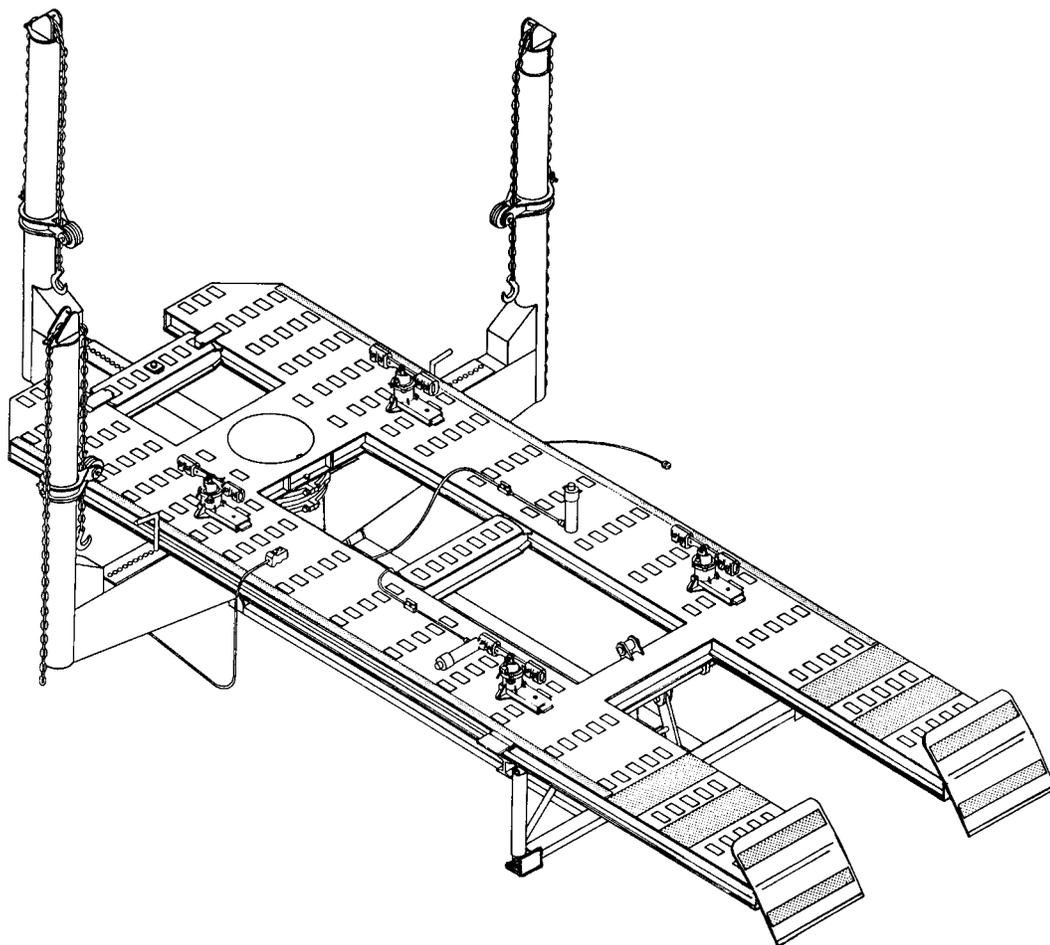


Chief EZ Liner S21



OWNERS MANUAL



CHIEF'S LIMITED ONE-YEAR WARRANTY & LIABILITY

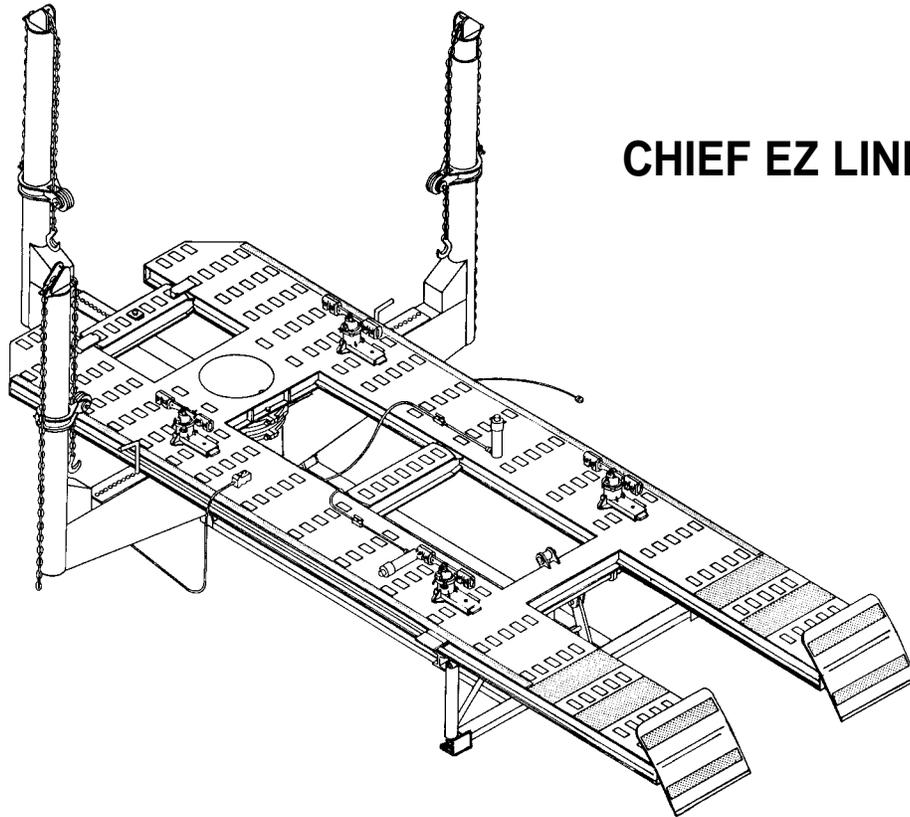
Chief Automotive Systems, Inc. warrants for one year from date of installation and/or purchase any of its products which do not perform satisfactorily due to defect caused by faulty material or workmanship. Chief's obligation under this warranty is limited to the repair or replacement of products which are defective and which have not been misused, carelessly handled, or defaced by repair or repairs made or attempted by others.

CHIEF AUTOMOTIVE SYSTEMS, INC. DOES NOT ASSUME RESPONSIBILITY FOR ANY DEATH, INJURY OR PROPERTY DAMAGE RESULTING FROM THE OPERATOR'S NEGLIGENCE OR MISUSE OF THIS PRODUCT OR ITS ATTACHMENTS. CHIEF MAKES NO WRITTEN, EXPRESS OR IMPLIED WARRANTY WHATSOEVER OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE OR OTHERWISE REGARDING THE EQUIPMENT OR ANY PART OF THE PRODUCT OTHER THAN THE LIMITED ONE-YEAR WARRANTY STATED ABOVE.

Returned merchandise requires a "RETURNED GOODS AUTHORIZATION NUMBER" on the package. Authorization numbers can be obtained by calling or writing the Customer Service Department, Chief Automotive Systems, Inc. No returned merchandise will be accepted without an authorization number. All returned merchandise must be shipped freight prepaid (and may be subject to a 15 percent handling and restocking charge) to:

Chief Automotive Systems, Inc.
Attn: Returned Goods Dept.
1924 E. Fourth St.
P.O. Box 1368
Grand Island, NE 68802-1368

or Your Authorized
Chief Automotive Systems, Inc.
Representative



CHIEF EZ LINER S21

This owners manual is written to familiarize operators with the safe and efficient operation of the Chief EZ Liner S21 System. The EZ Liner System features a unique multiple/simultaneous pulling method to return the vehicle's damaged structure and sheet metal to its original position.

The S21 features three towers at its front, with the capability of adding one or two optional towers at the rear providing 360 degree access to the vehicle. The machine tilts hydraulically for either drive on or winch positioning of the vehicle.

NOTE: Illustrations shown in this manual may vary slightly from actual product.

This manual is not intended to replace Chief Automotive Training. For information concerning Training, contact Chief Automotive Systems, Inc.

