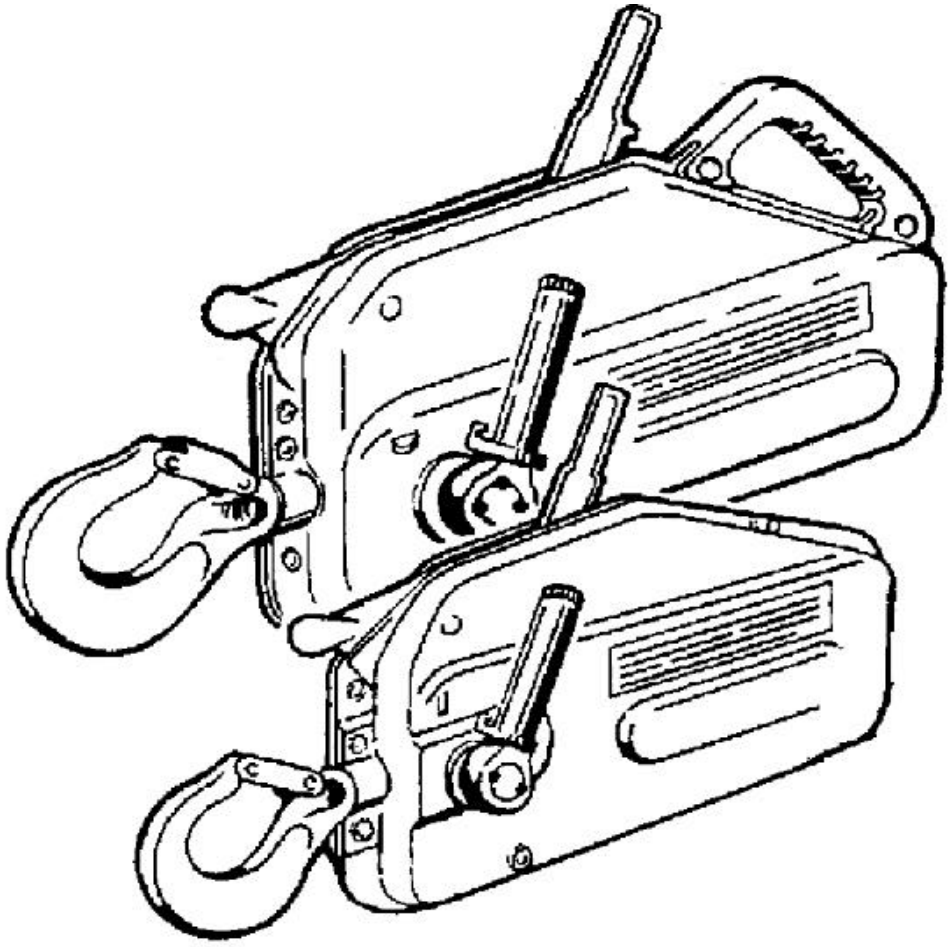
Griphoist-Tirfor

TU-17/TU-8 & TU-28/TU-16



Date: 04/05/04
Version:2a

Service and Maintenence Manual

Tractel Group
Griphoist Division

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UL Listing Card

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Underwriters Laboratories Inc.®

TRACTEL INC
GRIPHOIST DIV
110 SHAWMUT RD
PO BOX 188
CANTON, MA 02021

TUFV April 18, 2002
Equiptment, Scaffolding

TRACTEL INC GRIPHOIST DIV **SA4785**
110 SHAWMUT RD PO BOX 188, CANTON MA 02021

Electric scaffold hoists, Models ETH-32L, XE301P, maximum load 700 lbs: Models ETH35C, ETH35C3, ETH35X, LE500P, **LE501P**, TE401P, -401PA, XE500P, **-**501P, -501PA, **maximum load 1000lbs**; Models TE1000P, -1001P, -1001PA, XE501PO, XE700P, -701P, XE720P, XE721P, maximum load 1500lbs; Models TE1020P, -1021P, -1021PA, maximum load 2000 lbs; Model XE1020P, maximum load 2400 lbs; Model XE2050P, maximum load 4400 lbs.

Manually operated scaffold hoists, Model TMS-600, maximum load 1320 lbs; Model TU-17, maximum load 1500 lbs; Model TU-28, maximum load 3000 lbs; Model TU-32, maximum load 6000 lbs; Model 408, maximum load 880 lbs.

Pneumatic scaffold hoists, Models ATH32L, -32LB, XA300P, -300PB, maximum load 700 lbs; Models ATH35C ATH35X, -35XB, LA500P, XA500P, -500PB, maximum load 1000 lbs; Models XA700P, -700PB, XA720PB, maximum load 1500 lbs; Model XA1030PO, maximum load 1850 lbs; Model TA1020P, maximum load 2000 lbs; Model XA1020P, maximum load 2400 lbs; Model XA2050P, maximum load 4400 lbs; Model XA2650P, maximum load 5300 lbs.

Independent secondary brakes, Model BS15.301, maximum load 1500 lbs; Model BS20.301, maximum load 3000 lbs; Model BS35.30, maximum load 6000 lbs.

Modular work platform, "Modular Staging", 2 to 12 m, rated 750 lbs; Models KD01, MP03, 2 to 18m, rated 750 to 1500 lbs; "PFD", 2 to 15m, load 6000 lbs.

Work Cages, Model PMR0700D, PMR0701D, VSMV-PMR0710D, rated 1000 lbs; Model WC01, rated 400 lbs.

This equipment consists of separate parts inspected at the factory by Underwriters Laboratories Inc. and is intended for use in complete complete installations. Installations are not inspected by Underwriters Laboratories Inc. but should be made in accordance with requirements of authorities having jurisdiction.

LOOK FOR CLASSIFICATION MARK ON PRODUCT

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Tools required

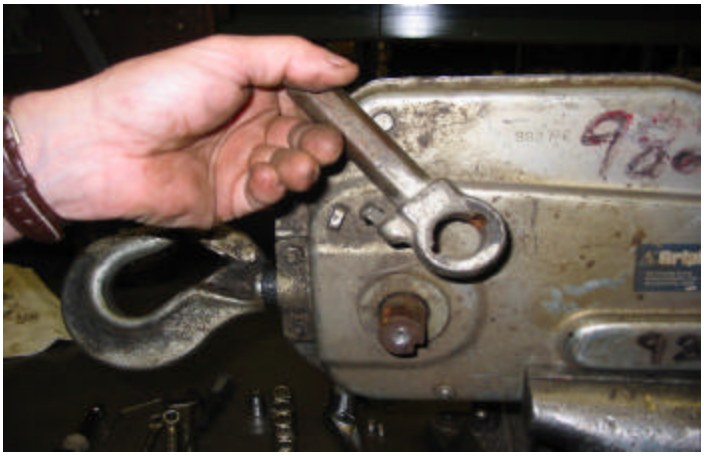
Hammer
Screwdriver (Flat head)
Gear puller
Pliers
Wrenchs
 -10mm (TU-17 / TU-8)
 -13mm (TU-28 / TU-16)
2 nails (for jaw spring compression)
General purpose grease

General Inspection

Check for casing deformation or damage as shown above. Severe deformity needs casing replacement. Small dents can be hammered flat on an anvil.

Disassemble TU-17 / TU-8

Use a gear puller to remove power stroke lever and shear pins.



Remove the handle and aluminum shear pins. (2 shear pins for TU-17, 3 shear pins from TU-28) If shear pins are broken, hoist has been overloaded. If shear pins have been replaced by steel fasteners, screws or welded the crankshaft / power stroke lever assembly must be replaced.

Place Tirfor on vice for easier removal of casing screws.

