Diamond Tools and Equipment
Basic Training Booklet
1. Use something hard to cut something soft / use something soft to cut something hard.
   When cutting concrete (hard material) - use a softer bond.
   When cutting asphalt (soft material) - use a hard bond.
   Many factors change the bonds, but this is the basic building blocks for using diamond tools.

2. Start in the middle; then adjust.
   Starting with a mid-range, general purpose bond makes it easier to dial-in the correct adjustments needed for
   which bond specification to be used for the most effective cutting.

3. Never say no!
   This is the DIAMOND PRODUCTS advantage.
   We can make a custom bond to match the exact application.

In soft material, diamonds hold their shape for a long time and do not fracture as quickly.

You want to hold on to those diamonds longer – a **hard** bond will do that in that **soft** material.

In hard material, diamonds fracture more quickly.

You want to release these and expose new diamonds faster – a **soft** bond will do that in **hard** material.

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**WHEN SEARCHING FOR THE RIGHT DIAMOND TOOL, ASK THE RIGHT QUESTIONS:**

What Are You Cutting? (concrete, asphalt, green concrete, block, etc)

What Type of Saw Are You Using? (walk behind, high speed, masonry, etc)

What Size Blade Do You Need? (12”, 14”, 16”, etc)

Wet or Dry Cutting? (water or air cooling)

What Price Range?
A diamond blade is circular steel disc with a diamond bearing edge. The edge or rim can have either a segmented, continuous or serrated rim configuration. The blade core is a precision made steel disc which may have slots called ‘gullets’. These provide faster cooling by allowing water or air to flow between the segments. These slots also allow the blade to flex. Blade cores are tensioned so that the blade will run straight at the proper cutting speed. Proper tension also allows the blade to remain flexible enough to bend slightly under cutting pressure and then go back to its original position. Diamond segments or rims are made up of a mixture of diamonds and metal powders. The diamonds used in bits and blades are man made (synthetic) and are carefully selected diamonds are then mixed with powder consisting of metals such as cobalt, iron, tungsten, carbide, copper, and other materials. This mixture is then molded into shape and then heated at temperatures from 1700 to 2300 under pressure to form a solid metal part called the ‘bond’ or ‘matrix’.

The segment or rim is slightly wider than the blade core. This side clearance allows the cutting edge to penetrate the material being cut without the steel dragging against the sides of the cut. There are several methods of attaching the segments to the steel core. Brazing - Silver solder is placed between the segment and the core is then heated until the solder melts and bonds the two together. This method is used for wet cutting blades only. Laser welding - The diamond segment and steel core are welded together by a laser beam. Mechanical bond - A notched, serrated or texture blade core may be used to “lock” the diamond rim or segments onto the edge of the blade. Mechanical bonds usually also include brazing or other metallurgical bonding processes to hold the rim or segments in place. After the blade is assembled it is ‘opened’, ‘broken in’ or ‘dressed’ by grinding the edge concentric to the center. This exposes the diamonds that will be doing the work and establishes the cutting direction as noted by the direction arrow stamped into the blade.

**TYPES OF DIAMOND BLADES**

Diamond blades don’t cut, they grind! The exposed diamond crystals do the grinding work. The metal matrix or bond holds the diamonds in place. Trailing behind each exposed diamond is a ‘bond tail’ which helps to support the diamond. As the blade rotates through the material the exposed surface diamonds grind the material being cut into fine powder.

After several thousand passes through the material being cut the exposed diamonds begin to crack and fracture. The matrix holding the diamond also begins to wear away.

Eventually the diamond completely breaks up and it's fragments are swept away with the material that it is grinding.

As the old diamonds are worn down they are replaced by the new ones and the process continues until the blade is worn out.

**HOW DO DIAMOND CUTTING TOOLS WORK?**
Factors Involving Concrete
When cutting concrete, several factors influence your choice of diamond blades. These include compressive strength. Concrete slabs may vary greatly in compressive strength, measured in pounds per square inch (PSI). Compressive strength in concrete is a measurement of the load carrying capability of concrete:

<table>
<thead>
<tr>
<th>Concrete Hardness</th>
<th>PSI</th>
</tr>
</thead>
<tbody>
<tr>
<td>Critically Hard</td>
<td>8,000 or more</td>
</tr>
<tr>
<td>Hard</td>
<td>6,800</td>
</tr>
<tr>
<td>Medium</td>
<td>4,600</td>
</tr>
<tr>
<td>Soft</td>
<td>3,000 or less</td>
</tr>
</tbody>
</table>

Most concrete roads are 4,000 - 6,000 PSI, while typical patios or sidewalks are about 3,000 PSI.

Hardness of the Aggregate
There are many different types of rock used as aggregate. Hardness often varies even within the same classification of rock. For example, granite varies in hardness and friability (a measure of how easily a material crumbles) over a wide range of medium-soft to hard.

The Mohs scale is frequently used to measure aggregate hardness. Values of hardness are assigned from one to 10. A substance with a higher Mohs number scratches a substance with a lower number higher Mohs scale numbers indicate harder materials. The following table shows where some common minerals fall on the Mohs scale.

**Mohs Scale**

<table>
<thead>
<tr>
<th>Mohs</th>
<th>Aggregate</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Talc</td>
</tr>
<tr>
<td>2</td>
<td>Gypsum</td>
</tr>
<tr>
<td>3</td>
<td>Calcite</td>
</tr>
<tr>
<td>4</td>
<td>Flourite</td>
</tr>
<tr>
<td>5</td>
<td>Apatite</td>
</tr>
<tr>
<td>6</td>
<td>Feldspar</td>
</tr>
<tr>
<td>7</td>
<td>Quartz</td>
</tr>
<tr>
<td>8</td>
<td>Topaz</td>
</tr>
<tr>
<td>9</td>
<td>Corundum</td>
</tr>
<tr>
<td>10</td>
<td>Diamond</td>
</tr>
</tbody>
</table>

Most aggregates fall into the 2 to 9 range on the Mohs scale.

Aggregate hardness is one important factor when cutting concrete. Because hard aggregate dulls diamond more quickly, segment bonds generally need to be softer when cutting hard aggregate. This allows the segment to wear normally and bring new, sharp diamond grit to the surface. Softer aggregate will not dull diamond grit as quickly, so harder segment bonds are needed to hold the diamonds in place long enough to use their full potential.

Size of the Aggregate
The size of aggregate affects diamond blade performance. Large aggregates tend to make a blade cut slower. Smaller aggregates tend to make a blade cut faster. The most common standard sizes of aggregate are:

- **Pea Gravel** - variable in size, usually 3/8” or less in diameter
- **¾ inch** - sieved size of ¾” or less
- **1-1/2 inch** - sieved size of 1-1/2” or less
FACTORS THAT AFFECT PERFORMANCE

Compressive Strength
Concrete may vary greatly in compressive strength which is measured in POUNDS per SQUARE INCH (PSI). Most concrete roads are approximately 4-6,000 PSI, while typical patios and sidewalks are about 3,000 PSI.

