

SCHEDULED MAINTENANCE INTERVALS

GM N BODY—OLDSMOBILE ALERO & PONTIAC GRAND AM

TO BE SERVICED	TYPE OF SERVICE	VEHICLE MILEAGE INTERVAL (x1000)													
		7.5	15	22.5	30	37.5	45	52.5	60	67.5	75	82.5	90	97.5	
Engine oil & filter	R	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	
Automatic transmission fluid & filter ①	SI	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	
Brake hoses	SI	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	
Chassis lubrication	SI	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	
Coolant level, hoses & clamps	SI	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	
Driveshaft boots & front suspension components	SI	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	
Exhaust system	SI	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	
Lubricate chassis & suspension	SI	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	
Lubricate steering linkage & transfer case linkage	SI	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	
Lubricate parking brake cable guides, underbody contact points & linkage	SI	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	
Manual transaxle oil	SI	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	
Throttle linkage	SI	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	
Brake linkage	SI	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	
Rotate tires	SI	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	
Air filter element & PCV filter	R				✓				✓				✓		
Engine coolant ②	R													✓	
Spark plugs ③	R				✓									✓	
Accessory drive belt(s)	SI				✓									✓	
EGR & fuel systems	SI				✓									✓	
Ignition cables	SI				✓									✓	

R Replace

SI Service or inspect

① Automatic transaxle fluid & filter replace at 100,000 miles (if not changed previously).

② Engine coolant: replace every 100,000 miles. Use O.E. specified (DEX-COOL™) coolant only. If any other coolant is used, the service interval is every 25,000 miles.

③ Platinum tip spark plugs: replace every 100,000 miles.

FREQUENT OPERATION MAINTENANCE (SEVERE SERVICE) ADDITIONS

If a vehicle is operated under any of the following conditions it is considered severe service:

- Towing a trailer or using a camper or sea-top carrier.
- Extensive idling or low-speed driving for long distances as in heavy commercial use, mail or delivery, taxi or police car.
- Operating on rough, muddy or salt-covered roads.
- Operating on unpaved or dusty roads.
- 80% or more of the vehicle operation is in 20°C (67°F) or higher temperatures, or extended operation in temperatures below 0°C (32°F).

Engine oil and filter: change every 3000 miles or 3 months, whichever occurs first.

Wheels and tires: inspect and rotate every 5000 miles.

Air cleaner element: inspect every 15,000 miles and replace or clean as needed. Replace it at least every 25,000 miles.

Automatic transaxle fluid & filter: replace every 25,000 miles.

PRECAUTIONS

Before servicing any vehicle, please be sure to read all of the following precautions, which deal with personal safety, prevention of component damage, and important points to take into consideration when servicing a motor vehicle:

- Never open, service or drain the radiator or cooling system when the engine is hot; serious burns can occur from the steam and hot coolant.

- Observe all applicable safety precautions when working around fuel. Whenever servicing the fuel system, always work in a well-ventilated area. Do not allow fuel spray or vapors to come in contact with a spark, open flame or excessive heat (a hot drop light, for example). Keep a dry chemical fire extinguisher near the work area. Always keep fuel in a container specifically designed for fuel storage; also, always properly seal fuel containers to avoid the possibility of fire or explosion. Refer to the additional fuel system precautions later in this section.

- Fuel injection systems often remain pressurized, even after the engine has been turned **OFF**. The fuel system pressure must be relieved before disconnecting any fuel lines. Failure to do so may result in fire and/or personal injury.

- Brake fluid often contains polyglycol ethers and polyglycols. Avoid contact with the eyes and wash your hands thoroughly after handling brake fluid. If you do get brake fluid in your eyes, flush your eyes

with clean, running water for 15 minutes. If eye irritation persists, or if you have taken brake fluid internally, IMMEDIATELY seek medical assistance.

- The EPA warns that prolonged contact with used engine oil may cause a number of skin disorders, including cancer! You should make every effort to minimize your exposure to used engine oil. Protective gloves should be worn when changing oil. Wash your hands and any other exposed skin areas as soon as possible after exposure to used engine oil. Soap and water, or waterless hand cleaner should be used.

