GENERAL

jackson racing supercharger b 18 installation manual

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Jackson Racing Supercharger B18 Installation Manual

Boosting performance on a B18 engine has become a staple for enthusiasts looking to extract more horsepower and torque from their vehicle. One of the most effective ways to achieve this is by installing a supercharger, and the **Jackson Racing Supercharger B18**kit has gained a reputation for its reliability, performance gains, and relatively straightforward installation process. Whether you're a seasoned mechanic or a DIY enthusiast, this comprehensive guide will walk you through every step of the installation, from preparation to final tuning, ensuring you get the most out of your B18 engine.

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1. Overview of the Jackson Racing Supercharger B18 Kit

The Jackson Racing B18 supercharger kit is specifically engineered for the **B18 engine family**found in a variety of vehicles such as the Toyota Corolla, Toyota Celica, and Toyota Camry. The kit includes:

- High pressure supercharger unit
- Intake manifold with integrated throttle body
- Exhaust manifold with intercooler mounting brackets
- Pressure gauge and vacuum lines
- All necessary mounting hardware, brackets, and gaskets
- Comprehensive installation instructions and wiring diagram

By adding forced induction, the B18 engine can produce up to 120 horsepower more, depending on the specific configuration and supporting modifications. The supercharger's design ensures efficient airflow, minimal lag, and a smooth power delivery curve, making it ideal for daily driving as well as track use.

2. Tools and Materials Needed

Before diving into the installation, gather the following tools and materials. Having everything on hand will streamline the process and reduce downtime.

- Socket set (10 mm, 12 mm, 13 mm, 15 mm)
- Torque wrench (preferably 1/4 inch drive)
- Jack stands and jack
- Engine drain pan
- Coolant and oil drain hoses
- Hydraulic press or manual torque bar for mounting the supercharger
- Gasket scraper and sealant
- High temperature silicone gasket sealant
- Electrical crimping tool and heat shrink tubing
- Multimeter (digital, 10 A range)
- Vacuum gauge and pressure gauge (if not included)
- Coolant, oil, and transmission fluid (as needed)
- Jackson Racing supercharger kit (B18 model)
- Replacement bolts and hardware (if necessary)
- Service manual for the specific vehicle model (for reference)

3. Preparation and Safety Precautions

Proper preparation is crucial for a successful installation. Follow these safety and preparation steps:

1. Work in a well ventilated area. Ensure adequate airflow to avoid inhaling fumes from oil or coolant.
2. Disconnect the battery. This prevents accidental short circuits when working on the wiring harness.
3. Drain fluids. Remove coolant, oil, and transmission fluid to avoid spills during engine removal.
4. Label all wires. Use colored tape or labels to identify each wire before disconnecting. This will simplify re wiring later.
5. Keep a clean work surface. Use a clean, flat table or workbench to avoid contamination of gaskets or seals.
6. Check the vehicle's service manual for any specific torque specs or unique steps for your model.

4. Engine Disassembly: Removing Existing Components

Removing the original intake and exhaust manifolds is a prerequisite for installing the new supercharger kit. The following steps outline the disassembly process.

4.1. Remove the Intake System

1. Detach the air filter box and the intake tubing from the throttle body.
2. Remove the throttle body by loosening the mounting bolts. Keep the bolts for re installation.
3. Disconnect the vacuum lines and any sensors attached to the throttle body.
4. Carefully remove the existing intake manifold. Use a gasket scraper to clean the mounting surface.

4.2. Remove the Exhaust System

1. Loosen and remove the exhaust manifold bolts.
2. Disconnect any sensors (e.g., exhaust gas temperature sensor) and vacuum lines.
3. Remove the exhaust manifold and clean the mounting surfaces.

4.3. Remove the Engine (Optional)

Depending on your vehicle's layout, you may need to remove the engine to access the supercharger mounting area fully. This step is optional but recommended for a cleaner installation.

1. Disconnect the battery, transmission, and any ancillary components (e.g., coolant lines, fuel lines).
2. Support the engine with an engine stand or jack.

