

# Oil Pan Removal

## GENERAL MOTORS OIL PAN REMOVAL

### NOTES

- ▶ **1964 BUICK V6 & 300" V8 ENGINES OIL PAN ASSEMBLY CHANGE NOTE** – Oil pan changed in production. Later type has lower oil sump level to improve engine efficiency at high speeds. When installing, pipe and flange assembly and dipstick must also be replaced with new type parts.
- ▶ **1964-65 BUICK OIL SEEPAGE AT ENGINE OIL PAN ATTACHING BOLTS CORRECTION (V6 & 300" V8):** Some engine oil pan bolt holes are drilled through to crankcase and can allow seepage which may be mistaken for oil pan gasket leak. To correct, remove 3 or 4 bolts in leak area, and if holes are drilled through, apply sealer Gr. 8.800, Part 980032, or equivalent.
- ▶ **EARLY 1964 CADILLAC OIL PAN SEAL LEAK CORRECTION:** On cars before Engine Number 028370, a rear oil pan seal leak may be corrected by installing new oil pan gaskets and a 1/16-1/8" bead of Transmission Oil Cooler Hose Cement, Part No. 1098993, at top corners of oil pan.
- ▶ **1965-70 PONTIAC OIL PAN SEEPAGE V8 ENGINES** – Even after normal procedures (replacing gaskets, checking bolt torque, etc.) have been followed, oil seepage may occur at the joint where the oil pan side rail gasket over-laps rear pan gasket. Oil pan reinforcement package (Part No. 484083) fits all 1965-70 V8 engines and will correct oil seepage.

### BUICK (EXC. SPECIAL & SKYLARK) V8

#### 1964-65

Remove oil pan retaining bolts, and remove oil pan. **NOTE** – On some models, it may be necessary to disconnect idler arm bracket from side rail and lower linkage for clearance.

#### 1966-67

Disconnect steering idler arm bracket-to-crossmember bolts, then remove lower flywheel housing. Lower pan and remove intake pipe and screen, rotate crankshaft for clearance, then move front of pan to right and lower pan through opening between crossmember and steering intermediate shaft.

#### 1968-69

Disconnect battery, raise car and drain oil. If equipped with manual transmission; loosen clutch equalizer bracket to frame attaching bolts, remove exhaust crossover pipe, remove front engine mounting bolts, and remove fan shroud to radiator tie bar screws. If equipped with automatic transmission; remove lower flywheel housing, remove shift linkage attaching bolt and swing out of way, remove front engine mounting bolts, remove fan shroud to radiator tie bar screws. On all models, raise engine by placing jack under crankshaft pulley mounting. Remove oil pan bolts and remove pan. **NOTE** – Remove rear seal on 1969 400" & 430" engines only.

### TIGHTENING SPECIFICATIONS

Application	Ft. Lbs.
Buick 6 Cyl.	
V6 .....	6-15
L6 1/4" .....	7
5/16" .....	10
Pan to Front Cover (1973).....	4
Buick V8	
1964-67 .....	9-13
1968-73 .....	14
Cadillac (1964-73).....	6-12
Chevrolet 4 Cyl.	
Chevy II .....	9-12
Vega .....	15
Chevrolet 6 Cyl.	
1965-67 .....	9-12
1968-73 1/4" .....	7
5/16" .....	11
Chevrolet V8 (283", 302", 327", 350", 400")	
1965-67 .....	①12-15
1968-73 1/4" .....	7
5/16" .....	6
Chevrolet V8 (396", 402", 427", 454")	
1965-67 Pan to Crankcase .....	10-13
Pan to Front Cover.....	5

Application	Ft. Lbs.
1968-73 Pan to Crankcase .....	11
Pan to Front Cover.....	7
Corvaire 1964 .....	5
1965-69 .....	8
Oldsmobile 6 Cyl.	
V6 .....	6-15
L6 1/4" Pan to Crankcase .....	7
1/4" Pan to Front Cover.....	5
5/16" Pan to Crankcase .....	10
Oldsmobile V8	
1965-67 1/4" .....	5-8
5/16" .....	12-15
1968-73 1/4" .....	8
5/16" .....	12
Pontiac 6 Cyl. (1964-73).....	②7
Pontiac V8 (1964-73) .....	③12

- ① – 6-9 Ft. Lbs. for 1/4" intermediate side bolts.
- ② – Screws attaching clutch housing cover, 9-15 Ft. Lbs.
- ③ – Oil pan reinforcement attaching screws, 10-20 Ft. Lbs.

## GENERAL MOTORS OIL PAN REMOVAL (Cont.)

### 1970-73

After disconnecting battery and throttle linkage, remove air cleaner and proceed as follows:

1) Remove fan shroud to radiator tie bar screws. Raise vehicle and drain oil. If equipped with auto. trans., remove lower flywheel housing. Remove shift linkage attaching bolt and swing out of the way.

