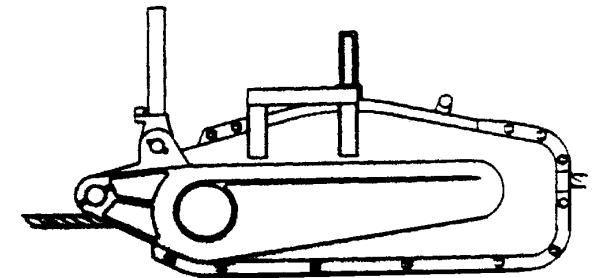
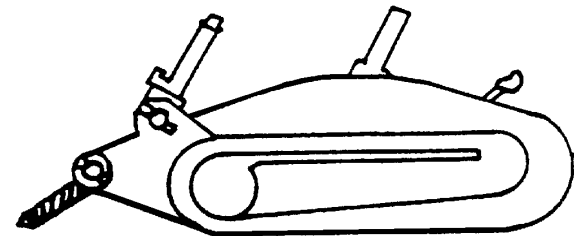


# tirfor®

## lifting and pulling machines operating and maintenance instructions

models  
T35  
T35S  
T30



equipment in  
accordance with  
CE directives



Lifting, Pulling and Access Systems

Tirfor Limited  
Old Lane,  
Halfway,  
Sheffield S19 5GZ.  
Tel: (0114) 248 2266  
Fax: (0114) 247 5649



Lifting, Pulling and Access Systems

## CONTENTS

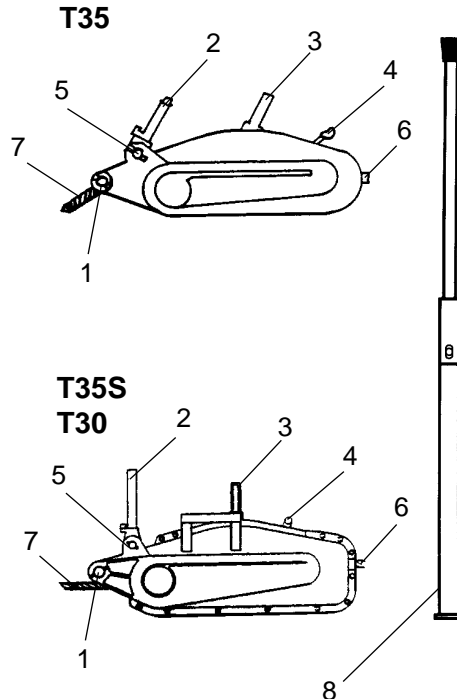
- General Warning
- Description of Equipment
- 1. Technical data
- 2. Rigging arrangements
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- 4. Releasing and closing the jaws
- 5. Anchoring
- 6. Operation and Dual Speed control
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- 10. Maintenance instructions
- 11. Warnings against hazardous operations
- 12. Troubleshooting
- 13. Health and safety at work
- 14. Labelling

Always concerned to improve the quality of its products, the TRACTEL Group reserves the right to modify the specifications of the equipment described in this manual.

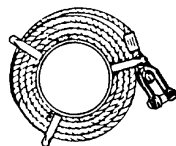
The companies of the TRACTEL Group and their agents or distributors will supply on request descriptive documentation on the full range of TRACTEL products: lifting and pulling machines, safety devices, electronic load indicators, accessories such as pulley blocks, hooks, slings, ground anchors, etc.

The TRACTEL network is able to supply an after-sales and regular maintenance service. Should you have any queries or require technical assistance, please do not hesitate to contact TIRFOR LIMITED.

Fig.1



- 1. Anchor pin
- 2. Forward operating lever
- 3. Reverse operating lever
- 4. Rope release lever
- 5. Dual Speed control
- 6. Rope guide
- 7. maxiflex wire rope
- 8. Telescopic operating handle



Wire rope on reeler

## 12 - TROUBLESHOOTING

### Pumping

A lack of lubricant in a TIRFOR machine sometimes brings about a condition known as "Pumping" which is not at all dangerous, but which is inconvenient. This situation occurs when the jaw which is gripping the rope becomes locked onto it preventing the other jaw from taking over the load. As the operating lever is moved in one direction the machine travels a few centimetres, but when the operating lever travels in the other direction the machine moves back the same distance in sympathy with the jaw which is locked onto the rope. The TIRFOR machine should be thoroughly lubricated and it will recommence working normally.

