

Dear Towing and Recovery Driver:

The purpose of this Study Guide for the Level 1 - Light Duty National Driver Certification Test is twofold: To review the material which will be covered on the test and to serve as a reference manual after you have obtained your certification.

The Study Guide is divided into the five (5) same categories as the test. They are:

Customer Service  
Personal Safety, Appearance, and Attitude  
Incident Management  
Truck  
Equipment

We have upgraded this study guide to include additional information to help you as you go about your job activities. In Chapter 2 we have revised the section on roadside assistance for the safety of the customer and the tow operator.

Also in Chapter 2 we have added a section on bloodborne pathogens as we realize towers often come in contact with blood and fluids at the incident scene and should be prepared to protect themselves.

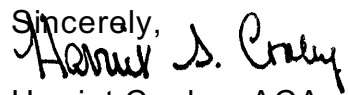
Chapter 3, Traffic Incident Management, has been completely revised to reflect the new information in the TIMTOW Guide. It also includes the TRAA Vehicle Identification (V-ID) card.

Chapter 4, Truck, has been expanded to include a recovery section and a section on towing motorcycles.

Chapter 5, Equipment, contains information on the new "6 x 25" wire rope (cable).

We hope you find this Study Guide enlightening and helpful. We congratulate you for participating in the National Driver Certification Program and being a pioneer in establishing a new standard of professionalism in the towing and recovery industry.

Congratulations on taking this important step in your professional towing career.

Sincerely,  
  
Harriet Cooley, ACA  
Executive Director &  
Director of Certification

# National Driver Certification Program



## Level 1 Test

# DISCLAIMER

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The *National Driver Certification Program* test is intended to measure certain basic knowledge in the following LIGHT DUTY tasks\*:

- Routine customer pick-up, delivery, and light recovery;
- Hook-ups for cars and light trucks up to 10,000 GVWR
- The differences between FRONT WHEEL and REAR WHEEL drive vehicles and appropriate procedures for each; and
- Installation of dollies and required dolly towing procedures.

**A SCORE OF 80% IS NEEDED TO PASS THE CERTIFICATION TEST**

We recognize that many LEVEL 1 towers will possess *more* knowledge than that mentioned above and may possess light duty recovery skills as well. The LEVEL 1 test focuses on and tests the knowledge that a driver *should* have acquired after 90 days working in the average towing operation. *Certification tests knowledge but does not address or attempt to evaluate the certified driver's actual job performance.*

\*This list only includes the basic technical tasks of the LEVEL 1 tower. The LEVEL 1 test has questions which cover five (5) CATEGORIES of knowledge: Customer Service, Incident Management, Safety/Personal Appearance, Truck, and Equipment.

Questions and comments may be directed to the National Driver Certification Program office, c/o TRAA, 2121 Eisenhower Avenue, Suite 200, Alexandria, VA 22314 or Call 1-800-728-0136.

**National Driver Certification Study Guide  
Category 1 - Customer Service**

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## **WHAT'S IN THIS FOR YOU?**

During the development of the National Driver Certification Test and Study Guide several people questioned the need to devote an entire section of the test and study guide to customer service. The thinking was that customer service is the concern of the owners of the towing businesses and not the drivers...WRONG...you, the driver, make the difference! It is the driver who deals directly with the customer, whether the customer be another business, such as a dealer or an individual person in need. In either case, the drivers are the direct contact; and appearance, attitude and technical knowledge represent the company to the customer.

In this section you will learn what the customer expects and needs, how you can best serve an angry or upset customer, and Do's and Don'ts of customer service.

### **I. THE DRIVER AS A CUSTOMER SERVICE AGENT**

The chances are that you know the technical side of your job pretty well. If you don't, you are probably learning it. But most service towers realize to really improve one's ability to serve others, one needs to improve skills in handling people. So what do service towers do for their customers? There are four clear areas where they demonstrate their expertise:

1. Attitude toward customers
2. Skills in dealing with customers
3. Preventing customer dissatisfaction
4. Coping with customer problems

### **A. ATTITUDE**

Quality service towers enjoy helping people meet their needs and solving their problems. Because they see problems as opportunities to be of help, the customer recognizes that the tower is ready, able and eager to serve them.

Quality towers handle people well. They know the technical parts of their job, but they also understand that their customers are just as much interested in how things are done as well as what is done. The service tower will take time to explain to his customer what the procedure will be and what to expect.

Quality towers care for their customers by watching out for their safety and welfare. Quality towers keep their equipment in good working order and with a professional appearance. At a time when the customer may disagree with the tower's procedure, the tower respectfully "hears" the customer's point of view and makes a decision based on his best working knowledge of the safety and efficiency factors required.

Courtesy is the key response to the customer in all circumstances.

Quality service towers give fair and equal service to all customers. There can be a temptation to “punish” a customer who has given a tower a hard time, but a quality tower will not repay a customer by making him wait, come back the next day or other tactics. Regardless of the sex, age, race or ethnic background, service oriented towers give all customers equal treatment.

## **B. SKILLS IN DEALING WITH CUSTOMERS**

Good service givers know their stuff. They have the technical knowledge and skills to perform their work efficiently and competently. Quality towers usually follow the seven-step method:

1. Create a friendly, courteous climate
2. Get necessary information by listening and asking questions
3. Check for complete understanding
4. Propose a plan of action
5. Get agreement on what is to be done, by whom, where, when, and how.
6. Provide the service agreed upon
7. Follow up to ensure results

### **C. PREVENT CUSTOMER DISSATISFACTION**

Because of their experience on the job, quality towers often can anticipate what customers need, sometimes even before the customers themselves know what they need. Efficient towers do the job right the first time because they know that errors and sloppy work are time consuming, costly, and make customers angry. They keep their promises and keep their customers informed as to what the process will be so they know what to expect. This lessens customer anxiety and customer dissatisfaction.

### **D. COPING WITH CUSTOMER PROBLEMS**

The best thing a tower can do is stay cool when a crisis arises. By doing so he can more quickly see solutions and he has a calming affect on the customer. Allowing upset customers to vent will help without needing to take personal offense at customer's offensive attitude.

When a customer has a complaint, the quality tower will not take offense and fume but will take a positive approach. When the tower looks at a complaint as an opportunity to problem solve, the customer very often will see him in an even better light and will become a better customer as a result.

## **II. WHAT CUSTOMERS WANT**

For drivers as service givers it will be helpful to give a profile of what it is that customers want or expect in the way of treatment. You need to know the 10 basic needs that motivate customers and what is responsible for their reactions:

### **A. CONTROL:**

Customers need to feel that they are in control of a situation. In the towing business the chances are that the customer is most frustrated simply because he/she is not in control. The driver must therefore show respect for the customer's vehicle because it is his possession and he is going to be anxious about its welfare.

### **B. GOALS:**

Customers need to feel that everything is being done to move toward their goals. Laying out a step-by-step plan of action helps a customer see the reality of what will be done to put him back into control and moving toward his goal.

### **C. SELF-IMAGE:**

Customers need to feel good about themselves. They need to feel intelligent and not talked down to. Always avoid making the customer feel silly or foolish about being in the situation he is in. Another thing to avoid is downgrading the competition. Don't insult the customer's intelligence by trying to engage him in negative stories about competition.



#### **D. FAIRNESS:**

Customers are most sensitive to being treated fairly. Customers talk with other customers and compare and they want to know they are receiving equal treatment. If you should damage a customer's vehicle, for instance, be sure to point out the damage to the customer and assure him that you will inform your supervisor so it can be repaired. Ducking the issue will only cause a lack of trust on the part of the customer.

#### **E. FRIENDLINESS:**

Customers want to feel good about the people with whom they interact. People don't enjoy being on the defensive or feeling as if they are being taken advantage of. You, the service giver, can set the pace with customers by being warm and friendly so they can enjoy a pleasant service transaction.

#### **F. UNDERSTANDING:**

In the towing business the chances are that a customer is going to be upset about the situation he finds himself in. In the case of an accident he will be aggravated about his loss of freedom and mobility and will be upset about damage, possible costs and generally unnerved due to the situation. The best thing you can do as a driver is assure him that you can take care of the vehicle. Explain what you will be doing and let the customer know that he is in capable hands.

### **G. SECURITY:**

Customers have a need to feel safe and secure. They like predictable situations and don't react well to being in unpredictable situations and out of control. The more you can reassure them about their safety and that of their vehicle the less "testy" they will be.

### **H. APPROVAL:**

People like to be recognized as good customers and regular patrons. The more you express your appreciation of the support of the customer, the more responsive he will be to you.

### **I. BELONGING:**

Customers enjoy being identified as people who belong to a group and they will be proud of their affiliation with an organization. Drivers who recognize regular customers, call them by name, and acknowledge their patronage satisfy that need to belong.

### **J. HONESTY:**

Due to false advertising, broken promises, and poor service, customers are wary and anxious about honesty. The more a driver responds on time with efficiency, the more he is promoting customer patronage and trust. Responding early and voluntarily about damage done by the tower can turn a negative into a positive.

### **III. COMMUNICATING WITH CUSTOMERS**

Most of us think that talking is the major means of communicating. In point of fact, the average driver will spend 9% of communication time in writing, 16% in reading, 25% in talking and 50% in listening! As we discuss each of these activities you will see how important each of them is in the course of your daily work.

#### **A. LISTENING**

When you think about it, many of the mistakes we make occur because we didn't really listen and gather the information we needed before beginning work on a project. There are good reasons to listen to your customers. First, you will get the information you need to do the job right the first time. Second, listening helps the customer. When you listen to a customer (who is usually upset or anxious) it has a calming and reassuring effect. Listening makes the customer feel important and that you care about him. Listening also helps a customer gain trust and confidence in you and as a result, he will more easily accept what you say. Listening helps reduce anger and if you are sincerely listening to your customer he will usually respond positively. Looking the customer in the eye, nodding, and giving other verbal signs of hearing are effective ways of letting the customer know you are listening.

## **HOW TO LISTEN**

### **1. ELIMINATE DISTRACTIONS -**

When you talk with a customer, reduce the noise around you as much as possible. Do not try to handle other tasks while talking with the customer-takes notes if necessary.

### **2. TAKE TIME TO LISTEN -**

Let the customer know you are taking the time to hear what he has to say and listen fully. Many times you need to pay attention to the way something is said as well as what is said. Listen to what is not said. When people get upset they leave out important information.

### **3. DON'T GET DEFENSIVE -**

Sometimes an upset customer can be critical and abusive. The best thing to do is let him talk and keep listening to him, trying not to interrupt. Eventually you can guide him back on a useful track.

### **4. ASK QUESTIONS -**

Listen to the end of the statement. If you do not hear the information, you need, then ask directly for it.

## **5. SUMMARIZE AND VERIFY -**

After you have listened carefully and asked questions, ask the customer if you can clarify by summarizing and verifying what he has said.

## **B. TALKING**

Talking is the second communication skill to consider. In quality customer service, what you say to customers and how you say it is critical:

### **1. THINK FIRST -**

Organize what you plan to say and think about how you want to say it.

### **2. CONSIDER YOUR LISTENERS -**

Talk to them in terms that they will understand. Consider their needs, background, experience, etc. Only use technical terms they will understand.

### **3. MAINTAIN EYE CONTACT -**

Look customers in the eye and don't try to do something else while you are talking. If it is necessary, move the customer to a place where it is quiet so that both of you can concentrate.

### **4. LISTEN TO VOICE QUALITY -**

Listen to the tone, speed, volume and pronunciation of your conversations. A common pitfall is speed when we are talking about things we know about. Remember the customer will not be as familiar with your terms of explanation.

## **5. AVOID ASSUMPTIONS -**

Don't assume customers know everything you are talking about. Many times customers will be too embarrassed to ask you to explain. Ask for feedback and you will be able to discern what he needs.

## **C. READING**

Every day costly mistakes are made in service-giving because someone didn't read carefully. Some helpful hints are:

### **1. PREPARE FOR READING-**

Find a quiet place where you can concentrate.

### **2. READ TECHNICAL DOCUMENTS AT LEAST TWICE -**

Important documents which contain a lot of information should be gone over a second time and highlighted-only after you make a copy!

### **3. READ ALOUD -**

The act of speaking as you read gets you involved in the reading and helps avoid the possibility of skipping over information.

### **4. DON'T JUDGE THE WRITER -**

If you receive a paper with smudge marks, misspelled words or messy handwriting don't lose your concentration to criticism. Get the information you need which is important data for your work.

## **D. WRITING**

How may work orders have been done incorrectly due to illegible handwriting?

There is a high level of misunderstanding in written communications both between the driver and the customer and the driver and other staff. To avoid misunderstanding in written work:

1. Write legibly and carefully.
2. Keep writing supplies and a small dictionary near you.
3. Keep your writing simple.
4. Keep all required paperwork in a clean, dry place and always check for accuracy and proper signatures.
5. Consider legal liability and don't put anything in writing which could be misinterpreted.

