SECTION V

WORKING STEEL

A GUIDE FOR PROPER USE AND CARE OF WORKING STEEL

Kent Demolition Tools working steels are made of the finest steel available and heat-treated in our own facility. Working steels, however well made, are wear parts, and are used in the most destructive applications. Even when the hydraulic breaker is used properly, and the operator is an experienced one, a working steel may become damaged. When a working steel has been damaged, it is useful to determine the cause immediately in order to prevent the damage from occurring again.

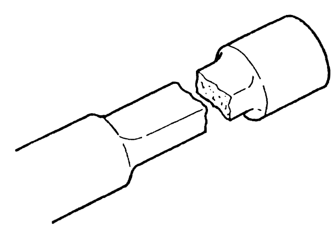
All Kent points are machined and hardened for maximum performance. Care must be taken to maintain the tools original condition for optimum productivity and life expectancy. It is not uncommon for an operator who is unfamiliar with using a hammer to break a point. This is part of the learning experience.

Listed below are several methods to determine tool failure and will quickly aid in warranty determination.

TOOL FAILURE NOT COVERED UNDER WARRANTY

- **Blank Firing or Free Running**

This occurs when the tool is not in proper contact with the work, thus causing the energy produced by the hammer to be concentrated on the tool retainer(s) and the retainer slot(s) on the tool itself. Caution should be used to prevent the hammer from sliding off slanted surfaces or when breaking through thin material.



The drawing at the right is typical of the kind of breakage that occurs from excessive blank firing.

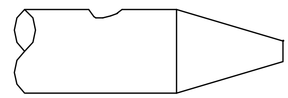
- **Worn-out Front Bushing(s) or Retainer pin(s)**

Worn-out front bushing(s) will cause the tool to become misaligned inside the hammer. This misalignment will cause uneven contact between the piston and tool, thus causing stress to concentrate on one particular area of the tool. This can also cause the tool to bind inside the hammer. Call your Kent dealer for acceptable wear allowances.

Worn-out retainer pin(s) will cause uneven loading on the pin(s) themselves, causing failure of the tool or retainer pin(s). This will also cause excessive wear to the front bushing(s).

- **Metal-to-Metal Contact**

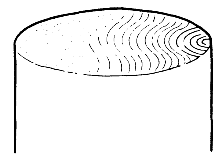
Extreme caution should be used to avoid scratches or gouges on the surface of the tool. These areas create a stress concentration point, thus weakening the tool.



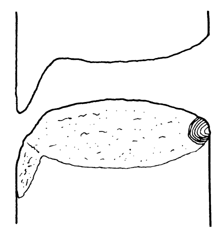
METAL-TO-METAL CONTACT

Another form of metal-to-metal contact is galling, which usually occurs from the lack of lubrication. Special care should be taken to keep the tool shank lubricated ever two (2) to three (3) hours.

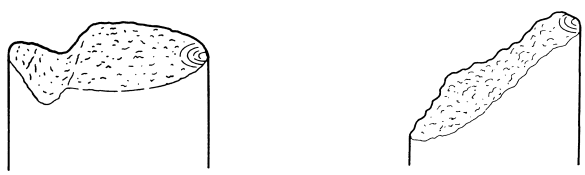
Steel failures that were caused by surface damage take two main forms. The simplest form is caused by deep scratches on working steel surface. The broken surface has a shell pattern around the starting point of failure, similar to the one in the fatigue failure. The other parts of the broken surface are brittle. These failures work slowly through the steel until it suddenly parts completely.



The second form of failure caused by surface damage occurs when there are deep scratches on working steel surface and there was also excessive bending stress. The broken surface also shows the shell pattern, but the other parts of the broken surface are brittle and usually have a "lip" like that in a stress failure.

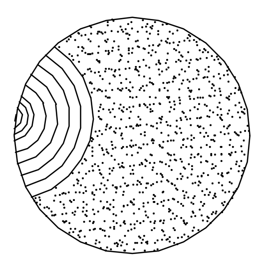


In its most extreme forms, the combination of surface damage and severe bending can quickly break even the best working steels. These two drawings show examples of severe stress breaks.



