

ECOLITE - TH200



Lighting Tower V4 User's Manual



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Preliminary

0.1 Introduction

The Taylor Construction Plant (TCP) Ecolite-TH₂₀₀ V4 is an eco-friendly, robust and compact mobile power supply and low energy lighting tower. The towable trailer style machine incorporates a BOC HYMERA fuel cell power generator. The fuel cell uses high purity Hydrogen provided by four BOC Linde GENIE gas cylinders to give an efficient and CO₂-free power source.

The right hand (Slave) compartment, as viewed from the rear of the trailer, carries two cylinders under a secure cage. Similarly, two gas cylinders are carried under a cage in the left hand (Control) compartment.

The fuel cell is used to supply power to the tower lighting luminaires via two maintenance free 12 V rechargeable batteries. The fuel cell and the batteries are housed in a concealed enclosure within the Control compartment. The luminaires are mounted on top of a hydraulic lighting mast. The mast is a multi-stage telescopic cylinder powered by a hydraulic pump.

The TH₂₀₀ V4 machine is suitable for outdoor and ventilated indoor use. The towable trailer construction also makes it easy to transport, manoeuvre and deploy. The hydraulic lighting mast can be extended quickly and easily and the luminaires can reach a maximum height of 9.1 metres.

0.1.1 Instructions for Use

This User's Manual is a vital reference source for new users and must be retained. When not in use the manual is stowed in the documentation tube provided inside the machine. On first delivery, two sets of keys for the padlocks on the gas cylinder cages are also stored in the tube. Make sure that you read the operating instructions carefully before use. With proper care, this product will provide reliable, long-term service.

All information, illustrations and specifications contained in this publication are based on the latest product information available at the time of publication. TCP reserve the right to make changes at any time without notice. Continued improvement and advancement of the design may cause changes to the machine that may not be included in this publication.

PLEASE READ THE OPERATING INSTRUCTIONS CAREFULLY AND UNDERSTAND THEM BEFORE YOU OPERATE THE MACHINE.

0.1.2 Identification of Product

This manual may refer to controls and equipment that are not present on your particular model. It is important that you become familiar with your machine and its equipment and how to operate it properly.

Information about the model, code and chassis serial number is on the serial number plate on the front of the machine. Always quote the model and serial number in correspondence with your dealer or the manufacturer.

0.1.3 Modifications to Product

TCP may from time to time issue service bulletins. These will keep you up to date as to any improvements or changes that may take place on the complete assembly or component parts.

0.1.4 Product Compliance and Conformity

The Ecolite-TH₂₀₀ has been designed and assessed with reference to the relevant European Union (EU) directives:

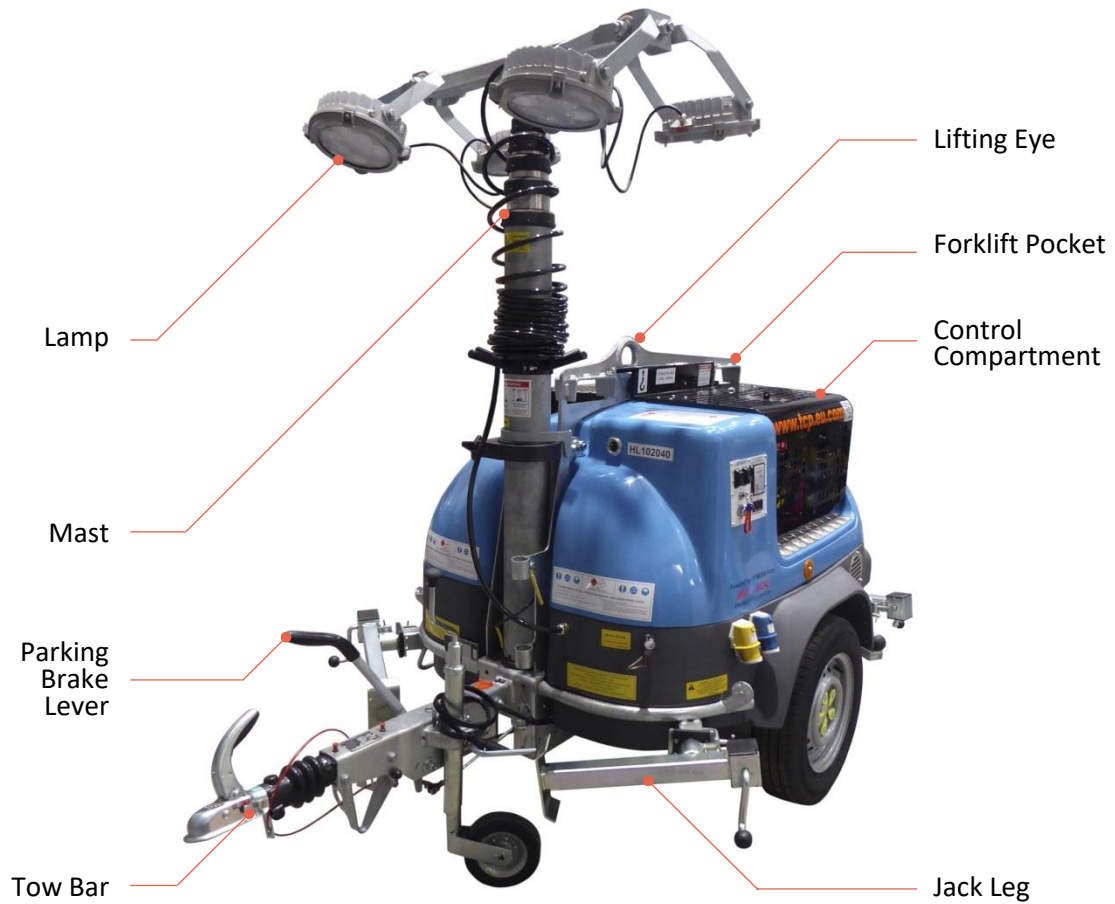
- 2006/42/EC – EU Machinery Directive
- 2004/108/EC – EU Directive on Electromagnetic Compatibility
- 2009/142/EC – EU Directive on Appliances that Burn Gaseous Fuels
- 2014/35/EU – EU Low Voltage Directive

Full details can be found in the technical file which can be obtained from TCP. Each new machine is issued with a warranty certificate and a certificate of conformity, which are sent to the head office of the purchaser. Further copies are available on request.

0.2 Specification

Conformité Européenne (CE) plate markings on the Ecolite-TH₂₀₀ V4 show that the machine conforms to all applicable EU directives.

