

Engine Removal

GENERAL MOTORS (Cont.)

CHEVROLET (Cont.)

3) Remove upper radiator support (if equipped) and radiator. Raise vehicle and support with safety stands. Disconnect exhaust pipes at manifolds. Remove converter housing inspection cover. Remove 3 converter-to-flex plate bolts. Remove engine mount through bolts.

4) Remove 3 (right side) engine-to-transmission bolts. Remove starter motor. Lower vehicle and install lifting device. Raise

transmission with suitable jack and remove 3 (left side) engine-to-transmission bolts.

5) Raise engine slightly and remove motor mount-to-engine brackets. Raise engine and transmission alternately until engine can be disengaged from transmission. Remove engine from vehicle.

CHEVROLET TIGHTENING SPECIFICATIONS

Application	Ft. Lbs.	Application	Ft. Lbs.
Motor Mount-to-Crossmember Nuts		Converter/Clutch Housing-to-Engine Bolts	
4-Cylinder	41	4-Cylinder	25
Motor Mount-to-Frame Nuts		V6 (Exc. Citation)	30
4-Cylinder	45	V6 Citation	63
V6 & V8 (Exc. Diesel)	35	V8	30
V8 Diesel	50	Converter-to-Flex Plate Bolts	
Motor Mount-to-Engine		All Models (Exc. Diesel)	35
4-Cylinder	35	V8 Diesel	40
V6 & V8 (Exc. Diesel)	40	Crossmember-to-Frame	
V8 Diesel	75	Citation & Chevette	40
Motor Mount Bracket-to-Engine		All Other Models	25
V6	92	Crossmember-to-Transmission	
Motor Mount Through Bolts	50	Center Nut	33
Strut Bracket-to-Radiator Support & Strut Bracket-to-Engine Bolts		End Nuts	21
V6	35	Rear Mount-to-Transmission	30-35
Strut Bar-to-Bracket Bolts		Rear Mount-to-Crossmember	40
V6	41		

OLDSMOBILE

4-CYLINDER MODELS

2.5L (151") - 1) On automatic transaxle, disconnect battery cables at battery. Drain cooling system. Remove air cleaner and heat tube. Disconnect engine wiring harness connector. Disconnect all vacuum lines. Remove accelerator and transaxle linkage at carburetor.

2) Remove upper radiator hose. If equipped, remove A/C compressor from mounting brackets and position aside, leaving refrigerant lines connected. Remove front engine strut assembly. Disconnect heater hoses at engine.

3) Remove transaxle-to-engine bolts, leaving upper 2 bolts installed. Remove front mount-to-cradle nuts. Remove forward exhaust pipe. Remove converter housing inspection cover and remove starter motor. Remove converter-to-flex plate bolts.

4) If equipped, remove power steering pump and bracket and position aside. Remove lower radiator hose. Remove 2 rear transaxle support bracket bolts. Remove fuel line at fuel pump. Position suitable jack and a block of wood under transaxle and raise engine and transaxle until front engine mount studs clear cradle.

5) Install engine lifting device and raise engine slightly. Remove 2 remaining transaxle-to-engine bolts. Slide engine forward and remove from vehicle.

6) On manual transaxle, disconnect battery cables at battery. Raise vehicle and support with safety stands. Remove front mount-to-cradle nuts. Remove forward exhaust pipe. Remove starter motor with wiring attached and position aside.

7) Remove clutch housing inspection cover. Lower vehicle. Remove air cleaner. Remove all clutch housing-to-engine bolts. Remove forward torque reaction rod from engine and radiator core support. If equipped, remove A/C compressor belt and compressor and position aside, leaving refrigerant lines connected.

8) Remove emission control hoses at canister. If equipped, remove power steering hose. Remove all vacuum lines and electrical connectors at solenoid. Remove heater blower motor. Disconnect accelerator cable at carburetor. Drain cooling system.

9) Disconnect heater hose at engine. Disconnect upper and lower radiator hoses. Disconnect engine wiring harness at firewall connector. Install engine lifting device. Lift engine, disconnect heater hose and fuel line at intake manifold. Remove engine from vehicle.

V6 MODELS

2.8L (173") - 1) Disconnect battery cables at battery. Remove air cleaner. Drain cooling system. Disconnect all vacuum lines to non-engine mounted components. On automatic transaxle, disconnect detent cable at carburetor lever.