- All new vehicles are now equipped with an air bag system. The system must be disabled before performing service on or around system components, steering column, instrument panel components, wiring and sensors. Failure to follow safety and disabling procedures could result in accidental air bag deployment, possible personal injury and unnecessary system repairs.

- Always wear safety goggles when working with, or around, the air bag system. When carrying a non-deployed air bag, be sure the bag and trim cover are pointed away from your body. When placing a non-deployed air bag on a work surface, always face the bag and trim cover upward, away from the surface. This will reduce the motion of the module if it is accidentally deployed. Refer to the additional air bag system precautions later in this section.

- Clean, high quality brake fluid from a sealed container is essential to the safe and proper operation of the brake system. You should always buy the correct type of brake fluid for your vehicle. If the brake fluid becomes contaminated, completely flush the system with new fluid. Never reuse any brake fluid. Any brake fluid that is removed from the system should be discarded. Also, do not allow any brake fluid to come in contact with a painted surface; it will damage the paint.

- Never operate the engine without the proper amount and type of engine oil; doing so WILL result in severe engine damage.

- Timing belt maintenance is extremely important! Many models utilize an interference-type, non-freewheeling engine. If the timing belt breaks, the valves in the cylinder head may strike the pistons, causing potentially serious (also time-consuming and expensive) engine damage.

- Disconnecting the negative battery cable on some vehicles may interfere with the functions of the on-board computer system(s) and may require the computer to undergo a relearning process once the negative battery cable is reconnected.

- When servicing drum brakes, only disassemble and assemble one side at a time, leaving the remaining side intact for reference.

- Only an MVAC-trained, EPA-certified automotive technician should service the air conditioning system or its components.

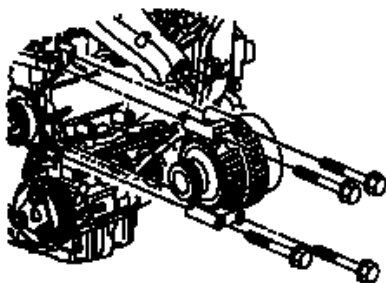
ENGINE REPAIR

Alternator

REMOVAL

2.2L Engine

1. Before servicing the vehicle, refer to the precautions in the beginning of this section.



42372-NBOD-G01

Alternator mounting—2.2L engine

2. Remove or disconnect the following:
 - Negative battery cable
 - Oil dipstick tube bolt and position the tube aside
 - Drive belt
 - Electrical connectors from the alternator
 - Alternator bolts
 - Alternator

2.4L Engine

1. Before servicing the vehicle, refer to the precautions in the beginning of this section.
2. Remove or disconnect the following:
 - Negative battery cable
 - Accessory drive belt
 - Alternator mounting bolts
 - Alternator electrical connectors
 - Alternator

3.4L Engine

1. Before servicing the vehicle, refer to the precautions in the beginning of this section.
2. Remove or disconnect the following:
 - Negative battery cable
 - Accessory drive belt
 - Alternator electrical connectors
 - Power steering-to-alternator line clip
 - Alternator mounting nuts and bolts
 - Alternator

INSTALLATION

2.2L Engine

1. Install or connect the following:
 - Alternator
 - Alternator bolts and tighten to 16 ft. lbs. (22 Nm)

- Electrical connectors to the alternator
- Drive belt
- Negative battery cable

2.4L Engine

1. Install or connect the following:
 - Alternator
 - Alternator electrical connectors
 - Alternator mounting bolts. Torque the bolts to 37 ft. lbs. (50 Nm).
 - Accessory drive belt
 - Negative battery cable

3.4L Engine

1. Install or connect the following:
 - Alternator. Torque the nuts to 22 ft. lbs. (30 Nm) and the bolts to 37 ft. lbs. (50 Nm).
 - Power steering-to-alternator line clip
 - Alternator electrical connectors
 - Accessory drive belt
 - Negative battery cable

Ignition Timing

ADJUSTMENT

The ignition timing is not adjustable, and is set electronically according to engine demand.

