SERVICE SUPPLEMENT

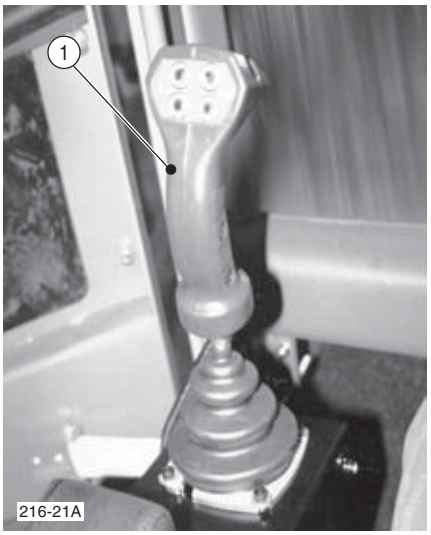
Tigercat® 853T/860T LEVELLER

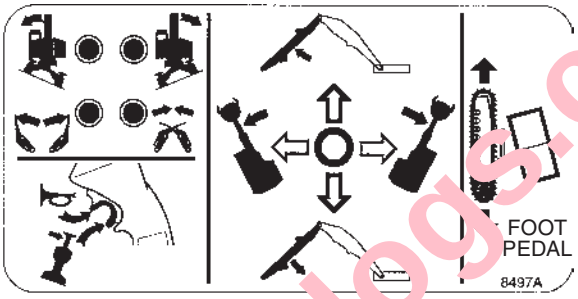
OCT. 99

SERIAL NUMBERS 853T393, 853T439, 853T448, 860T508

CONTENTS

CONTROLS - CAB





1. L.H. JOYSTICK CONTROL LEVER

Stick
Move the joystick BACK to move the stick IN.

Move the joystick FORWARD to move the stick OUT.

Swing
Move the joystick RIGHT to swing the upper to the RIGHT.

Move the joystick LEFT to swing the upper to the LEFT.

Thumb switch, lower left - Accumulating Arms
Push to OPEN the arms.

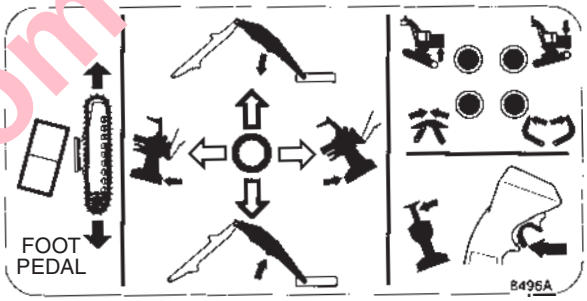
Thumb switch, lower right - Accumulating Arms
Push to CLOSE the arms.

Thumb switch, upper left - Tilt left
Push to tilt leveller to the left.

Thumb switch, upper right - Tilt right
Push to tilt leveller to the right.

Trigger switch down, Wrist
Pull the trigger switch down to rotate the wrist to the RIGHT.

Trigger switch up, Horn
Pull the trigger switch up to sound the horn.



2. R.H. JOYSTICK CONTROL LEVER

Main boom
Move the joystick BACK to RAISE the boom.

Move the joystick FORWARD to LOWER the boom.

Head Tilt
Move the joystick RIGHT to tilt the felling head FORWARD.

Move the joystick LEFT to tilt the felling head BACK.

Thumb switch, lower left - Clamp Arms
Push to CLOSE the arms.

Thumb switch, lower right - Clamp Arms
Push to OPEN the arms.

Thumb switch, upper left - Tilt Fore
Push to tilt leveller forward.

Thumb switch, upper right - Tilt Aft
Push to tilt leveller backward.

Trigger switch - Wrist
Pull the trigger switch to rotate the wrist to the LEFT.

IMPORTANT
This manual is applicable to factory installed machine functions and controls. It does not take into account any changes or modifications made after shipment. Verify all functions before operating this machine.

LEVELLER

The leveller circuit is controlled by a solenoid operated pilot valve and pilot operated levelling control valves.

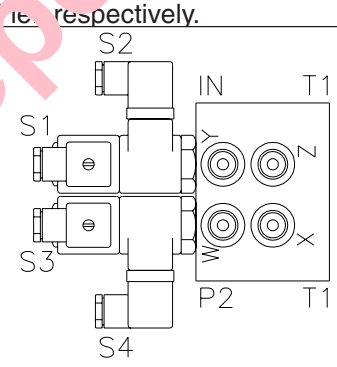
NOTE: All tilt directions (left, right, forward and backward) in this manual refer to direction of tilt when the operator is facing the front of the machine (toward the idler).

