

- Saws and drills must be guarded properly.
- Mesh-guarding (minimum of 1/2-inch opening) must be in place around the belts of compressors.
- Tool rests, upper tongue-guarding and transparent spark shields must be on each bench grinder.
- Pipe benders require guarding at four separate locations: bumper die area, gate pinch-point zone, swage box and the adjustable-collar area.

### 10.3 Safety With Common Shop Equipment

Misuse of common shop equipment can lead to serious injuries. Here are just some of the ways you can prevent these injuries:

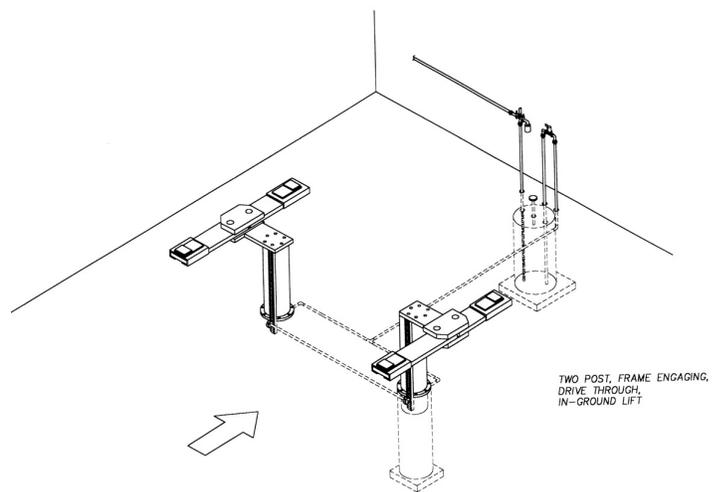
#### 10.3.1 AUTOMOTIVE LIFTS

Federal OSHA does not specifically include automotive lifts in their regulations. Some states mention automotive lifts in their regulations but typically the standards referenced are not current. Be advised that local Federal and State OSHA inspectors often exercise their broad range of authority by issuing citations based upon the General Duty Clause, in instances where the inspector feels that conditions or practices relating to automotive lifts are unsafe for the employee. In such cases, the generic safety materials described in this section are usually “suggested” by the inspector for consideration for adoption by the employer in order to comply with the General Duty Clause as it pertains to automotive lifts.

##### 10.3.1.1 Types of Automotive Lifts

###### In-Ground Lifts

Lifts with lifting assemblies situated below the garage floor are known as in-ground lifts. These lifts employ one or more pistons, depending on the type of vehicle and how much weight is to be lifted. For instance, one or two pistons (arranged side-by-side) may lift passenger



cars, vans and light trucks, where two or more pistons (arranged fore-and-aft) may be required to lift larger vehicles such as trucks, transit coaches and fire engines.

In-ground lifts are powered in one of the following ways:

- Self-contained air/oil reservoir (semi-hydraulic)
- Separate air/oil reservoir (full hydraulic)
- Electric-hydraulic pumping unit which supplies oil under pressure without the use of air pressure

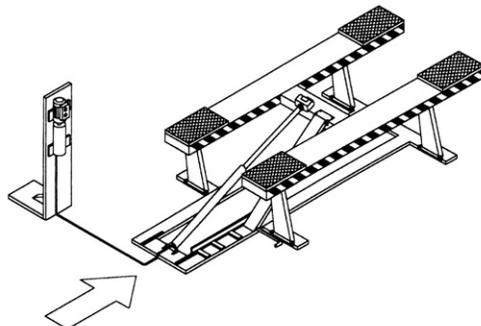
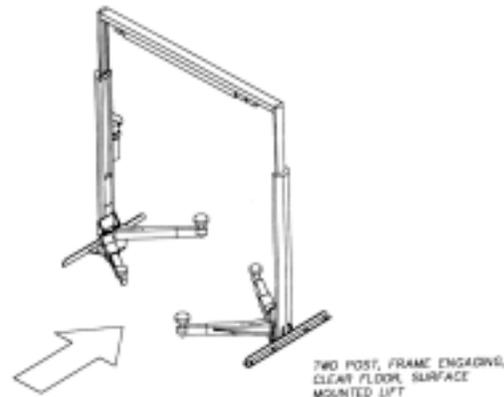
In-ground lifts are made to conform to almost any type of vehicle. They are either:

- **Drive-through** – allowing the vehicle to be driven between the lift arms permitting easy access to the underside of the vehicle.
- **Drive-over** – allowing the vehicle to be driven over the lift without contacting the lift's components.
- **Drive-on** – allowing the vehicle to be driven onto runways.

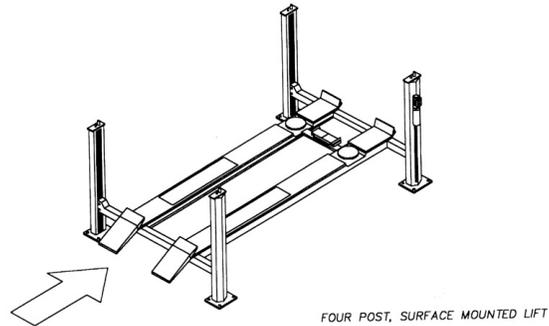
### Surface-mounted Lifts

Surface-mounted lifts are anchored to the concrete garage floor and are powered by an electric motor, which operates either a hydraulic pump and cylinder(s) or a screw-type drive. These are the following types of surface-mounted lifts.

