

Car Collision Repair System

User Manual

CONTENTS

Chapter 1 GENERAL INFORMATION	3
1.1 GENERAL INFORMATION	3
1.2 CONTENTS AND SPECIFICATIONS.....	3
1.3 SYMBOLS	4
Chapter 2 FRAME MACHINE DESCRIPTION.....	5
2.1 GENERAL PRESENTATION OF STANDARD COMPONENTS	5
2.1.1 FRAME ASSEMBLY	5
2.1.2 CLAMPS/SUPPORT ASSEMBLY	5
2.1.3 HYDRAULIC SYSTEM.....	6
2.1.4 ACCESSORY ASSEMBLY	6
2.2 APPLICABILITY	6
Chapter 3 INSTALLATION.....	6
3.1 UNPACKING	6
3.2 INSTALLATION.....	7
3.2.1 ADVANCE INSTRUCTIONS.....	7
3.2.2 INSTALLATION	7
Chapter 4 SECURITY NORMS.....	9
4.1 GENERAL RULES	9
4.2 QUALIFYING THE PERSONNEL.....	9
4.3 SPECIFIC NORMS.....	9
4.3.1 INSIDE THE REPAIRING OPERATION ENVIRONMENT	10
4.3.2 USING HYDRAULIC OPERATION	10
4.3.3 USING PULLING TOOLS	11
Chapter 5 OPERATION INSTRUCTIONS.....	11
5.1 PRELIMINARY USE INSTRUCTIONS	11
5.2 CLAMP PROCESS	12
5.3 FRAME PROCESS	12
5.3.1 The operations for the frame lifting process.....	12
5.3.2 The operations for the frame landing process.....	13
5.3.3 Operating the pulling tower	13
5.4 HYDRAULIC SYSTEM PROCESS.....	15
Chapter 6 MAINTENANCE.....	16
6.1 GENERAL RULES	16
6.2 DETAILED RULES	16
6.3 FREQUENT QUESTIONS	17

Chapter 1 GENERAL INFORMATION

1.1 GENERAL INFORMATION

Read the manual carefully before proceeding to work with the frame machine. The Operators and the Qualified Technicians have to carefully read the instructions contained in the present publication.

1. The target of this manual is providing the user all the necessary information so that, this will ensure correct and safe use of the frame machine.
2. Information includes: Technical data, Functions, Installation, Maintenance, Spare Parts and Safety Notice.
3. If you have any questions regarding these instructions, please consult our technical office to get the necessary explanations.
4. The manual is an integral part of the frame machine, and should be taken care of by the owner. It should be kept in the vicinity of the frame machine and suitably stored.
5. If the manual becomes lost or damaged, please contact our technical department for a replacement.
6. Data and drawings are for illustration, and it is forbidden for anyone to copy, modify or use for personal or business reasons.
7. Liability: Although every effort has been made to ensure the accuracy of this manual. The information compiled in this manual is not guaranteed to be completely free of errors or omissions. It is the responsibility of the owners and operators of each facility to ensure that the facility complies with all applicable regulations. .

1.2 Contents and Specifications

When unpacking the frame machine, please check the parts correspond to following.

Table 1:

Specification	MODEL:	HC401
	YEAR OF PRODUCTION	
	FRAME LENGTH	5200mm
	FRAME WIDTH	2100mm
	FRAME HEIGHT	560mm
	HYDRAULIC PRESSURE	70Mpa(1000psi)
	POST MAX. TENSION	95KN
	POST WORKING RANGE	360 Degree
	PNEUMATIC PRESSURE RANGE	0.8MPa

1.3 SYMBOLS

SYMBOL



MEANING

Caution foot

COMMENT

When moving the tower, operators should following the regulations in order to avoid injuring feet.



WARNING

Do not stand behind the working tower, in case the chain or accessory detaches. Chains should not be distorted or knotted.

