

Clamping jaws/ Anchor grips

Inspection and maintenance

Please also refer to “Directions for Safety and Accident Prevention“ B 341.11/1 and the DIN 1045-3 and DIN 1045-4 standards.

The clamping jaws in the internal stressing grip of the jack as well as the anchor grips must be constantly inspected because safety in prestressing operations essentially depends upon their condition. If the jaws are worn the wire or strand may slip during stressing and may then whip across the prestressing bed.

This could lead to fatal injury!



Clamping jaws

Two major causes of rapid wear are:

- The length of wire/strand gripped being too short: The jaws fracture.
- Incorrect detensioning of individual wires / strands: The wires / strands slip.

If the prestressing steel is stressed to 80–85% of its breaking load, the clamping jaws have to be cleaned and greased after the following numbers of stress cycles:

Round clamping jaws 7°: approx. 250, e.g. type 34P, 34M, 38P, 38PL, 42P, 45P80 and others

Round clamping jaws 8.5°: approx. 500, e.g. type 38 / 8.5 and others

Round clamping jaws 10°, two-step jaws, flat jaws: approx. 800–1000, e.g. type 39, 39PM and others

With a lower utilization of the prestressing steel, the inspection intervals can be longer.

If there exist any differing data relating to the specific stressing jack used, these are to be followed.

In addition, the clamping jaw teeth have to be checked for wear.

If the number of stress cycles applied cannot be determined or if the above numbers cannot be obtained, the internal stressing grip of the jack must be dismantled, cleaned and the clamping jaws be inspected at least every two months in the case of a hydraulic grip and at least once every month in the case of a mechanical grip.

For inspection and maintenance, the clamping jaws must be taken out and the teeth be cleaned with a wire brush. Any old, dirty lubricant must be washed off so that it can be seen whether the teeth are still in perfect condition. Follow the relevant operating instructions relating to the removal of clamping jaws.

Before being fitted back, a suitable lubricant (on a molybdenum disulfide basis) must be brushed or sprayed over the ends and outer surfaces of the clamping jaws. The taper in the threaded part should also be cleaned and amply lubricated.

Proceed in a similar manner with all the parts against which the clamping jaws press or slide and in the area of the cup springs in the case of mechanical stressing grips.

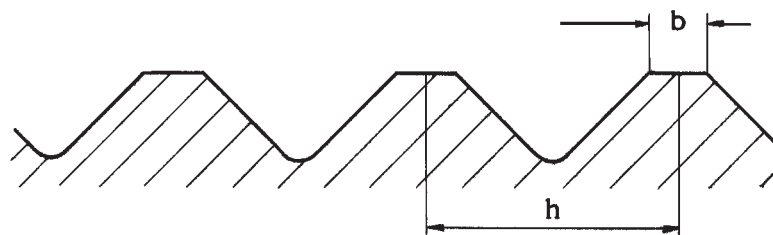
(For suitable lubricants, see leaflet “Cleaning / Preservative Agents - Spraying Equipment“)

The service life of clamping jaws depends very much on how well they are cleaned and lubricated but the hardness of the prestressing wires or strands and their shape and the stressing force applied also affects the life of the jaws and so it is impossible to give any absolute indication of how many times clamping jaws can be used. The information given below is thus a very rough guide. The actual life of the jaws will vary from one application to another.

Service life of clamping jaws in hydraulic stressing grips: 500–5000 stressing operations

Service life of clamping jaws in mechanical stressing grips: 100–1000 stressing operations

In the case of round and flat clamping jaws, the wear has reached the permissible maximum when the teeth have flattened to the extent indicated in the drawing.



h mm	b max. mm
1.0	0.2 - 0.3
1.5	0.4
2.0	0.5
3.0	0.5

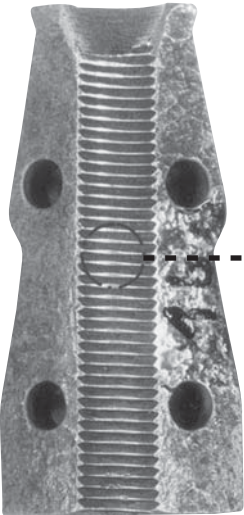
On epoxy-coated strand the “b“ values have to be divided by 2.

