KWARA STATE POLYTECHNIC, ILORIN, NIGERIA

A TECHNICAL REPORT ON

STUDENT INDUSTRIAL WORK EXPERIENCE SCHEME (SIWES)

UNDERTAKEN AT:

YOMI PRODUCTIVE AUTO FIRM, ILORIN, NIGERA

COMPILED AND WRITTEN BY:

OYEWOLE PROMISE CALEB

(ND/23/MEC/PT/0071)

SUBMITTED TO THE:

DEPARTMENT
MECHANICAL ENGINEERING

DECLARATION

I hereby declare that all information documented in this technical report was carried out during the Student Work Experience Program (SIWES) was compiled and written by **OYEWOLE PROMISE CALEB,** with matriculation number **ND/23/MAC/PT/0071** and not in any way a copied information.

……. …….

Signature **Date**

……. …….

Signature **Date**

ACKNOWLEDGEMENT

I firstly acknowledge Almighty God for giving me the strength, wisdom and knowledge to undergo SIWES Program.

Finally, my appreciation goes to the management of Kwara State Polytechnic for giving us the opportunity to engage in this program and also SIWES coordinator in person of Engr. Abayomi Osemei and other staffs that made themselves available to impact knowledge to us.

WEEK 1

DAY ONE: REPAIRING OF CRAMP SHAFT

Here's a comprehensive guide:

1. **Diagnosis:** First, confirm that the crankshaft is indeed the problem. Symptoms of a failing crankshaft can include unusual noises, oil leaks, or engine performance issues.
2. **Gather Tools and Parts:** You will need tools such as a socket set, torque wrench, and possibly a crankshaft pulley puller. Make sure you have replacement parts, like bearings or a new crankshaft if necessary.
3. **Remove the Engine:** If the crankshaft needs replacement, it's often easier to remove the entire engine from the vehicle. Disconnect the battery, remove the hood (if necessary), and drain the engine oil and coolant.
4. **Disassemble the Engine:** Remove components like the intake manifold, exhaust manifold, and cylinder heads. Take off the oil pan to access the crankshaft.
5. **Inspect the Crankshaft:** Once exposed, check for any visible damage, such as cracks or excessive wear. Use a micrometer to measure the journals and ensure they are within specifications.
6. **Repair or Replace:** If the crankshaft is damaged but can be salvaged, you might be able to grind it down to a smaller size and replace the bearings. If it's too damaged, replace it with a new or refurbished crankshaft.
7. **Reassemble the Engine:** Follow the reverse order of disassembly. Make sure to replace all gaskets and seals to prevent leaks. Torque all bolts to the manufacturer's specifications.
8. **Reinstall the Engine:** Once fully assembled, reinstall the engine back into the vehicle. Reconnect all necessary components, including electrical connections and hoses.
9. **Testing:** After everything is back together, fill the engine with oil and coolant, reconnect the battery, and start the engine. Listen for any unusual noises and check for leaks.
10. **Final Checks:** After running the engine for a while, recheck the oil level and inspect for any leaks or issues.

Remember, working on an engine can be complex and may require professional assistance if you're not experienced. Always consult your vehicle's service manual for specific instructions related to your car model.

Diagram of crank shaft

WEEK 1

DAY 2: FIXING OF THERMAL SENSORS

1. **Diagnosis:** Start by determining if the thermal sensor is faulty. Common symptoms include incorrect temperature readings on the dashboard or the engine running too hot or too cold.
2. **Gather Tools:** You'll need basic tools like a socket set, a multimeter for testing, and possibly a replacement thermal sensor if the existing one is defective.
3. **Locate the Sensor:** Identify where the thermal sensor is located in your vehicle. This is usually near the engine block or the thermostat housing.
4. **Disconnect the Battery:** Always disconnect the battery before working on electrical components to avoid any short circuits.
5. **Remove the Old Sensor:** Carefully disconnect the wiring harness from the thermal sensor. Use the appropriate socket to unscrew and remove the sensor from its mounting.
6. **Test the Sensor:** Before replacing, you can test the old sensor with a multimeter. Check the resistance according to the specifications in the vehicle's service manual. If it's out of range, it needs to be replaced.
7. **Install the New Sensor:** If replacing, apply some thread sealant to the new sensor and install it in the same position as the old one. Make sure it's securely tightened but not over-torque.
8. **Reconnect Wiring:** Reattach the wiring harness to the new sensor. Ensure it's connected properly and securely.
9. **Reconnect the Battery:** After everything is in place, reconnect the battery.

10. **Testing:** Start the engine and monitor the temperature gauge. Make sure it reflects the correct readings and that there are no warning lights on the dashboard.

11. **Final Checks:** After a test drive, double-check for any leaks or issues.

DAY 3: REPLACEMENT OF CYLINDER HEAD AND VALVES TRAIN

1. **Preparation:** Ensure you have all the necessary tools and replacement parts, including a new cylinder head gasket, valve seals, and any new valves if needed.
2. **Disconnect the Battery:** Always start by disconnecting the battery to prevent any electrical issues.
3. **Remove Engine Components:** Depending on your vehicle, you may need to remove various components to access the cylinder head. This can include the intake manifold, exhaust manifold, and any other obstructing parts.
4. **Drain Fluids:** Drain the engine oil and coolant to prevent spills during the removal process.
5. **Remove the Cylinder Head:**
    - Unscrew the bolts holding the cylinder head in place, following the manufacturer's specified pattern to avoid warping.
    - Carefully lift the cylinder head off the engine block. You might need to gently tap it if it's stuck.
6. **Inspect the Cylinder Head and Block:** Check for any damage or warping on both the cylinder head and the engine block. If there are any issues, you may need to machine the surfaces.
7. **Replace the Valve Train:**
    - If you're replacing the valve train, remove the old valves, springs, and retainers.
    - Install the new valves and ensure they are seated properly.
8. **Install the New Cylinder Head:**
    - Place a new gasket on the engine block.
    - Carefully position the new or refurbished cylinder head onto the block, aligning it with the dowel pins.
9. **Torque the Head Bolts:** Follow the manufacturer's specifications for the correct torque sequence and specifications for tightening the cylinder head bolts.
10. **Reassemble Components:** Reinstall any components you removed earlier, including the intake and exhaust manifolds, and reconnect any hoses or electrical connections.

11. **Refill Fluids:** Fill the engine with new oil and coolant.
12. **Reconnect the Battery:** Once everything is back in place, reconnect the battery.
13. **Test the Engine:** Start the engine and check for any leaks or issues. Monitor the temperature and ensure everything is functioning correctly.

WEEK 2

DAY 1: engine breakage connecting of oil and of coils binding

Repairing engine breakage, especially related to oil connections and coil binding, can involve several steps. Here's a general guide:

1. **Identify the Issue:** Determine where the breakage has occurred. Check for oil leaks, damaged oil lines, or issues with the ignition coils.
2. **Gather Tools and Parts:** You may need tools like wrenches, screwdrivers, a torque wrench, and replacement parts such as oil lines or ignition coils.
3. **Disconnect the Battery:** Always disconnect the battery before working on the engine to prevent any electrical issues.
4. **Drain Oil:** If there's an oil leak, drain the engine oil to prevent spills when you make repairs.
5. **Repair Oil Connections:**
   - If an oil line is broken, remove the damaged section and replace it with a new line. Make sure to secure it properly to avoid leaks.
   - Check the oil filter and replace it if necessary.
6. **Address Coil Binding:**
   - If the ignition coils are binding or damaged, remove them carefully. Inspect the connectors and wiring for any signs of wear or damage.

     Replace any faulty coils and ensure they fit snugly without binding.
7. **Reassemble Components:** Once repairs are made, reattach any components you removed. Ensure all connections are tight and secure.
8. **Refill Oil:** After repairing the oil connections, refill the engine with new oil.
9. Reconnect the Battery: Reconnect the battery and check for any electrical
10. **Test the Engine:** Start the engine and monitor for any leaks or unusual noises. Ensure that it runs smoothly.
11. If you're not comfortable with these repairs, it may be best to consult a professional mechanic for assistance.

WEEK 2

DAY 2: Suspension of Car Absorber and Pushing Wear Pumps and Breaking

1. **Identify the Problem:** Check if the suspension absorber has worn out or if it leaks oil. Also, check the wear pumps and brakes for any issues.
2. **Gather Tools and Parts:** You go need tools like wrenches, a jack, jack stands, and new suspension absorbers. If the wear pumps or brakes need replacement, get the necessary parts too.
3. **Lift the Car:** Use the jack to lift the car and secure am with jack stands to prevent any accidents.
4. **Remove the Old Absorber:**
   - Locate the bolts holding the absorber in place.
   - Remove the bolts using the appropriate wrench. You might need to compress the spring if the absorber is part of a strut assembly.
5. **Install the New Absorber:**
   - Position the new absorber in place and secure it with the bolts. Make sure everything is tight.
6. **Inspect the Brakes:** Check the brake pads and rotors for wear. Replace them if needed to ensure safe braking.
7. **Lower the Car:** Once everything don install, carefully lower the car back to the ground.
8. **Test Drive:** Take the car for a test drive to ensure the new suspension works well and there be no unusual sounds.

WEEK 2

DAY 3: Changing of Pad Brake

1. **Gather Your Tools:** You go need a jack, jack stands, lug wrench, and a brake pad replacement kit.
2. **Lift the Car:** Use the jack to lift the car and place jack stands for safety.
3. **Remove the Wheel:** Use the lug wrench to remove the lug nuts and take off the wheel.
4. **Locate the Brake Caliper:** The brake caliper is the part that holds the brake pads.
5. **Remove the Caliper:** Unscrew the bolts holding the caliper in place. Carefully slide the caliper off the brake rotor.
6. **Remove Old Brake Pads:** Take out the old brake pads from the caliper bracket. You might need to use a flathead screwdriver to pry them out gently.

7. **Install New Brake Pads:** Place the new brake pads in the caliper bracket. Make sure they fit securely.
8. **Reinstall the Caliper:** Slide the caliper back over the new pads and secure it with the bolts you removed earlier.
9. **Put the Wheel Back:** Place the wheel back and hand-tighten the lug nuts.
10. **Lower the Car:** Carefully lower the car back to the ground and then tighten the lug nuts fully.
11. **Test the Brakes:** Before you drive, pump the brake pedal a few times to ensure the pads seat properly.

WEEK 2

DAY 4: Setting of Car Timing and Setting of Board

1. **Gather your Tools:** You will need a timing light, wrenches, and possibly a service manual for your car model.
2. **Locate the Timing Marks:** Find the timing marks on the crankshaft pulley and the timing cover. These marks will show the correct timing alignment.
3. **Connect the Timing Light:** Attach the timing light to the battery and the spark plug wire for the cylinder you want to check.
4. **Start the Engine:** Let the engine warm up to normal operating temperature.
5. **Check Timing:** Point the timing light at the timing marks. The light will flash when the spark plug fires. Compare the marks to see if they align correctly.
6. **Adjust Timing:** If the timing does not align, loosen the distributor hold-down bolt and turn the distributor slightly until the marks align. Tighten the bolt once you get the right timing.

WEEK 2

DAY 5: changing of shock absorber

Tools Needed

- Jack and jack stands
- Wrench set
- Socket set
- Screwdriver
- Pliers
- New shock absorber

1. **Lift the Car:** Use the jack to lift the car and secure it with jack stands. Make sure the car is stable before you start work.

2. **Remove the Wheel:** Take off the wheel where you want to change the shock absorber.
3. **Locate the Shock Absorber:** Find the shock absorber when you want to change.
4. **Unbolt the Shock Absorber:** Use the wrench or socket to remove the bolts at the top and bottom of the shock absorber. Keep the bolts safe for reinstallation.
5. **Remove the Old Shock Absorber:** Carefully take out the old shock absorber from the mount.
6. **Install the New Shock Absorber:** Place the new shock absorber in the same position as the old one. Make sure it fit well.
7. **Bolt It Back:** Reinstall the bolts you removed earlier, tightening them securely.
8. **Reattach the Wheel:** Put the wheel back on and tighten the lug nuts.
9. **Lower the Car:** Remove the jack stands and lower the car back to the ground.
10. **Test Drive:** Take the car for a test drive to ensure the new shock absorbers is working well and your ride feel comfortable.

WEEK3

DAY 1: Oil leaks replacement of seals and gaskets, orings to fix oil leaks

Tools Needed:

- Wrench set
- Socket set
- Screwdrivers
- Pliers
- Gasket scraper
- Replacement seals, gaskets, and O-rings
- Engine oil (if necessary)

These are the steps to Replace Seals and Gaskets:

1. **Identify the Leak:** Firstly, you will need to find where the oil leak and Check around the engine, oil pan, and any connection points.
2. **Prepare the Area:** Make sure you get a clean working area. You can use a degreaser to clean the area around the leak.
3. **Drain the Oil (if necessary):** If the leak from the oil pan or somewhere you will need to remove oil, drain the oil into a container.

4. **Remove the Old Gasket/Seal:** Use a gasket scraper to carefully remove the old gasket or seal. Make sure that no debris is left behind.
5. **Clean the Surface:** After removing the old gasket, clean the surface where the new gasket go sit. It will help the new gasket seal better.
6. **Install the New Gasket/Seal:** Place the new gasket or seal in position. If it's O-ring, make sure it fit snugly.
7. **Reassemble Parts:** Put back any parts you remove, tightening the bolts to the manufacturer's specifications.
8. **Refill Oil (if necessary):** If you drain the oil, refill it to the correct level.
9. **Check for Leaks**: Start the engine and let it run for a few minutes. Check the area where you replace the seals and gaskets for any signs of leaks.
10. **Test Drive:** Take the car for a short drive and check again for leaks after you return.

WEEK3

DAY 2: TIMING BELT AND CHAIN REPLACEMENT

Tools Needed:

- Wrench set
- Socket set
- Screwdrivers
- Timing belt or chain kit
- Torque wrench
- Engine oil (for lubricating parts)

Steps to Replace Timing Belt or Chain:

1. **Disconnect the Battery:** Always start by disconnecting the negative terminal of the battery to prevent any electrical issues.
2. **Remove Engine Covers**: Take off any plastic or metal covers to cover the timing belt or chain area.
3. **Align Timing Marks:** Before you remove the old timing belt or chain, make sure that you align the timing marks on the crankshaft and camshaft. This go help you set the new one correctly.
4. **Remove the Old Timing Belt/Chain:**
   - For timing belt: Loosen the tensioner and remove the belt.
   - For timing chain: You might need to remove the oil pan or other components to access the chain. Follow the specific instructions for your vehicle.
5. **Inspect Components:** Check the tensioner, idler pulleys, and other components for wear.

