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PTT CLUTCH FACTS

The peak break-away torque of all PTT clutches increase as the clutch wears. YES, as the clutch wears, the clutch will transmit more torque! Once you understand this little-known fact, you can rest easy in the knowledge that if the clutch does not slip when it is initially installed, it will only get better with age.

Sizing the clutch break-away torque capacity to your application is covered elsewhere (see How To Select A Clutch) however it should be noted that it is possible to have too much clutch torque capacity. You should avoid having more than twice the engine torque for the clutch peak break-away torque. You want the clutch to slip if a sharp torque spike is transmitted back up the drivetrain from the drive wheels, such as if a driver experiences wheel-to-wheel contact with another competitor, or upon impact with a stationary object that suddenly stops the drive wheels. This helps avoid expensive engine or gearbox damage.

PTT clutches can be custom tailored for a lower release load by installing a diaphragm spring with a lighter clamp load. This is frequently done in order to reduce pedal effort which helps reduce driver fatigue in longer endurance events. It is also done to lower the force exerted on the engine thrust bearing. A lot of smaller 4-cylinder engines cannot withstand the excessively high release loads imparted from some aftermarket racing clutches.

All PTT clutches are designed to never exceed 800 pounds of force during release. Some unknowledgeable clutch manufacturers will install two standard diaphragm springs into a clutch cover and call it high performance. This is irresponsible and demonstrates a lack of good engineering judgment (or no engineering at all!). Although it will double the torque capacity of the clutch, it also doubles the load imparted to the engine's thrust bearing, potentially causing it's early failure.

The torque capacity of a PTT clutch can be changed in three ways:

1. Install a high-torque pressure plate instead of a regular pressure plate. This pressure plate has a reduced diameter fulcrum. Installing a high-torque pressure plate will increase the torque capacity of a clutch with NO increase in spring clamp load or pedal effort.
2. Select a different diaphragm spring. PTT diaphragm springs are rated from 'AA' to 'C'. Standard clutches come with 'A' rated springs. Changing from an 'A' spring to a 'AA' spring will increase the torque capacity. Conversely, changing from an 'A' spring to a 'B' spring will reduce the torque capacity. Typically, springs are changed to accommodate pedal effort requirements just as much as for peak break-away torque capacity.
3. Select a different friction material. PTT offers bronze metallic, organic and iron metallic based friction materials. Different friction materials offer different coefficients of friction (Cf). A different friction material could be selected for its drivability as well as its ultimate torque capacity.

Heat is the enemy of any clutch. Heat is generated whenever you slip a clutch. Care should be used at all times to reduce the amount of heat generated in your clutch. Just as conserving your tires is important, so is conserving your clutch. The smaller the clutch, the more critical it is to reduce the amount of heat from slipping. Smaller clutches have less thermal mass. As a result, they are much more sensitive to heat damage. The smart racer will always push their car around in the pits, never drive the car on the trailer, and avoid slipping the clutch. In the heat of the battle, it is always better to break the tires loose to get the car going, rather than excessively slip the clutch.

FRICTION MATERIALS

SINTERED BRONZE METALLIC - PTT's standard friction material is a proprietary sintered metallic material that has been custom blended to meet a variety of different requirements. It is also ground to an extremely fine finish. This eliminates excessive clutch wear and any bedding-in requirement. Standard thicknesses available in this material are .105", .200", or .250" thick. The thickness of the disc for use in your clutch is determined by the type of use it is ultimately put to. Generally speaking, a thicker disc would be selected if the clutch is going to be consistently subjected to higher operating temperatures. All clutch torque ratings shown in this catalog are for clutches using this material. Metallic friction materials stand up to extreme heat abuse better than organic friction materials.

ORGANIC - Organic friction materials have a softer, more forgiving engagement characteristic. PTT organic discs have a higher coefficient of friction (Cf) than some metallic linings offered. Using the same clamp load (diaphragm spring), the organic material will deliver a higher torque capacity. GENERALLY, you can plan on approximately 400 lb. ft. of break-away torque per 7.25" disc. Organic friction materials lose Cf as the lining temperature goes up. If you get an organic clutch hot, and it slips, let the clutch cool down to avoid costly damage to the rest of the clutch components due to excessive heat.

SINTERED IRON METALLIC - Currently only available in a 7.25" disc size. When configured as a single disc, this clutch has a peak break-away torque rating of 550 lb. ft. In many situations, this clutch will allow you to go from a standard 2 disc clutch to a 1 disc clutch to reduce static weight and greatly reduce M.O.I.