IMPORTANT:

1. DO NOT attempt to operate Chief EZ Liner S21 without first reading this entire manual.
2. Complete safety information is highlighted throughout this manual and is identified by: 

This safety alert symbol identifies safety information. Operator injury could result if these CAUTION notes are not followed.

3. Qualified service personnel must check operational capacity of EZ Liner system prior to its initial use and at intervals of no more than one year. Contact Chief Automotive Systems, Inc. or contact your authorized Chief Automotive Systems, Inc. representative.
4. Persons operating EZ Liner repair system must be at least 18 years of age, must be trained in operation of EZ Liner system, and must have demonstrated their qualifications to the employer. They must also be specifically assigned to operate the EZ Liner system by the employer and this assignment must be made in writing.

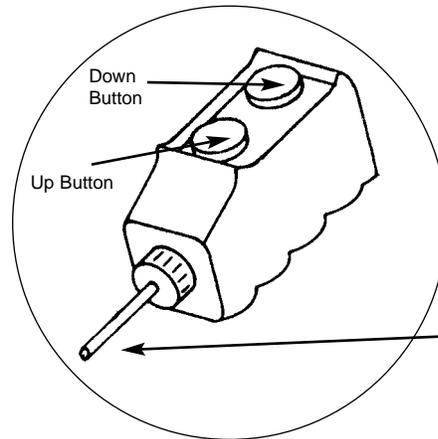
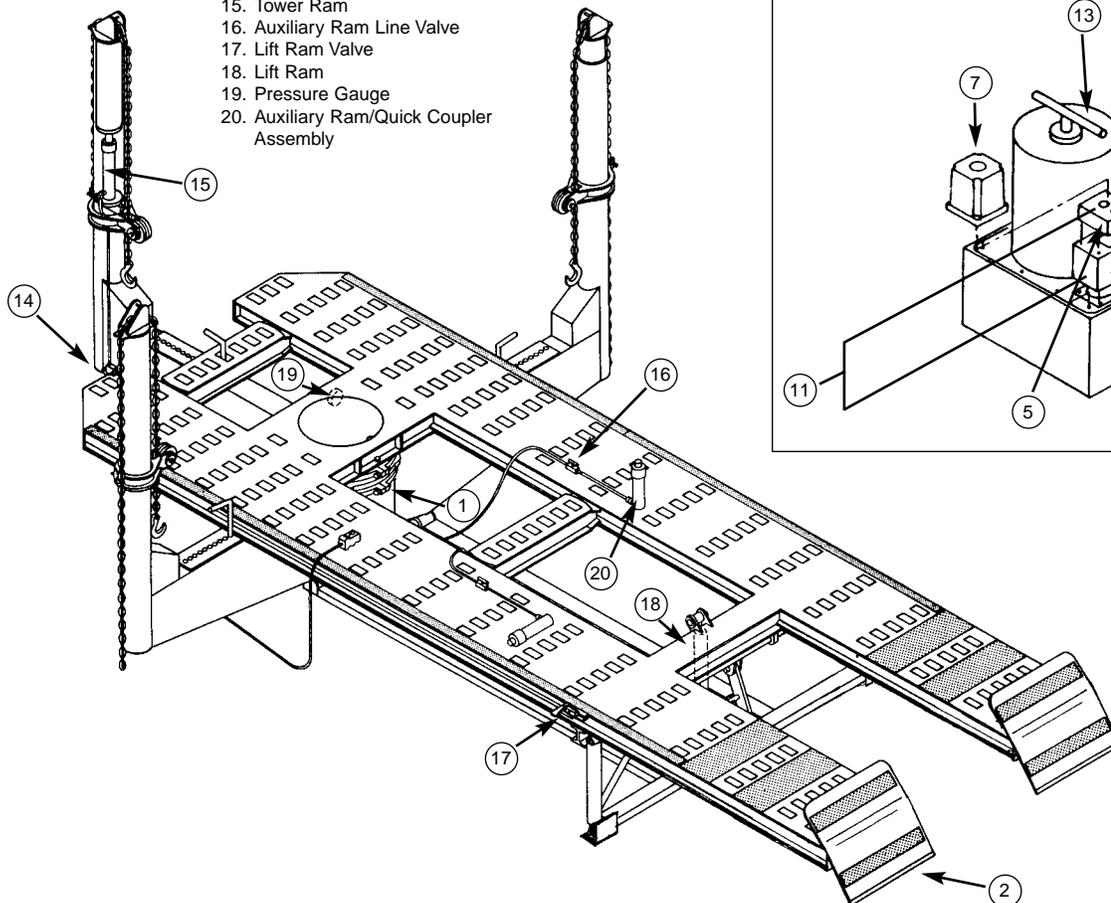
HYDRAULIC SYSTEM COMPONENTS

The EZ Liner S21 is powered by an electrically operated hydraulic pump which is operated by a remote control switch. The components of this system are identified in Figure 1.

Hydraulic pressure is distributed to tower rams, auxiliary rams, and lift ram. The flow of hydraulic fluid to each of these rams is controlled by a valve. Hydraulic pressure is monitored by a pressure gauge mounted on the machine's front crossmember. To exert hydraulic pressure, press 'up' button on hand-held switch and to release hydraulic pressure, press 'down' button.

IMPORTANT: Tower rams and auxiliary rams can be operated either simultaneously (with equal hydraulic pressure) or individually. The lift ram must be operated individually. Whenever using the hydraulic system, close all valves where hydraulic pressure is not required.

1. Pedestal
2. Removable Loading Ramps
3. Motor Starting Relay
4. Valve Block
5. Linkage Block
6. Power Cord
7. Solenoid
8. Joy Cord
9. Square D Switch
10. Control Switch Assembly
11. Valve Body With/Linkage Base
12. Reservoir
13. Motor
14. Tower Valve
15. Tower Ram
16. Auxiliary Ram Line Valve
17. Lift Ram Valve
18. Lift Ram
19. Pressure Gauge
20. Auxiliary Ram/Quick Coupler Assembly



NOTE: By holding switch with **Control Cord** down, stress is reduced in this area of cord.