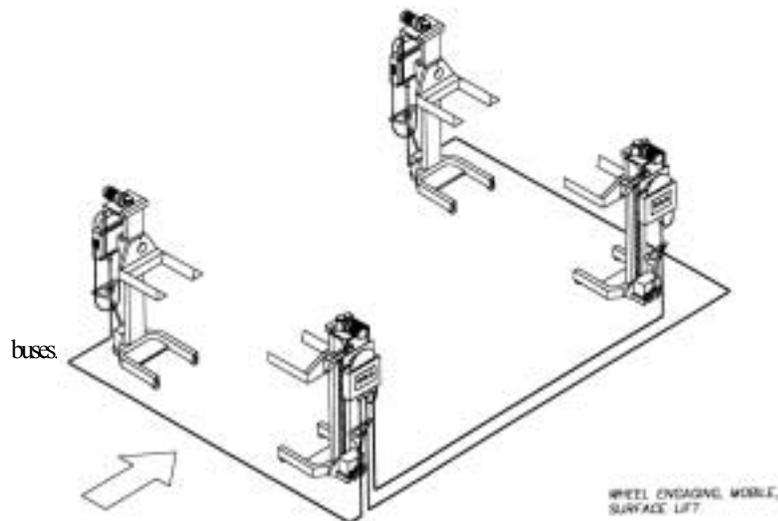
- **Two-column drive-through, frame-engaging** – the lift arms ride up each column and are usually synchronized mechanically, hydraulically, or electronically. These lifts are the most common in use today.
- **Screw lifts** – the lift uses rotating screw pillars that move the lift arms. (29CFR, 1910.219)
- **Short-rise** – the lift is powered by an electric hydraulic power unit or by compressor air. These lifts are used primarily for tire and brake service and auto body repair.



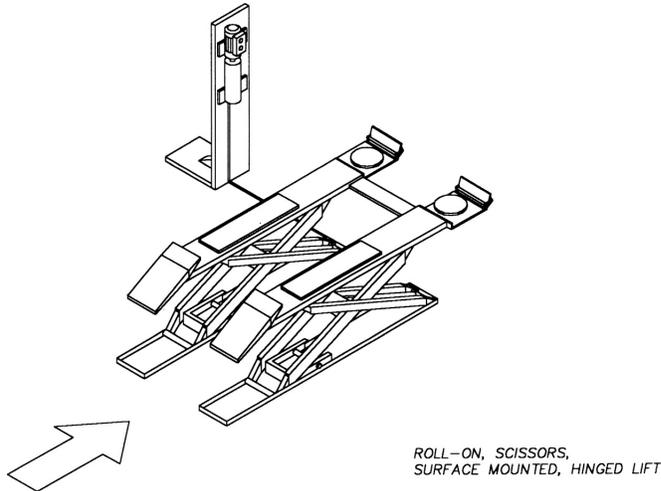
- **Four-column** – the lift allows the vehicle to be driven onto two runways and lifted by its tires. This lift is often used by muffler, oil change and transmission shops and shops providing wheel alignment. (29CFR, 1910.21-1910.32)



- **Moveable-type wheel engaging** – each of the lifting columns is mobile and contains an electric power unit interconnected with other columns. A master control unit synchronizes the lifts so they operate in unison. This lift is used primarily with long wheel-base vehicles such heavy trucks and transit buses.



- **Parallelogram-Style** – the lift uses two runways to lift the vehicle. The lifting mechanism moves the vehicle a short distance fore or aft when lifting or lowering the vehicle depending on how the lift is mounted. These lifts operate in the same way as the short-rise lift. (29CFR, 1910.212)



**Scissors** – the lift is either a drive-on or a fixed pad/underbody engaging with a lifting mechanism similar to the parallelogram lift. However, this lift raises and lowers the vehicle in a straight vertical direction. (29CFR, 1910.212)

### 10.3.1.2 Safety Awareness

Read all lift safety materials supplied to you and your employer. The following documents should have been furnished to you with the lift when it was purchased.

- **Specific Operating, Inspection and Maintenance Requirements.** This document should have been furnished by the lift manufacturer.
- **Generic Operating, Inspection and Maintenance Requirements.** This document usually comprises ANSI/ALI ALOIM-2000, Standard for Automotive Lifts – Safety Requirements for Operation, Inspection and Maintenance.
- **Lifting Point Information for Frame-Engaging Lifts.** This document usually comprises ALI/LP-Guide, Quick Reference Guide, Vehicle Lifting Points for Frame Engaging Lifts, (Domestic and Imported Cars and Light Trucks).
- **Generic Safety Manual.** This document usually comprises ALI/SM93.1 Lifting It Right (safety manual).
- **Safety Tips Card.** This document usually comprises ALI/ST90 Safety Tips (card)

Additionally, a series of **Uniform Warning Labels**, or placards, showing and describing Warnings, Cautions and Safety Instructions should be posted on all lifts. If your lift does not have these labels or, if they are in need of replacement, contact the lift manufacturer to obtain the appropriate labels or placards for your lift. These labels or placards usually comprise one of the following sets, ALI/WL101, ALI/WL200, ALI/WL300, ALI/WL400, ALI/WL500 and ALI/WL600.

In addition to the safety materials described above there are American National Standards describing the manufacture, installation and service of your lift, they are:

- ANSI/ALI ALCTV-1998, Standard for Automotive Lifts - Safety Requirements for the Construction, Testing and Validation.
- ANSI/ALI ALIS-2000, Standard for Automotive Lifts - Safety Requirements for the Installation and Service.

### **10.3.1.3 Recommended Safety Practices**

The following identify many of the recommended safety practices. You will find more detail later in this section.