<table>
<thead>
<tr>
<th>Concrete Hardness</th>
<th>PSI</th>
<th>Application</th>
</tr>
</thead>
<tbody>
<tr>
<td>Critically Hard</td>
<td>8,000+</td>
<td>Nuclear plants</td>
</tr>
<tr>
<td>Hard</td>
<td>6-8,000</td>
<td>Bridge piers</td>
</tr>
<tr>
<td>Medium</td>
<td>4-6,000</td>
<td>Highways</td>
</tr>
<tr>
<td>Soft</td>
<td>3,000 or less</td>
<td>Sidewalks/Patios</td>
</tr>
</tbody>
</table>

Types of Sand
Sand is the component of the mix which determines the abrasiveness of the concrete. Sand can either be ‘sharp’ (abrasive) or ‘round’ (non-abrasive). Crushed sand or bank sand are usually sharp; river sand is usually round.

Reinforcing Steel
Steel reinforcing tends to make a blade cut slower. Less reinforcing allows a blade to cut faster. Heavy rebar can also result from different grades of steel. Typical rebar is grade 40 but grade 60 is also common. Rebar gauges are in eighths of an inch. #4 is 1/2” diameter, #5 is 5/8” diameter, etc.

<table>
<thead>
<tr>
<th>Size</th>
<th>Examples</th>
</tr>
</thead>
<tbody>
<tr>
<td>Light</td>
<td>Wire mesh, single mat</td>
</tr>
<tr>
<td>Medium</td>
<td>#4 rebar, every 12” on center each way (OCEW) single mat, wire mesh, multi-mat</td>
</tr>
<tr>
<td>Heavy</td>
<td>#5 rebar, 12” OCEW, single mat #4 rebar, 12” OCEW, double mat</td>
</tr>
</tbody>
</table>

Green or Cured Concrete
The drying or curing of concrete greatly affects how the concrete will interact with a diamond blade. Green concrete is freshly poured concrete that has not yet cured. It is softer and more abrasive than cured concrete. Harder bond with undercut protection should be used in this application until it is cured at which point a softer bond would be appropriate. The definition of green concrete can vary widely. Water, temperature, moisture in the aggregate, time of the year and the amount of water in the mix all influence the curing time. It is generally considered “green” for 8 to 48 hours after it has set.

Horsepower and Variables
If a blade is used with a machine that does not have sufficient horsepower for the diamond / bond system, the blade will not perform well. Diamond particles will polish forming flat spots and the blade will become glazed. Typically flat saws range in power from 8 to 75 horsepower. In selecting a blade, manufacturers or distributors should be told what the horsepower of the saw is. Using a blade designed for low horsepower saws on a high horsepower saw will result in fast cutting rate and short blade life. Using a blade designed for high horsepower saws on a low horsepower saw will result in slow cutting rates, long blade life.

To summarize all of these factors that impact blade performance the following chart is presented.

<table>
<thead>
<tr>
<th>Variables</th>
<th>Change</th>
<th>RESULTS</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Cutting Speed</td>
</tr>
<tr>
<td>The Blade</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Segment Bond Hardness</td>
<td>Harder</td>
<td>Slower</td>
</tr>
<tr>
<td></td>
<td>Softer</td>
<td>Faster</td>
</tr>
<tr>
<td>Diamond Quality</td>
<td>Lower</td>
<td>Slower</td>
</tr>
<tr>
<td></td>
<td>Higher</td>
<td>Faster</td>
</tr>
<tr>
<td>Diamond Concentration</td>
<td>Lower</td>
<td>Slower</td>
</tr>
<tr>
<td></td>
<td>Higher</td>
<td>Faster</td>
</tr>
<tr>
<td>Segment Width</td>
<td>Thinner</td>
<td>Slower</td>
</tr>
<tr>
<td></td>
<td>Thicker</td>
<td>Faster</td>
</tr>
<tr>
<td>The Saw</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Horse Power</td>
<td>Lower</td>
<td>Slower</td>
</tr>
<tr>
<td></td>
<td>Higher</td>
<td>Faster</td>
</tr>
<tr>
<td>Blade Speed</td>
<td>Higher</td>
<td>Slower</td>
</tr>
<tr>
<td></td>
<td>Lower</td>
<td>Faster</td>
</tr>
<tr>
<td>The Job</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Water Volume</td>
<td>Higher</td>
<td>Slower</td>
</tr>
<tr>
<td></td>
<td>Lower</td>
<td>Faster</td>
</tr>
<tr>
<td>Cutting Depth</td>
<td>Deep</td>
<td>Slower</td>
</tr>
<tr>
<td></td>
<td>Shallow</td>
<td>Faster</td>
</tr>
<tr>
<td>Cutting Pressure</td>
<td>Lower</td>
<td>Slower</td>
</tr>
<tr>
<td></td>
<td>Higher</td>
<td>Faster</td>
</tr>
<tr>
<td>The Material</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Material Hardness</td>
<td>Harder</td>
<td>Slower</td>
</tr>
<tr>
<td></td>
<td>Softer</td>
<td>Faster</td>
</tr>
<tr>
<td>Material Abrasiveness</td>
<td>Less</td>
<td>Slower</td>
</tr>
<tr>
<td></td>
<td>More</td>
<td>Faster</td>
</tr>
<tr>
<td>Aggregate Size</td>
<td>Larger</td>
<td>Slower</td>
</tr>
<tr>
<td></td>
<td>Smaller</td>
<td>Faster</td>
</tr>
<tr>
<td>Steel Reinforcing</td>
<td>More</td>
<td>Slower</td>
</tr>
<tr>
<td></td>
<td>Less</td>
<td>Faster</td>
</tr>
</tbody>
</table>

High Speed Hand Saw
Masonry Saw
Small Electric Hand Tools
Low HP Push Walk Behind

Walk Behind Saws
Wall Saws
Tile Saws
Block Saws

INTERMITTENT CUTTING
CONTINUOUS CUTTING
LOW QUALITY SYNTHETIC DIAMONDS
- Weaker crystals with irregular shape
- Shorter life & lower cutting rates
- Lower thermal stability
- Does not handle steel & hard aggregates well
- Jagged points that break causing faster wear & lower cutting & drilling performance
- Widely used in lower priced dry products

MEDIUM QUALITY SYNTHETIC DIAMONDS
- Good crystal strength & shape
- Good for sawing & drilling applications
- Good cutting speed
- Handles moderate steel & hard aggregate applications

HIGH QUALITY SYNTHETIC DIAMONDS
- Strongest crystals
- Lasts longer
- Withstands high temperatures
- Octahedral shape for increased tool life & faster cutting
- High impact strength against steel & hard aggregate

QUESTIONS OF DIAMOND QUALITY

SEGMENT HEIGHT VS. DIAMOND DEPTH

Diamond Segment

Segment Height: The overall measurement of the total height - diamond depth + backer pad
Diamond Depth: Diamond-bearing portion of a segment made up of the metal bond/matrix
Backer Pad: Bottom portion of the segment that has no diamonds which is the weld point of the segment.

