Ignition Coils with Spark Plugs Installation Guide

1. Safety Precautions

Perform all repair work only when the engine is fully cooled down to prevent burn injuries. Disconnect the battery negative terminal before removing any ignition system components to avoid electric shock, accidental engine cranking, and ignition system malfunction. Wear safety gloves and safety goggles during the entire operation. Do not touch ignition coils or spark plug wires while the engine is running or the vehicle ignition is ON. Keep all spark plug holes clean and free of dirt, debris, and foreign particles to prevent engine internal damage.

2. Pre-Installation Inspection

Confirm that the new ignition coils match the original OEM specifications, including connector pin layout, mounting position, and coil resistance parameters. Verify that the new spark plugs meet the factory requirements in heat range, thread size, and overall structure. Inspect the insulator surface for cracks, chips, or defects. Prepare required tools: socket set, spark plug socket, ratchet, extension bar, torque wrench, feeler gauge, and dielectric grease.

Figure 1: Parts & Tools Inspection
Check all new ignition coils and spark plugs for physical damage, specification consistency, and complete accessories before installation.

3. Old Components Removal Procedure

1. Disconnect the vehicle battery negative cable.
2. Locate the ignition coils mounted on the valve cover or cylinder head.
3. Press the locking tab and disconnect the electrical connector from each ignition coil gently to avoid connector damage.
4. Remove the ignition coil mounting bolt (standard 10mm size).
5. Pull the ignition coil straight upward to remove it from the spark plug tube. Do not twist or bend the coil boot excessively.
6. Use a spark plug socket with an extension bar to loosen and remove the old spark plug counterclockwise.
7. Inspect the old spark plugs for carbon buildup, oil contamination, electrode wear, or overheating marks for engine condition reference.

💡 **Figure 2: Ignition Coil Removal**
Vertically lift the ignition coil to separate it from the spark plug tube, avoid twisting and forced prying.

🔩 **Figure 3: Spark Plug Removal**
Use a dedicated spark plug socket for disassembly to prevent electrode damage and slipping.

4. Pre-Assembly Preparation

✅ **Important Note: Fully Pre-Processed Parts**
All new spark plugs and ignition coils are fully pre-processed before installation. The spark plug gaps are calibrated to OEM standard, thread anti-corrosion treatment and coil boot insulation protection are completed. No on-site adjustment, gap correction, or additional grease application is required. The parts are ready for direct installation.

5. New Parts Installation Procedure

1. Thread the new spark plug into the cylinder head by hand first to prevent cross-threading and thread damage.
2. Tighten spark plugs according to standard torque specifications:
- Aluminum cylinder head: 22–28 N·m (16–21 ft-lbs)
- Cast iron cylinder head: 28–35 N·m (21–26 ft-lbs)
3. Install the new ignition coil into the spark plug tube, ensure the coil boot fits tightly and seals completely on the spark plug insulator.
4. Reinstall the ignition coil mounting bolt. After hand tightening, torque it to 8–12 N·m (7–10 ft-lbs).
5. Reconnect the electrical connector until an audible click is heard to confirm full locking connection.
6. Repeat the same installation steps for all engine cylinders in order.

📏 **Figure 4: Spark Plug Torque Installation**
Use a torque wrench for standard tightening to avoid thread slipping or insufficient sealing.

🔌 **Figure 5: Ignition Coil Installation**

Ensure the coil boot is fully sealed and the electrical connector is completely locked in place.

6. Post-Installation Inspection & Verification

1. Double-check all ignition coil connectors are fully locked and all mounting bolts are properly torqued without looseness.
2. Clean the engine bay and ensure no tools or foreign objects are left inside.
3. Reconnect the battery negative cable.
4. Start the engine and maintain idle speed for 3 to 5 minutes.
5. Observe engine operation: no rough idle, engine misfire, abnormal noise, or ticking sound.
6. Perform a road test to confirm smooth acceleration and normal engine power output.

7. Troubleshooting Common Issues

Symptom	Possible Cause	Solution
Rough idle and engine vibration	Incorrect spark plug gap, loose ignition coil, poor electrical connection	Recalibrate spark plug gap, reinstall and secure coils, re-lock connectors
Engine misfire during acceleration	Defective ignition coil or damaged spark plug	Replace faulty ignition coil or damaged spark plug with new parts
Arcing or clicking noise during ignition	Insufficient insulation protection or poor coil boot sealing	Re-seat the coil boot and ensure full sealing condition
Hard starting or no start condition	Loose coil connection or cross-threaded spark plug	Inspect all components and reinstall following standard procedure
Oil residue on spark plug threads	Valve cover gasket leakage	Replace valve cover gasket and clean spark plug tubes thoroughly

8. Important Installation Notes

Do not reuse worn, cracked, or aging ignition coil boots. Always replace spark plugs in a complete set to ensure balanced engine performance. Never over-torque spark plugs to avoid stripping threads on aluminum cylinder heads. Keep spark plug tubes clean to prevent misfire

issues. After installation, clear all stored engine misfire trouble codes to restore normal vehicle operation.

📌 **Final Reminder**

All components are pre-processed and ready for direct installation. Strictly follow torque standards and installation sequence to avoid engine misfire and component damage.