DELTA 630M ALL TERRAIN

USE AND MAINTENANCE HANDBOOK

S.p.A.

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INTRODUCTION

Dear Customer,

Thank you for having chosen a ***Ritmo*** machine.

This handbook will show you all your new **DELTA** machine features, and how to get the most of them. In this book you will also find all the information and suggestions needed to use the machine in a proper, safe and professional manner. We therefore recommend its complete reading before starting using the machine. We also recommend to keep it for future consultations and/or new users.

Please remember that this machine is a professional device; its use must be limited to skilled and certified personnel.

Certain of your complete satisfaction,

Best regards,

Ritmo
PLASTIC WELDING TECHNOLOGY

2. SAFETY PRECAUTIONS

GENERAL SAFETY

The use of the **DELTA 630M ALL TERRAIN** *is intended exclusively to qualified personnel according to the standards in force. Use the machine only for purposes as described on chapter 3 "Fields of Application" and according to the operator's manual. Any other use is forbidden, since it may cause harm to persons, damage the machine or other objects. Do not remove the safety devices (switches, micro-switches, seals, etc).*

Replace defective or worn out parts only with ***Ritmo*** genuine spare parts.

Any intervention or repair on the machine has to be performed by qualified personnel.

Safety Warnings

This hazard sign  appears in this manual.
When you see this sign, carefully read what it says.
YOUR SAFETY IS AT STAKE.

You will see the hazard sign with these words:
DANGER, WARNING and CAUTION.

Indicates an imminently hazardous situation which, if not avoided, will result in death or serious injury.

Indicates a potentially hazardous situation which, if not avoided, could result in death or serious injury.

Indicates a hazardous situation which, if not avoided, may result in minor or moderate injury.

In this manual you should look for two other words: **NOTICE** and **IMPORTANT**.

NOTICE: can keep you from doing something that might damage the machine or someone's property. It may also be used to alert against unsafe practices.

IMPORTANT: can help you do a better job or make your job easier in some way.

Read and understand

Do not operate this equipment until you have carefully read, and understand the chapter 2. "Safety" and chapter 6. "Operation" of this manual, and all other equipment manuals that will be used with it.
Your safety and the safety of others depend upon the correct use of this equipment.

Follow all applicable federal, state, local, and industry specific regulations.

Ritmo America Manufacturing cannot anticipate every possible circumstance that might involve a potential hazard. The warnings in this manual and on the machine cannot warranty complete safety: you must apply a procedure, tool, work method, or operating technique that is safe for you and others. You should also ensure that the machine will not be dangerous or be damaged by the method of operation or maintenance you choose.

General Safety

Safety is important. Report anything unusual that you notice during set up or operation.

LISTEN for thumps, bumps, rattles, squeals, air leaks, or unusual sounds.

SMELL odors like burning insulation, hot metal, burning rubber, hot oil, or natural gas.

FEEL any changes in the way the equipment operates.

WATCH for problems with wiring and cables, hydraulic connections, or other equipment.

REPORT anything you see, feel, smell, or hear that is different from what you expect, or that you think may be unsafe.

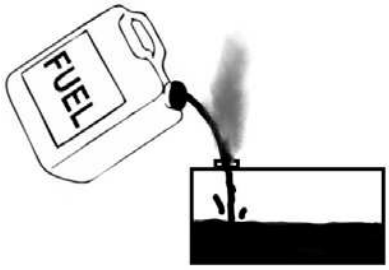
Ware Safety Equipment

Wear the safety equipment as prescribed by the standards in use.

Pay attention not to get caught in some parts of the machine.
Remove jewelry and rings, and do not wear loose-fitting clothing or long hair that could catch on controls or moving machinery.

Fuel handling

DANGER Gasoline and diesel fuel are extremely flammable and their vapors will explode if ignited.
Do not fill the fuel tank while the engine is hot or running, as spilled fuel could ignite.
Refuel in a well ventilated area. Do not smoke or allow flames or sparks in the area where the engine is refueled, or where gasoline is stored.
Do not start the engine near spilled fuel. Wipe up spills immediately.
Make sure that the fuel tank cap is closed and properly secured.
Avoid repeated or prolonged contact with skin or breathing of vapor.



Engine

DANGER Internal-combustion engines can cause explosions when operated in a hazardous environment. Do not operate gas or diesel powered machines in a hazardous environment.
When operating in a hazardous environment, keep engine and chassis in a safe area by using hydraulic extension hoses.
Help prevent fires by keeping machine clean of accumulated trash, debris and facer shavings.

Carbon Monoxide

Engine exhaust gases contain carbon monoxide which can cause nausea, fainting and death. Avoid inhaling exhaust fumes and never run the engine in a closed or confined area.

Heater

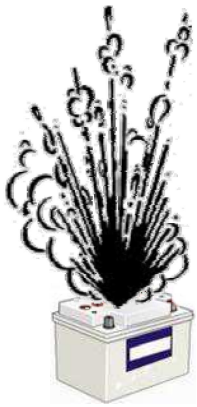
DANGER The heater is not made to work in hazardous environment. Do not use the heater in places with an explosion hazard. Do not use the machine in an explosive atmosphere (in presence of gas, gasoline vapors, firedamp etc.).

Keep out of range from the heater those materials that may be damaged by heat of catch fire (oil, varnish, paint, solvents etc.).

Electric motors and alternators

DANGER Electric motors and alternators cannot be used in places with an explosive atmosphere.
To use these components in dangerous places without precautions can be the cause of explosions and death.

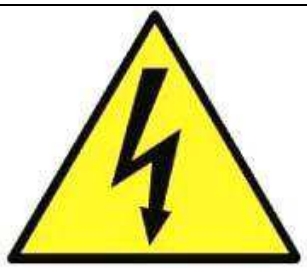
Battery



WARNING Do not expose the battery to flames or electrical sparks. Hydrogen gas generated by battery action is explosive. Blindness or serious injury can be the results from an exploding battery. Avoid the contact between the battery terminals and metal objects; this can cause an explosion and/or a fire.

WARNING Avoid contact between battery fluid and skin, eyes, fabrics, or painted surfaces. The sulfuric acid can cause burns. After touching a batter or battery cap, do not touch or rub your eyes. Thoroughly wash your hands. If the acid contacts your eyes, skin or clothing, immediately flush with water for at least 15 minutes and seek medical attention.

Electric hazards



WARNING

Do not expose the machine to rain or other liquids.

Be sure that the protective gears (e.g. gloves) are always dry.

Do not expose the cable to chemical substances or to mechanical stress (e.g. walking or riding vehicles on the cables, avoid contact with sharp objects etc).

Before using the machine check that the single components are not damaged, especially insulating parts, cables, fairlead and cable lockers.

Clean properly the machine once your done using it. Do not use solvents, gasoline, abrasive tools or substances that could damage the insulating parts.

Connect the machine to ground.

Check the efficiency of the grounding system.

Crush hazard

WARNING Hydraulically operated jaws are operated under pressure. Anything caught in the jaws will be crushed. Keep fingers, feet, arms, legs, and head out of the jaws area. Always check pipe alignment with a pencil or similar object. There is no protective system that avoids being crushed by the jaws. Keep a safety distance from the crushing points.

Warning !!! : if caught in between the jaws press the emergency button. The carriages will suddenly stop and the pressure in the hydraulic circuit will be released allowing the manual opening of the carriages.

Cut hazard

WARNING **The blades of the facer are sharp.** Do not attempt moving the facer while it's working. Always be very careful while handling the facer.

NOTICE: disconnect the facer (and remove the facer where possible) before doing any maintenance.

Splinter hazard

Keep at a safe distance when facing.
Wear protective goggles.

IMPORTANT: Before doing any job, clean the heads of the pipes from any deposits (stones, mud, sand etc.).

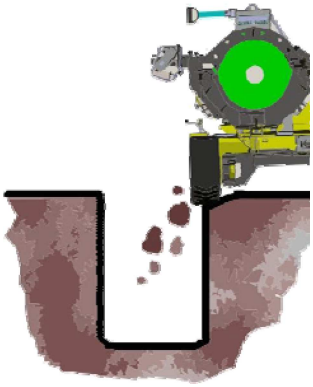
Hydraulic components

Sudden hydraulic oil leak can cause serious injury, or even be fatal if the pressure is very high.

WARNING Escaping fluid under pressure can penetrate the skin causing serious injury. Keep hands and body away from pinholes which eject fluid under pressure. Use a piece of cardboard or paper to search for leaks. If any fluid is injected into the skin, it must be immediately removed by a doctor.

NOTICE: Use safety goggles and keep clean the hydraulic system area to avoid hi-pressure air to cause oil splashes into the eyes.

Keep the machine away from the ditch



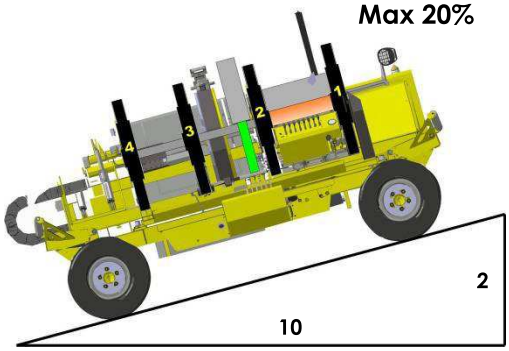
WARNING Keep the machine away from ditches or holes in the ground. Heavy equipment too close to a ditch can cause the walls of the ditch to cave in. Keep the machine far enough away from the edge of the ditch to prevent injuries to personnel and equipment damages from a ground collapse.

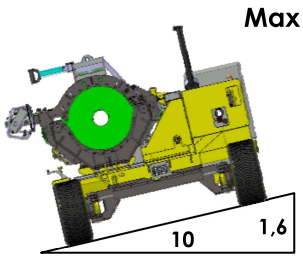
Machine usage

Place the machine on the ground as leveled as possible.

If it is necessary to operate machine on unlevel grade, make sure that the ground is stable. Some unstable conditions may be ice, snow, mud and loose gravel.

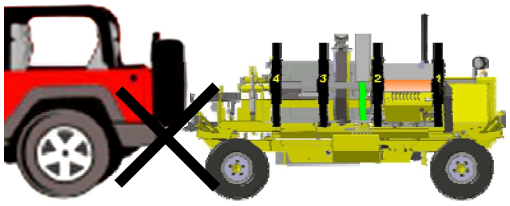
WARNING The machine cannot operate on a straight slope with a gradient higher than 20% and side slope with gradient above 16%. (See pictures on the side).





Towing

CAUTION The machine was not designed for towing. Attempting to tow the machine can result in damaging the machine. Always transport the machine by flat bed truck or similar means, and make sure that it is properly secured.



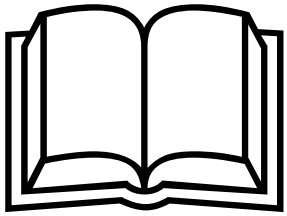
Scorching hazard

CAUTION The heater is hot and will burn clothing and skin. Keep the heater in its insulated heater stand when not in use, and use with care during the welding process.

NOTICE: Use only a clean non-synthetic cloth such as a cotton cloth to clean the heater plates.

Welding procedure

Purchase the pipes from the supplier together with the parameters you will need to weld the pipes together and abide by the given procedure.



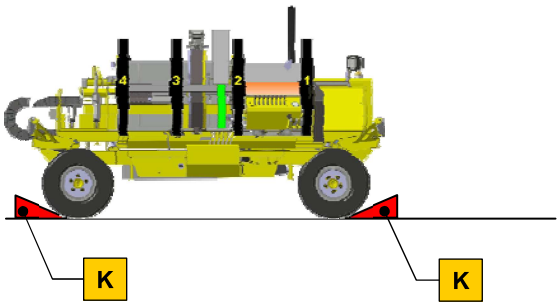
⚠CAUTION Failure to follow pipe manufacturer's procedure could result in a bad joint. Always follow pipe manufacturer's procedures.

Periodically check the temperature

NOTICE: Incorrect heating temperature can result in bad fusion joints. Check heater plate surface temperature periodically with a properly calibrated pyrometer, and make necessary adjustments.
The thermometer on heaters indicates internal temperature, and should be used as a reference only.

Fusion machine positioning

Place fusion machine on ground as leveled as possible. If it is necessary to operate machine on unlevel grade, chock the wheels and block the unit to make it as stable as possible.



Earmuffs mandatory

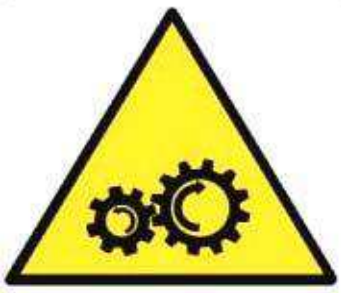
When the operator is using the machine for more than 4 hours a day is mandatory to use earmuffs.

Getting caught hazard

Keep a safe distance when the facer is working and when the carriages are moving.

Remove bracelets and necklaces. Gather up long hair.

Use the correct protective gears and garments.



FIELD OF APPLICATION

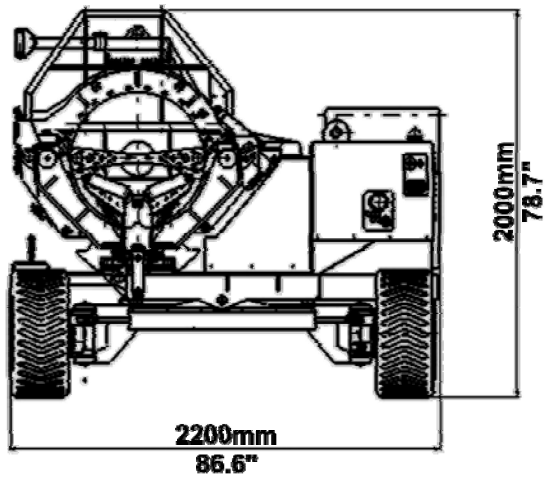
DELTA 630M ALL TERRAIN is a yard welder with a conductive heater for head to head welding of pipes and/or fittings in Polyethylene (PE), Polypropylene (PP) and other thermoplastic materials used for the transporatation of combustible gas, water and other fluids under pressure. Tees, bends, wyes, flange joints can also be welded if the third jaw is moved.
The use of the welder is allowed only to trained and qualified personnel, according to standards.

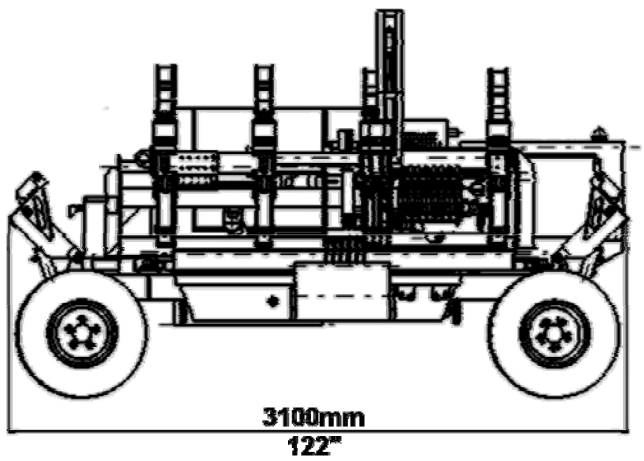
TECHNICAL FEATURES

STANDARD COMPOSITION

Diameters range	∅ 225 ÷ 630 mm
Materials	Polietilene PE-HD, Polipropilene PP e altri materiali termoplastici
Ambient working temperature range	-5 ÷ +40°C [23 ÷ 140°F]
Noise (operator side)	L_{eq}=75 dB (A)
Total machine weight (standard)	3000 kg (6614 lb)
Pressure range	150 bar (0 ÷ 2176 psi)
Diesel tank capacity	60 lt (15,8 gallon)
Hydraulic oil tank capacity	80 lt (21,2 gallon)
Oil type	Use oil with a viscosity of 46 (according to ISO3448) If the average temperature is over than 35°C (95°F) use oil with a viscosity of 68 (according to ISO3448) Recommended: TEXACO RANDO HDZ, ESSO UNIVIS N, SHELL TELLUS
Maximum altitude	2000 mt (6560 ft)

MACHINE BODY	
Cylinders total section	**56,91 cm² (8,82 in²)**
Weight	800 kg (1764 lb)





FACER	
Overall dimensions l×l×h	39.4×10.8 ×40.2in (1000×275×1020 mm)
Weight	331 lb (150 kg)
Facer disks rotation speed	16 rpm

HEATING PLATE	
Maximum absorbed power	9300 W
Temperature range	356÷536°F (180÷280°C)
Overall dimensions l×l×h	39.8×3×39.4 in (1011×75×1000 mm)
Weight	110.2 lb (50 kg)

3. FIELD OF APPLICATION – TECHNICAL FEATURES

FACING/HEATING PLATE SUPPORT	
Overall dimensions l×l×h	17.9×39.4×30.3 in (454×1000×770 mm)
Weight	176.4 lb (80 kg)

INSERTS DIAMETER	Inserts weight (8 pieces each)
225 mm	168 Kg (370,4 lb)
250 mm	168 Kg (370,4 lb)
280 mm	156,8 Kg (345,7 lb)
315 mm	146,4 Kg (322,8 lb)
355 mm	139,2 Kg (306,9 lb)
400 mm	126,4 Kg (278,7 lb)
450 mm	108,8 Kg (239,9 lb)
500 mm	91,2 Kg (201,1 lb)
560 mm	62,4 Kg (137,6 lb)
630 mm	72,2 Kg (159,1 lb)

INSERTS DIAMETER	Inserts weight (8 pieces each)
8 IPS	370,4lb (168kg)
10 IPS	347,4lb (157,6kg)
12 IPS	322,8lb (146,4kg)
14 IPS	306,9lb (139,2kg)
16 IPS	278,7lb (126,4kg)
18 IPS	239,9lb (108,8kg)
20 IPS	201,1lb (91,2kg)
22 IPS	137,6lb (62,4kg)
24 IPS	68,8lb (31,2kg)

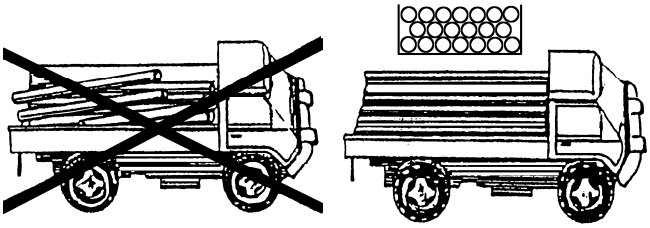
8 DIPS	370,4lb (168kg)
10 DIPS	345,7lb (156,8kg)
12 DIPS	321lb (145,6kg)
14 DIPS	285,7lb (129,6kg)
16 DIPS	246,9lb (112kg)
18 DIPS	215,2lb (97,6kg)
20 DIPS	149,9lb (68kg)

ON REQUEST

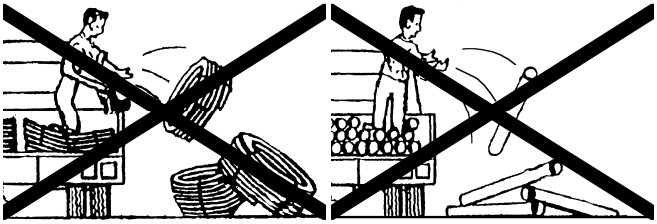
- Code 80401340 Flange joints tool
- Code 84391052 Printer kit (printer + connection cable) for welding certification (report)
- *Cod. 87568602* Additional rollers
- Cod. 84303405 Kit extension for pipe exhaust gases
- *Cog. 84303404* Extensions kit (for in-ditch fusions)

4. GENERAL WELDING CRITERIA

Transportation, loading and unloading, handling and storage of pipes and fittings must be done very carefully using the most suitable mechanical means.



Transportation and loading



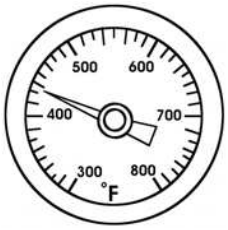
Unloaded

It is important to avoid any scratches on the surface of pipes and fittings. Avoid any friction of the elements against hard or sharp objects (such as side-boards in means of transport, tools or against rough ground, etc..).

INITIAL CHECKS

THERMOMETER

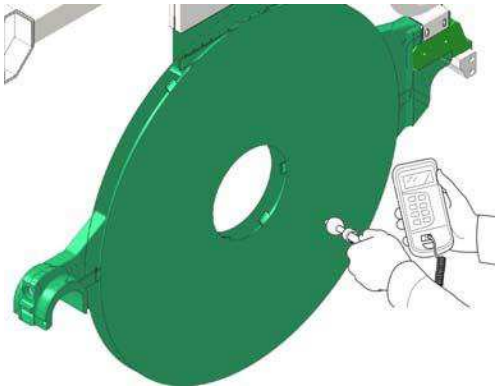
Make sure it's in good working conditions.



HEATING PLATE

Make sure the teflon surface is free from damage.

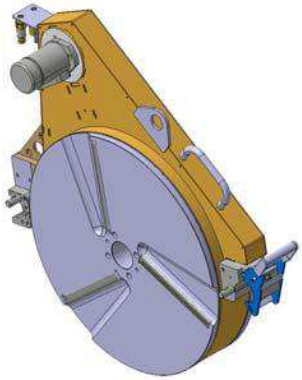
Use a digital thermometer to check that the temperature reached corresponds to the temperature value set.



FACER

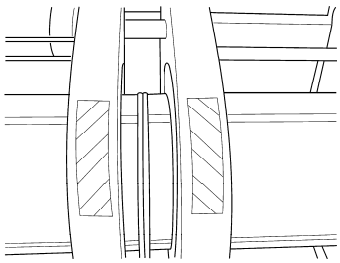
Make sure that is in good working conditions.

Check the sharpening of the blades.



FUSION

Test everything by doing a trial fusion.

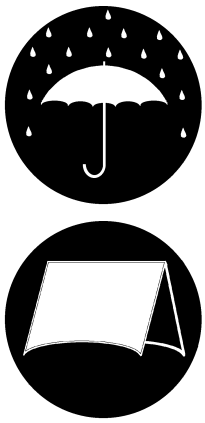


ENVIRONMENTAL AND WEATHER CONDITIONS

Welding must take place in a dry place.

In case of rain, high humidity rate, wind, low temperatures or excessive sunlight, the area where welding is done must be adequately protected.

It is forbidden to raise the temperature of the areas to be welded by using blowlamps or burners in direct contact with it.



SET UP AND PRELIMINARY CHECKS BEFORE WELDING

PIPES/FITTINGS TO BE WELDED

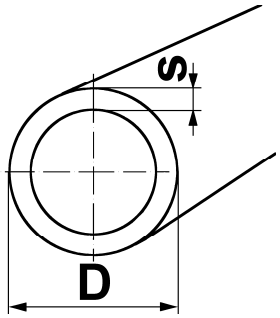
a) They must have

The same outer diameter **D**;

The same thickness **s**.

Tolerances for diameter **D** and thickness **s** must be within the range established by national regulations.

b) They must have the same product sigma (σ).

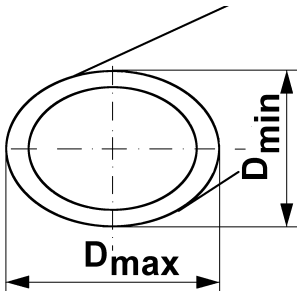


EGG-SHAPED PIPES

The out-of-roundness percentage

$$\frac{D_{max}-D_{min}}{D} \times 100$$

must be in the range established by the national standards (**D**= nominal outer diameter).

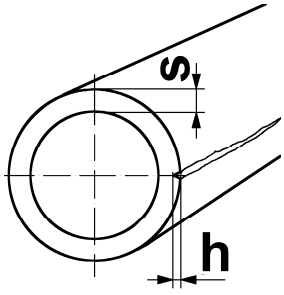


GROOVES AND SCRATCHES

The percentage

$$\frac{h}{s} \times 100$$

must be in the range established by the national standards (**h** = groove depth, **s** = pipe thickness).



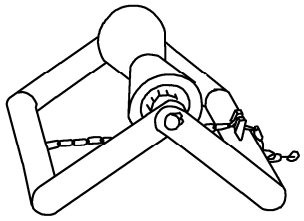
CLEANING

Clean the inside and outside surface of the area to be welded.

Use the cleaning products recommended by the producers.

ROLLERS

In order to reduce friction (and also the drag pressure **P_t**) place the ends of the pipes on the special rollers.

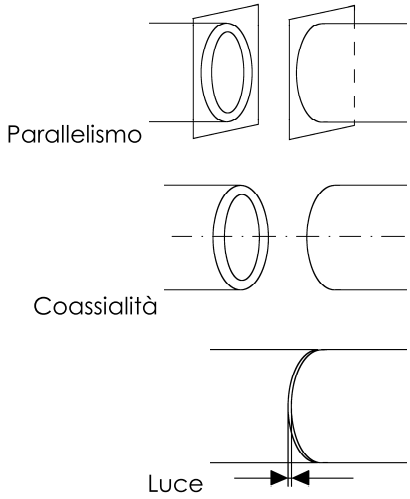


WIND PROTECTION

In order to avoid the stack effect, cover the dead ends (the ones that are not being welded) of the pipes.

LOCKING THE PIPE IN THE JAWS:

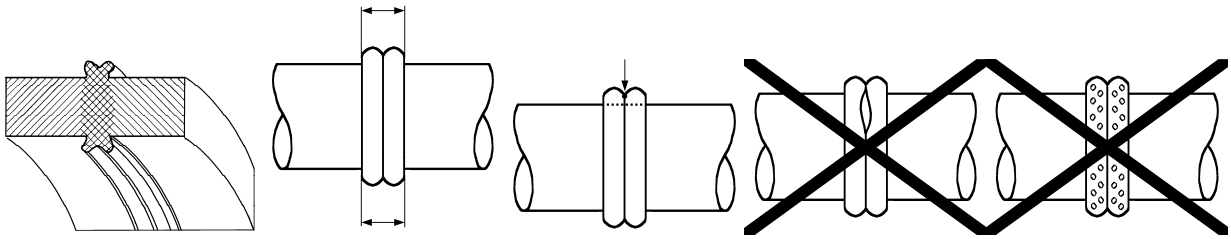
The three conditions on the right must be in the range established by national standards.



DRAGGING PRESSURE P_t

It must always be calculated with the pipes locked in position.

Visual check the joint:



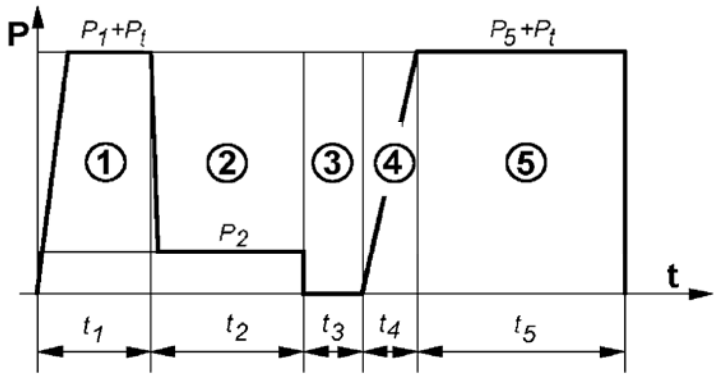
Follow the working procedures established by the nation regulations and those learnt during preparatory and training courses.

WELDING CYCLES (according to ISO21307 and European welding standards)

The operator must set up and check the following welding parameters:

Temperature of the heating plate	Pressure values
Size of bead	Duration of each phase

- **STANDARD WELDING CYCLE**



P_1: Approaching pressure and preheating pressure;

P_2: Maximum heating pressure;

P_5: Welding pressure,

P_t (Dragging pressure): this is the pressure required to beat the friction in the machine. This value must be measured by reading the pressure gauge in the electrohydraulic gearcase.
.t_1, **t_2**, …, **t_6**: duration of phases **1**,**2**, …, **6**.

1- Approaching and preheating. Bring the two edges to be welded near the heating element at the pressure indicated by **(P_1+P_t)** and wait until the bead has reached the expected size from the standard used.

2- Heating phase. Reduce pressure to its maximum value **P_2**, which is sufficient to maintain the contact between the edges and the heating element for the length of time indicated by **t_2**.

IMPORTANT*:** By reducing pressure, the operator must take care not to separate the edges from the heating element. Should this happen, the welding ***must be repeated.

3- Removing the heating element. Do not exceed **t_3** time to remove the heating element. Make sure not to damage the two edges.

4- Reaching the welding pressure. Bring the edges into contact. Gradually increase pressure until the value **(P_5+P_t)** is reached within **t_4** time. Prevent excessive leakage of melted material from the edges in contact.

5- Welding phase. Keep the edges in contact at the pressure indicated by **(P_5+P_t)** for the length of time indicated by **t_5**.