2) Disconnect exhaust pipe at manifold and remove front engine mounting bolts.

3) **NOTE** – At this point, cars equipped with A/C place support under right side of transmission prior to raising engine, preventing engine trans. assembly from cocking to the right when engine is being raised.

Raise engine as far as possible by placing a jack under crankshaft pulley mounting. Remove engine mounts completely from frame. This is necessary for clearance of pan rail.

4) Remove oil pan bolts and oil pan. To install, reverse removal procedure, using new gasket set and seal.

## BUICK SPECIAL & SKYLARK 6 CYL. & V8

### 1964-67

Raise car and drain oil. Disconnect steering idler arm bracket-to-crossmember attaching bolts, then remove lower flywheel housing. Remove oil pan bolts and lower pan enough to remove oil pump pipe and screen-to-cylinder block bolts. Rotate crankshaft for maximum clearance of forward end of oil pan. Move front of pan to right and lower pan through opening between crossmember and steering intermediate shaft.

### 1968-69

To remove engine oil pan, it is necessary to remove engine from car, refer to "Engine Removal".

### 1970-72

Disconnect battery and remove fan shroud to radiator tee bar screws. Remove air cleaner and disconnect throttle linkage. Raise vehicle and drain crankcase. On manual transmission models, loosen clutch equalizer bracket to frame bolts and disconnect exhaust crossover pipe at engine. On automatic transmission models, remove lower flywheel housing, shift linkage attaching bolt and swing linkage out of way and disconnect exhaust crossover from engine. On all models, disconnect idler arm at frame and push steering linkage forward. Remove front engine mount bolts and raise engine, **NOTE** – If equipped with air conditioning, place support under right side of transmission before raising engine. Remove oil pan bolts and if necessary, rotate crankshaft for clearance and remove oil pan. **NOTE** – Remove rear seal on 455" engines.

## APOLLO 6 CYL.

### 1973

Disconnect battery positive cable. Remove radiator upper mounting panel or side mount bolts and place padding between fan and radiator. Disconnect fuel tank line at fuel pump. Raise vehicle, drain oil, remove starter and either flywheel underpan or converter underpan and splash shield. Disconnect steering rod at idler lever and move steering linkage away from pan. Rotate crankshaft until timing mark is

at six o'clock position. Remove brake line from crossmember and through bolts from engine front mounts and remove left front mount and frame bracket. Remove oil pan bolts, lower pan slightly and roll it into left engine mount space. Tilt front of pan upward and remove pan by pulling down and rearward.

## CADILLAC

### 1964-65

Disconnect battery positive cable and drain oil. Disconnect wires from starter solenoid and remove starter assembly from flywheel housing. Remove exhaust manifold pipe from manifolds, remove heat control valve, and swing exhaust pipe out of way. Remove idler arm support mounting screws from frame side member and lower support. Remove capscrew holding transmission rear cooler pipe clamp to upper flywheel cover plate. Remove nut holding front cooler pipe clamp to right front oil pan locating stud and remove clamp from stud. Remove upper flywheel cover plate-to-flywheel housing and oil pan attaching screws and nuts and remove cover plate. Remove oil pan-to-cylinder block and engine front cover attaching screws and nuts, remove oil pan.

**INSTALLATION NOTE** – Carefully observe special gasket installation procedures below to prevent oil leaks. Procedures supersede all previous recommendations.

Cement gasket to both sides of oil pan. Install pan end seals on ends of pan by pulling locating tangs on seal through locating holes in pan. Be sure seals are firmly positioned with ends of each seal properly located in cut-out notches in side gaskets. Using rubber cement, seal all four corner notch openings. Clean notches in cylinder block where ends of oil pan rear end seal fit, and fill this cavity with Transmission Cooler Hose Cement, No. 1098993. Install oil pan by reversing removal procedure.

### 1966-67

Disconnect and remove starter, then remove exhaust manifold heat control valve, and swing exhaust pipe out of way. Remove idler arm support mounting screws from frame side member and lower support, then disconnect pitman arm at drag link and lower steering linkage. Remove transmission lower cover, then remove oil pan.

### 1968-73

**NOTE** – On Cadillac Eldorado, engine must be removed to remove oil pan. See "Engine Removal".

On all other models, disconnect negative battery cable, drain engine oil and remove exhaust "Y" pipe at exhaust manifold. Remove starter motor, remove two idler arm support mounting screws and lockwashers from frame side member, and lower support. Disconnect pitman arm at center link, using Puller J-8990, or equivalent, and lower steering linkage. Remove transmission lower cover. Remove nuts and cap screws that hold oil pan to cylinder block and lower pan. Remove side gaskets and rubber front and rear seals from oil pan, and discard seals.

**INSTALLATION NOTE** – Carefully observe special gasket installation procedures below to prevent oil leaks. Procedures supersede all previous recommendations.

