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Operating Manual
for the
Remote-controlled Felling Wedge
TR300

Version 2 English

As at 25/02/2020

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Contents

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1. About this Operating Manual

1.1 Validity

This Operating Manual applies to the remote-controlled felling wedge TR300, referred to here on as the TR300.
It is intended for use by forestry professionals.
The Operating Manual contains important information to transport, operate, use, and maintain the TR300 safely and correctly, as well as guidance on how to remedy simple malfunctions.

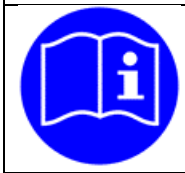
1.2 Description of the warning symbols

Symbol	Meaning
	Warning of the risk to the health, life, or property of person using the wedge.

The signal words have the following meaning:

Signal word	Meaning
DANGER!	Indicates a hazard that is likely to cause death or serious injury.
WARNING!	Indicates a hazard that has the potential to cause death or serious injury.
CAUTION!	Indicates a hazard that can lead to lost time injury.
ATTENTION!	Indicates a hazard that could cause property damage, that is, to the environment, physical assets, or the device itself.

1.3 Other symbols in this Operating Manual

Symbol	Meaning
	**Read Operating Manual** – read and understand this Operating Manual before initial use!
	**Wear a protective helmet** – when carrying out forestry work and using this device, wear a protective helmet with hearing protection and eye protection!

	**Wear protective gloves** – when carrying out forestry work and using this device, wear suitable protective gloves!
	**Wear protective boots** – when carrying out forestry work and using this device, wear protective boots with a cut-resistant insert and steel toe cap!
	**Wear protective clothing** – when carrying out forestry work and using this device, wear cut-resistant trousers and close fitting, high visibility (hi-viz) clothing!

2. Safety information

Warning: *There is a risk of serious damage to personal health or property if you do not follow the safety and warning instructions in this Operating Manual.*

The TR300 was manufactured in accordance with the generally accepted regulations of technology. There is a risk of personal injury and property damage if you do not observe the following basic safety instructions and warnings in this Operating Manual.

- Before working with the TR300, read and understand this Operating Manual.
- Keep the Operating Manual in a legible state.
- Ensure that the Operating Manual is available to all users at all times.
- Ensure that persons operating the TR300 are experienced tree fallers, who understand the rules and regulations contained in the Approved Code of Practice for Safety and Health in Forest Operations (ACOP).
- Always wear the correct personal protective equipment when working with the chainsaw and the TR300:

Wear a protective helmet – when carrying out forestry work and using this device, wear a protective helmet with hearing protection and eye protection!

Wear protective gloves – when carrying out forestry work and using this device, wear suitable protective gloves.

Wear protective boots – when carrying out forestry work and using this device, wear protective boots with a cut-resistant insert and steel toecap!

Wear protective clothing – when carrying out forestry work and using this device, wear cut-resistant trousers and close fitting hi viz clothing!

- The operator must meet the mental and physical requirements for forestry work and must not be under the influence of alcohol, drugs or medication.
- Ensure there are no loose or damaged parts before using the TR300.
- Only use the TR300 with original accessories and spare parts.

Irrespective of the instructions in this Operating Manual, any country-specific health and safety regulations must be applied.

2.1 Intended use

The TR300 is a felling aid which should only be used for tree felling. It is powered by a cordless impact wrench and is operated with a wireless remote control, allowing the faller to retreat to a safe position before activating the wedge to fell the tree.

Caution: *The TR300 does not replace machine assistance using a winch rope or hydraulic attachment!*

The TR300 may not be used:

- To fell trees that have a heavy back or side lean,
- To fell trees that show evidence of fungus or rot where the felling cuts are made.

Additional safety measures (such as machine assistance), must be applied when felling trees that display the above conditions. The TR300 can only be used when felling trees in a forest environment. Ensure any intended use does not exceed the specifications of the TR300 (see Section 3 “Technical Data”).

The TR300 should only be used on trees that could be felled using manual wedging techniques. Always ensure the TR300 is securely positioned in the back cut before activating it. To comply with these instructions the operator of the TR300 must have read and understood this Operating Manual, in particular Section 2.4.