2) On all models, disconnect accelerator linkage at carburetor. Disconnect engine wiring harness connector. On automatic transaxle, disconnect ground strap from engine at engine forward strut. On all models, disconnect radiator hoses from radiator and heater hoses from engine.

GENERAL MOTORS (Cont.)

OLDSMOBILE (Cont.)

3) If equipped, remove power steering pump and bracket from engine. On automatic transaxle, raise vehicle. Remove exhaust crossover pipe. Disconnect fuel line at rubber hose connection at right side of engine. Remove right front engine mount-to-cradle nuts.

4) Disconnect battery cables at starter and transaxle housing. Remove transaxle housing inspection cover and remove converter-to-flex plate bolts. Remove transaxle case-to-engine block support bracket bolts. Lower vehicle. Position support stand under transaxle rear extension.

5) Remove engine strut bracket from radiator support and swing rearward. Remove transaxle housing-to-engine bolts, noting location of ground stud bolt. If equipped, remove A/C compressor from mounting bracket and position aside, leaving refrigerant lines connected. Install engine lifting device and remove engine from vehicle.

6) On manual transaxle, disconnect clutch cable from transaxle. Disconnect shift linkage from transaxle shift levers. Remove cables from transaxle bosses. Disconnect speedometer cable from transaxle. Install engine support fixture tool (J-22825 or equivalent) to rear of engine.

7) Raise engine until weight is removed from engine mounts. Remove all but 1 transaxle-to-engine attaching bolts. Unlock steering column and raise vehicle. Remove stabilizer-to-lower control arm nuts. Remove side, crossmember plate-to-side and crossmember assembly attaching bolts.

8) Remove plate on left side. Loosen plate bolts on right side. Remove exhaust crossover pipe. Remove front, rear and side powertrain mount-to-cradle nuts. Remove left front tire and wheel assembly. Remove front crossmember-to-right side member bolts.

9) Using axle puller tool (J-28468 or equivalent), remove both axle drive shafts from transaxle assembly. Remove left side cradle-to-body mount bolts. Swing side and crossmember assembly to left and secure outside of fenderwell.

10) Lower left side of engine and transaxle assembly by loosening engine support fixture tool. Position jack under transaxle. Remove last transaxle-to-engine attaching bolt and separate engine from transaxle. Lower vehicle. Install engine lifting device.

11) If equipped, remove A/C compressor from mounting bracket and position aside, leaving refrigerant lines connected. Disconnect forward strut bracket from radiator support and position aside. Remove engine from vehicle.

3.8L (231") & 4.1L (252") Exc. Toronado – 1) Mark hinges for reinstallation and remove hood. Disconnect battery and drain cooling system. Remove air cleaner. If equipped, remove A/C compressor from mounting bracket and position aside, leaving refrigerant lines connected. Remove fan, pulleys and belts.

2) Disconnect radiator and heater hoses at engine. Remove fan shroud assembly. If equipped, remove power steering pump and position aside, leaving hoses connected. Disconnect and plug fuel pump hoses at pump. Disconnect battery ground cable from engine.

3) Disconnect all electrical wiring at engine. Disconnect all vacuum lines to non-engine mounted components. Disconnect accelerator cable and TV cable at carburetor. Disconnect engine-to-body ground strap at engine. Raise vehicle on hoist and disconnect battery cable from starter motor.

4) Disconnect cable shield from engine. Disconnect exhaust pipes at manifolds. On automatic transmission, remove converter housing inspection cover. Remove converter-to-flex plate bolts. Remove engine-to-transmission attaching bolts.

5) On manual transmission, transmission is removed with engine. Remove drive shaft, shift linkage, clutch equalizer shaft and transmission mount. On all models, remove motor mount through bolts. Lower vehicle.

6) On automatic transmission, support transmission. On all models, install lifting device to engine. Raise engine and transmission alternately until engine clears motor mounts and can be disengaged from transmission, then remove engine from vehicle.

4.1L (252") Toronado – 1) Mark hinges for reinstallation and remove hood. Disconnect battery and drain cooling system. Remove air cleaner. Disconnect heater hoses at engine. Remove fan, pulleys and belts. Disconnect radiator hoses from engine.

