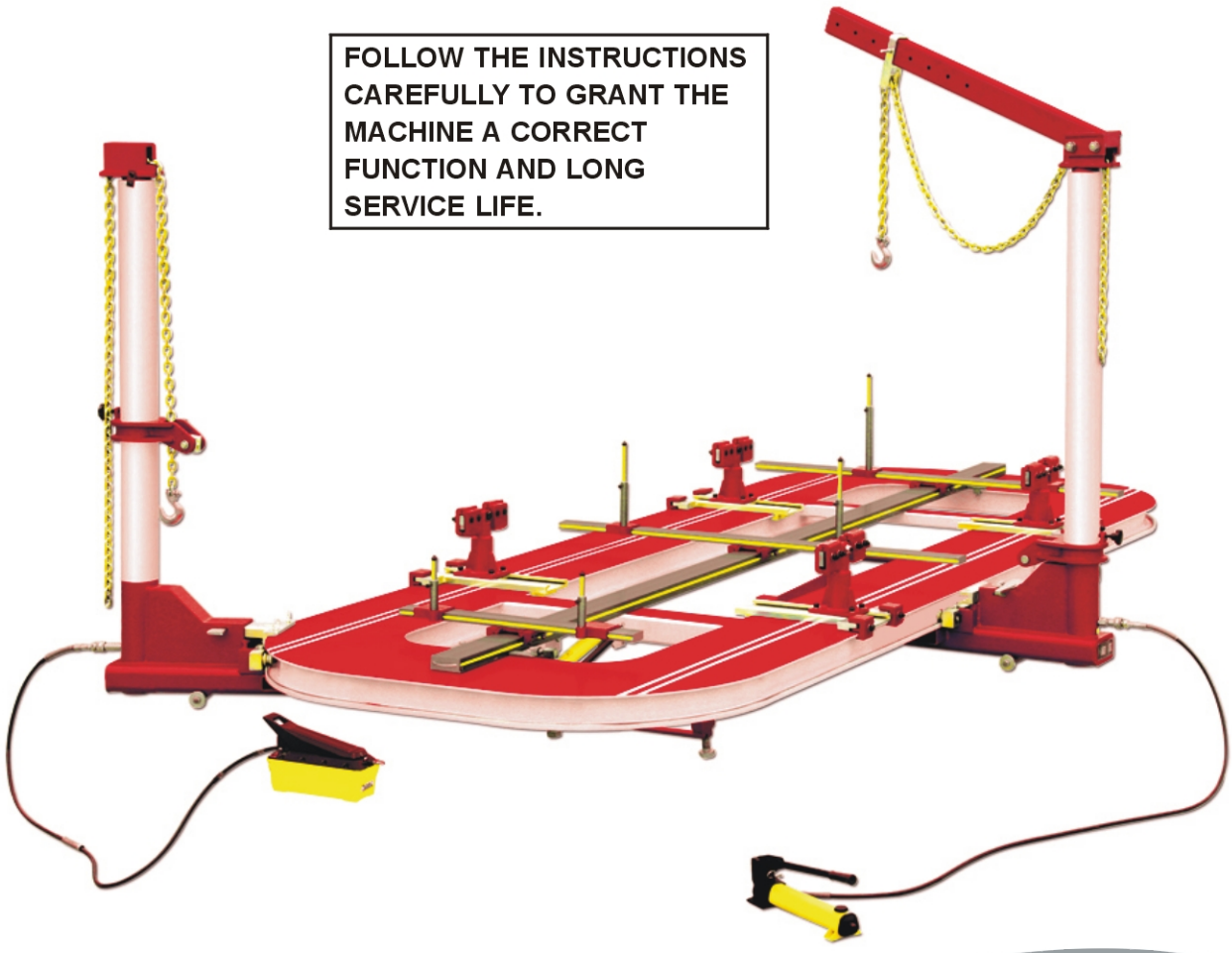
AUTO COLLISION REPAIR EQUIPMENT

EE-CRT3500

USER MANUAL

KEEP THE MANUAL NEAR THE MACHINE ALL TIME AND MAKE SURE ALL USERS HAVE READ THIS.

FOLLOW THE INSTRUCTIONS CAREFULLY TO GRANT THE MACHINE A CORRECT FUNCTION AND LONG SERVICE LIFE.



一、Standard Configuration Components and Brief Introduction of Function

The Standard Configuration Components of Universal Collision Repair Equipment EE-CRT3500 consist of 7 parts such as Working Platform , Pulling Equipment, Measuring System, Tool Room , Working Platform Lifing Frame and Front Support Leg.
Shown in Fig. 1