## GENERAL MOTORS OIL PAN REMOVAL (Cont.)

Cement gasket to both sides of oil pan. Install pan end seals on ends of pan by pulling locating tangs on seal through locating holes in pan. Be sure seals are firmly positioned with ends of each seal properly located in cut-out notches in side gaskets. Using rubber cement, seal all four corner notch openings. Clean notches in cylinder block where ends of oil pan rear end seal fit, and fill this cavity with Transmission Cooler Hose Cement, No. 1098993. Install oil pan by reversing removal procedure.

### VEGA 2300 4 CYL. ENGINES

1971-73

With car on hoist, support front of engine so that weight is off engine front mounts. Remove frame crossmember and both front crossmember braces. Disconnect steering idler arm at frame side rail. **NOTE** – With A/C, disconnect idler arm at relay rod. Mark relationship of steering linkage pitman arm to steering gear pitman shaft, and remove pitman arm. **NOTE** – Do not rotate steering gear pitman shaft while steering arm is disconnected as this will change wheel alignment. Remove flywheel cover or converter underpan. Remove oil pan screws and remove oil pan.

### CHEVELLE 6 CYL. ENGINES

1964-68

Engine must be removed to remove oil pan. See "Engine Removal".

1969

**Chevelle With Synchro-mesh Transmission** – Engine must be removed to remove oil pan. See "Engine Removal".

**Chevelle With Automatic Transmission** – Disconnect battery positive cable at battery. Remove radiator upper mounting panel and insert a piece of heavy cardboard between fan and radiator. Disconnect starter brace at starter and disconnect and plug fuel line at fuel pump. Remove converter housing underpan and splash shield. Remove inboard starter bolt and loosen outboard starter bolt, swing starter outboard to gain adequate clearance for pan removal. Rotate crankshaft until timing mark on damper is at 6 o'clock position. Remove both engine mount through bolts. Raise front of engine until motor mounts separate from frame brackets. Remove right motor mount from engine and insert two bolts in mount holes. Continue raising engine until able to insert a 4½" block of wood on right side between the bolts and frame bracket and a 4" block on left side, between mount and frame. Remove oil pan retaining bolt and lower pan, remove front main bearing cap and oil pan. Discard gaskets and seals.

1970-73

Disconnect battery positive cable, remove radiator upper mounting panel or side mount bolts and place padding between fan and radiator. Disconnect fuel tank line at fuel pump. Raise vehicle, drain oil and remove starter. Remove either flywheel underpan or converter under pan and splash shield. Remove through bolts from front engine mounts and remove oil pan bolts. Raise engine until engine mounts can be removed from frame brackets, then raise engine to approximately three inches. Lower oil pan and remove.

### V8 ENGINES

1964-69

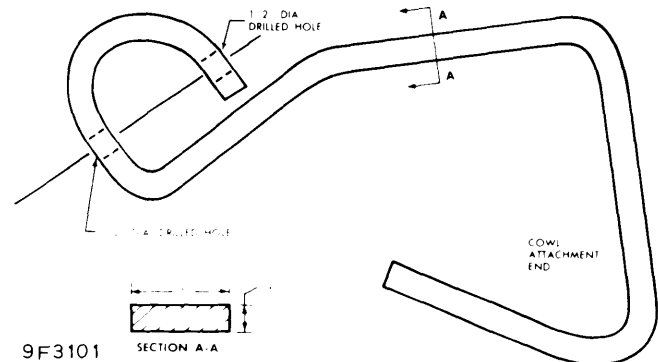
Engine must be removed to remove oil pan. See "Engine Removal" on Page 5-457.

1970-73

**Chevelle (Small Block V8 Engines)** – Remove distributor cap to prevent damage when engine is raised. Remove fan shroud retaining bolts. Disconnect exhaust pipes or crossover pipe. With Auto. Trans., remove converter housing under pan and splash shield. Rotate crankshaft until timing mark on damper is at 6 o'clock position. Disconnect starter brace at starter, remove inboard starter bolt and loosen outboard bolt. Starter can be swung outboard. Remove through bolts from engine front mounts. Raise engine until 3 inch blocks can be inserted under engine mounts. Lower engine on blocks and remove oil pan.

1970-72

**Chevelle (Mark IV Engines)** – Remove distributor cap, radiator shroud and upper mounting panel. Place heavy cardboard between fan and radiator. Disconnect battery cable and throttle cable. Fabricate engine suspension hook (see illustration) and place in position with suitable chain (approximately 4 feet long) over cowl. Insert a bolt through hook and center link of chain. Raise vehicle and drain engine oil. On floor shift synchro-mesh models disconnect shift linkage from shift lever. Other models, disconnect transmission linkage. Disconnect speedo cable and backup light switch connector. Remove crossmember bolts, raise engine, slide crossmember to rear. Remove exhaust crossover pipe or disconnect exhaust pipes at manifolds. Remove transmission from engine. On manual transmission remove flywheel housing and clutch throwout bearing. Remove engine mount through bolts and raise engine 4 inches. Suspend rear of engine by attaching chain from fabricated hook to bell housing or transmission mounting bolts. Lower jack. Raise front of engine and insert 2 inch blocks of wood under engine mounts. Rotate crankshaft until timing mark on damper is at 6 o'clock and remove oil pan.



