



# LIFTING CLAMPS

## 2019 Reference Book





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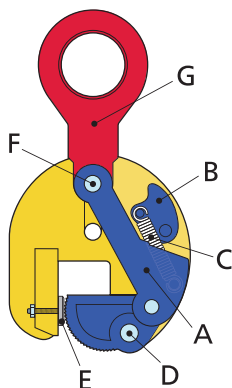


# TS/STS/TJP/TJPU

TS/STS spare parts are available either separately or as repair sets. TJP/TJPU spare parts are available separately only, NOT available in repair sets. It is recommended when any parts are damaged to replace them straight away and not to take any risk.

When ordering spare parts always give:

- model
- lifting capacity
- jaw opening and serial number
- the needed spare parts.



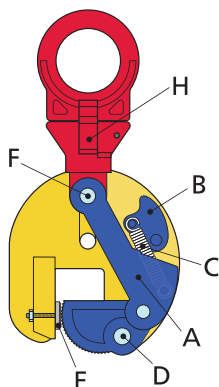
| Model    | A      | B                   | C      | D       | E      | F           | G               |
|----------|--------|---------------------|--------|---------|--------|-------------|-----------------|
|          | Cam    | Lock Lever Assembly | Spring | Cam Pin | Pivot  | Shackle Pin | Lifting Shackle |
| 0.75 TS  | 550020 | 550031              | 250000 | 550029  | 550019 | 550058      | 550050          |
| 1 TS     | 550820 | 550831              | 250800 | 550829  | 550819 | 550858      | 550850          |
| 1 TSE    | 550880 | 550831              | 250800 | 550829  | 550819 | 550858      | 550850          |
| 1.5 TS   | 550120 | 550131              | 250100 | 550129  | 550119 | 550158      | 550150          |
| 2 TSE    | 550920 | 550131              | 250100 | 550129  | 550119 | 550158      | 550150          |
| 3 TSE    | 550920 | 550131              | 250100 | 552929  | 550119 | 550158      | 550150          |
| 4.5 TS   | 550220 | 550231              | 250200 | 550329  | 550219 | 550258      | 550250          |
| 4.5 TSE  | 552220 | 550231              | 250200 | 550329  | 550219 | 550258      | 550250          |
| 6 TS     | 550320 | 550331              | 250300 | 550329  | 550219 | 550358      | 550350          |
| 6 TSE    | 552420 | 552431              | 250300 | 550329  | 550219 | 550358      | 550350          |
| 7.5 TS   | 550420 | 550431              | 250400 | 550429  | 550219 | 550458      | 550450          |
| 7.5 TSE  | 552620 | 552531              | 250400 | 550529  | 550219 | 550458      | 550450          |
| 9 TS     | 552620 | 552531              | 250400 | 551029  | 550219 | 550458      | 550450          |
| 12 TS    | 550520 | 550531              | 250400 | 550529  | 550219 | 550558      | 550550          |
| 15 TS    | 501520 | 550631              | 250600 | 550629  | 550619 | 550658      | 550650          |
| 17 TS    | 501520 | 550631              | 250600 | 550629  | 550619 | 550658      | 550650          |
| 20 TS    | 502020 | 550731              | 250700 | 550729  | 550719 | 550758      | 550750          |
| 25 TS    | 502020 | 550731              | 250700 | 550729  | 550719 | 550758      | 550750          |
| 30 TS    | 502020 | 550731              | 250700 | 550929  | 550719 | 550758      | 550750          |
|          |        |                     |        |         |        |             |                 |
| .25 TJP  | 550020 | 550031              | 250000 | 550029  | 570711 | 550058      | 550050          |
| .25 TJPU | 550020 | 550031              | 250000 | 550029  | 570711 | 550058      | 555050          |
| 1 TJP    | 550820 | 550831              | 250800 | 550829  | 570815 | 550858      | 550850          |

# TSU/STSU/TSEU

All spare parts are available either separately or as repair sets. It is recommended when any parts are damaged to replace them straight away and not to take any risk.

When ordering spare parts always give:

- model
- lifting capacity
- jaw opening and serial number
- the needed spare parts.



| Model    | A      | B                   | C      | D           | E      | F           | H               |
|----------|--------|---------------------|--------|-------------|--------|-------------|-----------------|
|          | Cam    | Lock Lever Assembly | Spring | Cam Pin     | Pivot  | Shackle Pin | Lifting Shackle |
| 0.75 TSU | 550020 | 550031              | 250000 | 550029      | 550019 | 550058      | 555050          |
| 1 TSU    | 550820 | 550831              | 250800 | 550829      | 550819 | 550858      | 555850          |
| 1 TSEU   | 550880 | 550831              | 250800 | 550829      | 550819 | 550858      | 555850          |
| 1.5 TSU  | 550120 | 550131              | 250100 | 550129      | 550119 | 550158      | 555150          |
| 2 TSEU   | 550920 | 550131              | 250100 | 550129      | 550119 | 550158      | 555150          |
| 3 TSEU   | 550920 | 550131              | 250100 | 552929      | 550119 | 550158      | 555150          |
| 4.5 TSU  | 550220 | 550231              | 250200 | 550329      | 550219 | 550258      | 555250          |
| 4.5 TSEU | 552220 | 550231              | 250200 | 550329      | 550219 | 550258      | 555250          |
| 6 TSU    | 550320 | 550331              | 250300 | 550329      | 550219 | 550358      | 555350          |
| 6 TSEU   | 552420 | 552431              | 250300 | 550329      | 550219 | 550358      | 555350          |
| 7.5 TSU  | 550420 | 550431              | 250400 | 550429      | 550219 | 550458      | 555450          |
| 7.5 TSEU | 552620 | 552531              | 250400 | 550529      | 550219 | 550458      | 555450          |
| 9 TSU    | 552620 | 552531              | 250400 | 551029      | 550219 | 550458      | 555450          |
| 12 TSU   | 550520 | 550531              | 250400 | 550529      | 550219 | 550558      | 555550          |
| 15 TSU   | 501520 | 550631              | 250600 | 550629      | 550619 | 550658      | 555650          |
| 17 TSU   | 501520 | 550631              | 250600 | 550629      | 550619 | 550658      | 555650          |
| 20 TSU   | 502020 | 550731              | 250700 | 550729      | 550719 | 550758      | 555750          |
| 25 TSU   | 502020 | 550731              | 250700 | 550729      | 550719 | 550758      | 555750          |
| 30 TSU   | 502020 | 550731              | 250700 | 550929      | 550719 | 550758      | 555750          |
| 2 TSU-R  | 562120 | 562131              | 250100 | 550129      | 562119 | 550158      | 555150          |
| 3 TSEU-A | 550920 | 555131              | 250100 | 552929      | 550119 | 550158      | 555150          |
|          |        |                     |        | Adjust. pin |        |             |                 |
| 3 TSEU-A |        |                     |        | 260629      |        |             |                 |

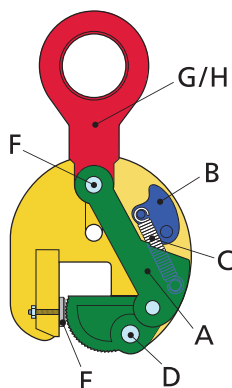


# Extra hardened pivot and cam

All spare parts are available either separately or as repair sets. It is recommended when any parts are damaged to replace them straight away and not to take any risk.

When ordering spare parts always give:

- model
- lifting capacity
- jaw opening and serial number
- the needed spare parts.



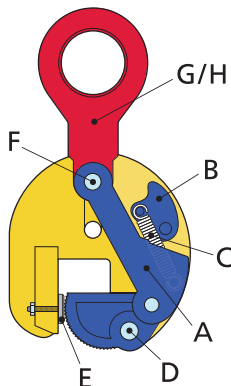
| Model       | A        | B                   | C      | D       | E        | F           | G/H             |
|-------------|----------|---------------------|--------|---------|----------|-------------|-----------------|
|             | Cam      | Lock Lever Assembly | Spring | Cam Pin | Pivot    | Shackle Pin | Lifting Shackle |
| 0.75 TS-H   | 550020.5 | 550031              | 250000 | 550029  | 550019.5 | 550058      | 550050          |
| 1 TSE-H     | 550880.5 | 550831              | 250800 | 550829  | 550819.5 | 550858      | 550850          |
| 2 TSE-H     | 550920.5 | 550131              | 250100 | 550129  | 550119.5 | 550158      | 550150          |
| 3 TSE-H     | 550920.5 | 550131              | 250100 | 552929  | 550119.5 | 550158      | 550150          |
| 4.5 TSE-H   | 552220.5 | 550231              | 250200 | 550329  | 550219.5 | 550258      | 550250          |
| 6 TS-H      | 550320.5 | 550331              | 250300 | 550329  | 550219.5 | 550358      | 550350          |
| 7.5 TSE-H   | 552620.5 | 552531              | 250400 | 550529  | 550219.5 | 550458      | 550450          |
| 0.75 TSU-H  | 550020.5 | 550031              | 250000 | 550029  | 550019.5 | 550058      | 555050          |
| 1 TSEU-H    | 550880.5 | 550831              | 250800 | 550829  | 550819.5 | 550858      | 555850          |
| 2 TSEU-H    | 550920.5 | 550131              | 250100 | 550129  | 550119.5 | 550158      | 555150          |
| 3 TSEU-H    | 550920.5 | 550131              | 250100 | 552929  | 550119.5 | 550158      | 555150          |
| 4.5 TSEU-H  | 552220.5 | 550231              | 250200 | 550329  | 550219.5 | 550258      | 555250          |
| 6 TSU-H     | 550320.5 | 550331              | 250300 | 550329  | 550219.5 | 550358      | 555350          |
| 7.5 TSEU-H  | 552620.5 | 552531              | 250400 | 550529  | 550219.5 | 550458      | 555450          |
| 0.75 TSMP-H | 550020.5 | 550031              | 250000 | 550029  | 550019.5 | 550058      | 550050          |
| 1 TSEMP-H   | 550880.5 | 550831              | 250800 | 550829  | 550819.5 | 550858      | 550850          |
| 2 TSEMP-H   | 550920.5 | 550131              | 250100 | 550129  | 550119.5 | 550158      | 550150          |
| 3 TSEMP-H   | 550920.5 | 550131              | 250100 | 552929  | 550119.5 | 550158      | 550150          |
| 4.5 TSEMP-H | 552220.5 | 550231              | 250200 | 550329  | 550219.5 | 550258      | 550250          |
| 6 TSMP-H    | 550320.5 | 550331              | 250300 | 550329  | 550219.5 | 550358      | 550350          |
| 7.5 TSEMP-H | 552620.5 | 552531              | 250400 | 550529  | 550219.5 | 550458      | 550450          |

# TSHP/TNMK/FBK

All spare parts are available either separately or as repair sets. It is recommended when any parts are damaged to replace them straight away and not to take any risk.

When ordering spare parts always give:

- model
- lifting capacity
- jaw opening and serial number
- the needed spare parts.



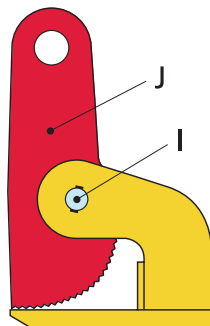
| Model      | A                 | B                   | C      | D           | E                 | F           | G/H             |
|------------|-------------------|---------------------|--------|-------------|-------------------|-------------|-----------------|
|            | Cam               | Lock Lever Assembly | Spring | Cam Pin     | Pivot             | Shackle Pin | Lifting Shackle |
| 1 TSHP     | 560120            | 560131              | 260100 | 555129      | 550119            | 550158      | 560150          |
| 1.5 TSHP   | 560120            | 560131              | 260100 | 555129      | 550119            | 550158      | 560150          |
| 3 TSHPU    | 550920            | 550131              | 250100 | 555129      | 550119            | 550158      | 555150          |
| 5 TSHPU    | 552220            | 550231              | 250200 | 550329      | 550219            | 550258      | 555250          |
|            |                   |                     |        | Adjust. Pin |                   |             |                 |
| 1.5 THSP-A |                   |                     |        | 560329      |                   |             |                 |
| Model      | A                 | B                   | C      | D           | E                 | F           | G               |
|            | Upper Push Plates | Lock Lever Assembly | Spring | Cam Pin     | Under Push Plates | Chain       | Lifting Shackle |
| 0.5 TNMK   | 562013            | 562031              | 250800 | 555129      | 562005            | 262351      | 262350          |
| 1 TNMK     | 562010            | 562431              | 250100 | 552929      | 562005            | 262351      | 262350          |
| 1.5 TNMK   | 562010            | 562431              | 250100 | 552929      | 562005            | 262351      | 262350          |
| 2 TNMK     | 562038            | 562631              | 250200 | 562618      | 562020            | 290160      | 290159          |
| 3 TNMK     | 562038            | 562631              | 250200 | 562618      | 562020            | 290160      | 290159          |
|            |                   |                     |        | Adjust. Pin |                   |             |                 |
| 0.5 TNMKA  |                   |                     |        | 260329      |                   |             |                 |
| Model      | A                 | B                   | C      | D           | E                 | F           | G               |
|            | Cam               | Lock Lever Assembly | Spring | Cam Pin     | Pivot             | Shackle Pin | Lifting Shackle |
| 1 FBK      | 550820            | 550831              | 250800 | 550829      | 550819            | 551008      | 551015          |
| 1.5 FBK    | 550120            | 550131              | 250100 | 550129      | 550119            | 551058      | 551050          |
| 3 FBK      | 550220            | 550231              | 250200 | 550329      | 550119            | 551158      | 551150          |

# FHX/TDH/THSK

All spare parts are available either separately or as repair sets. It is recommended when any parts are damaged to replace them straight away and not to take any risk.

When ordering spare parts always give:

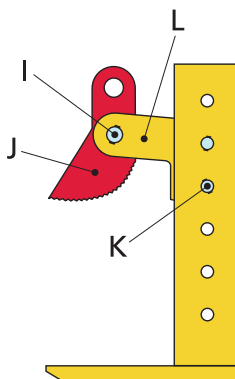
- model
- lifting capacity
- jaw opening and serial number
- the needed spare parts.



| Model  | J      | I       |
|--------|--------|---------|
|        | Cam    | Cam Pin |
| 1 FHX  | 561123 | 561129  |
| 2 FHX  | 561023 | 553029  |
| 3 FHX  | 561023 | 553029  |
| 4 FHX  | 561223 | 553229  |
| 6 FHX  | 561223 | 553229  |
| 8 FHX  | 561423 | 553429  |
| 10 FHX | 561423 | 553429  |
| 12 FHX | 561423 | 553429  |
| 1 TDH  | 570123 | 561129  |
| 2 TDH  | 570223 | 553029  |
| 4 TDH  | 570623 | 553429  |
| 6 TDH  | 570623 | 553429  |

| Model   | J      | I       |
|---------|--------|---------|
|         | Cam    | Cam Pin |
| 2 FHSX  | 561523 | 553029  |
| 3 FHSX  | 561523 | 553029  |
| 4 FHSX  | 561723 | 553229  |
| 6 FHSX  | 561723 | 553229  |
| 8 FHSX  | 561823 | 553429  |
| 10 FHSX | 561823 | 553429  |
| 12 FHSX | 561823 | 553429  |
| 15 FHSX | 520120 | 553629  |

| Model    | J      | I       | K              | L                |
|----------|--------|---------|----------------|------------------|
|          | Cam    | Cam Pin | Adjustable Pin | Connecting Plate |
| 1.5 THSK | 530159 | 260358  | 260329         | 515160           |
| 3 THSK   | 530159 | 260358  | 260329         | 530160           |
| 4.5 THSK | 530159 | 260358  | 260329         | 530160           |
| 6 THSK   | 530159 | 260358  | 260629         | 560160           |
| 9 THSK   | 530159 | 260358  | 260629         | 560160           |

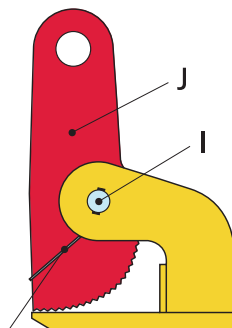


# FHX-V/TNMMH

All spare parts are available either separately or as repair sets. It is recommended when any parts are damaged to replace them straight away and not to take any risk.