2.2 Improper use and limitations of use

Improper Use: Improper use of the TR300 wedge is prohibited.

- Users should not reconstruct or modify the TR300, or use it outside of the instructions in Section 2.1 “Intended use”;
- Users should not use the TR300 under operating conditions other than those described in this Operating Manual;
- Users should not disregard the necessary care instructions before and during use.

Improper use of the TR300 will result in the invalidation of all warranty claims. The manufacturer is not liable for damage to the TR300 and for personal injury caused by improper use or care of the device.

Limitations of use

Information: In high temperatures (+ 50° C) or heavy frost (-20° C), the battery may shut down. It can be “woken up” by placing it on the charger or by pressing the display button.

Information: Avoid subjecting the cordless impact wrench to sudden impact or blows. Do not use the TR300 for prolonged periods in adverse weather conditions

2.3 Qualifications of the personnel

Any person using the TR300 must be familiar with this Operating Manual and have the necessary knowledge and skills to safely operate and maintain the TR300. Persons operating and servicing the TR300 must have the following qualifications:

• Relevant training in forest operations and a basic knowledge of tree felling and timber harvesting methods
• First-aid training
• Competence in operating a chain saw

Persons operating or servicing the TR300 and carrying out any felling work must not be under the influence of alcohol, drugs or medications that affect their ability to react. No person under the age of 18 may carry out the felling work or use the TR300.

2.4 Important things to know

General safety instructions

- The instructions in this Operating Manual must be complied with to prevent dangerous situations and avoid damage.
- All relevant accident prevention regulations and other generally recognised safety, occupational health, and road traffic regulations must be complied with.
- Only use the TR300 if it is in good condition.
- Only use or repair the TR300 with technically sound, original accessories and spare parts.

Safety instructions pertaining to the workplace

- Ensure that there are no unauthorised persons or structures present in the felling area.
- Block off any access points to the felling area with clear warning signs and barrier tape.

- Apply and maintain the “Two Tree Length” rule.
- Clear around the tree before making any felling cuts.
- Ensure the area around the tree is stable and clear of any debris that may affect footing.
- Clear an adequate escape route away from the tree, the recommended angle of this escape route is 45^{o} away from and opposite the intended direction of fall
- Place the required tools so that they can be readily accessed, but do not impede movement around the tree.
- Ensure that there is a first-aid kit on site.
- Ensure weather conditions are favourable when using the TR300. Felling in strong winds, thunderstorms, icy weather, or on frozen ground is not recommended.
- Only work in daylight.

2.5 Action in an emergency

If there is a risk of personal injury or damage to the TR300, for example, through a malfunction or a dangerous situation:

