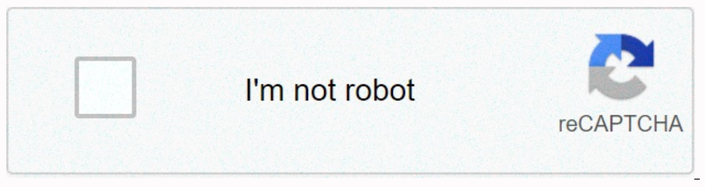

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P0171 ford f150 code

While the DTC code P0171 and its closely related cousin, P0174, are two of the most common codes for overwriting the Ford F150 model, almost all Ford models are equally likely to suffer the effects of this code at some point, and especially Ford applications that have done more than about 60,000 miles or more. In this article, we'll take a closer look at what this code means exactly, as well as explore possible repair options that won't cost you an arm and a leg. In technical terms, the codes P0171 and P0174 are defined as System too Slim (Bank 1), and System too Lean (Bank 2) respectively, but in both cases, the word slim refers to conditions in which the air/fuel mixture deviates from the ideal ratio of 14.7 : 1 with an amount that exceeds the specified limit for a particular application. In practice, the ideal air/fuel mixture in gasoline refers to 14.7 parts of air to one part of fuel available for combustion. In this ratio (also known as Lambda =1), all fuel is burned using all air. Thus, when a condition arises in which the air/fuel mixture contains more than 14.7 parts of air to one part of the fuel, the mixture is said to be lean. NOTE: Bank 1 refers to the cylindrical bank containing the #1; while Bank 2 refers to cylindrical banks that do not contain #1. Therefore, code P0174 does not apply to engines that do not have two cylinder banks. What causes code P0171 / P0174? There are many possible causes for this code, but in cases where no other code exists, the most common cause is a vacuum leak that causes unmetered air to enter the engine, with a damaged MAF (Mass Airflow) sensor, or damaged/contaminated after being close behind. How does a machine vacuum leak cause code P0171/P0174? Since PCM needs to know exactly how much air is entering the engine at any given moment to be able to calculate the fuel delivery strategy that corresponds to driving conditions at any given moment, it depends on the MAF sensor to measure the volume of air intake very accurately at all times. Note that PCM also obtains input data regarding temperature and therefore, intake air density, to be able to calculate the appropriate fuel delivery strategy that is always as close as possible to maintaining the ideal air/fuel mixture at all times. Thus, if any air enters the engine through a vacuum leak downstream of the MAF sensor, the PCM cannot insert this additional volume of unmetered air into its fuel delivery calculation, as it cannot determine the exact volume of additional air. In addition, due to the pcm's ability to compensate for the presence of unmetered air limited, it will assign code P0171 or P0172 (or both) depending on the application, and vacuum leak site. How does the MAF sensor cause code P0171/P0174? The purpose of MAF sensor is to monitor / measure the amount of air intake that enters the machine. So, if the sensor is damaged, or if the sensor element's sensing is contaminated/thwarted by a layer of oil or other contaminants, the sensor will likely be under the report of the amount of air passing over it due to report more than the amount of air passing through it. If the MAF sensor is under the report, the PCM (Powertrain Control Module) will register rich running conditions because the PCM sees less than 14.7 parts of air to one part of the fuel. However, sensors are more likely to report the amount of air; if this happens PCM sees more than 14.7 parts of air into one fuel part (conditions are slim), and it will set the code P0171 or P0174, or both, depending on the application. What are the most common symptoms of code P0171 / P074? Typical symptoms of this code include the following- · Saved problem code and illuminated warning light · Rude, or erratic unemployed · Poor performance · Misfire on one or more cylinders · The engine may doubt or stumble upon note #1 acceleration: Note that in some cases, one or more symptoms may only appear under certain conditions, such as when the engine is hot. NOTE #2: Be aware that the symptoms listed here apply to vacuum leakage; other possible causes of this code may produce similar symptoms that may vary in intensity, depending on the nature of the problem and application. Can I fix code P0171 / P0174 myself? While diagnosing and repairing these codes should not present the average DIY mechanics with undue difficulty, it should be noted that there are other possible causes of this code, in addition to vacuum leaks and faulty MAF sensors. Therefore, it is advisable to obtain a vacuum system diagram of the affected application engine, as well as a code reader that can monitor the direct flow of data. If other codes exist, it may become necessary to monitor the operation of the oxygen sensor, the function of the EGR valve (Exhaust Gas Recirculation), long-term fuel trim, as well as the operation of the fuel system, including monitoring the actual fuel pressure during various engine speeds. In some cases, using a smoke machine to track vacuum leaks is the fastest way to find leaks that may not be easily visible. IMPORTANT NOTE: Given the above, it should not be assumed that P0171 and/or P0174 is always the result of a vacuum leakage of the machine. Note that because no code identifies specific parts, components, systems, or sub-systems as possible causes of the problem, it is critical that the affected application's error memory is scanned for EGR-related problems or fuel systems that can also cause this code to be defined. Way code P0171 / P0174 if no other code exists If no other active or pending code exists, it is safe to assume that the problem is a problem vacuum leakage. Here's how to find it- Step 1 Make sure the engine is cool to prevent burning or scalding itself. If a scanner with