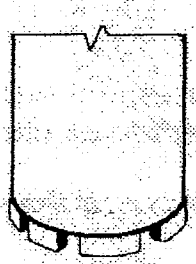
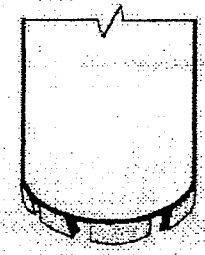
TROUBLE SHOOTING CORE BITS



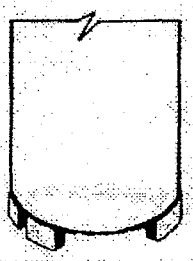
GLAZING
(Bit stops drilling or is very slow)

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 to control speed and pressure.
CAUSE: Aggregate is too hard.
REMEDY : Change to a softer bond.



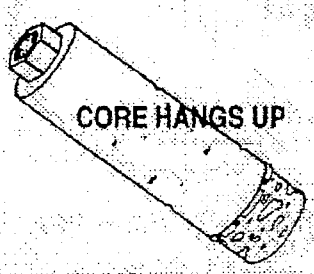
BENT SEGMENTS

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.



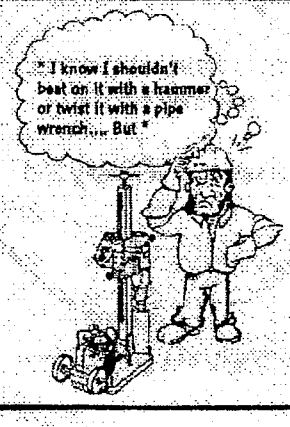
LOST SEGMENTS
(Particularly on bits up to 1-3/4")

CAUSE: Steel reinforcing rod
REMEDY: Ease up on feed pressure (watch ammeter). Use a higher quality bit and increase the water flow.
CAUSE: Not enough water too 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 and dirty method damages the bit and the rig and dramatically slows the drilling process.



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.

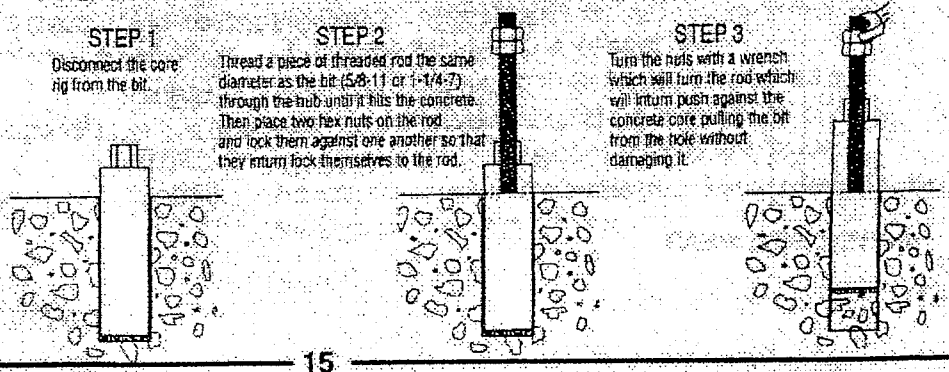
HOW TO REMOVE A STUCK BIT



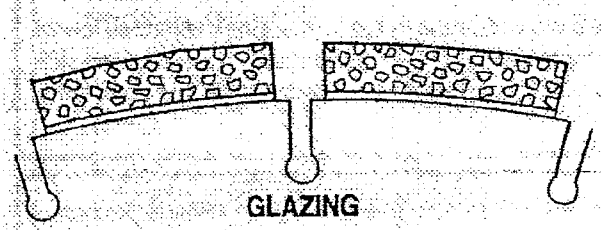
STEP 1
Disconnect the core rig from the bit.

STEP 2
Thread a piece of threaded rod the same diameter as the bit (5/8-11 or 1-1/4-7) through the hub until it hits the concrete. Then place two hex nuts on the rod and lock them against one another so that they inturn lock themselves to the rod.