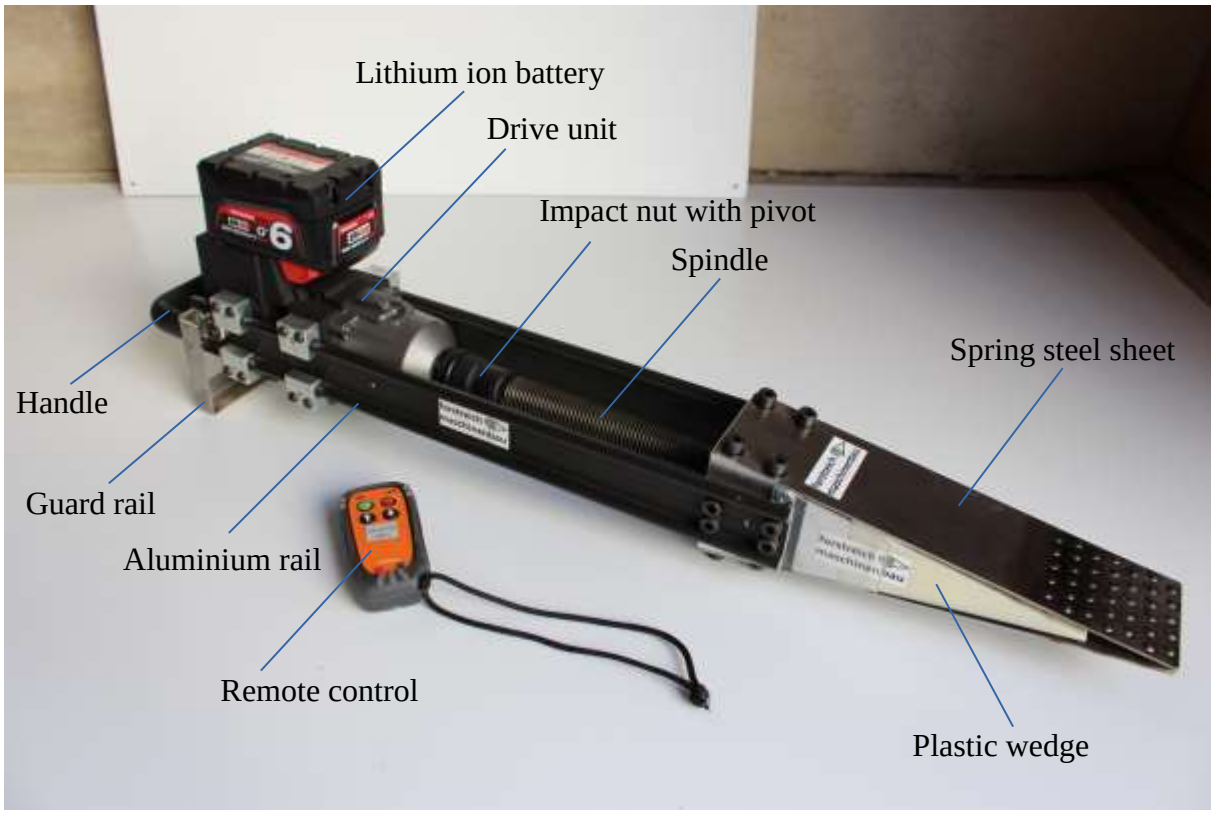
- Immediately switch the TR300 off.
- Leave the TR300 in the back cut.
- Manually insert plastic wedges to relieve pressure on the TR300 wedge.
- Leave the danger area immediately.
- Once the situation has been made safe, remove the TR300 from the tree and return it to the dealer for repair.
- If the plastic wedge between the plates has jammed in the back cut, do not press the Forward button as this will damage the plates.

3. Technical data

Description	Mechanical felling wedge TR300
Max. compression force (tonne)	25
Weight incl. 5.0 Ah battery and remote (kg)	10.1
Length (mm)	800
Width (mm)	130
Height (mm)	150
Stroke/revolution (mm)	3
Impact rotation speed (1/min)	0 - 2400
Range of remote control approx.(m) with no obstructions	50
Remote control auto-off time (min)	2
Entire system auto-off time (min)	320

4. Setup and function

4.1 Setup



Wireless remote control:

Information: The display of the wireless connection flashes regularly to indicate the correct connection. In case of an error, the LED flashes continuously.

4.2 Function

The TR300 is a tool that should only be used in tree felling operations. The TR300 is inserted into the back cut of the tree being felled. The serrations on the steel plates must be in contact with wood fibre (not bark encasement). These serrations bite into the wood fibres, holding the wedge in the cut. During activation, the plastic wedge is driven between the steel plates to create the required lift.

When “Start” is pressed on the remote-control, the wireless connection is activated. It takes a moment for this connection to activate. When “Forward” is then pressed, the spindle will rotate clockwise and push the plastic wedge out between the two steel plates. The spindle will stop automatically when it reaches the stop at the end of its thread.

When the “Back” button is pressed, the spindle rotates anti-clockwise, retracting the plastic wedge to its original position. The spindle will stop automatically when the plastic wedge is fully retracted. For large diameter trees, two remote-controlled felling wedges can be used next to each other.

If the remote control is faulty or lost, the same functions can be activated with the manual switch on the motor unit of the wedge.