Clamping jaws

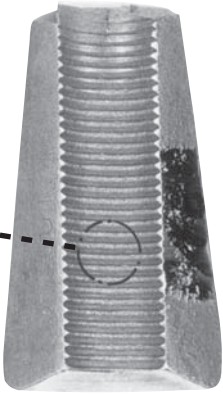
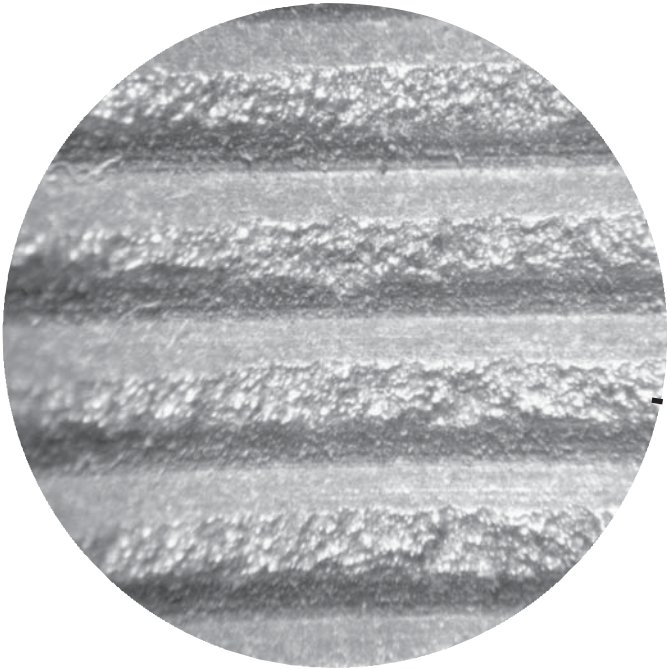
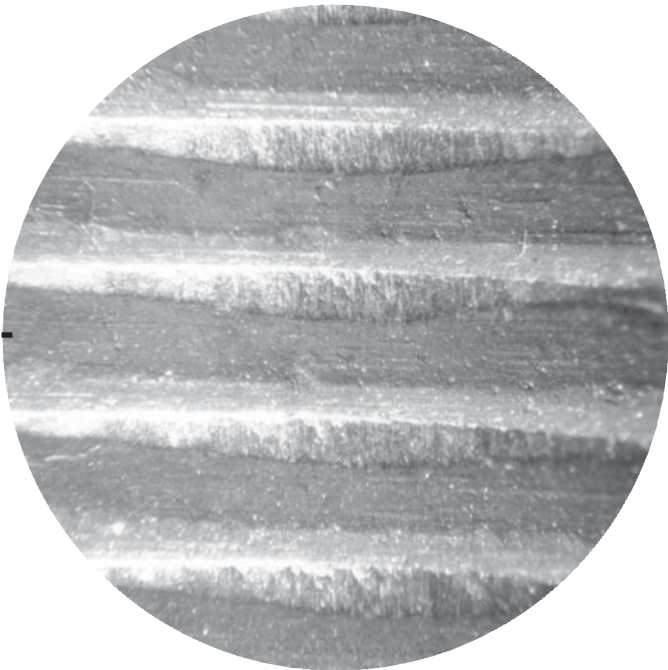
Assessment of worn clamping jaws



1 a



1 b



1 c

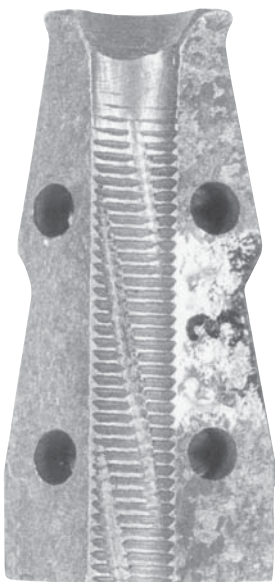


2

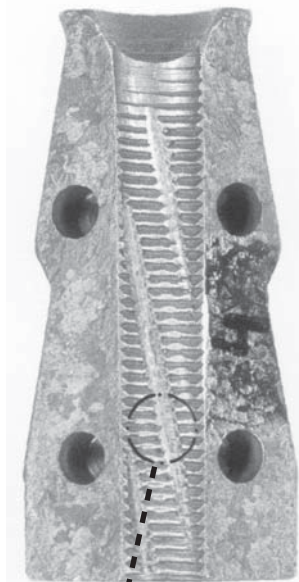
Segments 1a, 1b, 1c and 2:

(Pitch 1.5 mm)

Limit of permissible wear is reached!
Replace the jaws!