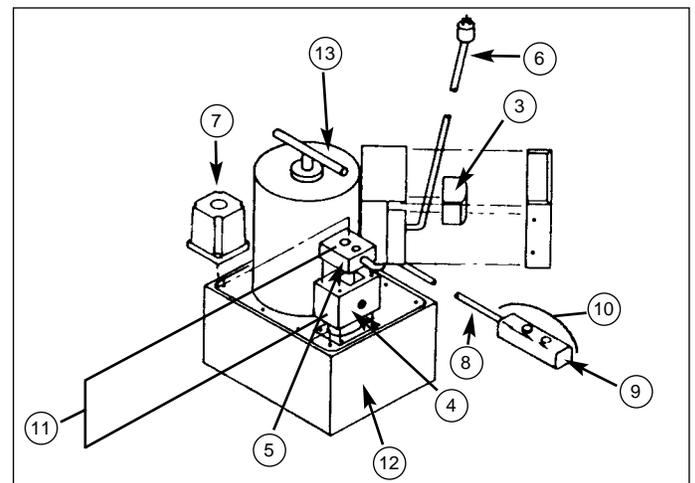


Figure 1

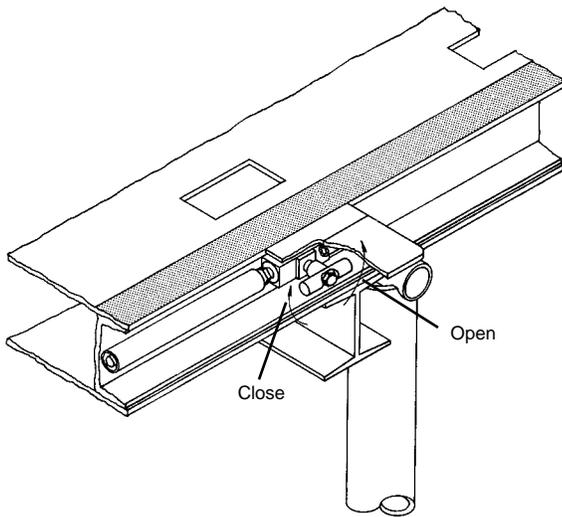


Figure 2

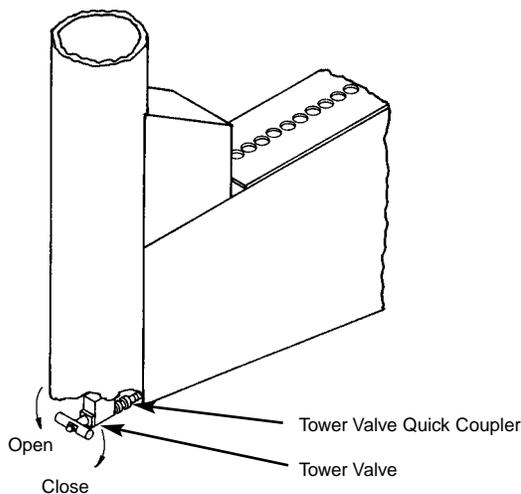


Figure 3

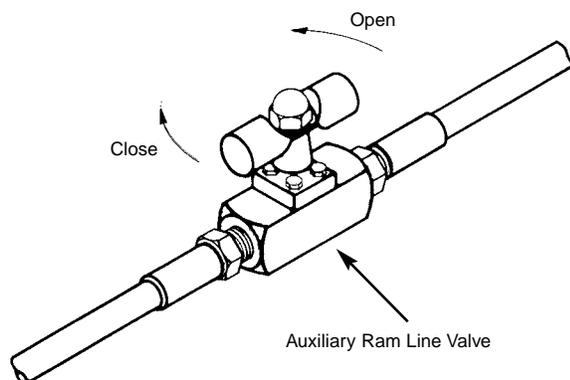


Figure 4

To operate hydraulic system:

1. Open valves to the hydraulic ram(s) to be used. Close valves to all other hydraulic rams. (See Figures 2-4.)

NOTE: To open, turn valve 1/2 turn to left (counterclockwise). To close, turn valve to right (clockwise). **DO NOT** overtighten. Overtightening can damage valve's needle and seat.

IMPORTANT: When using lift valve, observe caution label on lift valve cover.



CAUTION	
Do NOT Open This Valve Unless:	
1. ALL TOWERS ARE PROPERLY PINNED TO THE MACHINE.	
2. VEHICLE'S WHEELS ARE BLOCKED, AND EMERGENCY BRAKE IS SET.	

2. Press **up** button on remote control switch to exert hydraulic pressure and press **down** button to release hydraulic pressure. (See Figure 1 — Page 2.)

NOTE: Hold remote control switch so its cord is in a downward position. This positioning reduces stress in this area of the cord.

3. Monitor pressure gauge whenever exerting hydraulic pressure. The gauge shows the amount of hydraulic fluid pressure in the lines. Readings represent pounds per square inch (psi) or barometers (bar).

NOTE: Pounds per square inch (psi) or bar readings can be used to determine the amount of pressure each ram applies to its respective chain (and vehicle). Such pressure is measured in tons (kilo Newtons). For every 1000 psi (70 bar) of pressure showing on the pressure gauge, there is 1 ton (9kN) of pressure exerted on the chain (and vehicle). Each ram that is in use will exert this amount of pressure.

IMPORTANT: Monitor pressure gauge continually during repair. Even though the EZ Liner S21 system is capable of making strong pulls, 10 ton (90kN) maximum rating, most repairs can be made at 2000 psi (140 bar) or less by using multiple pulls and proper stress relieving of work hardened (folded) metal.

MOVABLE CROSSMEMBERS

The EZ Liner system features two movable crossmembers that mount to the channels on the inner edges of the mainframe. They can be used in front, center or rear sections of machine. Illustration on Page 1 shows normal location of crossmembers.

The primary use of movable crossmembers is to support and secure towers at ends of machine. They can also be used as a base for making hydraulic pulls or pushes when auxiliary rams are positioned perpendicular (90 degrees) with top or bottom of crossmember.

To remove crossmember from machine, hold crossmember secure while turning it counterclockwise. (See Figure 5.) To reinstall crossmember, reverse the procedure making sure it engages the channels on the inner edges of the mainframe.

When movable crossmembers are used in front or rear sections of machine, crossmember locks (see Figure 8) must be used to prevent unintentional movement.

NOTE: EZ Liner S21 crossmembers do not feature safety crossmember locks. These are available on EZ Liner 25 systems only.

CAUTION:

1. Do not use movable crossmembers as a step.
2. Do not use movable crossmembers as a base to make a hydraulic pull or push unless auxiliary ram is positioned perpendicular (90 degrees) with top or bottom of crossmember.
3. During removal and installation:
 - a. Hold crossmember secure.
 - b. Install crossmember locks to prevent unintentional movement. Crossmember locks are not designed to secure crossmember as a base for hydraulic pulling/pushing.

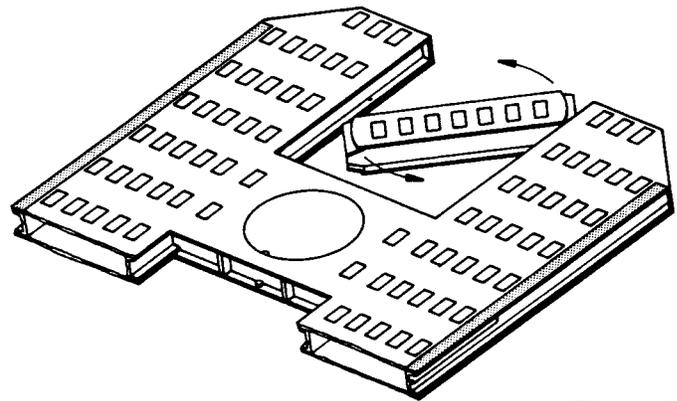


Figure 5

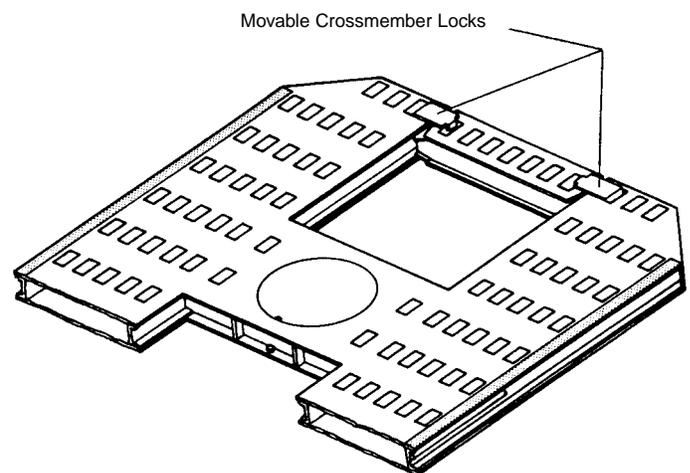


Figure 6

TOWERS

The EZ Liner System is equipped with pulling towers at front of machine. Optional rear towers are also available. Multiple pulls can be set up quickly and are controlled by a hand-held remote control switch. Lateral and elevated pulling angles can be made or changed in just a fraction of a minute.

CAUTION: Normal working range of 1/2 inch (13mm) tower chain is 650 to 4,745 psi (45 to 325 bar) on pressure gauge with applied force to the chain of 9,620 lbs. (43kN). Proof test on this tower chain is 28,000 lbs. (125kN). The normal working range of 3/8 inch (10mm) tie down chain is 500 to 2,650 psi (35 to 250 bar) on pressure gauge with applied force to the chain of 7,400 lbs. (33kN). Proof test on this tie down chain is 20,000 lbs. (90kN).

IMPORTANT: The following information on towers relates to front towers only! Although much of this information is applicable to **rear towers**, refer to **Auxiliary Tower Owners Manual** for specific instructions.