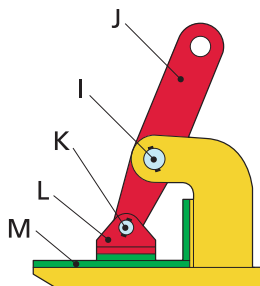
When ordering spare parts always give:

- model
- lifting capacity
- jaw opening and serial number
- the needed spare parts.



Torsion spring

| Model   | J      | I       |                |
|---------|--------|---------|----------------|
|         | Cam    | Cam Pin | Torsion Spring |
| 1 FHX-V | 561123 | 553119  | 253100         |
| 2 FHX-V | 561023 | 551658  | 253200         |
| 3 FHX-V | 561223 | 553129  | 253600         |
| 4 FHX-V | 561223 | 553329  | 253600         |
| 6 FHX-V | 561223 | 553329  | 253600         |



| Model  | J      | I       | K        | L               | M               |
|--------|--------|---------|----------|-----------------|-----------------|
|        | Cam    | Cam Pin | Link Pin | Upper Pushplate | Plate Cover set |
| 1 TNMH | 553080 | 561129  | 550029   | 553173          | 553056          |
| 2 TNMH | 553085 | 553029  | 550129   | 553178          | 553066          |
| 3 TNMH | 553085 | 553029  | 550129   | 553178          | 553066          |
| 4 TNMH | 554085 | 553429  | 550259   | 554178          | 554056          |
| 6 TNMH | 554085 | 553429  | 550259   | 554178          | 554066          |

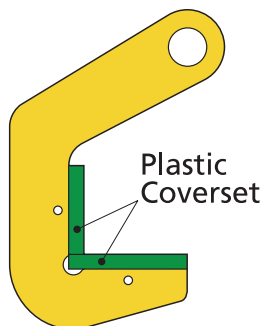


# TPH/TBC

All spare parts are available either separately or as repair sets. It is recommended when any parts are damaged to replace them straight away and not to take any risk.

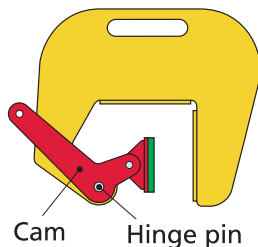
When ordering spare parts always give:

- model
- lifting capacity
- jaw opening and serial number
- the needed spare parts.



| Model     | Total Width | Plastic Coverset |  | Total Width | Plastic Coverset |
|-----------|-------------|------------------|--|-------------|------------------|
| 1.5 TPH   | 37 mm       | 560301           |  |             |                  |
| 3 TPH     | 37 mm       | 560301           |  |             |                  |
| 4 TPH     | 42 mm       | 560402           |  |             |                  |
| 6 TPH     | 42 mm       | 560402           |  |             |                  |
| 8 TPH     | 45 mm       | 560801           |  |             |                  |
| 10 TPH    | 85 mm       | 560810           |  | 67 mm       | 560813old        |
| 12 TPH    | 85 mm       | 560810           |  | 67 mm       | 560813old        |
| 15 TPH    | 100 mm      | 560820           |  | 67 mm       | 560813old        |
| 20 TPH    | 100 mm      | 560820           |  | 67 mm       | 560813old        |
| 5 TPH-HD  |             | 565100           |  |             |                  |
| 10 TPH-HD |             | 565100           |  |             |                  |
| 20 TPH-HD |             | 565100           |  |             |                  |
| 30 TPH-HD |             | 565100           |  |             |                  |
| 60 TPH-HD |             | 565100           |  |             |                  |

| Model   | Hinge Pin (small) | Hinge Pin (large) | Cam    |
|---------|-------------------|-------------------|--------|
| 0.5 TBC | 570128            | 570129            | 570120 |
| 1 TBC   | 570128            | 570129            | 570120 |



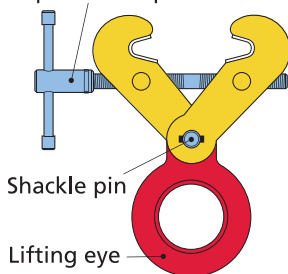
# FSV(S)(U) TBS/TSRC/TSCC

All spare parts are available either separately or as repair sets. It is recommended when any parts are damaged to replace them straight away and not to take any risk.

When ordering spare parts always give:

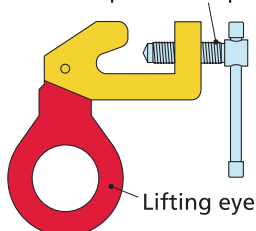
- model
- lifting capacity
- jaw opening and serial number
- the needed spare parts.

Spindel compl.

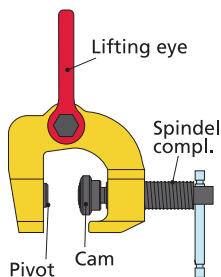


| Model   | Lifting Eye | Shackle Pin | Spindel compl. |
|---------|-------------|-------------|----------------|
| 1 FSV   | 551550      | 551558      | 251530         |
| 2 FSV   | 551550      | 551558      | 251530         |
| 3 FSV   | 551650      | 551658      | 251530         |
| 4 FSV   | 551750      | 551758      | 251730         |
| 5 FSV   | 551850      | 551858      | 251730         |
| 10 FSV  | 551950      | 551958      | 251930         |
| 2 FSVS  | 551550      | 551558      | 561010         |
| 3 FSVS  | 551650      | 551658      | 561010         |
| 4 FSVS  | 551750      | 551758      | 564010         |
| 5 FSVS  | 551850      | 551858      | 564010         |
| 3 FSVSU | 551655      | 551658      | 561010         |
| 4 FSVSU | 551755      | 551758      | 564010         |
| 5 FSVSU | 551855      | 551858      | 564010         |
| 1.5 TBS | 550850      |             | 562424         |
| 3 TBS   | 550150      |             | 562424         |
| 5 TSRC  | 551855      | 551858      | 251730         |

Spindel compl.



Lifting eye



| Model    | Lifting Eye | Cam    | Spindel compl. | Pivot  |
|----------|-------------|--------|----------------|--------|
| 0.5 TSCC | 500550      | 515011 | 515021         | 550019 |
| 1 TSCC   | 501550      | 515121 | 562717         | 562116 |
| 1.5 TSCC | 501550      | 515121 | 562717         | 562116 |
| 3 TSCC   | 503550      | 515321 | 562817         | 550219 |
| 6 TSCC   | 506050      | 515621 | 562917         | 550219 |

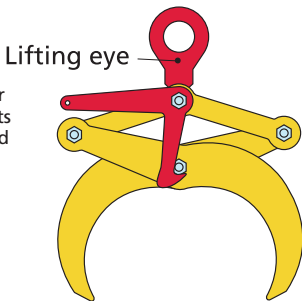


# TTL/TBLC/TVK

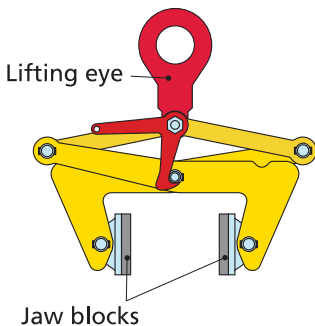
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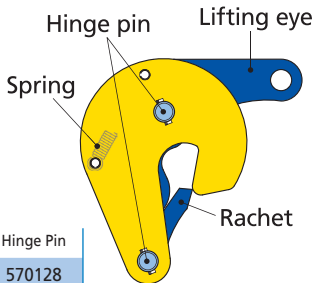
- model
- lifting capacity
- jaw opening and serial number
- the needed spare parts.



| Model   | Lifting Eye |
|---------|-------------|
| 0.5 TTL | 550850      |
| 1 TTL   | 550850      |
| 2 TTL   | 550150      |
| 3 TTL   | 550150      |



| Model    | Lifting eye | Jaw blocks (small) | Jaw blocks (large) |
|----------|-------------|--------------------|--------------------|
| 0.5 TBLC | 550850      | 500523             | 500524             |
| 1 TBLC   | 550850      | 500523             | 500524             |
| 2 TBLC   | 550850      | 500523             | 500524             |
| 3 TBLC   | 550150      | 503023             | 503024             |



| Model | Lifting eye | Ratchet | Spring | Hinge Pin |
|-------|-------------|---------|--------|-----------|
| TVK   | 528002      | 528001  | 228003 | 570128    |

# Sparepart kits

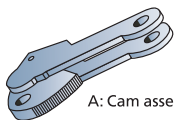
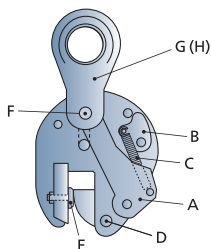
All spare parts are available either separately or as repair sets. It is recommended when any parts are damaged to replace them straight away and not to take any risk.

When ordering spare parts always give:

- model
- lifting capacity
- jaw opening and serial number
- the needed spare parts.



## Vertical Clamp



A: Cam assembly



F: Shackle pin



B: Lock lever assembly



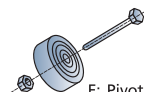
G: Lifting eye for TS, STS



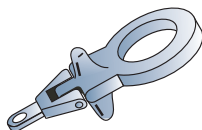
C: Lock spring



D: Cam pin

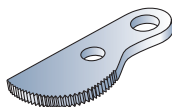
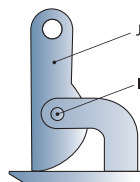


E: Pivot complete



H: Lifting eye for TSU, TSEU

## Horizontal Clamp



J: Cam for FHX, FHSX



I: Cam pin for FHX, FHSX



## Repair Sets

| Model       | Reference No. | Jaw-opening (inches) | Cam    | Spring | Cam pin | Pivot  |
|-------------|---------------|----------------------|--------|--------|---------|--------|
| 0.75 T      | RS650000      | 0 - .5               | 550020 | 250000 | 550029  | 550019 |
| 1 T         | RS650801      | 0 - .75              | 550820 | 250800 | 550829  | 550819 |
| 1 TSE       | RS650811      | 0 - 1                | 550880 | 250800 | 550829  | 550819 |
| 1.5 T       | RS650101      | 0 - .75              | 550120 | 250100 | 550129  | 550119 |
| 2 T         | RS650901      | 0 - 1.375            | 550920 | 250100 | 550129  | 550119 |
| 3 T         | RS650911      | 0 - 1.375            | 550920 | 250100 | 552929  | 550119 |
| 4.5 T       | RS650201      | 0 - 1                | 550220 | 250200 | 550329  | 550219 |
| 4.5 TSE     | RS650221      | 0 - 1.75             | 552220 | 250200 | 550329  | 550219 |
| 6 T         | RS650301      | 0 - 1.25             | 550320 | 250300 | 550329  | 550219 |
| 6 TSE       | RS650311      | 0 - 1.97             | 552420 | 250300 | 550329  | 550219 |
| 7.5 T       | RS650401      | 0 - 1.5              | 550420 | 250400 | 550429  | 550219 |
| 7.5 TSE     | RS650611      | 0 - 2.187            | 552620 | 250400 | 550529  | 550219 |
| 9 T         | RS650612      | 0 - 2.187            | 552620 | 250400 | 551029  | 550219 |
| 12 T        | RS650501      | 0 - 2                | 550520 | 250400 | 550529  | 550219 |
| 15 T - 17 T | RS650601      | 0 - 3                | 501520 | 250600 | 550629  | 550619 |
| 20 T - 25 T | RS650701      | 0 - 3.14             | 502020 | 250700 | 550729  | 550719 |
| 30 T        | RS650711      | 10 - 3.5             | 502020 | 250700 | 550929  | 550719 |

## Revision Sets

| Model       | Reference No. | Lock Lever Assembly | Cam    | Spring | Cam pin | Pivot  |
|-------------|---------------|---------------------|--------|--------|---------|--------|
| 0.75 TS     | RV650000      | 550031              | 550020 | 250000 | 550029  | 550019 |
| 1 TS        | RV650801      | 550831              | 550820 | 250800 | 550829  | 550819 |
| 1 TSE       | RV650811      | 550831              | 550880 | 250800 | 550829  | 550819 |
| 1.5 TS      | RV650101      | 550131              | 550120 | 250100 | 550129  | 550119 |
| 2 TS        | RV650901      | 550131              | 550920 | 250100 | 550129  | 550119 |
| 3 TS        | RV650911      | 550131              | 550920 | 250100 | 552929  | 550119 |
| 4.5 TS      | RV650201      | 550231              | 550220 | 250200 | 550329  | 550219 |
| 4.5 TSE     | RV650221      | 550231              | 552220 | 250200 | 550329  | 550219 |
| 6 TS        | RV650301      | 550331              | 550320 | 250300 | 550329  | 550219 |
| 6 TSE       | RV650311      | 552431              | 552420 | 250300 | 550329  | 550219 |
| 7.5 T       | RV650401      | 550431              | 550420 | 250400 | 550429  | 550219 |
| 7.5 TSE     | RV650611      | 552531              | 552620 | 250400 | 550529  | 550219 |
| 9 T         | RV650612      | 552531              | 552620 | 250400 | 551029  | 550219 |
| 12 T        | RV650501      | 550531              | 550520 | 250400 | 550529  | 550219 |
| 15 T - 17 T | RV650601      | 550631              | 501520 | 250600 | 550629  | 550619 |
| 20 T - 25 T | RV650701      | 550731              | 502020 | 250700 | 550729  | 550719 |
| 30 T        | RV650711      | 550731              | 502020 | 250700 | 550929  | 550719 |

## Repair Sets - Extra hardened pivot and cam

| Model     | Reference No. | Jaw-opening (inches) | Cam      | Spring | Cam pin | Pivot    |
|-----------|---------------|----------------------|----------|--------|---------|----------|
| .75 TS-H  | RS650000.5    | 0 - .51              | 550020.5 | 250000 | 550029  | 550019.5 |
| 1 TS-H    | RS650801.5    | 0 - .98              | 550820.5 | 250800 | 550829  | 550819.5 |
| 1 TSE-H   | RS650811.5    | 0 - .98              | 550880.5 | 250800 | 550829  | 550819.5 |
| 1.5 TS-H  | RS650101.5    | 0 - .79              | 550120.5 | 250100 | 550129  | 550119.5 |
| 2 TSE-H   | RS650901.5    | 0 - 1.38             | 550920.5 | 250100 | 550129  | 550119.5 |
| 3 TSE-H   | RS650911.5    | 0 - 1.38             | 550920.5 | 250100 | 552929  | 550119.5 |
| 4.5 TSE-H | RS650221.5    | 0 - 1.77             | 552220.5 | 250200 | 550329  | 550219.5 |
| 6 TS-H    | RS650301.5    | 0 - 1.26             | 550320.5 | 250300 | 550329  | 550219.5 |
| 7.5 TSE-H | RS650611.5    | 0 - 2.17             | 552620.5 | 250400 | 550529  | 550219.5 |



## Repair Sets

| Model        | Reference No. | Jaw-opening (inches) | Cam    | Spring | Pivot(s) | Cam pin | Push Plates |        |
|--------------|---------------|----------------------|--------|--------|----------|---------|-------------|--------|
|              |               |                      |        |        |          |         | Upper       | Under  |
| 0.5 TNMK     | RS652035      |                      |        | 250800 |          | 555129  | 562013      | 562005 |
| 1 - 1.5 TNMK | RS652036      |                      |        | 250100 |          | 552929  | 562010      | 562005 |
| 2 - 3 TNMK   | RS652039      |                      |        | 250200 |          | 562618  | 562038      | 562020 |
|              |               |                      |        |        |          |         |             |        |
| 1 FBK        | RS651010      | 0 - .59              | 550820 | 250800 | 550819   | 550829  |             |        |
| 1.5 FBK      | RS651000      | 0 - .79              | 550120 | 250100 | 550119   | 555129  |             |        |
| 3 FBK        | RS651100      | 0 - .98              | 550220 | 250200 | 550119   | 550329  |             |        |
|              |               |                      |        |        |          |         |             |        |
| 1 - 1.5 TSHP | RS650851      | 0 - 3.15             | 560120 | 260100 | 550119   | 555129  |             |        |
| 3 TSHPU      | RS650251      | 0 - 1.378            | 550920 | 250100 | 550119   | 555129  |             |        |
| 5 TSHPU      | RS650351      | 0 - 1.77             | 552220 | 250200 | 550219   | 550329  |             |        |
|              |               |                      |        |        |          |         |             |        |
| 2 TSU-R      | RS650111      | 0 - .79              | 562120 | 250100 | 562119   | 550129  |             |        |
|              |               |                      |        |        |          |         |             |        |
| 2 TOBK       | RS650001      | .12 - .79            | 551120 | 250100 |          | 555129  |             |        |