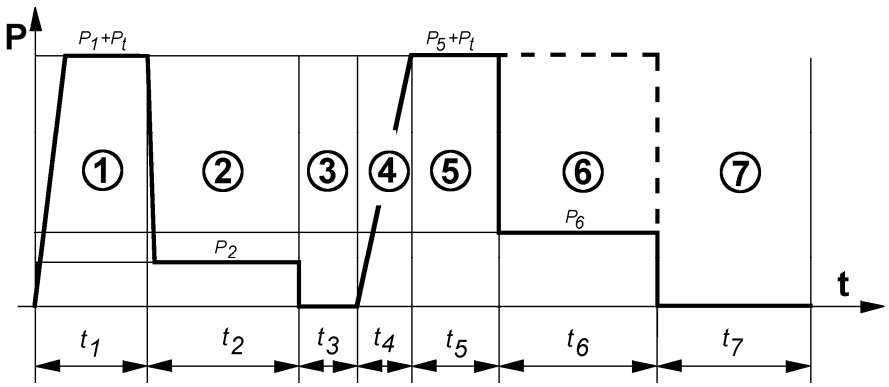
Do not use water or compressed air to accelerate cooling.

The joint should be protected against rain, wind and/or excessive sunlight

DOUBLE PRESSURE WELDING CYCLE

This cycle is used when welding PE 100 elements with wall thickness equal to or greater than 20 mm.

For elements in PE 100 of thickness less than 20 mm., use the single pressure welding cycle.



The first four phases are identical with respect to the single pressure welding cycle.

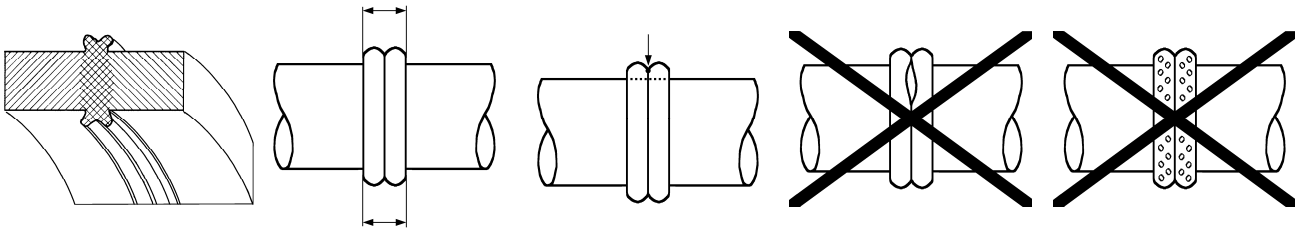
5/6: Welding phase. Welding takes place in two stages. Keep the edges in contact at pressure **(P_5+P_t)** for time **t_5**.
Subsequently reduce the pressure to **P_6** and keep the edges in contact for time **t_6**.

7: Cooling phase. Discharge pressure gradually until you reach 0. Allow the joint to cool at ambient temperature for time **t_7** without subjecting it to mechanical stress.

Do not use water or compressed air to speed up the cooling phase. If necessary, protect the joint from rain, wind or excess solar radiation.

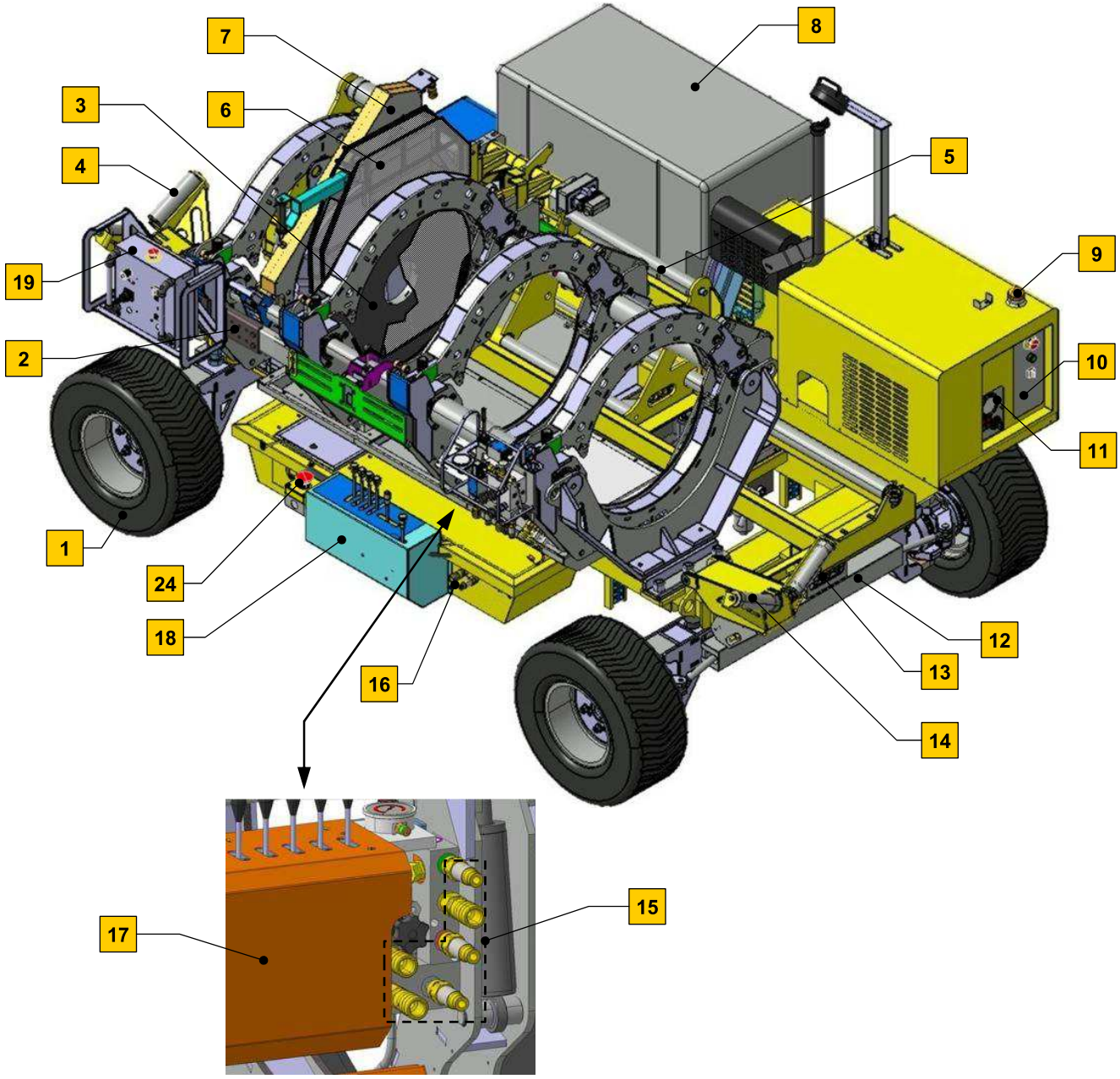
After time **t_7** the welded elements can be removed from the machine.

Visual check of the joint:



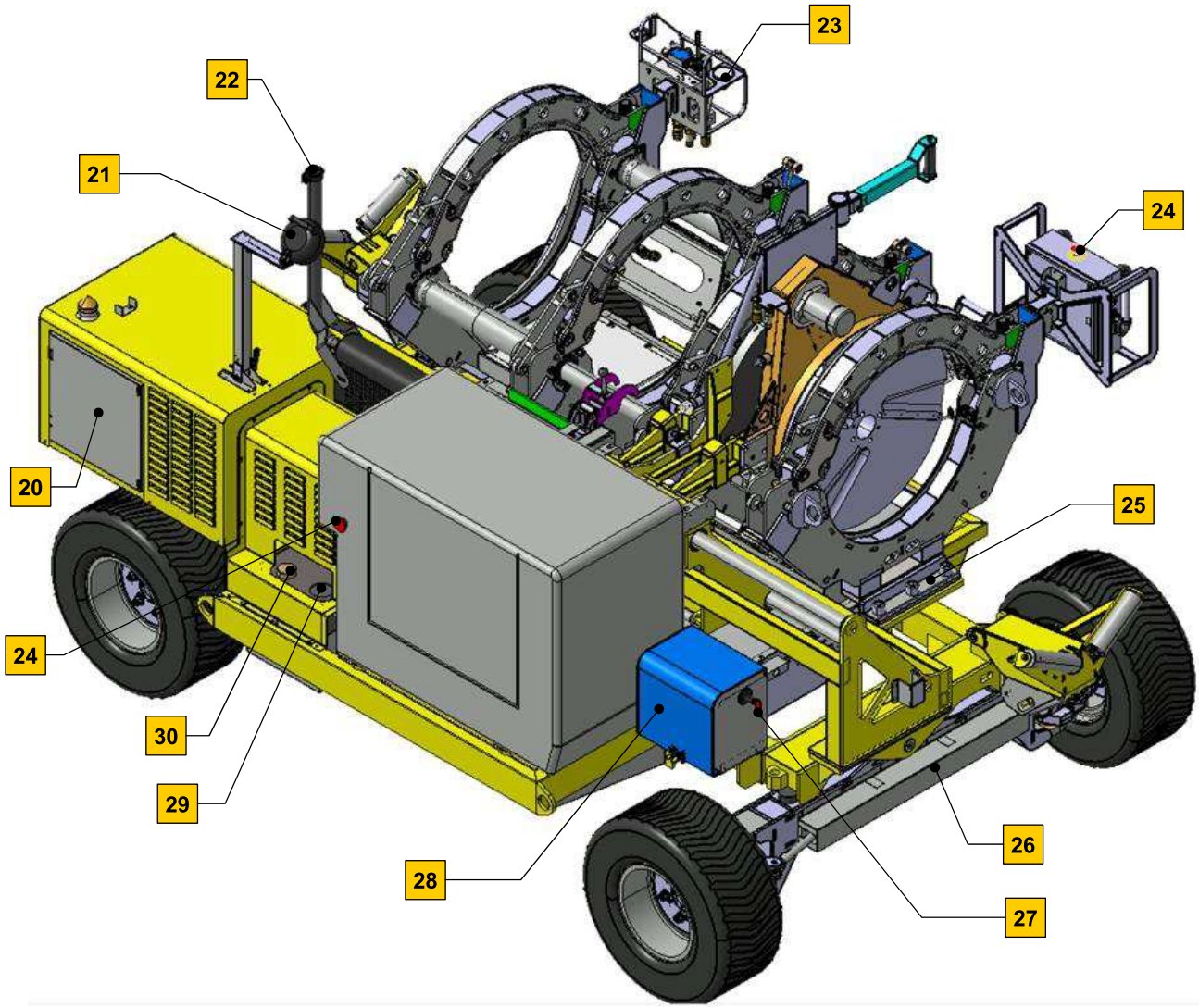
Follow the working procedures established by the national regulations in force and those learnt during preparatory and training courses.

ASSEMBLY (front)



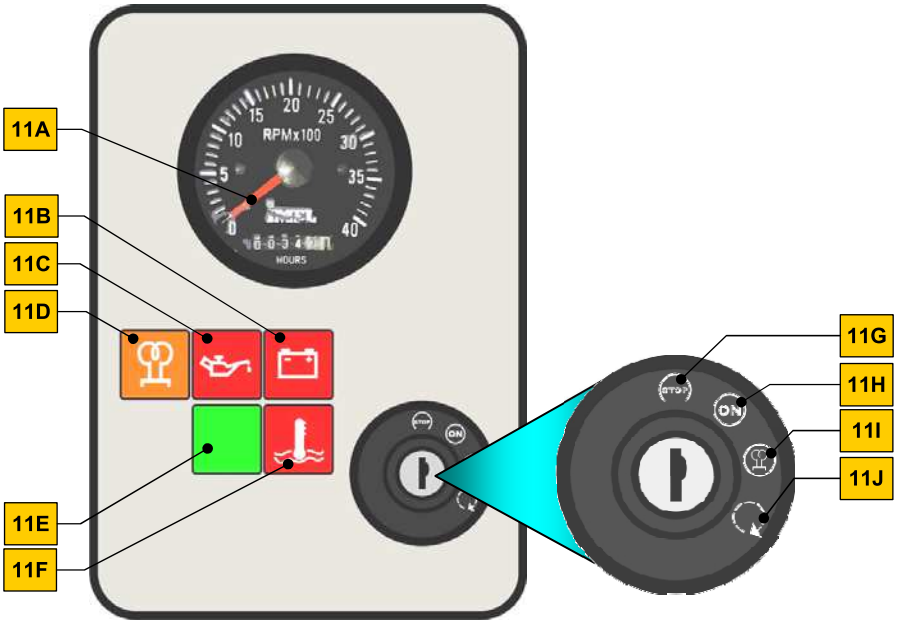
1. Wheel
2. Draggings bar
3. Heating plate
4. Front roller/lifter
5. Facer/heater sliding bar
6. Antiscorch heater protection
7. Facer
8. Engine compartment
9. Flashing light
10. Main electric box
11. Engine electric box
12. Back axle wheel
13. Light
14. Back roller/Lifter
15. Machine body hydraulic connectors
16. Truck hydraulic connectors
17. Jaws control panel
18. Auxiliaries control panel (facer, heating plate, heating plate protection, rollers.)
19. Main control panel

ASSEMBLY (back)



20. Main electric box
21. Light
22. Muffler
23. Hydraulic manifold block
24. Emergency button
25. Chassis locking/unlocking plate
26. Front axle wheel
27. ON/OFF battery switch/key
28. Battery compartment
29. Fuel level gauge
30. Fuel tank cap (DIESEL)

ENGINE ELECTRIC BOX (11)

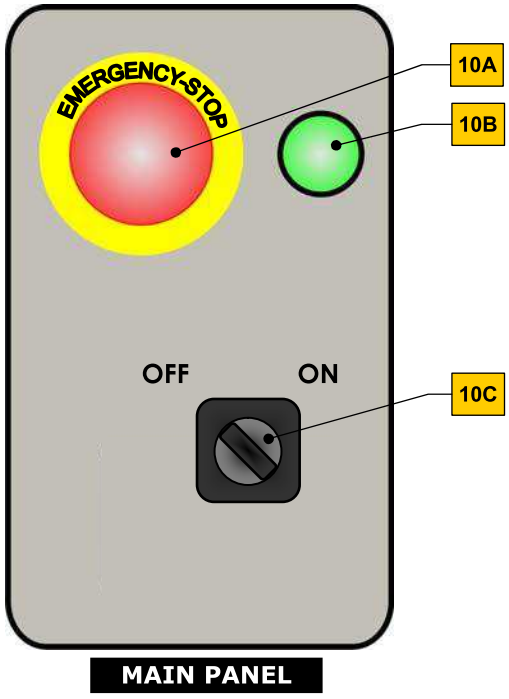


11A. Engine speed indicator
11B. Battery warning light
11C. Engine oil level warning light
11D. Plugs preheating light
11E. Engine ignition light
11F. Water temperature warning light

KEY START

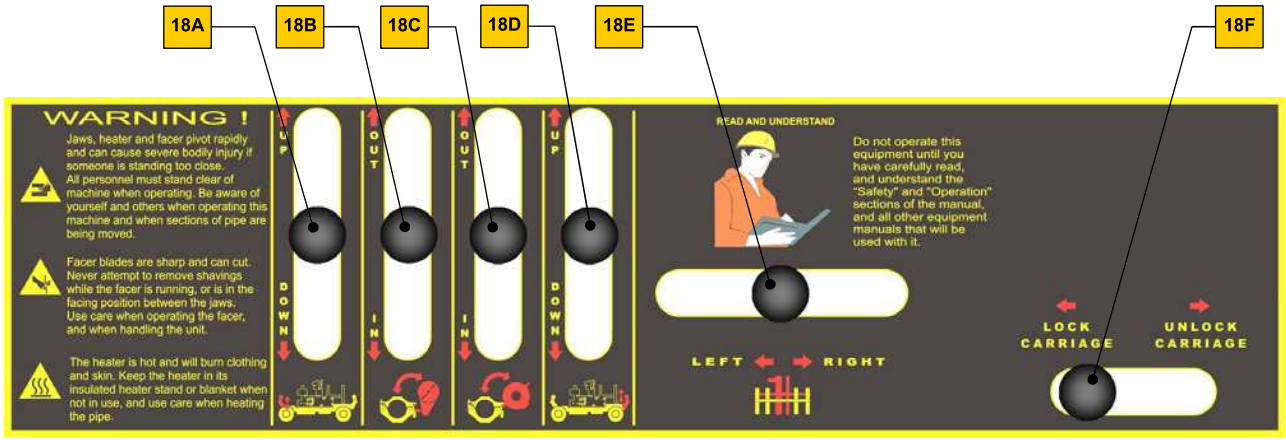
11G. Engine stop position
11H. Warning lights check position
11I. Preheating plugs position
11J. Engine start position

MAIN ELECTRIC BOX (10)



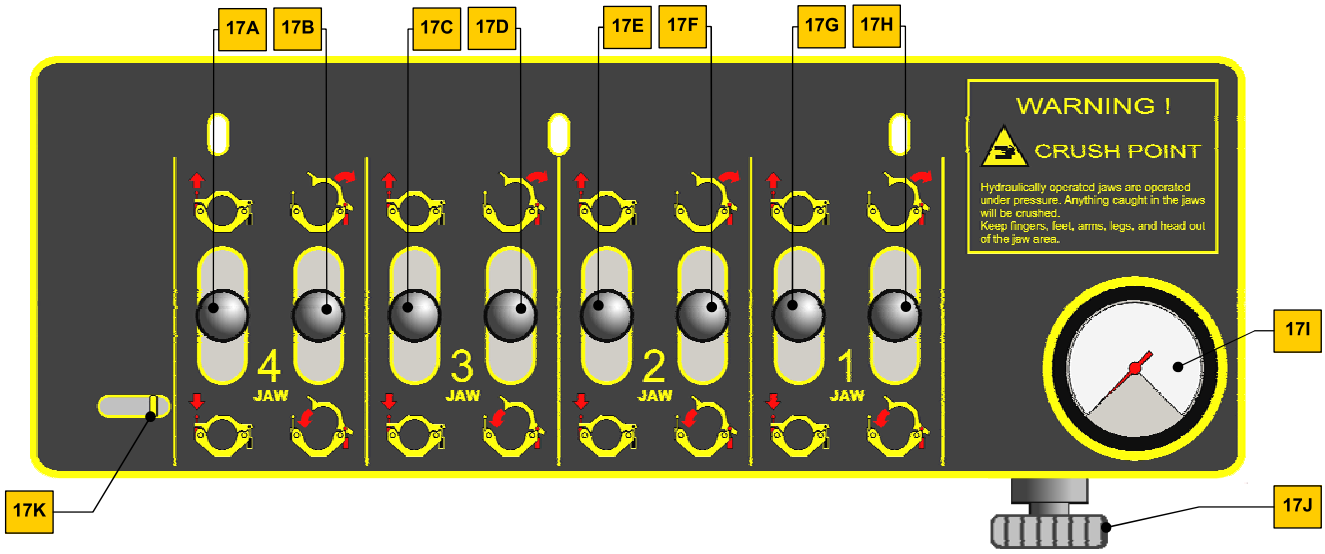
10A. Emergency button
10B. Start button
10C. **ON/OFF** heating plate switch

AUXILIARES CONTROL PANEL (18)



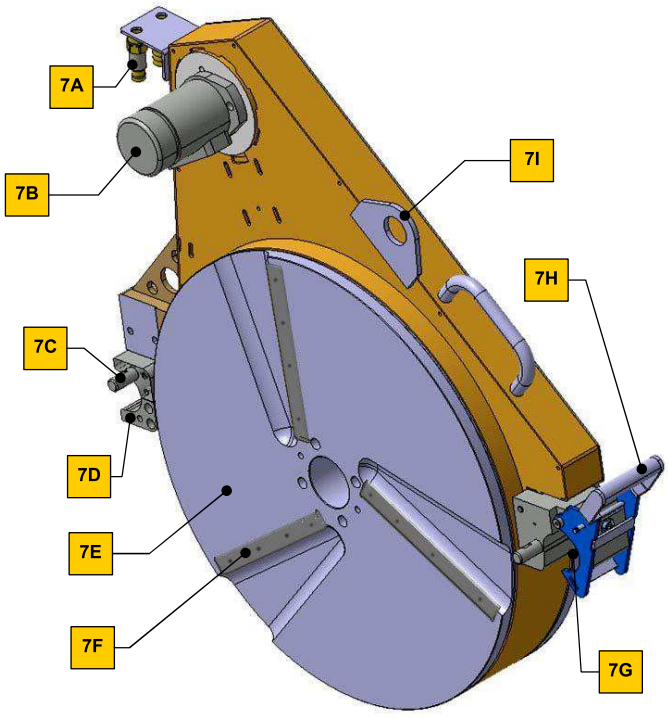
18A. Front roller/lifter lever
18B. Facer lever
18C. Heating plate lever
18D. Rear roller/lifter lever
18E. Auxiliares lever
18F. Lock/unlock facer/heating plate carriage

JAWS CONTROL PANEL (17)



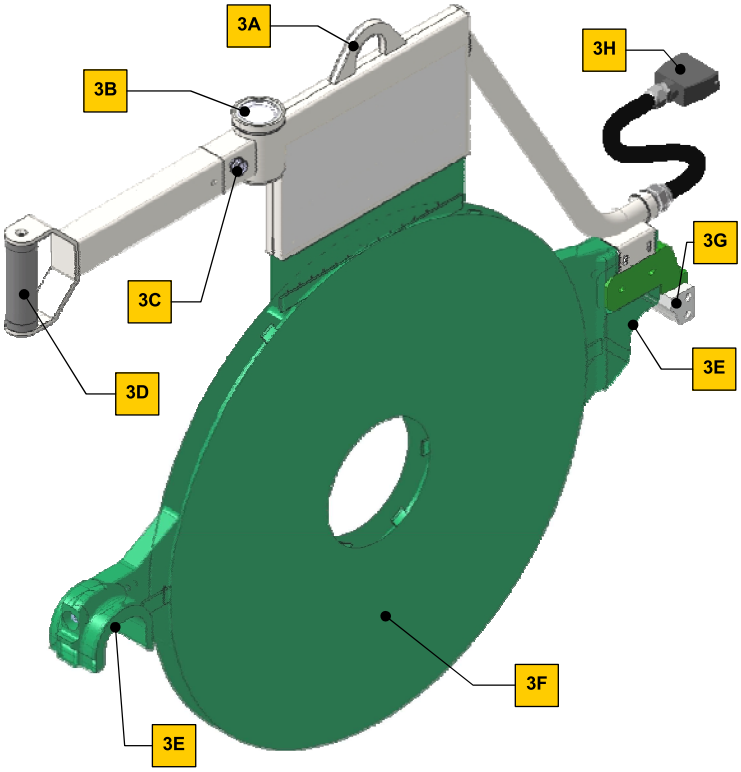
17A. Jaw n°4 lock/unlock lever
17B. Jaw n°4 open/close lever
17C. Jaw n°3 lock/unlock lever
17D. Jaw n°3 open/close lever
17E. Jaw n°2 lock/unlock lever
17F. Jaw n°2 open/close lever
17G. Jaw n°1 lock/unlock lever
17H. Jaw n°1 open/close lever
17I. Jaws hydraulic circuit gauge
17J. Jaws hydraulic circuit regulation valve
17K. Levers unlocking/safety device

FACER (7)



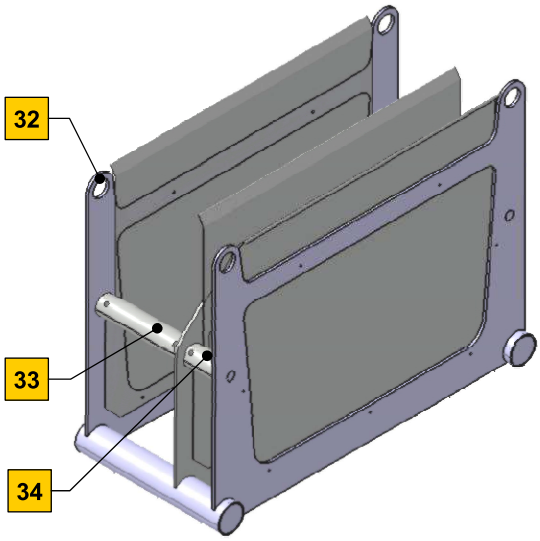
7A. Hydraulic plugs
7B. Hydraulic motor
7C. Support on cylinder ord
7D. Support on cylinder rod (removable)
7E. Disk
7F. Blade
7G. Support on Cylinder rod (fix)
7H. Locking handle
7I. Lifting attachment

HEATING PLATE (3)



3A. Lifting attachement
3B. Thermometer
3C. Handle unlock wheel
3D. Handle
3E. Support on Cylinder rod (fix)
3F. Heater
3G. Support on cylinder rod (removable)
3H. Plug

HEATING PLATE/FACER SUPPORT



32. Lifting attachment
33. Facer slot
34. Heater slot

STANDARD EQUIPMENT

Tool bag

T allen wrench 14mm:
- *To fasten/unfasten the carriages to the chassis*

T allen wrench 8mm:
- *To fasten/unfasten the heater/facer from the fix support.*
- *To fasten/unfasten the heater/facer removable fork.*

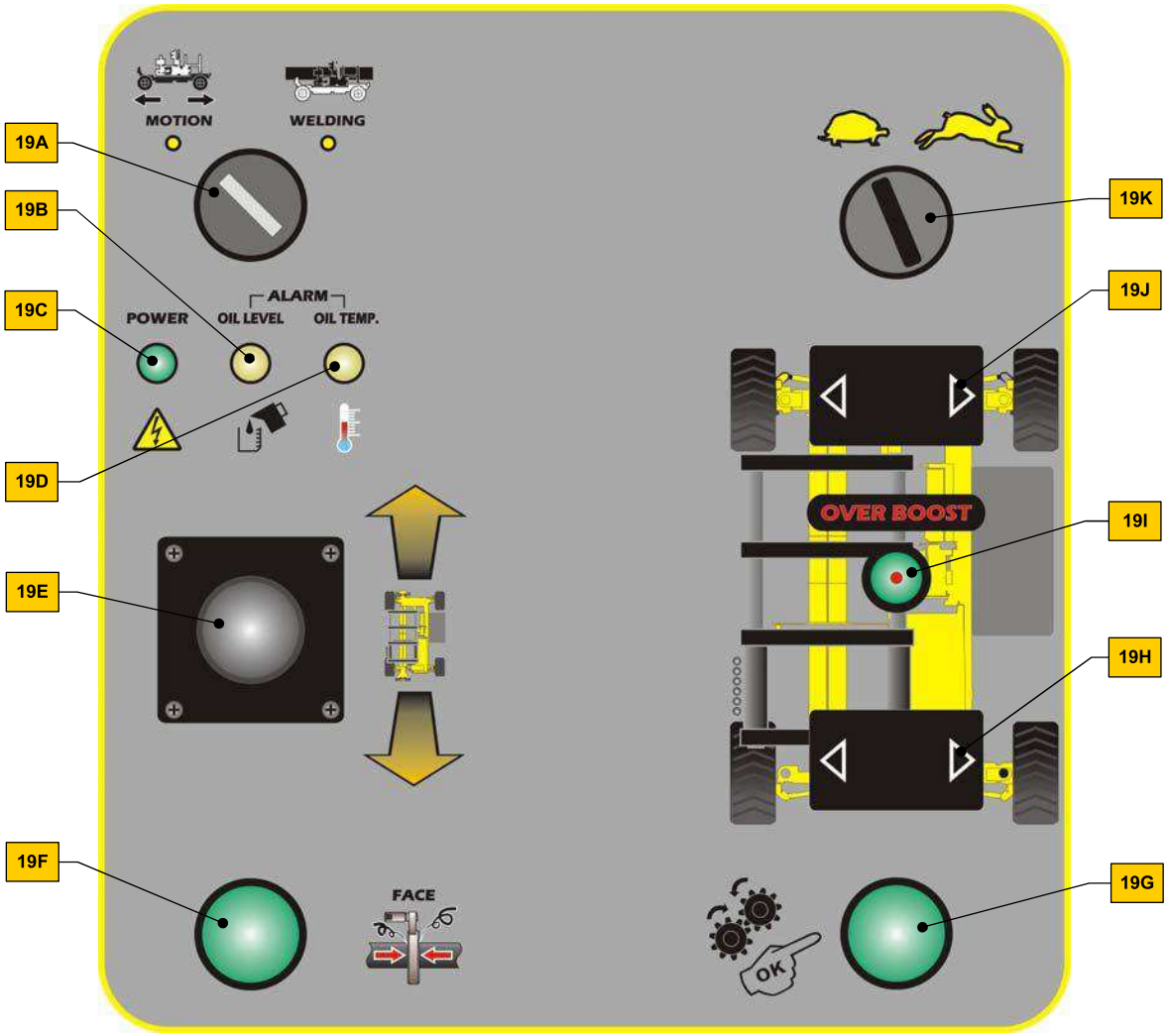
L allen wrench 6mm:
- *To fasten/unfasten stabilizers.i*

