



GLOBAL CRANE TRAINING

AC200-1 OPERATION

Outriggers



Outriggers Content



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Outriggers

Notes on Outriggers:

Always observe the following information, in order to ensure safe working:

– Before stabilizing:

Main boom in longitudinal direction; superstructure locked in transport position.

- Only rotate the superstructure if the crane is stabilized on outriggers.
- Before taking up the load, always support the crane on outriggers.
- During the stabilizing procedure the outrigger pads need some space for shifting movements to the sides.
- Always extend the outrigger struts up to the corresponding pinning position (color or arrow marking) and pin.
- For reasons of safety, the outrigger struts can only be extended on the same side as the corresponding switch panel.

The crane operator can thus only extend outrigger struts which he can observe continuously. The outrigger struts on one side can be activated at the same time.

Caution: risk of crushing and collision when the outrigger struts are driven at the same time!

The outrigger cylinders on the opposite, non-visible side must be activated for leveling (see relevant section).

In order to avoid risk of crushing, the crane operator may only drive an outrigger cylinder until the outrigger plate is positioned on the ground when he can directly observe an outrigger cylinder. This means that he may only drive an outrigger cylinder if he is on the side where the relevant cylinder is. However, before extending the outrigger cylinder further for supporting on outriggers or for leveling from one side he must make sure that there is no further risk of crushing or collision. If necessary, the crane operator must assign a banks man.

- Always keep both switch panels locked.

Only the switch panel that is needed directly for operating may be opened.

To prevent misuse, it must be closed again immediately afterwards.

- After being put on outriggers (before beginning work with the crane), the tires must no longer touch the ground.
- Make sure the ground is even and capable of carrying the load before setting down the outrigger plates! No foreign material (for example: stones, metal objects, etc.) are permitted under the outrigger plates! The max. surface pressure with standard outrigger plates:
 - Outrigger plate, front \varnothing 600 mm (23.6 in)
Surface pressure approx. 295 N/cm² (428 lbs/ in²)
Outrigger force 834 kN (85 t / 187.4 kip)
 - Outrigger plate, rear \varnothing 700 mm (27.6 in)
Surface pressure approx. 255 N/cm² (370 lbs/ in²)
Outrigger force 981 kN (100 t / 220.5 kip)The surface may only be tilted by a maximum of 5° (9%).
- Where there is insufficient load bearing capacity the soil pressure in the area of the outrigger plate must be reduced using rigid underlay plates (mats).
- The maximum permitted support forces must be observed.
- Only level the crane with counterweight and fitted equipment by extending the vertical support cylinders.
- In order to protect the supporting cylinders from overloading, they must not be extended to the limit; there must always be a remaining lift of 2 to 3 cm (0.8 to 1.2 in) after leveling. The remaining lift is also necessary, so that actual support pressure values can be displayed.



Extending and retracting the supports with a load attached is not permitted. Risk of tipping!

In order to avoid damage to the outriggers as well as accidents in the course of driving or operating the crane, take special care to do the following:

- Unlock the supports before they are extended or retracted.**
- Pin / secure the supports for work with the crane.**
- Pinning / locking of the (retracted) struts in transport position.**
- Secure the outrigger pads in transport position**

There is a danger of accidents, if the prescribed outrigger support area, specified in the load capacity table, is not used.

No other outrigger support area is permitted – HIGH RISK OF DAMAGE !

Notes on Leveling with Counterweight

Before attaching the counterweight, the crane must be on outriggers and leveled.

After attaching the counterweight, the crane must be re leveled in the range of 360 (in steps of 90°) .

Starting position:

- Crane on outriggers; outrigger basis depending on required configuration state.**
- Superstructure position 180 degrees = main boom to the rear.**

Procedure for leveling with counterweight:

1. Check the supporting forces at the support pressure display on the crane chassis (see "Support pressure display").

Make sure that the supporting forces are symmetrically balanced (left / right).

2. By adjusting the inclination of the main boom or by extending telescope 1, distribute the load moment of the counterweight in such a way, that the outrigger pressure on all 4 supports is roughly identical.

3. Check the leveling of the crane, if necessary repeat the procedure (see "Checking the leveling of the chassis").

Risk of accidents!

- The leveling can be done by extending or retracting the supporting cylinders, up to a maximum supporting force of 50 t (110 kip).**
- If the supporting force of one of the 4 supports exceeds 50 t (110 kip), then the leveling procedure may only be carried out by extending the supporting cylinders (no longer by retraction).**

However, this is only possible, if the supporting force of the support to be extracted does not exceed 50 t (110 kip).

Therefore the support force must be distributed by slightly adjusting / turning the superstructure / main boom / equipment.

4. Rotate superstructure by 180° .
5. Repeat steps 2 and 3.



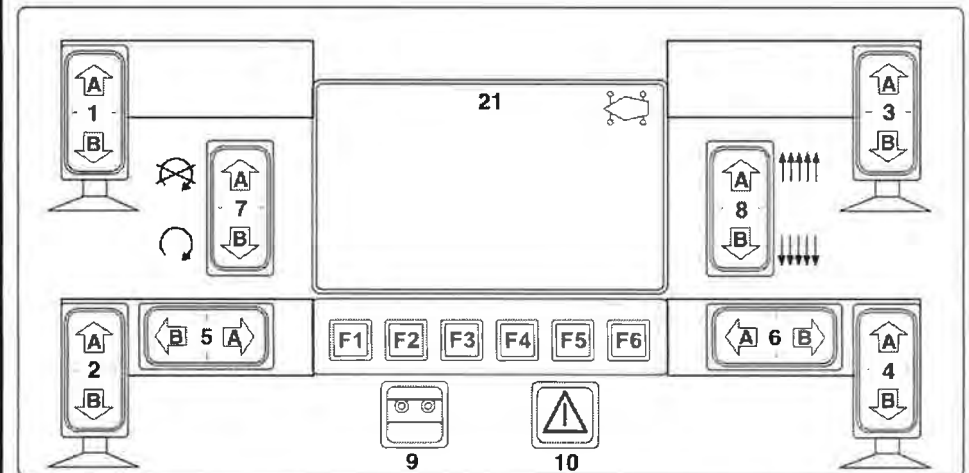
Arrangement of Outrigger Controls

Outrigger controls are located on the chassis to the left and right (in the direction of travel).

Switch panel left side

Pos. Function

- 1 Rocker switch "outrigger cylinder front right"
 - 1A: Retracting
 - 1B: Extending
 - 2 Rocker switch "outrigger cylinder front left"
 - 2A: Retracting
 - 2B: Extending
 - 3 Rocker switch "Supporting cylinder, back right "
 - 3A: Retracting
 - 3B: Extending
 - 4 Rocker switch "Supporting cylinder, back left"
 - 4A: Retracting
 - 4B: Extending
 - 5 Rocker switch "outrigger strut front left"
 - 5A: Retracting
 - 5B: Extending
 - 6 Rocker switch "outrigger strut rear left"
 - 6A: Retracting
 - 6B: Extending
 - 7 Rocker switch "engine start/engine stop"
 - 7A: Engine stop
 - 7B: Engine start
 - 8 Self return rocker switch "all outrigger cylinders together"
 - 8A: Retracting
 - 8B: Extending
 - 8B with key 10: Level automatically
 - 9 Button "raise all axles"
 - 10 Button "caution" (safety key)
 - 1.) "Boot data bus" (hold pressed approx. 5 sec.)
 - 2.) forwards / with button (7B) "engine start"
 - 3.) forwards / with button (8B) with "automatic leveling"
 - 21 Display with crane symbol left-hand side
- The symbol on the push buttons always determines the function of the outrigger cylinder.*

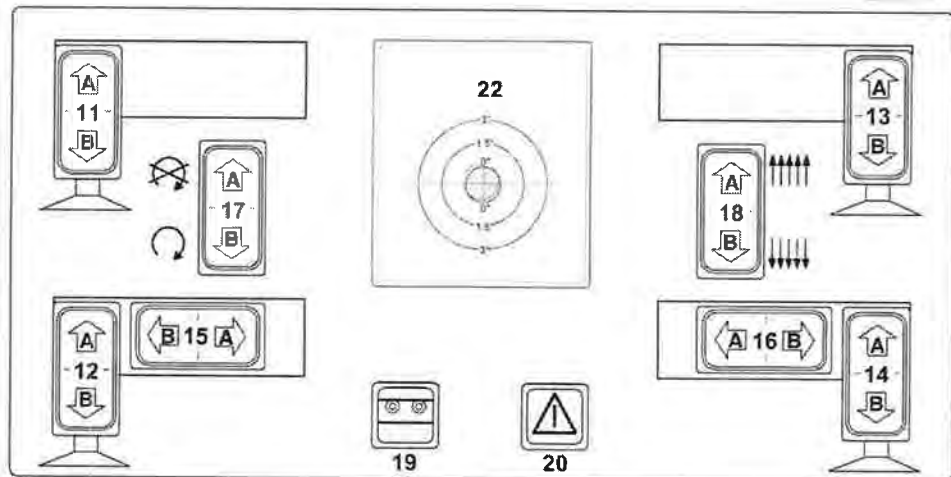


Switch panel right side:

Pos. Function

- 11 Rocker switch "Supporting cylinder, back left"
 - 11A: Retracting
 - 11B: Extending
- 12 Rocker switch "Supporting cylinder, back right"
 - 12A: Retracting
 - 12B: Extending
- 13 Rocker switch "outrigger cylinder front left"
 - 13A: Retracting
 - 13B: Extending
- 14 Rocker switch "outrigger cylinder front right"
 - 14A: Retracting
 - 14B: Extending
- 15 Rocker switch "outrigger strut back right"
 - 15A: Retracting
 - 15B: Extending
- 16 Rocker switch "outrigger strut front right"
 - 16A: Retracting
 - 16B: Extending
- 17 Rocker switch "engine start/engine stop"
 - 17A: **Engine stop**
 - 17B: **Engine start**
- 18 Rocker switch "Supporting cylinders together"
 - 18A: Retracting
 - 18B: Extending
 - 18B with key 20: Level automatically
- 19 Button "raise all axles"
- 20 Button "caution" (safety key)
 - 1.) "Boot data bus" (hold pressed approx. 5 sec.)
 - 2.) forwards / with button (17B) "engine start"
 - 3.) forwards / with button (18B) for "automatic leveling"
- 22 Level

The symbol on the push buttons always determines the function of the outrigger cylinder.



Information System for the Outrigger Controls

The information is shown on the display of the outrigger controls (left on the chassis).

The system on the left vehicle side is described and illustrated as an example (crane symbol "P" to the left).

The system consists of the display (21) and the function keys F1 – F6.

Legend:

(K) Function keys F1 – F6

F1 = Contrast

F2 = Brightness

F3 = Inverting

F4 = Support position for outrigger support area display (optional)

F5 = Inclination

F6 = Support Forces

(L) Symbols for the function keys

(M) Support forces at the front struts (and support position

for the outrigger support area display (optional))

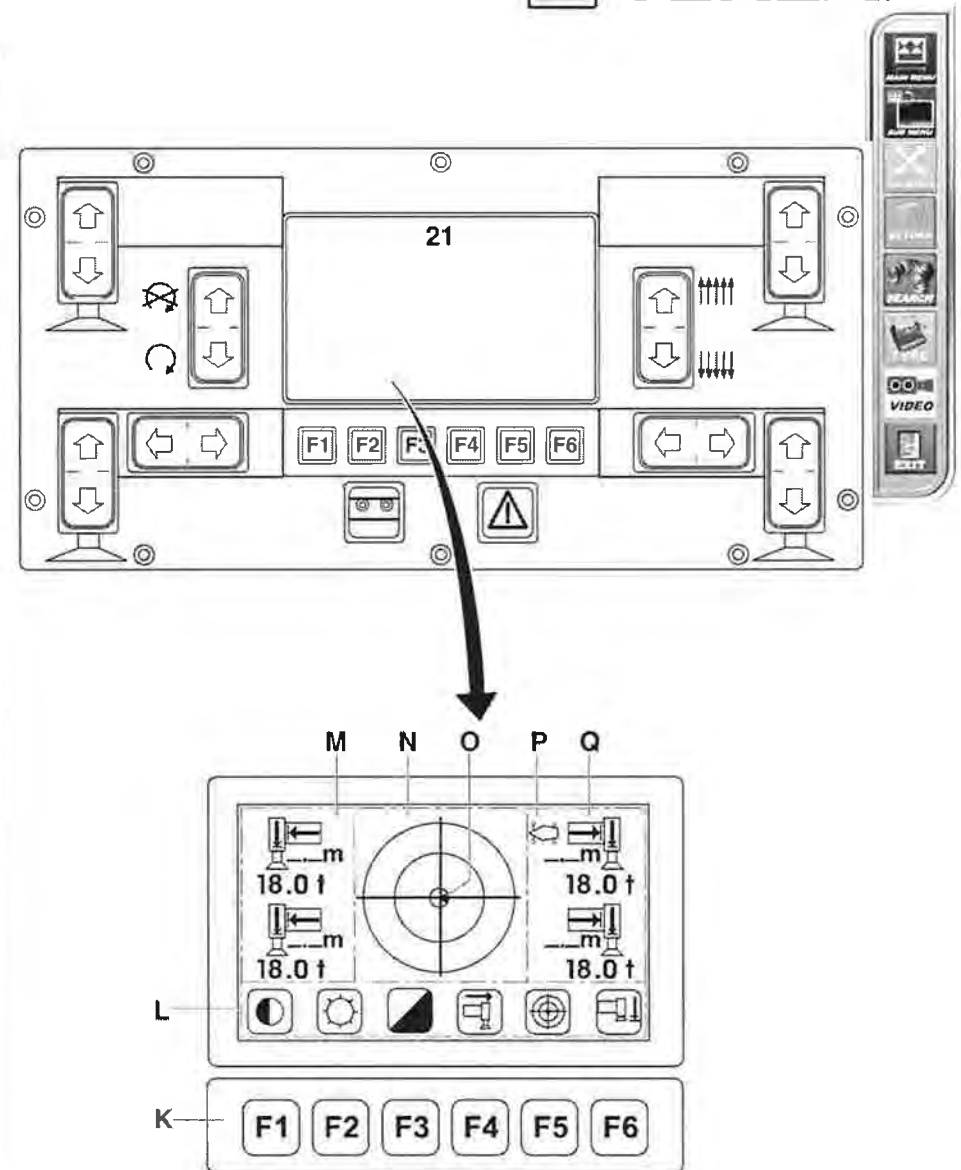
(N) Level

(O) Electronic level

(P) Crane symbol

(Q) Support forces at the rear struts (and support position

for the outrigger support area display (optional))
 If the crane is not equipped with the optional outrigger support area display, the corresponding space in the display is free.



Indicators on the Display

Diagram "A": (Level, support force, support position (optional))

- Basic display with electronic level indicator / bubble and indication of supporting force.

When the supporting cylinders are operated, the moving direction is displayed in the form of an arrow, as well as the supports, indicated as symbols.

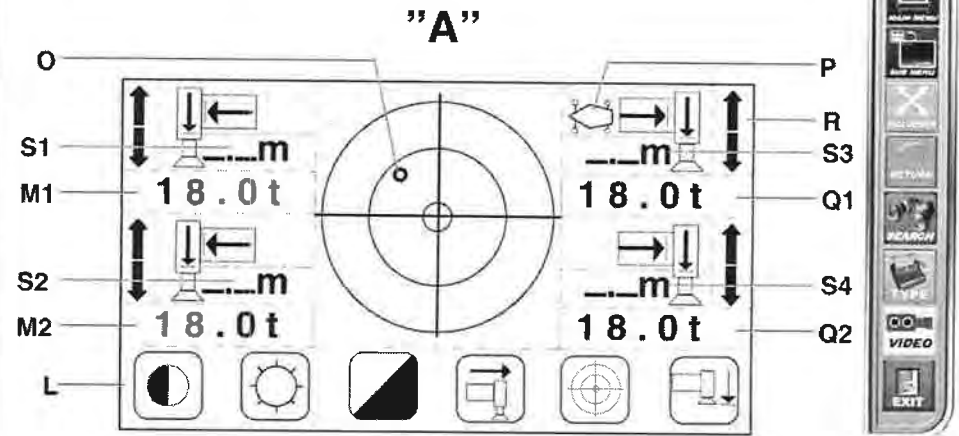


Diagram "A": (Level, support force, support position (optional))

Diagram "B" (Inclination)

Legend:

(L) Symbols for the function keys

L1 = Exiting the display

L6 = Adjustment, menu assisted (results in diagram "F")

(M) Support forces on the front struts

M1 = Support force front right

M2 = Support force front left

(N) Level

(O) Electronic level

(P) Crane symbol

(Q) Support forces on the rear struts

Q1 = Support force rear right

Q2 = Support force rear left

(R) Retraction / extension movement of the outrigger cylinders

(S) Support position for outrigger support area display (optional)

S1 = Support position, front right

S2 = Support position, front left

S3 = Support position, rear right

S4 = Support position, rear left

If the crane is not equipped with the optional outrigger support area display, the corresponding space in the display is free.