### Jerkiness

This is also a symptom of lack of lubrication. The TIRFOR machine should be thoroughly lubricated.

### Blockage

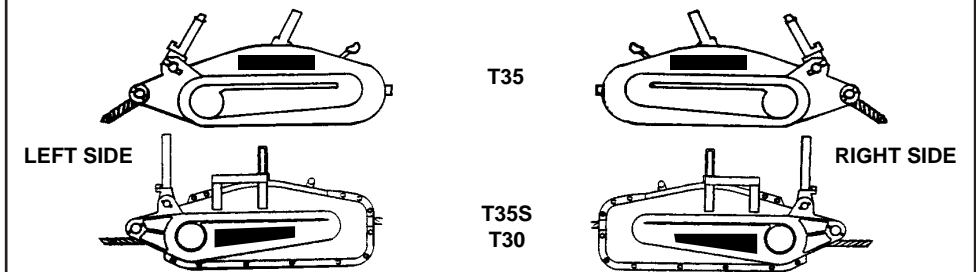
If the wire rope becomes blocked in the machine, generally because a damaged section of wire rope is stuck within the jaws, it is imperative to stop operating the machine. The load should be taken by another machine on a separate wire rope, or by another means, whilst ensuring that all safety precautions are taken. When the blocked machine is no longer under load, the damaged rope may be released and removed. Should this not be possible, return the machine and wire rope to TIRFOR LTD. or an approved repairer.

## 13 - HEALTH & SAFETY AT WORK

All lifting equipment must be supplied, operated, maintained and tested according to the applicable statutory requirements, and specially to the provisions of the Health and Safety at Work Act.

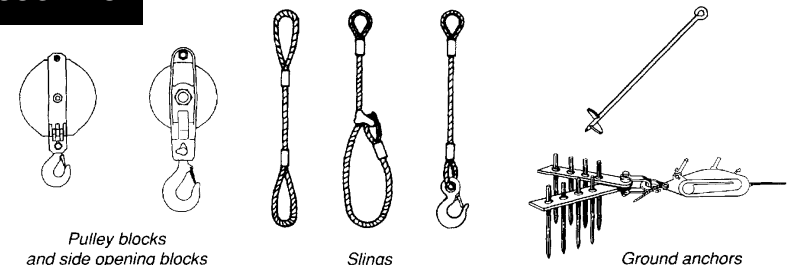
It is also the responsibility of every company to ensure that their employees have been fully and properly trained in the safe operation of their equipment.

## 14 - LABELLING



Ensure that the labels indicated above in black are in place.  
Replacement labels can be supplied on request

## ACCESSORIES



Pulley blocks  
and side opening blocks

Slings

Ground anchors

Alternatively operate the forward and reverse operating levers to allow the lubricant to penetrate all parts of the mechanism.

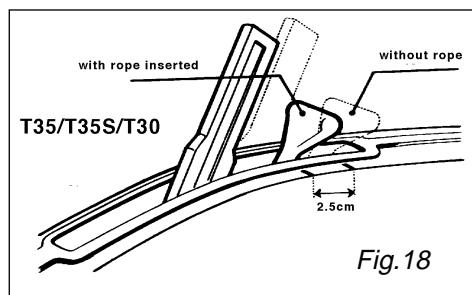
N.B. Excess lubrication cannot cause the machine or wire rope to slip.

Any machine where the side cases show signs of dents or damage, should be returned to an approved repairer of TIRFOR Ltd.

#### Checking Wear on Jaws (T35/T35S/T30) (Fig.18)

A periodic inspection to ensure that overwork has not caused any wear on the jaws should be carried out every three or six months, depending on the amount of use the machine has had.

This inspection can be performed without dismantling the machine.



1. Without any rope in the machine push the rope release lever into it's closed position (See section 4) and make a mark on the case of the machine of this position.
2. Insert the fused and tapered end of the rope into the machine, push the rope release lever again into it's closed position and make a second mark on the case of the machine of this position.
3. If the distance between the two marks is less than 2.5cm it means that wear has taken place on the jaws and the machine must be serviced and/or repaired by an official repairer of Tirfor equipment.