Ecolite model	Standard TH ₂₀₀ V4
Overall length	2503 mm
Overall width, travel position	1455 mm
Overall mast height	9100 mm
Overall height, travel position	2170 mm
Overall width, jack legs deployed	2105 mm
Gross trailer weight	750 kg
Tow hitch height	420 mm
Ground clearance	244 mm
Maximum highway towing speed	Dependent on local speed limits
Wheel size	155/R13
Tyre pressure	2.5 bar (35 psi)
Braking system	Park and overrun
Stabilising system	4 x corner levelling jack legs
Lifting positions	1 x top lifting eye and 2 x top forklift pockets
Power source (FUEL CELL)	BOC HYMERA-200
Output voltage (Hymera)	10-30 V DC (set at 24 V DC for standard TH ₂₀₀)
Fuel source	4 x Linde GENIE 20 litre compressed hydrogen gas cylinders (300 bar)
Run time	35 hrs per cylinder @ 300 bar (200 W)
Output power (max)	200 W
Luminaires	4 x 38 W Primalence Polaris LED Lamps or 4 x 50 W Primalence Stella LED lamps
Operating voltage (Luminaires)	24 V DC
Maximum wind speed for safe operation	100 km/h
Additional mast safety system	TCP AMOSS



Section 1 - Safety Information

1.1 General

To prevent unexpected and unnecessary down time, report all malfunctions to TCP. Do not operate the machine until corrected. This manual describes general examinations and operations with the safety precautions required for normal operating conditions. It is not a guide however, for other than normal conditions or situations.

Users must be safety conscious at all times. Be alert to recognise potential operating safety hazards and take the necessary precautions to ensure safe operation of the machine.

1.2 Decals and Labels

Read and always obey the safety guidelines on the decals and labels attached to the chassis. Failure to do so before you start the machine could result in personal injury or damage to the machine.

**Un1049
Hydrogen Compressed**

PLEASE REFER TO THE OPERATORS MANUAL AND QUICK START GUIDE

- Operating Voltage is 28VDC
- Max Pressure- Cylinder = 300Bar, Hymera = 10Bar
- Do not use machine if there is damage to regulators, manifolds or gas hoses.
- Beware of trapping or cutting curly cord
 - When raising, lowering or rotating tower, ensure that curly cord does not become trapped.
 - If cord gets cut or crushed, replace before operating light tower.
 - If all the lights are out but the control unit is fully powered, Suspect damaged curly cord. Isolate power and fully inspect curly cord and Junction Box.

TCP-4983 Iss.A

WARNING
CRUSH ZONE
CAN CAUSE
SERIOUS INJURY
STAY CLEAR

TCP-1080-01 Iss.A

WARNING

SERIOUS INJURY CAN OCCUR

MAKE SURE ALL PERSONNEL ARE CLEAR OF TOWER WHEN RAISING OR LOWERING.

ELECTRIC SHOCK HAZARD. WILL CAUSE SEVERE INJURY OR DEATH.

DO NOT POSITION LIGHT TOWER UNDER ELECTRIC POWER LINES. DO NOT MOVE LIGHT TOWER WITH MAST RAISED.

TCP-3005-01 Iss.A

TCP
www.tcp.eu.com

No unauthorised person may operate this machine

SMOKING Under No Circumstances should there be Naked Flames or Smoking in the vicinity of this machine.

STATIC Discharge any static before attempting to assemble hoses to Machine and Cylinders.

SNIFTING Do Not Sniff the Cylinder Valve before fitting Regulator. Wipe fittings with lint free cloth.

SPRAY Check for leaks at Couplings / Joints using Correct / Supplied Leak detection Spray.

SPANNER Do Not use Tools to tighten Regulator or Hose connections. These are finger tight connections only.

START Now you are ready to Run / Start up the Machine. Operators Manual

Contact Details:-
Taylor Construction Plant Ltd
Quayside Industrial Park
Bates Road, Maldon,
ESSEX. CM9 5FA
Tel:- 01621 850777
Email:- mail@tcp.eu.com

**Un1049
Hydrogen Compressed**

Refer to SDS, For further information, www.BOOnline.co.uk

TCP-4068-01 Iss.B


Deploy jacklegs and fully apply the handbrake before attempting to raise the mast.
The handbrake on this unit engages with and operates the **Automatic Mast Operating Safety System**.
(‘TCP AMOSS’© safety system.)
DO NOT attempt to move with the mast erected.

TCP-2341-01 Iss.A

1.3 Safety Messages
















Before you operate the machine, please read, understand and at all times obey the safety messages located throughout this manual.

Safety messages of a general nature are located in this section of the manual. Safety messages specific to a particular section are located at the front of that section. Safety messages specific to a particular task within a section are located before that task.

Safety messages that denote a warning or caution are preceded by a safety alert symbol  and a signal word.

A warning means that personal injury or death is possible if the instruction is not obeyed. The message identifies the hazard, explains the consequences if ignored and indicates how to avoid it. A caution means that damage to the machine is possible.

Additional safety alert symbols used to reinforce the worded message:

	Read documentation		Discharge static		Hard hat required
	Eye protection required		Gloves required		Foot protection required
	No smoking		No open flame		No flames
	Pressurised cylinder		Flammable gas		Explosion risk
	High voltage hazard		Watch your head		Hand crush hazard

Section 2 - Transportation

2.1 Ecolite

WARNING

Do not transport the machine with a regulator connected to an installed gas cylinder. The regulator may be damaged in transit and lead to a hydrogen gas leak. Always close the cylinder valve and disconnect the regulator before transportation.

Do not transport the machine with the lighting mast extended. The mast may contact an overhead obstruction and become unstable. Always retract the mast before transportation.

Do not hang anything from the shipping tie-down eyes, tower or cross-arm. This may result in serious personal injury or damage to the machine.

2.1.1 Vehicle Mounted Ecolite

CAUTION

Make sure that the gas cylinders are securely fastened within their housing if transporting the machine with the cylinders installed.

Make sure the lifting devices used are attached securely and have enough weight-bearing capacity to lift or hold the machine safely. Always remain aware of the position of other people around you when you lift the machine.

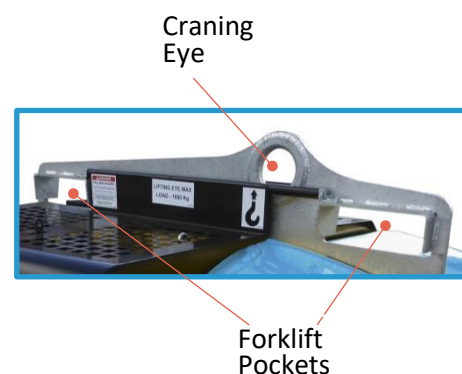
Make sure the forklift forks are inserted into the pockets a minimum of 600 mm. Attach the forklift safety chain before you lift the

machine. Failure to do so may cause the machine to fall off the forks.