Information: *The remote control will switch off automatically after 2 minutes with no operation. It can be reactivated by simply pressing the green "Start" button again.*

Information: *To avoid total discharge of the battery, the TR300 will automatically shut down after 4 hours of inactivity. To reactivate, simply remove and re-insert the battery.*

5. Operation

5.1 Initial use

Remove all components from the packaging, check to make sure they are complete.
Read the Operating Manual.
Before using the wedge, fully charge the battery or batteries.
Carry out a pre-start check, by activating the TR300 to full extension and retraction.
Check that the front and rear end stops are working correctly.

5.2 Before each use

Do not operate the TR300 in heavy rain, wind, or extreme temperatures.

Caution: *In high temperatures (+ 50° C) or heavy frost (-20° C), the battery may shut down. The battery can be "woken up" by putting it on the charger or by pressing the display button. Do not use the battery outside these temperature limits.*

Ensure that the batteries are fully charged!
Always have a fully charged back up battery!
Before use, check all components for damage and obvious defects!

Caution: *If the remote-controlled felling wedge TR300 shows any defects, it must not be used!*

Carry out a function check by fully extending and retracting the TR300 felling wedge. Check that the front and rear end stops are reached.

Keep two replacement batteries (type AAA) in a suitable place for the remote control.
Have at least 4 polypropylene wedges and a suitable hammer available to facilitate the correct operation of the TR300.

5.3 Transport to the job site

Ensure the TR300 is secured in the tool compartment of the vehicle transporting it to the workplace.

Use the provided shoulder strap to carry the TR300 to the felling face.

The TR300 wedge can also be carried by holding on to one of the guide bars, or the rear handle. Avoid disturbing the remote control aerial mounted on the rear end of the motor unit when carrying the wedge in this fashion.

5.4 Evaluate the tree and prepare the workspace

Before starting any felling, assess the tree to be felled for any overhead hazards, excessive lean, decay or unstable ground.

Pay particular attention to:

- Height, diameter, lean, and side lean
- Shape of the crown and excessive branch weight on one side
- Sailers, dead wood and any dry or loosely hanging branches
- Wind strength and direction
- Interlocked branches or vines likely to restrict tree movement
- Obstructions in the intended direction of fall, including roads, powerlines, fences, waterways, etc.

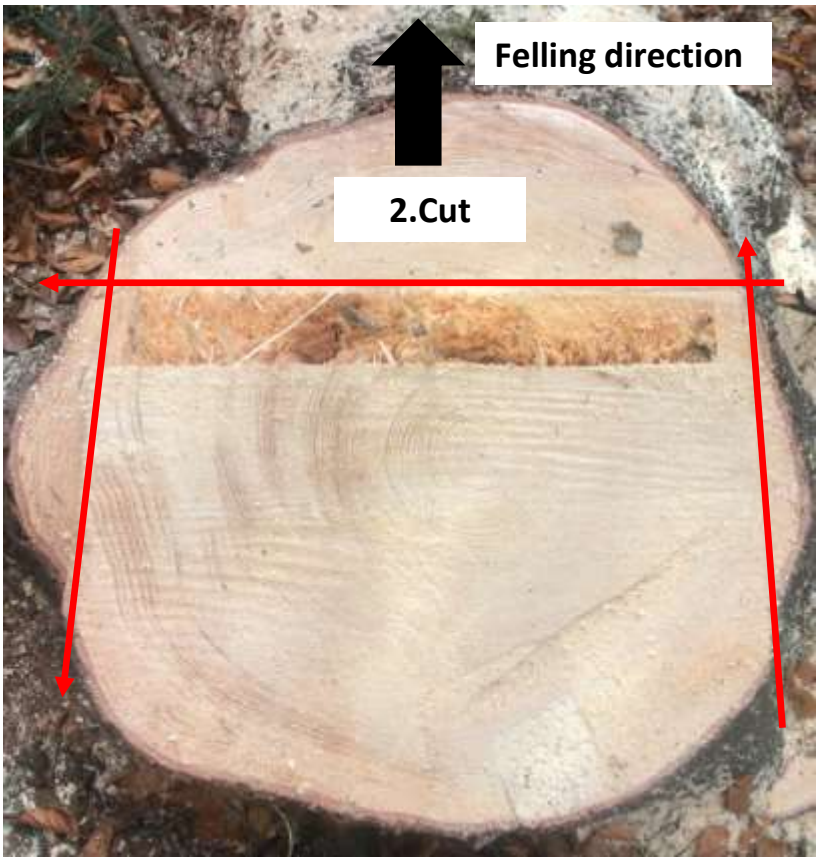
Warning: *The TR300 should not be used to fell trees with excessive back or side lean. It should also not be used for trees where there is evidence of rot or decay in the trunk of the tree to be felled.*

