



SAFETY HAZARD ALERT

Plate Filter Presses

A miner was killed when two large hydraulic cylinders used on a press that de-waters slurry catastrophically failed while the press was in operation. View the fatalgram at <http://www.msha.gov/FATALS/2013/FAB13c02.asp>.

The two cylinders of the Jingjin 2000x2000x40 quick opening automatic membrane filter press failed simultaneously at their mounting flanges. The mounting flanges were located at the piston end of the cylinder (cylinder head). When the press was operating, high stresses were applied where the cylinder was welded to the mounting flange. Cracks developed at the cylinder-to-flange connection in a relatively short period of time. The press had been in operation for approximately 18 months. The photographs below show a flange on a second press at the mine with similar cracks in the cylinder.



Flange, cylinder, and piston



Cracks in cylinder body and flange

Due to the rapid development of the cracks and the resulting catastrophic failure of the cylinders, MSHA recommends that all mine operators inspect flange-to-cylinder weld areas for cracks on all similarly designed plate filter presses. Inspection of the mounting bolts and the frame mounts should also be conducted. The inspection should be performed by personnel with experience in non-destructive examination of metal components with suspected cracking. Noticeable flexing or other movement of the press superstructure strongly indicates likely cracking of the cylinder. A periodic inspection schedule should be implemented on all presses which utilize this or similar designs.

The proper design, maintenance, and operating parameters of hydraulic components and circuits are essential to the safe operation of hydraulic systems. MSHA requests that mine operators notify MSHA of any cylinder found to contain cracks. Reports of cracks and requests for additional information should be directed to Phil McCabe at 304-547-2315 or McCabe.Phillip@dol.gov.