The Ecolite may be transported with or without the gas cylinders installed.

Turn the lights to align with the chassis.

Lift the machine onto the transportation vehicle by use of the central craning eye or forklift pockets.



NOTE: The maximum load capacity of the craning lifting eye is 1000 kg.

Four bottom tie-down eyes, two at the rear and two at the front, are provided to firmly secure the machine to the transportation vehicle. The Jacklegs should be rotated and face downwards, not outwards.

Return this manual and both padlock keys to the documentation tube for transportation with the machine.

2.1.2 Towed Ecolite

The machine can also be hitched to a towing vehicle for transportation.

2.2 Gas Cylinders

 **WARNING**



Do not smoke in vehicles that carry gas cylinders. Flammable hydrogen gas could be present during transportation. To avoid risk of ignition or explosion, do not smoke or use open flames in the vehicle.

When gas cylinders only are to be transported on vehicles, close the cylinder valves tightly and disconnect the regulators.

Make sure that there are no leaks.

Fit the protective caps to the cylinder valves.



Read the safety requirements of the British Compressed Gases Association (BCGA) Guidance Note 27 (or equivalent in country of use).

Section 3 - Deployment

3.1 Site Conditions

3.1.1 Safety Equipment

Know what safety equipment is required and use it. The minimum PPE when you deploy or operate the machine is hard hat, safety glasses, protective gloves and safety footwear.

A high visibility vest, respirator and earplugs may also be a site requirement.

3.1.2 Initial Trailer Position

WARNING



Do not deploy the machine under overhead power cables etc. There is a risk of electric shock. Make sure that the area above the mast when fully extended is clear of obstructions.

CAUTION

Make sure the machine is deployed on firm and level ground. If deployed on soft ground or a slope the machine could become unstable and move or topple during operation.

Make sure that the area that immediately surrounds the machine is clean, neat and free of debris.

Assess the site conditions carefully before you position the machine.

Learn the operating characteristics and limitations of the machine. Know what operating clearances the machine requires for safe use all round.

Position the machine on the same or higher level than the area being lit. The shadow length is reduced when the light is higher.

3.1.3 Lighting Mast

WARNING

Do not deploy the mast in wind speeds greater than 100 km/hour. There is a risk that the machine may topple and cause damage or personal injury.

CAUTION

Make sure all four jack legs touch the ground and the machine is level before you deploy the mast. The mast may not telescope down properly if the machine is not level.

Make sure the parking brake is on before you attempt to extend the mast. You cannot extend the mast unless the brake is on (**TCP AMOSS**).

NOTE: *The mast will retract automatically if the parking brake is released (**TCP AMOSS**).*

Be aware that the lighting mast extends to a maximum of 9.1 metres.

Be aware of operating hazards that weather changes can create on the job. Know proper site procedures to obey when a severe rain or electrical storm strikes.

Bear in mind that, if required, the Ecolite may be used in a well-ventilated indoor space.

3.2 Other Considerations

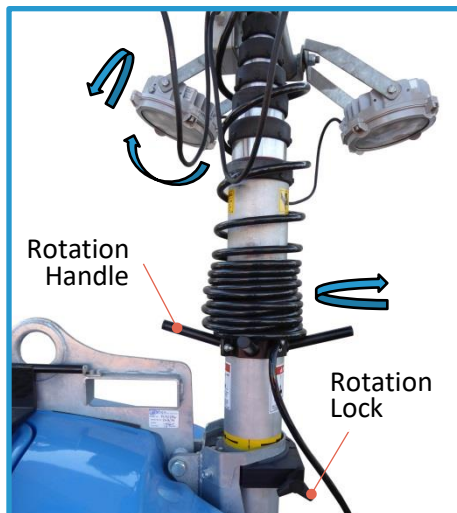
3.2.1 Lighting Applications

During lighting applications the machine should not be placed where those who work under the light are:

- forced to look into the light regularly or
- forced to work with their backs to the light (shadows will block the light from the work area).

3.2.2 Lighting Adjustment

To direct the tower lights as required the lighting mast can be rotated by up to 340 degrees:



Loosen the rotation lock.

Turn the rotation handle to redirect the lights.

Tighten the rotation lock.

In addition to rotation of the mast, each of the four lights can be rotated on two axes and tipped back and forth.

To make these adjustments, you must retract the lighting mast to allow access:

Turn off the lights and allow time for them to cool.

Retract the mast.

NOTE: The mast will retract automatically if the parking brake is released (TCP **AMOSS**).

Direct the lights either downwards or horizontally as required (e.g. to illuminate a facade).

3.3 Move Trailer Position

⚠ WARNING

Do not remove the levelling jacks until the jockey wheel is down and locked. Failure to do so will cause the trailer to topple and cause damage or personal injury.

⚠ CAUTION

Make sure the lifting devices used are attached securely and have enough weight-bearing capacity to lift or hold the machine safely. Always remain aware of the position of other people around you when you lift the machine.

Make sure the forklift forks are inserted into the pockets a minimum of 600 mm. Attach the forklift safety chain before you lift the machine. Failure to do so may cause the machine to fall off the forks.

The **A**utomatic **M**ast **O**perating **S**afety **S**ystem (**TCP AMOSS**) will not allow you to move the machine while the mast is up. The mast will telescope down automatically when the parking brake is released.

Turn off the tower lights and allow time for them to cool.

Retract the mast.

Wind up, push in and stow the four levelling jacks.

Manhandle the trailer into the required position. If necessary, use the central craning or forklift pockets.

NOTE: *The maximum load capacity of the craning lifting eye is 1000 kg.*

Alternatively, attach the trailer to a towing vehicle to move it to the new position.

Section 4 - Towing Instructions

4.1 Pre-Attachment Checks

WARNING

Do not tow the trailer using defective parts. Faulty parts may be hazardous and could cause an accident and personal injury.

Examine the couplings on the towing vehicle to make sure they are rated equal to or greater than the 'gross trailer weight'.

Inspect the couplings for wear or damage.

Inspect the trailer tyres for tread wear, inflation, and condition.

CAUTION

Make sure that none of the wheel nut torque indicators has moved from its original position. The indicators are pre-set pointing to the centre of the wheel.