## **IV. HANDLING ANGRY CUSTOMERS**

Service oriented drivers develop two basic attitudes towards complaints: 1. See complaints as useful. They are not fun and if a customer is angry it can be time consuming and unpleasant, but there is always something to be learned from the experience. 2. Be understanding when you encounter anger and hostility. Don't get hooked by angry behavior. Basically, there are right steps to handling an angry customer:

1. Listen without interruption
2. Don't get defensive
3. Express empathy
4. Ask questions to understand the problem
5. Find out what they want
6. Explain what you can and cannot do
7. Take action
8. Follow up to ensure customer satisfaction

\* Do not be afraid to refer the customer to your superior if you feel you have done all you can do. Some customers feel they will not get what they want unless they talk to be "big gun" and it would not be helpful to the customer or you to try to prevent that. Give the customer the necessary information as to who he should contact and explain that you will be giving your boss a full report as well.

## **V. DO'S AND DON'TS**

### **DO -**

1. Introduce yourself by name and name of company
2. Learn the customer's name and use it respectfully thereafter
3. Listen to the customer's problem
4. Project a confident, professional image that builds trust



5. Be understanding when a customer is upset, anxious or angry
6. Anticipate your customer's needs
7. Explain what will be necessary for you to provide the service
8. Provide the required service calmly and efficiently
9. Complete all necessary paperwork and required signatures
10. Follow up to assure customer satisfaction

### **DON'T**

1. Argue with a customer
2. Criticize a customer's brand of automobile
3. Make promises you can't keep
4. Use equipment which is not functioning properly
5. Drive a cluttered, dirty truck
6. Work in sloppy, greasy clothing
7. Take shortcuts which will compromise safety
8. Keep a customer waiting while you attend other tasks
9. Talk down your competition to a customer
10. Promise repair time without checking with the shop

### **VI. COMPLETE, ACCURATE, AND LEGIBLE FORMS AND INVOICES**

You should be familiar with the clerical duties that you must perform in the field.

These forms are the life blood of your company's success. You should be given some form of training when you first go to work for the company that will familiarize you with the forms that your business uses.

Your job is not complete until you have completed all your clerical duties. You will have to fill out invoices in the field that describe the services and charges that you have performed. Each company will have its own version of invoice, but all invoices will contain much the same information. This information will include:

1. Date
2. Time
3. Customer name/address
4. Location
5. Vehicle description (year & make) and license number
6. List of services rendered - type of equipment used
7. Towing destination and distance
8. Authorized signature
9. Notation of any pre-existing damage with customer's initials (ideally)
10. Your signature

A CUSTOMER RELEASE FORM is another important form that must be completed.

It must be used when there are legal liabilities involved such as the customer

requesting services that are not recommended. If damage occurs as a result of such a request your company could be held responsible in a court of law if the form has not been signed that would release it from responsibility. Always explain the situation to the customer and recommend alternate solutions. If the customer still insists after your explanation, then you must require that he signs the LIABILITY RELEASE.

### **VEHICLE CONDITION REPORT**

Always fill out a report disclosing the entire condition of the vehicle before you perform any service to the vehicle. It is sometimes helpful to take a photograph of the vehicle. A picture is worth a thousand words. The vehicle condition form should be signed by the customer and by you. NOTE: If damage occurs to a customer's vehicle during a tow you should show the customer the damage and notify supervisor to make an appointment for repair.

Remember, a signature on one or all of these forms does not release you from any negligent actions. It does not free you to perform improper procedures or from exercising reasonable care.

### **VII. THE BOTTOM LINE....COURTESY!**

Courtesy often distinguishes your organization from others that are similar in kind.

But what is real courtesy?

- A sincere attitude of concern and caring
- An understanding of customer needs and wants
- Being polite to others when they are not polite and courteous to you
- Using courtesy words and phrases sincerely at all times
- Understanding that courtesy “actions” speak louder than words.

## **VIII. SOURCES**

The Art of Giving Quality Service in the Motor Carrier Industry, Education Committee of the American Trucking Association, 1984.

Light/Medium Duty Towing Manual, Towing and Recovery Association of America, 1993.

Service Solutions, The Service Edge for Creating And Maintaining Distinctive Customer Service, 1990.

## **IX. NOTES:**

# National Driver Certification Study Guide

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## TEN SAFETY COMMANDMENTS OF TOWING

1. **ALWAYS** treat the customer courteously and ensure his/her safety.
2. **NEVER** put yourself or your customer between your truck and the vehicle to be towed.
3. **NEVER** stand and/or work in the path of oncoming traffic or allow your customer to do so.
4. **NEVER** tow without secondary restraints (formerly called safety chains.)
5. **NEVER** get under a raised vehicle unless it's completely stable and supported by safety stands.
6. **ALWAYS** secure the steering wheel of a towed vehicle.
7. **NEVER** use cable clamps.
8. **NEVER** smoke while actually working with your truck or the vehicle to be towed, particularly around fuel or fuel systems, or when carrying passengers in your vehicle.
9. **NEVER** leave your keys in the ignition when you are away from your truck.
10. **ALWAYS** inspect your truck and equipment daily.

## **WHAT'S IN A SAFE ATTITUDE FOR YOU?**

A driver's attitude is as visible as his appearance and has as long a lasting affect. The first impression of you reflects how you feel about yourself, your attention to detail and how well you are going to take care of the customer. The first impression of you also contributes to the opinion a customer will have about your company. Whether you realize it or not, you are a walking advertisement for your company. The truck and equipment have the company name, address and telephone number on them and as a customer observes you at work, he will register an opinion about the company, its policies and procedures for handling customers and its attitude regarding safety. Because we are all human, we make judgments based on what we see and then we make generalizations from there. As a driver you have a real responsibility to exhibit an attitude of concern, safety and confidence. In everything you do, from your demeanor and personal appearance to your handling of equipment, you demonstrate an attitude of safety and the attitude you display will result in the response your customer will have toward you and your company.

This section of the Study Guide focuses on safety in all aspects of a tow operator's job. You will see how an attitude of safety will affect how a driver considers his personal safety with reference to his treatment of drugs and alcohol; how he can be safe in extreme weather conditions; the handling of hazardous materials; knowledge of roadside safety and his knowledge of radio/dispatch emergency procedures.

## **I. PERSONAL SAFETY**

Just as your vehicle needs proper maintenance to be in good working order, so do you. You may be able to prevent an accident from happening if you are in top physical and mental condition. This happens only if you eat right, sleep a sufficient amount of time each night, and try to minimize distractions caused by personal problems. Good diet and good hygiene will help you stay alert and help you feel right.

In this section we will address several conditions which can affect your personal safety. The first section will be on drugs and alcohol which have the potential to be disastrous both physically and professionally to the driver. Because there are new and more stringent drug and alcohol rules coming into play through the Department of Transportation (DOT), we have provided specific information for the driver concerning affects of driving, alcohol use, drug use and indications of use.

Another personal safety risk is extreme weather. Some conditions exist in different areas of the country and may not affect you directly, however, because this is a National Certification test we feel it important to explain the physical ramifications of extreme heat and cold and what helpful things can be done in those conditions. With the constant reminders of the AIDS virus, we thought it important to address the dangers of bloodborne pathogens and means of protection.

Finally, a large number of daily calls to towing companies are for roadside assistance. These services are extremely dangerous and the number of emergency personnel, police,



fire, rescue and towers being struck by passing motorists is increasing. Roadside safety instruction is also part of this section.

Why is safety training important? There are several reasons, the main one being that it saves lives and prevents accidents. The towing profession can be extremely dangerous, and if you are unaware of the dangers you can be permanently injured or lose your life. There are other reasons why safety training is beneficial for all concerned: for the public it builds confidence in the company when they see emphasis placed on safety skills. It reduces insurance costs. Many insurance companies will actually give discounts if all personnel receive routine safe training or, perhaps, certification!

#### **A. ALCOHOL AND DRUG ABUSE**

According to the Federal Motor Carrier Safety Regulations (FMCSR), “no driver shall use alcohol, as defined in Sec. 382.107, or be under the influence of alcohol, within four hours before going on duty or operating, or having physical control of a commercial motor vehicle.” Translated to Blood Alcohol Concentration Level (BAC), for a commercial motor vehicle a violation occurs when the driver’s alcohol concentration is 0.04 or higher.

Many people assume that drivers must appear drunk before they are too intoxicated to drive. The legal offense, however, is not acting like a drunk but driving a vehicle while impaired by alcohol, while driving under the influence of alcohol, even at low levels, there are several skill areas which are directly impaired:

1. **Reaction time** - an increase in the total time required to respond to a situation.
2. **Tracking** - Keeping the vehicle in the position on the road with respect to lanes, other cars, etc.
3. **Vision** - The ability to perceive/detect an object in motion and control over eye movement and ability to merge two images.
4. **Comprehension** - The ability to perceive hazards, to take in what you see and hear.
5. **Attention** - The ability to focus attention on one or more driving tasks.
6. **Coordination** - Skilled motor performance and coordination as well as skills requiring high levels of precise movement.

### **ALCOHOL CONTENT**

Although alcoholic beverages come in a variety of types their active ingredient is alcoholic (ethanol). All alcoholic beverages, however, are not the same in terms of alcohol content. There can be considerable variation in alcohol content among types of beers, wines and mixed drinks. Drinks that mix more than one shot of liquor, such as martinis, Black Russians have a higher total alcohol content. The alcohol content of one martini is equal to 1.75 glasses of wine or nearly 2 beers.

Alcohol is not digested in the stomach, but passes into the small intestine where it is absorbed directly into the blood. The amount of alcohol present in the body is generally measured in terms of weight of the alcohol in a given volume of blood. On the average, a typical drink containing one half ounce of pure alcohol will increase the BAC level of a 150 pound man about 0.02%

1 serving of alcohol = 12 oz of beer (5% alcohol) **or** 5 oz wine (12% alcohol) **or** 1 oz 80 proof liquor (40% alcohol.)

Generally speaking, it takes the body 1 hour to burn one serving of alcohol.

Factors which affect the relationship between alcohol consumed and BAC level are:

- Weight** - Generally a large person requires more alcohol to reach a particular BAC level than a small person.
  
- Gender** - Women generally reach higher BAC's than men of same weight with the same amount of alcohol intake.
  
- Amount of food in the digestive track** - Most alcohol-to-BAC charts are calculated on the basis of an empty stomach. When alcohol and food are both present in the stomach, the alcohol is absorbed into the blood more slowly because the valve

to the intestine remains closed longer because of the presence of food.

**Time spent drinking** - Alcohol is eliminated by the body at a constant rate of about half an ounce, the amount in one typical drink, per hour. If a person drinks slowly, at close to his elimination rate, alcohol will not build up in the body.

**Time since last drink** - Because time is needed for alcohol to progress from the digestive track to the rest of the body, a person's BAC can continue to rise after he or she has stopped drinking. After a peak BAC is reached, the amount of alcohol in the body decreases slowly as it is eliminated.

### **INDICATIONS OF ALCOHOL USE**

The conduct and appearance of a driver may cause a supervisor to test to determine the Blood Alcohol Content level. As stated previously, a BAC of 0.04 is a violation for a commercial motor vehicle driver. Some of the indications of alcohol use are:

1. Odor of alcohol on the breath - a person who has alcohol in his system cannot detect the odor of alcohol on his own breath. The driver may attempt to mask the break odor by eating mints or strong foods.

2. The person sways while maintaining balance - this refers to side to side or back and forth motion. The person finds it necessary to shift his feet to maintain balance.
3. The person uses arms for balance - he is unable to stand without weaving.
4. Leaning against walls or doorways in an attempt to hide inability to stand without swaying.
5. Slurred speech or speech pattern which seems confused. Takes a long time for a person to answer a simple question.
6. General awareness - does the person act normal or sleepy and stupor-like?

Many of the behavioral indicators of drug abuse and alcohol abuse are the same. When the signs are very similar it is difficult to be precise in determining whether the person is abusing drugs or alcohol or both. Alcohol leaves a person's system much faster than drugs so the alcohol test should be done first. Also, the alcohol test can be done on site, usually the driver must be transported to a collection site for the urine specimen. Three indicators would cause reasonable suspicion:

- Odor of alcohol is present
- Drug paraphernalia is present
- Driver looks confused, possibly glassy-eyed, lacks coordination and is staggering.

The primary drug testing modality is the urine specimen. There are five types of drugs tested for in all urinalysis:

Marijuana

Cocaine

Opiates

Phencyclidine (PCP)

Amphetamines

Below are listed the five drugs most tested for, their symptoms and their effects on driving.

None of these drugs or prescription drugs not approved by your supervisor are acceptable to take while on duty.

<u>DRUG</u>	<u>SYMPTOMS</u>	<u>EFFECT ON DRIVING</u>
<b>Amphetamines</b>	Hypersensitivity	Risk Taking
	Dilated Pupils	Overreaction
	Excessive talking	Impaired judgment
<b>Cocaine</b>	Mood swings/depression	Risk Taking
	Bad Breath	Aggressive
	Restlessness	Blurred Vision
	Irritable	Overreaction
	Running nose/nose bleeds	
<b>Marijuana</b>	Impaired Vision	Distorted Vision
	Slowed reflexes	Reduced Concentration
	Slowed Thinking	Slowed reaction time
	Short Term Memory Loss	Distorted time/distance
	Staring	Distortion
<b>Opiates</b>	Cold, moist, bluish Skin	Distorted Vision
		Slurred Speech
		No Concentration
	Constricted Pupils	Distorted time/distance
	Memory Loss Rapid Mood Swings	
<b>Phencyclidine</b>	Increased blood pressure	Risk Taking
	Delusions	Aggressive
	Confusion	Impaired coordinations
	Panic	
	Flashbacks	
	Dry mouth	Delayed reaction time

## **B. BLOODBORNE PATHOGENS**

Bloodborne pathogens are any agents which cause disease which can be transferred or carried through blood or other potentially infectious materials. Human immuno-deficiency (HIV) and hepatitis B (HBV) viruses are both examples of bloodborne pathogens. According to the Occupational Safety and Health Administration (OSHA), approximately 5.6 million workers in health care and other facilities are at risk of exposure to bloodborne pathogens such as HIV and HBV. Besides the more obvious occupations such as nurses, physicians, dentists, laboratory technologists, emergency room personnel, housekeeping and laundry workers, other occupations are also at risk. They include law enforcement personnel, firefighters, paramedics, emergency medical technicians, tow truck operators and anyone whose job might require providing first response medical care or a job in which there is a reasonable expectation of contact with blood or other potentially infectious materials.