## 11 - WARNINGS AGAINST HAZARDOUS OPERATIONS



The operation for TIRFOR machines, in accordance with the instructions of this manual, is a guarantee of safety. Nevertheless, it is useful to draw the attention of users to the **following warnings**:

- TIRFOR machines as described in this manual must not be used for lifting people.
- Never attempt to motorise the models of TIRFOR machines described in this manual.
- TIRFOR machines must not be used beyond their maximum working load.
- TIRFOR machines must not be used for applications other than those for which they are intended.
- Never attempt to operate the rope release mechanism whilst the machine is under load.
- Never obstruct the operating levers or the rope release lever.
- Never operate the forward and reverse operating levers at the same time.
- Never use a handle, other than the telescopic operating handle supplied, to operate the TIRFOR machine.
- Never anchor the machine other than by it's appropriate anchor point.
- Never obstruct the machine, which could prevent the machine, the wire rope and the anchor points from operating in a straight line.
- Never use the TIRFOR MAXIFLEX wire rope as a sling.
- Never apply a load to the loose wire rope exiting from the anchor point of the TIRFOR machine.
- Never subject the controls to sharp knocks.
- Never attempt to reverse the rope completely through the machine whilst under load.
- Do not operate the TIRFOR machine when the rope ferrule gets to within 10cm of the machine. Otherwise the ferrule is likely to foul the casing and push the rope guide inside the machine.



## GENERAL WARNING



1. Before using the TIRFOR machine it is essential for the safe and correct operation of the equipment that this manual be read and fully understood and that all the instructions be followed. This manual should be made available to every operator. Extra copies of this manual will be supplied on request.
2. The TIRFOR machine allows the operator to carry out work with complete safety. Ensure that this machine is only handed over for use or rigging to an operator who is trained to operate it in a responsible manner.
3. Never use a machine which is not in good working condition. Replace any worn or damaged wire rope (see Section 9). Continuous monitoring of the condition of the machine, its wire rope and anchor sling is an important safety consideration.
4. The manufacturer declines any responsibility for the consequences of dismantling or altering the machine by any unauthorised person. Specially excluded is the replacement of original parts by parts of another manufacturer.
5. The models as described in this manual must not be used for lifting people. TIRFOR LTD markets a range of TUA machines (TU8A, TU16A and TU32A) specially designed for lifting people on suspended platforms. For further information on equipment for lifting people, and on any special applications, please refer to TIRFOR LTD.
6. The models as described in this manual are designed for manual operation and must not be motorised.
7. Never attempt to overload the machine.
8. Standard TIRFOR machines are not designed for use in explosive atmospheres. Models T35S/T30 machines together with wire rope fitted with special steel ferrule complies with the requirements for use underground. The standard T35 aluminium machine must not be used.
9. Always remember that a load moved over any degree of angle of slope is defined as "LIFTING" and all calculations to determine the effort required to move a load must be based on the maximum working load of the machine. "PULLING" only applies to a direct horizontal line pull.
10. IMPORTANT: If the equipment described in this manual is supplied to an employed person, check that you meet your obligations with respect to safety at work regulations (see page 10 chapter 13).

## DESCRIPTION OF THE EQUIPMENT

The TIRFOR machine is a hand-operated lifting and pulling machine. It is versatile, portable and multi-purpose, not only for pulling and lifting but also for lowering, tensioning and guying.

The originality of the TIRFOR machine is the principle of operation directly on the wire rope which passes through the mechanism rather than being reeled onto a drum of a hoist or conventional winch. The pull is applied by means of two pairs of self-energising jaws which exert a grip on the wire rope in proportion to the load being lifted or pulled.

The machine is fitted with an anchor pin so that it can be secured quickly to any suitable anchor point.

The models described in this manual (T35, T35S and T30) are fitted with dual speed control on the forward operating lever. The first one is used for medium forward operating lever. The first one is used for medium forward operating speeds to give a lifting capacity of about 2 tons (low position). The second speed enables the unit to be used at slower working speed (high position).