L allen wrench 5mm:
- *To fasten/unfasten covers*

Modified fork wrench 22 mm:
- *To fasten/unfasten inserts*

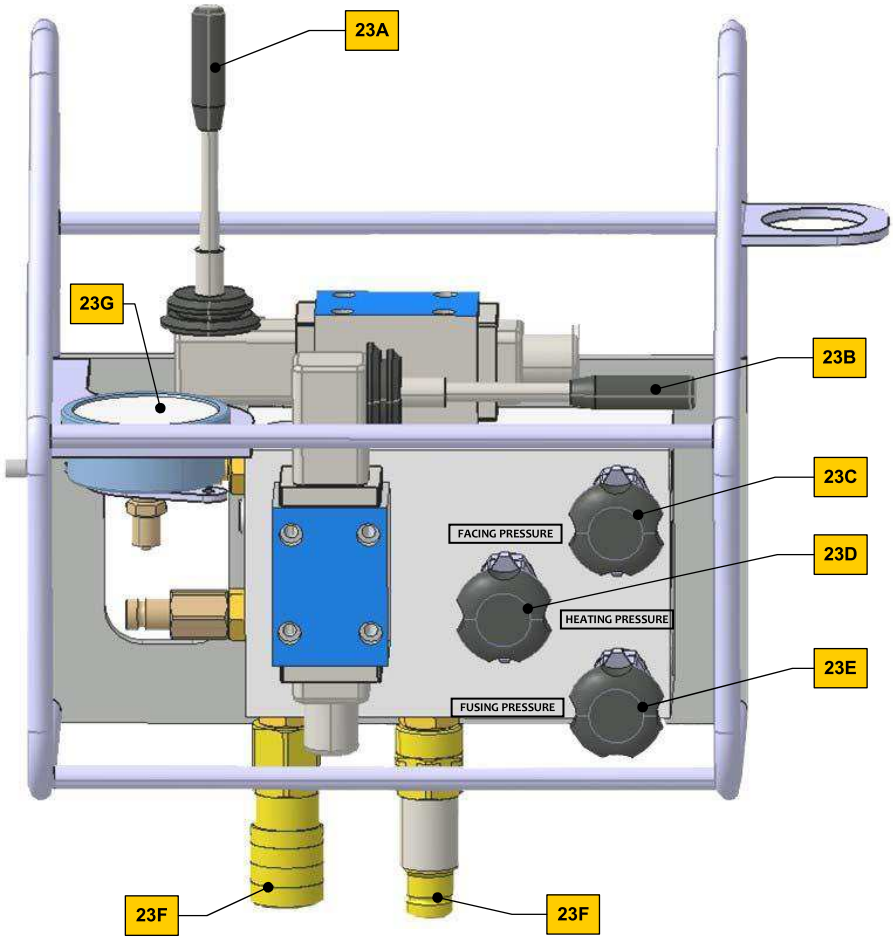
Use and maintenence manual

CONTROL PANEL (19)



19A. MOTION/WELDING mode selector
19B. Oil level warning light
19C. Power supply indicator
19D. Oil temperature light
19E. Joystick forward/backward traction
19F. ON/OFF facer button
19G. Start button
19H. Rear steering button
19I. OVER BOOST button
19J. Front steering button
19K. Track speed selector

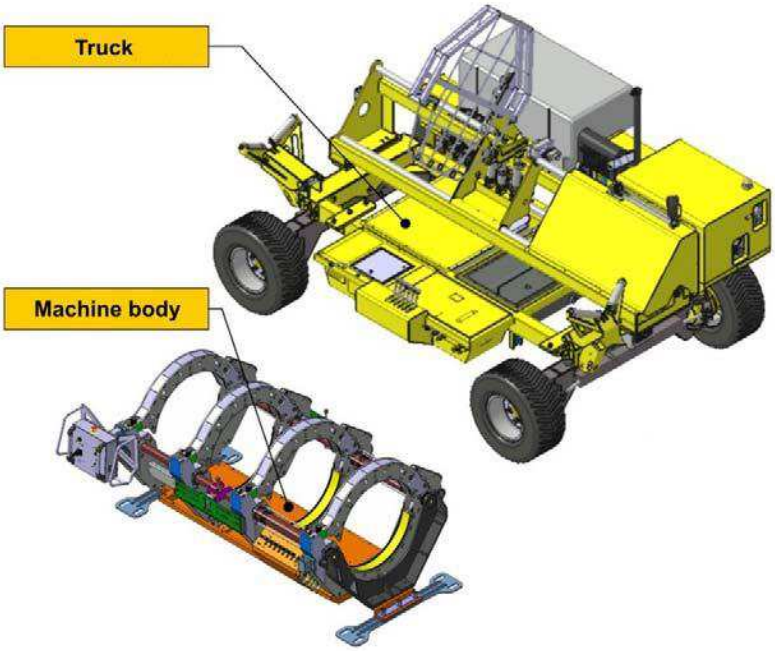
HYDRAULIC MANIFOLD BLOCK (23)



23A. Carriage control valve
23B. Selector valve
23C. Facing pressure valve
23D. Heating pressure valve
23E. Fusing pressure valve
23F. Quick-coupling hoses
23G. Pressure gauge

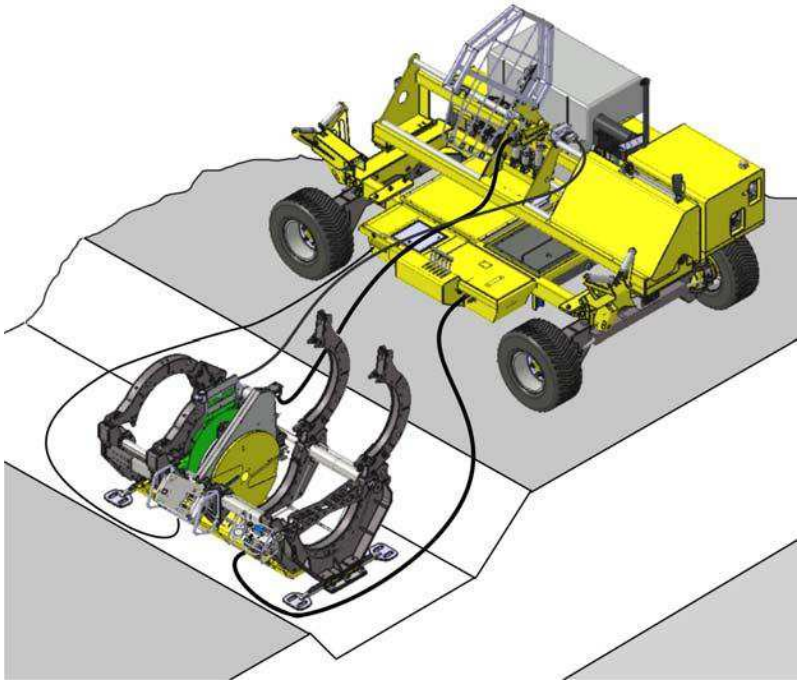
MACHINE DESCRIPTION

Fusion machine consists of a machine body (fusion unit) mounted on a track (motorized) to facilitate pipes loading along pipeline.
The purpose of the generator is to move the track and to pump the oil that also delivers power to the rest of machine's components (heater, facer and control box) making the machine completely self contained.

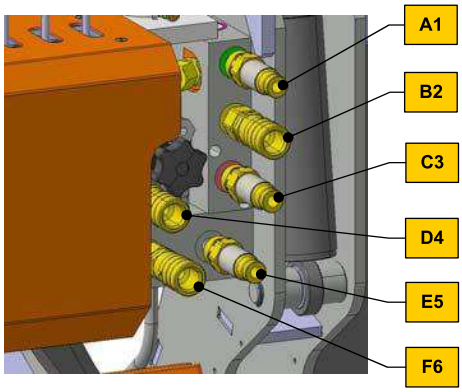


Machine body consists of a support structure, two guiding elements (cylinders) and two jaws sets, one is movable and the other is fixed, each one has 2 Jaws for pipes locking and for placing clamps inserts of different diameters.

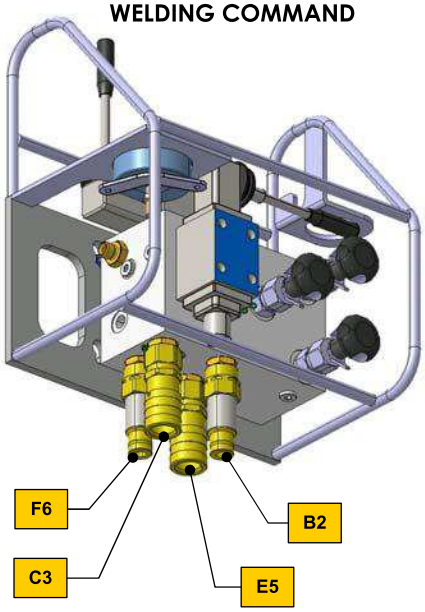
For "in-ditch" fusions (extensions kit on request) it is possible to remove the machine body from the track and work from a remote position by using special extensions given as standard.

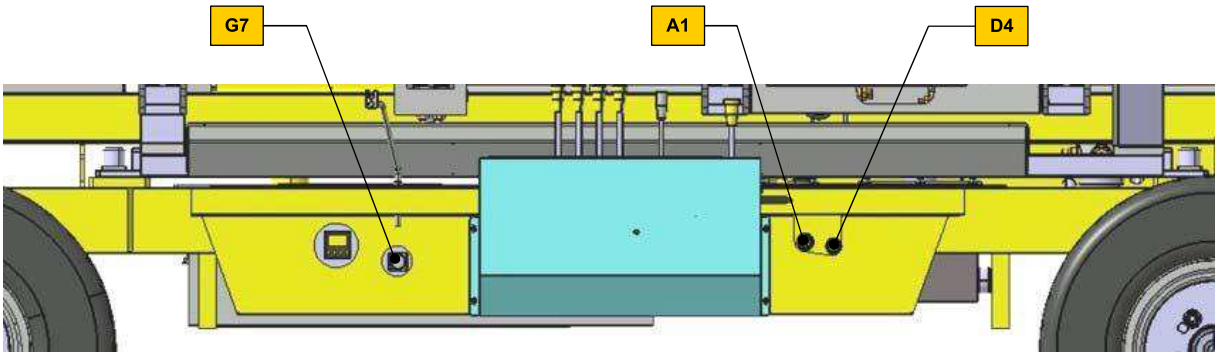


TRACK COMMAND

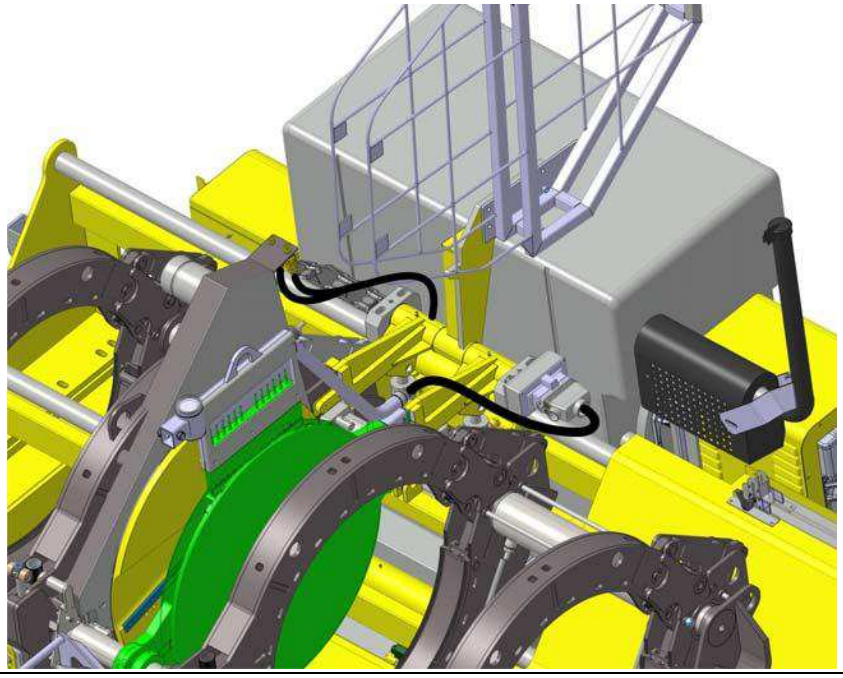


WELDING COMMAND



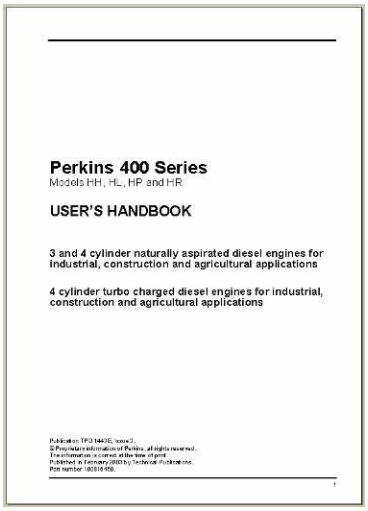


FACER/HEATING PLATE CONNECTION



Engine use instructions

WARNING **Before starting the machine read carefully the diesel-engine instructions in attachment.**



Perkins 400 Series
Models HH, HL, HP and HR

USER'S HANDBOOK

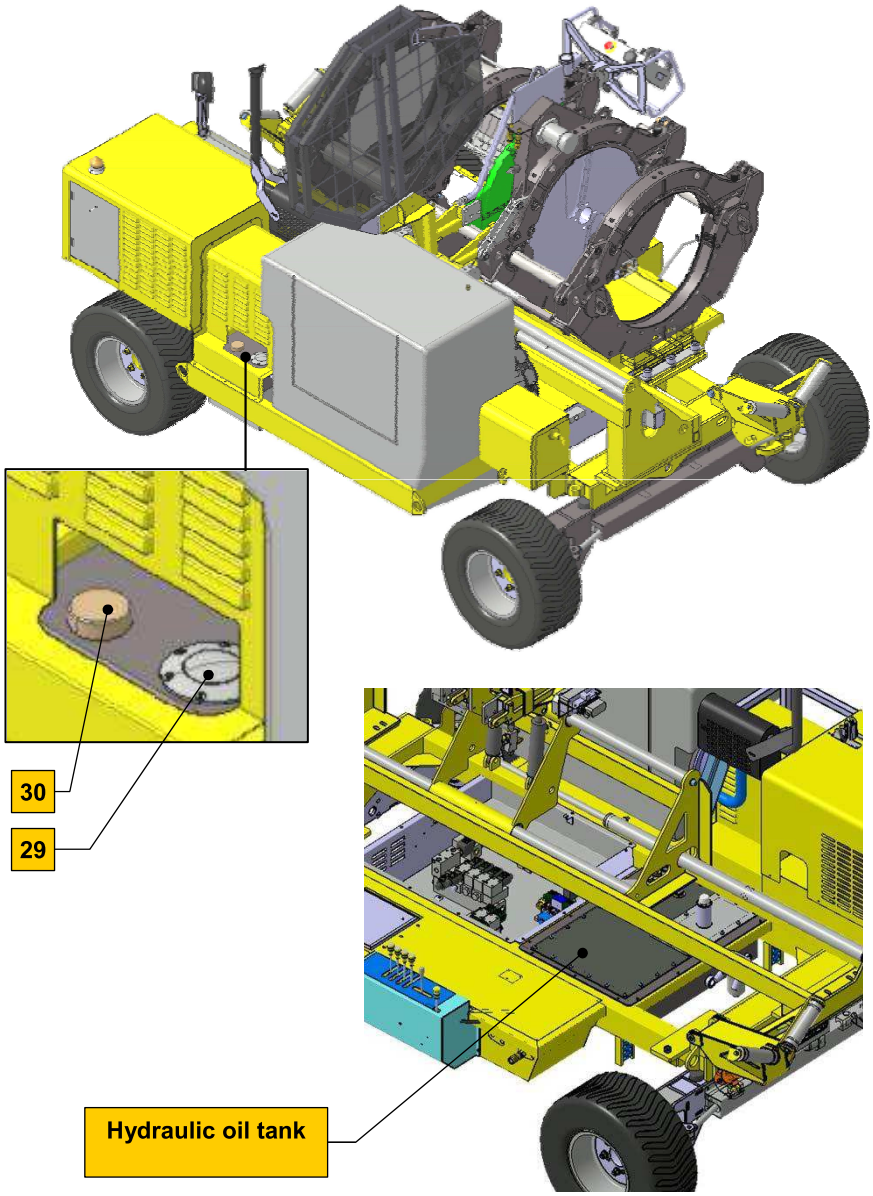
3 and 4 cylinder naturally aspirated diesel engines for industrial, construction and agricultural applications

4 cylinder turbo charged diesel engines for industrial, construction and agricultural applications

Check-ups before starting the engine

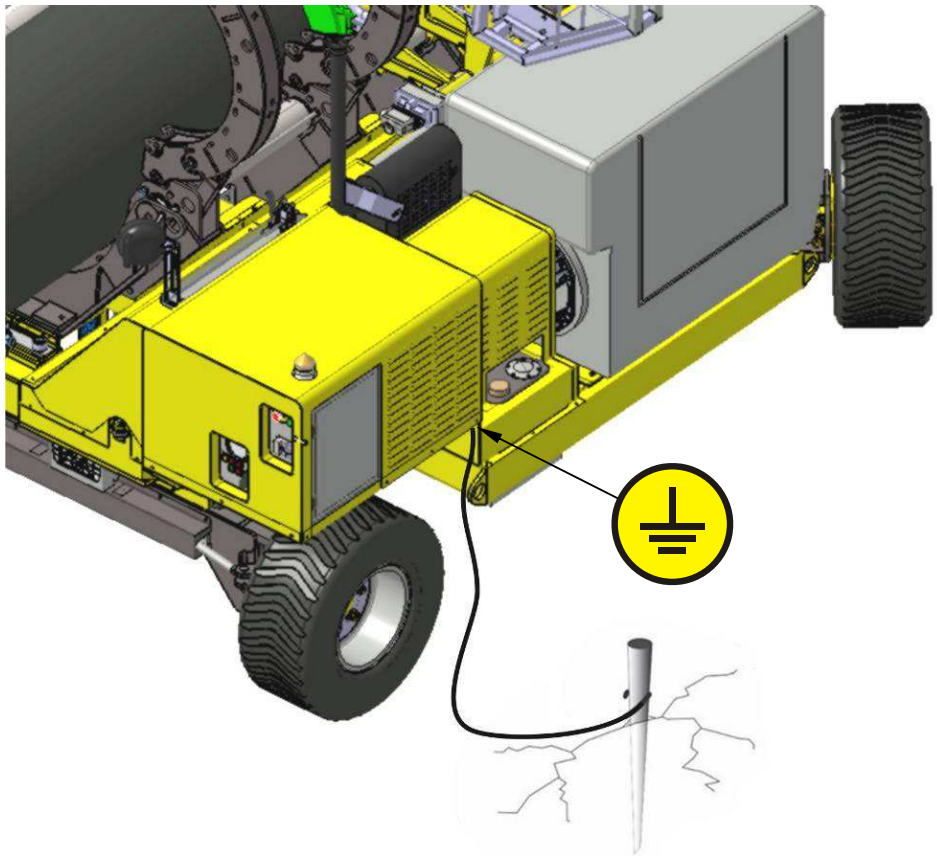
Check the diesel (gauge **29**) and oil level in the tanks.
See pg. **3.**/1 "**Technical data**"

Check-up the diesel engine as described in the manual in attachment.



Ground connection

Before starting the machine connect the machine to the ground as shown in the right picture.



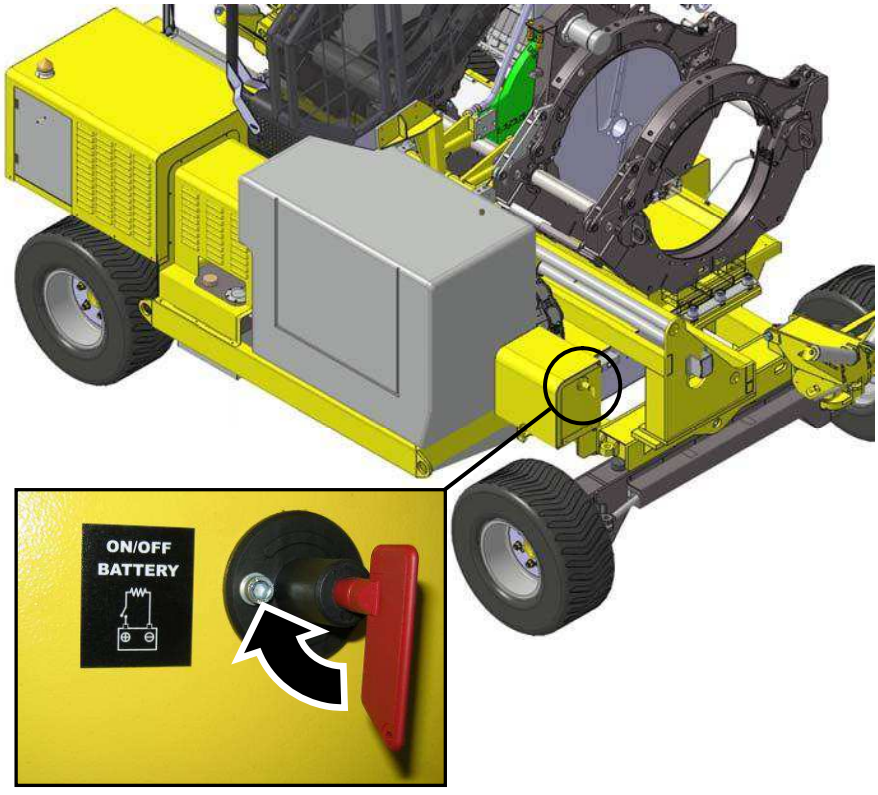
For the ground connection use a picket and a cable of the correct size (minimum size = 25 mm^2).

WARNING Every time the machine is moved in a new position remember to move also the picket and to ground it in a new position.

Switching on the battery

Turn the battery switch **ON** as shown in the picture on the right.

NOTICE: When the machine is not in use it is strongly suggested to turn the switch in the **OFF** position to avoid the battery to discharge.



Starting the engine
Check that the emergency button **24** is not pressed, **(every emergency buttons on the machine, if pressed, turn off the electrical controls and the diesel engine)**

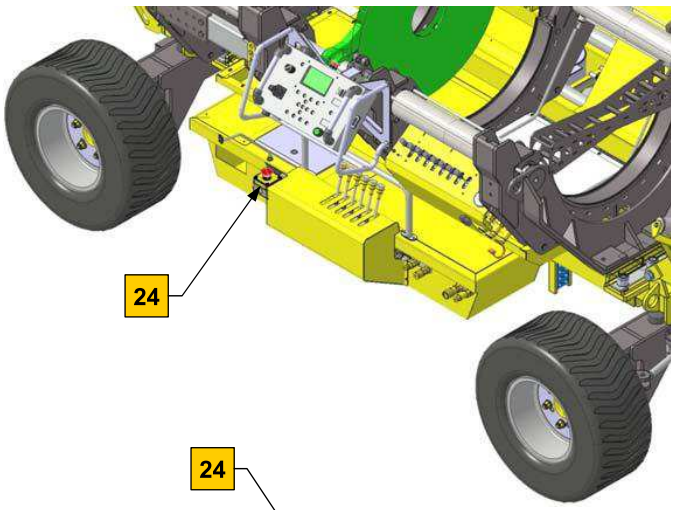
Turn the key in **11H** position. The lights **11B**, **11C**, **11D**, **11E** turn on for the initial check.

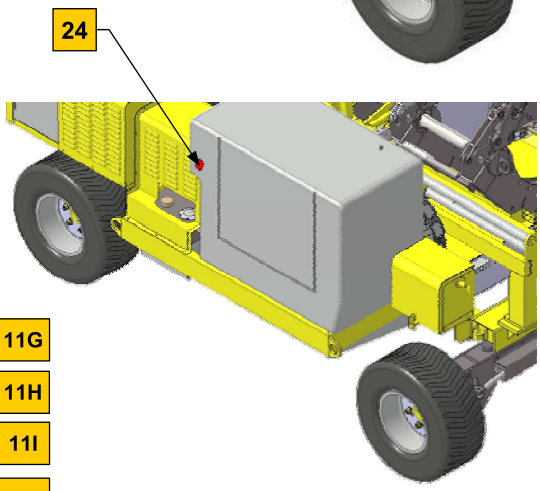
Wait for the light **11D** to turn off and then move the key in **11J** to start the engine.

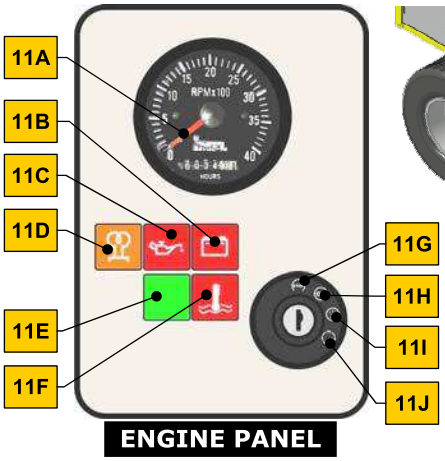
When the engine is started the release the key, which should go back to **11H** position (ON).

If the engine doesn't start in 5 seconds release the engine button and wait at least 10 seconds before trying the ignition again.

NOTICE: The engine is set at a constant rate of 1500 RPM.







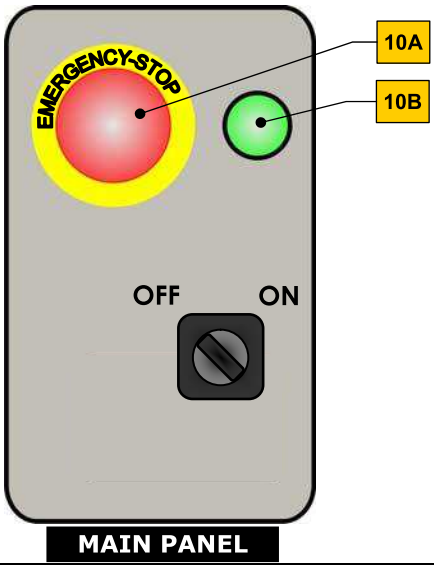
Important!
After pressing one of the buttons emergency, the diesel engine is turned off but ENGINE PANEL stays on. Please remember to turn the key on the ENGINE PANEL (engine STOP position 11G) to turn off the engine and prevent it from draining the battery.

Turning on the main electric box

Check that the emergency buttons **10A** and the one on the control panel **24** are not pressed, **(every emergency buttons on the machine, if pressed, turn off the electrical controls and the diesel engine)**

Press the start button **10B.**

Important!
Check that the connections between the control panel and the machine are correct (see pg.**6.**/2). The missed connection will not allow the machine to turn **ON**.



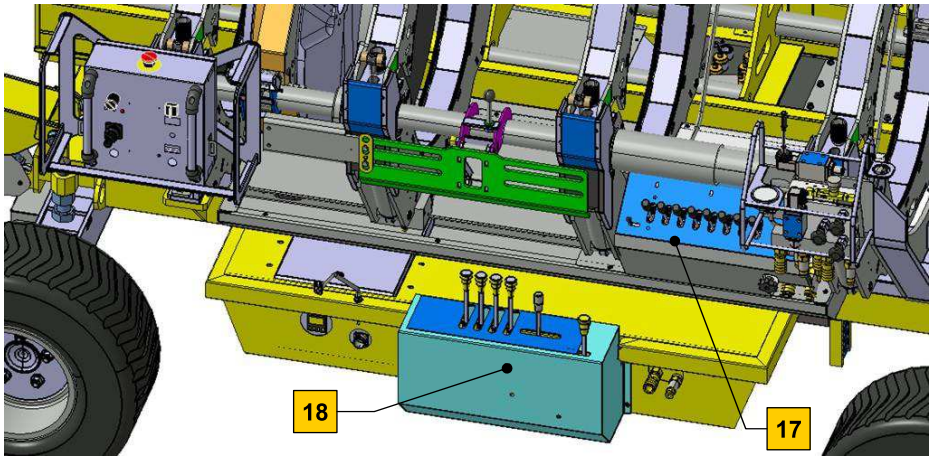
Mode selector
The machine is equipped with a key selector that allows choosing between **MOTION** or **WELDING** mode.