FABRICATED STEEL STRAP

1973 CHEVELLE & MONTE CARLO, MARK IV ENGINE

See Chevrolet, and Camaro V8 oil pan removal.

## GENERAL MOTORS OIL PAN REMOVAL (Cont.)

### CHEVROLET, CAMARO & CHEVY II (NOVA) 4 & 6 CYL. ENGINES

#### 1965-67 CHEVY II

1) Drain crankcase, disconnect battery and remove starter. Disconnect steering idler arm bracket at right frame side rail and swing steering linkage down for clearance. On 6 Cyl. cars, remove front crossmember (let stabilizer bar hang down while removing crossmember on station wagons). On all cars, remove oil pan attaching bolts and remove oil pan. **NOTE** - *When installing oil pan, install screws into timing gear cover last as they are installed at an angle, and will line up after installation.*

#### 1965-67 (EXC. CHEVY II)

Drain crankcase, disconnect battery, remove starter, radiator hoses, fuel pump, and distributor cap. Remove fan blade and engine front mount through bolts. Disconnect steering idler arm bracket at right frame side rail and swing steering linkage down for clearance. On cars with automatic transmission, disconnect transmission cooler lines at transmission and remove converter housing underpan. Rotate crankshaft to 6 o'clock timing mark position. Raise engine and insert a 5" wood block under front engine mounts. Remove oil pan attaching bolts, remove oil pump (Camaro only), then remove oil pan.

**INSTALLATION NOTE** - *Install screws into crankcase cover last as they are installed at an angle and holes will line up after other oil pan bolts are installed.*

#### 1968

Disconnect battery positive cable. Remove through bolts from front engine mounts. Drain radiator, disconnect upper and lower radiator hoses at radiator. Remove fan blade, raise vehicle and drain crankcase. Remove starter. On vehicles equipped with automatic transmission, disconnect cooler lines at transmission and remove converter housing underpan. Disconnect steering rod at idler lever, then swing steering linkage, for oil pan clearance. Rotate crankshaft until timing mark on damper is at 6 o'clock position. Using a suitable jack (with a block of wood on top), raise engine enough to insert 2" x 4" wood blocks under engine mounts, lower engine onto blocks. **NOTE** - *Cut 2" x 4" wood blocks 5½" long, so they can be used on all Chevrolet engines (5½" length up for in line engines and the 4" side up for V8 engines).* On Chevrolet, remove oil pan and discard gaskets and seals. On Camaro and Chevy Nova (Chevy II), remove oil pan retaining screws, lower pan and remove the two bolts holding oil pump assembly and then one bolt securing intake pipe and screen to block. Remove oil pump, oil pan, and discard gaskets and seals.

#### 1969-72

Disconnect battery positive cable and remove through bolts from front engine mounts. Remove upper radiator mounting panel or side mount bolts. Insert a piece of heavy cardboard between fan blade and radiator. Raise vehicle, drain crankcase, and remove starter. On vehicles with automatic transmission, remove converter housing underpan. Disconnect steering rod at idler lever, then swing steering linkage for clearance of oil pan. Rotate crankshaft until timing mark on damper is at 6 o'clock position. On Chevrolet and Camaro, use a suitable jack (with block of wood on top), raise engine enough to insert 2" x 4" wood blocks under engine mounts, then lower engine onto blocks. On Chevrolet, remove oil pan and dis-

card gaskets and seals. On Camaro, remove oil pan retaining screws and lower pan, remove the two bolts securing oil pump assembly and the one nut holding intake pipe and screen to block, remove oil pump, oil pan and discard gaskets and seals. On Nova, remove hood hinge front bolts, loosen rear bolts, swing hood up to install Tool J-22382-1 (or equivalent). Connect hoist or chain fall and raise engine approximately 2". On Nova, also remove left engine mount and frame bracket. Remove oil pan by lowering it into opening left by removal of left engine mount. When pan is clear, tilt upward and remove by pulling down and rearward. Discard gaskets and seals.

#### 1973

**All Models** - Disconnect battery positive cable. Remove radiator upper mounting panel or side mount bolts and place padding between fan and radiator. Disconnect fuel tank line at fuel pump. Raise vehicle, drain oil, remove starter and remove either the flywheel underpan or converter housing underpan and splash shield. Note the following for individual vehicles:

**Nova** - Disconnect steering rod at idler lever and move steering linkage to one side for oil pan clearance. Rotate crankshaft until timing mark is at six o'clock position. Remove brake line from front crossmember, remove through bolts from engine front mounts and remove oil pan bolts. Remove left engine mount and frame bracket and remove oil pan by moving pan into left engine mount space then pulling down and rearward.