## Revision Sets

| Model        | Reference No. | Jaw-opening (inches) | Cam    | Spring | Pivot(s) | Cam pin | Push Plates |        | Lock Lever |
|--------------|---------------|----------------------|--------|--------|----------|---------|-------------|--------|------------|
|              |               |                      |        |        |          |         | Upper       | Under  |            |
| 0.5 TNMK     | RV652035      |                      |        | 250800 |          | 555129  | 562013      | 562005 | 562031     |
| 1 - 1.5 TNMK | RV652036      |                      |        | 250100 |          | 552929  | 562010      | 562005 | 562431     |
| 2 - 3 TNMK   | RV652039      |                      |        | 250200 |          | 562618  | 562038      | 562020 | 562631     |
|              |               |                      |        |        |          |         |             |        |            |
| 1 FBK        | RV651010      | 0 - .59              | 550820 | 250800 | 550819   | 550829  |             |        | 550831     |
| 1.5 FBK      | RV651000      | 0 - .79              | 550120 | 250100 | 550119   | 555129  |             |        | 555131     |
| 3 FBK        | RV651100      | 0 - .98              | 552220 | 250200 | 550219   | 550329  |             |        | 550220     |
|              |               |                      |        |        |          |         |             |        |            |
| 1 - 1.5 TSHP | RV650851      | 0 - 3.15             | 560120 | 260100 | 550119   | 555129  |             |        | 560131     |
| 3 TSHPU      | RV650251      | 0 - 1.378            | 550920 | 250100 | 550119   | 555129  |             |        | 550131     |
| 5 TSHPU      | RV650351      | 0 - 1.77             | 552220 | 250200 | 550219   | 550329  |             |        | 550231     |
|              |               |                      |        |        |          |         |             |        |            |
| 2 TSU-R      | RV650111      | 0 - .79              | 562120 | 250100 | 562119   | 550129  |             |        | 562131     |
|              |               |                      |        |        |          |         |             |        |            |
| 2 TOBK       | RV650001      | .12 - .79            | 551120 | 250100 |          | 555129  |             |        | 550131     |

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## 1 GENERAL

Congratulations with the acquisition of a Terrier safety plate lifting clamp. The quality systems of management and services of Terrier Lifting Clamps B.V. fully comply with ISO 9001 standards. The many years of vast experience are a guarantee of optimum quality and safety. Terrier Lifting Clamps are made of top quality steel and fully comply with European standards as laid down in Machine Directive 2006/42/EG.

## 2 OPERATING PRINCIPLE

Terrier's safety plate lifting clamps derive their name from the built-in safety mechanism, which consists of a locking device, a tension spring and a lever. Once the lever has been operated, the safety mechanism provides constant pre-tensioning of the cam on the steel plate, thereby ensuring that the clamp does not slip when lifting force is applied. When a load is being lifted the clamping force on the cam is increased by the weight of the load. The safety system also ensures that the clamp will not work itself loose from the plate as the load is being lowered.

### **Additional info for owners of a TSU-R lifting clamp**

The TSU-R lifting clamp has been specifically designed for the lifting and handling of stainless steel plates. In order to prevent corrosion due to carbon contamination, this lifting clamp features stainless steel components and a nickel-plated body and lever. Due to these features, the contact area between the clamp's jaw and the stainless steel plate no longer has to be cleaned from possible carbon steel residues after lifting has taken place.

## 3 APPLICATION

Terrier plate lifting clamps have been designed solely for the lifting and transporting of steel plates and structures where it is possible to place the clamp on a flat point of contact.

### **The following notes apply to the Hardox clamp models**

- These clamp models feature a specially developed "hard" segment and "hard" pin so that these lifting clamps can be used for lifting steel sheets and/or structures with a maximum hardness of 45 Hrc, (429 HB, 1450 N/mm<sup>2</sup>).



- The 1 TSHP and 1.5 TSHP have three pins for a solid grip and is therefore highly suitable for lifting "Holland Profiel" (flat bulb bar steel).

**The following only applies to the TSU-R clamp model**

The TSU-R clamp has been designed solely for lifting stainless steel plates and structures featuring a flat point of contact. Where the clamp is used to lift carbon steel plates, the clamp can no longer be used for lifting stainless steel plates, without the risk of carbon contamination.

**Allowable operating positions**

Depending on the clamp model the following operating positions are allowed:

- only vertical positions (TS, TSE)
- from both vertical and horizontal positions (TSU and MP models)
- from all positions (TSU, TSEU, STSU, TSU-R)

Notice: A reduced working load limit (W.L.L.) applies when lifting from other than vertical positions. See also the load diagram.

## 4 SAFETY INSTRUCTIONS

**Safety First! Guarantee your personal safety by carefully reading the following safety instructions first.**

Ensure your own safety and continue to benefit from our product safety by having the clamp inspected, tested and, if necessary, overhauled at least once a year by Terrier Lifting Clamps B.V. or another recognized mechanical repair and service center. See also Chapter 8

- Overhauling. Contact Terrier Lifting Clamps B.V. for further information.

**AVOID SITUATIONS DANGEROUS TO LIFE**

**(see also the section 'How to correctly use vertical lifting clamps')**

- Never work with an untested or disapproved lifting clamp.
- Always keep a safe distance when lifting and never stand under the load.
- Do not use the clamp if damaged; have the clamp repaired by Terrier Lifting Clamps B.V. or another recognized mechanical repair and service center. If in doubt consult your supplier.
- Never lift more than one plate at a time.
- Never lift plates heavier than the W.L.L., as indicated on the clamp and the test certificate.
- Never lift plates which have a weight less than 10% the W.L.L. indicated on the clamp and test certificate.
- Do not lift plates which are thicker or thinner than the jaw opening, as indicated on the clamp and the test certificate.
- Take care when lifting from a non-vertical position. The working load limit (W.L.L.) may be considerably reduced in these lifting situations.
- When using a number of lifting clamps at the same time, provide lifting slings or chains of a sufficient length to ensure that the angle between the slings or chains never exceeds 60 degrees.
- When simultaneously operating a number of lifting clamps side by side use a lifting beam (equalizer) and lifting slings or chains of sufficient length to ensure that the lifting shackles on the clamps are never subjected to lateral load.
- Do not place the clamp on tapered or conical shaped sections of the plate or structure to be lifted.

- Remove all grease, oil, dirt, corrosion and mill scale from the plate at the point where the clamp is to be attached.
- The surface hardness of the plate must not exceed 37HrC (345 Hb, 1166 N/mm<sup>2</sup>). With regard to the TSU-R lifting clamp please notice that the surface hardness of the plate must not exceed 30 HrC (283 Hb, 945 N/mm<sup>2</sup>).
- The clamp is only suitable for use in normal atmospheric conditions.

### SAFETY PRECAUTIONS

- As far as applicable, make sure that the lifting shackle or MP fork is never subjected to lateral load.
- A free-fall or uncontrolled swaying at the crane hook resulting in objects being struck may cause damage to the clamp. If this happens check whether the clamp is in good working order before using it.
- Lifting clamps are not suitable for creating permanent joints.
- The clamp should be subjected to a regular maintenance interval on a monthly basis; see Chapter 6 - Maintenance.
- Do not modify the clamp (by welding, grinding, etc.), as this can adversely affect its operation and safety, thereby nullifying any forms of guarantee and product liability.
- For this reason, only make use of genuine Terrier components!
- Any improper use of the clamp and/or failure to observe any directions and warnings in these operating instructions concerning the use of this product may endanger the health of the user and/or bystanders.

### Special note for TSU-R lifting clamp owners

Use the TSU-R lifting clamp solely for lifting stainless steel plates and structures. In spite of the considerable mechanical strength of the coating, the clamp must be handled with extreme care! Possible damage due to impacts such as knocks, falls, etc. must be avoided.

## 5 LIFTING

- Verify whether the working load limit (W.L.L.) of the clamp is sufficient for the load created in the lifting situation.
- Attach the lifting clamp to the hoisting mechanism:
  - directly to a crane hook by means of a safety shackle,
  - by means of a coupling link or D-type shackle,
  - by means of a sling or chain, if necessary, in conjunction with a coupling link or D-type shackle.
- Ensure that all attachments have been tested and are of the correct tonnage. Make sure that coupling links and shackles are large enough to allow the clamp to move freely in the hook.
- Check whether the clamp has any visible damage.
- Operate the lever to check whether the clamp opens and closes smoothly.
- Check whether the teeth of the cam are free from dirt and if necessary clean with a steel wire brush. Note: the cam of the TSU-R lifting clamp should only be cleaned with brass brush.
- Remove any grease, dirt and mill scale from the plate at the site of the lifting clamp.
- Use the lever to open the clamp.
- Place the jaws as far as they will go over the plate, making sure that the clamp is positioned so as to balance the load when it is being lifted.

- Close the clamp by turning the lever fully back.
- Lift gently to allow lifting force to be applied; check whether the clamp is slipping.
- If the load is slipping, read this Chapter 5 - Lifting again.
- If the load continues to slip, refer to Chapter 6 - Maintenance.
- Make sure that the load is in a stable position before loosening the clamp from the plate.

## 6 MAINTENANCE

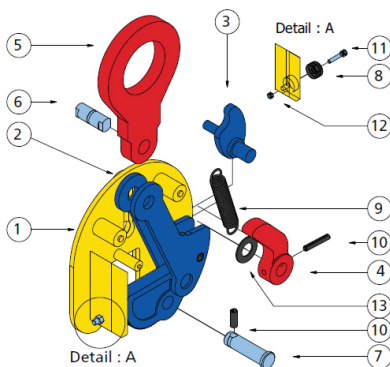
- Check the general condition of the clamp at least once a month, see also Chapter 7 - Disassembling/Assembling.
- Stop using the clamp if:
  - the body is split or deformed, in particular in way of the corners of the jaws,
  - the lifting shackle and/or connecting piece or MP fork (if applicable) are visibly deformed,
  - the cam and/or pivot teeth are no longer sharp,
  - the spring has become stretched or broken,
  - the lever locking mechanism has become inefficient or has ceased to work,
  - the shackle pins are visibly deformed,
  - any retaining pins are missing,
  - the keyway groove is dirty,
  - the marking on the clamp is no longer legible.

Depending on the defects/malfunctions noted:

- disassemble and clean the clamp (see Chapter 7 - Disassembling/Assembling or have the clamp overhauled by Terrier Lifting Clamps B.V. or another recognized mechanical repair center (see Chapter 8 - Overhauling).

### 7a DISASSEMBLING/ASSEMBLING TS, STS, TSE, TSHP CLAMP MODELS

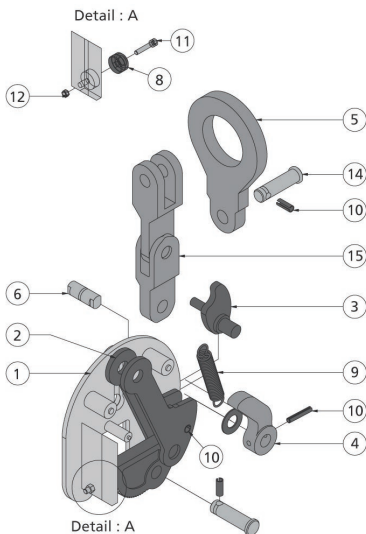
- Open the clamp to its full extent.
- Remove the tension spring (9); in the case of 0.75 TS, 1 TS(E), 1.5 TS, 2 & 3 TSE first remove the retaining pin in the cam assembly (10).
- Remove the retaining pin (10) and the cam pin (7).
- Push the lifting shackle (5) in until the shackle pin (6) can be removed via the mounting hole.
- Remove the lifting shackle (5) and the cam assembly (2).
- Dismantle the lever (4) by removing the retaining pin (10) and take the lock assembly (3) out of the clamp.
- Remove the pivot (8) using a socket and ring spanner.
- Clean all parts with a standard degreasant.
- Grease all shackle pins with a bearing grease.
- Oil the spring if necessary.
- Assemble all the parts in reverse order.



- Always insert new retaining pins (10) and do so with the aid of a hammer, combination pliers and pin punch.
- Always fit a new pivot bolt (11) and nut (12).
- When replacing parts always use original Terrier components.
- Remove any burr with a file.

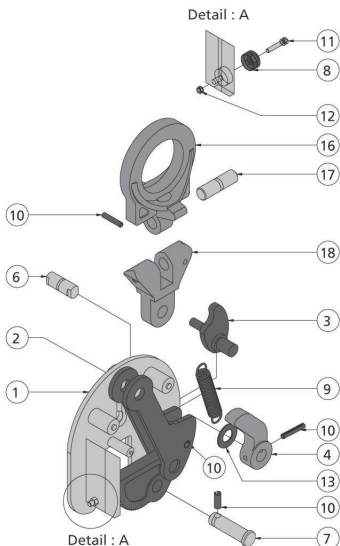
## 7b DISASSEMBLING/ASSEMBLING TSMP, STSMP, TSEMP CLAMP MODELS

- Open the clamp to its full extent.
- Remove the tension spring (9); in the case of the 0.75 TSMP, 1 TS(E)MP, 1.5 TSMP, 2 & 3 TSEMP first remove the retaining pin (10) in the cam assembly.
- Remove the retaining pin (10) and the cam pin (7).
- Remove the retaining pin (10) and the link pin (14).
- Remove the lifting shackle (5).
- Push the fork (15) in until the shackle pin can be removed via the mounting hole (6).
- Remove the fork (15) and the cam assembly (2).
- Disassemble the lever (4) by removing the retaining pin (10) and take the lock assembly (3) out of the clamp.
- Remove the pivot (8) using a socket and ring spanner.
- Clean all parts with a standard degreasant.
- Grease all shackle pins with bearing grease
- Oil the spring if necessary.
- Assemble all the parts in reverse order.
- Always insert new retaining pins (10) and do so with the aid of a hammer, combination pliers and pin punch.
- Always fit a new pivot bolt (11) and nut (12).
- When replacing parts always use original Terrier components.
- Remove any burr with a file.



## 7c DISASSEMBLING/ASSEMBLING TSU, STSU, TSEU, TSU-R, TSHPU CLAMP MODELS

- Open the clamp to its full extent.
- Remove the tension spring (9) in the case of the 0.75 TSU, 1 TS(E)U, 1.5 TSU, 2 & 3 TSEU first remove the retaining pin (10) in the cam assembly (2).
- Remove the retaining pin (10) and the cam pin (7).
- Take the retaining pin (10) out of the connecting piece (18) and remove the link pin (17).
- Remove the lifting shackle (16).
- Push the connecting piece (18) in until the shackle pin (6) can be removed through the mounting hole.
- Remove the connecting piece (18) and the cam assembly (2).
- Disassemble the lever (4) by removing the retaining pin (10) and take the lock assembly (3) out of the clamp.
- Remove the pivot (8) using a socket and ring spanner.
- Clean all parts with a standard degreasant.
- Grease all shackle pins with bearing grease.
- Oil the spring if necessary.
- Assemble all the parts in reverse order.
- Always insert new retaining pins (10) and do so with the aid of a hammer, combination pliers and pin punch.
- Always fit a new pivot bolt (11) and nut (12).
- Always use original Terrier components when replacing parts.
- Remove any burr with a file.



## 8 OVERHAULING

At least once a year, or if occasioned by damage to the clamp, the lifting clamp should be inspected, tested and if necessary overhauled by Terrier Lifting Clamps B.V. or another recognized mechanical repair and service center. If in doubt refer to your supplier.