live data stream monitoring is available, connect it to the data link connector, and turn on the machine. Select the PID (Parameter Identifier) data menu, and set the monitoring function to fuel trim; if there is a vacuum leak, the value of the fuel trim will be positive. If the value is positive, raise the engine speed to about 2,500 RPM to see if the fuel trim value drops to a level closer to normal, which should happen because the leak will have a smaller effect on the overall air/fuel mix at higher engine speeds. NOTE #1: Fuel trimming values differ between applications, so see the manual for the values that apply to affected applications. NOTE #2: Using a scanner to confirm or eliminate vacuum leaks because the cause of the problem is the fastest way to diagnose the root cause. However, if the scanner is not available, and it is known that no other code exists, there are other ways to diagnose the problem - as described below - Step 2 Begin your inflow examination by checking that all air/vacuum hoses are present, and that all joints are properly secured by the proper hose clamps. Step 3 If all clamps are tight, check all vacuum hoses and vacuum lines for signs of damage that look like chafing, rubbing, tears, spitting, and dry rot on soft rubber connectors. Pay special attention to the soft rubber fittings that connect the PCV (Positive Crankcase Ventilation) valve to the inlet manifold through a hose or hard plastic line. Repair or replace parts on time. Step 4 Verify that the line connecting the brake amplifier (gasoline engine) to the entry manifold is free of damage, and does not split, crack, or perforate. Replace hoses and/or connectors/fittings that are in poor condition. Step 5 If the vacuum system contains, or is equipped with a vacuum check valve or a vacuum-operated actuator, check if all vacuum valves allow air to flow through it only in the direction indicated on the valve - usually indicated by an arrow. In addition, make sure that all vacuum-operated actuators are in working order - check if these components contain voids when activated. Replace the components as needed; some cam faulty vacuum check valves allow unmetered air to enter the engine, as do some vacuum actuators. Step 6 If a thorough examination of the engine vacuum system does not produce a clear leak, the suspect leaks the semifold gasket in - proceed as follows, but DO NOT flammable aerosols such as brakes or carbohydrate cleaners to prevent possible engine fires - Turn on the engine and leave it idle. Spray some sprays that can be inflamed such as WD-40 or similar to and around all pipe joints, as well as to all mating surfaces where the incoming manifold attaches to the engine block. If a a present (and assuming the spray reaches the leak) the idle quality will soon change, albeit temporarily, because the spray closes the leak. Note that although professional technicians use this method to track vacuum leaks, it is not always possible to reach all possible leak sites. If this happens, one of the other ways is to use the length of the garden hose as a stethoscope. Cut a length of about 24 inches or more, and hold the tip to your ear while inserting the other end into all the nooks and crannies in and around the incoming manifold that you can't reach with the spray. The large volume of the hose will amplify the sound of sucking leaks, and you will hear a loud whooshing sound when the open end of the hose is on, or close to the leak site. Once you have identified the leak site, see the manual for the affected application for details on the correct procedures to follow to disassemble and or remove what needs to be removed to gain access to the leak. Note that fixing some manifold leaks involves partial disassembly and or removal of major engine components; If you are uncomfortable with the idea of doing this, refer the vehicle for professional diagnosis and repair to avoid the possibility of causing damage or damage where there was none before. Step 7 If the problem persists but no other code exists and the steps outlined above do not resolve the issue, it is entirely possible that the leak path is open only under very specific operating conditions. The most likely site of this type of leakage is the manifold inlet that changes shape slightly when the engine is hot. Thus, check and verify that all inlet manifolds retain the bolt/stud/nut present and tightened to the recommended torque value. However, keep in mind that in most cases, no amount of retightening can repair damaged gaskets, which damage usually occurs when the gasket leaks for the first time. If changing the bolt/stud/bean manifold does not solve the problem, the only reliable long-term remedy may be the replacement of the incoming manifold gasket, or in rare cases, the incoming manifold itself along with the new gasket. Other possible causes of code P0171 / P0174 In Ford applications, and especially on F150 models, the most likely cause other than vacuum leakage is a faulty DPFE (EGR differential pressure) sensor. These sensors are known to have very high failure rates, and when they fail, they allow excessive amounts of exhaust gas to enter the engine at the wrong time, which when it does, mimics the symptoms of a vacuum leak. Note, however, that it is not very for the EGR related code to be not present when the DPFE sensor has failed. Other possible causes of the code P0171 / P0174 can include the following, but note that all possible causes listed below will almost certainly result in generating additional code- · Damaged PCV (Positive Crankcase Ventilation) Valve · Fuel pressure is low due to limited fuel filter, faulty fuel pump, damaged fuel pressure regulator, or damaged fuel pressure sensor. · Clogged, dirty or damaged fuel injectors

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