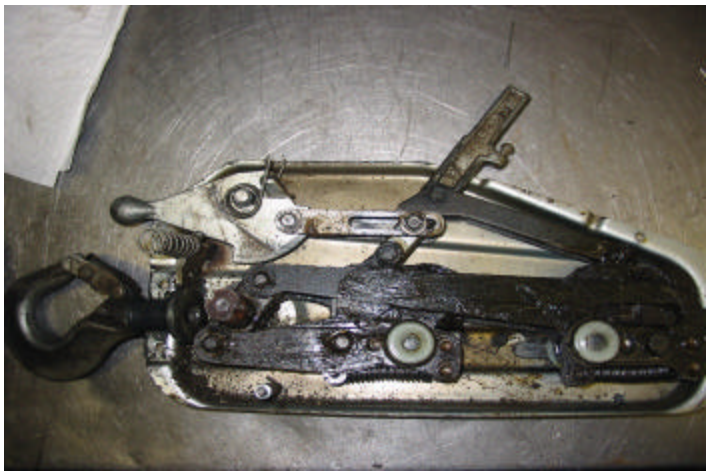
2 sets of spare shear pins are found in the power stroke lever under a plastic cap. If missing replace them.

Check that mushroom capped rivet is in place. It holds the telescopic handle in place.

Remove casing screws.
10mm wrench TU-17 / TU-8

Check for wear or any loose parts (snap rings) inside casing cover.

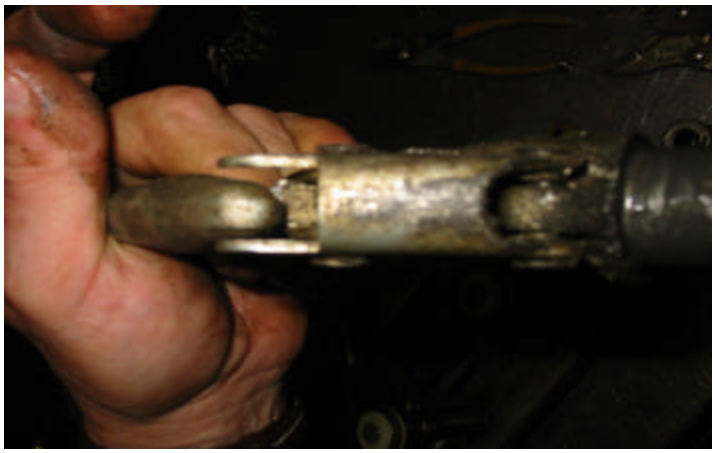
Check that both casing bushings are in place and in good condition. No splits, etc.



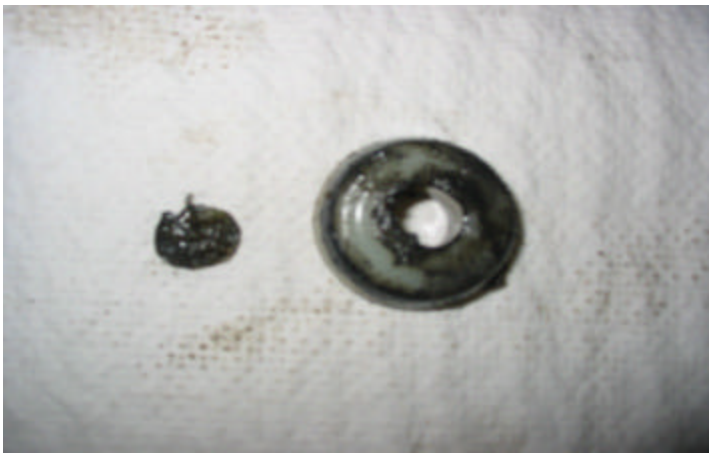
Remove casing cover once casing screws are removed.

Check for bent safety latch on hook. Repair or replace as necessary. check latching function. Make sure that the hook is not opened due to a tip load.

Check for roller damage. If axle has punched out hole in center of roller replace it.



Use pliers to adjust bent safety latch. Side plates should be parallel.



Broken roller (TU-17/TU-8) as shown above need to be replaced.

Check that clutch pusher has not been mush-roomed by hammering. This shows that user tried to move it with anchor hook extended.

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Disassemble the two jaw blocks

Remove pin snap ring (5 mm) from upper pin of reversing lever (Position. 040) and clutch pin (Position. 041)

Push pins through reversing lever and dissas-semble reversing lever connecting rod

Remove pin snap from reversing lever pin (Position. 39) and remove reversing lever connecting rod from assembly.

Remove pin snap from crankshaft connecting rod (Position. 919) and remove crankshaft power stroke lever. Check that nylon bushings are in place and not broken.

Warning: Never remove jaw pins until springs has been compressed and nail is placed through hole in shaft to prevent it from flying upon disassembly.

Compress the springs and place a nail in jaw spring shaft before removing spring from jaw assembly.

Inspect jaw wear and replace when nessas-ary. (see appendix B for jaw inspection)

Remove pin snap ring from pin (Position. 032 & Position. 034) and dissassemble jaw assem-bly

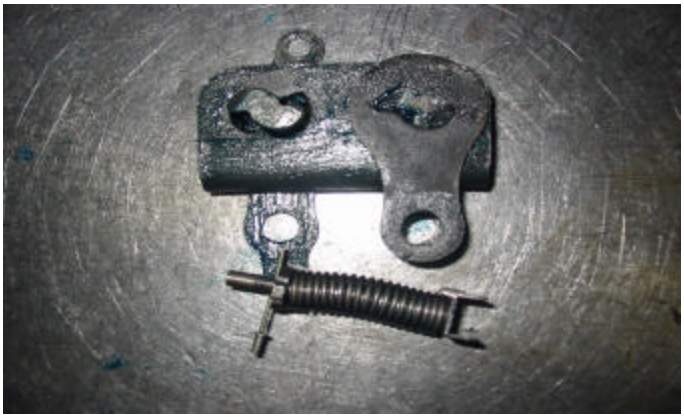
Dissassemble front jaw the same way.

Thoroughly clean and inspect all parts before reassemble. New grease must be applied for reassembly.

Warning! Do not use any grease with graphite or molydisulphide. These can cause slippage between the wire rope and jaws.

Reassemble

Generously grease each part and start assembly by laying down jaw actuating cam and free cam (Position. 14 & Position. 15)

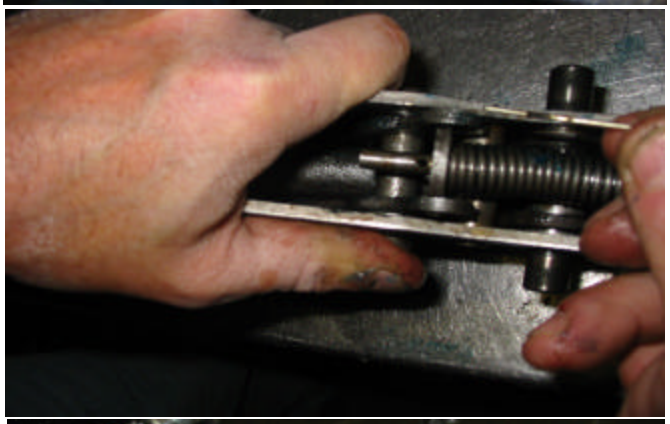


Assemble jaw as shown above. (Refer to exploded view in appendix A for assembly)

Note: Make sure to apply extreme pressure grease to the jaw keys. Lack of lubrication on the S shaped jaw keys can cause the jaws to stick and “pumping occurs where the rope does not advance through the machine when operating.

Slide rear jaw connecting plate over the jaw assembly. Be careful that the S shaped jaw keys do not fall out.

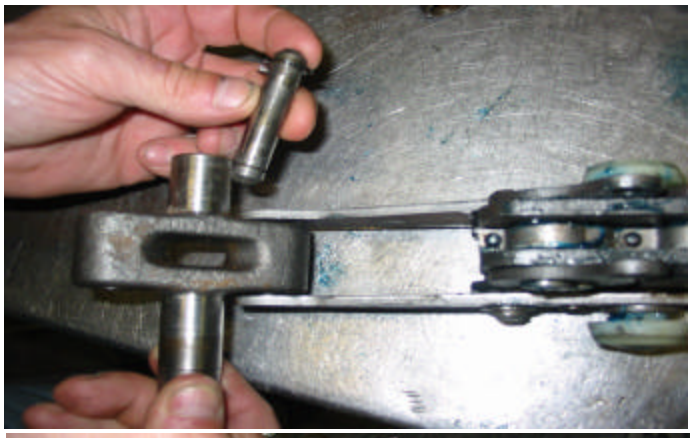
Place 4 flat washers and 1 spacer in to assembly for complete rear jaw assembly. (Refer to appendix A for exploded assembly view)



Place spring in position, apply pressure to aw cam to compress the spring slightly and remove the nail. Finalize assembly by placing pin snap back on pin and center the axle for the rollers.

