

ENG-02, Engine Installation

Tools Needed

- Jack stands
- Floor Jack
- Hose clamps or locking pliers (locking pliers can damage hoses)
- Metric Socket set
- Metric Wrench set
- Set of Phillips and Flat tip screwdrivers
- Engine Hoist
- Diagonal cutters
- Several clothes hangers, bailing wire, and/or bungee cords of different sizes
- Clutch alignment tool (Manual Transmission)

Other Procedures Needed

- [ENG-11](#), Motor Mounts - Checking
- [ENG-12](#), Motor Mount Replacement
- [DME-01](#), DME Control Unit Removal and Installation
- [AF-01](#), Air Filter Housing and Air Flow Sensor - Removal and Installation
- [IGN-01](#), Distributor Cap and Rotor Replacement
- [COOL-04](#), Radiator Removal and Installation
- [COOL-02](#), Coolant System Draining, Filling, and Venting

Procedure

As the engine removal procedure is written assuming the engine is removed from below, the installation procedure detailed here is based on the same assumption. That means that the steering rack and engine cross-member should already be removed from the car.

1. For manual transmission cars, if the clutch disc and/or pressure plate was removed while the engine was out of the car, ensure that the clutch disc has been aligned with the pressure plate prior to attempting to install the engine. Actually, the should have been done prior to installing the engine's bell housing. You can obtain a clutch alignment tool from Baum Tool. However, a universal clutch alignment tool which can be obtained at most major auto parts stores will work just as well.
2. Ensure that the motor mount brackets are attached to the engine block.
3. Ensure that the car is raised high enough to slide the engine underneath. Position the engine under the car in the center of the engine compartment.
4. Attach an engine hoist or chain hoist to the engine's lifting points (2 - one at the back of the cam housing, one near the alternator).

5. Raise the engine into position in the car. The engine will have to be move toward the front of the engine compartment to clear the front end of the drive shaft. When the end of the drive shaft is positioned in the center of the opening in the clutch housing, slide the hoist toward the rear of the car. The engine may have to be rocked slightly as it is moved back onto the drive shaft. However, if the clutch disc is aligned properly, the drive shaft should insert without a great deal of effort.
6. Install the torque tube (central tube) flange to clutch housing bolts (4, M10 x 35mm). Torque bolts to 42 Nm (30 ft-lbs).

Note

Prior to installing the cross-member, check the motor mounts using [ENG-11](#), to see if they need to be replaced.

7. Ensure the engine motor mounts are installed into the cross-member. Install the lower motor mount bolts (10 mm) but, do not fully tighten until the cross-member is raised into place.

NOTE

If new motor mounts have been installed, use [ENG-12](#) to determine the correct length of upper motor mount bolts (4 - 8mm bolts) to be used.

8. Using a floor jack, raise the cross-member into position under the engine. Check to make sure that the motor mounts line up with the motor mount brackets on the engine block.
9. You'll probably find it easiest to slide the steering shaft universal joint on to the spline inlet shaft of the steering rack before the cross-member is fully raised into position. Be sure to install the universal joint in the correct orientation as marked on the input shaft splines and universal joint during removal. Install the universal joint locking bolt.
10. Install the upper motor mount bolts (8mm) and using a 13 mm socket torque to 23 Nm (17 ft-lbs). Using a 17 mm socket, torque the lower motor mount bolts to 32 ft-lbs.
11. When the cross-member is fully raised into position, install the cross-member mounting bolts (12 mm) and using a 19 mm socket, torque to 85 Nm (63 ft-lbs).
12. Disconnect the engine hoist and move the hoist and floor jack out of the way.
13. Install the suspension control arms and stabilizer bar. Torque the control arm to cross-member lock nut (12 mm) to 48 ft-lbs. Torque the rear control arm mounting bracket bolts (10 mm) to 34 ft-lbs. This is the assembly for the eccentric caster bolt at the rear of the control arm.

14. Attach the steering knuckle to the control arm ball joint. Torque the steering knuckle lock nut (10 mm) to 37 ft-lbs.
15. Bolt the air condition compressor into place.
16. Install the front stabilizer bar. Torque the stabilizer to control arm lock nut (10 mm) to 18 ft-lbs. Torque the stabilizer bracket to body bolts (8 mm) to 17 ft-lbs.
17. Install the alternator, if removed.
18. Install motor mount heat shield.
19. Install slave cylinder.
20. Install the exhaust system.
21. If equipped, install the oxygen sensor (USA cars)
22. Attach fuel supply and return lines.
23. Install the charcoal venting hose.
24. Install the AC fast idle hose.
25. Install all vacuum and coolant hoses.
26. Reattach the hose to the heater control valve and the hose for the coolant return line from the heater core.
27. Install the power steering pump and reconnect hoses.
28. Install the starter and reconnect electrical leads.
29. Route the engine wiring harness through the firewall to the DME control unit.
30. Reconnect all engine grounds. There should be a connection near the top of the clutch housing on the driver's side of the vehicle (RHD) and a connection on the block near the same location. There should also be a ground connection on the firewall either inside the engine compartment or inside the battery compartment. **BE SURE TO CLEAN ALL GROUND CONNECTIONS THOROUGHLY BEFORE INSTALLATION.** A bad ground connection can result in poor running and may lead to eventual failure of the DME control unit.
31. Connect the brake booster vacuum hose.
32. Connect the throttle cable and, if equipped, the cruise control cable and cruise control unit servo electrical connector.
33. Install the radiator using [COOL-04](#).
34. On turbocharged cars install the turbocharger cooling pump, connect hoses, and electrical connector.
35. Install the rotor and distributor cap using [IGN-01](#).
36. Install the air flow sensor and air filter housing using [AF-01](#).
37. Attach the engine wiring harness to the firewall using appropriate cable ties.
38. Inside car, connect the wiring harness to the DME control unit (and KLR on turbo models).
39. Using [COOL-02](#), fill and vent the coolant system.
40. Fill the power steering reservoir.
41. Check the engine oil for proper level.
42. Connect the battery leads.

43. Install the fuse for the fuel pump, if removed.
44. Start vehicle and allow to warm up. Check for leaks in the engine compartment and underneath the vehicle. Move steering wheel from side to side and check level in power steering reservoir. Add fluid as necessary.
45. Stop vehicle, install skid pan, front wheels, and lower vehicle from jack stands.

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