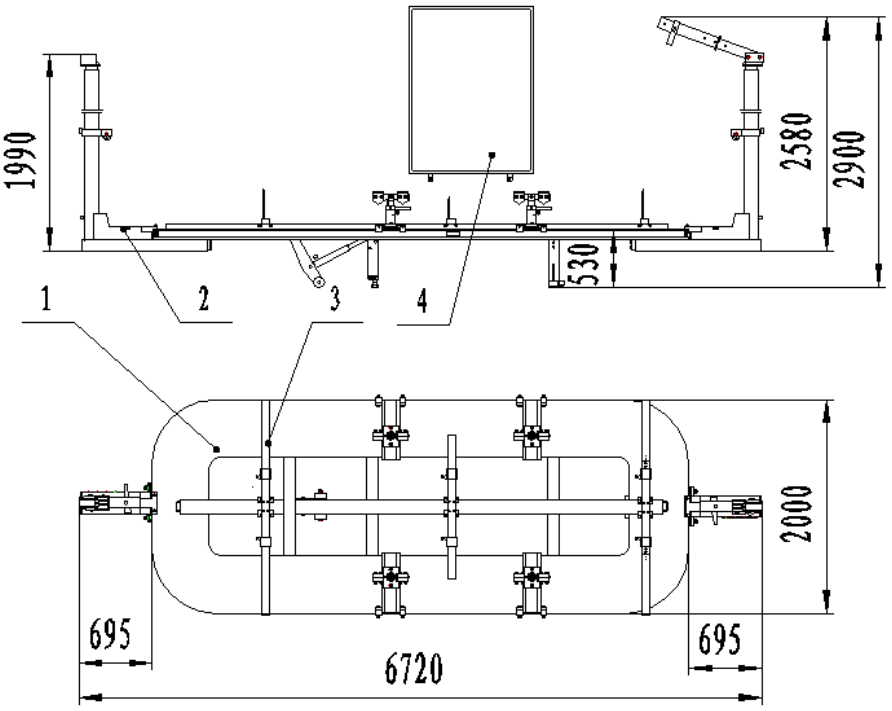


Fig. 1 Universal Collision Repair Equipment EE-CRT3500

1. Working Platform 2. Pulling Equipment 3. Measuring System 4. Tool Room

（一）、Working Platform

Working Platform is the base parts of Universal Collision Repair Equipment EE-CRT3500 and is used to fix and straighten vehicles just like “operation table”. It mainly consists of 2 parts, Working Platform Frame and Main Clamps . Shown in Fig 2. Repairing Vehicles could be fixed on Working Platform reliably via Clamps.

Main Clamps could be fixed at any part of Working Platform Frame via pressing plates and bolts.

Main Clamps is mainly used to clamp vehicles' undamaged edge to fix vehicles' bodies. It could be dynamic load adjusted upward. The adjustable scope is "300~380mm". If you unscrew the Clamps Nut using special socket wrench, the main clamp chops could splay flexibly. The Main Clamps could dynamic load adjustable in the height direction. For heavy damaged chassis, you could make Main Clamps directly push upward the damaged part to straighten the vehicle.

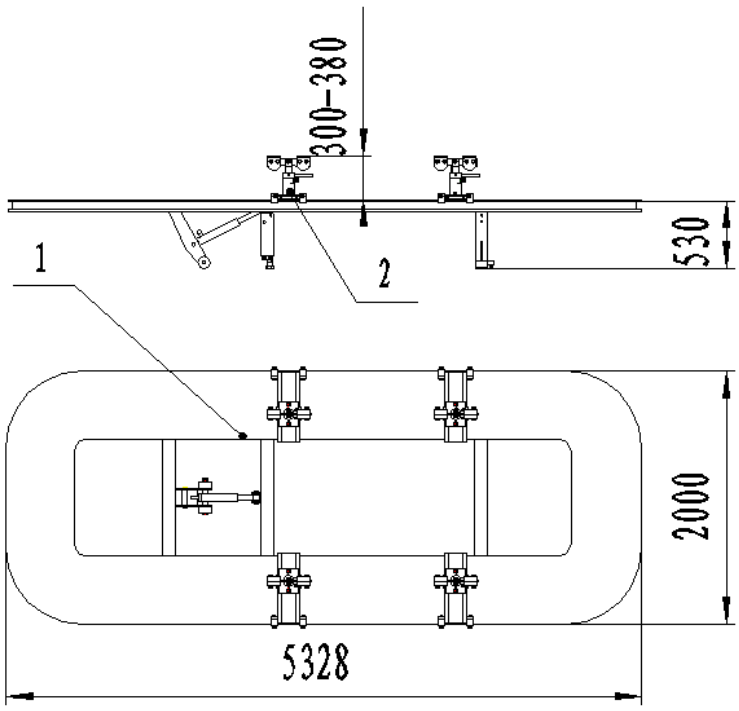


Fig. 2 Working Platform

1.Working Platform 2. Main Clamp

（二）、Pulling Equipment

Pulling Equipment is mainly used to straighten vehicle's damaged area. It consists of hydraulic cylinder, air-driven hydraulic pump, and pulling tower etc. Shown in Fig 3. The pull force of straightening is provided by hydraulic cylinder and air-driven hydraulic pump.

Pulling Equipment could slide along track and can be fixed at any position for 360-degree access to straighten vehicle. According to the vehicle part to be straightened, pull out the locating block of the pulling equipment, insert locating pin to connect with the working platform, and then wedge tightly with the wedge block, so that the pulling equipment could fix on the working frame, One end of the chain is fixed in the groove of the upper part of the inner tower column; the other end is connected with the clamps that clamp the damaged area via guide wheel. Hydraulic cylinder, pneumatic pump and manual pump are all make use of the famous brand of hydraulic of America. The maximum pushing force of hydraulic cylinder is 10t. The maximum oil pressure of Manual pump and hydraulic cylinder is 69MPa(1000 PSI). Read the manual among the attachments with the equipment to get information of operation and maintenance of hydraulic cylinder and Manual pump. Hanging arm of the pulling tower could upward stretch the straightening part. The Hanging arm and the pulling tower are locked via pin roll. **Attention: When hanging arm stretch, pulling force couldn't beyond 1.5 ton, pulling arm couldn't be used to hoist heavy, avoid to cause any injury to person and repaired auto.**