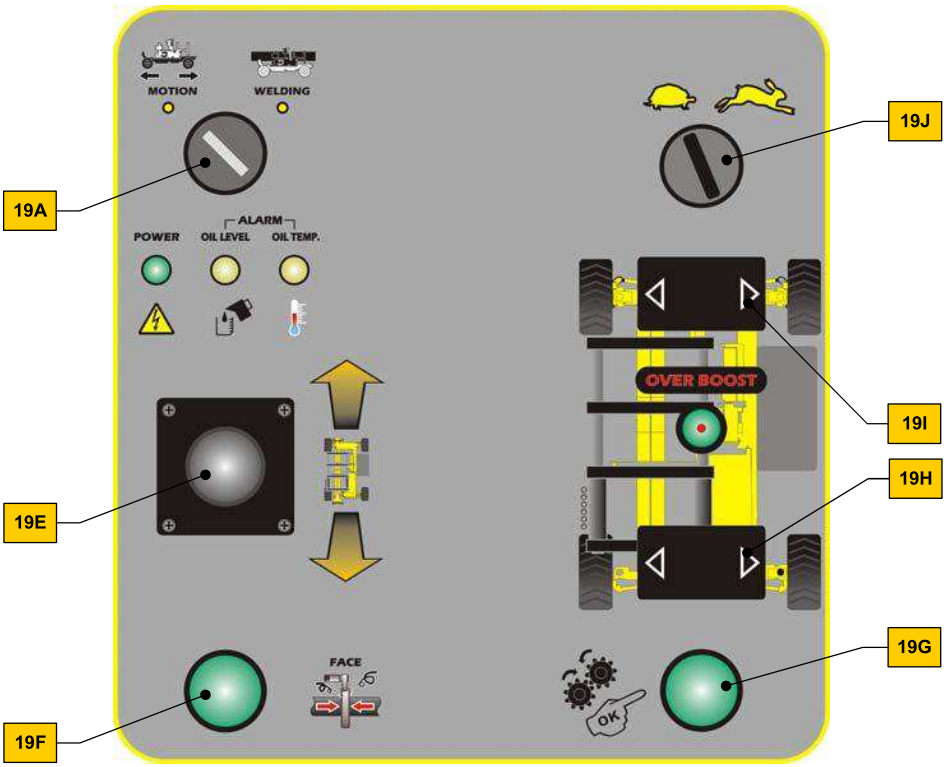
MOTION mode: allows moving the track.

✓ = ACTIV COMMANDS – MOTION mode											
17	18	19A	19B	19C	19D	19E	19F	19G	19H	19I	19J
		✓				✓	✓	✓	✓	✓	✓

WELDING mode: allows using all the instruments (hardware and software) involved in the welding process.

✓ = ACTIV COMMANDS – WELDING mode											
17	18	19A	19B	19C	19D	19E	19F	19G	19H	19I	19J
✓	✓	✓				✓	✓	✓	✓	✓	✓



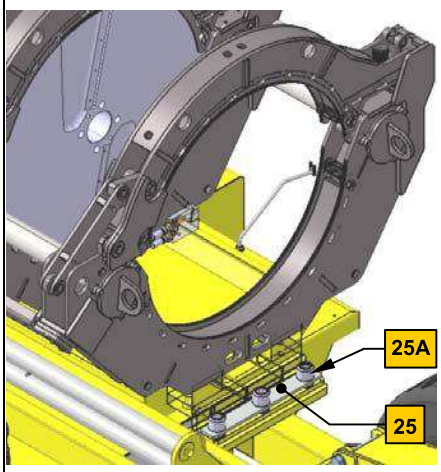


Lifting the machine

If necessary it is possible to lift/move the machine using a crane (being sure that it can lift the weight of the machine) and the supplied frame **T**.

Before lifting/moving the machine check that:

1. The front and rear plates **25** which connect the machine body to the track are properly locked with the screws **25A**.



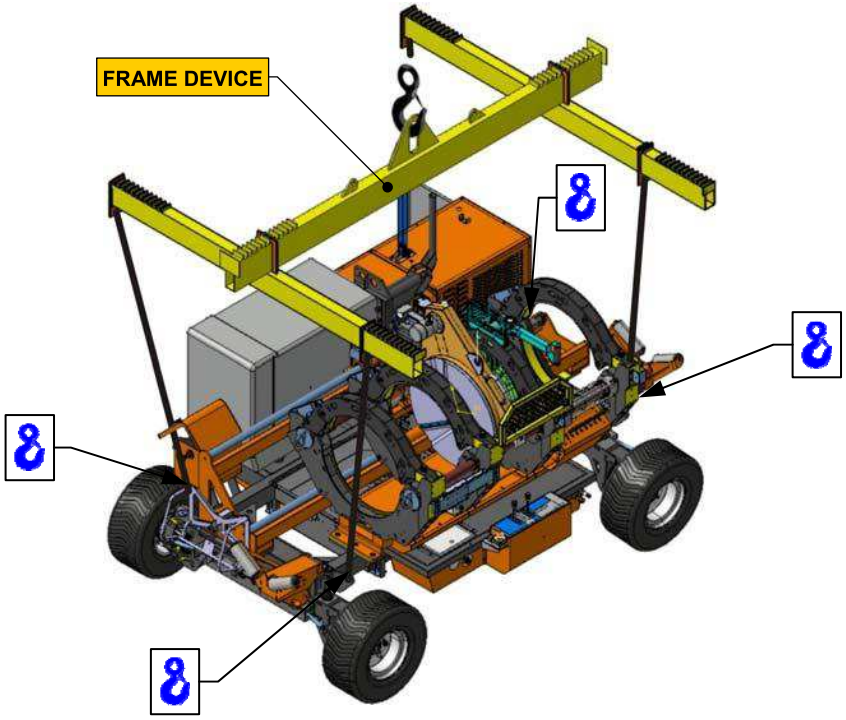
2. All the components (facer, heater, and carriage) must be positioned as in the pictures on the right.

Important!
Connect the hooks of the lifting chains in (**1**, **2**, **3**, **4**) to the "frame device" respecting the distances (the picture on the right) to keep on correctly the load.

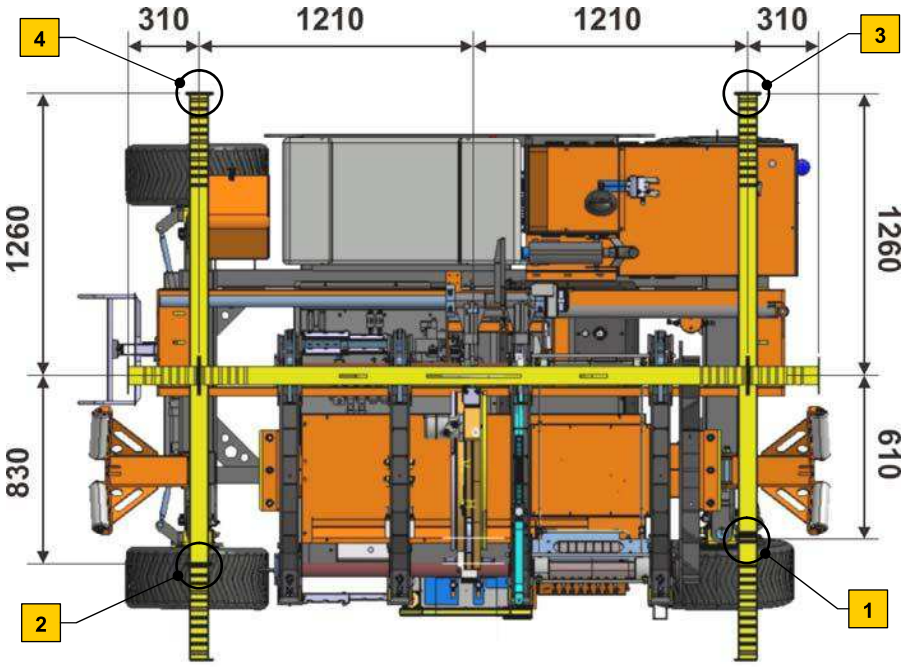
To lift the machine, hook up the supplied chains as shown in the pictures (hooks). (**machine weight 6614 lb [3000 kg]**)

WARNING!

Use only the lifting points indicated by

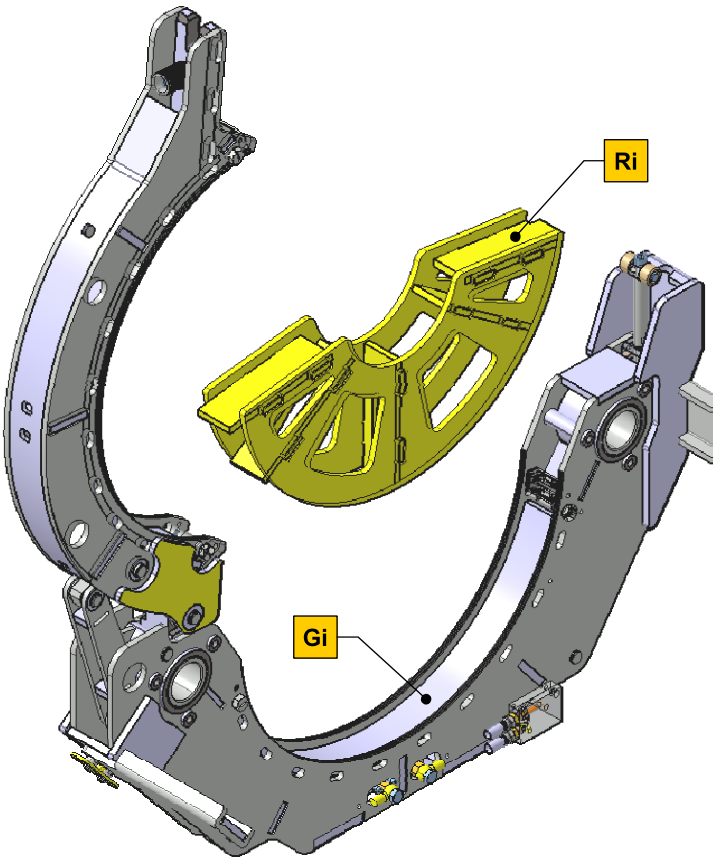


Dimensions are shown in millimeters (**mm**)



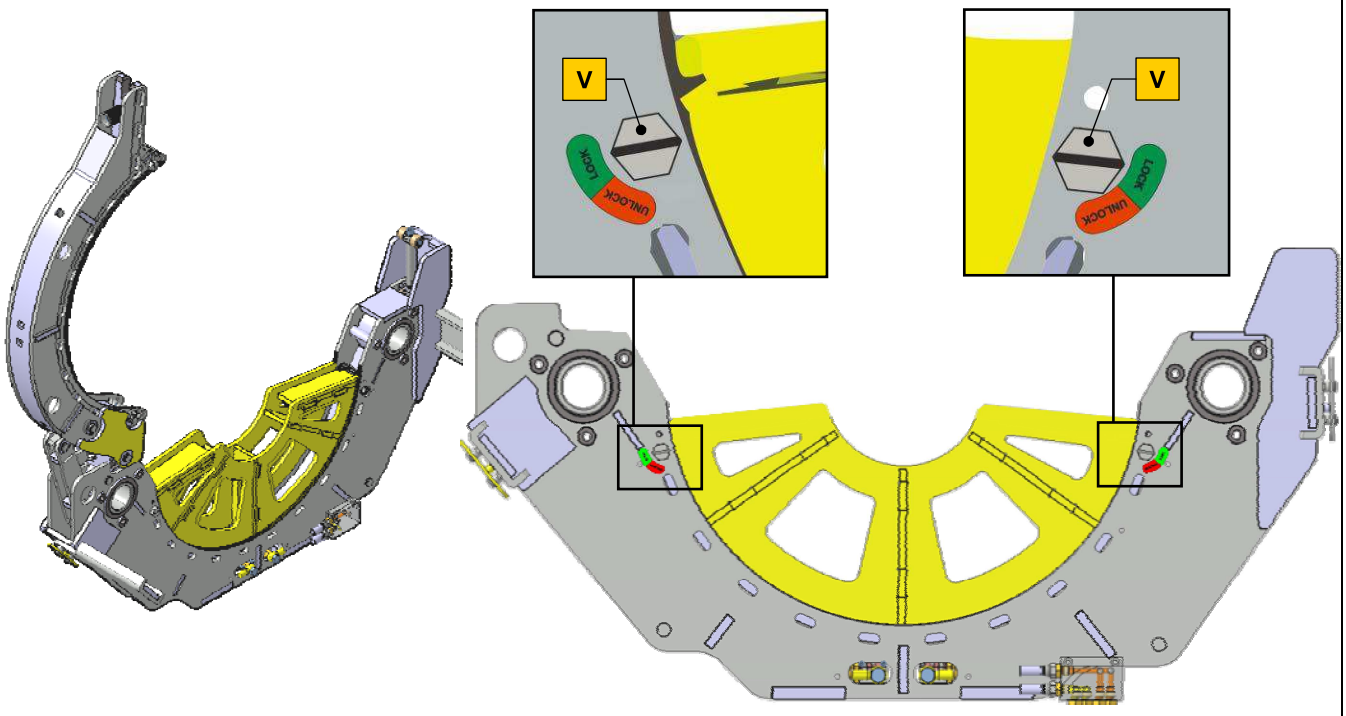
Lower inserts assembly

Position the insert **Ri** on the lower jaw **Gi** (to move the upper jaws see pg. **6.**/20).



Locking the lower inserts

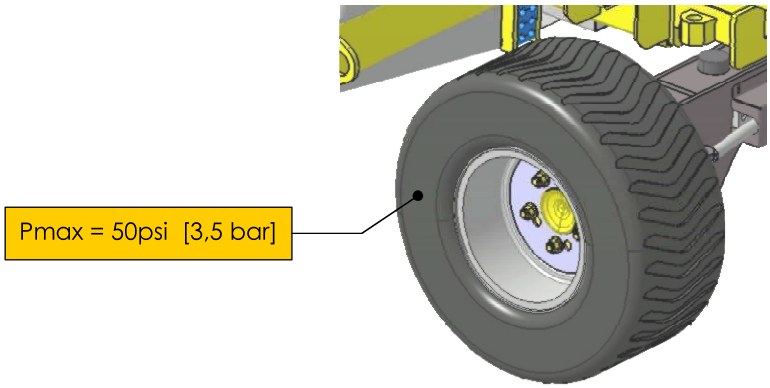
Lock the inserts in position using the supplied wrench, turn the screws **V** the **LOCK** position (green colour).



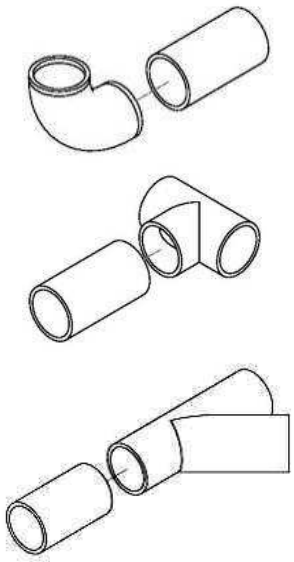
Machine positioning

Position the track in order to have the machine as stable as possible and avoid a turnover.

WARNING Before using the machine check the status and pressure of the tires (Pmax = 50psi [3,5 bar]).

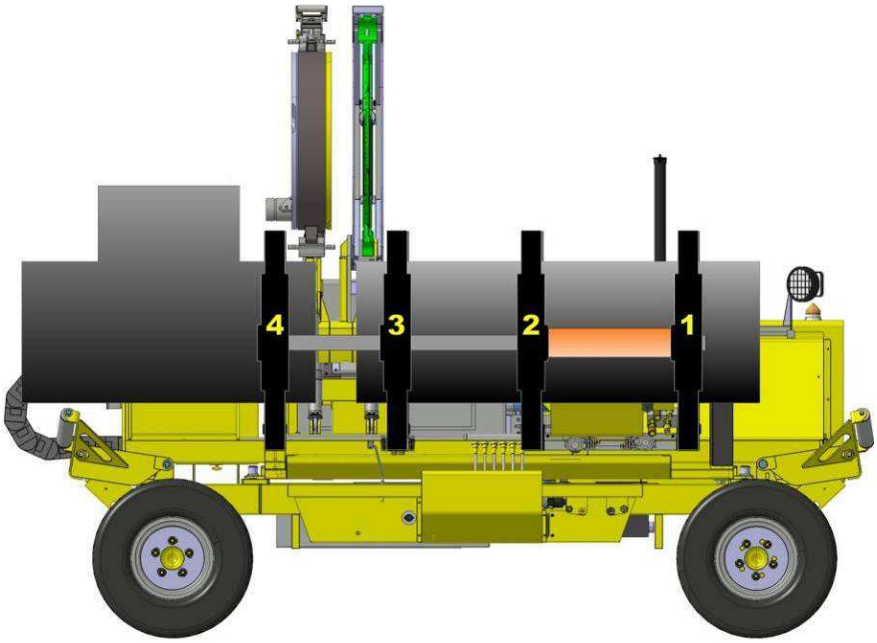


FITTINGS WELDING PROCEDURE



During the normal pipe to pipe welding process facer and heater are used between the **2**nd and **3**rd jaw.

Instead, while welding pipe to fitting the area between the **3**rd and the **4**th (picture on the right) jaw is used. Proceed as written here below to change the machine configuration.

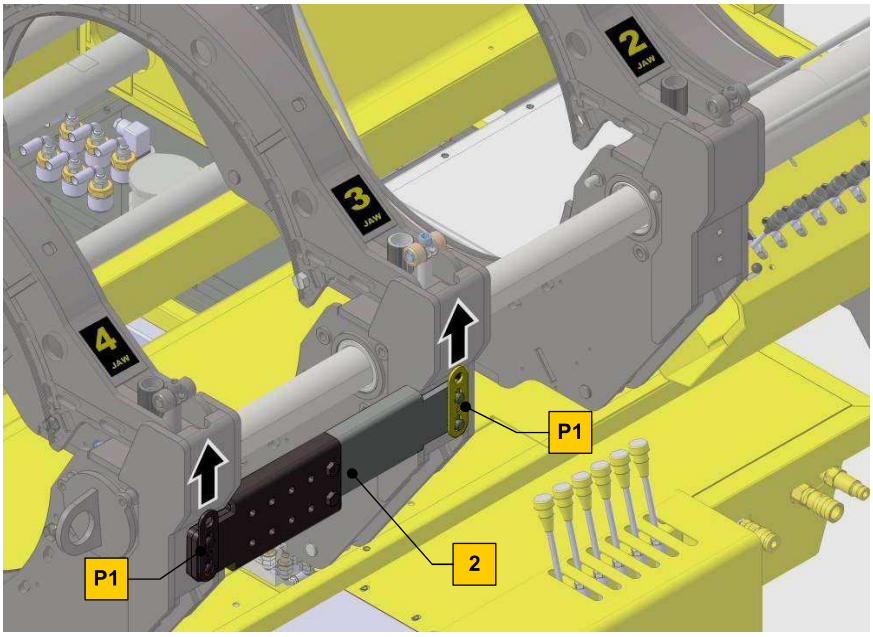


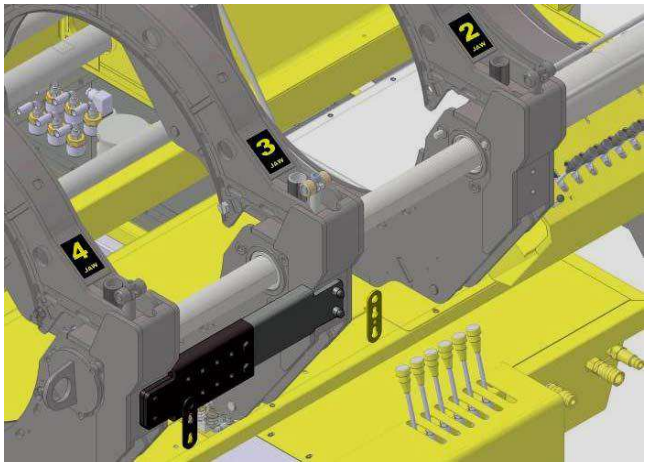
Shifting the dragging bar

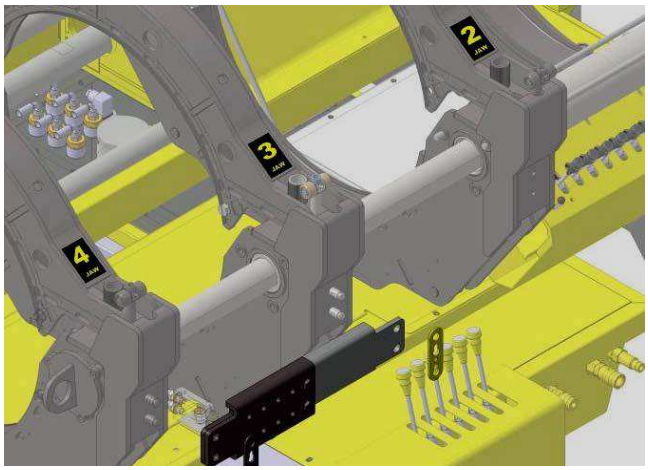
Important!
All the operations described below concern both sides of the machine.

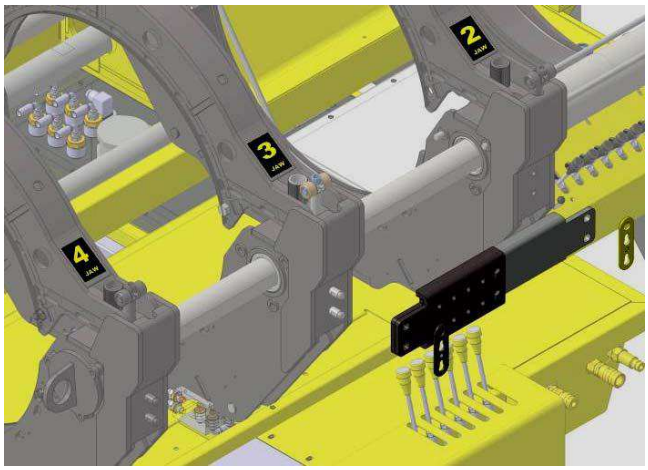
Take off the two small plates **P1** lifting them up as in the picture here on the right.

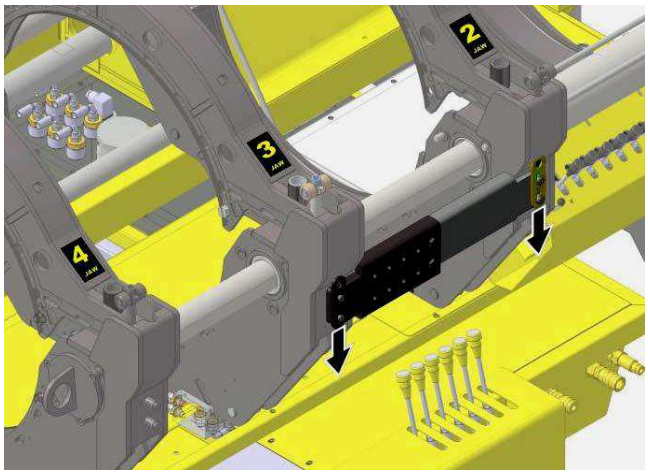
Mount again the dragging bar **2** between the **3**rd and **4**th jaw as described in the picture sequence.









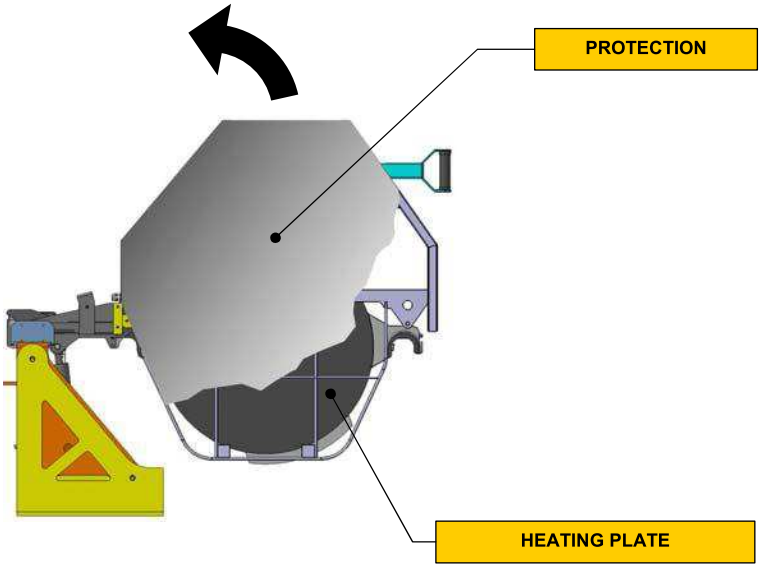


CONFIGURATION TO "WELDING IN THE DITCH"

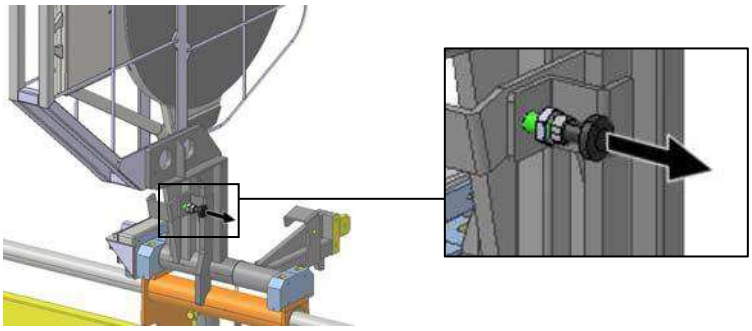
Lifting heating plate protection

IMPORTANT!
Proceed with the lifting of protection before release heating plate.

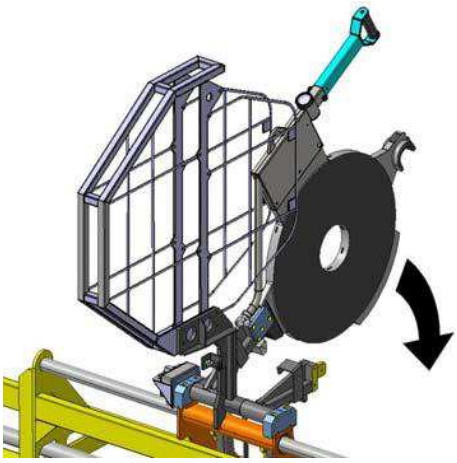
Pull the lever **18C** to lift heating plate with protection.



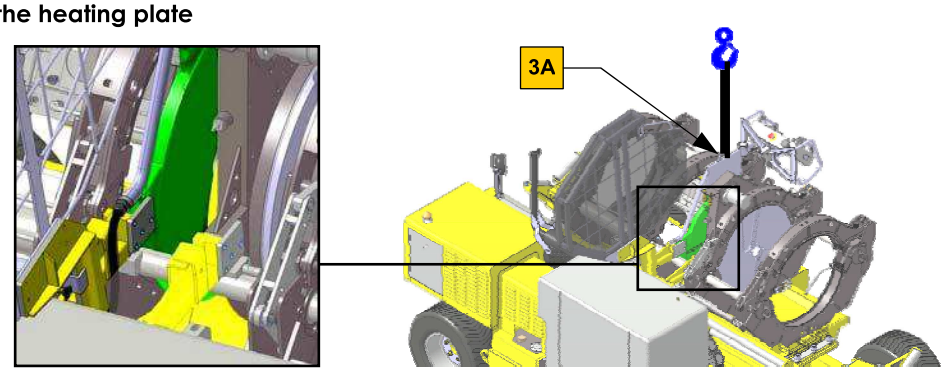
Release the protection from heating plate by pulling and turning the release pin in the direction indicated by the arrow.



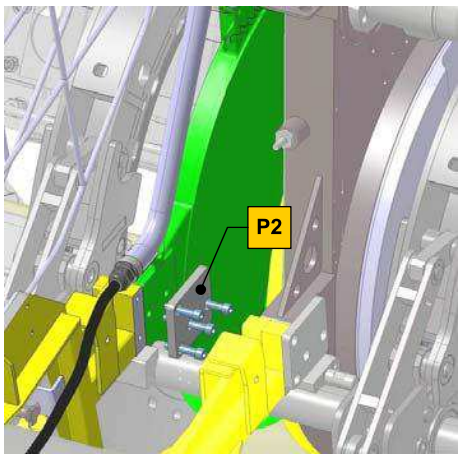
Pull the lever **18C** to lower the heating plate only.



