Here the drive side crankshaft nut came loose just once too often, and the sprocket was a simple easy push fit onto the crank, proving too much for the woodruft key. Not only did the key break, but also a good part of the crank fractured away.

I would normally consider such a crank to be scrap, but with nothing to loose I wondered if I could fix it. I welded it up using a TIG welder and ground it back on my lathe with a toolpost grinder. Not a crank that I would race with, but in a slave engine for testing parts or exhausts, it would do very nicely thank you.

This is the result of storing a motor for many years before it eventually goes to a dealer and on to you at autojumble. Water and condensation have ruined the bearing surface of this Alpha crankshaft since the loose rollers in an alloy cage run directly on the crank surface. See repair later in text.

## Dismantling the crankshaft

It should be dismantled and rebuilt for the start of each season, and will last for at least 20 days of racing or enduro, but depending on your activity, this may not be an entire season especially if you include test days and practise sessions. A crankshaft rebuild should last at least two seasons under trials conditions, and 10,000 miles on the road.

To dismantle a crank you need a 4 ton press. The ideal is that there should be no detectible longitudinal play in either big end or small end bearings while clean and dry. Some small amount of movement is acceptable if you use Castrol R, say 2 thou maximum. The Villiers cranks use side shims on the bigend pin to restrict the side to side movement of the conrod to within 20 thou or so, some movement is clearly required to allow the oil an easy entry path. The modern Honda MX machines seem to shim the conrod at the smallend to virtually no end float at all, and leave the bigend to float without shims or restraint.

An example of what can happen is John's racing crank which was perfect at the start of the 1993 season, and finished with 2 thou movement at the end of the season. He was really lucky to finish as the ground bearing surface of the crankpin was missing from the underside of the pin, and this missing material gave the 2 thou play vertically up and down, but at 90° there was no play at all.

Some cranks take a stepped 20/22 mm pin, others take a straight 22 mm crankpin, the author slightly prefers to use 22mm Yamaha pins rather than Villiers components, whatever the pin choice, it should need over 2 tons to push the pin in, much less than 2 tons then get an oversize crankpin. With an oversize pin and a new bearing, the rod may no longer fit, so you need a selection of good condition rods with different amounts of wear if you must do it yourself.

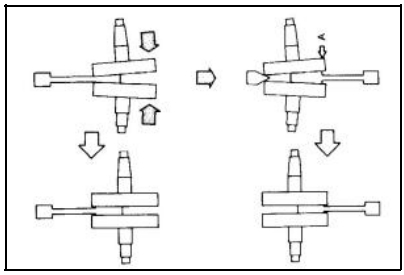

**Figure 17** Correcting misalignment

Putting a crank back together again is a straightforward but difficult and time consuming job unless you have the knack for it. The crank is assembled in a vice to start with and later in a press, and must be so that the crank halves are exactly in unison on the crankpin. Start by nipping up in the vice and then check by rule and eye to see if they are in line and reasonable square. Now use the vice to press the pin in some 2 mm into the crank and check more accurately. This is your last chance to get it right, when the flywheels are pressed together it will take