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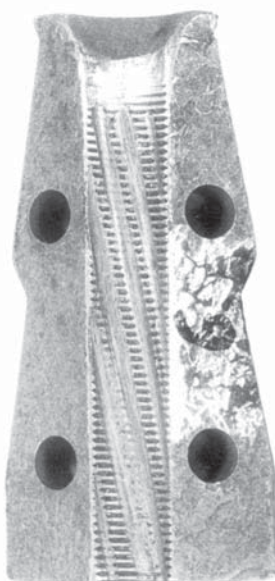
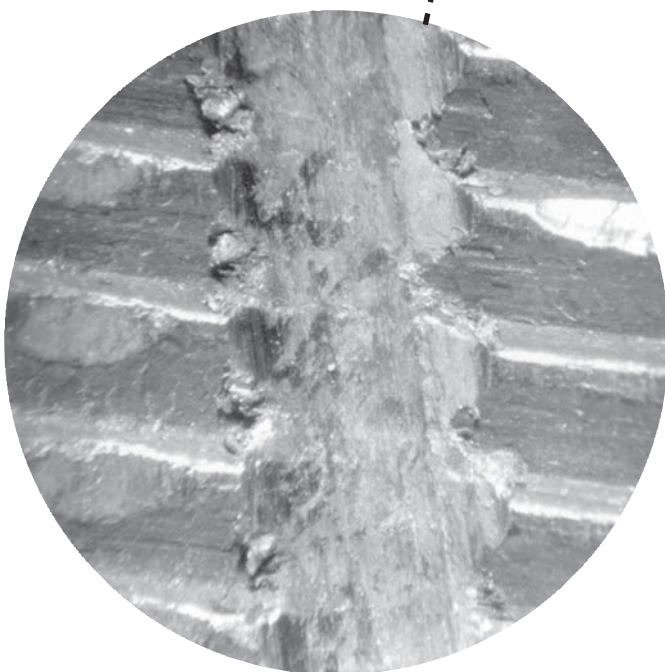
Segments 3, 4 and 5:
(Pitch 1.5 mm)

Limit of permissible wear is exceeded

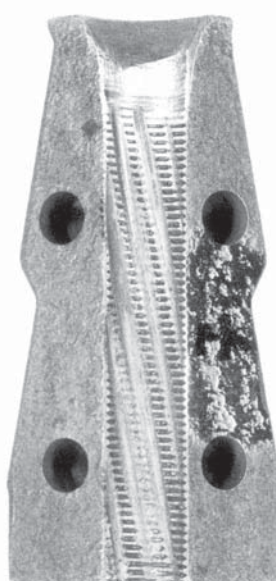
A strand has slipped

Replace the jaws!

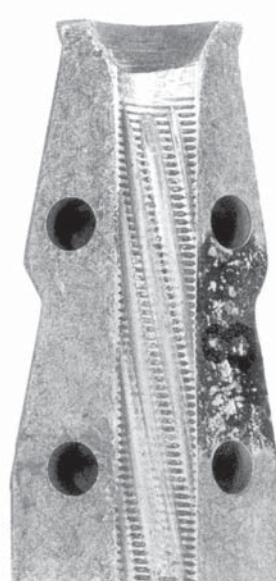
Risk of fatal accident!



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Segments 6, 7 and 8:
(Pitch 1 mm)

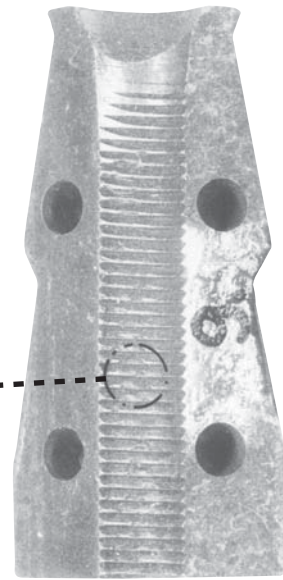
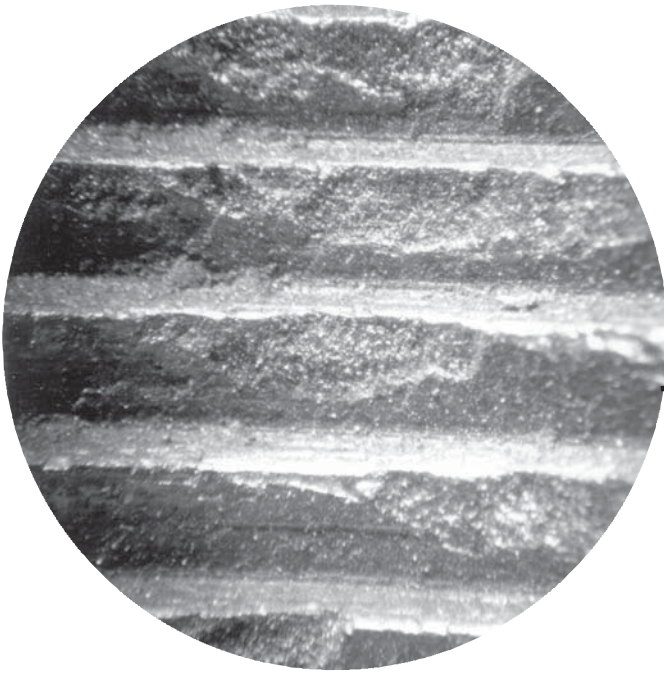
Limit of permissible wear is exceeded

