Operators Manual

SelfLifter

TL425

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Terminology

Left Hand Crane

The description of the “handing” of the cranes is as follows: Assume you are standing in the position where a container is placed on the ground by the SelfLifter. When you are facing the SelfLifter, the “Left Hand Crane” is the crane on your left side. On a SelfLifter that loads to the right hand side of the vehicle, the “Left Hand Crane” is at the rear. For a SelfLifter that is a left hand lift, the “Left Hand Crane” is at the front of the SelfLifter.

Right Hand Crane

Assume you are standing in the position where a container is placed on the ground by the SelfLifter. When you are facing the SelfLifter, the “Right Hand Crane” is the crane on your Right side. On a SelfLifter that loads to the right hand side of the vehicle, the “Right Hand Crane” is at the front. For a SelfLifter that is a left hand lift, the “Right Hand Crane” is at the rear of the SelfLifter.

Lift Side

The side of the SelfLifter where the stabiliser legs will go down. The container can be moved furthest away and down to the ground on the “Lift Side”.

Off Side

The side of the SelfLifter on which the stabiliser legs do not go out. This is the side on which the arms can only move a short way into. The container must never be lifted over this side or the vehicle may roll over. It is also referred to as the NO GO side.

Top Arm

The crane lifting arm that is on top of the two arms. It has the lifting chains connected to its end.

Bottom Arm

The crane lifting arm that is the lower of the two. It is connected to the crane carriage and has the top arm connected to its other end.

Stabiliser Leg

The stabiliser leg is placed on the ground or the vehicle the load is lifted off or on to. The purpose is to stop the SelfLifter from tipping over sideways. It is essential that the stabiliser legs are used whenever a load is lifted. Never presume the SelfLifter vehicle is heavy or stable enough to operate the cranes without putting the stabiliser legs on firm support.

Stabiliser Inner Leg (or) Stabiliser Extension

The sliding member inside the stabiliser leg assembly that moves out in a straight line.

Stabiliser Outer Leg (or) Stabiliser Housing

The stabiliser member that pivots on the crane carriage and moves by rotating about this pivot.

Foot

The plate that is pivot mounted to the end of the Stabiliser Inner Leg. It sits flat on the ground or other solid load bearing surface.

Crane Carriage (or) Crane Base

The base assembly that the arms and legs are attached to. It has hydraulic cylinders attached to it to move the Bottom Arm and the Outer Leg. It may slide to accommodate loads of different length.

Chain Pin

The shaft (or Pin) that goes into the hole at one end of the top arm that the lifting chains are connected to.

SelfLifter

This is our name for a container transporting truck or trailer that can lift a container onto itself with its own cranes. This type of machine is also called a sideloader, a sidelifter, a swinglifter, a swingloader or a selfloader. Some people also use the brand or manufacturers name to refer to the machine.

Controls

This section describes the location and function of the operator controls of the Selflifter.

Main Control Box

The main control box is located in a steel cabinet with a hinge down door. It is located on the side of the chassis. The control cabinet has two lockable push to open latches. The main control cabinet is also used to store the cable remote control.

Main Control Cabinet

The main control box includes the main power key switch, the work lamp switch, the hour meter and two indicator lamps. Inside the box is the electrical equipment and fuses for control of the SelfLifter.

Key Switch

The key switch applies power to operate the valves which control the crane movement. It must be switched on (turned clockwise) before the cranes can be operated from the cable remote control box. When the key switch is turned on, a green lamp located below the key switch is illuminated. The operator should remember to turn off the key switch when operation of the SelfLifter is finished.

Work Lamp Switch

The work lamp switch illuminates a lamp on each crane that lights up the area at each end of the container to assist in low light operation. When the work lamp switch is on, an orange lamp below the switch also illuminates to remind the operator that there is power on to the work lamps.

Hour Meter

The hour meter records operating time in hours (white numbers). It runs whenever the key switch is turned on. This meter helps ensure maintenance is carried out at appropriate intervals so the SelfLifter is safe to operate over its life.