(X) Tilt across the driving direction

(Y) Tilt in the driving direction

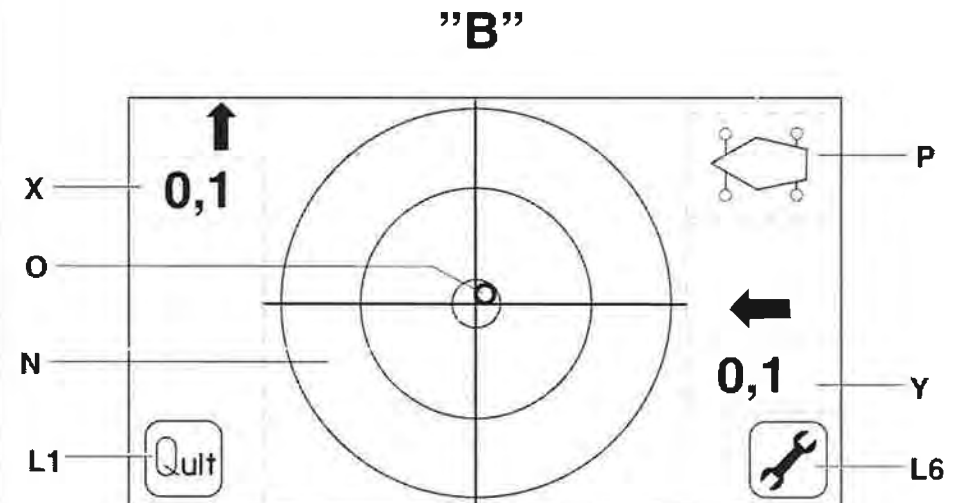
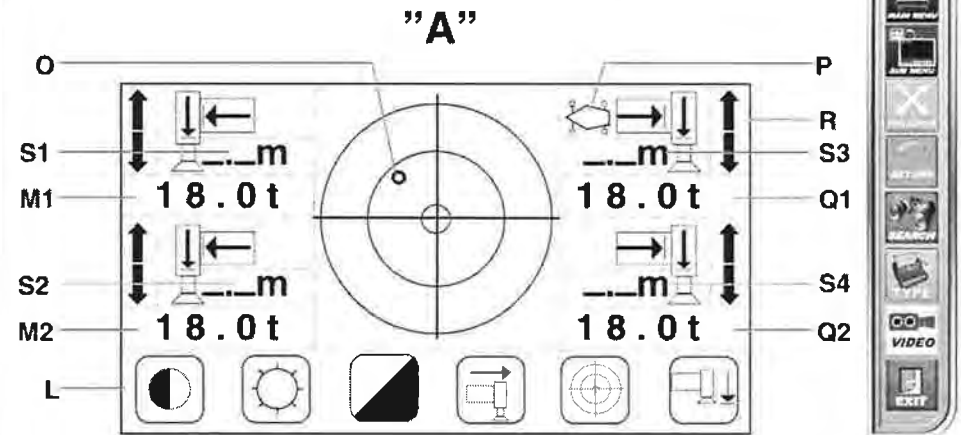


Diagram "C" (supporting force)

Diagram "D" (Support position of the strut, menu assisted)

(optional)

Legend:

(L) Symbols for the function keys

L1 = Exiting the display

L4 = Support force (results in diagram "D")

L6 = Support position of the strut, menu assisted (optional) (leads to depiction "C")

(M) Support forces on the front struts

M1 = Support force front right

M2 = Support force front left

(P) Crane symbol

(Q) Support forces on the rear struts

Q1 = Support force rear right

Q2 = Support force rear left

(S) Support position of the strut, menu assisted

S1 = Support position, front right

S2 = Support position, front left

S3 = Support position, rear right

S4 = Support position, rear left

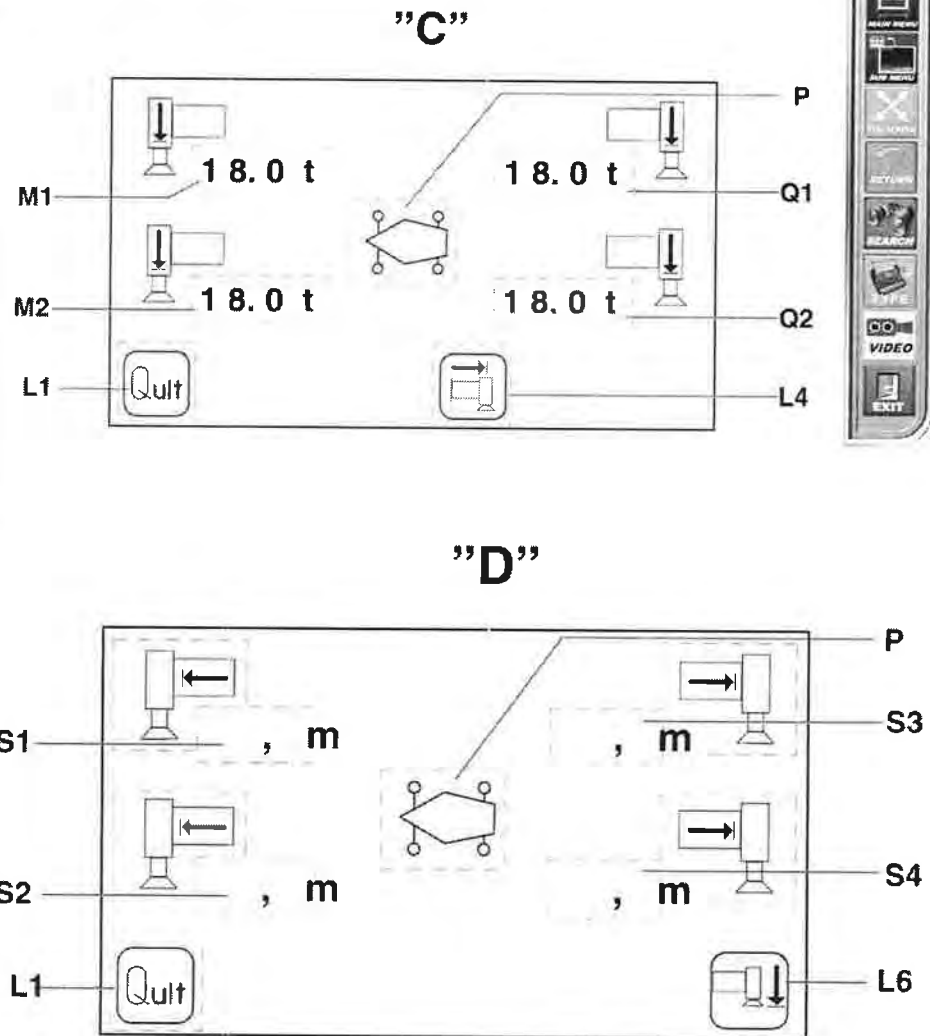


Diagram "E" (contrast), menu assisted

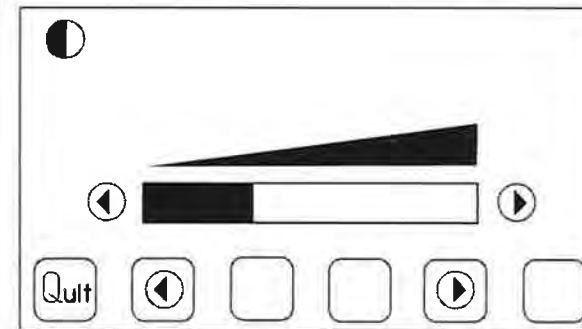
Modify contrast:

- Key F2 = darker
- Key F5 = lighter
- Key F1 (Exit) leads to view "A" (level and support force)

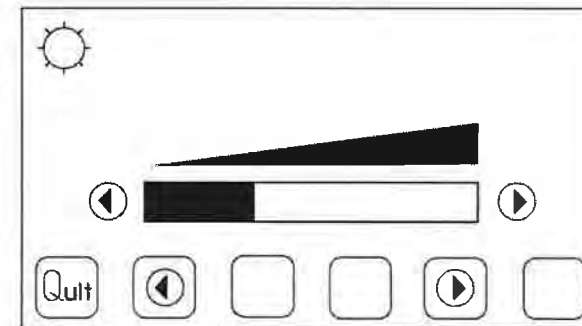
Diagram "F" (brightness), menu assisted

Modify brightness:

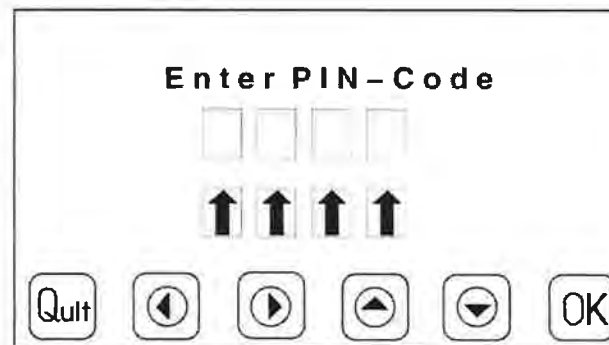
- Key F2 = darker (corresponding bar display)
- Key F5 = lighter (corresponding bar display)
- Key F1 (Exit) leads to view "A" (level and support force)

Diagram "G" (coding; only for service)


"E"



"F"



"G"



Functions

Starting position:

- Crane parked in transport position
- parking brake applied
- Ignition switch in position "0" (external start standby)

"Boot" data bus:

Press key "caution" (10 / 20) approx. 5 secs.

External engine start:

Press key "caution" (10 / 20) before / with key "engine start" (7B / 17B) until the engine is running.

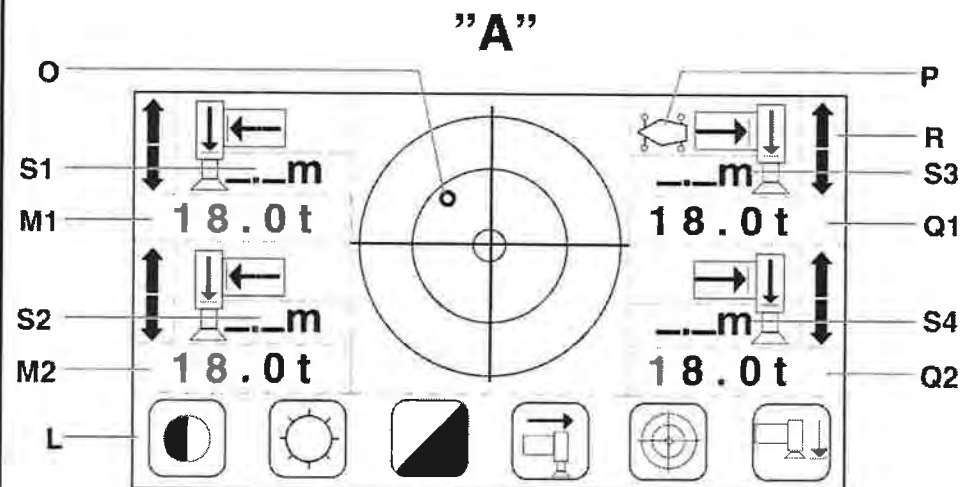
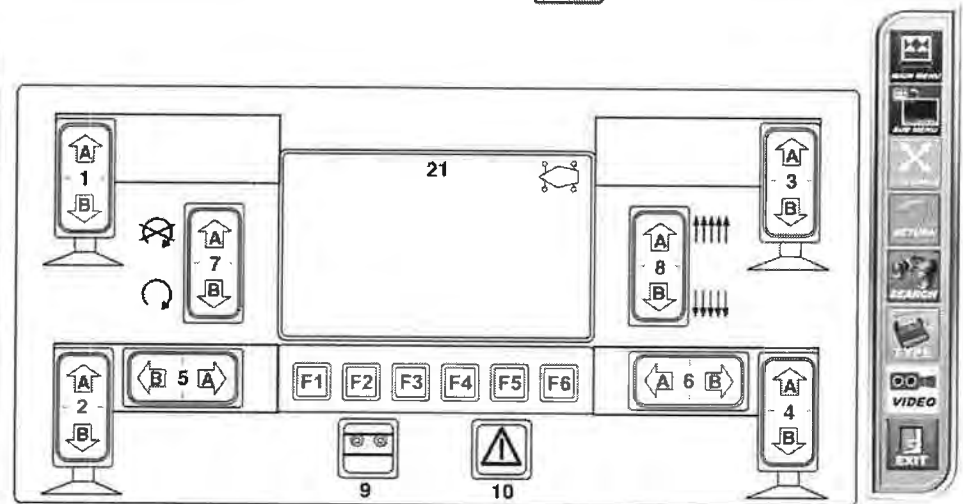
External engine stop:

"Caution" key (10 / 20) ahead / press "Engine stop" key (7A / 17A)

and hold until engine has stopped.

Modify contrast:

- Call up diagram "A"
- Key F1 = diagram "E" (contrast)
- Key F2 = darker
- Key F5 = lighter
- Key F1 = Quit, back to diagram "A"



Modify brightness:

- Call up diagram "A"
- Key F2 = diagram "F" (brightness)
- Key F2 = darker (corresponding bar display)
- Key F5 = lighter (corresponding bar display)
- Key F1 = Quit, back to diagram "A"

Inverting

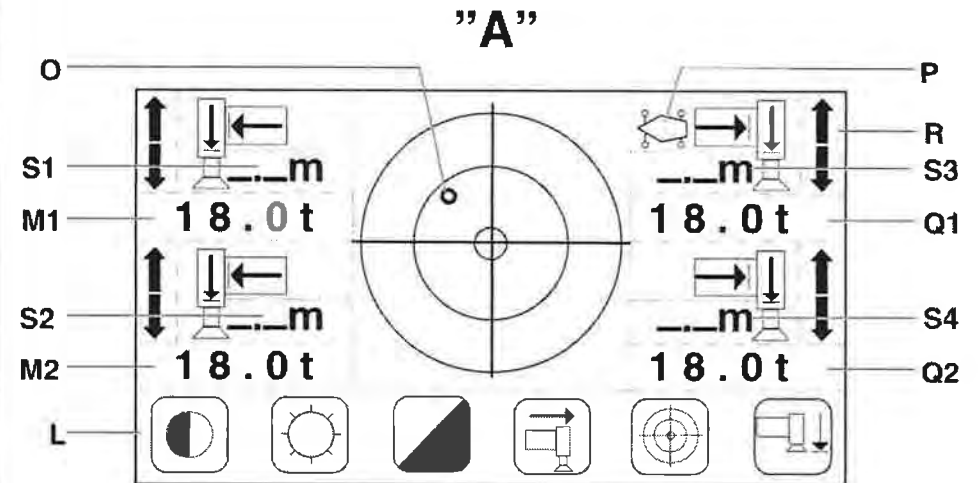
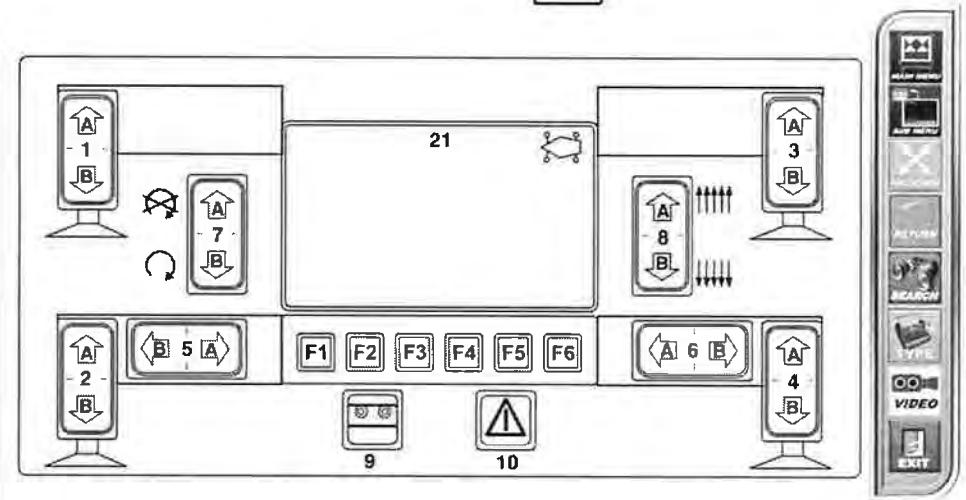
- Call up diagram "A"
- Key F3 = Inverting

Inclination indicator

- Call up diagram "A"
- Key F5 = diagram "B" (inclination)
- Key F1 = Quit, back to diagram "A"

Support pressure display

- Call up diagram "A"
- Key F6 = diagram "C" (supporting force)
- Key F1 = Quit, back to diagram "A"



Support Pressure Display

The support force is determined by pressure contacts in the four outrigger cylinders and shown in the outrigger control display.

Monitor the supporting forces at every support procedure with the help of the support pressure display.

"Boot" data bus:

Press key "caution" (10 / 20) approx. 5 secs.

Displaying supporting force:

- Call up diagram "A"
- Key F6 = diagram "C" (supporting force)
- Key F1 (L1) = Quit, back to diagram "A"

The following supporting force values must not be exceeded:

85 tons (187.4 kip) at the front supporting cylinders.

100 tons (220.5 kip) at the rear supporting cylinders.

Important note on complying with limit values:

The limit values to be followed are not monitored automatically.

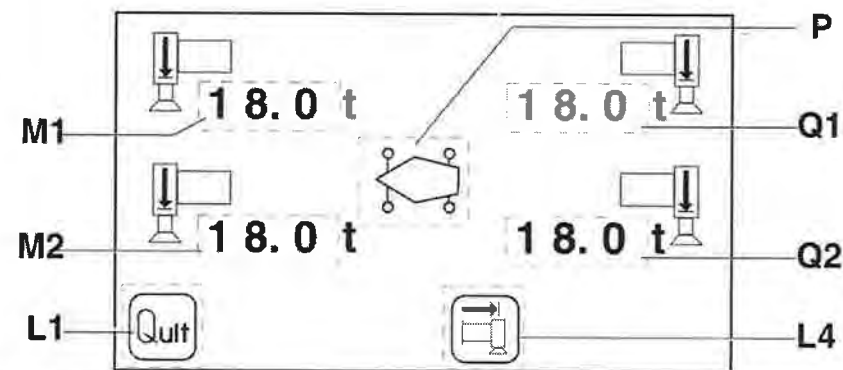
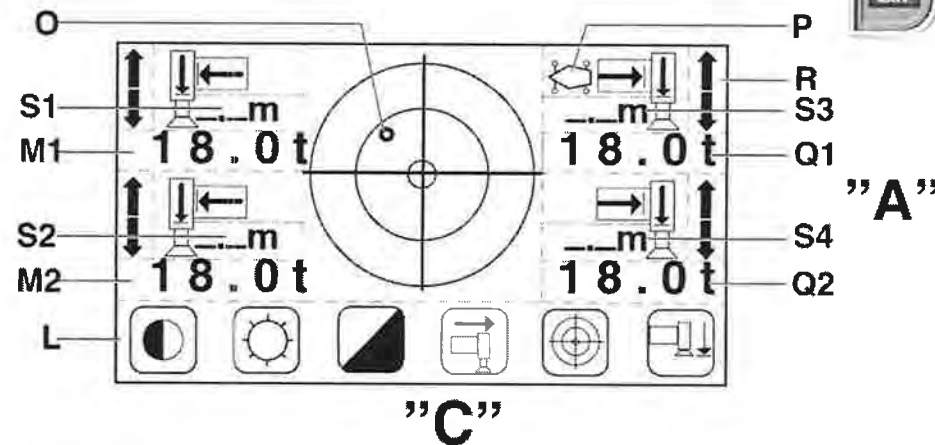
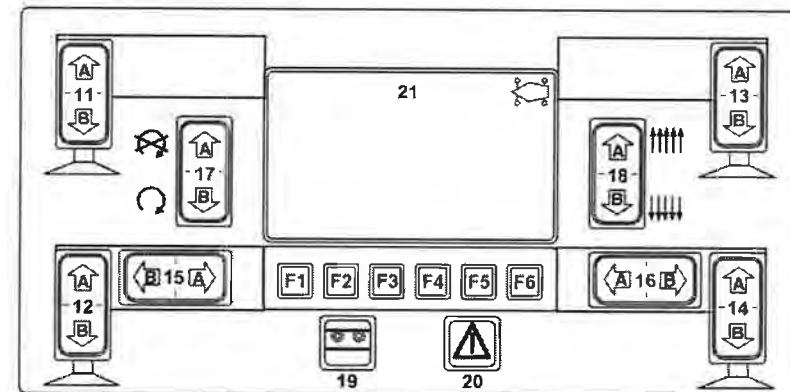
The support pressure display shows tolerance values.

The

display value can differ from the actual value by up to approx. 10% (plus / minus).

Keep this in mind, e.g. in relation with limited load-carrying capacity of the ground.

While the crane is in operation, the support pressure display is supplied with power from the superstructure via an electrical swiveling connection.



Inclination Indicator

The inclination of the crane is detected by an electronic inclination transmitter and displayed at the switch panels of the outrigger controls on the chassis.

The display consists of an electronic level indicator / bubble and numerical values for the X and Y axes (one each).

Depending on the direction of a deviation, a negative value (with a minus before the value) can also be displayed.

The level is used for basic orientation; the numerical values are definitely the decisive values.

"Boot" data bus:

Press key "caution" (10 / 20) approx. 5 secs.