- Customers and bystanders should not be in the lift area.
- Do not allow anyone to ride on the lift or in the vehicle when raising or lowering.
- Automotive lifts should only be operated by trained personnel. If you do not know how to position or lift a vehicle properly, ask for training.
- Equipment-operating and safety-related instructions should be posted on the lift or be available in the service bay area.
- Inspect the lift for broken or damaged parts, particularly those components that contact and support the vehicle. If damaged or broken, report the problems to your shop manager. Do not use the lift until it has been repaired.
- Be sure all electrical wiring to your lift meets local electrical codes.
- Before driving a car or truck into the shop bay, be sure the area is free of grease and oil, tools, cords and hoses, trash and any other debris.
- Lift-operating controls must be “deadman” type, (return to off or neutral when released). Do not override this feature.
- Be sure lift locking latches are in good working order.
- Do not permit technicians to go under a vehicle if lift-locking latches are not set to engage. If using lifts that are equipped with locking latches that engage only at full rise, be sure to use vehicle support stands to support the lift and vehicle if the lift is not raised to full rise.
- Post the capacity rating on each lift. Never overload your lift.
- Before driving the vehicle into the lift, position arms and supports to provide unobstructed clearance. Do not hit or run over lift arms, adapters, or axle supports.
- Load the vehicle on the lift carefully. Position lift supports to contact at the vehicle manufacturer’s recommended lifting points. Raise lift until supports contact the vehicle. Check supports for secure contact with vehicle. CAUTION: If you are working under the vehicle, the lift should be raised high enough for the locking device to be engaged.
- With some vehicles, the removal (or installation) of components may cause a critical shift in the center of gravity, and result in raised vehicle instability. Be sure to use vehicle support stands to stabilize the vehicle.
- Before lowering lift, be sure tool boxes, stands, etc. are removed from under the vehicle. Release locking devices before attempting to lower the lift.

- Before removing the vehicle from the lift, position the lift arms and supports to provide an unobstructed exit.

### 10.3.1.2 Lift Capacity

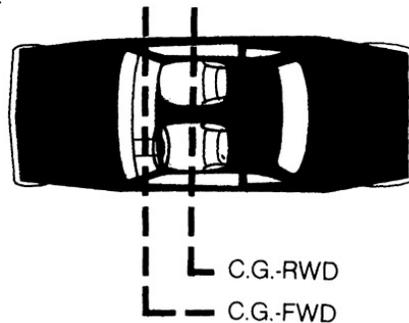
Never overload your lift. The lift's capacity should be posted on the lift. If it is missing or is not readable, check with the lift manufacturer or the service representative.

### 10.3.1.3 Spotting the Vehicle

Spotting the vehicle is a critical step in the lifting process. Depending on the type of lift your shop uses, lifting techniques will vary. Refer to the vehicle manufacturer's instructions or to the lifting point information furnished with the lift.

### 10.3.1.6 Center of Gravity

Before lifting any vehicle, you need to know the vehicle's center of gravity. This is the point between the front and rear of the vehicle where the weight is distributed equally. Each vehicle will have a different center of gravity due to weight distribution, wheel-base, location of drive train, and other factors such as cargo. On rear-wheel drive (RWD) passenger cars, the center of gravity is generally below the driver's seat. On front wheel drive (FWD) passenger cars, generally the center of gravity is slightly in front of the driver's seat.



Before lifting the vehicle, check the manufacturers recommended lifting points. Beginning with some 1994 year models, automobile manufactures have physically identified their recommended lift points on the frame or on the body panel, and by placing a label on the vehicle.

### 10.3.1.7 Lifting the Vehicle

The following explains the basic steps required to lift a vehicle. Refer to the manufacturer's instruction for the type of lift used in your shop for specific instructions.

1. Spot the vehicle properly.
2. Raise the lift until the pads or other supports contact the vehicle. Be sure to stay in control of the lift while it is in motion. Do not block open or override the self-closing feature of the lift controls.
3. Check to see that the supports are contacting the recommended lifting points securely.
4. Raise the vehicle about a foot off the ground.
5. Shake it by moderately pushing on the rear or front bumper.
6. Check the lifting points again. If the supports appear to be slipping or are not contacting a flat surface, you've positioned a lift arm or other support incorrectly. Lower the lift and start over.
7. If a support is not firmly touching a contact point, lower the vehicle and reposition each support.
8. Once the load is secure, lift the vehicle to the desired height.
9. Check the contact points once more before going under the vehicle.

If the lift does not have a locking device or is below the point where the locking device engages, place four vehicle support stands under the vehicle's frame or suspension for support.

When using moveable-type wheel engaging lifts, always use four vehicle support stands to support the load. These stands should support twice the weight capacity of the lift. Do not support vehicles with air bag suspensions using vehicle support stands alone.

#### **10.3.1.8 Maintaining Load Stability**

Once the vehicle is lifted and positioned securely, it is important to make sure the vehicle stays that way. If there's a sudden shift in the center of gravity, the car could become unstable and fall. The following are some of the possible causes of a sudden shift.

#### **10.3.1.9 Removing Components**

Removing components from the vehicle may cause a change the vehicle's center of gravity. For instance, if the transmission weighing approximately 150-200 pounds is removed, the center of gravity will change. The following lists some of the major components that may cause a sudden change in gravity.