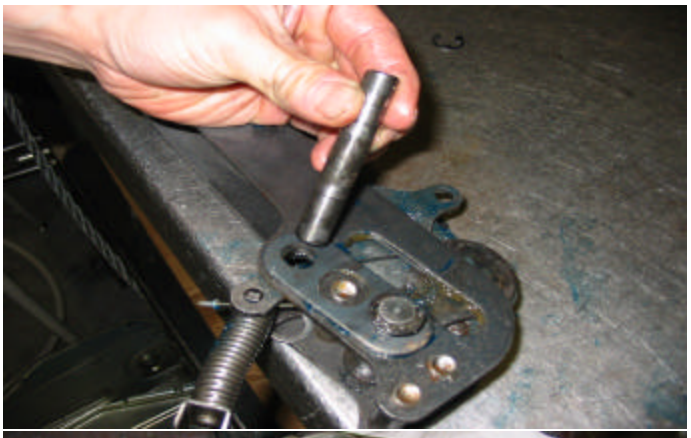
Front jaw assembly

Grease nylon roller and place roller with washers on to jaw assembly pin. (Position. 034)



Place crankshaft on to rear jaw connecting plates. Make sure that the stop pin is recessed in the side plate slot.

Generously grease each part and assemble jaw the same way as rear jaw.



Place bushing between free cams. Place jaw assembly into front jaw assembly plate. Place 4 flat washer and pin in alignment.

Once assembly finalized, remove nail and secure pin in assembly by pin snap ring.

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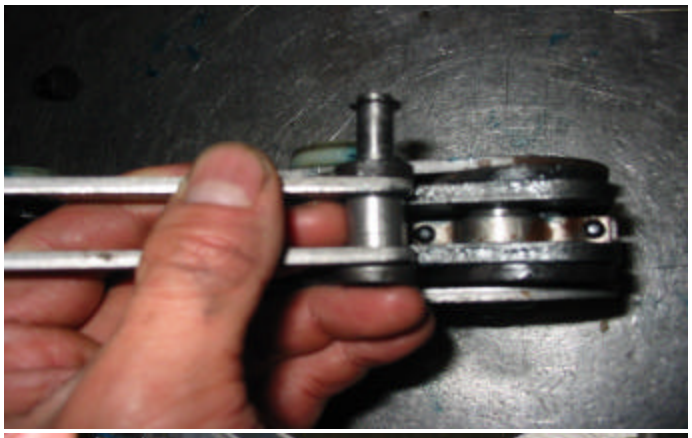
Grease roller and place roller on jaw assembly pin on guide roller. (Position. 034)

Secure crankshaft connecting pin with pin snap ring.

Connect front and rear jaw with crankshaft. (Position. 919)

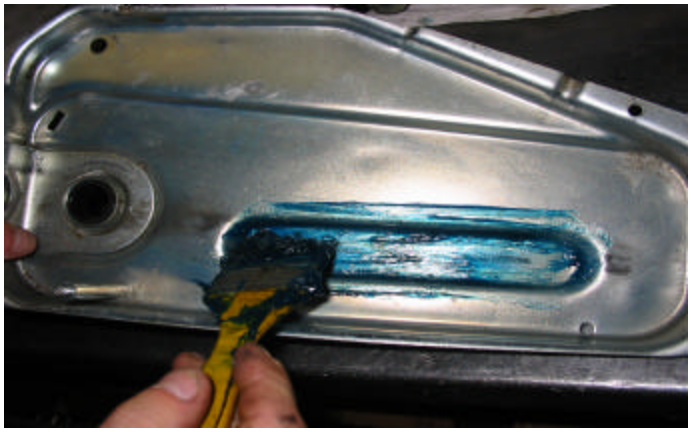
Start reversing lever assembly by fasten lever in place with reversing lever pin (Position. 039)



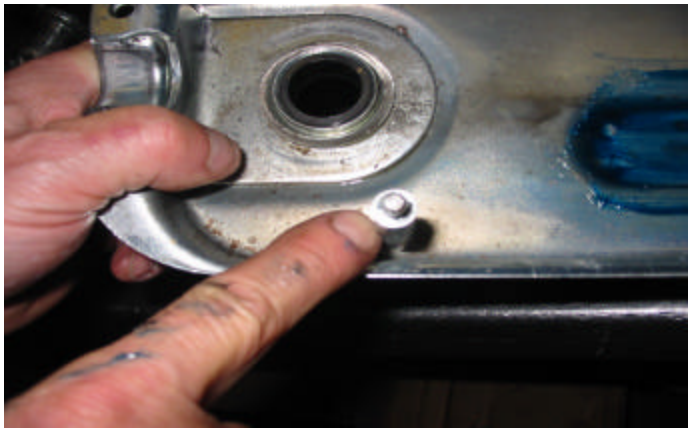
Place spacer and fasten reversing lever connecting rods with reversing lever pin. (Position. 039)

Assemble clutch actuating lever sub assembely to reversing lever. Secure assembly with pin and pin snap ring.

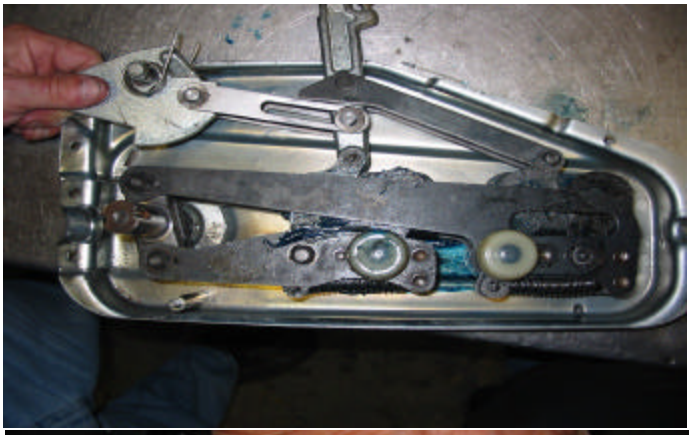
Assemble reversing connecting rods (Position.021) to Reversing lever (Position. 903)

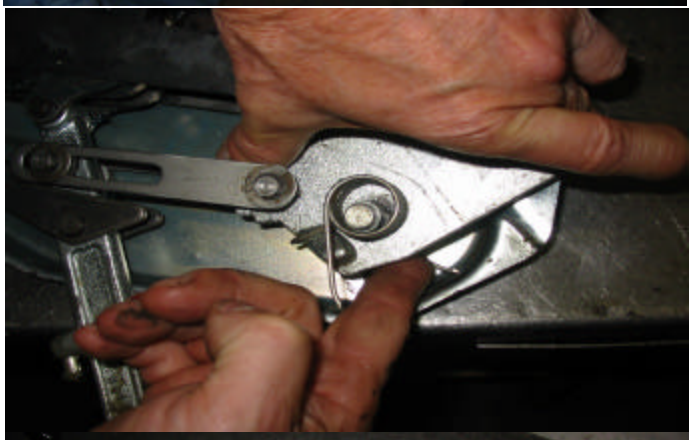


Grease right hand casing and check for casing deformity, nylon bushing, and bearing wear.