LEVELLING SOLENOID PILOT VALVE

The levelling solenoid pilot valve consists of an aluminium manifold which houses two solenoid operated directional valves. Pilot port 'P2' is connected to the pilot manifold which supplies pilot oil to the two internal solenoid operated pilot valves. Port 'T1' is a tank return line. Ports 'W', 'X', 'Y' and 'Z' supply oil at system pressure to the pilot operated levelling control valve. The levelling solenoid valve is mounted off of the pilot filter bracket on 853E levellers and on the plate between the linde valve and the radiator on 860 levellers.

OPERATING DESCRIPTION

When the forward tilt thumb switch is pushed solenoid 'S1' is energized and opens port 'Y' which supplies oil to the pilot operated fore/aft levelling control valve section. The forward tilt spool is shifted and oil is supplied to the fore/aft tilt cylinders causing the leveller to tilt forward. Solenoids 'S2', 'S3' and 'S4' operate in the same manner as 'S1' described above, opening ports 'Z', 'W', and 'X' causing the leveller to tilt back, right and left respectively.



845B-14 **LEVELLING SOLENOID PILOT VALVE**

CONTROL VALVE - WRIST/ CLAMP/ ACCUMULATOR/SAW/TILT

The levelling control valve sections, located above the Linde main valve bank, are part of the wrist/ clamp/saw/accumulator/tilt control valve. The wrist/clamp/saw/accumulator/tilt control valve consists of six open center spool sections, an end inlet section, a mid inlet section and an outlet section. The end inlet section supplies a single spool which is used for the saw function. The mid inlet section supplies the remaining five spools which are used to control the wrist, clamp, accumulator, side tilt and fore/aft tilt functions. Each spool is pilot operated. The outlet section is common to all six spool sections and returns oil to hydraulic tank via the oil cooler.

OPERATING DESCRIPTION
LEVELLER FUNCTION

Oil (system pressure) enters the mid inlet section of the control valve. When the spools are centred (at rest) the oil is allowed to pass through the spool sections (wrist, clamp, accumulator, side tilt, fore/aft tilt) into a common tank passage and back to tank via the outlet section.

Each levelling spool (fore/aft tilt and side tilt) has a self centering 3-position spool which is open centred. A spring in the spool end cap holds the spool in the centre neutral position.

The spool is shifted by pilot pressure being applied to one end of the spool from the levelling solenoid pilot valve. Shifting the spool directs oil (system pressure) from the wrist/clamp/ accumulator pump to the levelling cylinders via one of two counterbalance valves.

To prevent over pressurizing of the operating circuits, each work port in the valve sections has a PORT RELIEF VALVE. The MAIN RELIEF VALVE installed in the mid inlet section of the control valve is set lower than the PORT RELIEF VALVES.

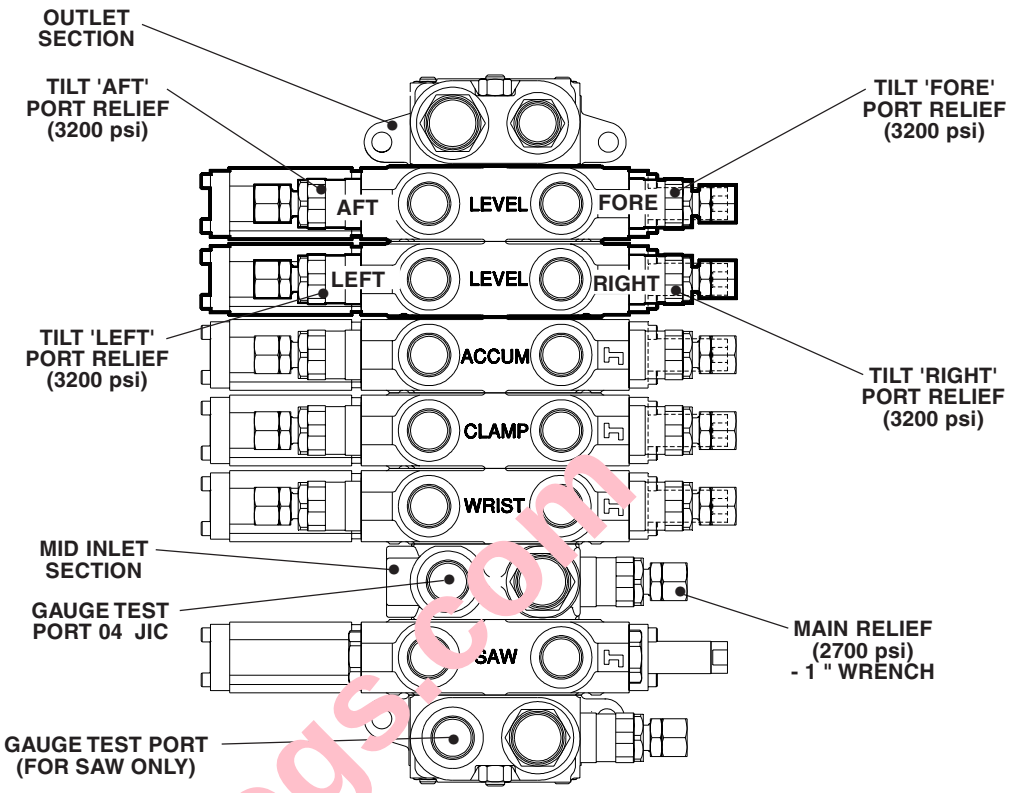
The relief valves divert oil to tank via the tank passages in the spool sections and the outlet section. They also function as an anti-cavitation valve.