All persons with a potential for exposure should be knowledgeable concerning the general modes of transmission, symptoms, warning signals related to possible exposure and procedures to follow if exposure occurs. For tow truck operators there is the potential of exposure to blood or other infectious materials in and around a vehicle at the scene of an accident. For those tow truck operators responsible for clean up at the scene, special care must be taken to have the necessary personal protective equipment and clothing.

“Personal protective equipment is specialized clothing or equipment worn by employees for protection from exposure to blood or other potentially infectious materials. Personal



protective equipment is considered 'appropriate' only if it does not permit blood or other infectious substances and contaminated materials to pass through to or reach an employee's work clothes, street clothes, undergarments, skin, eyes, mouth or other mucous membrane under normal conditions of use and for the time the protective equipment is in use."

Personal protective equipment consists of, but is not limited to, gloves, face shields, masks and eye protection, gowns, aprons and similar items. Disposable latex gloves should be a standard component of a tow truck operator's emergency response equipment. Always replace gloves if torn, punctured, contaminated, or if their ability to function as a barrier is impaired

Anytime a tow truck operator thinks he/she may have been exposed in some way i.e., puncture from a needle in a vehicle or exposure to body fluids at the scene, he/she should immediately inform his/her employer and make arrangements for a check-up by a health professional. It is most important that the employee be very specific in the explanation of exposure: what was he/she doing at the time the exposure occurred, what protective equipment was he/she wearing, what type of exposure i.e., puncture to skin, eyes, mouth etc.

### **C. EXTREME WEATHER PERSONAL SAFETY**

Under extreme conditions, physical hazards can be more prevalent and dangerous than towing hazards. It is important that you dress appropriately. In addition, weather can

change very quickly, so be sure to carry clothing for possible situations, such as rain gear.

Extreme weather amplifies the amount of exertion and time involved in a recovery; so you need to learn to recognize signs of stress and fatigue. In cold weather or very hot weather, the dispatcher should listen for signs that the weather conditions have had an effect on the driver, such as slurred speech or disoriented thoughts.

Although these extreme weather conditions may not apply to you in your present position, they might come into play sometime in your future employment.

## **1. RECOGNIZING ICE CHARACTERISTICS**

Clear, solid ice formed by direct freezing of water is stronger than cloudy, bubbled, granular ice made of melted and refrozen ice or snow. Ice is usually weaker during the early and late times of the season, when an insulating blanket of snow causes thin ice by slowing down the freezing process. The snow also adds its own weight to the burden the ice must bear.

Ice over moving waters - inlets, outlets, underwater springs and rivers - is especially dangerous. On bodies where water levels fluctuate (such as lagoons or reservoirs), the ice is hazardous because the changing levels weaken inshore ice. If working with divers in cold water, be sure there are extra divers to go in and replace divers who may be in distress. If you need to cut a hole in ice, make it a triangular hole. Push the ice that has been cut underneath the ice at the hole to serve as a firm base. Along the shore and

around pilings, piers, stumps and rocks, ice is weakened by buckling and cracking caused by the waters expansion as it freezes. River ice is safer on straight stretches than at bends. Consider weight distribution -- it is safer to walk spaced apart in single file than in a group.

## **2. RESCUE PROCEDURES**

Do not walk or run to the edge of the breakthrough. You could become the next victim. If the ice seems weak, throw the victim a rope or something which can be used as a floatation device until the rope is found. If the ice seems strong enough, lie on your stomach and reach the victim with a pole, broom, branch or piece of clothing. Form a chain of rescuers if other people are around. Each person lies on the ice and hold the ankles of the person in front of him.

## **3. PHYSICAL AFFECTS OF FREEZING WATER**

### **A. FROSTBITE**

Frostbite, the freezing of body tissue, is caused by formation of ice crystals in the skin. It is the most common injury suffered by workers exposed to the cold. The body is more vulnerable when there is a high wind because blood rushes to the surface to warm it, then cools rapidly due to rapid loss of heat. The wind chill factor is calculated from the combination of the temperature and the wind speed. The skin can freeze when the wind chill factor is below the freezing point, even though the actual air temperature is considerably higher. Low temperature, humidity, and high wind increase the chances of getting injured. Other factors include contact with water, gasoline and metal.

Frostbite usually affects the faces, ears, fingers, and toes. The small extremities are vulnerable because they are exposed, or in the case of toes and fingers, because circulation is slowed. However, larger areas of the body can be affected also.

There are three degrees of frostbite: first degree, when skin freezes but doesn't blister; second degree, where skin freezes and blisters and peels; and third degree, where skin freezes and dies.

The first signs of frostbite include tingling, aching, and an uncomfortable sensation of coldness. These symptoms may be followed by numbness, changes in skin coloring to white or grayish yellow, pain that often goes away later, and blistering. The frostbitten part is pale and cool to the touch and feels like a block of wood or marble.

The treatment for frostbite is to protect the affected areas, and handle them gently. Immerse the frozen part in water that is between 104 and 108 degrees. If you cannot determine the water temperature, keep the water temperature so that it feels tepid to the normal touch. Don't use water bottles, which may cause thermal burns. Rewarming will take about 20 to 45 minutes in water. There may be some pain as the part gets warm. If toes or fingers have been injured, place dry sterile gauze between but not wrapped around the affected areas after they're warmed. Do not rub or pinch the injured part, which may cause increased tissue damage and can lead to gangrene. Do not place bandages, ointments, salves, or anything else on the frostbitten part which would constrict it or keep air from it. As soon as possible, get medical assistance.

## **B. HYPOTHERMIA - ( LOWER BODY TEMPERATURE)**

Hypothermia can result in death if not treated in time. It is a condition in which a person is exposed to extreme cold for a long enough time to dangerously lower the core temperature of the body. Profuse sweating for a period of time can also cause this condition. Victims first start to shiver, then feel dizzy, numb, drowsy, weak, and confused. They also experience impaired judgment and vision along with slurred speech.

First aid is similar to frostbite. Get the victim out of the cold and call for medical assistance as soon as possible. Keep the body as warm as possible, but be aware that hypothermia is a condition that must be treated by a medical expert. If the body is rewarmed too fast, cold blood is returned to the heart and causes severe arrhythmias and sometimes cardiac arrest.

## **4. PHYSICAL AFFECTS OF HOT WEATHER**

Heat-related physical problems are more likely to occur on days of high humidity with temperatures above 95 degree and no breeze. The body's best defense against heat is the evaporation of sweat which cools the body so when humidity is above 75% with no breeze, evaporation decreases. In addition, heat-related problems can occur in unventilated areas with heat-producing equipment.

### **A. HEAT CRAMPS**

Heat cramps usually occur after hard exertion. These cramps are usually located in the legs, arms, or abdomen. Heat cramps may be accompanied with heat exhaustion.

Heat cramps can be treated by drinking a mixture of up to one teaspoon of salt per quart of water, at the rate of one-half glass every 15 minutes. If the symptoms continue longer than one hour, medical advice should be sought. Salt tablets are not recommended because they are stomach irritants. Massaging the muscle does not help and may cause more pain. After suffering from heat cramps, exertion should be avoided for about 12 hours.

## **B. HEAT EXHAUSTION**

Heat exhaustion occurs when a person does not take in enough water and sodium to replace lost fluids during exertion. This results in a serious blood flow disturbance, similar to shock. When large amounts of water and salt are lost and not replaced, blood flow decreases.

The signs of heat exhaustion are headache, dizziness, nausea, and weakness. The person could also experience faintness, loss of appetite, and brief unconsciousness. The skin is pale, cool, and sweaty, and body temperature may be below normal. The person may have difficulty walking, and his eyes will be dilated. Breathing is rapid and shallow. If untreated, heat exhaustion usually progresses to heat stroke.

Treatment includes cooling, but not chilling, the person. Move the person to a cool place and remove and loosen as much clothing as practical. Have the person lie down and elevate his foot about a foot. If possible, apply cold, wet compresses to the skin and fan them. Medical assistance should be sought since it is hard to tell the difference between heat exhaustion and heat stroke.

### **C. HEAT STROKE**

Heat stroke is a potentially life-threatening condition and occurs when the body's heat-regulating mechanisms fail and the body temperature soars. As the body temperature rises to 105 to 110 degrees, sweating stops and brain cells are damaged or destroyed, causing death. Heat stroke usually occurs rapidly.

A person suffering from heat stroke has many of the same symptoms as one suffering from heat exhaustion. Some differences are that a person with heat stroke has hot skin with a very high temperature and may or may not be sweating. A person with heat exhaustion will have a normal or below normal temperature, may be sweating, but have cool skin. A person with heat stroke may also exhibit bizarre behavior or collapse.

Heat stroke is life-threatening and needs immediate medical attention. The longer a person goes without treatment, the greater the danger of death. The person should be cooled rapidly, but he must be closely monitored by a medical expert.

Heat exhaustion and heat stroke exhibit very similar symptoms that are difficult to distinguish by a layperson. Both are life-threatening and have drastically different forms of treatment. A person suffering from either one of these should have IMMEDIATE medical attention. Therefore, if a person shows any of these symptoms, seek medical assistance immediately.

### **D. PERSONAL SAFETY APPAREL**

The first rule of safety in towing and recovery is that it is never safe to put your whole body

or any parts of your body under a load. There are no forms of apparel which can protect you at the possibility of slippage, vehicle movement or dropping in just too possible in the towing situation.

Glove use is a must. There are two types of gloves required for very different circumstances: Regular work gloves are a must for day-to-day workloads, hook-ups, jump starts, etc. Drivers should also have in their truck latex gloves for situations where there may be blood, body fluids, or paraphernalia at the scene or in a vehicle to be towed. Gloves should also be worn to keep your hands clean and protect the customer's car from grease and grime. Remove gloves while doing paperwork to protect from smearing.

Eyewear is very important when tow operators are involved with a job which could include sparks, flames, vapors, or any projectiles which could cause life injury.

It is always best to wear steel toed boots with rubber soles during towing and recovery work. As mentioned previously, there is always a possibility of dropping heavy objects and damaging feet. Rubber soled boots protect the driver during wet, muddy, inclement weather and provide traction on slippery surfaces. In some cases, the rubber soled boot may prevent shock.

Finally, there are some recovery circumstances which could warrant the use of safety vests and hard hats. There are no actual regulations which require the use of specific safety apparel but common 'safety' sense will tell you that it is wise to take the precautions rather than risk injury.



## DAILY DRIVER INSPECTION SHEET

UNIT NUMBER	DRIVER	DATE	MILEAGE
	PRE-TRIP	POST-TRIP	
Oil			Added
Fuel (gals.)			Radiator Fluid
Head Lights			Marker Lights
Tail Lights			Beacons
Work Lights			Sling Straps
J-Hooks			Cable
Jumper Cables			Boom
Shovel			Dollies
Truck Tires			Dolly Tires
M/C Straps			Steering
Brakes			Clutch
Radio			Mirrors
Mud Flaps			Transmission
Driveline/UJoint			Pto
Air Leaks			Air Lines
Hook-Up Chains			Axle Chains
Snatch Blocks			Scotch Blocks
Shive Wheels			Out-Riggers
Rear Jack Stands			Out-Riggers
Battery & Term.			Windshield Wipers

## II. SAFETY DRIVING EQUIPMENT

### PRE AND POST-TRIP VEHICLE INSPECTION

Pre and post-trip inspections are required by Federal law. These inspections should be considered important enough to do whether they are legally required or not because it insures safe daily operation. When inspecting your truck, use a checklist. Items on the checklist include tires, brakes, lighting equipment, towing equipment and safety equipment. Lighting equipment includes headlights, tail-lights, turn signals, extension lamps, auxiliary and emergency lights. Towing equipment includes cable, chains, sling, and/or wheel-lift, hydraulic cylinders and hoses, dollies, snatch blocks, steering wheel tie-down devices, spacer blocks and 4 x 4 inch timbers. Safety equipment include horn, flares or warning devices, fire extinguisher, first aid kit, and flashlight.

### PROPER MAINTENANCE, PERIODIC CHECKS, AND REGULAR INSPECTIONS

See sample DAILY DRIVER INSPECTION SHEET.

Proper maintenance, periodic checks, and regular inspections are important for several reasons:

1. **Safety.** Frequent inspection and continual maintenance give you the opportunity to correct any problems before they can cause an accident due to equipment failure.
2. **Durability and dependability.** A well maintained vehicle is much less likely to have equipment failure and is going to last much longer.