To operate front towers:

NOTE: Tower operation requires use of tower pins or tower tie bolts. The following procedure references use of tower pins. Tower tie bolt applications appear on Page 7.

1. Swing tower to desired lateral pulling angle and pin it to mainframe or movable crossmember. (See Figure 7.) Tower pin can be used in any tie down hole or along edge of machine. (See Figure 8.) DO NOT position tower pin in front of or at rear of movable crossmember as it will apply excessive stress to crossmember locks. Instead, install tower pin through crossmember tie down hole. (See Figure 7.) Tower pin must be fully seated in lower pinning hole to avoid damage to top pinning hole. (See Figure 9.)
2. To adjust slack tower chain, grip chain on each side of tower. (See Figure 10.) Lift out on tail of chain until it is approximately 45 degrees from tower. Then disengage chain from tower head and pull chain to either increase or decrease amount of slack.

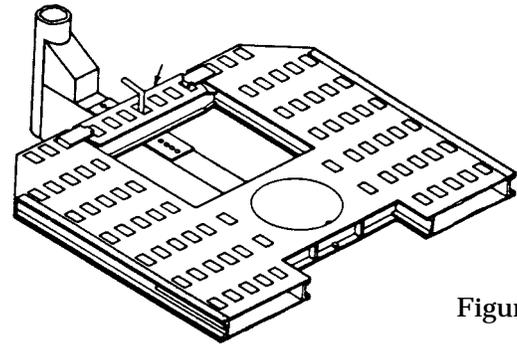


Figure 7

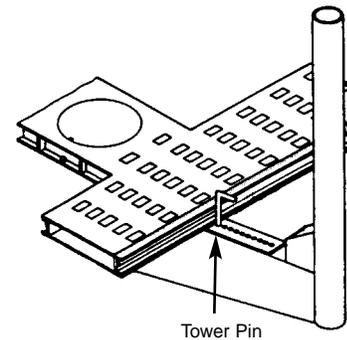


Figure 8

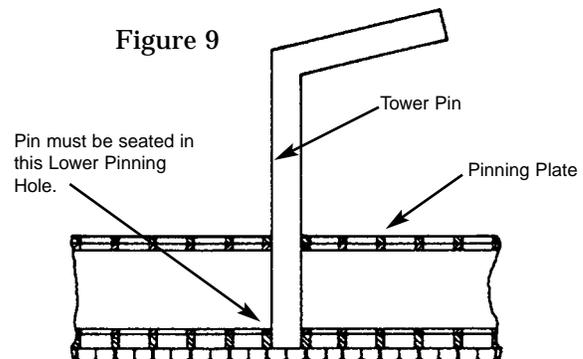


Figure 9

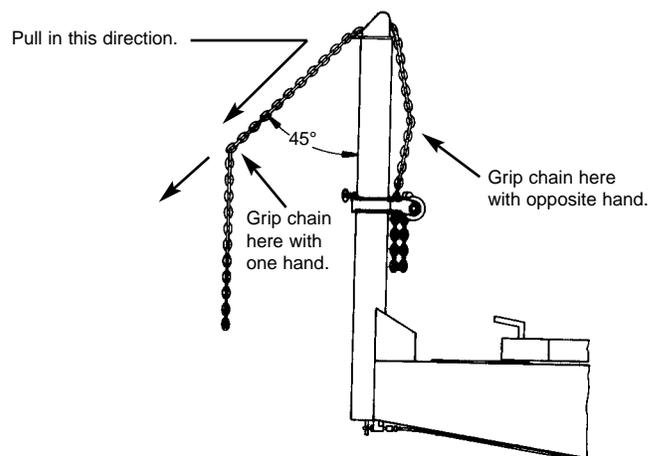


Figure 10

- Support collar with one hand while loosening collar locking knob with opposite hand. Then position collar approximately 3 inches (75 mm) above desired pulling height and retighten collar locking knob. (See Figure 11.)

NOTE: Make sure there is enough slack chain before loosening collar. After loosening locking knob, it might be necessary to turn collar slightly to disengage it from tower pipe.

- Let tower chain hang free momentarily to remove twist. Then, without twisting chain, attach hook to vehicle. Pull on tail end of chain to remove slack and then lower collar. (See Figure 12.)

IMPORTANT: Remove twist from chain before lowering collar. Make sure that chain links between collar roller and hook align.

- Open tower valve. Then press up button to exert pressure and down button to release pressure.

CAUTION: Observe following WARNING label which appears on tower.

WARNING !

DO NOT position yourself close to, or in line with, chains, clamps, or other accessories while pressure is applied to this system. Failure to observe this warning could result in operator injury due to the possibility of a chain or accessory disengaging or failing while pressure is applied to this system.

IMPORTANT: DO NOT tighten collar locking knob while pressure is applied to system because it will be impossible to loosen the knob without pressure on the system. If it has been tightened by error while pressure is on the system, reapply pressure and loosen the knob.

- When tower is no longer needed, close tower valve, disengage tower chain hook, and store collar using one of the three methods shown in Figure 13.

CAUTION:

- Collar locking knob must be tightened before removing tower chain from vehicle.
- Collar locking knob must be tight when collar is not in use.
- Store collar at bottom of tower pipe or support collar with tower chain.

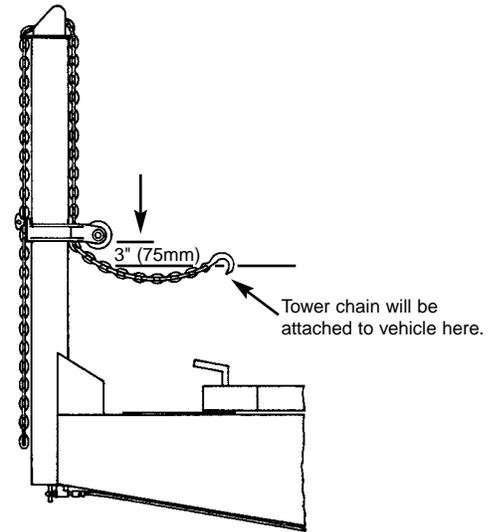
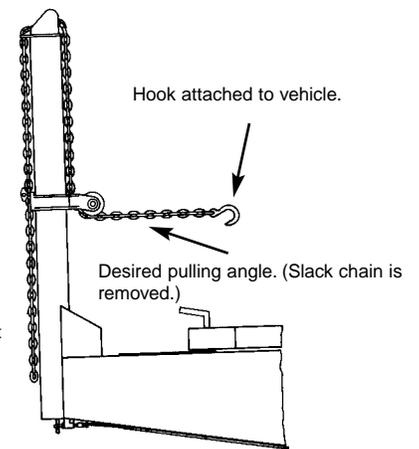


Figure 11



Collar Locking Knob can be left loose while pull is being made; however, it must be tightened before removing Chain from vehicle.

Figure 12

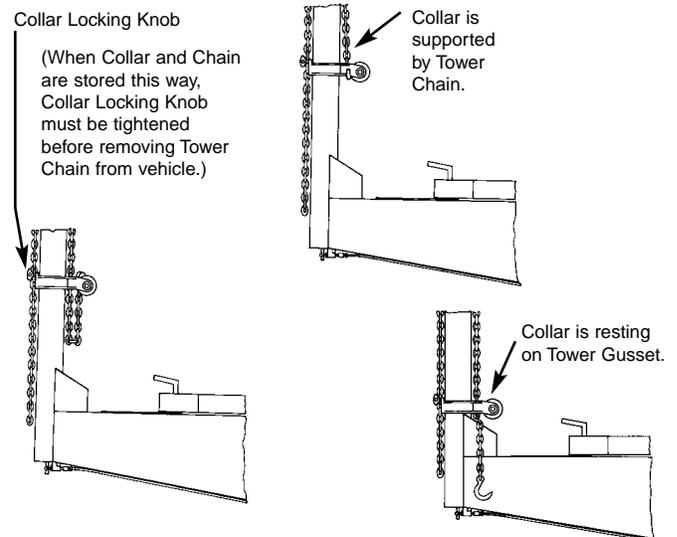


Figure 13

TOWER TIE BOLT APPLICATIONS

Certain pulling and/or pushing situations necessitate use of tower tie bolts in place of tower pins. Tower tie bolts must be inserted through one of the outer tie down holes on mainframe (or movable crossmembers) and be threaded into one of the pinning holes on tower gusset. Tower tie bolts must be tightened to between 120-150 foot pounds (160 -200 Nm) of torque.