Max Loading of overhead puller

The Max loading of every bore is identified on the overhead puller. All operations marked by this symbol must be followed.



Chapter 2 FRAME MACHINE DESCRIPTION

2.1 GENERAL PRESENTATION OF STANDARD COMPONENTS

2.1.1 FRAME ASSEMBLY

The frame assembly is the place where the maintenance and repair process is carried out. It is divided into the following subgroups:

A. Frame.

The maximum applicable lifting weight of the frame is 3000 Kg.



B. Pulling tower.

The pulling tower can traverse 360 degrees around the frame.

C. Loading ramps.

The loading ramps are used for loading and unloading vehicles.

D. Overhead puller.

The overhead puller is mounted on the tower and is used to repair the top area of the vehicle.

2.1.2 CLAMPS/SUPPORT ASSEMBLY

There four main clamps and two wheel brackets. The clamp system is used to locate, clamp and support the vehicle. These clamps are adjustable. The wheel bracket is used to bolt to the wheel hub



Main clamp



Wheel bracket

2.1.3 HYDRAULIC SYSTEM

Two air hydraulic pumps are included.

2.1.4 ACCESSORY ASSEMBLY

1. Pulling tools accessories.

The standard tools board consists of 10 pieces of accessories. The different pulling tools are used according to different damage. The pulling tools may be used singly, or can be combined.

 **ATTENTION:** When using the equipment, do not exceed the Max Load capacity stated in table 3. The manufacturer has the right to change the quantity and model of pulling tools.

2. Dolly for wheel

The wheel dolly is used to assist in moving the vehicle, when the vehicles wheel has been damaged.

2.2 APPLICABILITY

Frame machine is used only for repairing the accident vehicles; any other use is to be considered improper and incorrect.

Any modification of the machine not previously authorized by the manufacturer relieves him from damages derived or referable to the aforesaid actions.

Chapter 3 INSTALLATION

3.1 UNPACKING

After transporting the frame machine package to the place destined for the installation,

remove the wrapping and check that:

- a. The content of the package corresponds to what was agreed upon in the order.
- b. There are no visibly damaged parts.

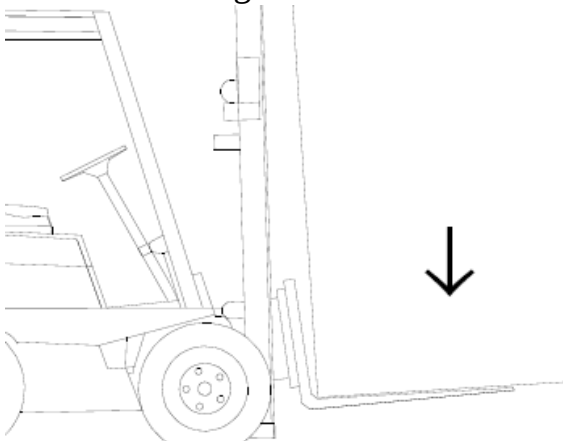
In both cases, if problems are encountered, do not proceed with the installation of the machine and warn the manufacturer immediately of the damage and/or the missing parts.

3.2 INSTALLATION

3.2.1 ADVANCE INSTRUCTIONS

Before beginning the installation work make sure that the positioning of the machine is acceptable

A suitable lifting device will be needed to assist with installation.