3. **Maximum equipment performance.** Equipment that is well maintained is going to perform at its created capacity for a much longer period of time.
4. **Cost control.** The cost of repairs or replacement is always much more expensive than maintenance costs.
5. **Reputation.** Nothing is more embarrassing than to call a tow truck for your own tow truck...be a pro.

The entire tow truck should be inspected daily. All fluids should be inspected, including the amount of fuel. Inspect towing devices. Check winch parts and make sure the cable is wound evenly, cables have no excess wear or damage, and all cables have proper terminals (no cable clips.) All lights should be in proper working order. Check all bolts and fasteners to assure that all are tightened and none are missing. Check all tow accessories for damage and to assure that they are properly secured so they cannot swing free of the tow truck. Check tire condition and pressure paying close attention to dolly tire pressure. All tires should be inflated to manufacturer's recommended pressure.

A more thorough service inspection should be performed once a month. This should include all the steps performed in a daily inspection, but they should be done in a more thorough manner. The boom should be inspected carefully by extending the boom and checking for proper liquidation and structural damage. Cables should be fully unwound, cleaned and lubricated. Re-wind the cables while holding tension on them to assure they

will wind evenly and tightly. Chains should be inspected link by link for distortion damage. Check all manual and/or hydraulic controls including hoses and connections. Lubricate or grease all fittings, gears, hydraulic cylinders, wheel lifts and tow bars once a month.

### **UNDERSTAND AND KEEP PROPER MAINTENANCE RECORDS**

Depending on the usage of the tow truck and its equipment, maintenance service intervals may vary. Obviously, the more frequent the usage, the more frequently preventive maintenance service should be performed. A good rule of thumb for service intervals is: every 3 to 6 thousand miles or 45 to 60 days.

Maintenance records are required by federal law. If you have kept proper maintenance records, the possibility of your being held liable for damage to towed vehicles due to equipment failure is greatly reduced.

Cost control is much easier to measure when you keep accurate maintenance.

### **KNOW WHEN TO GET HELP FROM A PROFESSIONAL MECHANIC**

If you are not properly trained in mechanical repairs, you could be facing liability charges if equipment that you have repaired fails. Know your abilities. You can be the very best at towing and recovery but not have much knowledge of mechanical repairs. That is not your job, so leave the repairs to the experts in that area. If you are not knowledgeable in repair work and you attempt repairs yourself, you may cost yourself and the company a lot of money in down time having to undo the damage caused by a faulty repair job.

You may be an expert in mechanical repairs but it may be a company policy that you do no repairs. If this is your company's policy, follow it.

### **MECHANICAL PROBLEMS WHICH CAN BE ASSOCIATED WITH ADVERSE WEATHER CONDITIONS**

Hydraulic systems frequently are affected by cold weather. In extremely cold temperatures use SAE 5W-20 motor oil. When selecting a motor oil, use actual temperatures, not the wind chill factor. The wind chill factor will have no affect on oil in sealed reservoirs.

Moisture contamination in the oil of a hydraulic system can separate and freeze in the hydraulic pump during cold weather. If a pump with frozen water is started, the drive shaft could be damaged.

During hot weather a heavier oil should be used because the heavier oil has a higher viscosity and does not break down as fast from the heat.

### **III. SAFE DRIVING SKILLS**

Safe driving skills begin with the driver's attitude about himself and other drivers on the road. Although it is of primary importance to drive courteously, it is also important to drive cautiously and not overestimate the other driver's competence. For any number of reasons, the other driver may not be paying attention and it is your responsibility to be aware of him and his vehicle as well as being aware of your truck and the vehicle you have in tow. Drivers who have children in a car, drivers who appear lost, drivers of cars with extensive

damage, and drivers who trail too closely to other vehicles are the reasons you must always be driving in a defensive manner.

### **MANAGING SPACE AROUND YOUR TRUCK**

One way to avoid problems with other vehicles and give yourself space is to manage the space around your tow truck. You can accomplish this by staying centered in your lane. In the areas beside and behind your truck it is important to increase your scanning. You should use your mirrors and actually turn your head to see if a vehicle is in a blind spot or tailgating you. Try to keep an escape route available if needed.

The most important space to manage is that in front of your truck. To maintain a cushion of safety in front of your truck you need to maintain a safe following distance.

The principle of the “Four Second” rule for following distance and how speed affects stopping distance will help you. Pick out a fixed point ahead...a lamp post for example. When the vehicle ahead passes the fixed point, count 1001-1004. If you reach the fixed point at the time you count four, you are following at just about the right distance. If you reach the fixed point before the four second period is up, you are too close. This pertains to tow trucks without towed vehicles during the day under clear, dry conditions.

### **STOPPING DISTANCE**

When driving a tow truck with a vehicle in tow it is important to increase your following distance because with the additional weight it is going to take longer to slow to a stop. You

should be aware of the time it takes to stop your vehicle. Your total stopping distance is how much distance it takes to actually stop your truck. The perception distance is the distance you travel from the moment you spot a problem until you decide to begin braking. The distance your truck will travel from the time you lift your foot from the accelerator until you apply it to the brakes is called the reaction distance and the distance your truck moves once the brakes are applied until it comes to a stop is called the braking distance.

Whenever you double your speed, it takes about four times as much distance to stop your vehicle. High speeds increase stopping distance while slower speeds reduce braking distance. Pain stops can cause damage to your truck, the vehicle being towed or other people or property.

## **RECOGNIZING HAZARDS**

The standard Accident Prevention Formula, developed by the National Safety Council, can greatly reduce chances of an accident when it is applied. The formula is:

1. Recognize all hazards
2. Understand the defense
3. Act correctly in time

The key element in driving is awareness. As you drive you should be scanning side-to-side for possible hazards and be able to spot traffic situations that are developing twelve to fifteen seconds ahead of your vehicle. For example: You are driving a heavily traveled street in the city and up ahead you see a parked car with back up lights, brake lights and

wheels turned toward the street. You are aware that this car is moving into or out from the space and you will make the necessary adjustments.

OR

You are on a busy street in a residential area and you spot a child darting out from between two cars several car lengths ahead, because you scanned ahead and from side-to-side you can stop in time to avoid hitting the child.

Generally speaking, a driver scans a block ahead in the city. Scanning ahead in rural areas is important too but for different reasons. In rural areas you have hills and curves and generally less space in the road and greater speed.

Unfortunately, no matter where you are driving there sometimes occurs that situation which you cannot anticipate. If you see that you cannot avoid a head-on collision you should always slow down and steer to the right, even if it means looking for something to glance off of. Never try to steer to the left of an oncoming vehicle.

### **DRIVING IN ADVERSE WEATHER OR ROAD CONDITIONS**

You can't steer or brake a vehicle unless you have traction. Traction is friction between the tires and the road. Wet or icy surfaces reduce traction and call for slower speeds.

It is recommended that you reduce speed by 1/3 on a wet road (55→35) and on packed snow reduce by 1/2 or more. Generally you should be aware of the following slippery surfaces:



1. Bridges
2. Shaded areas
3. Patchy melting ice
4. Rain or water on oily surfaces
5. Wet leaves
6. Sand

Hydroplaning can be the result of slippery water or slush covered surfaces. Hydroplaning is like water skiing: the tires lose their contact with the road and lose traction. It becomes impossible to steer or brake. The best thing you can do to regain control is to take your foot off the accelerator...when the vehicle is hydroplaning DO NOT use the brakes to slow down. It doesn't take a lot of water to cause hydroplaning and it can occur at speeds of 30 mph if there is a lot of water. Tires with low pressure or those with tread worn are likely to be prone to hydroplaning. A driver should be especially careful driving through standing water because of the chance of hydroplaning.

#### **IV. ROADSIDE SERVICES AND SAFETY**

A very large number of calls may be for rural, urban, freeways or interstate services. Regardless of the location there are certain evaluations you should make and precautions you should take as you arrive at the scene of a roadside call:

Scan the scene as you arrive. Look for sight distance and blind curves. Check the condition of the road and size – 2-lane or 4-lane, adequate shoulder space – where, if

any, is the nearest safe place to work? What are the weather conditions? Is there road construction? What is the time of day – rush hour, night? Where is the safest place for the stranded motorist to be?

From your dispatcher you should have learned:

Exact location-name of roadway, landmarks, direction of travel.

Specific needs-accident, jump-start, flat tire, fuel delivery

Type of automobile

Hazards-leaking gas, spillages

Whether stranded motorist or emergency assistance call

How many passengers are at the scene

The function you are going to perform will help determine where you will park your truck. If you know that you are there for a tow you would pull up in front of the disabled vehicle. If you park behind a disabled vehicle, leave 1½ truck lengths between your truck and the vehicle. Park to the left of the disabled vehicle, parallel to traffic, off roadway, wheels turned toward the curb and setting the park brake. If it is possible, park at a slight angle to oncoming traffic that can offer protection to the vehicle.

Before getting out of the truck, inform dispatch, turn on appropriate warning lights, put on a reflective vest and check your rearview mirror to insure it is safe to open your truck door. Go to the passenger side of the disabled vehicle and talk to the customer. **The number of**

**emergency personnel (police, fire and rescue *and* towers) being struck by passing motorists is increasing so it is important to heed this advice and watch your back.**

When talking with the customer keep an eye on the oncoming traffic. It is always safest to keep the customer in his/her car or in the cab of your truck, but if that is not possible, make sure he/she is on the shoulder as far away from oncoming traffic as possible. **Never stand in front of, behind or between vehicles and never allow your customer to do so.**

If you are going to have to work by the side of the road, always position yourself so you can observe oncoming traffic. Never turn your back on oncoming traffic and try never to lie down by the side of the road to hook up. If you are using tools and equipment, keep them off the side of the road because they could be hit by oncoming traffic. Any objects or debris become flying projectiles when hit by a passing vehicle.

When preparing to leave the scene always assist the customer in re-entering traffic.

When you are ready to leave, check your mirrors for oncoming traffic, give your signals and pull slowly into traffic.

If you have the vehicle in tow, be sure that the extension lights are on the towed car ... it is not enough to have the amber lights flashing ... brake lights and signal lights must be clearly in view on the rear of the car so as to alert traffic approaching from the rear. State laws vary on the use of flashing lights. Generally speaking, it is safer NOT to have them on as you are towing the vehicle as they become a distraction to other drivers in traffic, but

if there is a regulation regarding this issue of course you should observe it.

## **1. PRECAUTIONS FOR JUMP STARTING**

If you know you are going to the scene for a jump-start, pull up behind the vehicle leaving about 1½ truck lengths between the vehicle and your truck. Park as discussed above and put the truck in park with the emergency brake on.

After assuring the safety of your customer, approach the vehicle from the shoulder side. Be sure that you have a safety vest, eye protection and gloves before beginning the connection process. In the light duty, Level 1 manual we addressed the use of jumper cables. Other options would be a booster box, a start-all unit or truck wired jumper cables. In *any* case, always be aware of leaking battery acid which could cause an explosion. This is one of the reasons why we stress eye protection.

**WARNING: Batteries contain acid and cause burns ... sparks can cause explosions and fires.**

Always assure that the ignition is off and the vehicle is in park or neutral before starting the hook-up procedure.

The procedure:

1. Connect positive cable (usually red) to positive post (+) of discharged battery wired to starter or solenoid.

2. Connect other end of same cable to same marked positive post of booster battery.
3. Connect second cable negative to other post of booster battery.
4. Make final connection on engine block of stalled vehicle away from battery. Stand back.

Start vehicle and remove cables in reverse of connection.

As you can see it is important to put jumpers on dead battery first and then connect the cable to your truck. This keeps you away from the dead battery should anything go wrong.

In the case of a booster box you will be standing right over the dead battery so protect yourself as much as you can with gloves and eye protection.

***DO NOT SMOKE*** around batteries, as the vapors are flammable. If you should get acid in your eyes or on your skin, flush with warm water and get medical attention immediately. Eye flushing kits are available and should be kept in your truck's first-aid kit.

## **2. CHANGING A FLAT TIRE**

As with the other services we have discussed, the very first thing a driver should do when arriving at the scene for roadside assistance is to ensure that the customer and his vehicle

are safe. If the vehicle with a flat tire is on the side of a roadway determine if it can be moved a short distance to a safer place. If not then move it to the far shoulder of the road. Either put the customer in the cab of your truck or safely off the road and away from traffic and the vehicle being serviced. Make sure the vehicle with the flat tire is in park and the emergency brake on. It is always advisable to consult the owner's manual of a vehicle needing a tire change.

Assemble what you will need to do the job keeping equipment and tools close by but well off the side of the road. Check the spare tire first to make sure it has air and is operable. Loosen the lug nuts on the flat tire while it is still touching the ground. By removing the spare from the trunk and getting the flat tire ready before you jack up the car you are preventing the possible of shaking the car off the lifting device. When preparations are completed, jack the car up to remove the flat. Always use the 9 and 3 o'clock position with your hands to put on or take off a tire. This prevents the possibility of getting your hands jammed between the tire and the vehicle or the tire and the ground. Gloves are important because often tires have sharp protruding nails, pieces of glasses and the like which could injure your hands. Be careful to protect your back when lifting the tire on or off the vehicle.

If you use your sling to lift the vehicle, make sure to use both chains not just the lower bar under the vehicle. Use wheel chocks or a piece of wood for additional safety. Safety stands are a wise investment.