Inspect the wheel nuts to make sure they are tight and that none are missing.

Inspect all reflectors and light lenses to make sure they are intact.

Fit the number plate to the rear bracket with the cable ties supplied.

Attach the trailer to the towing vehicle.

Summary:

- Examine tow vehicle couplings
- Inspect trailer tyres
- Inspect torque indicators and wheel nuts
- Inspect reflectors and light lenses
- Fit number plate
- Attach trailer to towing vehicle



Number
Plate
Bracket

Torque
Indicators



4.2 Attach the Trailer

Pull up the parking brake lever to the limit of its travel to apply the brake.

Wind down the jockey wheel to lift the towing cup above the vehicle tow ball.

Position the vehicle tow ball under the towing cup.

Wind up the jockey wheel to lower the towing cup onto the tow ball.

NOTE: Once the two parts are correctly engaged, the towing cup handle will lock in the closed position. Handle position 'x' = open, '-' = closed (not ready to tow), '+' = closed and engaged (ready to tow).

Examine the coupling to make sure the trailer is properly attached.

Wind up the jockey wheel until fully retracted.

Release the clamp, lift the jockey wheel as high as possible in the clamp and tighten the clamp.

Inspect the jockey wheel to make sure it is well clear of the brake mechanism and is securely retained.

Attach the breakaway safety cable to the towing vehicle.

Connect the trailer lighting cable to the towing vehicle.

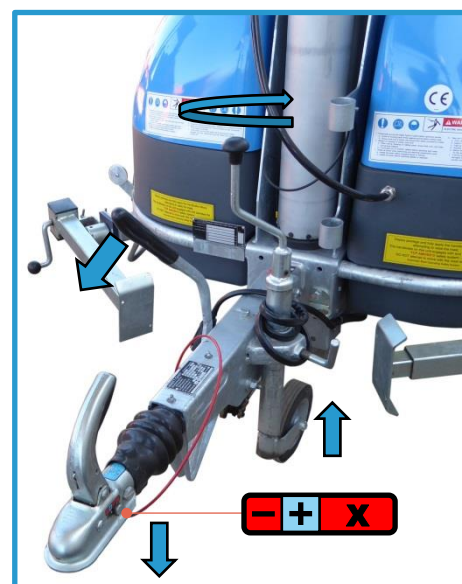
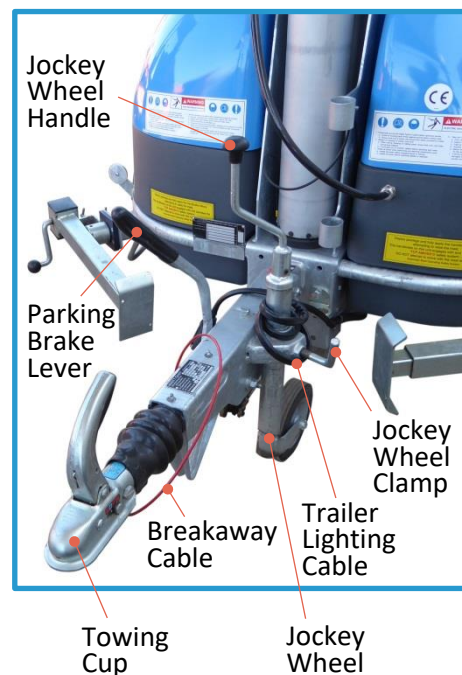
Make sure the directional, reverse and trailer lights operate correctly.

Release the parking brake, make sure it is in the fully off position and then tow the trailer to the required location.

NOTE: The maximum recommended tow speed on a highway is 75 km/h. However, this is dependent on local speed limits. The recommended maximum off-road tow speed is 15 km/h (less on uneven terrain).

Summary:

- Apply trailer parking brake
- Engage towing cup with tow ball
- Fully retract and clamp jockey wheel
- Attach breakaway cable
- Connect lighting cable
- Make sure lights operate
- Release trailer parking brake



4.3 Disconnect the Trailer

⚠ WARNING

Do not release the jockey wheel assembly clamp lever while the weight of the trailer is on the jockey wheel. The trailer will tip forward and could cause damage or personal injury.

Make sure the parking ground is level and clear of obstacles.

Pull up the parking brake lever to the limit of its travel to apply the brake.

NOTE: You cannot extend the mast unless the brake is on.

Disconnect the trailer lighting cable from the towing vehicle.

Disconnect the breakaway cable from the towing vehicle.

Release the jockey wheel assembly clamp and lower the wheel approximately half way to the ground.

Tighten the clamp.

Wind down the jockey wheel while you open and hold up the towing cup handle to release the weight from the vehicle tow ball.

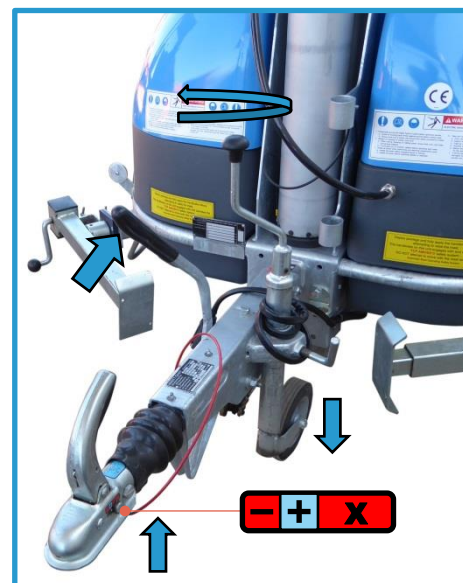
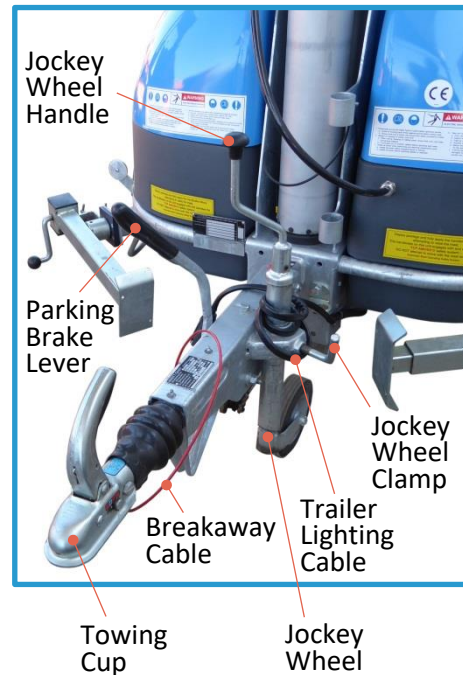
NOTE: Towing cup handle position 'x' = open, '-' = closed (not ready to tow), '+' = closed and engaged (ready to tow).