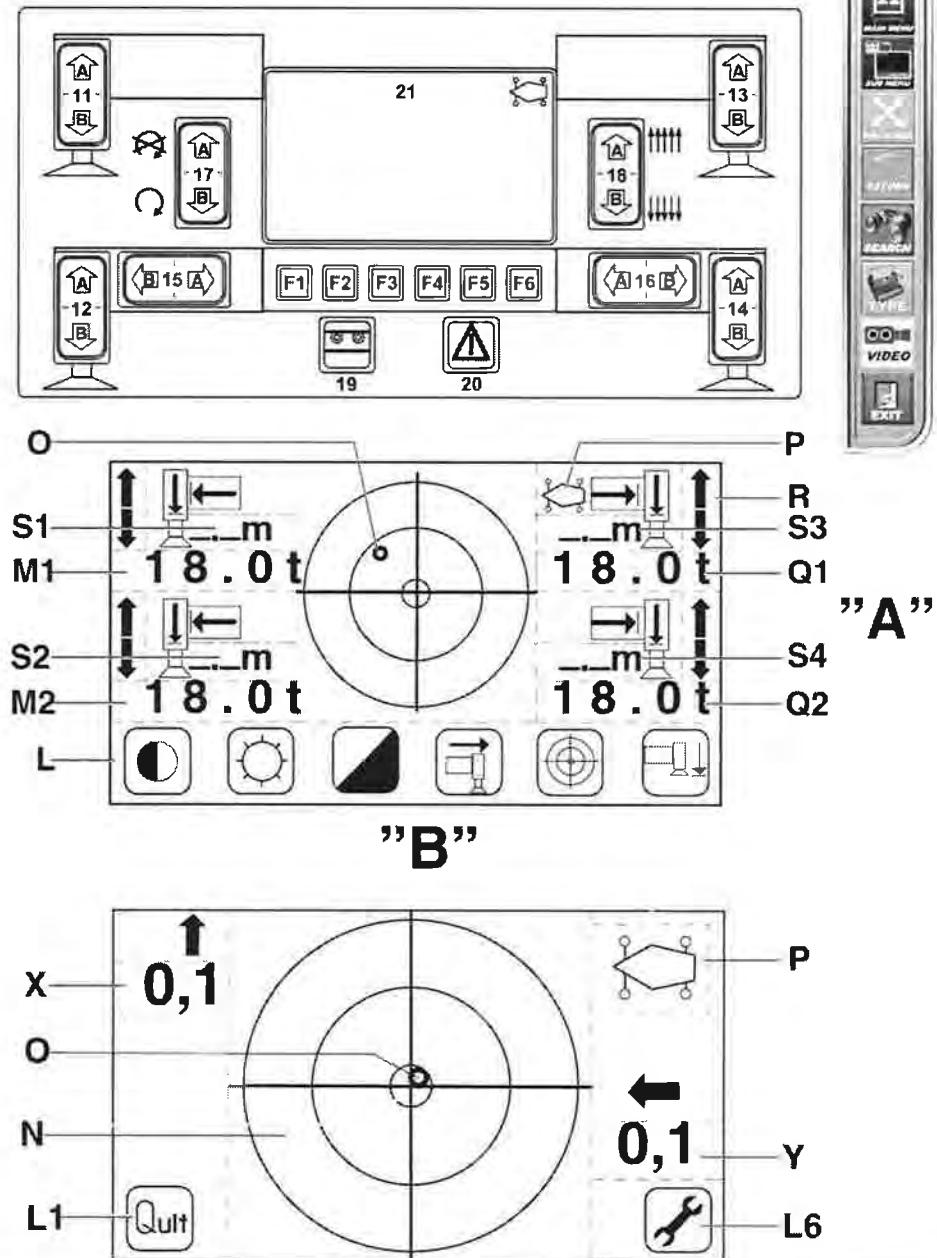
Display of inclination

- Call up diagram "A"
- Key F5 = diagram "B" (inclination)
- Key F1 (L1) = Quit, back to diagram "A"

The inclination indicator must be observed during the leveling procedure.

Deviations must not exceed 0.1 degrees (equivalent to approx. 0.2 %).

The numerical values X and Y are always decisive. They show the current deviation of the crane system.



Outrigger Support Area Display (Optional)

If the crane is equipped with an outrigger support area display, there is a length measuring device (1) fitted to each strut in order to determine the support position (outrigger width B) of each strut.

The values shown under S1 to S4 in the basic display "A" or the outrigger support area display "D" indicate the pinning position of the individual struts.

The strut length (L) is always the same in a crane with H-shaped outriggers (as in this type of crane).

Risk of overturning!

The support position of each strut is **ONLY** displayed. The value which corresponds to the support position is not passed on the LLD.

There are **NO** instructions and there is **NO** shutdown if the displayed outrigger support area does not correspond with the outrigger support area set in the IC-1.

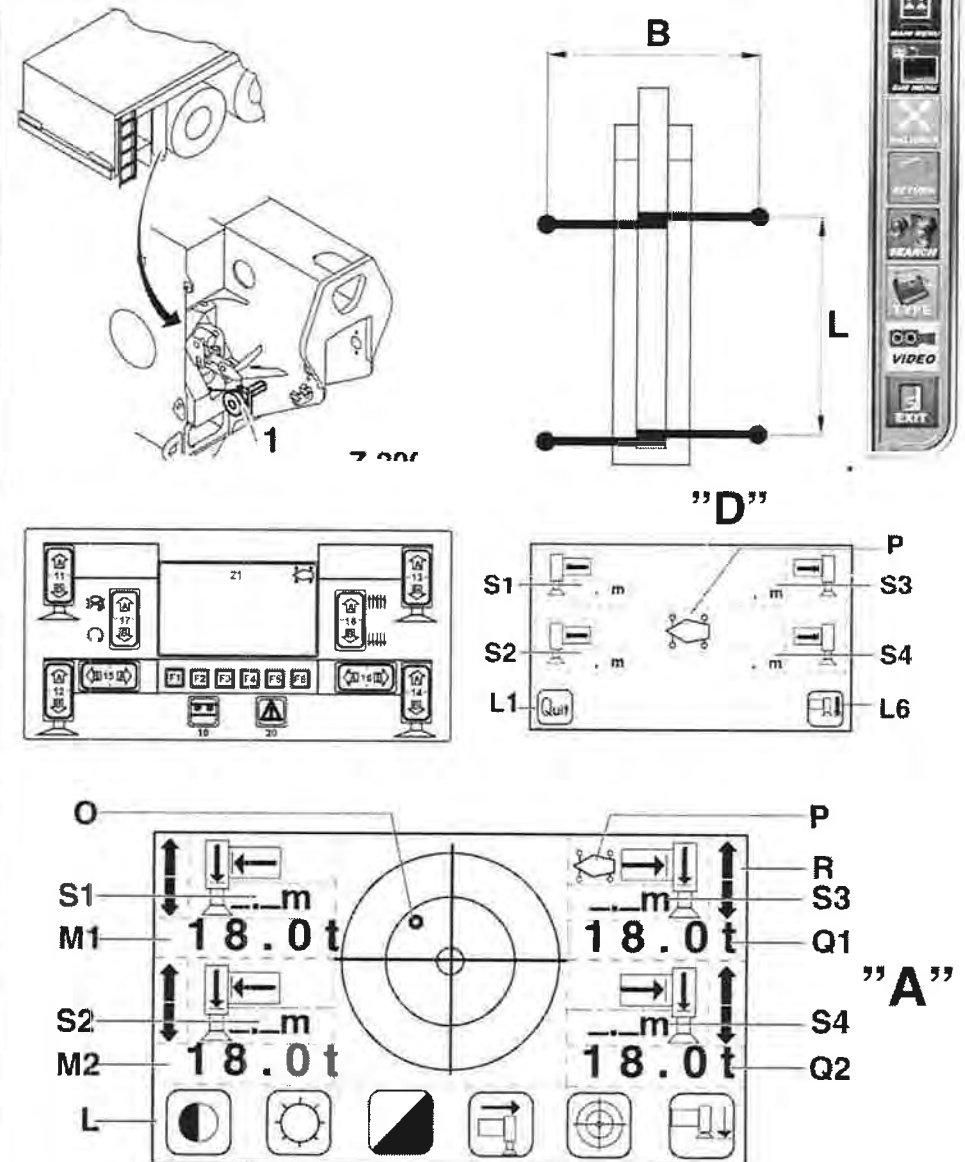
"Boot" data bus:

Press key "caution" (10 / 20) approx. 5 secs.

Show outrigger support area display:

- Call up diagram "A"
- Key F4 = Depiction "D" (strut width)
- Key F1 (L1)
- = Quit, back to diagram "A"

Observe the instructions and warnings on the outrigger support area display on the following page!



Instructions on display of the support position (S1 to S4):

– *The support position of the strut is only displayed if the current extension length of the outrigger strut corresponds with a permitted strut variant (8.2 m (26.9ft); 6.85 m (22.5 ft); 5.7 m (18.7 ft) and 2.8 m (9.2 ft)).*

If the outrigger strut is in a state of extension which does not correspond with any permitted strut variant, the number "0" appears at the corresponding strut.

– *For this crane type, two outrigger struts are moved within each other at each strut in order to achieve the required strut width.*

The correct position of both outrigger struts in relation to each other – dependent on the desired strut width – is described in the section "Strut variants" (section 12.9).

The optional length measuring device for the display of the support position only recognizes the strut's extension length.

The length measuring device does not recognize when both outrigger struts are in an "incorrect" position to each other or when the outrigger struts are not pinned to each other.

Risk of tilting and breaking!

The correct position of the outrigger struts in relation to each other must be observed, in particular with reduced outrigger support areas.

The optional "Outrigger support area display" does not recognize when the crane is supported on outriggers with a permitted strut width but both outrigger struts are not in the correct position in relation to each other.

If required, the correct support on outriggers must be monitored manually.

Risk of accidents!

The required insertion / pinning of the struts is not monitored and is the responsibility of the operating personnel.

The corresponding instructions in section 12 of the operating instructions of the crane chassis must be observed. The required insertion / pinning of the struts is not monitored and is the responsibility of the operating personnel.

The corresponding instructions in section 12 of the operating instructions of the crane chassis must be observed.



Automatic Leveling

The crane can also be leveled automatically (by extending the outrigger cylinders together). This is only possible when "Extending" cylinders.

It is of no importance for the function, in which starting position the supporting cylinders are.

Risk of crushing!

When leveling automatically, all supporting cylinders are extended simultaneously; that means also those cylinders that cannot be seen from the switch panel. It must be ensured that no one is in the hazardous area.

Starting position:

- Crane parked in transport position
- parking brake applied
- outrigger struts extended / pinned / locked (outrigger pads are fitted)
- display: Diagram "B" (inclination)

Steps for automatic leveling:

1. Press key "caution" (10 / 20) and key "extend all outrigger cylinders together" (8B / 18B) together.

Inverse display during "Automatic operation".

The engine runs at increased speeds so that the required pressure oil quantity is made available by the hydraulic pump.

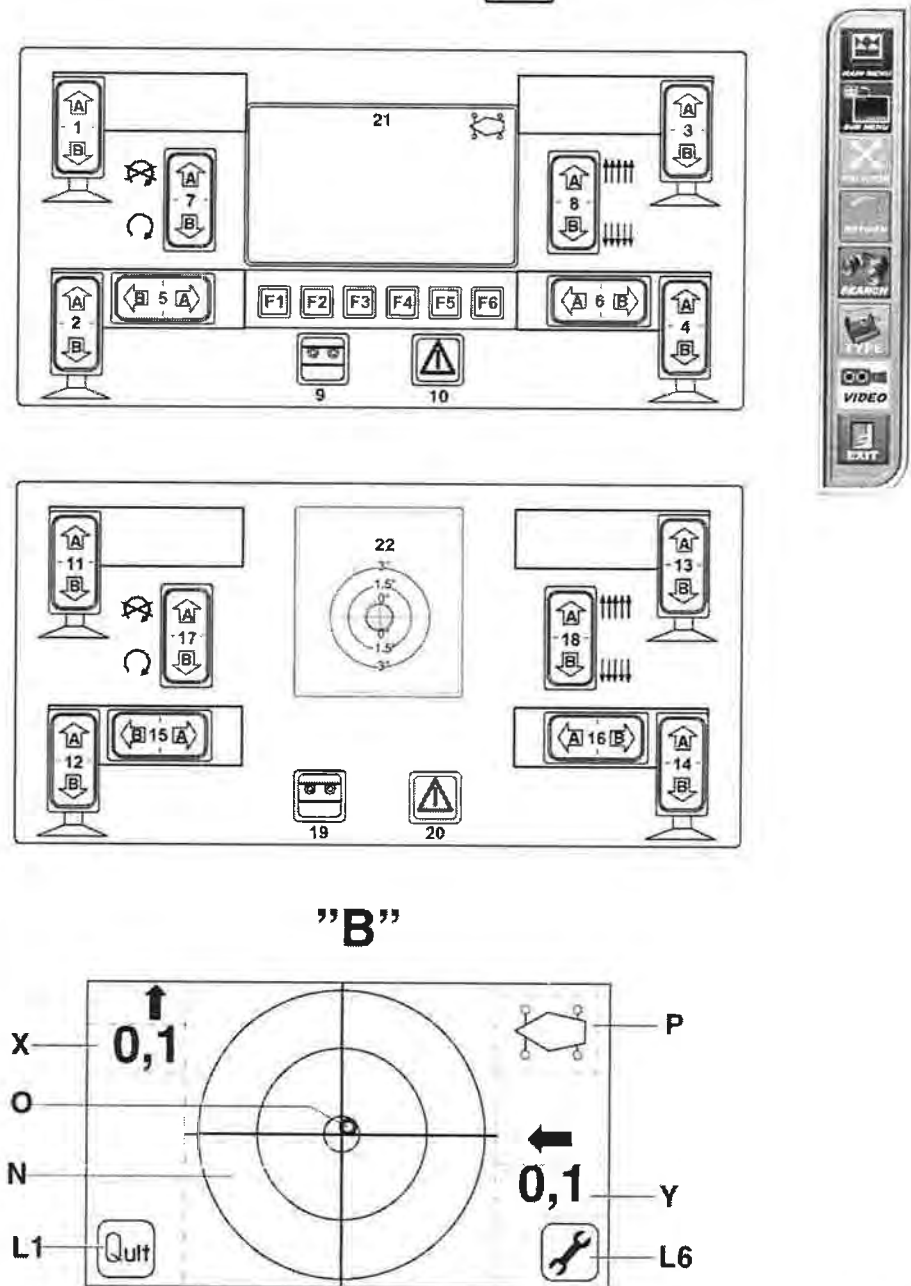
The outrigger cylinders are extended to a check support force.

This ensures that all outrigger cylinders have contact with the ground before the actual leveling procedure begins.

If supporting forces are identical, then all supporting cylinders are extended together in this (possibly different) condition, as long as both keys are held pressed (10 / 20) and (8B / 18B).

2. If there is sufficient clearance between wheels and the ground (including bending after taking up a load later on), let go of button (8B / 18B) and continue to keep "Caution" key (10 / 20) pressed.

The speed increase of the engine is reduced when fine leveling begins.



3. As soon as the crane is level (angle tolerance value 0.1 degrees),
the procedure is automatically stopped.
The information on the display is shown in standard format again.

After the procedure, the system might change the displayed inclination value from 0.1 to 0.2.

This however has no negative effect on the required precision.

4. Let go of key (10 / 20).

Make sure there is a remaining lift (2 to 3 cm / 0.8 to 1.2 in) in the supporting cylinders; Compare supporting forces.

The system does not automatically take the remaining lift into consideration.

If releveling is necessary:

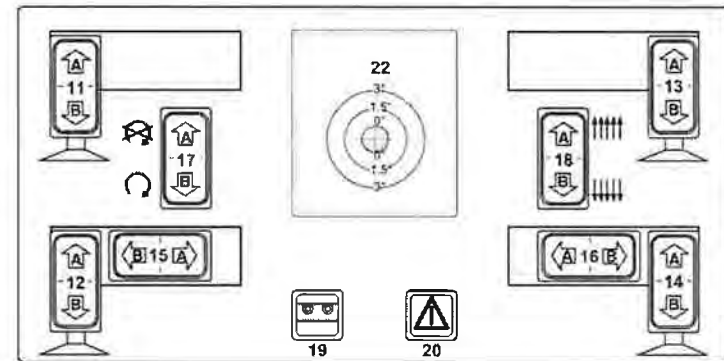
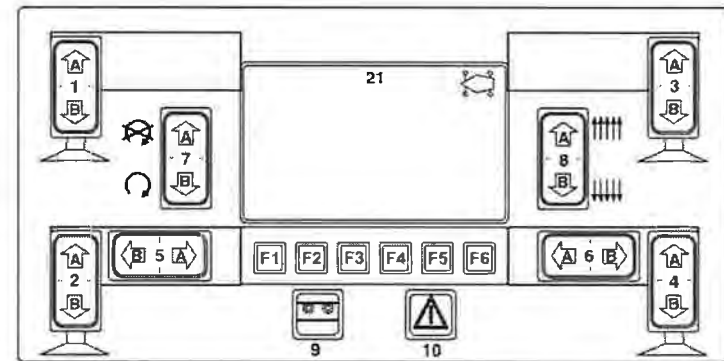
Hold button „Caution“ (10 / 20) and press „Extend all outrigger cylinders“

button shortly (8B / 18B).

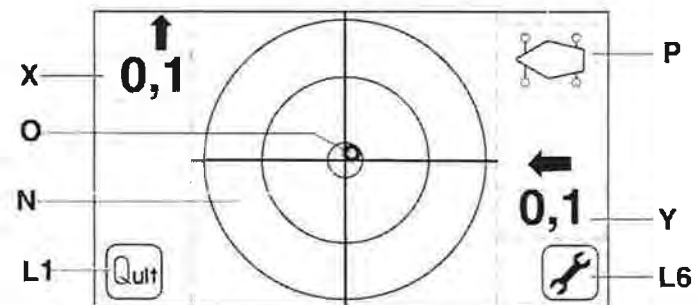
Leveling is carried out as already described.

Combined retraction of all supporting cylinders:

Press the button "caution" (10 / 20) and key "retract all outrigger cylinders" (8A / 18A) together.



"B"



"Hold Axles" / "Raise Axles" Functions

When the crane is on outriggers, the wheels must not touch the ground. The **"Hold axles" or "Raise axles" functions are available** for this purpose.

The decision as to which function should be selected to achieve clearance, depends on the ground conditions at the site.

(flat, firm ground), select **"Hold axles"**.

If the ground conditions at the site are **not as described in section** then select **"Raise axles"**.

"Hold Axles" Function

"Hold axles" is selected **before the crane is stabilized**.

All axles are fixed in the starting position (horizontally aligned and suspension cylinders in the middle position).

If the crane is lowered back on to the wheels for moving (by retracting the supporting cylinders), then it does not have to be relevelled.

It is aligned horizontally and the suspension cylinders are in the middle position.

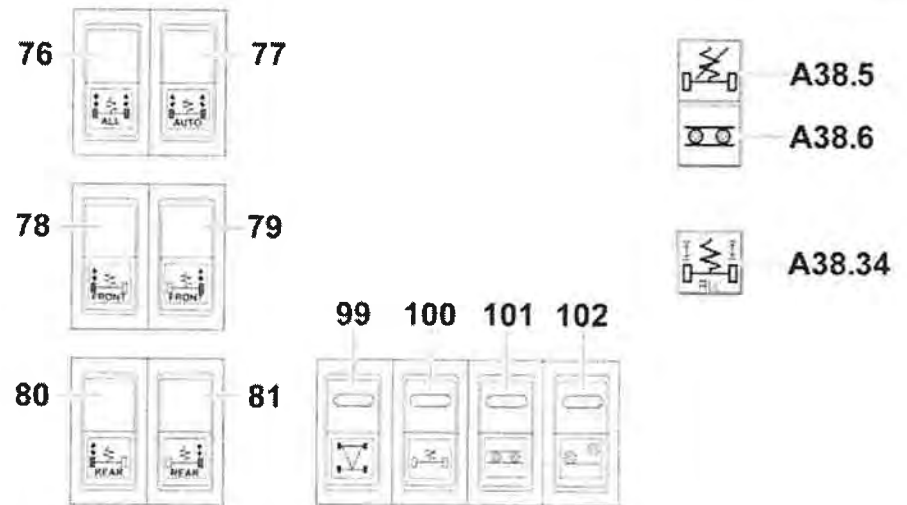
Switching on "Hold axles" after "Moving on the Road" – Suspension is Not Locked

1. Stop the crane, switch to neutral gear, apply the parking brake.
2. Actuate switch (101, S4428) "hold axles". Message (A38.6) lights up .

