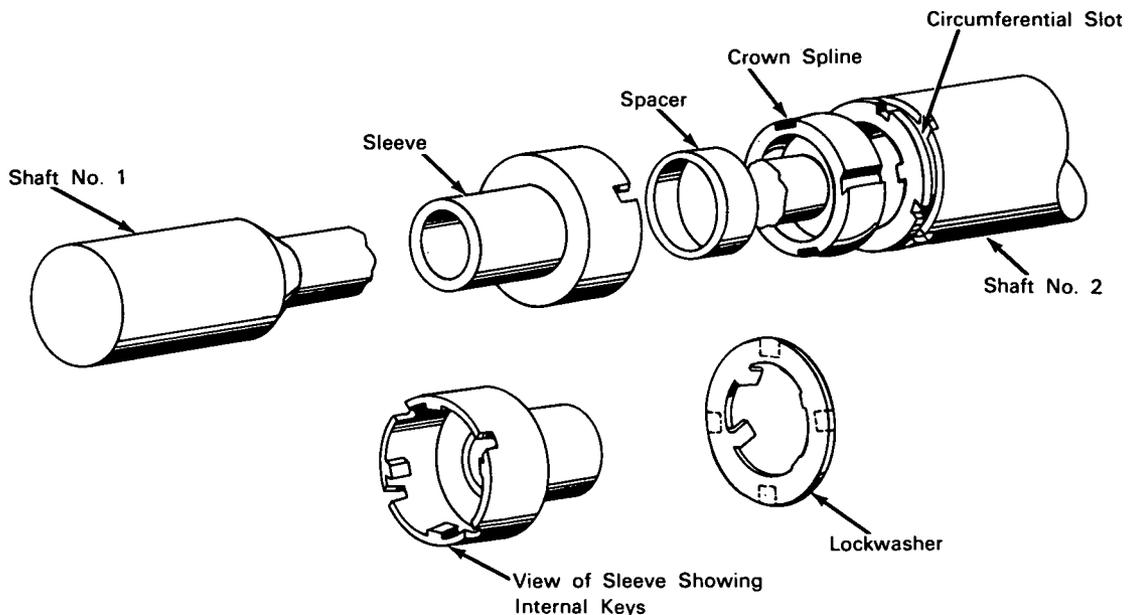


# NASA TECH BRIEF



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## New Coupling Compensates for Shaft Misalignment



**The problem:** To couple male and female splined shafts that are not perfectly aligned. The coupling must not be speed limited and in the event of a mechanical failure, all parts must be contained.

**The solution:** A four-piece coupling that permits angular displacement by means of a crown spline and sleeve arrangement. The sleeve affords protection in the event of mechanical failure by containing the other components.

**How it's done:** The sleeve and spacer are held in place on shaft 1 by the crown spline which is press-fit on the end of the shaft. The lockwasher is slipped over the shoulder of shaft 2 when its bent internal tabs index with the 4 slots in the shoulder and it enters the circumferential slot. It is then rotated 30° so its internal

tabs index with the cutouts in the back face of the circumferential slot and it is pressed home. The assembled sleeve, spacer, and crown spline mounted on shaft 1 are moved forward until the crown spline slots index with the keys in the bore of shaft 2 and the crown spline enters the bore. At the same time, the sleeve is rotated so that its internal keys index with the slots on the shoulder and as it is pressed forward these internal keys enter the circumferential slot. The sleeve is rotated 30° so that the slots in its face index with the 4 cut but unbent tabs of the lockwasher. These tabs are bent down into the slots in the face of the sleeve and assembly is complete. The lockwasher cannot slip because of its internal bent tabs and the sleeve is prevented from slipping by the lockwasher's bent external tabs. Both sleeve and lockwasher are

(continued overleaf)

prevented from moving axially by the position of the internal keys of the sleeve as they ride in the channel of the circumferential slot. Torque is transmitted between the shafts by the crown spline which, due to its crown contour, accommodates slight misalignment between the shafts.

**Notes:**

1. This coupling has one advantage over other existing couplings in that there would appear to be no speed limitation to the device within the angular misalignment limits.

2. Inquiries concerning this innovation may be directed to:

NASA Space Nuclear Propulsion Office  
Technology Utilization Branch  
U.S. Atomic Energy Commission Bldg.  
Germantown, Maryland  
Reference: B65-10077

**Patent status:** NASA encourages commercial use of this innovation. No patent action is contemplated.  
Source: Westinghouse Electric Corporation  
under contract to NASA Space  
Nuclear Propulsion Office  
(NU-0013)