For a detailed description of the relief valves, refer to RELIEF VALVES in the MACHINE SERVICE MANUAL.

COUNTERBALANCE VALVE

There are two counterbalance valves. The fore/aft tilt counterbalance valve is mounted at the rear of the intermediate pivot. The side tilt counterbalance valve is mounted at the front to the undercarriage assembly. Each counterbalance valve consists of a two cavity 90 degree cross piloted steel body and two adjustable pilot operated counterbalance valves.

The purpose of each counterbalance valve is to act as a cross line relief which provides load holding and helps prevent hydraulic hose failure. In addition the counterbalance valves provide more precise control of levelling stability by minimizing creep.

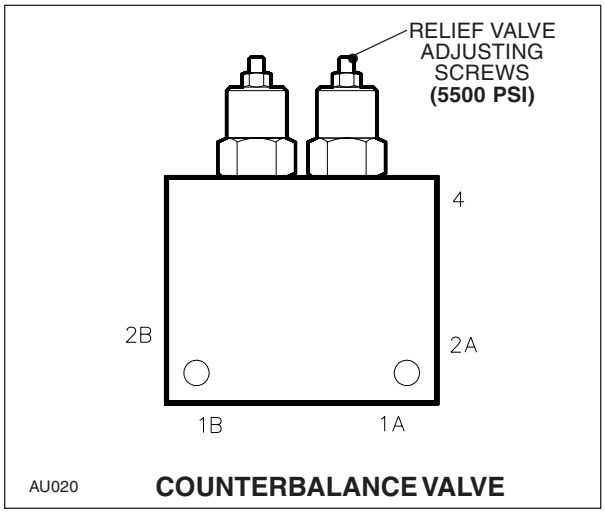


860-22 **CONTROL VALVE - WRIST/CLAMP/ACCUMULATOR/SAW/TILT VALVE**

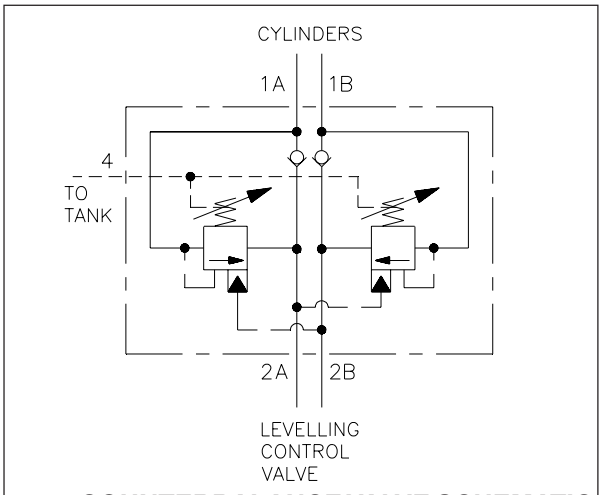
OPERATING DESCRIPTION

To tilt to the right oil from the side tilt levelling control valve passes into port '2A' through an internal check valve and out port '1A' of the side tilt counterbalance valve and is directed to the rod end of the right hand cylinder and the base end of the left hand cylinder. To tilt to the left oil from the side tilt levelling control valve passes into port '2B' through an internal check valve and out port '1B' of the side tilt counterbalance valve and is directed to the rod end of the left hand cylinder and the base end of the right hand cylinder.