Tower tie bolts must be installed when the following situations exist:

1. Tower does not lift up firmly against underside of mainframe when making a pull, for example: when pulling upward at 45 degree angle or less. (See Figure 14.)

NOTE: Tower will not lift in this situation and will be forced down if tower tie bolt is not installed.

2. Auxiliary ram is used to push from tower to vehicle. (See Figure 15.) Tower will be forced down in this situation unless tower tie bolt is installed.

CAUTION: DO NOT attempt this setup without reading Auxiliary Ram Owners Manual.

3. Pull from side of tower exceeds 45 degree angle from tower base. (See Figure 16.) This situation does not necessarily force tower up or down, but instead causes tower pedestal rings to twist.

NOTE: The higher collar is on tower, the more severe the twisting action.

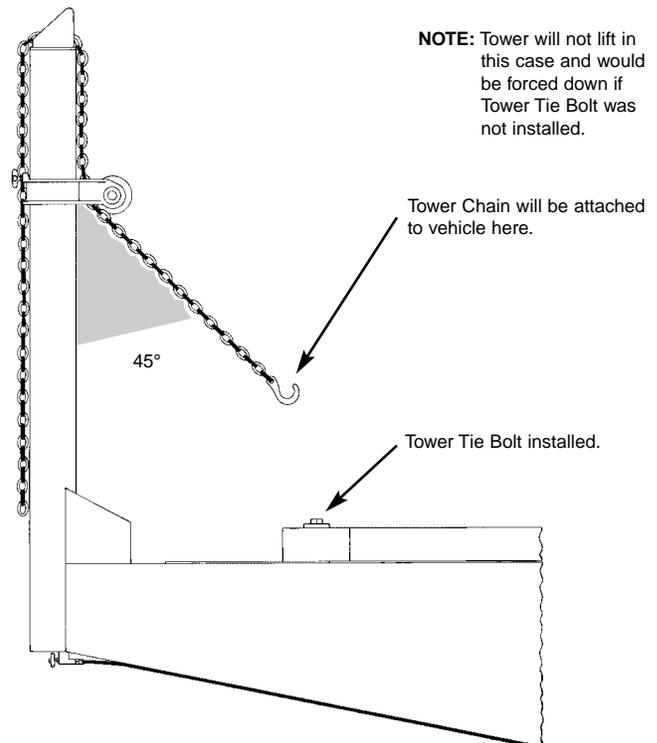


Figure 14

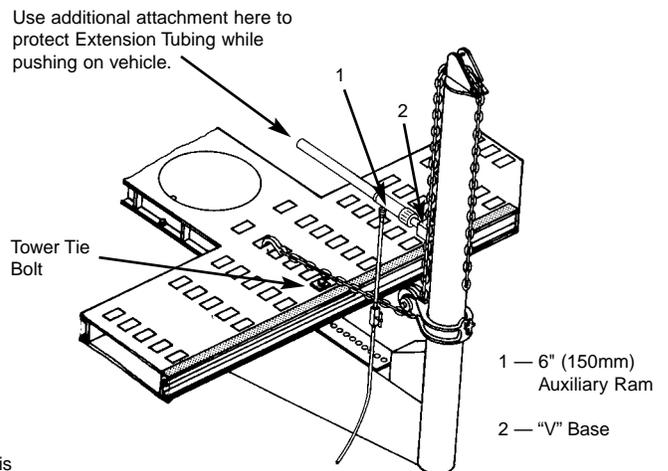


Figure 15

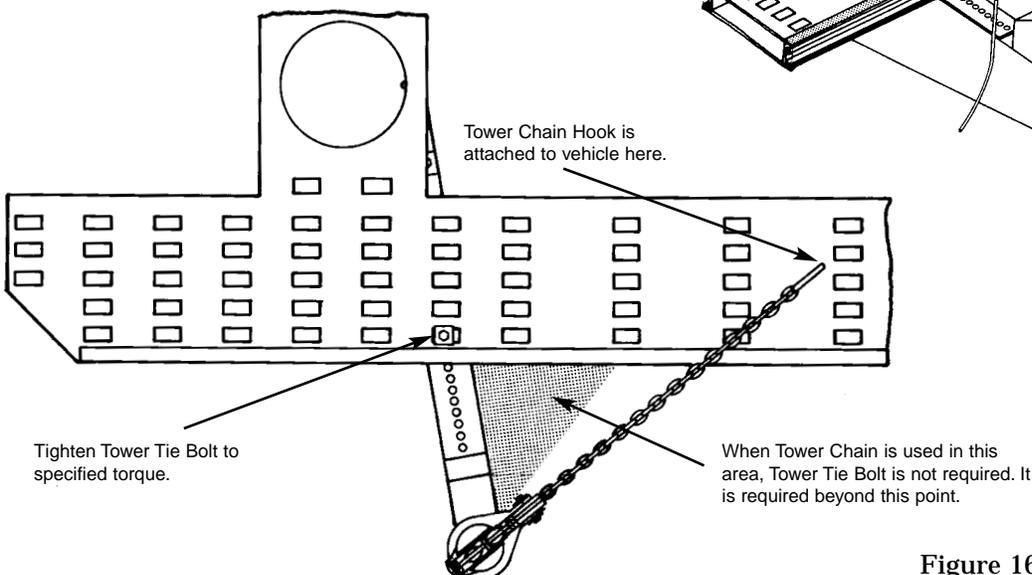


Figure 16

LOWERING/RAISING MACHINE

When lowering or raising a machine with a vehicle aboard observe the following precautions.

⚠ CAUTION:

1. When driving or winching vehicle on or off machine, use helper to guide you. If vehicle's brakes are inoperable, use a Chief Winch and refer to instructions packaged with that accessory.
2. Immediately after positioning vehicle on mainframe, put vehicle in park (if automatic transmission), apply vehicles emergency brake, and have helper block vehicles wheels.
3. Prior to lowering machine, slowly roll vehicle to rear of machine, put vehicle in park (if automatic transmission), apply vehicles emergency brake, and block vehicles wheels. Then install loading ramps at rear of machine.
4. Keep vehicles wheels blocked during raising and lowering procedures and whenever vehicle is not anchored to mainframe.
5. When raising or lowering machine with vehicle aboard, DO NOT walk behind machine.

TO LOWER MACHINE

IMPORTANT: Observe preceding precautions when lowering machine with vehicle aboard.

1. Position towers at front of machine and secure them to front movable crossmember using tower pins.
NOTE: If EZ Liner is equipped with auxiliary towers, bolt these towers to sides of machine using outermost tie down holes in fifth row of tie down holes from rear of machine. (See Auxiliary Tower Owners Manual.)
2. Install loading ramps at rear of machine.
3. Raise lift valve cover and open lift valve half turn to left. Then close all other ram valves.
4. Press 'up' button on remote control switch to lift machine until there is no weight on stiff legs. Then swing stiff legs forward until they are at 30 degree angle from their vertical position. (See Figure 17.)

⚠ CAUTION:

1. Clear all obstacles from under and around machine.
2. DO NOT allow anyone or anything to ride on machine or be under machine during lowering procedures.
4. Press 'down' button on remote control switch to lower rear of machine to floor.
NOTE: DO NOT lay remote control switch on machine.

