

**MIL-STD-294A**  
**15 July 1969**

**SUPERSEDING**

**MIL-STD-294**

**2 November 1956**

**MILITARY STANDARD**  
**VISUAL INSPECTION GUIDE**  
**FOR**  
**RUBBER V BELTS**



**FSC 3030**

MIL-STD-294A  
15 July 1969

DEPARTMENT OF DEFENSE

WASHINGTON, D. C. 20301

Visual Inspection Guide for Rubber V-Belts  
MIL-STD-294A

1. This Military Standard is mandatory for use by all Departments and Agencies of the Department of Defense.

2. Recommended corrections, additions, or deletions, should be addressed to the Naval Ship Engineering Center, Center Building, Prince George's Center, Hyattsville, Maryland 20782.

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FORWARD

Government material procurement specifications and standards are primarily concerned with detailing composition, construction and necessary requirements to satisfy the demand for dependability and longevity. The visible defects shown in this document are guides for inspectors to evaluate quality and workmanship of the finished product. This Military Standard is not intended to take the place of requirements, tests and examinations specified in V-belt procurement specifications and documents. The quality requirements specified in the basic specification are governing.

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## 1. SCOPE

1.1 Scope. This standard covers only visible defects for V-belts, that have a trapezoidal cross-section, manufactured with natural or synthetic rubber compounds and reinforced with cord, fabric or wire. Power is transmitted through the nonparallel sides of the belt. Timing belts or belts that transmit power through the inner face or bottom are excluded.

1.2 Purpose. The primary objective of this standard is to furnish descriptive words and photographs of deficiencies that may occur during the manufacture of V-belts. This Standard is issued for the use of Federal and Military agencies to appraise, through visual examination, the acceptance or rejection of V-belts.

## 2. REFERENCED DOCUMENTS

2.1 The issues of the following documents in effect on date of invitation for bids form a part of this standard to the extent specified herein.

### GOVERNMENTAL

#### MILITARY STANDARDS

- MIL-STD-105 - Sampling Procedures and Tables for Inspection by Attributes.
- MIL-STD-177 - Rubber Products, Terms for Visible Defects of.

(Copies of specifications, standards, drawings and publications required by suppliers in connection with specific procurement functions should be obtained from the procuring activity or as directed by the contracting officer.)

## 3. DEFINITIONS

3.1 Major and minor defects. Defects are defined as follows:

- (a) Major. A major defect is a defect, other than critical, that is likely to result in failure, or to reduce materially the usability of the unit of product for its intended purpose.
- (b) Minor. A minor defect is a defect that is not likely to reduce materially the usability of the unit of product for its intended purpose, or is a departure from established standards having little bearing on the effective use or operation of the unit.

3.2 Word descriptions. Word descriptions of visible defects are in accordance with MIL-STD-177.

3.3 Angle. The angle formed at the intersection of the projections of the driving sides of the belt.

3.4 Cords. Twisted fibers of natural or synthetic material used to reinforce the belt structure.

3.5 Cogged or notched. A belt produced with a series of evenly spaced U- or V-shaped indentations in the inner circumference or bottom face.

3.6 Cover. The outer material of the belt, consisting of one or more plies of stretchable fabric or cord, impregnated with rubber compounds for adhesion, usually intended as a protective covering.

3.7 Compression member. The narrower trapezoidal portion of the belt in the section below the tension members that may contain cords or fabric.

3.8 Indentation. A recess on the belt surface.

3.9 Longitudinal seam. The junction point of material in the length of the finished belt.

3.10 Mandrel. A machined form to control size and to support the material during belt fabrication and vulcanization.

3.11 Matched belts. Two or more belts that have identical rotational lengths and cross-sectional areas within specified limits.

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3.12 Misidentification. Marking or identification incorrect, missing or illegible.

3.13 Tension member. Cord, fabric, or wire reinforcement, usually arranged symmetrically in the inner belt structure parallel to the length of the belt.

3.14 Transverse seam. The junction of material edging across the length of the finished belt.

Table I - Classification of defects

Defect	Major	Minor	Figure number
Indentation, any side	X	----	1
Indentation, any side	X	----	2
Indentation, any side	X	----	3
Indentation, any side	X	----	4
Indentation, wearing side	X	----	5
Indentation, top or bottom	X	----	5
Light spot	X	----	6
Light spot	----	X	7
Press lap defect	X	----	8
Press lap defect	X	----	9
Flow distortion	X	----	10
Flash distortion (here shown with flash in place but will appear usually for inspection with flash removed)	X	----	11
Flash untrimmed (not acceptable but can be removed)	X	----	12
Misplaced brand with twist (twist revealed by bending belt as shown)	X	----	13
Misplaced brand without twist	----	X	14
Protrusion, size shown, any side	X	----	15
Protrusion, 1/2 size shown wearing side	X	----	15
Protrusion, 1/2 size shown top or bottom	----	X	15
Blister, any side	X	----	16
Foreign material, wearing side	X	----	17
Foreign material, top or bottom	----	X	17
Foreign material, internal	X	----	18
Hole, in cogging area	X	----	19
Porosity, not in cogging area	X	----	20
Open longitudinal seam, any side	X	----	21
Open longitudinal seam, wearing side	X	----	22
Open longitudinal seam, top or bottom	----	X	22
Loose longitudinal seam, any side	X	----	23
Open transverse seam	X	----	24
Open transverse seam, wearing side	X	----	25
Open transverse seam, only top or bottom and no larger than shown	----	X	25
Loose transverse seam	X	----	26
Loose transverse seam, wearing side	X	----	27
Loose transverse seam, top or bottom	----	X	27
Torn cover	X	----	28
Torn cover, wearing side	X	----	29
Torn cover, top or bottom	----	X	29
Trim cut	X	----	30
Trim cut	----	X	31
Scratch, not through a ply	----	Y	32