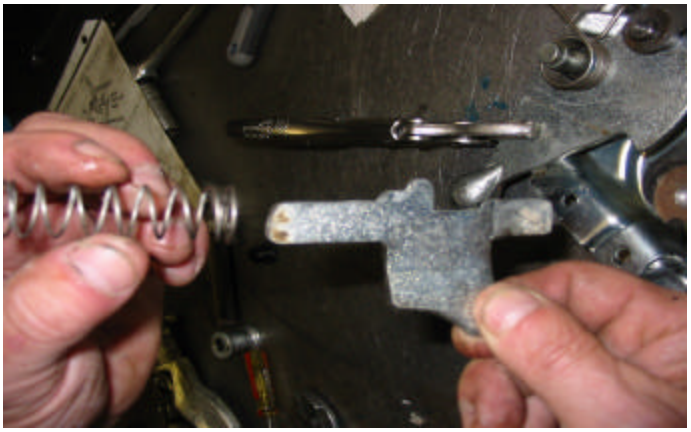


Make sure casing spacer thread (Position. 045) is fastened before placing the jaws into cover.

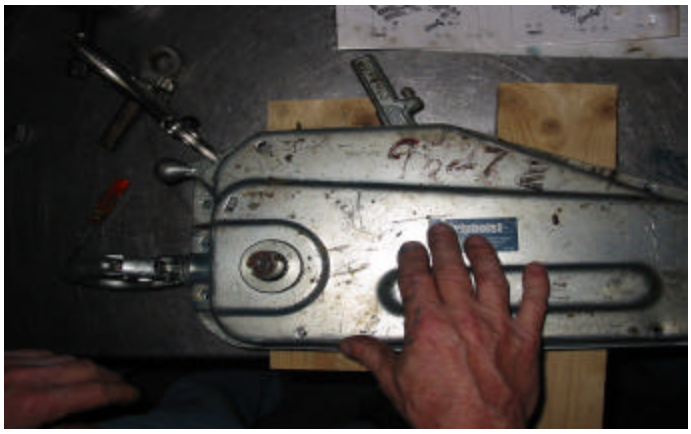




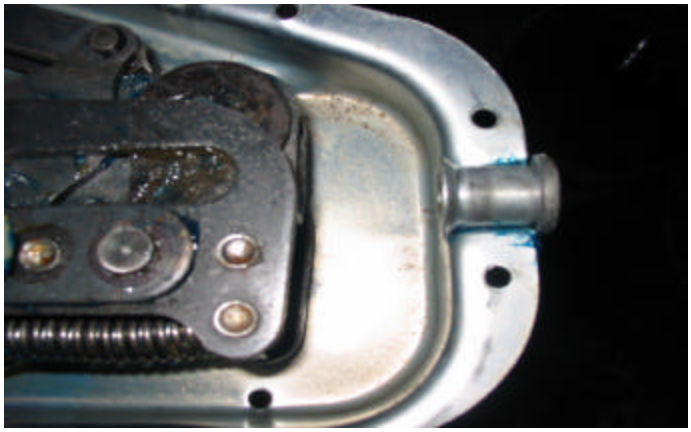
Place jaws into casing and tuck the spring on clutch actuating lever in to casing. Use a vise grip to hold clutch actuating lever in place.



Assemble clutch lock pusher into casing.

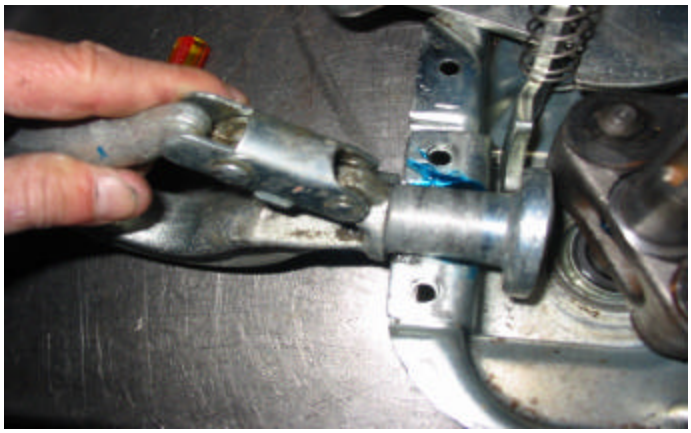


Place left hand casing over assembly.



Place rope entry in position.

Start tightening all casing screws.



Place anchoring hook in position.

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Place hoist on vise for easier assembly.

Fasten through casing screw.

Make sure casing flange is in place for fastening

Grease shaft and install power stroke lever on crankshaft. Secure it with 2 new shear pins for TU-17/TU-8 and 3 for TU-28/TU-18. Do not reuse shear pins.

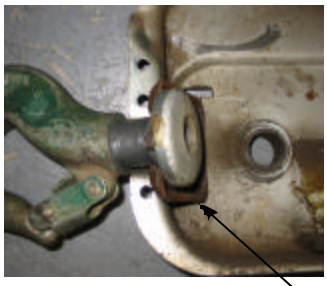
TU-17 / TU-8 & TU-28/TU-16 Physical Differences

TU-28 appears to look like the TU-17 with the exception in size and several minor differences which are described below.

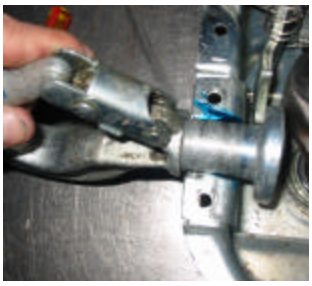
TU-28 has a carrying handle.

TU-17 does not have carrying handl.

The Hook



TU-28 shown above has a loose casing strengthener to reinforce the area around the hook.



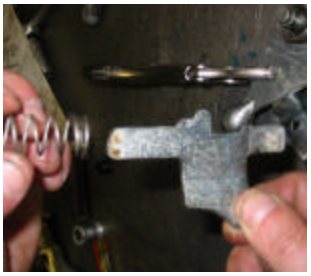
TU-17 shown above does not have a loose casing strengthener, but has reinforcement in the hook area of the casing.

TU-28's crankshaft w/ power stroke lever has 3 aluminum shear pins.

TU-17's crankshaft w/ power stroke lever has 2 aluminum shear pins.

The clutch lock pusher with spring

TU-28's clutch lock pusher with.



TU-17's clutch lock pusher with spring.

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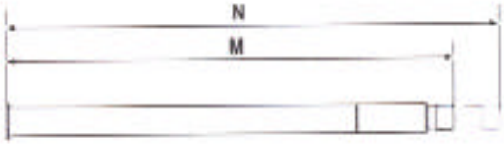
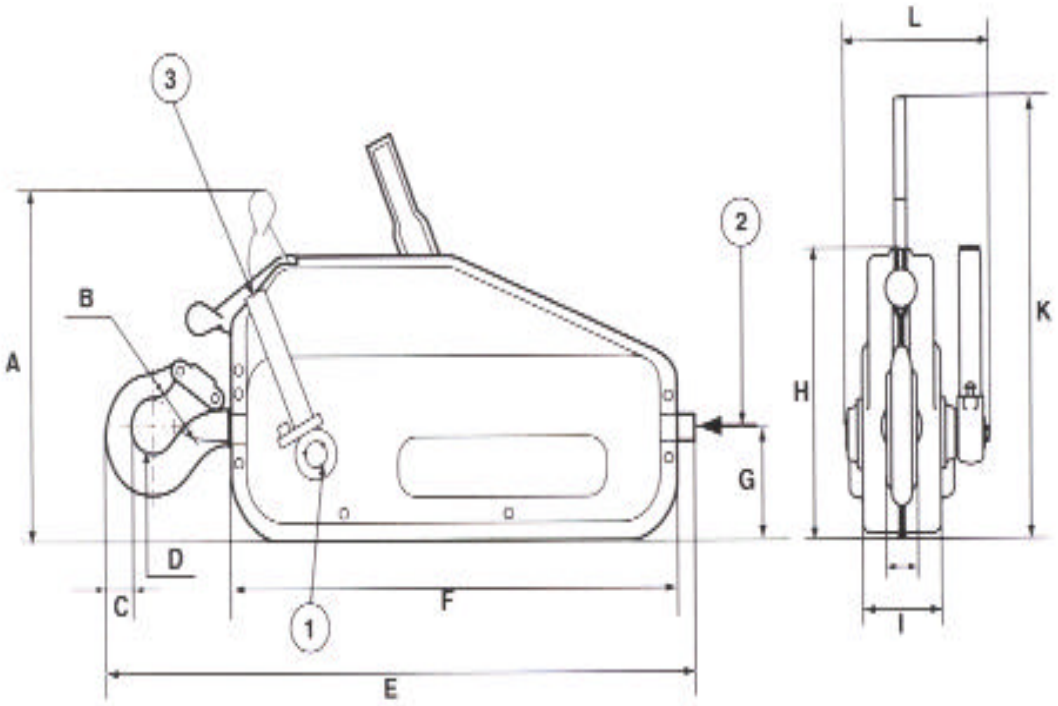
TU-17 Dimensions

