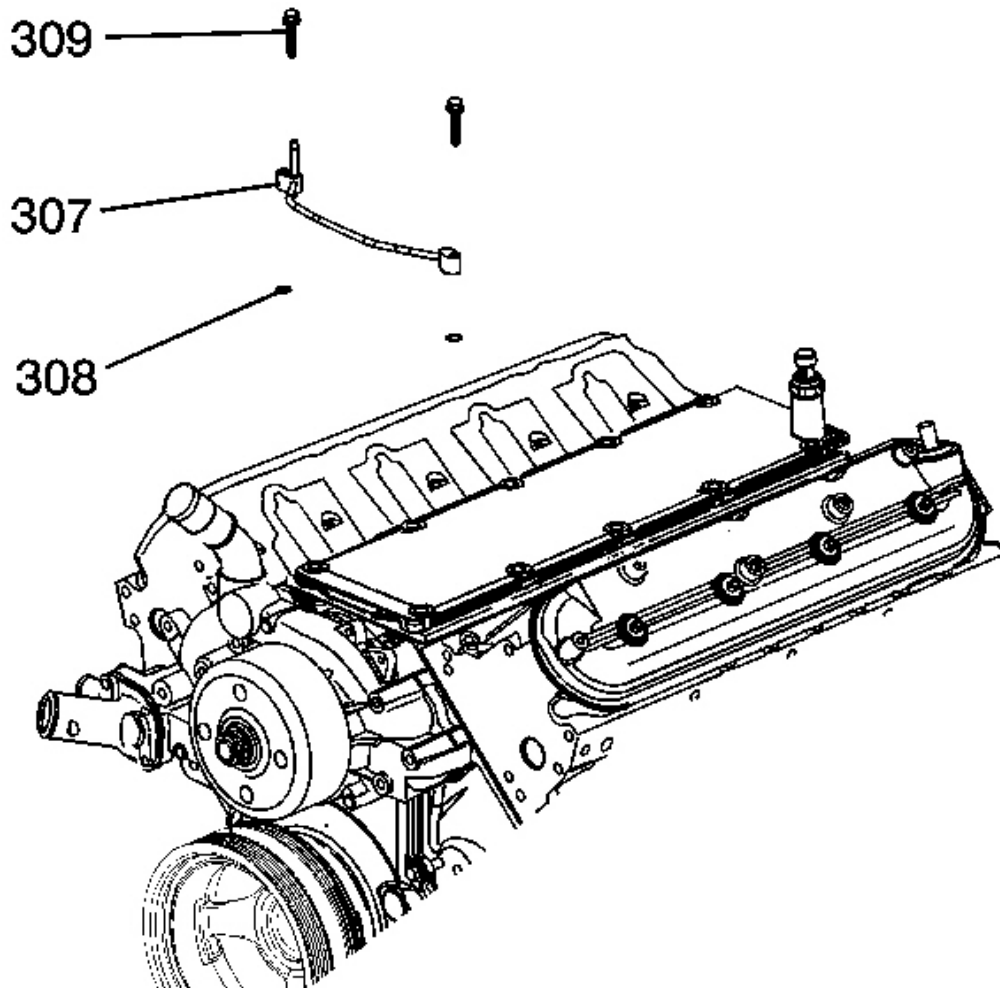


Fig. 615: Identifying Engine Coolant Air Bleed Pipe
Courtesy of GENERAL MOTORS CORP.

2. Install the pipe (307) and seals (308).

NOTE: Refer to Fastener Notice in Cautions and Notices.

3. Install the bolts (309).

Tighten: Tighten the bolts to 12 N.m (106 lb in).

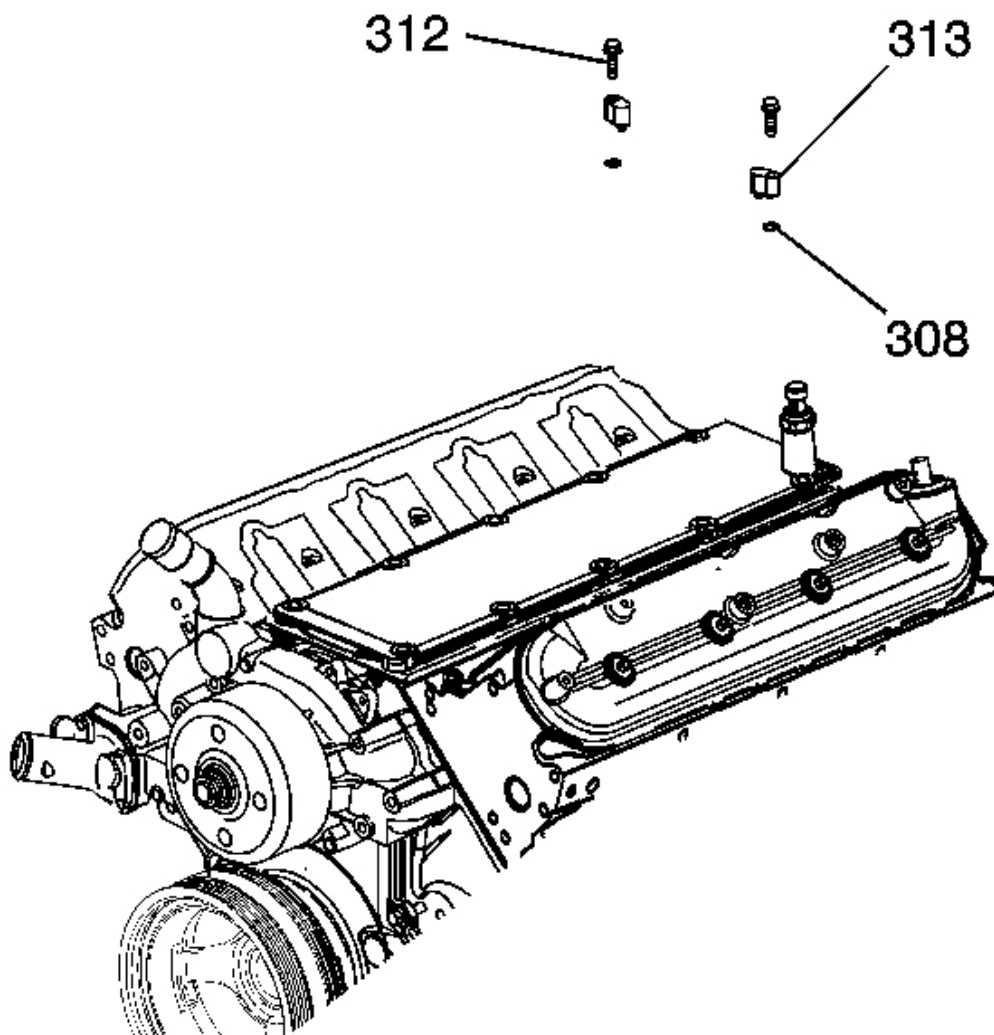


Fig. 616: Identifying Coolant Air Bleed Cover Bolts
Courtesy of GENERAL MOTORS CORP.

4. Install the covers (313) and seals (308).
5. Install the bolts (312).

Tighten: Tighten the cover bolts to 12 N.m (106 lb in).

INTAKE MANIFOLD INSTALLATION

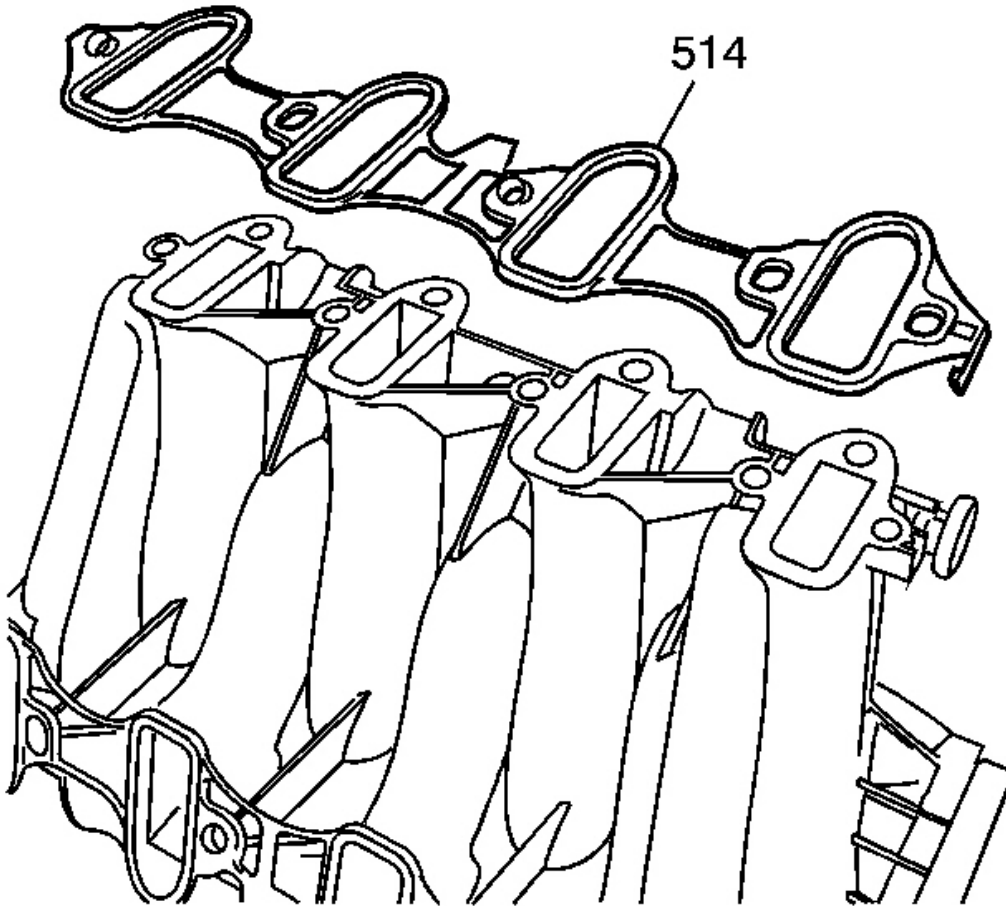


Fig. 617: View Of Intake Manifold-To-Cylinder Head Gasket
Courtesy of GENERAL MOTORS CORP.

IMPORTANT:

- The intake manifold, throttle body, fuel injection rail and fuel injectors may be removed as an assembly. If not servicing the individual components, install the intake manifold as a complete assembly.
- **DO NOT** use the intake manifold gaskets again. Install **NEW** intake manifold-to-cylinder head gaskets.

1. Install **NEW** intake manifold-to-cylinder head gaskets (514).

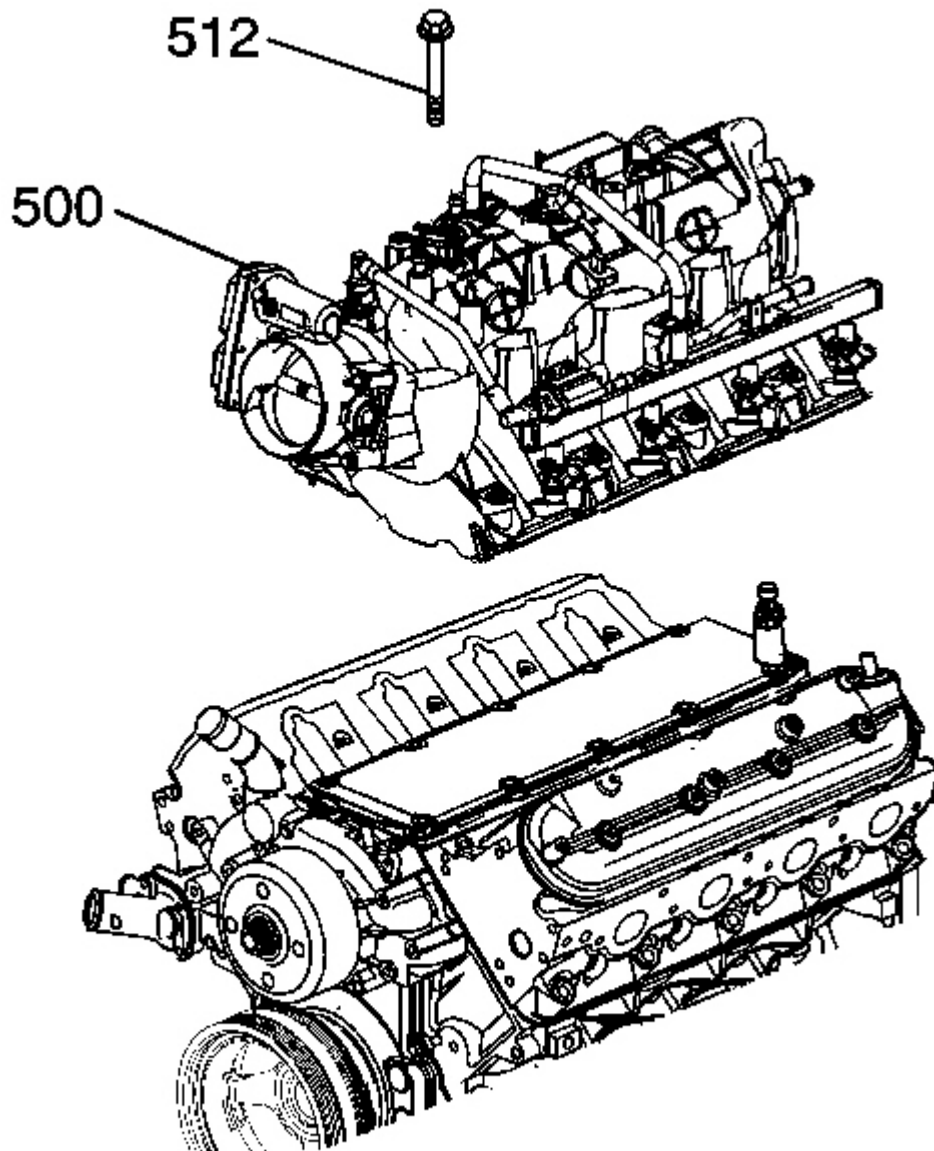


Fig. 618: Identifying Intake Manifold Bolts
Courtesy of GENERAL MOTORS CORP.

2. Install the intake manifold (500).
3. Apply a 5 mm (0.20 in) band of threadlock GM P/N 12345382 (Canadian P/N 10953489) to the threads of the intake manifold bolts (512). Refer to **Sealers, Adhesives and Lubricants** .

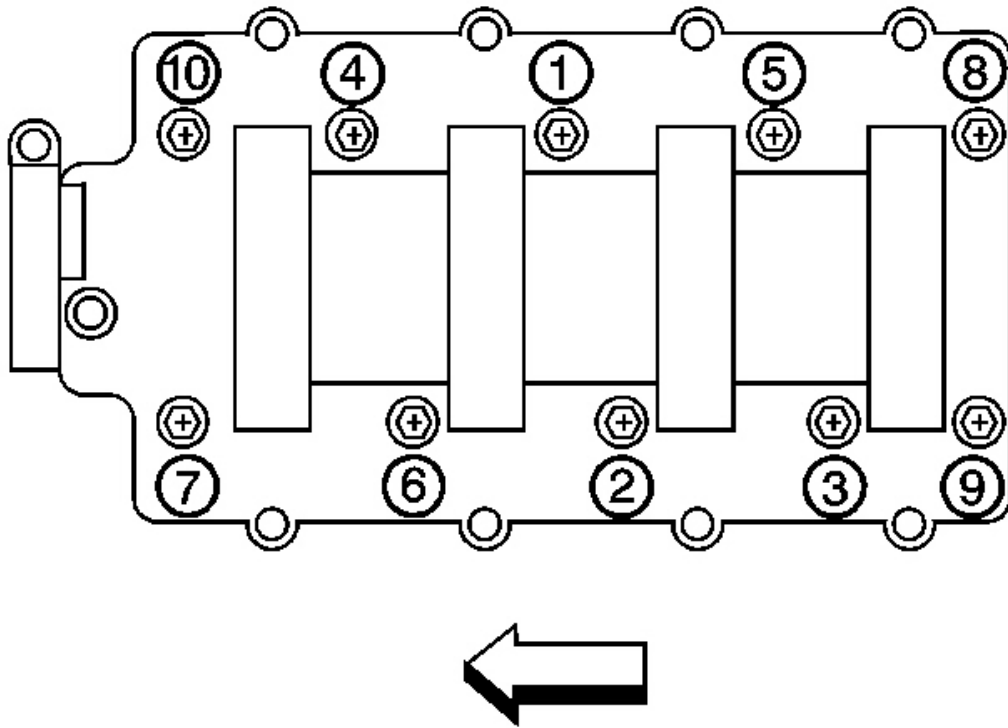


Fig. 619: Identifying Intake Manifold Bolt Tightening Sequence
Courtesy of GENERAL MOTORS CORP.

NOTE: Refer to Fastener Notice in Cautions and Notices.

4. Install the intake manifold bolts.

Tighten:

1. Tighten the intake manifold bolts (1-10) a first pass in sequence to 5 N.m (44 lb in).
2. Tighten the intake manifold bolts (1-10) a final pass in sequence to 10 N.m (89 lb in).

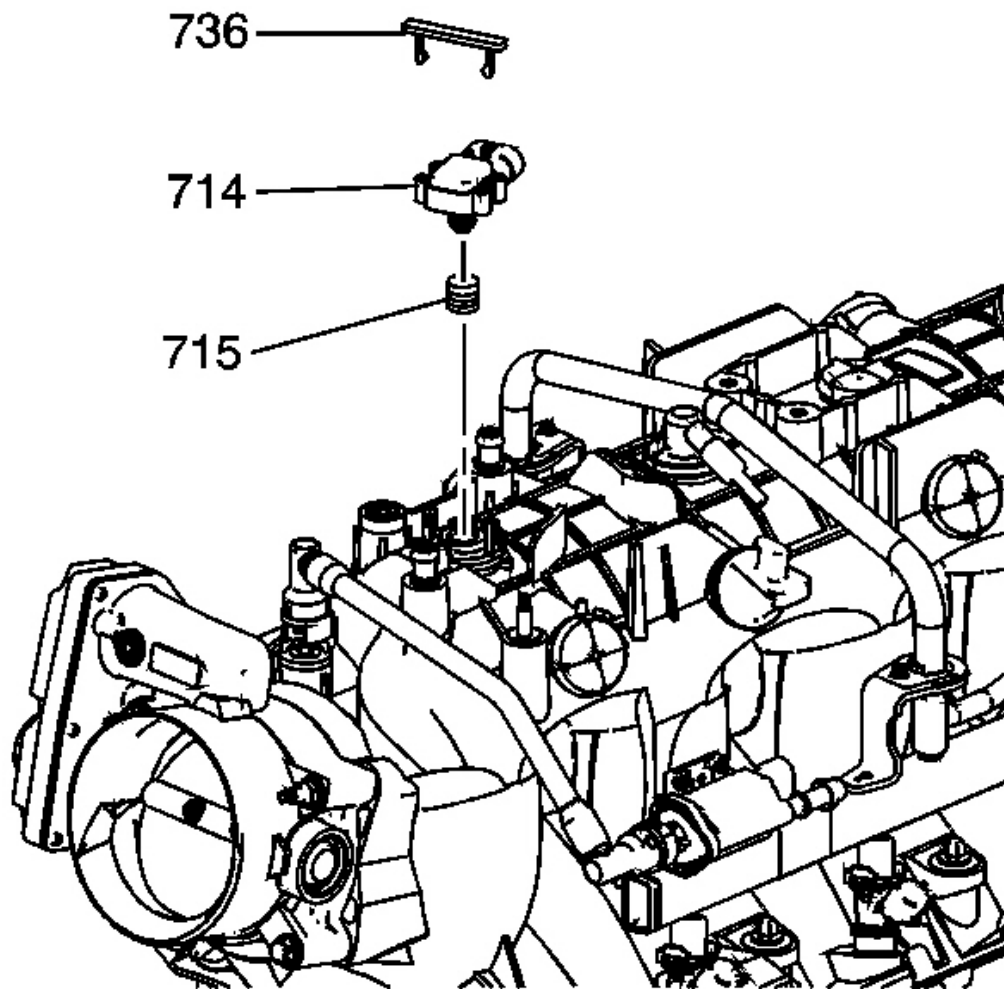


Fig. 620: View Of MAP Sensor
Courtesy of GENERAL MOTORS CORP.