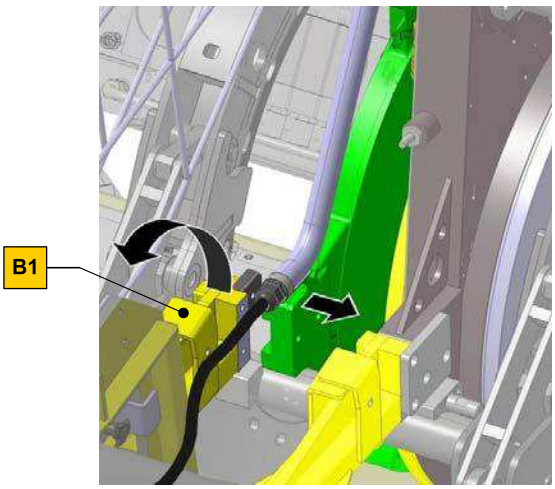
How to detach the heating plate



- Disconnect the heater power cable
- Lower the heater into position between the carriages (for the movements of the machine see pg. **6.**/26).
- Support the heater with the hook **3A** and a lifting system able to stand the heater weight. (110.2lb [50 kg]).



- Unscrew the plate **P2**

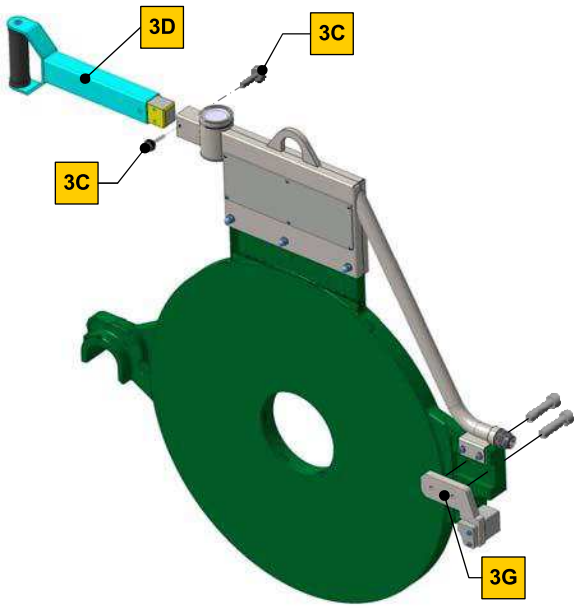


- Side-shift the heater to unhook it from the support **B1**.
- Lift the support **B1.**
- Lift the heater to take it away from the machine.

- Fasten the handle **3D** using the screws **3C**.
- Fasten the support **3G** to the heater.

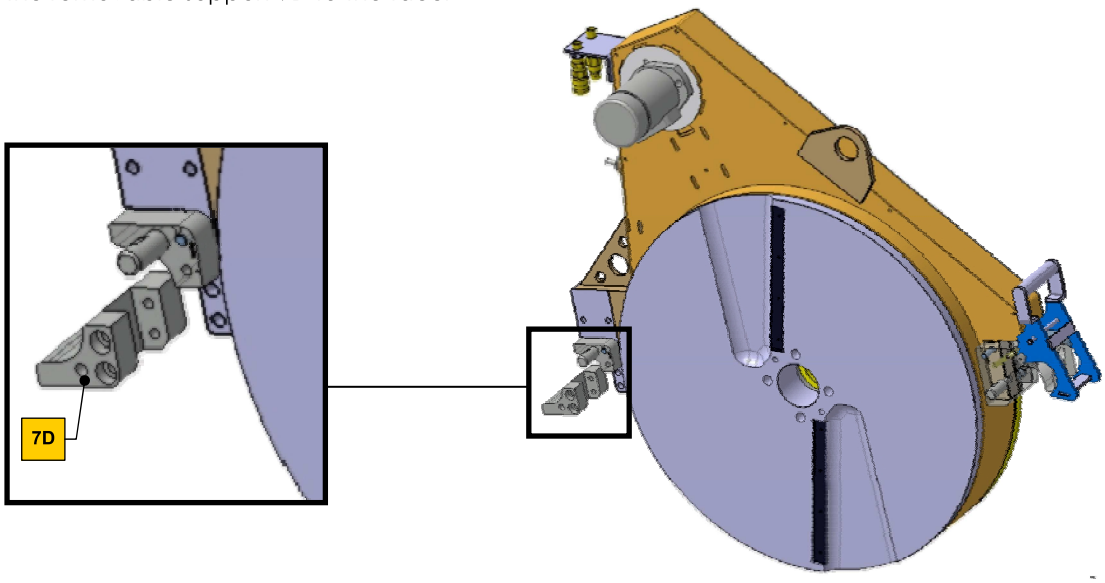
WARNING!
SCORCHING HAZARD

All these operations must be done when the heater is cold.



How to detach the facer

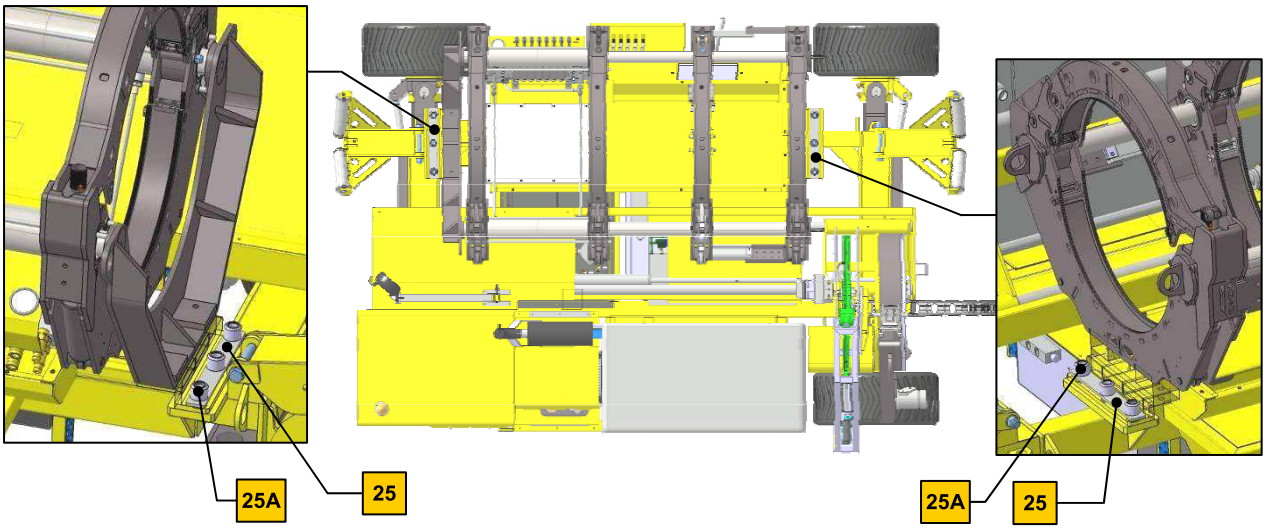
- Disconnect the hydraulic connectors.
- Lower the facer into the carriages (for the movements of the machine see pg. **6.**/24).
- Detach the facer following exactly the same procedure as for the heater (see pg.**6.**/11 and **6.**/12).
- Fasten the removable support **7D** to the facer



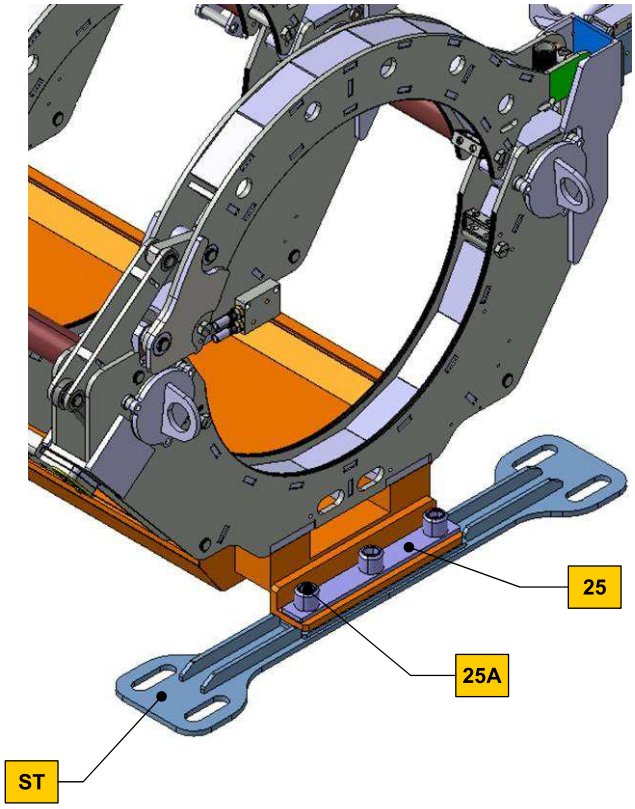
How to detach the machine body

Hook the supplied chains as shown in the picture below (machine body weight 1764 lb (800 kg)

- Detach the machine body from the track unfastening the screws **25A** that are locking the plates **25** (front and rear).

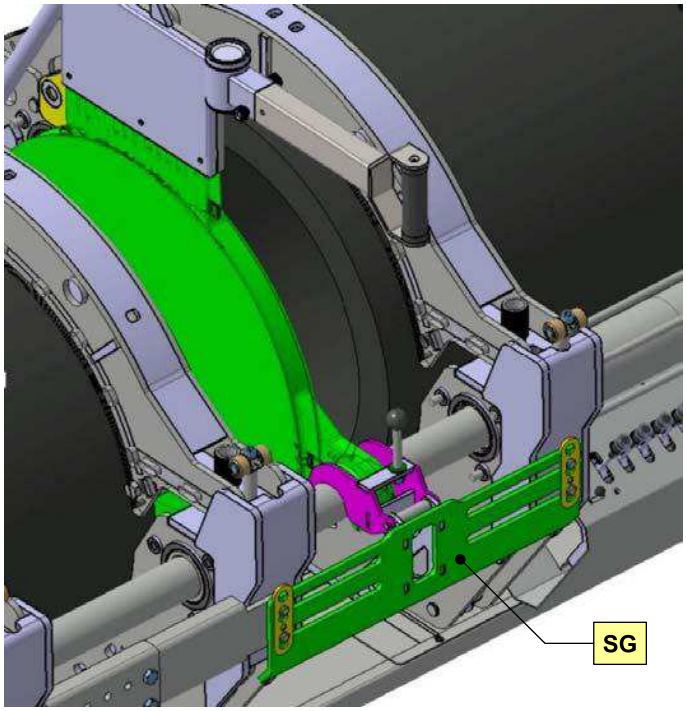


- Lift the machine body
- Replace the plates **25** (front/rear) and fasten the stabilizer **ST** using the screw **25A.**



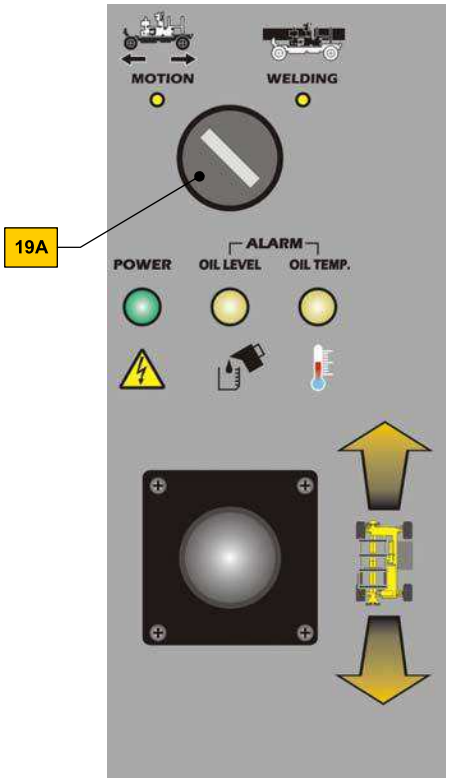
Heater detaching device

When welding in the ditch the device **SG** should be assembled to make possible for the heater to detach from the pipes when changing from the second (heat soaking) to the third phase (fusion).

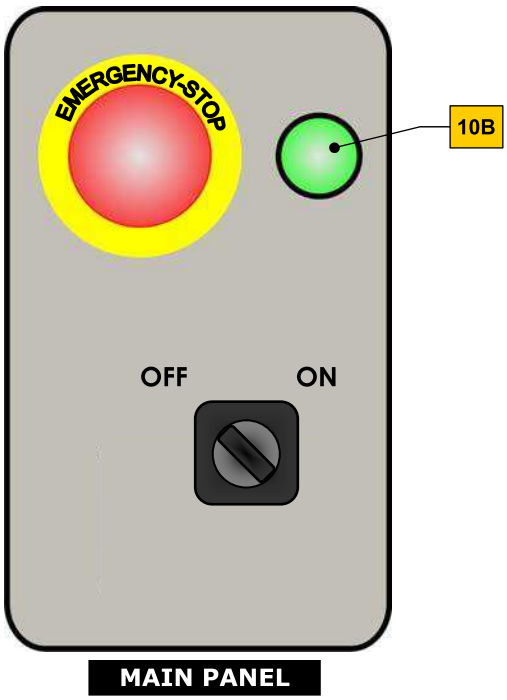


MOVING THE TRACK (MOTION Mode)

After turning on the machine (see pg. **6.**/5), turn the selector key **19A** into the "**MOTION**" position.

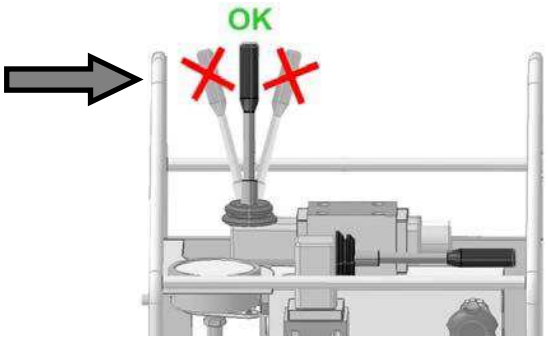


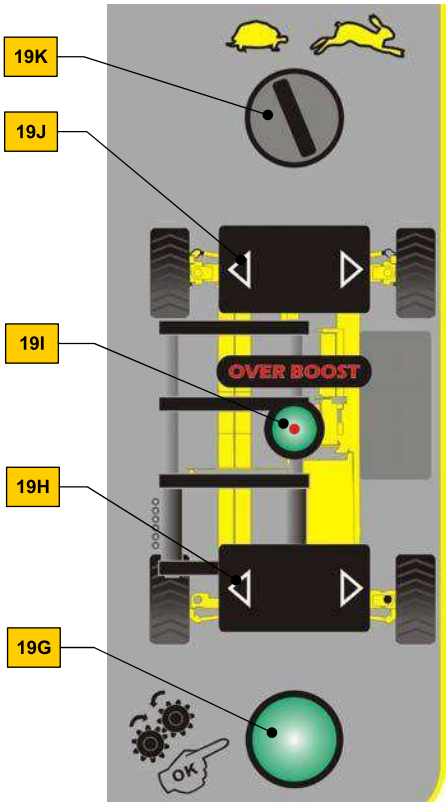
Press start button **10B** located on the main electric box.



MAIN PANEL

Notice:
Make sure that the lever Open/Close carriage is positioned centrally as shown before press button 19G.



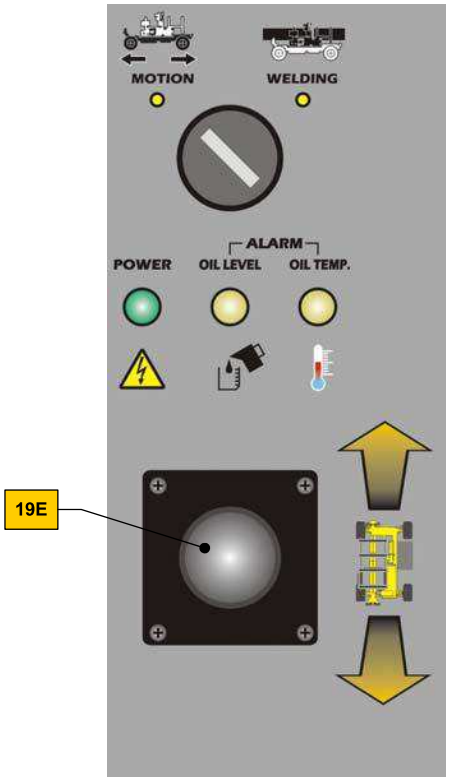


SAFETY SYSTEM

To be able to use the commands to move the machine the consent button **19G** must be activated before every single command button is used.
The missed use of the button **19G** disable the motion of the machine.

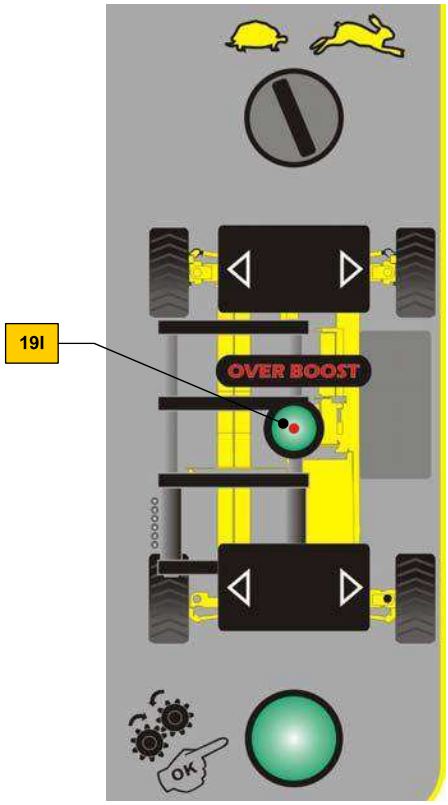
Notice:
*If after 5 seconds after pressing the button **19G** no command is given to the machine the button is automatically deactivated. Press again the button to be able again to move the machine.*

To move the machine back and forth, pull the joystick **19E** in the direction wanted and according to the sticker on the control panel. The joystick is a progressive one; therefore the inclination of the joystick is controlling how fast the machine is moving.

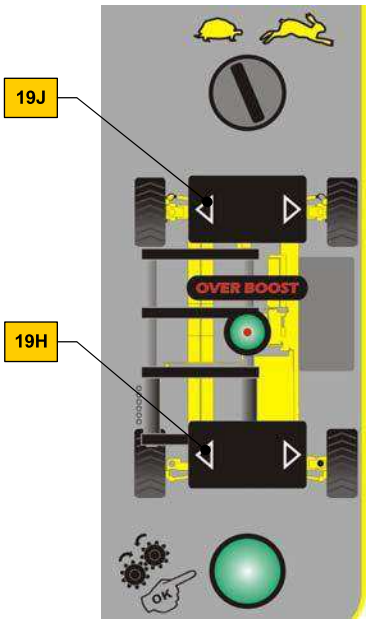


"OVER BOOST" command

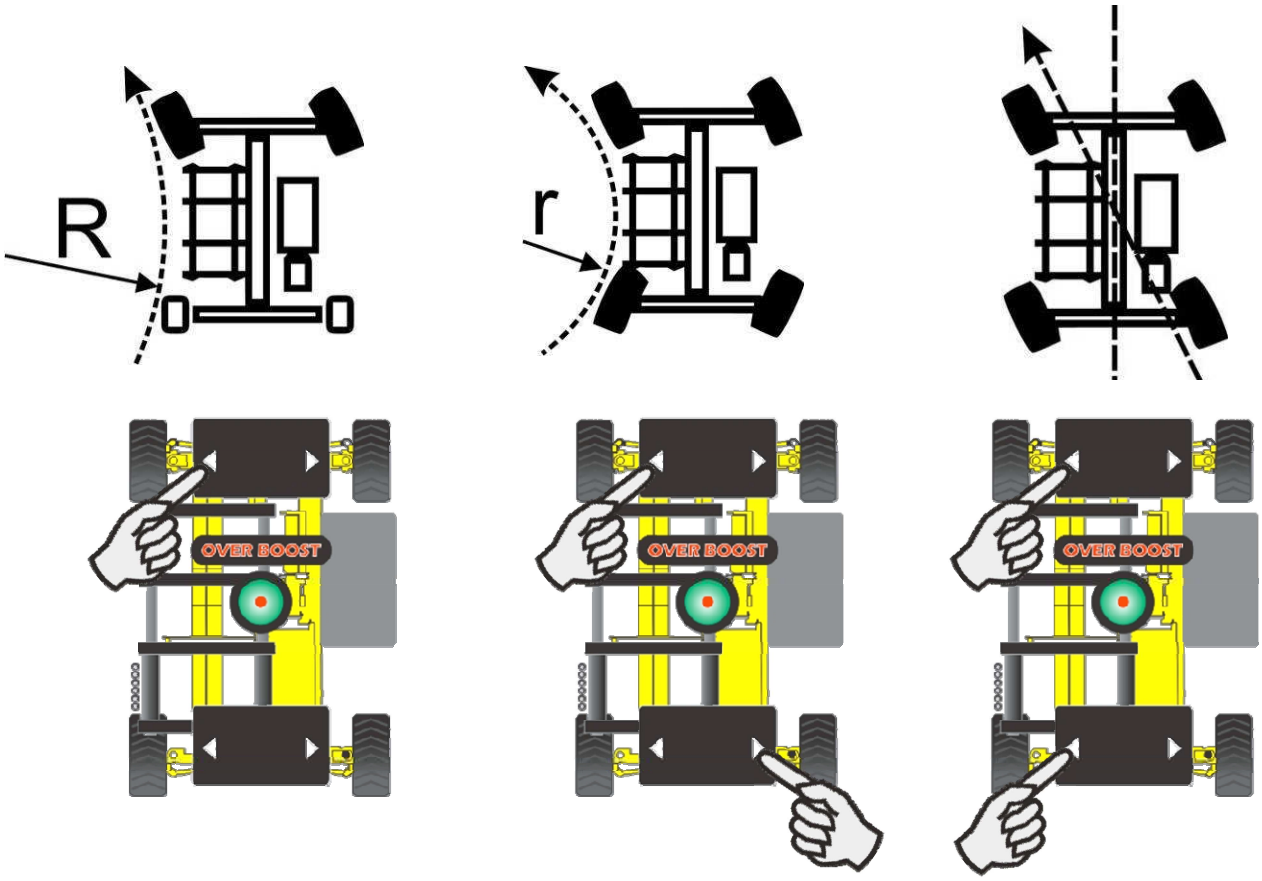
Pressing the OVER BOOST button while moving the track gives the maximum pressure to the traction system without changing the speed.
This command can be used if it's necessary to overcome an obstacle or when going up a short steep slope.
This command is active only 7 second since pressing the button **19I** (fix light), then it is inactive for the next 60 seconds (blinking light).



Use the buttons **19J** and **19H** in order to steer the wheels of the track.
Pressing both buttons at the same time is possible to steer in many different ways (see the following examples).



Wide turning radius	Narrow turning radius	Side motion "crab style"



Notice

- When the buttons **19J** and **19H** are released the wheels remain in the set position.
- Release the button once the limit stop position is reached.

WELDING mode

After having the machine in a stable position turn the selector **19A** into the "WELDING" position.

Lifting heating plate protection

Lift the heating plate protection **(see Cap. 6./11)**

Turn on heating plate

Nota:
Make surethe switch on the control panel is in ON position (see cap. 5./3)

Set the temperature following the instructions below.

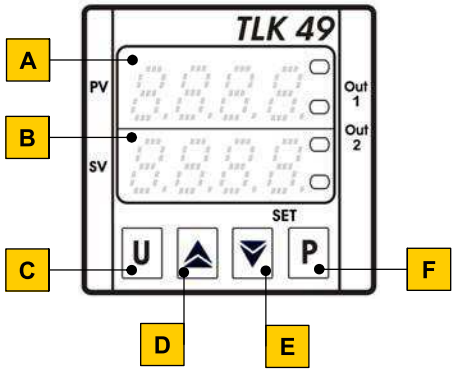
(See "Welding parameters" Cap. 9)

Push **F** and use buttons **D** and **E** to set the right value on the display **B**.

Push **F** again to confirm.

The temperature controller will adjust the heating plate temperature to the set point. The display will show the actual heating plate temperature (Display **A**)

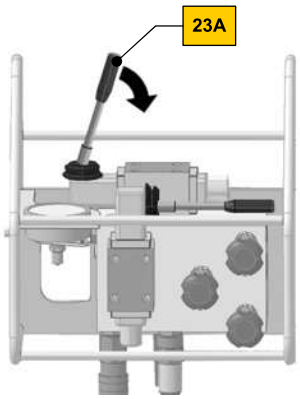
N.B. For further details, please refer to microprocessor instructions. (attached on this manual)



- **A.** Heating plate temperature
- **B.** Heating plate temperature set point
- **C.** Program button (ref. At the end ot the manual)
- **D.** Button used to increase the heating plate temperature and select the menu parameters
- **E.** Button used to decrease the heating plate temperature and select the menu parameters
- **F.** Menu button and parameter confirmation

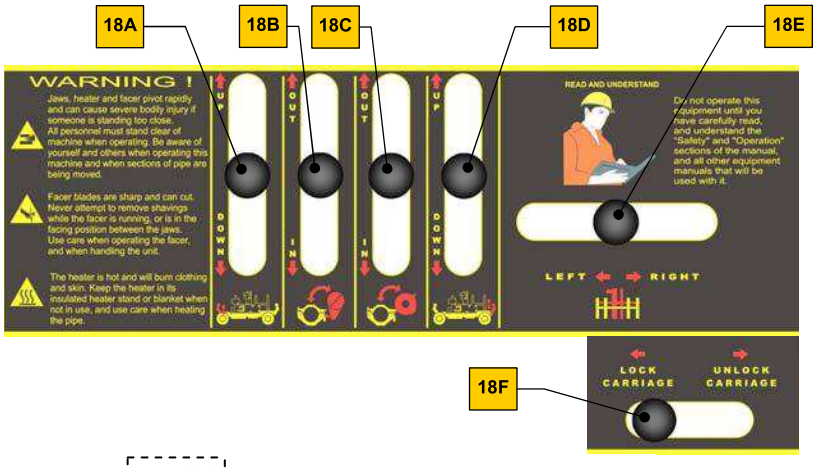
Loading the pipes

Take the carriages apart as far a possible and move lever **23A (OPEN)** to its central position.
Bring the lever **23A** back to the standby position when carriages are open.



Push **OUT** the levers **19B** and **19C** to lift the facer, the anti-scorching protection and the heater to free the pipes loading area between the carriages.

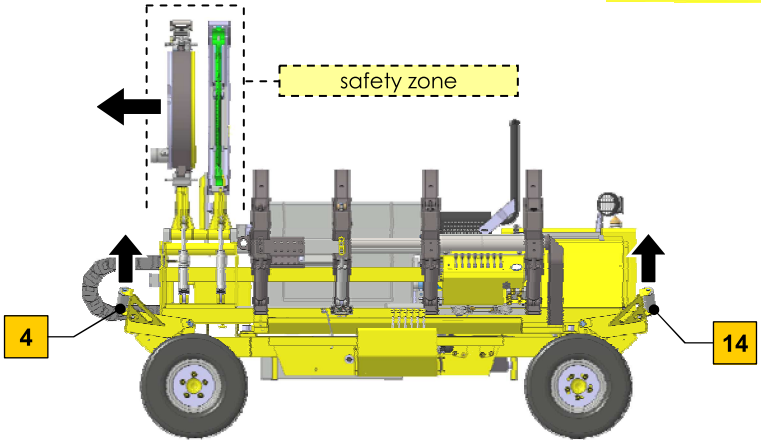
Notice! in order to be able to move the levers it's necessary to lift them up.



Notice!
In order to be able to move the auxiliary carriages it's necessary to unlock turning on the lever 18F (LOCK/UNLOCK CARRIAGE)

Pull the lever **18E** on the LEFT to move the group heater/facer to the left in the safety zone.

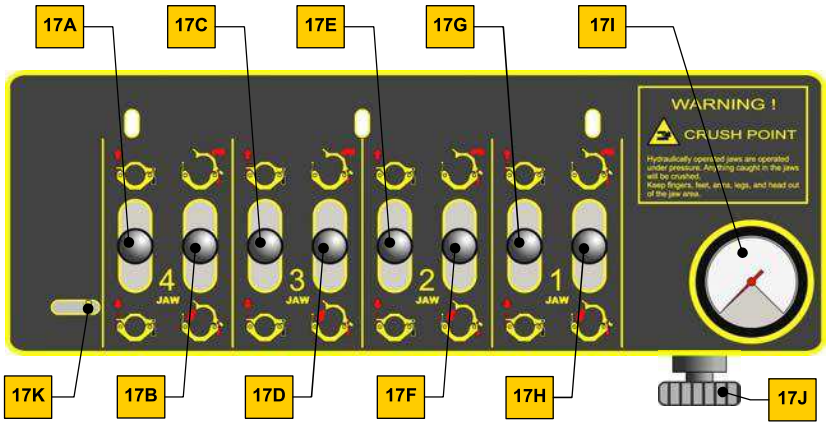
Pull the levers **18A** and **18D** to lift the hydraulic rollers **4** and **14**.