6. **Install the New Timing Belt/Chain:**
    - For timing belt: Place the new belt on the pulleys, ensuring that the timing marks still align.
    - For timing chain: Install the new chain according to the manufacturer's instructions,.
7. **Reassemble Everything:** Put back any covers and components you remove. Tighten all bolts to the manufacturer's specifications using a torque wrench.
8. **Reconnect the Battery:** After everything is back in place, reconnect the battery.
9. **Start the Engine:** Start the engine and listen for any unusual noises. Check if everything is run smoothly.
10. **Test Drive:** Take the car for a short drive to ensure that everything is work well.

WEEK3

DAY 3: Valves seal replacement and oil leaks and compression issues

Tools Needed

- Socket set
- Wrench set
- Screwdrivers
- Valve spring compressor
- New valve seals
- Engine oil (for lubricating parts)
- Clean rags

Steps to Replace Valve Seals:

1. **Disconnect the Battery:** Start by disconnecting the negative terminal of the battery to prevent any electrical issues.
2. **Remove Engine Covers:** Take off any plastic or metal covers that is covering the valve area.
3. **Remove the Cylinder Head:** You will need to remove the cylinder head to access the valves. This involves:
    - Disconnecting the intake and exhaust manifolds.
    - Removing any hoses or wiring connected to the head.
    - Loosening the head bolts in a specific sequence to avoid warping.
4. **Remove Valve Springs:** Use the valve spring compressor to remove the springs and retainers.
5. **Replace Valve Seals:** Take out the old valve seals and install the new ones. Make sure that you lubricate the new seals with engine oil before installation to prevent damage.

6. **Reassemble Valve Springs:** After replacing the seals, put the valve springs and retainers back in place. Ensure that everything is tight.
7. **Cylinder Head**: Put the cylinder head back on, make sure you follow the manufacturer's torque specifications for the head bolts.
8. **Reconnect Everything:** Reattach the intake and exhaust manifolds, hoses, and wiring you remove earlier.
9. **Reconnect the Battery:** Once everything is back in place, reconnect the battery.
10. **Start the Engine:** Start the engine and check for any oil leaks. Listen for any unusual sounds that fit indicate issues.
11. **Test Drive:** Take the car for a short drive to ensure that the oil leaks stops and the compression issues don improve.

WEEK3

DAY 4:REPAIR OF DAMAGE PISTON RINGS.

Tools Needed

- Engine hoist (if you pull the engine)
- Socket set
- Wrench set
- Piston ring compressor
- New piston rings
- Gasket set
- Engine oil (for lubrication)
- Clean rags

STEPS TO REPAIR PISTON RINGS:

1. **Disconnect the Battery:** Start by disconnecting the negative terminal of the battery to prevent any electrical issues.
2. **Remove the Engine:** If necessary, you fit need to remove the engine from the vehicle. This dye usually easier for repairs. Disconnect all necessary components like exhaust, intake, and electrical connections.
3. **Remove the Cylinder Head**: Take off the cylinder head by loosening the head bolts in the correct sequence. This will give you access to the pistons.
4. **Remove the Oil Pan:** Take off the oil pan to access the bottom of the engine. This will allow you to see the connecting rods.
5. **Remove the Pistons:** Use a socket to remove the connecting rod bolts and carefully push the pistons out of the cylinder. You fit need to rotate the crankshaft to help with this.

6. **Inspect the Cylinder Walls:** Check the cylinder walls for any damage or scoring. you fit need to re-bore the cylinders or replace the engine .If is too damaged,
7. **Replace Piston Rings:**
    - Remove the old piston rings from the pistons.
    - Clean the piston grooves to remove any carbon buildup.
    - Install the new piston rings using a piston ring compressor. Make sure that you follow the correct orientation for the rings.
8. **Reinstall the Pistons:** Carefully push the pistons back into the cylinders, ensuring you align the connecting rods correctly.
9. **Reattach the Cylinder Head:** Put the cylinder head back on, using a new gasket if necessary. Follow the manufacturer's torque specifications for the head bolts.
10. **Reinstall the Oil Pan:** Reattach the oil pan and ensure that all bolts are tight.
11. **Reconnect Everything:** Reconnect the exhaust, intake, and any electrical connections you removed earlier.
12. Reconnect the Battery: Once everything don back in place, reconnect the battery.
13. Start the Engine: Start the engine and listen for any unusual sounds. Check for oil leaks and ensure everything is working properly.

WEEK3

Day 5: Replacement of spark plugs

Tools You Needed

- Socket wrench with the right size spark plug socket
- Torque wrench
- Ratchet extension
- Spark plug gap tool
- Anti-seize lubricant (optional)
- New spark plugs

Steps to Replace Spark Plugs:

1. **Gather your Tools:** Make sure that you get all the tools that you will need before you start.
2. **Disconnect the Battery:** To avoid any electrical issues, disconnect the negative terminal of the battery.
3. **Locate the Spark Plugs:** Open the hood and locate the spark plugs. They are usually found on top of the engine, connected to the ignition coils or wires.

4. **Remove the Ignition Coils or Wires:** If your car has ignition coils, you need to remove it first. If they're wires, carefully pull them off the spark plugs. Take note of the order so you can put them back correctly.
5. **Remove the Old Spark Plugs:** Use the socket wrench to unscrew the old spark plugs. Turn counterclockwise until they all come out.
6. **Check the Gap on New Spark Plugs:** Before you install the new spark plugs, check the gap using the spark plug gap tool. Adjust the gap to match the specifications for your vehicle.
7. **Install New Spark Plugs:** Apply a little anti-seize lubricant to the threads of the new spark plugs (optional). Insert the new spark plugs into the holes and hand-tighten them first. Then, use the socket wrench to tighten them to the manufacturer's torque specifications.
8. **Reconnect Ignition Coils or Wires:** Once the new spark plug is in place, reconnect the ignition coils or wires in the correct order.
9. **Reconnect the Battery:** Reconnect the negative terminal of the battery.
10. **Start the Engine:** Start the engine and listen for smooth operation. If everything is okay, you have successfully replaced the spark plugs.

WEEK 4

DAY 1: REPLACE BLOCK ENGINES AND CYLINDER SLEEVES

Tools Needed

- Engine hoist or crane
- Socket set
- Wrench set
- Torque wrench
- Piston ring compressor
- Gasket scraper
- New gaskets and seals
- Engine oil

STEPS TO REPLACE BLOCK ENGINES AND CYLINDER SLEEVES:

1. **Prepare the Vehicle:** Disconnect the battery and drain the engine oil and coolant. Remove any components blocking access to the engine block, such as the air intake, exhaust manifold, and any accessories.
2. **Remove the Engine:** Use the engine hoist to lift the engine out of the vehicle. Disconnect any remaining wiring and hoses connected to the engine.
3. **Disassemble the Engine:** Once the engine is out, remove the cylinder head, pistons, and connecting rods. Take note of how everything is arranged for reassembly.

4. **Remove the Cylinder Sleeves:** If the cylinder sleeves is removable, you will need to use a sleeve puller to take them out. Clean the engine block thoroughly to remove any debris or old gasket material.
5. **Install New Cylinder Sleeves:** If you are using new sleeves, ensure that they fit properly into the block. Use a sleeve installer to press the new sleeves into place.
6. **Reassemble the Engine:** Install the pistons back into the cylinders using a piston ring compressor. Reattach the connecting rods and torque according to the manufacturer's specifications. Then, place the cylinder head back on and torque it down properly.
7. **Replace Gaskets and Seals:** Install new gaskets and seals to prevent leaks. Make sure you apply gasket sealer if necessary.
8. **Reinstall the Engine:** Use the engine hoist to carefully lower the engine back into the vehicle. Reconnect all wiring, hoses, and components you removed earlier.
9. **Fill Fluids:** Refill the engine oil and coolant. Make sure all fluids are at the recommended levels.
10. **Reconnect the Battery:** Reconnect the negative terminal of the battery.
11. **Start the Engine:** Start the engine and check for any leaks or unusual sounds. Allow it to remain idle for a few minutes to ensure everything is working well.

WEEK 4
DAY 2: MALFUNCTION OF OXYGEN SENSOR

1. **Check Engine Light:** If the check engine light is on, it could be due to a faulty oxygen sensor.
2. **Poor Fuel Economy:** If you notice that your fuel consumption increases without any reason, it can mean that the oxygen sensor is not reading the air-fuel mixture properly.
3. **Rough Idle:** If your engine is moving roughly or hesitating when you accelerate, this can be a sign of oxygen sensor problem.
4. **Failed Emissions Test:** If you take your car for emission test and it fails, it can be due to a malfunctioning oxygen sensor.

COMMON CAUSES OF MALFUNCTION

1. **Contamination:** Dirt, oil, or coolant can clog the sensor, affecting its performance.
2. **Wiring Issues:** Damaged or frayed wiring can disrupt the signal between the sensor and the engine control unit (ECU).
3. **Age:** Over time, oxygen sensors can wear out and lose their effectiveness.
4. **Exhaust Leaks:** Leaks in the exhaust system can introduce extra oxygen, causing incorrect readings.

WEEK 4

DAY 3: EXCHANGE OF COMPRESSORS VALVES AND PUMP REPLACEMENT

STEPS FOR EXCHANGE AND REPLACEMENT

1. **PREPARATION**:
   - Disconnect power supply to the system to avoid any electrical hazards.
   - Ensure you have all the necessary tools and replacement parts ready.
2. **REMOVE OLD COMPONENTS**:
   - For the compressor, carefully disconnect the electrical connections and refrigerant lines. Make sure to recover any refrigerant according to environmental regulations.
   - Remove the valves by unscrewing them from their fittings. Take note of the orientation for proper installation of the new ones.
   - For the pump, disconnect the inlet and outlet pipes and any electrical connections.
3. **Install New Components:**
   - Install the new compressor by connecting it to the refrigerant lines and electrical connections. Ensure everything is tight and secure.
   - Install the new valves, making sure they are oriented correctly.
   - For the pump, connect the inlet and outlet pipes and electrical connections.
4. **Testing:**
   - After installation, turn on the power supply and check for leaks in the refrigerant lines and connections.
   - Run the system to ensure that all components are functioning correctly and efficiently.
5. **Final Checks:**
   - Monitor the system for any unusual noises or performance issues after the replacement

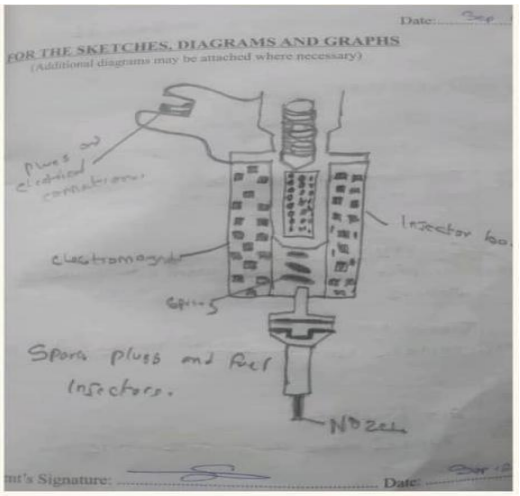
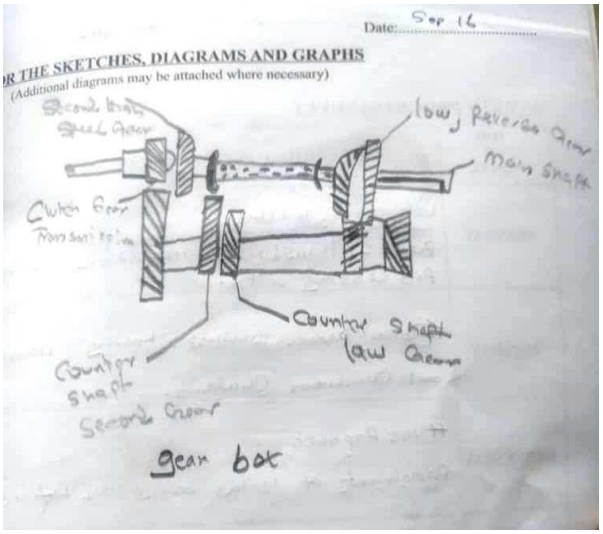


DIAGRAM Of SPARK PLUGS



WEEK 5

DAY 1: REPLACEMENT OF GEAR BOX IN A CAR

STEPS FOR GEARBOX REPLACEMENT:

1. **Preparation**:
   - Make sure you get all the necessary tools like wrenches, sockets, and a jack.
   - Disconnect the battery to prevent any electrical issues.
2. **Lift the Vehicle**:
   - Use a jack to lift the car and secure it with jack stands. This will give you enough space to work under the vehicle.
3. **Drain Transmission Fluid**:
   - Locate the transmission fluid pan and drain the fluid into a container. This will help prevent mess when you remove the gearbox.
4. **Remove the Old Gearbox**:
   - Disconnect the driveshaft from the gearbox. You may need to remove the bolts holding the driveshaft in place.
   - Remove any electrical connectors and linkage connected to the gearbox.
   - Unscrew the bolts holding the gearbox to the engine and carefully slide the gearbox out. You might need a helper for this step since gearboxes tend to be heavy.
5. **Install the New Gearbox:**
   - Position the new gearbox and align with the engine. Secure it with the bolts you removed earlier.
   - Reconnect the driveshaft and ensure all electrical connectors are securely attached.
6. **Fill Transmission Fluid:**
   - Once everything is back in place, refill the transmission with the appropriate fluid.

