

# Black Dog Manufacturing

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## Instruction Manual Rover Engine Block Tester

### Introduction

The vehicle you are working on has a coolant leak causing the cylinders to ingest water, or the head gasket has failed to the outside of the engine, or there is a leak in the combustion chamber, causing the engine to overheat and displace coolant. Almost always, the initial diagnosis is “**failed head gaskets**”. Unfortunately, on the aluminum Land Rover engine, there is a chronic problem that is not addressed by just replacing the head gaskets. The problem may very well be slipped liners in the block.

In order to insure that you do not have a “weeping” block or a “slipped” sleeve, we developed our tool kit to help you find the real problem and help you provide your customer with an accurate diagnosis.

### Instructions

- 1) Remove both cylinder heads.
- 2) Remove the water pump.
- 3) Clean the block surface in the same manner you would to reinstall new head gaskets.
  - a. **!!!Important!!!**: Do not use high-speed discs of any kind to clean the block surface. Damage to the surface will occur and may prevent head gasket sealing.
- 4) Apply a thin coat of Permatex ultra gray around coolant port on top of the block surface. (Or you may cut a gasket to fit the plates.)
- 5) Install the Black Dog Block Off Plates to the front and back of both cylinder banks using the bolts provided. Torque the bolts to 40 foot-pounds. (Figures 1.1 and 1.2)



6) Install the modified water pump with gasket provided. Torque to 18 foot-pounds. (Figure 1.3)



7) Fill the block with 50/50 coolant (you may re-use the old coolant) through the holes in the plates (Figure 1.4). Insure the block is completely full and that there is no air in the cooling system.



- 8) Install the plug and Schrader valve assembly into the Black Dog Block Off Plate.
- 9) Pressurize the block to 40 pounds through the Schrader valve fill port (Figure 1.5).
  - a. **!!Important!!**: Do not over pressurize.



- 10) Set heat lamps on the center valley of the engine. Multiple lamps may be used. Be sure to use caution to insure that nothing comes into contact with the lamps, as the high temperature will melt plastic tubing or wire insulation (Figure 1.6).
  - a. High Intensity bulb lamps are used in construction sites as “auxiliary work lamps” and are available at your local home improvement store.



- 11) Monitor the pressure during the test. Generally, results will be seen within a couple of hours, but may take eight hours or more, possibly requiring an overnight test. If there are no “immediate results”, keep the lamps on and the pressure up for 24 hours.
- 12) The results will be evident when you see coolant seeping, spraying, or sweating between the steel cylinder liner and the aluminum block. Any leakage no matter how small, means the engine block must be replaced, they cannot be repaired.
- 13) If you do not see any coolant appearing around the sleeves after 24 hours, then there is a high probability that the block is good and new head gaskets and resurfaced heads may be fitted with confidence.