Release the parking brake and make any final adjustments to the position of the trailer.

Pull up the parking brake lever to the limit of its travel to apply the brake.

Summary:

- Apply trailer parking brake
- Disconnect lighting cable
- Disconnect breakaway cable
- Release Jockey wheel clamp
- Lower wheel to disengage towing cup
- Adjust trailer position

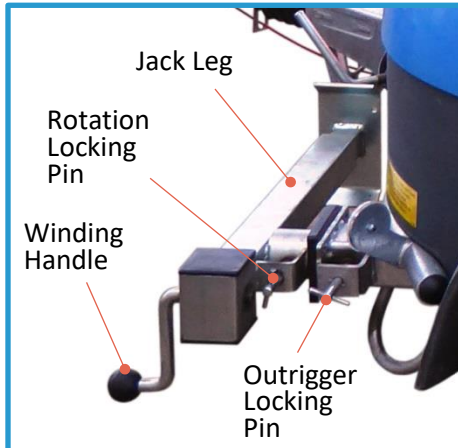


4.4 Make the Trailer Stable

CAUTION

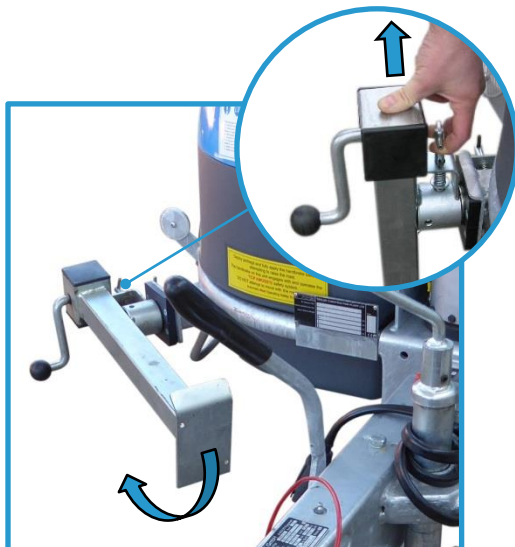
Make sure the trailer is disconnected from the towing vehicle and the parking brake is applied.

Start with the jack leg on the highest ground.



Hold the jack leg with one hand and pull the rotation locking pin to release the leg.

Allow the leg to fall to the vertical position.

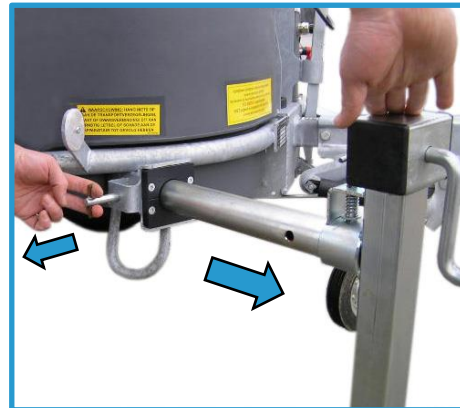


Examine the leg to make sure the rotation pin locks it in the vertical position.

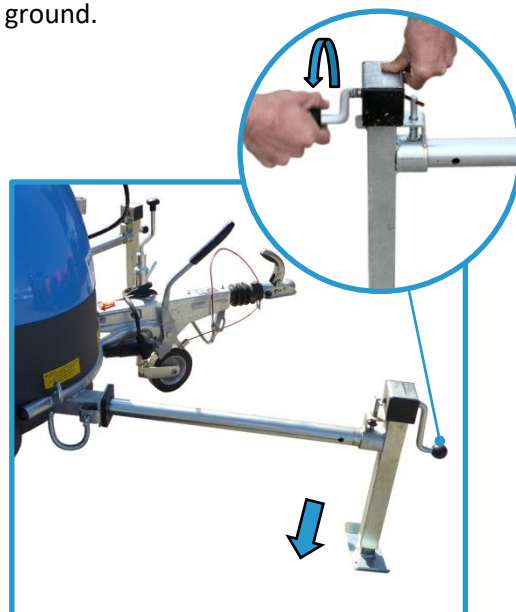
Summary:

- Release jack leg
- Allow leg to fall
- Lock leg in vertical position
- Remove outrigger pin
- Extend leg from trailer body
- Lower foot to ground
- Make sure trailer is level

Pull out the outrigger locking pin and pull the jack leg away from the body of the trailer to its fullest extent.



Wind down the foot of the jack leg to touch the ground.

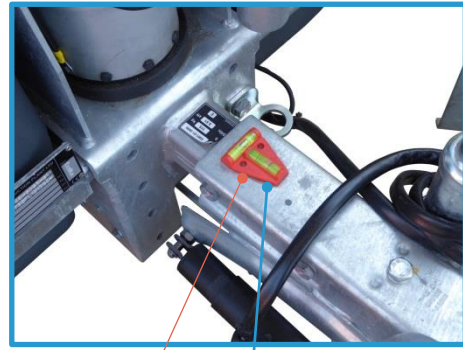


Repeat the procedure for the remaining three jack legs.

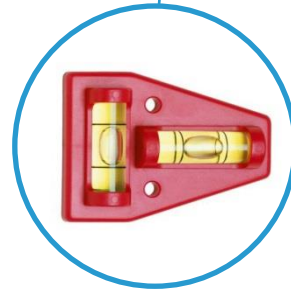


Adjust the jack legs to level the trailer in both directions.

NOTE: Monitor the spirit level bubbles on the tow bar while you adjust the jack legs.



Spirit Level Bubbles



Examine the trailer to make sure it is stable and firmly supported by all four jack legs.

Section 5 - Operating Instructions

5.1 Using the Ecolite-TH₂₀₀ V4

5.1.1 Preparation

⚠ WARNING

Do not start a machine that is in need of repair. A faulty machine may be hazardous and could cause personal injury. Contact the manufacturer or supplier.



Read the BOC *High Purity Hydrogen Safety Data Sheet* in conjunction with this procedure.



Put on appropriate PPE, i.e. hard hat, safety glasses, protective gloves and safety footwear.

⚠ WARNING



Do not smoke or use open flames within a 1 metre radius of the machine. Flammable hydrogen gas could be present during operation. To avoid risk of fire or explosion extinguish any source of local ignition.

⚠ CAUTION



Make sure that there is no static electrical charge between yourself and the gas cage. This can be achieved if you touch a grounded piece of metal.

