

AMSOIL PowerSports Oils

Provide Superior Wet-Clutch Performance

By definition, a clutch is a coupling used to connect and disconnect the driving and driven parts of a mechanism. Modern motorcycles and ATVs require the use of a clutch to connect and disconnect the engine (driving) and transmission (driven). Without the clutch, there would be no way to stop the vehicle from moving without also stopping the engine. The clutch also makes shifting easier and minimizes stress on gears and other components, extending equipment life.

Why a Wet-Clutch?

The clutch is a frictional device, meaning it requires friction to complete the task of connecting the engine and transmission. Because a clutch is a frictional device, and one of the main purposes of a lubricant is to reduce friction, why would anyone introduce an oil to a clutch? Modern technology and superior technological know-how have afforded the ability to formulate multifaceted lubricants capable of functioning in a variety of conditions. While not all lubricants are suitable for use in wet-clutch applications, an oil-immersed clutch benefits from the lubricant's ability to reduce operating temperatures, prevent the formation of deposits and clean internal components. All of these benefits lead to better performance and longer life.

Clutch Slip

Clutch slip is a big concern with many powersports enthusiasts. To the operator, clutch slip feels like an elongated shift or a delay in the transfer of power from the engine to the wheels. This is due to a lack of friction generated within the clutch pack.

The clutch pack is located between the clutch's inner hub and the clutch basket and consists of a series of two types of plates: steel and frictional. The inner-most plate is a plain steel plate (sometimes aluminum) which attaches to the inner hub via tabs on the plate's inner diameter, and the inner hub is connected to the transmission. The next plate is a frictional plate which attaches to the clutch basket via tabs on its outer diameter, and the basket is attached to the engine. The frictional plates are coated with a fibrous compound that helps them grip the steel plates when the clutch is engaged. The plates within the pack alternate until the desired pack height is reached.

A spring-loaded pressure plate atop the clutch pack applies constant force to the clutch pack. The mechanical device that engages and disengages the clutch assembly, normally a lever located on the handle bars, pulls the pressure plate back and allows the plates within the clutch pack to separate, severing the connection between the engine and transmission.

The clutch is only disengaged in order to stop the transfer of power from the engine to the wheels. When engaged, the clutch spring applies a constant load on the pressure plate, forcing the clutch pack together. The load creates a high level of static friction between the plates in the pack, causing them to rotate together. In this position, rotational movement from the engine is transferred to the clutch basket, to the frictional plates, through the steel plates, into the inner hub and finally to the transmission input shaft. The key here is the static friction that holds the frictional and steel plates together, allowing the transfer of power from the engine to the wheels. Clutch slip occurs when this static friction is

overcome and the plates rotate at different speeds, or slip.

Common Causes for Clutch Slip

While it seems logical to blame the lubricant for clutch slip, there are many possible causes. Worn frictional plates, glazed clutch plates, loss of clutch spring tension, improper clutch pack height, engine modifications, operator error and the use of an incorrect lubricant all are potential causes for clutch slip. If a lubricant with the correct frictional properties is used, it is the least likely cause of clutch slip.

Wet-Clutch Compatibility

Wet-clutch compatibility is determined through standards set forth by the Japanese Automotive Standards Organization (JASO) and the International Organization for Standardization (ISO). Both standards categorize oils according to their frictional properties, allowing consumers to choose the appropriate oil based on which JASO or ISO category is recommended by the equipment manufacturer. If no JASO or ISO category is listed on an oil, it is likely that compatibility in wet-clutch applications has not been reviewed. These oils should not be used in wet-clutch applications.

AMSOIL and Wet-Clutch Compatibility

The frictional characteristics of all AMSOIL powersports oils have been fully reviewed using the test methodology set forth in JASO standard T903:2006 sub-standard T904 and ISO standard 24254:2007. While clutch slippage and wet-clutch compatibility are major concerns, it is important to choose an oil that provides maximum protection and performance for other lubricated components as well. A good oil must not only offer the necessary frictional properties, but also minimize operating temperatures and reduce the formation of varnish and lacquer. A good oil must also maintain plate cleanliness, provide good anti-foaming properties and superior shear stability. These are characteristics offered by all AMSOIL motor oils for powersports applications.

According to AMSOIL Technical PowerSports Product Manager Dave Anderson, choosing an oil that provides balanced protection is paramount. "Different pieces of equipment have different appetites for fluids," said Anderson. "In order to obtain the best performance for any piece of equipment it is important that the fluid is formulated to address the main concerns for that application. That is one of the key reasons AMSOIL provides the variety of products it does." Anderson said testing is the key to ensuring AMSOIL products excel. "Our desire is to provide the best possible performance we can technically provide," said Anderson. "Many AMSOIL powersports products are very application-specific because, from a technical standpoint, that's the only way we can provide the highest level of performance possible."