Corvette Tech Tip

Multiple discs vs. Single disc clutches

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There are several significant advantages of a smaller diameter, multiple disc clutch over a larger diameter single disc unit.

Multi disc clutch advantages:

1. Increase the amount of torque able to be transmitted.
2. Decrease the pedal effort to operate the clutch.
3. Decrease the weight of the clutch
4. Decrease the M.O.I. (Moment of Inertia) of the clutch.

The amount of torque that a clutch transmits is critical to the ultimate performance of a vehicle.

Multi disc clutches increase the available torque capacity by 2 for twin disc and 3 for triple disc.

Torque Capacity is affected by 4 factors:

1. Decreasing the diameter reduces torque capacity.
2. A smaller diameter clutch has a smaller diaphragm, which usually means a lower clamping force
3. Adding a second clutch disc doubles the torque capacity.
4. Increasing the coefficient of friction of the clutch discs increases the torque capacity.
5. If the multi disc clutch is correctly designed and engineered, the losses from the smaller diameter and lower clamp force are much less than the gain in coefficient of friction and extra disc(s), giving the torque increase.

Diameter	Weight	No of Discs	Torque
9.0in/225mm	33.8lb/15.4kg	2	1010ft lbs/1365Nm
7.25in/185mm	26.6lb/12.1kg	3	984ft lbs/1330Nm
12.0in/300mm	46.0lb/21.0kg	1	781ft lbs/973Nm

Pedal Effort

Smaller diaphragms used in multi disc clutches will usually require less pedal effort to disengage the clutch. This is in direct contrast to a larger single disc clutch, which has a larger diaphragm with heavier pedal effort.

Decreased Weight

The above examples clearly show the weight relationship between multi disc and single disc clutches.

M.O.I. (Moment of Inertia)

Lower weight means less inertia has to be overcome to spin the clutch. This means less engine power is needed to turn the clutch. The net effect is the vehicle is able to accelerate faster.

Lower weight also means that the clutch discs will not continue to spin on for as long and allow faster shifting. The net result again is faster acceleration and less time when there is no power being transmitted to the wheels.