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Table I - Classification of defects, (Cont'd)

Defect	Major	Minor	Figure number
End scrap, material missing	X	-----	33
Wrinkle in cover, tension member not distorted	-----	X	34
Cogging cut-outs skipped, more than one cog	X	-----	35
Cogging cut-out overlap	-----	X	36
Cogging missed, more than one cog	X	-----	37
Wavy wire in steel cable belt	X	-----	38

## Defects not shown on photographs

Defect	Major	Minor	
Cogging cut-out skipped	X	-----	
Cogging missed, one cog	-----	X	
Hole, not in cogging area	X	-----	
Marking, with wrong information	X	-----	
Marking, missing or illeceible	X	-----	
Matching faulty	X	-----	
Porosity in cogging area	X	-----	
Scratch through ply	X	-----	
Wrinkle in cover, tension member distorted	X	-----	

## 4. GENERAL REQUIREMENTS

4.1 Sampling. All belts shall be subjected to one or more sampling procedures in accordance with MIL-STD-105, as specified by the purchaser, except where the material specification includes a sampling plan. Acceptance or rejection of the lot, sublot, or batch shall be on the same basis.

## Custodians:

Army - ME  
Navy - SH  
Air Force - 82

## Preparing activity:

Navy - SH  
(Project 3030-0051)

## Review activities:

Army - ME, MI  
Navy - SH, YD  
Air Force - 82

## User activities:

Army - AT, EL  
Navy - AS



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Figure 1. Indentation on bottom of belt - major.

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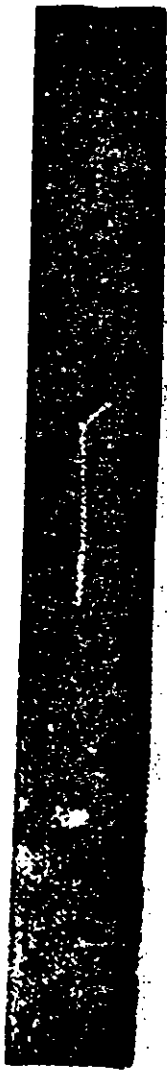
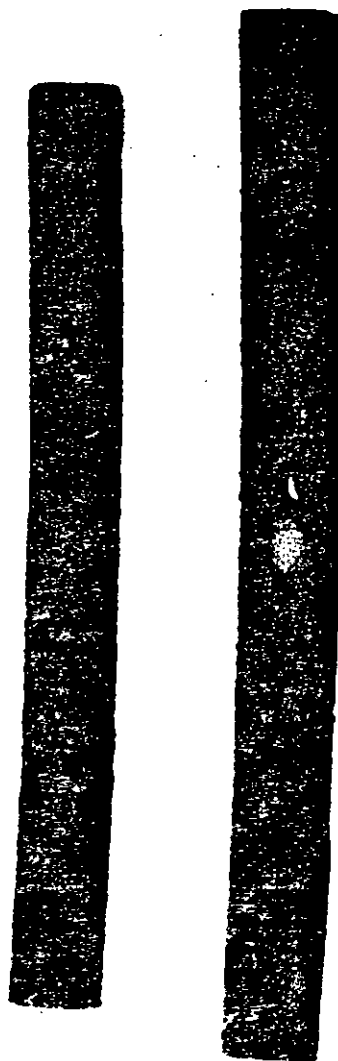


Figure 2. Indentation on top of belt - major.

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Figure 3. Indentation on top of belt - major.

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Figure 4. Indentation on top of belt - major.

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Figure 3. Indentation on top of belt - major

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Figure 6. Light spot - major.

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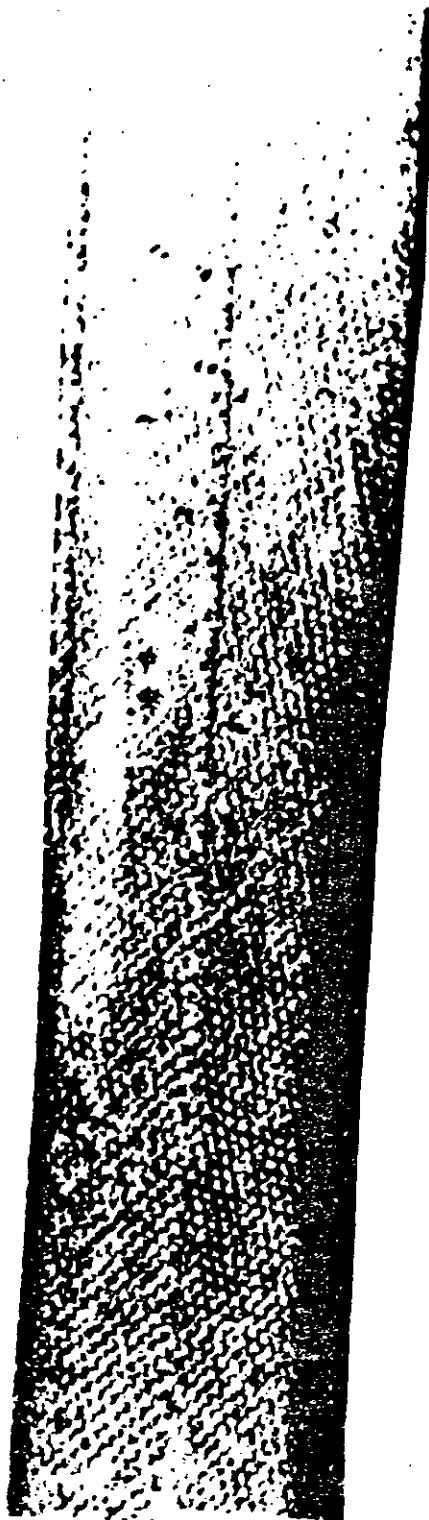


Figure 7. Light spot - minor (upper limit for minor, any larger becomes major).