## 9 DISPOSAL

Once it has reached the end of its useful life, the clamp can be treated as scrap iron, provided that the clamp is rendered unfit for use.

## 10 TROUBLESHOOTER'S CHECKLIST

| Failure/malfunction            | Possible Cause                                                        | Action                                                      |
|--------------------------------|-----------------------------------------------------------------------|-------------------------------------------------------------|
| Load slipping                  | Load dirty<br>Pivot dirty<br>Pivot and/or cam blunt<br>Jaws bent open | Clean load<br>Clean clamp<br>Overhaul clamp<br>Reject clamp |
| Lifting shackle pivoting badly | Lifting shackle overloaded                                            | Reject clamp                                                |
| Fork is pivoting badly         | Fork overloaded                                                       | Reject clamp                                                |
| Body bent                      | Clamp overloaded                                                      | Reject clamp                                                |
| Lifting shackle oval shape     | Clamp overloaded                                                      | Reject clamp                                                |
| Spring defective               | Spring worn out                                                       | Overhaul clamp                                              |
| Shackle pins bent              | Clamp overloaded                                                      | Reject clamp                                                |
| Retaining pins missing         | Incorrectly assembled                                                 | Fit new retaining pins                                      |
| Clamp difficult to open/close  | Key way slot dirty<br>Clamp worn out<br>Clamp contaminated            | Clean clamp<br>Reject clamp<br>Clean clamp                  |

## 11 WARRANTY

Terrier Lifting Clamps provides a 5 year warranty on its lifting clamps. This warranty is applicable to the original end user of the lifting clamps. Only if the clamp has been inspected, checked and maintained by this instructions and by an official dealer. This warranty period of 5 years is valid from the day of purchase, and is liable to all conditions and measurements stated in this document.

### 11a CONDITIONS

This warranty only covers failures in the lifting tools which is the consequence of production errors which occur during normal use. The warranty covers no wear to components such as pivots, cam assemblies, lock springs etc. Should there be any kind of failure within this guarantee period, the lifting tool will be replaced or repaired to insight of the producer.

No warranty is given to clamps due to the following failures:

- Regular wear
- Overload.
- Wrong and/or careless use
- Damages
- Not following procedures and measures
- Hoisting differing material other than indicated on clamp or stated in the user-manual
- Adapting and/or modifying of the Terrier clamp.
- The injudicious use of the clamp, and not succeeding all indications which are stated in the users manual.
- When maintenance and/or revision has not been carried out by an authorized Terrier distributor.



**The producer is not responsible for incidental damage or damage due to use of the lifting tools as well as from violation of this manual.**

## 11b PROCEDURE SAFETY INSPECTION

All inspections and repairings must be written down in the maintenance diagram.

This counts not only for your own inspections but also for inspections which are carried out by your authorized Terrier distributor. When the clamp is handed in for maintenance and inspection you always must provide the maintenance diagram.

### Defective Lifting Clamps

When a form of wear or damage is indicated, you must take the following measures.

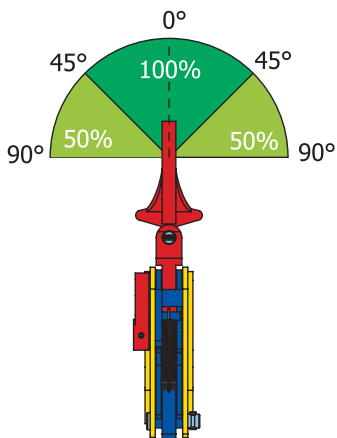
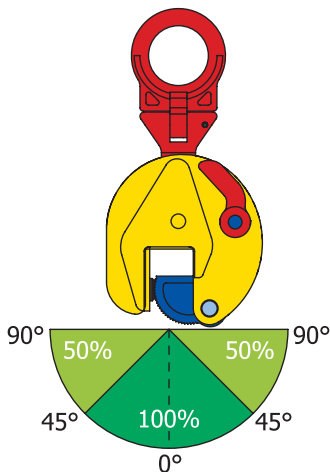
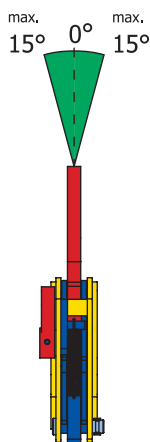
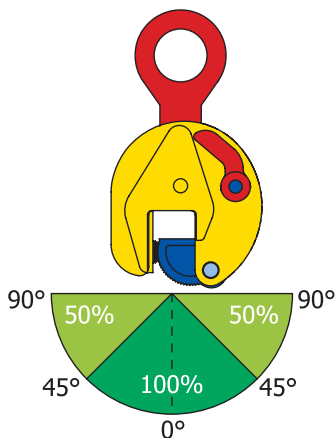
- 1 Take the lifting clamp out of use. (Note the date of failure of the lifting clamp)
- 2 Try to recover the cause of the failure, for example (complete list is available in chapter 1):
  - Overload
  - Wrong and/or careless use
  - etc

These claims stated in no.2 do not fall under the guarantee! To guarantee the security of you and your colleagues you are obliged to follow up this procedure.

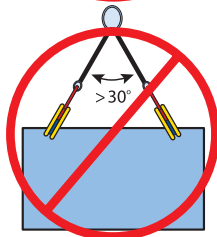
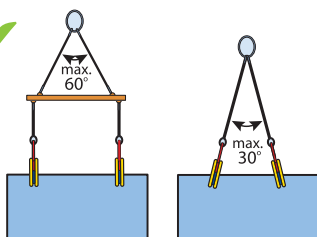
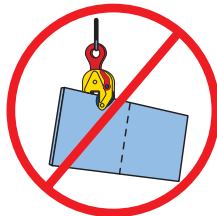
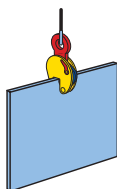
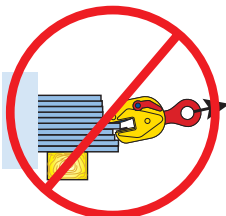
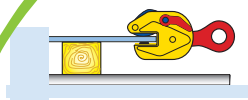
- 3 Return your lifting clamp (with the maintenance history) to your authorized Terrier distributor.
- 4 If the lifting clamp has been revised / repaired by your distributor, you can safely use your clamp again. Note down the date of re-commissioning in the maintenance table.

## 11c INSPECTION SCHEDULE

| Months                                         | 4 | 8 | 12 | 16 | 20 | 24 | 28 | 32 | 36 | 40 | 44 | 48 | 52 | 56 | 60 |
|------------------------------------------------|---|---|----|----|----|----|----|----|----|----|----|----|----|----|----|
| Years                                          | 1 |   |    | 2  |    |    | 3  |    |    | 4  |    |    | 5  |    |    |
| Safety inspections by your own inspector       | ■ | ■ |    | ■  | ■  |    | ■  | ■  |    | ■  | ■  |    | ■  | ■  |    |
| Maintenance by an official Terrier distributor |   |   | ■  |    |    |    |    |    | ■  |    |    |    |    |    | ■  |
| Revision by an official Terrier distributor    |   |   |    |    |    | ■  |    |    |    |    |    | ■  |    |    |    |



# SAFELY LIFTING



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## 1 GENERAL

Congratulations with the acquisition of your Terrier safety plate lifting clamp. The quality systems of management and services of Terrier Lifting Clamps B.V. fully comply with ISO 9001 standards. The many years of vast experience are a guarantee of optimum quality and safety. Terrier Lifting Clamps are made of top quality alloyed steel and fully comply with European standards as laid down in Machine Directive 2006/42/EG.

## 2 OPERATING PRINCIPLE

The FHX, FHSX, FHSX-V, TNMH and THSK horizontal safety lifting clamps have specifically been designed for the horizontal lifting and transporting of non-bending steel plates. The clamps consist of a body, cam, and cam pin. The cam also functions as a lifting shackle and ensures that the load is held firmly while it is being lifted.

## 3 PERMITTED APPLICATIONS

### FHX, FHSX, FHX-V and TNMH

Terrier FHX, FHSX and TNMH lifting clamps are only suitable for lifting and horizontal movement of non-bending steel plates and structures where it is possible to position the clamp on a flat point of contact. The clamps should always be used in pairs, or multiples thereof. In the latter case, however, preferably with a load spreader beam.

### TDH

Terrier TDH lifting clamps are only suitable for lifting and horizontal movement of both bending steel plates and formed steel plates, where it is possible to position the clamp on a flat point of contact. TDH clamps should always be used in pairs, or multiples thereof.

### THSK

Terrier THSK clamps are only suitable for horizontal movement of steel plates and packages of steel plates, where it is possible to position the clamp on a flat point of contact.



The clamps should always be used in pairs, or multiples thereof. In the latter case, however, preferably with a load equalizing beam. Provided that the steel plate or plates do not bend (deflect), one or more plates can be hoisted at once per lift. When pairs or multiple clamps are used, each clamp should carry an equal part of the load.

#### 4 SAFETY INSTRUCTIONS

**Safety first! Guarantee your personal safety by carefully reading the following safety instructions first.**

Ensure your own safety and continue to benefit from our product safety by having the clamp inspected, tested and, if necessary, overhauled at least once a year by Terrier Lifting Clamps B.V. or a recognized mechanical repair and service centre. See also Chapter 8 - Overhauling. Contact Terrier Lifting Clamps B.V. for further information.

##### AVOID SITUATIONS DANGEROUS TO LIFE

Prevent dangerous situations by seriously taking care of the following precautions:

- Never work with an untested clamp.
- Keep your distance when lifting and never stand under the load.
- Do not use the clamp if (it has been) damaged; have the clamp immediately repaired by Terrier Lifting Clamps B.V. or a recognized mechanical repair centre. If in doubt consult your supplier.
- Never lift more than one plate or a package of plates at a time.
- Never lift plates heavier than the working load limit (W.L.L.), as indicated on the clamp and in the test certificate.
- Do not lift plates which are thicker or thinner than the jaw opening, as indicated on the clamp and in the test certificate.
- When using a number of lifting clamps at the same time, please provide lifting slings or chains of a sufficient length to ensure that the angle between the slings or chains never exceeds 60°.
- When simultaneously operating a number of lifting clamps side by side, please use a lifting beam (equalizer) and lifting slings or chains of a sufficient length to ensure that the lifting shackles on the clamps are never subjected to lateral load.
- Do not place the clamp on tapered or conical sections of the plate or structure to be lifted.
- Remove all grease, oil, dirt, corrosion and mill scale from the plate at the point where the clamp is to be attached.
- Ensure that the clamp(s) is (are) positioned so as to balance the load when it is being lifted.
- The surface hardness of the plate must not exceed 37 HRC (345 Hb, 1166 N/mm<sup>2</sup>).
- The clamp is only suitable for use in normal atmospheric conditions.

##### SAFETY PRECAUTIONS

Ensure that the cam can never be subjected to lateral load.

- A free fall or uncontrolled swaying at the crane hook resulting in objects being struck, may cause impact damage to the clamp. If this happens check whether the clamp is still in good working order before using it.
- Lifting clamps are not suitable for creating permanent joints.
- Maintenance of the clamp should take place on a regular monthly basis, see Chapter 6 - Maintenance.

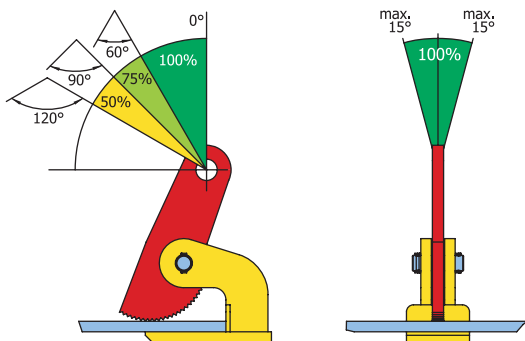
- Do not modify the clamp (by welding, grinding, etc.), as this can adversely affect its operation and safety, thereby nullifying any forms of guarantee and product liability.
- For the very same reason, use only original Terrier components.
- Any improper use of the clamp and/or failure to observe any directions and warnings in these operating instructions concerning the use of this product may endanger the health of the user and/or bystanders.

### The following additional safety precautions are applicable to the FHX, FHSX, FHX-V, TNMH TDH and THSK model

The clamps can be loaded laterally at a maximum angle of 15°, only when they are not loaded more than the maximum W.L.L. and the permitted top angle. The capacity of the clamps has been calculated on basis of a maximum top angle of 60°. In case of situations with larger top angles, then the W.L.L. should be reduced proportionally, according the following loading drawing.

With shored up usage, a maximum top angle of 60° is applicable and the W.L.L. is 50% of the maximum permissible working load. The environmental temperature for use of the standard lifting clamps is between minus 40 and 100 °C.

The clamps can be loaded laterally at a maximum angle of 15°



### 5a LIFTING WITH FHX, FHSX, FHX-V, TDH and TNMH CLAMPS

- Check whether the working load limit (W.L.L.) of the clamp is sufficient for the load created in the lifting situation. Note: The working load limit (W.L.L.) is shown on the lifting clamp.
- Attach the lifting clamp to the hoisting mechanism either by means of a:
  - safety shackle directly to a crane hook,
  - coupling link or D-shackle,
  - sling or chain, if necessary in conjunction with a coupling link or D-shackle.
- Ensure that all attachments have been tested and are of the correct tonnage. Make sure that coupling links and shackles are large enough to allow the clamp to move freely in the hook.
- Check whether the clamp has any visible damage. Check whether the cam opens and closes smoothly.



- Check whether the teeth of the cam are free from dirt, and if necessary clean with a wire brush.
- Remove any grease, dirt and mill scale from the plate at the site of the lifting clamp.
- Open the clamp.
- Place the jaws as far as they will go over the plate, making sure that the clamp is positioned so as to balance the load when it is being lifted.
- Lift gently so that the lifting force can be applied; check whether the clamp is rotating or tilting.
- If the clamp is rotating or tilting read the fore mentioned remarks on lifting again.
- Ensure that the load is in a stable position.

#### 5b LIFTING WITH THSK CLAMPS

- Place the clamp onto the plate (cable or chain already attached to the tooth segment; and take care that the chain if cable is not twisted);
- Tighten the clamps firmly by hand;
- Tension the cables or chains with the crane hook, while the inside of the jaws presses firmly against the edge of the plate (note: due to the fact that the clamp does not have a constant pre-tension available on the tooth segment, it will be necessary to watch the position of the clamps until the cables are tensioned: make sure the clamps stay in the correct position).
- The load can now be lifted carefully.
- During the transport of the load, take care that a constant tension is maintained on chains or slings.
- To unhook, the crane hook should be lowered so far that the clamp is completely free of any load (note: make sure that when the load is lowered, there are no obstacles - underneath where the load could rest on during lowering and whereby the clamps will become unloaded too early by accident).
- The clamps can now be removed from the load.

#### 6 MAINTENANCE

- Check the general condition of the clamp at least once a month, see Chapter 7 - Disassembling/Assembling.
- Do not use the clamp if:
  - the body is split or deformed, in particular in way of the jaw corners,
  - the cam has been visibly deformed,
  - the cam teeth are no longer sharp,
  - the shackle pins have visibly been deformed,
  - any retaining pins are missing,
  - the marking on the clamp is no longer legible.

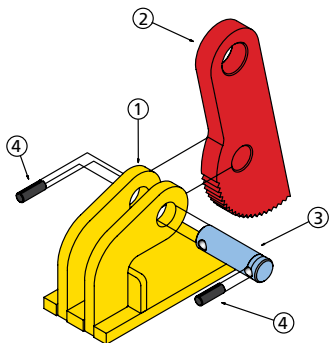
Depending on the defects noted:

disassemble and clean the clamp (see Chapter 7 - Disassembling/Assembling) or have the clamp overhauled by Terrier Lifting Clamps B.V. or another recognized mechanical repair center (see Chapter 8 - Overhauling).

## 7a DISASSEMBLING/ASSEMBLING FHX, FHSX, FHX-V, TDH CLAMPS

The clamps can be easily disassembled for cleaning and inspection purposes. Please make use of the following procedure.

