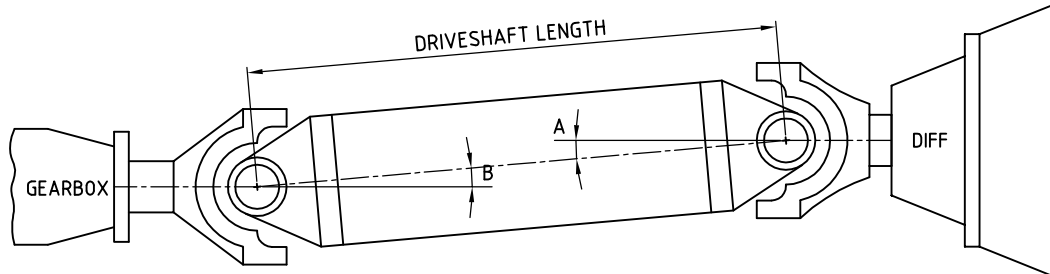


## DRIVESHAFT OPERATING ANGLE

Operating angles in a driveshaft are the angles between the pinion, driveshaft and transmission centerlines. The optimal angle for any driveshaft to run at is 1/2 degree, where many vibrational and frictional problems are non-existent. In order to minimize power loss and vibration in an offset configuration, the pinion centerline and transmission centerline need to be parallel within 1/2 degree. With suspension movement the operating angle will increase, but should not exceed 15 degrees. If the centerlines are off too far, the U-joints travel at uneven operating velocities, causing vibration (this is the same problem induced by poorly phased end yokes). The vibration is hard to distinguish from an unbalanced driveshaft.



A = FRONT UNIVERSAL JOINT OPERATING ANGLE  
 B = REAR UNIVERSAL JOINT OPERATING ANGLE  
 A SHOULD BE EQUAL TO B

NOTE: ANGLES HAVE BEEN EXAGGERATED

## DRIVESHAFT CRITICAL SPEED

Critical speed is the speed at which a spinning shaft will become unstable. This is one of the single largest factors in driveshaft selection. When the whirling frequency and the natural frequency coincide, any vibrations will be multiplied, so much that the shaft may self destruct. Another way to think of this is that if a shaft naturally vibrates at 130 times a second, and at one point the shaft passes through 0 degrees 130 times a second (7800 RPM) then the shaft has hit critical speed. There are several ways to raise the critical speed of a driveshaft. You can make it lighter, stiffer, or increase diameter without increasing weight. This is the reason carbon fibre makes a good driveshaft, it is stiff and light and can be made to any diameter or wall thickness. Aluminium, while it has a very good critical speed is not quite as strong as steel. Steel, with good strength characteristics will have a lower critical speed.

PART #	DRIVESHAFT LENGTH (mm / inches)								
	1120 44"	1170 46"	1220 48"	1270 50"	1320 52"	1370 54"	1420 56"	1470 58"	1520 60"
DS-3.0"-MOLLY 1350	9025	8238	7550	6945	6410	5934	5510	5129	4787
DS-3.5"-MOLLY 1350	10464	9557	8762	8063	7444	6894	6403	5963	5566
DS-3.0"-MS 1350	8905	8129	7450	6854	6326	5856	5437	5062	4724
DS-3.5"-MS 1350	10435	9528	8734	8036	7418	6869	6378	5939	5543
DS-4.0"-MS 1350	11858	10829	9929	9136	8435	7811	7254	6755	6306

Note: Critical speed of driveshaft (RPM)

Driveshaft lengths are center to center of universal joint