INDECO AUSTRALIA P/L

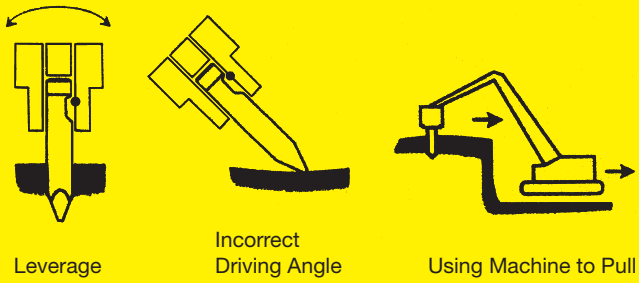
ABN 96 056 693 344

HYDRAULIC BREAKER CHISEL

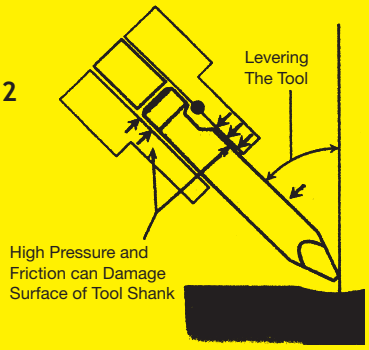
1. The main cause of increased fatigue stress in a demolition tool is any form of side pressure during service which creates bending.

Utilizing the tool as a lever, using the incorrect driving angle or attempting to break ground using the pull of the machine are all detrimental to the life of a demolition tool. Used incorrectly, the tool will 'snap the tool like a carrot'.

◆ **Fig 1**



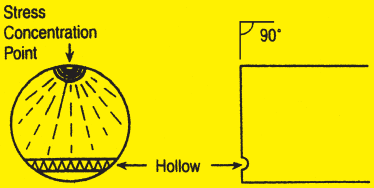
◆ **Fig 2**



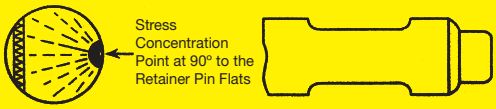
Indeco Demolition tools are manufactured from first class materials and then heat treated to produce a fatigue and wear resistant tool. Thus when a tool has apparently failed to give a satisfactory service life, a brief visual inspection can often give a quick indication of the cause.

◆ **Fig 3.** Typical fractures caused by excessive bending/leverage of the demolition tool. Warranty claims rejected.

◆ **Fig 4.** Typical of high stress fracture, usually caused by using the machine to "pull". Warranty claims rejected.



◆ **Fig 5.** Typical fracture caused by levering tool. Warranty claims rejected



Other causes of increased fatigue stress in demolition tools include.

a) 'Free running'. This is any situation where the hammer piston strikes the top of the demolition tool, but the working end is not a proper contact with the rock or concrete to be broken. This includes jobs where the tool slides off the work and also when breakthrough of thin concrete slabs or boulders occur.

b) Mechanical and thermal damage, any form or damage to the surface of a demolition tool renders it more liable to suffer fatigue failure. Thus all care must be exercised to prevent accidental gouging or contact welding 'galling' or 'pick-up', due to contact between the tool and chuck bushings through the lack of lubrication or excessive leverage. (see Figure 2)

c) Lubrication Care must be taken to avoid metal to metal contact that, as a result of galling or pick-up could cause deep damage marks which, in turn, lead to the formation of fatigue cracks and eventual failure of the demolition tool. Ensure that the shank of the demolition tool is well lubricated before locating in the machine. Molybdenum bisulphide grease is recommended for this application at three hourly intervals as per manufacturers instructions.

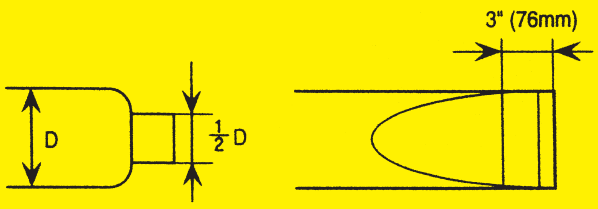
d) Corrosion A rusty demolition tool is more likely to suffer fatigue failure, thus keep tools well greased and sheltered from the weather when not in use.