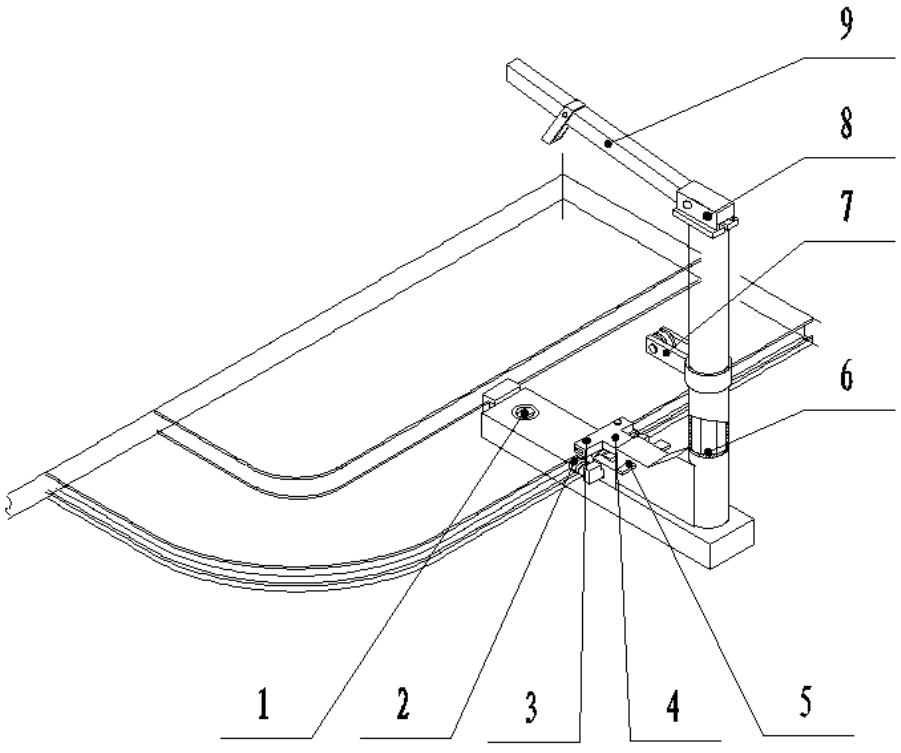


Fig.3 Pulling Equipment

1、Guide Wheel 2、Running Gear 3、Locating Pin 4、Located Block

5、Wedge Mas6.Cylinder7、setting wheel 8、pin roll 9、Hanging Arm

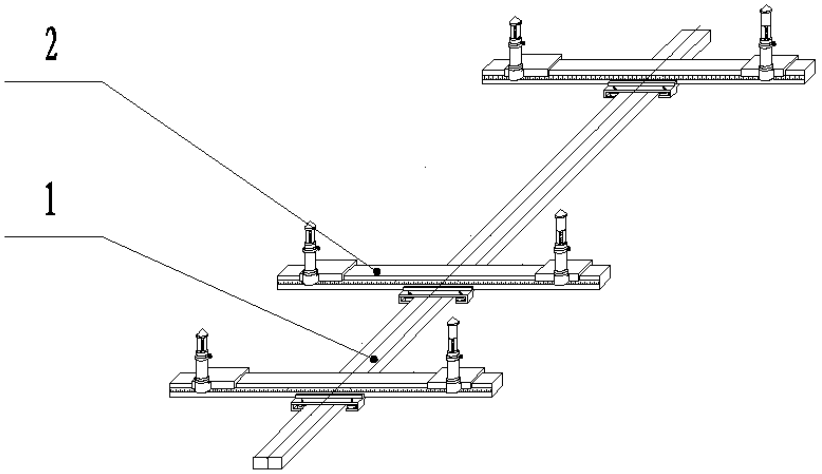
(三)、Measuring System

Mechanism Measuring System

Mechanism Measuring System offers the function of 3-dimention measuring for vehicle's body and chassis. So you can check the damaged area of the vehicle. Referring the data of original vehicle, you can decide the straightening direction and the straightening data. Repair the damage area as it was at the beginning.

Measuring system consists of Measuring Ladder, Chassis Measuring Ruler and Gantry Measuring Frame. Shown in fig 10

Measuring System offers such feathers as light, flexibility, practical etc. The installing and measuring datum plane is the surface of working platform.



1. Measuring Ladder 2. Chassis Measuring Ruler

Fig.4 Mechanism Measuring System

1. Measuring Ladder

Measuring Ladder consists of horizontal bar and vertical bar. Chassis Measuring Ruler and Gantry Measuring Frame can be put on the Measuring Ladder. It can slide along measuring ladder in the longitudinal direction. Measuring Ladder is located on the machining area of working platform. It is fixed with 'G' shape clamp.

2.Chassis Measuring Ruler

Chassis Measuring Ruler mainly consists of Chassis Slide Seat; Chassis Cross Bar, Measuring Seat, Standard Measuring Rod, Rod Extension and Measuring Elements etc. Shown in fig 11. Chassis Measuring Ruler can slide along Measuring Ladder as a

whole. Measuring Seat can slide along Chassis crossbar with Standard Measuring Rod. Standard Measuring Rod can slide in the Measuring Seat with Measuring Elements. So it can implement 3-dimension measuring of the chassis feature point.

The Chassis Slide Seat's end toward the front of vehicle (with red mark) is the place of longitudinal reading. The place with red mark on the Measuring Seat is Place of Landscape Orientation Reading. The top surface of Measuring Rod is Place of Height Reading. Shown in fig 8

There is one set of Standard Measuring Rods, which can cover most of measuring points. There are two sets of Rod Extensions, which can expand the height measuring scope to 700mm, and can measuring higher feather position. Measuring Elements include Round Measuring Pointer, L Type Measuring Pointer and Elbow etc. They are suitable to measuring all kinds of type measuring position. Shown in fig 8. If the Elbow is equipped with Measuring Cup, Round Measuring Pointer, the equipment can measure the position in the horizontal direction. It offers the advantage that it is convenient to measure some special position.