STEP 3
Turn the nuts with a wrench which will turn the rod which will inturn push against the concrete core pulling the bit from the hole without damaging it.

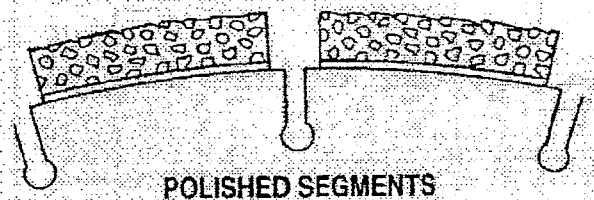


TROUBLE SHOOTING - DIAMOND PROBLEMS



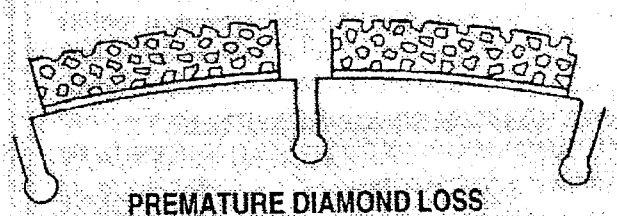
GLAZING

CAUSE: Diamonds are too friable (too hard).
REMEDY: Change to a softer diamond.
CAUSE: Bond is too hard.
REMEDY : Change to a softer bond.
CAUSE: Blade speed is too high.
REMEDY: Check and correct blade speed.



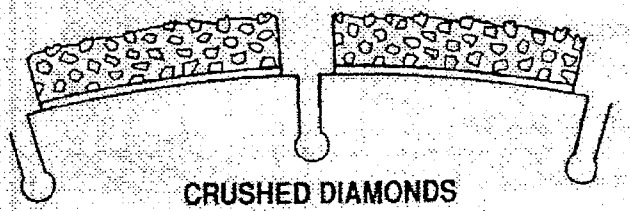
POLISHED SEGMENTS

CAUSE: Diamonds are too hard.
REMEDY: Change to a softer diamond.
CAUSE: Diamond size is too large.
REMEDY : Change to a smaller diamond.
CAUSE: Diamond concentration is too high.
REMEDY: Change spec to a lower concentration.



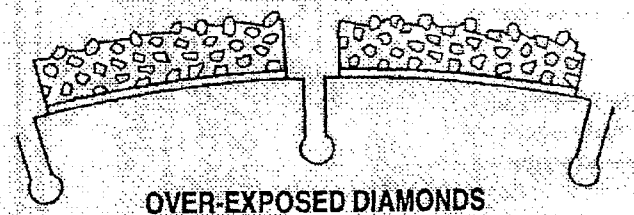
PREMATURE DIAMOND LOSS

CAUSE: Diamonds are too soft (poor quality).
REMEDY: Change spec to a harder diamond.
CAUSE: Bond is too soft for diamond quality.
REMEDY : Change to a harder bond.



CRUSHED DIAMONDS

CAUSE: Diamonds are too hard.
REMEDY: Change to a softer diamond.
CAUSE: Diamond size is too large.
REMEDY : Change to a smaller diamond.
CAUSE: Too much pounding or vibration
REMEDY: Check machine bearing, hubs,alignment etc.



OVER-EXPOSED DIAMONDS

CAUSE: Bond is too soft for material.
REMEDY: Change to a harder diamond.
CAUSE: Diamond concentration and bond is unsuitable.
REMEDY : Change bond.

CONCRETE ANCHORING - COMMON SENSE AND FACTS

CONCRETE ANCHORING IS A CRAFT. It is not a science. It is a craft because of the tremendous variables found in concrete, the tolerances of the carbide drills and anchors, the tools used to set them and most importantly the skill of the installer. As a craft it is imperative that the "craftsman" learn as much about the material, tools and conditions that he has to work with.

ALLOWABLE WORKING LOADS & MATERIAL STRENGTH. A quick look at the catalogs of various anchor manufacturers will have many scratching their heads. Some print the ultimate load while others state the maximum allowable load. Shown below are the performance charts on Drop-In anchors from three major manufactures which at first glance could be confusing and if not properly understood the cause of a costly anchor failure.