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Figure 8. Press lap defect - major



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Figure 9. Press lap defect - major.

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Figure 10. Flow distortion - major.

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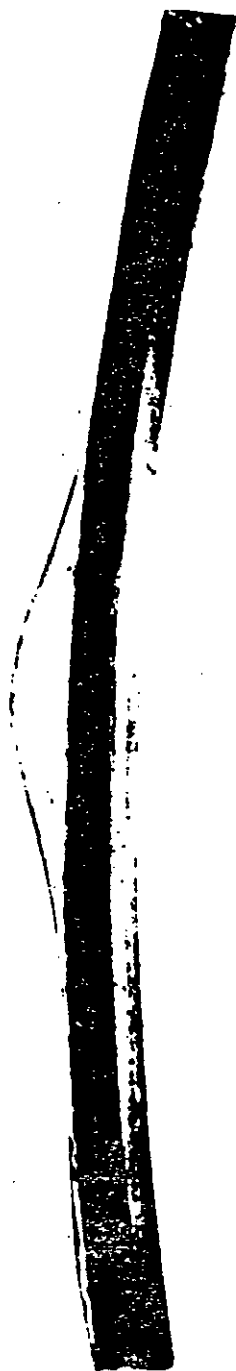


Figure 11. Flash distortion - major

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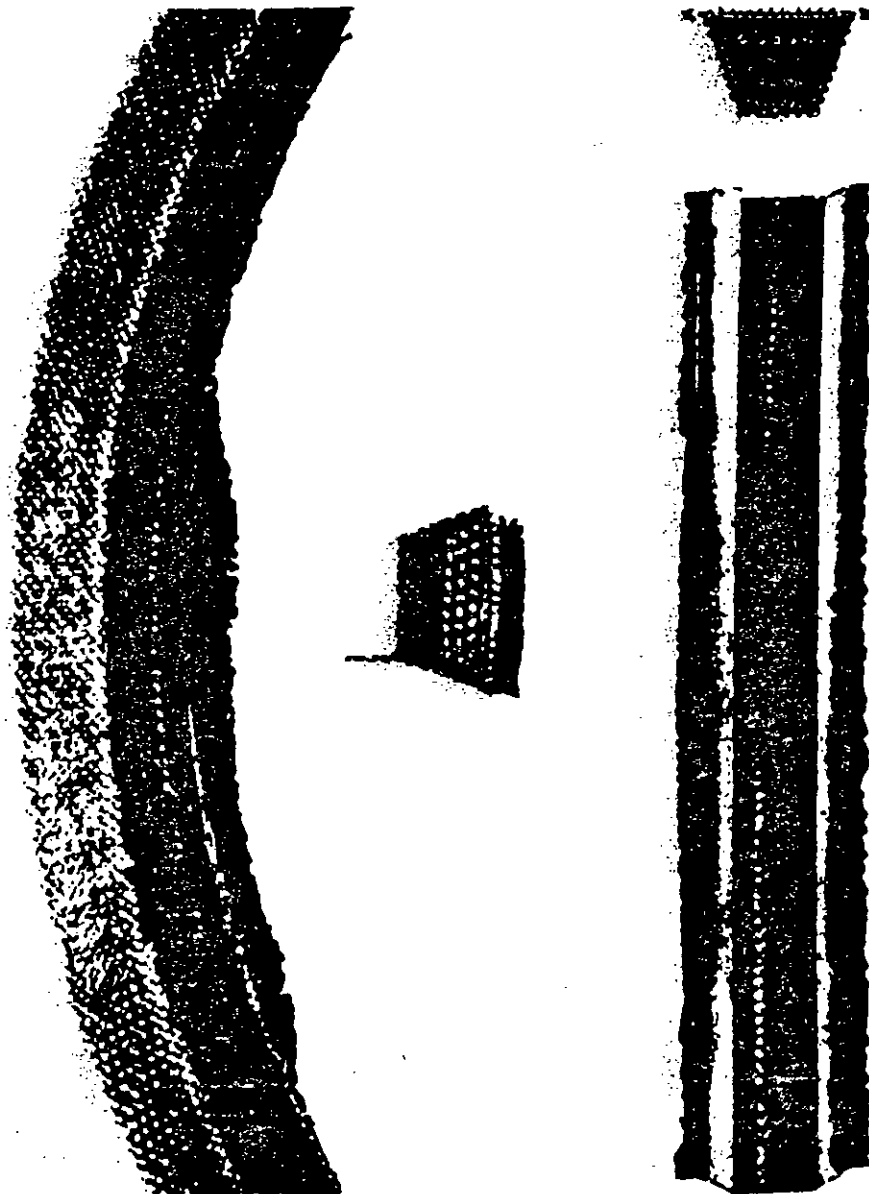


Figure 12. Flash untrimmed - major

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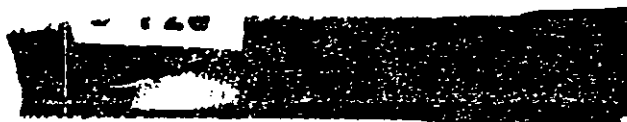


Figure 13. Misplaced brand with twist - major.