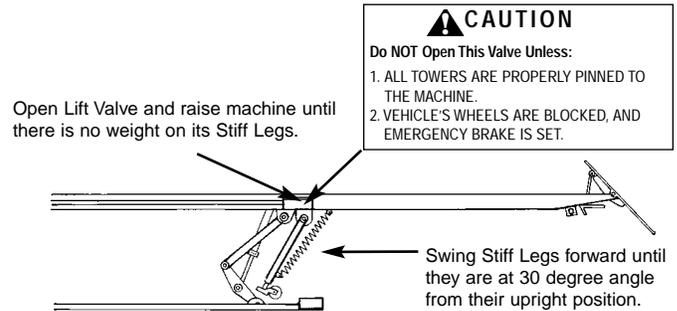


Figure 17

To Raise Machine

IMPORTANT: Observe preceding precautions when raising machine with vehicle aboard.

1. Check location of towers making sure they are secured to machine as noted in Step 1 — To Lower Machine.
2. Raise lift valve cover and open lift valve half turn to left. Then close all other ram valves.
3. Press 'up' button on remote control switch to lift machine until stiff legs are in upright position. Then press 'down' button to lower stiff legs into their respective stiff leg catch. (See Figure 18.)

⚠ CAUTION:

1. Clear all obstacles from under and around machine.
2. DO NOT allow anyone or anything to ride on machine or be under machine during raising procedures.

NOTE: When mainframe lifts off floor, safety ramps automatically pivot into position.

4. Close lift valve and lower lift valve cover.

IMPORTANT: Lift valve must be closed when using auxiliary towers and rams.

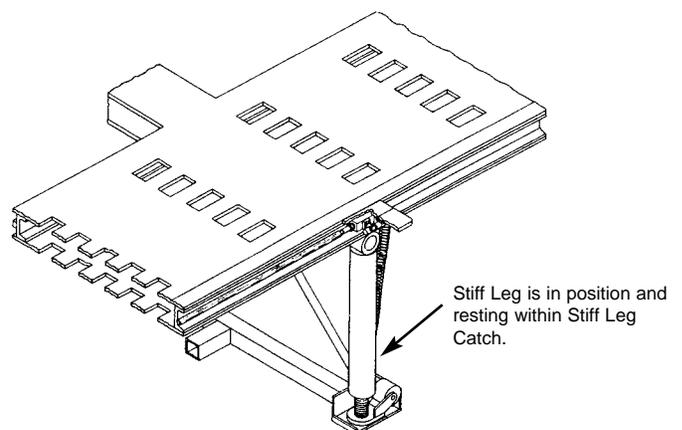


Figure 18

MACHINE MAINTENANCE

Check And Inspect

These components should be checked 'monthly' and anytime a problem is suspected.

Tower Chains, Tie-Down Chains

The chains supplied with the EZ Liner are high quality, high strength chains that meet or exceed NACM Standards for 80 Grade. The tower chain hooks are high quality hooks that are AISI 8622 Steel Alloy Heat Treated.

CAUTION:

1. DO NOT heat chain or hook while repairing vehicle — 600F (316C) of heat on chain will weaken it.
2. DO NOT tip load chain hook. Tip loading chain hook will stress hook beyond its designed capability and could cause hook to fail.
3. DO NOT pull with twisted chain links. Pulling with twisted chain links will stress chain links beyond their designed capability and could cause chain to fail.

Tower chains must be inspected for wear, nicks, gouges, stretched and bent links. If found, replace chain.

Tower chain hooks must be inspected for twist and stretched openings. If found, replace chain.

Safety Ramp

Inspect safety ramps making sure they lift into position each time the machine is raised. Lubricate hinges and other moving parts with oil if they do not lift into position.

Pedestal Bolts

Remove pump lid and check mainframe to pedestal bolts/ nuts for looseness.

Power and Control Cords

Inspect power and control cords for worn insulation or other damage. If found, replace cord(s).

Tower To Mainframe Gap

Measure gap between top of tower gusset and bottom of mainframe. If gap measures between 5/16 inch (8mm) and 7/16 inch (11mm), see Tower Tie Bolt Usage, Page 7. If gap exceeds 7/16 inch (11mm), see Troubleshooting Section — Tower To Mainframe Gap, Page 16.

Cleaning and Lubricating

These components should be cleaned and lubricated as specified for trouble free and extended service. When lubricating use the following:

Oil — Use motor oil for all components requiring oil.
Grease — Use a SUS750 Lithium type grease such as lubricate #630-2 for all components requiring grease.

Tower Heads

Grease tower heads every six months.

1. Remove tower chain from tower head.
2. Remove tower head from tower pipe.
3. Clean dirt from tower head rub pads and where tower head pipe rubs on inside of tower pipe.
4. Apply grease to tower head pipe and rub pads.
5. Reinstall tower head and tower chain.

Collars

Clean and lubricate collars monthly.

1. Use compressed air to blow out dirt or dust that collects between collar ears and rollers.

-  **CAUTION:** Wear safety glasses while using compressed air to blow out dirt and dust.
2. Place a few drops of oil on roller pin between roller and collar ears (each side). Then turn roller a few times. Roller must turn freely.

Lift Jack

Grease lift jack every six months.

1. Clean dirt and excess grease from lift jack's pivot points.
2. Using grease gun, apply grease to grease fittings of each lift jack pivot point.

Stiff Leg Assembly

Oil stiff leg assembly pivot points and rollers every two months.

1. Clean dirt from pivot points.
2. Place a few drops of oil at each pivot point and on roller pins.

Tower Rings

Grease tower rings every six months. Dirt and plastic dust can accumulate on rings and pedestal ring grooves causing towers to turn hard. Developing a bead of grease between rings and pedestal ring grooves seals out much of the dirt and plastic dust.

1. Wipe old grease and dirt from rings and pedestal ring grooves.
2. Swing towers to one side of machine and position against mainframe.
3. Use grease gun to apply grease to each grease fitting (2 per ring) on rear half of each ring. Apply enough grease so a small bead of grease develops between ring and pedestal ring groove.
4. Swing towers to opposite side of machine and position against mainframe. Then repeat Step 3.
5. Swing towers several times to work grease around rings and pedestal ring grooves. If more grease is needed, repeat the procedure.

NOTE: If tower still swings hard, see Troubleshooting Section — Towers Swing Hard, Page 16; or, see following segment on Cleaning Pedestal Ring Grooves.

Cleaning Pedestal Ring Grooves

If preceding procedures will not correct tower(s) that swing hard, thoroughly clean pedestal ring grooves.

1. Swing towers to one side of machine and bolt towers to mainframe using tower tie bolts.

 **CAUTION:** Failure to properly bolt towers to mainframe could result in operator injury as well as damage machine.

2. Remove upper and lower rear halves of tower ring.
IMPORTANT: Mark each ring's location before removing and note number and location of shims that are between front and rear halves of rings. Rings and shims must be reinstalled in their original locations.
3. Wipe dirt and grease from rings and pedestal ring grooves. Then wipe ring grooves with a solvent soaked rag and wipe dry.
4. Apply grease to pedestal ring grooves.

5. Replace upper rear halves of rings and secure bolts — snug only.

6. Remove tower tie bolts, swing towers to opposite side of machine and reinstall tower tie bolts securing towers to mainframe.

 **CAUTION:** Failure to properly bolt towers to mainframe could result in operator injury as well as damage to machine.

7. Remove upper rear halves of rings and repeat Step 3 on this side of machine.

8. Apply grease to pedestal ring grooves and to rear halves of rings.

9. Replace upper and lower rear halves of tower rings and tighten ring bolts.

IMPORTANT: Rings and shims must be reinstalled in their original position.

10. Apply a small bead of grease between rings and pedestal ring grooves to keep much of the dirt and plastic dust out of the ring area. See preceding information on Tower Rings.

Eliminating Air In Hydraulic System

All air has been removed from hydraulic system at the factory, but if hydraulic system is opened to replace a system component, it is necessary to bleed air from system prior to using it.

Bleeding Air In System At Quick Coupler

1. Separate quick coupler.
2. Place male end of quick coupler in container and hold rag over container and quick coupler.

 **CAUTION:** Wear safety glasses to protect eyes from hydraulic oil in the event it squirts out of container and past the rag.