	2000 PSI Concrete		4000 PSI Concrete		6000 PSI Concrete	
Anchor Size	Tension	Shear	Tension	Shear	Tension	Shear
⅛"	480	430	560	450	770	760
3/16"	790	990	1240	1060	1410	1480
¼"	1000	1470	1690	1560	2550	2340
5/16"	1390	2220	2420	3050	2600	3400
⅜"	2210	3800	4010	4400	4100	5300

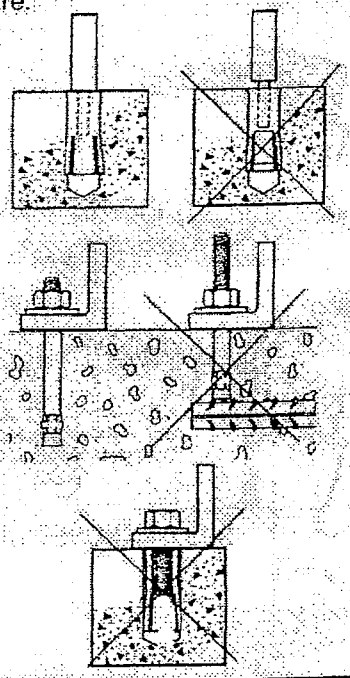
		COMPRESSIVE STRENGTH OF CONCRETE			
		2000 PSI		5000 PSI	
BOLT SIZE	NOMINAL DRILL BIT SIZE	LBS. TENSILE	LBS. SHEAR	LBS. TENSILE	LBS. SHEAR
1/4	3/8	1540	1600	2,400	2,177
3/8	1/2	3024	3640	4,200	3,950
1/2	5/8	3634	6556	6,590	6,422
5/8	7/8	--	--	9,750	12,500
3/4	1	--	--	11,500	16,590

Bolt Size/ Threads Per Inch	Drill Bit Size	A Thread Depth	B Min. Hole Depth	Ultimate Pullout* Lbs.	Ultimate Shear* Lbs.
1/4"/20	3/8"	3/8"	1"	3,204	1,986
3/8"/16	1/2"	1/2"	1-5/8"	6,350	3,968
1/2"/13	5/8"	3/4"	2"	8,544	6,502
5/8"/11	7/8"	1"	2-1/2"	15,218	10,380
3/4"/10	1"	1-1/4"	3-3/16"	17,255	13,962

It is imperative that the Allowable Working Load be determined with regard to the strength of the concrete and the particular cutting or drilling operation before hand. If the ultimate load is published the safe working load is 25% of the ultimate load (4:1) and this value must be matched with the strength of the concrete which can affect the performance of the anchor by another a factor of almost 3:1

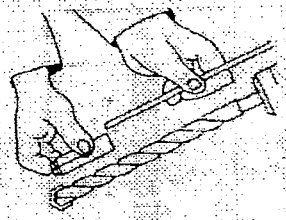
ANCHOR FAILURE - With rare exception almost every anchor failure is caused by the operator. Not the anchor. Among the most prevalent mistakes in the sawing and drilling industry are:

1. Not fully expanding a drop-in anchor because the wrong setting tool was used or the operator simply "felt" that the anchor was set.
2. Setting a stud anchor at too shallow a depth because it was on top of a rebar.
3. Setting a capsule anchor by simply driving the threaded stud into the capsule and not spinning it. As the adhesive has not been mixed with the catalyst it will not set fully or not set at all.
4. Leaving an inordinate amount of dust in the hole when using an adhesive anchoring system. The adhesive bonds to the dust and the dust is bonded to nothing.
5. Using an anchor which does not have the capacity for the job. A particular anchor may be adequate on a horizontal surface but totally inadequate when used on a vertical one with the exaggerated component loads on equipment in this position.
6. Using the wrong size carbide bit to drill the hole. The best example of this is using an old worn 5/8" bit for 1/2" anchors. The anchor is quick to install and just as quick to fail.