DIAMOND PRODUCTS DRY HIGH SPEED QUALITY GRADES

<table>
<thead>
<tr>
<th>High Speed Quality Grade</th>
<th>Quality Description</th>
<th>Segment Height</th>
<th>Diamond Depth</th>
</tr>
</thead>
<tbody>
<tr>
<td>Delux-Cut</td>
<td>Basic Quality</td>
<td>.512”</td>
<td>.377”</td>
</tr>
<tr>
<td>Star Blue</td>
<td>Good Quality &amp; Good Cutting Value</td>
<td>.472”</td>
<td>.394”</td>
</tr>
<tr>
<td>Standard Gold</td>
<td>Better Quality &amp; Better Cutting Value</td>
<td>.472”</td>
<td>.394”</td>
</tr>
<tr>
<td>Imperial Purple</td>
<td>Better Quality &amp; Very Good Cutting Life</td>
<td>.433”</td>
<td>.354”</td>
</tr>
<tr>
<td>X-tra Plus Red</td>
<td>Higher Quality &amp; Long Cutting Life</td>
<td>.350”</td>
<td>.255”</td>
</tr>
<tr>
<td>Heavy Duty Orange</td>
<td>Very High Quality &amp; Longer Cutting Life</td>
<td>.394”</td>
<td>.295”</td>
</tr>
<tr>
<td>Premium Black</td>
<td>Highest Quality &amp; Longest Cutting Life</td>
<td>.350”</td>
<td>.255”</td>
</tr>
</tbody>
</table>
**A QUESTION OF QUALITY**

Do you want to know the PRICE or how much it will COST?

**WHICH BLADE DO I SELL?**

Higher Quality Blades Offer Better Savings Down the Road

<table>
<thead>
<tr>
<th>Blade Type</th>
<th>Price</th>
<th>Approximate Life in Inch Feet (example)</th>
<th>Cost per Inch Foot</th>
</tr>
</thead>
<tbody>
<tr>
<td>14&quot; X .125 x 1&quot; Delux-Cut</td>
<td>$114</td>
<td>1,000</td>
<td>$0.11 per in. ft.</td>
</tr>
<tr>
<td>14&quot; X .125 x 1&quot; Imperial Purple</td>
<td>$392</td>
<td>5,000</td>
<td>$0.08 per in. ft.</td>
</tr>
<tr>
<td>14&quot; X .125 x 1&quot; Heavy Duty Orange</td>
<td>$600</td>
<td>10,000</td>
<td>$0.06 per in. ft.</td>
</tr>
</tbody>
</table>

**INCH FEET TO BE CUT**

- 25,000

**Cost per Inch Foot Calculation**

- **14" X .125 x 1" Delux-Cut**
  
  \[ \text{Cost per Inch Foot} = \frac{114}{1,000} = 0.11 \text{ per in. ft.} \]

- **14" X .125 x 1" Imperial Purple**
  
  \[ \text{Cost per Inch Foot} = \frac{392}{5,000} = 0.08 \text{ per in. ft.} \]

- **14" X .125 x 1" Heavy Duty Orange**
  
  \[ \text{Cost per Inch Foot} = \frac{600}{10,000} = 0.06 \text{ per in. ft.} \]

**Cost of Blades Calculation**

- **25,000 Inch Feet to be Cut**
  
  \[ \text{Cost of Blades} = \text{Cost per Inch Foot} \times 25,000 \]

- **14" X .125 x 1" Delux-Cut**
  
  \[ \text{Cost of Blades} = 0.11 \times 25,000 = $2,750 \]

- **14" X .125 x 1" Imperial Purple**
  
  \[ \text{Cost of Blades} = 0.08 \times 25,000 = $2,000 \]

- **14" X .125 x 1" Heavy Duty Orange**
  
  \[ \text{Cost of Blades} = 0.06 \times 25,000 = $1,500 \]

*Prices and inch footage shown are for example only and should not be used as a definitive amount. Footage rates vary depending on quality grade, bond spec and multiple other variables.*
**DIAMOND CUTTING FACTS**

**Diamond Blade Components** (Wet Blade Shown)

- **Blade Core** - The steel disc that makes up the main body of the blade which has an arbor hole in the center along with a drive pin hole.
- **Segment** - Metal matrix containing diamonds which are brazed or welded to the tube.
- **Slant Segment** - helps prevent undercutting of the blade core. Other types of wear protection are: Full Radius and Inserts.
- **Gullet** - laser-cut 'keyway' in the blade core that allows air cooling and gives space between segments.

**Walk Behind Wet Blades**

<table>
<thead>
<tr>
<th>Blade Diameter</th>
<th>Maximum Cutting Depth</th>
<th>Recommended Operating Speed RPM</th>
<th>Maximum Safe Speed RPM</th>
</tr>
</thead>
<tbody>
<tr>
<td>12&quot;</td>
<td>3-3/4&quot;</td>
<td>2900</td>
<td>4500</td>
</tr>
<tr>
<td>14&quot;</td>
<td>4-3/4&quot;</td>
<td>2900</td>
<td>3900</td>
</tr>
<tr>
<td>16&quot;</td>
<td>5-3/4&quot;</td>
<td>2600</td>
<td>3400</td>
</tr>
<tr>
<td>18&quot;</td>
<td>6-3/4&quot;</td>
<td>2600</td>
<td>3000</td>
</tr>
<tr>
<td>20&quot;</td>
<td>7-3/4&quot;</td>
<td>2450</td>
<td>2700</td>
</tr>
<tr>
<td>24&quot;</td>
<td>9-3/4&quot;</td>
<td>1950</td>
<td>2250</td>
</tr>
<tr>
<td>26&quot;</td>
<td>10-3/4&quot;</td>
<td>1950</td>
<td>2100</td>
</tr>
<tr>
<td>30&quot;</td>
<td>11-3/4&quot;</td>
<td>1650</td>
<td>1800</td>
</tr>
<tr>
<td>36&quot;</td>
<td>14-3/4&quot;</td>
<td>1300</td>
<td>1500</td>
</tr>
<tr>
<td>42&quot;</td>
<td>17&quot;</td>
<td>1050</td>
<td>1300</td>
</tr>
<tr>
<td>48&quot;</td>
<td>20&quot;</td>
<td>900</td>
<td>1000</td>
</tr>
</tbody>
</table>