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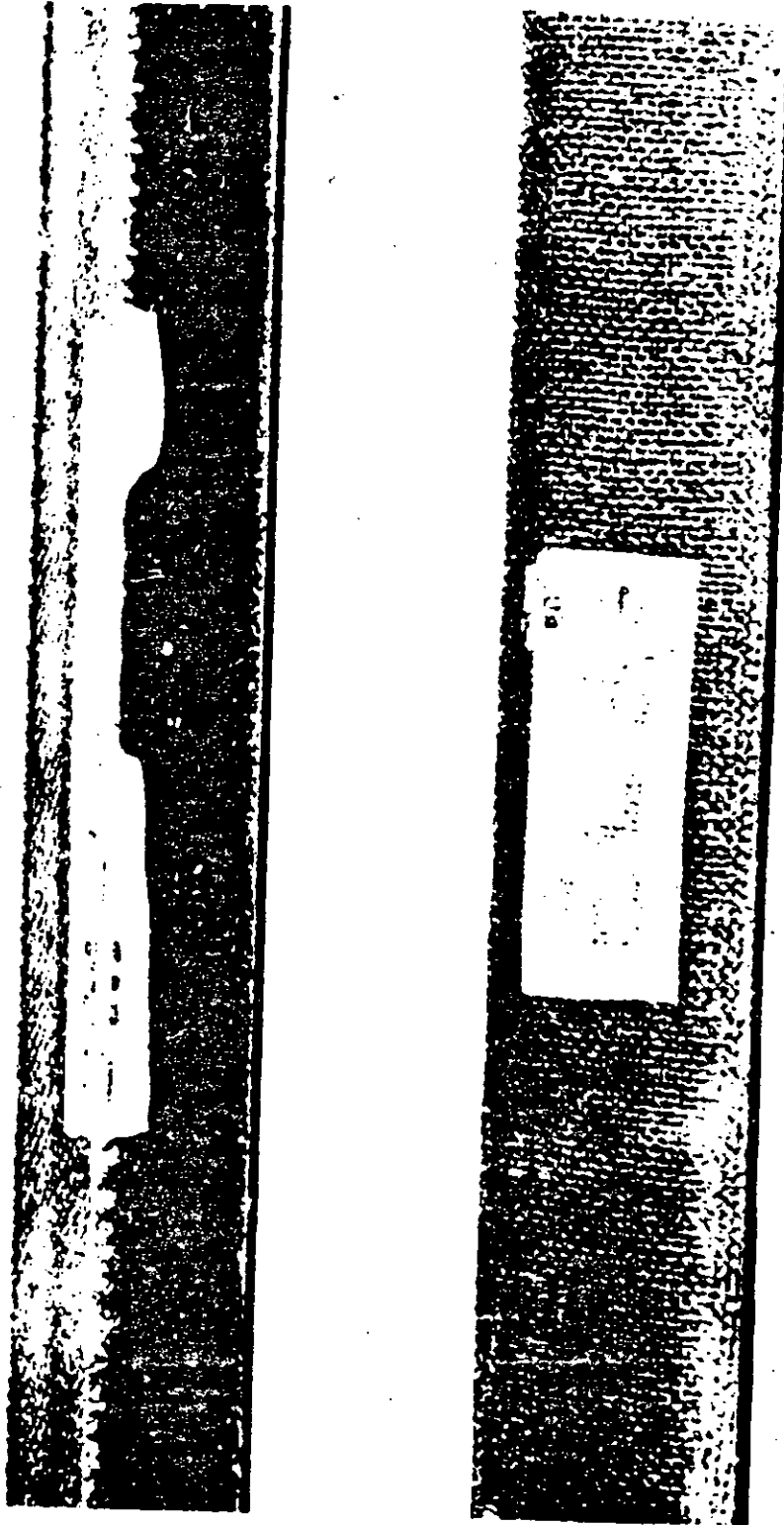


Figure 14. Misplaced brand without twist - minor. (Left belt has misplaced brand. Right belt is a correct one for comparison).

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Figure 15. Protrusion - major.

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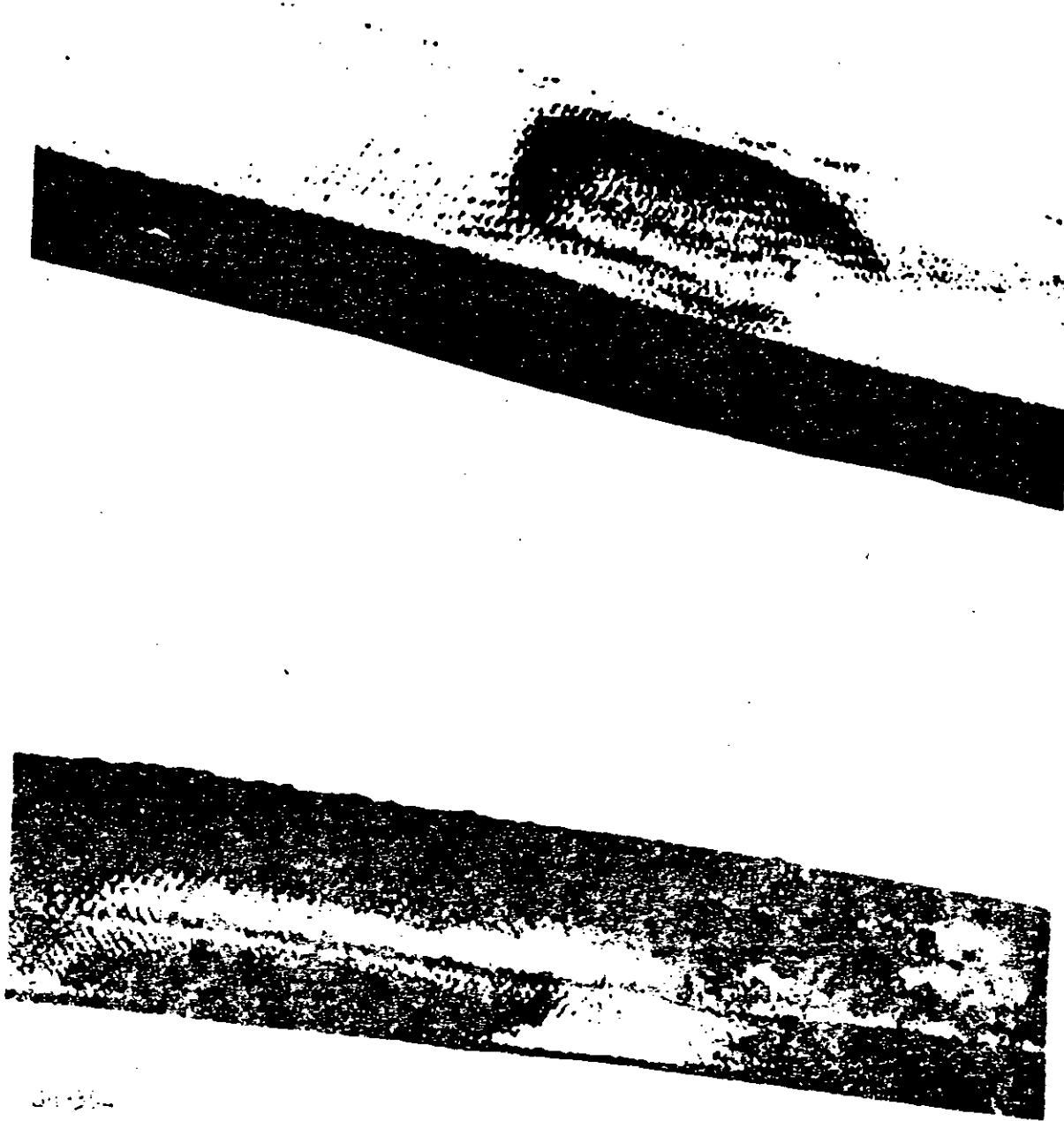