1. Shear pins
2. Rope guide
3. Spare shear pins



Telescopic Control Lever



Rated Load lbs. (kg)	Wire Rope in. (mm)	Effort to control lever lbs. (kg)		Rope Travel in. (mm)		Dimensions in.														Weight lbs. (kg)
		forward	reverse	forward	reverse	A	B	C	D	E	F	G	H	I	J	K	L	M	N	
2,000 (800)	5/16 (8.3)	79 (36)	40 (18)	2 (50)	2.4 (60)	10.6 (270)	1.3 (32)	1.2 (30)	1.6 (40)	20.9 (530)	15.6 (397)	2.8 (70)	76.6 (194.5)	2.3 (58)	1.1 (28)	11.2 (285)	4.3 (110)	17.9 (455)	28.9 (735)	19 (8.5)

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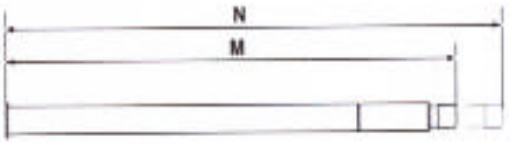
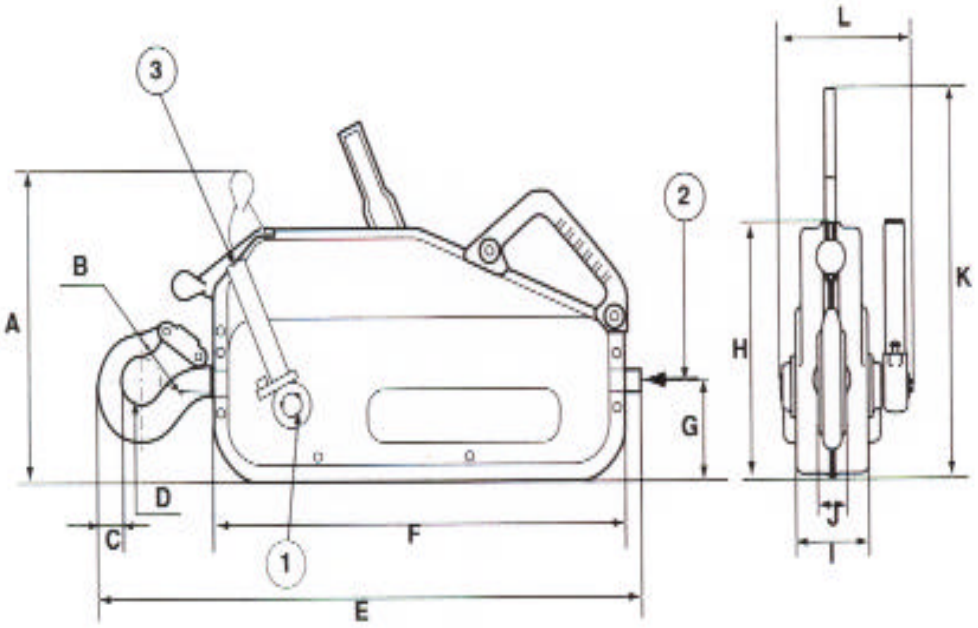
TU-28 Dimensions

1. Shear pins
2. Rope guide
3. Spare shear pins



Telescope Control Lever



Rated Load lbs. (kg)	Wire Rope in. (mm)	Effort to control lever lbs. (kg)		Rope Travel in. (mm)		Dimensions in.													Weight lbs. (kg)
		forward	reverse	forward	reverse	A	B	C	D	E	F	G	H	I	J	K	L	M	N	
4,000 (1,600)	7/16 (11.5)	119 (54)	44 (20)	2.2 (56)	2.8 (70)	12.8 (325)	1.5 (38)	1.2 (30)	1.9 (48)	26 (660)	19 (483)	3.4 (85.5)	9.3 (236)	3.1 (80)	1.2 (31)	14.2 (360)	5.7 (145)	25.4 (645)	45.3 (1150)	41 (18.5)

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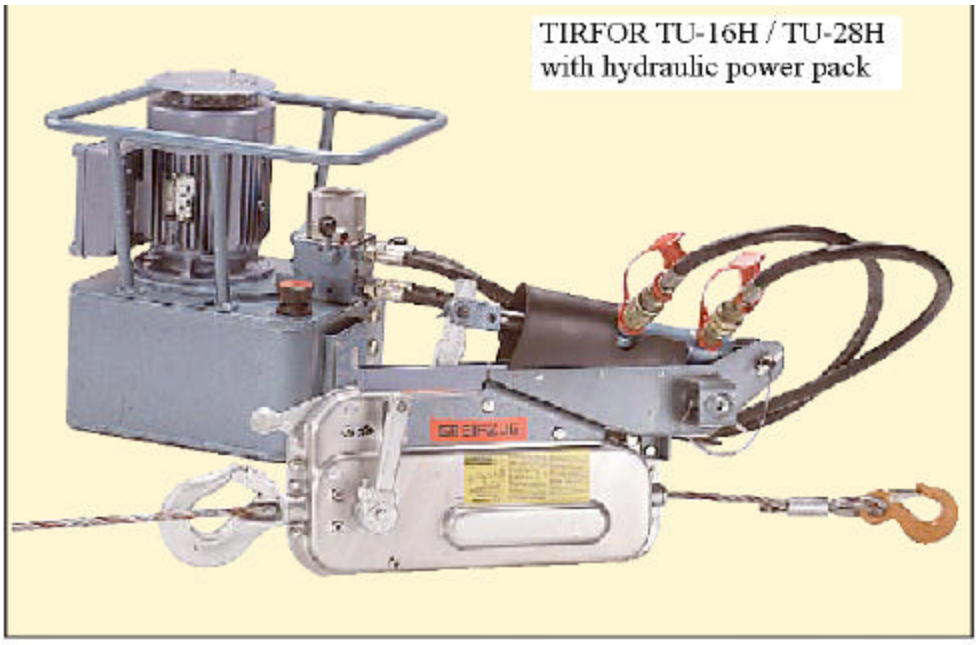
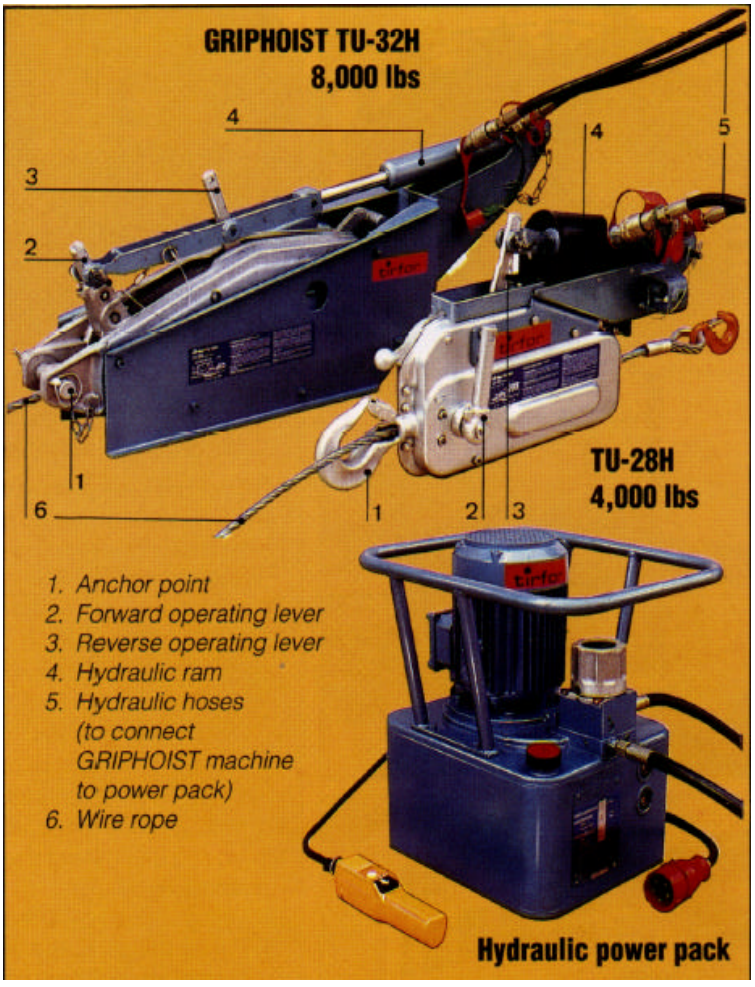
Hydraulic Powered Units



