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Position an oil drain pan under the drain plug, then remove the engine oil pan drain plug slowly using the appropriate tool. (Typically a wrench or socket.) Allow the oil to drain for 5-10 minutes.



WARNING: Raise the vehicle as recommended by it's manufacturer. Never get under a vehicle that is supported only by a jack. The engine oil will be hot; care should always be taken to avoid direct skin contact with used engine oil.

4

Check the condition of the drain plug gasket. If there is any indication of wear or weathering, replace it with a new washer of the same size and type.

5

Reinstall the drain plug and tighten securely, making certain not to cross-thread or over-tighten the plug.

6

If a housing or cap has a drain plug, remove it to allow any remaining oil to drain from housing. If there is no drain plug, proceed using appropriate tools to remove the filter cap from housing. If applicable, note the location of the O-ring on the drain plug seal and remove.



WARNING: The filter will be hot and contain hot oil. It should be handled carefully using a rag or paper towel. Care should always be taken to avoid direct skin contact with used engine oil. Remove any splashed oil from vehicle surfaces.

Troubleshooting

Issue	Recommended Action
Low oil warning light remains illuminated.	Check oil level. Check for oil leaks. If this condition persists do not run the engine or operate the vehicle, severe engine damage may result. (Refer to Filter Manufacturer's Council bulletins 83-2R2 and 93- 1R1 available at www.filtercouncil.org .)
Oil pressure gauge indicates low oil pressure.	Check oil level. Check for oil leaks. If this condition persists do not run the engine or operate the vehicle, severe engine damage may result. (Refer to Filter Manufacturer's Council bulletins 83-2R2 and 93- 1R1 available at www.filtercouncil.org .)
There is the odor of hot oil or smoke is visible.	Turn off the engine. If applicable, remove the key from the ignition. Check for leaks or spillage that may have occurred while adding or removing oil from the system. If leaks or spillage is found, allow the engine to cool and clean any oil from the affected surfaces. If the condition persists, turn off the engine. If applicable, remove the key from the ignition and make certain that the oil pan drain plug and oil filter have been correctly installed.



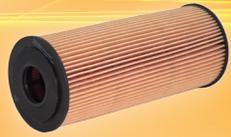
WIX Institute
of Filtration Technology



Engine Oil and Cartridge Filter Service



installation tips



Engine Oil and Cartridge Filter Service

Tools Typically Needed:

Wrench Set	Disposable Gloves
Socket Set	Rags or Paper Towels
Ratchet	Funnel
Oil Filter Wrench	Oil Drain Pan
Eye Protection	Lifting Equipment



WARNING: Moving parts and high engine temperatures pose a significant hazard and may result in serious personal injury. Improper servicing can result in personal injury and severe engine damage.

1 Start the engine - Allow the engine to run until it reaches normal operating temperature.

2 Park on a level surface in an appropriate area; turn the engine off and set the parking brake. If applicable, remove the key from the ignition. Wear safety glasses and disposable gloves.



WARNING: To prevent injuries, allow the engine to cool for 30 minutes before continuing to the next step.

7 Remove the used filter and dispose of in accordance with all appropriate regulations and local requirements.



8 Clean both the filter housing cap and housing. Examine for damage such as a cracks, breaks, or damaged threading. Check the O-ring seatings, making sure they are undamaged and clean. Replace damaged components if needed. While removing the used O-ring, note its proper placement on the cap or housing.



9 Install the new filter and O-ring sets accordingly. Make sure the filter is in the correct orientation. Caution must be used when placing the new O-ring in the housing or on the cap. Make sure the O-ring is not damaged and correctly sized for the application. Once properly positioned, the new O-ring must be lubricated with clean, new, engine oil, and slipped on by rolling the O-ring into its intended groove. O-rings may be installed onto the housing caps, in housing grooves, or other locations.



WARNING: Carefully lower the vehicle, after confirming that any tools or other materials have been removed from under the vehicle.

10 Make sure all drain plugs have been properly re-installed and tightened. Install the new filter cartridge in the housing cap or housing and install. Tighten the housing cap as recommended by the manufacturer. This may require the use of special tools .



WARNING: Do not overfill the engine with oil. Serious engine damage may result.

11 Start the engine and let it idle for at least a minute. The oil warning light may be illuminated momentarily, or the pressure gauge may indicate low oil pressure as the system fills with oil. If this condition persists for more than a few seconds, turn off the engine and refer to the troubleshooting section contained in this document.

12 Turn off the engine and if applicable, remove the key from the ignition. Check under the vehicle for evidence of leakage from the drain plug or oil filter. (If any leakage is detected, see the troubleshooting section contained in this document.)

13 Check the oil level, and add oil as necessary. The level of the oil should be at or near the full mark. If needed, add oil until it is at the recommended level.

14 Dispose of the used oil and filter in accordance with all applicable local, state, and federal requirements.

15 Record the date and mileage of the service performed for future reference.