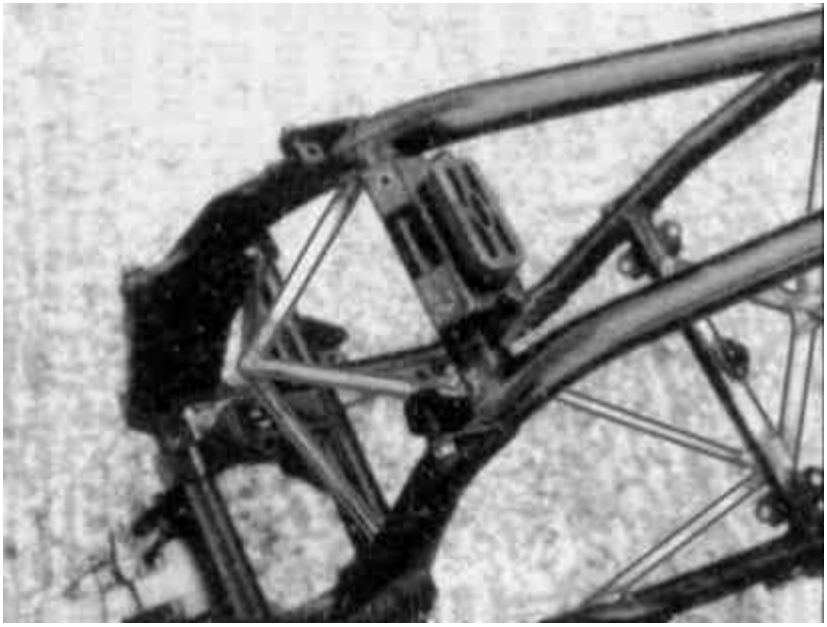
Measurement

Before staring work on such a project it is very useful to measure the frame stiffness, as this way you can keep a check on the effectiveness of your work. This is not as difficult as it sounds, because you are only after a comparative figure and great accuracy is not necessary for our purposes.
I have a heavy piece of tubing which is machined to be a good fit in the swing arm mounting of the frame, this piece of tubing is then fixed to a rigid piece of machinery in the workshop, although any solid object will do, such as a wall. For convenience of loading this mounting tube is located vertically, so that when the frame is mounted on it the frame lies horizontally. The frame can be loaded in torsion and lateral bending by applying a force to the end of another piece of tubing through the head-stock, this should be a good fit in the head-stock and if about three or four feet long it will be possible to significantly flex the frame with moderate hand pressure on the end of this tube. Frightening isn't it? Whenever I have done this in front of an audience, there is disbelief and amazement at the degree of deflection that can so easily be produced. If a constant load is applied through a spring balance always in the same place along the tube then we can compare the frame stiffness during the course of modification. Perhaps a more valuable consequence of this controlled loading is that we can actually see and measure the pattern of deformation within the frame. This makes it very easy to assess where it is most important to put bracing tubes and where it would be largely ineffective.

Main frame

The photographs show the finished modifications that were done on this Kawasaki 750., and incorporated are examples of many of the techniques mentioned in other chapters.



This pyramid above the swing arm pivot area is a very effective way of adding some torsional stiffness to an area subject to twisting deformation.