7. **Test the Vehicle:**
    - Reconnect the battery and start the engine. Test the gears to ensure everything is working properly.
8. **Final Checks:**
    - Check for any leaks and make sure the fluid level is correct

WEEK 5

DAY 2: REPLACEMENT OF MOTOR FANS AND COILS

Steps for Replacing Motor Fans and Coils:

1. **Preparation**
    - Gather all necessary tools like screwdrivers, wrenches, and a multimeter.
    - Disconnect the power supply to prevent any electrical shock.
2. **Access the motor**:
    - Depending on the type of equipment (like an air conditioner or refrigerator), you may need to remove covers or panels to access the motor.
3. **Remove the old fan**:
    - Locate the screws or clips holding the fan in place. Remove dem carefully.
    - Disconnect any wires attached to the fan motor.
4. **Install the new fan**:
    - Position the new fan in place and secure it with the screws or clips you removed earlier.
    - Reconnect the wires to the new fan motor, ensuring they are connected properly.
5. **Replace the coils:**
    - If you are replacing coils, locate the coil assembly. Disconnect any wires and remove the screws holding the coils in place.
    - Install the new coils by securing them with screws and reconnecting the wires

WEEK 5

Day 3: Inspect and replace worn out valves, seals filter

Steps for Inspecting and Replacing Valves, Seals, and Filters:

1. **Valves Inspection:**
    - Check valves for any signs of wear or damage. If valves is worn out, they need replacement.
    - Ensure to identify the correct type and size of valves for replacement.

2. **Seals Examination:**
    - Inspect seals for any leaks or wear. If seals is damaged, they need to be replaced.
    - Make sure to get the right seals for your equipment or system.
3. **Filter Check:**
    - Examine the filter for dirt, clogs, or damage. If the filter is worn out, it's affecting the performance of your equipment.
    - Replace the filter if necessary to maintain proper functioning.
4. **Replacement Process:**
    - When replacing valves, seals, or filters, make sure to follow manufacturer instructions.
    - Use the correct tools and replacement parts to ensure a proper fit.
5. **Testing:**
    - After replacement, test the equipment to ensure that valves, seals, and filters will work effectively.

WEEK 6

DAY 1: CHANGING OF BRAKE PADS AND ROTORS

Steps for Changing Brake Pads and Rotors:

1. **Gather Tools and Materials:**
    - You will need a jack, jack stands, a lug wrench, a socket set, and new brake pads and rotors.
2. **Prepare the Vehicle:**
    - Park the vehicle on a flat surface, engage the parking brake, and loosen the lug nuts on the wheel you want to work on.
3. **Lift the Vehicle:**
    - Use the jack to lift the vehicle and place it on jack stands for safety.
4. **Remove the Wheel:**
    - Take off the wheel by removing the lug nuts completely.
5. **Remove the Brake Caliper:**
    - Locate the brake caliper and remove the bolts holding it in place. Carefully slide the caliper off the brake rotor. You may need to hang it with a wire to avoid stress on the brake line.
6. **Remove Old Brake Pads:**
    - Take out the old brake pads from the caliper bracket. They should slide out easily.

7. **Remove the Old Rotor:**
    - If the rotor is held by screws, remove those. Then, slide the old rotor off the hub.
8. **Install New Rotor:**
    - Place the new rotor onto the hub, ensuring it fits snugly.
9. **Install New Brake Pads:**
    - Slide the new brake pads into the caliper bracket. Make sure they are positioned correctly.
10. **Reattach the Caliper:**
    - Carefully slide the caliper back over the new brake pads and rotor. Secure it by tightening the caliper bolts.
11. **Reinstall the Wheel:**
    - Place the wheel back on and hand-tighten the lug nuts.
12. **Lower the Vehicle:**
    - Remove the jack stands and lower the vehicle back to the ground.
13. **Tighten Lug Nuts:**
    - Use the lug wrench to tighten the lug nuts in a star pattern to ensure even pressure.
14. **Test the Brakes:**
    - Before driving, pump the brake pedal a few times to seat the new pads and check for any unusual sounds or issues.

WEEK 6

Day 2: Changing of oil and filter and transmission of fluid

Changing Oil and Filter:

1. Gather Tools and Materials:

- You will need an oil filter wrench, a socket set, an oil catch pan, a funnel, new oil, and a new oil filter.

2. Prepare the Vehicle:

- Park the vehicle on a flat surface and turn off the engine. Allow it to cool if it has been running.

3. Lift the Vehicle:

- Use a jack to lift the vehicle and place it on jack stands for safety.

4. Drain Old Oil:

- Locate the oil drain plug under the vehicle. Place the oil catch pan underneath and remove the drain plug to let the old oil drain out completely.

5. Remove Old Oil Filter:

- Use the oil filter wrench to remove the old oil filter. Be careful as it may still contain some oil.

6. Install New Oil Filter:

- Apply a little new oil to the rubber gasket of the new filter. Screw it on by hand until it's snug, then tighten it slightly more with the wrench.

7. Replace Drain Plug:

- Once all the old oil has drained, replace the drain plug and tighten it securely.

8. Add New Oil:

- Remove the oil fill cap on top of the engine. Using a funnel, pour in the new oil as per the vehicle's specifications. Replace the oil fill cap.

9. Check Oil Level:

- Start the engine and let it run for a minute. Check the oil level using the dipstick and add more oil if necessary.

Changing Transmission Fluid:

1. Gather Tools and Materials:

- You will need a transmission fluid pump, a catch pan, a funnel, and the appropriate transmission fluid.

2. Prepare the Vehicle:

- Park the vehicle on a flat surface and turn off the engine. Allow it to cool if it has been running.

3. Locate the Transmission Fluid Drain Plug:

- Find the drain plug for the transmission fluid. It's usually located at the bottom of the transmission pan.

4. Drain Old Transmission Fluid:

- Place the catch pan underneath and remove the drain plug to let the old fluid drain out completely.

5. Replace Drain Plug:

- Once drained, replace the drain plug and tighten it securely.

6. Add New Transmission Fluid:

- Use a funnel to add the new transmission fluid through the dipstick tube or a designated fill port. Make sure to use the correct type of fluid for your vehicle.

7. Check Fluid Level:

- Start the engine and let it run for a minute. Check the transmission fluid level using the dipstick and add more fluid if necessary.

8. Test Drive:

- Take the vehicle for a short drive and check for any leaks or issues with shifting.

WEEK 6

Day 3:Installing of compressor coil and thermostat battery

Installing Compressor Coil:

1. Safety First:

- Ensure the power is turned off to the unit to avoid any electrical hazards.

2. Remove the Old Coil:

- If there's an existing compressor coil, carefully disconnect the wires and remove any mounting screws or brackets holding it in place.

3. Install the New Coil:

- Position the new compressor coil in place. Secure it with the mounting screws or brackets.

4. Reconnect Wires:

- Connect the wires to the new coil according to the wiring diagram, ensuring they are securely attached.

5. Check Connections:

- Double-check that all connections are tight and secure.

6. Restore Power:

- Turn the power back on and test the compressor to ensure it operates correctly.

Installing Thermostat Battery:

1. Remove the Thermostat Cover:

- Gently pull off the thermostat cover to access the battery compartment.

2. Take Out Old Batteries:

- Remove the old batteries from the compartment. Note the orientation of the batteries (positive and negative ends) for the new ones.

3. Insert New Batteries:

- Place the new batteries in the compartment, ensuring they are oriented correctly.

4. Replace the Cover:

- Snap or screw the thermostat cover back into place.

5. Test the Thermostat:

- Adjust the thermostat to see if it powers on and functions correctly.

WEEK 6

Day 4:Checking of power supply unit and sensor calibration

Checking the Power Supply Unit:

1. Safety Precautions:

- Ensure the car is turned off and the keys are removed from the ignition.

2. Locate the Power Supply Unit:

- This is usually found in the engine compartment or under the dashboard, depending on your car model.

3. Inspect for Damage:

- Look for any visible signs of damage, corrosion, or loose connections in the power supply unit.

4. Use a Multimeter:

- Set the multimeter to the DC voltage setting. Connect the positive lead to the positive terminal and the negative lead to the negative terminal of the power supply unit.
- Check the voltage reading. It should match the specifications in your car's manual (usually around 12-14 volts for a battery).

5. Test the Fuses:

- Check the fuses associated with the power supply unit. Replace any blown fuses.

Sensor Calibration:

1. Identify the Sensors:

- Determine which sensors need calibration (e.g., oxygen sensor, throttle position sensor).

2. Connect a Diagnostic Tool:

- Use an OBD-II scanner to connect to your car's diagnostic port. This is usually located under the dashboard.

3. Read Sensor Data:

- Access the live data from the sensors through the scanner. Check the readings against the expected values in your car's service manual.

4. Perform Calibration:

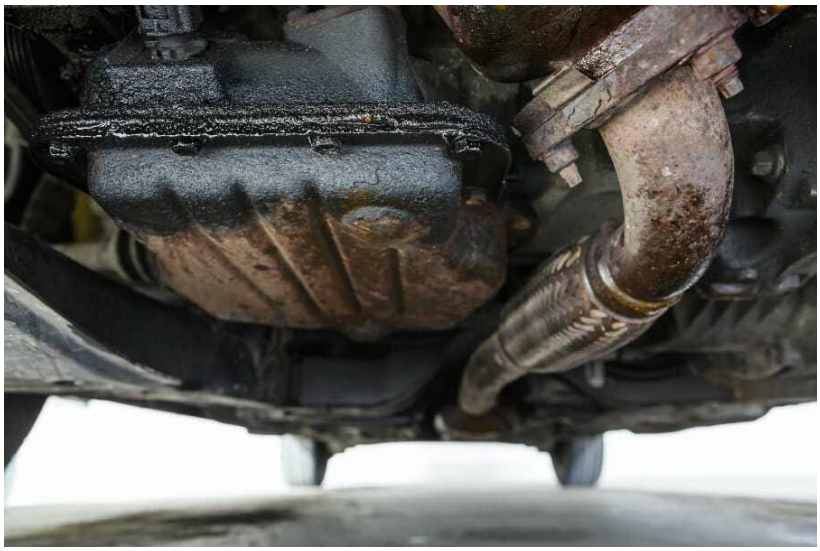
- If the readings are off, follow the calibration procedure specific to the sensor. This may involve resetting the sensor or adjusting its position.

5. Clear Codes:

- After calibration, clear any diagnostic trouble codes (DTCs) from the system using the OBD-II scanner.

6. Test Drive:

- Take the car for a test drive to ensure that the sensors are functioning correctly and that there are no warning lights on the dashboard.



WEEK 6

DAY 5:FIXING OF OIL LEAKAGE

1. Identify the Source of the Leak:

- Inspect the Engine: Look for oil spots under the car and check around the engine and oil pan for any visible leaks.
- Check Seals and Gaskets: Pay special attention to the oil filter, valve cover gasket, and oil pan gasket, as these are common sources of leaks.

2. Gather Necessary Tools and Materials:

- Tools: Wrenches, screwdrivers, oil catch pan, and a jack (if needed).
- Materials: New gaskets or seals, oil, and possibly an oil filter.

3. Drain the Oil:

- If the leak is significant, consider draining the oil to prevent further spillage. Place an oil catch pan under the oil pan and remove the drain plug.

4. Replace Gaskets or Seals:

- **Oil Filter:** If the oil filter is leaking, remove it using an oil filter wrench and replace it with a new one.

- Gaskets: For gaskets, remove the old gasket material, clean the surface, and apply a new gasket or sealant as per manufacturer specifications.

5. Reassemble and Refill:

- Reattach any components you removed, ensuring all bolts and screws are tightened properly.
- Refill the engine with the appropriate type and amount of oil.

6. Test for Leaks:

- Start the engine and let it run for a few minutes. Check again for any signs of oil leakage.

7. Monitor:

- Keep an eye on the oil level and the area under the car over the next few days to ensure the leak has been fixed

WEEK 7

DAY 1:REBUILDING OF CYLINDER HEAD

1. Remove the Cylinder Head:

- Disconnect Battery: Start by disconnecting the battery to ensure safety.
- Drain Coolant: Drain the engine coolant to prevent spills when you remove the cylinder head.
- Remove Components: Take off any components that obstruct access to the cylinder head, such as the intake manifold, exhaust manifold, and any hoses or wiring.
- Unbolt the Cylinder Head: Carefully unbolt the cylinder head from the engine block. Follow the manufacturer's specifications for the correct sequence and torque settings.

2. Inspect the Cylinder Head:

- Check for Damage: Look for cracks, warping, or any other damage. A machine shop can help with this if you're unsure.
- Clean the Surface: Use a gasket scraper to remove old gasket material from the cylinder head and engine block surfaces.

3. Rebuild the Cylinder Head:

- Replace Valve Seals: Remove and replace the valve seals if they are worn.
- Resurface the Head: If the head is warped, it may need to be resurfaced at a machine shop to ensure a proper seal.
- Replace Valves and Springs: If any valves are damaged, replace them along with their springs.

4. Reassemble the Cylinder Head:

- Install New Gasket: Place a new head gasket on the engine block.
- Reattach the Cylinder Head: Carefully position the cylinder head back onto the engine block, ensuring alignment with dowel pins.
- Torque Bolts: Follow the manufacturer's specifications for the correct torque sequence and settings for the cylinder head bolts.

5. Reinstall Components:

- Reattach any components you removed, such as the intake and exhaust manifolds, hoses, and wiring. Ensure everything is connected properly.

6. Refill Fluids:

- Refill the engine with oil and coolant, ensuring you follow the correct specifications.

7. Test the Engine:

- Reconnect the battery and start the engine. Check for leaks and ensure the engine runs smoothly.

WEEK 7

DAY 2: RESURFACING OF ENGINE BLOCK

1. Preparation:

- Remove the Engine Block: If it’s still in the vehicle, you may need to remove it for proper resurfacing.
- Clean the Block: Thoroughly clean the engine block to remove any oil, dirt, and old gasket material. Use a gasket scraper and solvent for this.

2. Inspect the Block:

- Check for Damage: Look for cracks, warping, or excessive wear. Use a straightedge and feeler gauge to check for flatness. If the block is warped beyond repair, it may need to be replaced.

3. Resurfacing Process:

- Machine Shop: The best way to resurface an engine block is to take it to a machine shop. They will use a milling machine or a grinder to achieve a flat and smooth surface.
- Cutting Depth: The machinist will determine the appropriate cutting depth based on the amount of material that needs to be removed to achieve flatness.

4. Final Cleaning:

- After resurfacing, clean the block again to remove any metal shavings or debris from the machining process.

5. Reinstallation:

- New Gasket: When reinstalling the cylinder head, always use a new head gasket to ensure a proper seal.
- Torque Specifications: Follow the manufacturer's specifications for the torque sequence and settings for the cylinder head bolts.

6. Testing:

- Once everything is reassembled, start the engine and check for any leaks or issues.