Figure 16. Blister, any side - major.



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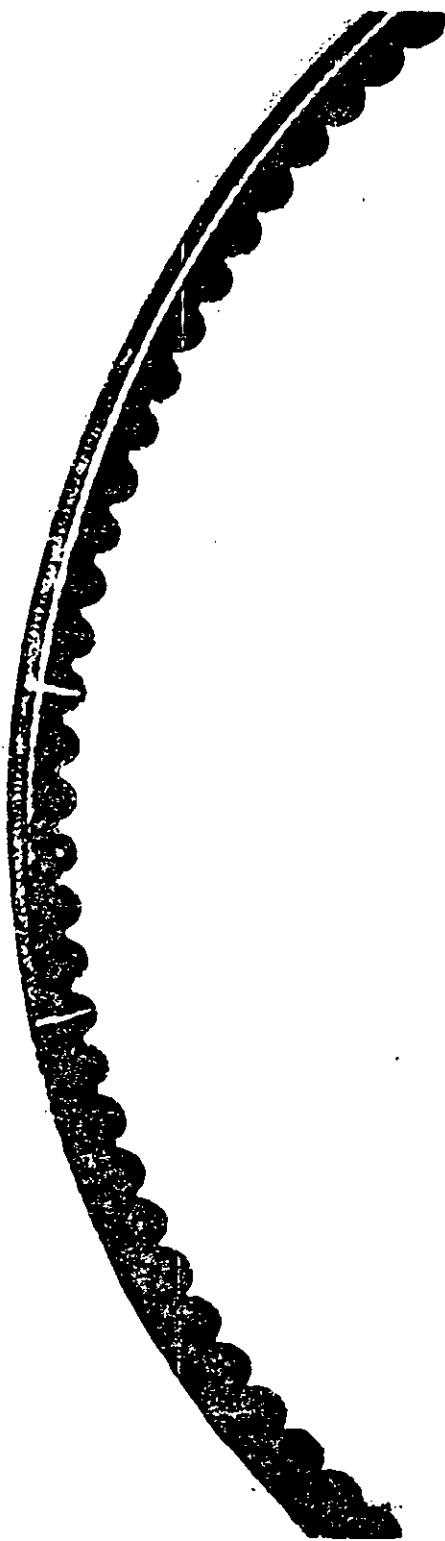
Figure 17. Foreign material, top of belt - minor.

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Figure 18. Foreign material, internal - major

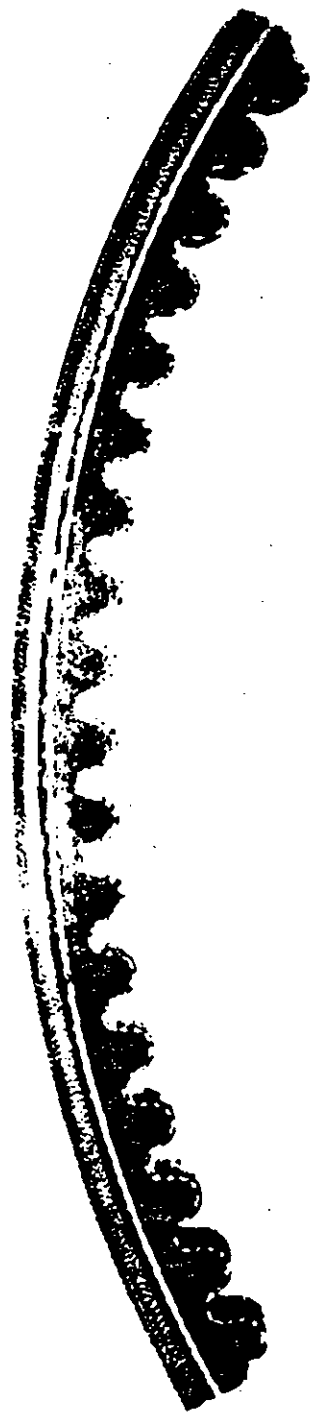
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Figure 19. Hole in cogging area - major

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SR1258

Figure 20. Porosity, between cord layer and upper part of belt - major.

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Figure 21. Open longitudinal seam - major.

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Figure 22. Open longitudinal seam, bottom of belt -  
minor; if on wearing side - major.

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CH25-1

Figure 23. Loose longitudinal seam - major.

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Figure 24. Open transverse seam - major.



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SH9508

Figure 25. Open transverse seam - major.

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Figure 26. Loose transverse seam - major.