3. Remove the engine from the chassis using a jack or engine hoist.

5. Supercharger Installation Steps

With the engine prepared, we can now install the Jackson Racing supercharger kit. Follow each step carefully, paying special attention to torque specifications and alignment.

5.1. Mounting the Supercharger

1. Position the supercharger unit onto the mounting bracket. Ensure that the inlet and outlet ports align correctly with the intake and exhaust manifolds.
2. Insert the mounting bolts through the bracket and into the engine block. Use a hydraulic press or torque bar to apply even pressure.
3. Tighten the bolts to the specified torque in a criss cross pattern. Refer to the Jackson Racing torque chart for exact values.

5.2. Installing the Intake Manifold

1. Apply a thin layer of high temperature gasket sealant to the mating surfaces of the supercharger and intake manifold.
2. Place the intake manifold onto the supercharger, aligning the throttle body and vacuum ports.
3. Secure the manifold with the provided bolts, tightening them in a criss cross sequence to ensure even pressure.
4. Reconnect the air filter box and intake tubing.

5.3. Installing the Exhaust Manifold

1. Apply gasket sealant to the exhaust manifold’s mounting surface.
2. Align the exhaust manifold with the supercharger outlet. Ensure the exhaust ports are correctly positioned.
3. Tighten the mounting bolts in the recommended sequence and torque specifications.
4. Reconnect any sensors and vacuum lines that were previously attached.

5.4. Intercooler Installation (Optional)

If your kit includes an intercooler or you plan to add one, mount it according to the manufacturer’s instructions. Typically, this involves securing the intercooler bracket to the engine bay and connecting the inlet and outlet hoses.

6. Wiring and Electronics

Proper wiring ensures the supercharger operates safely and efficiently. Follow these steps to integrate the electrical components.

6.1. Connecting the Pressure Gauge

1. Locate the pressure gauge port on the supercharger housing.
2. Attach the gauge cable, ensuring a secure connection.
3. Run the cable to the driver’s side dash or a suitable location for visibility.

6.2. Wiring the Supercharger Control Module

1. Identify the power and ground connections on the control module.
2. Use the supplied wiring harness to connect to the vehicle’s battery and chassis ground.
3. Verify all connections are secure and insulated with heat shrink tubing.

6.3. Integrating with the ECU

The supercharger requires calibration within the engine control unit (ECU) to adjust fuel delivery and ignition timing.

This step may involve:

- Updating ECU firmware with a new software patch.
- Adjusting throttle mapping and boost curves.
- Ensuring that the ECU can read the supercharger's boost sensor.

Consult the vehicle's service manual for specific ECU tuning procedures. If you're not comfortable performing ECU tuning, consider hiring a professional tuner.

7. ECU Tuning and Calibration

Once the physical installation is complete, fine-tuning the ECU is essential for optimal performance and reliability.

7.1. Baseline Data Collection

1. Connect a data logger to the vehicle's OBD-II port.
2. Drive the vehicle at various speeds to collect baseline data on throttle position, boost pressure, and engine RPM.
3. Record any anomalies or irregularities.

7.2. Adjusting Fuel Maps

Adding a supercharger increases air intake, necessitating additional fuel. Adjust the ECU's fuel maps to ensure the air/fuel ratio remains within the optimal range (typically 12.5:1 to 13.5:1). Use a fuel pressure gauge and a wideband O2 sensor for accurate readings.

7.3. Ignition Timing Optimization

Higher boost levels can cause detonation if ignition timing is not adjusted. Increase ignition timing gradually while monitoring knock sensors. Aim for a timing curve that maximizes power without inducing knock.

7.4. Final Testing

After tuning, perform a dyno run or a controlled track test to validate performance gains. Compare the results to the baseline data and adjust as needed.

8. Testing and Troubleshooting

Thorough testing ensures that the supercharger system operates safely and efficiently.

8.1. Visual Inspection

- Check all bolts for proper torque.
- Verify that all hoses and sensors are securely connected.

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