WEEK 7

Day 3:Replacement of crank shaft bearing and adjustment of valves clearance

Replacement of Crankshaft Bearings:

Tools and Materials Needed:

- New crankshaft bearings
- Engine oil
- Torque wrench
- Socket set
- Pliers
- Engine assembly lube

Steps:

1. Preparation:

- Disconnect the battery and drain the engine oil.
- Remove the oil pan to access the crankshaft.

2. Remove the Crankshaft:

- Remove any components obstructing the crankshaft, such as the timing belt/chain and the front cover.
- Unbolt the main bearing caps using the correct socket size and carefully lift the crankshaft out.

3. Replace Bearings:

- Remove the old bearings from the crankshaft and the engine block.
- Clean the surfaces thoroughly.
- Install the new bearings into the block and on the crankshaft, ensuring they are seated correctly.

4. Reinstall the Crankshaft:

- Place the crankshaft back into the block, aligning it properly.
- Reinstall the main bearing caps and torque them to the manufacturer's specifications.

5. Reassemble:

- Reinstall all removed components in the reverse order.
- Replace the oil pan and refill the engine with oil.

Adjustment of Valve Clearance:

Tools and Materials Needed:

- Feeler gauge
- Wrench set
- Screwdriver
- Torque wrench

1. Preparation:

- Ensure the engine is cold and disconnect the battery.
- Remove the valve cover to access the valves.

2. Determine Clearance:

- Refer to the vehicle's service manual for the correct valve clearance specifications.
- Rotate the engine to the appropriate position where the valves are fully closed.

3. Check Clearance:

- Insert the feeler gauge between the rocker arm and the valve stem.
- If the clearance is not within specifications, adjustments are needed.

4. Adjusting:

- Loosen the lock nut on the rocker arm.
- Turn the adjustment screw to achieve the correct clearance and then tighten the lock nut.

5. Final Steps:

- Recheck the clearance after tightening to ensure it hasn't changed.
- Replace the valve cover and reconnect the battery.

6. Testing:

- Start the engine and listen for any unusual noises, indicating that adjustments may be needed.

WEEK 7

DAY 4: REPLACING OF PISTON RINGS

Tools and Materials Needed:

- New piston rings
- Piston ring compressor
- Torque wrench
- Socket set
- Pliers
- Engine oil
- Clean rags
- Gasket scraper (if needed)

1. Preparation:

- Disconnect the battery and drain the engine oil.
- Remove the engine from the vehicle if necessary to access the pistons.

2. Remove the Cylinder Head:

- Unbolt and lift off the cylinder head to expose the pistons.
- Make sure to keep track of all bolts and components.

3. Remove the Pistons:

- Use a socket to remove the connecting rod bolts and gently push the pistons out of the cylinder block.
- Be careful not to damage the cylinder walls.

4. Remove Old Rings:

- Carefully remove the old piston rings from the pistons. You can use a small screwdriver or your fingers, but be cautious not to scratch the piston grooves.

5. Clean the Pistons:

- Clean the pistons thoroughly with a rag and engine oil. Ensure that there is no debris or old oil left.

6. Install New Rings:

- Before installing new rings, check the ring gaps. Use a feeler gauge to ensure they meet manufacturer specifications.
- Install the new rings onto the pistons, starting with the oil ring, followed by the compression rings. Make sure the rings are oriented correctly according to the manufacturer's instructions.

7. Reinstall Pistons:

- Use a piston ring compressor to compress the rings and insert the pistons back into the cylinder bores. Be gentle to avoid damaging the rings.

- Reattach the connecting rods to the crankshaft, ensuring the bolts are torqued to the specified values.

8. Reassemble the Engine:

- Reinstall the cylinder head and torque it down according to specifications.
- Replace any gaskets that were removed and reassemble the engine components.

9. Final Checks:

- Refill the engine with oil and reconnect the battery.
- Start the engine and check for any leaks or unusual noises.

WEEK 7

Day 5: changing of timing belt and chains

Changing the timing belt and chains is an important maintenance task

Tools and Materials Needed:

- New timing belt or chain
- Timing tools (specific to your vehicle)
- Wrenches and sockets
- Screwdrivers
- Torque wrench
- Engine oil
- Clean rags
- Gasket scraper (if needed)

1. Preparation:

- Disconnect the battery and remove any engine covers or components obstructing access to the timing belt or chain.

2. Remove the Old Timing Belt/Chain:

- Rotate the engine to align the timing marks on the crankshaft and camshaft. This ensures that the engine is at the top dead center (TDC).
- Loosen the tensioner and remove the old timing belt or chain. Make sure to note the routing of the belt/chain for reinstallation.

3. Inspect Components:

- Check the tensioner, idler pulleys, and other related components for wear. It's often a good idea to replace these parts at the same time as the belt or chain.

4. Install the New Timing Belt/Chain:

- Install the new timing belt or chain, ensuring it follows the correct routing and that the timing marks remain aligned.
- If using a belt, adjust the tensioner according to the manufacturer's specifications.

5. Reassemble the Engine:

- Reinstall any components that were removed to access the timing belt/chain.
- Make sure to torque all bolts to the manufacturer’s specifications.

6. Final Checks:

- Reconnect the battery and start the engine. Listen for any unusual noises and check that everything is running smoothly

WEEK 7

DAY 6: REPLACING OF OIL PUMPS

Tools and Materials Needed:

- New oil pump
- Gasket or sealant (if required)
- Wrenches and sockets
- Screwdrivers
- Torque wrench
- Oil filter (optional, but recommended)
- Engine oil

1. Preparation:

- Disconnect the battery to ensure safety.

- Drain the engine oil by removing the oil drain plug and letting it flow into a container.

2. Remove Components:

- Depending on your vehicle, you may need to remove various components to access the oil pump, such as the oil pan, timing cover, or other engine parts. Refer to your vehicle's service manual for specific instructions.

3. Remove the Old Oil Pump:

- Once you have access, locate the oil pump. It is typically mounted on the engine block.
- Remove the bolts securing the oil pump and carefully take it out. Be mindful of any oil that may still be in the pump.

4. Inspect and Clean:

- Inspect the oil pickup tube and screen for any debris or damage. Clean the area where the oil pump mounts to ensure a good seal with the new pump.

5. Install the New Oil Pump:

- Place the new oil pump in position and secure it with the bolts. Make sure to follow the manufacturer's torque specifications.
- If your oil pump requires a gasket, ensure it is properly positioned to prevent leaks.

6. Reassemble the Engine:

- Reinstall any components that were removed to access the oil pump.
- Replace the oil filter if you didn't do so earlier, and reinstall the oil drain plug.

7. Refill Engine Oil:

- Fill the engine with new oil, using the type recommended by the manufacturer.

8. Final Checks:

- Reconnect the battery and start the engine. Let it run for a few minutes while checking for leaks around the oil pump.
- Check the oil pressure to ensure the new pump is functioning correctly

WEEK 8

DAY 1: REBUILDING AND CONNECTING OF ROD IN A CAR

1. Understanding the Connecting Rod

- The connecting rod connects the piston to the crankshaft. It converts the linear motion of the piston into rotational motion for the crankshaft.

2. Disassembly

- Remove the Engine: Start by removing the engine from the vehicle.
- Disassemble the Engine: Take off the cylinder head and oil pan to access the connecting rods.
- Remove the Piston: Unscrew the bolts that hold the connecting rod to the piston and gently slide the piston out.

3. Inspecting the Connecting Rod

- Check for wear, cracks, or damage. If the rod is damaged, it may need to be replaced.
- Measure the dimensions of the rod to ensure they are within specifications.

4. Rebuilding the Connecting Rod

- If the rod is salvageable, you may need to recondition it. This can involve:
- Boring: If the rod's big end is worn, it can be bored out to fit a new bearing.
- Polishing: The surfaces can be polished to remove any imperfections.

5. Reconnecting the Rod

- Attach the Rod to the Piston: Slide the piston back into the cylinder and attach the connecting rod to the piston using new bolts.
- Attach the Rod to the Crankshaft: Position the connecting rod over the crankshaft and secure it with the appropriate bolts. Ensure that they are tightened to the manufacturer's specificati 6. Reassembly
- Reassemble the engine by putting the oil pan and cylinder head back in place.
- Reinstall the engine into the vehicle

WEEK 8

DAY 2: ADJUSTING OF VALVES CLEARANCE

1. Gather Necessary Tools

- You'll need a feeler gauge, wrench set, screwdriver, and possibly a torque wrench, depending on your engine specifications.

2. Locate the Valves

- Remove any components obstructing access to the valve cover, such as air intake or engine covers.

3. Remove the Valve Cover

- Unscrew the bolts holding the valve cover in place and carefully lift it off to expose the valves.

4. Set the Engine to TDC (Top Dead Center)

- Rotate the engine using a wrench or the starter motor until the piston of the cylinder you're working on is at its highest point. You can usually find a timing mark on the crankshaft pulley to help align it.

5. Check Valve Clearance

- Use the feeler gauge to measure the gap between the valve stem and the rocker arm or adjusting screw. Refer to your vehicle's service manual for the correct clearance specifications.

6. Adjust the Clearance

If the clearance is not within specifications, adjust it:

- Loosen the lock nut on the adjusting screw.
- Turn the adjusting screw to achieve the desired clearance, then tighten the lock nut carefully while holding the screw in place.

7. Recheck the Clearance

- After adjusting, measure the clearance again with the feeler gauge to ensure it's correct.

8. Repeat for Other Valves

- Repeat the process for all valves in the engine, ensuring you rotate the engine to TDC for each cylinder you're adjusting.

9. Reassemble

- Once all adjustments are complete, replace the valve cover and any other components you removed.

10. Final Checks

- Start the engine and listen for any unusual noises. If everything sounds good, you've successfully adjusted the valve clearance!

WEEK 8

DAY 3::REPAIRING OF KNOCK ENGINE AND TAPPING

1. Identify the Source of the Noise

- Determine whether the knocking or tapping is coming from the top (valve train) or bottom (piston or crankshaft) of the engine. This can help narrow down the potential causes.

2. Check Oil Level and Condition

- Low or dirty engine oil can cause knocking sounds. Check the oil level using the dipstick, and if it's low, top it up. If the oil is dirty, consider an oil change.

3. Inspect the Valves and Lifters

- If the noise is coming from the top of the engine, it could be due to improper valve clearance or worn lifters. Adjust the valve clearance as needed and consider replacing any worn lifters.

4. Examine the Piston and Connecting Rods

- If the knocking is more severe and coming from the bottom, it could be due to a worn piston or connecting rod bearings. This requires a more in-depth inspection:
- Remove the oil pan to access the connecting rods.
- Check for wear on the bearings. If they are worn out, they will need to be replaced.

5. Check for Detonation

- Engine knocking can also be a sign of detonation (pre-ignition). This can be caused by using low-octane fuel or incorrect timing. Ensure you're using the correct fuel and check the ignition timing**.**

6. Inspect the Exhaust System

- Sometimes, tapping noises can come from the exhaust system. Check for loose heat shields or exhaust components that may need tightening.

7. Consult a Mechanic

- If you're unable to pinpoint the issue or if the problem persists after your checks, it may be best to consult a mechanic for a professional diagnosis.

WEEK 8

DAY:4 FIXING OF OVERHEATING ENGINE

1. Check Coolant Levels

- Start by checking the coolant reservoir. If it's low, add the appropriate coolant mixture (usually a 50/50 mix of coolant and water).

2. Inspect for Leaks

- Look for any visible leaks in hoses, the radiator, or the water pump. If you find any leaks, they need to be repaired or replaced.

3. Examine the Radiator

- Ensure that the radiator is not clogged or blocked. Clean any debris from the radiator fins and check for any signs of damage.

4. Check the Thermostat

- The thermostat regulates the flow of coolant. If it's stuck closed, it can cause overheating. You can test it by removing it and placing it in hot water to see if it opens.

5. Inspect the Water Pump

- The water pump circulates coolant throughout the engine. If it's not functioning properly, it may need to be replaced. Check for leaks around the pump and listen for any unusual noises.

6. Look at the Cooling Fans

- Ensure that the cooling fans are operating correctly. If they're not turning on when the engine is hot, there may be an issue with the fan motor or the temperature sensor.

7. Check for Blocked Hoses

- **Inspect the hoses for any blockages or kinks that could restrict** coolant flow. Replace any damaged hoses.

8. Flush the Cooling System

- If the coolant is dirty or contaminated, consider flushing the cooling system to remove

WEEK 8

DAY 5: REPAIR OF FAULTY FUEL INJECTOR

1. Identify the Symptoms

- Common signs of a faulty fuel injector include rough idling, poor acceleration, engine misfires, and decreased fuel efficiency. Confirm that the injector is indeed the problem.

2. Gather Necessary Tools

- You'll need basic tools like a socket set, screwdrivers, a fuel injector cleaning kit, and possibly a multimeter for testing.

3. Relieve Fuel System Pressure

- Before starting repairs, relieve pressure in the fuel system. Locate the fuel pump fuse and remove it, then run the engine until it stalls. This will help prevent fuel spray during disassembly.

4. Remove the Engine Cover (if applicable)

- If your vehicle has an engine cover, remove it to access the fuel rail and injectors.

5. Disconnect Fuel Lines

- Carefully disconnect the fuel lines from the fuel rail. Be prepared for some fuel spillage, so have a rag handy.

6. Remove the Fuel Rail

- Unbolt the fuel rail from the engine and gently pull it away, which will also pull out the injectors.

7. Inspect and Clean the Injectors

- Check the injectors for any signs of blockage or damage. If they are dirty, you can use a fuel injector cleaning kit to clean them. Follow the kit instructions carefully.

8. Test the Injectors

- Use a multimeter to check the resistance of the injector coils. If the resistance is out of the specified range, the injector is faulty and needs replacement.

9. Replace Faulty Injectors

- If you find any faulty injectors, replace them with new ones. Ensure that you lubricate the O-rings with engine oil before installation to prevent damage.

10. Reassemble

- Reattach the fuel rail, reconnect the fuel lines, and reinstall the engine cover if removed. Replace the fuel pump fuse.

11. Test the System

- Start the engine and check for any leaks around the injectors and fuel lines. Ensure the engine runs smoothly without any issues.

WEEK 9

DAY ONE: CHANGING OF CRAMP SHAFT

Here's a comprehensive guide:

1. **Diagnosis:** First, confirm that the crankshaft is indeed the problem. Symptoms of a failing crankshaft can include unusual noises, oil leaks, or engine performance issues.