Warning: *The TR300 should not be considered a replacement for machine assistance.*

5.5 Prepare the tree

Once the felling direction has been determined, clear around the tree and check that there are no obstructions in the intended direction of fall. Clear a suitable escape route away from the tree at the recommended 45° angle opposite the intended direction of fall. Remove any flanges or scallops likely to affect the insertion of the felling cuts or the strength of the hinge wood.

Trim roots in a box-shaped manner. Note: this technique may not be suitable when felling radiata pine in New Zealand.



Determine where the TR300 should be inserted in the back cut and trim the bark off the stem at this point. Ensure that there is enough distance between the outer edge of the tree and the hinge for the wedge to fully extend.

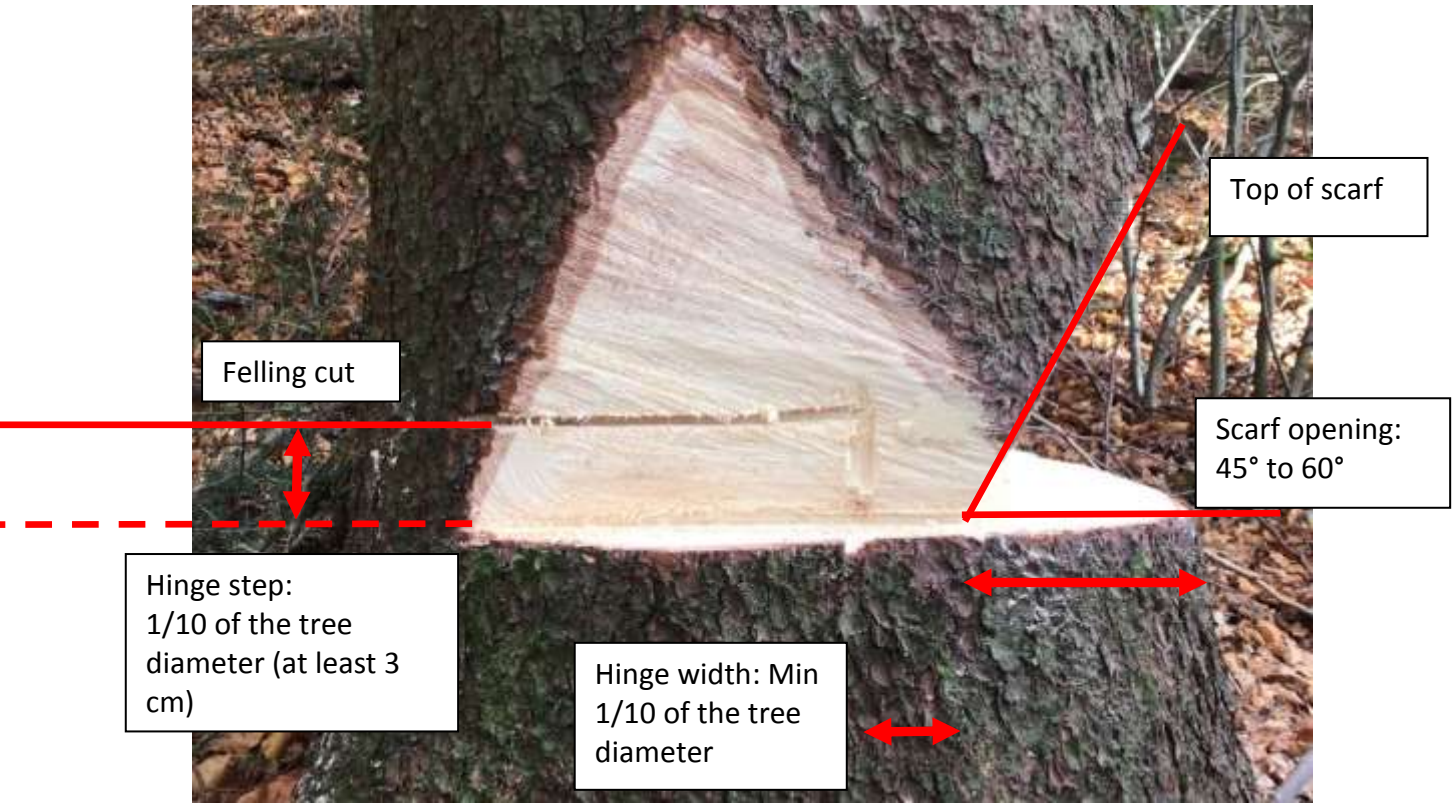
Caution: *If the distance to the hinge is too short, the TR300 can be pushed out of the cut, or the tip of the plastic wedge can be damaged when it comes up against the hinge.*