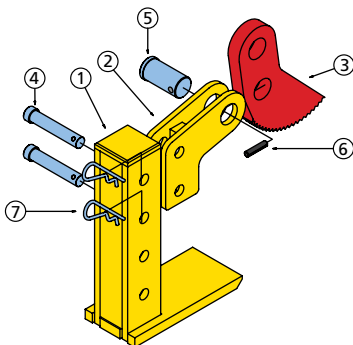
- Remove the retaining pin (4) and the cam pin (3).
- Remove the cam (2).
- Clean all parts with a standard degreasant.
- Grease the cam pin (3) with bearing grease.
- Assembling the clamp is in reverse order.
- Always insert new retaining pins (4) with the aid of a hammer, combination pliers and pin punch.
- Always use original Terrier components when replacing parts.
- Remove any burr with a file.



## 7b DISASSEMBLING/ASSEMBLING THSK CLAMPS

The THSK clamp can be easily disassembled for cleaning and inspection. Please make use of the following procedure.

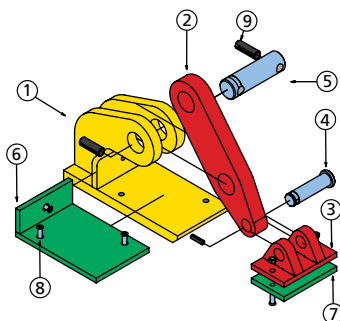
- Remove the tension pin (6) with the use of a pin driver from the tooth segment shaft (5).
- The tooth segment shaft can now be pushed out of the frame and the tooth segment (3) can be removed.
- Remove the hairpin pegs (7) and the pins (4), and the two side plates (2) can be taken from the clamp.
- Clean all the parts with a standard degreasant.
- Assembling of the clamp is in reverse order.
- Always use original Terrier components when replacing parts.
- Remove any burr with a file.



## 7c DISASSEMBLING/ASSEMBLING TNMH CLAMPS

The TNMH clamp can be easily disassembled for cleaning and inspection. Please make use of the following procedure.

- Remove the retaining pin (9) and the cam pin (5).
- Remove the cam (2).
- Remove the small retaining pin (9) and the cam pin (4).
- Clean all parts with a standard degreasant.
- If necessary you can remove the fabric pads (6 & 7) by removing the bolts (8)
- Grease the cam pin (4 & 5) with bearing grease.
- Assembling the clamp is in reverse order.
- Always insert new retaining pins (9) with the aid of a hammer, combination pliers and pin punch.
- Always use original Terrier components when replacing parts.
- Remove any burr with a file.



## 8 OVERHAULING

At least once a year or in case of any damage to the clamp, the clamp should be inspected, tested and if necessary overhauled by Terrier Lifting Clamps BV or a recognized mechanical repair centre.

## 9 DISPOSAL

Once it has reached the end of its useful life the clamp can be treated as scrap iron, provided that the clamp is rendered unfit for further use.

## 10 TROUBLESHOOTER'S CHECKLIST

| Failure/malfunction           | Possible Cause                                         | Action                                                      |
|-------------------------------|--------------------------------------------------------|-------------------------------------------------------------|
| Load slipping                 | Load dirty<br>Cam dirty<br>Cam blunt<br>Jaws bent open | Clean load<br>Clean clamp<br>Overhaul clamp<br>Reject clamp |
| Cam pivoting badly            | Cam overloaded                                         | Reject clamp                                                |
| Body bent                     | Clamp overloaded                                       | Reject clamp                                                |
| Cam shackle oval              | Clamp overloaded                                       | Reject clamp                                                |
| Cam pin bent                  | Clamp overloaded                                       | Renew cam pin                                               |
| Adjustable pins bent          | Clamp overloaded                                       | Reject clamp                                                |
| Retaining pins missing        | Incorrectly assembled                                  | Fit new retaining pins                                      |
| Clamp difficult to open/close | Clamp worn out<br>Clamp contaminated                   | Reject clamp<br>Clean clamp                                 |

## 11 WARRANTY

Terrier Lifting Clamps provides a 5 year warranty on its lifting clamps. This warranty is applicable to the original end user of the lifting clamps. Only if the clamp has been inspected, checked and maintained by these instructions and by an official dealer. This warranty period of 5 years is valid from the day of purchase, and is liable to all conditions and measurements stated in this document.

### 11a CONDITIONS

This warranty only covers failures in the lifting tools which is the consequence of production errors which occur during normal use. The warranty covers no wear to components such as pivots, cam assemblies, lock springs etc. Should there be any kind of failure within this guarantee period, the lifting tool will be replaced or repaired to insight of the producer.

No warranty is given to clamps due to the following failures:

- Regular wear
- Overload.
- Wrong and/or careless use
- Damages
- Not following procedures and measures
- Hoisting differing material other than indicated on clamp or stated in the user-manual
- Adapting and/or modifying of the Terrier clamp.
- The injudicious use of the clamp, and not succeeding all indications which are stated in the users manual.
- When maintenance and/or revision has not been carried out by an authorized Terrier distributor.

**The producer is not responsible for incidental damage or damage due to use of the lifting tools as well as from violation of this manual.**

### 11b PROCEDURE SAFETY INSPECTION

All inspections and repairings must be written down in the maintenance diagram. This counts not only for your own inspections but also for inspections which are carried out by your authorized Terrier distributor. When the clamp is handed in for maintenance and inspection you always must provide the maintenance diagram.

#### Defective Lifting Clamps

When a form of wear or damage is indicated, you must take the following measures.

- 1 Take the lifting clamp out of use. (Note the date of failure of the lifting clamp)
- 2 Try to recover the cause of the failure, for example (complete list is available in chapter 1):
  - Overload
  - Wrong and/or careless use
  - etc

These claims stated in no.2 do not fall under the guarantee! To guarantee the security of you and your colleagues you are obliged to follow up this procedure.

- 3 Return your lifting clamp (with the maintenance history) to your authorized Terrier distributor.
- 4 If the lifting clamp has been revised / repaired by your distributor, you can safely use your clamp again. Note down the date of re-commissioning in the maintenance table.



11c INSPECTION SCHEDULE

| Months                                        | 4 | 8 | 12 | 16 | 20 | 24 | 28 | 32 | 36 | 40 | 44 | 48 | 52 | 56 | 60 |
|-----------------------------------------------|---|---|----|----|----|----|----|----|----|----|----|----|----|----|----|
| Years                                         | 1 |   |    | 2  |    |    | 3  |    |    | 4  |    |    | 5  |    |    |
| Safety inspections by your own inspector      |   |   |    |    |    |    |    |    |    |    |    |    |    |    |    |
| Maintenance by a official Terrier distributor |   |   |    |    |    |    |    |    |    |    |    |    |    |    |    |
| Revision by a official Terrier distributor    |   |   |    |    |    |    |    |    |    |    |    |    |    |    |    |

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## 1 GENERAL

Congratulations with the purchase of your new Terrier FSV (W) or TBS lifting clamp. The quality systems of management and services of Terrier Lifting Clamps B.V. fully comply with ISO 9001 standards. The many years of vast experience are a guarantee of optimum quality and safety. Terrier Lifting Clamps are made of top quality alloyed steel and fully comply with European standards as laid down in Machine Directive 2006/42/EG.

## 2 OPERATING PRINCIPLE

The FSV(W) and TBS lifting clamps feature a screw thread mechanism consisting of a threaded spindle and two spindle nuts. As soon as the spindle has been actuated, this mechanism ensures that a constant clamping force is applied by the jaws. In this way the clamp will not work itself loose from the object.

The linked clamping parts ensure that the clamping force continues, which means that the load continues to be held firmly. As there is no cam and pivot arrangement the object to be lifted does not become damaged.

## 3 PERMITTED APPLICATIONS

### FSV

The FSV(W) lifting clamps are only suitable for lifting and handling steel beams (T, UNP, INP, IPE, HE etc) and steel strips.

Permissible positions for using the two clamps are:

- lifting and handling from a vertical position.
- lifting work, where the lifting clamp is used as a lifting point.

### TBS

The TBS bulb screw clamps have been specifically and exclusively designed for the provision on a bulb profile of a temporary lifting point. (HP profile according to EN 10-204)

The TBS bulb screw clamp is used individually to create a temporary lifting point on a bulb profile.

The lifting shackle may be subjected to a lateral load of up to 45° left or 45° right in relation to the perpendicular.



## 4 SAFETY INSTRUCTIONS

**Safety first! Guarantee your personal safety by carefully reading the following safety instructions first.**

Ensure your own safety and continue to benefit from our product safety by having the clamp inspected, tested and, if necessary, overhauled at least once a year by Terrier Lifting Clamps B.V. or a recognized mechanical repair and service centre. See also Chapter 8 - Overhauling. Contact Terrier Lifting Clamps B.V. for further information.

### **Avoid situations dangerous to life**

Prevent dangerous situations by seriously taking care of the following precautions:

- Never work with an untested clamp.
- Keep at a distance when lifting and never stand under the load.
- Do not use the clamp if damaged; have the clamp repaired by Terrier Lifting Clamps B.V. firstly, or by a recognized mechanical repair centre. If in doubt, please consult your dealer.
- Never lift more than one beam or load at a time.
- Never lift beams that are heavier than the working load limit (W.L.L.), as indicated on the clamp and the test certificate.
- Do not attach the TBS clamps to any other parts but bulb profiles (HP profiles EN 10-204)
- Do not lift beams or strips smaller or bigger than the jaw opening, as indicated on the clamp and the test certificate.
- When simultaneously operating a number of lifting clamps facing each other, use lifting slings or chains which are of sufficient length to ensure that the angle between the slings or chains never exceeds 60°.
- When simultaneously operating a number of lifting clamps side by side, use a lifting beam (equalizer) and lifting slings or chains of sufficient length to ensure that the lifting shackles on the clamps are never subjected to a lateral load of more than 10°.
- Do not place the clamp on tapered or conical sections of the beam to be lifted.
- Make sure that the clamp(s) is/are positioned so as to balance the load when it is being lifted.
- The clamp is only suitable for use in normal atmospheric conditions.

### **Safety precautions**

- Ensure that the lifting shackle can never be subjected to 10° lateral load.
- A free fall or uncontrolled swaying at the crane hook resulting in objects being struck may cause damage to the clamp. If this occurs, check whether the clamp is in good working order before using it.
- Lifting clamps are not suitable to be used as permanent joints.
- The clamp should be subjected to preventive maintenance on a monthly basis in accordance to the guidelines as described in Chapter 6 - Maintenance.
- Do not modify the clamp (by welding, grinding, etc.), as this can adversely affect its operation and safety, thereby nullifying any forms of guarantee and product liability.
- For the very same reason, use only original Terrier components.
- The TBS bulb screw clamps may be mounted onto a bulb profile with a hardness of up to 345 Hb (37 Rc). Please consult with your dealer if harder steel types are used.
- If you are using a TBS bulb screw clamp, please observe the following additional inspection duties: Make sure that the size of the bulb profile matches the range of the bulb screw clamp.
- Any improper use of the clamp and/or failure to observe any directions and warnings in these operating instructions concerning the use of this product may endanger the health of the user and/or bystanders.

## 5 LIFTING

- Verify whether the working load limit (W.L.L.) of the clamp is sufficient for the load created in the lifting situation.
- Attach the lifting clamp to the hoisting mechanism:
  - directly to a crane hook by means of a safety shackle,
  - by means of a coupling link or D-type shackle,
  - by means of a sling or chain, if necessary, in conjunction with a coupling link or D-type shackle.
- Ensure that all attachments have been tested and are of the correct tonnage. Make sure that coupling links and shackles are large enough to allow the clamp to move freely in the hook.
- Check whether the clamp has any visible damage.
- Operate the spindle to check whether the clamp opens and closes smoothly.

### FSV

- Check that the threaded spindle is free of dirt and if necessary clean it with a wire brush.
- Remove excess dirt from the beam or strip where the lifting clamp is to be applied.
- Open the clamp by using the threaded spindle.
- Position the jaw as far as they will go over the beam or strip, ensuring that the clamp is positioned so as to balance the load when it is being lifted.
- Close the clamp by reversing the threaded spindle as far as it will go (finger tight).
- Start the lifting and check whether the clamp is shifting.
- If the clamp continues to shift read through Chapter 6 - Maintenance.
- Make sure that the load is in a stable position, before taking the clamp off the plate.

### TBS

- Open the clamp by means of the thread spindle.
- Position the clamp completely onto the bulb profile, in such a way that the bulb falls into the recess of the clamp and the flat side of the bulb profile faces the spindle side.
- Close the clamp by fully (i.e. finger tight) closing the thread spindle.
- Mount the hoisting element onto the lifting shackle and start lifting gently.
- Make sure the clamp does not shift. If the clamp shifts or if the load becomes unbalanced, repeat the above.
- When the load has reached its destination, lower the crane hook until the clamp is fully unloaded. This can be verified by the slackness of the hoisting chain and a free movement of the lifting shackle of the clamp.
- Take the hoisting element from the lifting shackle while holding on to the frame.
- The bulb screw clamp is removed from the construction by loosening the thread spindle.

## 6 MAINTENANCE

From a safety point of view, please check the general condition of the clamp at least once a month, see Chapter 7 - Disassembling/Assembling.

Stop using the clamp if:

- the clamping parts are split or deformed, in particular the jaws;
- the lifting shackle is visibly deformed;
- the shackle pins are visibly deformed;
- the retaining pins are missing;
- the threaded spindle is visibly deformed;
- the threaded spindle is dirty or damaged;
- there is too much room in the spindle nuts;
- the marking on the clamp is no longer legible.

### Depending on the defects noted:

- dismantle and clean the clamp (see Chapter 7 - Disassembly/Assembly) or
- have the clamp overhauled by Terrier Lifting Clamps B.V. or a recognized mechanical repair centre (see chapter 8 - Overhauling).

If in doubt consult your supplier.

## 7 DISASSEMBLING/ASSEMBLING

The clamp can be easily disassembled for cleaning and inspection.

### Disassembling

Please make use of the following sequence (see construction drawing on page 32):

- Open the clamp to its full extent.
- Remove the retaining pin (9) and the spindle head (6).
- Remove the retaining pins (8) and the link pin (7).
- Remove the lifting shackle (3) and the spacers (5).
- Unscrew both clamping parts from the threaded spindle (4).
- Clean all parts with a standard degreaser.
- Grease the shackle pin (7), threaded spindle (4) and spindle bushes (5) with bearing grease.

### Assembling

Assemble all the parts in reverse sequence.

Note: The two spindle bushes must be screwed on to the threaded spindle over the same length in relation to the center, before the spindle head is fitted.

- Make sure that always new retaining pins are inserted and do so with the aid of a hammer, combination pliers and pin punch.
- When replacing parts, always use original Terrier components.
- Remove any burr with a file.

If in doubt consult your supplier.

### TBS

Important! Before disassembling the clamp, mark each part in such a way that they are easily reassembled in the original position.

### Disassembling the TBS

- Remove the retaining pin (5), with which the lifting shackle spindle (3) is secured, from the frame (1).
- Remove the lifting shackle spindle (3) and the lifting shackle (4).
- Unscrew the screw spindle (2) from the frame (1) and remove it.

### Assembling the TBS

When reassembling the clamps, assemble all parts in reverse order. To ensure the safety of the clamp, only use the original Terrier replacement parts when repairing the clamp. Make sure they are marked to allow proper identification.

If you carry out any inspections, repairs or modifications yourself, you will nullify all forms of guarantee and product liability.

After inspection, repair and/or reassembly, the clamps should be tested using a certified testing bench.

## 8 OVERHAULING

At least once a year or in case of any damage to the clamp, the clamp should be inspected, tested and if necessary overhauled by Terrier Lifting Clamps B.V. or by a recognized mechanical repair centre. If in doubt consult your supplier.

## 9 DISPOSAL

Once it has reached the end of its useful life, the clamp can be treated as scrap iron, provided that the clamp is rendered unfit for further use.

