

2

ASSIGNMENT 2

ENGINE OIL CHANGE

ASSIGNMENT OBJECTIVES

When you complete Assignment 2, you'll be able to

- 2.1. Explain how to perform automotive engine oil and filter changes



ASSIGNMENT 2

VOCABULARY

The terms you need to know for this assignment are

- Oil-life monitor system
- Scratch awl

One of the first jobs of a new technician in a shop or specialty shop is usually lubrication service and checking fluid levels. In fact, many do-it-yourselfers perform oil and filter changes along with checking basic fluid levels. While performing a routine oil change, you should observe the general condition of the vehicle and engine. Driving the vehicle gives you a chance to check the brakes, steering, and engine operating condition. If you find something of concern, you must notify your supervisor, the service consultant, or the shop owner.



SAFETY NOTE: When working with hot components or liquids, you should wear heat-resistant gloves that cover your hands and forearms to prevent personal injury. Even if you wear protective clothing, be careful. Safety glasses with side shields must be worn at all times. In addition, always use the locks on a hoist or use jack stands when working under a vehicle.

BASIC OIL CHANGE

Most OEMs recommend that the engine oil be replaced with a new filter every 7,500 miles (12,000 km) or every 6 to 12 months. Most vehicles made since the early 2000s use an *oil-life monitor system* to notify the driver when the engine oil should be changed (Figure 6). The oil-life monitor will light a dash lamp when the oil needs to be changed. It also indicates the amount of oil life left before the oil-change indicator is illuminated (Figure 7). Most OEMs recommend that the oil be changed according to a “normal” or “severe use” schedule. On GM vehicles with the OnStar system, the vehicle communicates oil life to the car dealership.



FIGURE 6—Oil-Life Monitor (Courtesy of James Halderman)



FIGURE 7—Oil-Change Indicator (Courtesy of James Halderman)

Before starting an oil change, get the oil and filter. The type of oil is determined by the OEM specifications. Oil viscosity, or thickness and weight, is listed in the owner's manual, online service information, and on the oil-fill cap, as shown in Figure 8.

FIGURE 8—Oil-fill cap showing the correct oil viscosity for the engine being serviced.
(Courtesy of James Halderman)



OIL AND FILTER CHANGE

To begin an oil or filter change, move the vehicle to the oil-change bay or pit. Raise the hood and make a quick inspection to find the oil filter. Some filters are mounted on the front of the engine and removed from under the hood instead of from under the vehicle. Other spin-on filters, like the one shown in Figure 9, are removed from under the vehicle while it's on a lift. Still newer engines have returned to a cartridge filter (Figure 10). Figure 11A shows a cartridge filter with its top included. Figure 11B shows the top removed.

FIGURE 9—Spin-on Oil-Filter Canister (Courtesy of James Halderman)





FIGURE 10—Cartridge Oil Filter (Courtesy of James Halderman)



FIGURE 11—Cartridge Oil Filter with Top (A) and Without (B) (Courtesy of James Halderman)



SAFETY NOTE: Failure to immediately clean up any oil spills may result in an injury to the technician or charges by the Environmental Protection Agency (EPA) for illegal waste disposal.

The next step is to lift the vehicle to your best working height. Again, always use basic safety procedures, including wearing heat-resistant gloves and safety glasses with side shields. With the vehicle raised, put the drain pan under the oil drain plug as shown in Figure 12. Loosen the drain plug slowly using a six-point box wrench so that you don't round off the corners. While the oil is draining, look for leaks and suspension concerns. Inspect tire-thread depth with a depth gauge. Tread wear across the tire should also be even.

FIGURE 12—Draining Engine Oil
(Courtesy of James Halderman)



Check the drain plug for a gasket (Figure 13). Many plugs have a brass or plastic washer to help seal the drain hole. Replace the gasket if one is used. When the oil is completely drained, install and torque the drain plug to OEM specifications. Never overtighten the plug because it's easily stripped. Locate the correct filter wrench. There are different wrenches available, and more than one may work. Filter location determines which wrench will be the best to use. If the filter is a spin-on type, position the drain pan under the filter and loosen it. If the filter is mounted horizontally, you can puncture the end with a *scratch awl*, which looks like an ice pick, and drain out the oil in the filter to prevent a mess. If a cartridge filter is used, loosen the cartridge housing cover nut (see Figure 11) and remove it; then remove the old cartridge. Most of the oil will be in the old cartridge, so there should be little drainage.

FIGURE 13—Drain Plug (Courtesy of James Halderman)



While the spin-on filter is draining, open the oil and use a finger to smear a light coat of oil on the filter gasket of the new replacement filter. (Figure 14). This will help with future removal. Remove the old filter and inspect the end that fits against the mount.



FIGURE 14— Spin-On Filter Gasket
(Courtesy of James Halderman)

Note: Many technicians fill the new filter with oil to speed up the lubrication process, as shown in Figure 15.



FIGURE 15—Filling the New Filter with New Engine Oil (Courtesy of James Halderman)

There should be a gasket in place. If there isn't, make sure the gasket isn't stuck to the engine mount. Wipe the engine mount with a clean rag and install the new filter. Tighten the filter by hand to the specifications shown on the filter. Generally, the oil filter is hand-tightened to about one-half of a turn after the seal contacts the engine mount. Never use a wrench to tighten the filter because this will make the filter difficult to remove during the next filter-change.

On a cartridge filter, install a new o-ring (Figure 16) on the housing cover and tighten the cover to OEM-torque specifications. With the filter tightened, check the area for stray tools. Remove the drain pan and lower the vehicle.

FIGURE 16—New O-Ring on a Filter Cartridge (Courtesy of James Halderman)



Use a large-mouth clean funnel to prevent oil from dripping on the engine (Figure 17). Most quart containers are shaped to reduce the amount of spillage. Install the specified amount of engine oil and then reinstall the filler cap.

FIGURE 17—Oil-Filling Funnel (Courtesy of James Halderman)



Start the engine and observe the oil pressure warning light. It should go out within a few seconds once the engine is running. If the light doesn't go out, shut the engine down immediately and tell your supervisor or instructor. If the light goes out, shut off the engine and recheck the engine oil level. Some of the oil goes in the filter, and the level may drop slightly. The level with a full filter should be at the full mark or slightly below the mark. Top off as needed.

Check for leaks under the vehicle. When the oil level is correct and no leaks are found, clean up any oil drips. Properly dispose of waste oil and old filters using federal, state, and local guidelines for hazardous waste disposal.

Now, take a few moments to review what you've learned by completing Self-Check 2.



ASSIGNMENT 2

SELF-CHECK

1. When working with hot components or liquids, heat-resistant gloves that cover hands and forearms should be used to prevent _____.
2. Most vehicles since the early 2000s have used a/an _____ system to notify the driver when engine oil should be changed.
3. Oil viscosity is listed in the owner's manual, in the online service information, and on the _____.
4. When the oil is completely drained, you install the drain plug. You then perform what additional action?

5. Use a finger to smear a light coat of _____ on the filter gasket.
6. On a cartridge filter, what would you install on the housing cover before tightening the cover to OEM torque specifications? _____
7. After completing an oil change, you should check for _____ under the vehicle.
- _____ 8. *True or False?* Many newer engines have returned to the cartridge filter.
- _____ 9. *True or False?* You would loosen an oil drain plug slowly using a 12-point box wrench.
- _____ 10. *True or False?* There should be a gasket in place. If there isn't, you should make sure the gasket isn't stuck to the engine mount.

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