Summary:

- Read Hydrogen Safety Data Sheet
- Put on appropriate PPE
- Extinguish sources of local ignition
- Discharge static electricity



5.1.2 Load the Gas Cylinders

WARNING

Do not leave the spare key on the machine. This could lead to unauthorised use when the machine is unattended. Remove the spare key and give it to the site controller or other responsible person.

NOTE: On first delivery the keys to the padlocks are stowed in the documentation tube located in the Control compartment.

Unlock and remove the padlock from the gas cage over the Slave compartment.

Lift the gas cage security cover.

Remove the 3-lobe knob from the clamping rod.

Lift out the clamping plate.

Load two hydrogen gas cylinders into the cage.

NOTE: Position each cylinder so that the regulator connector faces away from the front and towards the centre of the machine.

CAUTION

Make sure the clamping plate fits over the lifting handle of each gas cylinder.

Fit the clamping plate over the clamping rod.

Fit the 3-lobe knob and hand-tighten so that the clamping plate secures the gas cylinders.

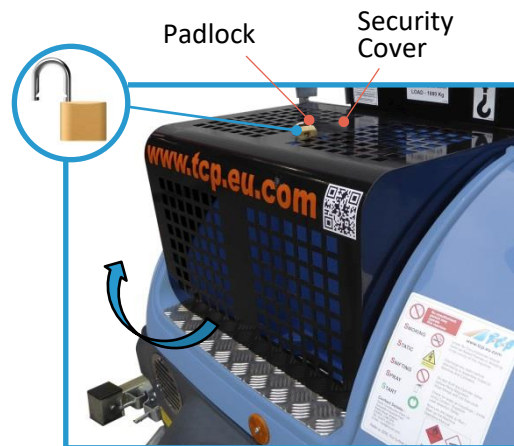
Repeat the above procedure in the Control compartment, which has a clamping plate with a 4-way manifold attached.

The manifold allows the hoses from the two banks of two cylinders to be connected to a central point.

Support the assembly on the raised security cover while loading the gas cylinders.

Summary:

- Remove padlock
- Lift security cover
- Remove clamp
- Load gas cylinders
- Fit clamp



Regulator Connector Gas Cylinder

5.1.3 Install the Regulators

⚠ WARNING



Do not release gas into the atmosphere from the cylinders at any point. Hydrogen gas will ignite easily. Avoid 'sniffling' the gas cylinders at all times.

⚠ CAUTION

Make sure the gas cylinder valve is off when you install or remove the regulator and gas hose.

NOTE: The regulators are stowed in two holders inside each gas cage security cover.

Unlock and lift the cover of the compartment.

Release a regulator from its holder and examine the sealing O-ring for damage.

NOTE: If the O-ring is damaged or missing, or if a leak is detected during use, contact the supplier or manufacturer.

Remove the protective cap from the gas cylinder valve.

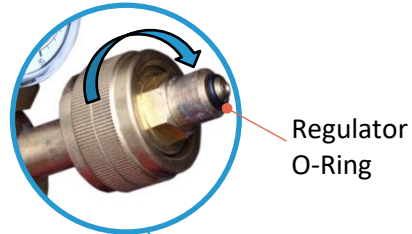
Connect the regulator to the gas valve.

Turn the connector in a counterclockwise direction and hand-tighten only.

Repeat the above procedure for the remaining three gas cylinders.

Summary:

- Examine regulator O-ring
- Connect regulator to cylinder



5.1.4 Install the Gas Hoses

All four gas cylinder hoses are connected to the 4-way manifold attached to the cylinder clamping plate.

NOTE: The manifold outlet is connected to the Hymera gas supply hose.

The gas cylinder hoses are fitted with black, red, yellow and blue coloured sleeves.

A label on the top of the plate has black, red, yellow and blue coloured circles. The circles identify the location of the gas cylinders.

Circular discs of the same colours are also fitted to the four header valves of the manifold.

Black and red denote cylinders in the Slave compartment. Yellow and blue denote cylinders in the Control compartment.

Each coloured gas hose must be connected to the regulator on the cylinder at the location with the corresponding colour.

Examine the sealing O-ring on the gas hose for damage.

NOTE: If the O-ring is damaged or missing, or if a leak is detected during use, refer to Section 4 before you attempt to replace it.

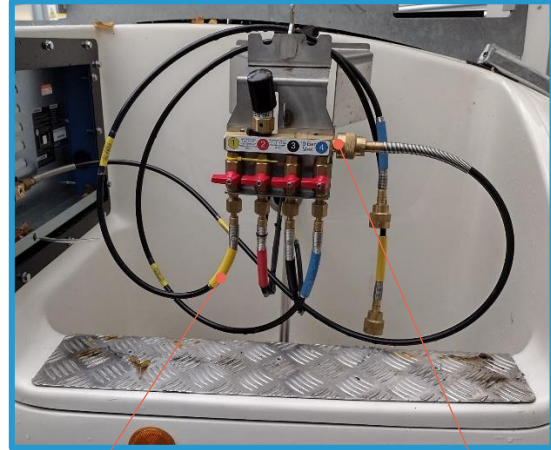
Connect the gas cylinder hose to the regulator.

Turn the connector in a counterclockwise direction and hand-tighten only.

Repeat the above procedure for the remaining three gas hoses.

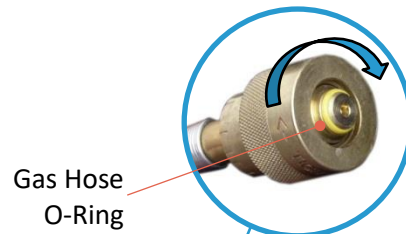
Summary:

- Examine gas supply hose O-ring
- Connect hose to regulator



Coloured Sleeve

Cylinder Identification Label



Gas Hose O-Ring



5.1.5 Look for Leaks

WARNING

Do not damage the regulator when it is connected to the gas cylinder and the valve is open. A damaged regulator may lead to a hydrogen gas leak. In the event of a leak shut down immediately and contact the manufacture or supplier.

Open the gas cylinder valve fully and then back it off half a turn so that it feels loose. The valve should be opened at least a turn and a half.

Remove the 'Teepol' leak detector from the Slave compartment.

Spray each joint with the 'Teepol' leak detector supplied with the machine and look for bubbles that show a leak. Do this every time a joint is made.

CAUTION

Make sure that the gas cylinder has adequate content and is properly connected and secured before use.

NOTE: The gauge on the regulator shows the gas pressure, and is used only to monitor the contents of the cylinder. When the pressure reads zero with the gas valve open, the cylinder is empty.