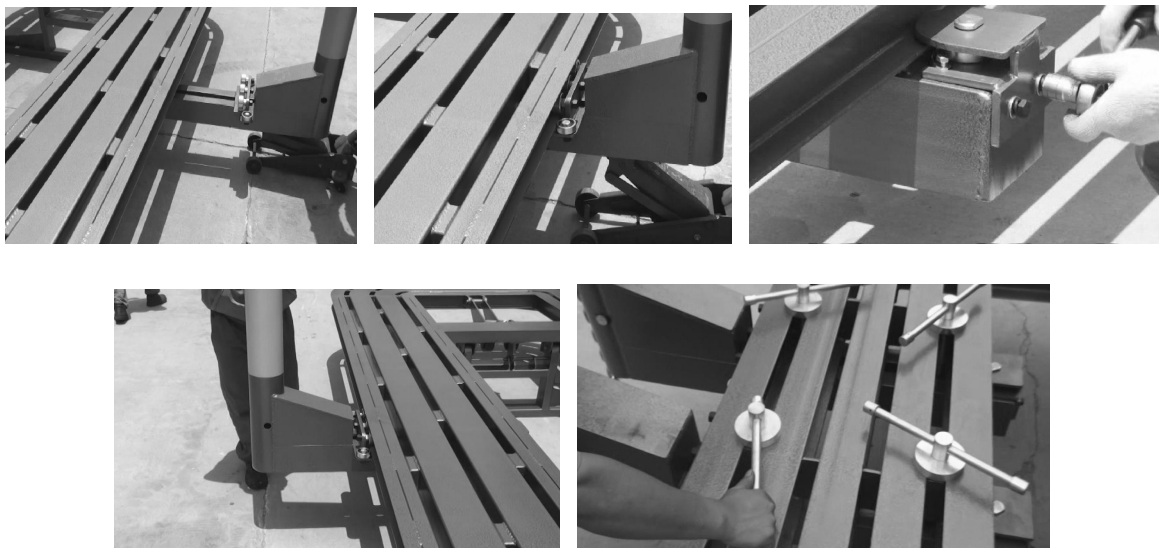


3.2.2 INSTALLATION

1. TOWER INSTALLATION

- a. After installing frame machine in an appropriate place. Please take into consideration that suitable distance should be left between the frame and the surrounding walls (recommended about 3 meters) in order to operate conveniently.
- b. Lift the tower on to the edge of the frame, and then push the tower in, to position the rollers on the frame edge.
- c. Attach the lock-arm on the edge of the tower with the M12 screw. There should be a gap of 3-4mm between lock-arm and the frame so the tower can traverse the frame edge without obstruction
- d. Prepare the necessary parts. Illustration.

- e. Install the stopper screw. Illustration.
- f. Install two handle screws. Illustration.



 **ATTENTION:** When operating the tower, the handle screw should be fastened. Illustration.

- g. Install the Guide-ring. Illustration.

- h. Install the hydraulic cylinder. Insert the cylinder into the bottom of Tower. Make the connect hole of cylinder is equal to the hole of tower. Then insert the Crossbar for cylinder. Illustration.

 **ATTENTION:** After Crossbar for cylinder is inserted, don't forget to install the block ring.

- i. Install Tower collar. Illustration.
- j. Pass upwardly the end without a hook of the chain through the wheel of guide-ring, then pass the chain Tower collar and fix the chain.
- k. Install the overhead puller. Illustration.



- l. Install the connector onto the cylinder. And attach the hydraulic hose with the swivel connection.

m. Attach the pump to the other end of the hose. Then attach the air hose to the compressor.



Chapter 4 SECURITY NORMS

4.1 GENERAL RULES



ATTENTION: Follow carefully, the instructions.

The manufacturer is exempted from any responsibility which concerns damage derived from not following the instructions and safety notices.

- a. Keep maintenance and instruction manual near the machine.
- b. Frame machine is produced in accordance with recognized technical and safety rules. Nevertheless it is possible that risks for the consumer may occur during use.
- c. Please observe the accident-prevention safety regulations.
- d. Keep all the safety information posted on the frame machine.

4.2 QUALIFYING THE PERSONNEL

- a. All personnel employed to operate the frame machine, must be aware of the safety procedures
- b. Personnel under training should be supervised by experienced persons.

4.3 SPECIFIC NORMS

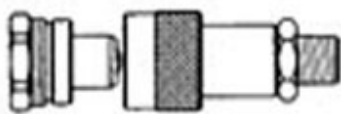
In the paragraphs below are listed all the regulations to be observed, in order to prevent possible accidents.