After the spare is on the vehicle and lug nuts have been put on , lower the vehicle to the ground , make sure the wheel is centered and lug nuts are snugged , then tighten the lug nuts in a criss-cross manner instead of each lug nut around the circle. Return the jack and defective tire to the trunk or the vehicle or to your truck. It is important to secure the defective tire for safety reasons.

Return the customer safely to his car. If there is paperwork to complete, do so in the cab of your truck and then escort him to his vehicle and guide him safely into traffic.

**DO NOT STAND BY THE SIDE OF THE ROAD AND DO THE PAPERWORK.**

### **3. PRECAUTIONS FOR GAS OR FUEL SUPPLY SERVICE**

As always, when approaching a vehicle needing roadside service, pull up behind the vehicle with the front end of your truck angled toward the road and tires turned away from the road. Put your truck in park and put the emergency brake on. Leave 1 ½ truck lengths between your truck and the vehicle. Extinguish all smoking products.

Because tanks are located on either side of vehicles depending upon the model, you will have no choice as to which side you will be working on so be especially alert to oncoming traffic. When responding to a need for fuel call, you will determine if the vehicle is actually out of fuel depending upon the age and make of the vehicle. If the vehicle has a fuel system with a carburetor you will remove the carburetor air filter and

examine the throat to determine if it is wet. Depress the accelerator to see if the carburetor pumps fuel. If there is none, put fuel in the tank.

If the vehicle has a fuel injection system check the fuel gauge, the fuse for the fuel pump and all connections at the fuel injectors. If you determine that those are functional, add fuel to the tank.

Once again, if paperwork is required, take care of that in the cab of your truck. Make sure to help the customer back onto the road safely and be alert to oncoming traffic when you are pulling onto the roadway as well.

#### **4. LOCK-OUTS**

With an anti-theft and electric locks on today's vehicles, the simple job of unlocking a vehicle without the key has become very complicated. There are numerous lock-out tools on the market today. Some will handle almost any job and some will handle very few. Be very careful of homespun techniques such as coat hangers, etc. because you could actually do damage to the lock and become part of the problem rather than the solution. When attempting to unlock a vehicle, work on the passenger side. This will cause less inconvenience to the customer if you are successful in opening the door but manage to damage the lock in the process...and you are safe from oncoming traffic.

#### **V. RADIO/DISPATCH EMERGENCY SKILLS**

The two-way radio is vital for communication in an emergency in calling for assistance,



special equipment or notifying required authorities. The radio can also be of practical help by keeping you updated on service calls, locations and directions if needed. Use of radios is licensed, regulated and monitored by the Federal Communications Commission (FCC). As a provider of emergency road service your company can get a license authorizing it to use radio frequencies designated by the FCC either for auto emergency or business. As a license holder you are responsible for all the units on the assigned frequencies, and the upkeep of the base and mobile units. Licenses can be revoked for not following FCC rules so drivers should always follow FCC protocol.

There are several things to bear in mind regarding radio use:

1. There may be other people tuned to your frequency so it is always important to use the radio only for conducting business in a strictly professional way.
2. Keep all of your radio transmissions as brief as possible.
3. Use the accepted ten-code system to save time and prevent misunderstandings.
4. Obscene or profane language is prohibited and is punishable under FCC rules.
5. Intercepting and using other communications not intended for your use is unlawful.
6. You must leave all radio repair or transfer to a licensed technician.
7. Sending false call letters or a false emergency distress message is strictly prohibited by FCC rules.
8. Interrupting a distress or emergency message is prohibited.

Generally, the rules of common courtesy should be your guide when using the two-way radio.

Specifically, as a towing operator you should inform the dispatcher of the following critical information at the scene of an accident/incident:

1. **Exact Location** - Name of roadway, highway, direction of travel and distance from a landmark
2. **Accident/Injuries** - If there are any injuries, advise of nature, number of victims and whether an ambulance is needed.
3. **Blocked Roadways** - Advise of vehicles or obstacles blocking roadway access.
4. **Hazards** - Advise of potential hazards at the scene; spilled loads, hazardous materials, fire or overturned vehicle.

After reporting, stay off the radio but accessible throughout the emergency.

## **VI. HAZARDOUS MATERIALS**

Upon arrival at the scene, as a first responder you are expected to recognize the presence of hazardous materials, protect self and public, secure the area, and call for the assistance of trained personnel as soon as conditions permit. Generally, the notification sequence and requests for technical information should occur in the following order:

1. **Your organization** - Notify your organization immediately. This will set in motion a series of events based on the information you provide.
  
2. **Emergency Response Telephone Number** - Locate and call the number listed on shipping paper (all hazardous material shipping papers contain emergency numbers.)
  
3. **CHEMTREC** - When shipping papers are unavailable or there is no emergency response number listed, call the Chemical Transportation Emergency Center (800) 424-9300. They will provide immediate advice on the nature of the product and they will contact the shipper of the material involved for further on-scene assistance.
  
4. **National Response (NRC)** - The **NRC**, which is operated by the U.S. Coast Guard, Receives reports required when hazardous substances are spilled. Federal law requires that anyone who releases into the environment a reportable quantity of hazardous substance (including oil when water is, or may be affected) or a material identified as a marine pollutant, must immediately notify the NRC.

- 5. Military Shipments** - For assistance at incidents involving materials being shipped by, for, or to the Department of Defense (DOD) (800)-851-8061 for materials other than explosives (703) 797-0218 or for incidents involving explosives and ammunition.

Your workplace should contain readily available Material Safety Data Sheets (MSDS) which are a source of information regarding hazardous and flammable materials. You should familiarize yourself with these sheets for backup on-scene safety.

Though most light duty towers have few experiences with hazardous materials it is important to recognize on-scene safety procedures for any call you respond to which has spillage, gaseous or vapor leakages. Respond as follows:

- Approach Cautiously** - Resist the urge to rush in. You cannot help others until you know what you are facing.

- Identify Hazards** - If you can. Having an Emergency Response Guidebook or placards in your truck will enable you to identify the material labeled. These are available from the US Department of Transportation and TRAA.

- Secure the Scene** - Without entering the immediate hazard area, do what you can to isolate the area and assure the safety of people and the environment. Move and keep people away from the scene. Allow room enough to move and remove your equipment.
  
- Obtain Help** - Advise your headquarters to notify responsible agencies and call for assistance from qualified personnel.
  
- Above All** - Do not walk into or touch spilled material. Avoid inhalation of fumes, smoke or vapors - even odorless gases or vapors could be harmful.

If you are faced with a fire be sure to use the right type of fire extinguisher. The B:C type fire extinguisher is designed to work on electrical fires and burning liquids. The A:B:C type is designed to work on burning wood, paper, and cloth as well.

Water can be used on wood, paper or cloth, both don't use water on an electrical fire (it will shock you) or on a gasoline fire (it will spread the flames.)

If you are not sure what to use, especially in the case of a hazardous materials fire, wait for qualified fire fighters. Tips on extinguishing a fire:

- Become familiar with the fire extinguisher before you need to use it
- Aim at the base of the fire, not at the flames
- Stay as far away from the fire as possible
- Be upwind of the fire so that flames are not carried to you
- Stay with the fire until cooled, absence of smoke or visible flames does not mean it is completely out
- Only attempt to extinguish a fire if you know what you are doing.

You should always keep an A:B:C: type fire extinguisher attached to your truck.

## **VII. SOURCES**

Coaching for One, FLI Learning Systems, Inc., 1990.

Emergency Response Guidebook, US Department of Education, 1993.

Federal Motor Carrier Safety Regulations, US Department of Transportation

Field Procedures, International Institute of Towing and Recovery, The University of Georgia, 1989.

Light/Medium Duty Towing and Recovery Manual, Towing and Recovery Association of America, November 1993.

Official CDL Guide, FLI Learning Systems, Inc., January 1990.

# National Driver Certification Study Guide

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## **WHAT'S IN IT FOR YOU?**

The following chapter on Traffic Incident Management (TIM) has been revised as of the summer of 2003. There has been much progress in the national TIM movement since the original publication of the National Driver Certification Program in 1995 and TRAA feels that this is an extremely important issue to address and update.

One misconception we will dispel from the very beginning is the thought that TIM only applies to medium and heavy towing and recovery. As you read through this chapter you will see that **ALL** (light, medium and heavy) responders to any traffic incident are part of a team whose effectiveness relies on the Communication, Coordination and Cooperation of all its members.

We will begin with some background in the development of TIM and then discuss specific aspects which apply to the tower's role on the TIM team:

### **I. BACKGROUND**

In March 2002, the American Association of State Highway Transportation Officials (AASHTO) Federal Highway Administration (FHWA), Intelligent Transportation Systems (ITS) and the Transportation Research Board (TRB), held a national conference on TIM. A steering committee composed of representatives from fire and emergency response, law enforcement, towing and recovery, technology, transportation and user communities assisted in refining the conference goals...the primary goal being to move forward with a



national traffic incident management strategy.

In groups of about twenty (20), participants explored Operational Issues, Technological Issues, and Institutional Issues. The issues that most affect towers were determined to be the following:

Training and Certification

Motorist Information

Communications, Coordination and Cooperation

Quick Clearance

On-Scene Big Picture

Positive Traffic Control

Liability

Scene Safety

Secondary Incident Prevention

National Standards

## **II. THE TIM TEAM**

TIM is a planned and coordinated process to detect, respond to and remove traffic incidents to restore traffic capacity as safely and quickly as possible. **It involves the coordinated interaction of multiple public agencies and private sector partners.** The emphasis on the public/private partnership is significant to towers as it includes them in the

role of responsibility at the scene and also provides them with equal protection as responders at the TIM scene.

Very simply stated, an incident is a disabled vehicle, accident or other disruption to the normal traffic flow. When an incident blocks a lane of traffic it chokes the flow of traffic and lines of vehicles build upstream of the incident. These are often referred to as queues and are the primary cause of secondary crashes. Blocking one lane of a three lane highway can cut the traffic flow by 50%; blocking two out of three lanes can cut traffic flow by 80%; and blocking NO lanes, such as an accident on a shoulder during heavy traffic flow with only two lanes in one direction, can reduce capacity by 25%. Note: flashing lights and upside down vehicles cause more rubber necking than does a flat tire or police traffic stop.

As we look at TIM at the scene we can see that the process falls into five site management operations:

Responder Safety

Secondary Crash Prevention

Traffic Control

Traffic Incident Site Management

Quick Clearance

### III. RESPONDER SAFETY

According to the US DOT, in 1999 nearly 10,000 police cars, 2000 fire trucks and 3000 others (ambulance service, tow trucks, etc.) were struck going to or struck at traffic incidents. While we know the numbers of tow truck operators killed or injured at the traffic incident scene is high, we do not have definitive data as to the exact number. Suffice to say, the loss of one responder is too many.

In the 10-09-01 Incident Management Model Law submitted to the National Committee for Uniform Traffic Laws and Ordinances (NCUTLO) the definition of **responder** is as follows:

**Responder** means any law enforcement, fire department, emergency medical services, hazardous materials, highway or transportation department, **towing and recovery** or any other organization authorized by law, governmental regulation, or local practice to respond to an incident.

**Response Personnel** means law enforcement, fire department, emergency medical services, **towing and recovery** and any other personnel authorized by law or local practice to respond to an incident.

This is the team: these responders working together in temporary traffic control and maintenance of an incident area have protection for themselves and each other as a primary purpose. Officially towers are being defined and called to service as a part of this TIM team for the first time in the documented history of TIM.

#### **IV. SECONDARY CRASH PREVENTION**

Studies have indicated crashes secondary to other incidents range from 13 to 37 percent of all crashes. The US DOT estimates that 18% of deaths on freeways were the result of secondary crashes. Questions to be addressed are: (1) How do we establish traffic control at the original incident; and (2) How do we prevent secondary crashes while managing the original crash scene?

It is here that the focus comes more and more on towers. After arriving at the scene and parking in a place that is safe and unobtrusive to the preliminary responders, the tower often has some time to wait before the actual clearance process begins. Recent research data supports the concept of using towers to help with temporary traffic control and securing the queue (end of the line of backed-up traffic) so as to prevent secondary crashes. More research, training and policy development on all responders participating in traffic control can have positive results on the number and severity of secondary crashes.

## **V. TRAFFIC CONTROL**

Traffic control for all incidents that close or severely impact traffic movement on one or more lanes is vitally important. Traffic control is also important for shoulder incidents. Where no lanes are blocked and in lighter traffic conditions, speeds on adjacent lanes may be higher as is the potential for disaster. Proper use of traffic control devices such as signs, cones, variable message boards, highway advisory radio, and other devices improve traffic flow in and around scenes.

The new Manual on Uniform Traffic Control Devices (MUTCD) outlines requirements for traffic control as it always has for work zones, but now defines incidents as requiring Temporary Traffic Control (TTC) consistent with temporary work zones. A multi-agency (including towing and recovery) approach is required to make sure all responders understand and use the basic procedures for safe movement of traffic

## **VI. INCIDENT SITE MANAGEMENT**

Good site management procedures can dramatically improve safety, traffic flow, clearance times and even responder image. Proper positioning of response vehicles, early deployment of tow trucks, setting proper priorities, practicing good emergency lighting discipline and working together are necessary for good site management.