## 10 TROUBLESHOOTER'S CHECKLIST

| Failure/malfunction            | Possible Cause                                                                                             | Action                                                                     |
|--------------------------------|------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------|
| Clamp is shifting              | Clamp not closed<br>Threaded spindle dirty<br>Threaded spindle worn out<br>Jaws bent open<br>Load is dirty | Close clamp<br>Clean spindle<br>Reject clamp<br>Reject clamp<br>Clean load |
| Lifting shackle pivoting badly | Lifting shackle overloaded                                                                                 | Reject clamp                                                               |
| Body bent                      | Clamp overloaded                                                                                           | Reject clamp                                                               |
| Lifting shackle oval           | Clamp overloaded                                                                                           | Reject clamp                                                               |
| Shackle pins bent              | Clamp overloaded                                                                                           | Reject clamp                                                               |
| Retaining pins missing         | Incorrectly assembled                                                                                      | Fit new retaining pins                                                     |
| Clamp difficult to open/close  | Threaded spindle dirty<br>Threaded spindle bent<br>Clamp worn out<br>Clamp contaminated                    | Clean spindle<br>Reject clamp<br>Reject clamp<br>Clean clamp               |

## 11 WARRANTY

Terrier Lifting Clamps provides a 5 year warranty on its lifting clamps. This warranty is applicable to the original end user of the lifting clamps. Only if the clamp has been inspected, checked and maintained by this instructions and by an official dealer. This warranty period of 5 years is valid from the day of purchase, and is liable to all conditions and measurements stated in this document.

### 11a CONDITIONS

This warranty only covers failures in the lifting tools which is the consequence of production errors which occur during normal use. The warranty covers no wear to components such as pivots, cam assemblies, lock springs etc. Should there be any kind of failure within this guarantee period, the lifting tool will be replaced or repaired to insight of the producer.

No warranty is given to clamps due to the following failures:

- Regular wear
- Overload.
- Wrong and/or careless use
- Damages
- Not following procedures and measures
- Hoisting differing material other than indicated on clamp or stated in the user-manual
- Adapting and/or modifying of the Terrier clamp.
- The injudicious use of the clamp, and not succeeding all indications which are stated in the users manual.
- When maintenance and/or revision has not been carried out by an authorized Terrier distributor.

**The producer is not responsible for incidental damage or damage due to use of the lifting tools as well as from violation of this manual.**

## 11b PROCEDURE SAFETY INSPECTION

All inspections and repairs must be written down in the maintenance diagram.

This counts not only for your own inspections but also for inspections which are carried out by your authorized Terrier distributor. When the clamp is handed in for maintenance and inspection you always must provide the maintenance diagram.

### Defective Lifting Clamps

When a form of wear or damage is indicated, you must take the following measures.

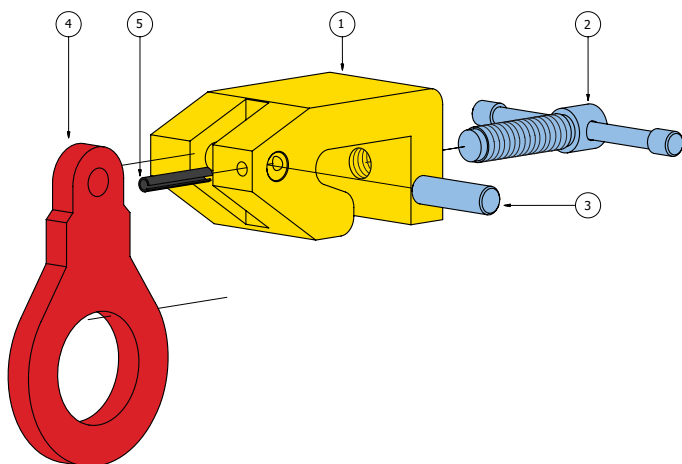
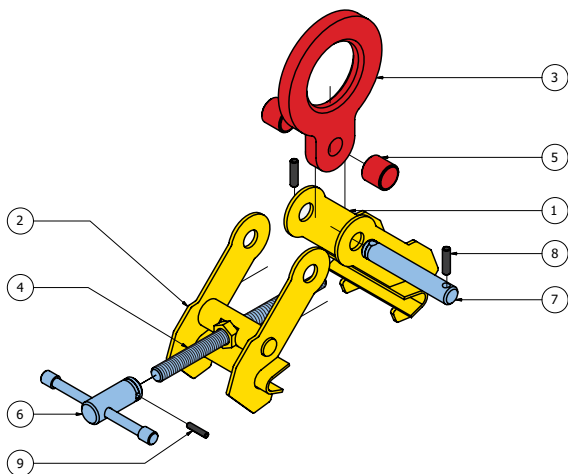
- 1 Take the lifting clamp out of use. (Note the date of failure of the lifting clamp)
- 2 Try to recover the cause of the failure, for example (complete list is available in chapter 1):
  - Overload
  - Wrong and/or careless use
  - etc

These claims stated in no.2 do not fall under the guarantee! To guarantee the security of you and your colleagues you are obliged to follow up this procedure.

- 3 Return your lifting clamp (with the maintenance history) to your authorized Terrier distributor.
- 4 If the lifting clamp has been revised / repaired by your distributor, you can safely use your clamp again. Note down the date of re-commissioning in the maintenance table.

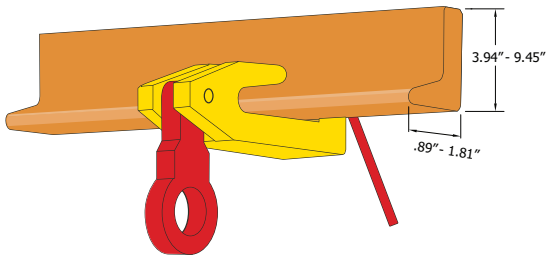
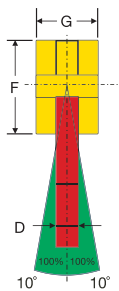
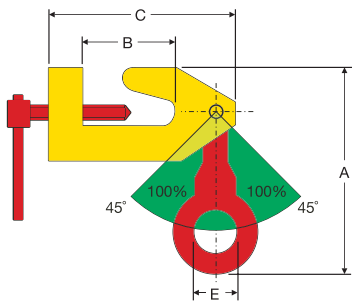
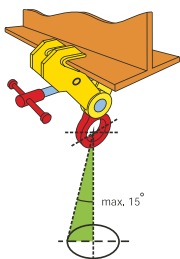
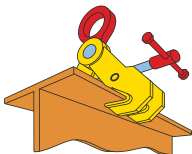
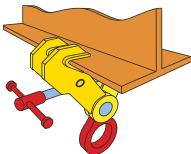
## 11c INSPECTION SCHEDULE

| Months                                         | 4 | 8 | 12 | 16 | 20 | 24 | 28 | 32 | 36 | 40 | 44 | 48 | 52 | 56 | 60 |
|------------------------------------------------|---|---|----|----|----|----|----|----|----|----|----|----|----|----|----|
| Years                                          | 1 |   |    | 2  |    |    | 3  |    |    | 4  |    |    | 5  |    |    |
| Safety inspections by your own inspector       |   |   |    |    |    |    |    |    |    |    |    |    |    |    |    |
| Maintenance by an official Terrier distributor |   |   |    |    |    |    |    |    |    |    |    |    |    |    |    |
| Revision by an official Terrier distributor    |   |   |    |    |    |    |    |    |    |    |    |    |    |    |    |





LOAD DIAGRAMS (WORKING LOAD LIMITS)



## CONTENTS

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## 1 GENERAL

Thank you for choosing one of our high-quality products. The quality systems of management and services of Terrier Lifting Clamps B.V. fully comply with ISO 9001 standards. The many years of vast experience are a guarantee of optimum quality and safety. Terrier Lifting Clamps are manufactured from high quality alloy steels and comply fully with all standards and product requirements including: European standard: NEN 13155, Australian standard: 4991, US standard: ASME B30.20-2010 and machinery directive 2006/42/EG.

## 2 OPERATING PRINCIPLE

The FSV/FSV(S)(U) and TBS lifting clamps feature a screw thread mechanism consisting of a threaded spindle and two spindle nuts. As soon as the spindle has been actuated, this mechanism ensures that a constant clamping force is applied by the jaws. In this way the clamp will not work itself loose from the object.

The linked clamping parts ensure that the clamping force continues, which means that the load continues to be held firmly. As there is no cam and pivot arrangement the object to be lifted does not become damaged.

## 3 PERMITTED APPLICATIONS

### FSV/FSV(S)(U)

The FSV/FSV(S)(U) lifting clamps are only suitable for lifting and handling steel beams (T, UNP, INP, IPE, HE etc) and steel strips.

Permissible positions for using the two clamps are:

- lifting and handling from a vertical position.
- lifting work, where the lifting clamp is used as a lifting point.

### TBS

The TBS bulb screw clamps have been specifically designed for the provision on a bulb profile of a temporary lifting point. (HP profile according to EN 10-204)

The TBS bulb screw clamp is used individually to create a temporary lifting point on a bulb profile.

The lifting shackle may be subjected to a lateral load of up to 45° left or 45° right in relation to the perpendicular and sideways 15°.

### TSRC

The TSRC rail clamps are only suitable for lifting and handling rails.

Permissible positions for using the two clamps are:

- lifting and handling from a vertical position.

**Safety First! Guarantee your personal safety by carefully reading the following safety instructions first.**

Ensure your own safety and continue to benefit from our product safety by having the clamp inspected, tested and, if necessary, overhauled at least once a year by Terrier Lifting Clamps B.V. or a recognized mechanical repair and service centre. See also Chapter 8 - Overhauling. Contact Terrier Lifting Clamps B.V. for further information.

### **Avoid situations dangerous to life**

Prevent dangerous situations by seriously taking care of the following precautions:

- Never work with an untested clamp.
- Keep at a distance when lifting and never stand under the load.
- Do not use the clamp if damaged; have the clamp repaired by Terrier Lifting Clamps B.V. firstly, or by a recognized mechanical repair centre. If in doubt, please consult your dealer.
- Never lift more than one beam or load at a time.
- Never lift beams that are heavier than the working load limit (W.L.L.), as indicated on the clamp and the test certificate.
- Do not attach the TBS clamps to any other parts but bulb profiles (HP profiles EN 10-204)
- Do not lift beams or strips smaller or bigger than the jaw opening, as indicated on the clamp and the test certificate.
- When simultaneously operating a number of lifting clamps facing each other, use lifting slings or chains which are of sufficient length to ensure that the permissible lifting angles are respected.
- When simultaneously operating a number of lifting clamps side by side, use a lifting beam (equalizer) and lifting slings or chains of sufficient length to ensure that the lifting shackles on the clamps are never subjected to a lateral load of more than 15°.
- Do not place the clamp on tapered or conical sections of the beam to be lifted.
- Make sure that the clamp(s) is/are positioned so as to balance the load when it is being lifted.
- The clamp is only suitable for use in normal atmospheric conditions.

### **Safety precautions**

- Ensure that the lifting shackle can never be subjected to 15° lateral load.
- A free fall or uncontrolled swaying at the crane hook resulting in objects being struck may cause damage to the clamp. If this occurs, check whether the clamp is in good working order before using it.
- Lifting clamps are not suitable to be used as permanent joints.
- The clamp should be subjected to preventive maintenance on a monthly basis in accordance to the guidelines as described in Chapter 6 - Maintenance.
- Do not modify the clamp (by welding, grinding, etc.), as this can adversely affect its operation and safety, thereby nullifying any forms of guarantee and product liability.
- For the very same reason, use only original Terrier components.
- If you are using a TBS bulb screw clamp, please observe the following additional inspection duties: Make sure that the size of the bulb profile matches the range of the bulb screw clamp.
- Any improper use of the clamp and/or failure to observe any directions and warnings in these operating instructions concerning the use of this product may endanger the health of the user and/or bystanders.

## 5 LIFTING

- Verify whether the working load limit (W.L.L.) of the clamp is sufficient for the load created in the lifting situation.
- Attach the lifting clamp to the hoisting mechanism:
  - directly to a crane hook by means of a safety shackle,
  - by means of a coupling link or D-type shackle,
  - by means of a sling or chain, if necessary, in conjunction with a coupling link or D-type shackle.
- Ensure that all attachments have been tested and are of the correct tonnage. Make sure that coupling links and shackles are large enough to allow the clamp to move freely in the hook.
- Check whether the clamp has any visible damage.
- Operate the spindle to check whether the clamp opens and closes smoothly.

### FSV/FSV(S)(U)

- Check that the threaded spindle is free of dirt and if necessary clean it with a wire brush.
- Remove excess dirt from the beam or strip where the lifting clamp is to be applied.
- Open the clamp by using the threaded spindle.
- Position the jaw as far as they will go over the beam or strip, ensuring that the clamp is positioned so as to balance the load when it is being lifted.
- Close the clamp by reversing the threaded spindle as far as it will go (finger tight).
- Start the lifting and check whether the clamp is shifting.
- If the clamp continues to shift read through Chapter 6 - Maintenance.
- Make sure that the load is in a stable position, before taking the clamp off the plate.

### TBS

- Open the clamp by means of the thread spindle.
- Position the clamp completely onto the bulb profile, in such a way that the bulb falls into the recess of the clamp and the flat side of the bulb profile faces the spindle side.
- Close the clamp by fully (i.e. finger tight) closing the thread spindle.
- Mount the hoisting element onto the lifting shackle and start lifting gently.
- Make sure the clamp does not shift. If the clamp shifts or if the load becomes unbalanced, repeat the above.
- When the load has reached its destination, lower the crane hook until the clamp is fully unloaded. This can be verified by the slackness of the hoisting chain and a free movement of the lifting shackle of the clamp.
- Take the hoisting element from the lifting shackle while holding on to the frame.
- The bulb screw clamp is removed from the construction by loosening the thread spindle.

### TSRC

- Check that the threaded spindle is free of dirt and if necessary clean it with a wire brush.
- Remove excess dirt from the rail where the lifting clamp is to be applied.
- Open the clamp by using the threaded spindle.
- Position the jaw as far as they will go over the rail, ensuring that the clamp is positioned so as to balance the load when it is being lifted.
- Close the clamp by reversing the threaded spindle as far as it will go (finger tight).
- Start the lifting and check whether the clamp is shifting.
- If the clamp continues to shift, read through Chapter 5 - Maintenance.
- Make sure that the load is in a stable position, before taking the clamp off the rail.

## 6 MAINTENANCE

From a safety point of view, please check the general condition of the clamp at least once a month, see Chapter 7 - Disassembling/Assembling.

Stop using the clamp if:

- the clamping parts are split or deformed, in particular the jaws;
- the lifting shackle is visibly deformed;
- the shackle pins are visibly deformed;
- the retaining pins are missing;
- the threaded spindle is visibly deformed;
- the threaded spindle is dirty or damaged;
- there is too much room in the spindle nuts;
- the marking on the clamp is no longer legible.

### Depending on the defects noted:

- dismantle and clean the clamp (see Chapter 7 -Disassembling/Assembling) or
- have the clamp overhauled by Terrier Lifting Clamps B.V. or a recognized mechanical repair centre (see chapter 8 - Overhauling).

If in doubt consult your supplier.

## 7 DISASSEMBLING/ASSEMBLING

The clamp can be easily disassembled for cleaning and inspection.

### Disassembling

Please make use of the following sequence (see construction drawing on page 49):

- Open the clamp to its full extent.
- Remove the retaining pin (9) and the spindle head (6).
- Remove the retaining pins (8) and the link pin (7).
- Remove the lifting shackle (3) and the spacers (5).
- Unscrew both clamping parts from the threaded spindle (4).
- Clean all parts with a standard degreasant.
- Grease the shackle pin (7), threaded spindle (4) and spindle bushes (5) with bearing grease.

### Assembling

Assemble all the parts in reverse sequence.

Note: The two spindle bushes must be screwed on to the threaded spindle over the same length in relation to the center, before the spindle head is fitted.

- Make sure that always new and original retaining pins are inserted and do so with the aid of a hammer, combination pliers and pin punch.
- When replacing parts, always use original Terrier components.
- Remove any burr with a file.

If in doubt consult your supplier.

### TBS

Important! Before disassembling the clamp, mark each part in such a way that they are easily reassembled in the original position.

### Disassembling the TBS

- Remove the retaining pin (5), with which the lifting shackle spindle (3) is secured, from the frame (1).
- Remove the lifting shackle spindle (3) and the lifting shackle (4).
- Unscrew the screw spindle (2) from the frame (1) and remove it.