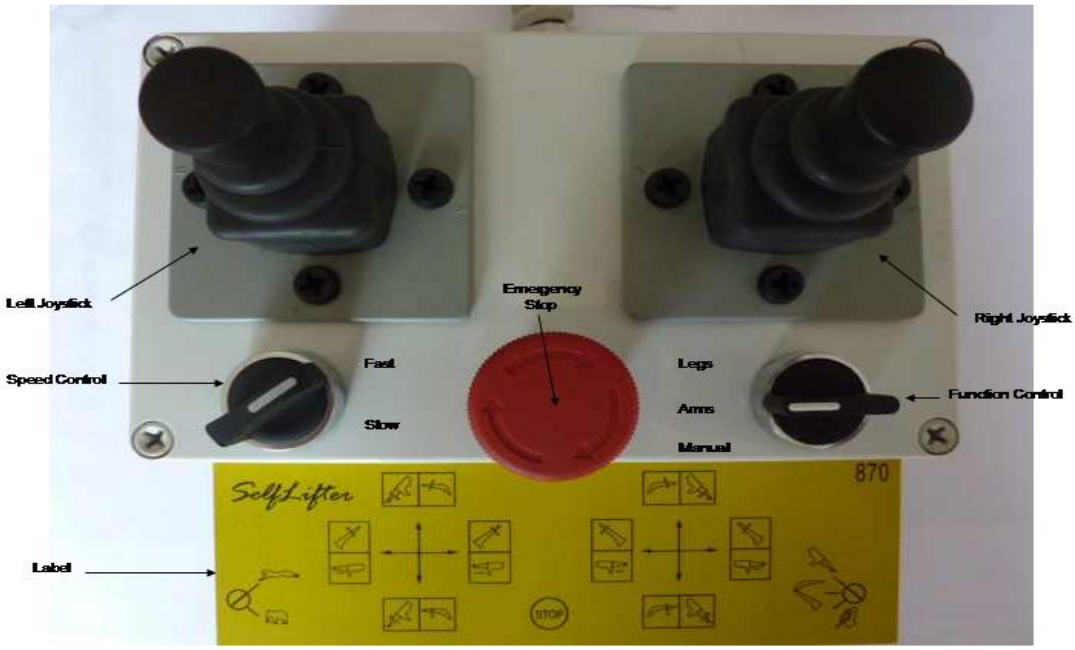
Main Power

The SelfLifter electrical control system is powered from the truck batteries. Power can be removed from the SelfLifter system by turning Off the truck's main isolating switch. This switch has a red T handle and is located on the forward side of the truck battery box. Follow the writing on the switch handle. When off, there will also be no power to operate the truck.

Cable Remote Control

This section describes the cable remote control which is the operators main means of controlling the motions of the cranes.

Cable Remote Control with truck in the background



Controls on Cable Remote Control (Label swung upwards)

Joysticks

The cable remote control is fitted with two joysticks. The one on the left operates the “Left Hand Crane” and the one on the right operates the “Right Hand Crane”. The label which is shown in the illustration indicates the function that is performed when the joystick is moved in the direction of the arrow on the label.

By moving a joystick away (in the direction of the remote control cable), the left top arm will move upwards or the stabilising leg will rotate downwards.

By moving the joystick towards the operator (towards the control switches on the remote control), The top arm will move downwards or the stabilising leg will rotate upwards.

By moving the left joystick to the left, the left bottom arm will move up and away from the SelfLifter or the stabiliser leg will slide outwards.

Moving the left joystick to the right will move the bottom arm inwards and down.

Moving the right joystick to the left will move the right bottom arm inwards and down.

Moving the right joystick away from the operator moves the right top arm upwards.

By moving the right joystick towards the operator, the right top arm moves upwards.

The joysticks are spring loaded to return to the central position. In this position, none of the crane arms or legs move. The joysticks provide proportional speed control. This means that the further way from the central neutral position the joystick is moved, the faster the arm or leg will move. For slow movements push the joysticks very little. For fast movements push the joysticks to the extremes of their travel.

Speed Control

The speed control knob works by rotating it to point to the jaguar symbol for high speed operation or the elephant symbol for slow strong lifting.

Function Control

This is a three position rotary control. It controls the response to the joysticks.

It is rotated fully clockwise to enable the joysticks to operate the stabiliser legs.

In its central position the joysticks will operate the arms.

When it is turned fully anti-clockwise, the joysticks are disabled and the SelfLifter can be operated by the levers on the hydraulic valves on each crane. Note that there is a time delay incorporated into the control so manual motion may not be possible until some time has elapsed from last operating the joysticks.

Emergency Stop

In an emergency push the knob down. Rotate the knob to allow it to pop up. For normal operation the knob must be up. This knob disconnects the power to the hydraulic controls. When it is pressed in, if the truck motor is still running with the PTO engaged, it is possible to move the arms and legs by the manual control levers on the valves.

Operation

Park Brake

It is essential that the park brake be applied before operating the cranes. The park brake must be pulled on first before engaging the PTO and then starting operation of the cranes.