## **QUICK CLEARANCE**

Early studies of incident management by the FHWA resulted in the finding that quick clearance is the most effective method to decrease responder injuries, decrease secondary crashes, improve mobility and improve public image of response agencies. Quick clearance should be a policy and be supported by laws that reduce liability for all responders including towers taking aggressive actions to open roadways.

There are a large number of actions that can be undertaken by individual and multi-agency groups to improve the process. They include law and policy changes, training, interagency agreements, managing the different and often conflicting priorities of on-scene responders, streamlining investigative procedures, updating towing regulations and procedures and setting challenging performance standards for clearance times.

## **VII. MUTCD**

To the towing and recovery industry this document is considered new language. The MUTCD is not something new. It is the national standard for traffic control signs, signals and pavement markings.

The MUTCD definition of a traffic incident: “A traffic incident is an emergency road user occurrence, a natural disaster or a special event.” In the towing and recovery industry our

daily tasks parallel that of the MUTCD definition of traffic incident. Chapter 6-I is short but thorough, and it categorizes incidents into three categories:

**Major**- expected duration of more than two hours. Major traffic incidents are typically traffic incidents involving hazardous materials, fatal crashes involving numerous vehicles and other disasters. These incidents typically involve closing all or part of a roadway.

**Intermediate** -expected duration of 30 minutes to two hours. Intermediate incidents are typically vehicle crashes, usually blocking travel lanes and usually require traffic control at the scene to divert road users past the blockage.

**Minor**-expected duration of under 30 minutes. They are typically disabled vehicles and minor crashes. On-scene response generally consists of only law enforcement and towing companies.

Chapter 6I aids the responder, which includes the tower, with options guidance and support. The document, when utilized by all responders, creates a safer work environment. The MUTCD increases the safety for the motoring public, decreases the probability of secondary incidents and restores traffic mobility effectively.

## **VIII. ARRIVAL AT THE SCENE**

While driving the tow truck, the most important thing to keep in mind is to get to the incident quickly but drive safely. The first thing the tow operator should do upon arrival at the scene of an accident-type of incident is to park the tow truck out of the way and locate the officer in charge or the incident commander. The officer may or may not be present so the tower should be aware of parking safety, secure the scene and follow good TIM practices until law enforcement arrives.

The incident response team is made up of a variety of officials representing different emergency and safety departments. The incident response team will vary in its content depending on the type of incident, but generally speaking, members of the following departments are present:

State and local DOT

Law enforcement

Fire and rescue

EMS

Towing services

It is important to identify and establish contact with the Incident Commander at the scene to determine who is in charge, to establish your identity, and to learn if specific circumstances exist that are not yet known to you. A cooperative working relationship



among all represented agencies makes the entire incident clean up process run more smoothly.

“ In a study of responses to a variety of incidents and disasters, the Federal Emergency Management Agency (FEMA) found that the problems in general were not those of technology. Instead, they were the result of poor task allocation and coordination, confused authority relationships, and inadequate information collection and distribution. Similarly, the difficulties associated with communications were not related to technology or equipment but were found to be the result of autonomous units acting independently and not talking with each other.” We cannot emphasize enough the necessity of the three “C’s”-- Communication, Coordination and Cooperation.

One of the most important aspects of the tower’s arrival is that, no matter what the size of the incident, the tower practices linear (single lane) parking upon arrival and aids in traffic control whenever possible. Historically, scene management has been the weakest area for towers because they are largely unaware of TIM Best Practices. There are three goals of TIM Best Practices: responder safety, public safety, quick and safe clearance and property preservation. Following is a safety checklist of nine questions each responder should ask when participating at the TIM scene:

Is your vehicle properly placed?

Is lighting clear and directive...not distracting?

Are you, as a responder, visible?

Can you communicate with other responders?

Are there open placement areas for other responders?

Does traffic have an out?

Have you properly identified and requested needed equipment?

Can you safely move traffic through the scene?

Is the scene compliant with MUTCD?

## **IX. SCENE SAFETY**

Once again, scene safety must be looked at from the point of view of responder safety as well as public safety. Traffic control should be MUTCD compliant regardless of which responder sets it up. Towers can play an important part by working with TIM Team toward scene control.

All compliant light duty units responding to an incident should have a minimum of 8 twenty-eight inch reflectorized cones. Also suggested would be an 18 inch by 18 inch reflectorized STOP/SLOW paddle.

All responders should wear a safety vest or clothing compliant with the American National Standards Institute standard: ANSI/ISEA 107-1000 Standard for High Visibility Safety Apparel. Responders should use the information provided in appendix B-1 of the standard as a guide to determine the class of garment to be worn.

## **X. SCENE LIGHTING**

The towing and recovery industry is ahead of the game in that this industry is already associated with amber warning lights in most states. Amber lights are the preferred choice of most TIM programs because they retain the highest visibility with the least negative characteristics.

A point that is being made to all responders with regard to lighting is that LESS is usually better, but there are two functions it serves: the primary one is warning; the other is guidance. Flashing lights, if there are too many, randomly scattered, it provides confusing information to drivers, and especially at night. There is a trend in Public Safety to reduce extraneous lighting and provide better traffic control.

**WARNING: NOTE OF SAFETY:** A word about scene work lights: Though necessary in some cases, scene work lights can also be very distracting to the motoring public. White work lights and vehicle headlights that face forward can affect traffic in the oncoming lanes, and fixed work lights that are illuminated on the traffic side of an incident scene or the rear can also be distracting to a passing motorist. Scene work lights are essential, but they must only illuminate the work area and not distract and blind approaching vehicle traffic.

## **XI. SAFE CLEARANCE POLICIES**

Clearance policies are an area of expertise for the towing and recovery industry. This industry's portion of the TIM movement was the open door through which towing and recovery was given the ability to participate in decisions affecting clearance policies at the incident scene. As the TIM movement developed, authorities consulted the towing and recovery industry to determine the best practices and most effective means of clearance. They learned that hours can be saved through early detection, early response and critiquing and practicing clearance techniques.

We have discussed the concept of quick clearance and part of that concept is the practice of relocating the vehicle. More and more law enforcement is asking the towing operators to clear the lanes and relocate the vehicle(s) involved in an incident and recover them later. The point here is to clear the lanes so that the traffic can begin to move again and move the crashed vehicles to a safe, off the road place for recovery.

Linear recovery or in line recovery with vehicles positioned in front of the crashed vehicle is sometimes referred to as single lane recovery or single lane uprighting. As in linear response, the linear recovery methods confine and condense the incident scene using a minimal offset to effect the recovery.

Light duty tow units range in GVW from 14,500 to 19,500 pounds with an average weight of 10,000 pounds, while an average passenger vehicle weighs 3,500 pounds -- this 3:1 weight advantage coupled with a hydraulic extendable boom allows for linear recovery.

Using linear recovery the tow operator can bring the casualty directly to the back of the towing and recovery unit thereby eliminating the need to reposition the vehicle to tow.

Safety is the name of the game. More and more responders are being killed or injured by the side of the road while attending to incidents. The major focus of the TIM movement is to get all responders to look out for the safety of themselves, each other and the motoring public. By working as a team, controlling traffic, clearing the scene quickly and wearing safety attire responders can minimize the number of fatalities and injuries during response to incident scenes.

## **XII. RESPONDER TEAMWORK**

In several ways the towing industry has taken some steps to reach out to other responding organizations. The TRAA Law Enforcement video and Vehicle-ID card was established for clear communications between law enforcement and towers. Recognizing that one of the biggest breakdowns in communication results in the tow operator bringing the wrong equipment to the scene, the industry set about creating a video dialogue between law enforcement and towers supported by the DOT vehicle classifications as a standard reference in identifying the type(s) of vehicles involved in an incident. Not only does this solve the problem of all four players being on the same page (law enforcement officer, law enforcement dispatcher, towing dispatcher and tow operator) but it has built a rapport and trust between law

enforcement and towers which has had trouble in the past. As use of the TRAA Video and V-ID card spreads across the country, the levels of trust and confidence can only become stronger. See V-ID card that follows.

# TRAA VEHICLE IDENTIFICATION GUIDE<sup>®</sup>

## CLASS 1 • LIGHT-DUTY • (6,000 lbs. or less GVW - 4 tires)\*



## CLASS 2 • LIGHT-DUTY • (6,001 - 10,000 lbs. GVW - 4 tires)\*



Classes 1 and 2 include passenger vehicles, light trucks, minivans, full size pickups, sport utility vehicles and full size vans.

## CLASS 3 • MEDIUM-DUTY • (10,001 - 14,000 lbs. GVW - 6 tires or more)\*



## CLASS 4 • MEDIUM-DUTY • (14,001 - 16,000 lbs. GVW - 6 tires or more)\*



## CLASS 5 • MEDIUM-DUTY • (16,001 - 19,500 lbs. GVW - 6 tires or more)\*



## CLASS 6 • MEDIUM-DUTY • (19,501 - 26,000 lbs. GVW - 6 tires or more)\*



Classes 3 through 6 include a wide range of mid-size vehicles, delivery trucks, utility vehicles, motorhomes, parcel trucks, ambulances, small dump trucks, landscape trucks, flatbed and stake trucks, refrigerated and box trucks, small and medium school and transit busses.

## CLASS 7 • HEAVY-DUTY • (26,001 - 33,000 lbs. GVW - 6 tires or more)\*



## CLASS 8 • HEAVY-DUTY • (33,001 lbs. and over GVW - 10 tires or more)\*



Classes 7 and 8 include a wide range of heavy vehicles, large delivery trucks, motor coaches, refuse trucks, cement mixers, all tractor trailer combinations including double trailers.

## Information Needed To Correctly Dispatch Towing and Recovery Units:

- Year, Make and Model of Vehicle to be Towed or Recovered
- DOT Classification (Class 1 – 8 based on GVW)
- Location of Vehicle
- Type of Tow (impound, accident, recovery motorist assist, etc.)
- Additional Vehicle Information
  - 2 wheel drive, 4 wheel drive, all wheel drive
  - damage to vehicle, tire condition
  - vehicle loaded or empty
  - cargo contents
  - does the vehicle have a trailer
  - are the keys with the vehicle

**Note:** Any vehicle may carry hazardous materials. Advise if placarded.

**\* Note:** The Gross Vehicle Weight Rating (GVWR) of the vehicle to be towed or recovered can be found on the identification label on the vehicle's driver's side doorframe. The number of pounds listed on the label can then be compared with the DOT Classification Vehicle Type Chart for the correct DOT class.

Law enforcement communications with towing and recovery operators describing an incident and the vehicles involved can insure quick and efficient clearing of these scenes and less disruption to traffic flow. In an effort to standardize communications, the towing industry is adopting the federal vehicle class standards as outlined herein.

## VIN CODES

The year of the vehicle is critical information for towing operators in order for them to reference correct towing procedures. The diagrams on the front are examples of classifications. The following information about vehicle identification numbers affixed to the chassis will help determine the vehicle's year. As noted, the vehicle's year, identified by a letter or number in the VIN sequence, is the eighth character from the right.

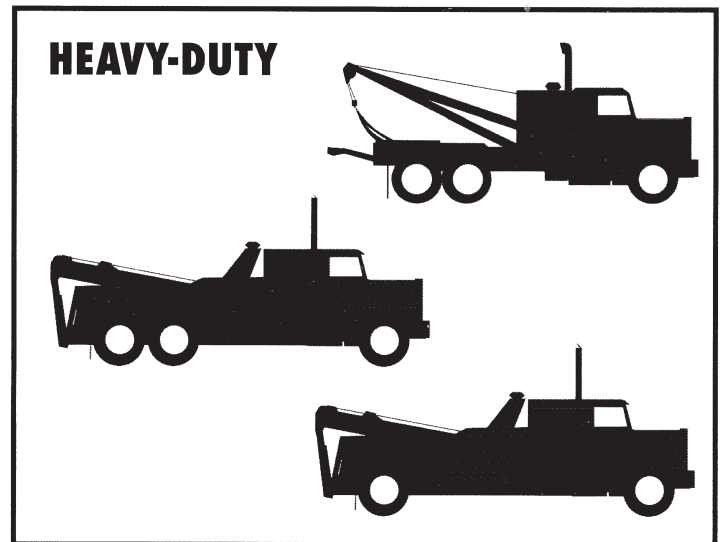
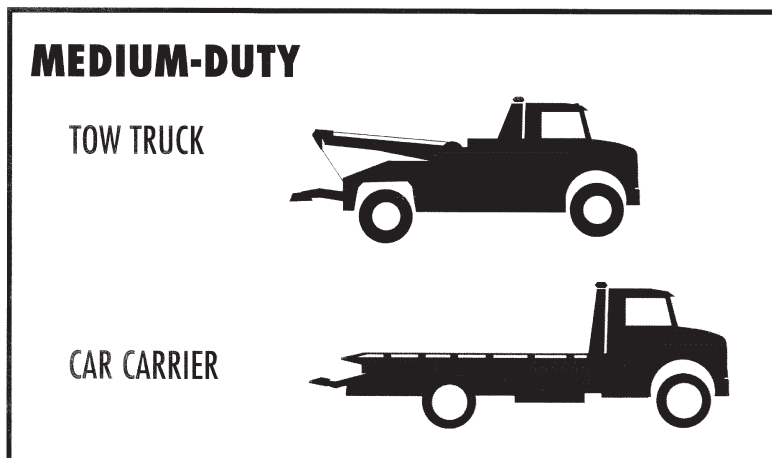
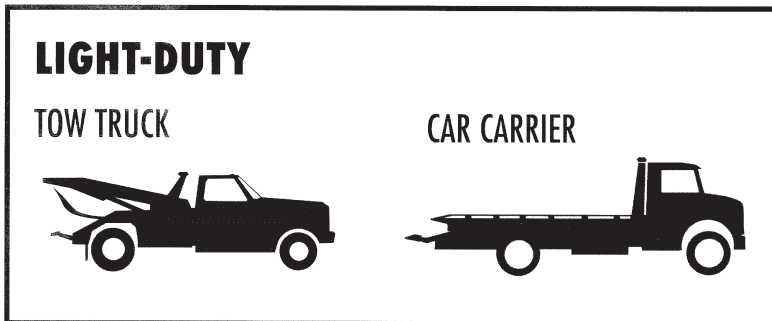
**1P8ZA1279SZ215470**