4.3.1 INSIDE THE REPAIRING OPERATION ENVIRONMENT

1. It is forbidden that persons, who are not trained, operate the frame machine.
2. During the operating process, please consult vehicle manuals for specifications.
3. During the operating process, the vehicle must remain clamped and secured.
4. The hydraulic hoses must be kept in good condition (take care not to damage the hydraulic hoses).
5. During the raising and lowering process, no personnel are under the frame.
6. During the operating process, the oil pressure gauge (if fitted) of the air hydraulic pump is not allowed beyond 6000PSI.
7. (Not B500) While raising or lowering the frame, do not stand behind the vehicle. While loading and unloading the vehicle to the frame, have assistance for direction.
8. During the operation process, do not stand close to the tense chains or the pulling tools.
9. Before using the chains, check that the chains are not twisted or knotted. Check chains periodically for damage or wear.
10. Use the special tools to increase or shorten the length of the chain. Do not cross or knot the chain.
11. It is forbidden to heat the chain.
12. The pulling tools must be well secured to the surface of the vehicle.

4.3.2 USING HYDRAULIC OPERATION

1. Note the pressure range. Do not exceed equipment ratings.
2. Never attempt to lift a load weighing more than the capacity of the hydraulic system.
3. Checking the sealed capability of the hydraulic system constantly. If it is not in good condition, repair or replace it immediately.
4. Do not excessively tighten this connection, only tighten by hand.



5. Use of a hydraulic gauge is recommended to measure the pressure, but not necessary
6. It is advisable to use the oil-water separator and

drain as necessary

4.3.3 USING PULLING TOOLS

1. Before using the pulling tools, ensure the clamps are clean.
2. Check frequently that the pulling tools are securely fastened.
3. When installing the pulling tools, do not damage the electric lines or hydraulic lines of the vehicle.
4. Pay attention when pulling the welding line, that the appropriate power only is used.
5. During the operation, nobody is allowed to stand behind the tight chain or pulling tools.
6. Do not exceed the Max Load capacity stated in table 3.

Chapter 5 OPERATION INSTRUCTIONS

5.1 PRELIMINARY USE INSTRUCTIONS

Before starting the frame machine it is necessary to do the following controls:

1. Check that all screws and bolts of the various components are tight during the installation.
2. Please check with the correct authorities regarding possible certification.
3. When using the pulling function, do so in small increments.
4. OPERATION BASIC RULES:
Pull a little each time, and then loosen the chain. Measure and pull again. When operating, follow the rules of " from inside to outside".
 - a. Pull lengthways the vehicle along the central line.
 - b. Pull in the breadthways direction.
 - c. Last the vertical direction.

After having prepared the vehicle, please follow the indications specified in the paragraph:

5.2 CLAMP PROCESS

Before operation, the accident vehicle must be clamped in order to avoid slipping.

1. According to the degree of damage or part of damage, operators must ascertain the appropriate location for clamping the vehicle. It is recommended that about 50cm to 70cm should be left between the tower post and vehicle body.

2. Place the vehicle onto the frame.



ATTENTION: During the operation, nobody is allowed to stand behind the vehicle.

3. Secure the vehicle and apply the brake (if possible) in order to avoid slipping. Observe the shape of the vehicle chassis, and then choose the suitable clamps.

4. Adjust the clamps to the required height (the height is decided by the degree of damage and the requirement of the operator.), and then loosen the screws of the clamps.

5. Lift the vehicle to the appropriate height by the secondary-lift in order to install the clamps.

6. Tighten the screws of the clamps in order to attach the vehicle body to the clamps.



ATTENTION: After every pulling operation and before the next pulling operation, check all the screws of the clamps are tight. If the screws become loose, the vehicle body may slip and cause injury.