5. Install the fuel rail. Refer to **Fuel Rail and Injectors Installation**.
6. Lubricate the manifold absolute pressure (MAP) sensor grommet (715) with clean engine oil.
7. Install the grommet onto the MAP sensor (714).
8. Install the MAP sensor and retainer (736).

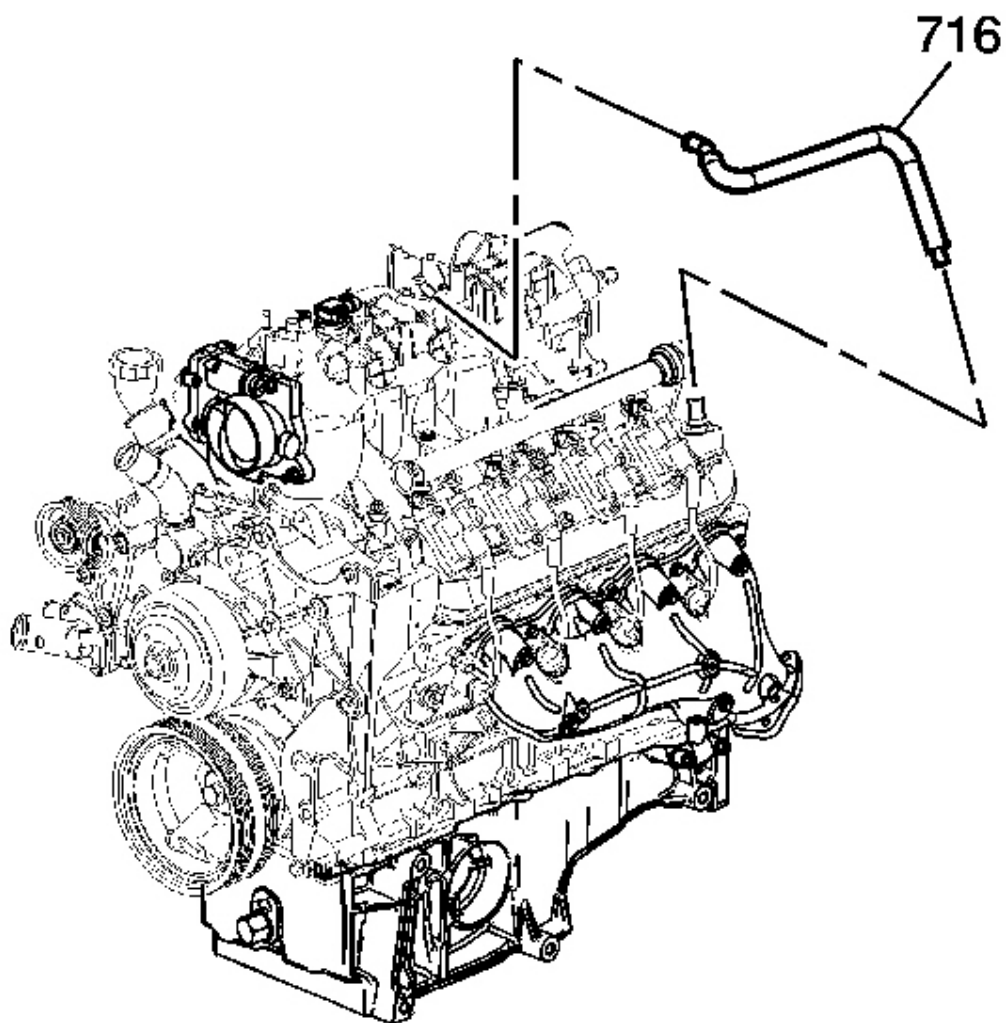


Fig. 621: View Of PVC Hose

Courtesy of GENERAL MOTORS CORP.

9. Install the positive crankcase ventilation (PCV) hose - dirty air (716).

FUEL RAIL AND INJECTORS INSTALLATION

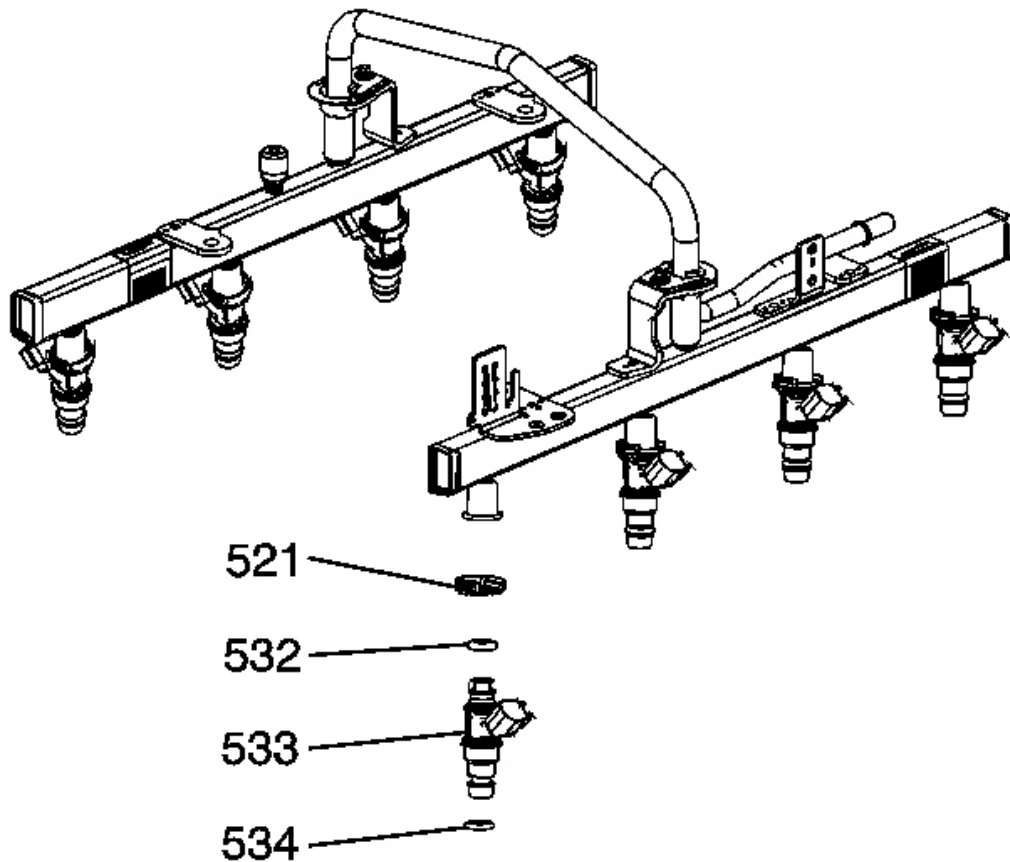


Fig. 622: View Of Fuel Rail & Injectors
Courtesy of GENERAL MOTORS CORP.

CAUTION: Refer to Fuel Rail Stop Bracket Installation Caution in Cautions and Notices.

IMPORTANT: DO NOT use the fuel injector O-ring seals again. Install NEW fuel injector O-ring seals during assembly.

1. Lubricate the NEW fuel injector O-ring seals (532, 534) with clean engine oil.
2. Install the O-ring seals to the fuel injectors.
3. Install the fuel injectors (533) and retainers (521).

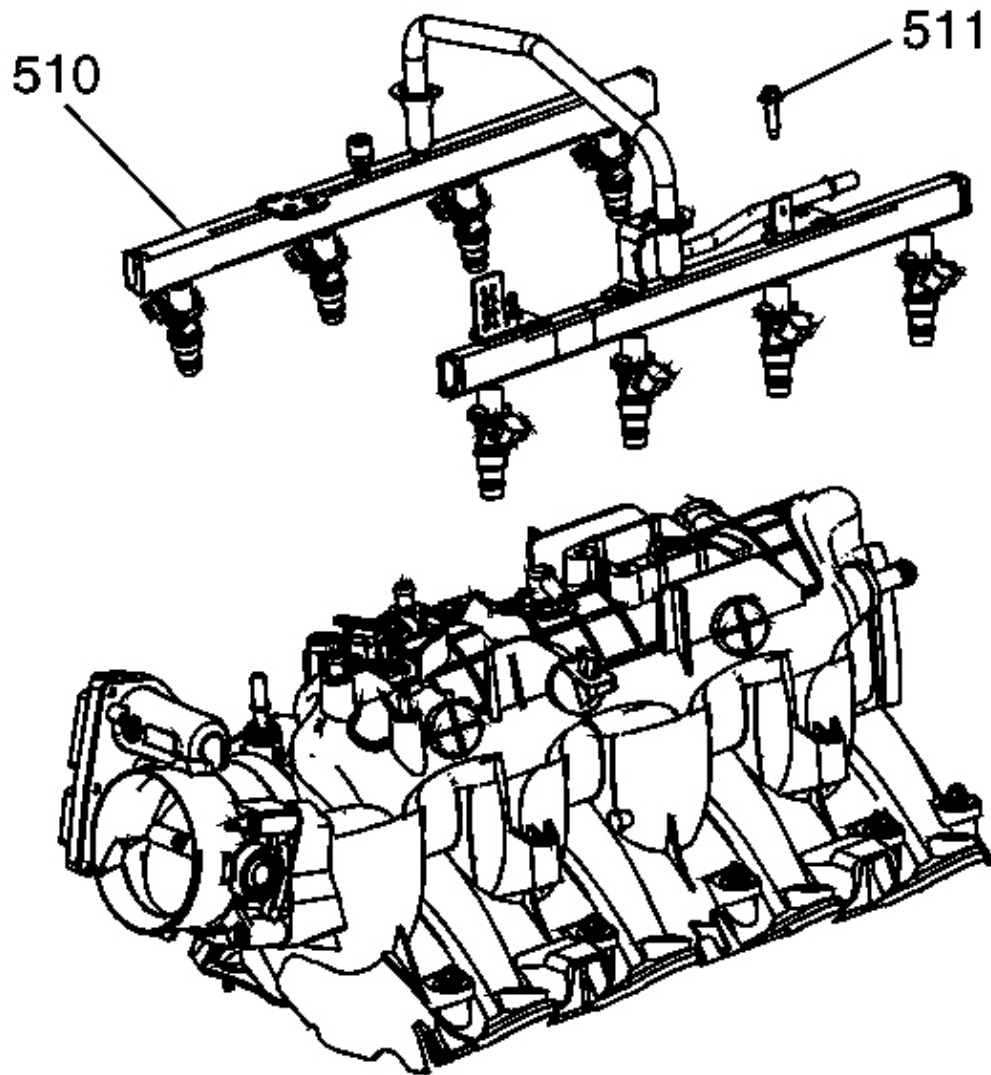


Fig. 623: Identifying Fuel Rail

Courtesy of GENERAL MOTORS CORP.

4. Install the fuel rail assembly (510) to the manifold. Push firmly on both sides of the rail until all the injectors have entered their bores.
5. Apply a 5 mm (0.2 in) band of threadlock GM P/N 12345382 (Canadian P/N 10953489) or equivalent, to the threads of the fuel rail bolts. Refer to **Sealers, Adhesives and Lubricants** .

NOTE: Refer to **Fastener Notice** in Cautions and Notices.

6. Install the fuel rail bolts (511).

Tighten: Tighten the fuel rail bolts to 10 N.m (89 lb in).

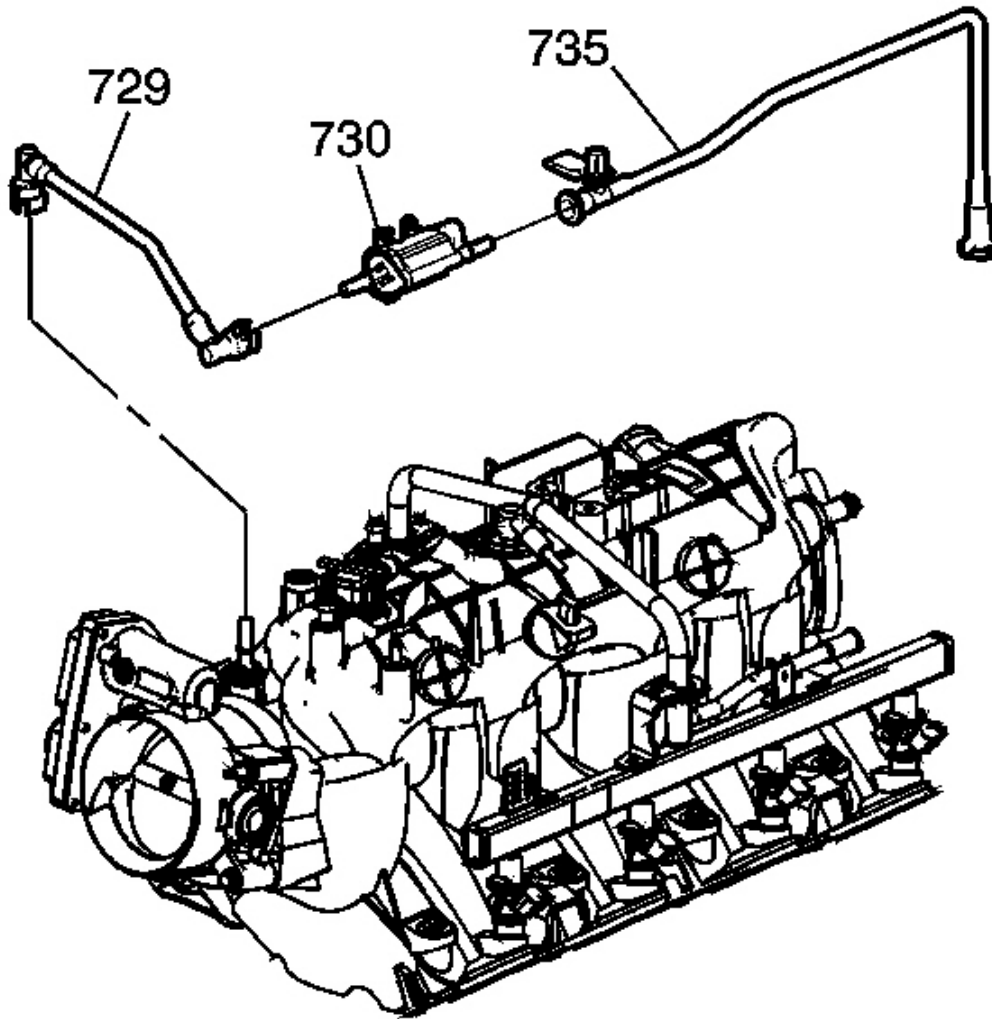


Fig. 624: View Of EVAP Purge Valve & Tubes
Courtesy of GENERAL MOTORS CORP.

7. Install the evaporative emission (EVAP) canister purge solenoid valve (730) and tubes (729, 735).

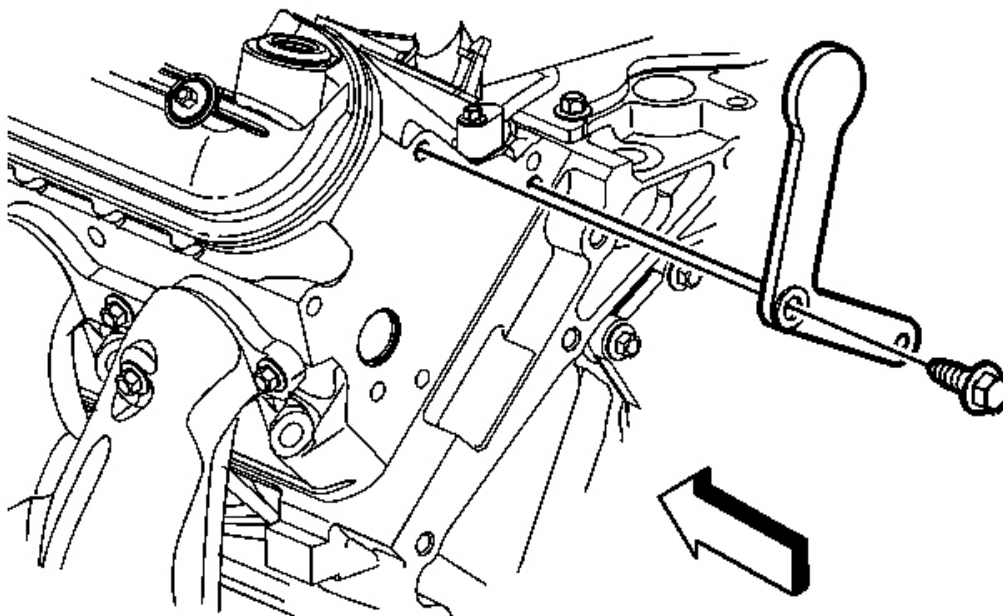


Fig. 625: View Of Fuel Rail Stop Bracket & Bolt
Courtesy of GENERAL MOTORS CORP.

8. Install the fuel rail stop bracket and bolt.

Tighten: Tighten the fuel rail stop bracket bolt to 50 N.m (37 lb ft).