### Assembling the TBS

When reassembling the clamps, assemble all parts in reverse order. To ensure the safety of the clamp, only use the original Terrier replacement parts when repairing the clamp. Make sure they are marked to allow proper identification.

If you carry out any inspections, repairs or modifications yourself, you will nullify all forms of guarantee and product liability.

After inspection, repair and/or reassembly, the clamps should be tested using a certified testing bench.

## 8 OVERHAULING

At least once a year or in case of any damage to the clamp, the clamp should be inspected, tested and if necessary overhauled by Terrier Lifting Clamps B.V. or by a recognized mechanical repair centre. If in doubt consult your supplier.

## 9 DISPOSAL

Once it has reached the end of its useful life, the clamp can be treated as scrap iron, provided that the clamp is rendered unfit for further use.

## 10 TROUBLESHOOTER'S CHECKLIST

| Failure/malfunction            | Possible Cause                                                                                             | Action                                                                         |
|--------------------------------|------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------|
| Clamp is shifting              | Clamp not closed<br>Threaded spindle dirty<br>Threaded spindle worn out<br>Jaws bent open<br>Load is dirty | Close clamp<br>Clean spindle<br>Reject clamp<br><br>Reject clamp<br>Clean load |
| Lifting shackle pivoting badly | Lifting shackle overloaded                                                                                 | Reject clamp                                                                   |
| Body bent                      | Clamp overloaded                                                                                           | Reject clamp                                                                   |
| Lifting shackle oval           | Clamp overloaded                                                                                           | Reject clamp                                                                   |
| Shackle pins bent              | Clamp overloaded                                                                                           | Reject clamp                                                                   |
| Retaining pins missing         | Incorrectly assembled                                                                                      | Fit new retaining pins                                                         |
| Clamp difficult to open/close  | Threaded spindle dirty<br>Threaded spindle bent<br>Clamp worn out<br>Clamp contaminated                    | Clean spindle<br>Reject clamp<br>Reject clamp<br>Clean clamp                   |

## 11 WARRANTY

Terrier Lifting Clamps provides a 5 year warranty on its lifting clamps. This warranty is applicable to the original end user of the lifting clamps. Only if the clamp has been inspected, checked and maintained by this instructions and by an official dealer. This warranty period of 5 years is valid from the day of purchase, and is liable to all conditions and measurements stated in this document.

### 11a CONDITIONS

This warranty only covers failures in the lifting tools which is the consequence of production errors which occur during normal use. The warranty covers no wear to components such as pivots, cam assemblies, lock springs etc. Should there be any kind of failure within this guarantee period, the lifting tool will be replaced or repaired to insight of the producer.

No warranty is given to clamps due to the following failures:

- Regular wear
- Overload
- Wrong and/or careless use
- Damages
- Not following procedures and measures
- Hoisting differing material other than indicated on clamp or stated in the user-manual
- Adapting and/or modifying of the Terrier clamp.
- The injudicious use of the clamp, and not succeeding all indications which are stated in the users manual.
- When maintenance and/or revision has not been carried out by an authorized Terrier distributor.

**The producer is not responsible for incidental damage or damage due to use of the lifting tools as well as from violation of this manual.**

## 11b PROCEDURE SAFETY INSPECTION

All inspections and repairs must be written down in the maintenance diagram.

This counts not only for your own inspections but also for inspections which are carried out by your authorized Terrier distributor. When the clamp is handed in for maintenance and inspection you always must provide the maintenance diagram.

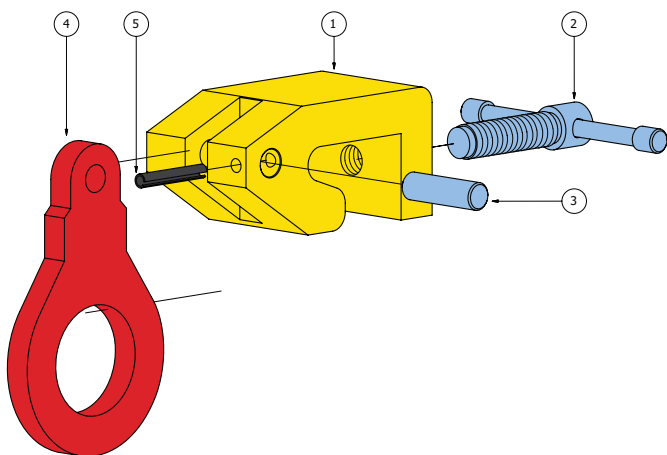
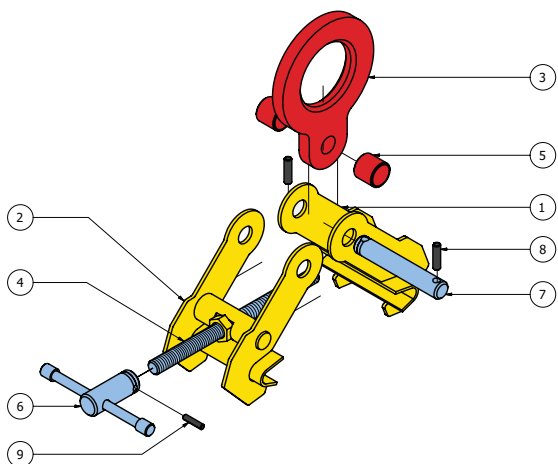
### Defective Lifting Clamps

When a form of wear or damage is indicated, you must take the following measures.

- 1 Take the lifting clamp out of use. (Note the date of failure of the lifting clamp)
- 2 Try to recover the cause of the failure, for example (complete list is available in 11a)  
These claims stated in no.2 do not fall under the guarantee! To guarantee the security of you and your colleagues you are obliged to follow up this procedure.
- 3 Return your lifting clamp (with the maintenance history) to your authorized Terrier distributor.
- 4 If the lifting clamp has been revised / repaired by your distributor, you can safely use your clamp again. Note down the date of re-commissioning in the maintenance table.

## 11c INSPECTION SCHEDULE

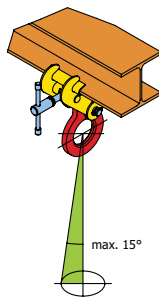
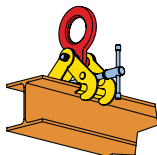
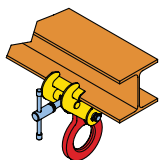
| Months                                         | 4 | 8 | 12 | 16 | 20 | 24 | 28 | 32 | 36 | 40 | 44 | 48 | 52 | 56 | 60 |
|------------------------------------------------|---|---|----|----|----|----|----|----|----|----|----|----|----|----|----|
| Years                                          | 1 |   |    | 2  |    |    | 3  |    |    | 4  |    |    | 5  |    |    |
| Safety inspections by your own inspector       |   |   |    |    |    |    |    |    |    |    |    |    |    |    |    |
| Maintenance by an official Terrier distributor |   |   |    |    |    |    |    |    |    |    |    |    |    |    |    |
| Revision by an official Terrier distributor    |   |   |    |    |    |    |    |    |    |    |    |    |    |    |    |



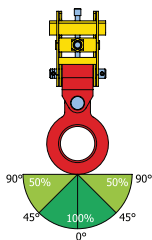
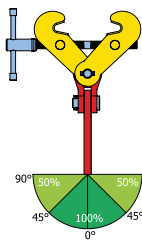


## LOAD DIAGRAMS (WORKING LOAD LIMITS)

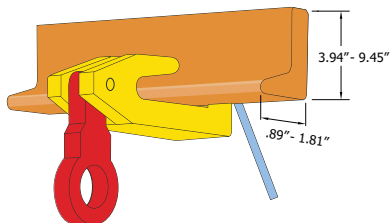
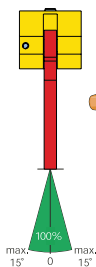
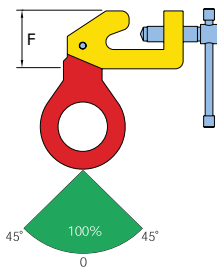
### FSV/FSVS



### FSVSU



### TBS



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## 1 GENERAL

Congratulations on buying your new Terrier safety sheet lifting clamp.

With the company's vast experience, Terrier Lifting Clamps B.V. can guarantee optimum quality and safety. Terrier lifting clamps are made from quality steel, and comply fully with the European requirements and norms given in the Machine Guideline 2006/42/EC: Australian Norm 4991, US norm ASME B30.20-2003, European Norm NEN 13155.

## 2 OPERATING PRINCIPLE

The Terrier safety TSCC lifting clamps are named after the safety mechanism which is made up of a spindle pivot and a cam. On tightening the spindle, there will be constant pressure on the pivot and cam. The clamp therefore cannot slip upon taking up the load. When lifting the load, the clamping strength of the clamp is increased by the weight of the load and the angle of the cam.

Also when depositing a load, the clamp cannot spontaneously let go.

## 3 AUTHORIZED APPLICATIONS

- The TSCC screw clamp is suitable for lifting and transporting steel objects.
- **Authorized use positions of the clamp are:**
  - 1 lifting and transporting of TSCC from a horizontal and vertical position.

## 4 SAFETY REGULATIONS

**Always pay attention to your own safety and to that of direct bystanders! Read the following safety regulations before using your new lifting clamp!**

For your own safety and in order to claim product liability, the clamp must be inspected and tested at least once (1x) annually, and revised by Terrier Lifting Clamps B.V. or another authorized revision company, if necessary.

See also Section 8 - Revision. Contact Terrier Lifting Clamps B.V. for more information.

## AVOID LIFE THREATENING SITUATIONS

- Avoid life threatening situations at work by complying with the following recommendations.
- Never work with a clamp which has not been approved.
- Keep a safe distance during lifting work and never walk or stand under the load.
- Do not use the clamp if it is damaged or has been damaged.
- Always have a damaged clamp immediately repaired by Terrier Lifting Clamps B.V. or another authorized revision company.
- Never lift more than one sheet simultaneously.
- Never lift sheeting which is heavier than the safe working load (WLL) given on the clamp, in the certificate and in the table.
- Never lift sheeting which is thicker or thinner than the jaw opening (as given on the clamp and in the certificate).
- When using a number of lifting clamps opposite each other, make sure the hoisting belts or chains are long enough.
- Clean the area where the clamp is to be attached, removing any grease, oil, dirt, corrosion and mill scale.
- Make sure the clamp (or clamps) is (are) attached in such a way that the load is balanced during lifting.
- The sheeting surface must not be harder than 37 Hrc (345 Hb, 1166 N/mm<sup>2</sup>).
- All clamps may only be used under normal atmospheric conditions.

## WARNING

- A free fall or uncontrolled swinging on the crane hook whereby there is contact with objects can damage the clamp. Should this occur, the clamp must first be thoroughly inspected before further use.
- Lifting clamps are not suitable as a form of permanent link.
- The clamp must be inspected monthly, see Section 6 - Maintenance.
- Do not make any constructional modifications to the clamp (welding, grinding, etc.), as such modifications may negatively affect its operation and safety. If any such modifications are made, all forms of warranty and product liability become invalid.
- The warranty and liability conditions also only apply when original Terrier components are used.

## 5 HOISTING

- Check whether the safe working load (WLL) of the clamp is sufficient for the force exerted in the hoisting situation.
- Attach the lifting clamp to the hoisting equipment:
  - 1 directly on a crane hook with safety securing device,
  - 2 by means of a chain shackle or D shackle,
  - 3 by means of a belt or chain possibly in combination with a chain shackle or D shackle.
- Make sure all attachment devices are approved and are of the correct tonnage. All the attachment links and securing devices must be sufficiently large, so that the clamp can move freely in the hook.
- Check that the clamp has no visible damage.
- Check that the clamp opens and closes easily.
- Clean the object where the lifting clamp will be fitted, removing grease, dirt and mill scale.

- Open the clamp by means of the spindle  
Position the jaw fully on the object and make sure the clamp is attached in such a way that the load is balanced during hoisting.
- Secure the clamp by completely tightening the spindle.  
Use at least 40 Nm for the 1.0 TSCC t/m 6.0 TSCC and at least 10 Nm for the 0.5 TSCC.  
This force can possibly be increased further when hoisting heavier or thicker materials.
- Hoist steadily to allow effective gripping of the load.
- If the load slips, work through the "hoisting" section (5) again.
- Make sure the load is stably positioned before the clamp is removed from the object.

## 6 MAINTENANCE

- Check the general condition of the clamp at least once monthly, see the "removal/installation" section (7).
- Do not use the clamp if:
  - the housing is damaged or deformed, especially the corners of the jaw,
  - the fastening is visibly deformed,
  - the pivot is stretched or broken,
  - the spindle mechanism no longer works (properly),
  - the split pin is missing.
- the marking on the clamp is no longer legible.

Depending on the extent of damage discovered:

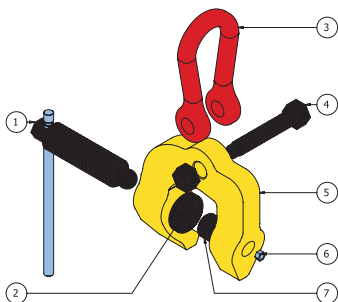
- remove and clean the clamp (see "removal/installation" section (7) or
- have the clamp revised by Terrier Lifting Clamps B.V. or another authorized revision company (see "revision" chapter (8)).

**If in doubt, contact your supplier.**

## 7 REMOVAL/INSTALLATION

- Open the clamp completely.
- Carefully remove the spindle from the housing. (1)
- The cam can now be removed from the spindle (2)
- Remove the securing device. (3)
- Remove the pivot by removing the nut and bolt (6 & 7)
- Clean all parts using a standard degreasing agent.
- Grease the spindle and the inside of the cam.
- Put everything back in the reverse order.
- Always install new split pins.
- When replacing parts, always use original Terrier parts.
- Remove any burrs with a file.

**If in doubt, contact your supplier.**





## 8 REVISION

At least once (1x) per year, or if the clamp becomes damaged, it must be inspected, tested and revised by Terrier Lifting Clamps B.V. or other authorized revision company, if necessary.

## 9 DESTRUCTION

At the end of its working life, the clamp can be treated as scrap iron, as long as it is rendered unusable first.

## 10 CHECKLIST FOR MALFUNCTIONS AND PROBLEMS

| Malfunction/problem          | Possible Cause         | Action              |
|------------------------------|------------------------|---------------------|
| Fastening hinge is too stiff | Clamp overloaded       | Reject clamp        |
| Housing bent                 | Clamp overloaded       | Reject clamp        |
| Fastening is oval            | Clamp overloaded       | Reject clamp        |
| Spindle turns stiffly        | Clamp overloaded       | Reject clamp        |
| Spindle bent                 | Clamp overloaded       | Reject clamp        |
| Split pin missing            | Incorrect installation | Fit a new split pin |
| Clamp opens/closely stiffly  | Clamp overloaded       | Reject clamp        |

## 11 5 YEAR WARRANTY

Terrier Lifting Clamps offers end users a 5 year warranty on the lifting clamps. This warranty is limited to the original end user of the hoisting equipment and is subject to the equipment being inspected, controlled and maintained according to the producer and dealer instructions throughout the warranty period. The warranty period is 5 years from the purchase date and is subject to the conditions and measures given here.

### 11a CONDITIONS

The warranty only covers defects in the hoisting equipment resulting from manufacturing errors arising during normal use. The warranty does not cover wear to components such as pivots, cams, tensioning springs, etc. If a defect occurs within this warranty period, the lifting equipment will be replaced or repaired as the producer thinks fit.

No warranty is given for clamps in which defects occur due to:

- Regular wear and tear.
- Overloading.
- Incorrect and/or rough use.
- Damage.
- Non-compliance with procedures and measures.
- Lifting materials other than those shown on the clamp or in the user manual.
- Modification/adaptation of the Terrier clamp.
- Improper use of the clamp, and non-compliance with any instructions given in the user manual in question.
- Maintenance and/or revision work not being carried out by an authorized Terrier dealer.

The manufacturer cannot be held responsible for incidental damage or damage resulting from use of the lifting equipment or from violation of these warranty terms.