5.3 FRAME PROCESS

5.3.1 The operations for the frame lifting process are:

1. Each tower should be located on the respective longer edge of frame, and then secured.

2. Check whether the hydraulic lines and air lines are in good condition. Make sure the connection is firm and ensure the pipeline is not obstructed.

3. Install the loading ramps on the edge of frame.

4. (1)If the vehicle is drivable, drive it onto the frame.

- (2) Or winch the vehicle onto the frame.

- (3) If the front-wheels are damaged, put the wheel dollies under the front-wheels and winch it onto the frame.

5. Make the vehicle secure and apply the brake.

6. (Not B500)Make use of the air hydraulic pump to lift the frame to the required height.

7. (Not B500)Then pull lightly the release valve, this will position the frame on the safety

locks.

5.3.2 The operations for the frame repair process are: (Not B500)

1. Before starting repair work, each tower should be located in the required position, and then secured.
2. Attach the hydraulic pump to the connection of the frame base.
3. Start the air hydraulic pump to lift the frame in order to open the self-stop mechanism.
4. Then pull lightly the release valve, here the frame will be fallen slowly until the frame is fallen to the floor.



ATTENTION: During raising and lowering the vehicle, the operators are allowed standing behind the vehicle. At the same time, make the vehicle secure and apply the brake.

Lower the frame slowly to avoid damage.

5.3.3 Operating the pulling tower

1. Locate pulling towers as required
 2. Install the tower clamps.
 3. Tighten every tower.
- (1) Firstly fix the stopper screw which is used for connecting the tower to the edge of frame.
- (2) Secondly fix two handle screws under every tower.
- (3) Thirdly fix the fixed screw onto the frame.



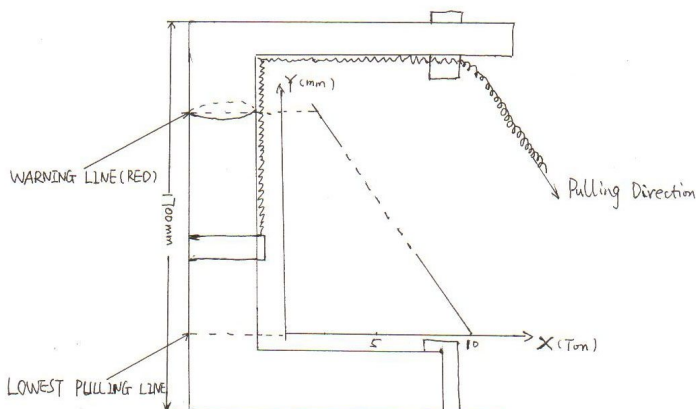
ATTENTION: Tighten all the screws used to fix the towers

4. Check the operation of step 3 and check again in order to avoid the tower post slipping.
5. Choose appropriate pulling tools, and then fix them to the required position on the vehicle. Attach the pulling tool to the chain of tower.
6. Avoid sharp bends and kinks. Adjust the chain as necessary.
7. Adjust the height of guide-ring according to the pulling angle.
8. Strain the chain and check whether the chain is secured to the self-locking device on top of tower post.
9. Start the hydraulic system.

 **ATTENTION:** Don't over exert the pump.

10. During the pulling operation, some parts need knocking in order to eliminate the internal power, so the operators should observe the tension of the chain.

 **ATTENTION:** The higher the guide-ring, lessen the power on the hydraulic system. The height of guide-ring cannot be beyond the red warning line marked on the tower post. Do not load greater than pulling power at 2000PSI. Please observe the drawing and the drawing explanation.



11. When moving to the next operation or pulling again, the operators should open the return-to-tank valve in order to release the pressure. Then the tower post will be returned to the primary position.

12. Adjust the chains, guide-ring and other accessories. Then repeat from step 1.

CAUTION: During the operation, nobody is allowed to stand behind the tower post and the pulling tools in order to avoid injury caused by the chain or tools flying backwards.