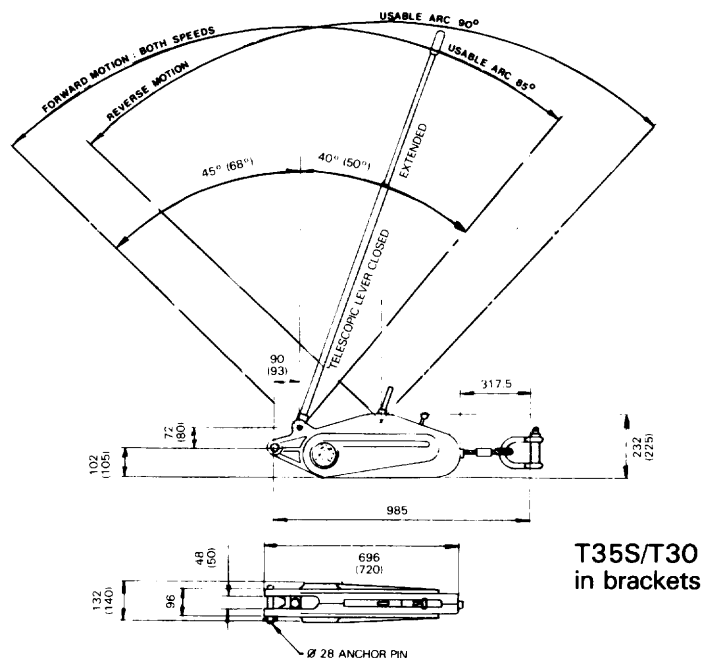
Each machine together with the CE declaration of conformity is supplied with each machine.

IMPORTANT: TIRFOR MAXIFLEX wire rope has been specially designed to meet the particular requirements of the TIRFOR machine. The manufacturer does not guarantee the safe operation of machines used with wire rope other than TIRFOR MAXIFLEX wire rope.

## 1 - TECHNICAL DATA

MODEL		T35	T35S	T30
Maximum working load	t	3.2		
Weight:				
machine	kg	26.8		
telescopic operating handle	kg	2.0		
standard 20m of wire rope	kg	23.0		
Total weight of standard equipment	kg	51.8		
Machine dimensions:				
length	mm	696		720
width	mm	132		140
height	mm		318	
telescopic handle: closed/extended	cm		65/115	
TIRFOR MAXIFLEX wire rope				
diameter	mm		16.3	
guaranteed breaking strain*	kg		16000	
weight per metre	kg		1.0	
Rope travel (forward/reverse)**	mm	s/s 38 f/s 48		

\* Including end fittings of the wire rope.  
 \*\* One complete cycle of the operating lever at maximum working load.  
 s/s = slow speed. f/s = fast speed



**T.35**

measurement  
in  
millimetres

**T35S/T30**  
in brackets

## 9 - MAXIFLEX WIRE ROPE



To guarantee the safe operation of TIRFOR machines, it is essential to use them exclusively with TIRFOR MAXIFLEX wire rope which has been specially designed to meet the requirements of the TIRFOR machine.

TIRFOR MAXIFLEX wire ropes have a red strand which is visible on new rope. One end of the wire rope has an end fitting, such as a shackle, fitted to a thimble fixed by a metal ferrule (See Fig. 14). The other end of the wire rope is fused and tapered (See Fig. 15)

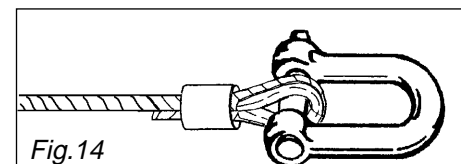


Fig.14

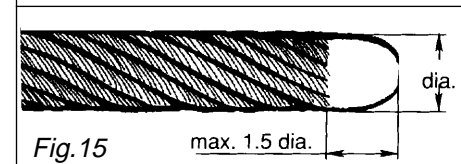


Fig.15

A wire rope in good condition is a guarantee of safety, to the same extent as a machine in good condition. It is necessary to continuously monitor the state of the wire rope, to clean and oil it with a rag soaked with motor oil or grease. Grease or oil containing graphite additives or molybdenum disulphide must not be used.

### Visual examination of the wire rope

The wire rope should be examined daily to detect any signs of wear (damage or broken wires: See examples in Fig.16)

In case of any apparent wear, have the wire rope checked by a competent person. Any wire rope with a reduction from the nominal diameter by more than 10% should be replaced. (See Fig. 17 for the correct method of measuring the diameter of a wire rope).