The hydraulic powered Tirfors are special mahcines that is powered by a self reciprocating hydraulic cylinder. Since fatique of the operator is not a factor, these machines are typically used for heavy loads over a longer distance. For extra durability and more severe service, the hydraulic machines have bearings in place of bushings and heat treated components.



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TU-28H vs. TU-28 Comparison

TU-28H is a hydraulic powered device. It differs from a regular TU-28 in the components used. Below are illustrations of the differences.

Power stroke lever shown above clearly demonstrates the difference between a hydraulic unit which is on the left and a standard unit on the right.

Note: Shear pins for hydrolic units are steel compare to aluminum for regular hand operated unit.

Crankshaft for hydraulic units has needle bearings demonstrated above on the left vs. standard hand operated unit which does not have bearing shown on above right.

Both front and rear jaws for hydraulic unit has red paint indicating extra hardening shown on above left.

Top crankshaft TU-28H has reinforced needle bearing contact surface vs. lower crankshaft that has no reinforced contact surface with casing.

Hydrolic unit has tapered hook base shown on left vs. ridgid base on a regular hand operated unit shown on right.

Left picture shows reinforced TU-28H casing with needle bearing vs. right picture that has nylon bushing for standard hand operated unit.

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TIRFOR TU-17

N°	Code SSA	Code TSA	Designation	N° per machine
005	10445	0082.002.01	clutch actuating lever	1
009	10455	0080.007	jaw actuating key	4*
(011)	(10475)	(0082.030)	lower jaw	(2) s. 914
014	10505	0082.005	jaw actuating cam	4*
015	10515	0080.008	free cam	4*
016	10525	0082.028	jaw pin distance plate	2*
018	9816	0433.445	jaw pin washer D 13x19x1 EP1 DIN 988	8*
021	10575	0082.006	reversing lever connecting rod	2*
022	10585	0082.007	clutch actuating cam	2*
026	21295	0084.001	clutch lock pusher	1
032	22715	0080.102	rear jaw assembly pin	1
034	10645	0080.093	jaw assembly pin on guide rollers	2*
035	10655	0082.027	front jaw assembly pin	1
037	10675	0080.024	jaw assembly bushing	2*
039	20045	0080.027	reversing lever pin	2
040	10705	0082.012	upper pin of reversing lever	1
041	10715	0080.041	clutch pin	2
042	10725	0082.013.01	clutch actuating lever pin	1
043	10735	0082.014	long shoulder rivet	3
044	10745	0082.015	short shoulder rivet	2*
(045)	(10755)	(0080.064.01)	casing spacer, threaced	(1) s. 910
048	585	0070.104.01	rope entry	1
052	18436	0433.443	washer D 13x25 EP3 DIN 1441	2*
(053)	(8638)	(0434.616)	safety shear pin 6x14.5	(2÷4) s. 920
(054)	(18406)	(0519.310)	plastic cap for shear pin container	(1) s. 921
056	10785	0080.061	nylon bushing	2*
057	10795	0080.092	guide roller	4*
062	2946	0433.835	pin snap ring 9 DIN 6799	10*
063	6036	0433.831	pin snap ring 5 DIN 6799	10*
064	15516	0433.004	clutch pin washer A 8,4 DIN 125	6*
065	10825	0082.016	clutch lock pusher spring	1
066	10835	0082.017	clutch spring	1
067	20025	0085.017.01	casing flange	4
(068)	(7996)	(0432.512)	NYLOC nut HM6	(1) s. 910
(069)	(29306)	(0431.050.01)	screw TH M 6x70/18	(1) s. 910
(070)	(166)	(0431.037.01)	short casing screw M 6x10 DIN 933	(2) s. 910
(071)	(36)	(0431.040.01)	long casing screw M 6x20 DIN 931	(2) s. 910
(072)	(266)	(0432.003.01)	casing nut H M 6 DIN 934	(8) s. 910
073	–	–	instruction plate	1
074	–	–	name plate	1
(075)	(46)	(0431.041.01)	screw M 6x25/21	(2) s. 9

* parts only supplied in full set per machine.

TIRFOR TU-17 **Assemblies complete**

N°	Code SSA	Code TSA	Designation	N° per machine
(901)	(4227)	(0082.922)	crankshaft with power stroke lever	(1) s. 912
903	4197	0082.914.01	reversing lever	1
904	9577	0084.900	anchoring hook with safety catch (925)	1
(905)	(4247)	(0082.905)	right hand casing with bearing and bushing	(1) s. 911
(906)	(4257)	(0082.906)	left hand casing with bearing and bushing	(1) s. 911
910	5307	0082.924	set bolts and nuts for casing compr. 1 spacer (045), 2 screws (070), 2 screws (071) 2 screws (075), 1 screw (069), 1 nut (068) and 8 nuts (072)	1
911	5377	0082.925	casing complete, compr. RH casing (905), LH casing (906) and bolts/nuts (910)	1
912	6347	0082.926	crankshaft (901)/power stroke lever with 6 safety shear pins (053) and 1 cap (054)	1
(913)	(4267)	(0082.909)	upper jaw complete	(2) s. 914
914	5317	0082.927	jaw assembly compr. 2 upper (913) and 2 lower jaws (011)	1
915	5327	0082.910	front jaw connecting plates compl.	1
916	5337	0082.911	rear jaw connecting plates compl.	1
917	5347	0080.904	jaw spring complete	2
919	5367	0080.014	crankshaft connecting rod pin	2
920	4577	–	set of 30 shear pins (053)	1
921	9837	–	set of 10 plastic caps (054)	1
925	11417	0082.926	safety catch complete for hook (904)	1
995	1207	3830.995	wire rope hook with "T" safety catch (996)	1
996	5257	9082.855	"T" type safety catch for hook (995)	1
997	509	0070.924	telescopic operating handle complete	1

IMPORTANT

When ordering spare parts, please mention code n° of parts required as well as serial number of machine in need of repair.