Return the 'Teepol' leak detector to the Control compartment.

Make sure that all four header valves are fully open at the manifold.

Lower the gas cage security cover.

Attach and lock the padlock.

Remove the padlock key and give to the site controller or other responsible person.

Summary:

- Open gas cylinder valve
- Look for gas leaks
- Lower security cover
- Attach padlock
- Remove padlock key



5.1.6 Power Up

⚠ WARNING

Do not obstruct or cover the ventilation holes on top of the gas cages. Blocked ventilation holes will lead to a build-up of hydrogen gas in the event of a leak. Remove any obstructions to allow the gas to disperse.

⚠ CAUTION

NOTE: Numbers 1 to 3 on the control panel suggest the operating order.

Insert the key into the switch on the remote control panel on the side of the machine. Turn the key to unlock (enable) the control panel.

NOTE: The Hymera and batteries are entirely controlled by the Ecolite-TH₂₀₀ V4 onboard control system. The operator only needs to control the machine using the following instructions.

Should there be any fault at any time with the machine, the fault light will illuminate and TCP should be contacted before further use.

Should the gas status light begin to flash, this is telling the operator gas is running low and there should be around 35 hours of operational time. Should the gas status light remain solid, the gas has run out.

NOTE: The Hymera will not restart until at least one cylinder is replaced and 6 bar is present.

The battery status indicator shows the status of the onboard battery storage, the Hymera will automatically charge the batteries as required if gas is installed.

The mast is operated using the mast switch, instructions are detailed in sections 5.1.7 and 5.1.8.

Lights are operated using the Light Switch which can be turned on continuously using the manual position or from dusk till dawn using the automatic position. When automatic lights are operated, the auto light will illuminate. When either manual lights or automatic lights are operated (with the ambient daylight has reduced sufficiently) or another load is in use on the mast, the load light will illuminate.

Summary:

- Enable remote control panel
- Make sure fault and gas status lights are off
- Operate mast and lights



Control Panel



Mast Switch Key Switch Light Switch

5.1.7 Extend the Mast

WARNING

Do not extend the mast when other personnel are in the vicinity. There is a risk of serious personal injury. Make sure all personnel are clear of the tower.

Do not use a lamp with a missing or damaged prismatic lens. The lens acts as a guard for the bare lamp and a diffuser to reduce glare. To avoid personal injury always make sure the lens is present and intact.

Do not attempt to move the machine when it is operational with the mast extended. If the trailer parking brake is released, the mast will retract automatically.

CAUTION

Make sure all levelling jacks are set firmly on the ground before you attempt to extend the mast.

Make sure the parking brake is on before you attempt to extend the mast. You cannot extend the mast unless the brake is on.

Make sure the curly cord does not become trapped and cut when you extend or rotate the mast.

Try to move the trailer and confirm that the brake is applied correctly on both wheels.

Examine the light lenses and make sure they are clean and undamaged.


Point the machine towards the area to be illuminated.

Adjust the lighting to set the required orientation and angle of the lamps.

Keep the area around the lighting tower clear of people while you extend the mast.

Summary:

- Make sure trailer is stable
- Make sure parking brake is on
- Set lamp orientation
- Extend mast to required height
- Remove control panel key

Turn the mast switch in the position  to extend the mast.

Release the mast switch at the required height.

NOTE: The overall height of the fully extended mast is 9.1 metres.

Turn the key to lock (disable) the remote control panel and then remove the key.



5.1.8 Retract the Mast

WARNING

Do not retract the mast when other personnel are in the vicinity. There is a risk of serious personal injury. Make sure all personnel are clear of the tower.

Enable the remote control panel.

Retract the mast when not in use or if high winds or electrical storms are expected in the area.

Retract the mast when you are finished with the lighting application.

Keep the area around the lighting tower clear of people while you retract the mast.

WARNING



Do not stand under the lights while you retract the mast. There is a risk of head impact or hand crush.

CAUTION

Make sure the curly cord does not become trapped and cut when you extend or rotate the mast.

To retract the mast, turn the mast switch in the position ↓

Release the mast switch at the required height or allow the mast to retract fully.

NOTE: The mast will retract automatically if you release the trailer parking brake. It can be stopped at any point if you apply the brake again.

Take Care - do not compromise stability if on a slope.

Summary:

- Retract mast when finished
- Turn power button
- Make sure lamps go off
- Turn off gas cylinder valve
- Remove the control panel key

5.1.9 Shut Down

To shut down completely, turn off the gas cylinder valves to stop the gas flow.

Disable the remote control panel and remove the key.



5.2 Change a Gas Cylinder

5.2.1 Preparation



Read the BOC *High Purity Hydrogen Safety Data Sheet* in conjunction with this procedure.



Put on appropriate PPE, i.e. hard hat, safety glasses, protective gloves and safety footwear.

WARNING



Do not smoke or use open flames within a 1 metre radius of the machine. Flammable hydrogen gas could be present during operation. To avoid risk of fire or explosion extinguish any source of local ignition.

CAUTION



Make sure that there is no static electrical charge between yourself and the gas cage. This can be achieved if you touch a grounded piece of metal.

Change to a spare cylinder when the yellow LED on the keypad flashes to show there is 'No Gas'.

Monitor the pressure gauges to identify the empty gas cylinder. The gauge on the empty cylinder will show no pressure.

Summary:

- Read Hydrogen Safety Data Sheet
- Put on appropriate PPE
- Extinguish sources of local ignition
- Discharge static electricity



5.2.2 Remove the Regulator and Gas Hose

⚠ CAUTION

Make sure the gas cylinder valve is off when you install or remove the regulator and gas hose.

Unlock and remove the padlock from the gas cage.

Lift the gas cage security cover.

Loosen and remove the 3-lobe knob from the clamping rod.

Lift out the clamping plate.

NOTE: If the cylinder to be changed is in the Control compartment, support the clamping plate on the raised security cover.

Close the gas cylinder valve fully to stop any gas flow and remove the gas pressure.

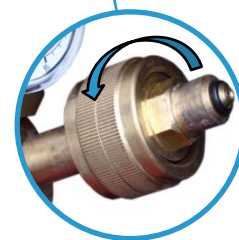
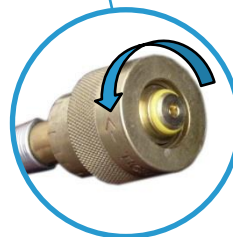
NOTE: If the gauge still shows pressure, close the header valve at the manifold before you remove the regulator. The regulator is finger tight only. Turn the connector in a clockwise direction to release.