Make sure that after making the slot for the wedge, the wood fibres in the tree run as vertically as possible and the bark is completely removed.

5.6 Apply safe felling techniques

First, the scarf must be established to determine the intended direction of fall.
Make sure that the depth of the scarf is between 1/5 to 1/3 of the tree diameter. The top-cut angle must be between 45° and 60° from horizontal.

Caution: *Ensure that there are no overcuts in the scarf!*



On particularly large trees a keyhole or bore cut can be made.
Ensure the correct bore cut technique is used to insert the keyhole in the middle of the proposed hinge, on the same plane as the bottom cut of the scarf.

Caution: *Except when bore cutting, position the chainsaw against the tree trunk to minimise the risk of kickback.*

Once the scarf cuts have been made, use the quarter cut technique to do the first part of the back cut. This can be done by standing to the side of the tree and, using a pushing chain,

cutting half of the remaining tree diameter from the back of the tree, through to the required hinge width (approx. 10% - 15% of tree diameter). Alternatively the faller can bore in behind the scarf to create the correct hinge width, then cut back to the rear of the tree, making sure the hinge is not damaged by overcutting the bore cut.

Trim the bark off the stem where the TR300 is going to be inserted.

Information: Wing cuts should only be used if they can be inserted safely and it is certain that they will not compromise the strength of the hinge.

Information: To improve the accuracy of the cuts and prevent premature failure of the hinge, vertical side cuts can be made in the tree to remove fluting, see diagram.
This technique is optional in New Zealand conditions.

Caution: *Ensure the hinge width is correct, (a minimum of 10% of tree diameter across the full diameter of the tree). Leave extra hinge wood on particularly heavy trees or trees with unusual characteristics.*

Insert a plastic wedge in the first part of the back cut and drive it in until it is firm.

An alternative method (as shown in the photographs) is to use the split level back cut and place both the plastic wedge and the TR300 in the first part of the back cut. This technique requires the first part of the back cut to be made wider to enable both the plastic wedge and the TR300 to be inserted side by side. The angled release cut of the split level method can then be done after the TR300 has been inserted. From the safe side of the tree, insert the second part of the quarter cut back cut, cutting through the other half of the back cut to establish the correct hinge width.

Caution: Avoid cutting the plastic wedge already inserted in the first part of the back cut.

Caution: Avoid cutting into the hinge.

5.7 Inserting the remote-controlled felling wedge

To insert the TR300, cut a sloping groove in the back cut to allow the wedge to be pushed in to a minimum depth of 7cm (up to the serrations on the lifting plates). Expand the opening of the groove to 2 - 3 cm and ensure there are no lips or steps in it. Check that the back cut is deep enough to take full extension of the plastic wedge as it is driven out between the steel plates.

Symmetrically expand the point of insertion

Insert the TR300 so that it is perpendicular to the tree and opposite the intended direction of fall.

Caution: *Do not hit the felling wedge with a hammer*

Caution: *Damage to the plastic wedge or the spindle could occur if the wedge is not correctly inserted in the groove*

Ensure that there is enough space between the TR300 and the hinge for the extending plastic wedge.