Several strands have slipped

Replace the jaws!

Risk of fatal accident!





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If the teeth break out, for example when stressing ribbed solid wire, the jaws must be replaced. The breakage in segments 9, 10 and 11 indicates the maximum permissible limit.

The jaws must be replaced because of the broken out teeth!

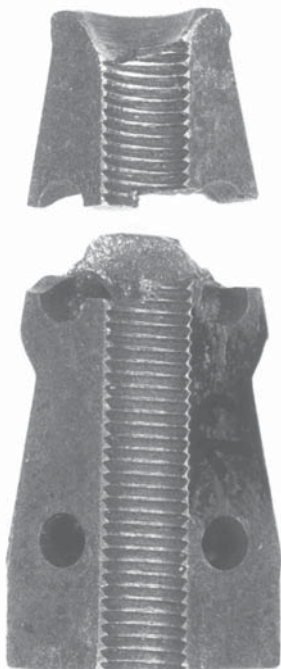


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Segment 12 has fractured because the surplus projecting length of wire was too short. The jaw is of no further use!

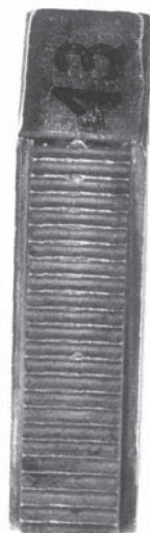


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Flat clamping jaws

Segments 13 and 14:

Limit of permissible wear is reached. Replace the jaws!



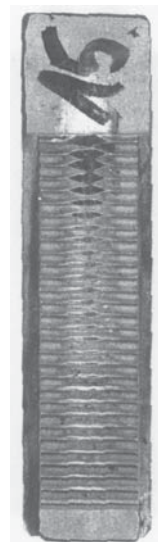
13



14

Segment 15:

Limit of permissible wear is exceeded.