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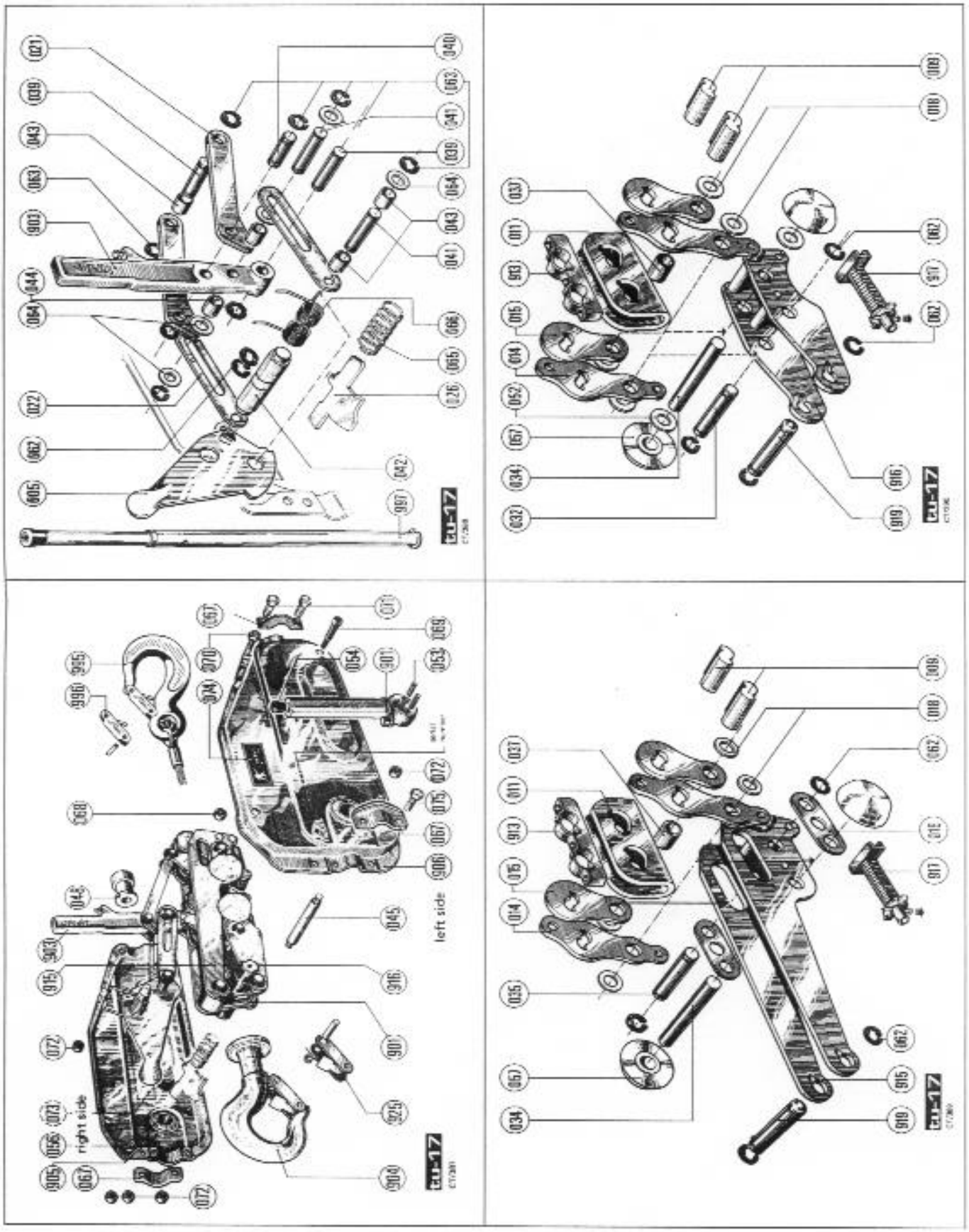

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TU-28 exploded view

GRIPHOIST TU-28 : Assemblies examples

No.	Code	Designation	No. per machine
(001)	(9807)	upper jaw complete	(2) s. Assy. 001
002	15477	front jaw connecting plate complete	1
003	9457	rear jaw connecting plate complete	1
004	9661	jaw spring complete	2
006	3067	ski tish lock pusher	1
009	9967	chain/hook connecting rod pin	2
010	9967	chain/hook connecting rod pin	(1) s. Assy. 002
(010)	(37727)	right hand swing with bearing and bushing	(1) s. Assy. 002
(010)	(37727)	left hand swing with bearing and bushing	
017	4157	reversing lever	1
020	4077	ass. of 50 safety shear pins (020)	1
021	9907	set of 10 plastic caps (001)	1
022	5777	chain/swing hook with safety catch (022)	1
(022)	(5747)	chain/swing	(1) s. Assy. 003
(024)	(527)	power stroke lever	(1) s. Assy. 003
030	11457	safety catch complete for hook (022)	1
031	3557	jaw assembly compr. 2 upper jaws (001) and 2 lower jaws (004)	1
032	3557	casing complete compr. RH casing (016), LH casing (015) and bolt/nuts (034)	1
033	3417	chain/self-tipover module lever complete, compr. chain/shaft (029), power stroke lever (024) with 9 safety shear pins (020) and 1 cap (021)	1
034	3407	set of bolts and nuts for casing compr. 3 screws (035), 2 screws (038), 1 screw (039), 6 nuts (019) and 1 nut (018.1)	1
035	1157	wire rope hook with "8" safety catch (034)	1
044	52207	"8" type safety catch complete for hook (022)	1
050	18	tel stitch quantity handle	1

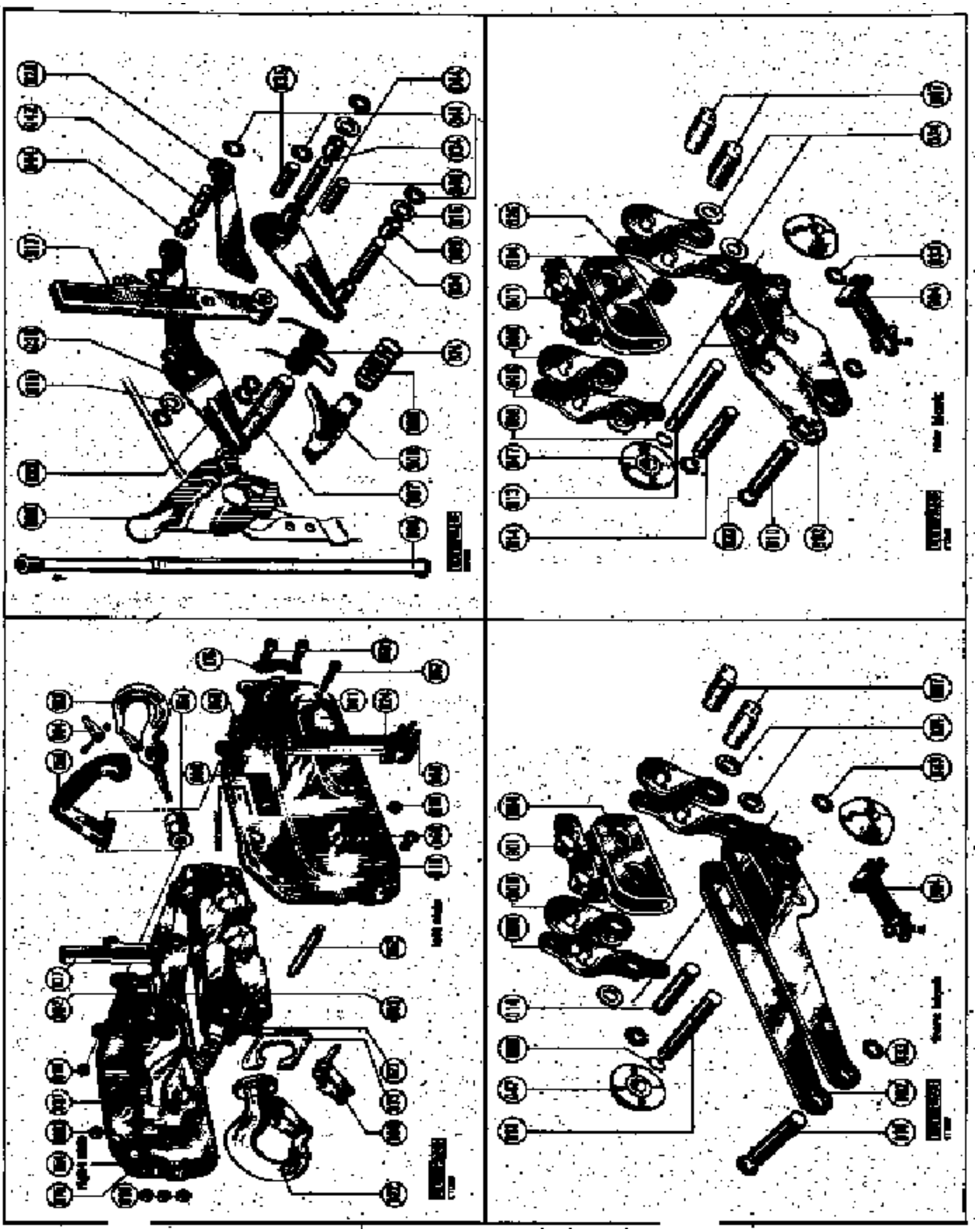
IMPORTANT

When ordering spare parts, please mention code no. of parts required as well as serial number of machine in need of repair.