2) Remove fan shroud. Disconnect transmission oil cooler lines at radiator and remove radiator. Discharge A/C system and remove A/C compressor. Disconnect all electrical wiring and vacuum lines at engine. Disconnect and plug fuel pump hoses at pump.

3) Disconnect accelerator cable at carburetor. Remove power steering pump from mounting bracket and position aside, leaving hoses connected. Remove alternator and disconnect engine-to-body ground strap(s) at engine. Raise vehicle on hoist and remove starter motor. Drain crankcase.

4) Remove converter housing inspection cover and remove converter-to-flex plate bolts. Remove lower engine-to-transmission attaching bolts. Remove right output shaft support bolts. Remove front motor mount bolts. Lower vehicle and install final drive support chain (BT-6322 or equivalent).

5) Remove remaining engine-to-transmission attaching bolts. Remove final drive-to-engine bracket bolts and remove bracket. Install engine lifting device and remove engine from vehicle.

V8 MODELS

All Models (Exc. Toronado) – 1) Drain cooling system. Remove air cleaner and (if equipped) hot air pipe. On diesel model, install screened cover (J-26996 or equivalent). On all models, mark hinges for reinstallation and remove hood. Disconnect negative battery cable at battery or batteries.

2) Disconnect ground wire at inner fender panel. Disconnect engine ground strap. Disconnect radiator hoses. Disconnect oil cooler lines at radiator; heater hoses, vacuum lines, fuel hose from fuel line, all electrical wiring, accelerator cable and on diesel model, bellcrank linkage at engine.

3) On diesel model, remove power steering pump hoses at gear. On all other models, (if equipped), remove power steering pump from bracket and position aside, leaving hoses connected and disconnect power steering hose bracket from engine. On all models, (if equipped), remove A/C compressor with mounting brackets from engine and position aside, leaving refrigerant lines connected.

4) Remove upper radiator support and remove radiator. Raise vehicle on hoist. Disconnect exhaust pipes at manifolds. Remove converter housing inspection cover. Remove converter-

Engine Removal

GENERAL MOTORS (Cont.)

OLDSMOBILE (Cont.)

to-flex plate bolts. Remove motor mount bolts or nuts. Remove 3 (right side) engine-to-transmission attaching bolts.

5) On diesel model, disconnect starter wiring and remove starter motor. On all other models, remove starter motor with wiring attached and secure to frame with wire. Lower vehicle and install engine lifting device. Using floor jack and block of wood, raise transmission and remove 3 (left side) engine-to-transmission attaching bolts and remove engine from vehicle.

Toronado – 1) Disconnect negative battery cable at battery or batteries. Drain cooling system. Remove upper radiator support. Remove air cleaner and (if equipped) hot air pipe. On diesel model, install screened cover (J-26996 or equivalent). On all models, mark hinges for reinstallation and remove hood.

2) Disconnect engine ground strap. Disconnect radiator and heater hoses at engine. Remove fan and fan shroud. Disconnect oil cooler lines at radiator and on all models except diesel, remove radiator. On diesel model, disconnect electrical wiring at alternator and remove alternator with upper brace.

3) On all models, remove power steering pump with bracket from engine and position aside, leaving hoses connected. Remove A/C compressor with brackets from engine and position aside, leaving refrigerant lines connected. Disconnect and plug fuel pump hoses at pump.

4) Disconnect accelerator cable and TV cable at engine. Disconnect all electrical wiring and vacuum lines at engine. Dis-

connect left side exhaust pipe at manifold. If equipped, remove upper mount heat shield. Remove left side transmission mount through bolt.

5) Remove final drive-to-engine bracket bolts and remove bracket. Raise vehicle on hoist. Remove splash shield. Remove converter housing inspection cover. Disconnect right side exhaust pipe at manifold. Disconnect starter wiring and remove starter motor. Remove converter-to-flex plate bolts. Remove front motor mount attaching nuts.

6) On diesel model, lower vehicle partially and remove right front tire and wheel assembly. Remove right side exhaust manifold. Disconnect oil cooler lines at oil filter base and remove oil filter base. Raise vehicle to full height. On all models, use sharp tool to mark position of washers on right side output shaft support bracket.

7) Remove right side output shaft support bracket-to-engine block attaching bolts. Remove lower right side engine-to-transmission attaching bolts. Install final drive support chain (BT-6322 or equivalent). Lower vehicle and install engine lifting device.