- Engines
- Transmissions
- Suspension components
- Rear axles and differentials
- Body and frame components

Use four vehicle support stands to stabilize and equalize the load if you plan to remove any of these components. Adjust the support stands to securely contact the

vehicle. **Never try to lower the vehicle onto the stands. Doing this disengages the lift's locking devices. If the lift is lowered too far or too quickly, the vehicle support stands could move, causing the vehicle to fall.**

Never use engine stands, transmission jacks or auxiliary stands in place of vehicle support stands. These devices are not capable of supporting the vehicle.

### **Using Cheaters**

Another common cause of a sudden shift in gravity is torquing or loosening fasteners with a cheater or breaker bar. The sudden pushing or pulling force could cause a slip from the lift's supports. To avoid this, tighten and loosen fasteners with an impact wrench.

### **Stored Energy**

An unexpected release of stored energy, such as removal of a loaded spring or load-supporting bolt, can cause components to shift position and change the center of gravity.

### **Unequal Loads**

The center of gravity may change depending on the load the vehicle is carrying (tradesmen's trucks or heavy material in the trunk, for example). Use four vehicle support stands to support unequal loads. Be sure the vehicle with its cargo does not exceed the capacity of the lift.

#### **10.3.1.10 If a Vehicle Should Fall**

If there is any indication that a vehicle on a lift is going to fall, get out of the way fast. Do not attempt to save it. Warn others who are in the area. Run in the opposite direction, but not toward a wall, workbench or other area that may trap you.

#### **10.3.1.14 Lowering the Vehicle**

Before lowering the vehicle remove all obstructions from under the vehicle, such as tool boxes, vehicle support stands, engine stands and transmission jacks. **This is especially important when using the parallelogram or scissors lifts. If anything gets caught in the lifting mechanisms, the lift could be damaged or materials could be thrown, injuring you or someone else.**

Be sure that everyone is clear of the lift before and while lowering the vehicle. Do not block open or override the self-closing feature of the lift controls. If you're using moveable-type wheel-engaging lifts, make sure each lift column is lowered at the same rate. Before removing the vehicle from the work bay, retract lift arms and supports to provide a safe and unobstructed exit. Contact pads and fork arms should be in their lowest position. If you're using frame contact extenders, remove

them before backing the vehicle out.

### **10.3.1.15 Maintaining the Lift (29CFR, 1910.147)**

Part of lift safety is daily maintenance. If it malfunctions or is damaged, it should not be used. Qualified lift service personnel should make repairs. The following addresses moving parts and drive systems of automotive lifts and what maintenance is required. For more detail refer to ANSI/ALI ALOIM-2000, Standard for Automotive Lifts – Safety Requirements for Operation, Inspection and Maintenance.

### **Telescoping Lift Arms (29CFR, 1910.144)**

Telescoping lift arms are found on frame-contact lifts. They are adjustable in order to accommodate different vehicle types and sizes. To maintain the lift arms, you must periodically:

- Check the over-travel stops for wear.
- Watch for stress cracks or breaks in welds and casting.
- Examine arms for permanent bending.
- Lubricate swivel points.
- Inspect all lift adapters and extenders before using them.
- Replace defective parts with original equipment.
- Do not heat and/or re-bend damaged arms or weld cracks.
- Do not modify the lift with components not approved by the lift manufacturer.

### **Chains and Cables**

Chains and cables are used mainly on surface-mounted lifts as a means of lifting and synchronization. Chains and cables are also used to synchronize the movement of pistons on some in-ground lifts. Below is a list of maintenance points:

- Check chains and/or cables for unusual stretch or wear.
- Lubricate chains and cables.
- Inspect end connections for corrosion or fatigue, excessive wear, connection hole elongation, or deformation.
- Check sprockets and pulleys for wear and damage.
- Examine coatings and sheaths on cables for wear.
- Be sure slack sensors are working correctly (if equipped).
- Keep salt, sand, water, dirt, and other debris away from the lift.
- Inform your supervisor of any damage you find.
- Have cables replaced if:
  - the cable is deformed, kinked, corroded, or excessively worn
  - the cable diameter is reduced
  - there are any broken, cut, bent, or crushed wires
  - the cable is contaminated with foreign materials
  - the end connections are damaged or worn
  - there is a sudden increase in slack
- Have the chain system serviced if:

- there is excessive wear on links, pins, or sides of sprockets or guides
- there is an increase in slack
- end connections are suspected of damage or wear
- chains are deformed, bent, rusted, or broken
- chains are contaminated with foreign materials

### Air/Oil Systems

Air is compressible. When under pressure, it can be dangerous. Remember the following points:

- The lift operator must be in control of the lift while in motion.
- Always exhaust all system pressure completely before inspecting the lift. Maintenance should be performed to comply with OSHA 1910.147.
- Comply with the manufacturer's recommendations for checking and adding hydraulic oil to the unit.
- Before removing the fill plug, re-check to be sure the air valve is in the exhaust position and all air in the tank is released. **Do not use impact tools to remove fill plugs.**
- Use the type oil specified by the lift manufacturer.
- If the lift is equipped with a low oil control, be sure it's operating properly.
- Use caution when removing other plugs, fittings, and connections. If you hear any escaping air or see liquid seeping around the plug, **stop immediately** and release the stored pressure in the system.
- Keep filters and magnets clean.
- Check seals, packing, and wipers periodically.
- Make sure the return lines to the reservoir are tightly connected and aren't leaking or damaged.
- Watch for blow-by and oil leaks in the cylinder housing, and check for nicks and dings in the piston rod or plunger.