Remove the gas hose from the cylinder and then remove the regulator.

Stow the regulator in its holder.

Summary:

- Remove padlock
- Lift security cover
- Remove clamp
- Close gas cylinder valve
- Remove gas supply hose
- Remove and stow regulator



5.2.3 Unload the Gas Cylinder

Put the protective cap on the gas cylinder valve connector.

Unload the hydrogen gas cylinder from the cage.

NOTE: *If the cylinder is empty, stow safely in a well ventilated secure area ready for collection by BOC.*

Load the new gas cylinder.

Lower the gas cage security cover.

Attach and lock the padlock.

Remove the key and give to the site controller or other responsible person.

Summary:

- *Unload old gas cylinder*
- *Load new gas cylinder*

Section 6 - Maintenance

6.1 Cleaning

CAUTION

Make sure that the Hymera inlet and outlet vents inside the Control compartment are clean and free of obstructions when cleaning the machine.

Make sure that all moving parts are clean and free of dirt and debris to prevent malfunction of the machine.

All hire machines will be cleaned on return to the TCP depot.

When you clean the machine on site, remove the regulators and gas hoses and unload the gas cylinders.

Wipe over the machine surfaces with lint free cloth and a mild detergent solution.

Never allow water to accumulate around the Hymera fuel cell enclosure.

Never wash the machine with a power washer or high pressure hose.

6.2 Inspection

Do a thorough inspection of the machine and its component parts on a regular basis.

6.2.1 Regulators and Gas Hoses

Examine the regulators and gas supply hoses, with the connectors, for any damage that may cause a hydrogen leak.

Replace any missing or damaged O-ring seals.

6.2.2 Lighting Mast

Examine the LED lamps for missing or damaged lenses.

Examine the curly cord for cuts or crushes.

Look for hydraulic fluid leaks around the joints and seals of the telescope mast.

Contact the manufacturer or supplier if a fault or leakage is found.

6.2.3 Decals and Labels

Examine all chassis mounted decals and labels for damage.

The decals and labels provide important operating instructions and warn of dangers and hazards.

Replace any missing or hard-to-read labels.

Spares are available from TCP.

6.2.4 Tyres

Do a regular check on the condition of the trailer tyres.

The tyres should meet local wear regulations if used on public roads.

Do a regular check of the air pressure in the tyres.

The tyre air pressure should be 2.5 bar (35 psi).

6.2.5 Wheel Nuts

Do a regular check of the trailer wheel nuts.

NOTE: *The torque indicators are pre-set pointing to the centre of the wheel.*

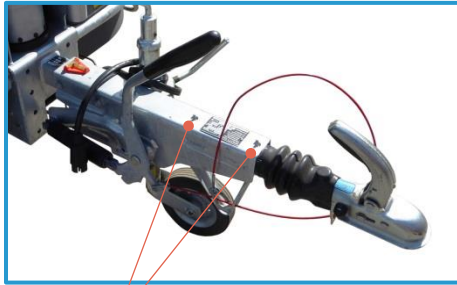
If any of the torque indicators have moved suspect a loose wheel nut.

Tighten the nut to a torque of 80-90 Nm and reset the torque indicator.

6.3 Inertia Brake Lubrication

The inertia brake applies the trailer brakes when the towing vehicle brakes.

Lubricate the inertia brake using medium multipurpose grease. Apply via the grease nipples.



Grease Nipples

The frequency of greasing depends on how often the trailer is towed. If the trailer is towed frequently, with frequent braking, the inertia brake will need more frequent greasing than if the brake is seldom used.

Inspect the inertia brake every three months (minimum interval).

If adequate lubricant is showing, grease the inertia brake annually.

6.4 O-Ring Replacement

WARNING

Do not cut the O-ring and take care not to damage the groove on the connector during removal or installation of the O-ring. A damaged O-ring or connector could lead to a hydrogen gas leak. Avoid the use of tools of any kind.

Contact the supplier or manufacturer before you attempt to replace a sealing O-ring on a regulator or gas supply hose.

NOTE: Spare O-rings are available from TCP, please quote the following stock numbers:

20-0244 Regulator O-Ring

20-0242 Hose O-Ring

Change O-rings by hand in a clean environment.

Carefully slide off the O-ring from the groove around the connector.

Slide on the replacement O-ring and make sure it is seated correctly in the groove.

Section 7 - Options

7.1 Option 1

The TH₂₀₀ V4 may be supplied with a tow bar fitted with a 40 mm towing eye instead of a towing cup. The trailer can then be coupled to a towing vehicle with a compatible tow hook.

7.2 Option 2

The external cable to each of the four mast lamps may be fitted with a quick release waterproof inline connector for ease of maintenance.

7.3 Option 3

An external cage with a manifold may be provided for linking up to four additional gas cylinders outside the rear of the trailer.

APPENDIX A EXTERNAL CAGE

A.1 Position the Cage

An optional external cage with a 4-way manifold for linking up to four additional gas cylinders may be provided.

Lift the cage by the four lifting eyes.

Move the cage into position between the jack legs and close to the rear of the machine.

Unlock and remove the padlock from the cage.

⚠ CAUTION

Make sure the cage is secured to the trailer with the lock and chain. This will prevent the connecting gas hoses from breaking away if the trailer is moved.

Open the rear door and remove the chain and lock.

Feed the ends of the chain through the holes at the bottom left hand corner of the cage.

Feed the chain through the tie-down eye at the rear of the trailer.

Secure the ends together with the lock.

Summary:

- Position the external cage
- Unlock and open the rear door
- Secure the cage to the trailer
- Load the gas cylinders
- Install the regulators and hoses



A.2 Connect Gas Cylinders

Load four gas cylinders into the cage and install the regulators and gas hoses.

Unlock and lift the gas cage cover of the Control compartment.

Disconnect the Hymera gas supply hose from the manifold outlet and fit a Y-shaped manifold in its place.

Connect the Hymera gas supply hose to one leg of the Y-shaped manifold.

Connect the gas hose from the cage to the other leg of the Y-shaped manifold.

Open all the manifold header valves.

Close and lock the rear door of the external cage.

Lower and lock the cover of the Hymera compartment.

Remove the keys and give to the site controller or other responsible person.

Summary:

- *Disconnect Hymera hose*
- *Fit Y-shaped manifold*
- *Connect Hymera hose to manifold*
- *Connect cage hose to manifold*
- *Lock up and remove keys*



Main Manifold

Y-Manifold

Cage Hose