**Dry Blades**

<table>
<thead>
<tr>
<th>Blade Diameter</th>
<th>Maximum Cutting Depth</th>
<th>Recommended Operating Speed RPM</th>
<th>Maximum Safe Speed RPM</th>
</tr>
</thead>
<tbody>
<tr>
<td>4&quot;</td>
<td>1&quot;</td>
<td>9075</td>
<td>15000</td>
</tr>
<tr>
<td>4-1/2&quot;</td>
<td>1-1/4&quot;</td>
<td>8065</td>
<td>13300</td>
</tr>
<tr>
<td>5&quot;</td>
<td>1-1/2&quot;</td>
<td>7250</td>
<td>12000</td>
</tr>
<tr>
<td>7&quot;</td>
<td>2-1/2&quot;</td>
<td>5175</td>
<td>8725</td>
</tr>
<tr>
<td>8&quot;</td>
<td>2-5/8&quot;</td>
<td>4500</td>
<td>7650</td>
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<tr>
<td>10&quot;</td>
<td>2-3/4&quot;</td>
<td>3600</td>
<td>7500</td>
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<tr>
<td>12&quot;</td>
<td>3-3/4&quot;</td>
<td>3400</td>
<td>6300</td>
</tr>
<tr>
<td>14&quot;</td>
<td>4-3/4&quot;</td>
<td>3200</td>
<td>5400</td>
</tr>
</tbody>
</table>

**Wall Saw Blades**

<table>
<thead>
<tr>
<th>Blade Diameter</th>
<th>Maximum Cutting Depth</th>
<th>Recommended Operating Speed RPM</th>
<th>Maximum Safe Speed RPM</th>
</tr>
</thead>
<tbody>
<tr>
<td>18&quot;</td>
<td>6-1/4&quot;</td>
<td>2600</td>
<td>3000</td>
</tr>
<tr>
<td>20&quot;</td>
<td>7-1/4&quot;</td>
<td>2450</td>
<td>2700</td>
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<td>24&quot;</td>
<td>9-1/4&quot;</td>
<td>1950</td>
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<td>30&quot;</td>
<td>12-1/4&quot;</td>
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<td>36&quot;</td>
<td>15-1/4&quot;</td>
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<td>1500</td>
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<td>1050</td>
<td>1300</td>
</tr>
<tr>
<td>48&quot;</td>
<td>21-1/4&quot;</td>
<td>900</td>
<td>1000</td>
</tr>
<tr>
<td>54&quot;</td>
<td>24-1/4&quot;</td>
<td>600</td>
<td>700</td>
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</tbody>
</table>

**Masonry Blades**

<table>
<thead>
<tr>
<th>Blade Diameter</th>
<th>Maximum Cutting Depth</th>
<th>Recommended Operating Speed RPM</th>
<th>Maximum Safe Speed RPM</th>
</tr>
</thead>
<tbody>
<tr>
<td>14&quot;</td>
<td>5&quot;</td>
<td>2550</td>
<td>3900</td>
</tr>
<tr>
<td>18&quot;</td>
<td>7&quot;</td>
<td>2300</td>
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<tr>
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<td>8&quot;</td>
<td>2300</td>
<td>2700</td>
</tr>
<tr>
<td>24&quot;</td>
<td>10&quot;</td>
<td>2300</td>
<td>2800</td>
</tr>
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</table>
### DIAMOND CORING FACTS

#### Segmented Core Bit Recommended R.P.M. Reference Chart

<table>
<thead>
<tr>
<th>Bit Diameter</th>
<th>Minimum RPM</th>
<th>Maximum RPM</th>
<th>Ideal RPM</th>
</tr>
</thead>
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</tr>
<tr>
<td>36&quot;</td>
<td>66</td>
<td>111</td>
<td>88</td>
</tr>
</tbody>
</table>

**SEGMENT**: Metal matrix containing diamonds which are brazed or welded to the tube.

**WATERWAY**: Allows cooling water to reach the cutting surface.

**TUBE OR BARREL**: Normally 14” in length with 13” core depth.

**HUB**: 1/2” to 1-1/2” threads 5/8-11 1-5/8 and up threads 1-1/4-7

**KERF**: Width of segment. Normally .145”
YOU AND YOUR HAND SAW

Inspection - Before Running Your Hand Saw

Attachments
Never modify a saw. Use only attachments expressly approved by the saw manufacturer.

Drive Shafts and Flanges
Check driveshaft threads for damage. Check that contact surfaces on diamond blade and flanges are flat, run true on the arbor and are free of foreign materials. Do not use flanges that are different sizes, warped, nicked or dirty.

Diamond Blade
Type - Check that blade is approved for hand-held, portable, high speed, cut-off saws. Do not exceed the maximum operating speed of the blade.
Damage - Inspect the blade for cracks or other damage. Do not use a wheel that has been dropped. This throws it out of tension and can cause damage to you and your saw.
Mounting - Do not use a blade that is too loose or too tight on the saw. Follow all blade mounting specifications in the operator’s manual.

Blade Guard
Check blade guard for cracks or other damage. Clean inside of guard before installing new blade. Check that guard can be adjusted and locked.

V-Belt and Covers
Check that the belt has the right tension. Check that covers are in place, tight, undamaged and that belt does not rub on them.

Vibration Isolation Elements
Check that the vibration elements are in place and undamaged.

Air Filter
Clean all air filters and pre-filters ever time you refuel.

Cooling Vents
Check all cooling passages and cylinder fins are clean.

Saw Body
Inspect power head and cutting arm for wear or damage. Check all components to be sure fasteners are tight.

Blade Sharpening
Diamond blades can be dulled by using wrong feed pressure or by cutting certain materials such as heavily reinforced concrete. Forcing a dull blade will cause overheating and eventually loss of segments.
Blade Vibration - The blade may become out of round and vibrate if too high a feed pressure is used or if blade is jammed into the cut. Lower feed pressure should stop the vibration. If it does not, discontinue use and replace the blade.
Drive Shaft RPM - At regular intervals, use a tachometer to check drive shaft RPM with saw at operating temperature, at full throttle and under no load. Maximum RPM is marked on the blade and the saw.

Operation - Hand Held Saws

General
A cut-off saw must be used by a trained, alert operator wearing protective clothing and equipment. A cut-off saw must be used only after the most careful inspection and must be used and maintained with extreme care.