If "hold axles" is switched on, the crane must not be moved as "R I S K O F B R E A K A G E" !

3. Support the crane (see section "Extend the back stop")

Extend the support until no wheel is in contact with the ground.



Switching on "Hold Axles" after "Driving in the Configured State"– Suspension Locked

1. Stop the crane, switch to neutral gear, apply the parking brake.
 - the crane is aligned horizontally,
 - suspension cylinder in the middle position.
2. Extend horizontal support.
3. Extend the outrigger cylinder, until the outrigger pads are pressed to the ground. Set the contact pressure so that the suspension pressure is at approximately 100 bar (1450 psi). Pressure check on pressure gauges (6, 9), (8, 11) and (7, 10).

The clearance between the mounting eyelets on the suspension cylinders equals 630 mm (24.8 in) (compare section "Extending the outriggers").

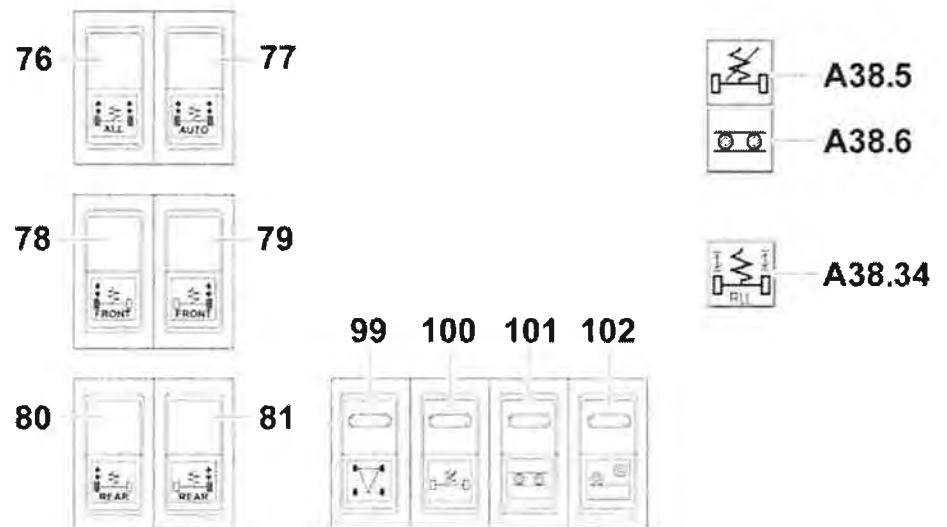
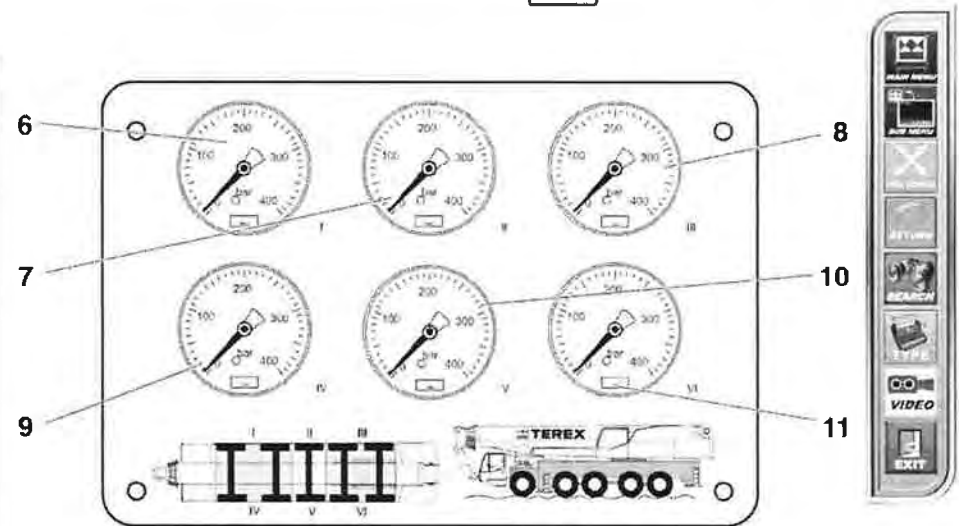
4. Switch off the suspension locking using switch (100, S4401).

Message (A38.5) goes out.

5. Actuate switch (101, S4428) "hold axles". Display (A38.6) lights up.

6. The supporting cylinders are extended further and the crane is stabilized.

Extend the support until no wheel is in contact with the ground. Keep to the sequence!



**Switching off "Hold Axles" for "Moving on the Road"
 – Suspension Not Locked or Switching to
 "Driving in the Configured State"– Suspension Locked**

1. Retract supporting cylinders, until the wheels of all axles have light and even contact with the ground.
 Pressure check on pressure gauges (6, 9), (8, 11) and (7, 10).
 Nominal value: approx. 100 bar (1450 psi).
 (see section "Retracting outriggers")
2. Lock the switch "hold axles" (101, S4428) in the "off" position.

Message (A38.6) goes out.

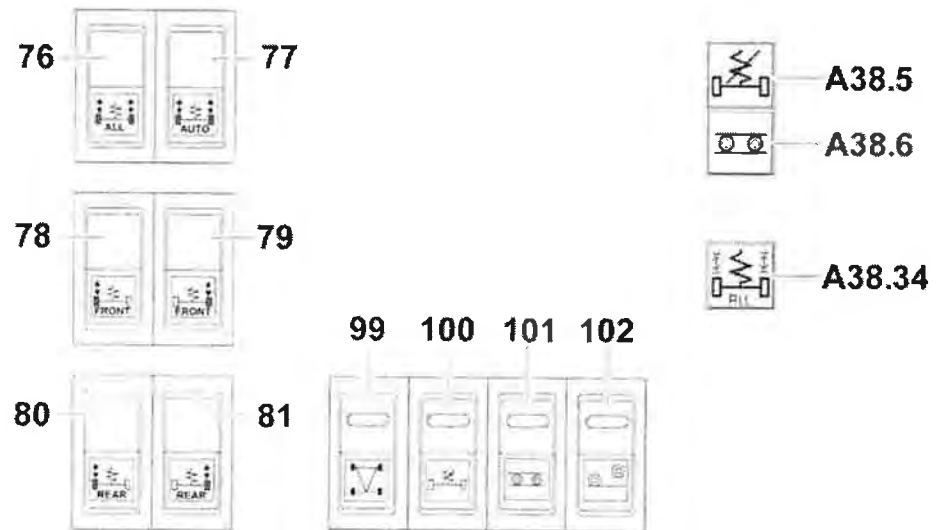
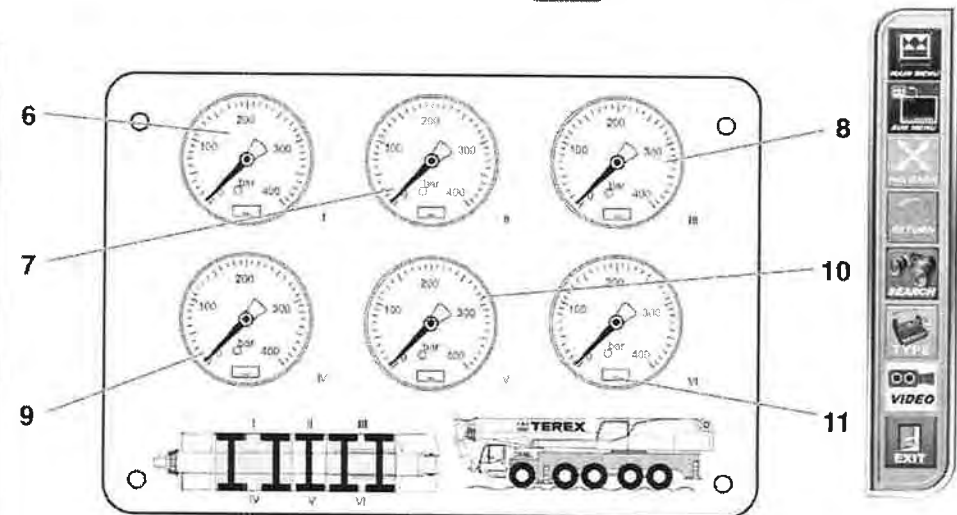
If the crane is now to be "driven in the erect mode", switch on the suspension lock using switch (100, S4401).

The message (A38.5) lights up.

In "Driving in a configured state", the outriggers (outrigger support area 8.4 m x 8.2 m / 27.6 ft x 26.9 ft) remain right above the ground with fitted outrigger plates.

"Driving in a configured state" is only permitted when the ground conditions correspond to those described in section "Driving in a configured state".

3. Continue to retract supporting cylinder / retract outrigger entirely and lock.
4. For "Moving the crane in transport position" (on-road driving, axle load max. 12 t / 26.4 kip) see section 6 of the operating instructions for the carrier.



"Raise Axles" Function

The "axles are raised" **after the crane is supported on outriggers**.

Switch on "Raise axles":

2 work steps are required for "Raise axles".

Between the two steps, the crane must be stabilized.

1. Press switch "hold axles" (101, S4428) in the driver's cab. Message (A38.6) lights up .

The axles remain in the middle position (on the ground).

The crane must now be supported on outriggers (cf. support procedure).

If the axles still have contact with the ground:

2. Press/hold button (9 / 19) on the outrigger control. All axles are raised as long as the button is pressed.

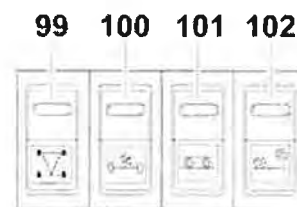
DRIVING IS FORBIDDEN if „Axles raised“ is activated signal A38.6 appears and stop light A30 is illuminated).

Switch off "raise axles":

When switch (101, S4428) is switched off in the driver's cab, all wheels are lowered to the ground again.

Before being driven the crane must be leveled again (aligned horizontally and the spring actuators placed in the middle position).

When the suspension is locked (locking switch 100, S4401 on, message A38.5 appears), "Raise axles" or "Hold axles" is not possible.

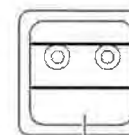


A38.5

A38.6



A38.34



9/19

Switching on "Raise Axles" after

"Moving on the Road" – Suspension is Not Locked.

If the crane is in "On-road driving" position before being stabilized, then raise the axles as described in the following:

1. Stop the crane, switch to neutral gear, apply the parking brake.
2. Press switch "hold axles" (101, S4428) in the driver's cab. Message (A38.6) lights up.

3. Support the crane (see section "Extend the back stop")

If the wheels still have contact with the ground:

4. Press/hold the button "raise axles" (9 / 19) on the outrigger controls.

All axles are raised as long as the button is pressed.

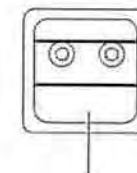
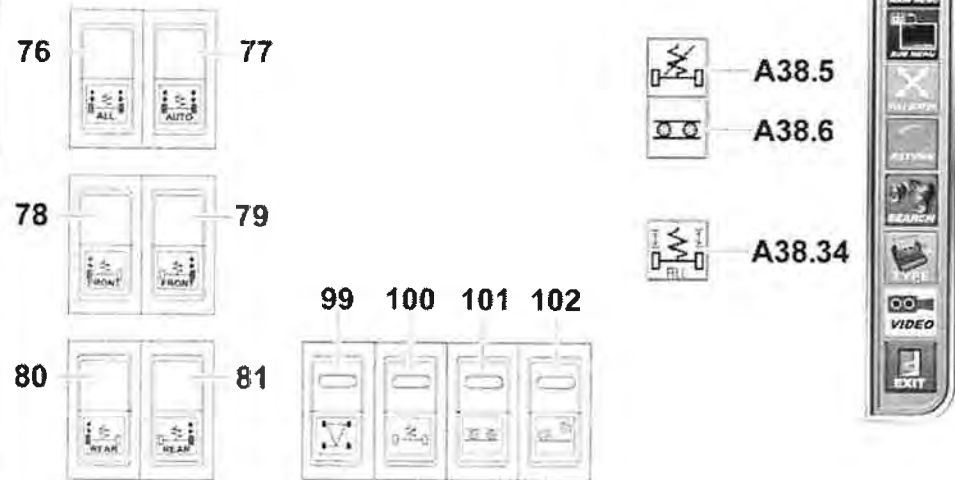
Extend the support until no wheel is in contact with the ground.

Switching on "Raise Axles" after

"Driving in the Configured State" – Suspension Locked

If the crane is in "Driving in the configured state" mode (supports extended, outrigger pads on the ground) before stabilizing, then proceed as follows to raise the axles:

1. Stop the crane, switch to neutral gear, apply the parking brake.
2. Extend the outrigger cylinder, until the outrigger pads are pressed to the ground. Set the contact pressure so that the suspension pressure is at approximately 100 bar (1450 psi). Pressure check on pressure gauges (6, 9), (8, 11) and (7, 10).
3. Switch off the suspension locking using switch (100, S4401). Message (A38.5) goes out.
4. Press switch "hold axles" (101, S4428) in the driver's cab. Message (A38.6) lights up .
5. Keep the crane stabilized.
6. If necessary: Press/hold button "hold axles" (9 / 19) on the outrigger controls until all wheels are free of the ground.



9/19

**Switching off "Raise Axles" for
"Driving on the Road" – Suspension Not Locked
or Switching to**

"Driving in the Configured State"– Suspension Locked

The procedure "Raise Axles" is switched off using switch (101, S4428) "Hold axles" in the cab. All wheels are then lowered to the ground.

1. Switch off switch "Hold Axles" (101, S4428) in the driver's cab.

Message (A38.6) goes out.

When switch (101, S4428) is switched off in the driver's cab, all wheels are lowered to the ground again.

2. Actuate button (76 or 77). Fill all suspension circuits to approx. 100 bar (1450 psi).

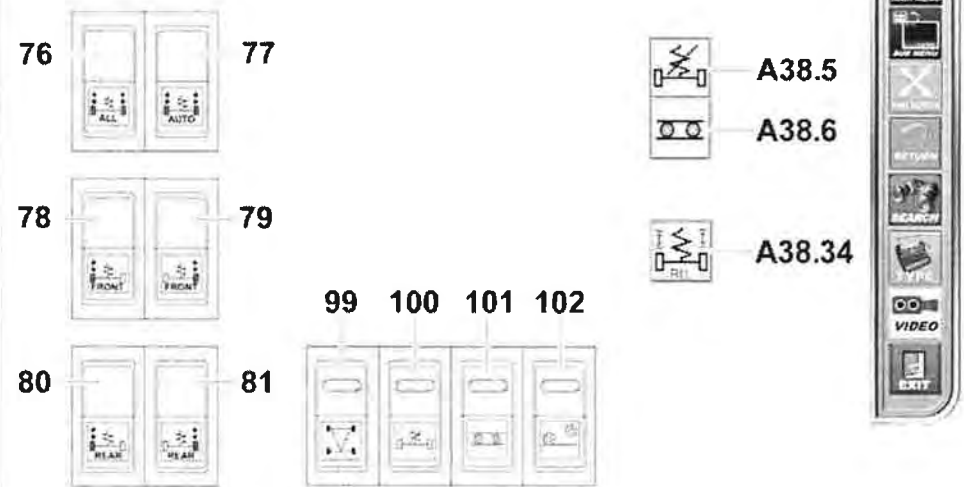
Monitor the rise in pressure on pressure gauges (6 to 11).

3. Retract supporting cylinders; reset the suspension.

Before the supporting cylinders are retracted, the wheels of all axles must first be in contact with the ground. Then the suspension must be readjusted (aligned horizontally and suspension cylinder in central position; see section 11 of these operating instructions).

If they are not readjusted, the suspension cylinders are "locked".

Driving is not permitted in this condition. Damage to undercarriage!



Measures before Stabilizing:

1. Apply parking brake (14).

On sloping ground in the longitudinal direction of the vehicle,

the vehicle must be prevented from rolling away by placing

wheel chocks at the axle last released.

2. Shift the transmission to the neutral position (12).

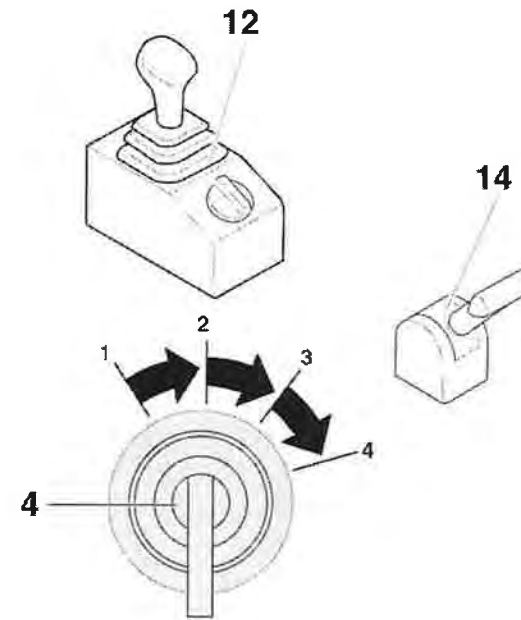
3. Lock the slew gear brake in the superstructure cab.

The superstructure may only be slewed in the supported condition!

4. Start crane chassis engine.

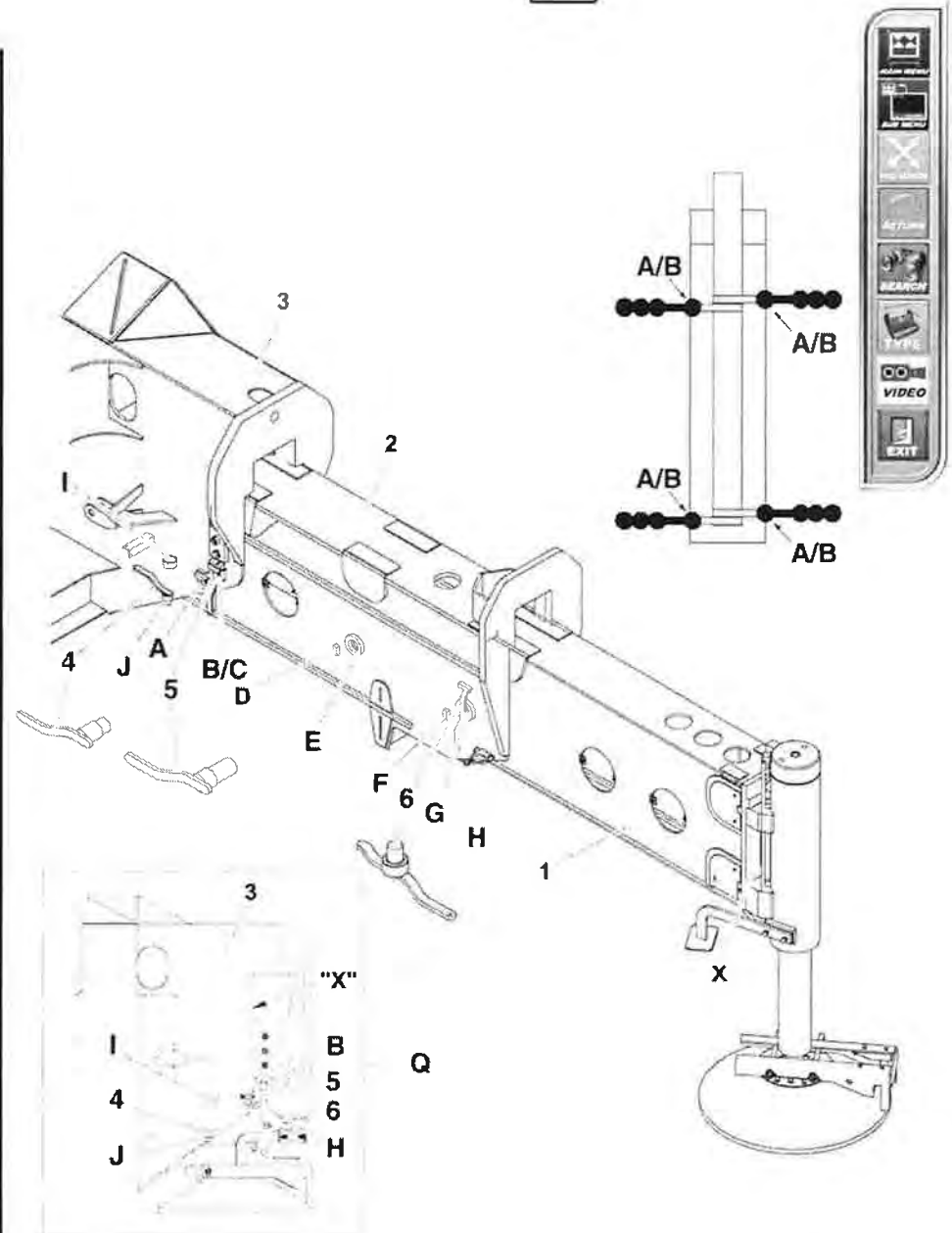
The engine can also be started at the switch panels of the outrigger controls. The ignition switch (4) must then be in the position " 2" (external ignition standby).