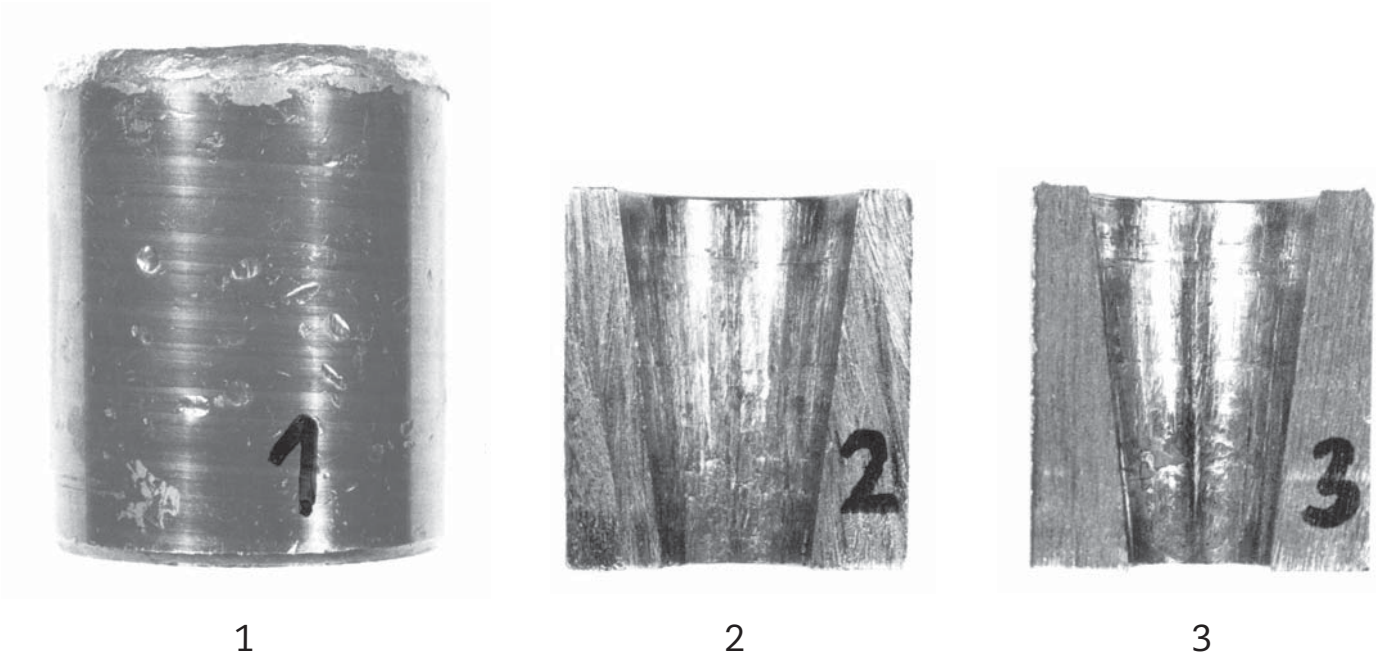


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Anchor barrels

Barrels must be replaced if their tapers have been scratched or damaged through pulling in the wedges and if any material has been torn away. They must also be replaced if barrel material has burred up before the wedge tip so that the further pulling in of the wedges would be prevented. Replacement is also necessary if the face of the barrel that abuts against the stressing jack is heavily damaged. All that is said applies equally to F-type barrels and couplers.

The following photographs illustrate damaged barrels that need to be replaced.

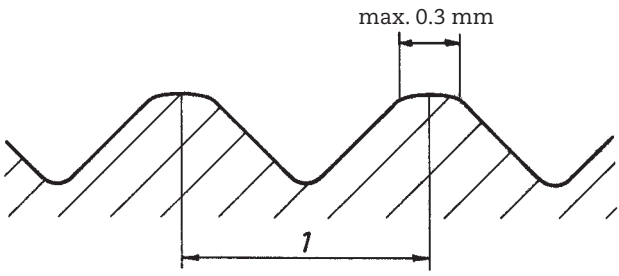


Wedges

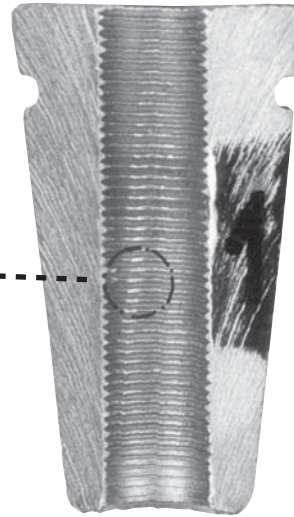
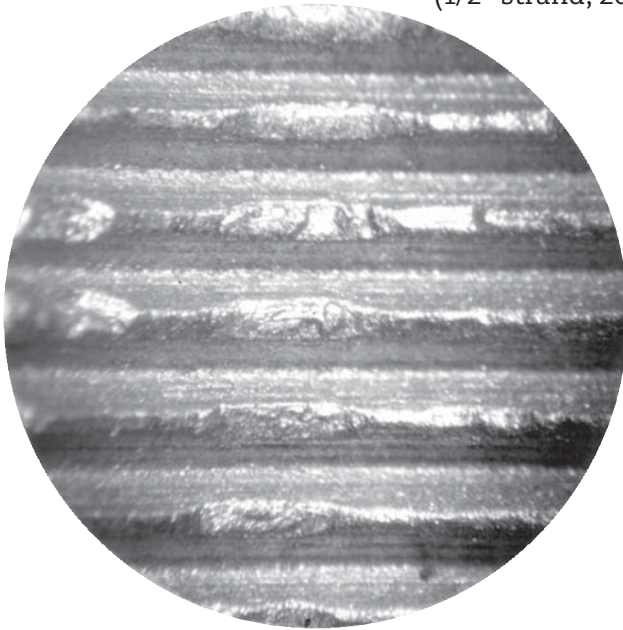
1. Damage following frequent stressing operations

The extent to which wedges can be used over again depends on many factors (see Anchor Grip leaflet B 146.01/1). After a number of stressing operations, the teeth of the wedges tend to flatten. Flattening by up to 3/10 mm per tooth with a 1 mm pitch is permissible but if this should be exceeded, then the wedges must be replaced.