The Operator
Never use a cut-off saw unless you are fully instructed in its use.

Physical Condition
Do not work when tired, under stress or under the influence of any medicine, drug or alcoholic beverage. If you tire while operating the saw, take a break.

Operation
- Check operator’s manual for proper fuel mixture. Running the saw on straight gas will cause a major breakdown.
- Fill tank outdoors at least 10-feet away from cutting area.
- Wipe up any spilled fuel and check for leakage.
- Place saw in an open area, cleared of all objects, on a firm, level surface at least 10 feet away from where it was fueled.
- Your cut-off saw is strictly a one-person saw. Make sure no one else is near the saw, but make sure there is someone near the area in case of accident.
- Set blade-guard so the rear section is close to work, directing particles away from the operator.
WARNING! Never use a saw without the blade guard. Always make sure the guard is undamaged, unmodified and adjusted for the work piece.

Starting
WARNING! Never drop start; you may lose control of saw
WARNING! Never start saw with wheel in cut. This could cause kick-back and serious injury.
WARNING! On cold starts, wheel will turn as soon as engine is started.
- Hold saw so that wheel does not touch anything, including the ground.
- Make sure you have a good balanced stance with good footing.
- Use starter grip and after pulling, let starter rewind fully. Don’t warp starter rope around your hand or let starter rope snap back. Injury to yourself or damage to starter could result.
- Check when you release the throttle control, engine RPM drops and returns to idle by itself. Check that wheel does not move when the engine is idling.
- Check that stop control stops engine.
- Before cutting, run saw at no load under full throttle for 30 seconds to check that blade runs evenly. WARNING! Do not use a blade that wobbles or pounds.

Cutting
- Support work piece so that you know what to expect while cutting and so it will not bind.
- Always cut at wide open throttle.
- Start cut gently, do not bump or jam wheel.
- Use high speed blades at the correct RPM.
- Move blade slowly back and forth as you cut.
- Use small portion of blade’s cutting edge.
- Only use cutting edge (segments) of blade for cutting.
WARNING! Absolutely never cut with the side of the wheel. It will damage the blade core and will cause severe injury to the operator. Do not use the side of an abrasive wheel, it will break and cause severe injury to the operator.
- Cut with blade straight up and down - at right angle to the work piece.

CARE AND STORAGE
High speed hand saws are rugged and dependable. However, since they are used in high-speed cutting operations, all service must be done when and how it is supposed to be done so the saw will operate effectively and safely.

Always handle saws carefully and store them with the blade removed. Protect them from temperature and moisture extremes. All diamond blades should be removed from the saw after use and carefully stored. Special care should be taken with abrasive wheels. Abrasive wheels should be stored on a firm, level surface. Avoid moisture and temperature extremes. Remove wheels before moving or transporting saw. Inspect new blades and wheels for handling or storing damage before use.
Walk Behind Saws

Preventative Maintenance
1. Lubricate the blade shaft bearings daily using high quality grease.
2. Check engine oil level daily. Keep oil clean and at “FULL” level.
   DO NOT overfill.
3. Grease the depth screw feed assembly weekly (screw feed models)
4. Air filters must be checked frequently and cleaned every day when
   dry cutting.
5. The high quality V-belts used on the Diamond Products walk behind
   saws are properly tensioned at the factory. DO NOT overtighten as
   this could damage blade shaft bearings and engine crankshaft
   bearings. To adjust belt tension, loosen engine mounting bolts and
   move engine with belt adjustment screw. When installing new belts,
   DO NOT attempt to stretch over pulleys.
6. Keep saw clean and free of cutting slurry for ease of maintenance.
7. DO NOT transport saw the blade mounted on the blade shaft. DO
   transport saw resting on shaft guard and NOT on front wheels.

Walk Behind Saw Start-Up
For instructions on starting, warm up and engine break in, refer to the
operator’s manual.
1. Always let engine to warm up at fast idle briefly before going to full
   power.
2. After engine warm up, always cut with engine at full power.
3. Always operate engine briefly at idle speed before stopping it.

Mounting the Blade
1. Raise machine to assure that the blade will clear pavement when
   installed.
2. Remove spindle nut and blade collar (flange).
3. Mount blade on shaft and replace flange and nut. The drive pin in the
   outer blade flange must go completely through the blade into matching
   hole on the inside blade flange.
4. Tighten nut with wrench provided with saw.
5. DO NOT operate saw without blade guard in place.
6. Whenever possible, cut from the right side of saw.

Operating Instructions
1. Be sure to use the correct Diamond Products blade for the material
   being cut. The correct blade will make a marked difference in the blade
   life and saw performance.
2. Cut only as deep as the specifications require. This will save blade life
   and reduce sawing costs.
3. Cut in a straight line. Mark the cutting line clearly so that the saw oper- 
   ator can follow without difficulty. DO NOT attempt to make curved cuts.
4. Connect saw to water supply.
5. Start engine and allow to idle briefly before going to full power.
6. With saw running and water supply on, position saw over line to be
   cut. Lower blade into the cut by slowly turning the depth feed handle to
   the LEFT. When blade reaches the desired depth of cut, lock handle
   with latch. When using a power raise/lower model, push button until
   blade hits the surface and lower to the desired depth.
7. With blade at desired depth of cut, allow engine to regain full power
   before moving ahead. Push forward steadily at a rate of speed that al-
   lows engine to run at or near maximum RPMs.
8. To maneuver saw from one cut to another, always raise blade as high
   as required to clear pavement.
9. If saw should stall for any reason, raise the blade completely out of cut
   before starting engine again.
10. When lowering blade into a partially made cut, use extreme care to
    be certain the blade is perfectly aligned within the existing cut.
11. At end of cut, bring, blade out of cut by turning screw feed handle to
    RIGHT. (screw feed models)
12. If you are cutting more than 2” deep, you can finish the job in less time
    and effort by step cutting in 2” increments. Cut a 2” depth on the first
    pass, 4” depth on the second and so on. On repeated passes, the blade
    will tend to follow the previous path.
13. DO NOT cut all the way through the material (concrete or asphalt) as
    it will cause rapid blade wear. While this does not damage the machine,
    gravel and sand that underlies most pavement will eat away at the blade.
    Lower the blade until you notice mud and sand in the water, then raise
    the blade one full turn of the crank.