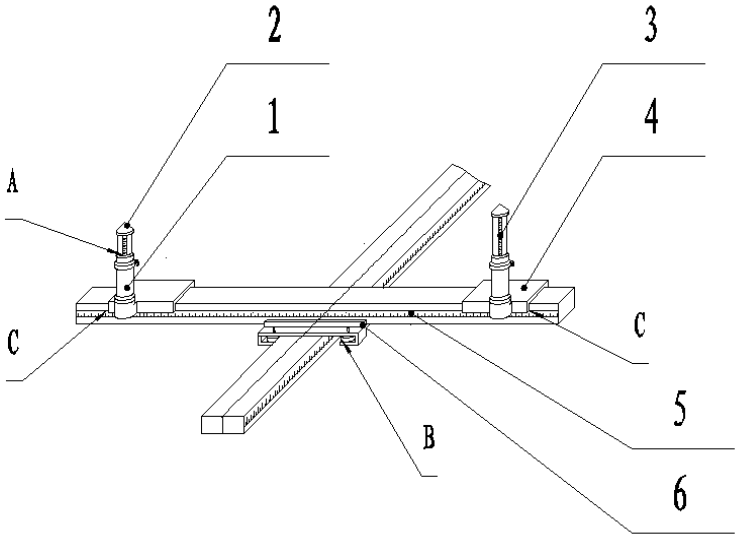


Fig. 5 Chassis Measuring Ruler

1. Standard Measuring Rod 2. Measuring Element 3. Measuring Rod 4. Measuring Seat 5. Chassis Cross Bar 6. Chassis Slide Seat A. Place of Height Reading B. Place of Longitudinal Reading C. Place of Landscape Orientation Reading

(四)、Tool Room

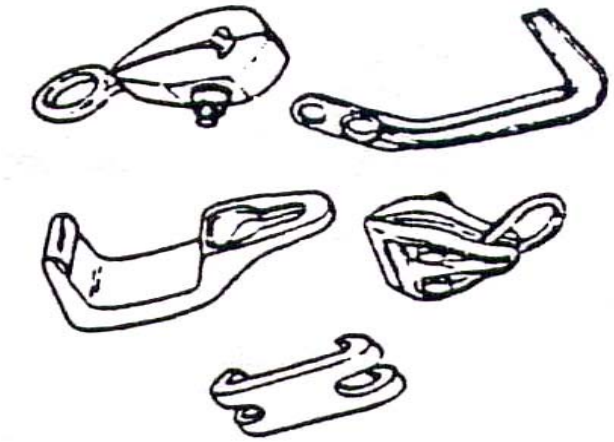
The Tool Room of General Vehicle Collision Repair Equipment mainly consists of Vehicle Loading Accessory, Clamps, moving accessory, Special Tools etc. It can meet all kinds of straightening needs. It is easy operation and high efficiency.

1. Vehicle Loading Ramp

Vehicle Loading Ramp is used to guide vehicle drive on working platform.

2. Clamps

Clamps are defined as tools that clamps vehicle damaged area. Clamps offer all kinds of types to meet various damaged areas. It is flexible to use them. Universal Collision Repair Equipment EE-CRT3500 provides nearly thirty kinds of clamps, which can meet all kinds of repair need. When using them we shall follow such principles as Convenient Clamping, Safety, Reliability, and Not Damaging Structure Parts.



3. Special Tools

Special tools are shown in fig 6

Special Tools include Socket Wrench and Hex. Wrench. Socket Wrench is specially used to tighten jigs and clamps. Hex. Wrench is mainly used to tighten clamp seat. Special Tools can increase efficiency.

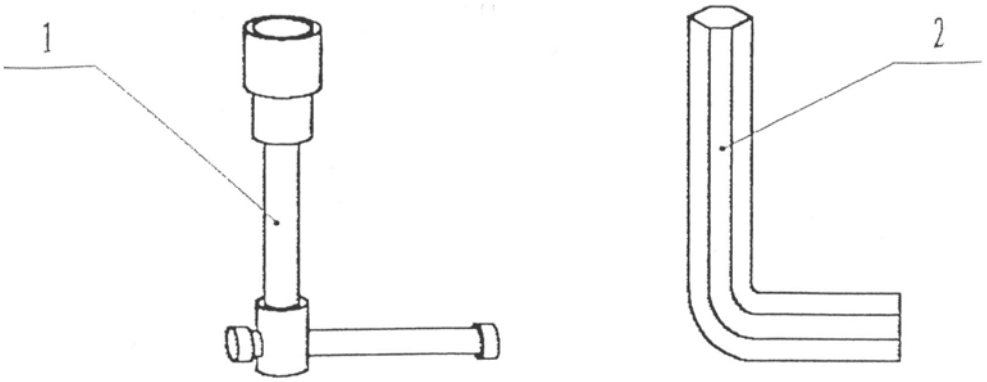


Fig. 6 Special Tools

1.Socket Wrench 2. Hex. Wrench

4. Tools Storage Cart

Tools Storage Cart is used to accommodate and move accessories with the equipment. Shown in fig 7. It is equipped with foot wheel. You can ease move There are some special device to put the accessories with the equipment on Tools Storage Cart, such as pothook and small case.