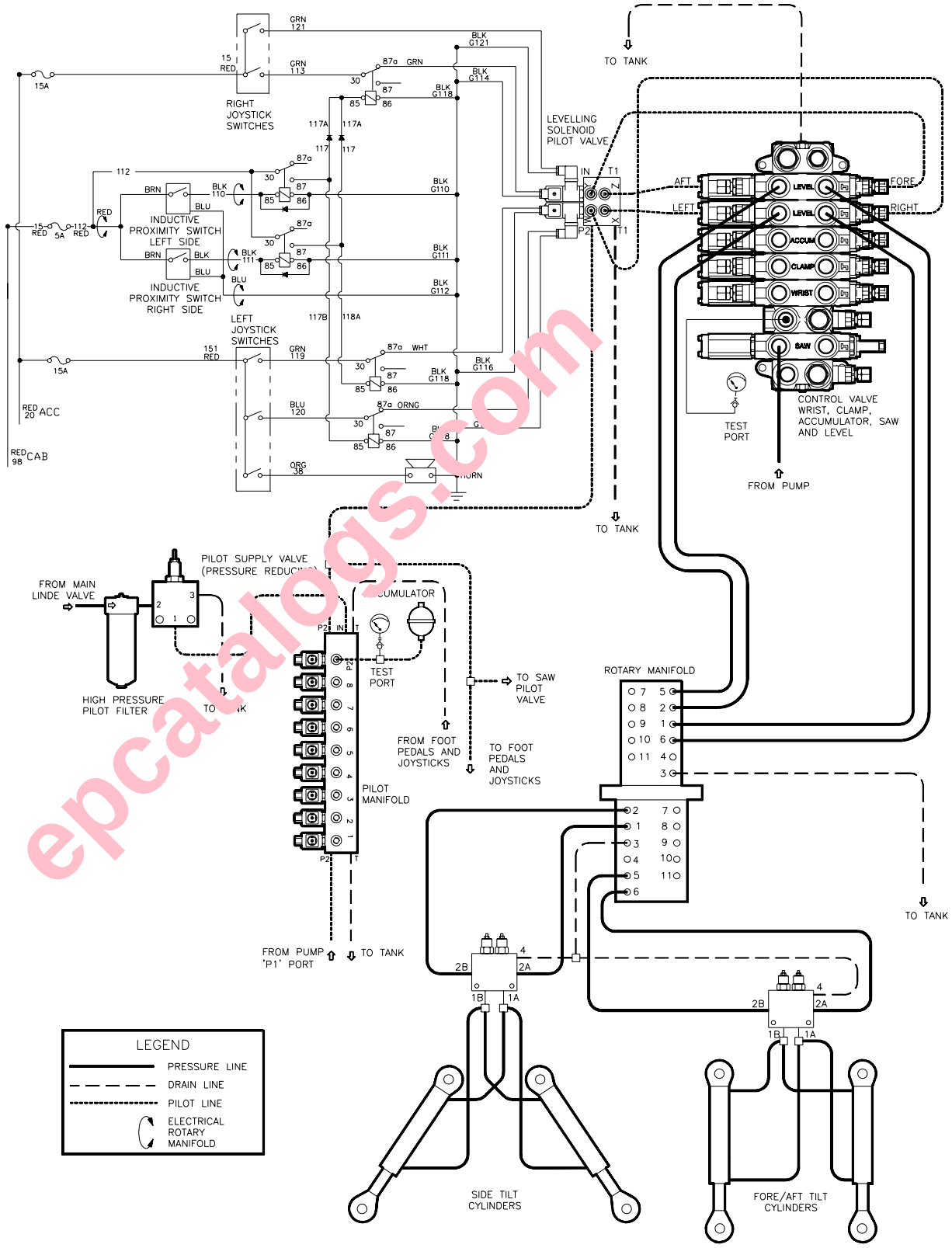
To tilt forward oil from the fore/aft tilt levelling control valve passes into port '2A' through an internal check valve and out port '1A' of the fore/aft tilt counterbalance valve and is directed to the rod end of the fore/aft levelling cylinders. To tilt backward oil passes into port '2B' through an internal check valve and out port '1B' and is directed to the base end of the fore/aft levelling cylinders.



AU020 **COUNTERBALANCE VALVE**



845B-16 **COUNTERBALANCE VALVE SCHEMATIC**



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LEVELLING CIRCUIT DIAGRAM