

Operating Speed

A number of factors influence the maximum RPM at which a driveshaft can be operated. The major criteria are as follows:

1. Overall length
2. Tube diameter
3. Universal joint angle
4. Mating component rigidity

The following Tables I, II, and III collectively define guidelines for the first three criteria.

Table I illustrates the maximum RPM normally allowed on the various universal joint sizes. The values are subject to the angle and speed limitations as defined in Tables II and Table III.

Table II defines the maximum allowable universal joint angle when operated at the specific RPM. These values are based upon an angular acceleration of approximately 1000 Rad/Sec.². This has been found to be acceptable in most applications. The table assumes a two joint system with operating u-joint angles of Driver and Driven shafts within 1° of each other.

TABLE I

Universal Joint Size	Maximum RPM
2C	6000
3C	6000
4C	5000
5C	5000
6C	5000
7C	4500
8C	4500
8.5C	4500
9C	4500
9.5C	4500
10C	3000
10.5C	3000
11C	2500
12C	2500
15C	2500

TABLE II

RPM	Angle
2000	8.50
2500	7.00
3000	5.75
3500	5.00
4000	4.25
4500	3.75
5000	3.25

Note that, for a given torque, the calculated universal joint life decreases as the universal joint angle increases.

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Operating Speed (continued)

Table III relates the maximum shaft length to operating RPM for the standard tube size. Be sure to consider any overspeed conditions.

See Tables I and II for limiting factors on operating speeds

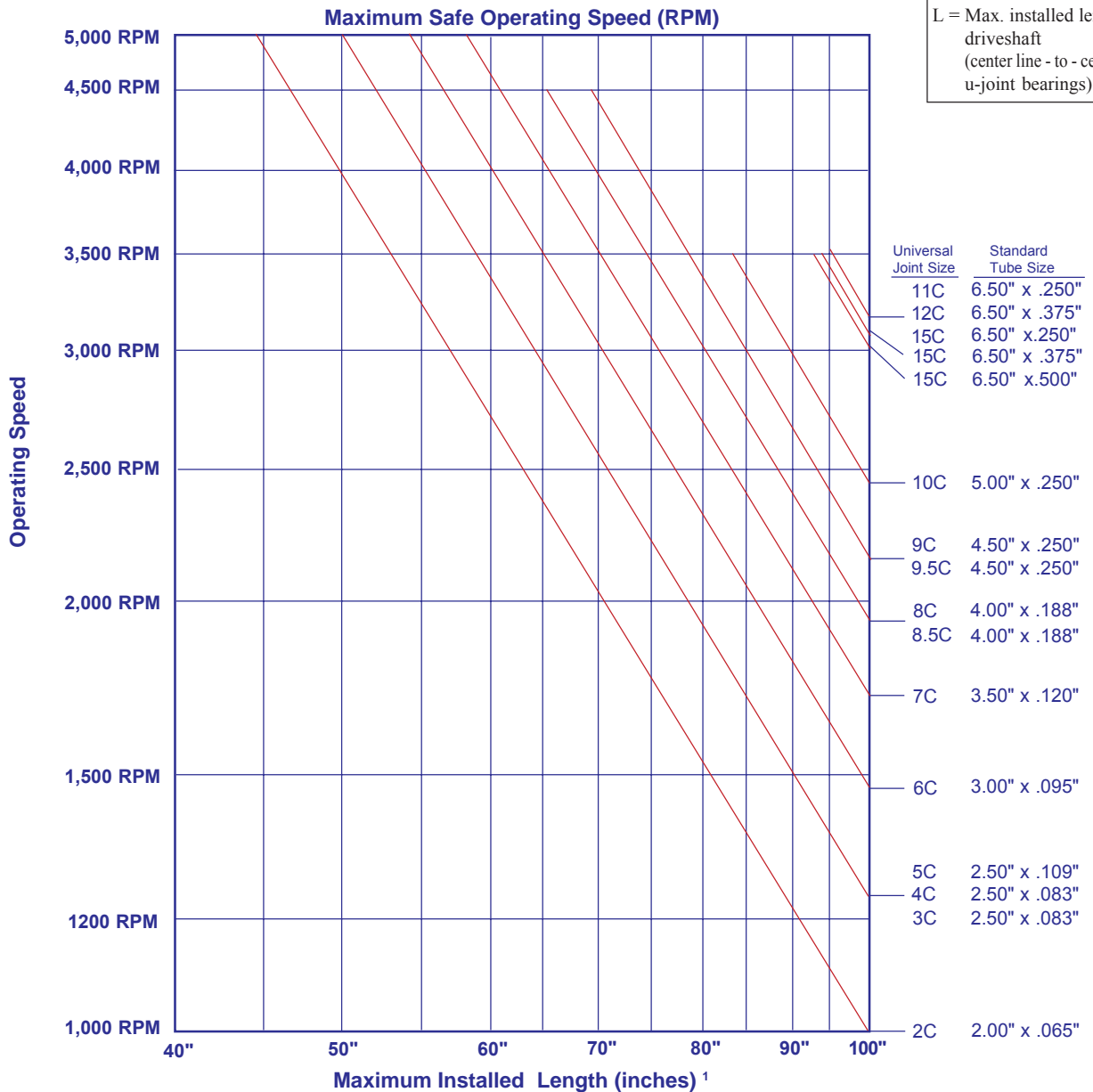
Larger diameter tubing is available on certain universal joint sizes to raise the operating RPM.

For other tube sizes or lengths not shown, the maximum safe operating speed can be determined by using the following formula.

$$\text{Max. Safe Operating Speed} = \frac{4.8 \times 10^6 \times .75 \sqrt{\text{ID}^2 + \text{OD}^2}}{L^2}$$

ID = Inner diameter of tube
 OD = Outer diameter of tube
 L = Max. installed length of driveshaft (center line - to - center line of u-joint bearings)

TABLE III



¹ Consult Rockford Powertrain regarding operating speeds for shaft lengths exceeding 70 inches (center line-to-center line of universal joint bearings).

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