2. **Gather Tools and Parts:** You will need tools such as a socket set, torque wrench, and possibly a crankshaft pulley puller. Make sure you have replacement parts, like bearings or a new crankshaft if necessary.
3. **Remove the Engine:** If the crankshaft needs replacement, it's often easier to remove the entire engine from the vehicle. Disconnect the battery, remove the hood (if necessary), and drain the engine oil and coolant.
4. **Disassemble the Engine:** Remove components like the intake manifold, exhaust manifold, and cylinder heads. Take off the oil pan to access the crankshaft.
5. **Inspect the Crankshaft:** Once exposed, check for any visible damage, such as cracks or excessive wear. Use a micrometer to measure the journals and ensure they are within specifications.
6. **Repair or Replace:** If the crankshaft is damaged but can be salvaged, you might be able to grind it down to a smaller size and replace the bearings. If it's too damaged, replace it with a new or refurbished crankshaft.
7. **Reassemble the Engine:** Follow the reverse order of disassembly. Make sure to replace all gaskets and seals to prevent leaks. Torque all bolts to the manufacturer's specifications.
8. **Reinstall the Engine:** Once fully assembled, reinstall the engine back into the vehicle. Reconnect all necessary components, including electrical connections and hoses.
9. **Testing:** After everything is back together, fill the engine with oil and coolant, reconnect the battery, and start the engine. Listen for any unusual noises and check for leaks.
10. **Final Checks:** After running the engine for a while, recheck the oil level and inspect for any leaks or issues.

WEEK 9

DAY 2:REPAIR OF FAULTY FUEL INJECTOR

1. Identify the Symptoms

- Common signs of a faulty fuel injector include rough idling, poor acceleration, engine misfires, and decreased fuel efficiency. Confirm that the injector is indeed the problem.

2. Gather Necessary Tools

- You'll need basic tools like a socket set, screwdrivers, a fuel injector cleaning kit, and possibly a multimeter for testing.

3. Relieve Fuel System Pressure

- Before starting repairs, relieve pressure in the fuel system. Locate the fuel pump fuse and remove it, then run the engine until it stalls. This will help prevent fuel spray during disassembly.

4. Remove the Engine Cover (if applicable)

- If your vehicle has an engine cover, remove it to access the fuel rail and injectors.

5. Disconnect Fuel Lines

- Carefully disconnect the fuel lines from the fuel rail. Be prepared for some fuel spillage, so have a rag handy.

6. Remove the Fuel Rail

- Unbolt the fuel rail from the engine and gently pull it away, which will also pull out the injectors.

7. Inspect and Clean the Injectors

- Check the injectors for any signs of blockage or damage. If they are dirty, you can use a fuel injector cleaning kit to clean them. Follow the kit instructions carefully.

8. Test the Injectors

- Use a multimeter to check the resistance of the injector coils. If the resistance is out of the specified range, the injector is faulty and needs replacement.

9. Replace Faulty Injectors

- If you find any faulty injectors, replace them with new ones. Ensure that you lubricate the O-rings with engine oil before installation to prevent damage.

10. Reassemble

- Reattach the fuel rail, reconnect the fuel lines, and reinstall the engine cover if removed. Replace the fuel pump fuse.

WEEK 9

DAY 3: CHANGING OF PAD BRAKE

1. **Gather Your Tools:** You go need a jack, jack stands, lug wrench, and a brake pad replacement kit.
2. **Lift the Car:** Use the jack to lift the car and place jack stands for safety.
3. **Remove the Wheel:** Use the lug wrench to remove the lug nuts and take off the wheel.
4. **Locate the Brake Caliper:** The brake caliper is the part that hold the brake pads.

5. **Remove the Caliper:** Unscrew the bolts holding the caliper in place. Carefully slide the caliper off the brake rotor.
6. **Remove Old Brake Pads:** Take out the old brake pads from the caliper bracket. You might need to use a flathead screwdriver to pry them out gently.
7. **Install New Brake Pads**: Place the new brake pads in the caliper bracket. Make sure they fit securely.
8. **Reinstall the Caliper**: Slide the caliper back over the new pads and secure it with the bolts you removed earlier.
9. **Put the Wheel Back:** Place the wheel back and hand-tighten the lug nuts.
10. **Lower the Car:** Carefully lower the car back to the ground and then tighten the lug nuts fully.
11. **Test the Brakes:** Before you drive, pump the brake pedal a few times to ensure the pads seat properly.

WEEK 9

DAY 4: REPLACING PISTON RINGS.

Tools Needed

- Engine hoist
- Socket set
- Wrench set
- Piston ring compressor
- New piston rings
- Gasket set
- Engine oil (for lubrication)
- Clean rags

Steps to Repair Piston Rings:

1. **Disconnect the Battery:** Start by disconnecting the negative terminal of the battery to prevent any electrical issues.
2. **Remove the Engine:** If necessary, you fit need to remove the engine from the vehicle. This is usually easier for repairs. Disconnect all necessary components like exhaust, intake, and electrical connections.
3. **Remove the Cylinder Head:** Take off the cylinder head by loosening the head bolts in the correct sequence. This go give you access to the pistons.
4. **Remove the Oil Pan:** Take off the oil pan to access the bottom of the engine. This go allow you to see the connecting rods.
5. **Remove the Pistons:** Use a socket to remove the connecting rod bolts and carefully push the pistons out of the cylinder. You fit need to rotate the crankshaft to help with this.
6. **Inspect the Cylinder Walls:** Check the cylinder walls for any damage or scoring, you will need to re-bore the cylinders or replace the engine.
7. **Replace Piston Rings:**
    - Remove the old piston rings from the pistons.
    - Clean the piston grooves to remove any carbon buildup.
    - Install the new piston rings using a piston ring compressor. Make sure you follow the correct orientation for the rings.
8. **Reinstall the Pistons:** Carefully push the pistons back into the cylinders, ensuring you align the connecting rods correctly.

9. Reattach the Cylinder Head: Put the cylinder head back on, using a new gasket if necessary. Follow the manufacturer's torque specifications for the head bolts.
10. Reinstall the Oil Pan: Reattach the oil pan and ensure all bolts is tight.
11. Reconnect Everything: Reconnect the exhaust, intake, and any electrical connections you removed earlier.
12. Reconnect the Battery: Once everything is back in place, reconnect the battery.
13. Start the Engine: Start the engine and listen for any unusual sounds. Check for oil leaks and ensure everything is working properly.
14. Test Drive: Take the car for a short drive to ensure the repairs don fix the issues.

WEEK 9

DAY 5: TIMING BELT AND CHAIN REPLACEMENT

Tools Needed

- Wrench set
- Socket set
- Screwdrivers
- Timing belt or chain kit
- Torque wrench
- Engine oil (for lubricating parts)

Steps to Replace Timing Belt or Chain:

1. Disconnect the Battery: Always start by disconnecting the negative terminal of the battery to prevent any electrical issues.
2. Remove Engine Covers: Take off any plastic or metal covers that is over the timing belt or chain area.
3. Align Timing Marks: Before you remove the old timing belt or chain, make sure that you align the timing marks on the crankshaft and camshaft. This go help you set the new one correctly.
4. Remove the Old Timing Belt/Chain:
    - For timing belt: Loosen the tensioner and remove the belt.
    - For timing chain: You might need to remove the oil pan or other components to access the chain. Follow the specific instructions for your vehicle.

5. Inspect Components: Check the tensioner, idler pulleys, and other components for wear. If dem don old, e go make sense to replace dem too.
6. **Install the New Timing Belt/Chain:**
   - For timing belt: Place the new belt on the pulleys, ensuring the timing marks still align.
   - For timing chain: Install the new chain according to the manufacturer's instructions, make sure it's tight.
7. Reassemble Everything: Put back any covers and components you remove. Tighten all bolts to the manufacturer's specifications using a torque wrench.
8. Reconnect the Battery: After everything don back in place, reconnect the battery.
9. Start the Engine: Start the engine and listen for any unusual noises. Check if everything is run smoothly.
10. Test Drive: Take the car for a short drive to ensure everything is work well.

WEEK 10

DAY 1: MIRROR REPLACEMENT AND ADJUST

1. Gather Tools and Materials

- You'll need a replacement mirror, a screwdriver (usually Phillips or flathead), and possibly a trim removal tool.

2. Remove the Old Mirror

- If it's an exterior mirror, start by removing any screws that hold the mirror in place. You may need to take off the interior door panel or cover to access the screws. For interior mirrors, there's often a set screw at the base that you can loosen.
- Carefully detach the mirror from its mount. If it's an electrical mirror, disconnect the wiring harness.

3. Install the New Mirror

- Position the new mirror in place and reconnect any wiring harness if it's an electrical mirror.
- Secure the mirror by tightening the screws or set screw. Ensure it's firmly attached.

4. Adjust the Mirror

- Once the mirror is installed, adjust it to your preferred position. For exterior mirrors, you can usually do this manually or with the adjustment switch if it's powered.

5. Test the Adjustment

- Sit in the driver's seat and check the mirror's visibility. Make any necessary adjustments to ensure you have a clear view of the road behind you.

6. Reassemble Any Removed Panels

- If you had to remove any door panels or covers, reattach them

WEEK 10

DAY 2: REPLACEMENT OF SPARK PLUGS

Tools You Needed

- Socket wrench with the right size spark plug socket
- Torque wrench
- Ratchet extension
- Spark plug gap tool
- Anti-seize lubricant (optional)
- New spark plugs

Steps to Replace Spark Plugs:

1. Gather Your Tools: Make sure you will get all the tools you need before you start.
2. Disconnect the Battery: To avoid any electrical issues, disconnect the negative terminal of the battery.
3. Locate the Spark Plugs: Open the hood and locate the spark plugs. Dem is usually found on top of the engine, connected to the ignition coils or wires.
4. Remove the Ignition Coils or Wires: If your car get ignition coils, you go need to remove dem first. If na wires, carefully pull dem off the spark plugs. Take note of the order so you fit put them back correctly.
5. Remove the Old Spark Plugs: Use the socket wrench to unscrew the old spark plugs. Turn counterclockwise until dem come out.
6. Check the Gap on New Spark Plugs: Before you install the new spark plugs, check the gap using the spark plug gap tool. Adjust the gap to match the specifications for your vehicle.
7. Install New Spark Plugs: Apply a little anti-seize lubricant to the threads of the new spark plugs (optional). Insert the new spark plugs into the holes and hand-tighten them first. Then, use the socket wrench to tighten them to the manufacturer's torque specifications.

8. Reconnect Ignition Coils or Wires: Once the new spark plugs don is in place, reconnect the ignition coils or wires in the correct order.
9. Reconnect the Battery: Reconnect the negative terminal of the battery.
10. Start the Engine: Start the engine and listen for smooth operation. If everything is okay, you don successfully replace the spark plugs.

WEEK 10

DAY 3: ALTERNATOR REPLACEMENT

1. Gather Tools and Materials

- You'll need a new alternator, a socket set, a wrench, and possibly a belt tensioner tool.

2. Disconnect the Battery

- Before starting, disconnect the negative terminal of the battery to avoid any electrical shorts.

3. Remove the Serpentine Belt

- Locate the belt tensioner and use a wrench or belt tensioner tool to relieve tension on the serpentine belt. Slide the belt off the alternator pulley.

4. Remove the Old Alternator

- Disconnect the electrical connectors from the alternator. There might be a clip or a bolt holding the connectors in place.
- Remove the bolts securing the alternator to the engine. You may need to access the alternator from underneath the vehicle, depending on its location.

5. Install the New Alternator

- Position the new alternator in place and secure it with the bolts. Make sure it's tightened properly.
- Reconnect the electrical connectors to the new alternator.

6. Reinstall the Serpentine Belt

- Loop the serpentine belt back over the alternator pulley and ensure it's properly seated on all pulleys. Use the tensioner to apply tension to the belt.

7. Reconnect the Battery

- Reconnect the negative terminal of the battery..

WEEK 10

DAY 4:REPLACEMENT OF RADIATOR FUEL

1. Gather Tools and Materials

- You'll need a new coolant, a funnel, a container to catch old fluid, and possibly a wrench.

2. Allow the Engine to Cool

- Make sure the engine is completely cool before starting. This prevents burns from hot coolant.

3. Locate the Radiator and Drain Plug

- Find the radiator and look for the drain plug at the bottom. Place a container underneath to catch the old coolant.

4. Drain the Old Coolant

- Open the drain plug and allow the old coolant to completely drain into the container. If there's no drain plug, you may need to remove the lower radiator hose to drain the coolant.

5. Flush the Radiator (Optional)

- If you want to ensure all old coolant is removed, you can flush the radiator with water. Close the drain plug or reattach the hose, fill the radiator with water, run the engine for a few minutes, and then drain again.

6. Add New Coolant

- Close the drain plug or reattach the hose. Using a funnel, fill the radiator with the new coolant. Make sure to use the correct type of coolant for your vehicle.

7. Check the Overflow Tank

- Don't forget to check the overflow tank and fill it with coolant if necessary.

8. Run the Engine

- Start the engine and let it run for a few minutes. This allows the new coolant to circulate. Keep an eye on the temperature gauge to ensure it doesn't overheat.

9. Check for Leaks

- After running the engine, check around the radiator and hoses for any leaks.

WEEK 10

DAY 5:FUEL FILTER REPLACEMENT

1. Gather Tools and Materials

- You'll need a new fuel filter, a wrench or socket set, a fuel line disconnect tool (if applicable), and a container to catch any spilled fuel.

2. Safety First

- Make sure the engine is off and cool. Disconnect the negative battery terminal to prevent any electrical issues.

3. Relieve Fuel Pressure

- Before removing the fuel filter, you need to relieve the fuel pressure. You can usually do this by removing the fuel pump fuse and starting the engine until it stalls.

4. Locate the Fuel Filter

- Find the fuel filter; it's often located along the fuel line underneath the vehicle or in the engine compartment.

5. Disconnect Fuel Lines

- Use the fuel line disconnect tool (if necessary) to carefully disconnect the fuel lines from the filter. Be prepared for some fuel to spill, so have your container ready.

6. Remove the Old Fuel Filter

- Unscrew or unclip the old fuel filter from its mounting bracket. Take note of the orientation of the filter for proper installation of the new one.

7. Install the New Fuel Filter

- Install the new fuel filter in the same orientation as the old one. Make sure it's securely mounted.