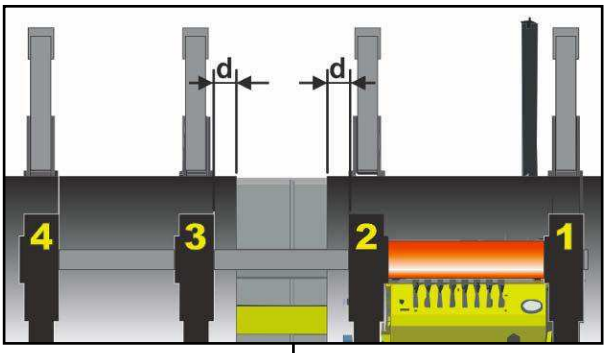
Open the upper jaws **n°1** pulling up the lever **17G** to unhook the front cylinder and then the lever **17H** to lift the jaw.

Notice!
In order to be able to move the levers it's necessary to unlock the safety device **17K** toward the left.

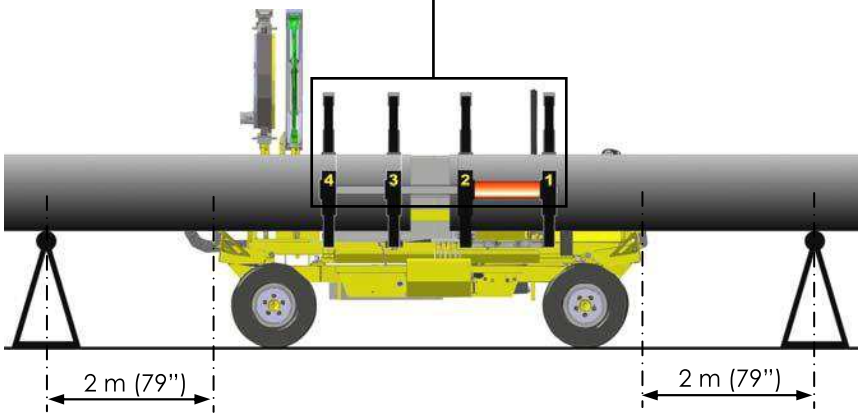
Proceed in the same way to lift the jaws **n° 2**, **3** e **4**.



Put the pipes on the rollers and position them in the jaws leaving the heads out of at least **d** = 35,6 mm in [1.4" inch].



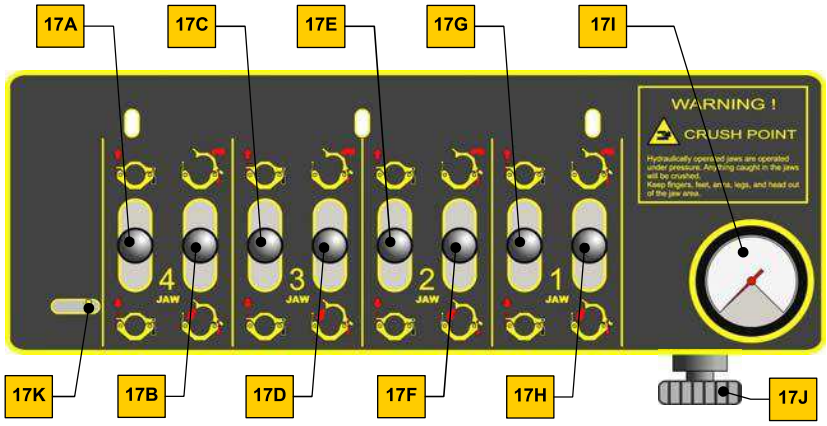
NOTICE: The long pipe must be supported by fixed rollers at a maximum distance of 2m (79") from the sides of the machine.



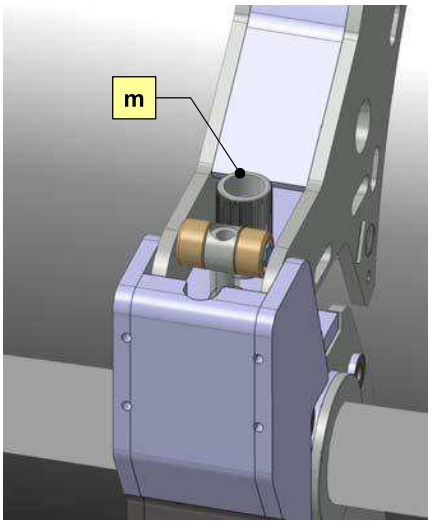
Close the upper jaw **n°1** pulling down the lever **17H.**

Important!
Before lowering the upper jaw verify that the locking cylinder is open-up.

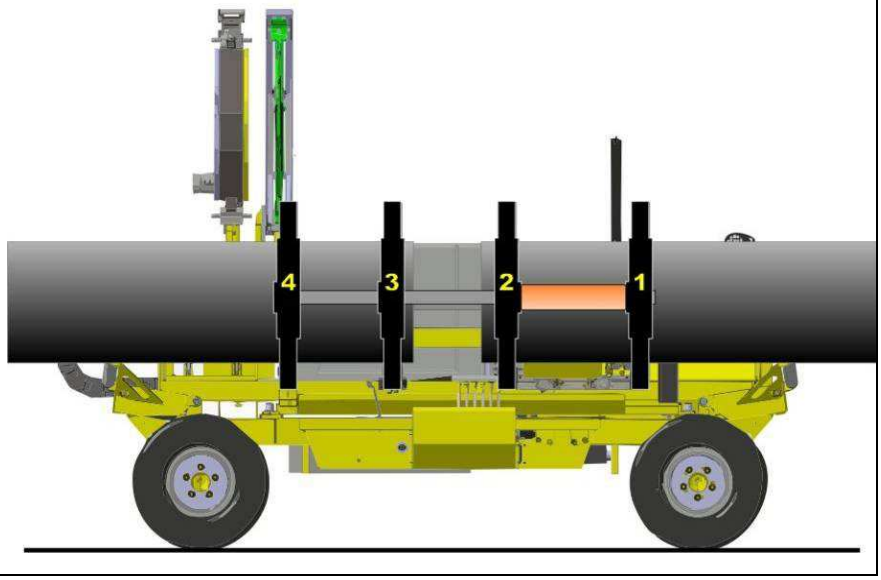
To lock the pipe in position pull down the lever **17G** setting the locking pressure with the valve **17J** (the value of the locking pressure is shown on the gauge **17I**).



Notice: To avoid squashing the pipe with a thin wall, set the spacer **m** in the front of the upper jaw.

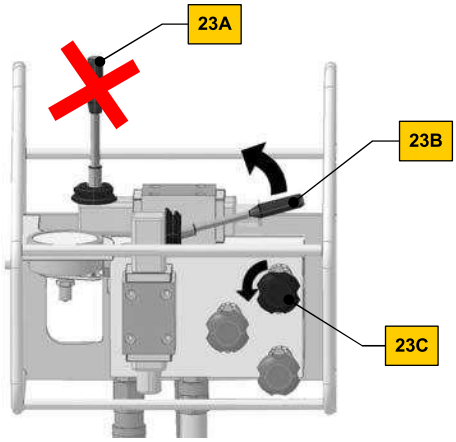


Proceed in the same way to lock the jaws **n° 2**, **3** and **4**.



Dragging pressure measurement P_t

The dragging pressure ***P_t*** *is the minimum pressure value necessary to set the movable carriage in motion.*



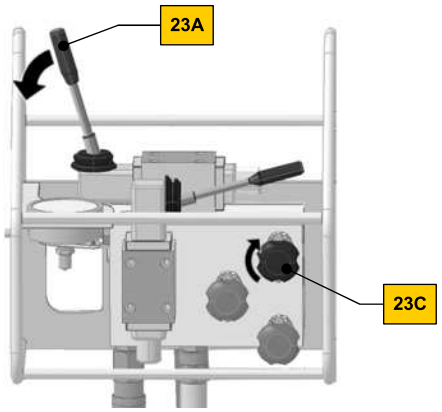
Important!

For drag pressure measurement P_t, pipes have to be locked in the machine

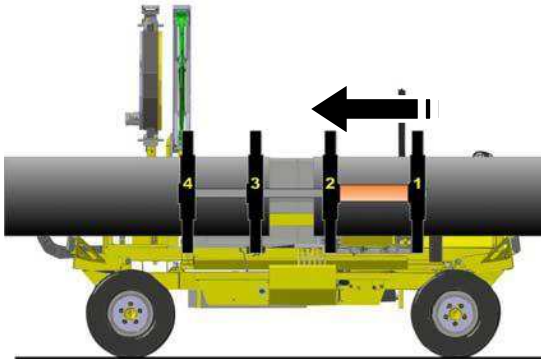
WARNING

Don't pull the lever 23A.

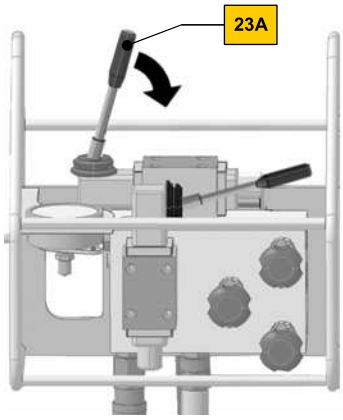
1. Pull selector valve **23B** upwards
2. Open facing pressure valve **23C** in order to reset pressure



3. Pull the lever **23A** to the left as in figure
4. Close facing pressure valve **23C** until carriage starts to move. After having slowly moved the carriage read on the manometer **23G** drag pressure value **P_t** and take a note.



Take the carriages apart as far a possible and move lever **23A** to its central position.



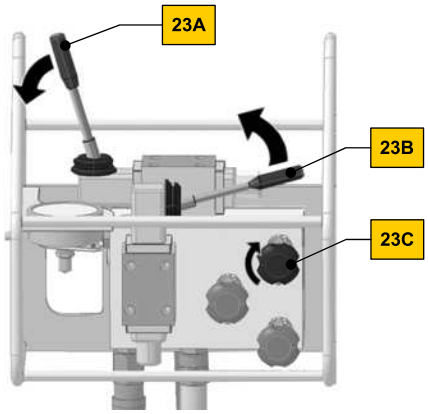
SETUP FACING PRESSURE

Note: ***It is absolutely necessary to measure P_t before setup facing pressure. Add drag pressure P_t to facing pressure.***

1. Pull selector valve **23B** upwards
2. Pull the lever **23A** to the left as in figure then close facing pressure valve **23C**
3. Open carriages and move lever **23A** to its central position

Follow instructions to perform facing pipe **(6./24)**

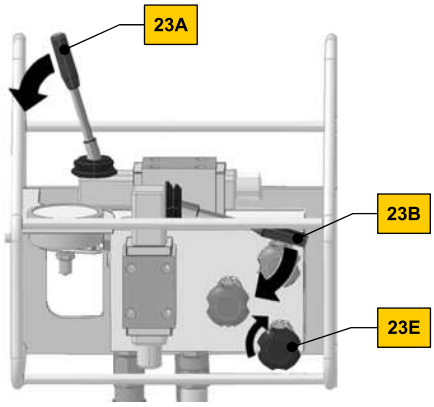
Facing pressure (MAX 18 bar)



SETUP FUSING PRESSURE (P_1)

Note: ***Add drag pressure P_t to fusion pressure.***

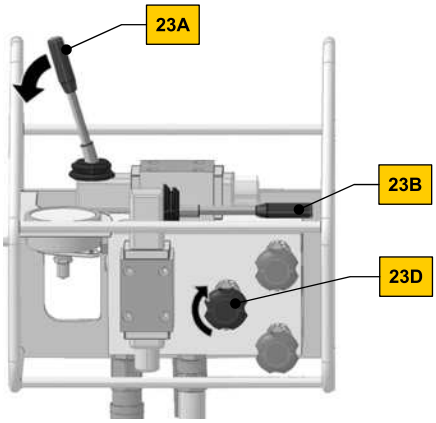
1. Pull selector valve **23B** downwards
2. Pull the lever **23A** to the left as in figure then close fusing pressure valve **23E** up to reaching pressure **(P_1 + P_t)**
3. Open carriages and move lever **23A** to its central position



SETUP HEATING PRESSURE

Note: ***Add drag pressure P_t to heating pressure.***

1. Pull selector valve **23B** in a central position
2. Pull the lever **23A** to the left as in figure then close heating pressure valve **23D** up to reaching pressure **(P_2 + P_t)**
3. Open carriages and move lever **23A** to its central position

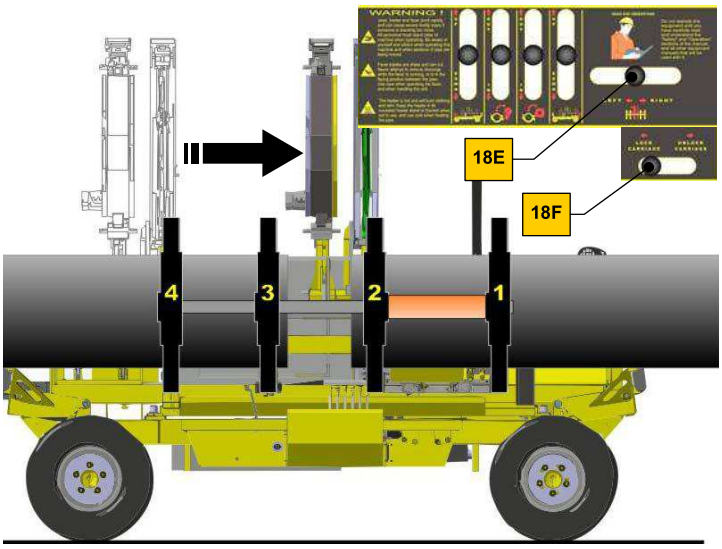


Facing

Notice!
In order to be able to move the auxiliary carriages it's necessary to unlock turning on the lever 18F (LOCK/UNLOCK CARRIAGE)

Pull the lever **18E** to position the carriage of the heater/facer in the welding area (in the picture on the side is between the **2nd** and **3rd** jaw).

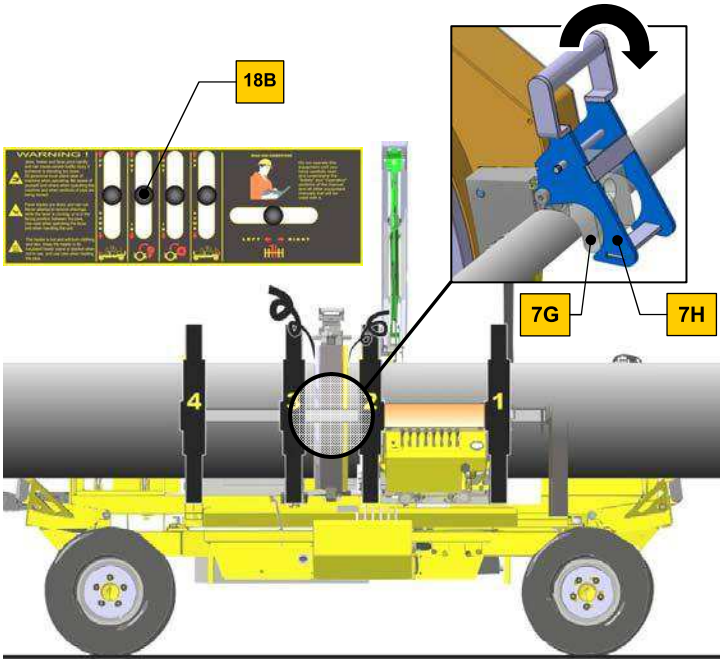
Lock the auxiliary carriages turning on the lever **18F.**



IMPORTANT:
Before lowering the facer verify that there are not going to be any collision between any parts of the machine (pipes heads, jaws, etc…)

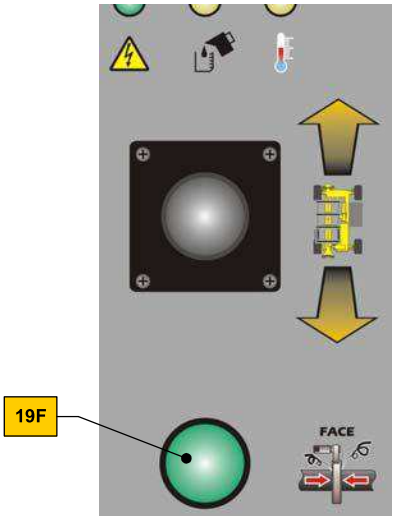
Operate on the lever **18B** to lower the facer until the support **7G** touches the rod of the front cylinder.

Be sure that the device **7H** is locked to the front cylinder rod.



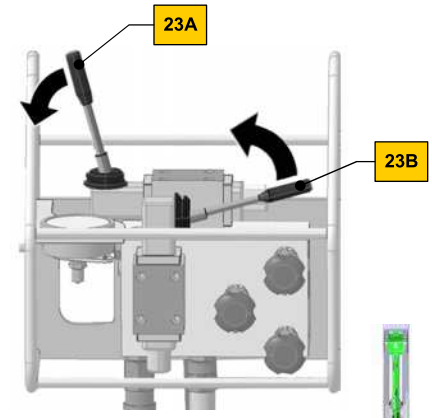
Push the button **19F (FACE)** to start the facer.

Nota:
The facer stops after 120sec. Push 19F to start the facer again.

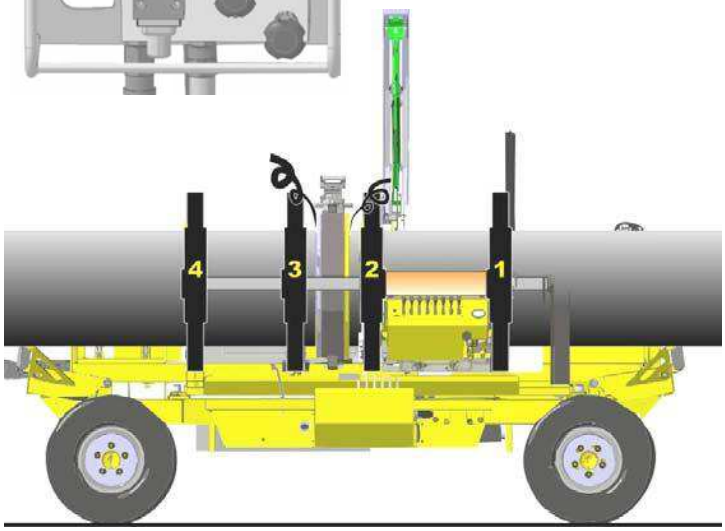


Notice!
Check that the selector valve 23B is in the correct position before starting facing.

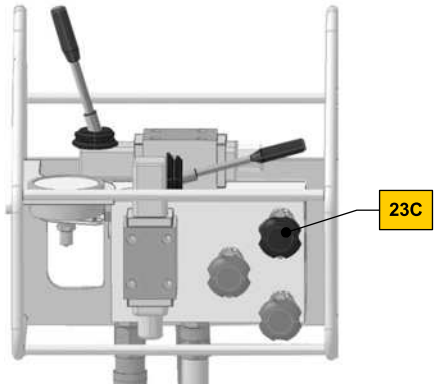
Pull control valve **23A** to the left as in figure to facing pipes.



The pipes heads are brought together and faced. The chip produced during the facing process must be continuous on both sides to be welded.



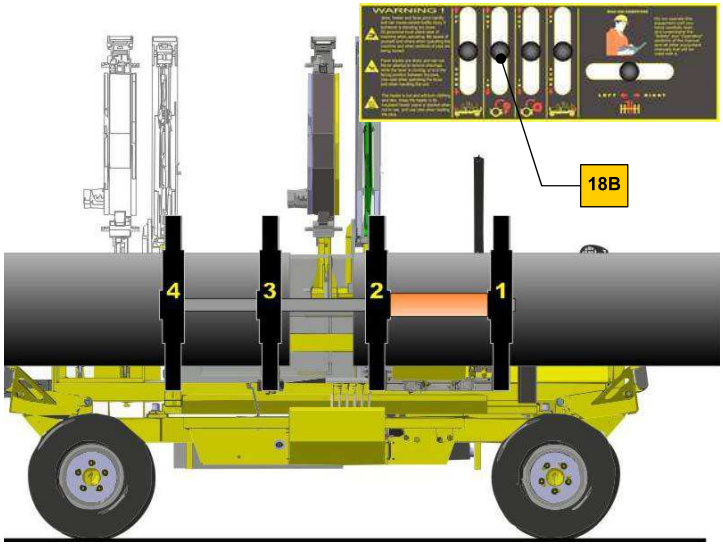
In order to increase/decrease a facing pressure value, it is possible operate to valve **23C**.



Open carriages, turn facer motor off by pressing **19F** button **(FACE)**.

In order to extract facer, operate to lever **18B**.

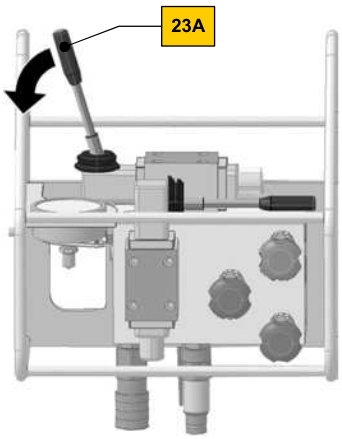
Remove chips from pipe ends. Do not touch faced pipe ends.

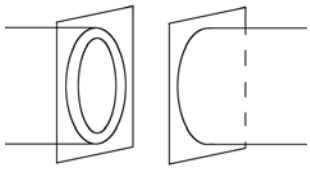


CHECK PROPER ALIGNMENT

Pull the lever **23A** to the left to bring pipes into contact then verify alignment of pipes after facing.

If the heads of the pipes are not coplanar it should be necessary to face them again.





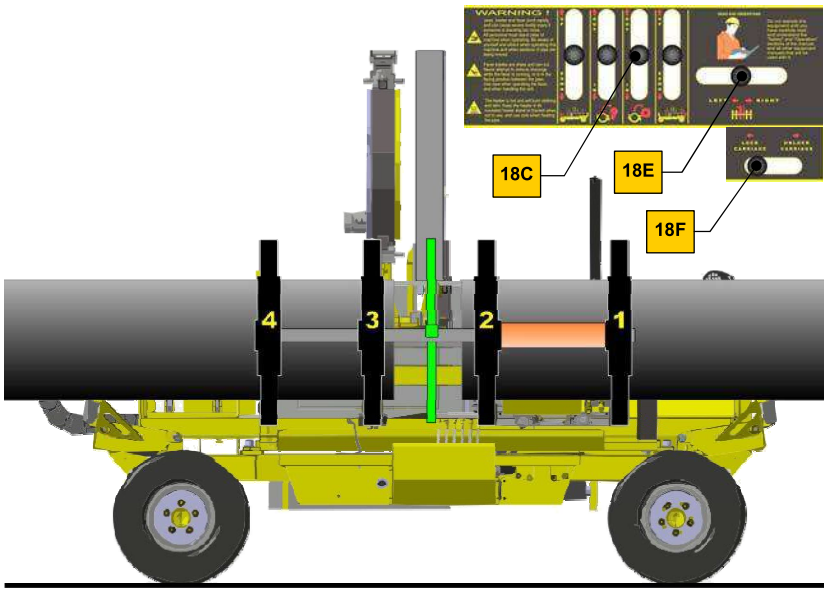
Insert the heating plate

Notice!
In order to be able to move the auxiliary carriages it's necessary to unlock turning on the lever 18F (LOCK/UNLOCK CARRIAGE)

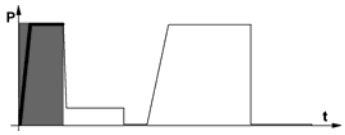
Correctly position the heater/facer carriage in order to lower the heater between the jaws (lever **18E**).

IMPORTANT:
Before lowering the heating plate verify that there are not going to be any collision between any parts of the machine (pipes heads, jaws, etc…)

Pull the lever **18C** to insert the heater between the pipes to be welded.

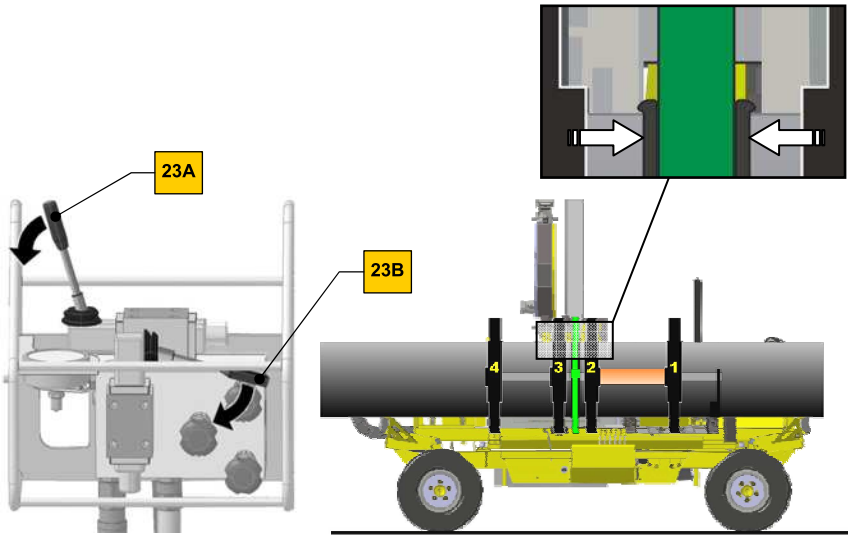


Approaching and preheating

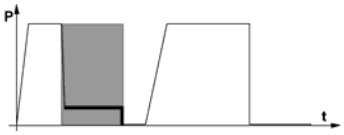


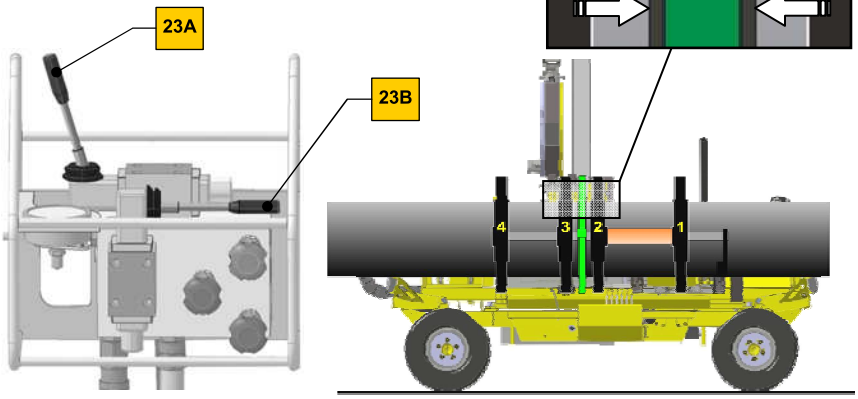
Notice!
Check that the selector valve 23B is in the correct position to use fusing setting (P_1 + P_t).

Pull the lever **23A** to the left to close carriage. The pressure inside the circuit increases up to when the preset **P_1+P_t** value (dragging and preheating pressure) is reached.



Heating

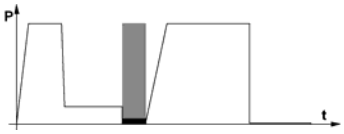


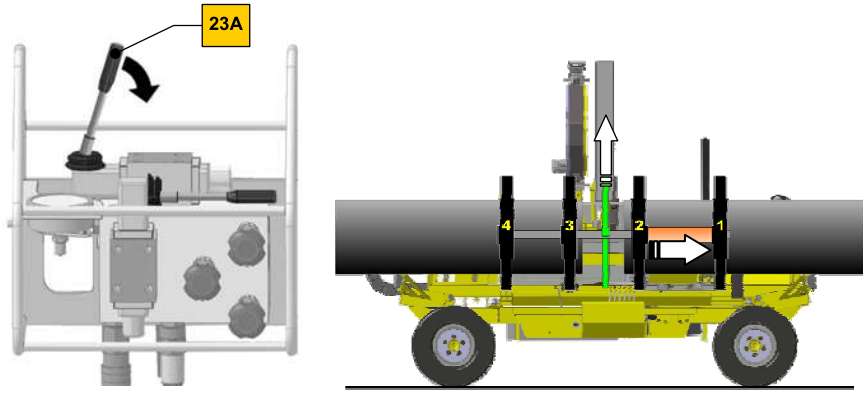


Notice!
Check that the selector valve 23B is in the correct position before starting heating P_2.