### Surface-mounted Systems

Most surface-mounted lifts use electrically powered hydraulic cylinder(s) or screw-type drives. Main concerns are:

- The lift operator must be in control of the lift while in motion.
- Do not exceed the load capacity.
- Maintain gearboxes, v-belt, timing belt or chain drives, if any.
- Check, clean, maintain, and lubricate drive screw and nut systems on screw-type lifts.
- Make sure the safety nut is working properly on screw-type lifts.
- Maintain hydraulic oil level in the unit.
- Maintain proper adjustment of equalizer cables.
- Maintain load sliding or rolling bearings.

### Special Load-bearing Components

Follow the manufacturer's instructions for checking and lubricating load bearings, rollers, and slide blocks. Refer to the manufacturer's recommendations for checking

and torquing floor anchors and superstructure connectors.

This section was developed by Frederick G. Heath of Heath and Associates through the sponsorship of the Automotive Lift Institute. The generic materials referenced in this section, along with a video presentation of the safety manual "Lifting-It-Right", are available from:

<p style="text-align: center;"><b>Automotive Lift Institute</b> PO Box 33116 Indialantic, FL 32903-3116 Tel. 407-722-9993 Fax. 407-722-9931 Eml. <a href="mailto:Autolift@iu.net">Autolift@iu.net</a> For more information go to: <a href="http://www.autolift.org">http://www.autolift.org</a></p>
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### 10.3.2 OTHER LIFTING EQUIPMENT

There are many other types of lifting equipment and support devices normally found in automotive service garage environments. As with Automotive Lifts discussed above, there is no specific coverage found in the OSHA regulations for these devices.

#### 10.3.2.1 Types of Other Lifting Equipment and Support Devices

- Hydraulic Hand Jacks
- Transmission Jacks
- Engine Stands
- Vehicle Support Stands
- Mechanical Screw Jacks
- Mechanical Bumper Jacks
- Mechanical Scissors Jacks
- Mechanical Frame Jacks
- Upright Type Mobile Lifts
- Service Jacks
- Wheel Dollies
- Shop Cranes
- Swing Type Mobile Lifts
- Scissors Type Mobile Lifts
- Auxiliary Stands
- Automotive Ramps
- High Reach Supplementary Stands

#### 10.3.2.2 Safety Awareness

Most of the equipment that is described above incorporates simple operating and maintenance instructions either on the packaging that protected the equipment at the time of purchase or, many times these instructions are also placed loose inside the box. It is important that the purchaser keep the instructions for guidance in safe operation and for future reference in the event of a need for repair.

### 10.3.2.3 Recommended Safety Practices

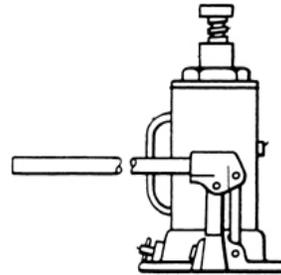
The recommended safety practices are grouped according to the type of the particular device. Failure to adopt these practices may result in property damage or personal injury.

#### All Listed Types

- Read and understand the instructions before operating.
- Inspect the device before each use.
- Seek qualified service if the device is subjected to abnormal loads or shock loads.
- Remove damaged devices from service until repaired.
- Make no alterations to the device.
- Do not exceed rated capacity.
- Use only on hard, level surfaces.
- Use only adapters or attachments supplied by the device manufacturer.

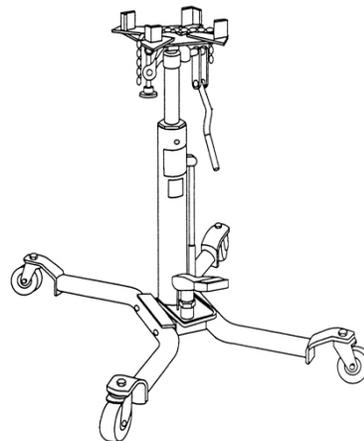
#### Hydraulic Hand Jacks

- Do not go under a vehicle when supported only by the jack.
- Lift vehicles only at the point recommended by the vehicle manufacturer.
- Lower the load slowly.
- Stay clear of load when lowering.



#### Transmission Jacks

- Support the raised vehicle before beginning work.
- When using transmission jacks with frame engaging lifts, maintain good contact between vehicle and supports.
- Limit the use to removal and installation of transmissions, transaxles and transfer cases.
- Do not use to support or stabilize raised vehicle.
- Lower the load before moving.
- Lower the load slowly.
- Stay clear of load when lowering.



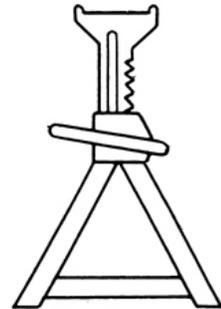
### Engine Stands

- Lock mounting plate before applying load.
- Make sure load is centered and secured to mounting attachments.
- Avoid off center loads that may rotate when the locking device is released.
- Release locking device slowly and carefully.



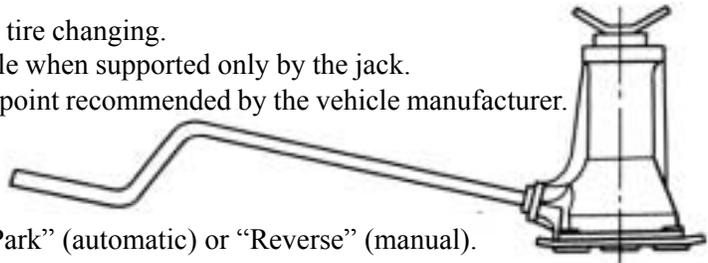
### Vehicle Support Stands

- Center load on saddles.
- Only use in pairs to support one end of a vehicle.
- Do not use two pairs to support both ends of a vehicle.
- Do not use a pair to support one side of vehicle.