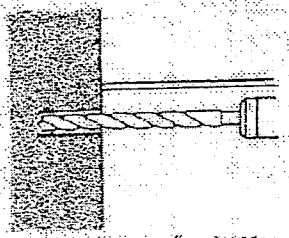


MECHANICAL ANCHOR GUIDE

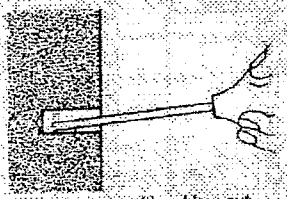
DROP-IN ANCHOR



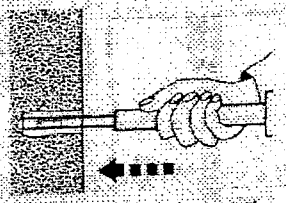
Adjust depth gauge so that anchor will be flush with surface when placed in hole.



Drill Hole the same diameter as the anchor.

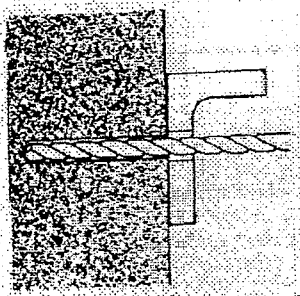


Clean the hole with a blow out bulb, compressed air or wet swab. Dust left in the hole acts as a lubricant and will reduce it's holding power.

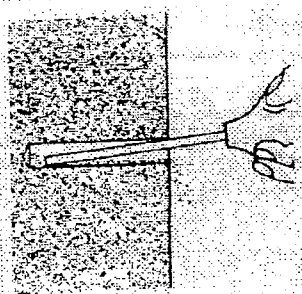


Install with the proper setting tool. The shoulder of the tool should be flush with the anchor when it is properly set.

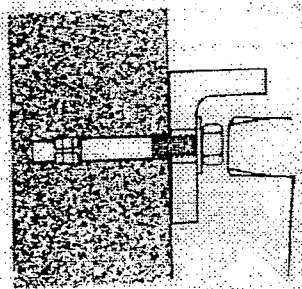
STUD (WEDGE) ANCHOR



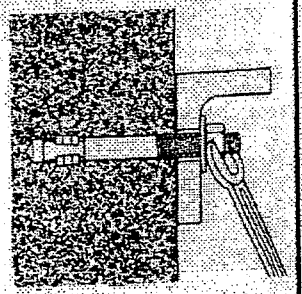
Drill Hole the same diameter as the anchor to a depth of at least the length of the anchor. This will allow the anchor to be pounded flush after it has been used.



Clean the hole with a blow out bulb, compressed air or wet swab. Dust left in the hole acts as a lubricant and will reduce it's holding power.

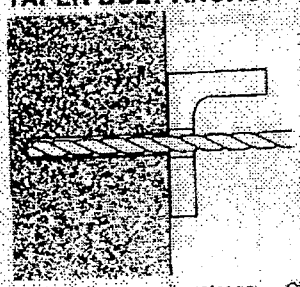


Place the nut on the stud so that all threads are covered by the nut. This will protect them from a missed hammer blow. Drive anchor into hole until it contacts the fixture.

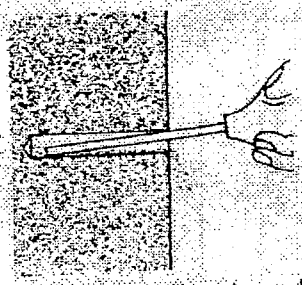


Tighten to the recommended torque value or 3 to 4 turns from the finger tight position. If anchor spins in the hole, force up using a screwdriver until the clip grips the concrete.