Engine Assembly

REMOVAL & INSTALLATION

2.2L Engine

MANUAL TRANSAXLE

1. Before servicing the vehicle, refer to the precautions in the beginning of this section.
2. Remove or disconnect the following:
 - Hood
 - Negative battery cable
 - Air inlet duct and resonator
 - Accelerator and cruise control cable
 - Hose from the brake booster
 - Power steering pump bolts and set the pump aside
 - Fuel lines
 - Transmission shift control cables
 - Transmission shift control cables from the bracket
 - Clutch actuator cylinder from the transmission
3. Drain the cooling system.
 - Radiator inlet hose

- Hose from the surge tank to the cylinder head
 - Outlet hose from the surge tank to the radiator
 - Bolt retaining the surge tank outlet hose to the intake manifold
 - Radiator outlet hose
 - Heater hoses
4. Disconnect the following electrical connectors:
 - Idle Air Control (IAC) motor
 - Throttle Position (TPS) sensor
 - Manifold Absolute Pressure (MAP) sensor
 - Crankshaft Position (CKP) sensor
 - Camshaft Position (CMP) sensor
 - Oil pressure sensor
 - Purge solenoid
 - Ignition coil and module assembly
 - Oxygen (O₂S) sensor
 - Vehicle speed sensor
 - Engine Coolant Temperature (ECT) sensor
 - Back-up lamp switch
 - Electrical harness from the engine and set the harness aside
 5. Raise the vehicle.
 6. Remove or disconnect the following:
 - Front suspension crossmember
 - Drive axles
 - Engine drive belt
 - AC compressor bolts and set the compressor aside.
 - Alternator and starter electrical connectors
 7. Drain the engine oil.
 - Front exhaust pipe from the exhaust manifold
 8. Use a block of wood to support the front of the engine at the front of the oil pan.
 9. Lower the vehicle onto an engine support table.
 - Front engine mount
 - Bolts which secure the transmission mounts to the frame
 10. Raise the vehicle away from the engine and transmission assembly.
 11. Install an engine hoist to the engine.
 - Transmission bellhousing bolts
 - Engine and the transmission
- To install:**
12. Installation is the reverse of removal. Please note the following torques:
 - Engine to the transaxle. Torque the bolts to 66 ft. lbs. (90 Nm).
 - Transaxle mount. Torque the bolt to 81 ft. lbs. (110 Nm).
 - Engine mount nuts and bolts to 49 ft. lbs. (66 Nm) and the engine mount bolts to 81 ft. lbs. (110 Nm)
 - A/C compressor. Torque the bolts to 16 ft. lbs. (22 Nm).

- Power steering pump. Torque the bolts to 25 ft. lbs. (34 Nm).
13. Refill the cooling system and engine oil.
 14. Start the engine and check for proper operation.

AUTOMATIC TRANSAXLE

1. Before servicing the vehicle, refer to the precautions in the beginning of this section.
2. Remove or disconnect the following:
 - Hood
 - Negative battery cable
 - Air inlet duct and resonator
 - Accelerator and cruise control cable
 - Hose from the brake booster
 - Power steering pump bolts and set the pump aside
 - Fuel lines
 - Transmission shift control cables
 - Transmission shift control cables from the bracket
 - Clutch actuator cylinder from the transmission
3. Drain the cooling system.
 - Radiator inlet hose
 - Hose from the surge tank to the cylinder head
 - Outlet hose from the surge tank to the radiator
 - Bolt retaining the surge tank outlet hose to the intake manifold
 - Radiator outlet hose
 - Heater hoses
4. Disconnect the following electrical connectors:
 - Idle Air Control (IAC) motor
 - Throttle Position (TPS) sensor
 - Manifold Absolute Pressure (MAP) sensor
 - Crankshaft Position (CKP) sensor
 - Camshaft Position (CMP) sensor
 - Oil pressure sensor
 - Purge solenoid
 - Ignition coil and module assembly
 - Oxygen (O₂S) sensor
 - Vehicle speed sensor
 - Engine Coolant Temperature (ECT) sensor
 - Back-up lamp switch
 - Electrical harness from the engine and set the harness aside
5. Remove or disconnect the following:
 - Upper transmission bellhousing bolts
6. Raise the vehicle.
 - Engine drive belt
 - AC compressor bolts and set the compressor aside
 - Crankshaft balancer