**Chevrolet & Camaro** - Raise engine until engine mount through bolts can be removed, remove bolts and continue to raise engine three inches. Insert 2" x 4" blocks under mounts and lower engine onto blocks. Remove oil pan bolts and oil pan.

## V8 ENGINES

#### 1965-67 (EXC. CHEVY II)

1) Drain crankcase, disconnect battery, remove starter, radiator hoses, and disconnect distributor cap. Remove fan blade, engine front mount through bolts, and fuel pump (not necessary to remove fuel pump from engine compartment). Disconnect steering idler arm bracket at right frame side rail and swing steering linkage down for clearance.

2) On cars with automatic transmissions, disconnect transmission cooler lines at transmission and remove converter housing underpan. Rotate crankshaft to 6 o'clock position. Raise engine and insert 5½" wooden blocks under engine mounts. Remove oil pan (on Camaro, drop oil pump into pan). **INSTALLATION NOTE** - *On 396" and 427" engines, start the three 1/2 x 20 bolts before tightening other bolts.*

#### 1965 CHEVY II

Drain crankcase, disconnect battery, remove starter. Disconnect steering idler arm bracket at right frame side rail and swing steering linkage down for clearance. Disconnect exhaust pipes at manifolds and allow pipes to hang free. Remove oil pan attaching bolts, and remove oil pan.

#### 1966-67

Engine must be removed to remove oil pan.

## GENERAL MOTORS OIL PAN REMOVAL (Cont.)

## 1968

Disconnect battery positive cable. Disconnect distributor cap from distributor (this will prevent breaking when raising engine). Drain radiator and disconnect lower radiator hose at water pump and remove oil dipstick and tube (where necessary). Remove fan blade, raise vehicle and drain oil, remove through bolts from engine front mounts. Disconnect and remove starter. On vehicles with automatic transmissions, remove converter housing underpan. Disconnect steering rod at idler lever, then swing steering linkage down for clearance. Rotate crankshaft until damper is at 6 o'clock position. Using a suitable jack, and a block of wood on top of jack, raise engine enough to insert 2" x 4" wood blocks under engine mounts, then lower engine onto blocks. Remove oil pan, discard gaskets and seals.

## 1969-73

Disconnect battery positive cable. Remove distributor cap and fan shroud retaining bolts. On Mark IV engines, place padding between fan and radiator. Disconnect exhaust pipes or crossover pipe and on automatic transmission models remove converter housing under pan and splash shield. On Nova, disconnect steering idler lever at frame and swing steering linkage down. On all models, rotate crankshaft until timing mark is at six o'clock position. On small V8 engines, disconnect starter brace at starter, remove inboard starter bolt and loosen outboard starter bolt and swing starter outboard. On all engines, remove front engine mount through bolts and raise engine until 2" (3" on Chevelle) blocks can be inserted under mounts. Lower engine onto blocks and remove pan.

## CORVAIR PASS. CARS &amp; GREENBRIER

## 1960-69

Drain crankcase, remove oil pan retaining bolts, and remove oil pan.

## CORVETTE

## 1965-67

Drain crankcase, disconnect battery, remove starter and flywheel or converter underpan. Disconnect steering linkage idler at frame and lower the linkage for clearance. Remove oil baffle, then remove oil pan screws and oil pan screws and oil pan.

*INSTALLATION NOTE - On 396" engines, start the three 1/2" x 20 oil pan attaching bolts before tightening other oil pan bolts.*

## 1968-73

Disconnect battery positive cable and remove oil dipstick and tube. Raise and support vehicle, then drain oil. On 1968 models remove starter and flywheel underpan. On all models, disconnect steering linkage idler at frame and lower linkage. Remove oil pan and discard old gaskets and seals.

## OLDSMOBILE

## 1966-73 TORONADO

Engine must be removed to remove oil pan. See "Engine Removal".

## 1965

Raise car, remove dipstick, and drain oil. On 330" engine, disconnect exhaust pipe from right exhaust manifold. On 400", 425" engines, lower relay rod by disconnecting idler arm or pitman arm. Position No. 1 piston at bottom of stroke. Remove exhaust crossover pipe and starter. Remove engine front mount attaching nuts and raise engine. Remove oil pan attaching bolts and remove oil pan.

## 1966-67 400" Engine

Disconnect battery, remove upper radiator baffle, and disconnect right engine mount. Remove drive shaft, transmission crossmember, transmission, and flywheel. Disconnect left exhaust pipe and starter. Raise engine and tilt to left using left mount as pivot. Remove oil pan (rotate crankshaft for clearance).