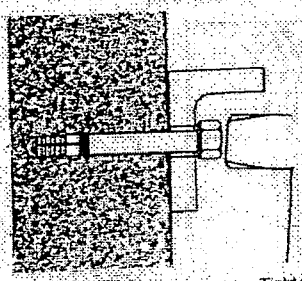
TAPER-BOLT ANCHOR



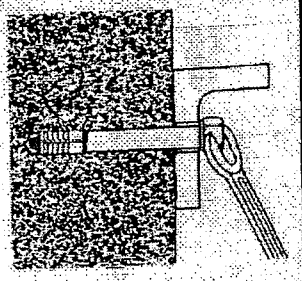
Drill Hole the same diameter as the anchor to a depth of at least the length of the anchor.



Clean the hole with a blow out bulb, compressed air or wet swab. Dust left in the hole acts as a lubricant and will reduce it's holding power.

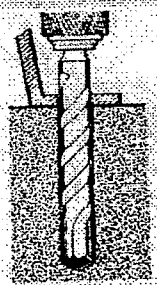


Drive the Taper-Bolt into place leaving the required head clearance.

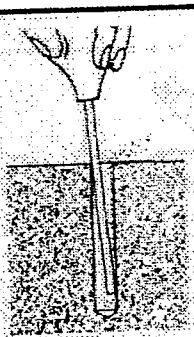


Tighten to the recommended torque or number of turns from the finger tight position. If hole is over sized, simply remove and pre-expand the expander nut. Taper-Bolt can be removed and bolt reused. Can be installed with impact tools.

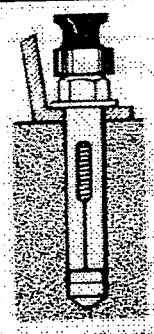
SLEEVE ANCHOR



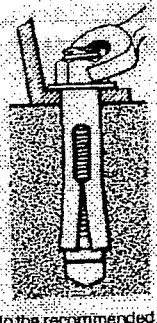
Drill Hole the same diameter as the anchor to a depth of at least the length of the anchor.



Clean the hole with a blow out bulb, compressed air or wet swab. Dust left in the hole acts as a lubricant and will reduce it's holding power.



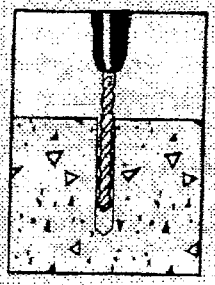
Drill Hole the same diameter as the anchor to a depth of at least the length of the anchor. This will allow the anchor to be pounded flush after it has been used.



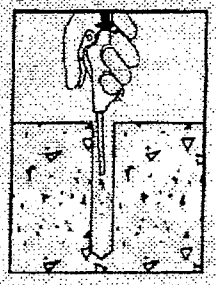
Tighten to the recommended torque value or 3 to 4 turns from the finger tight position. Sleeve anchors may be used in hollow block so long as the correct length is selected.

ADHESIVE BONDED ANCHOR GUIDE

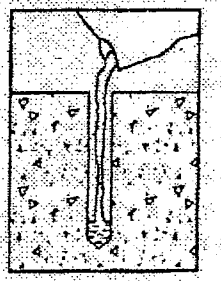
POURABLE ADHESIVE ANCHOR (Horizontal applications only)



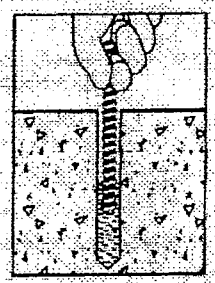
Drill hole to proper depth.



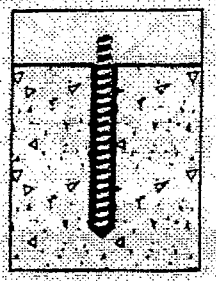
Clean with a blow out bulb, wire brush,water pressure.Dust left in the hole acts as a lubricant and will reduce it's holding power.



Mix adhesive and pour correct amount per manufacturers instructions into the hole.

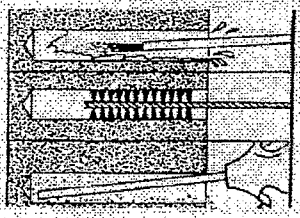


Insert threaded rod slowly into hole using a twisting motion.