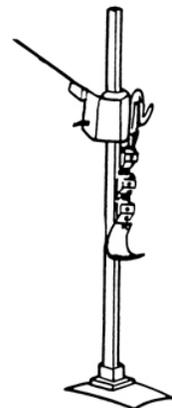
### Mechanical Screw Jacks

- Use only for emergency tire changing.
- Do not go under a vehicle when supported only by the jack.
- Lift vehicles only at the point recommended by the vehicle manufacturer.
- Turn off ignition.
- Set parking brake.
- Turn on hazard signals.
- Place transmission in “Park” (automatic) or “Reverse” (manual).
- Chock the diagonally opposite wheel in front and rear.
- Follow tire changing procedure of vehicle manufacturer.



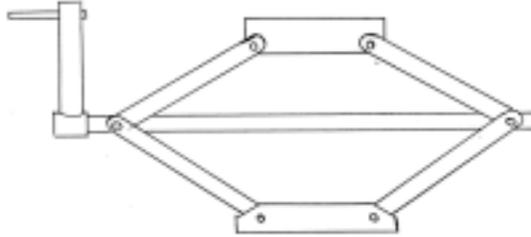
### Mechanical Bumper Jacks

- Use only for emergency tire changing.
- Do not go under a vehicle when supported only by the jack.
- Lift vehicles only at the point recommended by the vehicle manufacturer.
- Turn off ignition.
- Set parking brake.
- Turn on hazard signals.
- Place transmission in “Park” (automatic) or “Reverse” (manual).
- Chock the diagonally opposite wheel in front and rear.
- Follow tire changing procedure of vehicle manufacturer.



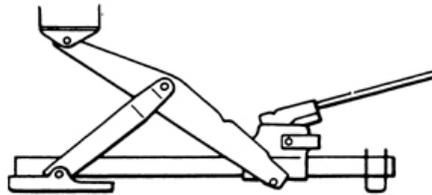
### Mechanical Scissors Jacks

- Use only for emergency tire changing.
- Do not go under a vehicle when supported only by the jack.
- Lift vehicles only at the point recommended by the vehicle manufacturer.
- Turn off ignition.
- Set parking brake.
- Turn on hazard signals.
- Place transmission in “Park” (automatic) or “Reverse” (manual).
- Chock the diagonally opposite wheel in front and rear.
- Follow tire changing procedure of vehicle manufacturer.



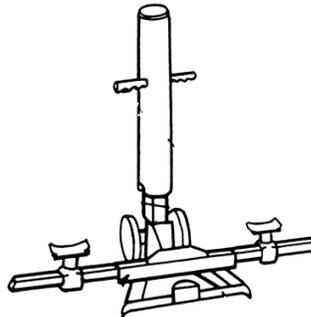
### Mechanical Frame Jacks

- Use only for emergency tire changing.
- Do not go under a vehicle when supported only by the jack.
- Lift vehicles only at the point recommended by the vehicle manufacturer.
- Turn off ignition.
- Set parking brake.
- Turn on hazard signals.
- Place transmission in “Park” (automatic) or “Reverse” (manual).
- Chock the diagonally opposite wheel in front and rear.
- Follow tire changing procedure of vehicle manufacturer.



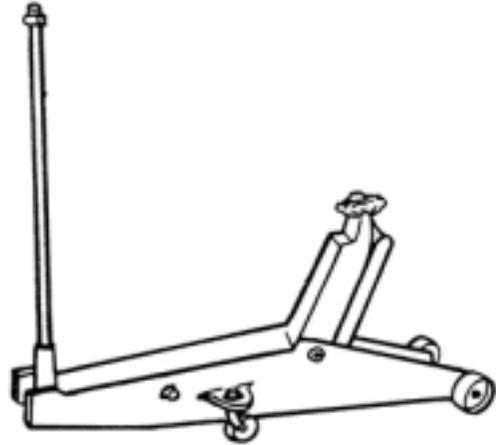
### Upright Type Mobile Lifts

- Load saddles equally.
- Do not go under a vehicle when supported only by the lift.
- Lift vehicles only at the point recommended by the vehicle manufacturer.
- Lower the load slowly.
- Stay clear of load when lowering.



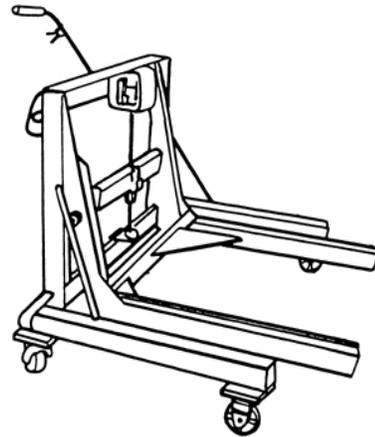
### Service Jacks

- Do not go under a vehicle when supported only by the jack.
- Do not move jack while loaded.
- Lift vehicles only at the point recommended by the vehicle manufacturer.
- Lower the load slowly.
- Stay clear of load when lowering.



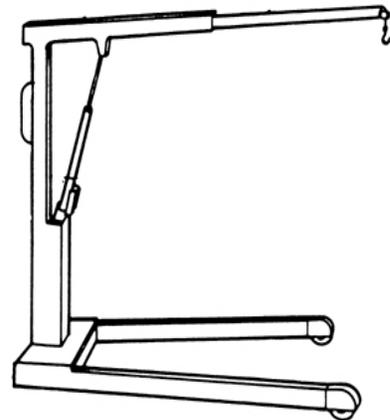
### Wheel Dollies

- Lower load to lowest position before moving.
- Apply load as close as possible to the vertical part of the lifting member.
- Secure load with restraint device before moving.
- Lower the load slowly.
- Stay clear of load when lowering.