## 1968 400" Engine

Disconnect negative battery cable and remove upper radiator baffle. Remove drive shaft, transmission crossmember, transmission, and flywheel. Disconnect left exhaust pipe and starter. Disconnect right hand engine mount. *NOTE - Both front and rear of engine must be raised and engine tilted to left, using left engine mount as a pivot.* Install a suitable engine support bar and place a 1" block of wood between support bar and right rear corner of oil pan (for additional lift on right side). Raise front of engine. Do not bolt tool to engine block, engine must rock when raised. Raise right side of engine approximately 2 1/2" and insert a blocking tool between upper and lower right hand mounts. Remove engine support bar from rear of engine and remove oil pan attaching bolts and remove oil pan toward rear of engine. *NOTE - Nos. 1 and 2 connecting rod journals should be at 4 or 7 o'clock position (viewed from front of engine).*

## 1969 400" Engine

Disconnect negative battery cable and fan shroud. Raise car and drain crankcase. Remove propeller shaft and disconnect exhaust pipe and starter. Install a suitable engine support bar and remove inspection cover. Disconnect modulator line, speedometer cable, oil cooler lines, solenoid wire and linkage. Remove transmission crossmember, transmission, and flywheel. Raise front of engine. Remove right engine mount and raise engine 2" and install wedge block. Loosen left engine mount to block bolts enough for removal of all oil pan bolts; remove bolts, free pan from block and disconnect oil pump. Remove oil pan with pump.

## 1966-67 Except Toronado &amp; 400" Engine

Lower relay rod by disconnecting idler arm or pitman arm, then disconnect engine mounts and raise front of engine as far as possible (distributor must not touch cowl, and fan must not hit shroud). Remove exhaust crossover pipe, starter, and then remove oil pan (rotate crankshaft for clearance).

## 1968-72 350" &amp; 455" (Except Toronado)

Disconnect negative battery cable, remove dipstick, and remove upper radiator support and fan shroud attaching screws. Raise car and drain crankcase. On Cutlass and Vista Cruiser, disconnect exhaust pipe from right exhaust manifold. On Delmont, Delta & 98 series, lower relay rod

## GENERAL MOTORS OIL PAN REMOVAL (Cont.)

by disconnecting idler arm or pitman arm. On all models, disconnect engine mounts and jack front of engine as far as possible, using a suitable engine support. Remove crossover pipe and starter, remove oil pan attaching bolts, position No. 1 crankshaft throw up and remove oil pan.

### 1973 (EXC. TORONADO)

Remove distributor cap and align rotor in number one firing position, disconnect battery cable and remove dip stick and upper radiator support and fan shroud attaching screws. Raise vehicle, drain oil, remove starter and exhaust pipes or crossover pipe. Disconnect engine mounts, raise and support engine and remove oil pan.

## OLDSMOBILE F-85 & OMEGA 6 CYL. ENGINES

### 1964-65

Raise car and drain oil. Remove lower flywheel housing. Remove oil pan bolts and lower pan enough to remove oil pump pipe and screen-to-cylinder block bolts. Turn crankshaft for clearance, and remove oil pan.

### 1966-69

Engine must be removed to remove oil pan.

### 1970-71

Disconnect positive battery cable. Disconnect fuel line at fuel pump and starter leads at starter motor. Remove upper radiator support and bracket to upper hose. On A/C cars remove fan and clutch assembly. Remove front engine mount bolts and raise car. Drain oil, disconnect transmission manual linkage (automatic only). Remove flywheel cover and starter, and disconnect exhaust pipe at exhaust manifold. Rotate timing mark on damper to 6 o'clock position. Raise engine with jack under harmonic balancer and remove right engine mount with bracket (mount to frame). Remove oil pan screws and loosen oil pan. Further raise engine, but only as high as required to remove oil pan. **CAUTION** – Avoid over-lifting engine.

### 1973 OMEGA

Disconnect battery negative cable and fuel tank line to fuel pump. Remove upper radiator support and bracket to hose and on air conditioned models remove fan and clutch assembly. Remove front bracket-to-motor mount bolts. Raise and support vehicle and drain oil. Disconnect transmission linkage (automatic transmission only). Remove flywheel cover, starter, and exhaust pipe from manifold. Position timing mark at six o'clock position and raise engine. Remove right engine mount with bracket and, raising engine as required, remove oil pan.

## V8 ENGINES

### 1965

Remove dipstick, drain oil, and disconnect exhaust pipe from right exhaust manifold. Remove crossover pipe and starter. Remove engine front mount attaching nuts and raise engine. Remove oil pan attaching bolts, turn crankshaft, and remove pan.

### 1966-67 Except 400" Engine

Disconnect exhaust pipe from right exhaust manifold, then disconnect engine mounts and raise front of engine as much as possible. **CAUTION** – Do not let distributor touch cowl or fan blades touch shroud. Remove crossover pipe, starter, and oil pan (rotate crankshaft for clearance).