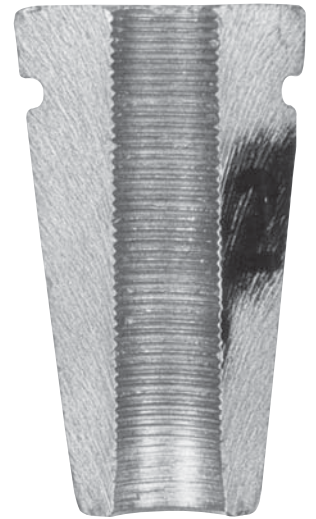
Flattening of the case-hardened surface at individual points is permissible.



The following examples illustrate segments from 2 wedge sets that were used for a number of stressing operations.
(1/2" strand, 200 stressing operations to wire breakage load)



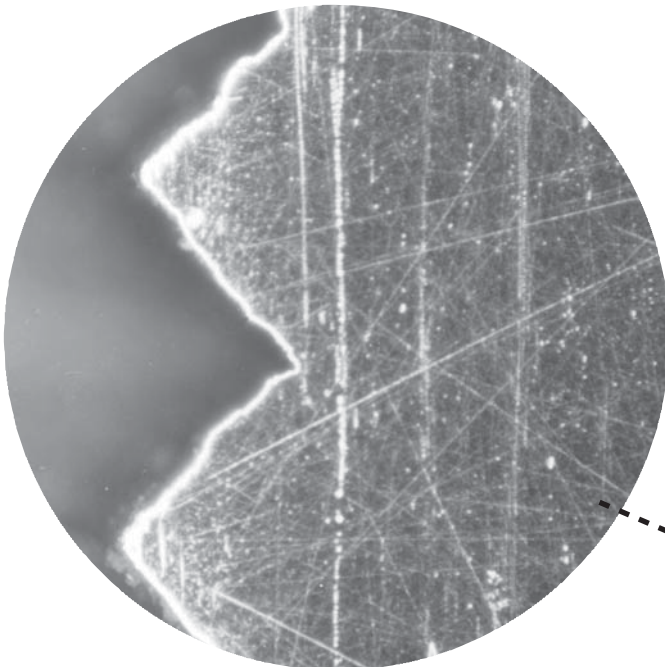
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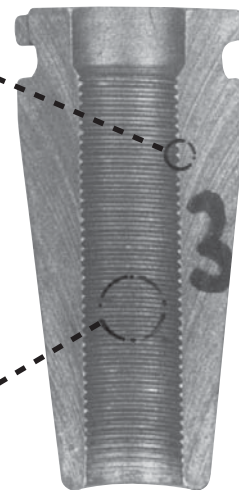
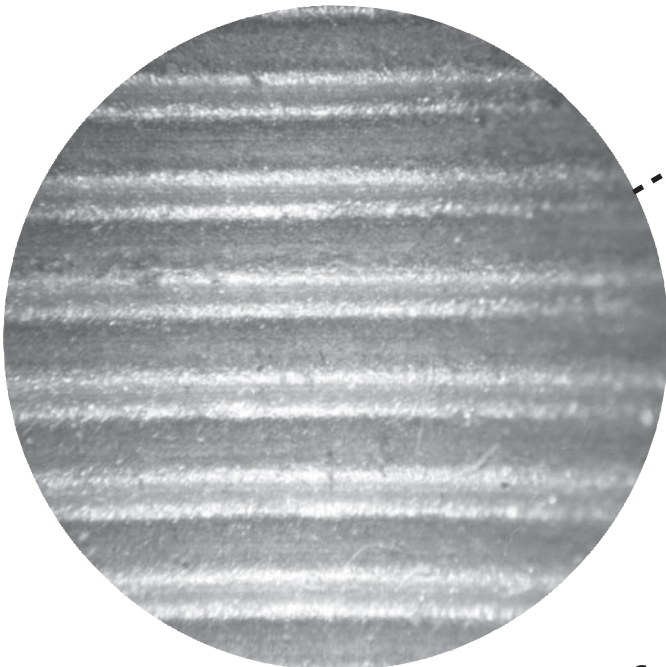
Segment 1:

Some positions have worn by more than about 0.3 mm. The wedges can still be used many times but to be on the safe side they should be separated from any that are undamaged.

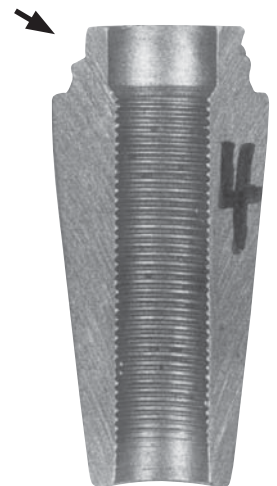


Segment 2:

Intact teeth, can still be used.