- Alternator and starter electrical connectors
7. Drain the engine oil.
 - Front exhaust pipe from the exhaust manifold
 - Starter
 - Flywheel-to-torque convertor bolts
 - Lower transmission bellhousing bolts
 - Transmission to engine brace
 8. Lower the vehicle.
 9. Install an engine hoist to the engine.
 - Front engine mount
 - Upper transmission bellhousing bolts
 - Engine and the transmission
 - Engine

To install:

10. Installation is the reverse of removal. Please note the following torques:
 - Upper bell housing bolts and tighten to 66 ft. lbs. (90 Nm)
 - Front engine mount and tighten the bolts to 81 ft. lbs. (110 Nm)
 - Lower bell housing bolts and tighten to 66 ft. lbs. (90 Nm)
 - Torque convertor bolts and tighten to 46 ft. lbs. (62 Nm)
 - Brace from the transmission to the engine bolts to 53 ft. lbs. (72 Nm)
 - A/C compressor. Torque the bolts to 16 ft. lbs. (22 Nm).
 - Power steering pump bolts to 19 ft. lbs. (25 Nm)
11. Refill the cooling system and engine oil.
12. Start the engine and check for proper operation.

2.4L Engine

AUTOMATIC TRANSAXLE

1. Before servicing the vehicle, refer to the precautions in the beginning of this section.
2. Properly drain the cooling system.
3. Relieve the fuel system pressure.
4. Drain the engine oil.
5. Remove or disconnect the following:
 - Fuel rail assembly
 - Air intake duct and bracket
 - Ignition coil assembly
 - Camshaft Position (CMP) sensor
 - Power steering pump. DO NOT remove the lines.
 - Oil pressure sending switch
 - Cruise control assembly
6. Install an engine support fixture.
 - Engine mount assembly
 - Fuel pressure regulator vacuum line
7. Raise the engine with the engine support fixture J-hook.

- Engine mount bracket
 - Accessory drive belt
 - Front wheels
 - Right front splash shield
 - Crankshaft balancer
 - Manifold Absolute Pressure (MAP) sensor electrical connector
 - Intake Air Temperature (IAT) sensor electrical connector
 - Exhaust Gas Recirculation (EGR) sensor electrical connector
 - Evaporator canister electrical connector
 - Alternator
 - Accelerator cable and bracket
 - Starter motor
 - Exhaust manifold heat shield
 - Exhaust pipe from the manifold
 - Engine intake coolant pipe
 - Torque converter cover
 - Torque converter bolts
 - Oxygen Sensor (O₂S)
 - A/C compressor. DO NOT remove the hoses.
 - Oil pan-to-bell housing bolts
 - Transaxle mount
 - Transaxle bolts
8. Install an engine lifting device and a transaxle support.
 9. Raise the engine slightly and separate it from the transaxle to remove it from the vehicle.

To install:

[[WARNING

Be sure the retaining bolts are in their correct locations. If not, engine damage may occur.

10. Install or connect the following:
 - Engine to the transaxle. Torque the bolts to 75 ft. lbs. (100 Nm).
 - Transaxle mount. Torque the through bolt to 55 ft. lbs. (75 Nm).
 - Oil pan-to-bell housing bolts. Torque the bolts to 17 ft. lbs. (23 Nm).
 - A/C compressor. Torque the bolts to 37 ft. lbs. (50 Nm).
 - O₂S
 - Torque converter bolts. Torque the bolts to 46 ft. lbs. (62 Nm).
 - Torque converter cover. Torque the bolts to 115 inch lbs. (13 Nm).
 - Intake coolant pipe
 - Exhaust pipe to the manifold. Torque the bolts to 26 ft. lbs. (35 Nm).
 - Exhaust manifold heat shield. Torque the bolts to 124 inch lbs. (14 Nm).