THROTTLE BODY INSTALLATION

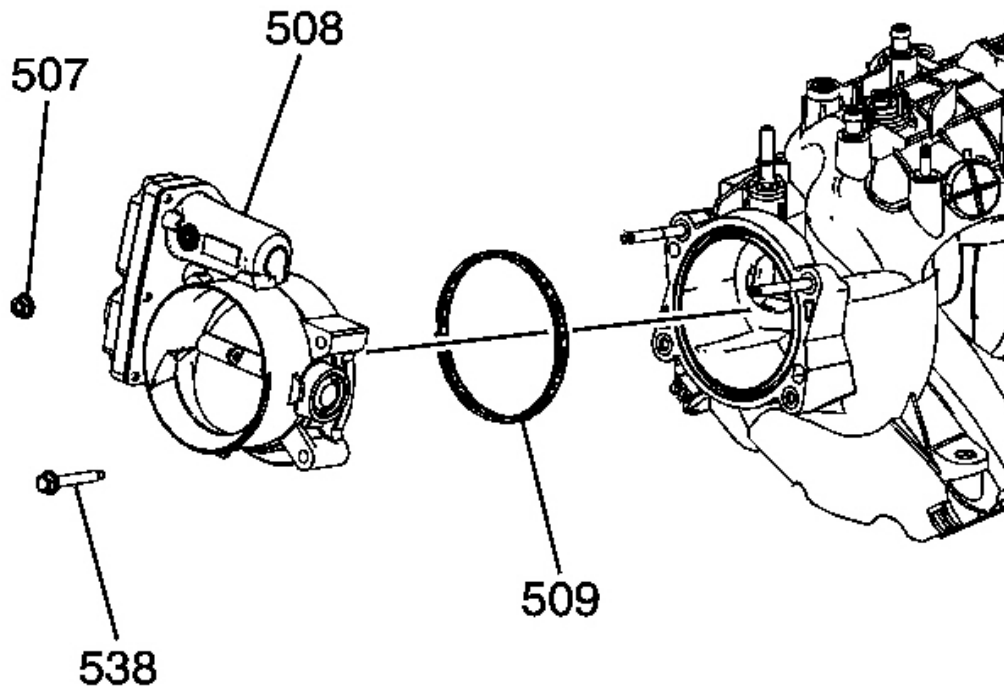


Fig. 626: View Of Throttle Body
Courtesy of GENERAL MOTORS CORP.

NOTE: Refer to Fastener Notice in Cautions and Notices.

1. Install the throttle body studs, as required.

Tighten: Tighten the throttle body studs to 6 N.m (53 lb in).

IMPORTANT: DO NOT use the throttle body gasket again. Install a NEW gasket during assembly.

2. Install the throttle body gasket (509) to the intake manifold. Align the locating tab of the gasket with the notch in the manifold.
3. Install the throttle body (508), bolts (538) and nuts (507).

Tighten: Tighten the throttle body nuts and bolts to 10 N.m (89 lb in).

WATER PUMP INSTALLATION

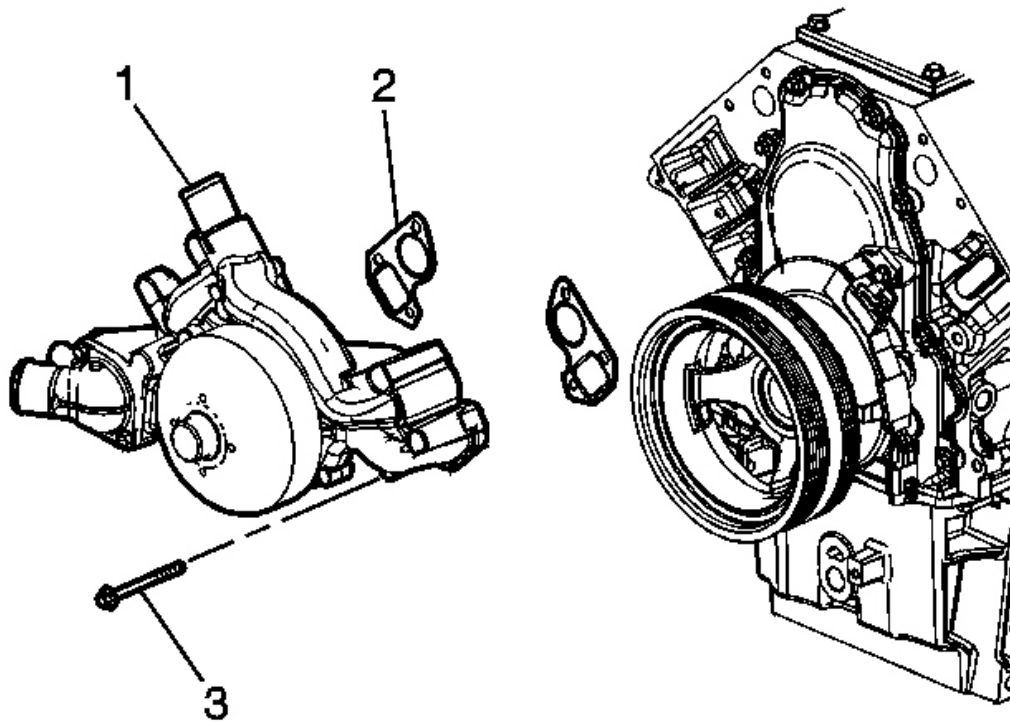


Fig. 627: View Of Water Pump
Courtesy of GENERAL MOTORS CORP.

NOTE: DO NOT use cooling system seal tabs or similar compounds, unless otherwise instructed. The use of cooling system seal tabs or similar compounds, may restrict coolant flow through the passages of the cooling system or the engine components. Restricted coolant flow may cause engine overheating and/or damage to the cooling system or the engine components/assembly.

IMPORTANT: All gasket surfaces are to be free of oil or other foreign material during assembly.

1. Install the water pump (1) and NEW gaskets (2).

NOTE: Refer to Fastener Notice .

2. Install the water pump bolts (3).

Tighten:

1. Tighten the water pump bolts a first pass to 15 N.m (11 lb ft).
2. Tighten the water pump bolts a final pass to 30 N.m (22 lb ft).

EXHAUST MANIFOLD INSTALLATION - LEFT SIDE

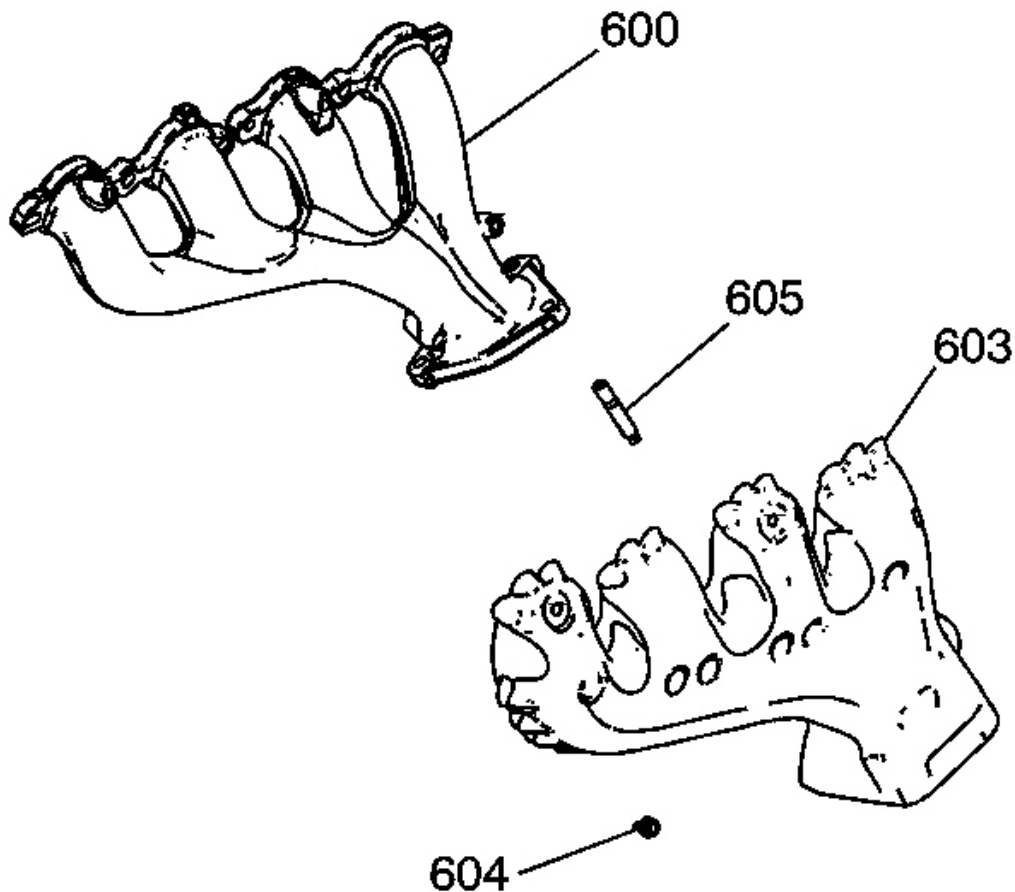


Fig. 628: View Of Exhaust Manifold
Courtesy of GENERAL MOTORS CORP.

NOTE: Refer to Fastener Notice in Cautions and Notices.

IMPORTANT:

- Tighten the exhaust manifold bolts as specified in the service procedure. Improperly installed and/or leaking exhaust manifold gaskets may affect vehicle emissions and/or on-board diagnostic

(OBD) II system performance.

- The cylinder head exhaust manifold bolt hole threads must be clean and free of debris or threadlocking material.
- Do not apply sealant to the first 3 threads of the bolt.

1. Install the heat shield (603) and bolts (604).

Tighten: Tighten the heat shield bolts to 9 N.m (80 lb in).

2. Install the exhaust pipe studs (605).

Tighten: Tighten the studs to 20 N.m (15 lb ft).

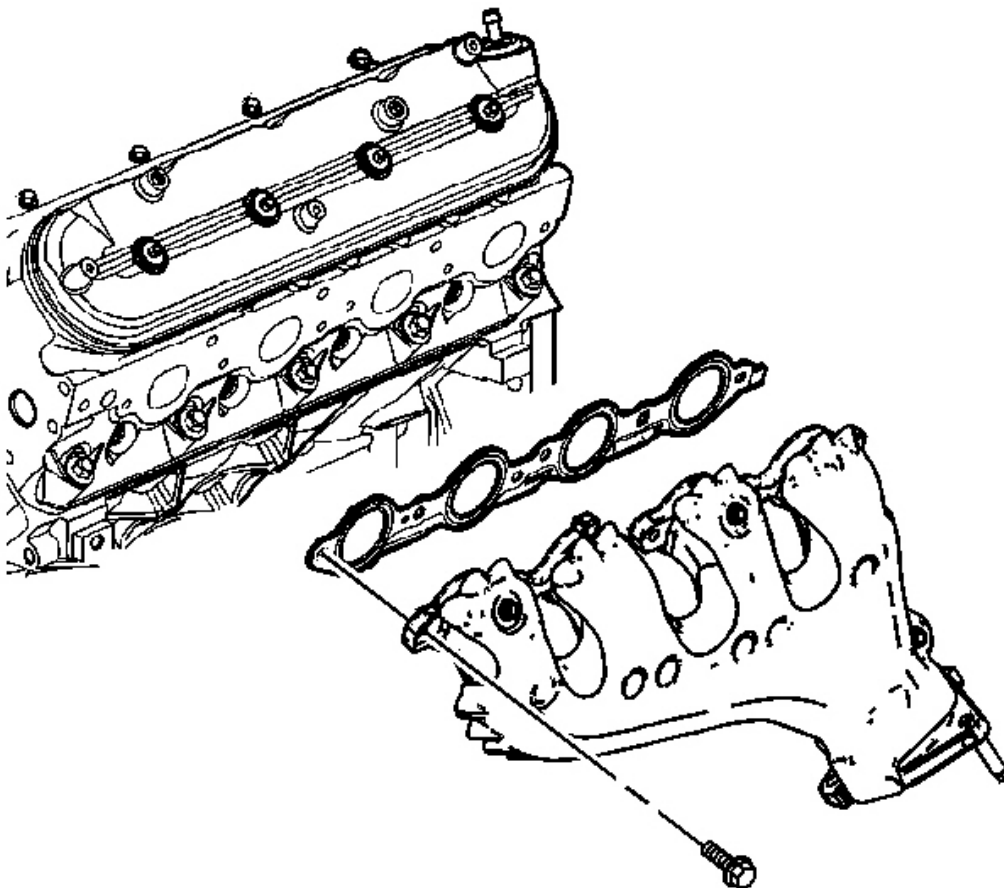


Fig. 629: View Of Left Exhaust Manifold & Gasket

2007 Chevrolet TrailBlazer

2007 ENGINE Engine Mechanical - 6.0L - TrailBlazer

Courtesy of GENERAL MOTORS CORP.

3. Apply a 5 mm (0.2 in) wide band of threadlock GM P/N 12345493 (Canadian P/N 10953488) or equivalent, to the threads of the exhaust manifold bolts. Refer to **Sealers, Adhesives and Lubricants** .
4. Install the exhaust manifold, NEW gasket and bolts.

Tighten:

1. Tighten the exhaust manifold bolts a first pass to 15 N.m (11 lb ft). Tighten the exhaust manifold bolts beginning with the center 2 bolts. Alternate from side-to-side and work toward the outside bolts.
 2. Tighten the exhaust manifold bolts a final pass to 20 N.m (15 lb ft). Tighten the exhaust manifold bolts beginning with the center 2 bolts. Alternate from side-to-side and work toward the outside bolts.
5. Using a flat punch, bend over the exposed edge of the exhaust manifold gasket at the rear of the left cylinder head.

EXHAUST MANIFOLD INSTALLATION - RIGHT SIDE

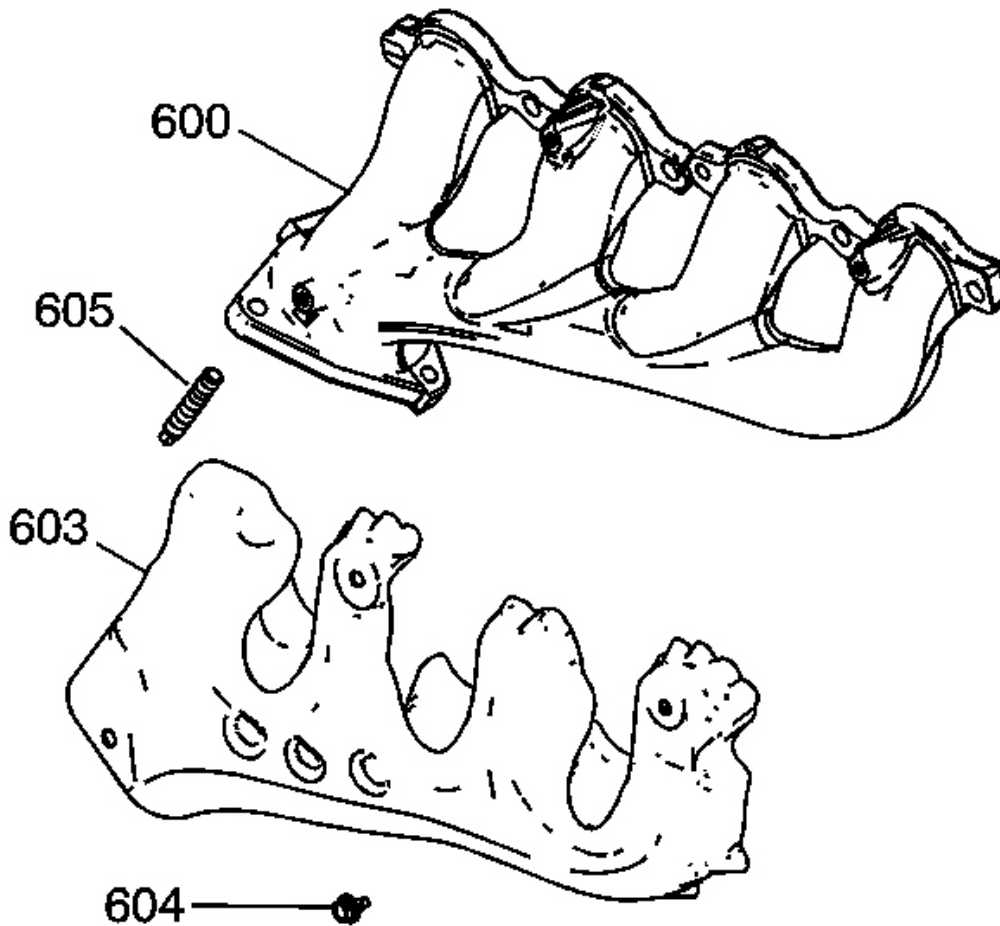


Fig. 630: View Of Right Exhaust Manifold & Heat Shield
Courtesy of GENERAL MOTORS CORP.

NOTE: Refer to Fastener Notice in Cautions and Notices.

IMPORTANT:

- Tighten the exhaust manifold bolts as specified in the service procedure. Improperly installed and/or leaking exhaust manifold gaskets may affect vehicle emissions and/or on-board diagnostic (OBD) II system performance.
- The cylinder head exhaust manifold bolt hole threads must be clean and free of debris or threadlocking material.
- Do not apply sealant to the first 3 threads of the bolt.

1. Install the heat shield (603) and bolts (604).

Tighten: Tighten the heat shield bolts to 9 N.m (80 lb in).

2. Install the exhaust pipe studs (605).

Tighten: Tighten the studs to 20 N.m (15 lb ft).

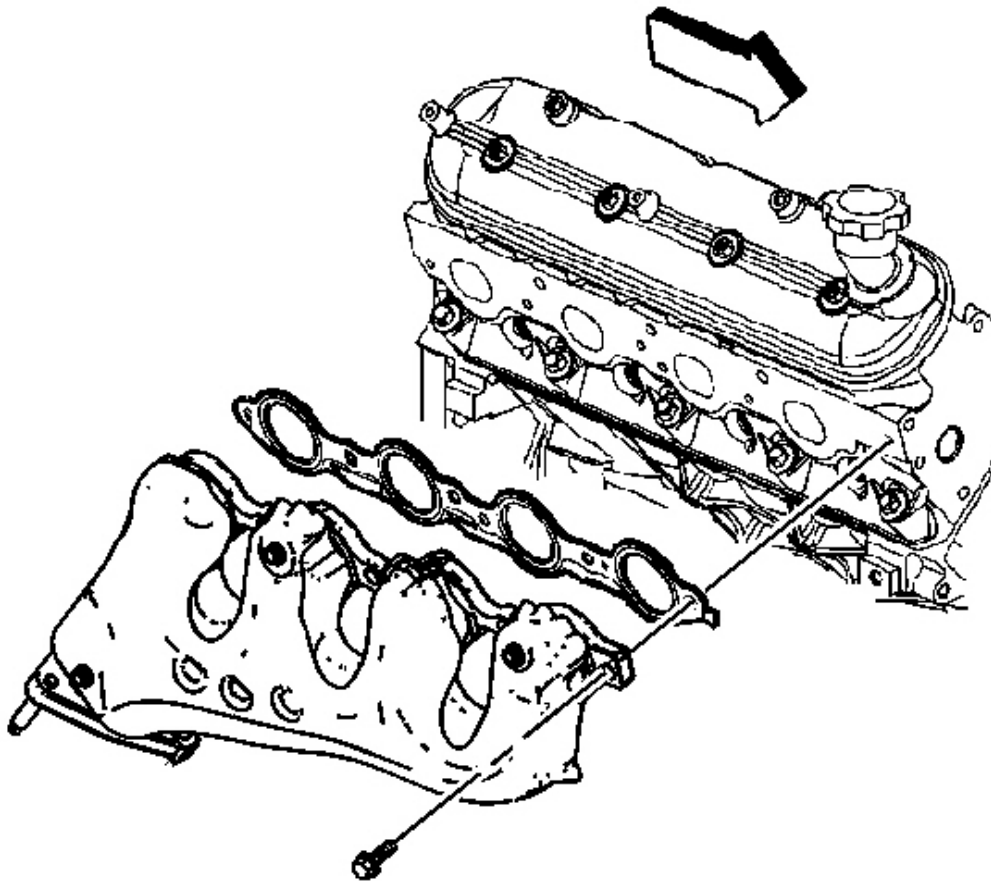


Fig. 631: View Of Right Exhaust Manifold & Gasket
Courtesy of GENERAL MOTORS CORP.

