Standard Operating Procedure

Changing Motor Oil In a Car

Purpose:

To be equipped with the right knowledge on how to change motor oil at the recommended intervals

Knowledge and Pre-requisites needed:

- Basic hand tool knowledge
- Understanding of major components in a car

Language definition:

- Car jack - this is the tool that will help lift your car (image 1)
- Wheel chocks - pieces of rubber or other material that keeps the wheel stable to prevent the wheels from rolling
- Jack points - areas under your car that are specifically welded and reinforced to raise the points of a car safely. Below is an image with the most common areas
- Chassis (image 2)
- Oil pan - this is a pan connected to your engine to hold oil when the engine is not running
- Transmission oil pan - this is a pan connected to your transmission, it holds the oil when the transmission is cold (the transmission transmits power from your engine to your wheels)
- Bolt threads - these are the rings that go around the length of a bolt
- Torque specifications - a specific value of how much force something should be tightened to

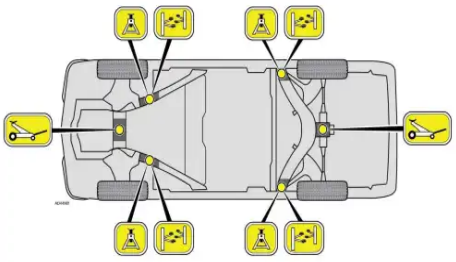

Image 1

Image 2

Tools needed:

- Chemical resistant gloves
- Car jack
- Car jack stands (as added support)
- Wheel chocks (to stop car from rolling back when raised)
    - If you don't have wheel chocks you can also use 2 pieces of wood
- ⅜ Ratchet
- 12mm, 13mm, 14mm deep sockets
- 10-150 in-lb Torque wrench (to tighten bolt to manufacturer specifications)
- Oil filter wrench (helps grip oil filter to remove it)
- Wire brush
- Car maintenance manual for this specific car
- Recommended oil (look on engine oil cap for recommended viscosity)
- Recommended oil filter (use owners manual or research)
- Drain bolt crush washer (crushes against the oil pan to prevent leakage)
- Motor oil drain container (to drain into and recycle used oil)
- Brake cleaner (to clean the area around the bolt and the bolt itself)
- Funnel
- 1 rag OR 2 paper towels

The Procedure

Prepping:

1. Research
    a. Find the specific oil filter your car needs
        i. Go into an auto part store website.
        ii. Input your car year, make, and model
        iii. Find the oil filter that fits your budget
        iv. Purchase online and pick it up in-store or have it delivered
    b. Manufacturer torque specifications for drain bolt
        i. Look up your car ‘year, make, and model drain bolt torque specs’ in a search engine. Heads up: it's usually no more than 15 inch lbs
2. Safely jacking the car up
    a. Make sure your car engine is cold to the touch. Why? You want to be working under a cold vehicle to prevent your hands getting scorched by hot oil when emptying the oil pan
    b. Go into your car and engage the emergency brakes. Why? An extra safety precaution to prevent the car from moving back. Heads up: You may have the emergency brake lever near your middle compartment or you may have a foot lever near the left side near your knee

c. Use your car jack to lift the car. If you are using a 1.5 to 2-ton jack it is safer to raise the car from the individual jack points under your car (see image 1 for example)
    i. If you used a 1.5 to 2-ton jack, place a jack stand under a part of the chassis on that side to help support the weight of the vehicle. Do this for both the left side and the right side of the vehicle.
    ii. If you have a 3 to 4-ton car jack use the jack to lift the front of the vehicle up. This can be done by placing the lifting portion of the jack under the jack point under the front of the car most typically seen near the middle of the wheels (see image 1). Place the jack stands under the chassis area to the left and right of the jacking point. Heads up: be careful to steer clear from jacking the car up under the oil pan and the transmission oil pan, if you jack under these, they will be damaged and need to be replaced.
d. Once your jack stands and jack are in place, come back up and give the vehicle a good push or a shake. Why? To ensure the vehicle is stable to prevent it from moving and falling on you

The Work:

Oil change:

1. Go under the car and place the motor oil drain container under the oil pan drain bolt
2. Test your deep sockets to see which fits your drain bolt, remove it
3. Use the tested size deep socket and attach it to your ⅜ ratchet
4. Place it on the drain pan bolt and turn the ratchet counterclockwise to loosen it, once loose, remove the tool and turn with your hand until it's removed all the way. Heads up: you may get oil on your hand even if wearing gloves
5. Let the oil drain until there is a drip, usually 10 to 20 minutes
6. Use brake cleaner to spray onto a rag or paper towel and clean around the drain hole, then use it to clean excess oil off of drain bolt
7. Use the wire brush to scrub drain bolt threads and dry oil sludge if any, then spray with brake clean and dry off with paper towel
8. Gather your crush washer and place it on the bolt threads to keep it on when threading the bolt back into the oil pan
9. Dry the drain whole one more time and then insert the drain bolt. Hand tighten until you can't tighten anymore
10. Use your ratchet to tighten the drain bolt until it stops. Heads up: only tighten until it stops. Why? It will prevent over-tightening which can lead to damaging the oil pan oil threads
11. Set your torque wrench to the torque specifications for the drain bolt from your research
12. Use the deep socket used to remove the drain bolt, on the torque wrench
13. Place the torque wrench on the drain bolt and tighten clockwise slowly until you feel a click. Heads up: you must tighten slowly because it's easy to miss the ‘click’ from the wrench, if you miss it you’ll overtighten the bolt and it may result in stripped oil pan threads

Oil filter change:

1. Find the oil filter (it may be a canister or it could be a canister and have a replaceable filter inside. You may also need to replace the rubber o-rings, these may come with your new oil filter)
2. Move your motor oil container under the area right below your oil filter
3. Use your oil filter wrench to grip the oil filter and spin it counterclockwise
4. Once you feel the oil filter start to spin more freely, finish removing it by hand
5. Grab your container of new engine oil, use a small pick or tool to make 2 holes in the protective foil seal, a small one at the top and a bigger one at the bottom (this will help the oil come out smoothly and make less mess) and once you're finished put the cap back on the oil
6. Use some of the new oil to lubricate the seal on the new O-ring
7. Install the oil filter back on and screw by hand until it stops
8. Use your oil filter wrench to tighten the canister down (if you have an oil filter wrench that you can use with a ratcheting wrench, you can use that as well)

Adding motor oil:

1. Check your owner's manual to see how many quarts of oil your car will need
2. Go to your engine and unscrew the oil cap
3. Place your funnel in the oil refill opening and start pouring the oil in, checking the side of the bottle to where it indicates the level of oil left in the container (this ensures you pour the right amount of oil)
    a. Heads up: it's better to end up with a little less oil than more oil than your manual states, the reason is that too much oil can cause your engine to froth the oil and create more work for the engine, damaging it over time.