- Starter motor. Torque the bolts to 66 ft. lbs. (90 Nm).
 - Accelerator cable and bracket
 - Alternator
 - Fuel pressure regulator vacuum line
 - Evaporator canister electrical connector
 - EGR sensor electrical connector
 - IAT sensor electrical connector
 - MAP sensor electrical connector
 - Crankshaft balancer. Torque the bolt to 129 ft. lbs. (175 Nm).
 - Right front splash shield
 - Front wheels
 - Accessory drive belt
 - Engine mount bracket. Torque the bolts to 96 ft. lbs. (130 Nm).
 - Engine mount assembly. Torque the bolts to 49 ft. lbs. (66 Nm).
 - Cruise control assembly
 - Oil pressure sending switch
 - Power steering pump. Torque the bolts to 19 ft. lbs. (26 Nm).
 - CMP sensor
 - Ignition coil assembly
 - Air intake assembly
 - Fuel rail assembly
11. Refill the cooling system and engine oil.
 12. Start the engine and check for proper operation.

MANUAL TRANSAXLE

1. Before servicing the vehicle, refer to the precautions in the beginning of this section.
2. Properly drain the cooling system.
3. Relieve the fuel system pressure.
4. Drain the engine oil.
5. Discharge and recover the refrigerant.
6. Remove or disconnect the following:
 - Air cleaner duct
 - Air cleaner
 - Underhood fuse block
 - Air cleaner bracket
 - Shift cables at the shift control
 - Shift cables from the bracket and remove the bracket
 - Back up lamp switch electrical connection
 - Vehicle Speed Sensor (VSS) electrical connection
 - Engine controls harness
 - Vacuum lines
 - Fuel line quick disconnect fittings
 - Radiator hoses
 - Heater hoses from the core
 - Slave cylinder hydraulic line
 - Evaporative (EVAP) solenoid
 - Ground cables at the rear of the engine block

- Power steering pump with lines attached and position the pump aside
 - Electrical connector from the A/C compressor and the Crankshaft Position (CKP) sensor and position the harness aside
 - Starter with the wires attached and position it aside
 - Surge tank bypass hose from the engine
 - Cruise and accelerator cables from the throttle body
 - Cruise control module
7. Tie the radiator to the hood latch panel with mechanics wire
8. Raise and support the vehicle. Safety strap the front of the vehicle to the hoist.
- Oil filter
 - Front splash shields
 - Front closeout panel
 - Lower radiator support
 - Right front brake hose
 - Retaining nut from the Brake Pressure Modulator Valve (BPMV) at the mounting bracket
 - Wheel Speed Sensors (WSS)
 - WSS harnesses from the control arm retainers and the frame retainers and position them aside
 - Driveshafts
 - Ball joints from the control arms
 - Outer tie rod ends from the control arms
 - Catalytic converter from the exhaust manifold
 - A/C compressor hose from the A/C compressor
 - Bolt from the power steering pressure line retainer
9. Lower the vehicle until the front suspension crossmember rests on the support table. Position a three inch block of wood between the front of the oil pan and the crossmember.
- Front engine mount-to-bracket bolts
 - Front suspension crossmember retaining bolts
10. Carefully raise the vehicle off of the engine/transaxle assembly. Install the engine hoist to the engine/transaxle assembly.
- Front and rear transaxle mount through-bolts
 - 2 side transaxle mount lower nuts
 - Engine/transaxle assembly off of the front suspension crossmember
 - Transaxle from the engine
 - Clutch drive plate and clutch driven plate
 - Flywheel
11. Mount the engine on a suitable engine stand.
- To install:**
12. Remove the engine from the engine stand
13. Install or connect the following:
- Flywheel
 - Clutch driven plate and clutch drive plate
 - Transaxle to the engine
14. Lower the engine/transaxle assembly on to the front suspension crossmember.
- 2 side transaxle mount lower nuts and tighten the nuts to 60 ft. lbs. (44 Nm)
 - Front and rear transaxle mount through-bolts. Tighten the through-bolts to 75 ft. lbs. (55 Nm).
15. Remove the engine hoist from the engine/transaxle assembly.
16. Carefully lower the vehicle on to the engine/transaxle assembly.
- Front suspension crossmember retaining bolts
 - Front engine mount-to-bracket bolts
 - Power steering pressure line retainer bolt.
 - A/C compressor hose to the A/C compressor
 - Catalytic converter to the exhaust manifold
 - Outer tie rod ends to the control arms
 - Ball joints to the control arms
 - Driveshafts
 - WSS harnesses to the frame retainers and the control arm retainers
 - Wheel speed sensors
 - Retaining nut to the BPMV at the mounting bracket
 - Right front brake hose to the vehicle
 - Lower radiator support
 - Front closeout panel and the panel fasteners
 - Front splash shields
 - New oil filter
17. Remove the safety straps from the front of the vehicle and the hoist. Lower the vehicle. Untie the radiator from the hood latch panel.
- Cruise control module
 - Cruise and accelerator cables to the throttle body
 - Surge tank bypass hose to the engine
 - Starter
 - Connectors to the A/C compressor and the CKP sensor
 - Power steering pump
- Ground cables at the rear of the engine block
 - EVAP solenoid
 - Slave cylinder hydraulic line
 - Heater hoses to the heater core
 - Radiator hoses
 - Fuel line fittings
 - Vacuum lines
 - Engine controls harness
 - VSS
 - Back up lamp switch
 - Shift cable bracket and the shift cables to the bracket
 - Shift cables at the shift control
 - Air cleaner bracket
 - Underhood fuse block
 - Air cleaner
 - Air cleaner duct
 - Negative battery cable
18. Refill the cooling system.
19. Refill the crankcase.
20. Recharge the A/C system.
21. Start the vehicle and verify no leaks.
22. Check and/or adjust the wheel alignment.