Starting

To operate the cranes, the truck engine must be running and the PTO must be engaged. To do this, the truck manual will explain the location of the switch and the method of engagement. Remember that in most cases, the PTO will not engage if the system air pressure is low. Also, the vehicle clutch normally has to be pushed in and held for long enough for the PTO drive gears to come into mesh completely. Once the gears are in mesh, the clutch pedal can be released and the PTO will start operating. When the PTO is operating, the shaft that drives the pump can be seen rotating by looking under the chassis between the two right hand front wheels.

If the shaft is not rotating, the PTO has not engaged properly and the cranes will not operate.

Engine Speed Control

There is a manually operated throttle (engine speed) control fitted to the motor. This control increases the speed of the motor without the need for a person to push the throttle pedal inside the cab.

This control is situated on the drivers (right hand) side just behind the cab at about chest height. It is a round black knob with a button in the middle. The button must be pushed in so that the knob can be moved. Push the button in and pull the knob out to increase the speed of the engine. The engine will be heard to increase speed. You should pull the knob out to increase the engine speed to about 1000 – 1500 rpm. You can see the engine speed by looking at the tachometer in the dash board in front of the steering wheel of the truck.

Powering up the cranes

To apply power to the cranes open the control cabinet and turn on the key. The green light below the key will illuminate.

Crane operation

Take the remote control out of the control box and extend the cable so that you can walk around the truck to the lift side to observe the operation of the cranes.

Move to the back of the truck on the lift side.

Refer to the description of the controls on the cable remote control section above.

Make sure the emergency stop switch is up.

Turn the speed control to fast.

Turn the function control to “stabiliser legs”.
Below assumes the arms and stabiliser legs are in the fully retracted position as they must be when driving along the road.

Operate the joysticks together to rotate (tilt) the legs. Assuming the legs are to be placed on the ground, tilt the legs down. When the legs get to around 30 degrees down from horizontal, move the joysticks so that the legs start to extend. With the legs fully extended continue to rotate the legs down. When the feet on the legs are about 200 mm above the ground, stop rotating and check that the legs are fully extended.

Change the speed control to slow speed. Rotate the front leg only so that the foot makes contact with the ground. Rotate it slightly further until the leg side of the crane carriage just starts to rise. It should only rise a few millimetres.

After the front crane leg is in place, move the rear leg until the ground has been contacted by the foot and the crane carriage has just risen on the leg side by a few millimetres.

Note: The ground where the foot is placed must be firm and capable of supporting a heavy load. Each foot when fully extended may put a load on the ground up to half the mass of the container plus the truck.

Switch the function control to “arms”.

Move the arms (in low speed) using the joysticks to move then up and out to pick up or deliver the container.

After the load has been moved on or off the SelfLifter, Put the arms back into a fully retracted (folded) state. Rotate the legs up a little then retract them about half way then rotate and retract them until the legs are fully retracted and rotated until horizontal.

Before driving away, check the twistlocks are engaged as required. Put the cable remote control back in the control box and neatly coil the cable at the bottom of the box. Figure of 8 coiling is tidiest. Turn off the key so the green light is out. If the work lamps lights are on, turn the knob anticlockwise to extinguish the lights. Close and lock the control box. The manual throttle must be pushed fully in so the engine resumes normal idling speed (about 600 rpm). Disengage the PTO

Caution

The operator must ALWAYS work the machine within the limits of load mass and load distance away in accordance with the “Safe Working Load Diagram”.

The load must never be allowed to move to the side of the truck which does not have legs extended. This side is referred to as the NO GO side. If a load is moved to the NO GO side of the truck, the truck can roll over.

For new operators it is recommended that when operating only one crane (joystick), take the hand completely off the other joystick. There is temptation for a new operator to move both joysticks even when they intend to only move one. (In training sessions, instructions are sometimes given to put the hand in the trouser pocket when the other hand needs to move only one crane at a time!)

Training

The TL425 SelfLifter should only be operated by persons who have received training in SelfLifter or Sidelifter operation.

Typical Operations

Lifting a container from the ground to the truck

Drive the truck up to the container then carefully position the truck so there is about 300 mm between the side of the truck and the container. Move the truck forward (or backwards) until the twistlocks on the cranes are lined up with the twistlock holes in the corners of the container.

Put on the park brake and engage the PTO. Use the manual throttle control to increase the engine speed to 1000 – 1500 rpm. Open the control cabinet and remove the cable remote control. Turn on the key to power up the cranes. Make sure the emergency stop button is up.