Example Components of a
Walk Behind Saw

1. Instrument Panel
2. Air Intake
3. Frame Lift
4. Air Intake
5. Engine
6. Front Pointer
7. Pointer Stop
8. Hinge Guard
9. Power Take Off (PTO)
10. Rotary Tensioner
11. Transmission Jackshaft
12. Hydraulic Cylinder
13. Throttle Cable
14. Water Valve
15. Frame Upright
16. Battery
17. Frame Base
18. Belt Guard
19. Muffler
20. Belt Drive
21. Shaft Tachometer Gexa
22. Blade Shaft
23. Front Axle
24. Blade Guard
25. Front Wheels
26. Rear Axle
27. Transmission
28. Rear Pointer
29. Hydraulic Pump
30. Rear Drive
31. Hydraulic Pump
32. Handlebars
Always look for symbols when on a job site. Adhere to the rules and warnings of all symbols and instructions. Always wear Personal Protective Equipment (PPE) when working with diamond tools and equipment.

Please read the instructions for use prior to operating the machine for the first time. Antes de la puesta en marcha, lea detenida-mente las instrucciones y familiarícese con la maquina.

- **Prohibited**
  - **Prohibicion**

- **Warning**
  - **Triangulo de advertencia**

- **Wear Eye Protection**
  - **Usar gafas de proteccion**

- **Wear Head Protection**
  - **Usar casco de proteccion**

- **Wear Breathing Protection**
  - **Usar mascara de proteccion**

- **Ear Protection Use is Mandatory**
  - **Es obligatorio el uso de proteccion auditiva**

- **Hard Hat is Mandatory**
  - **Es obligatorio el uso de casco duro**

- **Safety shoes are mandatory**
  - **Es obligatorio el uso de zapatos de seguridad**

- **Fall protection is mandatory**
  - **Es obligatorio el uso de ropa adecuada**

- **Use in Well Ventilated Area**
  - **Utilizzare in presenza di un'aeguata ventila-zione**

- **Danger, Poison Exhaust Gas**
  - **Peligro, gases de escape toxicos**

- **Do Not Use in Flammable Areas**
  - **No usar en areas inflamables**

- **No Non-Working Personnel in Area**
  - **Prohibido para personas ajenas a la obra**

- **Motor Off**
  - **Parar el motor**

- **Keep All Guards in Place**
  - **Mantenga siempre las protecciones de la haja en su sitio**

- **Danger! Keep Hands Away From Machinery**
  - **Máquina peligrosa - Mantenga manos y pies alejados de la maquinaria**

- **No Smoking**
  - **No fumar**
SAFETY AND YOUR EQUIPMENT

PERSONAL PROTECTIVE EQUIPMENT

To protect the head. Wear only approved, rated helmets.

Steel Toe Boots
To protect the feet from falling pieces

Clothing
Rugged, snug clothing to protect from sparks or debris

Gloves
Heavy duty, non-slip gloves

Safety Glasses
For eye protection from flying debris and particles

Ear Plugs
Protects against extremely loud noise caused by equipment

Dust Respirator
For help in protecting from dust inhalation

Reflective Vest
For increased visibility on the job site

Helmet

Operations such as wall sawing, core drilling, slab sawing, chain sawing, hand sawing and wire sawing may present noise exposures that exceed an eight-hour, time weighted average of 85 dBA. Operators should not be subject to noise levels in excess of the following noise level limits without proper hearing protection.

<table>
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<tr>
<th>Duration (in hours)</th>
<th>dBA Decibel</th>
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<tr>
<td>8</td>
<td>90</td>
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<tr>
<td>6</td>
<td>92</td>
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<tr>
<td>4</td>
<td>95</td>
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<tr>
<td>3</td>
<td>97</td>
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<tr>
<td>2</td>
<td>100</td>
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<td>1-1/2</td>
<td>102</td>
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<tr>
<td>1</td>
<td>105</td>
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<tr>
<td>1/2</td>
<td>110</td>
</tr>
<tr>
<td>1/4 or less</td>
<td>115</td>
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</table>

Hand Saw Kickback
Saw kickback can occur extremely fast and with great force. Failure to comply with the following rules can result in severe or fatal injury to the operator. The diamond blade may climb in the cut and result in kickback. Applying too much feed pressure can contribute to this. If too much feed pressure is being used, it can be more difficult to control the kickback.

To Avoid a Kickback
1. Always cut in a 90 degree, perpendicular to the ground.
2. Keep good balance and footing.
3. Use both hands and keep firm grip with thumb and fingers encircled.
4. Keep work piece at a comfortable distance when cutting.
5. Run saw at full throttle.
6. Be careful when re-entering the cut.
7. Never cut above shoulder height.
8. Be alert to shifting of work piece or anything that could cause cut to close and pinch the blade.

Ladders
The American National Standards Institute (ANSI) adopted and issued a code of safety requirements for portable ladders. The code, last revised in 1982, sets out the properties and design specifications for wood (A14.1), metal (A14.2), and reinforced plastic (A14.5) ladders. Completed ladders must also be capable of pass a variety of test requirements as set out in the code.

<table>
<thead>
<tr>
<th>ANSI TYPE *</th>
<th>DUTY RATING **</th>
<th>DESCRIPTION</th>
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</thead>
<tbody>
<tr>
<td>TYPE 1A</td>
<td>300 lbs.</td>
<td>Extra heavy duty industrial</td>
</tr>
<tr>
<td>TYPE I</td>
<td>250 lbs.</td>
<td>Heavy duty industrial</td>
</tr>
<tr>
<td>TYPE II</td>
<td>250 lbs.</td>
<td>Medium duty commercial</td>
</tr>
<tr>
<td>TYPE III</td>
<td>200 lbs.</td>
<td>Light duty household</td>
</tr>
</tbody>
</table>

* OSHA essentially follows the guidelines set by ANSI. Therefore, industrial users should purchase and properly use TYPE 1A and TYPE I ladders to be in compliance with OSHA regulations. TYPE II and TYPE III are NOT permitted on the job site.

**The Duty Rating means that the ladder is designed to meet these loads with a safety factor of four (4) when set and used properly at 75-1/2° to the horizontal.
SAFETY RULES

These rules apply to the operations related to concrete sawing and drilling. These are brief summaries of safety issues and are not all-inclusive for safety and procedures for these operations. Read and understand your operator’s manual for each piece of equipment that you will be operating.

Flat Sawing
1. Check with the owner or hiring contractor to identify any electrical lines, gas lines or other hazards that may be located under or in the slab that will be cut.
2. Shut off any utilities that may be damaged by the slab sawing.
3. Ensure the machine is working properly and the blade is appropriate for the material and the RPM requirements.

Core Drilling
1. Check with the owner or hiring contractor to identify any electrical lines, gas lines or other hazards that may be located in or under the slab or in or behind the wall that will be cored.
2. Secure base of the rig stand to prevent movement during coring operations.
3. Provide for proper protection below the coring area to prevent any persons from being struck by the falling core. A spotter is recommended.
4. If you are using a vacuum to secure a rig to a wall, you must have another way to secure the rig in case power were to be cut off or shut down during drilling.