3. Apply a 5 mm (0.2 in) wide band of threadlock GM P/N 12345493 (Canadian P/N 10953488) or equivalent, to the threads of the exhaust manifold bolts. Refer to **Sealers, Adhesives and Lubricants**.
4. Install the exhaust manifold, NEW gasket and bolts.

2007 Chevrolet TrailBlazer

2007 ENGINE Engine Mechanical - 6.0L - TrailBlazer

Tighten:

1. Tighten the exhaust manifold bolts a first pass to 15 N.m (11 lb ft). Tighten the exhaust manifold bolts beginning with the center 2 bolts. Alternate from side-to-side and work toward the outside bolts.
2. Tighten the exhaust manifold bolts a final pass to 20 N.m (15 lb ft). Tighten the exhaust manifold bolts beginning with the center 2 bolts. Alternate from side-to-side and work toward the outside bolts.
5. Using a flat punch, bend over the exposed edge of the exhaust manifold gasket at the rear of the left cylinder head.

OIL LEVEL INDICATOR AND TUBE INSTALLATION

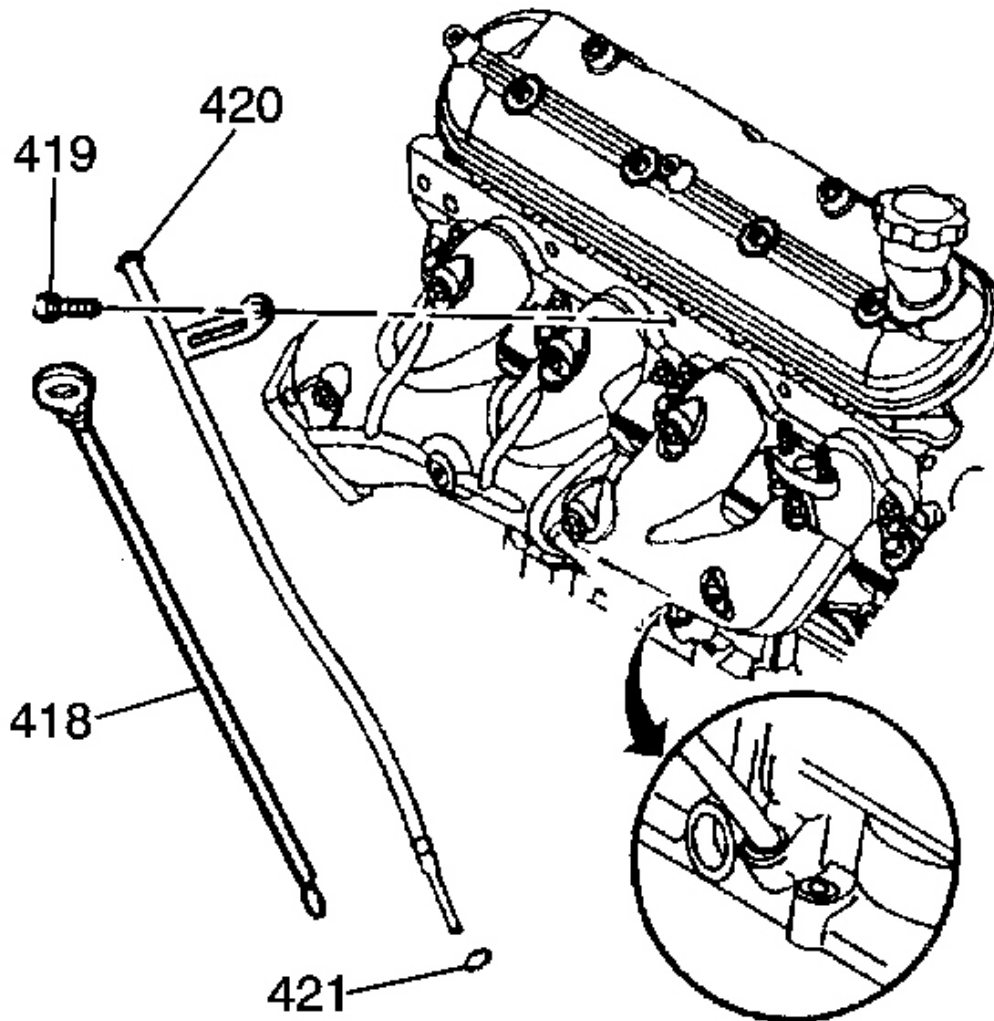


Fig. 632: Identifying Oil Level Indicator & Tube
Courtesy of GENERAL MOTORS CORP.

1. Inspect the O-ring seal (421) for cuts or damage. If the oil level indicator tube O-ring seal is not cut or damaged, it may be used again.
2. Lubricate the O-ring seal with clean engine oil.
3. Install the O-ring seal onto the oil level indicator tube (420).
4. Install the oil level indicator tube into the engine block and rotate into proper position.

NOTE: Refer to Fastener Notice in Cautions and Notices.

5. Install the tube bolt (419).

Tighten: Tighten the oil level indicator tube bolt to 25 N.m (18 lb ft).

6. Install the oil level indicator (418) into the tube.

ENGINE FLYWHEEL INSTALLATION

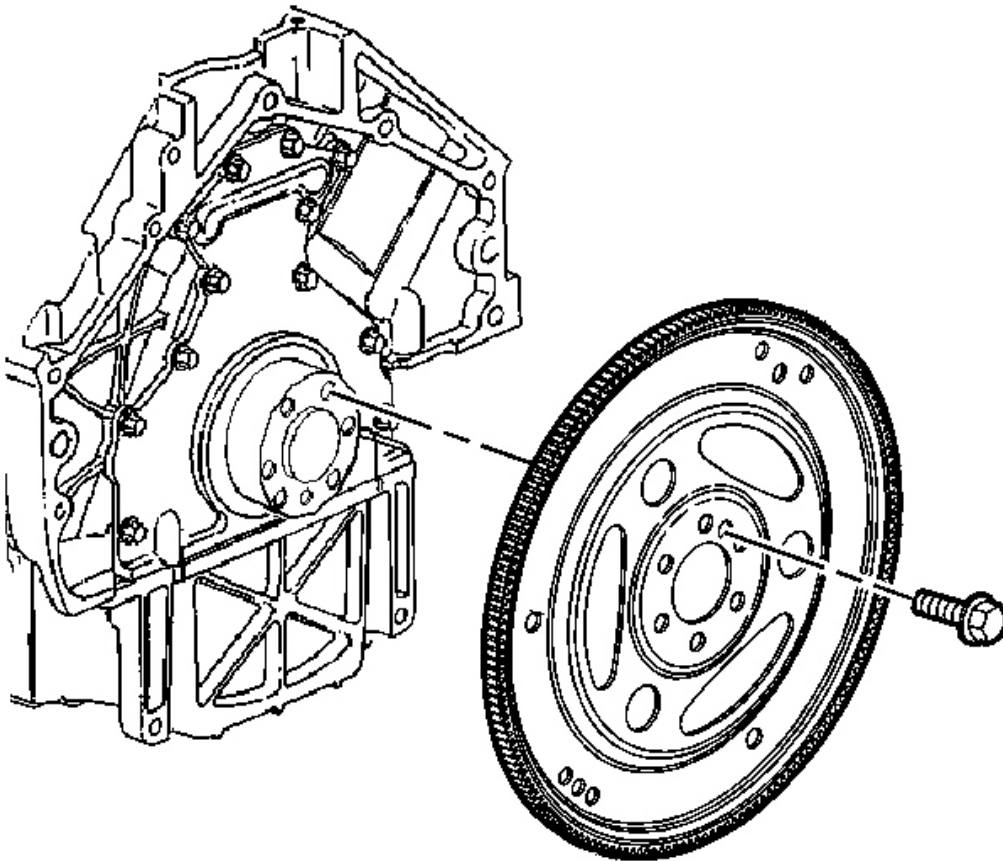


Fig. 633: View Of Flywheel

Courtesy of GENERAL MOTORS CORP.

IMPORTANT: The flywheel and flex plate do not use a locating pin for alignment and will not initially seat against the crankshaft flange, but will be pulled onto the crankshaft by the bolts. This procedure requires a 3-stage tightening process.

1. Install the automatic transmission flex plate to the crankshaft, if applicable.

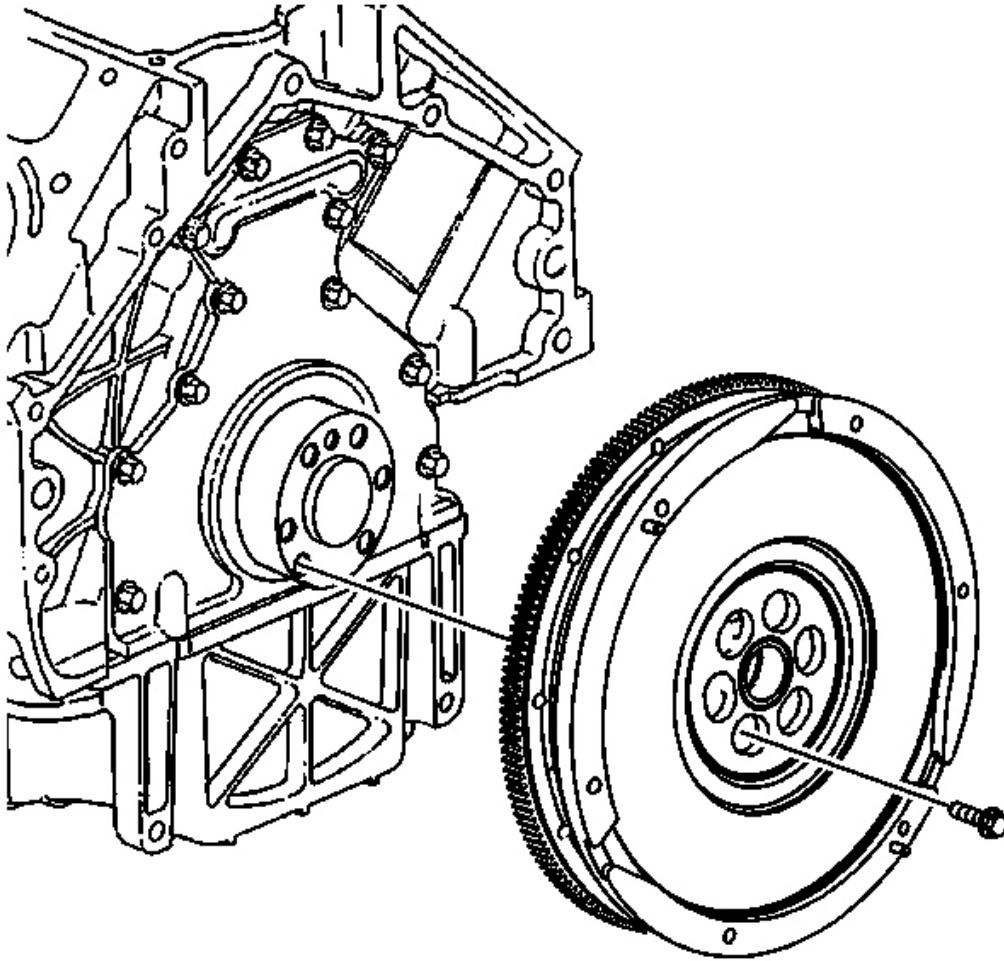


Fig. 634: View Of Manual Transmission Engine Flywheel
Courtesy of GENERAL MOTORS CORP.

2. Install the manual transmission flywheel to the crankshaft, if applicable.
3. Apply threadlock GM P/N 12345382 (Canadian P/N 10953489) or equivalent, to the threads of the bolts.

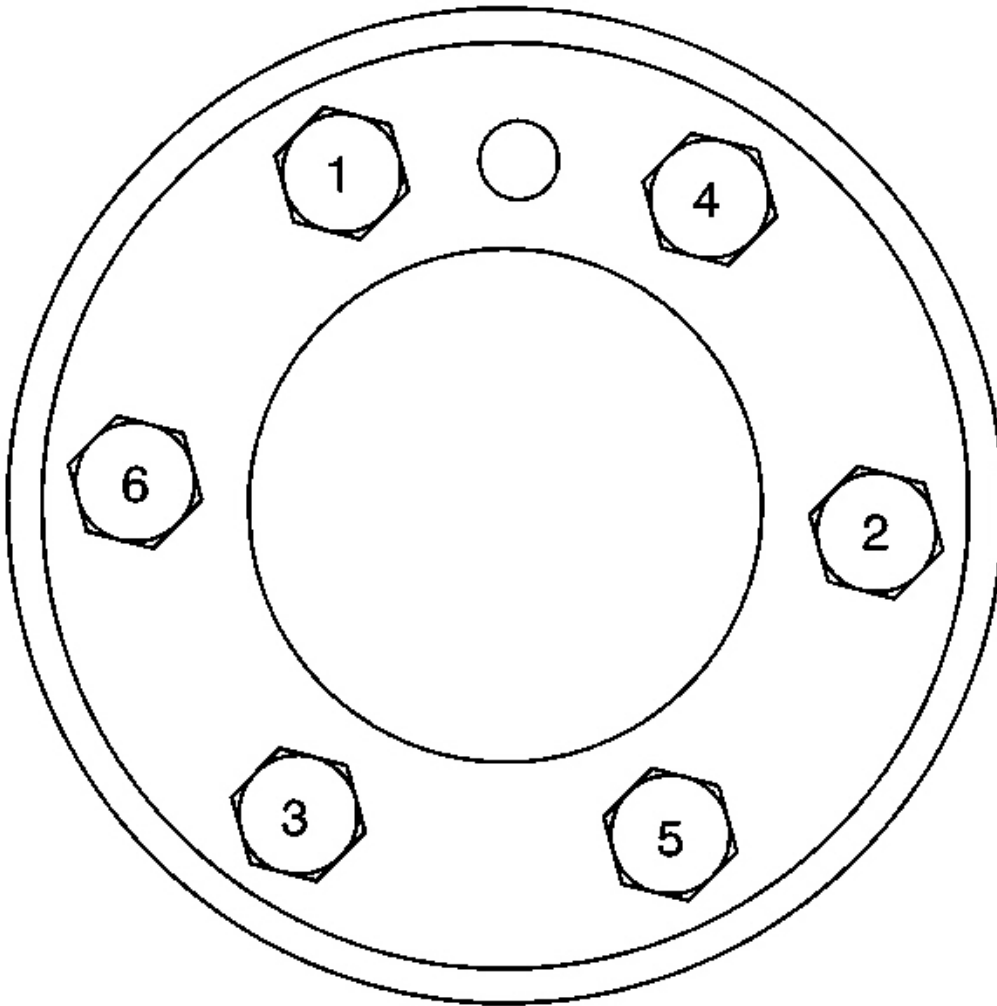


Fig. 635: Identifying Flywheel Bolt Tightening Sequence
Courtesy of GENERAL MOTORS CORP.

NOTE: Refer to Fastener Notice in Cautions and Notices.

4. Install the engine flywheel bolts (1-6).

Tighten:

1. Tighten the engine flywheel bolts (1-6) a first pass in sequence to 20 N.m (15 lb ft).
2. Tighten the engine flywheel bolts (1-6) a second pass in sequence to 50 N.m (37 lb ft).
3. Tighten the engine flywheel bolts (1-6) a final pass in sequence to 100 N.m (74 lb ft).

CRANKSHAFT BALANCER INSTALLATION

Tools Required

- **J 41478** Crankshaft Front Oil Seal Installer
- **J 41665** Crankshaft Balancer and Sprocket Installer
- **J 42386-A** Flywheel Holding Tool
- **J 45059** Angle Meter

Installation Procedure

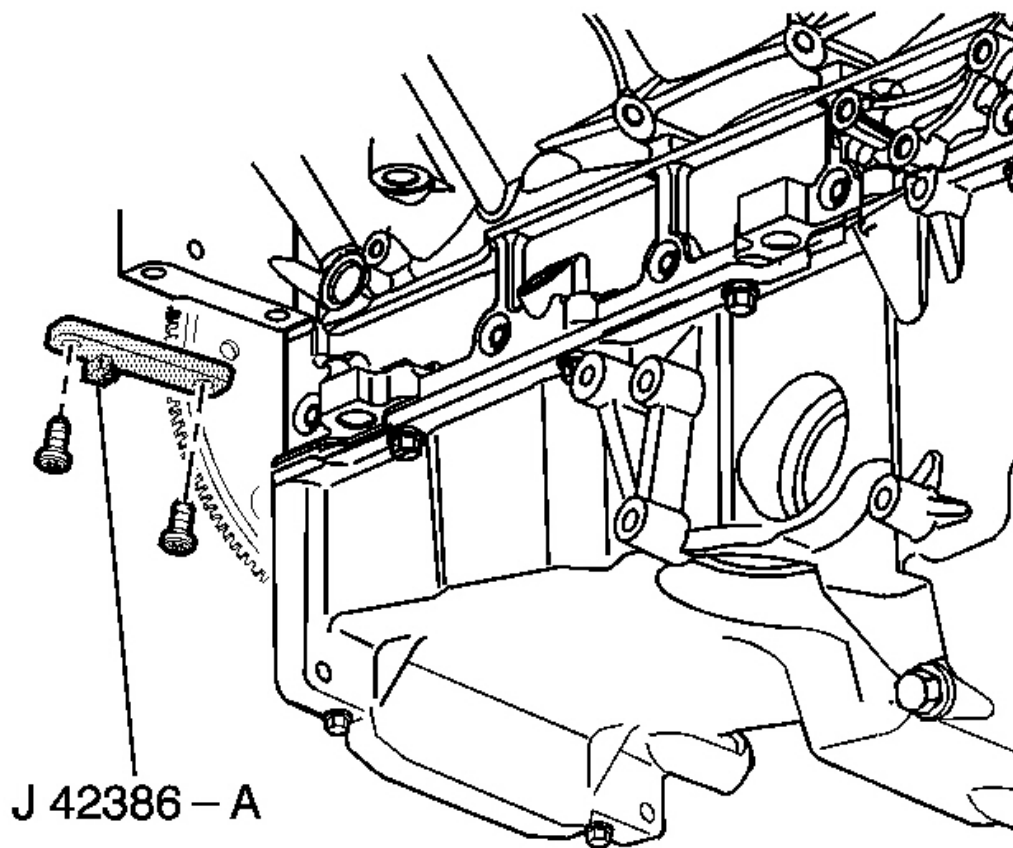


Fig. 636: View Of J 42386-A Flywheel Tool
Courtesy of GENERAL MOTORS CORP.