WEAR

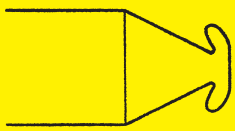
Wear is influenced by group conditions, but as a general guide the following applies:
Blank tools worn more than 1/2 diameter or moils and chisels worn back from the 3" (76mm) of working end classed as reasonable life (Ref Figure 9). Warranty claims rejected.

Mushrooming: this is caused by driving the chisel or points into hard dense material for too long a period of time without penetration. This generates intense heat, softening the point, thus causing it to 'mushroom'. This is not a manufacturing fault (Ref Figure 10). Warranty claims rejected.

◆ **Fig 9**



◆ **Fig 10**



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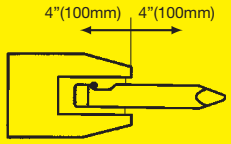
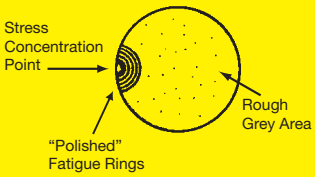
HYDRAULIC BREAKER CHISEL

A demolition tool fatigue failure will generally occur approximately 4” (100mm) either side of the chuck front face (see fig 6). Another slightly less common failure area can fall approximately 8” (200mm) from the working end, subject to nature of use.
The fracture face itself will normally exhibit a semicircular polished area with the remainder being of a rougher appearance (see Fig 7). The polished semi-circular area in Figure 7 is the fatigue area and generally starts from a damage mark or other stress raiser on the outside of the demolition tool and spreads inwards. The fatigue area slowly widens until the stresses being applied cause the remaining section to fail. Generally, the size of the fatigue area indicates the level of stress applied to the tool, i.e. the smaller the fatigue area, the higher the stress level, although once a fatigue crack has taken place, it requires a lower stress level to cause it to grow.

◆ **Fig 6**



◆ **Fig 7**

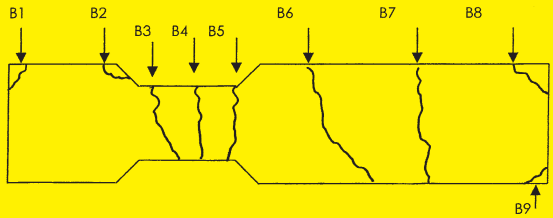


◆ **Fig 8**

Note fatigue lines Originate from the internal point, not outer diameter, Very rare failure due to steel defect.

100% warranty accepted.

◆ **Fig 9**



B1: Excessive wear of the bushlty
B2 & B3: Repeated blank firing
B4,B5,B6 & B7: Bending overload from excessive prying or slant
B8: Hammering without adequate pressure on the rock
B9: Hammering by leaving the chisel too long in the one place without breaking the rock

WARRANTY GUIDE

- If a chisel is of faulty manufacture, it will fail within the first ten days of use.
- A quality chisel can also fail in this period if it is subject to operational abuse and misuse
- Indeco Australia warrants chisels supplied by them for a period of 30 Days
- For a warranted tool failure, a pro-rata credit up to 80% maximum will be issued

Other common causes of breakage include:

- Bending overload - due to excessive levering or slant hammering - Warranty Rejected
- Bending overload - due to worn bushes or retainers - Warranty Rejected
- Fatigue stress and misuse - Warranty Rejected
- Inadequate Lubrication - Warranty Rejected
- ‘Cold’ start-up and operation - Warranty Rejected
- Steel or manufacturing defect - Warranty Approved

The greatest percentage of chisel failures are caused when the chisel is cold. Start up the machine and warm up hydraulic oil before firing the breaker. When the oil is warm, idle the machine and carefully operate the breaker for 5 to 10 minutes before operating at full power. For tool care and operation, the following must also be complied with:

- When a hammer is operating correctly, two variable tresses are developed in the tool:
  a) When the piston strikes the tool - the tool steel is compressed
  b) When the piston rises - the tool steel expands. The continuous reversal of compression and expansion forces create fatigue stresses in the tool. Even tools of superior quality can often break before they are worn out.

- Grease tool shank before installation
- Allow the tool to warm up
- Do not force or lever the tool
- Always apply pressure on the tool when breaking
- Avoid heat build up - Move the tool every 15 seconds
- Do not weld or apply heat to the tool.
- Sharpen only on milling machine or lathe
- Store tool in a dry area to prevent rust