Wall Sawing
1. Check with the owner or hiring contractor to identify any electrical lines, gas line or other hazards that may be located in or under the slab or in or behind the wall that will be cut.
2. Check both sides of the wall prior to setting up.
3. Provide necessary barricades and warning lines on the opposite side of wall.
4. Determine wall thickness; strap and wedge the wall to prevent premature tip-out.
5. Check both sides of the wall prior to tipping out the section. Use a spotter on the backside to prevent anyone from being struck by the wall section.

Safe Blade Installation Procedures
- Raise the saw high enough to allow clearance for mounting the blade.
- Before starting the mounting procedure, make sure the ignition switch is OFF or the engine kill switch is in the stop position.
- With electric or hydraulic powered saws, make sure the saw is disconnected from the power source.
- Remove the blade shaft nut or bolt and the outer collar or flange.
- Inspect both flanges and the arbor shaft for damage, nicks and burrs. The inner flange should be tight on the shaft.
- Slide the blade onto the arbor shaft. It should fit snugly. DO NOT force it, alter the arbor hole or file the blade shaft to force it to fit.
- If it does not fit, either there is damage or you have the wrong blade. Inspect the shaft for grooves caused by saw blades.
- Check to make sure the inside and outside flanges are of the same diameter, not excessively worn and free from concrete buildup.
- Align the blade so the pin on the flange is placed through the drive pin hole on the blade and into the inner flange. Hand-tighten the mounting nut or bolt with the pin in the hole.
- Prior to wrench-tightening the blade shaft nut, grasp the outer edge of the blade and rotate it up toward the back of the saw to remove any clearance between the drive pin and the drive pin hole.
- Tighten the blade nut securely, according to the operator’s manual, using the proper wrench. Before starting the saw, make sure the blade guard is installed properly and will not interfere with the blade. Again, NEVER attempt to operate a saw without a blade guard.
- Before sawing, check for missing or loose nuts and bolts, and check any drive belts. Tighten or replace them if necessary.
**HYDRAULIC TROUBLE SHOOTING**

<table>
<thead>
<tr>
<th>Problem</th>
<th>Symptom</th>
<th>Pressure Reading Power Unit</th>
<th>Flow &amp; Pressure on Test Kit</th>
<th>Cause</th>
<th>Solution</th>
</tr>
</thead>
<tbody>
<tr>
<td>No blade rotation</td>
<td>0 or maximum Maximum psi</td>
<td></td>
<td>Hydraulic quick coupler not connected: wall saw internal damage 'locked up'</td>
<td>Inspect, connect as necessary, test disconnect from hydraulic system, test by hand to locate problem</td>
<td></td>
</tr>
<tr>
<td>Pump noise</td>
<td>0 psi</td>
<td>Pump shaft failed - pump not rotating</td>
<td></td>
<td>Remove pump to inspect - repair as needed</td>
<td></td>
</tr>
<tr>
<td>Blade rotates but with major power loss</td>
<td>Excessive system temp. - pump or meter may be noisy</td>
<td>Maximum psi, but slow gauge response under blade stall</td>
<td>Partial to full flow, but psi slow response maximum flow, maximum psi</td>
<td>Excessive aeration in hydraulic oil or pump cavitation</td>
<td>Refer to pump service manual</td>
</tr>
<tr>
<td></td>
<td>Excessive hose vibration</td>
<td>Maximum psi, but slow gauge response under blade stall</td>
<td>Partial to full flow, but psi slow response</td>
<td>Hydraulic meter fail, excess internal slippage - noisy Pump failure - excess internal slippage shaft failure</td>
<td>Repair or replace as necessary</td>
</tr>
<tr>
<td>Blade rotates but with major power loss</td>
<td>minor heat buildup, no blade</td>
<td>Difficult to maintain 1250 psi and over stalling blade</td>
<td>Maximum flow Maximum psi</td>
<td>Blade polished can not utilize horsepower output from saw</td>
<td>Replace blade or attempt to 'open up' segments but running in abrasive material</td>
</tr>
<tr>
<td>No heat build up, no noise, oil to compensator when hose fitting checked</td>
<td>300 psi or less</td>
<td>12 gpm or less 300 psi or less</td>
<td>Stuck flow compensator spool</td>
<td>Remove and clean as necessary - inspect on removal to prove cause</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Maximum psi</td>
<td>Flow less than max psi</td>
<td>Worn flow compensator spool or weak spring on flow compensator spool</td>
<td>Adjust to correct reading or replace</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Maximum psi or less than max</td>
<td>Less than max flow or pressure or less than max on both</td>
<td>Misadjusted compensator spools</td>
<td>Adjust to correct specifications</td>
<td></td>
</tr>
<tr>
<td>No oil to compensator when hose fitting checked</td>
<td>300 psi or less</td>
<td>12 gpm or less 300 psi or less</td>
<td>Sensing hose obstructed or sensing hose not connected</td>
<td>Repair or replace Inspect and correct</td>
<td></td>
</tr>
<tr>
<td>Aerated oil to compensator when hose fitting checked</td>
<td>300 psi or less, but erratic</td>
<td>12 gpm or less 300 psi or less but erratic</td>
<td>Aeration in hydraulic oil or air inclusion in sensing line</td>
<td>Refer to pump aeration cause and solution or bleed sense line</td>
<td></td>
</tr>
<tr>
<td>No heat build up, no noise oil to compensator when hose fitting checked</td>
<td>300 psi or less</td>
<td>12 gpm or less 300 psi or less</td>
<td>Stuck pressure compensator spool</td>
<td>Remove and clean as necessary - inspect on removal to prove cause</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Less than maximum, slow response on stall</td>
<td>Full flow, but less than maximum psi, slow response</td>
<td>Weak spring on pressure compensation spool - worn pressure compensator spool</td>
<td>Adjust to correct reading or replace compensator assembly</td>
<td></td>
</tr>
</tbody>
</table>

**HYDRAULIC MOTOR RPM CHART - MAXIMUM RPM WITH CUBIC INCH DISPLACEMENT & GPM COMBINATIONS**

<table>
<thead>
<tr>
<th>Cubic Inch</th>
<th>Danfoss Motor</th>
<th>Char-Lynn Motor</th>
<th>White Motor</th>
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<tr>
<td>.77</td>
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**HYDRAULIC TROUBLE SHOOTING**

To choose the right hydraulic motor for your application, follow this formula: Closest G.P.M. of your power unit + closest RPM of core bit on the Bit RPM chart above and match these values on the chart above to get the Cubic Inch of the motor you need.
**TROUBLESHOOTING DIAMOND BLADES**

**CAUSE:** Insufficient coolant (water) at the cutting surface of a wet cut core bit or blade  
**REMEDY:** Increase the flow of water and check for proper direction of the water to the cutting surface.