8) On diesel models, move oil cooler lines rearward and remove radiator. Remove water control valve. On all models, use floor jack and block of wood to raise or lower transmission while removing remaining engine-to-transmission attaching bolts. Remove engine from vehicle.

OLDSMOBILE TIGHTENING SPECIFICATIONS

Application	Ft. Lbs.	Application	Ft. Lbs.
Motor Mount-to-Crossmember Nuts		Strut Bracket-to-Radiator Support & Strut Bracket-to-Engine Bolt	
4-Cylinder	41	V6 Omega	35
Motor Mount-to-Frame Nuts		Strut Bar-to-Bracket Bolt	
4-Cylinder	45	V6 Omega	41
V6 & V8 (Exc. Toronado)	35	Engine-to-Transmission Bolt	35
V6 & V8 Toronado	50	Converter-to-Flex Plate Bolt	35
Motor Mount-to-Engine Bolt		Right Side Output Shaft-to-Engine Bolt	
4-Cylinder	35	V6 & V8 Toronado	55
V6	55	Transmission Mount-to-Frame Nut	
V8	75	V6 & V8 Toronado	40
Motor Mount Bracket-to-Engine Bolt		Crossmember-to-Frame Bolt	40
V6 Omega	92	Rear Mount-to-Transmission Bolt	40
Motor Mount Bracket-to-Support Bolt		Rear Mount-to-Crossmember Nut	
V8 Diesel	60	V6 & V8 (Exc. Cutlass)	60
Motor Mount Through Bolt	55	V6 & V8 Cutlass	40

PONTIAC

4-CYLINDER MODELS

2.5L (151") – 1) On automatic transaxle, disconnect battery cables at battery. Drain cooling system. Remove air cleaner and heat tube. Disconnect engine wiring harness connector. Disconnect all vacuum lines. Remove accelerator and transaxle linkage at carburetor.

2) Remove upper radiator hose. If equipped, remove A/C compressor from mounting brackets and position aside, leaving refrigerant lines connected. Remove front engine strut assembly. Disconnect heater hoses at engine.

3) Remove transaxle-to-engine bolts, leaving upper 2 bolts installed. Remove front mount-to-cradle nuts. Remove forward exhaust pipe. Remove converter housing inspection cover and remove starter motor. Remove converter-to-flex plate bolts.

4) If equipped, remove power steering pump and bracket and position aside. Remove lower radiator hose. Remove 2 rear transaxle support bracket bolts. Remove fuel line at fuel pump. Position suitable jack and a block of wood under transaxle and raise engine and transaxle until front engine mount studs clear cradle.

GENERAL MOTORS (Cont.)

PONTIAC (Cont.)

5) Install engine lifting device and raise engine slightly. Remove 2 remaining transaxle-to-engine bolts. Slide engine forward and remove from vehicle.

6) On manual transaxle, disconnect battery cables at battery. Raise vehicle and support with safety stands. Remove front mount-to-cradle nuts. Remove forward exhaust pipe. Remove starter motor with wiring attached and position aside.

7) Remove clutch housing inspection cover. Lower vehicle. Remove air cleaner. Remove all clutch housing-to-engine bolts. Remove forward torque reaction rod from engine and core support. If equipped, remove A/C compressor belt and compressor and position aside.

8) Remove emission control hoses at canister. If equipped, remove power steering hose. Remove all vacuum lines and electrical connectors at solenoid. Remove heater blower motor. Disconnect accelerator cable at carburetor. Drain cooling system.

9) Disconnect heater hose at engine. Disconnect upper and lower radiator hoses. Disconnect engine wiring harness at firewall connector. Install engine lifting device. Lift engine, disconnect heater hose and fuel line at intake manifold. Remove engine from vehicle.

V6 MODELS

2.8L (173") - 1) Disconnect battery cables at battery. Remove air cleaner. Drain cooling system. Disconnect all vacuum lines to non-engine mounted components. On automatic transaxle, disconnect detent cable at carburetor lever.

2) On all models, disconnect accelerator linkage at carburetor. Disconnect engine wiring harness connector. On automatic transaxle, disconnect ground strap from engine at engine forward strut. On all models, disconnect radiator hoses from radiator and heater hoses from engine.