3.4L Engine

1. Before servicing the vehicle, refer to the precautions in the beginning of this section.
2. Disconnect the negative battery cable.
3. Drain the engine coolant.
4. Remove or disconnect the following:
 - Air cleaner assembly
 - Hood
 - Accessory drive belt
 - Hoses from the surge tank
 - Cruise control module
 - Upper wiring harness from the engine
 - Throttle and cruise control cables
 - Starter motor
 - A/C compressor and move it aside with the lines attached
 - Lower wiring harness from the engine components
 - Catalytic converter from the rear exhaust manifold
 - Torque converter cover
 - Torque converter-to-flywheel bolts
 - Engine splash shields
 - Transaxle-to-engine brace and the 2 outer transaxle mounting bolts
 - Upper and lower radiator hoses
 - Fuel lines from the engine
 - Vacuum hose from the power brake booster
 - Heater hoses
5. Install an engine hoist and raise the engine slightly.

6. Remove or disconnect the following:
 - Engine mount and bracket
 - Power steering pump
 - Transaxle-to-engine bolts
 - Engine from the vehicle

To install:

7. Install or connect the following:
 - Engine. Torque the upper transaxle-to-engine bolts to 66 ft. lbs. (90 Nm).
 - Engine support fixture and remove the engine hoist
 - Power steering pump. Torque the bolts to 25 ft. lbs. (34 Nm).
 - Engine mount bracket and mount. Torque the bolts to 43 ft. lbs. (58 Nm) and the nuts to 35 ft. lbs. (47 Nm).
 - Heater hoses
 - Fuel lines
 - Vacuum hose to the power brake booster
 - Upper and lower radiator hoses
 - Both outer transaxle to engine bolts. Torque the bolts to 66 ft. lbs. (90 Nm).
 - Transaxle to the engine brace. Torque the bolts to 32 ft. lbs. (43 Nm).
 - Engine splash shields
 - Flexplate to the torque converter. Torque the bolts to 46 ft. lbs. (62 Nm).
 - Torque converter cover. Torque the bolts to 89 inch lbs. (10 Nm).
 - Catalytic converter to the exhaust manifold. Torque the bolts to 25 ft. lbs. (34 Nm).
 - A/C compressor. Torque the bolts to 37 ft. lbs. (50 Nm).
 - Starter motor. Torque the bolts to 32 ft. lbs. (43 Nm).
 - Lower and upper wiring harnesses

[[CAUTION

To avoid personal injury and/or damage to the vehicle, replace the throttle cable with a new one any time the engine has been removed from the vehicle.