When the outriggers are operated, an engine speed of 1200 rpm is automatically set.



Pinning Positions of the Outrigger Struts

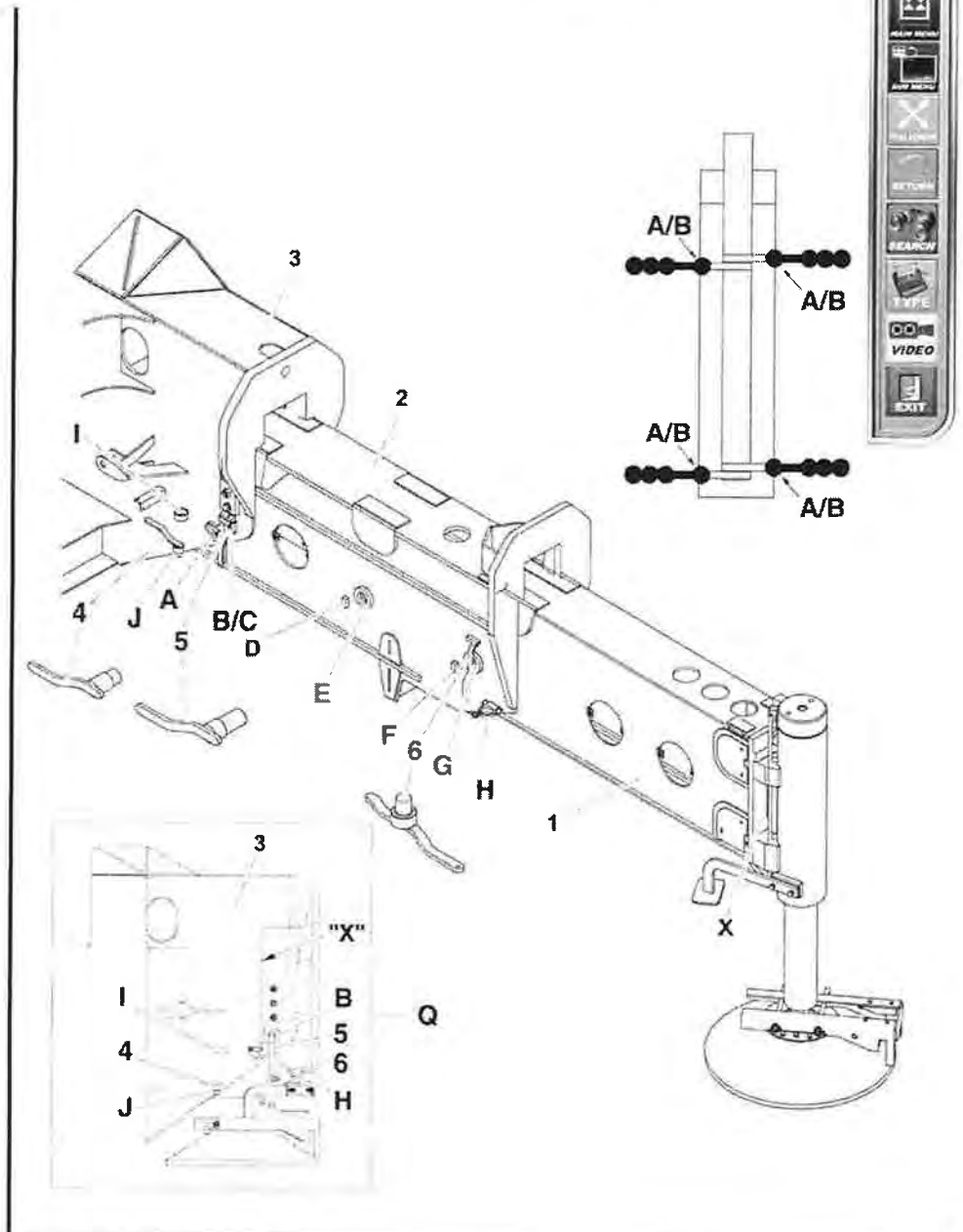
- (1) = Inner outrigger strut
 - (2) = Outer outrigger strut
 - (3) = Chassis frame / outrigger box
 - (4) = Driving bolt
 - (5) = Bolt for transportation state and pinning of the chassis frame to the outer outriggers
 - (6) = Bolt for pinning the inner outriggers to the outer outriggers
 - (A) = Marking point on chassis frame for driving bolt (4)
 - (B) = Marking point on chassis frame for transportation position of the outriggers and all outrigger support areas
 - (C) = Marking point on outer outrigger strut (2) for outrigger support area 8.2 m (26.9 ft)
 - (D) = Stop outrigger support area 6.85 m (22.5 ft)
 - (E) = Marking point on outer outrigger strut (2) for outrigger support area 6.85 m (22.5 ft)
 - (F) = Stop for outrigger support area 5.7 m (18.7 ft)
 - (G) = Marking point on outer outrigger strut (2) for outrigger support area 5.7 m (18.7 ft), transportation position
 - (H) = Marking point on outer outrigger strut (2) for outrigger support area 2.8 m (9.2 ft)
 - (I) = Support point for bolts (5)
 - (J) = Support point for driving bolt (4)
 - (X) = Support surface on inner outrigger strut (1) for transportation safety lock
- Bolt (5) is used for pinning the outriggers and the chassis frame in the transportation position and / or in the 4 outrigger widths. In the transportation position, bolt (5) is then flush with surface (X) of the inner outrigger strut (1).*
- The pin (4) is used for driving the stops (D / F) for the support base areas 5.7 m (18.7 ft) and 6.85 m (22.5 ft).*
- The marking points (A / B) are located on the separating plates of the front or rear outrigger box sets.*



Transportation State of the Outrigger Struts

(detail Q)

- Outriggers completely retracted
- Bolt (5) fitted into point (B) in the chassis frame (Bolt (5) is fitted through the outer outrigger box and is flush with surface (X) in the inner outrigger box.)
- Driving bolt (4) is set down on point (J) or fitted into point (A) (must be removed first when setting on outriggers.)
- Bolt (6) set down on point (H).



Stabilizing Procedure

Extending the Outriggers

(Outrigger Support Area 8.40 m x 8.20 m / 27.6 ft x 26.9 ft)

When the crane is on outriggers, the wheels must not touch the ground ("Hold axles" / "Raise axles" functions).

Once you have convinced yourself that no obstacles or persons are present in the extension area for the stabilisers and that all notes on dangers in section 12.1 have been observed, then proceed as described in the following.

1. Bring outrigger pad in operating position

Clean the bottom of the outrigger cylinder's piston rod and the top of the outrigger plate (if contaminated), remove the forelocks (3), remove the socket pins (2), pull the outrigger plates (1) into the support position.

Attach plug bolts and forelock again.

Risk of accidents!

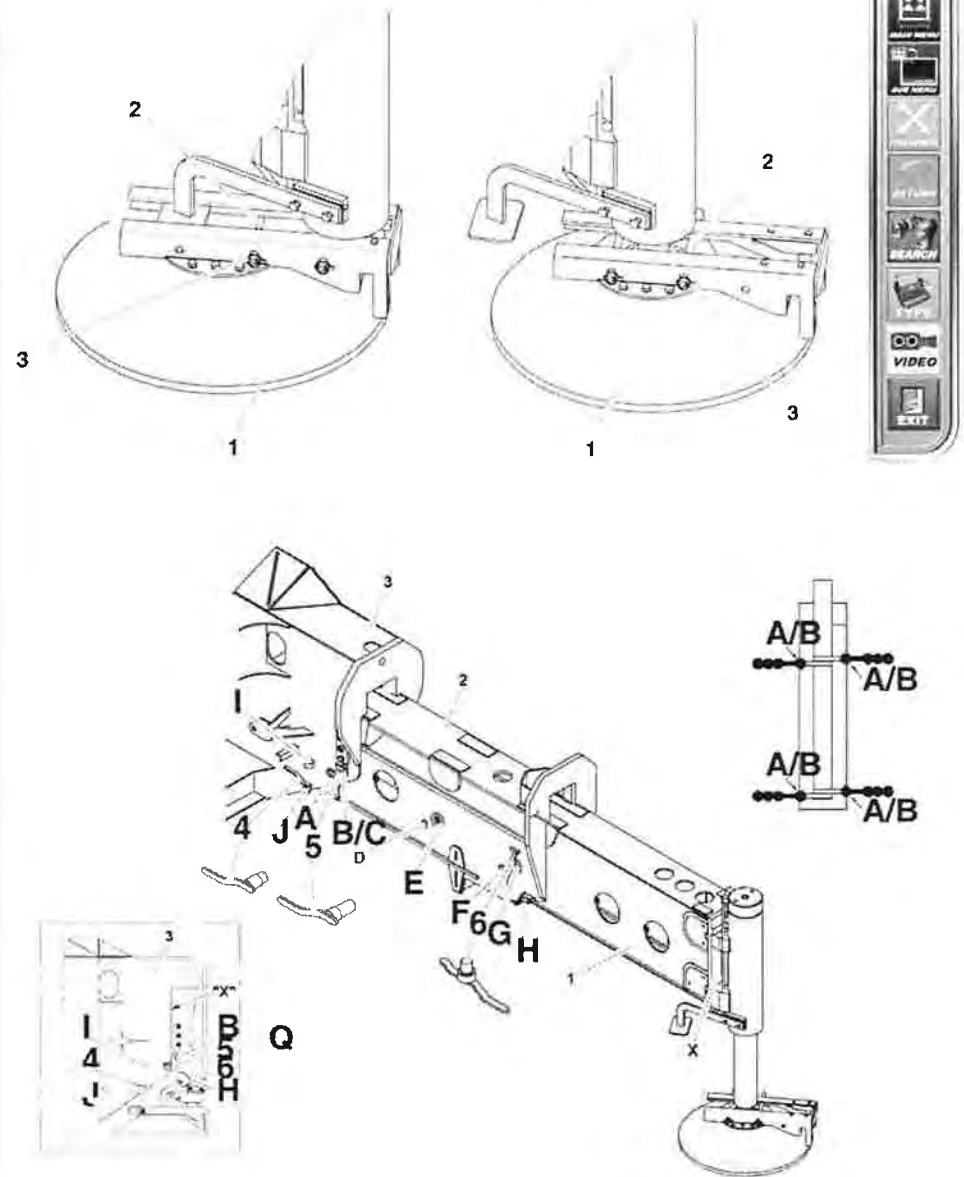
The contact surface between the outrigger cylinder's piston rod and the outrigger plate must be clean. In particular, no foreign matter is permitted (for example: stones, sand, etc.).

2. Remove safety bolts (5) from the outrigger struts.

Open required switch panel.

Only the switch panel that is needed directly for operating may be opened.

In order to avoid improper use, it must be locked again, directly after use !



3. Extending the outrigger struts

Left side: press self return rocker switch 5B or 6B

Right side: press self return rocker switch 15B or 16B

The outrigger struts can only be extended / retracted (horizontally) at the switch panel of the corresponding side.

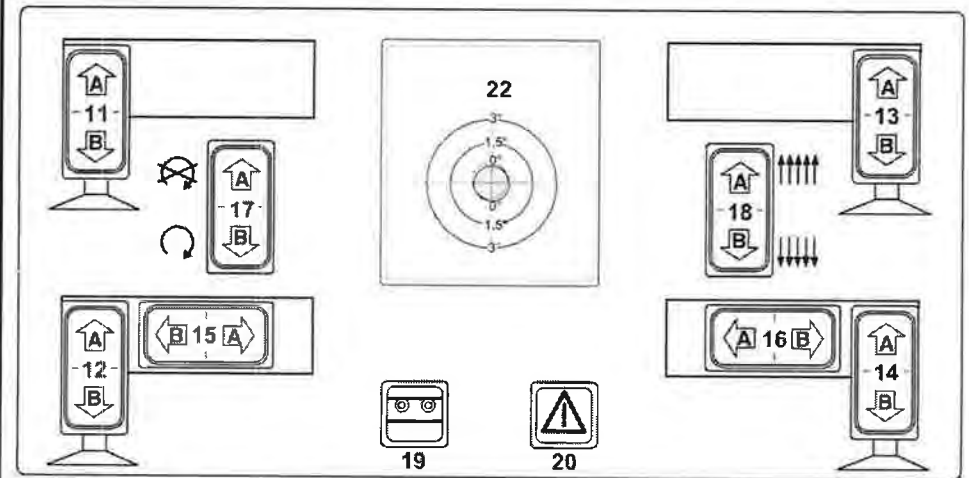
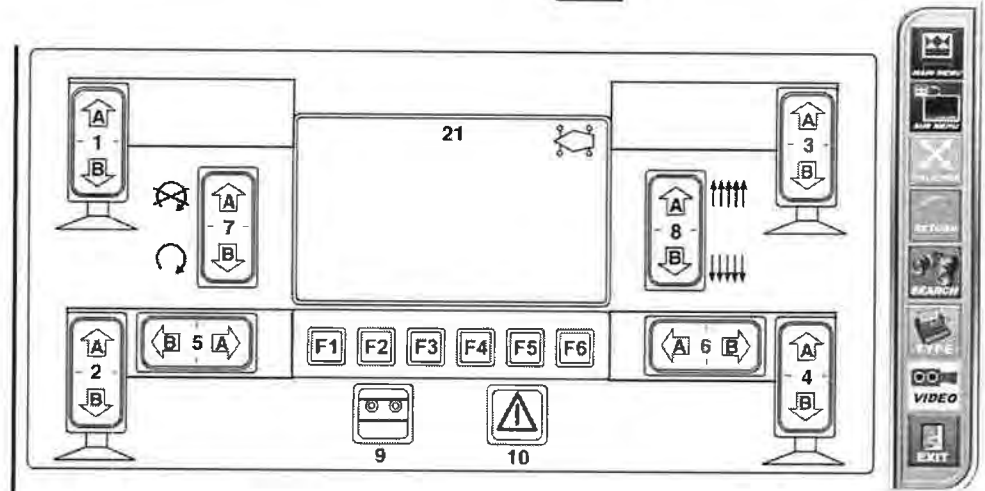
*Extend the outrigger struts **one at a time up to the colored marking.***

Hold on to the rocker switch while extending.

Risk of crushing!

Before extending the outrigger struts, make sure that nobody is present in the danger area where the outrigger struts are extended horizontally !

4. Fit and secure locking bolts (5) and (6) between the chassis frame and the outer outrigger strut, or between the outrigger struts.



5. Extending the outrigger cylinders

Risk of crushing!

There is a risk of crushing while the outrigger cylinders are extended. The outrigger cylinders may only be extended at the side that is within the crane operator's view at the switch panel.

Extend the outrigger cylinders of the relevant side until they have made contact with the ground.

While operating the outriggers, no corrections may be made to the positions of the outrigger pads.

Risk of accidents!

When attaching the outrigger plates in this operating step, make sure that there is no foreign matter (for example: stones, metal objects, etc.) under the outrigger plates!

Switch panel left side: press self return rocker switch 1B, 2B, 3B or 4B.

Switch panel right side: press self return rocker switch 11B, 12B, 13B or 14B.

In order to protect the supporting cylinders from overloading, they must not be extended to the limit; a remainder of 2 to 3 cm (0.8 to 1.2 in) should still be left.

The remaining clearance is also necessary, so that actual support pressure values can be displayed.

If the crane is tilted visibly, then carry out a rough correction by further extending the appropriate outrigger cylinders.

When doing so, make sure that the outrigger cylinders can be further extended for the following leveling procedure.

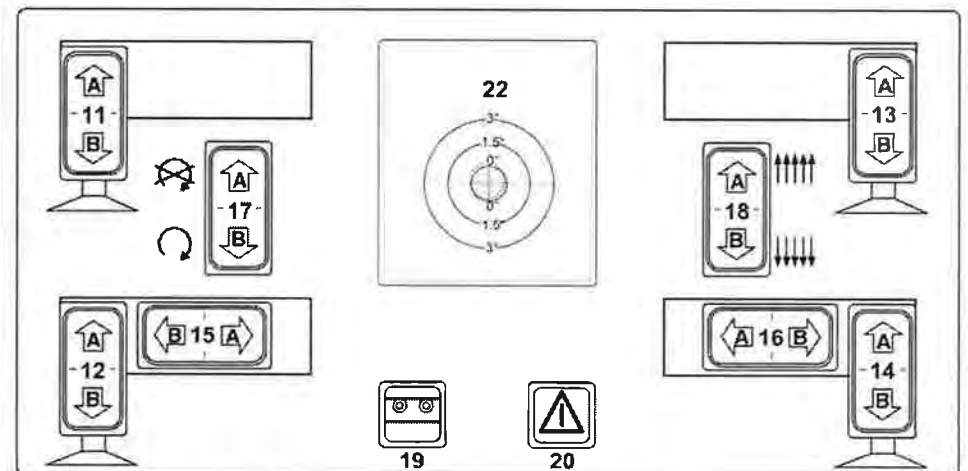
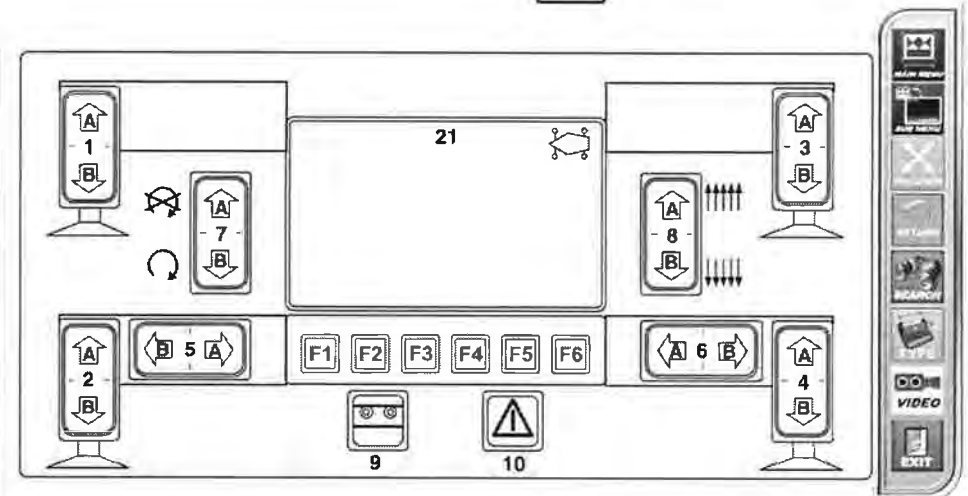
6. Attach counterweight (see load capacity table and operating instructions for the superstructure, section 9).