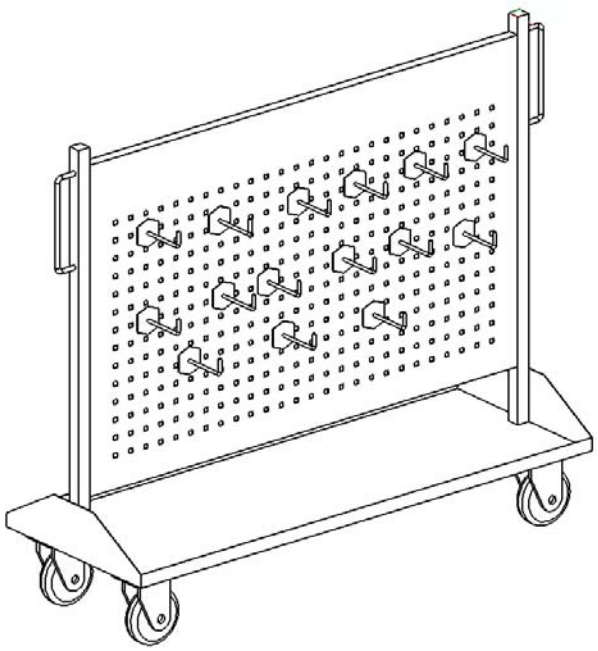


Fig .7 Tools Storage Cart

（五）、The Lifting Frame of Working Platform Lifting Frame

The working platform lifting frame consists of main lift frame, oil cylinder, air hydraulic pump, Shown in fig 8. The operation way as follow:

1.Connect the exit pipe of the air pump with the air inlet of pneumatic pump, connect one end of one-way restrictive valve to the oil- out of pneumatic pump, anoter end connect with high pressure oil pipe, empty gas in the oil pipe, and then connect another end of oil pipe with the oil cylinder. Check each connect part, ensure each part connect reliable, no leak.

2. Setting the press of the pneumatic pump to 6.5 Bar, turn on the power of the pneumatic pump, so as to supply air.

3. Then step on the switch of the pneumatic pump to “PRESSARE”, so as to realize the lift of the working platform. At the time releasing the switch, the working platform can stop and maintain at one place.

4. To relize the descend of working platfor, it need to lift to the working platform to 5-10 cm higher than level height, and then turn the back support leg leave to the support place, then step the switch of pneumatic pump to “RELEASE”, then could realize the platform descend.

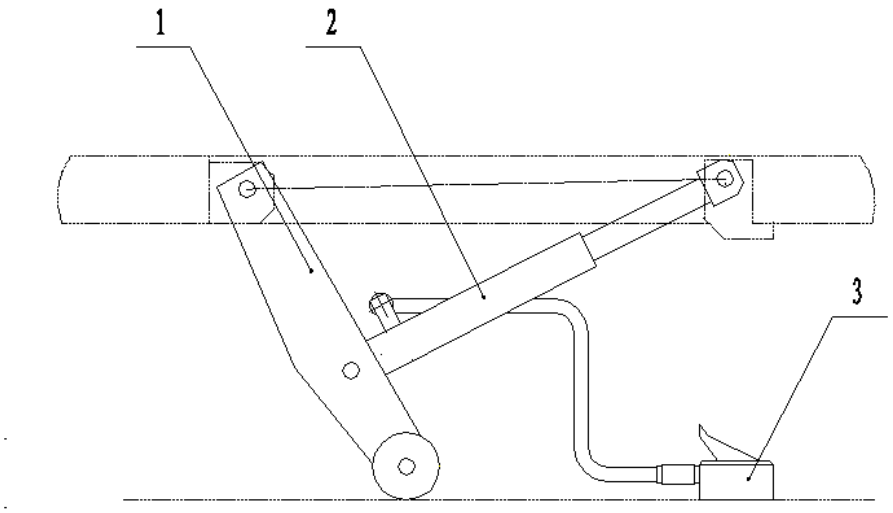


Fig.8 Lifting Frame

1. Lifting Frame 2.Oil Cyliner 3.Pneumatic Pump

(六) Front Support

Front support is used to support working platform front, show in fig 9, front support adjust screw is used for working platform's levellig.

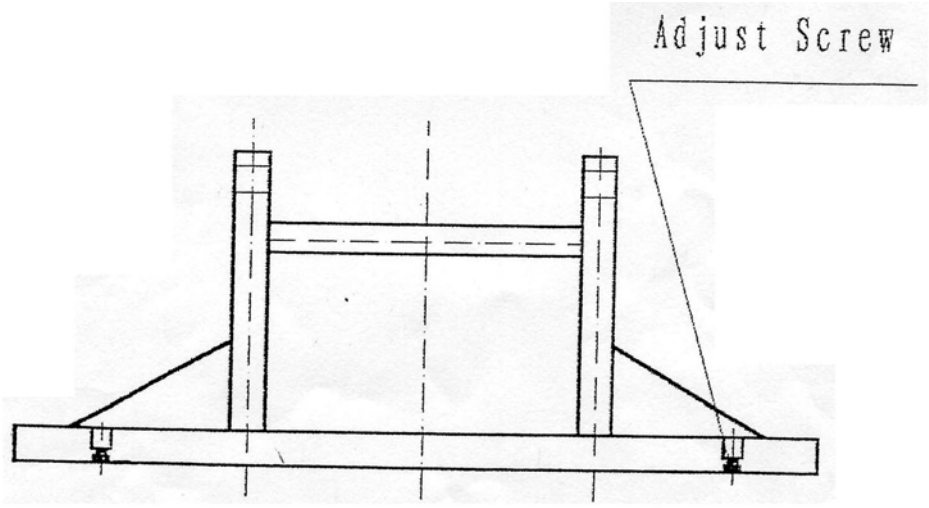


Fig.9

二、 General Vehicle Collision Repair System Operation Procedure

General Vehicle Repair Collision Repair System straightens the damaged vehicles should follow the following procedures:

1. Preparation before Vehicle Loading
2 .Vehicle Loading and Clamping
3. Measuring
4. Straightening Operation

(一) Preparation before Vehicle Loading

1. Ascertaining the straightening project. According the status of vehicles' damage, ascertain the pulled part, direction and the part to be protected during the pulling process. If necessary, some parts shall be taken down and cleaned, for example, the battery shall be taken down.