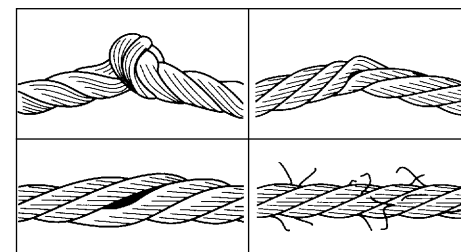


Fig.16 - Examples of damaged wire rope

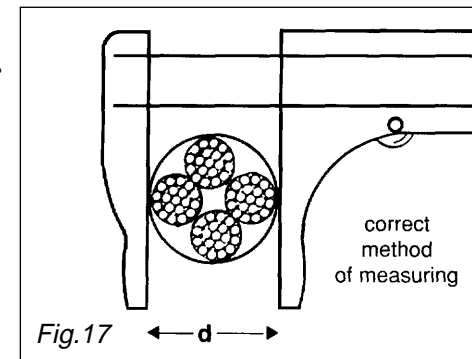


Fig.17

**IMPORTANT:** It is recommended, specially for lifting applications, to ensure that the length of wire rope is greater than actually required. Allow an extra meter approximately.

When lifting or lowering loads over long lengths of wire rope, steps should be taken to stop the load from rotating to prevent the wire rope from unlaying.

Never allow a tensioned wire rope to rub over sharp edges. The wire rope must only be used with pulleys of an appropriate diameter.

Never expose the wire rope to temperatures beyond 100 degrees C.

Never use the wire rope that has been subject to damage such as fire, corrosive chemicals or atmosphere or exposed to electric current.

Storage: See section 7.

## 10 - MAINTENANCE INSTRUCTIONS

The machine should be inspected, cleaned and lubricated at regular intervals, at least annually, by an approved TIRFOR LTD repairer. Never use grease or oil containing graphite additives or molybdenum disulphide. To clean the machine, allow the machine to soak in a bath of some proprietary cleansing fluid but not acetone and derivatives or ethylene trichloride and derivatives. Then shake the machine vigorously to loosen foreign matter and turn it upside down to allow the dirt to come out through the openings for the operating levers. Allow the mechanism to drain and become dry. After this treatment, **ensure that the machine is well lubricated** by applying a quantity of oil (type SAE 90-120) onto the internal mechanism through the openings for the operating levers. To carry out this procedure, it is best for the machine to be not under load and in the released position.

## 6 - OPERATION

TIRFOR machines are very easy to use. Place the telescopic operating handle on either the forward or reverse operating lever, lock it into position by twisting, and move the operating handle to and fro. The operating arc is variable for ease of operation.

When operation stops, both jaws automatically grip the wire rope and hold the load which is spread equally between the jaws.

The to-and-fro operation of the forward or reverse lever gives continuous movement of the load.

**IMPORTANT:**  
When lowering or slackening the rope with the T35/T35S/T30, the forward operating lever should be in the 'high' position to ensure correct operation. (See section 6.1 Dual Speed)

### 6.1 - DUAL SPEED (T35/T35S/T30)

For Fast Speed operation lift the pin on the top of the forward operating handle (2) and give the dual speed control pin (5) half a turn anti clockwise until the pin is securely located in it's new position. (see fig. 13.1)

For Slow Speed operation lift the button on the top of the forward operating handle (2) and give the dual speed control pin (5) half a turn clockwise until the pin is securely located in it's new position. (See fig. 13.2)

## 7 - RELEASING THE WIRE ROPE AND STORAGE

It is essential to take the load off the machine before attempting to release the jaws. To do this, operate the reverse operating lever until there is no tension in the wire rope.

Remove the telescopic operating handle and return it to the closed position.

Release the machine and follow the instructions for installing the wire rope in the reverse order. Re-engage the jaws of the machine before putting it into storage.

Store the machine and wire rope in a dry place, away from the effects of the weather. The wire rope should be completely removed from the machine and rewound onto it's reeler.