NOTE: Refer to Fastener Notice .

2007 Chevrolet TrailBlazer

2007 ENGINE Engine Mechanical - 6.0L - TrailBlazer

IMPORTANT:

- The crankshaft balancer is balanced as an individual component. It is not necessary to mark the balancer prior to removal.
- The crankshaft balancer installation and bolt tightening involves a 4 stage tightening process. The first pass ensures that the balancer is installed completely onto the crankshaft. The second, third and fourth passes tighten the NEW bolt to the proper torque.
- The used crankshaft balancer bolt is used only during the first pass of the balancer installation procedure. Install a NEW crankshaft balancer bolt and tighten as described in the second, third and fourth passes of the balancer bolt tightening procedure.
- Ensure the teeth of the tool engage the engine flywheel teeth.

1. Install the **J 42386-A** and bolts.

Use 1 M10 - 1.5 x 120 mm and 1 M10 - 1.5 x 45 mm bolt for proper tool operation.

Tighten: Tighten the **J 42386-A** bolts to 50 N.m (37 lb ft).

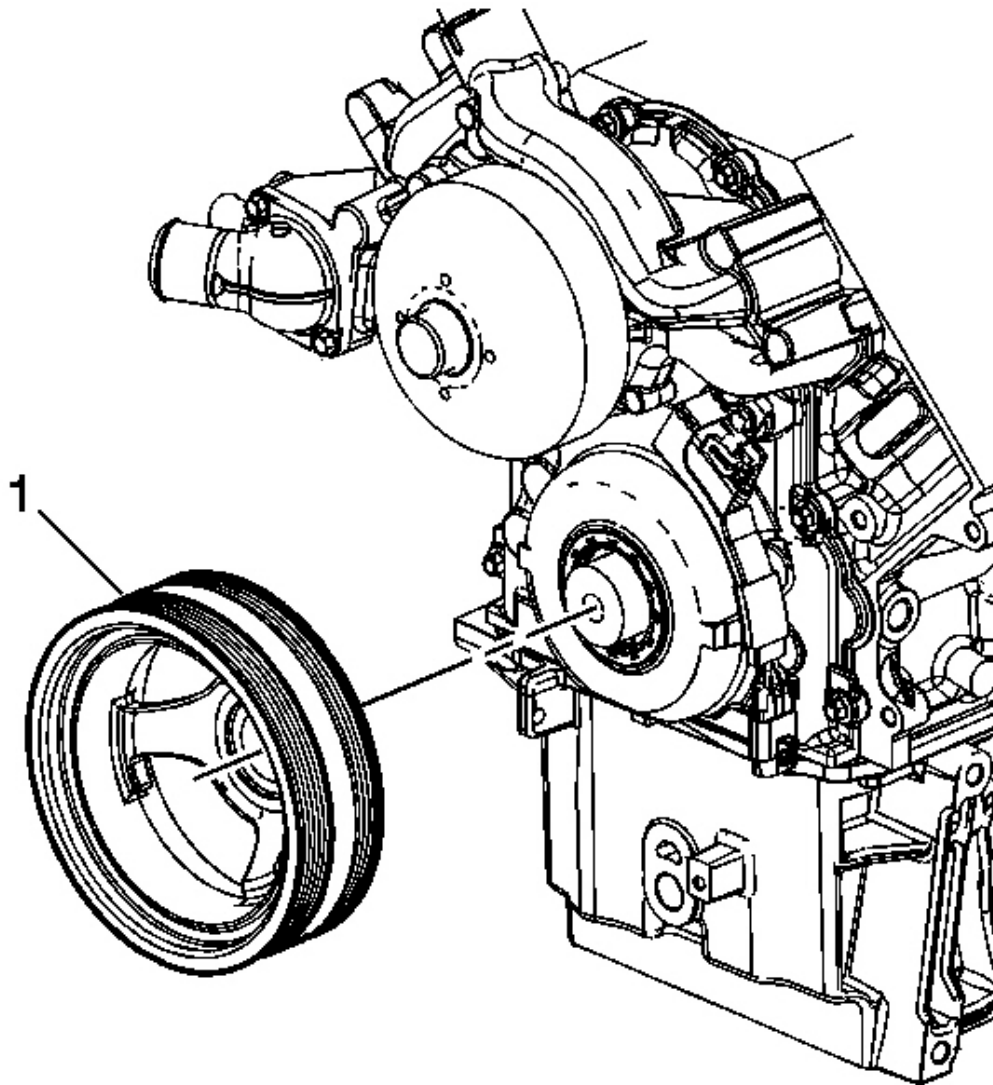


Fig. 637: View Of Crankshaft Balancer
Courtesy of GENERAL MOTORS CORP.

IMPORTANT: The balancer should be positioned onto the end of the crankshaft as straight as possible prior to tool installation.

2. Position the balancer (1) onto the end of the crankshaft.

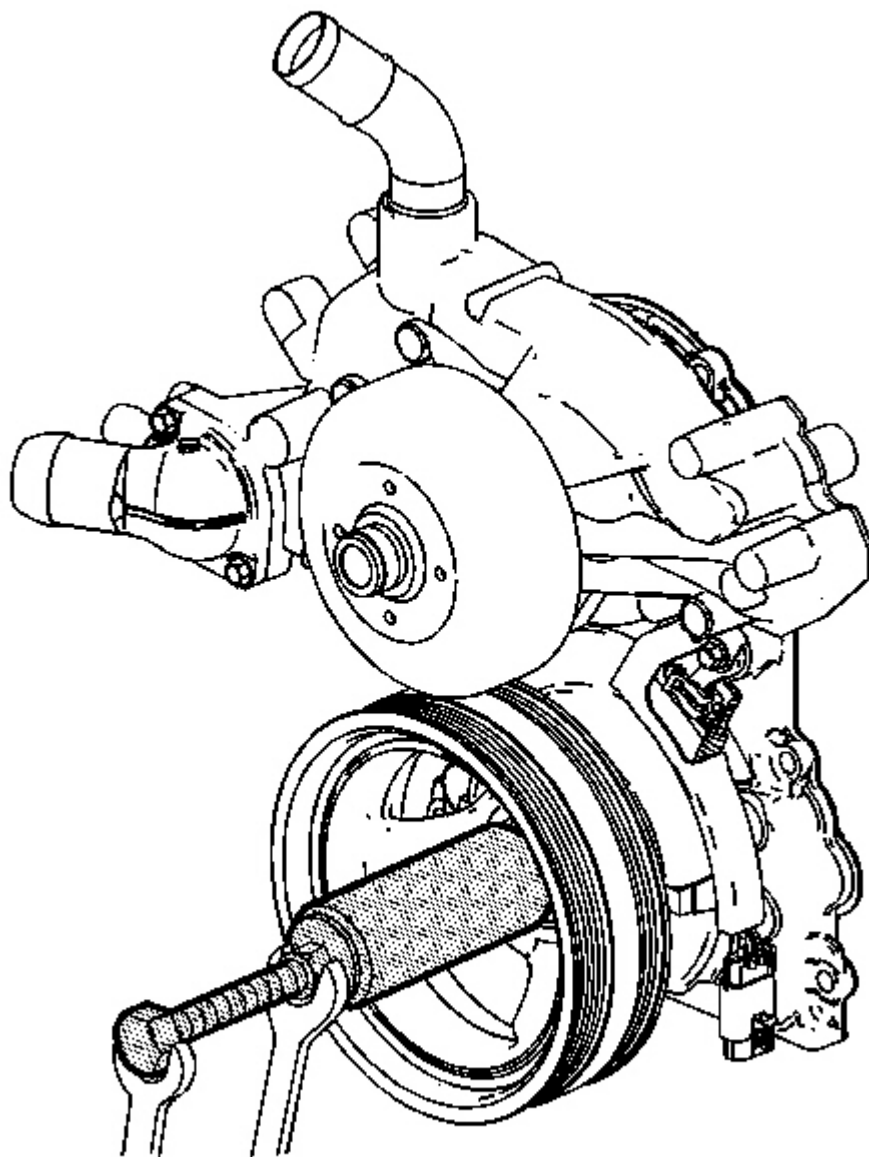


Fig. 638: View Of Balancer & Special Tool
Courtesy of GENERAL MOTORS CORP.

3. Use the **J 41665** and the **J 41478** in order to install the balancer.
 1. Assemble the **J 41478** threaded rod, nut, washer and the **J 41665** installer.

2007 Chevrolet TrailBlazer

2007 ENGINE Engine Mechanical - 6.0L - TrailBlazer

Insert the smaller end of the installer into the front of the balancer.

2. Use a wrench and hold the hex end of the threaded rod.
3. Use a second wrench and rotate the installation tool nut clockwise until the balancer is started onto the crankshaft.
4. Remove the tool and reverse the installation tool.

Position the larger end of the installer against the front of the balancer.

5. Use a wrench and hold the hex end of the threaded rod.
6. Use a second wrench and rotate the installation tool nut clockwise until the balancer is installed onto the crankshaft.
7. Remove the balancer installation tools.

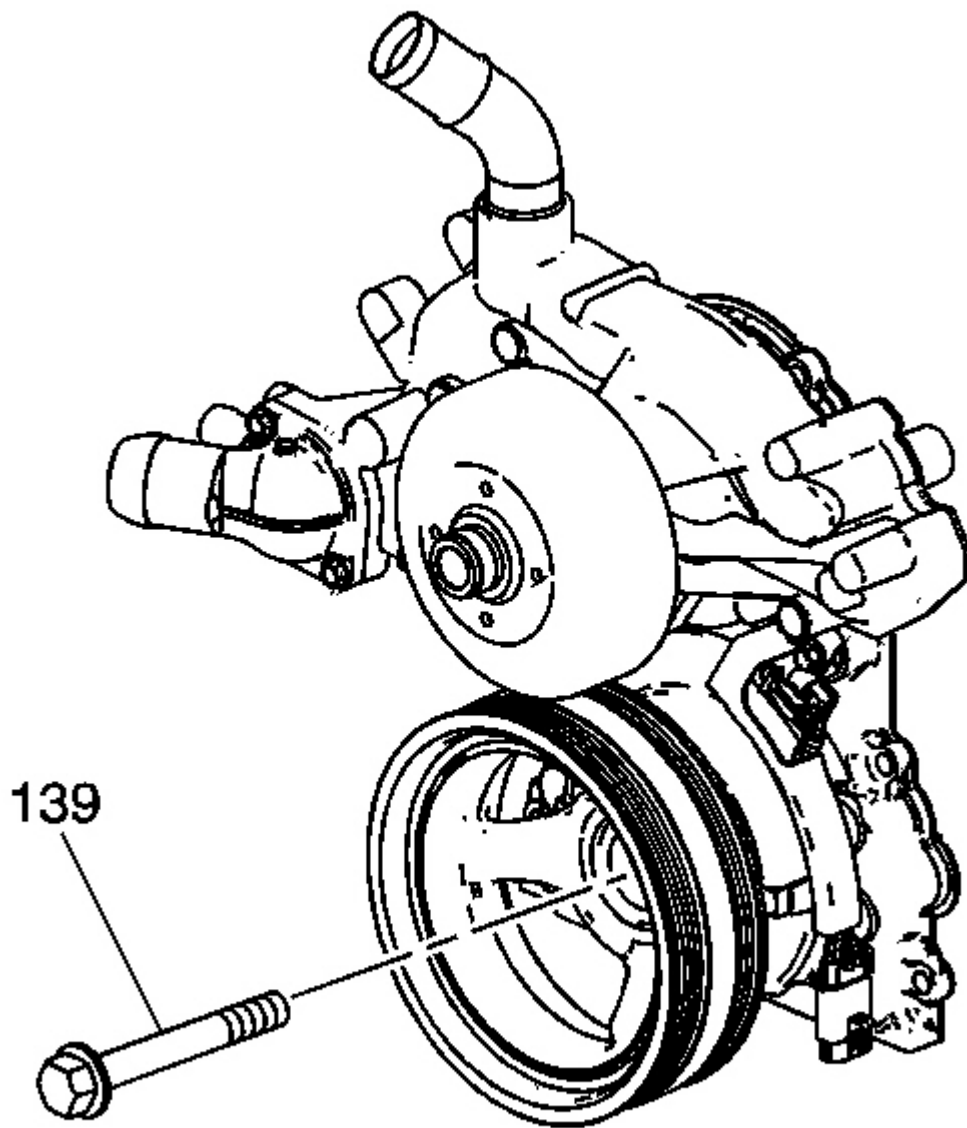


Fig. 639: Identifying Crankshaft Balancer Bolt
Courtesy of GENERAL MOTORS CORP.

4. Install the used crankshaft balancer bolt (139).

Tighten: Tighten the crankshaft balancer bolt to 330 N.m (240 lb ft).

5. Remove the used crankshaft balancer bolt.

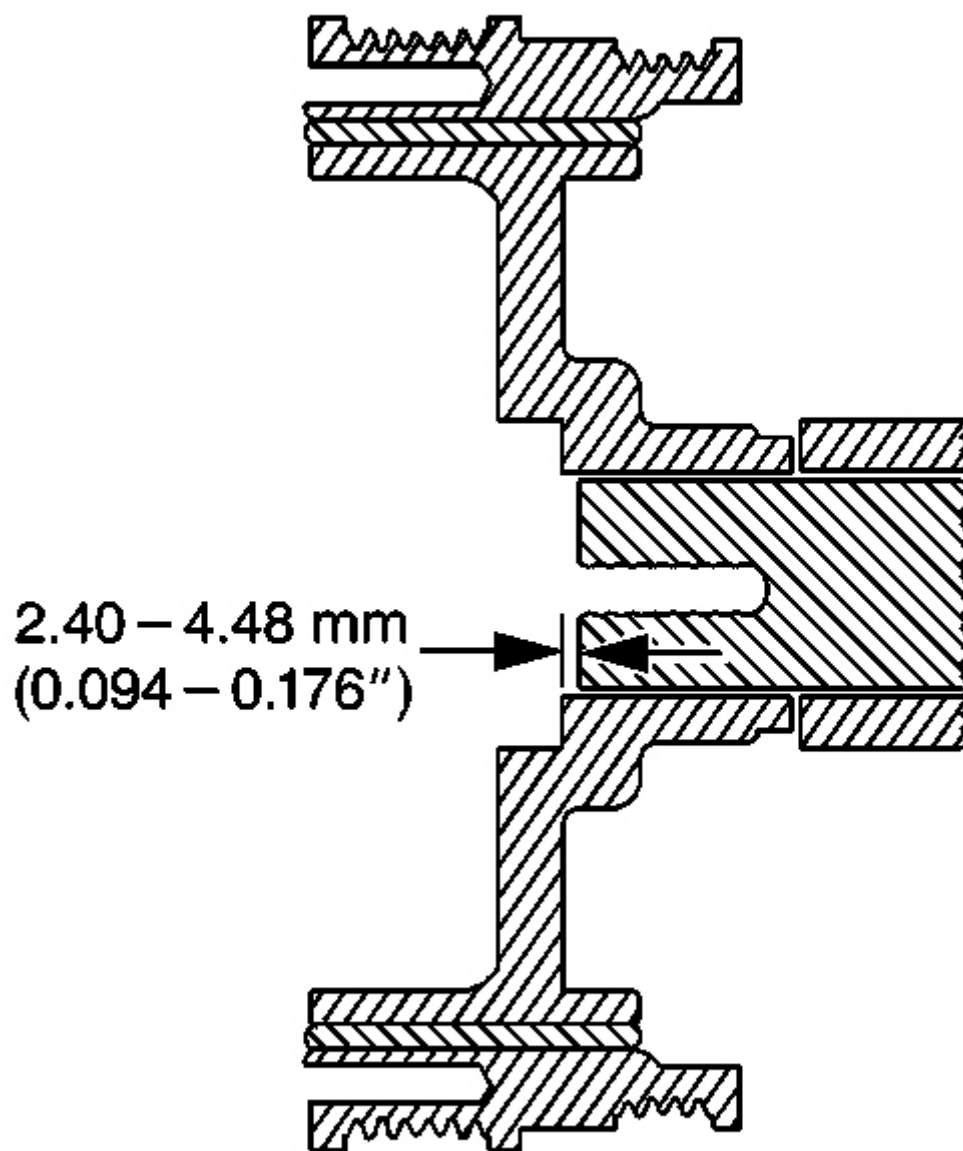


Fig. 640: Identifying Hub To Crankshaft Distance
Courtesy of GENERAL MOTORS CORP.

IMPORTANT: The nose of the crankshaft should be recessed 2.4-4.48 mm (0.094-0.176

in) into the balancer bore.

6. Measure for a correctly installed balancer.

If the balancer is not installed to the proper dimensions, install the **J 41665** and repeat the installation procedure.