Check that the ground at each end of the container is firm and that there are no buried pipes or other things that make the ground soft.

Lower the legs and feet until they just make contact with the ground and then a little further so that the crane carriages move a few millimetres up on the legs side.

Change the function switch to “arms” and move the arms out until the chain pin is in the centre of each end wall of the container. Lower the chains until the chain end container lock blocks touch the ground. Lower the chain pins a further 800 - 1200 mm keeping the chain pins at the centre of each end wall of the container.

Engage the container lifting lock blocks with the holes at the bottom of the ends of the container at each corner.

Note that the lock blocks must be rotated so the chain is above the lock block and about 90 degrees away from vertical in the opposite direction to that where the chain will be when the container is lifted. This means that for a lock block on your right when you face the hole into which the lock block is fitted, turn the lock block clockwise with the chain 90 degrees away from vertical. Push the lock block in then rotate it anticlockwise until the chain is about 20 degrees to the left of vertical. At this position, the chain will remain in position and not fall out.

For the container corner hole on your left, turn the lock block anticlockwise so the chain is about 90 degrees to the left of vertical. Push the lock block into the hole in the container corner casting and when fully in, rotate it clockwise until it is about 20 degrees to the right of vertical. At this point the lock block and chain will not fall out.

Ensure the speed switch is in low speed.

Lift the container up using the top arm. Provided the container side is about 300 mm away from the truck side, the container can be lifted up until the container bottom is about 100 mm above the twistlock on the crane carriage.

Move the joysticks towards each other to move the bottom arms inwards to move the container over the truck. Stop the bottom arm movement as the centre of the container approaches a position central with the truck. It may be necessary to lift the top arm up slightly to ensure the container is above the twistlocks ready to move down to engage with them.

Keep the container no higher than the vertical plates that guide the container down to the twistlocks. These plates ensure the container is not able to move off to the NO GO side of the truck.

Use one joystick only to control one crane to finally land the container onto the twistlocks at one end of the container. If on sloping ground, first move the end of the container that is at the higher ground. Once the first end of the container is completely on and engaged over the

twistlocks, use the other joystick and crane to position the other end onto the twistlocks. Lower both bottom and top arms so they are horizontal.

Switch to high speed and retract the stabiliser legs.

Put the cable remote control in the metal control box and turn off the key switch. Check all is complete and the twistlocks are locked. Push the manual throttle control in to idle the engine and climb into the cab and disengage the PTO. The truck can then be driven away normally.

Note: Always ensure the mass of the container is within the lifting capacity of the SelfLifter.

Lifting a container off the SelfLifter onto the ground

Put on the park brake and engage the PTO. Use the manual throttle control to increase the engine speed to 1000 – 1500 rpm. Walk round the truck unlocking each twistlock as you come to it. Check all is clear and the ground is firm in the area, especially where the container is to be put down. Open the control cabinet and remove the cable remote control. Turn on the key to power up the cranes. Make sure the emergency stop button is up.

Check that the ground at each end of where the container is going to be placed is firm and that there are no buried pipes or other things that make the ground soft.

Lower the legs and feet until they just make contact with the ground and then a little further so that the crane carriages move a few millimetres up on the legs side.

Turn the speed switch to “Low Speed”

Change the function switch to “arms” and move the top arms up until one end of the container just starts to lift on the legs side of the container.

Move the appropriate joystick to just lift the other end of the container.

With both joysticks, move the top arms up to lift the container on the legs side about 100 mm above the transport position. The bottom of the corner castings should be about 50 mm above the top of the twistlock heads.

Assuming the bottom arms are fully down, move the bottom arms up until the container just starts to rise on the off side.

If for some reason, the bottom arms are not both fully down with their cylinders fully retracted, move both arms up until on end of the container just starts to rise on the off side. Then use the joystick for the other end to move the bottom arm up until that end of the container just starts to rise.

Once the container is in a position where the lift side is 100 mm lifted and the other side has just started to move, push both joysticks fully away from each other so both bottom arms move outwards together.

With containers with unequal loading at each end, or with heavy containers, one crane may move faster than the other. If this happens, slow down one end so the container is about the same distance out at each end.

Note that the end of the container closest to you looks bigger than the end farther away. A distance or gap between a container and the SelfLifter will look bigger at the end close to you even if it is the same as at the end farther away.