Before reeling the wire rope, it is recommended to inspect it, clean it with a brush and then grease it. (See section 9)

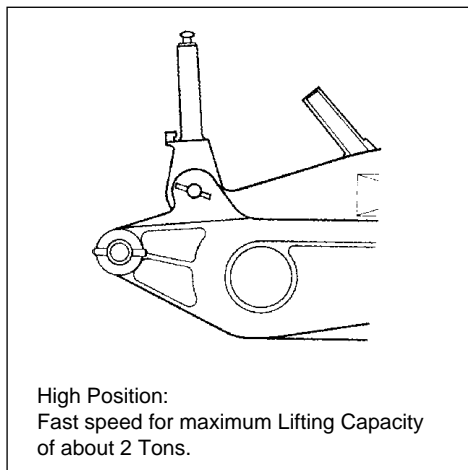


Fig. 13.1

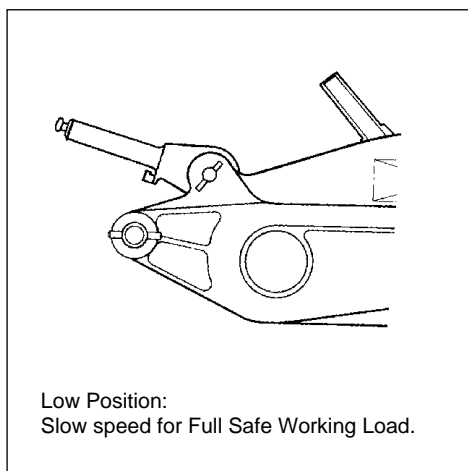


Fig. 13.2

## 8 - SAFETY DEVICES

### Rope Release Safety Device

It is impossible to operate the rope release lever when there is any load on the machine, as the jaws are locked by the tension in the rope.

The load has to be taken off the machine before this action is possible (See section 4)

## 2 - RIGGING ARRANGEMENTS

Various ways of rigging are shown in Figs. 2.1, 2.2, 2.3 and 2.4. Figs. 4 and 5 show particular arrangements (one forbidden and the other recommended).

The machine may be anchored to a fixed point with the wire rope travelling towards the machine (Figs. 2.1, 2.2, 2.3), or travel along the wire rope, with the load, the wire rope itself anchored to a fixed point (Fig. 2.4). In example 2.2, the maximum working load of the pulley and the anchor point should be equal to or greater than twice the load.

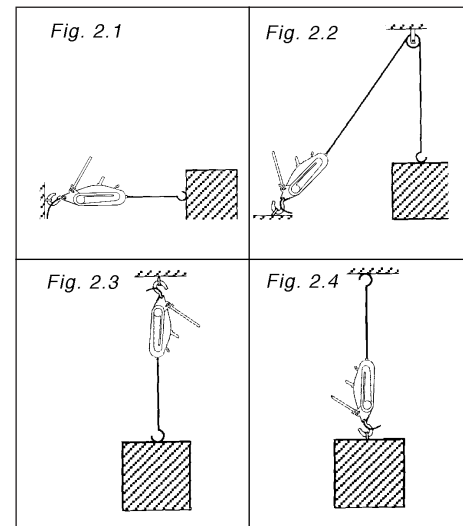
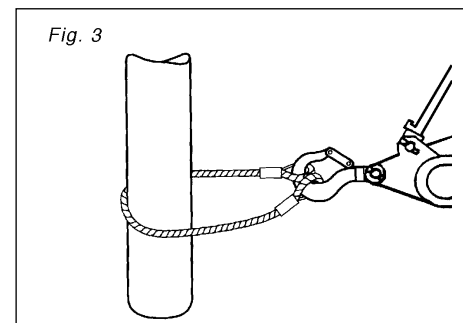
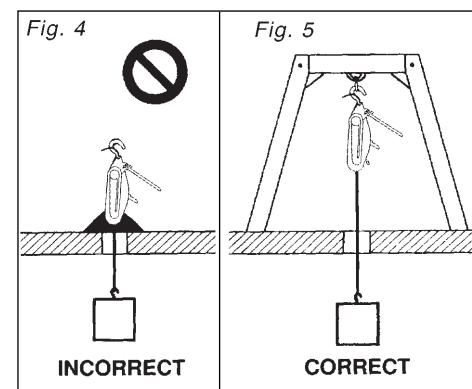


Fig. 3

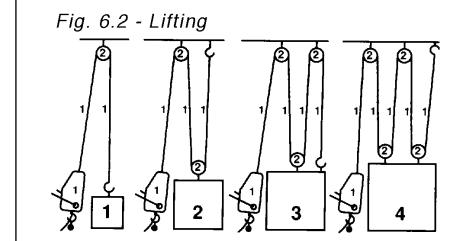
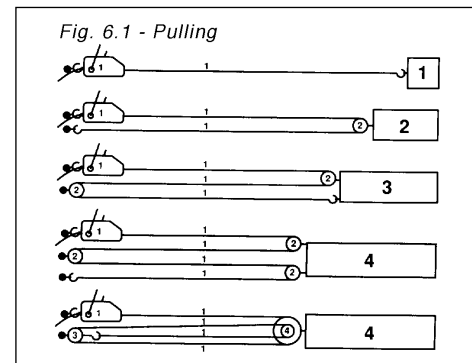