8. Reconnect Fuel Lines

- Reconnect the fuel lines to the new filter, ensuring they are secure.

9. Reinstall Fuel Pump Fuse

- Reinstall the fuel pump fuse that you removed earlier.

10. Reconnect the Battery

- Reconnect the negative battery terminal.

11. Check for Leaks

- Turn the ignition to the "on" position (without starting the engine) a few times to build pressure in the fuel system. Then check for any leaks around the new filter.

WEEK 10

DAY 6: CLUTCH AND TORQUE CONVERTER REPLACEMENT

Clutch Replacement

1. Gather Tools and Materials

- You'll need a jack and jack stands, wrenches, a clutch alignment tool, and a new clutch kit.

2. Safety First

- **Ensure the vehicle is on a flat surface, and disconnect the negative battery terminal.**

3. Remove the Transmission

- Raise the vehicle and support it with jack stands. Remove any components obstructing the transmission, such as the drive shaft or exhaust system. Then, unbolt the transmission from the engine and carefully remove it.

4. Remove the Old Clutch

- Once the transmission is out, you'll see the clutch assembly. Remove the pressure plate bolts and take off the old clutch disc. Inspect the flywheel for wear and replace it if necessary.

5. Install the New Clutch

- Place the new clutch disc onto the flywheel, using the clutch alignment tool to ensure it's centered. Then, attach the pressure plate and tighten the bolts in a crisscross pattern to ensure even pressure.

6. Reinstall the Transmission

- Carefully lift the transmission back into place, ensuring it aligns properly with the engine. Reattach all components you removed earlier.

7. Reconnect the Battery

- Reconnect the negative battery terminal and test the clutch operation.

Torque Converter Replacement

1. Gather Tools and Materials

- You'll need the same tools as for the clutch replacement, plus a new torque converter.

2. Safety First

- Ensure the vehicle is on a flat surface, and disconnect the negative battery terminal.

3. Remove the Transmission

- Just like with the clutch replacement, raise the vehicle and support it with jack stands. Remove the drive shaft and any other components obstructing the transmission.

4. Remove the Old Torque Converter

- Once the transmission is out, locate the torque converter. It's typically bolted to the flexplate. Remove the bolts and carefully pull the torque converter off the input shaft.

5. Install the New Torque Converter

- Align the new torque converter with the input shaft and push it onto the shaft until it's fully seated. Then, reattach it to the flexplate with the bolts.

6. Reinstall the Transmission

- Carefully lift the transmission back into place, ensuring it aligns properly with the engine. Reattach all components you removed earlier.

7. Reconnect the Battery

- Reconnect the negative battery terminal and check the operation of the torque converter.

WEEK 11

DAY 1: CHANGING OF PAD BRAKE

1. Gather Your Tools: You will need a jack, jack stands, lug wrench, and a brake pad replacement kit.
2. Lift the Car: Use the jack to lift the car and place jack stands for safety.
3. Remove the Wheel: Use the lug wrench to remove the lug nuts and take off the wheel.
4. Remove the Caliper: Unscrew the bolts holding the caliper in place. Carefully slide the caliper off the brake rotor.
5. Remove Old Brake Pads: Take out the old brake pads from the caliper bracket. You might need to use a flathead screwdriver to pry them out gently.
6. Install New Brake Pads: Place the new brake pads in the caliper bracket. Make sure they fit securely.
7. Reinstall the Caliper: Slide the caliper back over the new pads and secure it with the bolts you removed earlier.
8. Put the Wheel Back: Place the wheel back and hand-tighten the lug nuts.
9. Lower the Car: Carefully lower the car back to the ground and then tighten the lug nuts fully.
10. Test the Brakes: Before you drive, pump the brake pedal a few times to ensure the pads seat properly.

WEEK 11

DAY 2: ROTOR RESURFACING

1. **Why Resurface?:** Over time, rotors can become warped or develop grooves due to wear from brake pads. Resurfacing helps restore a flat surface, which improves braking performance and extends the life of your brake pads.

2. **When to Resurface:** You should consider resurfacing your rotors if:
   - You notice vibrations when braking.
   - The brake pads are being replaced.
   - The rotors are below the minimum thickness specification (which can be found in your vehicle's service manual).

3. The Process:

- Remove the Wheels: Start by lifting the car and removing the wheels to access the brake components.
- Take Off the Calipers: Remove the brake calipers to free the rotors. Be sure to support the calipers with a hanger or bungee cord to avoid straining the brake lines.
- Remove the Rotors: Once the calipers are off, you can slide the rotors off the hub.
- Resurfacing: The rotors are then taken to a machine shop where they are placed on a lathe. The lathe grinds down the surface of the rotor to ensure it is smooth and even.
- Reinstall: After resurfacing, reinstall the rotors, calipers, and wheels. Make sure to properly torque all bolts to the manufacturer's specifications.

WEEK 11

DAY 3:SPRING REPLACEMENT (COIL,LEAF)

1. Coil Springs:

- Function: Coil springs support the weight of the vehicle and help absorb shocks from the road. They are typically found in the front suspension of many cars and some rear suspensions.
- Signs of Wear: Look for sagging, rust, or cracks in the coils. If your vehicle has a bouncy ride or uneven tire wear, it could be a sign that the coil springs need replacement.
- Replacement Process:
- Lift the Vehicle: Use a jack to lift the car and secure it with jack stands.
- Remove the Wheel: Take off the wheel to access the suspension components.

- Disconnect the Suspension: Remove any components that are attached to the coil spring, such as the strut assembly or control arms.
- Remove the Old Spring: Use a spring compressor to safely compress the coil spring before removing it. This prevents injury from the spring releasing suddenly.
- Install the New Spring: Place the new coil spring into position and slowly release the compressor.
- Reassemble: Reattach all components and ensure everything is torqued to the manufacturer's specifications.

2. Leaf Springs:

- Function: Leaf springs are typically used in the rear suspension of trucks and SUVs. They provide support for heavy loads and help maintain ride height.
- Signs of Wear: Check for cracks, broken leaves, or sagging. If the rear of the vehicle sits lower than the front, it may indicate worn leaf springs.

Replacement Process:

- Lift the Vehicle: As with coil springs, start by lifting the vehicle and securing it with jack stands.
- Remove the Wheel: Take off the wheel to access the leaf spring assembly.
- Disconnect the Leaf Spring: Remove any bolts or shackles that connect the leaf spring to the axle and frame.
- Remove the Old Spring: Carefully take out the old leaf spring. You may need to support the axle while doing this.
- Install the New Spring: Position the new leaf spring and secure it with the bolts.

WEEK 11,

DAY 4:STEERING GEARBOX REPLACEMENT

1. Preparation:

- Tools Needed: You'll typically need a socket set, wrenches, screwdrivers, a steering wheel puller, and possibly a torque wrench.
- Safety First: Make sure to park the vehicle on a flat surface, engage the parking brake, and disconnect the battery.

2. Remove the Old Gearbox:

- Access the Gearbox: Depending on your vehicle, you may need to remove the lower steering column cover to access the gearbox.

- Disconnect Components: Remove any components connected to the gearbox, such as the steering shaft, power steering lines, and any electrical connections.
- Unbolt the Gearbox: Locate the mounting bolts that secure the gearbox to the frame. Remove these bolts and carefully take out the gearbox.

3. Install the New Gearbox:

- Position the New Gearbox: Place the new gearbox in the same position as the old one.
- Bolt it In Place: Secure the gearbox with the mounting bolts, ensuring they are tightened to the manufacturer's specifications.
- Reconnect Components: Reattach the steering shaft, power steering lines, and any electrical connections.

4. Final Steps:

- Check Fluid Levels: If your vehicle uses power steering, make sure to check and fill the power steering fluid as needed.
- Reconnect the Battery: Reconnect the battery and start the vehicle.
- Test the Steering: Turn the steering wheel to ensure it operates smoothly. Look for any leaks around the gearbox.

5. **Alignment:** After replacing the gearbox, it's a good idea to have a professional alignment done to ensure proper handling and tire wear.

WEEK 12

Day1: Replacement of tire rotation and tire balancing

1. **Preparation**: Gather your tools, such as a jack, jack stands, and a lug wrench.
2. Lift the Vehicle: Use the jack to lift the vehicle and secure it with jack stands.
3. Remove Tires: Loosen the lug nuts and remove the tires.
4. **Rotate Tires:** Depending on your vehicle's drivetrain (front-wheel drive, rear-wheel drive, or all-wheel drive), follow the recommended rotation pattern:
   - **Front-Wheel Drive:** Move the front tires to the back on the same side and the back tires to the front, switching sides.
   - **Rear-Wheel Drive:** Move the back tires to the front on the same side and the front tires to the back, switching sides.
   - **All-Wheel Drive:** Consult your owner's manual for the specific pattern.

5. Reinstall Tires: Place the tires back on and hand-tighten the lug nuts

1. **Remove Tires:** If the tires are still on the vehicle, you'll need to remove them as described above.
2. **Balance the Tires:** Take the tires to a professional balancing machine. The technician will spin the tire and wheel assembly to identify any heavy spots.
3. **Add Weights:** The technician will attach small weights to the rim to balance the assembly. This process is crucial for a smooth ride.
4. **Reinstall Tires:** Once balanced, reinstall the tires on the vehicle, hand-tightening the lug nuts first

WEEK 12

DAY 2:WHEEL BEARING REPLACEMENT

Tools and Materials Needed

- Jack and jack stands
- Lug wrench
- Socket set
- Torque wrench
- Hammer
- Bearing puller or slide hammer (if necessary)
- New wheel bearing
- Grease
- Clean rags

1. Preparation:

- Park your vehicle on a flat surface and engage the parking brake.
- Gather all necessary tools and materials.

2. Lift the Vehicle:

- Use the lug wrench to loosen the lug nuts on the wheel where you will replace the bearing.
- Use the jack to lift the vehicle and secure it with jack stands.

3. Remove the Wheel:

- Completely remove the loosened lug nuts and take off the wheel.

4. Access the Wheel Bearing:

- Depending on your vehicle, you may need to remove the brake caliper and rotor to access the wheel bearing. Use the appropriate socket to remove the caliper bolts, and hang the caliper securely (don't let it dangle from the brake line).
- Remove the brake rotor.

5. Remove the Hub Assembly:

- If your vehicle has a hub assembly, you may need to remove the hub nut (usually held in place with a cotter pin). Use a socket to remove the hub nut.
- Use a bearing puller or slide hammer to remove the hub assembly from the spindle.

6. Replace the Bearing:

- Remove the old wheel bearing from the hub assembly. You may need to tap it out gently with a hammer.
- Clean the hub assembly and apply grease to the new bearing. Install the new bearing into the hub assembly, ensuring it is seated properly.

7. Reassemble:

- Reinstall the hub assembly onto the spindle and secure it with the hub nut. Make sure to torque it to the manufacturer's specifications.
- Reinstall the brake rotor and caliper, ensuring everything is tightened properly.

8. Reinstall the Wheel:

- Place the wheel back on and hand-tighten the lug nuts.
- Lower the vehicle and then use the torque wrench to tighten the lug nuts to the specified torque.

9. Final Checks:

- Before driving, double-check that everything is secure and that the wheel spins freely without any noise.

WEEK 12

DAY 3: EXHAUST SYSTEM REPAIR

Tools and Materials Needed

- Jack and jack stands
- Lug wrench
- Socket set
- Wrench set
- Exhaust repair tape or clamps (if repairing a small leak)
- Replacement parts (like pipes or mufflers, if needed)
- Safety goggles and gloves

1. Identify the Problem:

- Start by inspecting the exhaust system for any visible damage, such as rust, holes, or loose connections. Listen for unusual noises while the engine is running, which can indicate leaks.

2. Lift the Vehicle:

- Park your vehicle on a flat surface and engage the parking brake. Use the lug wrench to loosen the lug nuts on the rear wheels if you need to lift the vehicle from the back. Then, use the jack to lift the vehicle and secure it with jack stands.

3. Access the Exhaust System:

- If necessary, remove any components that obstruct access to the exhaust system. This may include heat shields or other undercarriage parts.

4. Repair Small Leaks:

- For small leaks, you can use exhaust repair tape or clamps. Wrap the tape around the damaged area or use a clamp to secure the section tightly.

5. Replace Damaged Sections:

- If you find significant damage, you may need to cut out the damaged section with a saw or pipe cutter. Measure and cut a new piece of pipe to fit, then use clamps or welding (if you have the equipment) to attach the new section securely.

6. Check the Muffler:

- Inspect the muffler for any signs of damage. If it's damaged, you'll need to replace it. Remove the old muffler by unbolting it from the exhaust pipes and replace it with a new one.

7. Reassemble:

- Once repairs are made, ensure all connections are tight and secure. Reinstall any components that were removed to access the exhaust system.

8. Test the Repair:

- Start the engine and listen for any unusual noises. Check for leaks by feeling for exhaust gases around the repaired areas.

WEEK 12

DAY 4 REGULAR OIL CHANGE

Regular oil changes are crucial for maintaining your car's engine

- New oil (check your owner's manual for the correct type and amount)
- New oil filter
- Oil filter wrench
- Socket set
- Funnel
- Drain pan
- Rags or paper towels
- Safety goggles and gloves

Steps for an Oil Change

1. Prepare Your Vehicle:

- Park your car on a flat surface and engage the parking brake. It’s best to let the engine cool down if it has been running.

2. Gather Supplies:

- Make sure you have all the necessary tools and materials ready.

3. Lift the Vehicle (if necessary):

- If your car is low to the ground, you may need to lift it using a jack and secure it with jack stands.

4. Drain the Old Oil:

- Place the drain pan under the oil pan. Remove the oil drain plug using a socket wrench and allow the old oil to drain completely into the pan. Be careful, as the oil may still be warm.

5. Replace the Oil Filter:

- Use an oil filter wrench to remove the old oil filter. Before installing the new filter, apply a little new oil to the rubber gasket on the new filter to ensure a good seal. Then, install the new filter by hand.

6. Replace the Drain Plug:

- Once all the old oil has drained, replace the oil drain plug and tighten it securely.

7. Add New Oil:

- Using a funnel, pour the new oil into the engine through the oil filler cap. Refer to your owner's manual for the correct type and amount of oil.

8. Check Oil Level:

- After adding oil, wait a minute for it to settle, then use the dipstick to check the oil level. Add more oil if necessary.