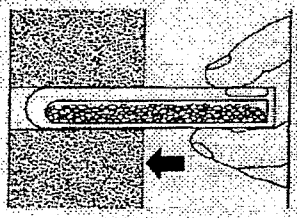


Allow to cure recommended time before applying load.

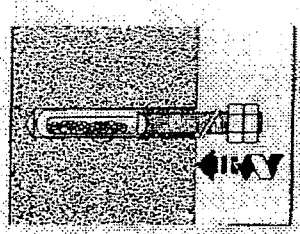
CAPSULE ANCHOR



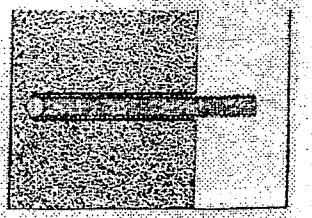
After drilling hole to proper depth clean with a blow out bulb, wire brush,water pressure.Dust left in the hole acts as a lubricant and will reduce it's holding power.



Insert capsule.

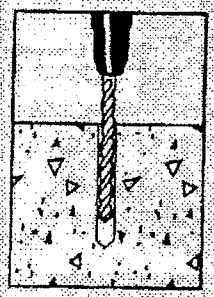


While rotating a chamfered stud with a rotary hammer or hammer drill drive it through the capsule. Remove the drill and setting tool from the stud

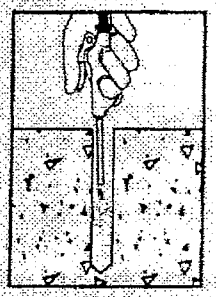


Allow stud to set until adhesive is cured which is dependent upon temperature.(20 minutes to 6 hours)

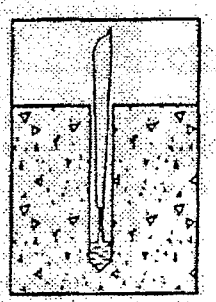
ADHESIVE ANCHOR (Solid application)



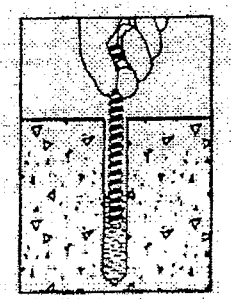
Drill hole to proper depth.



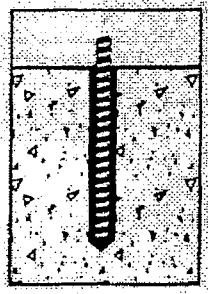
Clean with a blow out bulb, wire brush,water pressure.Dust left in the hole acts as a lubricant and will reduce it's holding power.



Injectiva adhesive unto the hole until it is approximately one-half full (per manufacturers instructions.)

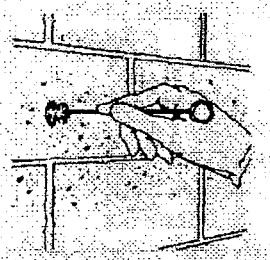


Insert threaded rod slowly into hole using a twisting motion.

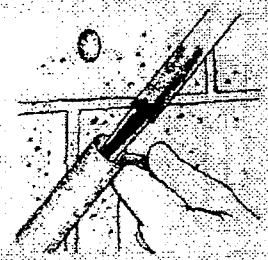


Allow to cure recommended time before applying load.

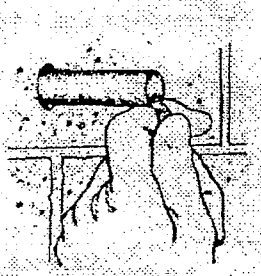
ADHESIVE ANCHOR (Hollow wall application)



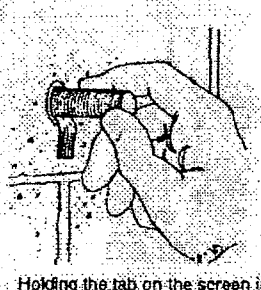
After drilling hole to proper depth clean with a blow out bulb, wire brush,water pressure.



Fill wire screen with adhesive while withdrawing the nozzel.



Insert the filed screen completely into the cleaned hole.