### 1966-67 400" Engine

Disconnect battery, remove upper radiator baffle, and disconnect right engine mount. Remove drive shaft, transmission crossmember, transmission, and flywheel. Disconnect left exhaust pipe and starter. Raise engine and tilt to left, using left mount as a pivot. Remove oil pan (rotate crankshaft for clearance).

### 1968-69 Except 400" Engine

Disconnect negative battery cable, remove dipstick, upper radiator support and fan shroud attaching screws. Raise car and drain oil. Disconnect exhaust pipe from right exhaust manifold. Disconnect engine mounts and raise front of engine as far as possible. Remove crossover pipe and starter. Remove oil pan attaching bolts, position No. 1 crankshaft throw up and remove oil pan.

### 1968 400" Engine

Disconnect negative battery cable and remove upper radiator baffle. Remove drive shaft, transmission crossmember, transmission, and flywheel. Disconnect left exhaust pipe and starter. Disconnect right hand engine mount. **NOTE** – Both front and rear of engine must be raised and engine tilted to left, using left engine mount as a pivot. Install a suitable engine support bar and place a 1" block of wood between support bar and right rear corner of oil pan (for additional lift on right side). Raise front of engine. Do not bolt tool to engine block, engine must rock when raised. Raise right side of engine approximately 2½" and insert a blocking tool between upper and lower right hand mounts. Remove engine support bar from rear of engine and remove oil pan attaching bolts and remove oil pan toward rear of engine. **NOTE** – Nos. 1 and 2 connecting rod journals should be at 4 or 7 o'clock position (viewed from front of engine).

### 1969 400" Engine

Disconnect negative battery cable and fan shroud. Raise car and drain crankcase. Remove propeller shaft and disconnect exhaust pipe and starter. Install a suitable engine support bar and remove inspection cover. Disconnect modulator line, speedometer cable, oil cooler lines, solenoid wire and linkage. Remove transmission crossmember, transmission, and flywheel. Raise front of engine. Remove right engine mount and raise engine 2" and install wedge block. Loosen left engine mount to block bolts enough for removal of all oil pan bolts; remove bolts, free pan from block and disconnect oil pump. Remove oil pan with pump.

### 1970-72

Disconnect negative battery cable and fan shroud. Hoist car, drain engine oil, remove propeller shaft and disconnect exhaust pipe and starter. Install engine support bar and remove inspection cover. Disconnect modulator line, speedometer cable, oil cooler lines, solenoid wire and linkage. Remove transmission crossmember, transmission and flywheel. Raise front of engine with a hoist and remove

## GENERAL MOTORS OIL PAN REMOVAL (Cont.)

right engine mount. Raise engine 2 inch and install block of wood. Loosen left engine mount to block bolts enough to permit removal of all oil pan bolts, remove bolts. Free pan from block and disconnect oil pump, remove oil pan with pump.

### 1973 OMEGA

See "1973 Oldsmobile (exc. Toronado)" Oil Pan Removal.

## PONTIAC

### 1965

Engine must be removed to remove oil pan.

### 1966-67

Disconnect battery, remove fan shield. On air conditioned cars, remove fan and pulley assembly, then remove compressor and move to one side (do not disconnect). Disconnect engine ground cables and be sure all engine connections have enough slack to raise engine 4½". Disconnect steering idler arm from frame, then remove exhaust crossover pipe. On cars with dual exhaust, disconnect pipes from manifolds. Remove starter, flywheel cover, and front engine mount-to-frame bolts. Support engine, remove left motor mount and loosen right motor mount-to-engine bolts. On 1967 models, loosen rear transmission mount.

*NOTE – It may be necessary to remove mount and rest the transmission on crossmember. On all models, raise engine about 4½", and remove oil pan by rotating clockwise to clear oil pump.*

### 1968-72

Disconnect battery cable and remove fan shield. On air conditioned cars, remove compressor from brackets and set aside (do not disconnect compressor entirely). Check routing and movement of hoses and wiring harnesses in order to raise engine (approximately 4½"). Raise engine and drain crankcase. Disconnect steering idler arm from frame. Remove exhaust crossover pipe, or if dual exhaust, disconnect exhaust pipes from manifolds. Remove starter assembly, starter motor brackets, and flywheel cover. Position a suitable engine lifting tool (with cross bar) to engine, bolt tool to timing chain cover. Using a suitable jack, support engine at lifting tool and remove motor mounts. Loosen rear transmission mount. *NOTE – It may be necessary to remove this mount and rest rear of transmission on crossmember, to obtain clearance. Remove oil pan bolts and raise engine straight up approximately 4½" and forward approximately 1½". Remove oil pan by rotating clockwise (facing forward) to clear oil pump. NOTE – If performing any work other than oil pan gasket replacement, remove jack and support engine with suitable blocks of wood.*

### 1973

Disconnect battery cable, remove power steering adjusting bolt and drive belt and tilt pump upward. Remove fan shroud (leave hanging loose) and remove fan. Insure proper routing of hoses and wires to avoid binding when engine is raised. Remove thermal override switch from rear of cylinder head. Raise vehicle and drain crankcase. On Firebird and Grand Prix, disconnect steering idler arm at frame and pitman arm from shaft. On all models, remove exhaust pipes from

manifolds, remove starter (leave wires attached), and remove flywheel cover. Using suitable lifting tools, raise engine and remove both frame bracket-to-engine mount through bolts. Remove oil pan bolts, raise engine as required and remove oil pan.