2. Ascertaining the chassis data and the body data suitable for the damaged vehicles. The detailed check way as follows:

1)、Ascertain the damaged vehicle's category, model, manufacturer, and produced age, etc. And according these you can find the vehicle's No. from the data and vehicle body's data catalogue.

2)、 According the vehicle's No., you can find the respective chassis data and vehicle's body data.

(二) Vehicle Loading and Clamping

1、Vehicle Loading:

Push the repaired vehicle along the loading ramp or pull the vehicle via the winch on the working platform. Move away the loading ramp. Then the vehicle loading is finished.

2、Vehicle Clamping：

1) Loading and Clamping when vehicle's front or rear is damaged.

a、Equip the clamp bases (It could not be taken down when vehicle loading and unloading each time)

b、Equip the four clamps on the clamp bases, and adjust the clamps' height to 350mm.

c、Move the Scissors Type Lift Frame to the vehicle's one end, and lift up the end. Use a couple of clamps to clamp the vehicle's skirt panel. Then move the lift frame to another end of vehicle. Use another couple of clamps to clamp the vehicle's respective skirt panel. The vehicle clamping is finished. Shown in fig.10

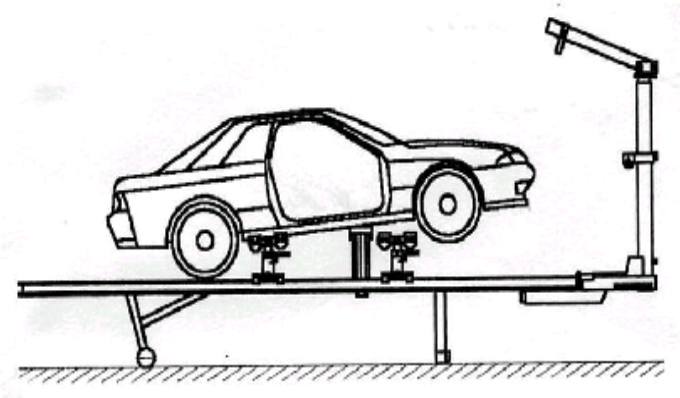


Fig. 10

2、Loading and clamping when vehicle's one side is damaged

The process of the one damaged side vehicle loading and clamping is primary the same as the one whose front or rear is damaged. The difference is that the edge is damaged so severely that it is suitable to be clamped by no clamp or by only one clamp. Under this condition, use two clamps to clamp the edge of vehicle undamaged side and use the accessory clamps to support, clamp, and fix the good parts. According the damaged status of the vehicle edge you elevate and lower the clamp. And clamp the damaged side front or rear. Then pull and straighten the damaged side. When the damaged side is straightened primary good, you may clamp this side. Then you can straighten the other damaged parts.

3、 Loading and clamping when there isn't skirt edge on the vehicle

If there is no skirt edge on the vehicle to be repaired, you can weld two couples of steel slats symmetrically on the suitable position of its chassis. After loading the vehicle, you can clamp it via the four steel slats.

4、Loading and clamping when the vehicle to be repaired is crossbeam type frame

The skirt panel of the crossbeam type vehicle is weak, so it is unsuitable to be clamped. If necessary you may clamp skirt panel to perform as assistant support. General the clamped parts of crossbeam type vehicle is the suspension fulcrum and the front part of the crossbeam. You shall use crossbeam special clamp to clamp the front of crossbeam and use outer suspension bracket to clamp the suspension fulcrum. You can use accessory support to fix the crossbeam type vehicle.

5、The following items shall be paid attention to during the vehicle loading and clamping process

a. During the process of loading the vehicle, you shall try to keep the longitudinal centerline of the vehicle coinciding with the longitudinal centerline of working platform.

b. After loading the vehicle, try to locate its gravity center in the middle part of the working platform.

c. If the vehicle length is beyond the length of the working platform, you should move the vehicle according to the damaged part (front damaged or rear damaged) so that

d. After loading the vehicle, you shall use small clamp, Locating pin, and positioning jacketing to perform as assistant support.

(三)、Measuring

When using Measuring System, you shall understand the measuring system's data table at first.

1. The explanation of the data table

The vehicle body data provided with the equipment includes chassis data table and body data table.

1.1 The layout of the chassis data table and explanation is shown in the Laser Measuring System Vehicle Chassis Data layout

1.2 All kinds of measuring elements in chassis data and their installation type during operation is shown in table 1

2. Measuring System Positioning

After loading the damaged vehicle, you shall roughly measure it to ascertain the straighten project. During the straightening process, you shall precisely measure the part to be straightened, so that you can judge if it is well straightened.

When using the measuring system, you shall posit it at first. The operation method is listed below.

(1) Referring to the data table suitable for the vehicle, find two points in the undamaged area on the front or on the rear of the chassis. In general the rear point is the front fulcrum of the rear suspension (When the point is damaged you may choose other points). In the data table the front fulcrum of the rear suspension fulcrum is marked with'o'especially. According the absolute portrait distance and landscape distance, you can determine another point.

(2) Put the measure ladder on the working platform, and mount the four sets of chassis rulers on the measuring ladder. In general the rear set of chassis rulers shall use the short crossbeam ones. According the installation type illustrated in the data table, you can install the measuring rob and the measuring elements well.

(3) Brick by brick adjust chassis measuring ruler, measuring sliding seat, and measuring position to make the numbers in sympathy with the numbers illustrated in data table. And brick by brick adjust the measuring ladder's position to make the measuring elements correspond to the positioning point (2-mm error is allowed). Tighten the tacking screws.