Keep control valve **23A** to the left position as in figure to heating pipes **(t_2)**

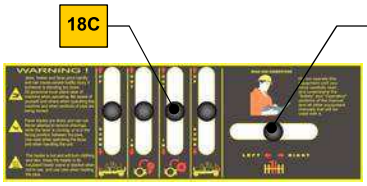
Removal of the heating plate





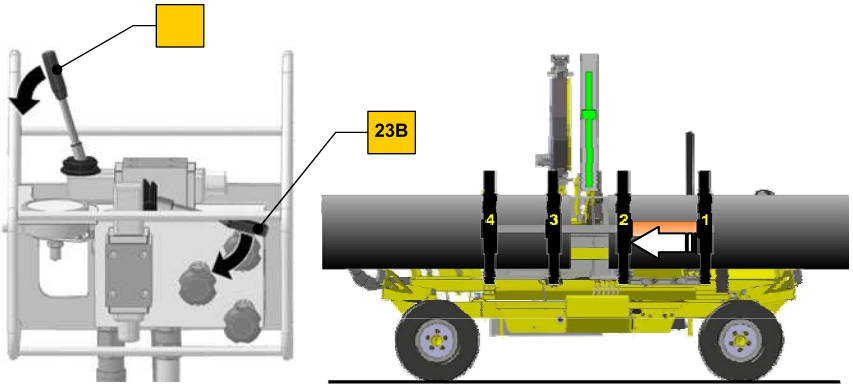
Once the time **t_2**, pull the lever **23A** to the right to open carriages then pull the lever **18C** to lift heating plate.

Notice:
It is possible that the heater is stuck with the pipes locked in the 3rd jaw; pull up the lever 18E (moving right the auxiliaries' carriage) to detach the heater from the pipe.



Pay attention not to shift too much on the left the auxiliaries carriage.

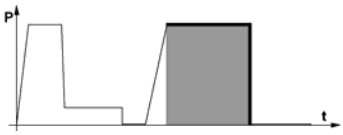
Reaching the welding pressure P_5



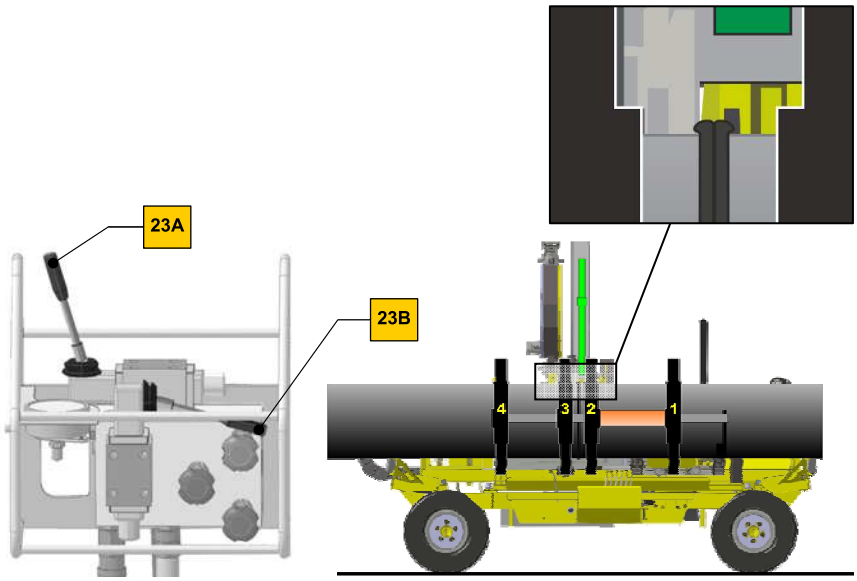
Notice!
Check that the selector valve 23B is in the correct position to use heating setting

Pull the lever **23A** to the left to close carriages and to reach the welding pressure phase **P_5**

Welding



Levers **23A** and **23B** must be in the position shown in figure all the time t_5

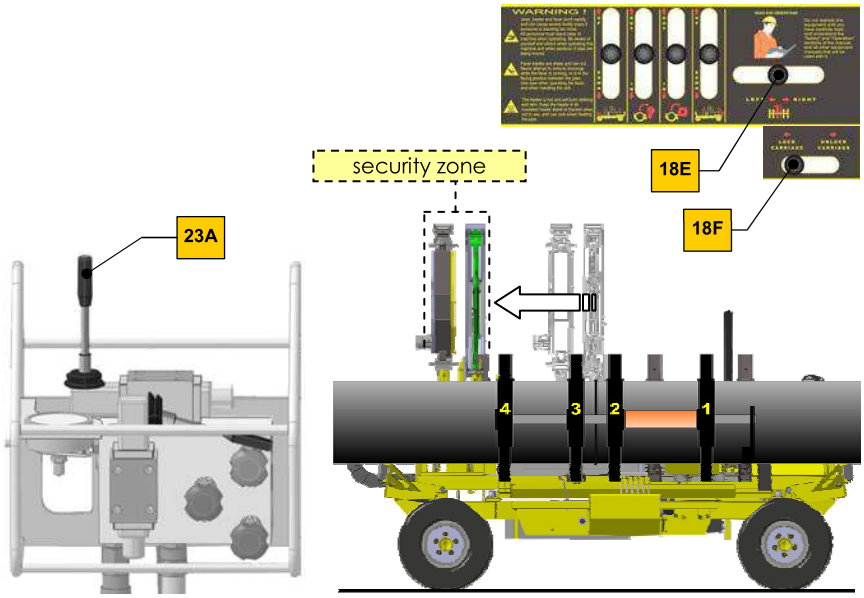


Notice!
In order to be able to move the auxiliary carriages it's necessary to unlock turning on the lever 18F (LOCK/UNLOCK CARRIAGE)

Pull the lever **18E** on the LEFT to move the group heater/facer to the left in the safety zone.

Lock the auxiliary carriages turning on the lever **18F.**

Open the jaws and remove the jointed pipe from the machine. Wait the complete cooling of the joint before stressing it.

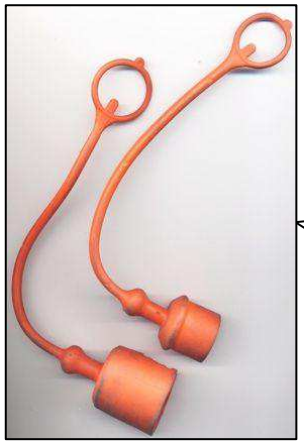


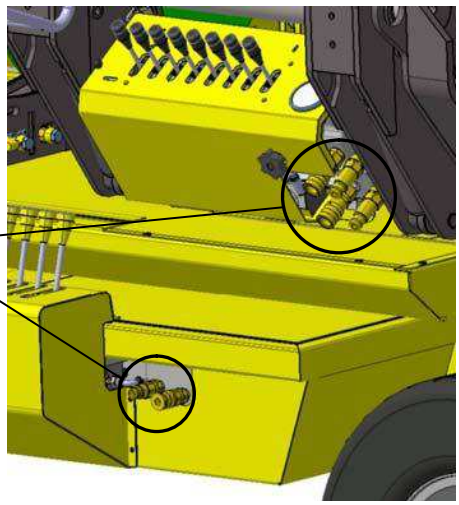
FAST COUPLINGS

Clean properly all the components of the machine after use. Protect them from impacts, liquids and dirt.

Clean properly the fast couplings.

To avoid dirt and sand to infiltrate into the hydraulic circuit, always protect the fast couplings with the supplied caps.

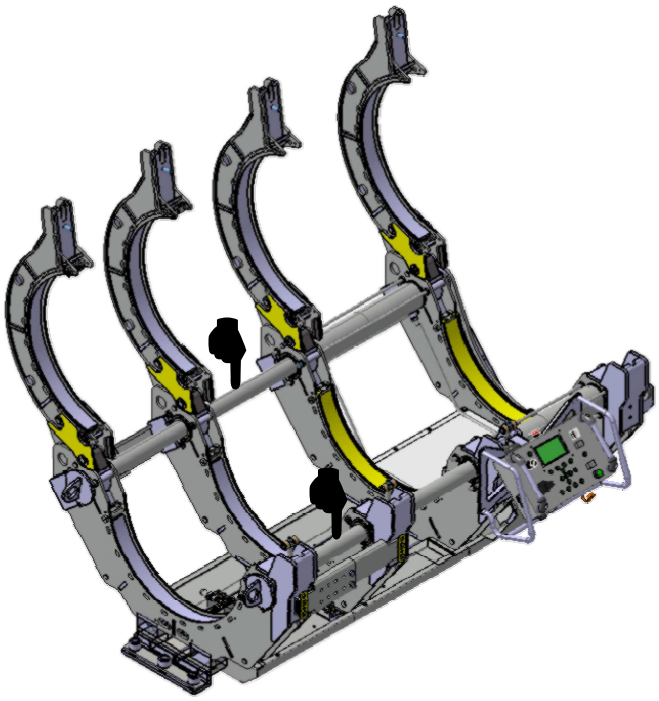




MACHINE BODY

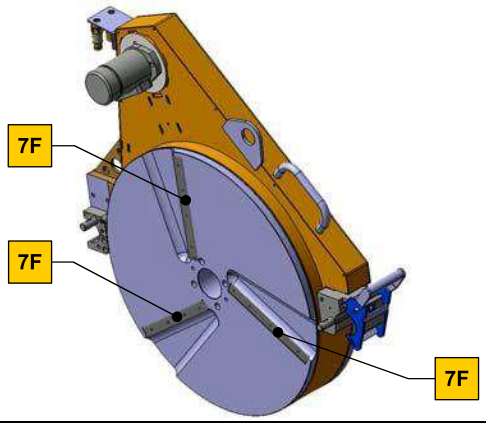
Keep clean the jaws' slots for the inserts.

Clean properly and protect from impacts the rods of the hydraulic cylinders.



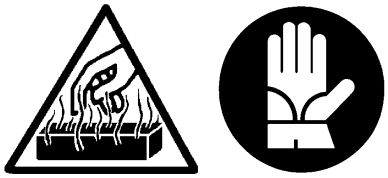
FACER

Periodically change the blades **7F**.

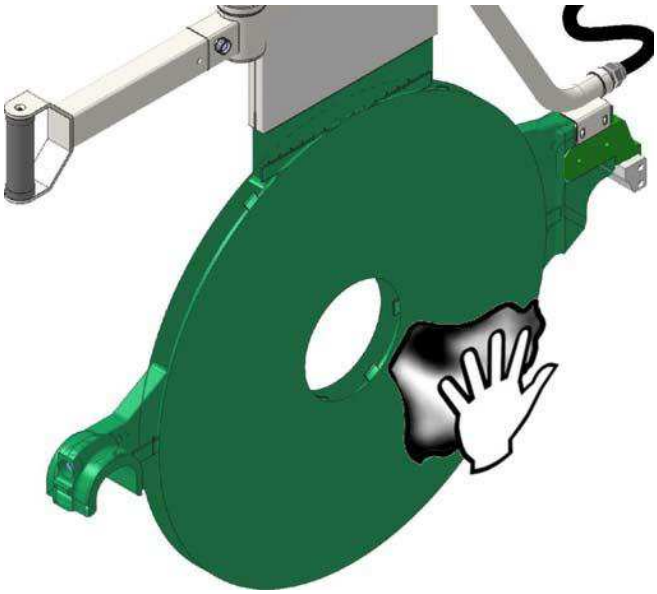


HEATING PLATE

At the end of every fusion clean the surface of the heater while it's still hot, with the right pickling agent (the product must not exhale toxic fumes when used on the hot surface of the heater).

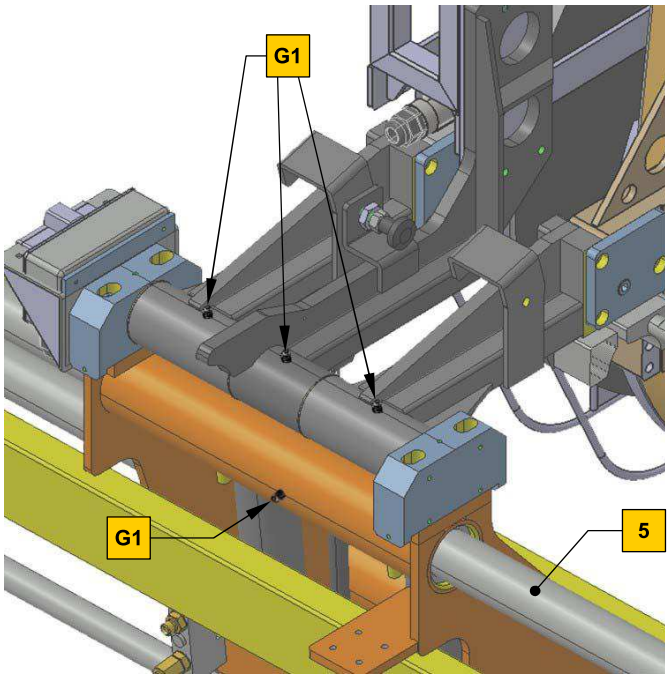


ATTENTION!!! : Due to the scorching hazard, this operation must be performed by the operator only using insulating gloves.



AUXILIARIES' CARRIAGE

Properly clean and protect the rod of the cylinder **5** from liquids and dirt. Periodically grease the sliding devices using the grease nipples **G1**.



HYDRAULIC GEARCASE

Every 1000 working hours and anyway once a year change oil completely, the filter 1 (**F1**) and the filter 2 (**F2**). (The type of oil used is extremely polluting: **get rid of it only in authorized wasting centers**.)

Use the types of oil suggested in the technical description of the gearcase (see pg.**3.**/1) .

Top up if necessary.

SC Hydraulic oil drain plug

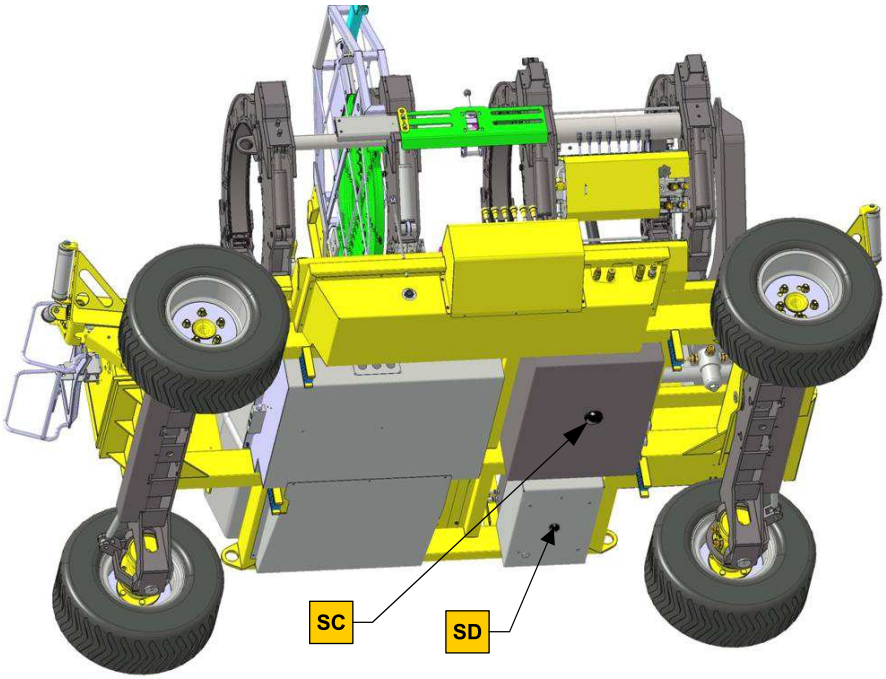
SD Cup of diesel drain

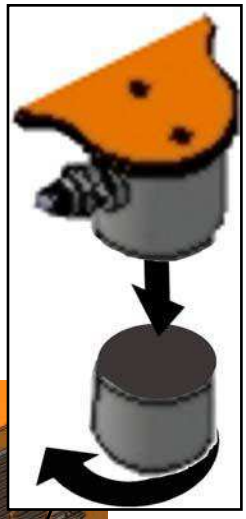
TP Oil tank cap

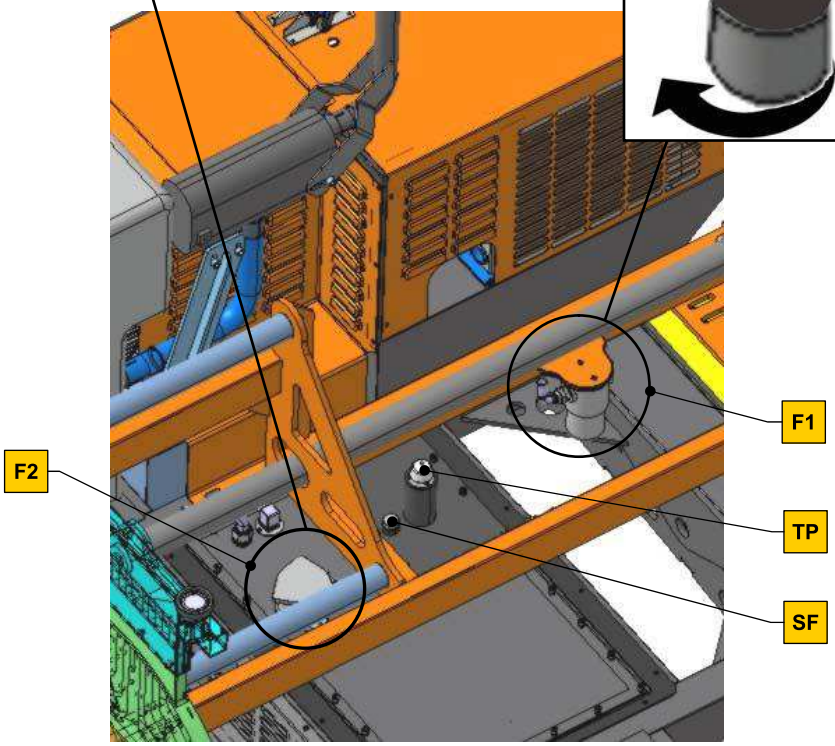
SF Oil dipstick

F1-F2 Oil filters

To change the engine's oil please have a look in the manual attached.





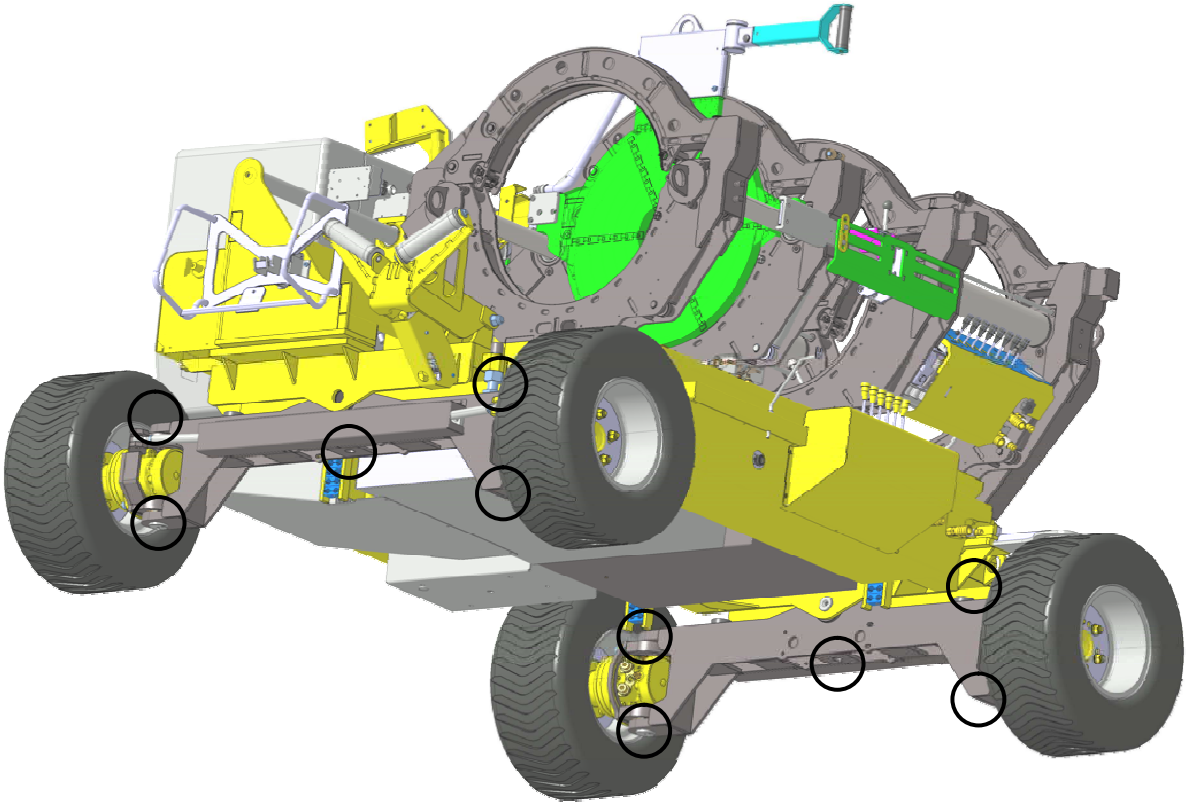


TRACK

Periodically grease the steering devices using the grease nipples (as shown in the following picture).

Use grease SHELL EP(LF)1.

○ Punti di ingrassaggio



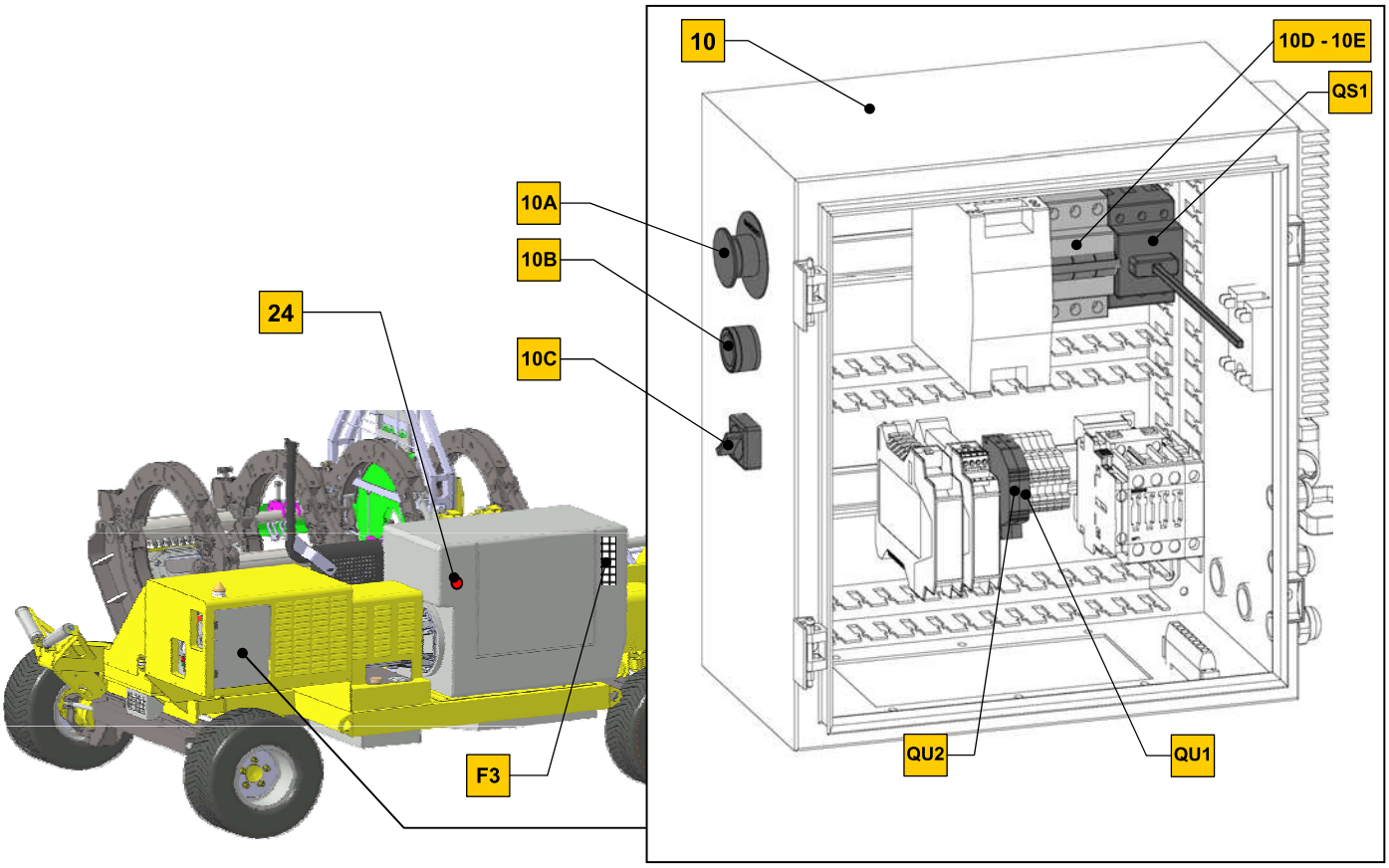
ENGINE (DIESEL)

See the handbook enclosed

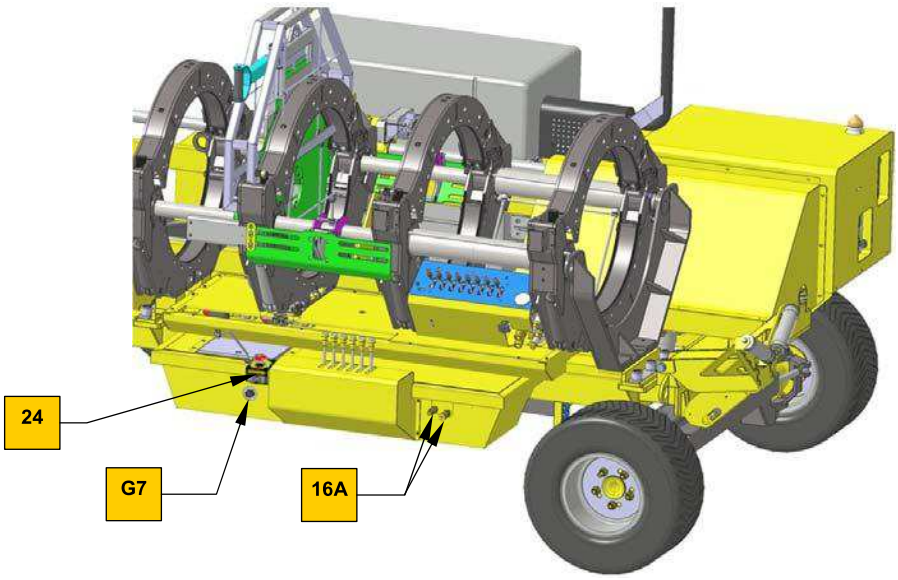
8. TROUBLESHOOTING

Preconditions:

1. The emergency buttons **10A** and **24** are not pushed
2. The start button was pushed
3. The switches **10D** and **10E** are ON
4. The main electric box **10** is properly closed (the switch **QU1** is switched ON)
5. The engine is running



24. Emergency button
10A. Emergency button
10B. Start button
10C. **ON/OFF** heating plate switch
10D. Leakage breaker
10E. Circuit breaker
QS1 Disconnecting switch
QU1 Fusecarrier
QU2 Fusecarrier
F3 Light fusecarrier



TRACK

FAILURE: Pushing the start button **10B** it doesn't light up but the control panel does not turn on.

Probable cause: The control panel connector **G7** is not properly connected.
Solution: Verify and restore the control panel connection.

Probable cause: Fuse **QU1** is burnt-out.
Solution: Change fuse **QU1.**

FAILURE: The head lamps are not working.

Probable cause: Burned light bulbs
Solution: change the light bulbs

Probable cause: Fuse **F3** is burnt-out
Solution: change fuse **F3**

HEATING PLATE

FAILURE: The start button and the control panel are ON but the heater is not warming up

Probable cause: The heater is broken.
Solution: Contact an authorized service centre.

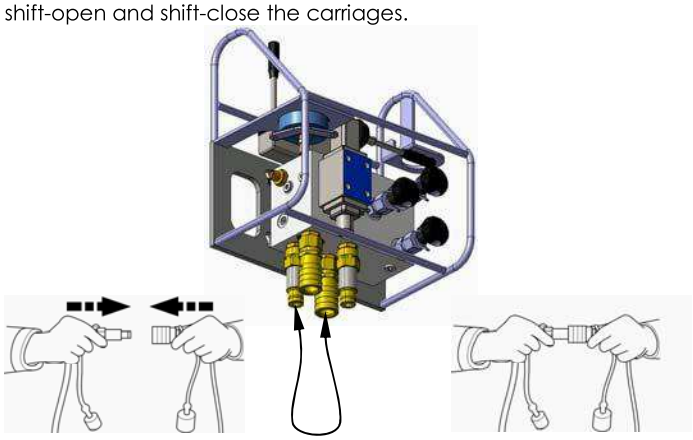
Probable cause: The temperature probe is broken.
Solution: Contact an authorized service centre.