Provided the container was lifted a full 100 mm above the lift side twistlocks, the container should move smoothly out and clear the twistlocks on the lift side as it moves in an arc out up

then down. If it doesn't look like it will clear the lift side twistlocks, lift the container slightly with the top arms.

When the container is about 300 mm away from the side of the SelfLifter, Lower it with the top arms.

The container should be lowered to about 100 mm above the ground.

If it is desired to move the container out further and away from the SelfLifter, do this with the container hovering about 100 mm above the ground. The reason for this is if the container is heavier than you expected and goes past the stability limits, the container will only drop 100 mm and the SelfLifter will not lift very far off the ground.

If a heavy container begins to lower by itself as you move it out well away from the SelfLifter then the relief valves in the arms may be past their maximum pressure and are letting the load lower so as not to exceed the safe load limit of the structure. Lower the box immediately if you observe this.

With the container in its final position on the ground, lower the tops arms further to allow the chain lock blocks to be uncoupled from the container.

Change to high speed and move the arms up and in then down until they are fully retracted. Then change the function control to legs and retract the legs fully.

Put the cable remote control in the metal control box and turn off the key switch. Check all is complete and the twistlocks are turned into the locked position. Push the manual throttle control in to idle the engine and climb into the cab and disengage the PTO.

Lifting a container off the ground with a large gap between the SelfLifter and the container

Sometimes the SelfLifter cannot be positioned close beside the container to be lifted.

Preparation for the lift

The most important aspect of lifting a container that is more than about 600 mm away from the SelfLifter is to ensure the SelfLifter and the container remain stable. If the container is too heavy relative to the distance it is away from the SelfLifter then stability could be inadequate and the SelfLifter could roll over.

For a lift with a gap between the SelfLifter and the container larger than about 600 mm the Safe Working Load diagram must be obeyed. This requires that the mass (weight) of the container is known. This is the total mass meaning the load inside plus the self weight of the container. The Safe Working Load diagram shows the maximum mass that can be lifted at various distances between the centre of the SelfLifter and the centre of the container. To relate this to the gap between the container and the SelfLifter sides, subtract 2.5 meters from the centre to centre distance.

For a lift with a large gap between the SelfLifter and the container AND with one or both legs not fully extended away from the SelfLifter, the maximum load that can be safely lifted is considerably reduced. This information is also shown on the Safe Working Load diagram.

Lifting technique

Commence as for a normal lift from ground to SelfLifter. After connecting the chains, follow as below:

Lift the container only 100 mm off the ground using the top arm.

Use the bottom arm (Joysticks together) to move the container towards the SelfLifter.

As the bottom arms move the container in it will rise higher above the ground. Move the joysticks to lower the top arms to keep the container about 100 mm above the ground as the container is moved closer to the SelfLifter.

When the container side is about 300 mm away from the side of the SelfLifter, atop bottom arm movement and use the top arm to lift the container up to about 100 mm above the twistlock level.

Complete the lift and setting down on the twistlocks as per a normal lift from ground to SelfLifter.

Lifting a container off a trailer or rail wagon

To lift a container off a trailer truck or rail wagon, the positioning of the legs are critical.

For a truck and trailer unit it is usually best to position the tractor unit or head of the truck at the opposite end of the head of the SelfLifter truck.

If the truck tractor unit's rear wheels are in the position where the SelfLifter legs extend, it is best to jack knife the tractor unit with the trailer to get the rear wheels away from the SelfLifter leg extension area.

For rail wagons, most wagons have a strong enough top surface to put the SelfLifter feet on to. If this is not the case or the container is too close to the end or there is another item on the wagon that prevents the foot going on the deck, then it needs to be put on the ground under the wagon as far away from the SelfLifter as it can be.

For a trailer or truck the SelfLifter leg can sometimes be put on the deck. If there is deck in the area where the foot can go, the foot MUST be positioned over the longitudinal chassis rail. On a trailer this is usually visible from the top of the deck. For a truck, the SelfLifter foot must be placed above a deck cross member above the chassis rail.

Trailers designed for operation in conjunction with Sideloaders have strong pads designed to take the weight of the feet of SelfLifters. For most other trailers or trucks, the decks will not be strong. Only the exposed chassis rails of trailers can be assumed strong enough to take the weight of loaded containers.

If a SelfLifter foot is to be put on the ground beside a trailer truck or wagon, manoeuvre the foot to get it as far under the vehicle as possible. Remember that side guards, fuel or air tanks are easily damaged so move the legs very slowly when they are close to the vehicle.

When the legs are not fully extended consult the Safe Working Load diagram prior to lifting a loaded container.