Here two notes shall be special explained

a. The data table given by us is worked out in accordance with some special vehicle type and some period vehicle. For the vehicle type made by the same manufacture but in different period, due to the rapid progress and the improving of the manufacture

technology, case-by-case data may not be at one.

b. When using data table, you shall pay attention to that the measuring precision of the measuring system is 2 mm., but the vehicle manufacture tolerance almost is under 3 mm. More over because of the manufacture technology, the tolerance of the chassis and vehicle body is 10 mm at times.

3. Measuring system operation

3.1 Installation of the chassis measuring ruler and the gantry measuring frame

After the measuring system being positioned, you shall install the gantry-measuring frame and other chassis-measuring ruler and measuring elements, etc. The installation approaches are listed below.

3.1.1 Installation of the gantry measuring frame

1. Choose the place of the gantry-measuring frame according the parts to be measured.

2. Take down the top bar, vertical beam (including vertical seat) assembly. Place the bottom seat body on the measuring ladder.

3. Fit together the vertical beam assembly and the top bar on the bottom seat body.

3.1.2 Installation of the chassis measuring ruler

1. Take down measuring sliding seat, measuring seat, and measuring rod.

2. Place the chassis crossbeam assembly on the measuring ladder.

3. Place the measuring sliding seat, measuring seat, and measuring rod on the chassis crossbeam.

3.2 Measuring the chassis and the vehicle body

3.2.1 Measuring the Feather Points of the chassis

1. According the character of the chassis measuring point and the measuring method illustrated in the data table, you can select the appointed measuring rod and measuring elements and fix them together.

2. Adjust the position of the chassis ruler, measuring sliding seat, and measuring rod to make the elements touch the measuring point.

3. Read the portrait, landscape, and height number illustrated by the chassis ruler. And compare them with the number illustrated in the data table. If the error is in the range of 2 mm, the point position is correct. Otherwise it is incorrect.

3.2.2 Measuring the vehicle body measuring points

1. According the character of the vehicle measuring point and the measuring

method illustrated in the data table, you can select the appointed measuring rod and measuring elements and fix them together.

2. Adjust the position of the gantry-measuring frame, left and right vertical beam-sliding seat, and cross-measuring rod to make the elements touch the measuring point.

3. Read the portrait, landscape, and height number. And compare them with the number illustrated in the data table. Then you can judge weather the point's position is correct.

3.2.3 Measuring vehicle when there is no available data

If there is no available data table for the vehicle to be repaired in the provided data, you can repair it in accordance with the following method.

1. Find two couples of symmetrical points in the undamaged area of the vehicle. The distance between the two couples of symmetrical points shall as possible as long. Position the measuring system via the two couples of symmetrical points.

2. Adopt traditional method to measure the vehicle or according some important structure dimensions or installation dimensions prosecute measuring. It is of course that you can measure the vehicle according your experience.

3. The following shall be noted during the process of the measuring:

The distance between the two sliding seats on chassis measuring ruler is adjusted well. Generally do not release the tacking screws. After using for a long time if you find the clearance between the chassis-measuring ruler and measuring ladder is too long, you can release the tacking screws to adjust the clearance. The adjust principle is that the chassis left and right measuring ruler shall be symmetry base on the center line of the chassis ladder. The adjustment error shall not more than ±0.5 mm.

(四)Straightening Operation Routine

1、Preparation for the straightening the vehicle

1). Take down the battery to avoid the acidity leaking and to protect other parts from eroding.

2). Take down the parts, which get in the way during the straightening process.

3). Measuring the vehicle and ascertain the straightening project.

2、Connection of the pulling system and the working platform

At first you shall ascertain the suitable connection point in accordance with the part

to be straightened. Ascertaining the connection point shall follow the following principle: During the process the straightening, when some part being applied stronger force, the chain shall be parallel to the towers' crossbeam to protect the tower from being damaged. After the connection position being ascertained, the positioning mass shall be pulled out. And insert the positioning pin, and then wedge it with wedging mass. The pulling equipment is fit together with the working platform tightly.

3. Connection of the hydraulic system and pulling system

Fit together the manual pump, oil pipe, oil cylinder. Check the oil volume of the manual pump. If the volume is not enough, please pour hydraulic oil (refer to the detail method in the manual book). Exhaust the air in the oil pipe.

4、Connection of pulling tower and straightened point

Select the clamps to be used in accordance with the damaged parts. For the rigid parts the pulling hook, pulling plate, and big clamps shall be selected in general. Connect the clamps and the chains reliably. And fixed the other end of the chain in the chamfer on the upper part of the inner tower beam.

5、Straightening Operation

Turn off the switch of the manual pump. Rock the handle of the manual pump. Then the pump pumps the oil. The cylinder is extended.

During the process of straightening, you shall adjust the height and position of the chain as well as the pulling system connection position.

6、Typical pulling operation

1.) When some parts of the damaged area need to be pulled downward, you can change the chain direction via idle wheel. Shown in fig 11.

2.) The straightening of the rear of the vehicle is shown in fig 12.

3.) When the top of the vehicle body need to be pulled upward, you can use the hanging bar and the Pushing Upward Components to implement this task. Shown in fig 13.