**CAUSE:** Insufficient cooling (air)  
**REMEDY:** Allow the blade to cool every few feet of cut by running it at full speed outside of the cut.

**CAUSE:** Blade is too hard for material being cut (Wrong Spec.) Bond will not wear away to expose new diamonds.  
**REMEDY:** Choose a softer bond.

**CAUSE:** Material being cut is too hard.  
**REMEDY:** Dress or sharpen the blade with a soft concrete block or old abrasive wheel to expose new diamonds. If continual dressing is needed change to a softer bond.

**CAUSE:** Insufficient power to permit blade to cut properly.  
**REMEDY:** Check and tighten belts and make sure adequate horsepower is available for application.

**CAUSE:** On stone or masonry blades the material may not have been held firmly which allowed the blade to twist or jam.  
**REMEDY:** Material must be held firmly.

**CAUSE:** Overheating due to an inadequate supply of water. Look for burning or discoloration near missing segments.  
**REMEDY:** Provide adequate supply of water.

**CAUSE:** Undercutting which wears away blade core and weakens the bond between segment and core.  
**REMEDY:** Increase water supply and if material being cut is very abrasive switch to water-resistant cores.

**CAUSE:** Blade is too hard for material being cut causing excessive dullness and the segment separates because of impact, fatigue or frictional heat.  
**REMEDY:** Use the proper blade specification for material being cut.

**CAUSE:** Worn shaft bearings on saw which allows blade to run eccentric.  
**REMEDY:** Install new bearings.

**CAUSE:** Engine not properly tuned which causes “hunting”.  
**REMEDY:** Tune the engine.

**CAUSE:** Blade arbor hole is damaged.  
**REMEDY:** If blase is in good condition the core may be re-bored.

**CAUSE:** Blade mounting arbor busing or is the wrong size.  
**REMEDY:** Replace worn arbor busing or arbor shaft.

Bond is too hard for material causing machine to “pound” at regular intervals, thereby wearing one half of the blade more than the other half.
**CAUSE:** A condition in which the steel core wears at a faster rate than the diamond segments. It is caused by highly abrasive material grinding against the core.

**REMEDY:** The blade core should be equipped with undercut protectors or segments.

**CAUSE:** Blade is used on a misaligned saw.

**REMEDY:** Check for proper saw alignment.

**CAUSE:** Blade is excessively hard for the material being cut.

**REMEDY:** Correct bond spec.

**CAUSE:** Material slippage causing blade twist.

**REMEDY:** Maintain a firm grip on material while cutting.

**CAUSE:** Undersized or mismatched blade collars.

**REMEDY:** Minimum 3-7/8" - 4-1/2" on concrete saws, 6" Minimum on blades over 30".

**CAUSE:** Blade used at improper RPM.

**REMEDY:** Check shaft RPM.

**CAUSE:** Improper mounting on arbor shaft allows collars to bend blade when tightened.

**REMEDY:** Make sure blade is securely on arbor shoulder until outside flange and nuts are firm.

**CAUSE:** Blade collar is not properly tightened allowing it to turn or rotate on the shaft.

**REMEDY:** Tighten collars.

**CAUSE:** Worn or dirty collars which do not allow proper blade clamping.

**REMEDY:** Clean and replace if necessary.

**CAUSE:** Blade not properly mounted.

**REMEDY:** Rebore arbor hole if within tolerances.

**CAUSE:** Using the wrong blade to spec. on highly abrasive materials.

**REMEDY:** Change to a more abrasive resistant bond.

**CAUSE:** Lack of sufficient coolant to the blade often detected by excessive wear in the center of the segment.

**REMEDY:** Make sure water supply system is functioning properly.

Wearing out-of-round accelerates wear. Usually caused by bad bearings, loose or worn "V" belts.
**TROUBLE SHOOTING DIAMOND BLADES**

**CORE CRACKS**

**CAUSE:** Blade is too hard for material being cut.  
**REMEDY:** Change to softer bond.

**CAUSE:** Excessive cutting pressure, jamming or twisting of the blade.  
**REMEDY:** The saw operator should use a steady even pressure without twisting the blade in the cut.

**CAUSE:** Overheating through inadequate water supply or not allowing a dry blade to intermittently cool down.  
**REMEDY:** Use adequate water on wet cutting blades and allow adequate air flow on dry blades.

**MISALIGNMENT**

**CAUSE:** Blade collars are not properly tightened or are worn out.  
**REMEDY:** Check tightness and replace collars if necessary.

**SEGMENT CRACKS**

**CAUSE:** Blade is too hard for the material being cut.  
**REMEDY:** Use correct blade with a softer bond.

**UNEVEN SIDE WEAR**

**CAUSE:** Insufficient water, generally on one side of the blade.  
**REMEDY:** Make sure water is being distributed evenly on both sides of blade.

**CAUSE:** Equipment problem which causes blade to wear out-of-round.  
**REMEDY:** Replace bearings, worn arbor shaft or misaligned spindle.

**CAUSE:** Saw head is misaligned.  
**REMEDY:** Check saw head alignment for trueness both vertically and horizontally.
TROUBLE SHOOTING CORE BITS

CAUSE: Too much feed pressure.
REMEDY: Open bit with abrasive material (Sand pot, concrete block, chop saw blade). Reduce feed pressure. Using an ammeter will help control speed and pressure.

CAUSE: Aggregate is too hard.
REMEDY: Change to a softer bond.

GLAZING
(Bit stops drilling or is very slow)

CAUSE: Too much feed pressure and not enough water.
REMEDY: Repair the bit if possible. Ease up on feed pressure and increase water flow.

CAUSE: Aggregate is too hard.
REMEDY: Change to a softer bond.

BENT SEGMENTS

CAUSE: Steel reinforcing rod
REMEDY: Ease up on feed pressure (water ammeter). Use a higher quality bit and increase the water flow.

CAUSE: Not enough water to properly cool bit.
REMEDY: Increase water flow.

CAUSE: Drill rig is not properly anchored
REMEDY: There are three ways of anchoring a core rig. **STANDING ON IT IS NOT ONE OF THEM!** This quick dirty method damages the bit and the rig and dramatically slows the drilling process.

LOST SEGMENTS
(Particularly on bits up to 1 – 3/4”)

CAUSE: Not enough water to remove slurry.
REMEDY: Remove bit and drive core out with a spike through the hub. Increase water flow.

CAUSE: Core barrel is dented because of hammering on it to remove previous hung up cores.
REMEDY: Repair the barrel. Increase water flow.

CORE STUCK