- Cruise control and throttle cables
 - Cruise control module
 - Accessory drive belt
 - Hoses to the surge tank
 - Hood. Torque the bolts to 13 ft. lbs. (17 Nm).
 - Air cleaner assembly
8. Refill the cooling system.
 9. Refill the crankcase.
 10. Start the engine and inspect for coolant and/or oil leaks.

11. Stop the engine and recheck the fluid levels after the engine has cooled.

Water Pump

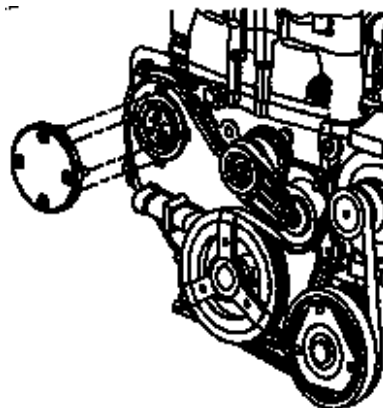
REMOVAL & INSTALLATION

2.2L Engine

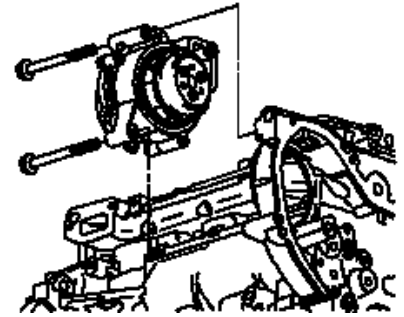
1. Before servicing the vehicle, refer to the precautions in the beginning of this section.
2. Disconnect the negative battery cable.
3. Drain the engine coolant.
4. Remove or disconnect the following:
 - Exhaust manifold, if equipped with an automatic transaxle
 - Right front wheel
 - Splash shield
 - Water pump sprocket access plate from the timing cover
5. Attach Water Pump Sprocket Holding Tool J 43651 to the sprocket using the access plate bolts to secure the tool to the engine front cover.
 - Sprocket to water pump bolts
 - Engine block to water pump bolt
 - Engine front cover to water pump bolt
 - Thermostat housing to water pump feed pipe
 - 2 water pump to engine block bolts
 - Water pump

To install:

6. Use a threaded stud in the water pump hub to align the hub to the water pump sprocket.
 - Water pump and bolts
 - Thermostat housing to water pump feed pipe
 - Engine front cover bolt and engine block to water pump bolt. Tighten the bolts to 15 ft. lbs. (20 Nm)



Remove the water pump sprocket access plate from the timing cover —2.2L engine



42372-NBOD-G04

Water pump mounting—2.2L engine

- 2 of the water pump sprocket to water pump bolts
7. Remove the threaded stud.
 - Last water pump sprocket to water pump bolt and tighten the sprocket bolts to 89 inch lbs. (10 Nm).
 8. Remove the tool.
 - Water pump sprocket access plate to the timing cover and tighten the bolts to 89 inch lbs. (10 Nm)
 - Splash shield
 - Right front wheel
 - Exhaust manifold, if removed
 9. Fill the cooling system.
 10. Connect the negative battery cable.

2.4L Engine

1. Before servicing the vehicle, refer to the precautions in the beginning of this section.
2. Disconnect the negative battery cable.
3. Drain the cooling system.
4. Remove or disconnect the following:
 - Oxygen Sensor (O₂S) electrical connector
 - Exhaust manifold heat shield
 - Coolant inlet housing bolt through the exhaust manifold
 - Exhaust manifold brace-to-manifold bolt
 - Manifold-to-exhaust pipe studs
 - Coolant inlet housing-to-water pump cover bolt
 - Exhaust pipe from the exhaust manifold by pulling it downward

[[WARNING

Do not rotate the flex coupling more than 4 degrees or damage may occur.

- Coolant inlet pipe from the oil pan
- Brake vacuum pipe from the camshaft housing
- Exhaust manifold from the cylinder head
- Heater hose from the heater outlet pipe