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Figure 27. Loose transverse seam, wearing side - major; top or bottom - minor.

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Figure 28. Torn cover - major.

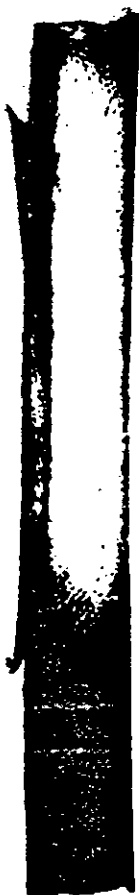
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381277

Figure 29. Torn cover, bottom of belt - minor; if on wearing side - major.

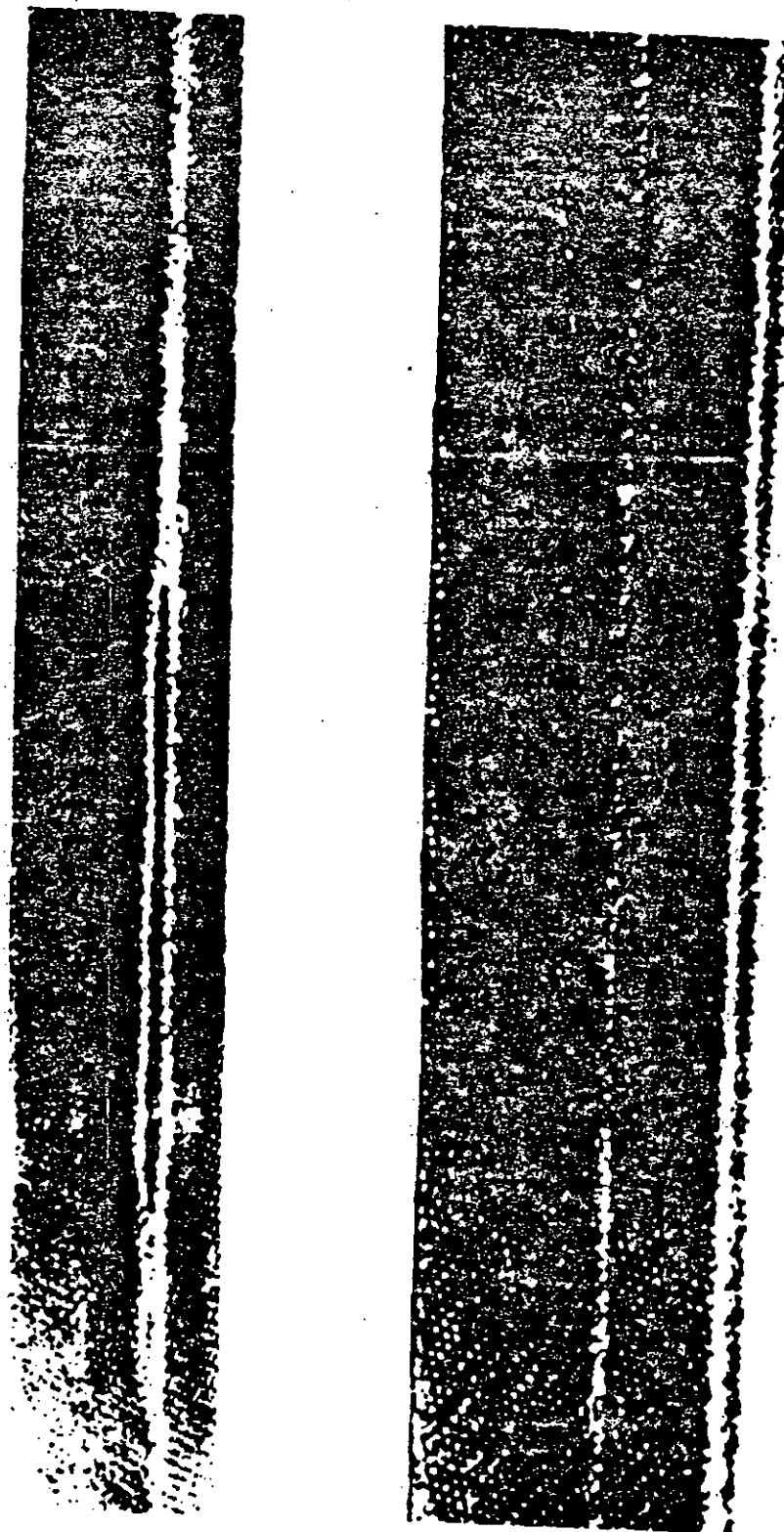
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Figure 30. Trim cut in cover - major.

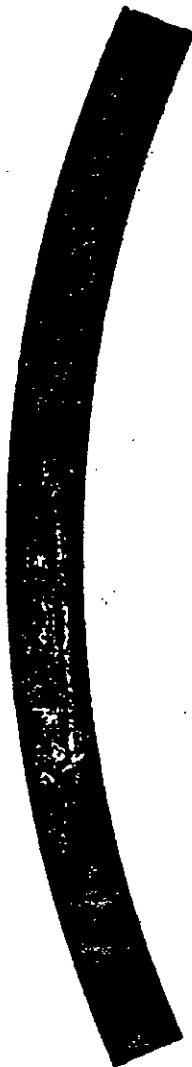
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SH9509

Figure 31. Trim cut in cover - minor.