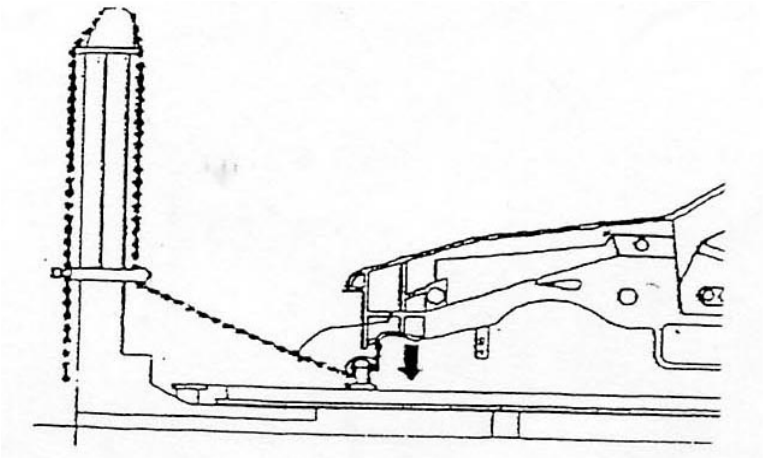


Fig 11 stretch the vehicle body downward

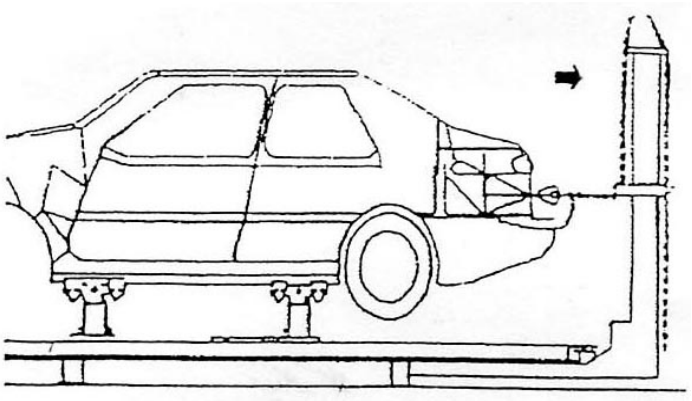


Fig 12 stretch upward of the vehicle rear

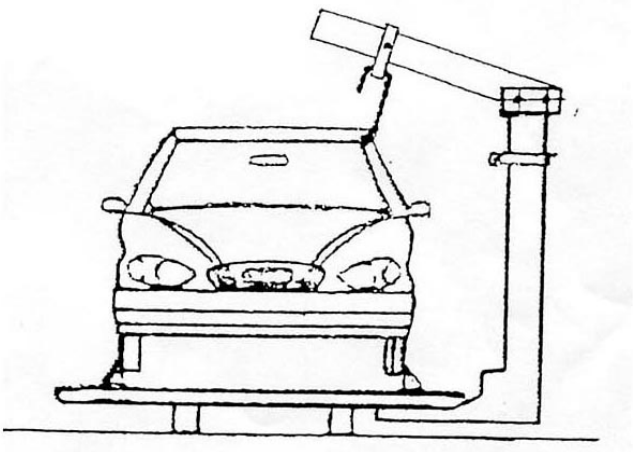


Fig 13 stretch upward of the vehicle top

7、**Some items shall be paid attention to during the process of straightening:**

1). Some parts shall be supported and fixed according to the feathers of straightening. For example, when pulling downward some damaged points on the chassis, you shall support or fix the start point of the crook. When the top part being straightened, the front end of the vehicle or the rear end of the vehicle chassis shall be fixed. And when the front end of the vehicle being pulled toward left or right, you must fix the front end of the chassis.

2). Measuring system shall be moved to the undamaged area to avoid that the chain and accessories can destroy the measuring system.

3). None is permitted to stand behind the pulling tower during the process of straightening. So the accident can be avoided.

三.Universal Vehicle Collision Repair Equipment Safety Operation and Maintenance

(一)、Safety Operation Item:

The equipment only could be use for crossbeam straightening, and couldn't be used for other, or else there is any problem, we wouldn't responsible for this. Safety Operation can avoid the personal injury and abnormal damage of equipment. Any injury and lost caused by unsafely operation, lack maintenance or wrong equipment operation, we wouldn't responsible for it. Safety operation shall be paid attention to during operation:

1. Before using the Universal Collision Repair Equipment you must read the operation manual and spare parts operation manual carefully. The equipment should be operated by the worker with proficiency training. The equipment must be used in indoor.

2. Before using you shall check the performance of the cylinder, oil pipe, air hydraulic pump of the lifting frame hydraulic system. You shall make sure their performance good. And you shall check the performance of the cylinder, oil pipe, Manual pump of the pulling system, ensure the performance well of each component. The oil pump and air pipe between of electric pump and equipment must add protecting pipe for sleeve.

3.Don' t touch the oil pipe when it is under pressure, the splashed pressure would shoot the skin and cause serious injury.

4.Forbid lift oil pipe or rotated connector to lift the hydraulic equipment, and should make use of handle or other safety method.

5.Assorted air-hydraulic pump of lifting frame air supply pressure could not beyond 0.8Mpa.

6. When the working platform stop at some height, you must rotate back support frame to the support position to lock; if with the self-lock equipment, must make the ratch of self-lock equipment to support the fixed rack effectively.

7. When you want to lowers the working platform, you must separate the pawl from the pawl rack.

8. The connection between the pulling system and the working platform must be firm. Before straightening you must check it.

9.Before straightening, you shall check the chain to assure it undamaged. Chain, hoist strap couldn't be used to hoist heavy object

10. Before straightening, the clamps must clamp the vehicle tightly.

11. The connection among the chain, the clamps and the clamped parts must be reliable.

12. During the straightening process, **man is forbidden to stand behind the tower and in the direction of the chain pulling force**, in order to ensure safety.

13. **When hanging arm stretch, pulling force couldn't beyond 1.5 ton, pulling arm couldn't be used to hoist heavy, avoid to cause any injury to person and repaired auto.**

(二)、Maintenance

1. After finishing your work, you shall clean up the dust. And you shall put away the clamps and measuring elements.

2. The hydraulic oil in the cylinder, air hydraulic pump and manual pump shall be replaced every half a year. For the operation ways you can read the manual books.