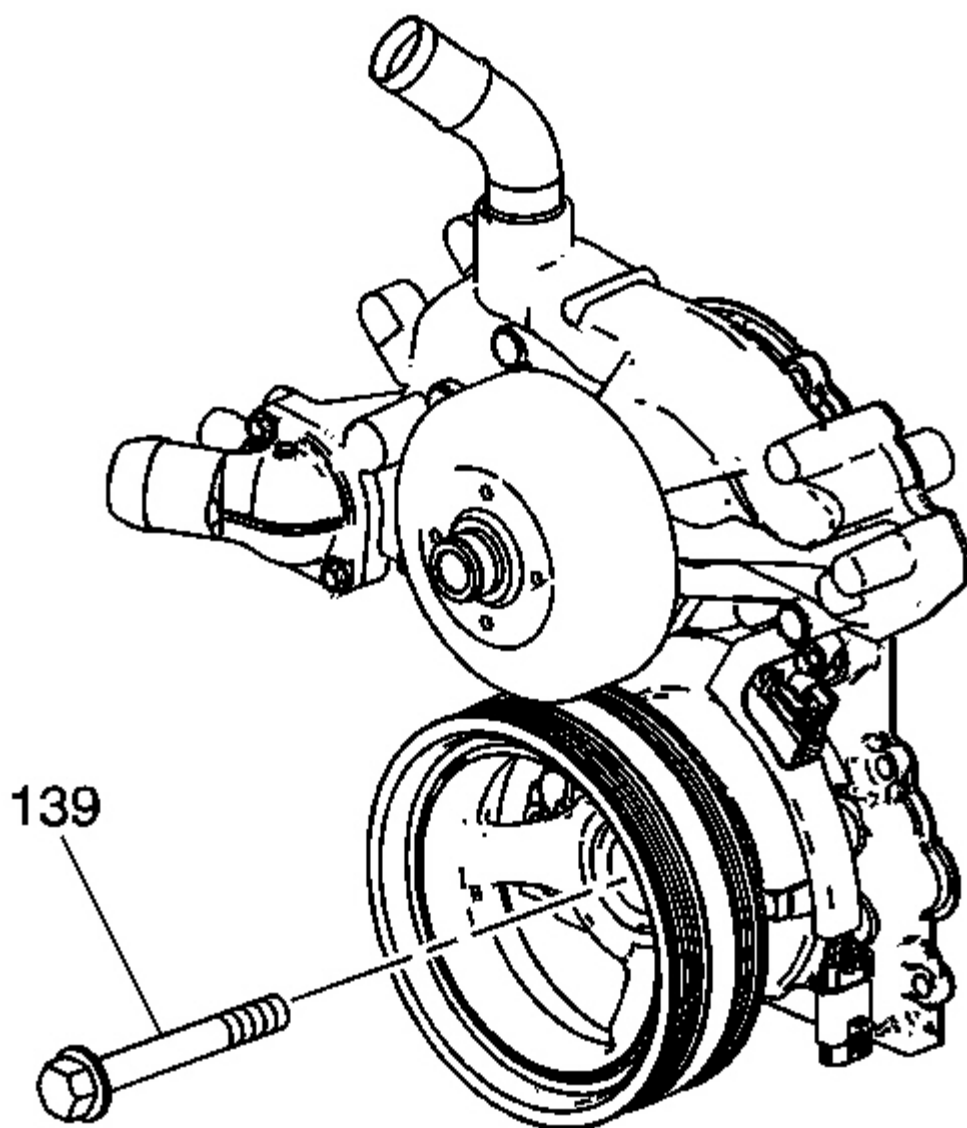


Fig. 641: Identifying Crankshaft Balancer Bolt
Courtesy of GENERAL MOTORS CORP.

7. Install the NEW crankshaft balancer bolt (139).

Tighten:

1. Tighten the crankshaft balancer bolt a first pass to 50 N.m (37 lb ft).
 2. Tighten the crankshaft balancer bolt a second pass to 140 degrees using the **J 45059** .
8. Remove the **J 42386-A** .

ENGINE PRELUBING

Tools Required

J 45299 Engine Preluber

Prelubing Procedure

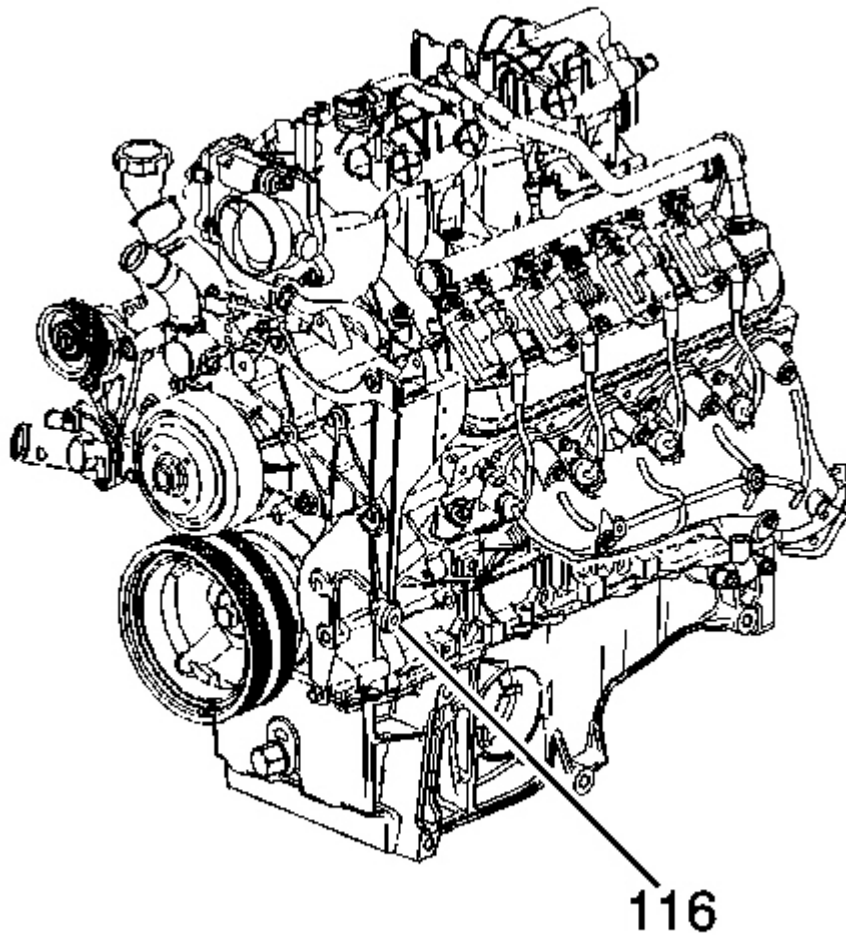


Fig. 642: Locating Engine Block Left Front Oil Gallery Plug
Courtesy of GENERAL MOTORS CORP.

IMPORTANT: A constant and continuous flow of clean engine oil is required in order to properly prime the engine. Be sure to use an approved engine oil as specified in the owners manual.

1. Remove the engine oil filter and fill with clean engine oil.

NOTE: Refer to Fastener Notice in Cautions and Notices.

2. Install the oil filter.

Tighten: Tighten the oil filter to 30 N.m (22 lb ft).

3. Locate the engine block left front oil gallery plug (116).
4. Install the M16 x 1.5 adapter P/N 509375.

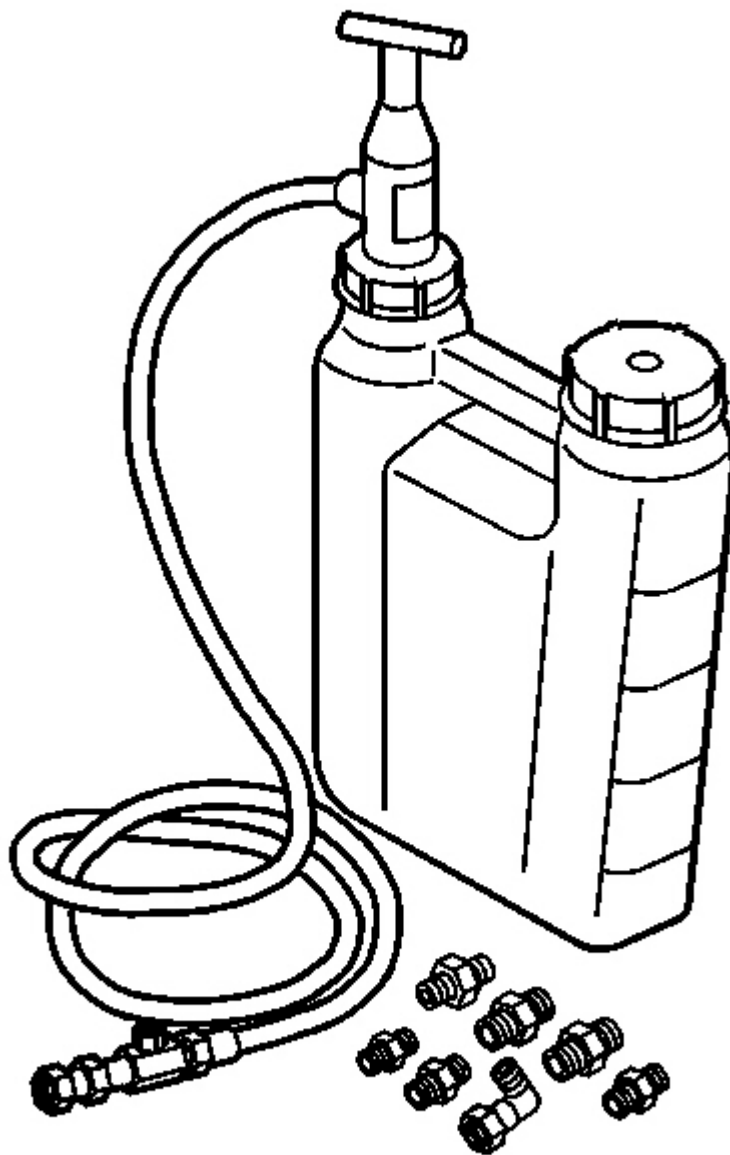


Fig. 643: Identifying Engine Preluber J 45299

Courtesy of GENERAL MOTORS CORP.

5. Install the flexible hose to the adapter and open the valve.
6. Pump the handle on the **J 45299** in order to flow a minimum of 1-1.9 liters (1-2 quarts) engine oil. Observe the flow of engine oil through the flexible hose and into the engine assembly.
7. Close the valve and remove the flexible hose and adapter from the engine.
8. Install the gallery plug to the engine.

Tighten: Tighten the oil gallery plug to 60 N.m (44 lb ft).

9. Top-off the engine oil to the proper level.

DESCRIPTION AND OPERATION

CRANKCASE VENTILATION SYSTEM DESCRIPTION

A closed crankcase ventilation system provides a more complete scavenging of crankcase vapors. Fresh air from the throttle body is supplied to the crankcase, mixed with blow-by gases and then passed through a crankcase ventilation pipe/passage into the intake manifold.

Results of Incorrect Operation

A plugged positive crankcase ventilation (PCV) pipe/passage way may cause any of the following conditions:

- Rough idle
- Stalling or slow idle speed
- Oil leaks
- Sludge in engine

DRIVE BELT SYSTEM DESCRIPTION

The drive belt system consists of the following components:

- The drive belt
- The drive belt tensioner
- The drive belt idler pulley
- The crankshaft balancer pulley
- The accessory drive component mounting brackets
- The accessory drive components
 - The power steering pump, if belt driven
 - The generator
 - The A/C compressor, if equipped
 - The engine cooling fan, if belt driven

2007 Chevrolet TrailBlazer

2007 ENGINE Engine Mechanical - 6.0L - TrailBlazer

- The water pump, if belt driven
- The vacuum pump, if equipped
- The air compressor, if equipped

The drive belt system may use 1 belt or 2 belts. The drive belt is thin so that it can bend backwards and has several ribs to match the grooves in the pulleys. There also may be a V-belt style belt used to drive certain accessory drive components. The drive belts are made of different types of rubbers - chloroprene or EPDM - and have different layers or plies containing either fiber cloth or cords for reinforcement.

Both sides of the drive belt may be used to drive the different accessory drive components. When the back side of the drive belt is used to drive a pulley, the pulley is smooth.

The drive belt is pulled by the crankshaft balancer pulley across the accessory drive component pulleys. The spring loaded drive belt tensioner keeps constant tension on the drive belt to prevent the drive belt from slipping. The drive belt tensioner arm will move when loads are applied to the drive belt by the accessory drive components and the crankshaft.

The drive belt system may have an idler pulley, which is used to add wrap to the adjacent pulleys. Some systems use an idler pulley in place of an accessory drive component when the vehicle is not equipped with the accessory.

ENGINE COMPONENT DESCRIPTION

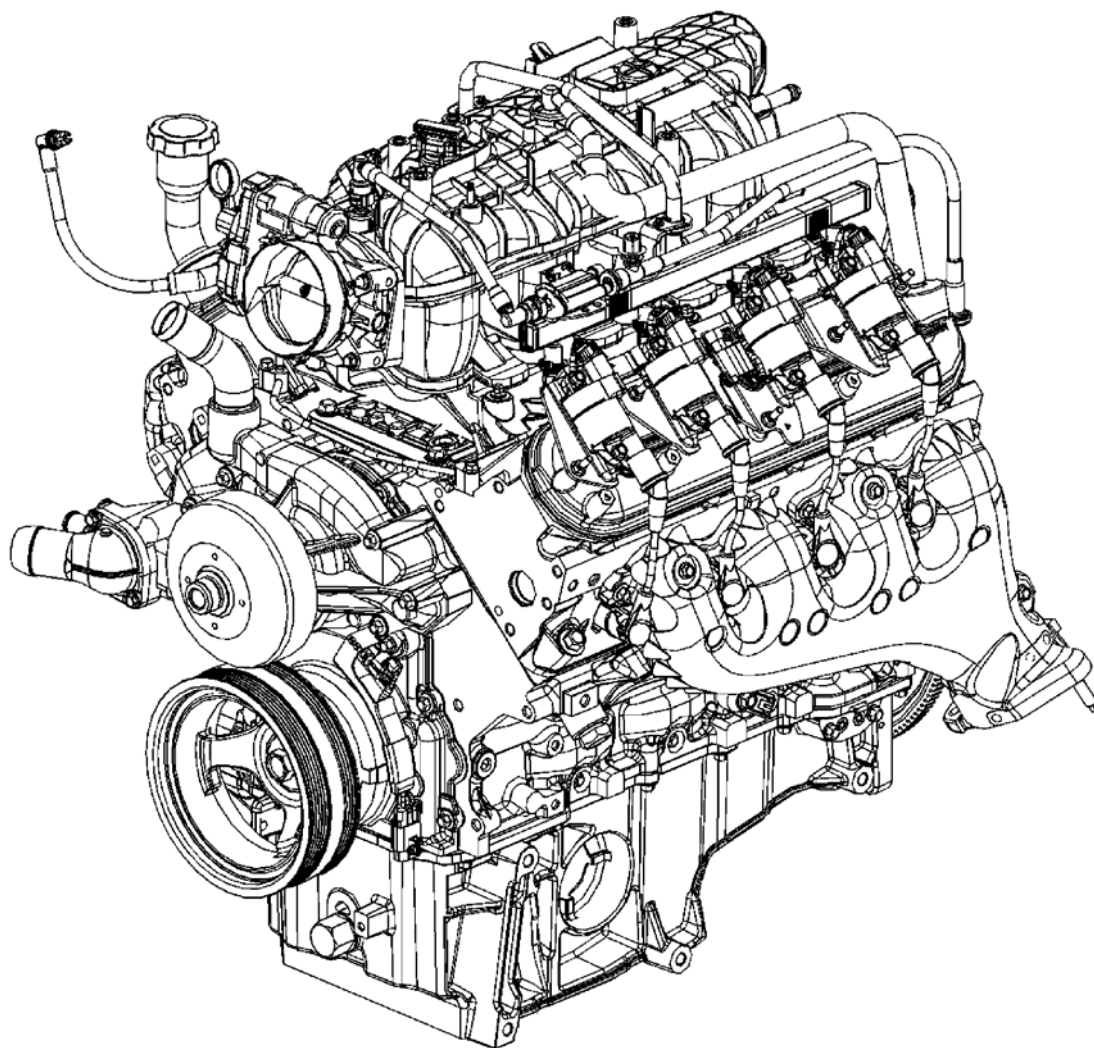


Fig. 644: View Of 6.0 Liter V8 Engine
Courtesy of GENERAL MOTORS CORP.

The 6.0 Liter V8 engine is identified as RPO LS2 VIN H.

Camshaft and Drive System

A billet steel 1-piece camshaft is supported by 5 bearings pressed into the engine block. The camshaft timing sprocket is mounted to the front of the camshaft and is driven by the crankshaft sprocket through the camshaft timing chain. The camshaft position (CMP) sensor lobes are incorporated into the front face of the camshaft sprocket with the CMP sensor mounted in the engine front cover. A timing chain tensioner is mounted to the front of the engine block above the crankshaft sprocket. The externally splined crankshaft sprocket is positioned to the crankshaft by a key and keyway. The crankshaft sprocket external splines drive the oil pump drive gear. A retaining plate mounted to the front of the engine block maintains camshaft location.

Crankshaft

2007 Chevrolet TrailBlazer

2007 ENGINE Engine Mechanical - 6.0L - TrailBlazer

The crankshaft is cast nodular iron. The crankshaft is supported by 5 crankshaft bearings. The bearings are retained by crankshaft bearing caps which are machined with the engine block for proper alignment and clearance. The crankshaft journals are undercut and rolled. The center main journal is the thrust journal. A crankshaft position (CKP) reluctor ring is press fit mounted at the rear of the crankshaft. The reluctor ring is not serviceable separately.

Cylinder Heads

The cylinder heads are cast aluminum and have pressed in place powdered metal valve guides and valve seats. Passages for the engine coolant air bleed system are at the front of each cylinder head. The valve rocker arm covers are retained to the cylinder heads by 4 center-mounted rocker arm cover bolts.

Engine Block

The engine block is a cam-in-block deep skirt 90 degree V configuration with 5 crankshaft bearing caps. The engine block is cast aluminum. The 5 crankshaft bearing caps each have 4 vertical M10 and 2 horizontal M8 mounting bolts. The camshaft is supported by 5 camshaft bearings pressed into the block.

Exhaust Manifolds

The exhaust manifolds are a 1-piece cast iron design. The exhaust manifolds direct exhaust gasses from the combustion chambers to the exhaust system. Each manifold also has an externally mounted heat shield that is retained by bolts.

Intake Manifold

The intake manifold is a 1-piece composite design that incorporates brass threaded inserts for mounting the fuel rail, throttle body and wire harness studs. Each side of the intake manifold is sealed to the cylinder head by a non-reusable silicone sealing gasket/nylon carrier assembly. The electronically actuated throttle body bolts to the front of the intake manifold. The throttle body is sealed by a 1-piece push in place silicone gasket. The fuel rail assembly, with 8 separate fuel injectors, is retained to the intake by 4 bolts. The injectors are seated into their individual manifold bores with O-ring seals to provide sealing. A fuel rail stop bracket is retained to the rear of the left cylinder head by a mounting bolt. The manifold absolute pressure (MAP) sensor is installed and retained to the top front of the intake manifold and sealed by an O-ring seal. The evaporative emission (EVAP) canister purge solenoid valve is mounted to the fuel rail at the left front of the intake manifold. There are no coolant passages within the intake manifold.

Oil Pan

The structural front-sump oil pan is cast aluminum. Incorporated into the design is the oil filter mounting boss, drain plug opening, oil level indicator tube opening and oil pan baffle. An internal oil filter tube directs pressurized oil from the engine block to the oil filter. Filtered oil is returned to the engine block through the oil filter tube to the engine block upper oil galleries. The oil filter tube assembly, which is mounted in the center area of the pan, includes the press-fit oil pressure relief valve. The alignment of the structural oil pan to the rear of the engine block and transmission housing is critical.