3) If equipped, remove power steering pump and bracket from engine. On automatic transaxle, raise vehicle. Remove exhaust crossover pipe. Disconnect fuel line at rubber hose connection at right side of engine. Remove engine right front mount-to-cradle nuts.

4) Disconnect battery cables at starter and transaxle housing. Remove transaxle housing inspection cover and remove converter-to-flex plate bolts. Remove transaxle case-to-engine block support bracket bolts. Lower vehicle. Position support stand under transaxle rear extension.

5) Remove engine strut bracket from radiator support and swing rearward. Remove transaxle housing-to-engine bolts, noting location of ground stud bolt. If equipped, remove A/C compressor from mounting bracket and position aside, leaving refrigerant lines connected. Install engine lifting device and remove engine from vehicle.

6) On manual transaxle, disconnect clutch cable from transaxle. Disconnect shift linkage from transaxle shift levers. Remove cables from transaxle bosses. Disconnect speedometer cable from transaxle. Install engine support fixture tool (J-22825 or equivalent) to rear of engine.

7) Raise engine until weight is removed from engine mounts. Remove all but 1 transaxle-to-engine attaching bolts. Unlock steering column and raise vehicle. Remove stabilizer-to-lower

control arm nuts. Remove side, crossmember plate-to-side and crossmember assembly attaching bolts.

8) Remove plate on left side. Loosen plate bolts on right side. Remove exhaust crossover pipe. Remove front, rear and side powertrain mount-to-cradle nuts. Remove left front tire and wheel assembly. Remove front crossmember-to-right side member bolts.

9) Using axle puller tool (J-28468 or equivalent), remove both axle drive shafts from transaxle assembly. Remove left side cradle-to-body mount bolts. Swing side and crossmember assembly to left and secure outside of fenderwell.

10) Lower left side of engine and transaxle assembly by loosening engine support fixture tool. Position jack under transaxle. Remove last transaxle-to-engine attaching bolt and separate engine from transaxle. Lower vehicle. Install engine lifting device.

11) If equipped, remove A/C compressor from mounting bracket and position aside, leaving refrigerant lines connected. Disconnect forward strut bracket from radiator support and position aside. Remove engine from vehicle.

3.8L (231") - 1) Mark hinges for reinstallation and remove hood. Disconnect battery and drain cooling system. Remove air cleaner. If equipped, remove A/C compressor from mounting bracket and position aside, leaving refrigerant lines connected. Remove fan, pulleys and belts.

2) Disconnect radiator and heater hoses at engine. Remove fan shroud assembly. If equipped, remove power steering pump and position aside, leaving hoses connected. Disconnect and plug fuel pump hoses at pump. Disconnect battery ground cable from engine.

3) Disconnect all electrical wiring and vacuum lines at engine. Disconnect accelerator cable at carburetor. Remove alternator and disconnect engine-to-body ground strap(s) at engine. Raise vehicle and support with safety stands.

4) If equipped, disconnect cable shield from engine. Disconnect exhaust pipes at manifolds. On automatic transmission, remove converter housing inspection cover. Remove converter-to-flex plate bolts. Remove engine-to-transmission attaching bolts.

5) On manual transmission, transmission is removed with engine. Remove drive shaft, shift linkage, clutch equalizer shaft and transmission mount. On all models, remove motor mount through bolts and cruise control bracket (if equipped). Lower vehicle.

6) On automatic transmission, support transmission. On all models, install lifting device to engine. Raise engine and transmission alternately until engine clears motor mounts and can be disengaged from transmission, then remove engine from vehicle.

V8 MODELS

4.3L (265") & 4.9L (301") - 1) Remove positive battery cable at battery. Drain cooling system. Raise vehicle on hoist. Remove transmission housing inspection cover. Remove converter-to-flex plate bolts. Disconnect air management hose from catalytic converter. Disconnect exhaust pipes at manifolds. Remove all but 1 engine-to-transmission attaching bolts.

Engine Removal

GENERAL MOTORS (Cont.)

PONTIAC (Cont.)

2) Remove fuel lines from fuel pump. Remove motor mount through bolts. Remove lower fan shroud bolts. Disconnect starter wiring and remove starter motor. Lower vehicles. Mark hinges for reinstallation and remove hood. Remove air cleaner. Disconnect all electrical wiring and vacuum lines at engine.