Caution: *If the distance to the hinge is too short, the TR300 can be pushed out of the cut or the plastic wedge damaged when it makes contact with the hinge.*

Use the manual switch to pre-load the wedge and ensure that the serrated plates have gripped into the wood fibres in the groove before retreating to the safe position. This should prevent the TR300 from being pushed out of the back cut.

Warning: *Do not touch the spindle when it is turning.*

5.8 Affix fall protection

If there is a risk of the TR300 going with the falling tree (for example, on steep terrain), use a hammer to hit the piton (the small steel spike attached to the head of the wedge on a cord) in to the stump (below the back cut).

Caution: *If there is a risk that the TR300 could fall from a height of 60 cm or more, it must be secured with the piton.*

5.9 Using the Split Level Back Cut

Caution: *Ensure that no person or machine is in the danger area (that is, within two tree lengths).*

If using the alternative split level back cut technique, insert the final sloping back cut from the safe side of the tree, see photo. Avoid overcutting the hinge and undercutting the plastic wedge.

Inserting the release cut of a split level back cut

Caution: *Undercutting the plastic wedge can damage the wedge or reduce the available lift. It could also result in the saw tip becoming jammed in the cut.*

Caution: *Avoid using the chainsaw in the same cut as the TR300. Doing so could result in a serious harm injury or damage to both the chainsaw chain and the TR300.*

5.10 Safety distance

Once all of the felling cuts have been made, move at least 10 metres away from the tree before activating the TR300.

Caution: *The wireless remote control of the TR300has a range of about 50 m. The safe area should be at least 10 m from the tree that is being felled, but still in a position to be able to see the tree and the danger area.*

5.11 Felling the tree

Check that there is no one within the two tree length zone before activating the TR300.

Push the “Start” button on the remote and wait a few seconds until the system is active. Press the “Forward” button to start the felling and watch the wedge to ensure it is lifting the tree.

Note: The TR300 has a power function that automatically kicks in as the load on the lifting plates increases. When the TR300 goes in to power mode, the spindle speed decreases and the motor unit makes a “rat a tat, tat” noise, similar to a jack hammer.

Caution: *During the felling process, watch the TR300 to ensure that it does not spit itself out of the back cut.*

Information: *The motor will automatically stop at the front stop. Once it is in this position, it can only be turned "backwards".*

5.12 Extending the lift of the TR300

Caution: *Ensure the tree being felled is safe and stable before re-entering the felling area.*

Secure the partially jacked tree with two stacked plastic wedges. Insert these wedges carefully to avoid any unexpected movement.

Caution: Ensure eye protection is worn to protect the faller from the stacked wedges accidentally spitting out of the cut as they are driven in.

Reverse the TR300 felling wedge carefully, ensuring that the top of the tree does not come back against the intended direction of fall. Then, either insert the TR300 deeper into the back cut, or place a suitable wooden spacer in the groove below the wedge and push it in until it is firm. Use the button on the motor unit to set the TR300 in the back cut. Move back to a safe position before activating the TR300 again. Always watch the tree crown for unexpected movement.

Caution: *Ensure the plastic wedge in the TR300 does not come up against the hinge when it is fully extended.*

5.13 After felling, preparation for further use

Caution: *Once the tree is on the ground, wait at least 10 seconds for the crowns of the surrounding trees to stop swaying. There is a risk that branches could be dislodged and fall into the work area.*

When the workplace is safe, retrieve the TR300 and retract it back to the start position using either the remote control, or the hand switch.

Caution: *When reversing the TR300, ensure that hands are kept clear of moving components. The lateral plastic guards have been mounted on the head of the TR300 as "safety flaps".*

Information: *When retracting, the motor automatically stops at the rear stop. Once it has reached this point, the TR300 can only be extended.*

6. Maintenance

The following maintenance instructions must be observed:
Repairs to the TR300 should only be carried out by authorised personnel or the manufacturer.
Always remove the battery before any maintenance work is done, (unless activation is necessary during maintenance, e.g. when lubricating the spindle).

6.1 Batteries

Charge the Milwaukee battery and the reserve battery fully in accordance with the battery operating instructions. Comply with the instructions of the battery manufacturer regarding charging and storage.
Only use the supplied original charger to charge batteries. Observe the operating instructions for the battery charger.