Piston and Connecting Rod Assembly

2007 Chevrolet TrailBlazer

2007 ENGINE Engine Mechanical - 6.0L - TrailBlazer

The pistons are cast aluminum. The pistons use 2 compression rings and a oil control ring assembly. The piston is a low friction, lightweight design with a flat or recessed top and barrel shaped skirt. The piston pins are chromium steel and are a full-floating design. The connecting rods are powdered metal. The connecting rods are fractured at the connecting rod journal and then machined for the proper clearance. All applications use a piston with a graphite coated skirt. The piston and pin are to be serviced as an assembly.

Valve Rocker Arm Cover Assemblies

The valve rocker arm covers are cast aluminum and use a pre-molded silicon gasket for sealing. Mounted to each rocker cover are the coil and bracket assemblies. Incorporated into the left cover is the positive crankcase ventilation (PCV) system dirty air passage. Incorporated into the right cover is the oil fill tube and the PCV fresh air passage.

Valve Train

Motion is transmitted from the camshaft through the hydraulic roller valve lifters and tubular pushrods to the roller type rocker arms. The nylon valve lifter guides position and retain the valve lifters. The valve rocker arms for each bank of cylinders are mounted on pedestals or pivot supports. Each rocker arm is retained on the pivot support and cylinder head by a bolt. Valve lash is net build.

NEW PRODUCT INFORMATION

The purpose of New Product Information is to highlight or indicate, important product changes from the previous model year.

Changes may include 1 or more of the following items:

- Torque values and/or fastener tightening strategies
- Changed engine specifications
- New sealants and/or adhesives
- Disassembly and assembly procedure revisions
- Engine mechanical diagnostic procedure revisions
- New special tools required
- A component comparison from the previous year

Torque Values and/or Fastener Tightening Strategies

- All fasteners and threaded holes on the LS2 engines utilize metric threads.
- Certain fasteners should not be used again. Bolts, studs or other fasteners that must be replaced, will be called out in the specific service procedure.
- Some applications may use a second design camshaft retainer plate and bolts. Refer to **Camshaft Installation**.
- The camshaft sprocket is now retained to the front of the camshaft using a single bolt design with a torque and angle tightening strategy.

2007 Chevrolet TrailBlazer

2007 ENGINE Engine Mechanical - 6.0L - TrailBlazer

New Sealants and/or Adhesives

- Sealers and adhesives, as required, are identified within the specific service procedures. Refer to **Sealers, Adhesives and Lubricants** .
- A new sealer has been identified for the oil pan to front cover and oil pan to rear housing sealing surfaces. Refer to **Sealers, Adhesives and Lubricants** .

Disassembly and Assembly Procedure Revisions

The timing chain and sprocket installation procedure has been revised. Refer to **Timing Chain and Sprockets Installation**.

Engine Mechanical Diagnostic Procedure Revisions

All diagnosis on a vehicle should follow a logical process. Strategy based diagnostics is a uniform approach for repairing all systems. The diagnostic flow may always be used in order to resolve a system condition. The diagnostic flow is the place to start when repairs are necessary. For a detailed explanation, refer to **Diagnostic Starting Point - Engine Mechanical**.

New Special Tools Required

- Timing belt tensioner retaining pin **EN 46330** is used to retain the timing chain tensioner during the installation procedure.
- Oil pressure gage adapter **EN-47971** is required for oil pressure testing. The new design oil filter with internal bypass valve has a larger diameter oil filter fitting.

A Component Comparison from the Previous Year

- The camshaft sprocket is now retained to the front of the camshaft using a single bolt design with a torque and angle tightening strategy.
- A new design timing chain tensioner replaces the timing chain dampener.
- The oil filter bypass valve is now internal to the oil filter.

LUBRICATION DESCRIPTION (COMPONENT LOCATOR)

2007 Chevrolet TrailBlazer

2007 ENGINE Engine Mechanical - 6.0L - TrailBlazer

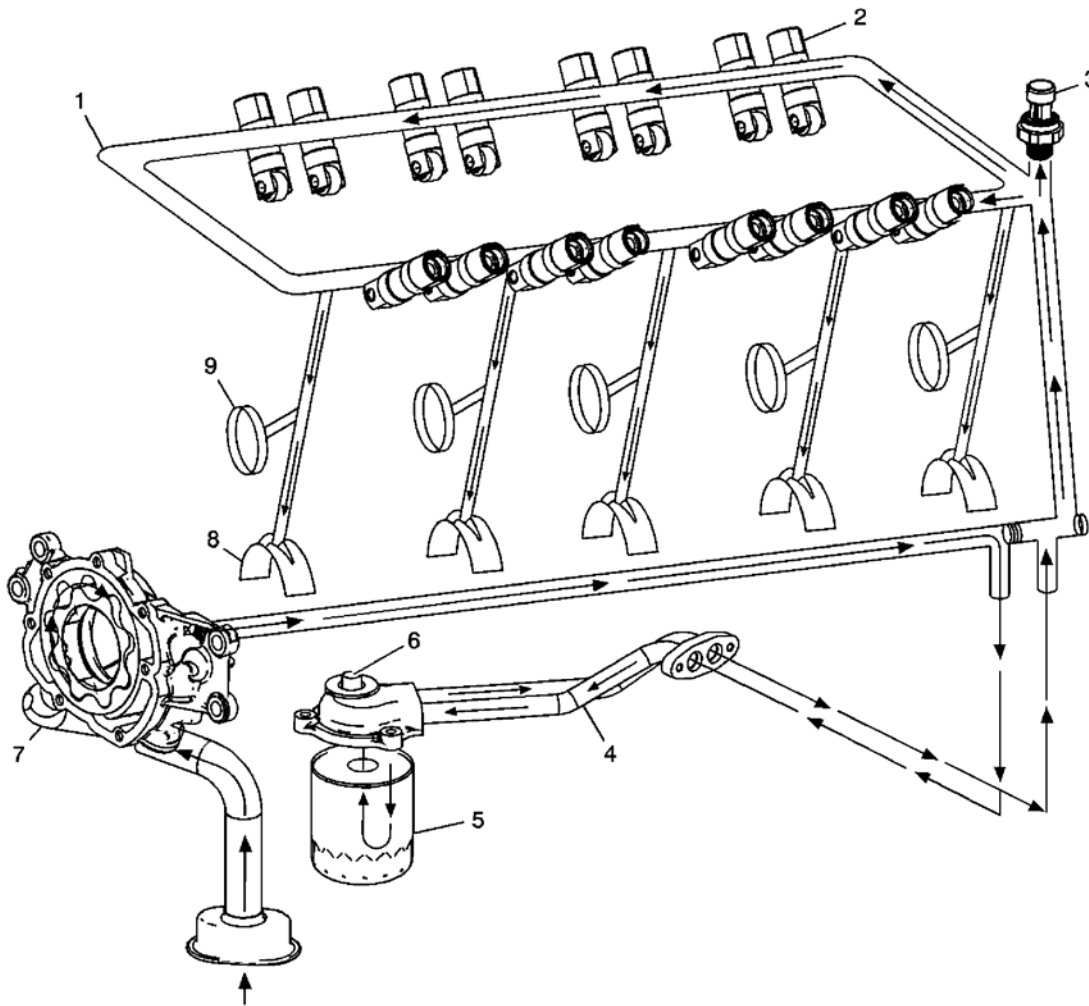


Fig. 645: Locating Lubrication Description Components
Courtesy of GENERAL MOTORS CORP.

Callouts For Fig. 645

Callout	Component Name
1	Upper Main Oil Galleries
2	Valve Lifters
3	Oil Pressure Sensor
4	Oil Filter Tube
5	Oil Filter
6	Oil Pressure Relief Valve
7	Oil Pump
8	Crankshaft Bearings
9	Camshaft Bearings

LUBRICATION DESCRIPTION (MAIN PRESSURE BELOW 55 PSI)

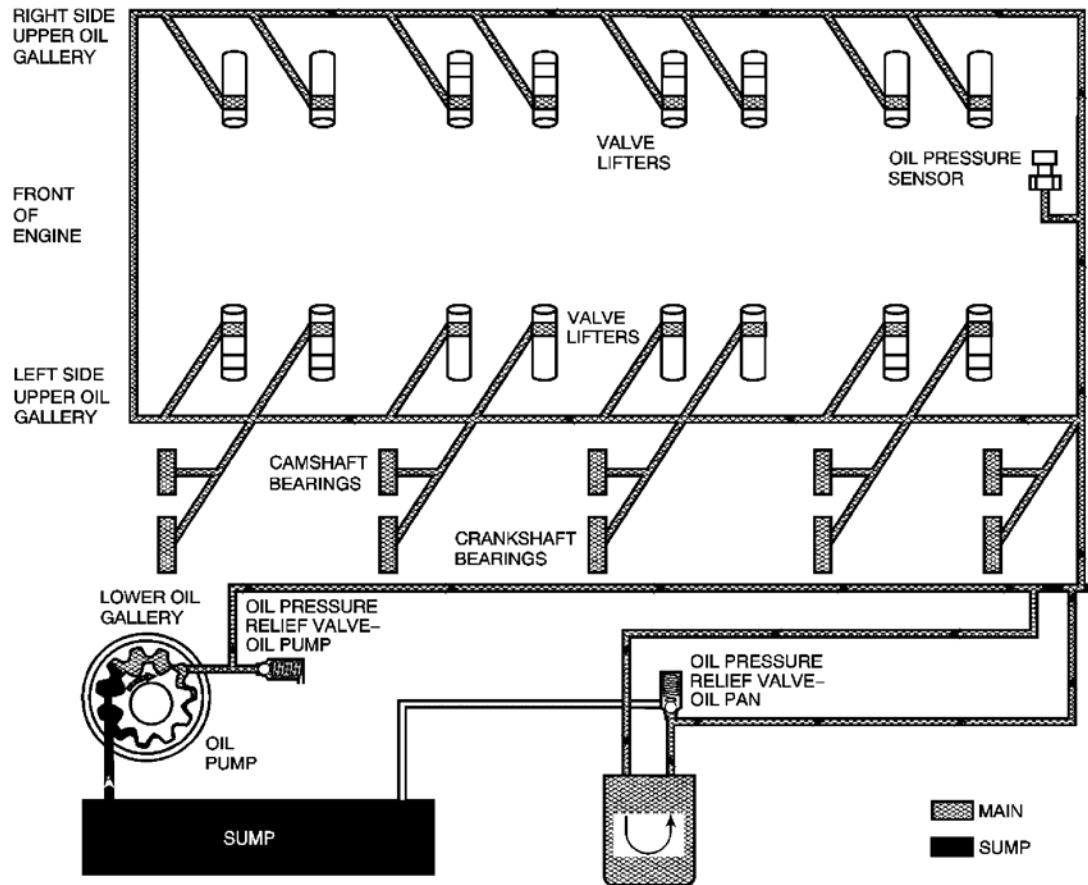


Fig. 646: Schematic Of Lubrication (Main Pressure Below 55 psi)
 Courtesy of GENERAL MOTORS CORP.

Engine lubrication is supplied by a gerotor type oil pump assembly. The pump is mounted on the front of the engine block and driven directly by the crankshaft sprocket. The pump gears rotate and draw oil from the oil pan sump through a pick-up screen and pipe. The oil is pressurized as it passes through the pump and is sent through the engine block lower oil gallery. Contained within the oil pump assembly is a pressure relief valve that maintains main oil pressure within a specified range.

Pressurized oil is directed through the engine block lower oil gallery and through the oil filter tube to the full flow oil filter, where harmful contaminants are removed. A bypass valve is incorporated into the oil filter, which permits oil flow in the event the filter becomes restricted. A second oil pressure relief valve is incorporated into the oil filter tube. The oil pan mounted oil pressure relief valve limits oil pressure directed to the oil galleries and valve system components to 379-517 kPa (55-75 psi) maximum.

Oil is then directed from the filter to the upper main oil galleries. Oil from the left upper oil gallery is directed to the crankshaft and camshaft bearings. Oil that has entered both the upper main oil galleries also pressurizes the valve lifter assemblies and is then pumped through the pushrods to lubricate the valve rocker arms and valve

stems. Oil returning to the pan is directed by the crankshaft oil deflector. The oil pressure sensor is located at the top rear of the engine.

LUBRICATION DESCRIPTION (MAIN PRESSURE ABOVE 55 PSI)

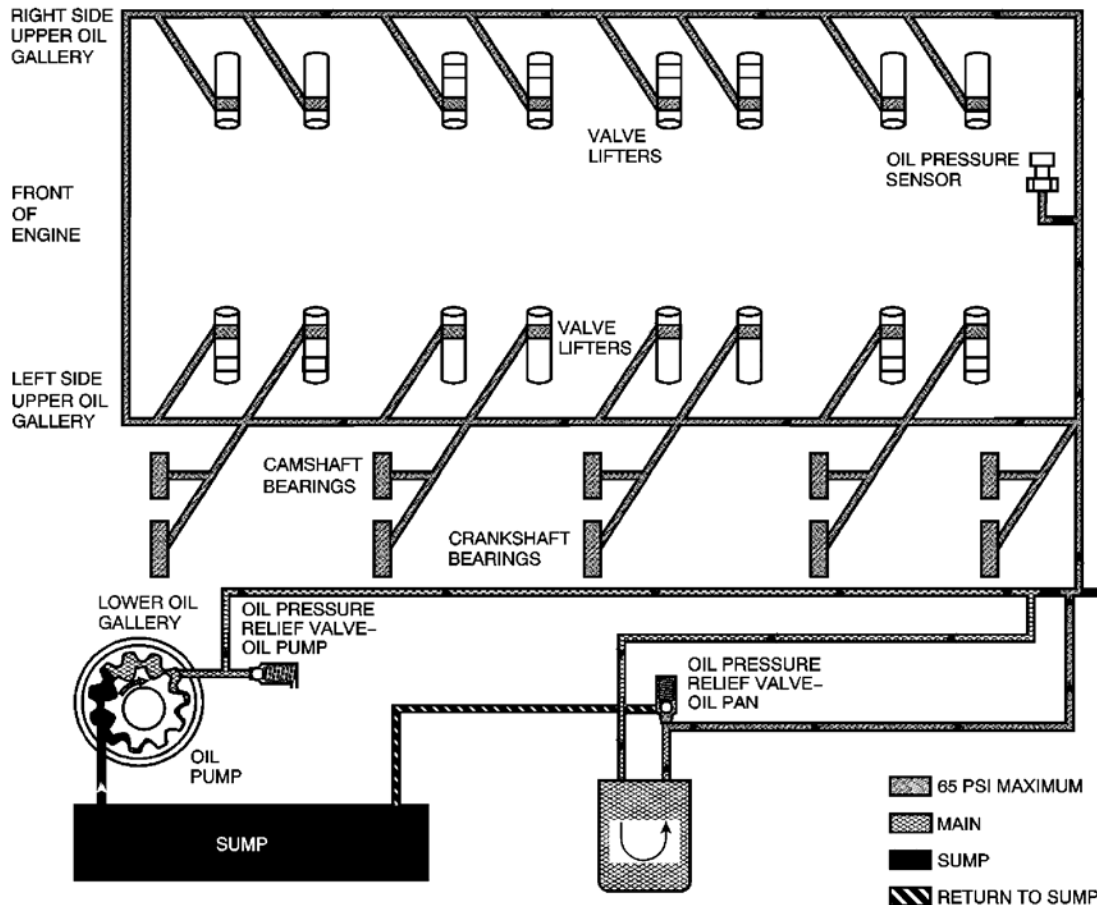


Fig. 647: Schematic Of Lubrication (Main Pressure Above 55 psi)
 Courtesy of GENERAL MOTORS CORP.

Engine lubrication is supplied by a gerotor type oil pump assembly. The pump is mounted on the front of the engine block and driven directly by the crankshaft sprocket. The pump gears rotate and draw oil from the oil pan sump through a pick-up screen and pipe. The oil is pressurized as it passes through the pump and is sent through the engine block lower oil gallery. Contained within the oil pump assembly is a pressure relief valve that maintains main oil pressure within a specified range.

Pressurized oil is directed through the engine block lower oil gallery and through the oil filter tube to the full flow oil filter, where harmful contaminants are removed. A bypass valve is incorporated into the oil filter, which permits oil flow in the event the filter becomes restricted. A second oil pressure relief valve is incorporated into the oil filter tube. The oil pan mounted oil pressure relief valve limits oil pressure directed to the oil galleries and valve system components to 379-517 kPa (55-75 psi) maximum.

When main oil pressure exceeds 379 kPa (55 psi), the oil pressure relief valve exhausts excess oil to the sump.

Oil is then directed from the filter to the upper main oil galleries. Oil from the left upper oil gallery is directed to the crankshaft and camshaft bearings. Oil that has entered both the upper main oil galleries also pressurizes the valve lifter assemblies and is then pumped through the pushrods to lubricate the valve rocker arms and valve stems. Oil returning to the pan is directed by the crankshaft oil deflector. The oil pressure sensor is located at the top rear of the engine.

CLEANLINESS AND CARE

- Throughout this section, it should be understood that proper cleaning and protection of machined surfaces and friction areas is part of the repair procedure. This is considered standard shop practice even if not specifically stated.
- When any internal engine parts are serviced, care and cleanliness is important.
- When components are removed for service, they should be marked, organized or retained in a specific order for assembly. Refer to **Separating Parts** .
- At the time of installation, components should be installed in the same location and with the same mating surface as when removed.
- An automobile engine is a combination of many machined, honed, polished and lapped surfaces with tolerances that are measured in millimeters or thousandths of an inch. These surfaces should be covered or protected to avoid component damage.
- A liberal coating of clean engine oil should be applied to friction areas during assembly.
- Proper lubrication will protect and lubricate friction surfaces during initial operation.

SEPARATING PARTS

- IMPORTANT:**
- **Many internal engine components will develop specific wear patterns on their friction surfaces.**
 - **When disassembling the engine, internal components MUST be separated, marked or organized in a way to ensure installation to their original location and position.**

Separate, mark or organize the following components:

- Piston and the piston pin
- Piston to the specific cylinder bore
- Piston rings to the piston
- Connecting rod location and orientation to the crankshaft journal
- Connecting rod to the bearing cap

A paint stick or etching/engraving type tool are recommended. Stamping the connecting rod or cap near the bearing bore may affect component geometry.