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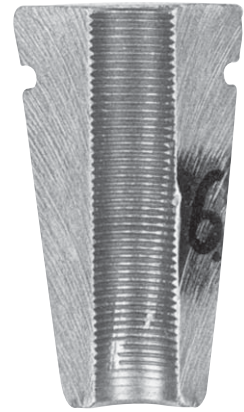
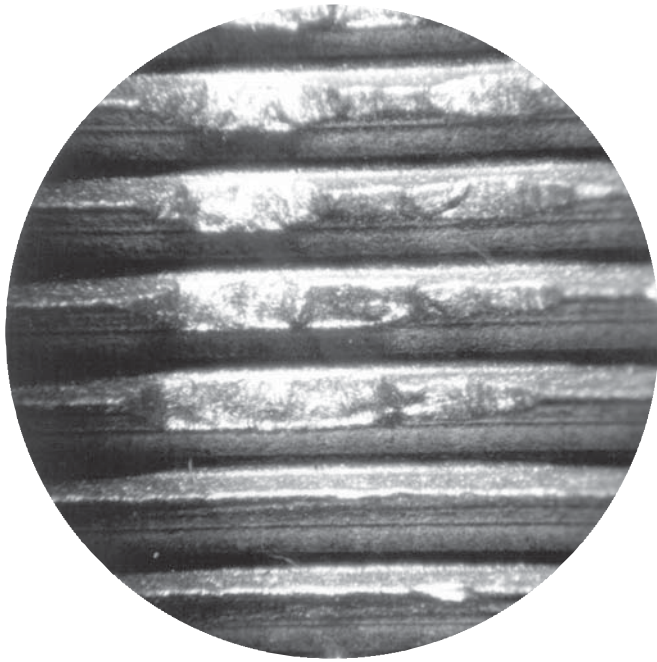
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Segment 3:

Teeth still intact, can still be used.

Segment 4:

Collar has broken off. No major effect on safety but replacement is still necessary.



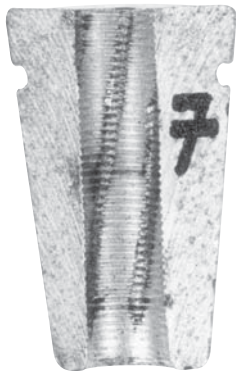
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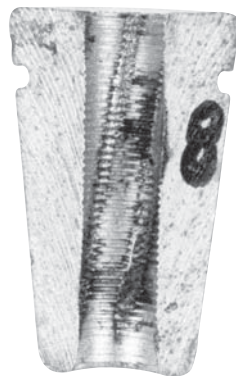
Segments 5 and 6:

Parts of the teeth are badly damaged.
These jaws should be replaced!

2. Damage after only a few stressing operations



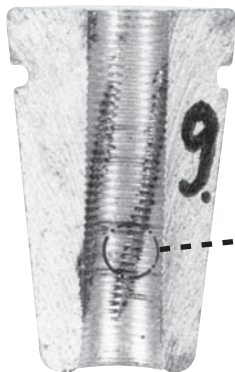
7



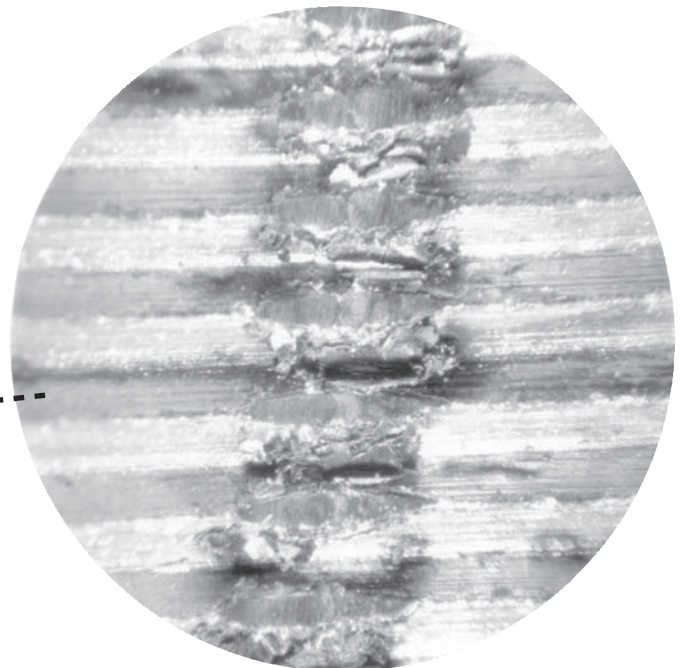
8

Where wedges or barrels are dirty or inadequately lubricated, strands generally slip before the stressing load is fully applied. The teeth are torn off and there is blue discoloration.