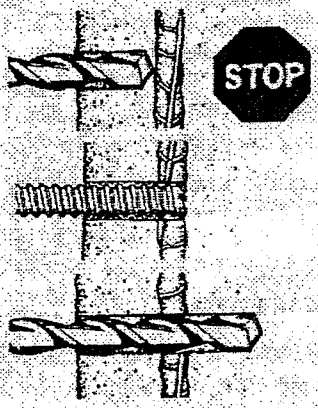


Holding the tab on the screen insert the threaded rod with a slow twisting motion. Allow to set for appropriate cure time which is dependent on temperature.

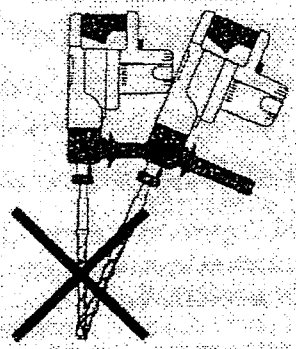
CARBIDE DRILL BITS

HOW TO USE AND EXTEND THE LIFE OF CARBIDE BITS

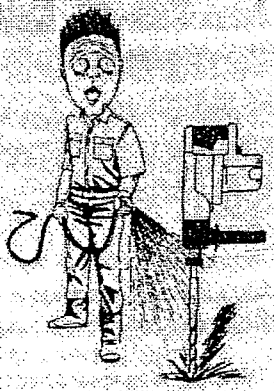
IF POSSIBLE AVOID REBAR
IF NOT USE A REBARE CUTTER



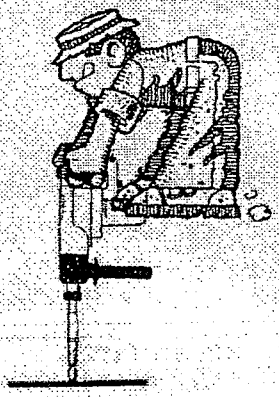
DON'T TRY TO RE-ALIGN THE BIT
AFTER YOU HAVE STARTED DRILLING



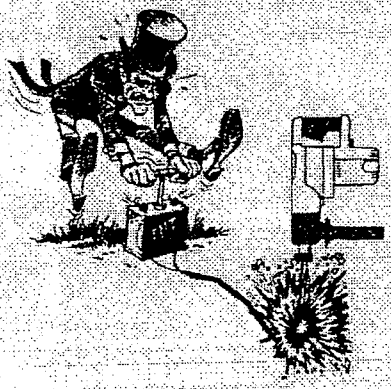
DON'T PUT WATER ON A BIT



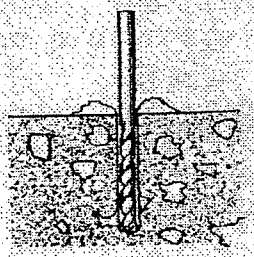
LET THE HAMMER DO THE WORK



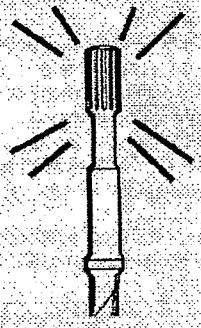
DON'T USE EXCESSIVE FORCE
TO REMOVE A BOUND-UP BIT



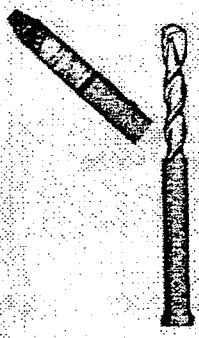
DON'T DRILL DEEPER
THAN THE FLUTES



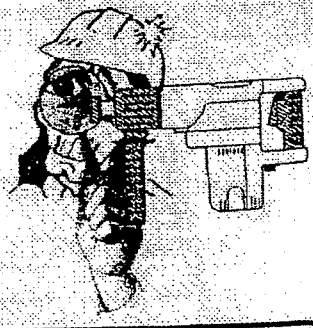
KEEP THE SHANK
CLEAN AND LUBRICATED



STORE THE BIT IN IT'S
OWN CONTAINER



CHECK THE NOSE-PIECE ON
YOUR HAMMER FOR WEAR



CORDS & POWER

DOUBLE INSULATED/GROUNDED TOOLS: A double insulated tool is one that has all the electrical parts of the motor insulated from each other and all gripping surfaces made of non-conductive materials. In essence there are two layers of insulation between the operator and the tool's electrical systems. Tools that are double insulated are not intended to be grounded and therefore are equipped with a two pronged plug. Three-pronged plugs are found on grounded tools and are electrically safe as long as the receptacle is properly grounded.