## PONTIAC TEMPEST, FIREBIRD & VENTURA 6 CYL. ENGINES

### 1964-65

Remove engine and transmission from car (see engine removal) and remove oil pan.

*INSTALLATION NOTE – Install side gaskets on cylinder block using grease as a retainer. Side gasket tabs index into notches of front seal. Install screws into timing gear cover last as they are installed at an angle and holes will line up after other oil pan bolts are installed. On 1965 models, install rear seal in main bearing cap, and install front seal on timing gear cover.*

### 1966-67

Engine must be removed to remove oil pan.

### 1968-69

Disconnect battery cable and remove air cleaner. On air conditioned cars, remove compressor from mounting brackets and position to one side. Inspect all hoses and wiring harnesses for proper routing (to prevent binding when raising engine). Prop hood open at least 6" for clearance between timing belt cover and inner hood panel. Raise vehicle and drain crankcase. Remove starter assembly and flywheel cover. Reroute or disconnect any wiring between bellhousing and floor pan (to prevent damage when bellhousing contacts floor pan). Loosen transmission insulator to crossmember retaining bolts. Remove right and left engine insulator to frame bracket through bolts. Rotate harmonic balancer until timing mark is at bottom. Bolt a suitable engine support bracket to front of harmonic balancer. With suitable equipment, raise engine at engine support until insulators clear frame brackets. Remove oil pan bolts. On Tempest, raise engine approximately 4½" and apply a rearward force on engine-transmission assembly until oil pan clears flywheel housing, remove oil pan. On Firebird, raise engine approximately 2", or until oil pan clears flywheel housing, remove oil pan.

### 1970-73

Remove upper radiator shield assembly and disconnect battery negative cable. Raise vehicle, disconnect exhaust pipes. Remove starter and flywheel inspection cover. Install suitable engine lift and support tackle. Raise engine slightly, remove frame to engine mount bolts. Remove right front insulator, then raise engine just enough to allow pan removal. Remove oil pan bolts and oil pan. *CAUTION – Do not exceed 35 ft. lbs. torque on lifting tool screw.*

## V8 ENGINES

### 1964-68

Engine must be removed to remove oil pan.

### 1969

**Tempest** – Engine must be removed to remove oil pan.

## GENERAL MOTORS OIL PAN REMOVAL (Cont.)

**Firebird** – Disconnect battery cable and remove fan shield and distributor cap. On air conditioned cars, remove compressor from brackets and set aside (do not disconnect compressor entirely). Check routing and movement of hoses and wiring harnesses in order to raise engine (approximately 4½"). Raise engine and drain crankcase. Disconnect steering idler arm from frame. Remove exhaust crossover pipe, or if dual exhaust, disconnect exhaust pipes from manifolds. Remove starter assembly, starter motor brackets, and flywheel cover. Position a suitable engine lifting tool (with cross bar) to engine, bolt tool to timing chain cover. Using a suitable jack, support engine at lifting tool and remove motor mounts. Loosen rear transmission mount. *NOTE – It may be necessary to remove this mount and rest rear of transmission on cross-member, to obtain clearance.* Remove oil pan bolts and raise engine straight up approximately 4½" and forward approximately 1½". Remove oil pan by rotating clockwise (facing forward) to clear oil pump. *NOTE – If performing any work other than oil pan gasket replacement, remove jack and support engine with suitable blocks of wood.*

1970-72

*NOTE – To remove oil pan on T-37 models, the engine must be removed from the chassis.*

Disconnect radiator hoses, check all wiring, hoses and lines for adequate freedom to allow engine to be raised. On Firebird and Grand Prix models, disconnect steering idler arm at frame and pitman arm from shaft. On all models disconnect exhaust pipes at manifolds and remove starter bracket, and flywheel inspection cover. On T-37 and Le Mans models, remove stabilizer to frame bracket bolts to insure free movement of engine lifting device. Position and attach suitable lifting device under front of engine and remove both frame bracket-to-engine mount through bolts. Remove oil pan bolts and raise engine until pan can be removed. *CAUTION – Do not exceed 35 ft. lbs. torque on screw.*

1973

See "1973 Pontiac" Oil Pan Removal.