7. Position superstructure in the direction of travel and thereby position counterweight above the rear outrigger.

8. Move boom to steep position.

The slew gear brake must be released at points 5 and 6.

Now reinsert it.



9. "Raise axles" now

"Raise axles" consists of two steps:

9.1 Press switch "hold axles" (101, S4428) in the driver's cab.

Message (A38.6) lights up .

The axles are still on the ground.

9.2 Press and hold down the key (9/19) at the outrigger controls.

All axles are raised.

Raise the axles until all wheels are free of the ground.

If "hold axles" is selected before the crane is supported on outriggers, message (A38.6) lights up, the axles are no longer raised.

It must be ensured however that all wheels are free of the ground.

When putting the crane on outriggers, make sure that the ground has sufficient load bearing capacity.

The individual support forces are displayed on the screen of the outrigger controls (left and right on the chassis) and on the PDC system of the superstructure.

Only the current supporting forces are displayed; not those that will occur when a load is picked up.

10. Extend rear supporting cylinder, until the lateral axis is balanced.

Switch panel left side: press self return rocker switch 3B / 4B.

Switch panel right side: press self return rocker switch 11B / 12B.

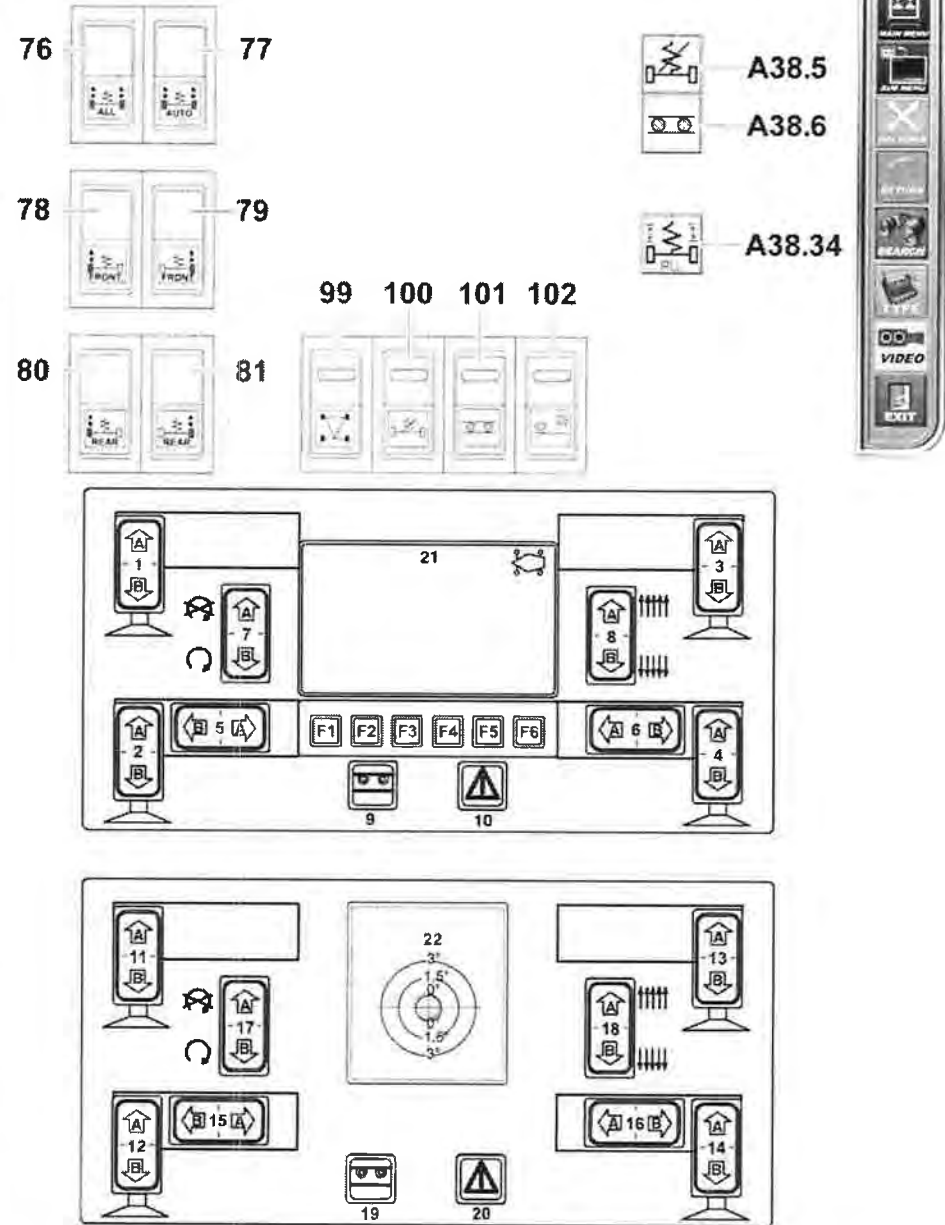
11. Extend the supporting cylinders at the front, in order to also bring the longitudinal axis in the balance.

Switch panel left side: press self return rocker switch 1B / 2B.

Switch panel right side: press self return rocker switch 13B / 14B.

Then use inclination indicator on the crane chassis to level it to 0.1° (equivalent to approx. 0.2 %).

In order to achieve a most even coordination of the supporting forces, the supporting cylinders at the front should finally be briefly pressed further together and then the same applies to the supporting cylinders at the rear. Make sure that all outrigger cylinders are loaded equally.



12. Check the set level once more.

If the transverse axis has come out of alignment, the leveling procedure must be repeated.

a.) Level the rear transverse axle.

b.) Retract the front support cylinders slightly and then extend to level the longitudinal axis.

Retracting the supporting cylinders is only permitted if the supporting forces are not exceeded.

In order to level the crane precisely, it will finally be necessary to operate all supporting cylinders from the switch panel on one side. In this case be particularly careful, especially when the supporting cylinders are operated that are not in the direct line of view.

Immediately afterwards, lock the switch panel !



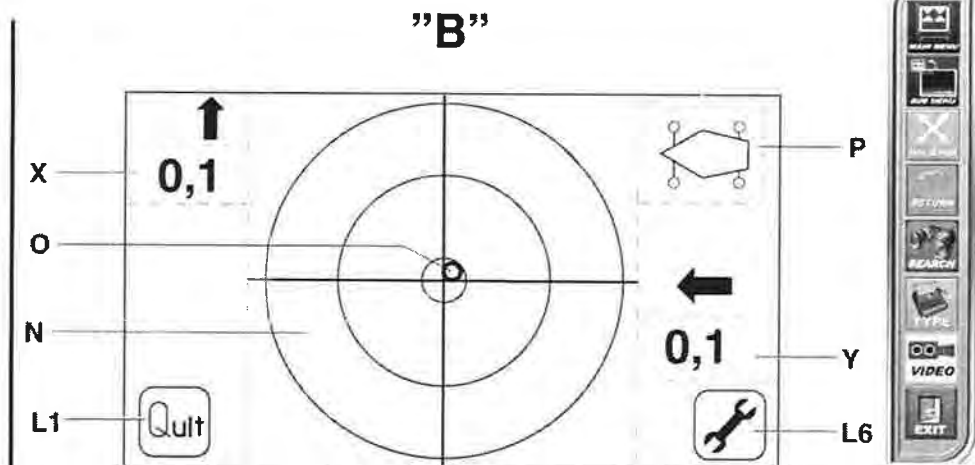
Checking the Level at the Chassis

After each new configuration, the level of the crane must be rechecked (see "Inclination indicator").

Careful leveling is essential for safe working with the crane.

Deviations must not exceed 0.1 degrees (equivalent to approx. 0.2 %).

The numerical values X and Y are always decisive. They show the current deviation of the crane system.



Retracting the Outriggers

The outriggers are retracted analogously in the reverse order of their extension.

Important notes on retracting the outrigger:

- Retract the outriggers separately and completely.
- Unbolt only the outrigger strut to be retracted.
- As soon as a support is in the transport position, insert the transport lock.
- When retracting the outrigger struts, reeving and crushing movements around the retracting parts and the carrier frame are possible.

It must be ensured that no persons are present in the danger zone.

- Retracting the outrigger supports when a load is attached to the crane is prohibited. Risk of tipping!
- The struts may only be retracted if the superstructure is in the transportation position or in position 0 to the rear for mobile operation. Risk of tipping!

Retracting the Outriggers

...for "Driving in Transport Position"

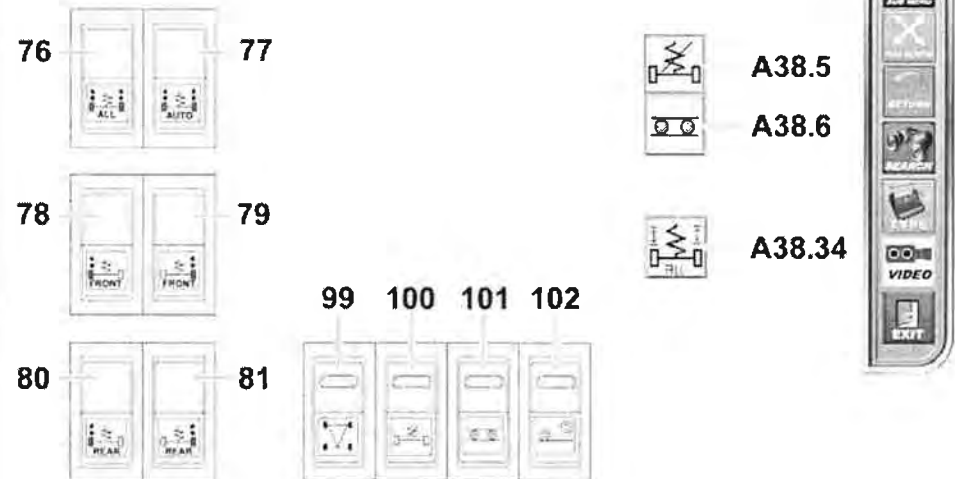
1. Lower main boom to transport position.
2. Remove counterweight.

Risk of crushing!

When lowering the suspension / retracting the supporting cylinders, crushing movements between tires and ground space are possible. Watch your feet!

It must be ensured that no persons are present in the danger zone.

3. Lock the switch "hold axles" (102, S4427) in the "OFF" position. The axles are lowered.



If "hold axles" was switched on, this point does not apply.

4. Pressing down the wheels

Press button (78 / 79 / 80 / 81) or button (76 or 77) until the wheels of all axles are pressed down on the ground.

The outrigger cylinders must be retracted if the outrigger height is greater than the suspension cylinder hoist.

5. Retracting the supporting cylinders:

Switch panel left side: Press rocker switch 1A, 2A, 3A or 4A.

Switch panel right side: Press rocker switch 11A, 12A, 13A or 14A.

Retract all outrigger cylinders completely!

When retracting the supporting cylinders on slopes in the longitudinal direction of the vehicle, the vehicle must be secured with support blocks at the axle that is to touch the ground first.

6. Retracting the outrigger struts:

Left side: press self return rocker switch 5A or 6A

Right side: press self return rocker switch 15A or 16A

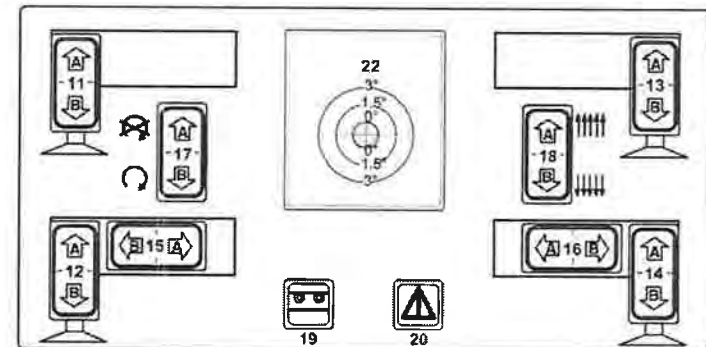
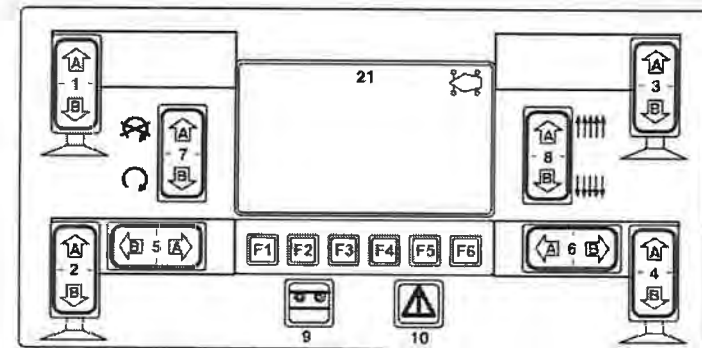
Retract all outrigger struts individually and completely!

**It is forbidden to retract or extend the cylinders with hanging load or if the superstructure is not in the transportation position or in position "mobile operation".
RISK OF TILTING!**

Risk of crushing and reeving !

When retracting the outrigger struts, reeving and crushing movements around the retracting parts and the carrier frame are possible.

Make sure that there is no one in the danger zone!



Secure the outrigger boxes which have been pushed into each other, using bolt (5) in point (B) in the chassis frame (3). The bolt (5) is fitted through the outer bumper brace and is flush with the inner bumper brace on surface (X). The driving bolt (4) is inserted in point (A) in the chassis frame or fitted in point (J).

The marking points (A) and (B) can be found on the bulk heads of the front and rear outrigger box pairs.

7. Bring the outrigger plates into the transport position

Remove the fore locks (3), remove the socket pins (2), pull the outrigger plates (1) into the transport position.

Attach plug bolts and forelock again.

8. If "Raise axles" was actuated:

Press button (76, S441 or 77, S4424) to level all axles. See section 11 "Adjusting for driving in the transport position".

Or

9. If "Hold axles" was actuated:

Lock switch (101, S4428) "hold axles" in the "OFF" position.

Message (A38.6) goes out.

Driving in the "Hold axles" condition is prohibited.

Damage to undercarriage!

Retracting the Outriggers

.... for "Driving in the Configured State"

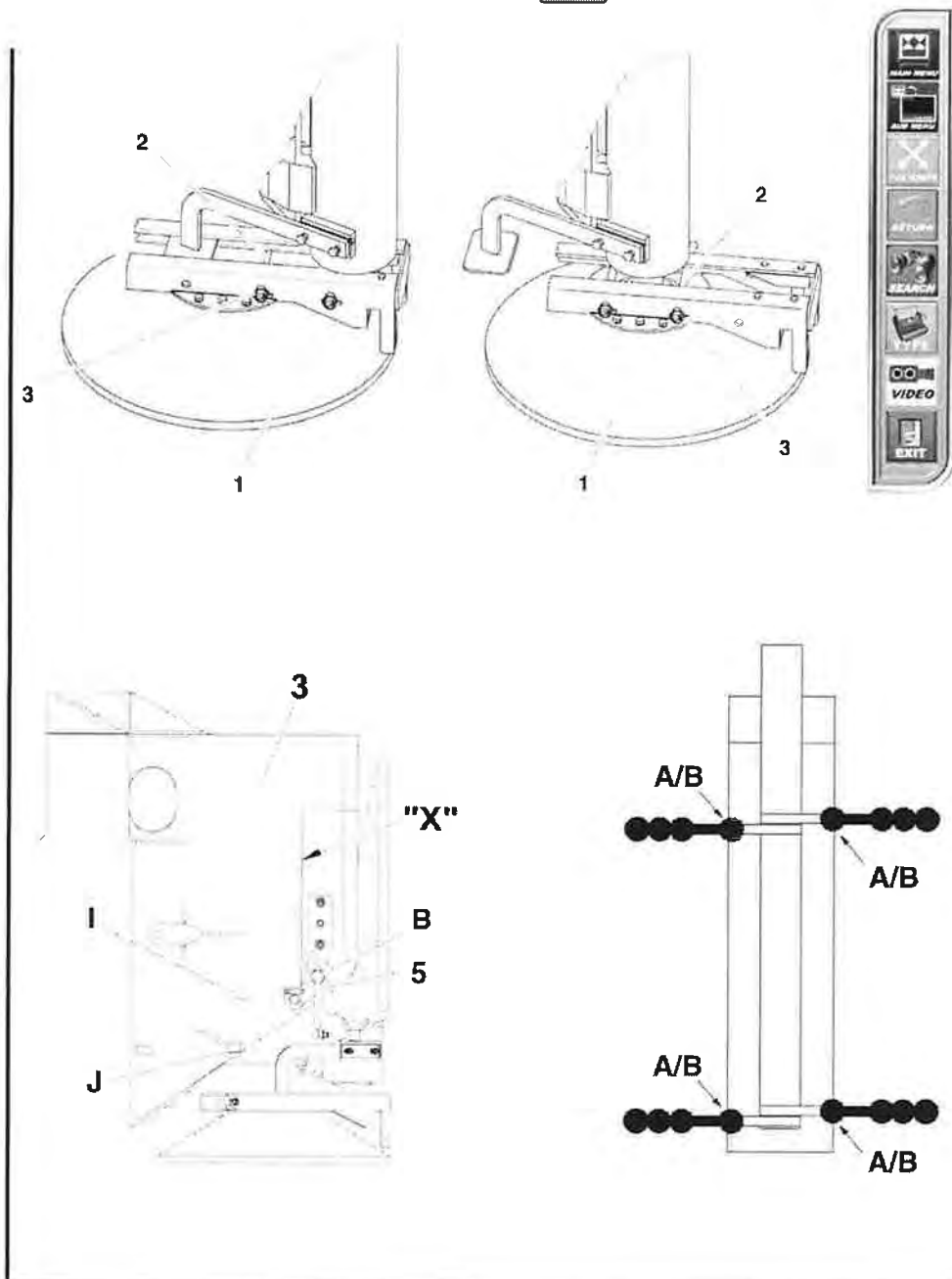
.... Before driving in the configured state".

Before lowering the crane on to the wheels (for subsequent "Driving in the configured state"), always pay attention to the permitted axle loads relating to rigging mode, counterweights,

superstructure position, main boom length and angle (see section 6 "Driving in the configured state").

When lowering the crane onto the wheels, the suspension pressure is monitored on the pressure gauges (6) to (11) in the driver's cab.

It must not exceed 270 bar (3916 psi).



Supporting Variants

Outrigger Support Area 8.40 m x 8.20 m (27.6 ft x 26.9 ft) (Standard Outrigger Support Area)

Outrigger struts (1) and (2) are fully extended for the outrigger support area 8.40 m x 8.20 m (27.6 ft x 26.9 ft).

The bolt (5) pins the chassis frame (fitting point B) to the outer outrigger strut (2) in point (C).

The bolt (6) pins the outer outrigger strut (2) to the inner outrigger strut (1) in point (G).

Working with the crane is permitted only with the load capacity tables supplied with the crane. The crane's construction number is noted on the load capacity tables.

If there are no specifications for the outrigger support area in the load capacity tables, then the outrigger struts must be extended completely and pinned.

Outrigger Support Area 8.40 m x 6.85 m (27.6 ft x 22.5 ft)

Outrigger strut (1) is fully and outrigger strut (2) is partially extended for the outrigger support area 8.40 m x 6.85 m (27.6 ft x 22.5 ft).

The measurement from the outer edge of the chassis frame to the outer edge of the outrigger strut (2) is 670 mm (26.4 in)

The extension length of 670 mm (26.4 in) is color marked on the outrigger strut (2).

If the outriggers are to be driven from the "normal" outrigger basis to reduced outrigger basis, pin bolt "B" in the locking position for driving.