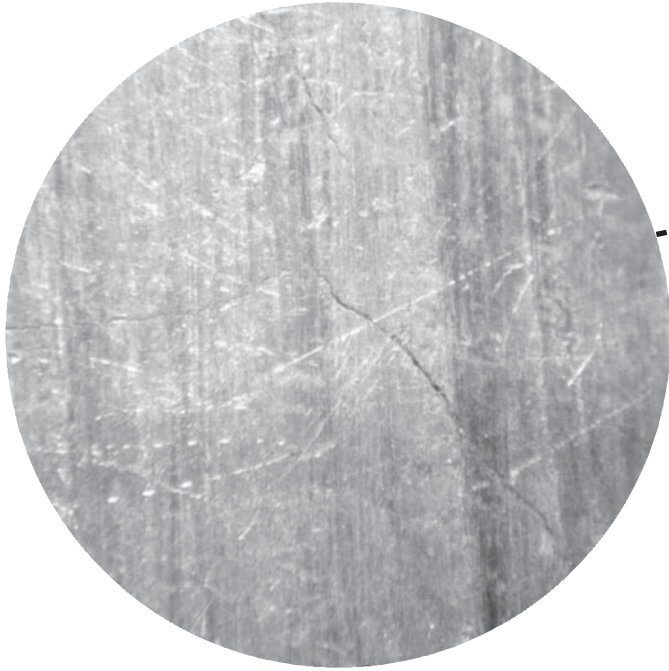
The wedge set must be replaced!



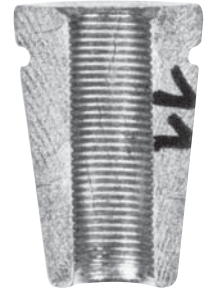
9



3. Cracks



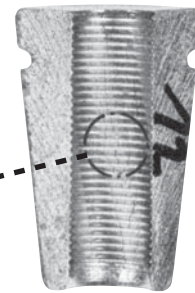
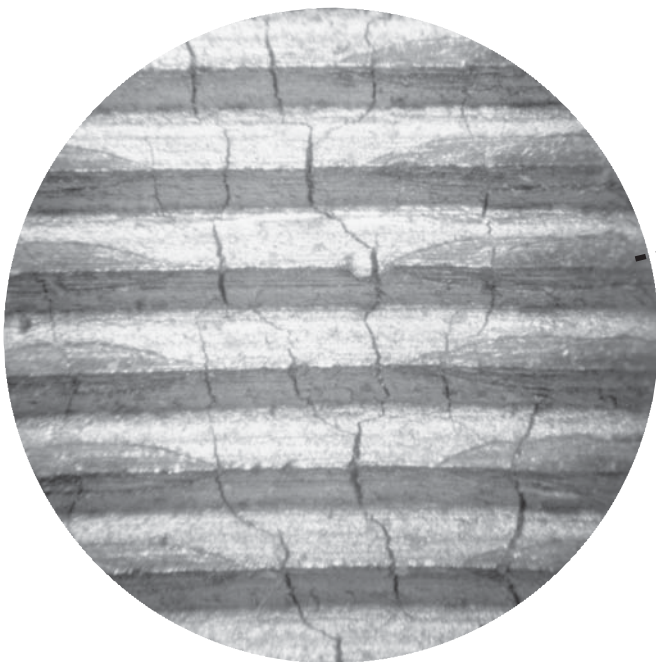
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11

Segments 10 - 12:

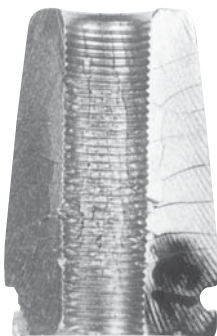
Fine hair cracks in the wedges are no cause for concern. The wedges can continue to be used until the cracks become larger.



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Segments 13 - 16:

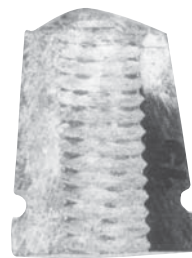
Where cracks extend right through and the tips of the wedges are broken off, immediate replacement is necessary.



13



14



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