



DRILL BIT SPECIFICATIONS

Bit Maintenance

- Bit wear and performance is dependent on ground conditions and operating procedure. Bits need regular sharpening to achieve full performance. SH&B recommend sharpening when a 1/3rd of the button profile is flat. The profile should be returned as close as possible to the original shape. In certain conditions the body around the buttons will also need to be addressed. The selection of correct grade of carbide is also important.
- The spline and retention areas should be inspected regularly. Galling on the drive surface will lead to premature bit failure. Excessive rotation torque and down feed weight will cause spline galling.
- The bit head shoulder mushrooms over time. This section may need to be dressed with a light grinder to avoid air restriction.

Bit Selection

- Incorrect drill bit selection can have a detrimental effect on the bit and also a hammers performance.
- SH&B offer a range of cutting structures to suit most ground conditions.
- Soft to medium ground conditions
 - Drop Centre (DCFE), 4 face flushing grooves
 - Variants
 - Full Ballistic (FB)
 - Semi Ballistic (SB)
- Hard ground conditions
 - Drop Centre (DC), 2 face flushing grooves

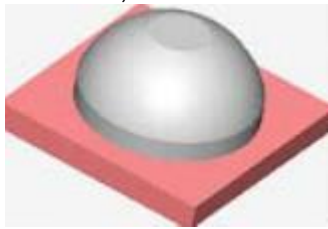


Drill bit resharpen/reshape guidelines

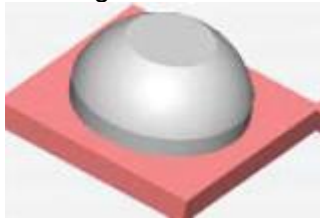
Carbides must be resharpened when:

- A drop in penetration is first noticed
- A wear flat one third (1/3) of the carbide diameter develops
- If 'snake skin' cracking is observed on the carbide surface

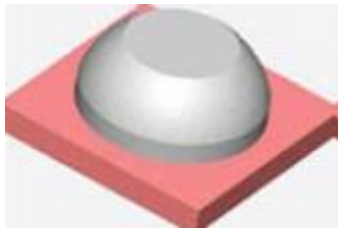
When a wear flat is 1/3 of button diameter, it should be resharpened.



A wear flat 1/2 of button diameter indicates too long an interval between sharpening events.



A wear flat of this magnitude indicates the bit has been grossly over-run and failure is likely to occur.



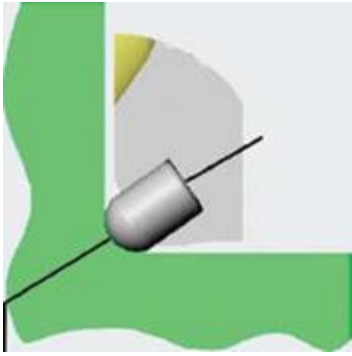
IMPORTANT: When resharpening buttons, make every attempt to restore their original profile. Buttons with a flat profile dramatically reduce the hammer/bit efficiency to fracture rock.

Characteristics of tungsten carbide buttons

- Immensely strong in compression loading;
- Relatively weak in shear (side) loading;

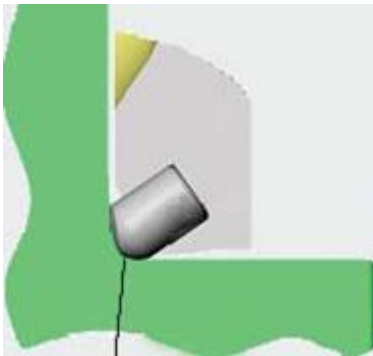
Extremely sensitive to stress concentrators such as grooves & snake skin/heat check surface cracks.

Sharp Button



The design and characteristics of a bit face is such that in operation the gauge buttons are subject, in the main, to compressive loading.

Worn Button



The generation of medium to large wear flats completely changes the direction of the applied forces from compressive loading to shear loading.

Sheared Button



Shear (side) loading of carbide buttons, under the fluctuating dynamics of drilling, can ultimately result in button breakage.

Button breakage due to shear loading is one of the most common modes of gauge row carbide failure.

Bit insert grinding/reshaping

To assure optimum performance levels from SH&B reverse circulation bits, it is advisable to reshape the tungsten carbide inserts as they wear. After a period of drilling, the buttons tend to develop a flat surface, rather than the original ovoid-rounded shape, and this can slow penetration rates and shorten life. This “flat” enlarges the longer the bit drills. Inspection and

experience (noting when penetration rates tend to decrease) can indicate when reshaping should be performed.

When to reshape

Experience has indicated the following as guidelines for resharpening buttons in order to retain drilling efficiency and maximise bit life. Overrun bits will result in high stresses imposed on the bit and may result in button breakages, face “chunking” and excessive spline stress.

When to reshape buttons

- A drop in penetration is first noticed.
- A wear flat one-third (1/3rd) of button diameter develops.
- If snake skin cracking is observed on wear surface.
- If stress chipping occurs, particularly on gauge buttons.

Grinding/reshaping procedure

- To restore the bit to maximum drilling efficiency, the approximate original shape of the button should be restored.
- The use of an automated or manual rotary mounted point grinder is advisable (20,000 – 25,000 RPM) with a shaped vitrified silicon carbide grinding wheel of 60 to 80 grit and J to L hardness. Diamond wheels with coolant application can also be used.
- When using a manual tool grind from the centre of the flat, rolling the wheel down the side of the button to remove the edge. Continue until the button is reshaped to an ovoid or rounded configuration.
- The reshaped button will be somewhat smaller than when new, but drilling efficiency will be restored. Although the gauge buttons are the most important to reshape because they are subject to higher wear, penetration rates will also be helped if the face button configurations are restored.
- It is recommended that face buttons be reshaped each time the gauge buttons are ground, even though the face buttons may not have worn to the same extent as the gauge buttons.

Before Resharpen



After Resharpen