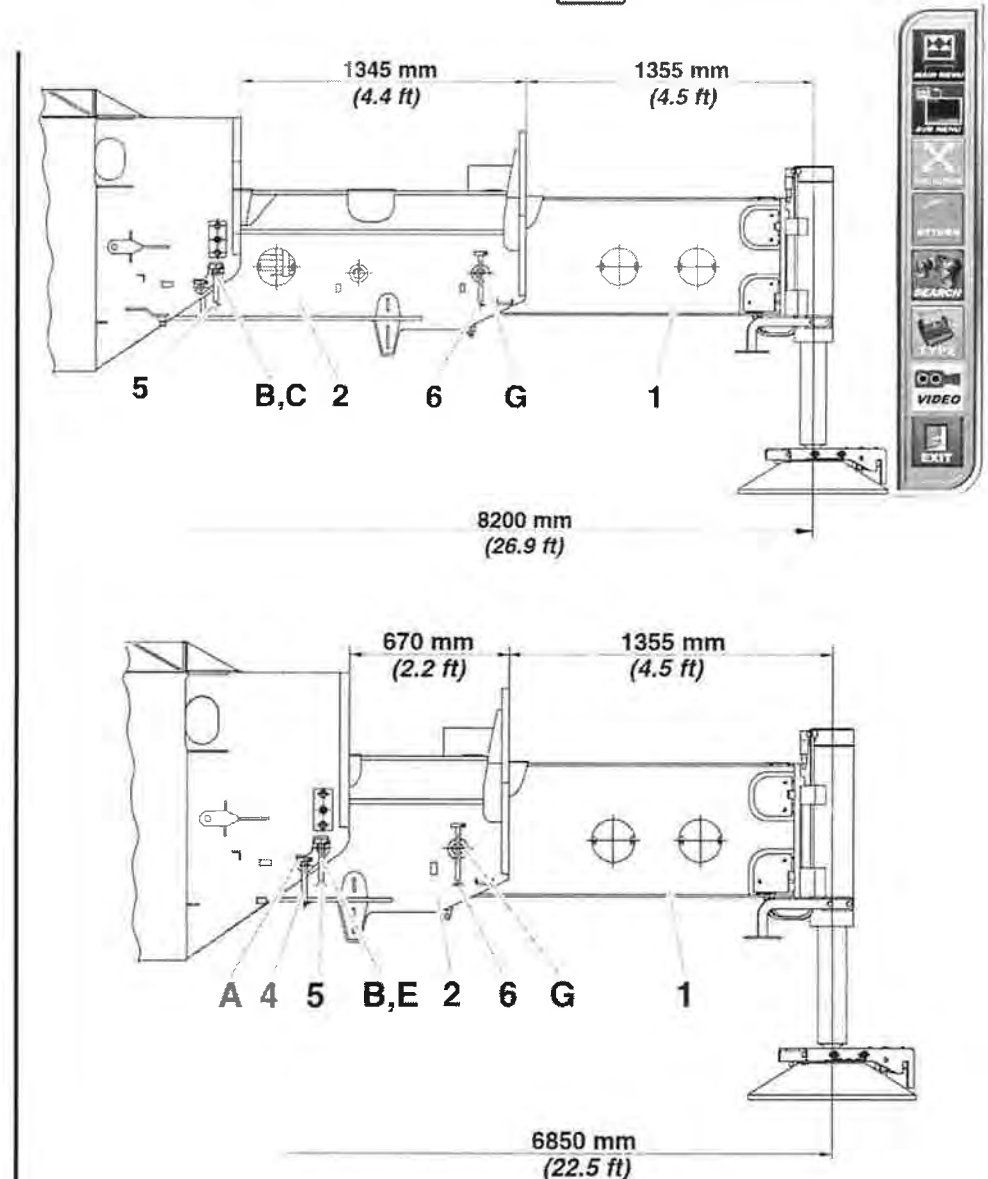
If the outrigger support area is reduced, then only certain counterweights / main boom lengths / equipment are permitted.

Details of these can be found in the corresponding load capacity tables.

Only the combinations specified there are permitted.

Drive the outrigger support area as follows:

- Remove bolt (5) from point (B)
- (remove transportation safety lock)



- Extend strut until the pinning hole (G) on the outer outrigger strut (2) is visible.
- Insert driving bolt (4) in point (A) on the chassis frame and secure.
- Extend strut until stop (D) of the outer outrigger strut (2) is flush with the driving pin (4) and the inner outrigger strut (1) is completely extended.
- Pin the chassis frame (fitting point B) to the outer outrigger strut (2) using bolt (5).
- Pin the outer outrigger strut (2) (fitting point G) to the inner outrigger strut (1) using pin (6).

Outrigger Support Area 8.40 m x 5.70 m (27.6 ft x 18.7 ft)

The inner outrigger strut (1) is completely extended and the outer outrigger strut (2) is not extended for the outrigger support area 8.40 m x 5.70 m (27.6 ft x 18.7 ft).

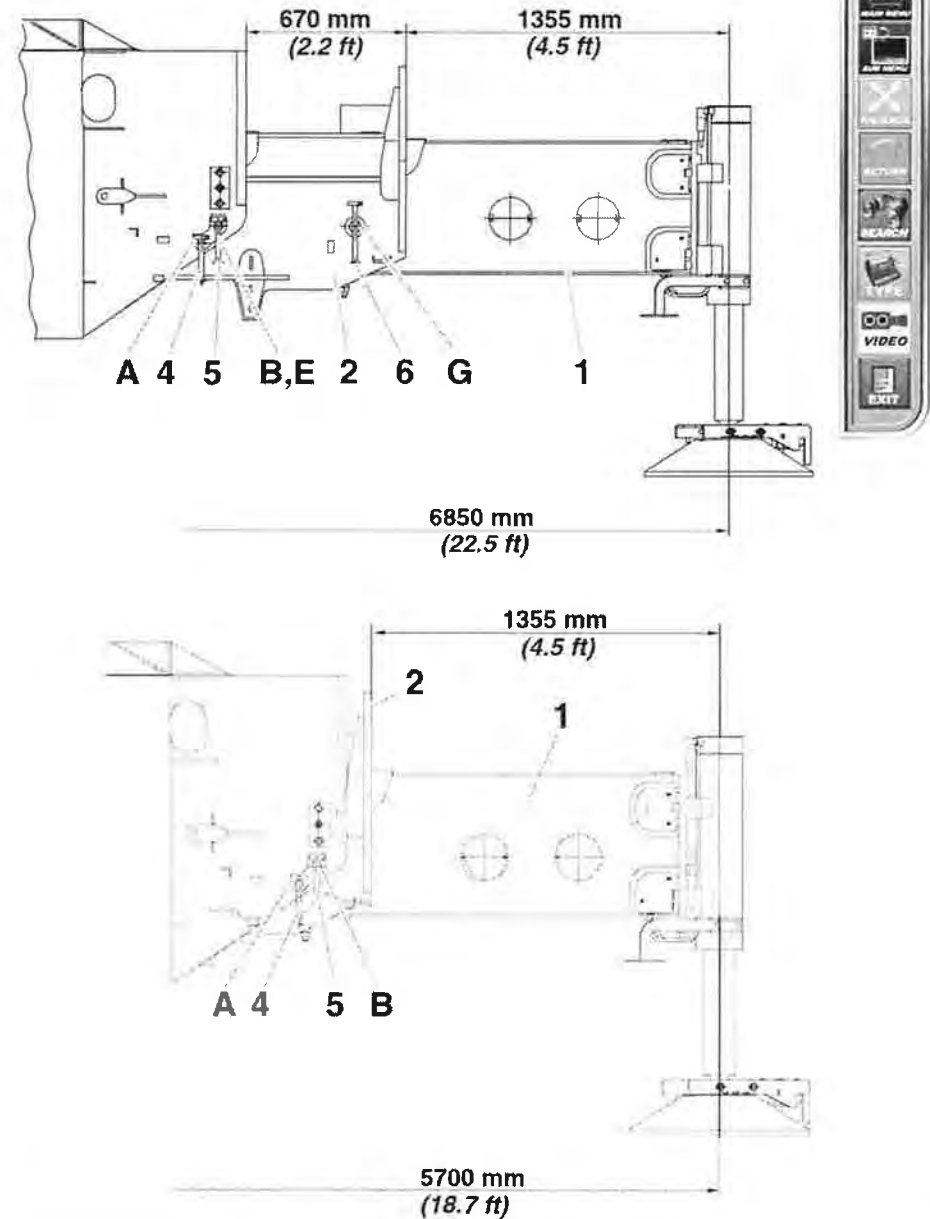
Drive the outrigger support area as follows:

- Remove bolt (5) from point (B) (remove transportation safety lock)
- Insert driving bolt (4) in point (A) on the chassis frame and secure.
- Extend strut until the inner outrigger strut (1) is completely extended.
- Pin the chassis frame (fitting point B) to the strut using bolt (5).
- The pin (5) is then pinned by the retracted outer outrigger strut (2) in the inner outrigger strut (1).

If the outrigger support area is reduced, then only certain counterweights / main boom lengths / equipment are permitted.

Details of these can be found in the corresponding load capacity tables.

Only the combinations specified there are permitted.



Outrigger Support Area 8.40 m x 2.80 m (27.6 ft x 9.2 ft)

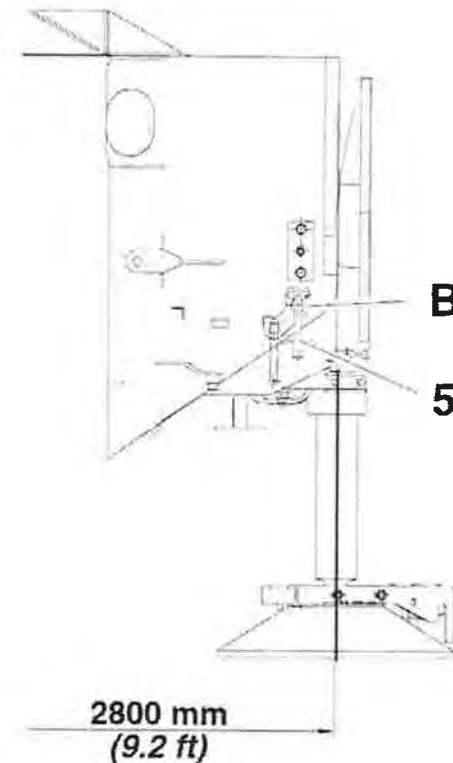
This outrigger support area is similar to the transportation state of the struts. The outrigger struts are completely retracted.

Bolt (5) is fitted in point (B) in the chassis frame. Only the outrigger cylinders are extended.

If the outrigger support area is reduced, then only certain counterweights / main boom lengths / equipment are permitted.

Details of these can be found in the corresponding load capacity tables.

Only the combinations specified there are permitted.



Fitting and Removing the Outrigger Struts (Optional Equipment)

Removing the Outrigger Struts

An auxiliary crane is required to remove and fit the outrigger struts. The weight is marked on plates on the sides of the struts.

Observe the centre of gravity when fitting the attachment equipment for dismantling the outrigger struts. Risk of tipping!

The quick disconnect couplings on hydraulic lines "R", "E" and "P" are marked with plates.

If there are no plates on the quick-release couplings, the couplings must be marked before they are disconnected.

Connection „R“ = extending the horizontal cylinders:

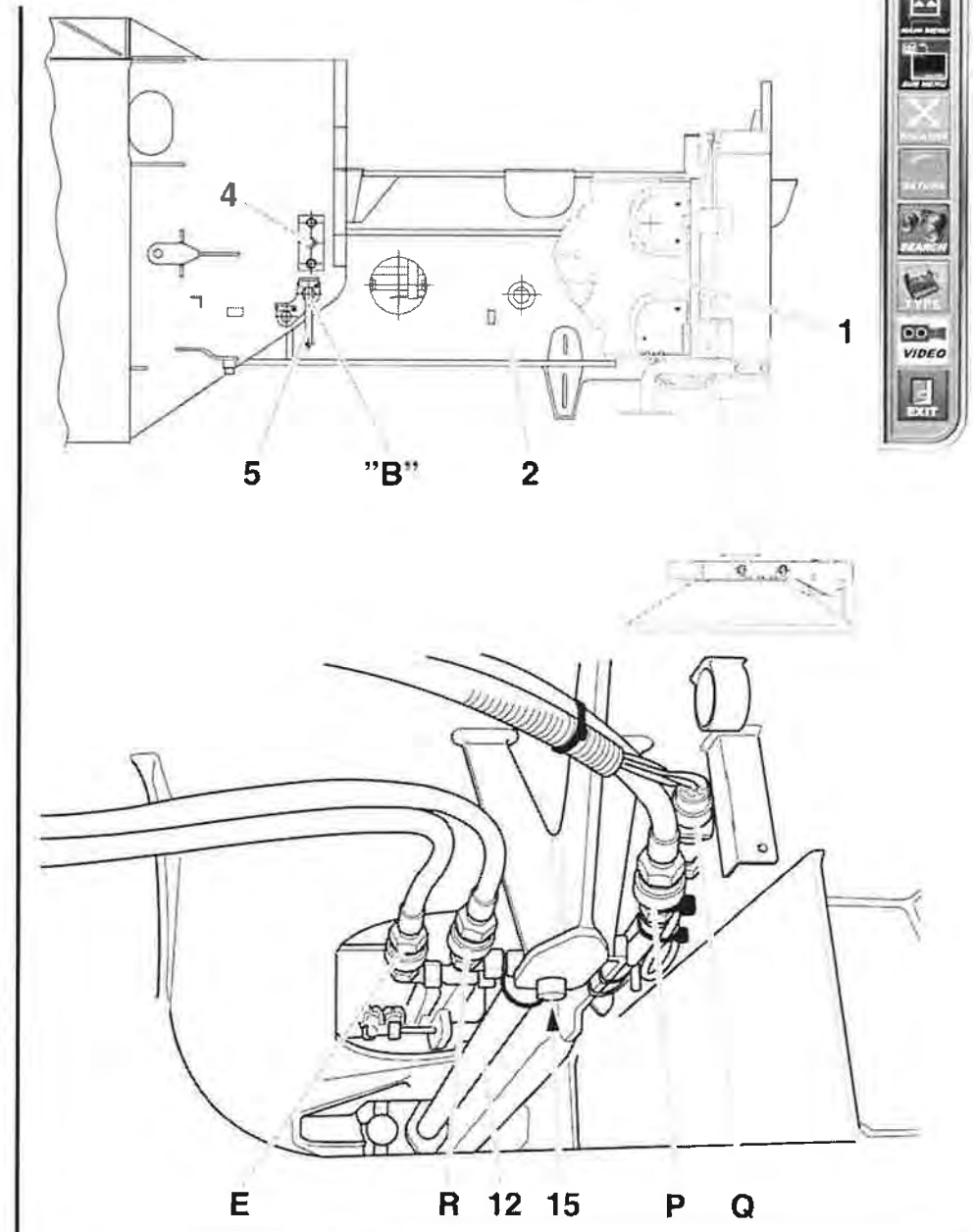
The outer connection to the piston rod of the horizontal cylinder on outrigger strut (2) **without "T-union"**

Connection "E" = retracting the horizontal cylinders and the vertical cylinders :

The inner connection to the piston rod of the horizontal cylinder on outrigger strut

(2) **with "T-union"**

Connection "P" = extending the vertical cylinder



To remove the outrigger struts, proceed as follows:

1. Remove locking bolt (5) at position (B).

The inner outrigger strut (1) (with fitted outrigger cylinder) is completely retracted.

2. Extend outrigger struts (2) completely.

3. Disengage the quick-release couplings of the hydraulic lines "R", "E", "P" and the electrical line.

When disconnecting or connecting the quick disconnect couplings, all buttons on the outrigger control panel must be off.

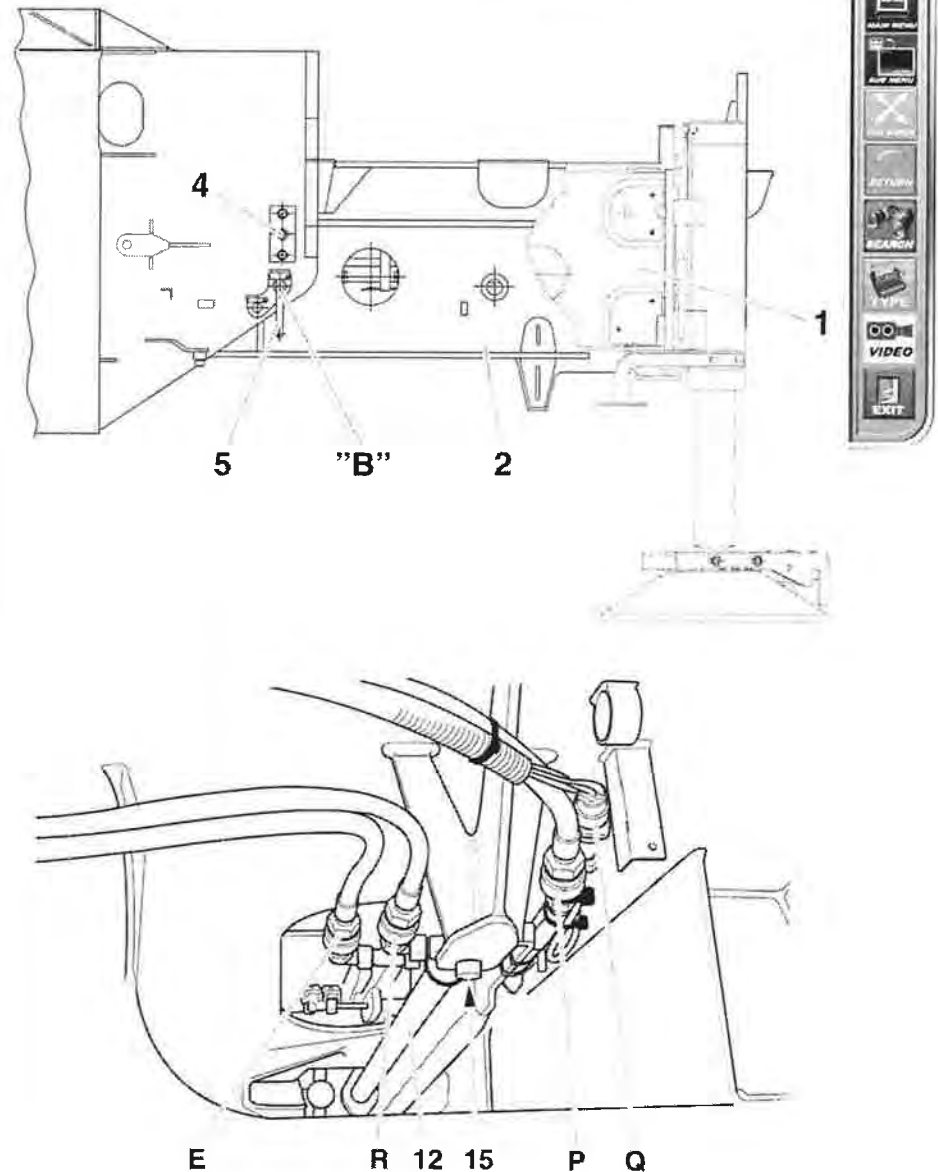
4. Remove connecting bolt (15) from the piston rod of the horizontal cylinder (12).

Disconnect plug "Q" of the support pressure display.

Depending on the friction conditions, it could be necessary to first completely extend the struts and then to retract the inner outrigger struts:

After the strut has been extended, bolt (5) must be fitted in point (B) in the chassis frame in such a way that the outer outrigger strut (2) is pinned to the chassis frame, but has not been fitted through.

The inner outrigger box is then mobile. Then the inner outrigger strut must be retracted.



5. Connect extension hoses to the quick disconnect couplings of the hydraulic leads „R” and „E”. Clean the quick disconnect couplings before assembling.

Check the O-rings for sealing the quick disconnect coupling.

The quick disconnect couplings should be screwed in up to the stop.

The hydraulic lines must not be mixed up.