N.B. Whatever the rigging arrangement, and if the machine is anchored directly to a fixed point, ensure that there are no obstructions around the machine which could prevent the wire rope, the machine and anchor from operating in a straight line. It is therefore recommended to use a sling of an appropriate capacity between the anchor point and the machine (Fig. 3).



The capacity of the machine may be increased considerably for the same effort by the operator by using multiple sheave blocks. (See examples set out in Figs. 6.1 and 6.2). The increase in the capacity shown is reduced depending on the efficiency of the pulleys. The diameter of the pulleys used should be equal to at least 18 times the diameter of the wire rope. (Refer to the applicable regulations)

**For any rigging arrangement other than those described in this manual, please consult TIRFOR LTD or a competent specialist engineer before operating the machine.**







## WARNING



It must be remembered that any load moved over any degree of angle or slope is defined as “LIFTING”, therefore, any rigging arrangement which requires the calculation of the forces applied should be checked by a competent engineer, with special attention to the appropriate strength of fixed point used.

For work such as guiding the trunk in tree felling, the operator should ensure that he is outside the danger area by passing the wire rope around one or more return pulleys.

### 3 - INSTALLING THE WIRE ROPE

N.B. When handling the wire rope it is recommended to protect the hands by using work gloves.

If the wire rope is to be anchored to a high anchor point, the wire rope should be anchored before fitting the wire rope in the machine.

1. Uncoil the wire rope in a straight line to prevent loops or kinks.
2. Release the internal mechanism (See section 4: “Releasing and engaging the jaws”)
3. Insert the fused and tapered end of the wire rope through the rope guide at the end opposite to the anchor.
4. Push the wire rope through the machine, and if necessary, helping it by operating the forward operating lever.
5. When the wire rope appears through the anchor point, pull the slack wire rope through the machine, to the point required.
6. Engage the jaws by operating the rope release mechanism (See section 4: “Releasing and engaging the jaws”)
7. Anchor the TIRFOR machine or the wire rope to the appropriate fixed point (See section 5: “Anchoring”) taking care to ensure that the anchor pin is correctly fixed.
8. Extend the telescopic operating handle until the spring locks into position. If necessary twist the two sections of the handle, one inside the other, to align the spring (Fig. 1).
9. Replace the telescopic operating handle on the chosen operating lever (forward or reverse) and twist the handle to ensure that it is locked in position (about a half turn).

After this procedure, the machine is ready for operation, providing the load is correctly anchored to the machine or the wire rope (See section 5: “Anchoring” and section 2 “Rigging Arrangements”).

### 4 - RELEASING AND CLOSING THE JAWS

Each machine is fitted with a lever (Fig. 1 Item 4) for releasing the jaw mechanism which should only be operated when the machine is not under load.

There are two positions for the rope release lever (See Fig. 7, and 7.2) : released or engaged.

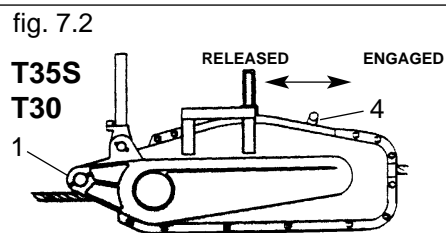
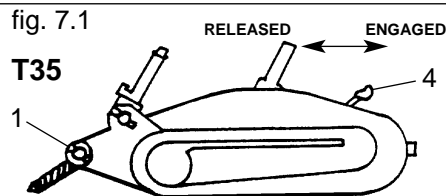
N.B. When not in operation, it is recommended that the rope release lever should be in the engaged position. The machine must therefore be released before attempting to feed in the wire rope.

**Releasing:** (Fig. 7.1 or 7.2)

Completely push the rope release lever (4) towards the anchor pin (1) into the notched position. The internal mechanism is now released and the jaws open.