5.4 HYDRAULIC SYSTEM PROCESS

1. Check the safety of the hydraulic system. Check every connection and avoid sharp bends and kinks when routing hydraulic hoses.
2. Attach the hoses of the hydraulic pumps to the connections of tower post and frame.
3. Attach the hydraulic system to air supply, and check that the air pressure is around 0.8 Mpa.
4. Check the oil level of pump and add oil if necessary.
5. Make sure the pump reservoir is vented. This pump must always be vented prior to use. Use either the “Vent Screw” or “Vent/Fill Plug”.



Vent/Fill Plug

6. Treadle operation.
 - a. To advance cylinder and to retract cylinder. Depress the “PRESSURE” end of treadle and the pump will start to pump hydraulic oil to the system so that the tower post or the mobile legs of the frame are lifted; Depress the “RELEASE” end of the treadle to retract cylinder so that the tower post or the mobile legs of the frame will descend. To stop the cylinder from retracting, release the treadle.
 - b. To hold the cylinder position. The pump will stop and hold pressure when the treadle is in the free/neutral position.

CAUTION: Don't pull quickly, when operating the release valve.

 ATTENTION: The working pressure of the hydraulic system is designed for a Max. pressure of 6000PSI.

Chapter 6 MAINTENANCE

6.1 GENERAL RULES

Maintenance has to be a preventive and planned activity, seen as a fundamental need to obtain safety, as a presupposition that the machines and the apparatus are subject to wear which is a potential cause of breakdowns. Therefore the safety of the frame machine depends also on a good preventive maintenance that allows for the replacement of objects subject to wear.

- a. Keep the working yard clean, and clean the frame machine after finishing the operation.
- b. Do not put leave accessories on the frame machine.

6.2 DETAILED RULES

Ordinary maintenance is a kind of periodic maintenance. The procedures of ordinary maintenance should be done by qualified and authorized personnel.

1. Operators should check periodically the connections of the hydraulic system in order to insure the tightness.
2. Operators should check periodically oil level of the pump with all cylinders or tools in the fully retracted position and add oil if necessary. Do not add oil when the hydraulic cylinder is extended, the reservoir will over-fill, when the cylinders are retracted.
3. Operators should change the hydraulic oil every 200 to 300 working hours. If there is lots of dust in the work environment, the frequency should be about 35 working hours.



ATTENTION: The hydraulic oil must be changed full.

Oil level

4. Operators should insulate the dust, grease and scrap from the hydraulic components.
5. Operators should lubricate periodically all the moving parts.
6. The pulling tools subject to wear have to have a scheduled maintenance. Repair or replace them as necessary.
7. The chain is subject to wear and also needs to have a scheduled maintenance. Insure

there is no notch, twist or any worn links. Replace them if necessary.



ATTENTION: If the frame machine is used with greater continuity or for heavy work, it is necessary to carry out checks more often.

6.3 FREQUENTLY QUESTIONS

See the chart below for any small problems.

MALFUNCTIONING	PROBABLE
Pump will not start	Air turned off or line blocked
Motor stalls under load	Low air pressure Inlet filter plugged, insufficient air flow
Pump fails to build pressure	External leak in system Internal leak in pump Internal leak in system component Low oil level
Pump builds less than full pressure	Low air pressure Internal relief valve set low External system leak Internal leak in system component
Pump builds pressure, but load does not move	Load greater than cylinder capacity at full pressure Flow to cylinder blocked
Cylinder drifts back on its own	External system leak Internal leak in system component
Cylinder will not return	Return flow or coupler restricted / blocked
A)Single-acting type	No load on a “load return” cylinder Return spring broken on cylinder Release valve malfunction
Cylinder will not return	Return flow or coupler restricted/blocked
B)Double-acting type	
Low oil flow rate	Reserve not vented Inadequate air supply Dirty air filter Clogged inlet filter