POWER: In general, the higher the amperage rating of a tool the more powerful the motor. This assumes that tools being compared have motors operating at the same efficiency. Efficiency is defined as a percentage which is obtained when comparing usable output amps (power) to the amps being drawn by the motor. Different motors and/or different manufacturers will not have the same efficiency. One tool manufacturer says 6 amps, another says 750 Watts and still another says 1 horsepower all for the same tool.... How does one make a logical comparison?

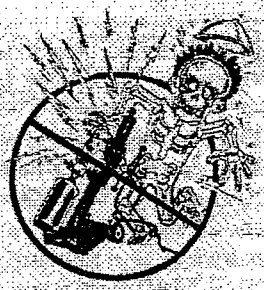
***WATTS = AMPS X VOLTS X 62%**
(AC apparent power)

$$\text{AMPS} = \frac{\text{WATTS}}{\text{VOLTS}}$$

1 HORSEPOWER = 746 WATTS

*This is the power consumed by the tool and not its power output. Output Watts is the true measure of a tool's power.

GROUND FAULT INTERRUPTER: A device which protects both the worker and the tool against line ground faults (short circuits). It does this by detecting any imbalance in the current flow to and from the tool. If a ground fault should occur, the current imbalance will trip the G. F. I. before the operator is shocked.



RECOMMENDED GENERATOR SIZES

H.P.	AMPS.	PHASE	GENERATOR SIZE IN KILOWATS
1/2-1	14	1ph	4
1	15	1ph	5
1-1/2	18	1ph	5
2		1ph	6.5
5		1ph	12
7.5		1ph	20
5		3ph	12
7.5		3ph	25
10		3ph	25
15		3ph	30
20		3ph	40
25		3ph	50
30		3ph	60
40		3ph	80

RECOMMENDED POWER CORD GAUGE

RATING OF TOOL H.P.	AMPS	PHASE	VOLTAGE	REQUIRED CORD GAUGE SIZE UP TO 50'	50-100'	100-150'	150-200'
1/3-1/4	7	1ph	125v	#18	#18	#16	#14
1/2	10	1ph	125v	#18	#16	#14	#12
3/4	13	1ph	125v	#16	#14	#12	#10
1	15	1ph	125v	#14	#12	#10	#8
1-1/2	20	1ph	125v	#12	#10	#8	#6
1-1/2	13	1ph	115v	#12	#10	#8	#6
1-1/2	6	1ph	230v	#14	#14	#12	#10
2	30	1ph	125v	#8	#6	#4	#2
2-1/2	21	1ph	115v	#10	#8	#6	#4
2-1/2	11	1ph	230v	#14	#12	#10	#8
5	23	1ph	230v	#10	#8	#6	#4
5	12	3ph	230v	#14	#12	#10	#8
5	6	3ph	460v	#14	#14	#12	#10
7-1/2	33	1ph	230v	#8	#8	#6	#4
10	24	3ph	230v	#10	#8	#6	#4
10	12	3ph	460v	#14	#12	#10	#8
20	52	3ph	230v	#6	#6	#4	#2
20	26	3ph	460v	#10	#8	#6	#4
25	58	3ph	230v	#6	#6	#4	#2
25	29	3ph	460v	#10	#8	#6	#4
30	37	3ph	460v	#8	#6	#4	#2
40	48	3ph	460v	#8	#6	#4	#2
50	62	3ph	460v	#4	#4	#2	#0