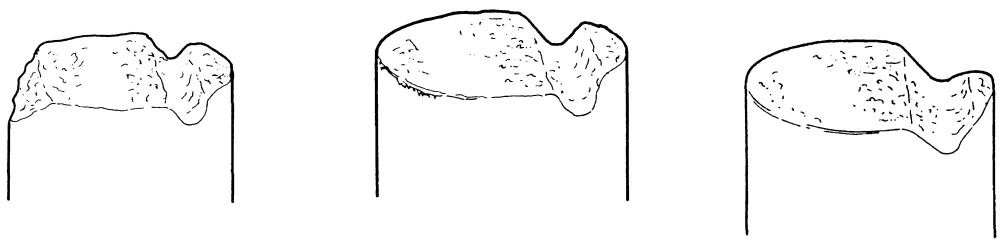
- **Prying**

This is the most common cause of tool failure. Even when there is no surface damage, the stress from prying can easily break a working steel. This kind of failure generally results from any type of side pressure such as an incorrect breaking angle or from using the tool to reposition material. The tool should not be used as a pivot point when repositioning the carrier. The power generated by the carrier will far exceed the strength of the tool.

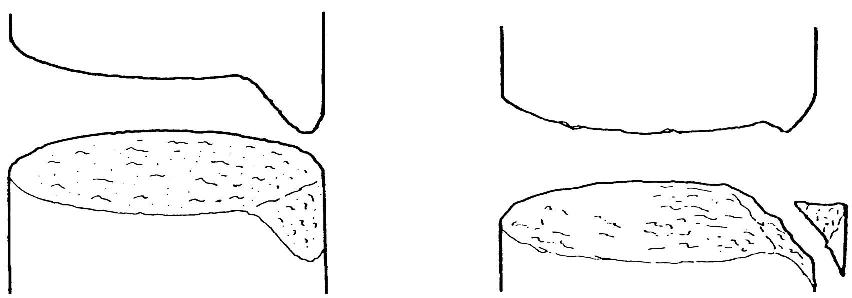


FATIGUE FAILURE

Similar failures can also occur when the steel is used with extreme down pressure, and the steel repeatedly slips off the work at an angle, or the material, itself moves from under the working steel.



As these drawings show, fatigue failures take many forms, but they all exhibit similar features. Generally, the broken surface is brittle and has a "lip" like that in the bending failure, even though, in some cases, the lip has been broken.

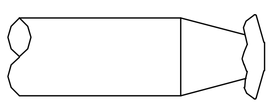


- **Corrosion**

Tools should be greased and stored out of the weather. Corrosion tends to accelerate the fatigue fractures of the tool.

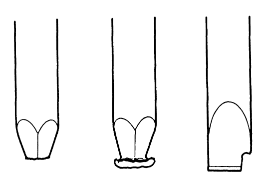
- **Mushrooming**

Driving the tool into a hard material for a long period of time generates an intense heat, indicated by a blue tone just above the point. This will soften the steel and cause the point to fold over or mushroom the end of the tool. Avoid hammering in one location for too long. If material does not break after a short period (approximately 45 to 60 seconds), reposition the tool.



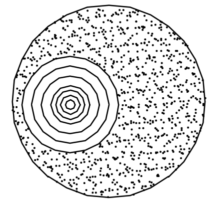
MUSHROOMING

If the overheated steel is suddenly cooled by being dipped in standing water, for example, the metal will harden and become brittle. These are some examples of failure caused by temper changes occurring on the job.



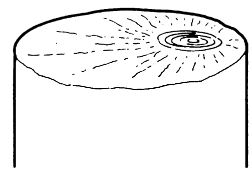
TOOL FAILURE COVERED UNDER WARRANTY

- **Internal Material Flaw**



INTERNAL MATERIAL FLAW

This failure occurs when a foreign material is rolled into the steel during the manufacturing process, causing an imperfection in the grain. The result is an inherent weakness in the tool shank and eventual breakage.