**EXAMPLE 1995 VIN NUMBER:** \_\_\_\_\_



1980.....A	1987.....H	1994.....R	2001.....1	2008.....8
1981.....B	1988.....J	1995.....S	2002.....2	2009.....9
1982.....C	1989.....K	1996.....T	2003.....3	2010.....A
1983.....D	1990.....L	1997.....V	2004.....4	2011.....B
1984.....E	1991.....M	1998.....W	2005.....5	2012.....C
1985.....F	1992.....N	1999.....X	2006.....6	
1986.....G	1993.....P	2000.....Y	2007.....7	

## TOW TRUCK/CAR CARRIER CLASSIFICATION





**National Driver Certification Study Guide  
Category IV - Truck**

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Generally speaking, there are two types of trucks used for towing and recovery: the sling/wheel lift and the car carrier or rollback. While both of these trucks tow disabled vehicles, carriers are not generally used for actual recovery work. For purposes of this guide sling/wheel lifts are generally divided into three categories: Light Duty, Medium Duty, and Heavy Duty. It is extremely important to differentiate between a tow truck's towing capacity and its recovery capability. For recovery the limits are governed by the strength of the boom, the power and strength of the winch and winch cables and the ability to stabilize the tow truck. For towing the limiting factor is the truck chassis, i.e., GVWR, rear axle ratings and front axle weight, and wheel base.

## **I. LIGHT DUTY TOW TRUCKS**

Typically a tow truck has four main parts:

1. Truck cab and chassis
2. Recovery apparatus, i.e., booms and winches
3. Body structure
4. Towing devices

(We will be dealing with towing devices individually but for a point of discussion, towing devices are tow slings, dollies and wheel lifts.)

Light duty tow trucks are designed to tow and recover passenger autos, pick up trucks and small vans. Their truck cab and chassis have a **Gross Vehicle Weight Rating** from 9 to 15,000 pounds and the recovery apparatus may be capable of lifting loads up to 12,000 pounds. Tow Truck bodies are about 86 inches wide and fit trucks with a CA (Cab-to-axle) distance of either 54, 60, or 84 inches generally. Chassis and structured rating are provided by the manufacturers.

Four basic parts of most tow trucks are the power system, booms, winches, and structure.

#### **A. POWER SYSTEMS**

Power systems for a tow truck are usually provided one of these three ways:

1. Electrically
2. Hydraulically
3. Mechanically

Electrical tow trucks are limited to light duty units. They are mounted on smaller truck chassis that have no PTOs. Booms are usually fixed and the winch of an electric tow truck is the only component that is electrically powered. There also exist some electric over hydraulic towing devices. The winch performance is limited by the truck battery and alternator.

Hydraulic tow trucks have greater versatility than mechanical units, although their maintenance costs may be high due to replacement of hoses, valves, pumps, and filters which are greatly affected by cold weather. They may also need special care when there is exposure to sand or an unusual amount of dust and dirt. The booms can be raised, lowered, extended and retracted under the load. All components are operated by hydraulic control valves and levers. Power is supplied by pumps driven through power-take-offs (PTOs) mounted on the transmission or a belt driving pump, as some automatic transmission trucks use belt driven underhood hydraulic pumps. Located in the truck cab, the PTO control must be engaged in order to operate the towing and recovery equipment. To engage a transmission PTO control with standard transmission:

1. Depress truck latch
2. Put transmission in neutral
3. Pull the PTO control knob out fully
4. Let out the clutch

To disengage the PTO control push the knob in fully.

Basically, the PTO takes power off the transmission to operate accessories like booms and winches. A driver should never travel with the PTO control engaged. Some trucks use PTO solenoids. With them depress clutch, turn on pump switch, put

transmission in neutral and let out clutch.

A mechanical towing and recovery unit is usually very reliable and will function in a wide range of climates. Mechanical winches have low maintenance cost as the only real repair costs are chains and sprockets. The boom's elevation is mechanically operated. These trucks have a manual winch for raising and lowering the boom. The winch on a mechanical unit is either in or out of gear, there is no way of adjusting its speed except by raising engine RPM with a remote throttle. Power through a PTO is usually supplied only to the recovery winches.

In summary:

### **THE GENERAL OPERATIONS AND FUNCTIONS OF A MECHANICAL TOWING AND RECOVERY UNIT**

1. Power Take Off (PTO). Power is supplied only to the recovery winches through a PTO on the truck's transmission. The control for the PTO is in the truck cab.
2. Drive Shafts.
3. Drive chain.
4. Winch brake. The winch brake should be adjusted regularly during preventive maintenance to insure that the winch when in the neutral position will not slip.

5. Controls. The boom is raised or lowered by a hand crank with an up/down selector, extension lock, and twin boom swing lock. **NEVER ATTEMPT TO RAISE OR LOWER THE BOOM WHILE THE TRUCK IS LOADED.** The winch drive system is controlled by the winch engagement control located on or near the winch. If the winch is not engaged by this control, the drum free-wheels and the cable can be pulled by hand. To operate the winch under power, the control must be engaged. The winch cable is powered by the winch in-out control located near the tailgate. The in-out control has a center position and two operating positions. The center position stops all winch movement. When released the control will return to the center position and maintain that position indefinitely if it is in good operating condition. To maintain proper safety, be sure that the winch in-out control is always in proper working order.
  
6. Winch/gear box. Mechanical tow trucks may have either one or two powered winches. They pull in loads and hoist them off the ground. The cables are routed over the boom and sheaves. Mechanical tow trucks may also have a manual winch for raising and lowering the boom.
  
7. Mast and booms. On mechanical tow trucks the booms are not usually powered. Instead they must be raised, lowered, extended, and retracted manually. Often this is accomplished with hand operated boom winches. **NEVER ATTEMPT TO RAISE OR LOWER THE BOOM WHILE THERE IS**

## **WEIGHT ON THE CABLE.**

8. **Hand crank.** The boom is manually raised and lowered by the hand crank and the up/down selector. After inserting the hand crank, set the selector to the raise position. Keeping a firm grip, turn the hand crank. If you stop turning the crank and back it off some, the winch ratchet will automatically lock. To lower the boom, set the selector to the down position and first turn the crank slowly to unlock the ratchet. You can then carefully allow the crank to unwind until the boom is in the desired position. Be sure to keep a firm grip on the handle as the boom is being lowered. Once the desired position is reached, reposition the selector and make sure the ratchet is engaged. Except when lowering the boom, the selector should always be set in the engaged position.

## **THE GENERAL OPERATIONS AND FUNCTIONS OF A HYDRAULIC TOWING AND RECOVERY UNIT**

1. **Power Take Off (PTO).** The PTO is used to drive the hydraulic pump. It, in turn, is usually driven by the truck's transmission. The PTO control is located in the truck cab and should be checked frequently for proper adjustment. If the PTO is noisy during operation, this could mean that the gear teeth are not meshing properly due to improper installation of the PTO, or the transmission fluid is low, or the PTO is not fully engaged.

2. **Hydraulic pump and system.** The hydraulic system must be properly maintained. If the components are not in good operating condition, such as bad seals in the cylinder or valves, there is a danger of the boom moving accidentally, especially under load. Hydraulic motors on winches can stall before the winch reaches its rated load. Either the motor is too small or the hydraulic system is designed to operate at a pressure too low for the motor. How much a winch will lift and its rating are not always the same. Always stay within the safe working limits of any component.
  
3. **Controls.** The boom controls on a hydraulic tow truck perform four operations. These are: in, out, up and down. These operations are done by two controls: elevation control and extension control. The elevation control is for up and down and the extension control is for in and out. As in the controls for the mechanical tow truck, the center position stops and locks indefinitely the boom movement. If the controls are not properly maintained there could be accidental movement. The up/down control has a counter-balance valve to prevent accidental movement of the boom, but if bad seals are allowing hydraulic oil leakage in the lift cylinders, the valve cannot prevent movement.
  
4. **Winches.** Hydraulic tow trucks may have one or two winches as can mechanical tow trucks. All tow trucks may also have auxiliary winches mounted



at the front bumper or the rear of the truck. These are called drag winches and their cables are routed directly to the load.

5. **Boom.** As stated earlier, the booms on hydraulic tow trucks are raised and lowered, extended and retracted under hydraulic power.
  
6. **Wheel lift/Under lift.** The wheel lift mechanisms are often raised, lowered, extended and retracted under hydraulic power. They can also have a tilting control that operates independently of any other controls. Wheel lifts should be checked frequently for bent or distorted parts, worn or damaged cross bar pins, missing parts, or cracks in welded joints. Where applicable use wheel straps and safety chains which are independent of the wheel lift. Safety chains must be attached in a manner that is independent of the wheel lift.

## **B. BOOMS**

Booms enable you to lift loads free of the ground and clear of the body. Most tow trucks have either one or two booms. The boom of a single-boom tow truck can be raised, lowered, extended and retracted. The booms of a twin-boom wrecker are usually raised and lowered manually.

Hydraulic tow trucks usually have elevation control and extension control to power the boom in and out and up and down. The controls are usually located near the tailgate

of the tow truck. The controls usually have two operating directions. When the controls are in the center position the boom is locked and will normally hold its position. As a maintenance and safety point you should be sure to check the hydraulic components regularly to assure they are in good working order. Bad seals in hydraulic cylinders or valves can allow a boom to move accidentally. If you have a boom that moves an inch or more in an hour, have it repaired immediately.

Mechanical tow trucks have booms which are not usually powered. They are raised, lowered, extended and retracted manually. Hand-operated boom winches are used to raise and lower the boom. Controls for manually operated booms are:

1. Up/down selector
2. Hand crank
3. Extension lock
4. Twin boom swing lock

Differences between a hydraulic and a mechanical boom:

1. Gear drive vs. Hydraulic drive
2. With mechanical winch - in or out of gear vs. hydraulic winches controlled by feathering valves.
3. Ability to control/change altitude of boom.
4. Hydraulic vs. Manual outriggers
5. Hydraulic recovery spades vs. scotch blocks mechanically vs. hydraulically

### **C. WINCHES**

Winches are used to pull in loads and hoist them free of the ground. The single winch unit consists of one winch and one cable which is normally routed over the boom and sheaves . . . it can limit the recovery capabilities of the towing unit but use of snatch blocks greatly increase the unit's versatility. (We will discuss snatch blocks in greater detail in the equipment section.)

Auxiliary winches are called drag winches and their cables are routed directly to the load without going over the boom. Some wreckers have a manual winch for raising and lowering the boom. A twin winch unit consists of two winches and two cables. Twin winches give you the ability to spread the pull over several attachment points. They also allow you to do vertical lifts while making horizontal pulls. Twin winches can compensate for more weight at one specific attachment point. Winches have two types of controls:

1. Power Control
2. Engagement Control

The engagement control engages and disengages the winch drive system. It must be engaged before the winch can be operated under power. When disengaged, the drum free-wheels and cable can be pulled out by hand.

The in-out control has two operating directions, usually indicated by a nameplate. Returning the control to its center position stops winch movement. The control automatically returns to the center position, but if it is not in good working order, it may stick which could cause the winch cable to move under power. Never release the control handle and walk away without making sure the winch has actually stopped.

Winch ratings are often given only for a bare drum and vary in the amount of cable on a drum.

#### **D. STRUCTURE**

Some tow trucks have rear jacks for use when lifting vertically. This makes it possible to lift heavier loads without raising the front wheels of the truck off the ground.

Scotch blocks are used to keep the wrecker from sliding during recovery work. They are placed on the ground touching the rear wheels. The chains go in the anchor holes of the tailgate with enough slack for the chains to barely touch the ground. Either back the truck into the scotch block until chains are tight or winch truck up onto the scotch blocks so that the weight of the tow truck helps the scotch block's teeth dig in. Brakes should be locked after the scotch blocks are in position.

## **E. RATINGS**

Tow trucks should have a rating plate or decal that shows the tow truck's key ratings. Note that tow truck ratings apply to apparatus, not the truck chassis. Towing and recovery ratings indicate the lifting and pulling capabilities of the booms and winches. Chassis ratings apply directly to the truck chassis. There are three such tow truck chassis ratings:

**Gross Vehicle Weight Rating (GVWR)** - value specified by the manufacturer as the maximum loaded weight of a single vehicle including all equipment, fuel, body, payload, driver, etc.