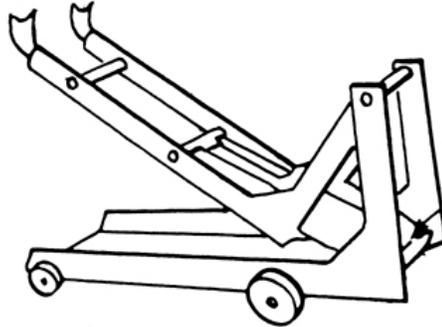
### Shop Cranes

- When removing an engine, roll the crane straight back to clear the radiator/grill and lower the load immediately.
- Lower load to lowest position before moving.
- Use slings or chains with a capacity equal to or greater than the crane.
- Do not allow load to swing freely.
- Lower the load slowly.
- Stay clear of load when lowering.



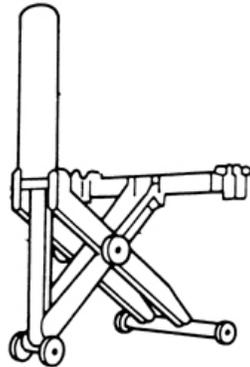
### Swing Type Mobile Lifts

- Load saddles equally.
- Do not go under a vehicle when supported only by the lift.
- Lift vehicles only at the point recommended by the vehicle manufacturer.
- Lower the load slowly.
- Stay clear of load when lowering.



### Scissors Type Mobile Lifts

- Load saddles equally.
- Do not go under a vehicle when supported only by the lift.
- Lift vehicles only at the point recommended by the vehicle manufacturer.
- Lower the load slowly.
- Stay clear of load when lowering.



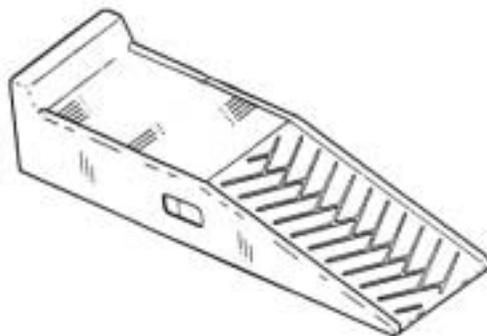
### Auxiliary Stands

- Support the raised vehicle before beginning work.
- Do not use to support or stabilize raised vehicle.
- Use only for partial support of vehicle components during removal or installation.
- Center load on saddle.



### Automotive Ramps

- Center load between sides of ramp.
- Only use in pairs to support one end of a vehicle.
- Do not use two pairs to support both ends of a vehicle.
- Do not use a pair to support one side of vehicle.
- Do not use on tires that are wider than the ramp support platform.



- Do not use other lifting equipment while vehicle is supported by ramps.
- Do not disconnect brakes, engine, transmission, drive train components or wheels while vehicle is supported by ramps.
- Align the ramps with the wheels before entering with the vehicle.
- Use an observer to guide the vehicle operator.
- Stand clear while guiding the vehicle operator.
- Proceed slowly and cautiously.
- Do not accelerate or apply brakes suddenly.
- When vehicle reaches ramp top, apply brakes only to prevent overtravel.
- Check stability by placing transmission in neutral and releasing brakes. Vehicle should not move.
- Turn off ignition.
- Set parking brake.
- Place transmission in “Park” (automatic) or “Reverse” (manual).
- Chock both wheels on the ground in front and rear.
- Check position of tires in ramp support platforms.
- Check stability by shaking vehicle sideways and endways.
- Check integrity of ramps after loading.

#### High Reach Supplementary Stands

- Center load on saddle.
- Do not use stands to support a raised vehicle.
- Use stands in pairs to stabilize a raised vehicle before starting work.



#### 10.3.2.4 Maintaining the Equipment

Part of lifting equipment safety is regular maintenance. If the particular device malfunctions or is damaged, it should not be used. Qualified service personnel should make repairs. Worn, damaged or bent components of these devices should be cause for removal from service. Do not use hydraulic or pneumatic equipment that is leaking.

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## Lift Accidents- A Case Study

### **What Good Are Standards?**

By Frederick G. Heath

Standards for manufactured products provide a welcomed accountability to the marketplace and make purchasing decisions easier – or do they?

Responsible trade associations comprised of manufacturers and sometimes distributors of competitive products develop standards for products offered by the members of the trade association. The American National Standards Institute (ANSI), an independent accreditation and standards approval authority, assures that all materially affected parties review the standards and that all issues are resolved in an equitable manner.

### STANDARDS CAN BE GOOD FOR MANUFACTURERS

Standards can level the playing field for manufacturers by setting a benchmark for performance. This also may reduce the risk of product liability lawsuits and help lower product liability insurance costs.

### STANDARDS CAN BE GOOD FOR PURCHASERS

Requiring conformity to standards can mean that all bids will be of comparable quality and performance. The purchase of a conforming product assures the purchaser that the product is state of the art and performs to industry standards.

### WHAT'S THE CATCH?

As a purchaser, you can require that bidders offer products that conform to a relevant standard, BUT...

How do you know that all sellers are offering conforming products? How confident do you feel that you are getting what you paid for? Do you have the time or the expertise to make these determinations?

The following case study illustrates what can happen even when the purchaser requires bidders to meet American National Standard guidelines.