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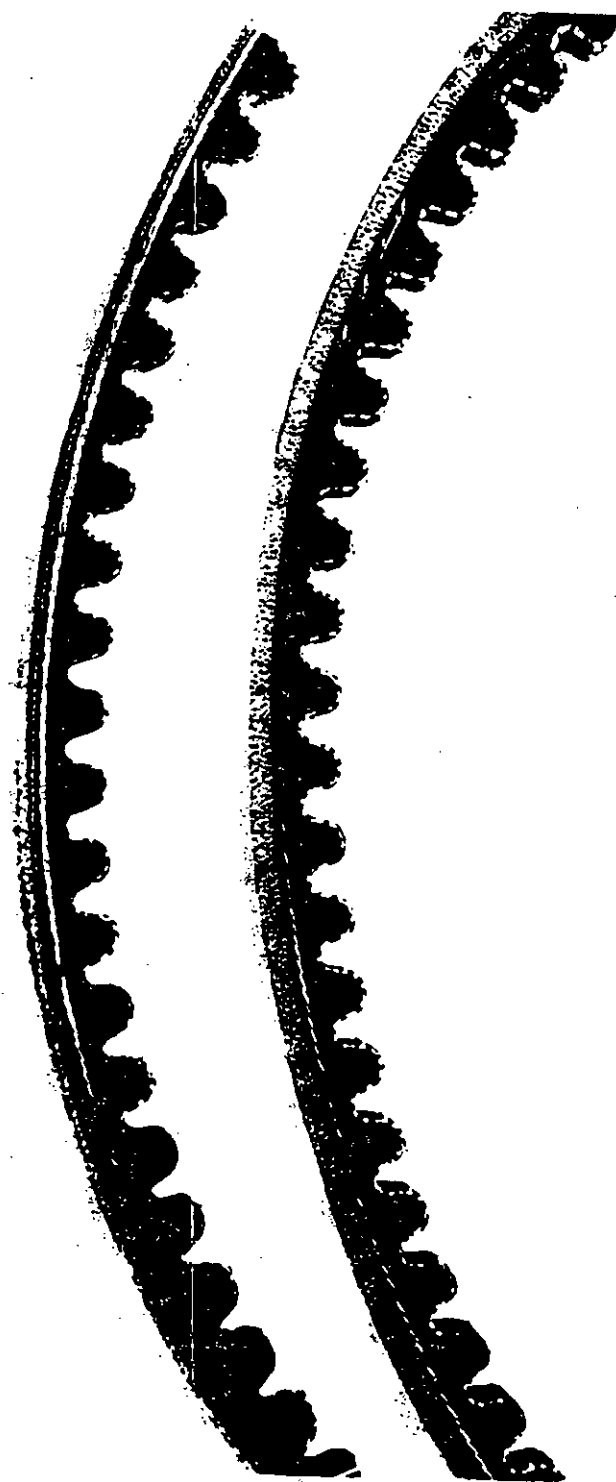


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Figure 32. Scratch, not through a ply - minor.



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38/1

Figure 33. End scrap (Left belt has material missing due to being cut too near the end of the mandrel. Right belt is a correct one for comparison.) - major.

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Figure 34. Wrinkle in cover - minor.

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SIH9373

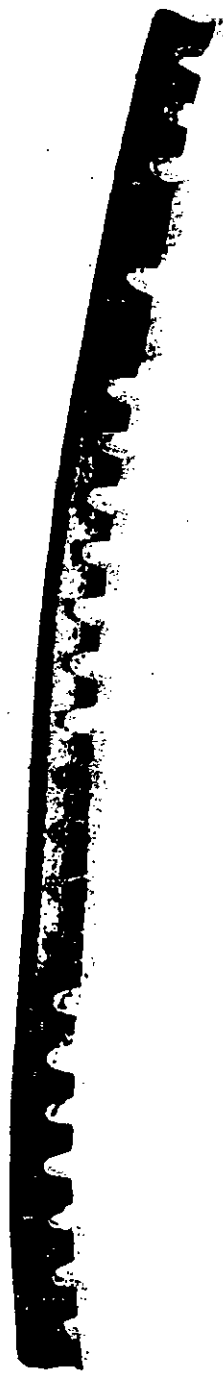
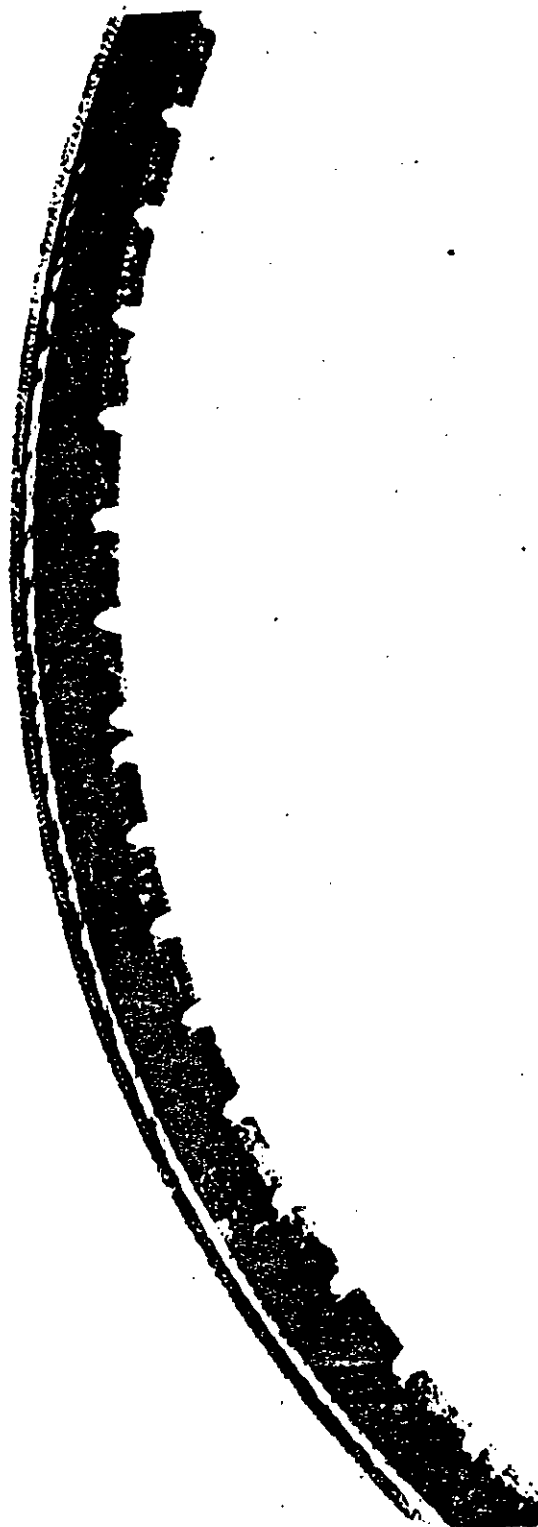


Figure 35. Cogging cut-outs skipped - major.