2007 Chevrolet TrailBlazer

2007 ENGINE Engine Mechanical - 6.0L - TrailBlazer

- Crankshaft main and connecting rod bearings
- Camshaft and valve lifters
- Valve lifters, lifter guides, pushrods and rocker arm assemblies
- Valve to the valve guide
- Valve spring to the cylinder head location
- Engine block main bearing cap location and direction
- Oil pump drive and driven gears

REPLACING ENGINE GASKETS

Tools Required

J 28410 Gasket Remover

Gasket Use and Applying Sealants

- Do not use any gasket again unless specified.
- Gaskets that can be used again will be identified in the service procedure.
- Do not apply sealant to any gasket or sealing surface unless called out in the service information.

Separating Components

- Use a rubber mallet to separate components.
- Bump the part sideways to loosen the components.
- Bumping should be done at bends or reinforced areas to prevent distortion of parts.

Cleaning Gasket Surfaces

- Remove all gasket and sealing material from the part using the **J 28410** or equivalent.
- Care must be used to avoid gouging or scraping the sealing surfaces.
- Do not use any other method or technique to remove sealant or gasket material from a part.
- Do not use abrasive pads, sand paper or power tools to clean the gasket surfaces.
 - These methods of cleaning can cause damage to the component sealing surfaces.
 - Abrasive pads also produce a fine grit that the oil filter cannot remove from the oil.
 - This grit is abrasive and has been known to cause internal engine damage.

Assembling Components

NOTE: Refer to **Sealant Notice** .

- When assembling components, use only the sealant specified or equivalent in the service procedure.
- Sealing surfaces should be clean and free of debris or oil.

2007 Chevrolet TrailBlazer

2007 ENGINE Engine Mechanical - 6.0L - TrailBlazer

- Specific components such as crankshaft oil seals or valve stem oil seals may require lubrication during assembly.
- Components requiring lubrication will be identified in the service procedure.
- When applying sealant to a component, apply the amount specified in the service procedure.
- Tighten bolts to specifications. Do not overtighten.

USE OF ROOM TEMPERATURE VULCANIZING (RTV) AND ANAEROBIC SEALER

Pipe Joint Compound

IMPORTANT: Three types of sealer are commonly used in engines. These are room temperature vulcanizing (RTV) sealer, anaerobic gasket eliminator sealer and pipe joint compound. The correct sealer and amount must be used in the proper location to prevent oil leaks. **DO NOT** interchange the 3 types of sealers. Use only the specific sealer or the equivalent as recommended in the service procedure.

- Pipe joint compound is a pliable sealer that does not completely harden. This type of sealer is used where 2 non-rigid parts, such as the oil pan and the engine block, are assembled together.
- Do not use pipe joint compound in areas where extreme temperatures are expected. These areas include: exhaust manifold, head gasket or other surfaces where gasket eliminator is specified.
- Follow all safety recommendations and directions that are on the container.

To remove the sealant or the gasket material, refer to **Replacing Engine Gaskets** .

NOTE: Refer to **Sealant Notice** .

- Apply the pipe joint compound to a clean surface. Use a bead size or quantity as specified in the procedure. Run the bead to the inside of any bolt holes.
- Apply a continuous bead of pipe joint compound to one sealing surface. Sealing surfaces to be resealed must be clean and dry.
- Tighten the bolts to specifications. Do not overtighten.

RTV Sealer

- RTV sealant hardens when exposed to air. This type of sealer is used where 2 non-rigid parts, such as the intake manifold and the engine block, are assembled together.
- Do not use RTV sealant in areas where extreme temperatures are expected. These areas include: exhaust manifold, head gasket or other surfaces where a gasket eliminator is specified.
- Follow all safety recommendations and directions that are on the container.

To remove the sealant or the gasket material, refer to **Replacing Engine Gaskets** .

2007 Chevrolet TrailBlazer

2007 ENGINE Engine Mechanical - 6.0L - TrailBlazer

NOTE: Refer to Sealant Notice .

- Apply RTV sealant to a clean surface. Use a bead size as specified in the procedure. Run the bead to the inside of any bolt holes.
- Assemble components while the RTV sealant is still wet, within 3 minutes. Do not wait for the RTV sealant to skin over.
- Tighten bolts to specifications. Do not overtighten.

Anaerobic Sealer

- Anaerobic gasket eliminator hardens in the absence of air. This type of sealer is used where 2 rigid parts, such as castings, are assembled together. When 2 rigid parts are disassembled and no sealer or gasket is readily noticeable, the parts were probably assembled using a gasket eliminator.
- Follow all safety recommendations and directions that are on the container.

To remove the sealant or the gasket material, refer to Replacing Engine Gaskets .

- Apply a continuous bead of gasket eliminator to one flange. Surfaces to be sealed must be clean and dry.

NOTE: Refer to Sealant Notice .

- Spread the sealer evenly with your finger to get a uniform coating on the sealing surface.

IMPORTANT: Anaerobic sealed joints that are partially torqued and allowed to cure more than 5 minutes may result in incorrect shimming and sealing of the joint.

- Tighten bolts to specifications. Do not overtighten.
- After properly tightening the fasteners, remove the excess sealer from the outside of the joint.

TOOLS AND EQUIPMENT

Special tools are listed and illustrated throughout this section, with a complete listing at the end of the section. These tools or their equivalents, are specially designed to quickly and safely accomplish the operations for which they are intended. The use of these special tools also minimize possible damage to engine components. Some precision measuring tools are required for inspection of certain critical components. Torque wrenches and a torque angle meter are necessary for the proper tightening of various fasteners.

To properly service the engine assembly, the following items should be readily available:

- Approved eye protection and safety gloves
- A clean, well lit, work area
- A suitable parts cleaning tank
- A compressed air supply

2007 Chevrolet TrailBlazer

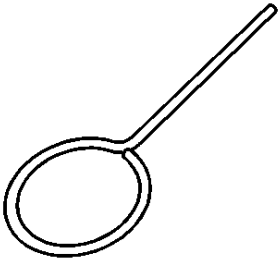
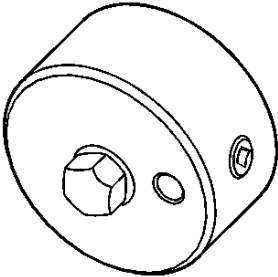
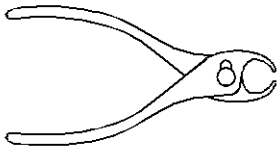
2007 ENGINE Engine Mechanical - 6.0L - TrailBlazer

- Trays or storage containers to keep parts and fasteners organized
- An adequate set of hand tools
- Approved engine repair stand
- An approved engine lifting device that will adequately support the weight of the components

SPECIAL TOOLS AND EQUIPMENT

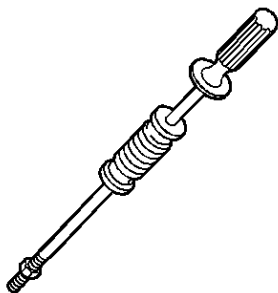
SPECIAL TOOLS

Special Tools

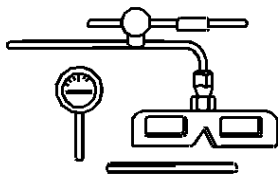
Illustration	Tool Number/Description
	EN-46330 Timing Belt Tensioner Retaining Pin
	EN-47971 Oil Pressure Gage Adapter
	J 3049-A Valve Lifter Remover

2007 Chevrolet TrailBlazer

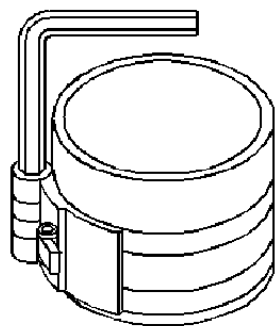
2007 ENGINE Engine Mechanical - 6.0L - TrailBlazer



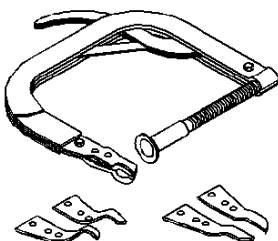
J 6125-1B
Slide Hammer



J 7872
Magnetic Base Dial Indicator



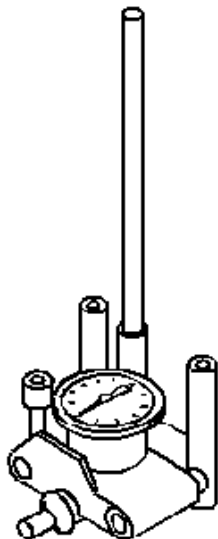
J 8037
Ring Compressor



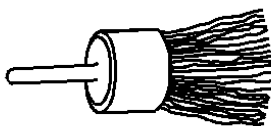
J 8062
Valve Spring Compressor - Head Off

2007 Chevrolet TrailBlazer

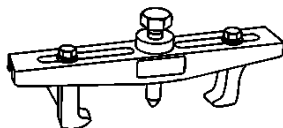
2007 ENGINE Engine Mechanical - 6.0L - TrailBlazer



J 8087
Cylinder Bore Gage



J 8089
Carbon Removal Brush

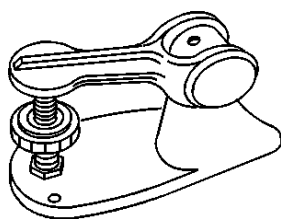
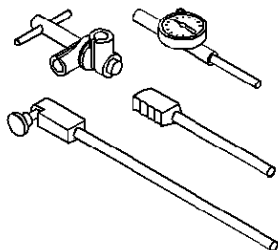


J 8433-1
Puller Bar

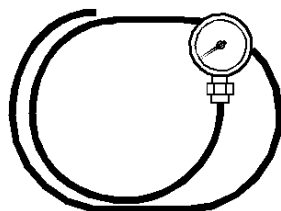
J 8520
Cam Lobe Lift Indicator

2007 Chevrolet TrailBlazer

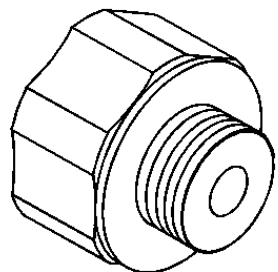
2007 ENGINE Engine Mechanical - 6.0L - TrailBlazer



J 9666
Valve Spring Tester



J 21867
Pressure Gage

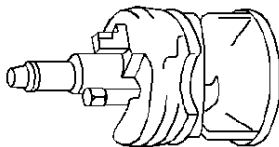
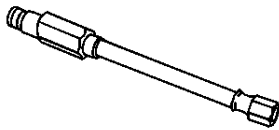


J 21867-16
Oil Pressure Adapter

J 22794
Spark Plug Port Adapter

2007 Chevrolet TrailBlazer

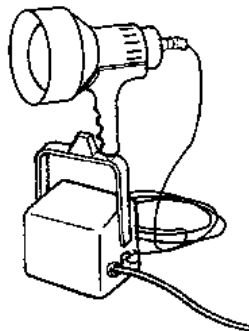
2007 ENGINE Engine Mechanical - 6.0L - TrailBlazer



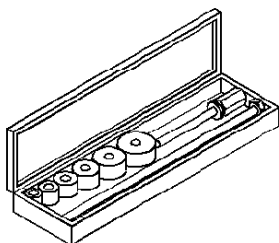
J 24270
Cylinder Bore Ridge Reamer



J 28410
Gasket Remover



J 28428-E
High-Intensity Black Light Kit



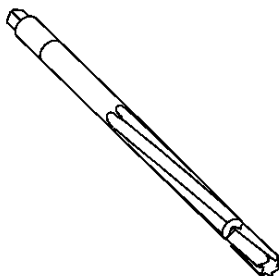
J 33049
Camshaft Bearing Service Set

2007 Chevrolet TrailBlazer

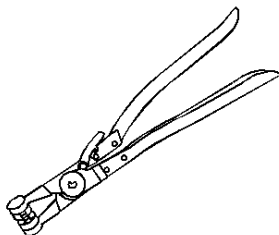
2007 ENGINE Engine Mechanical - 6.0L - TrailBlazer



J 35667-A
Cylinder Leakdown Tester



J 37378-1
Valve Guide Reamer

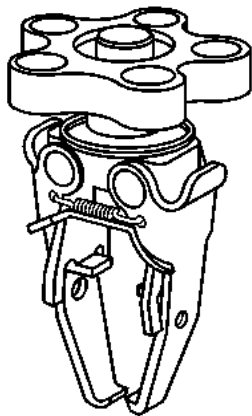


J 38185
Hose Clamp Pliers

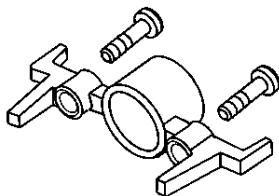
J 38606

2007 Chevrolet TrailBlazer

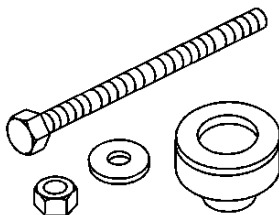
2007 ENGINE Engine Mechanical - 6.0L - TrailBlazer



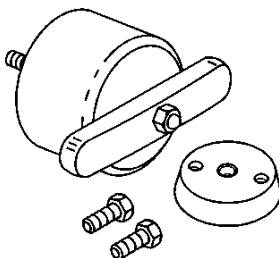
Valve Spring Compressor



J 41476
Front and Rear Cover Alignment Tool



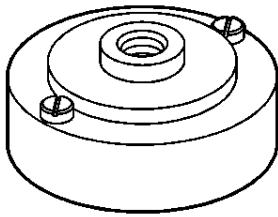
J 41478
Crankshaft Front Oil Seal Installer



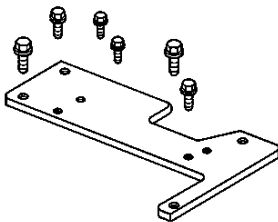
J 41479
Crankshaft Rear Oil Seal Installer

2007 Chevrolet TrailBlazer

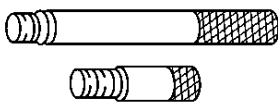
2007 ENGINE Engine Mechanical - 6.0L - TrailBlazer



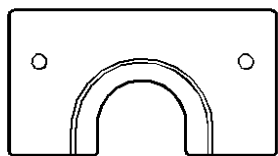
J 41479-2A
Crankshaft Rear Oil Seal Installation Guide



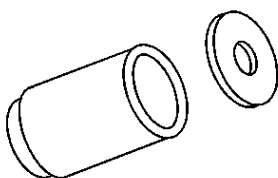
J 41480
Front and Rear Cover Alignment



J 41556
Connecting Rod Guide



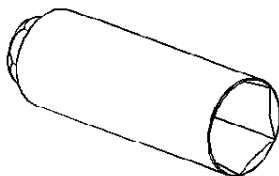
J 41558
Crankshaft Sprocket Remover



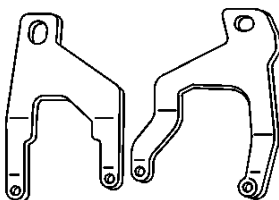
J 41665
Crankshaft Balancer and Sprocket Installer

2007 Chevrolet TrailBlazer

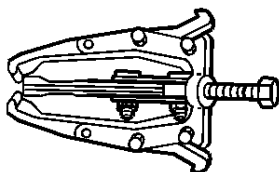
2007 ENGINE Engine Mechanical - 6.0L - TrailBlazer



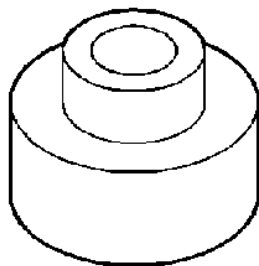
J 41712
Oil Pressure Switch Socket



J 41798
Engine Lift Bracket



J 41816-A
Crankshaft Balancer Remover

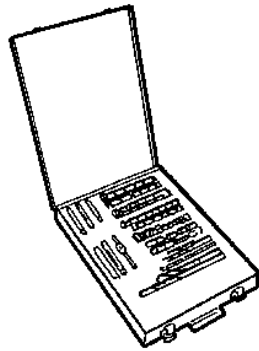
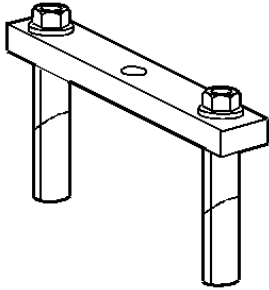


J 41816-2
Crankshaft End Protector

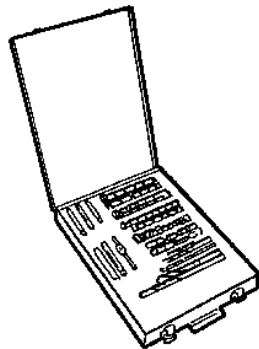
J 41818
Crankshaft Bearing Cap Remover

2007 Chevrolet TrailBlazer

2007 ENGINE Engine Mechanical - 6.0L - TrailBlazer



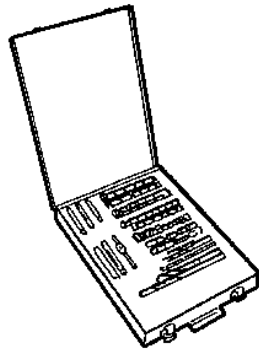
J 42385-100
Head/Main Bolt Thread Repair Kit



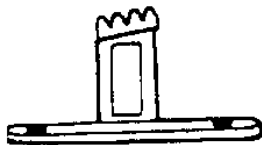
J 42385-200
Common Threads Repair Kit

2007 Chevrolet TrailBlazer

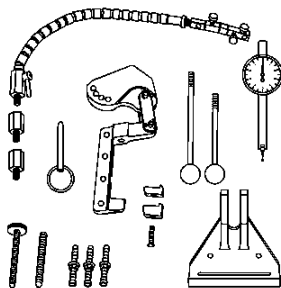
2007 ENGINE Engine Mechanical - 6.0L - TrailBlazer



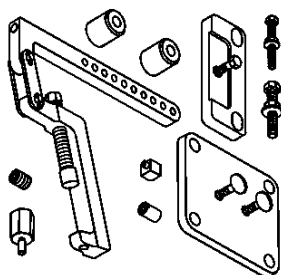
J 42385-300
Fixtures and Hardware Kit



J 42386-A
Flywheel Holding Tool



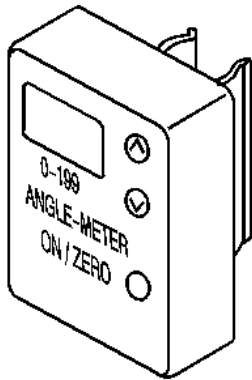
J 43690
Rod Bearing Clearance Checking Tool



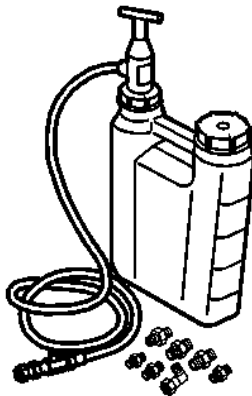
J 43690-100
Rod Bearing Checking Tool - Adapter Kit

2007 Chevrolet TrailBlazer

2007 ENGINE Engine Mechanical - 6.0L - TrailBlazer



J 45059
Angle Meter



J 45299
Engine Preluber