HYDRAULIC GEARCASE

FAILURE: Pressure shortage

Probable cause: Insufficient oil in the tank.
Solution: Restore the oil level in the tank.

Probable cause: Presence of air in the hydraulic circuit.
Solution: Connect the gearcase fast coupling together **16** to drain the air out of the circuit. Use repetitively the commands to shift-open and shift-close the carriages.



Probable cause: Presence of impurities in the hydraulic circuit.
Solution: Contact an authorized service centre.

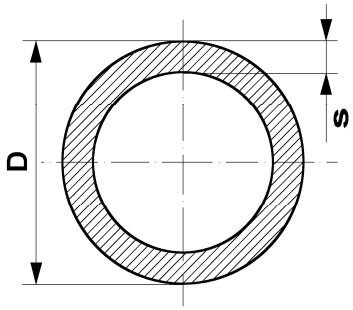
FAILURE: Oil leak.

Probable cause: Hydraulic connections or fittings are loosened or worn out.
Solution: Tighten hydraulic connections or fittings. Replace worn out parts.

*During warranty period, in case of problems of any nature, send your **DELTA 630 M** to **Ritmo** centre or to an authorized service centre. Any intervention to the machine (and generator) performed by personnel not authorized by **Ritmo** will void warranty.*

9. WELDING PARAMETERS

PIPE/FITTING FEATURES



The pipe/fitting classification in **Standard Dimension Ratio (SDR), Series (S)**, **Nominal Pressure (NP)**, as well as the welding parameters, they all depend on the **dimensions** of the pipe/fitting:

D: Outside diameter

s: Wall thickness (use a calibre to measure)

These are the formulas and ratios to be taken into consideration:

$SDR = \frac{D}{s}$ (Standard Dimension Ratio)	$S = \frac{1}{2}\left(\frac{D}{s} - 1\right)$	$SDR = 2 \times S + 1$	$S = \frac{SDR - 1}{2}$

SDR	41	33	27,6	26	22	21	17,6	17	13,6	11	9	7,4	6
S	20	16	13.3	12,5	10,5	10	8,3	8	6,3	5	4	3,2	2,5
PN (PE 80)	3,2	4	///	5	6	///	///	8	10	12,5	16	20	25
PN (PE 100)	4	5	6	///	///	8	///	10	12,5	16	20	25	32
PN (PP)	2,5	3,2	///	4	///	///	6	///	///	10	12,5	16	20

(Nominal Pressure at 20° C)

Herewith is a tables list of parameters (in compliance with various regulations for the most common diameters and thickness of pipes / fittings).

NOTE 1: The value of the approaching pressure P_1, which is equivalent to that of the welding pressure P_5, is to be set at the gearcase and is obtained by ***adding*** the corresponding obtained value from one of the herewith given tables to the value of the dragging pressure (P_t) measured by the oforator at the machine.

NOTE 2: Before consulting the tables herewith, the oforator must make sure that the **real** size, as measured at the pipe / fitting, actually **corresponds** to the nominal ones of that particular pipe / fitting. Use a callifor for this measurement.

NOTE 3: The values mentioned apply to a welding ambient at 20°C with adequate protection from adverse weather conditions.

WELDING PARAMETERS CHARTS

DELTA 630M ALL TERRAIN

PEHD
ISO21307(06-2011) TEPA=56,91 cm^2)

PP
DVS2207-11(08-08)

Tabelle parametri di saldatura

-

Welding parameters charts

-

Tablas parámetros de soldadura

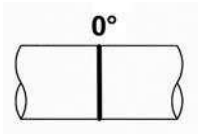
I	"**IMPORTANTE**: si ricorda che le norme, di cui alle tabelle riprodotte nelle pagine successive, concernono il procedimento di saldatura e devono essere conosciute dal saldatore il quale, è sempre tenuto a verificare in opera autonomamente i relativi parametri sulla base delle stesse e ad essere aggiornato su eventuali evoluzioni delle norme medesime. Ritmo SpA declina ogni responsabilità con riferimento all'utilizzo delle tabelle, qui riportate a mero titolo esemplificativo."

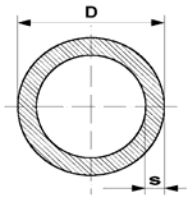
GB	"**ATTENTION PLEASE**: the standards used in the following tables refer to the welding procedures and must be known to the operator performing the welding. The operator must verify the parameters during welding by his/her own, and keep up-to-date with any possible changes to the standards. Ritmo S.p.A. declines all responsibility for the contents and use of such tables, herewith attached as mere examples."

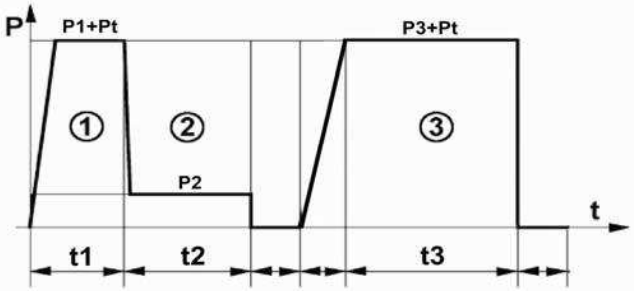
E	"**IMPORTANTE**: Tenga en cuenta que las normas, de las cuales son extractas las tablas que figuran en las páginas siguientes, se refieren al procedimiento de soldadura y deben ser conocidas por el soldador que, esta siempre obligado a verificar en obra y autónomamente los respectivos parámetros sobre la base de las mismas y a estar actualizado de cualquier cambio en las propias normas. Ritmo S.p.A. se exime de toda responsabilidad relacionada con el uso de dichas tablas, aquí presentes solo a título de ejemplo."

DELTA 630 ALL TERRAIN
(TEPA 56,91 cm2)
ISO 21307 (01-06-2011)
(single HIGH-PRESSURE)

PE-HD







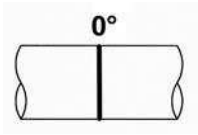
A cooling time out of the machine and before handling or installation may be recommended, but in most cases is not necessary with these cooling times.
(ISO 21307: 2011)

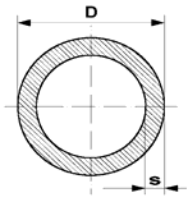
D [mm]	s [mm]	SDR = D/s	T [°C]	1		2		maximum heating plate removal time [sec]	3	
				*P1 [bar]	A [mm]	P2 [bar]	t2 [sec]		*P3 [bar]	t3 [min]
225	5,5	41	200 to 230	3	1,8	0 to drag pressure	61	9	3	2
225	6,9	33	200 to 230	4	2,0	0 to drag pressure	76	9	4	3
225	8,6	26	200 to 230	5	2,3	0 to drag pressure	95	9	5	4
225	10,8	21	200 to 230	7	2,6	0 to drag pressure	119	9	7	5
225	12,8	17,6	200 to 230	8	2,9	0 to drag pressure	141	9	8	6
225	13,4	17	200 to 230	8	3,0	0 to drag pressure	147	9	8	6
225	16,6	13,6	200 to 230	10	3,5	0 to drag pressure	183	10	10	7
225	20,5	11	200 to 230	12	4,1	0 to drag pressure	226	10	12	9
225	25,2	9	200 to 230	14	4,8	0 to drag pressure	277	11	14	11
225	30,8	7,4	200 to 230	17	5,6	0 to drag pressure	339	11	17	13
225	37,4	6	200 to 230	20	6,6	0 to drag pressure	411	12	20	16
250	6,2	41	200 to 230	4	1,9	0 to drag pressure	68	9	4	3
250	7,7	33	200 to 230	5	2,2	0 to drag pressure	85	9	5	3
250	9,6	26	200 to 230	7	2,4	0 to drag pressure	106	9	7	4
250	11,9	21	200 to 230	8	2,8	0 to drag pressure	131	9	8	5
250	14,2	17,6	200 to 230	10	3,1	0 to drag pressure	156	9	10	6
250	14,8	17	200 to 230	10	3,2	0 to drag pressure	163	9	10	6
250	18,4	13,6	200 to 230	12	3,8	0 to drag pressure	202	10	12	8
250	22,7	11	200 to 230	15	4,4	0 to drag pressure	250	10	15	10
250	27,9	9	200 to 230	18	5,2	0 to drag pressure	307	11	18	12
250	34,2	7,4	200 to 230	21	6,1	0 to drag pressure	376	11	21	15
250	41,5	6	200 to 230	25	7,2	0 to drag pressure	457	12	25	18
280	6,9	41	200 to 230	5	2,0	0 to drag pressure	76	9	5	3
280	8,6	33	200 to 230	7	2,3	0 to drag pressure	95	9	7	4
280	10,7	26	200 to 230	8	2,6	0 to drag pressure	118	9	8	5
280	13,4	21	200 to 230	10	3,0	0 to drag pressure	147	9	10	6
280	15,9	17,6	200 to 230	12	3,4	0 to drag pressure	175	10	12	7
280	16,6	17	200 to 230	13	3,5	0 to drag pressure	183	10	13	7
280	20,6	13,6	200 to 230	15	4,1	0 to drag pressure	227	10	15	9
280	25,4	11	200 to 230	19	4,8	0 to drag pressure	279	11	19	11
280	31,3	9	200 to 230	22	5,7	0 to drag pressure	344	11	22	13
280	38,3	7,4	200 to 230	27	6,7	0 to drag pressure	421	12	27	16
280	46,5	6	200 to 230	31	8,0	0 to drag pressure	512	13	31	20
315	7,7	41	200 to 230	7	2,2	0 to drag pressure	85	9	7	3
315	9,7	33	200 to 230	8	2,5	0 to drag pressure	107	9	8	4
315	12,1	26	200 to 230	11	2,8	0 to drag pressure	133	9	11	5
315	15,0	21	200 to 230	13	3,3	0 to drag pressure	165	10	13	6
315	17,9	17,6	200 to 230	15	3,7	0 to drag pressure	197	10	15	8
315	18,7	17	200 to 230	16	3,8	0 to drag pressure	206	10	16	8
315	23,2	13,6	200 to 230	19	4,5	0 to drag pressure	255	10	19	10
315	28,6	11	200 to 230	24	5,3	0 to drag pressure	315	11	24	12
315	35,2	9	200 to 230	28	6,3	0 to drag pressure	387	12	28	15
315	43,1	7,4	200 to 230	34	7,5	0 to drag pressure	474	12	34	19
315	52,3	6	200 to 230	39	8,8	0 to drag pressure	575	13	39	22

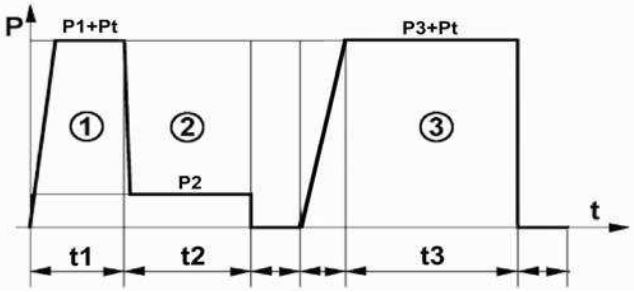
*Si ricorda di sommare a questo valore il valore della pressione di trascinamento Pt precedentemente misurato
*Remember to add to this value the pulling pressure Pt previously calculated.

DELTA 630 ALL TERRAIN
(TEPA 56,91 cm2)
ISO 21307 (01-06-2011)
(single HIGH-PRESSURE)

PE-HD







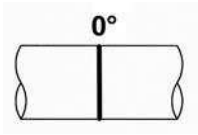
A cooling time out of the machine and before handling or installation may be recommended, but in most cases is not necessary with these cooling times.
(ISO 21307: 2011)

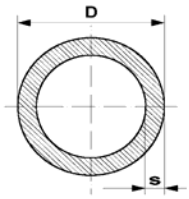
D [mm]	s [mm]	SDR = D/s	T [°C]	1		2		maximum heating plate removal time [sec]	3	
				*P1 [bar]	A [mm]	P2 [bar]	t2 [sec]		*P3 [bar]	t3 [min]
355	8,7	41	200 to 230	9	2,3	0 to drag pressure	96	9	9	4
355	10,9	33	200 to 230	11	2,6	0 to drag pressure	120	9	11	5
355	13,6	26	200 to 230	13	3,0	0 to drag pressure	150	9	13	6
355	16,9	21	200 to 230	16	3,5	0 to drag pressure	186	10	16	7
355	20,1	17,6	200 to 230	19	4,0	0 to drag pressure	221	10	19	9
355	21,1	17	200 to 230	20	4,2	0 to drag pressure	232	10	20	9
355	26,1	13,6	200 to 230	25	4,9	0 to drag pressure	287	11	25	11
355	32,2	11	200 to 230	30	5,8	0 to drag pressure	354	11	30	14
355	39,7	9	200 to 230	36	7,0	0 to drag pressure	437	12	36	17
355	48,5	7,4	200 to 230	43	8,3	0 to drag pressure	534	13	43	21
355	59,0	6	200 to 230	50	9,9	0 to drag pressure	649	14	50	25
400	9,8	41	200 to 230	11	2,5	0 to drag pressure	108	9	11	4
400	12,3	33	200 to 230	14	2,8	0 to drag pressure	135	9	14	5
400	15,3	26	200 to 230	17	3,3	0 to drag pressure	168	10	17	7
400	19,1	21	200 to 230	21	3,9	0 to drag pressure	210	10	21	8
400	22,7	17,6	200 to 230	25	4,4	0 to drag pressure	250	10	25	10
400	23,7	17	200 to 230	26	4,6	0 to drag pressure	261	10	26	10
400	29,4	13,6	200 to 230	31	5,4	0 to drag pressure	323	11	31	13
400	36,3	11	200 to 230	38	6,4	0 to drag pressure	399	12	38	16
400	44,7	9	200 to 230	46	7,7	0 to drag pressure	492	12	46	19
400	54,7	7,4	200 to 230	54	9,2	0 to drag pressure	602	13	54	24
450	11,0	41	200 to 230	14	2,7	0 to drag pressure	121	9	14	5
450	13,8	33	200 to 230	17	3,1	0 to drag pressure	152	9	17	6
450	17,2	26	200 to 230	21	3,6	0 to drag pressure	189	10	21	7
450	21,5	21	200 to 230	26	4,2	0 to drag pressure	237	10	26	9
450	25,5	17,6	200 to 230	31	4,8	0 to drag pressure	281	11	31	11
450	26,7	17	200 to 230	32	5,0	0 to drag pressure	294	11	32	11
450	33,1	13,6	200 to 230	40	6,0	0 to drag pressure	364	11	40	14
450	40,9	11	200 to 230	48	7,1	0 to drag pressure	450	12	48	18
450	50,3	9	200 to 230	58	8,5	0 to drag pressure	553	13	58	22
450	61,5	7,4	200 to 230	69	10,2	0 to drag pressure	677	14	69	26
500	12,3	41	200 to 230	17	2,8	0 to drag pressure	135	9	17	5
500	15,3	33	200 to 230	21	3,3	0 to drag pressure	168	10	21	7
500	19,1	26	200 to 230	26	3,9	0 to drag pressure	210	10	26	8
500	23,9	21	200 to 230	33	4,6	0 to drag pressure	263	10	33	10
500	28,3	17,6	200 to 230	38	5,2	0 to drag pressure	311	11	38	12
500	29,7	17	200 to 230	40	5,5	0 to drag pressure	327	11	40	13
500	36,8	13,6	200 to 230	49	6,5	0 to drag pressure	405	12	49	16
500	45,4	11	200 to 230	59	7,8	0 to drag pressure	499	13	59	20
500	55,8	9	200 to 230	71	9,4	0 to drag pressure	614	14	71	24

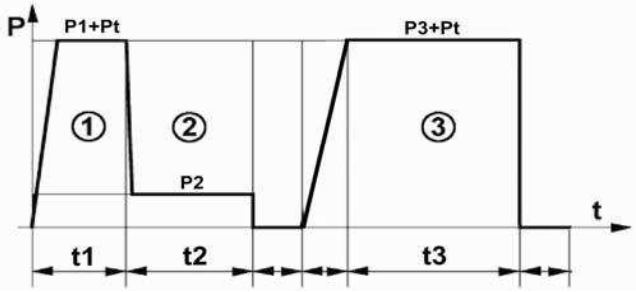
*Si ricorda di sommare a questo valore il valore della pressione di trascinamento Pt precedentemente misurato
*Remember to add to this value the pulling pressure Pt previously calculated.

DELTA 630 ALL TERRAIN
(TEPA 56,91 cm2)
ISO 21307 (01-06-2011)
(single HIGH-PRESSURE)

PE-HD







A cooling time out of the machine and before handling or installation may be recommended, but in most cases is not necessary with these cooling times.
(ISO 21307: 2011)

D [mm]	s [mm]	SDR = D/s	T [°C]	1		2		maximum heating plate removal time [sec]	3	
				*P1 [bar]	A [mm]	P2 [bar]	t2 [sec]		*P3 [bar]	t3 [min]
560	13,7	41	200 to 230	21	3,1	0 to drag pressure	151	9	21	6
560	17,2	33	200 to 230	27	3,6	0 to drag pressure	189	10	27	7
560	21,4	26	200 to 230	33	4,2	0 to drag pressure	235	10	33	9
560	26,7	21	200 to 230	41	5,0	0 to drag pressure	294	11	41	11
560	31,7	17,6	200 to 230	48	5,8	0 to drag pressure	349	11	48	14
560	33,2	17	200 to 230	50	6,0	0 to drag pressure	365	11	50	14
560	41,2	13,6	200 to 230	61	7,2	0 to drag pressure	453	12	61	18
560	50,8	11	200 to 230	74	8,6	0 to drag pressure	559	13	74	22
630	15,4	41	200 to 230	27	3,3	0 to drag pressure	169	10	27	7
630	19,3	33	200 to 230	34	3,9	0 to drag pressure	212	10	34	8
630	24,1	26	200 to 230	42	4,6	0 to drag pressure	265	10	42	10
630	30,0	21	200 to 230	52	5,5	0 to drag pressure	330	11	52	13
630	35,7	17,6	200 to 230	61	6,4	0 to drag pressure	393	12	61	15
630	37,4	17	200 to 230	64	6,6	0 to drag pressure	411	12	64	16
630	46,3	13,6	200 to 230	78	7,9	0 to drag pressure	509	13	78	20
630	57,2	11	200 to 230	94	9,6	0 to drag pressure	629	14	94	25

*Si ricorda di sommare a questo valore il valore della pressione di trascinamento Pt precedentemente misurato
*Remember to add to this value the pulling pressure Pt previously calculated.

Tabelle parametri di saldatura

-

Welding parameters charts

-

Tablas parámetros de soldadura

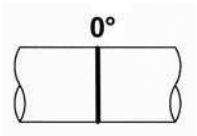
I	"**IMPORTANTE**: si ricorda che le norme, di cui alle tabelle riprodotte nelle pagine successive, concernono il procedimento di saldatura e devono essere conosciute dal saldatore il quale, è sempre tenuto a verificare in opera autonomamente i relativi parametri sulla base delle stesse e ad essere aggiornato su eventuali evoluzioni delle norme medesime. Ritmo SpA declina ogni responsabilità con riferimento all'utilizzo delle tabelle, qui riportate a mero titolo esemplificativo."

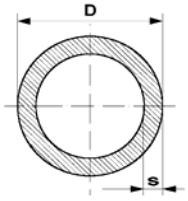
GB	"**ATTENTION PLEASE**: the standards used in the following tables refer to the welding procedures and must be known to the operator performing the welding. The operator must verify the parameters during welding by his/her own, and keep up-to-date with any possible changes to the standards. Ritmo S.p.A. declines all responsibility for the contents and use of such tables, herewith attached as mere examples."

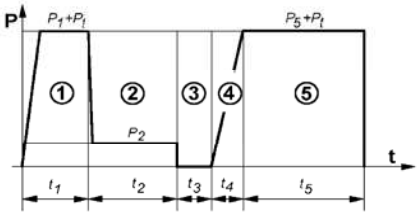
E	"**IMPORTANTE**: Tenga en cuenta que las normas, de las cuales son extractas las tablas que figuran en las páginas siguientes, se refieren al procedimiento de soldadura y deben ser conocidas por el soldador que, esta siempre obligado a verificar en obra y autónomamente los respectivos parámetros sobre la base de las mismas y a estar actualizado de cualquier cambio en las propias normas. Ritmo S.p.A. se exime de toda responsabilidad relacionada con el uso de dichas tablas, aquí presentes solo a título de ejemplo."

TEPA=56,91cmq

DELTA 630 A.T.
(ASTM - 56,91cm2)
DVS 2207-11 (08/2008)
PP





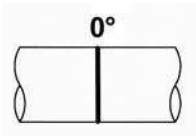


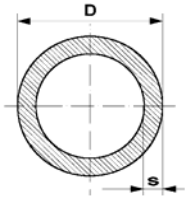
D [mm]	s [mm]	SDR = D/s	T [°C]	1		2		3	4	5	
				*P1 [bar]	A	P2 [bar]	t2 [sec]	t3 max [sec]	t4 [sec]	*P5 [bar]	t5 [min]
225	6,9	33	210	1	0,5	0	173	6	7	1	12
225	8,6	26	210	1	1,0	0	197	6	8	1	15
225	12,8	17,6	210	1	1,0	0	255	7	12	1	21
225	20,5	11	210	2	1,5	0	345	10	18	2	32
225	25,0	9	210	3	1,5	0	390	11	21	3	39
225	30,8	7,4	210	3	2,0	0	437	12	26	3	46
225	37,4	6	210	4	2,5	0	487	14	32	4	55
250	6,2	41	210	1	0,5	0	162	6	7	1	10
250	7,7	33	210	1	1,0	0	185	6	8	1	13
250	9,6	26	210	1	1,0	0	211	7	9	1	16
250	14,2	17,6	210	2	1,0	0	272	8	13	2	23
250	22,7	11	210	3	1,5	0	367	10	20	3	35
250	27,8	9	210	3	2,0	0	414	11	24	3	42
250	34,2	7,4	210	4	2,0	0	463	13	29	4	51
280	6,9	41	210	1	0,5	0	173	6	7	1	12
280	8,6	33	210	1	1,0	0	197	6	8	1	15
280	10,7	26	210	2	1,0	0	227	7	10	2	18
280	15,9	17,6	210	2	1,0	0	292	8	14	2	26
280	25,4	11	210	4	1,5	0	394	11	21	4	39
280	31,2	9	210	4	2,0	0	440	12	27	4	47
280	38,3	7,4	210	5	2,5	1	493	14	33	5	56
315	7,7	41	210	1	1,0	0	185	6	8	1	13
315	9,7	33	210	2	1,0	0	213	7	9	2	16
315	12,1	26	210	2	1,0	0	246	7	11	2	20
315	17,9	17,6	210	3	1,0	0	317	9	16	3	28
315	28,5	11	210	5	2,0	0	419	12	24	5	43
315	35,3	9	210	5	2,0	1	472	13	30	5	53
315	43,5	7,4	210	7	2,5	1	523	15	38	7	62
355	8,7	41	210	2	1,0	0	199	6	8	2	15
355	10,9	33	210	2	1,0	0	230	7	10	2	18
355	13,6	26	210	3	1,0	0	264	8	12	3	22
355	20,1	17,6	210	4	1,5	0	341	9	18	4	32
355	32,2	11	210	6	2,0	1	448	13	28	6	48
355	39,5	9	210	7	2,5	1	499	15	34	7	58
355	49,0	7,4	210	8	2,5	1	554	17	42	8	69

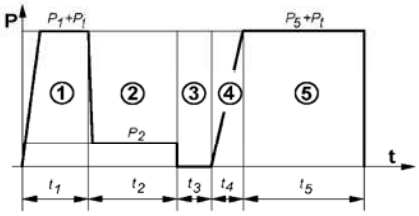
*Si ricorda di sommare a questo valore il valore della pressione di trascinamento Pt precedentemente misurato
*Remember to add to this value the pulling pressure Pt previously calculated.

TEPA=56,91cmq

DELTA 630 A.T.
(ASTM - 56,91cm2)
DVS 2207-11 (08/2008)
PP







D [mm]	s [mm]	SDR = D/s	T [°C]	1		2		3	4	5	
				*P1 [bar]	A	P2 [bar]	t2 [sec]	t3 max [sec]	t4 [sec]	*P5 [bar]	t5 [min]
400	9,8	41	210	2	1,0	0	214	7	9	2	16
400	12,3	33	210	3	1,0	0	249	7	11	3	20
400	15,3	26	210	3	1,0	0	285	8	14	3	25
400	22,7	17,6	210	5	1,5	0	367	10	20	5	35
400	36,3	11	210	7	2,0	1	480	14	31	7	54
400	44,5	9	210	9	2,5	1	528	16	39	9	63
450	11,0	41	210	3	1,0	0	231	7	10	3	18
450	13,8	33	210	3	1,0	0	267	8	13	3	23
450	17,2	26	210	4	1,0	0	308	9	16	4	27
450	25,5	17,6	210	6	1,5	1	395	11	22	6	39
450	40,9	11	210	9	2,5	1	508	15	35	9	59
500	12,3	41	210	3	1,0	0	249	7	11	3	20
500	15,3	33	210	4	1,0	0	285	8	14	4	25
500	19,1	26	210	5	1,5	1	331	9	17	5	30
500	28,4	17,6	210	7	2,0	1	419	12	24	7	43
500	45,5	11	210	11	2,5	1	534	16	39	11	65
560	13,7	41	210	4	1,0	0	266	8	12	4	22
560	17,2	33	210	5	1,0	1	308	9	16	5	27
560	21,4	26	210	6	1,5	1	354	10	19	6	33
560	31,7	17,6	210	9	2,0	1	444	12	27	9	48
630	15,4	41	210	5	1,0	1	286	8	14	5	25
630	19,3	33	210	7	1,5	1	333	9	17	7	30
630	24,1	26	210	8	1,5	1	381	11	21	8	37
630	35,7	17,6	210	12	2,0	1	475	14	31	12	53

*Si ricorda di sommare a questo valore il valore della pressione di trascinamento Pt precedentemente misurato
*Remember to add to this value the pulling pressure Pt previously calculated.

CE

I **DICHIARAZIONE DI CONFORMITÀ**
GB **CONFORMITY DECLARATION**
E **DECLARACION DE CONFORMIDAD**
P **DECLARAÇÃO DE CONFORMIDADE**
D **KONFORMITÄTSERKLÄRUNG**
F **CERTIFICAT DE CONFORMITÈ**

Ritmo S.p.A.
Via A. Volta, 35/37 - 35037 Teolo (PD) - ITALIA
Tel. ++39-(0)49-9901888 Fax ++39-(0)49-9901993

I Dichiara che il prodotto di sua produzione di seguito identificato:
GB Declares that the product of its our production named as follows:
E Declara que los productos identificados mas abajo:
P Declara que as seguintes soldadoras (de sua produção):
D Erklärt daß das Produkt von unserer Produktion wie folgt identifiziert ist:
F Déclare que le produit identifié ci-dessous:

DELTA 630M ALL TERRAIN

I è conforme alle disposizioni delle seguenti Direttive:
GB is made in compliance with the following directives:
E está conforme con lo dispuesto:
P respeitam quanto indicado nas seguintes Directivas e Normativas:
D gemäß den geltenden gesetzlichen Richtlinien:
F est conforme aux directives suivantes:

2006/42/CE
2004/108/CE
2006/95/CE
UNI 10565 :2008
ISO 12176-1 :2012
UNI EN ISO 12100 :2010
CEI 44-5

I

La presente dichiarazione perde ogni validità in caso di modifiche apportate al prodotto non approvate esplicitamente e per iscritto dal costruttore.

GB

This declaration becomes null and void in the event of any changes being made to the product without the written and explicit manufacturer's approval.

E

Esta declaración no es válida en caso de aportar modificaciones a los productos sin la expresa autorización escrita del fabricante.

P

Qualquer modificação efectuada ao aparelho, que não tenha sido autorizada *a priori* em modo explícito e por escrito pelo fabricante, anula a presente declaração.

D

Die Gültigkeit der vorliegenden Erklärung ist nichtig im Falle von Änderungen des Gerätes, die nicht ausdrücklich schriftlich vom Hersteller genehmigt wurden.

F

Cette déclaration n'est plus valable en cas de modifications non approuvés expressément par écrit par le fabricant.

Bresseo di Teolo, 22/02/13

(Renzo Bortoli): _____

Firma / Signature / Unterschrift / Firma / Assinatura / Signature