3. Depress ball check at end of quick coupler against bottom of container.

 **CAUTION:** DO NOT have any pressure on the system when pressing ball check on quick coupler.

4. Press up button on control switch to pump air out of system and continue until only hydraulic oil is being pumped out.
5. Reconnect quick coupler.
6. Refill hydraulic fluid reservoir to within 1" (25mm) of top with SUS215 viscosity 100 degrees F (38 C) 10W hydraulic oil or automatic transmission oil with all other rams or towers fully retracted.

Bleeding Air From System Beyond Quick Coupler

Contact an authorized Chief Automotive Systems, Inc. Service representative.

HYDRAULIC PUMP REMOVAL/INSTALLATION (EZ LINER S21)

Pump Removal

1. Disconnect power supply cord from power supply and pull cord out through top of pedestal opening.
2. Coil remote control switch cord and position it on top of motor as shown in Figure 19.

or

Disconnect remote control switch cord from motor and pull it out through bottom of pedestal.

3. Lift pump out of pedestal.

NOTE: If bolts securing pump to base of pedestal have not previously been removed, remove them. The bolts are only necessary for transporting the EZ Liner.

Top View



Figure 19

(EZ LINER S21)

Pump Installation

1. Set pump into pedestal.

NOTE: It may be necessary to pull up slightly on hose that attaches pump to hose block (see arrow — Figure 20) to prevent it from being pinched under pump.

2. If remote control switch cord was coiled and positioned on top of motor, as shown in Figure 19, route hand-held control unit out through bottom of pedestal.

If remote control switch cord was disconnected for removal purposes, reroute cord at top of pedestal through to bottom of pedestal and reconnect it to motor.

3. Insert power supply cord at top of pedestal, route it through to bottom of pedestal, and plug it into power supply.

4. Position hydraulic lines similar to what is shown in Figure 21.

IMPORTANT: Following installation, recheck position of all hydraulic and electrical lines to be sure they are not pinched under pump.

Top View

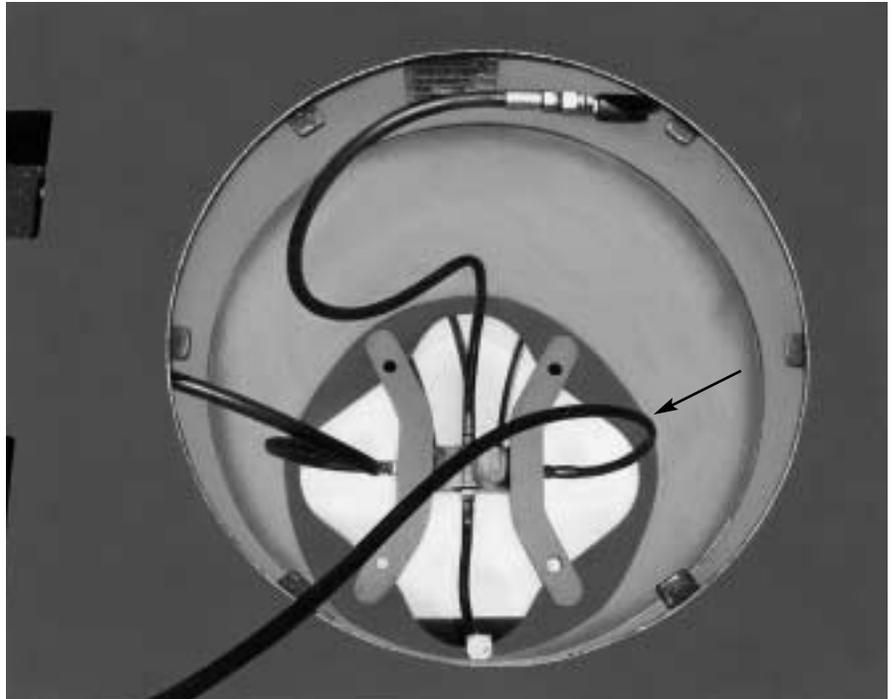


Figure 20

Top View

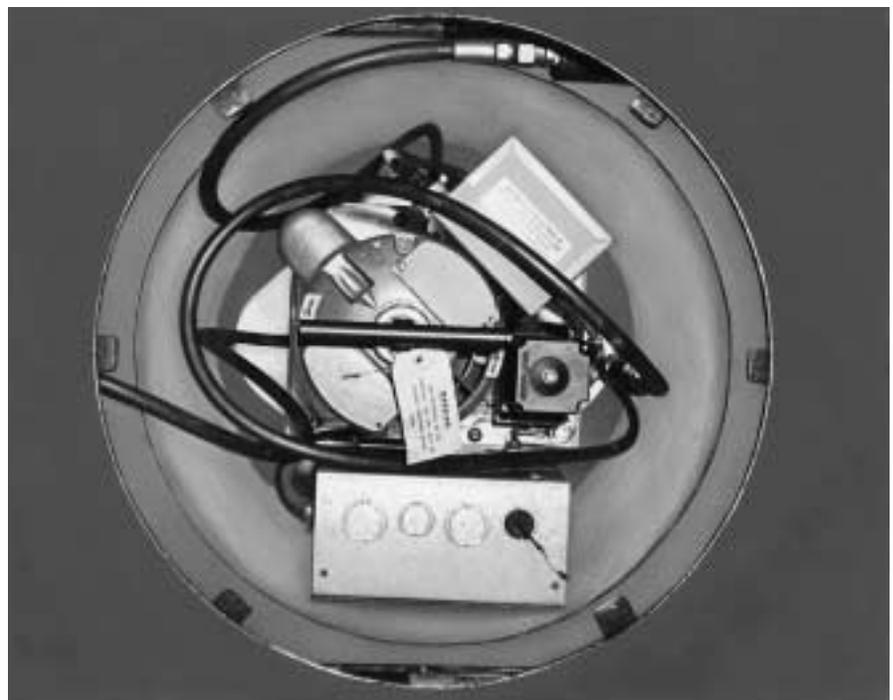


Figure 21

TROUBLESHOOTING

PROBLEM	CAUSE	POSSIBLE SOLUTION
PUMP WILL NOT:		
Run	<p>Bad square D switch.</p> <p>Bad motor starting relay.</p> <p>Power cord disconnected.</p> <p>Poor electrical connector.</p> <p>No power to motor.</p> <p>Circuit breaker tripped or blown fuse.</p> <p>Broken wires in control cord.</p> <p>Bad motor.</p> <p>Bad power cord and/or switch.</p>	<p>Replace square D switch. Contact Chief Automotive Systems Service Representative.</p> <p>Replace motor starting relay. Contact Chief Automotive Systems Service Representative.</p> <p>Plug in power cord.</p> <p>Replace plug or receptacle.</p> <p>Check circuit.</p> <p>Reset circuit breaker or replace fuse.</p> <p>Replace control cord or repair it.</p> <p>Replace motor/pump assembly.</p> <p>Replace power cord and/or switch.</p>
Build pressure or builds pressure slowly.	<p>Hydraulic fluid is low.</p> <p>Bad pin and piston kit or bad low pressure spring.</p> <p>Quick Coupler at shut off valve is loose.</p> <p>Release valve open all the time.</p>	<p>Fill fluid reservoir to within 1" (25mm) of top with SUS215 Viscosity @ 100°F (38C) 10W hydraulic oil or automatic transmission oil with all rams down and machine sitting level.</p> <p>Replace pin and piston kit or low pressure spring. Contact Chief Automotive Service Representative.</p> <p>Tighten Quick Coupler.</p> <p>Contact Chief Automotive Service Representative.</p>
Hold pressure	<p>Contamination in valve.</p> <p>Valve bleeding pressure.</p> <p>Hydraulic oil leak.</p> <p>Faulty check valves.</p>	<p>Operate pump and release pressure several times to flush valve.</p> <p>Flush valve or replace.</p> <p>Check hoses, fittings, and quick couplers, and tighten or replace.</p> <p>Replace internal check valves. Contact Chief Automotive Service Representative.</p>
Operate efficiently under pressure	<p>Extension cord is too long or wire gauge is too small.</p> <p>IMPORTANT: Extension cord usage is not recommended. If used, extension cords must meet standards (listed at right) and be used on a short term basis only.</p> <p>Facility wiring is inadequate.</p>	<p>Use extension cord rated for 25 amps at 120 volts with ground wire up to 25 feet (7.5m) long, or use extension cord rated for 16 amps at 220 volts with ground wire up to 25 feet (7.5m) long.</p> <p>Rewire facility to comply with local electric code. Add dedicated line with 30 amp breaker.</p>
RAM WILL:		
Jump	Air in hydraulic system.	Bleed air from system. See Machine Maintenance, Page 10.
Not Extend	<p>Valve not open.</p> <p>Loose quick coupler.</p> <p>Pump will not build pressure.</p>	<p>Open valve one turn.</p> <p>Tighten quick coupler.</p> <p>See Pump Problems above.</p>
Not Retract	<p>Loose quick coupler.</p> <p>Dirt in quick coupler.</p> <p>Ram piston is bent.</p>	<p>Tighten quick coupler.</p> <p>Disconnect quick coupler and clean male and female halves.</p> <p>Replace ram.</p>
Hydraulic Oil Leakage:	<p>Hose leaking.</p> <p>Loose quick coupler.</p> <p>Loose fitting.</p> <p>Inadequate sealant in pipe threads.</p> <p>Overfilled pump reservoir.</p>	<p>Replace hose.</p> <p>Tighten.</p> <p>Tighten.</p> <p>Apply teflon tape to pipe threads after properly cleaning and retighten.</p> <p>Drain oil to 2" (50mm) below fill cap.</p>