**Engaging:** (Fig. 7.1 or 7.2)

Press down vertically onto the rope release lever (4) too release from the notched position and push the rope release lever back completely towards the rope entry guide. The internal mechanism is now engaged and the jaws closed.



### 5 - ANCHORING



**Failure to anchor the TIRFOR machine correctly runs the risk of a serious accident. The user must always ensure before operation that the anchor point(s) for the machine and wire rope are of sufficient strength to hold the load.**

It is recommended that TIRFOR machines should be anchored to a fixed point or to the load using an appropriate capacity sling. It is forbidden to use the machine's wire rope as a sling by passing it around the load and hooking it back onto itself (Fig. 8 : incorrect anchoring arrangement: Fig. 8a : correct anchoring arrangement).

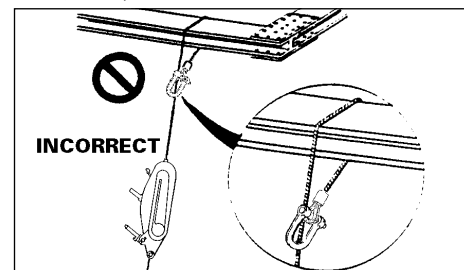


Fig.8 - Incorrect slinging

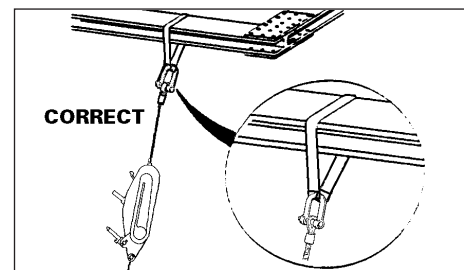


Fig.8a - Correct slinging

TIRFOR machines are anchored by means of a removable anchor pin, fitted across the two ends of the side cases (Fig. 9 and 10) and locked in position by a spring clip (See Figs. 11 and 12).

To anchor using the anchor pin, follow the procedure below:

1. Open the spring clip of the anchor pin.
2. Remove the spring clip from the anchor pin.
3. Slide the anchor pin out of the side cases (Fig. 10)
4. Fit the anchoring arrangement, such as a sling, between the side cases.
5. Refit the anchor pin through the side cases and anchoring arrangement, such as the eyes of the sling.
6. Refit the spring clip to the anchor pin.

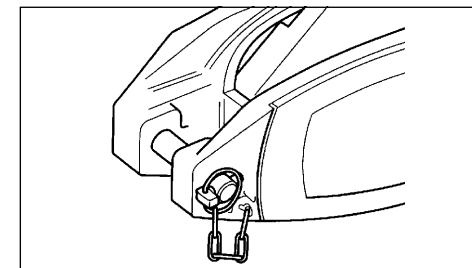


Fig.9 - Anchor pin in position.

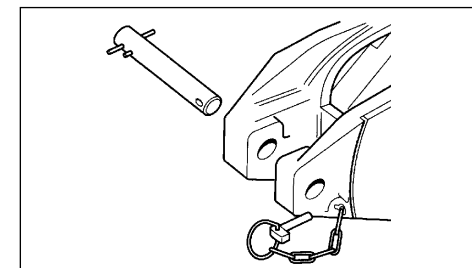


Fig.10 - Anchor pin removed.

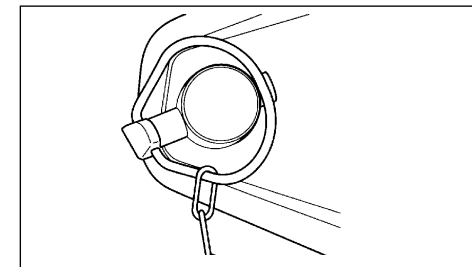


Fig.11 - Spring clip closed.

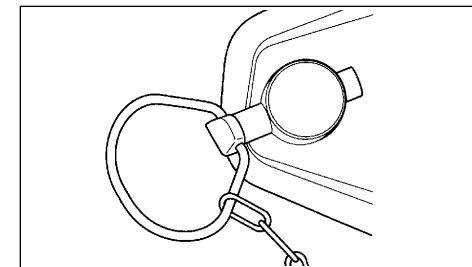


Fig.12 - Spring clip open.

## WARNING



**It is essential for the safe operation of the machine to ensure that, before loading the machine, the anchor points, and pins, are correctly secured**