

# Engine Removal

## GENERAL MOTORS (Cont.)

### CADILLAC (Cont.)

10) Support transmission with suitable jack or support stand. 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

5.7L & 6.0L (350" & 368") - 1) Disconnect negative battery cable at battery or batteries. Drain cooling system. Remove bolts attaching strut support rods at radiator cover and position support rods out of way. Remove screws attaching top radiator shroud to radiator support and screw attaching upper radiator hose to shroud.

2) Using suitable drill, drill out rivets attaching upper shroud-to-lower shroud. Remove screws attaching radiator cover-to-radiator support and remove cover. Mark hinges for reinstallation and remove hood. Remove air cleaner and inlet duct assembly.

3) Disconnect upper radiator hose at engine. Disconnect electrical wiring and position harness out of way. Disconnect brake vacuum hose from brake pipe. Disconnect throttle linkage and vapor canister hose. Disconnect power steering pump and position pump aside, leaving hoses connected.

4) Remove fan. Disconnect lower radiator hose. Disconnect right side spark plug wires and retainer and position wires out of way. Remove A/C compressor and position aside on right fender, leaving refrigerant lines connected. Remove heater hoses from water valve at rear of right side cylinder head.

5) Raise vehicle on hoist. Remove engine-to-transmission attaching bolts. Remove motor mount through bolts. Remove starter motor. Remove converter housing inspection cover. Remove converter-to-flex plate bolts. Support transmission using suitable jack or support stand.

6) Support exhaust system so weight is removed from hangers. Disconnect exhaust pipes at manifolds. Disconnect and plug

fuel line and vapor return line at fuel pump. Remove transmission jack or support stand and lower vehicle.

7) Move right side lifting bracket to a position so it straddles No. 1 cylinder. Install lifting device to engine. Raise engine slowly, pulling forward to disengage transmission, and remove engine from vehicle.

### CADILLAC TIGHTENING SPECIFICATIONS

Application	Ft. Lbs.
Motor Mount-to-Engine Bolt	
V6 .....	65
V8 (Exc. Diesel).....	①20
V8 Diesel .....	70
Motor Mount Bracket-to-Support Bolt	
V8 Diesel .....	65
Motor Mount Bracket-to-Frame Bolt .....	①30
Motor Mount Through Bolt .....	45
Engine-to-Transmission Bolt .....	35
Converter-to-Flex Plate Bolt	
V6 .....	35
V8 (Exc. Diesel) .....	30
V8 Diesel .....	40
Rear Mount-to-Transmission Bolt .....	35
Rear Mount-to-Crossmember Nut	
V6 .....	35
V8 (Exc. Diesel) .....	45
V8 Diesel .....	39
Crossmember-to-Frame Bolt	
V6 .....	35
V8 (Exc. Diesel) .....	20
V8 Diesel .....	48

① - Eldorado and Seville models: 70 ft. lbs.

## CHEVROLET

#### 4-CYLINDER MODELS

1.6L (98") - 1) Mark hinges for reinstallation and remove hood. Disconnect battery cables. Remove battery cable clips along right frame rail. Drain cooling system and remove radiator hoses at engine and heater hoses at heater.

2) Disconnect engine wiring harness at firewall connector. Remove radiator upper support, radiator and fan. Remove air cleaner. Disconnect fuel line at rubber hose connection along left frame rail.

3) Disconnect automatic transmission throttle valve linkage. Disconnect accelerator cable at carburetor. If equipped, remove A/C compressor attaching bolts and position compressor aside leaving refrigerant lines connected.

4) Raise vehicle and support with safety stands. Disconnect exhaust pipe at manifold. Remove converter or clutch housing inspection cover. On automatic transmission, remove converter-to-flex plate bolts. Remove converter or clutch housing-to-engine retaining bolts.

5) Lower vehicle. Support transmission with suitable jack or support stand. Remove safety straps from front engine mounts

and remove engine mount nuts. Install engine lifting device and remove engine from vehicle.

2.5L (151") - 1) On automatic transaxle, disconnect 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.)

### CHEVROLET (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, leaving wiring connected and position out of way.

**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. Remove power steering hose (if equipped). Remove vacuum lines and electrical connectors at solenoid. Remove heater blower motor. Disconnect throttle 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 (229" & 231") - 1)** Mark hinges for reinstallation and remove hood. Disconnect battery cables at battery. Remove air cleaner. Drain cooling system. Remove radiator and heater hoses at engine. Remove fan shroud, radiator, fan, pulleys and belts. Disconnect all electrical wiring, vacuum lines and fuel inlet line at fuel pump.

**2)** Disconnect accelerator linkage at engine. If equipped, remove A/C compressor and power steering pump from mounting brackets and position aside, leaving hoses connected. Remove alternator. Raise vehicle and support with safety stands. Drain crankcase.

**3)** Disconnect exhaust pipe at manifold and converter bracket (if equipped) at transmission rear mount. Remove starter. On automatic transmission, remove converter housing inspection cover. Remove converter-to-flex plate bolts. Remove engine-to-transmission attaching bolts. Manual transmission is removed with engine.

**4)** Remove drive shaft, shift linkage, clutch equalizer shaft and transmission mount. On all models, remove motor mount through bolt and cruise control bracket (if equipped). Lower vehicle and support transmission.

**5)** Install lifting device to engine, raise engine and remove motor mount-to-engine brackets. Raise engine and transmission alternately until engine can be disengaged from transmission. Remove engine from vehicle.

### V8 MODELS

**1)** Mark hinges for reinstallation and remove hood. Disconnect battery cables at battery or batteries (if equipped). Remove air cleaner. Drain cooling system. Disconnect ground wire at inner fender panel. Disconnect engine ground strap. Disconnect radiator hoses.

**2)** Disconnect automatic transmission oil cooler lines, heater hoses, vacuum lines, fuel hose from fuel line, electrical wiring and throttle cable at engine. Remove A/C compressor and power steering pump from mounting brackets and position aside, leaving hoses connected (if equipped).

# 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-