PROBLEM	CAUSE	POSSIBLE SOLUTION
MACHINE WILL NOT:		
Lift	Lift valve not open. Loose quick coupler on lift ram. Other valves open. Too much weight at rear of machine. Vehicle weight exceeds 6,500 lbs. (2925 kg.) capacity. Inadequate hydraulic pressure.	Open lift valve one turn. Tighten. Close all other valves. Move vehicle forward on machine. Do not attempt to load vehicle.
	Object under pedestal.	Check pressure gauge to see if 5000 PSI of hydraulic pressure is being used, and increase pressure if it is not. Lower machine and remove object.
Lower	Lift valve not open. Loose quick coupler on lift ram.	Open lift valve one turn. Tighten.
	Restrictor valve spring has lost some of its strength.	Remove restrictor valve spring located in block next to lift valve, and stretch it slightly. Reinsert spring and try again.
	Object under lift mechanism. Dirt in restrictor swivel orifice.	 CAUTION: Machine must be supported by machine's stiff legs before removing restrictor valve spring. Raise machine and remove object. Disassemble and clean.
Towers:		
Swing Hard	Ring grooves are dirty.	Clean and regrease. See Machine Maintenance, Page 10.
	Bent tower rings.	Repair or replace. Contact Chief Automotive Service Representative.
	Crushed ring bearings.	Replace bearings. Contact Chief Automotive Service Representative.
Jump When Swung	Pedestal is dented.	Repair or replace pedestal. Contact Chief Automotive Service Representative.
To Mainframe Gap Exceeds 7/16 inch (11mm)	Improper use.	Readjust tower. Straighten tower ring. Contact Chief Automotive Service Representative.
Collars Jump:		
Under Load	Improper fit between collar and tower pipe.	Refit collar. Contact Chief Automotive Service Representative.
When Pressure Is Released	Defective surge valve.	Replace surge valve. Contact Chief Automotive Service Representative.
	Improper fit between collar and tower pipe.	Refit collar. Contact Chief Automotive Service Representative.

FOR ADDITIONAL TROUBLESHOOTING INFORMATION OR A SERVICE ENGINEER, CONTACT CHIEF AUTOMOTIVE SYSTEMS, INC., 1-800-445-9262 (TOLL FREE).

PARTS INFORMATION

To order replacement parts for a Chief EZ Liner system, refer to a Chief EZ Liner S21 Parts Manual (Part No. 683659) and then contact Chief Automotive Systems, Inc. 800-445-9262. (If outside the United States, contact nearest Chief Automotive Systems, Inc. representative.)

The numbers and drawings in the EZ Liner S21 Parts Manual represent those parts that an owner might install. For part numbers not listed, contact Chief Automotive Systems, Inc.

NOTE: The tower components identified on page 3 of the parts manual relate to S21 front towers only. For parts information relating to rear towers, refer to Auxiliary Tower Owners Manual (Part No. 693882) for specific information.

When contacting Chief Automotive Systems, Inc. by telephone or mail, provide the following information: name, name of shop, shop telephone number, and shop address. Additional information needed when ordering: description of part(s) and part number(s). Also indicate the EZ Liner Model for which the part is intended.

NOTE: Chief reserves the right to alter product specifications and/or package components without notice.

 **CAUTION:** Always use Chief authorized parts (or equivalent) with the EZ Liner system. If replacing electrical and hydraulic components, bolts/fasteners and/or chain, make certain the parts meet the following standards (minimum requirements).

Electrical Components

All electrical components must be replaced with Chief authorized parts or their equivalent and be UL approved.

The three-wire power cord and the four-wire remote control switch cord must be 12 gauge minimum in lengths equal to factory installed cords.

Hydraulic Hoses

All hydraulic components must be replaced with Chief authorized parts or their equivalent.

The two-wire braid 1/4 inch (6.3mm) inner diameter hydraulic hoses must have a minimum burst pressure of 20,000 psi (1400 bar) and a minimum working pressure of 5,000 psi (350 bar) (as per SAE Standard 100 R2A). They must be in lengths equal to factory installed hoses.

Bolts/Fasteners

All bolts and fasteners must be replaced with Chief authorized parts or their equivalent and must not be less than Grade 5 (Class 8.8).

Any bolt used in a **pulling clamp** that is frequently tightened must be a Grade 8 (Class 10.9).

All bolt lengths and diameters must be equal to those installed at the factory.

Chain

All **S21 tower and accessory chains** must be replaced with Chief authorized chain or an equivalent.

Front tower chain must be NACM Grade 80 1/2 inch (13mm) alloy chain, proof tested to 28,000 pounds (112kN) and have a workload of 14,000 pounds (63kN). It must be in a length and size equal to factory installed chain.

Rear tower chain and all accessory chain must be NACM Grade 80 3/8 inch (10mm) alloy chain, proof tested to 20,000 pounds (90kN) and have a workload of 10,000 pounds (45kN). They must be in a length and size equal to factory installed chain.

 **CAUTION:** DO NOT use EZ Liner S21 rear tower chain (3/8-12 with hook) on EZ Liner S21 front towers.

Labels

CAUTION, WARNING and OTHER Labels — Replacement labels are available and some labels are also available in some foreign languages. To order, contact Chief Automotive Systems, Inc. 800-445-9262.

EZ Liner S21 Specifications

Weight (30 Series).....	7,000 lbs. (3,175 k.g.)
Weight (31 Series).....	7,588 lbs. (3,442 k.g.)
Weight (32 Series).....	8,033 lbs. (3,644 k.g.)
Power Required.....	120v, 15 amp, 60 hz.
Hydraulic Power.....	10 tons per tower (89 kN)
Hydraulic Fluid.....	9.5L SUS215 Viscosity, 100° F (38C), 10W
Controls.....	One hand-held unit on 21' (6.4m) of cord
Length.....	21' 8" (6.6m) (safety ramps included)
	23' 1" (7m) maximum length with front towers extended
	24' 3" (7.39m) with front and rear towers extended
Width.....	7'4" (2.23m)
	12' 10" (3.9m) with front towers extended to both sides
	14' 4" (4.4m) with front and rear towers extended to both sides
Height.....	8'5" (2.56m)
	9'3" (2.82m) with tower rams extended up
Clearance.....	2' (.6m) recommended on all sides
Working Height.....	31" (.79m) from floor to top of mainframe
Tie Down Openings....	250
Lift Capacity.....	6,500 lbs. (2,950 k.g.)
Sound Pressure Level at Control Position.....	81 dB(A)



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