

AIR LEAKS AND WHAT THEY COST

By Ian Speer

Well here I am writing the second article. I had responses from within Australia and overseas as well to the article about Separators and Strategies to Improve their Life plus some comments about the picture.

I would like to thank all who took the time to contact me. It is interesting to learn about the experiences of people in the field and I will continue to try to respond individually. For people troubled by my mixing imperial and metric units, sorry but they both seem to be used in our business. This month's missive addresses an often ignored subject.

AIR LEAKS AND WHAT THEY COST

Air is free! Maybe so, but compressed air is one of the most expensive energy sources available. Just how expensive can be seen from the table below which compares the operating costs of a few different devices with similar outputs.

A 25 bhp electric motor, energy cost A\$0.06/kWh = $18.5 \times 6 =$ A\$1.11/h to run

A 25 bhp diesel motor say 220g/kWh = 4.1 kg/h of fuel or about 4.7 litres/h @ 60c/l = A\$2.80/h

A DTH hammer developing about 25 bhp requires a 750/350 compressor to run effectively.

Such a compressor will need about 300 bhp to drive it thus $300 \times 0.746 \times 0.212^* = 47.4$ kg/h or about 55 litres/h @ say 60c/l = A\$33.00/h

* The larger motor will be more fuel efficient

These figures are approximations and DO not take into account wear and tear, servicing or other consumables however they do illustrate just how expensive compressed air is.

EXCUSES

- It's only a small leak.
- It's too hard to fix.
- The fitters can do it.
- We do not have time to fix the leak during this service.
- We will do it next time.

There are lots more where these came from.

A 1/8 inch diameter hole will leak 60 scfm at 350 psig which is 8% of the output of a 750/350 compressor or A\$31.68 for 12 hours operation.

For a six day week over a full year the cost will be A\$9000.00/year or A\$750.00/month.

Many rigs have more than one leak and the direct fuel waste is enormous. In addition to the direct fuel cost, wear and tear on the equipment, fuel transport and storage costs there is another even larger cost.

LOSS OF PRODUCTION

If we use an example of a 900/350 operating a typical 5 inch RC hammer. The hammer should hold about 350 psig if it and the rods and swivels are in good condition. If such a system had 80 scfm of leaks which is quite possible then the hammer will hold about 40 psig lower pressure.

The loss of pressure to drive the hammer will directly reduce the performance of the hammer as well as reducing the flushing of the drilled cuttings away from the face of the bit. Not convinced? Try lowering your air pressure 40 psig by reducing the setting on your high pressure regulator and watch your drilling speed. I will be interested in your results.

WHAT TO DO?

- 1 Fix all the air leaks you can find around the rig and if possible test with a leak detector or soapy water in a squeeze bottle. Not your hand!
- 2 Keep all inner tube O rings in good condition.
- 3 Consider ordering inner tubes that have several O ring grooves per joint.
- 4 Check your rod joints and the internal O rings in your hammer regularly.
- 5 Check your running and shutdown blowdown valves (RBDV & SDBDV) for leaks, neither should pass any air when drilling at full capacity.

Point 5 is very important if you have a late-model, 2-stage unit as many of these have the RBDV and SDBDV exhausts plumbed into a common muffler. The result of this practice is that detection of a leaking or worn valve is difficult.

I prefer to see the RBDV and SDBDV fitted with separate mufflers and exhausted directly to the atmosphere it is then easy to find a leak and regain the lost performance.

Some units also have their running blowdown exhaust connected back to the compressor intake and this is part of the design of the air regulation system and can serve as an anti rumble (cavitation) function. In these cases one has to be aware of the issues and check periodically for leaks. Fitting a pair of 1/2 inch ball valves to enable the line from the running blowdown to be temporarily closed and the second valve opened to atmosphere to check for leaks may be a simple alternative.

Not much to it but there is potential to save a lot of money.

In general industry it is accepted that up to 20% of all compressed air is lost to leaks. I believe that the drilling industry performs better than that figure but ALL air leaks fixed will translate into direct savings and increased production which is good for the driller and the rig owner.

Go fix the leaks and invite me to the party you can have with the savings.

Ian Speer

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