GRIPHOIST TU-28

No.	Code	Designation	No. per machine
4004	(9836)	lower jaw	(2) s.Assy. 031
006	9546	jaw actuating cam	4*
007	9555	jaw actuating key	4*
008	9569	hub cam	4*
013	20045	jaw assembly pin on guide rollers	2*
014	19555	frame jaw assembly pin	2
015	4648	clutch pin washer	4*
(016)	(270)	casing nut H M8 DIN 934	(8) s. Assy. 004
(016.1)	(2664)	casing nut Alyleto HM8	(1) s. Assy 004
023	5455	reversing lever operating rod	2
024	9539	jaw pin washer 17x24x1,5 DIN 988	6*
025	9515	jaw assembly bushing - frame block	1*
026	4749	pin snap ring 12 DIN 6799	10*
034	9546	clutch pin	2
035	9555	reversing lever drive pin	1
036	9559	clutch actuating cam	2*
037	–	instruction plate	1
038	–	name plate	1
040	9575	reversing lever pin - rear block	1
041	2949	pin snap ring 9 DIN 6799	8*
042	9555	reversing lever pin - front block	1
044	9565	reversing lever pin bushing	2
047	22725	guide roller	4*
051	1155	rope entry	1
(058)	(5715)	safety hook/ threaded	(1) s. Assy. 004
064	1155	bushing ring	2*
(068)	(5553)	chain pin 6x14,5	(24) s. Assy. 020
(069)	(176)	sealing screw TH M8x16 DIN 933	(24) s. Assy. 004
(069.1)	(4552)	sealing screw TH M 8x20 DIN 933	(2) s. Assy. 004
(057)	(5525)	sealing screw TH 8x60/22	(1) s. Assy. 004
058	5528	carrying handle	1
(059)	(4509)	screw TH M8x25 DIN 933	(2) s. Assy. 004
060	5545	clutch lock plunger spring	1
(061)	(19409)	cap for lower pin connector	(1) s. Assy. 021
066	19556	pin snap ring A 16 DIN 7968	2
067	5535	clutch spring pin	1
068	9545	clutch actuating lever	2*
069	9555	clutch pin bushing	1
073	9725	sealing straightener	1
074	5559	clutch spring	1
075	22555	sealing flange	2*

*parts only supplied in full sets per machine.



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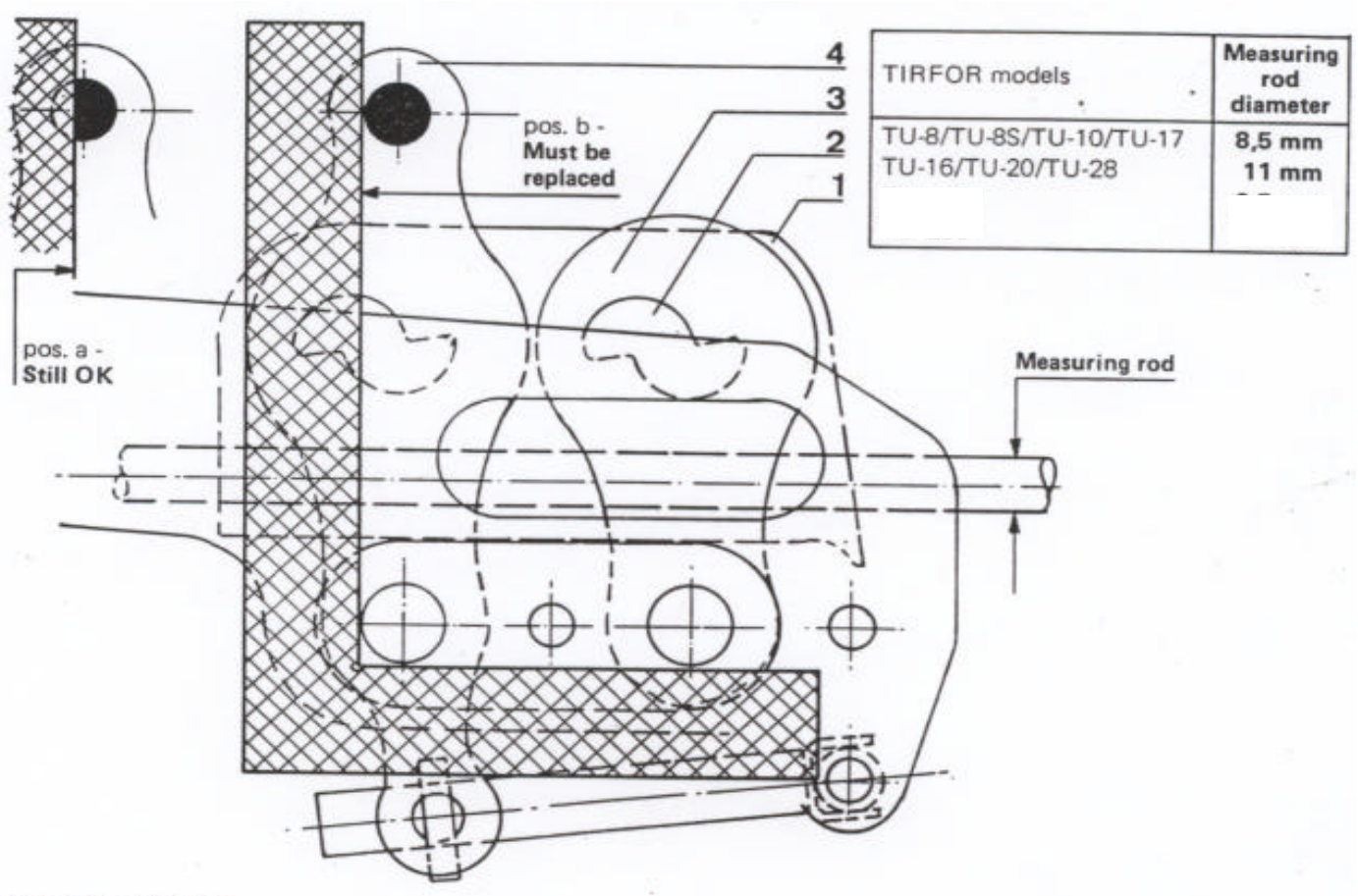
Appendix B

Jaw inspection

The Wear on the jaws of the tirfor hoists is generally very small. It is nevertheless recommended to check periodically the wear when inspecting and repairing the machines. This checking can be made on mounted jaws.

1) Introduce the measuring rod (see table for diameter according to model) between both jaws;

2) Place a square under jaw assembly pins:
   a) if the hole of reversing lever pin is still partially covered by the square, the jaws are OK;
   b) if this hole is completely uncovered, the jaws are worn and must be replaced. In this case, better check also the other wear parts mentioned in the list hereunder and eventually replace them at the same time.



TIRFOR models	Measuring rod diameter
TU-8/TU-8S/TU-10/TU-17	8,5 mm
TU-16/TU-20/TU-28	11 mm

List of jaws wear parts:

Pos.	Designation	Parts Qty per hoist	Code number for hoists: TU-8/TU-8S/TU-10/TU-17	Code number for hoists: TU-16/TU-20/TU-28
1	Two sets of upper and lower jaw assemblies	1	5317	3387
2	Jaw actuating key	4	10455	8355
3	Free cam	4	10515	8365
4	Jaw actuating cam	4	10505	8345