9. Run the Engine:

- Start the engine and let it run for a few minutes. This allows the new oil to circulate. Check for any leaks around the oil filter and drain plug.

10. Dispose of Old Oil:

- Make sure to dispose of the old oil and oil filter properly. Many auto parts stores offer recycling services.

WEEK 12

DAY 5: CLUTCH REPLACEMENT

Tools and Materials Needed

- New clutch kit (includes pressure plate, clutch disc, and release bearing)
- Socket set
- Wrenches
- Screwdrivers
- Clutch alignment tool (often included in the clutch kit)
- Jack and jack stands
- Torque wrench
- Safety goggles and gloves

Steps for Clutch Replacement

1. Prepare Your Vehicle:

- Park your car on a flat surface and engage the parking brake. Disconnect the battery to ensure safety.

2. Lift the Vehicle:

- Use a jack to lift the vehicle and secure it on jack stands. Make sure it's stable before working underneath.

3. Remove the Transmission:

- Depending on your vehicle, you may need to remove components like the driveshaft, exhaust, and any electrical connections to access the transmission.
- Unbolt the transmission from the engine. This usually involves removing bolts from the bell housing.

4. Detach the Clutch Components:

- Once the transmission is removed, you can access the clutch assembly. Remove the pressure plate by unbolting it and take out the old clutch disc.
- Inspect the flywheel for any damage or wear. If necessary, it may need to be resurfaced or replaced.

5. Install the New Clutch:

- Place the new clutch disc onto the flywheel, ensuring it's aligned correctly. Use the clutch alignment tool to help with this.
- Position the new pressure plate over the clutch disc and bolt it in place, tightening the bolts in a crisscross pattern to ensure even pressure.

6. Replace the Release Bearing:

- Install the new release bearing onto the transmission input shaft.

7. Reassemble the Transmission:

- Carefully align the transmission back to the engine and bolt it in place. Reconnect any components you previously removed.

8. Reconnect Everything:

- Reattach the driveshaft, exhaust, and any electrical connections. Make sure everything is secure.

9. Lower the Vehicle:

- Once everything is reassembled, lower the vehicle back to the ground.

10. Reconnect the Battery:

- Reconnect the battery and start the engine to check if everything is functioning correctly. Test the clutch to ensure it engages and disengages smoothly.

WEEK 13

DAY 1: CHANGING OF OIL AND FLUID CHECK

- New oil (check your owner's manual for the correct type and amount)
- New oil filter
- Oil filter wrench
- Socket set
- Funnel
- Drain pan
- Rags or paper towels
- Safety goggles and gloves

Steps for an Oil Change

1. Prepare Your Vehicle:

- Park your car on a flat surface and engage the parking brake. It's best to let the engine cool down if it has been running.

2. Gather Supplies:

- Make sure you have all the necessary tools and materials ready.

3. Lift the Vehicle (if necessary):

- If your car is low to the ground, you may need to lift it using a jack and secure it with jack stands.

4. Drain the Old Oil:

- Place the drain pan under the oil pan. Remove the oil drain plug using a socket wrench and allow the old oil to drain completely into the pan. Be careful, as the oil may still be warm.

5. Replace the Oil Filter:

- Use an oil filter wrench to remove the old oil filter. Before installing the new filter, apply a little new oil to the rubber gasket on the new filter to ensure a good seal. Then, install the new filter by hand.

6. Replace the Drain Plug:

- Once all the old oil has drained, replace the oil drain plug and tighten it securely.

7. Add New Oil:

- Using a funnel, pour the new oil into the engine through the oil filler cap. Refer to your owner's manual for the correct type and amount of oil.

8. Check Oil Level:

- After adding oil, wait a minute for it to settle, then use the dipstick to check the oil level. Add more oil if necessary.

9. Run the Engine:

- Start the engine and let it run for a few minutes. This allows the new oil to circulate. Check for any leaks around the oil filter and drain plug.

10. Dispose of Old Oil:

- Make sure to dispose of the old oil and oil filter properly. Many auto parts stores offer recycling services.

WEEK 13

DAY 2: BRAKE PAD REPLACEMENT

1. **Gather Your Tools:** You go need a jack, jack stands, lug wrench, and a brake pad replacement kit.
2. **Lift the Car:** Use the jack to lift the car and place jack stands for safety.
3. **Remove the Wheel:** Use the lug wrench to remove the lug nuts and take off the wheel.
4. **Locate the Brake Caliper:** The brake caliper is the part that hold the brake pads.
5. **Remove the Caliper:** Unscrew the bolts holding the caliper in place. Carefully slide the caliper off the brake rotor.
6. **Remove Old Brake Pads:** Take out the old brake pads from the caliper bracket. You might need to use a flathead screwdriver to pry them out gently.
7. **Install New Brake Pads:** Place the new brake pads in the caliper bracket. Make sure they fit securely.
8. **Reinstall the Caliper:** Slide the caliper back over the new pads and secure it with the bolts you removed earlier.
9. **Put the Wheel Back:** Place the wheel back and hand-tighten the lug nuts.
10. **Lower the Car:** Carefully lower the car back to the ground and then tighten the lug nuts fully.
11. **Test the Brakes:** Before you drive, pump the brake pedal a few times to ensure the pads seat properly.

WEEK 13

DAY 3: REPLACEMENT OF SPARK PLUGS AND FUEL INJECTOR

Tools You Needed

- Socket wrench with the right size spark plug socket
- Torque wrench
- Ratchet extension
- Spark plug gap tool
- Anti-seize lubricant (optional)
- New spark plugs

Steps to Replace Spark Plugs:

1. **Gather Your Tools:** Make sure that you get all the tools you go need before you start.
2. **Disconnect the Battery:** To avoid any electrical issues, disconnect the negative terminal of the battery.
3. **Locate the Spark Plugs:** Open the hood and locate the spark plugs. Dem is usually found on top of the engine, connected to the ignition coils or wires.
4. **Remove the Ignition Coils or Wires:** If your car get ignition coils, you go need to remove dem first. If na wires, carefully pull dem off the spark plugs. Take note of the order so you fit put them back correctly.
5. **Remove the Old Spark Plugs:** Use the socket wrench to unscrew the old spark plugs. Turn counterclockwise until dem come out.
6. **Check the Gap on New Spark Plugs:** Before you install the new spark plugs, check the gap using the spark plug gap tool. Adjust the gap to match the specifications for your vehicle.
7. **Install New Spark Plugs:** Apply a little anti-seize lubricant to the threads of the new spark plugs (optional). Insert the new spark plugs into the holes and hand-tighten them first. Then, use the socket wrench to tighten them to the manufacturer's torque specifications.
8. **Reconnect Ignition Coils or Wires:** Once the new spark plugs don is in place, reconnect the ignition coils or wires in the correct order.
9. **Reconnect the Battery:** Reconnect the negative terminal of the battery.
10. **Start the Engine:** Start the engine and listen for smooth operation. If everything is okay, you don successfully replace the spark plugs.

WEEK 13

DAY 4: CHANGING OF SHOCK ABSORBER

Tools Needed

- Jack and jack stands
- Wrench set
- Socket set
- Screwdriver
- Pliers
- New shock absorber

1. **Lift the Car**: Use the jack to lift the car and secure am with jack stands. Make sure the car is stable before you start work.

2. **Remove the Wheel:** Take off the wheel where you wan change the shock absorber. This go give you better access.

3. **Locate the Shock Absorber:** Find the shock absorber you want to change. It's usually mounted between the chassis and the axle.

4. **Unbolt the Shock Absorber:** Use the wrench or socket to remove the bolts at the top and bottom of the shock absorber. Keep the bolts safe for reinstallation.

5. **Remove the Old Shock Absorber:** Carefully take out the old shock absorber from the mount.

6. **Install the New Shock Absorber:** Place the new shock absorber in the same position as the old one. Make sure e is fit well.

7. **Bolt It Back:** Reinstall the bolts you removed earlier, tightening them securely.

8. **Reattach the Wheel:** Put the wheel back on and tighten the lug nuts.

9. **Lower the Car:** Remove the jack stands and lower the car back to the ground.

10. **Test Drive:** Take the car for a test drive to ensure the new shock absorbers is work well and your ride feel comfortable.

WEEK 13

DAY 5: REPLACING OF PISTON RINGS

Tools and Materials Needed:

- New piston rings
- Piston ring compressor
- Torque wrench
- Socket set
- Pliers
- Engine oil
- Clean rags
- Gasket scraper (if needed)

1. Preparation:

- Disconnect the battery and drain the engine oil.
- Remove the engine from the vehicle if necessary to access the pistons.

2. Remove the Cylinder Head:

- Unbolt and lift off the cylinder head to expose the pistons.
- Make sure to keep track of all bolts and components.

3. Remove the Pistons:

- Use a socket to remove the connecting rod bolts and gently push the pistons out of the cylinder block.
- Be careful not to damage the cylinder walls.

4. Remove Old Rings:

- Carefully remove the old piston rings from the pistons. You can use a small screwdriver or your fingers, but be cautious not to scratch the piston grooves.

5. Clean the Pistons:

- Clean the pistons thoroughly with a rag and engine oil. Ensure that there is no debris or old oil left.

6. Install New Rings:

- Before installing new rings, check the ring gaps. Use a feeler gauge to ensure they meet manufacturer specifications.
- Install the new rings onto the pistons, starting with the oil ring, followed by the compression rings. Make sure the rings are oriented correctly according to the manufacturer's instructions.

7. Reinstall Pistons:

- Use a piston ring compressor to compress the rings and insert the pistons back into the cylinder bores. Be gentle to avoid damaging the rings.
- Reattach the connecting rods to the crankshaft, ensuring the bolts are torqued to the specified values.

8. Reassemble the Engine:

- Reinstall the cylinder head and torque it down according to specifications.
- Replace any gaskets that were removed and reassemble the engine components.

9. Final Checks:

- Refill the engine with oil and reconnect the battery.
- Start the engine and check for any leaks or unusual noises.

WEEK 14

DAY 1: REPAIR OF FAULTY FUEL INJECTOR

1. Identify the Symptoms

- Common signs of a faulty fuel injector include rough idling, poor acceleration, engine misfires, and decreased fuel efficiency. Confirm that the injector is indeed the problem.

2. Gather Necessary Tools

- You'll need basic tools like a socket set, screwdrivers, a fuel injector cleaning kit, and possibly a multimeter for testing.

3. Relieve Fuel System Pressure

- Before starting repairs, relieve pressure in the fuel system. Locate the fuel pump fuse and remove it, then run the engine until it stalls. This will help prevent fuel spray during disassembly.

4. Remove the Engine Cover (if applicable)

- If your vehicle has an engine cover, remove it to access the fuel rail and injectors.

5. Disconnect Fuel Lines

- Carefully disconnect the fuel lines from the fuel rail. Be prepared for some fuel spillage, so have a rag handy.

6. Remove the Fuel Rail

- Unbolt the fuel rail from the engine and gently pull it away, which will also pull out the injectors.

7. Inspect and Clean the Injectors

- Check the injectors for any signs of blockage or damage. If they are dirty, you can use a fuel injector cleaning kit to clean them. Follow the kit instructions carefully.

8. Test the Injectors

- Use a multimeter to check the resistance of the injector coils. If the resistance is out of the specified range, the injector is faulty and needs replacement.

9. Replace Faulty Injectors

- If you find any faulty injectors, replace them with new ones. Ensure that you lubricate the O-rings with engine oil before installation to prevent damage.

10. Reassemble

- Reattach the fuel rail, reconnect the fuel lines, and reinstall the engine cover if removed. Replace the fuel pump fuse.

WEEK 14

DAY 2: SETTING OF CAR TIMING AND SETTING OF BOARD

1. Gather Your Tools: You go need a timing light, wrenches, and possibly a service manual for your car model.
2. Locate the Timing Marks: Find the timing marks on the crankshaft pulley and the timing cover. These marks is show the correct timing alignment.
3. Connect the Timing Light: Attach the timing light to the battery and the spark plug wire for the cylinder you wan check.
4. Start the Engine: Let the engine warm up to normal operating temperature.
5. Check Timing: Point the timing light at the timing marks. The light go flash when the spark plug fires. Compare the marks to see if they align correctly.
6. Adjust Timing: If the timing no align, loosen the distributor hold-down bolt and turn the distributor slightly until the marks align. Tighten the bolt once you get the right timing.

WEEK 14

DAY 3: ALTERNATOR REPLACEMENT

1. Gather Tools and Materials

- You'll need a new alternator, a socket set, a wrench, and possibly a belt tensioner tool.

2. Disconnect the Battery

- Before starting, disconnect the negative terminal of the battery to avoid any electrical shorts.

3. Remove the Serpentine Belt

- Locate the belt tensioner and use a wrench or belt tensioner tool to relieve tension on the serpentine belt. Slide the belt off the alternator pulley.

4. Remove the Old Alternator

- Disconnect the electrical connectors from the alternator. There might be a clip or a bolt holding the connectors in place.
- Remove the bolts securing the alternator to the engine. You may need to access the alternator from underneath the vehicle, depending on its location.

5. Install the New Alternator

- Position the new alternator in place and secure it with the bolts. Make sure it's tightened properly.
- Reconnect the electrical connectors to the new alternator.

6. Reinstall the Serpentine Belt

- Loop the serpentine belt back over the alternator pulley and ensure it's properly seated on all pulleys. Use the tensioner to apply tension to the belt.

7. Reconnect the Battery

- Reconnect the negative terminal of the battery.

8. Test the New Alternator

- Start the engine and check that the alternator is functioning properly. You should see the battery warning light go off on the dashboard.

WEEK 14

DAY:4 FIXING OF OVERHEATING ENGINE

1. Check Coolant Levels

- Start by checking the coolant reservoir. If it's low, add the appropriate coolant mixture (usually a 50/50 mix of coolant and water).

2. Inspect for Leaks

- Look for any visible leaks in hoses, the radiator, or the water pump. If you find any leaks, they need to be repaired or replaced.

3. Examine the Radiator

- Ensure that the radiator is not clogged or blocked. Clean any debris from the radiator fins and check for any signs of damage.

4. Check the Thermostat

- The thermostat regulates the flow of coolant. If it's stuck closed, it can cause overheating. You can test it by removing it and placing it in hot water to see if it opens.

5. Inspect the Water Pump

- The water pump circulates coolant throughout the engine. If it's not functioning properly, it may need to be replaced. Check for leaks around the pump and listen for any unusual noises.