The non-return valve in the quick disconnect coupling can open only if the coupling is screwed in up to the stop. Closed or only partially open non-return valves can cause damage to the hydraulic system.

Mixed-up hydraulic lines can also damage the hydraulic system and cause malfunctions.

6. Connect the extension cable for activation of the hydraulic valves.

7. Retract the horizontal cylinder. Disconnect the connection hoses on the quick disconnect couplings of hydraulic lines „R” and „E” on the chassis.

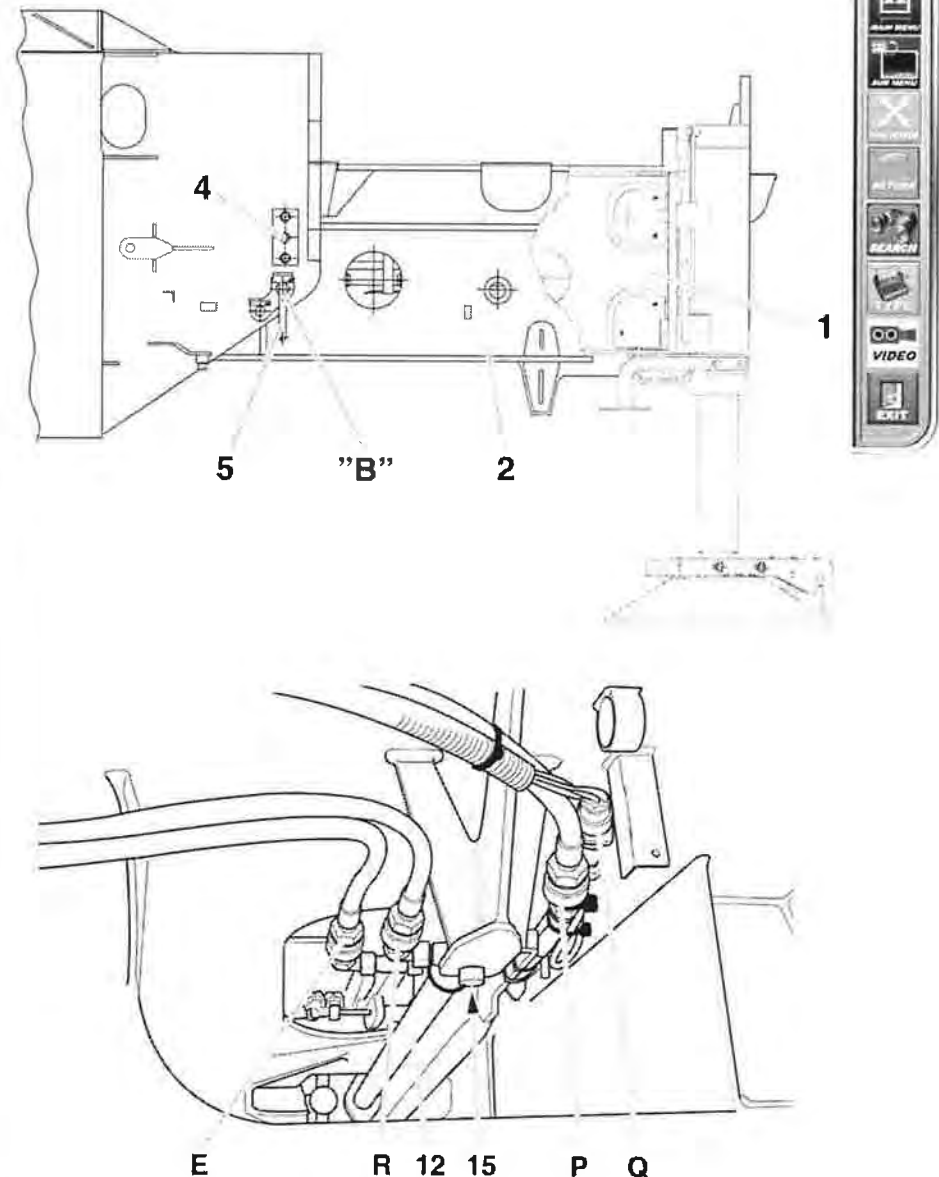
8. Attach auxiliary crane to the outer outrigger struts (2) using suitable lifting tackle.

9. Unscrew rollers (4) on both sides and extend outrigger strut (2) horizontally using the auxiliary crane.

10. Disconnect the connection hoses on the quick disconnect couplings of hydraulic lines „R” and „E”.

Place dust caps on all quick disconnect couplings. Remove the electrical cable.

Load outrigger struts on an adequate transport vehicle and secure.



Installation of the Outrigger Struts

The outrigger struts are fitted analogously in the reverse order. Please observe the cautionary notes for the corresponding working steps.

Before fitting : clean and grease the sliding surfaces on the outrigger struts and on the chassis.

After fitting and before extending the struts: ensure that the hydraulic lines can move freely.



Supporting the Outrigger Plates Due to Insufficient Load-bearing Capacity of the Ground

The load-bearing capacity of the ground must be sufficient to absorb the maximum support forces which can occur.

Normally, the outrigger plates would not be sufficient by surface area to set the crane up safely on backfilled or natural ground.

If necessary, increase the support area by stacking suitable materials under the outrigger plates.

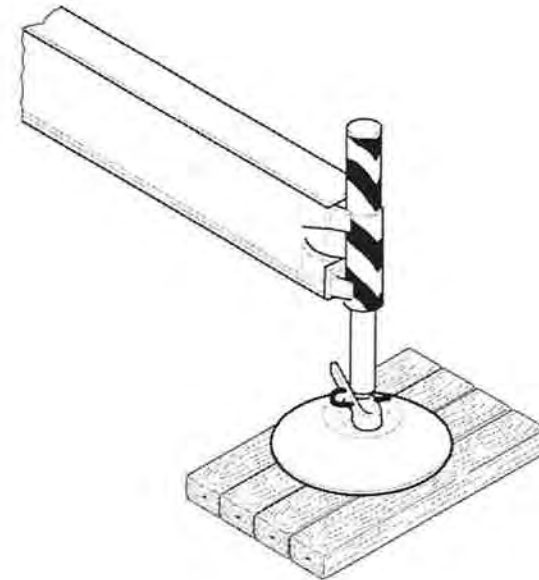
Suitable materials (for example, timbers with the same dimensions, special panel constructions made of wood or metal) must be used for the support! The crane operator must make these available.

The struts must be in the centre of the support and must cover all supporting timbers sufficiently.

You must also check whether channels, covered pits or cellars are in the vicinity of the scheduled crane location and how they are laid out. You must also take hidden dangers such as melting ice or flooding into consideration.

These dangers are often the cause for cranes falling over.

In the following segment you will find details on "Permitted ground pressures" of various types of ground and how to determine the required support area.



Permitted Ground Pressure

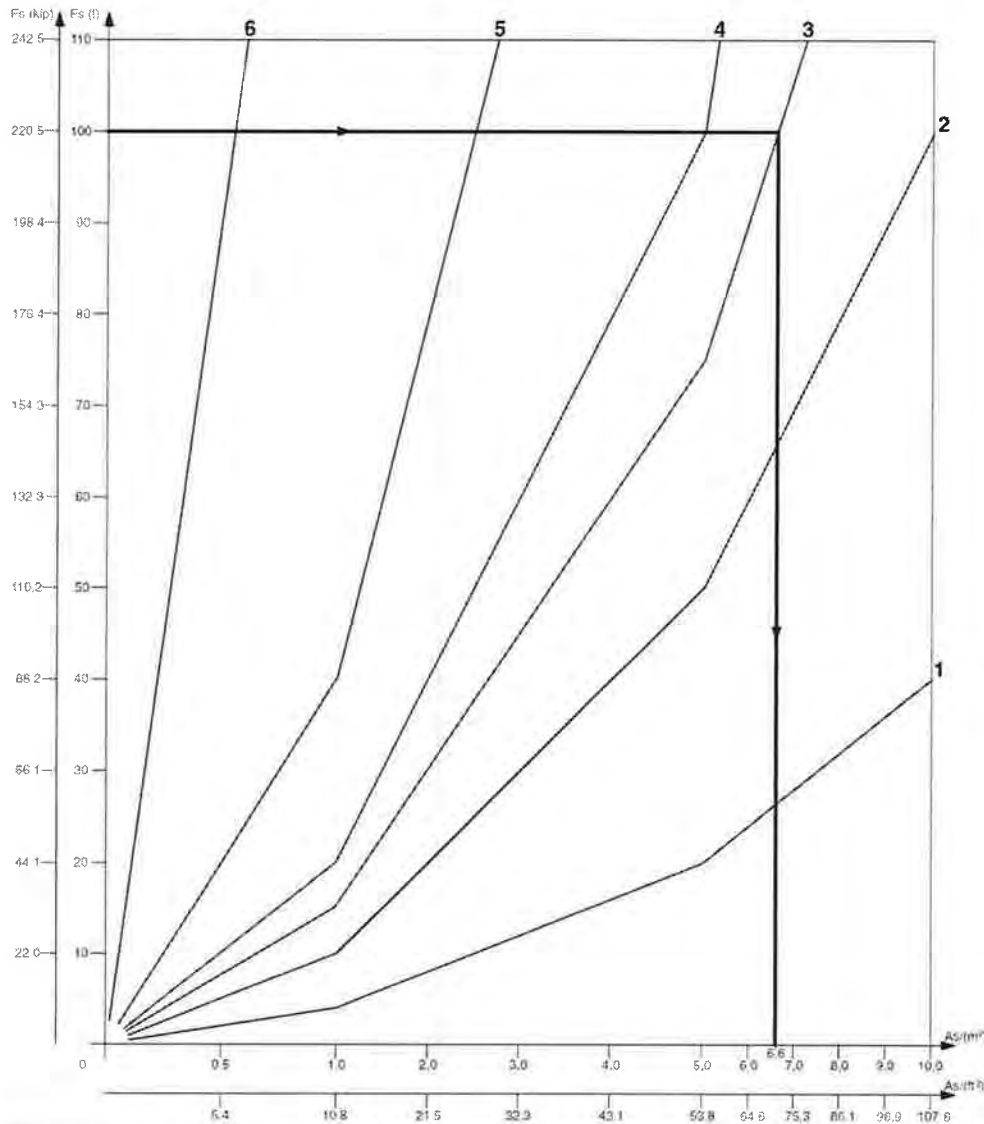
The permitted loading of the ground is determined by type and condition of the ground. Instructions on permitted ground pressures can be found for example, in the standard DIN 1054 "Permitted loading of the construction ground" (for excerpt see the following table).

Type of ground	Permitted ground pressures	
	N/cm ²	psi
1. Organic ground in general: Peat, sludge, bog soil	0	0
2. Non-compressed rubble: Construction site rubble, etc.	0 – 10	0 – 15
3. Non-cohesive ground: Sand, gravel, stones and mixtures thereof	20	29
4. Cohesive grounds:		
a) Course clay, mixed with e.g. topsoil	12	17
b) Coarse clay, consisting of all-weather clay and clay from slopes	13	19
c) Rich clay, consisting of clay and fillers		
stiff	9	13
semi-firm	14	20
firm	20	29
d) Mixed granular ground: Clay to sand, gravel and stone areas		
stiff	15	21
semi-firm	22	32
firm	33	47
5. Consistently firm rock:		
– cracked with weather wear	150	217
– not cracked	400	580

If doubts exist with regard to the load-bearing capacity of the ground, an examination of the ground must be carried out (e. g. with a pile sensor).



p [N/cm ²]	4	10	15	20	40	150
p [psi]	6	15	21	29	58	217
	1	2	3	4	5	6



Determining the Required Support Area

For this type of machine, the maximum support forces vary at the front and rear supports.

The maximum support force is 100 t (220.5 kip) at the rear supports and it is 85 t (187.4 kip) at the front supports.

The rear outrigger plates have a diameter of 700 mm (27.6 in) (support surface of 0.4 m² / 4.3 ft²).

The front outrigger plates have a diameter of 600 mm (23.6 in) (support surface of 0.3 m² / 3 ft²).

Procedure

The permitted ground pressure "p" for the type of ground on which the supporting procedure is to be carried out can be found in the table in segment .

The corresponding curve (1 to 6) must then be selected for the assigned graph out of the table in figure.

The support force F_s is depicted on the y - coordinate (ordinate) in the graph in figure bottom).

The required support surface A_s is noted on the x - coordinate (abscissa).

Curves 1 to 6 show the relation between the support force F_s and the required support area A_s with regard to the permitted ground pressure "p".

Example

For a "stiff" mixed granular ground (clay to sand, gravel and stone areas) ($p=15$ N/cm² (21 PSI)) in accordance with the table "Permitted ground pressure" in segment, the following values can be taken for the adjacent diagram:

For $p=15$ N/cm² (21 PSI), the values of the curve 3 are the decisive ones (see table (Z 200 617 top).

The support surface ($A_s=6.6$ m² / 71.0 ft²) required for the outrigger plates is calculated from this with a maximum support force ($F_s = 100$ t / 220.5 kip) at the rear supports.

In order to increase the outrigger pad's support surface area - which is too small in this example - to the required support surface area, suitable supports (i.e: timber planks) must be laid underneath.



Safe Distance to Slopes and Pits

Erect the crane with a sufficiently safe distance to slopes or pits.

The distance also depends on the type of ground.

The distance to the edge of a slope (X) must be at least 2 m (6.6 ft).

A general rule is:

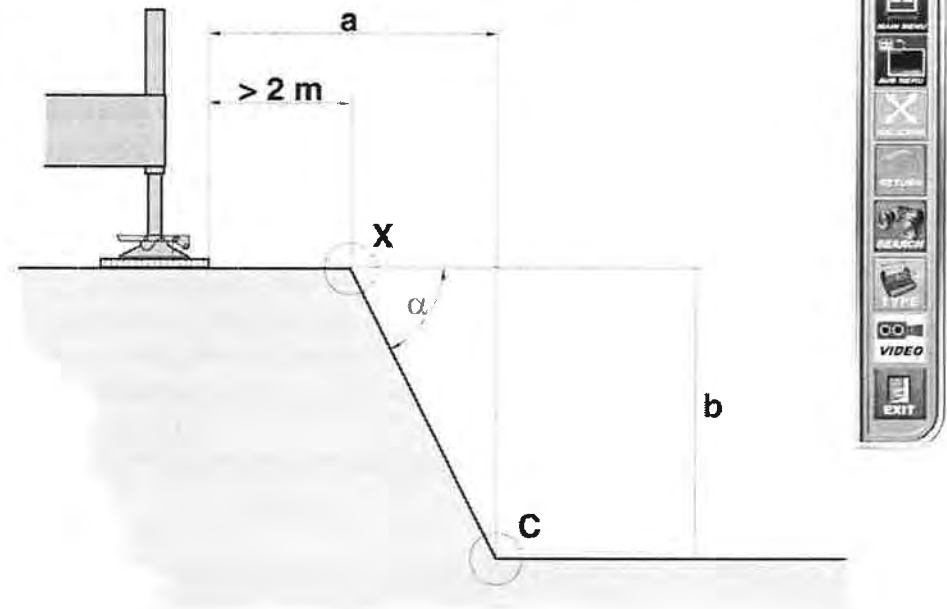
- For loose or backfilled soils the safety distance (a) must be twice the size of the ditch depth (b)

The slope angle α must be $< 30^\circ$.

- for natural, firm soils the safety distance (a) must be as large as the ditch depth (b).

The slope angle α must be $< 45^\circ$.

The safety distance is measured starting at the base of the pit (C).





Superstructure operation

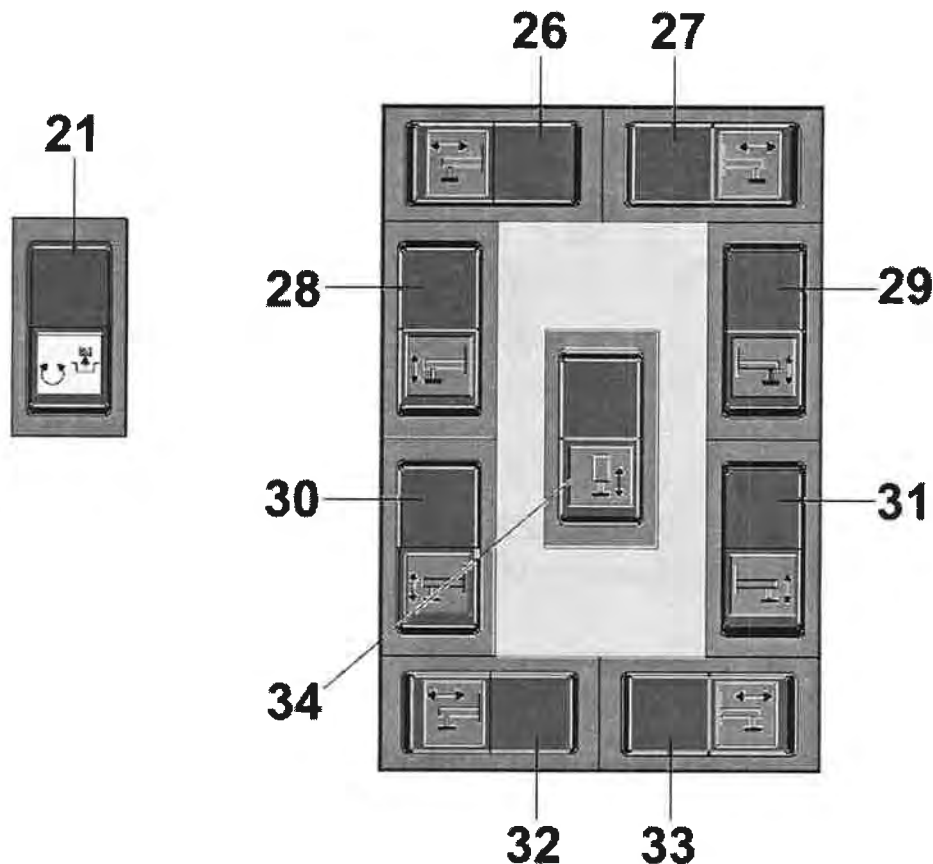
Supporting the crane on outriggers from the crane operator's cab In order to support the crane on outriggers from the crane operator's cab, you must follow the procedure as well as the danger and safety instructions detailed in the chassis section.

The outriggers should generally be set using the operating elements in the chassis.

However, it is possible to operate the outriggers from the crane operator's cab for follow-up leveling.

This should only be done in exceptional cases and only if the crane operator has a clear view of all outriggers.

(If necessary, appoint a spotter.)



Proceed as follows:

- Slew superstructure to the rear and lock the superstructure using button (21).
 - Activate slewing gear parking brake (22, S8805).
- The outriggers are driven using the following button:
- 26 S4316 Double- Outriggers front left, retract / button extend horizontally**
 - 27 S4315 Double- Outriggers front right, retract/ button extend horizontally**
 - 28 S4320 Double- Outriggers front left, retract / button extend vertically**
 - 29 S4319 Double- Outriggers front right, retract/ button extend vertically**
 - 30 S4322 Double- Outriggers rear left, retract / button extend vertically**
 - 31 S4321 Double- Outriggers rear right, retract / button extend vertically**
 - 32 S4318 Double- Outriggers rear left, retract / button extend horizontally**
 - 33 S4317 Double- Outriggers rear right, retract / button extend horizontally**
 - 34 S4331 Double- Outriggers complete, retract/ button extend vertically**



There is a danger of crushing in the area between the tires and the base if the crane is lowered directly onto the tires when retracting the outriggers.

Ensure that no persons enter this area before lowering the crane.

The crane may only be driven within an area where all the outrigger struts can be seen by the crane operator, either directly or by using the mirrors. Check the position of the mirrors before operating the outrigger struts.