3) Disconnect accelerator cable and TV cable at carburetor. Remove ground cable bolt at right rear cylinder head. Remove wiring harness guide bolt at left front cylinder head. Remove engine wiring harness from engine. If equipped, remove power steering hoses at gear.

4) Remove spark plug wires and distributor cap from engine. Remove upper and lower radiator hoses from engine. Remove upper fan shroud bolts. Remove fan. If equipped, disconnect transmission oil cooler lines. Remove fan shroud and radiator. If equipped, remove A/C evaporator connector at right side rocker arm cover.

5) Remove heater hoses at firewall. If equipped, remove A/C compressor and position aside, leaving refrigerant lines connected. Remove windshield wiper motor. Support transmission using floor jack and a block of wood. Remove last engine-to-transmission attaching bolt. Install engine lifting device and remove engine from vehicle.

5.0L (305") - 1) Mark hinges for reinstallation and remove hood. Disconnect battery cables at battery. Remove air cleaner and drain cooling system. Disconnect radiator and heater hoses. Remove fan shroud and radiator. Disconnect all electrical wiring and vacuum lines at engine.

2) Disconnect fuel line at fuel pump and accelerator linkage at intake manifold. If equipped, remove A/C compressor and power steering pump from mounting brackets and position aside, leaving refrigerant lines and fluid hoses connected. Raise vehicle and drain crankcase.

3) Disconnect exhaust pipe at manifold. If equipped, disconnect converter bracket at rear transmission mount. Remove starter motor. Remove clutch/converter housing inspection cover. On automatic transmission, remove converter-to-flex plate bolts.

4) On all models, remove motor mount through bolts. Remove engine-to-transmission attaching bolts. Lower vehicle and raise transmission using floor jack. Install engine lifting device, raise engine slightly and remove motor mount-to-engine brackets. Raise engine and transmission alternately until engine can be disengaged from transmission, then remove engine from vehicle.

5.0L (307") & 5.7L (350") - 1) Drain cooling system. Remove air cleaner and hot air pipe. Mark hinges for reinstallation and remove hood. Disconnect negative battery cable at battery or batteries. Disconnect engine ground strap and ground wire at inner fender panel. Disconnect radiator and heater hoses at engine.

2) Disconnect all electrical wiring and vacuum lines at engine. If necessary, disconnect power steering hose bracket from engine or power steering hoses from gear. Disconnect fuel hose from fuel line. If equipped, remove A/C compressor from mounting brackets and position aside, leaving refrigerant lines connected.

3) Disconnect accelerator cable and TV cable from engine. Remove upper radiator support, transmission oil cooler lines and radiator. Raise vehicle on hoist. Disconnect exhaust pipes at manifolds. Remove converter housing inspection cover. Remove converter-to-flex plate bolts.

4) Remove motor mount through bolts. Remove 3 (right side) engine-to-transmission attaching bolts. Remove starter motor with wiring attached and position aside. Lower vehicle and install engine lifting device. Raise transmission slightly and remove 3 (left side) engine-to-transmission attaching bolts and remove engine from vehicle.

PONTIAC TIGHTENING SPECIFICATIONS

Application	Ft. Lbs.
Motor Mount-to-Crossmember Nuts	
4-Cylinder	41
Motor Mount-to-Frame Nuts	
4-Cylinder	45
V6 & V8 (Exc. Diesel)	30
V8 Diesel	50
Motor Mount-to-Engine Bolts	
4-Cylinder	35
V6	55
V8 (Exc. Diesel)	40
V8 Diesel	75
Motor Mount Bracket-to-Engine Bolts	
V6	92
Motor Mount Through Bolts	
V6 & V8 (Exc. 305" V8)	50
V8 305"	70
Strut Bracket-to-Radiator Support & Strut Bracket-to-Engine Bolts	
V6	35
Strut Bar-to-Bracket Bolts	
V6	41
Transmission Housing-to-Engine Bolts	
4-Cylinder	25
V6 (Exc. Phoenix)	30
V6 Phoenix	63
V8 (Inc. Diesel)	30
Converter-to-Flex Plate Bolts	
All Models (Exc. Diesel)	35
V8 Diesel	40
Crossmember-to-Frame Bolts	
Phoenix	40
All Other Models	25
Rear Mount-to-Transmission	35
Rear Mount-to-Crossmember	35