6. Look at the Cooling Fans

- Ensure that the cooling fans are operating correctly. If they're not turning on when the engine is hot, there may be an issue with the fan motor or the temperature sensor.

7. Check for Blocked Hoses

- Inspect the hoses for any blockages or kinks that could restrict coolant flow. Replace any damaged hoses.

8. Flush the Cooling System

- If the coolant is dirty or contaminated, consider flushing the cooling system to remove

WEEK 14

DAY 5:REPLACE BLOCK ENGINES AND CYLINDER SLEEVES

Tools Needed:

- Engine hoist or crane
- Socket set
- Wrench set
- Torque wrench
- Piston ring compressor
- Gasket scraper
- New gaskets and seals
- Engine oil

Steps to Replace Block Engines and Cylinder Sleeves:

1. **Prepare the Vehicle:** Disconnect the battery and drain the engine oil and coolant. Remove any components blocking access to the engine block, such as the air intake, exhaust manifold, and any accessories.
2. **Remove the Engine:** Use the engine hoist to lift the engine out of the vehicle. Disconnect any remaining wiring and hoses connected to the engine.

3. **Disassemble the Engine:** Once the engine is out, remove the cylinder head, pistons, and connecting rods. Take note of how everything is arranged for reassembly.
4. **Remove the Cylinder Sleeves:** If the cylinder sleeves is removable, you go need to use a sleeve puller to take dem out. Clean the engine block thoroughly to remove any debris or old gasket material.
5. **Install New Cylinder Sleeves:** If you is using new sleeves, ensure dem fit properly into the block. Use a sleeve installer to press the new sleeves into place.
6. **Reassemble the Engine:** Install the pistons back into the cylinders using a piston ring compressor. Reattach the connecting rods and torque dem to the manufacturer's specifications. Then, place the cylinder head back on and torque it down properly.
7. **Replace Gaskets and Seals:** Install new gaskets and seals to prevent leaks. Make sure that you apply gasket sealer if necessary.
8. **Reinstall the Engine:** Use the engine hoist to carefully lower the engine back into the vehicle. Reconnect all wiring, hoses, and components you removed earlier.
9. **Fill Fluids:** Refill the engine oil and coolant. Make sure that all fluids is at the recommended levels.
10. **Reconnect the Battery:** Reconnect the negative terminal of the battery.
11. Start the Engine: Start the engine and check for any leaks or unusual sounds. Allow it to idle for a few minutes to ensure everything is working well.

WEEK 14

DAY 6: CHANGING OF SHOCK ABSORBER

Tools Needed

- Jack and jack stands
- Wrench set
- Socket set
- Screwdriver
- Pliers
- New shock absorber

1. **Lift the Car:** Use the jack to lift the car and secure am with jack stands. Make sure the car is stable before you start work.
2. **Remove the Wheel:** Take off the wheel where you wan change the shock absorber. This go give you better access.
3. **Locate the Shock Absorber:** Find the shock absorber you want to change. It's usually mounted between the chassis and the axle.

4. **Unbolt the Shock Absorber:** Use the wrench or socket to remove the bolts at the top and bottom of the shock absorber. Keep the bolts safe for reinstallation.
5. **Remove the Old Shock Absorber:** Carefully take out the old shock absorber from the mount.
6. **Install the New Shock Absorber:** Place the new shock absorber in the same position as the old one. Make sure e is fit well.
7. **Bolt It Back:** Reinstall the bolts you removed earlier, tightening them securely.
8. **Reattach the Wheel:** Put the wheel back on and tighten the lug nuts.
9. **Lower the Car:** Remove the jack stands and lower the car back to the ground.
10. **Test Drive:** Take the car for a test drive to ensure the new shock absorbers is work well and your ride feel comfortable.

WEEK 15

DAY 1: REPLACEMENT OF GEAR BOX IN A CAR

STEPS FOR GEARBOX REPLACEMENT:

9. **Preparation**:
   - Make sure you get all the necessary tools like wrenches, sockets, and a jack.
   - Disconnect the battery to prevent any electrical issues.
10. **Lift the Vehicle**:
    - Use a jack to lift the car and secure it with jack stands. This will give you enough space to work under the vehicle.
11. **Drain Transmission Fluid**:
    - Locate the transmission fluid pan and drain the fluid into a container. This will help prevent mess when you remove the gearbox.
12. **Remove the Old Gearbox**:
    - Disconnect the driveshaft from the gearbox. You may need to remove the bolts holding the driveshaft in place.
    - Remove any electrical connectors and linkage connected to the gearbox.
    - Unscrew the bolts holding the gearbox to the engine and carefully slide the gearbox out. You might need a helper for this step since gearboxes tend to be heavy
13. **Install the New Gearbox:**
    - Position the new gearbox and align with the engine. Secure it with the bolts you removed earlier.

- Reconnect the driveshaft and ensure all electrical connectors are securely attached.

14. Fill Transmission Fluid:

- Once everything is back in place, refill the transmission with the appropriate fluid.

15. Test the Vehicle:

- Reconnect the battery and start the engine. Test the gears to ensure everything is working properly.

16. Final Checks:

- Check for any leaks and make sure the fluid level is correct

WEEK 15

DAY 2: REPLACEMENT OF MOTOR FANS AND COILS

Steps for Replacing Motor Fans and Coils:

6. **Preparation**
   - Gather all necessary tools like screwdrivers, wrenches, and a multimeter.
   - Disconnect the power supply to prevent any electrical shock.
7. **Access the motor**:
   - Depending on the type of equipment (like an air conditioner or refrigerator), you may need to remove covers or panels to access the motor.
8. **Remove the old fan**:
   - Locate the screws or clips holding the fan in place. Remove dem carefully.
   - Disconnect any wires attached to the fan motor.
9. **Install the new fan**:
   - Position the new fan in place and secure it with the screws or clips you removed earlier.
   - Reconnect the wires to the new fan motor, ensuring they are connected properly.
10. **Replace the coils:**
    - If you are replacing coils, locate the coil assembly. Disconnect any wires and remove the screws holding the coils in place.
    - Install the new coils by securing them with screws and reconnecting the wires

WEEK 15

Day 3: Inspect and replace worn out valves, seals filter

Steps for Inspecting and Replacing Valves, Seals, and Filters:

6. **Valves Inspection:**
   - Check valves for any signs of wear or damage. If valves is worn out, they fit need replacement.
   - Ensure to identify the correct type and size of valves for replacement.
7. **Seals Examination:**
   - Inspect seals for any leaks or wear. If seals is damaged, they need to be replaced.
   - Make sure to get the right seals for your equipment or system.
8. **Filter Check:**
   - Examine the filter for dirt, clogs, or damage. If the filter is worn out, it fit affect the performance of your equipment.
   - Replace the filter if necessary to maintain proper functioning.
9. **Replacement Process:**
   - When replacing valves, seals, or filters, make sure to follow manufacturer instructions.
   - Use the correct tools and replacement parts to ensure a proper fit.
10. **Testing:**
   - After replacement, test the equipment to ensure that valves, seals, and filters is working effectively.

WEEK 16

DAY 1: REBUILDING AND CONNECTING OF ROD IN A CAR

1. Understanding the Connecting Rod

- The connecting rod connects the piston to the crankshaft. It converts the linear motion of the piston into rotational motion for the crankshaft.

2. Disassembly

- Remove the Engine: Start by removing the engine from the vehicle.
- Disassemble the Engine: Take off the cylinder head and oil pan to access the connecting rods.
- Remove the Piston: Unscrew the bolts that hold the connecting rod to the piston and gently slide the piston out.

3. Inspecting the Connecting Rod

- Check for wear, cracks, or damage. If the rod is damaged, it may need to be replaced.
- Measure the dimensions of the rod to ensure they are within specifications.

4. Rebuilding the Connecting Rod

- If the rod is salvageable, you may need to recondition it. This can involve:
- Boring: If the rod's big end is worn, it can be bored out to fit a new bearing.
- Polishing: The surfaces can be polished to remove any imperfections.

5. Reconnecting the Rod

- Attach the Rod to the Piston: Slide the piston back into the cylinder and attach the connecting rod to the piston using new bolts.
- Attach the Rod to the Crankshaft: Position the connecting rod over the crankshaft and secure it with the appropriate bolts. Ensure that they are tightened to the manufacturer's specificati 6. Reassembly
- Reassemble the engine by putting the oil pan and cylinder head back in place.
- Reinstall the engine into the vehicle

WEEK 16

DAY 2: ADJUSTING OF VALVES CLEARANCE

1. Gather Necessary Tools

- You'll need a feeler gauge, wrench set, screwdriver, and possibly a torque wrench, depending on your engine specifications.

2. Locate the Valves

- Remove any components obstructing access to the valve cover, such as air intake or engine covers.

3. Remove the Valve Cover

- Unscrew the bolts holding the valve cover in place and carefully lift it off to expose the valves.

4. Set the Engine to TDC (Top Dead Center)

- Rotate the engine using a wrench or the starter motor until the piston of the cylinder you're working on is at its highest point. You can usually find a timing mark on the crankshaft pulley to help align it.

5. Check Valve Clearance

- Use the feeler gauge to measure the gap between the valve stem and the rocker arm or adjusting screw. Refer to your vehicle's service manual for the correct clearance specifications.

6. Adjust the Clearance

If the clearance is not within specifications, adjust it:

- Loosen the lock nut on the adjusting screw.
- Turn the adjusting screw to achieve the desired clearance, then tighten the lock nut carefully while holding the screw in place.

7. Recheck the Clearance

- After adjusting, measure the clearance again with the feeler gauge to ensure it's correct.

8. Repeat for Other Valves

- Repeat the process for all valves in the engine, ensuring you rotate the engine to TDC for each cylinder you're adjusting.

9. Reassemble

- Once all adjustments are complete, replace the valve cover and any other components you removed.

10. Final Checks

- Start the engine and listen for any unusual noises. If everything sounds good, you've successfully adjusted the valve clearance!

WEEK 16

DAY 3::REPAIRING OF KNOCK ENGINE AND TAPPING

1. Identify the Source of the Noise

- Determine whether the knocking or tapping is coming from the top (valve train) or bottom (piston or crankshaft) of the engine. This can help narrow down the potential causes.

2. Check Oil Level and Condition

- Low or dirty engine oil can cause knocking sounds. Check the oil level using the dipstick, and if it's low, top it up. If the oil is dirty, consider an oil change.

3. Inspect the Valves and Lifters

- If the noise is coming from the top of the engine, it could be due to improper valve clearance or worn lifters. Adjust the valve clearance as needed and consider replacing any worn lifters.

4. Examine the Piston and Connecting Rods

- If the knocking is more severe and coming from the bottom, it could be due to a worn piston or connecting rod bearings. This requires a more in-depth inspection:
- Remove the oil pan to access the connecting rods.
- Check for wear on the bearings. If they are worn out, they will need to be replaced.

5. Check for Detonation

- Engine knocking can also be a sign of detonation (pre-ignition). This can be caused by using low-octane fuel or incorrect timing. Ensure you're using the correct fuel and check the ignition timing**.**

6. Inspect the Exhaust System

- Sometimes, tapping noises can come from the exhaust system. Check for loose heat shields or exhaust components that may need tightening.

7. Consult a Mechanic

- If you're unable to pinpoint the issue or if the problem persists after your checks, it may be best to consult a mechanic for a professional diagnosis.

WEEK 16

DAY:4 FIXING OF OVERHEATING ENGINE

1. Check Coolant Levels

- Start by checking the coolant reservoir. If it's low, add the appropriate coolant mixture (usually a 50/50 mix of coolant and water).

2. Inspect for Leaks

- Look for any visible leaks in hoses, the radiator, or the water pump. If you find any leaks, they need to be repaired or replaced.

3. Examine the Radiator

- Ensure that the radiator is not clogged or blocked. Clean any debris from the radiator fins and check for any signs of damage.

4. Check the Thermostat

- The thermostat regulates the flow of coolant. If it's stuck closed, it can cause overheating. You can test it by removing it and placing it in hot water to see if it opens.

5. Inspect the Water Pump

- The water pump circulates coolant throughout the engine. If it's not functioning properly, it may need to be replaced. Check for leaks around the pump and listen for any unusual noises.

6. Look at the Cooling Fans

- Ensure that the cooling fans are operating correctly. If they're not turning on when the engine is hot, there may be an issue with the fan motor or the temperature sensor.

7. Check for Blocked Hoses

- **Inspect the hoses for any blockages or kinks that could restrict** coolant flow. Replace any damaged hoses.

8. Flush the Cooling System

- If the coolant is dirty or contaminated, consider flushing the cooling system to remove

WEEK 16

DAY 5: REPAIR OF FAULTY FUEL INJECTOR

1. Identify the Symptoms

- Common signs of a faulty fuel injector include rough idling, poor acceleration, engine misfires, and decreased fuel efficiency. Confirm that the injector is indeed the problem.

2. Gather Necessary Tools

- You'll need basic tools like a socket set, screwdrivers, a fuel injector cleaning kit, and possibly a multimeter for testing.

3. Relieve Fuel System Pressure

- Before starting repairs, relieve pressure in the fuel system. Locate the fuel pump fuse and remove it, then run the engine until it stalls. This will help prevent fuel spray during disassembly.

4. Remove the Engine Cover (if applicable)

- If your vehicle has an engine cover, remove it to access the fuel rail and injectors.

5. Disconnect Fuel Lines

- Carefully disconnect the fuel lines from the fuel rail. Be prepared for some fuel spillage, so have a rag handy.

6. Remove the Fuel Rail

- Unbolt the fuel rail from the engine and gently pull it away, which will also pull out the injectors.

7. Inspect and Clean the Injectors

- Check the injectors for any signs of blockage or damage. If they are dirty, you can use a fuel injector cleaning kit to clean them. Follow the kit instructions carefully.

8. Test the Injectors

- Use a multimeter to check the resistance of the injector coils. If the resistance is out of the specified range, the injector is faulty and needs replacement.

9. Replace Faulty Injectors

- If you find any faulty injectors, replace them with new ones. Ensure that you lubricate the O-rings with engine oil before installation to prevent damage.

10. Reassemble

- Reattach the fuel rail, reconnect the fuel lines, and reinstall the engine cover if removed. Replace the fuel pump fuse.

11. Test the System

- Start the engine and check for any leaks around the injectors and fuel lines. Ensure the engine runs smoothly without any issues.