6.2 Inspection

Inspect the TR300 felling wedge for defects before use. Check all components for cracks, deformation, and damage.
Regularly check the threaded nut for wear.
Do not use damaged components!

6.3 Lubrication

Ensure the threaded spindle is sufficiently lubricated **before each use**. Spray it with grease and turn it back and forth to distribute the lubrication.
Ensure that the surfaces between the plastic wedge and the steel sheets are lubricated **before each use**.

6.4 Cleaning

Regularly remove the dirt and wood shavings from the TR300; this increases the service life.
Carefully clean the spindle and wedge with a cloth, do not use strong, corrosive, harsh /

abrasive cleaning agents. The ventilation slots in the drive unit can be blown out with compressed air. After cleaning, grease all sliding surfaces.

Caution: *Wear work gloves to avoid the risk of cuts from sharp edges!*

6.5 Functional check

Carry out a functional check by extending and retracting the TR300. Check that the front and rear stops are safely reached without the power function being activated. The power function should only activate when the TR300 is under load. If it is activated when not under load, check for resistance in the spindle or sliding guide. This may be due to inadequate cleaning/ or lubrication.

6.6 Tips and tricks

You can easily disassemble and straighten any distorted steel plates, unless they are obviously cracked or broken.
The steel plates must be replaced if there are cracks or other forms of damage.
If necessary, send the plates, or the whole TR300, to the manufacturer for inspection and/or repair.
Only use original spare parts– contact the distributor for these parts.

7. Storage

Only store the TR300 in a safe dry place.
Always remove the battery from the TR300 when not in use.
To avoid discharging the Milwaukee battery, the receiver on the TR300 will automatically switch off after 3 hours of inactivity. It can be reactivated by removing the battery and re-installing it, or by putting it on the charger.

8. Disposal

If the TR300 is no longer usable and/or cannot be repaired, it must be disposed of in accordance with local regulations. Dispose of the components properly. Ensure that no harmful substances are released into the environment.

9. Accessories and spare parts

Article number	Description	Article number	Description
001-1018	Plastic wedge	006-1008	Safety-O-ring
001-1006	Spring steel sheet	006-1009	Safety pin
001-1009	Cylinder head screw M8 x 16	008-1004	Rear handle
007-1004	Threaded nut	008-1008	Sliding guide
007-1005	Threaded spindle	008-1010	Metal frame
008-1002	Log	008-1012	Loop of shoulder strap
006-1002	M18B5 battery 5.0 Ah	008-1015	Shoulder strap
006-1005	M18B9 battery 9.0 Ah	008-1016	Protective plate side
006-1007	Impact nut SW22	008-1025	Safety pin Ø5 x 32

10. Warranty

The manufacturer assumes a warranty on the function and faultless operation of the material used in manufacture of the TR300 felling wedge for 12 months from the date of delivery. This does not cover the consequences of normal wear and tear, overloading, improper handling, or the use of third-party spare parts.

A warranty can only be accepted if the device is handed over to the manufacturer or its agent in complete un-dismantled condition for inspection. Damage caused by material or manufacturer errors will be remedied free of charge by means of replacement or repair.

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11. Service

Forstreich Maschinenbau is available to answer any questions you may have about the TR300 felling wedge. Please contact:

Forstreich GmbH
Managing Director Stefan Reichenbach
Schwarzwaldstr.314
79117 Freiburg
info@forstreich.de
www.forstreich.de
Mobile number +49 151 110300401

12. EC Declaration of Conformity

The manufacturer: Forstreich GmbH
Managing Director Stefan Reichenbach
Schwarzwaldstr.314
79117 Freiburg
Tel.: +49(0)151/11030401

Hereby declares that the following product:
Product description: mechanical felling wedge TR300
Year of manufacture: from 11/2018

Complies with all relevant provisions of the Guidelines 2006/42/EC, 2014/30/EU, 2014/35/EU, and 2011/65/EU.

The following harmonised standards were applied:

EN ISO 12100 Safety of machinery – general design principles, risk assessment, and risk reduction

Freiburg, 01.09.2019 

Date Signature