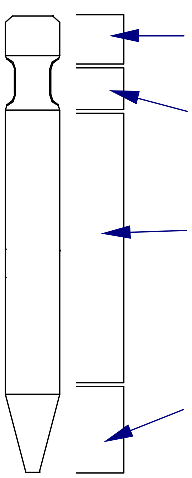
The fatigue failure is started by the defects within the working steel. The broken surface exhibits a shell pattern around the starting point of failure, like that in the fatigue failure. The other parts of the broken surface are brittle.

This is the only kind of working steel failure that is always covered under warranty.

As a rule, working steel failures can be diagnosed by looking at the break itself, and at the place on the steel where the break occurred. Discoloration, like "rainbow" effects or blue bands, is the result of extreme heat.

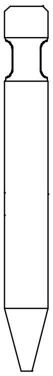
Look for surface cracks, galling, or gouge marks. Breaks that start as surface damage have a "sea shell" pattern, with the damaged spot at the center. A large "sea shell" indicates a slow growing break; a small one indicates one compounded by side stress.

Stress failures start small, and spread into the center of the steel. In a stress failure, the coarser the grain, the greater the stress was, and the more rapid was the failure.



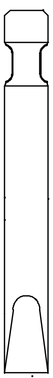
- Failures in this area are usually the result of blank firing, worn bushing(s), worn retainer pin(s) or the lack of lubrication.
- Failures in this area are usually the result of worn retainer pin(s) or blank firing.
- Failures in this area are usually the result of prying, metal-to-metal contact or corrosion. Prying failures often exhibit a shell-like formation near the edge of the steel diameter where the break began, and a "tail" opposite that where the remaining steel bent and tore.
- Failures in this area are usually the result of heat build-up, mushrooming, or improper contact with the work.

Kent HydraRams are available with three (3) different types of working steels. They are the moil, chisel and the blunt. Each of these working steels has its own purpose as described below:



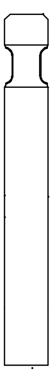
MOIL

This is by far the most popular working steel. It is a general purpose point used to break anything from concrete to hard rock. Its pencil-type point is used to fracture the material. The tool is best where penetration speed is important.



CHISEL

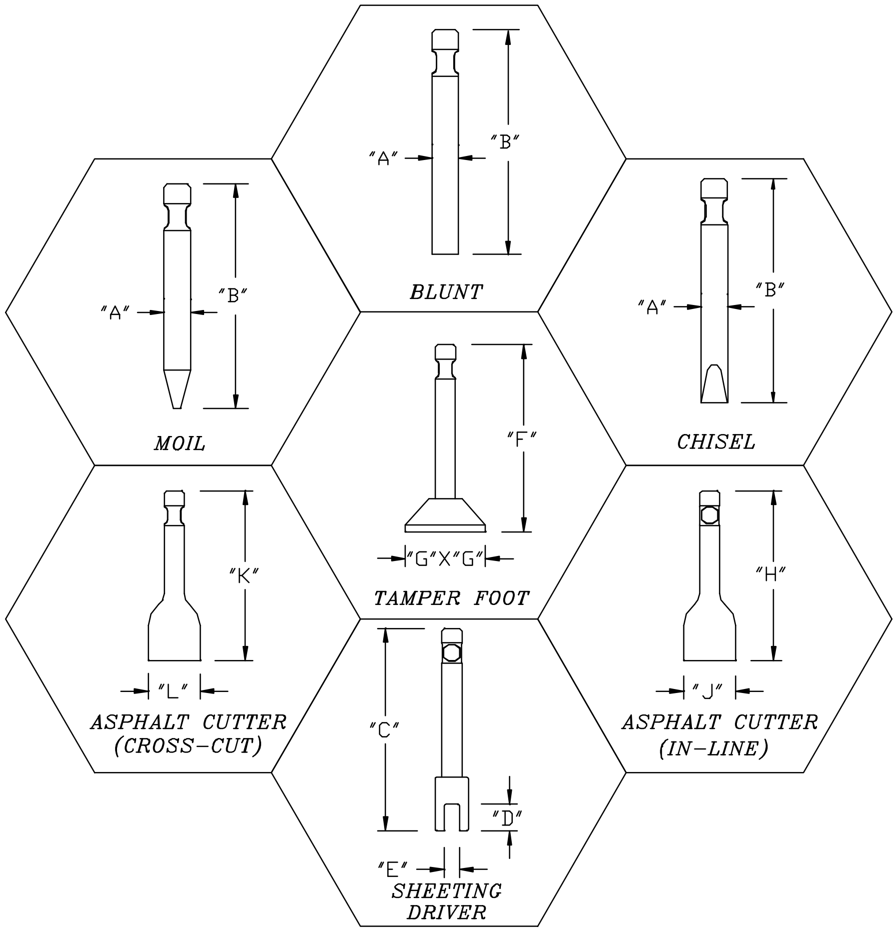
This style of point is used generally used for trench work, where a controlled break is required, and for rock breaking on materials with a definite line of cleavage. A chisel bit also works well in softer concretes where a moil might penetrate quickly, but not cause a fracture line.