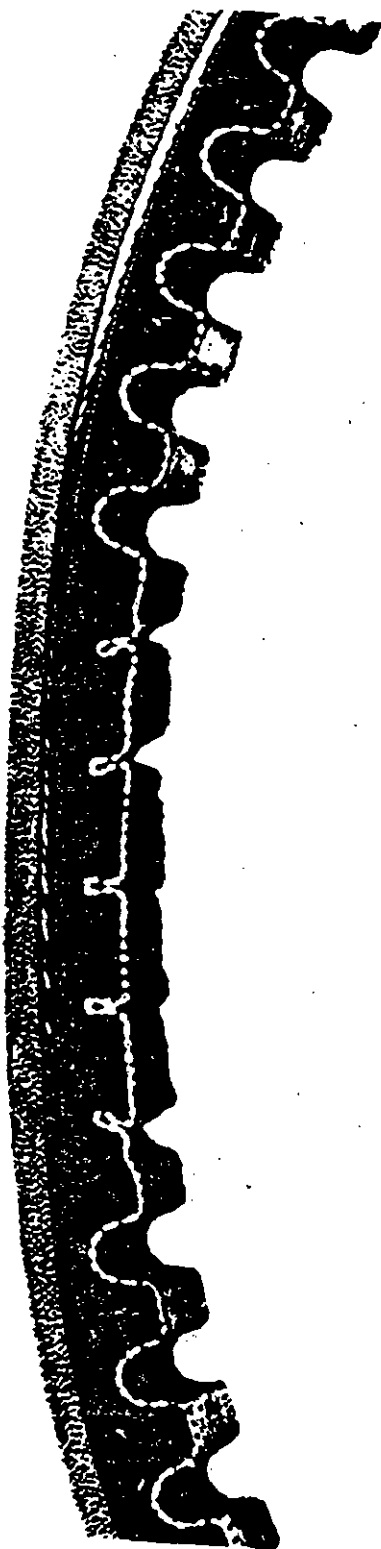
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SH9374

Figure 36. Cogging cut-out overlap - minor.

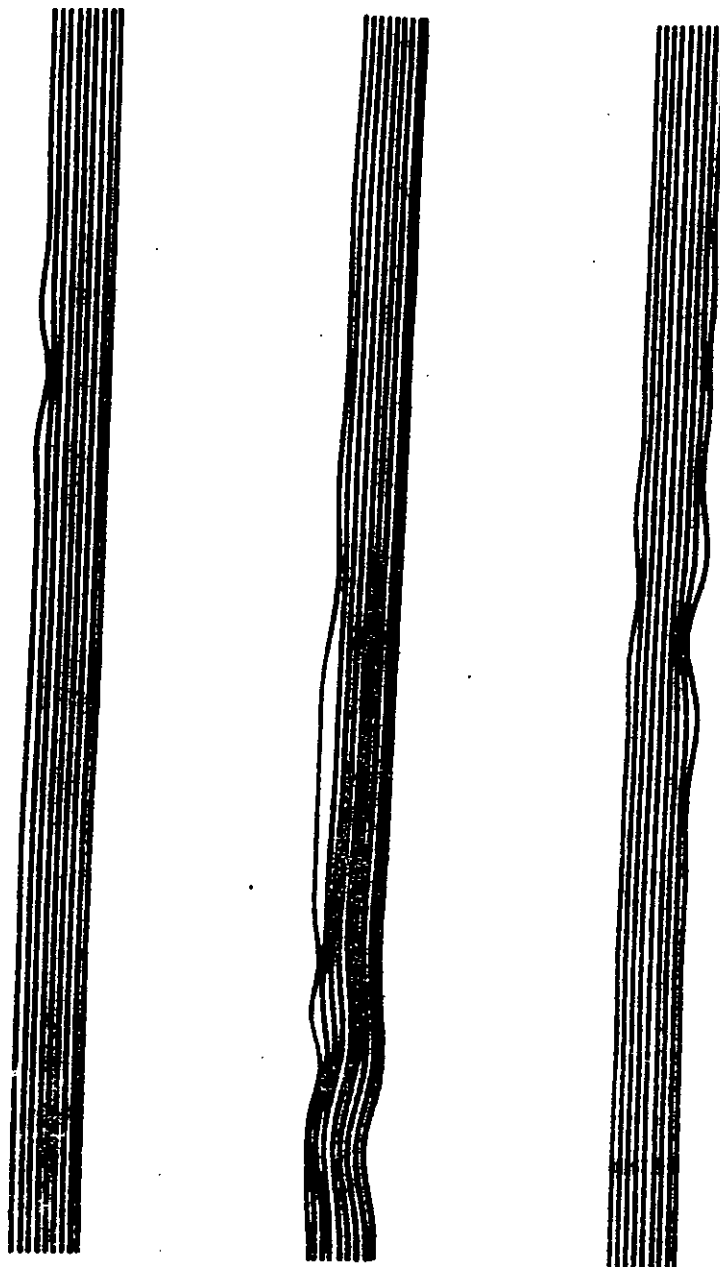
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SR1375

Figure 37. Cogging missed - major.

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DR 370

Figure 38. Wavy wire in steel cable belt (X-ray view) - major.