### A CASE IN POINT

A school district in a city of several million people owned a large fleet of school busses. The fleet was large enough, and the geographical distribution was wide enough, that the school district operated multiple service facilities.

A cost study performed showed that the installation of automotive service lifts could save a significant amount of labor. The school district decided to purchase automotive lifts for each facility based on a competitive bid.

The purchasing agent handling the bid, not surprisingly, knew little about automotive lifts. All the agent had to go on was:

- That the lifts should be of the drive-on ramp style
- They should be long enough to accommodate the bus with the longest wheelbase in the fleet
- They should have a lifting capacity adequate to lift the heaviest bus in the fleet

The purchasing agent asked one of his automotive service tool suppliers who might supply the school district with automotive lifts. Armed with several potential sources, the purchasing agent interviewed a few of the prospective sellers of automotive lifts.

The purchasing agent prepared a public invitation for bid that required that the automotive lifts comply with the American National Standard in effect at that time. The purchasing agent actually added the model number of the lift offered by the preferred provider as an example of a lift that would satisfy the school district requirements and meet the American National Standard. The purchasing agent also properly added the phrase “or equal” to the invitation for bid, thinking that this would encourage competitive bidding.

When the bids were opened, all of the bidders claimed that their products were compliant with the American National Standard, and all of the bidders claimed that their products were equivalent to the model selected and met the length and weight requirements.

The choice appeared to be simple – select the bidder with the lowest price. The low bidder, however, was an unfamiliar company. The purchasing agent appropriately asked the low bidder to confirm that the lifts were compliant with the specifications, compliant with the American National Standard and equal to the preferred model specified. The company confirmed the specifications and the purchasing agent made the purchase.

Maintenance workers soon encountered problems with the pneumatic lift latch release systems. Although the systems complied with the bid specifications, they were flimsy and soon ceased to operate. The school board decided to remove the latch release systems because the latches would still function automatically by gravity actuation when raising the

load, and the operators could simply disengage the latches manually when they wished to lower the load.

After several years of use, an operator had raised one of the lifts with a bus in position for an oil change. After the operator was certain the latches had engaged, he went under the bus and applied his wrench to the oil drain plug. As he was turning his wrench, he heard two loud “popping” sounds. The next thing he knew he was on the floor pinned by a front structural cross member of the lift – the rear of the lift was still in the raised position.

#### WHAT HAPPENED?

The lift suffered a catastrophic failure. The operator survived although badly injured.

As frequently happens in such instances, the injured employee filed suit against the manufacturer of the automotive lift and the installer of the automotive lift. The installer (a one man operation) filed for bankruptcy protection. This left the manufacturer to defend his product.

In the prosecution of the ensuing case, the plaintiff called the author as an expert to attempt to determine exactly what happened. Here are some of the facts:

- The lift length was sufficient for the bus with the longest wheelbase.
- The lift stated capacity was sufficient for the heaviest bus in the fleet.
- The lift contained ramps and runways for the busses to drive on.
- The lift included a nameplate stating compliance with the appropriate American National Standard.

However, the lifts did not comply with the applicable American National Standard. The manufacturer claimed compliance where it did not exist. The author discovered a long list of discrepancies including:

- Deficient lifting chains, sheaves, and end connections;
- Dimensional mismatches;
- Lack of fail-safe provisions; and
- Inadequate instructional materials.

## SO, WHAT GOOD ARE STANDARDS?

Compliance with American National Standards is voluntary, unless laws or regulations incorporate them by reference. Responsible manufacturers exercise their best efforts to achieve compliance for all of the reasons stated at the beginning of this article. Unfortunately, there are manufacturers like the one who made these lifts who scoff at compliance issues or others who simply don't understand what standards mean, but claim compliance anyway.

## WHAT SHOULD YOU DO?

Make sure you do not forget to:

### 1. DEVELOP COMPREHENSIVE BID SPECIFICATIONS.

If your organization does not have the expertise to prepare such bid specifications, consider contracting with an independent, industry expert to help write invitations for bid.

2. CAREFULLY EVALUATE THE LOW BIDDER. This means determining if the low bidder is active in their trade association. Talk to the trade association staff. Are their facilities adequate for the manufacture of your equipment? Do they have the necessary engineering expertise? Do they have adequate financial responsibility? Do they have product liability insurance? What are the limits? Interview other purchasers of the same or similar equipment. Ask them about experience with the product. If your organization does not have the expertise to evaluate the low bidder, consider contracting with an independent, industry expert to help.

3. REQUIRE PRODUCT CONFORMITY CERTIFICATION by an independent third party, such as a qualified testing laboratory. The U.S. Department of Labor, Occupational Safety and Health Administration lists its Nationally Recognized Testing Laboratories (NRTLs) on the Internet at ([www.osha.gov](http://www.osha.gov)).

## CERTIFICATION

If the purchase of the automotive lift described above had required that an independent third party certify the product, then the accident likely would not have happened. The Automotive Lift Institute sponsors an ANSI accredited, independent third party certification program for automotive service lifts. The program requires verification of product compliance to

the American National Standard by an OSHA accredited, Nationally Recognized Testing Laboratory. If the purchasing agent had known about this program, he could have likely avoided the tragedy of the loss to the employee and to the school district. A list of certified automotive service lifts can be found at [www.ali-directory.org](http://www.ali-directory.org).

Unfortunately, this certification program only applies to automotive service lifts. Maybe some day, more manufacturer groups will recognize the need for product certification programs. At least, you can feel confident in your purchase of automotive lifts by requiring certified products.

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