## 11b PROCEDURE FOR SAFETY INSPECTION

All inspection and repair work must be noted in the inspection schedule. This applies not only to your own inspection work but also to inspection work carried out by your authorized Terrier dealer. When the equipment is submitted for maintenance and inspection, the maintenance report must always be provided.

### Defective Lifting Clamp

On discovering any form of wear or damage, the following measures must be taken.

- 1 Take the lifting clamp out of operation. (Note down the date of decommissioning the lifting clamp)
- 2 Try to find the cause of the defect, for example (see full list under point a):
  - Overloading
  - Improper use (the clamp is not suitable for dragging and securing materials)
  - Non-sensible use
  - Rough use

Any such damage is not covered by the warranty! Please follow this procedure in order to guarantee your safety and that of your colleagues/personnel.

- 3 Hand in your lifting clamp with maintenance history to your authorized Terrier repair shop.

- 4 Once the clamp has been revised/repared by your repair shop, it can be used again. Note down the date of re-commissioning in the maintenance table.

## 11c INSPECTION SCHEDULE

| Months                                           | 4 | 8 | 12 | 16 | 20 | 24 | 28 | 32 | 36 | 40 | 44 | 48 | 52 | 56 | 60 |
|--------------------------------------------------|---|---|----|----|----|----|----|----|----|----|----|----|----|----|----|
| Years                                            | 1 |   |    | 2  |    |    | 3  |    |    | 4  |    |    | 5  |    |    |
| Safety inspections by your own inspector         |   |   |    |    |    |    |    |    |    |    |    |    |    |    |    |
| Maintenance by an authorized Terrier repair shop |   |   |    |    |    |    |    |    |    |    |    |    |    |    |    |
| Revision by an official Terrier distributor      |   |   |    |    |    |    |    |    |    |    |    |    |    |    |    |



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## 1 General.

***Please carefully read the instructions in this user manual before using the lifting clamp. If you have any doubts, please consult with your dealer.***

Congratulations with the acquisition of a Terrier safety plate lifting clamp. The quality systems of management and services of Terrier Lifting Clamps B.V. fully comply with ISO 9001 standards. The many years of vast experience are a guarantee of optimum quality and safety. Terrier Lifting Clamps are made of top quality steel and fully comply with European standards as laid down in Machine Directive 2006/42/EG.

## 2 Operating principle.

The TVK and TVKH vertical safety lifting clamps have been specifically and exclusively designed for the vertical lifting of steel drums.

The TVK and TVKH clamps consist of a body, cam & cam pins. The cam also functions as a lifting shackle and ensures that the drum is held firmly while it is being lifted.

## 3 Permitted applications.

### TVKH

The TVKH clamp is used individually. When lifting the drum must remain in a vertical position at all times.

### TVK

The TVK clamp may be used individually or with other clamps using a two-way or four-way intersection. If a drum is hoisted using only one TVK lifting clamp, the drum may get damaged. To avoid this, the drum should be hoisted using two lifting clamps at the same time. To guarantee safe hoisting, the TVK clamp has been pretensioned.

## 4 Safety Instructions.

***Safety first! Guarantee your personal safety by carefully reading the following safety instructions first.***

Ensure your own safety and continue to benefit from our product safety by having the clamp inspected, tested and, if necessary, overhauled at least once a year by Terrier Lifting Clamps B.V. or a recognized mechanical repair and service centre. See also Chapter 8 - Overhauling. Contact Terrier Lifting Clamps B.V. for further information.

#### **AVOID SITUATIONS INVOLVING RISK OF LIFE**

Avoid situations involving risk of life by observing the following directives:

- Never work with an untested clamp.
- Keep your distance when lifting and never stand under the load.
- Do not use the clamp if (it has been) damaged; have the clamp repaired by Terrier Lifting Clamps BV or another recognized mechanical repair and service centre. If in doubt, consult with your supplier.
- Never lift loads heavier than the working load limit (WLL), as indicated on the clamp and in the certificate.
- Never lift loads for which the clamps have not been designed.
- When using more than one TVK lifting clamp at the same time, opposite each other, provide lifting slings or chains of a sufficient length to ensure that the angle between the slings or chains does not exceed 60 degrees.
- When simultaneously operating a number of lifting clamps side by side, please use a lifting beam (equalizer) and lifting slings or chains of a sufficient length to ensure that the lifting shackles on the clamps are never subjected to lateral load.
- Remove all grease, oil, dirt, corrosion and mill scale from the barrel/drum at the point where the clamp is to be attached.
- Ensure that the clamp(s) is (are) positioned so as to balance the load when it is being lifted.
- The clamp is only suitable for use in normal atmospheric conditions.

#### **WARNING**

- Do not subject the lifting shackle of the lifting clamp to a lateral load for more than ten degrees.
- A free-fall or uncontrolled swinging movement at the crane hook resulting in objects being struck may cause damage to the clamp. If this occurs, check whether the clamp is in good working order before using it again.
- Lifting clamps are not suitable for creating permanent joints.
- Maintenance to the clamp should be carried out on a regular monthly basis. See Chapter 6 - maintenance.
- Do not modify the clamp (by welding, grinding, etc.), as this can adversely affect its operation and safety, thereby nullifying any forms of guarantee and product liability.
- For the very same reason, use only original Terrier components.
- Any improper use of the clamp and/or failure to observe all directions and warnings in this user manual concerning the use of this product may endanger the health of the user and/or bystanders.
- The operating temperature of both lifting clamps ranges from 100°C (212°F) to minus 40°C (-40°F). Please consult with your dealer if other application temperatures are applied.

#### **5 Lifting with TVK & TVKH Clamps.**

##### **Preventive inspection**

- Check whether the working load limit (W.L.L.) of the clamp is sufficient for the load created in the lifting situation. Note: The working load limit (W.L.L.) is shown on the lifting clamp.



- Attach the lifting clamp to the hoisting mechanism either by means of a:
  - safety shackle directly to a crane hook,
  - coupling link or D-shackle,
  - sling or chain, if necessary in conjunction with a coupling link or D-shackle.
- Ensure that all attachments have been tested and are of the correct tonnage. Make sure that coupling links and shackles are large enough to allow the clamp to move freely in the hook.
- Check whether the clamp has any visible damage.
- Remove any grease, dirt and mill scale from the barrel/drum at the site of the lifting clamp.
- Open the clamp.
- Place the jaws as far as they will go over the barrel/drum, making sure that the clamp is positioned so as to balance the load when it is being lifted.
- Lift gently so that the lifting force can be applied; check whether the clamp is rotating or tilting.
- If the clamp is rotating or tilting read the fore mentioned remarks on lifting again.
- Ensure that the load is in a stable position.

If you are using a TVK clamp, please observe the following additional inspection duties: Check the cam and the frame for clearly visible signs of wear and/or damage. Also check the lock spring. When pressing the cam, the draw spring should demonstrate visible tensile elasticity.

#### **Lifting with TVK clamps**

Correctly position the clamp on the rim of the drum, in such a way that the toothed segment grips underneath the drum rim. The clamp should remain on the drum rim in pretensioned position. Lifting force may now be applied.

When the load has reached its destination, lower the crane hook until the clamp is fully unloaded. This can be verified by the slackness of the hoisting chain and a free movement of the packing gland of the clamp. Push down the packing gland while holding on to the frame. The clamp will open and the drum can be taken away.

#### **Hoisting with the TVKH clamps**

Correctly position the clamp on the rim of the drum, in such a way that the packing gland is securely positioned underneath the drum rim. The load may now be hoisted.

When the load has reached its destination, lower the crane hook until the clamp is fully unloaded. This can be verified by the slackness of the hoisting chain and a free movement of the packing gland of the clamp. Push down the packing gland while holding on to the frame. The clamp will open and the drum can be taken away.

## **6 MAINTENANCE**

Check the general condition of the clamp at least once a month, see Chapter 7 - Disassembling/Assembling.

Do not use the clamp if:

- the body is split or deformed, in particular in way of the jaw corners,
- the cam has been visibly deformed,
- the cam teeth are no longer sharp,
- the shackle pins have visibly been deformed,
- any retaining pins are missing,
- the marking on the clamp is no longer legible.

Depending on the defects noted:

- disassemble and clean the clamp (see Chapter 7 - Disassembling/Assembling) or have the clamp overhauled by Terrier Lifting Clamps B.V. or another recognized mechanical repair center (see Chapter 8 - Overhauling).

## **7 Disassembling / Assembling TVK & TVKH Clamps.**

Important! Before disassembling the clamp, mark each part in such a way that they are easily reassembled in the original position.

### **Disassembling the TVK**

- Remove the retaining pin (5), to which the lock spring (4) is attached, from the frame (1).
- Remove the retaining pins (7), which secure the pivot pin (6) and the frame pin (6).
- Disassemble both pins.
- Remove the cam (3) and the packing gland (2).

### **Disassembling the TVKH**

- Remove the three Allen bolts (5)
- Remove the retaining pins (7)
- Slide both sides apart.

### **Reassembling the TVK and the TVKH**

When reassembling the clamps, assemble all parts in reverse order. To ensure the safety of the clamp, only use the original Terrier replacement parts when repairing the clamp. Make sure they are marked to allow proper identification. If you carry out any inspections, repairs, or modifications yourself, you will nullify all forms of guarantee and product liability. After inspection, repair and/or reassembly, the clamps should be tested using a certified testing bench.

## **8 OVERHAUL**

At least once a year or in case of any damage to the clamp, the clamp should be inspected, tested and if necessary overhauled by Terrier Lifting Clamps BV or a recognized mechanical repair centre.

## **9 DISPOSAL**

Once it has reached the end of its useful life the clamp can be treated as scrap iron, provided that the clamp is rendered unfit for further use.



## 10 TROUBLESHOOTER'S CHECKLIST

| Failure/malfunction           | Possible Cause                            | Action                                    |
|-------------------------------|-------------------------------------------|-------------------------------------------|
| Load slipping                 | Load dirty<br>Cam dirty<br>Jaws bent open | Clean load<br>Clean clamp<br>Reject clamp |
| Cam pivoting badly            | Cam overloaded                            | Reject clamp                              |
| Body bent                     | Clamp overloaded                          | Reject clamp                              |
| Lifting shackle oval          | Clamp overloaded                          | Reject clamp                              |
| Cam pin bent                  | Clamp overloaded                          | Renew cam pin                             |
| Retaining pins missing        | Incorrectly assembled                     | Fit new retaining pins                    |
| Clamp difficult to open/close | Clamp worn out<br>Clamp overloaded        | Reject clamp<br>Reject clamp              |

## 11 WARRANTY

Terrier Lifting Clamps provides a 5 year warranty on its lifting clamps. This warranty is applicable to the original end user of the lifting clamps. Only if the clamp has been inspected, checked and maintained by this instructions and by an official dealer. This warranty period of 5 years is valid from the day of purchase, and is liable to all conditions and measurements stated in this document.

### 11a CONDITIONS

This warranty only covers failures in the lifting tools which is the consequence of production errors which occur during normal use. The warranty covers no wear to components such as pivots, cam assemblies, lock springs etc. Should there be any kind of failure within this guarantee period, the lifting tool will be replaced or repaired to insight of the producer.

No warranty is given to clamps due to the following failures:

- Regular wear
- Overload.
- Wrong and/or careless use
- Damages
- Not following procedures and measures
- Hoisting differing material other than indicated on clamp or stated in the user-manual
- Adapting and/or modifying of the Terrier clamp.
- The injudicious use of the clamp, and not succeeding all indications which are stated in the users manual.
- When maintenance and/or revision has not been carried out by an authorized Terrier distributor.

***The producer is not responsible for incidental damage or damage due to use of the lifting tools as well as from violation of this manual.***

## 11b PROCEDURE SAFETY INSPECTION

All inspections and repairings must be written down in the maintenance diagram. This counts not only for your own inspections but also for inspections which are carried out by your authorized Terrier distributor. When the clamp is handed in for maintenance and inspection you always must provide the maintenance diagram.

### Defective Lifting Clamps

When a form of wear or damage is indicated, you must take the following measures.

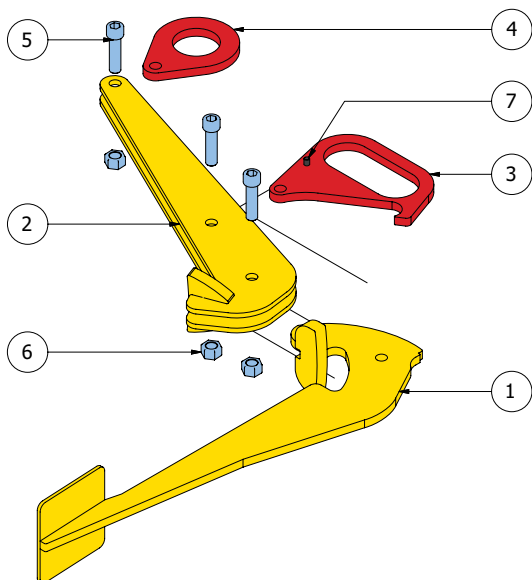
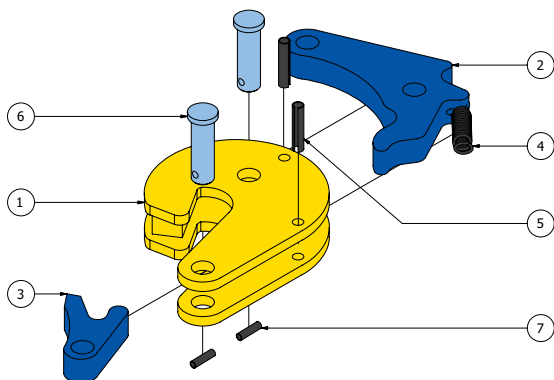
- 1 Take the lifting clamp out of use. (Note the date of failure of the lifting clamp)
- 2 Try to recover the cause of the failure, for example (complete list is available in chapter 1):
  - Overload
  - Wrong and/or careless use
  - etc

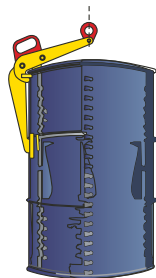
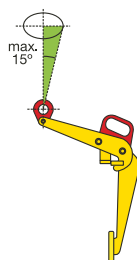
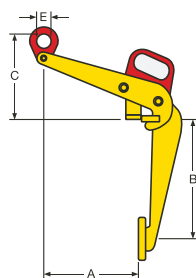
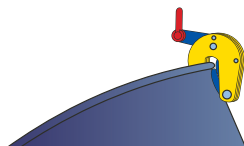
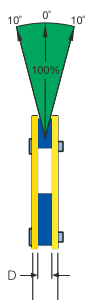
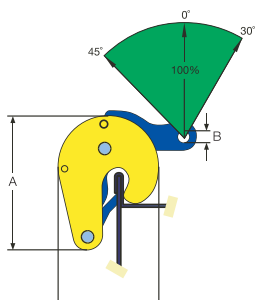
These claims stated in no.2 do not fall under the guarantee! To guarantee the security of you and your colleagues you are obliged to follow up this procedure.

- 3 Return your lifting clamp (with the maintenance history) to your authorized Terrier distributor.
- 4 If the lifting clamp has been revised / repaired by your distributor, you can safely use your clamp again. Note down the date of re-commissioning in the maintenance table.

## 11c INSPECTION SCHEDULE

| Months                                         | 4 | 8 | 12 | 16 | 20 | 24 | 28 | 32 | 36 | 40 | 44 | 48 | 52 | 56 | 60 |
|------------------------------------------------|---|---|----|----|----|----|----|----|----|----|----|----|----|----|----|
| Years                                          | 1 |   |    | 2  |    |    | 3  |    |    | 4  |    |    | 5  |    |    |
| Safety inspections by your own inspector       | ■ | ■ |    | ■  | ■  |    | ■  | ■  |    | ■  | ■  |    | ■  | ■  |    |
| Maintenance by an official Terrier distributor |   |   | ■  |    |    |    |    |    | ■  |    |    |    |    |    | ■  |
| Revision by an official Terrier distributor    |   |   |    |    |    | ■  |    |    |    |    |    | ■  |    |    |    |







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