BLUNT

This flat type of point is used to break softer material such as coal or shale. A moil or chisel will tend to punch holes in this type of material, where a flat blunt will shatter the material. It is also useful when breaking irregularly shaped material where its broad tip makes it easier to position.

To obtain the maximum production from the breaker, it is important to select the proper working steel. Consult your Kent representative for assistance in selecting the proper working steel for your application.



MODEL \ PART NO.	MOIL	CHISEL	BLUNT	SHEETING DRIVER	TAMPER FOOT	ASPHALT CUTTER	
						IN-LINE	CROSS-CUT
KHB-1GII	12310	12311	12309	—	—	—	—
KHB-2GII	12223	12221	12222	—	BM12224	12293	12292
KHB-3GII	10694	10695	10693	10688	BM10685	10691	10697
KHB-5GII	10547	10548	10546	BM10567	BM10566	10583	10579
KHB-8GII	11036	11037	11035	11041	BM11038	11045	11046

NOTE: IN-LINE ASPHALT CUTTER IS PARALLEL WITH BASE MACHINE
CROSS-CUT ASPHALT CUTTER IS PERPENDICULAR WITH BASE MACHINE

MODEL \ DIM.	"A"	"B"	"C"	"D"	"E"	"F"	"G"	"H"	"J"	"K"	"L"
KHB-1GII	1.5	15.75	—	—	—	—	—	—	—	—	—
KHB-2GII	1.75	18.25	—	—	—	20.5	12	20.5	6	20.625	6
KHB-3GII	2.375	22	27	4	2.25	23.375	12	22	7	21.375	7.75
KHB-5GII	3	25.25	30.25	4	2.25	28	12	24.25	8	25.375	7.75
KHB-8GII	3.5	29.75	34.75	4	2.25	31.5	12	—	—	—	—

NOTE: ALL DIMENIONS ARE SHOWN IN INCHES

Working Steel Dimensions

TOOL MODEL	DIAMETER	LENGTH "A"	LENGTH "B"	WEIGHT
KHB2G	1 3/4"	18 1/4"	12 1/4"	12 LBS.
KHB3G	2 3/8"	22"	13 3/4"	25 LBS.
KHB5G	3"	25 1/4"	16"	45 LBS.
KHB8G	3 1/2"	29 3/4"	18 1/4"	79 LBS.
KHB10G	4 1/4"	37 1/2"	26 1/4"	145 LBS.
KHB15G	4 3/4"	43 5/8"	26 1/4"	218 LBS.
KHB20G	5 1/4"	47 1/2"	30 1/4"	295 LBS.
KHB30G	6"	51 1/2"	30 1/4"	409 LBS.
KHB40G	6 1/4"	55 1/2"	32 3/4"	480 LBS.
KHB50G	7"	59 1/2"	34 3/4"	655 LBS.