**Gross Axle Weight Rating (GAWR)** - which is the value specified by the manufacturer as the carrying capacity of a single axle. The total GAWR for all axles equals the truck's GVWR. For example, a tow truck with GVWR of 27,500 pounds has a front axle which is rated at 9,000 pounds and rear axles rated at 18,500.

**Gross Combination Weight Rating (GCWR)** - value by manufacturer as the maximum loaded weight of a combination vehicle or the GVWR of the power unit plus the GVWR of each vehicle in the combination.

## **II. TOWING DEVICES**

## **A. TOW SLING**

The conventional tow sling should be used only for towing convention autos, light trucks and small vans. The tow truck chassis should have a GVWR of at least 10,000 pounds. Tow sling ratings are permanently marked on the serial plate of the tow sling. A tow sling lift rating of 3,500 pounds indicates that you should not lift any part of a vehicle which would put more than 3,500 pounds to the tow sling. Most conventional tow slings will lift 3,500 pounds.

## **HOOK-UP PROCEDURES**

The boom(s) must be positioned before hooking up the tow.

The boom end sheave should be about the same height as the truck cab. It should not be any higher unless it is necessary for the boom to clear the towed vehicle. If the boom is too high, the sling straps will slope forward and the towed vehicle could ride up the straps in a sudden stop.

The tow sling can be supported by one or two winch cables.

The hook of a single winch cable must be attached to the shackle of the tow sling.

The hooks of a dual winch unit should be attached to equal distance shackles on the tow sling.

A snatch block can be used with the winch cable to create a two part line, thus reducing the load on each part of the line. Use the parking brake and/or wheel chocks to keep the towed vehicle from rolling during hook-up.

Position the tow sling by backing the tow truck until the anchor bar is approximately 6-8 inches from the vehicle.

Unlock the spacer bar extensions.

Rest the anchor bar on the ground with the sling straps slack by letting out the winch cable. NOTE: the sling straps support the weight of the vehicle, not the tow bar. The only time this is not true is if the tow bar is positioned ahead or directly under the bumper.

The anchor bar is then positioned under the vehicle to be towed. This is done by extending the spacer bars.

“T” hooks, “J” hooks or the use of grab hooks (known as wrapping) are used to attach the tow chains under each side of the vehicle. “T” hooks are used if the vehicle has slots provided for them. Remember not all slotted holes are intended for “T” hooks.

If there are no “T” hook slots, then “J” hooks or grab hooks should be used.

Special precautions when using “J” hooks:

1. Always attach “J” hooks with their tips up.
2. Always take care that the load is applied to the radius of the “J” hook and not to the tip.
3. Ensure brake lines remain clear of hooks.

Special precaution: When wrapping grab hooks always loop ends over attachment point and hook onto chain link. Should slack occur, chain will remain attached.

There must be at least three links of chain between the anchor bar grab hooks and the “J” hooks or “T” hooks. The tow chains on each side of the vehicle should be tightened and wrapped around the grab hook on the anchor bar.

The spacer bar locks should be set so that the extensions automatically lock when they retract during the lift.

The slack must be removed from the sling straps by retracting the winch cable.

The towed vehicle’s transmission should be in neutral and the parking brakes released before lifting the vehicle.

Straighten the wheels of the towed vehicle and secure the steering wheel when towing from the rear.



Using the winch cable, lift the vehicle until the tires are approximately 8 inches off the ground, watching of course for safe clearance on the other end of the towed vehicle.

Attach the free end of each chain to the grab hook on the upper bar of the tow sling. Any remaining tow chain should be secured so it cannot swing.

When towing a disabled vehicle with a tow sling, the tow truck end of the tow bar must always be higher than the hook-up end of the tow bar.

**WARNING: NEVER** use cable clamps on the cable supporting the tow sling.

## **B. LIGHT-DUTY WHEEL LIFT**

Wheel lifts are used to tow vehicles by their wheels. Most wheel lifts have a boom, cross bar, L-arms (sometimes forks or claws) and wheel straps. Booms of most wheel lifts are hydraulically powered to raise, lower, extend or retract. Light duty wheel lifts are designed to lift only conventional autos and unloaded light trucks and small vans. The light duty truck chassis should have a GVWR of at least 10,000 pounds. Like the sling, wheel lifts have a lift rating and a tow rating.

## **THE PROPER USE OF WHEEL LIFTS AND WHEEL STRAPS**

Use the parking brake and/or wheel chocks to keep the towed vehicle from rolling during hook-up.

Position the wheel lift by backing the tow truck until the cross bar is about 6 inches from the bumper of the vehicle.

Adjust the wheel lift width to be 2-3 inches outside of the tires of the towed vehicle and lock them on the cross bar.

Lower and extend the wheel lift boom until the cross bar nearly touches the ground and both tire support arms contact both tires of the towed vehicle.

When using L-arms, lower and extend the wheel lift boom until the L-arm receptacles of the support arms are close to the outer sidewalls of the towed vehicle's tires. The support arms should be locked into place.

The L-arms should be locked into position firmly against the side of the tires. This is done by inserting them into the receptacles on the ends of the support arms.

**ALWAYS** use wheel straps if your wheel lift is designed to use them as a safety precaution against the towed vehicle bouncing free of the wheel lift on bumpy roads or with a sudden stop.

Straighten the wheels of the towed vehicle and secure the steering wheel, even when the front wheels are lifted.

Using safety stands under the towed vehicle, attach the safety chains. **ALWAYS**

**USE SAFETY CHAINS!**

Ensure that the safety chains are securely attached. Once you have checked to assure the free end of the towed vehicle will not touch the ground, you are ready to tow.

**USING A WHEEL LIFT ON A VEHICLE WITH A FLAT TIRE**

If a vehicle has a flat tire, jack up the wheel that has the flat using a floor jack or a conventional auto jack. Then lower the wheel onto a small 4x4 inch block of wood. Load the vehicle onto the wheel lift as usual carefully adjusting the arm under the flat tire to keep it no wider than the wheel, therefore, not allowing the wheel to fall through the support arms and the L-arm.

Although we have discussed specific steps for hook-ups, certain precautions for hooking up a front wheel drive and rear wheel drive vehicle are always in order:

1. Refer to manufacturer's manual for towing recommendations.
2. Most late model vehicles cannot be towed properly using a tow sling.
3. Always secure the steering wheel with the wheels straight to keep the tires straight.
4. Always use safety chains independent of the towing device.
5. When hooking up a vehicle, always check the trailing end to ensure proper clearance from road surface and make sure that there is sufficient clearance between the tow truck wheel lift mechanism and the towed vehicle's fuel tank and the towed vehicle and the tow truck tailgate.

On a daily basis you should check the L-arms, forks, wheel straps and safety chains.

At least once a month you should check:

1. Oil levels
2. Mounting bolts
3. Wheel lift structure
4. Boom
5. Controls
6. Hydraulic hoses
7. Lock rings, cotter pins, nuts, screws

8. Pivot pins (should be lubricated weekly if unit is used ten times a day or more.)
9. Safety chains link by link
10. Wheel lift leak down test
11. Hydraulic pump drive belts
12. Lubricate entire wheel lift (weekly if used ten times a day.)

\*Some wheel lifts have an independent hydraulic system with its own reservoir and engine driven pump. The pump may be PTO or belt-driven. You should use either motor oil or industrial hydraulic oil. Because of the hydraulic unit's sensitivity to cold you should use SAE 10W oil in moderate temperatures and SAE 5W oil in extremely cold temperatures.

### **C. LIGHT-DUTY TOW DOLLIES**

The purpose of a tow dolly is to support the wheels on the trailing end of a towed vehicle, whenever it is necessary to keep the wheels of the towed vehicle from touching the road. There are three types of tow dollies:

1. Pan dollies - which have two pans that support the trailing wheels of the vehicle being towed.
2. Self-loading dollies - a pop-up dolly which has a built in mechanism that enables you to load and unload a vehicle without use of other equipment.
3. Jack-up dollies - in which lifting is done by use of an independent bumper jack.

Dollies may be used in the following circumstances:

1. Accidents when both axles are damaged or inoperable.
2. When towing a vehicle on the drive axle.
3. When towing any vehicle that the manufacturer recommends dollies.
4. As an alternate to removing the drive shaft or disengaging the transmission linkage.
5. Illegally parked vehicles when axles are locked and/or the axle has wheels turned in a sideways position and locked.
6. Low ground clearance of the towed vehicle.
7. To avoid damage to transmission on 4 x 4.

The vehicle must be lifted to load onto a pan dolly.

You may either use the tow truck or a floor jack to lift the vehicle onto the pan dolly. Because of the placement of lift points on vehicles it is easier to use the tow truck whenever possible.

Block the wheels of the vehicle at the end you will tow and raise the wheels that you are going to load.

Position the dolly cross tubes under the wheels, placing one tube in front of each wheel and one behind each wheel.

Attach the wheel assemblies to the cross tubes being sure to use the safety pins.

The dolly pans are placed directly under the wheels of the vehicle.

The vehicle can then be lowered into the pans and the rest of the hook-up made.

Never exceed the dolly tire manufacturer's recommended speed or weight capacity.

### **UNLOADING THE VEHICLE**

To unload the vehicle from the pan dolly, first block the wheels of the dolly then unhook the vehicle from the tow truck and block the wheels.

Raise the vehicle, remove the dolly, then lower the vehicle.

### **POP-UP DOLLIES**

Pop-up dollies can be loaded without first lifting the wheels.

The vehicle can be hooked up to the tow truck first, thus stabilizing the vehicle and eliminating having to block the wheels.

The crossbars are placed under the wheel first, then the wheel assemblies are placed adjacent to the towed vehicle's tires. The crossbars or axles are then attached to the dolly wheel assemblies using caution to get the axles as close to the tires as possible so that the towed vehicle's tires do not fall through and contact the pavement. Then use the activator bar to lift one side at a time.

### **III. CAR CARRIERS/ROLLBACKS/FLATBEDS**

Car carriers are intended primarily for transporting vehicles, but they are not limited to this specifically. They can be used for transporting cargo.

Most light-duty carriers used in the towing and recovery industry have aluminum beds 17 to 21 feet in length which slide back and tilt for ground level loading passenger autos or light pick up trucks. Some carriers have either tow bars or wheel lifts for towing a second vehicle. Carrier beds and wheel lifts are generally powered hydraulically. Tow bars may be either powered hydraulically or positioned manually.

Light duty carriers usually have a truck chassis with GVWR's ranging from 14,500 to 19,000 pounds. Most carrier manufacturers recommend a minimum GVWR of 14,500 pounds.



## **OPERATION AND PRECAUTION DURING OPERATION**

Use the bed carrier control located on either side of the carrier bed to control forward and rearward travel of the bed. If the car carrier has only one control it will be located on the left side. The bed must be moved to the rear 6 to 12 inches before it can be tilted. There should be two triangular marks on most carriers that show proper positioning for tilting; one on the bed, and one on the control. When the two marks are even, the bed may be titled. The tilt control is in the same location as the carrier control.

The tilt control should not be engaged until the bed is clear of the hold-down locks. The triangular markings indicate when the bed is clear of the locks. Some carriers have lockout devices that prevent tilting unless the bed is clear of the locks.

A vehicle should be loaded onto the bed as close to the cab as possible. The weight of the engine in the vehicle should be loaded as close to the cab as possible, in order to retain sufficient front axle weight on the truck chassis.

### **A. LOADING THE CAR CARRIER**

Position the car carrier so that it is aligned with the vehicle and the rear edge of the bed is no closer than 9 feet from the vehicle to be loaded. Engage the PTO and set the throttle control if equipped for the recommended engine speed. The bed is moved rearward then tilted until the stabilizer touches the ground, then moved

rearward until the bed touches the ground. Whenever possible, loading straps should be used instead of the chains because they are less likely to cause damage. The hooks should be attached to the vehicle's tie-down points. The winch cable drum should be disengaged so that the drum free wheels, allowing the cable to be pulled out by hand and attached to the loading strap. Tighten the cable with the cable drum control located on the side of the bed with the bed controls. Remember that the winch cable control cannot be used until the cable drum control (located on the winch) is engaged. The next step is to winch the vehicle onto the bed. Remember, you must first have the vehicle in neutral and the brakes released for loading and unloading. Attach a safety chain at the front of the vehicle. Do not winch the vehicle completely forward until after the rear chains are attached. Tow chains should be attached to the vehicle at the rear of the carrier with as little slack as possible. The chains will be tightened when the vehicle is winched forward. Once the vehicle is in position,, the vehicle's transmission should be placed in park and the parking brakes applied. Next the carrier bed should be returned to the travel position. This procedure is the reverse of the preparation for loading. The triangular marks must be lined up by moving the bed forward. Then tilt the bed until the bed is completely down. The bed is then moved completely forward. Check to be sure that it is secured in the hold-down locks. The engine throttle is reset for idle and the PTO disengaged. A second chain must also be attached to the vehicle at the front of the bed and both tightened with load binders.

## **B. PROPER SECURING OF THE LOAD**

Two tie down chains should always be used at **both** ends of the vehicle. The chains at the rear of the bed are tightened with the winch cable. The chains at the front of the bed are tightened with load binders.

## **C. AUXILIARY LIGHTING AND EMERGENCY LIGHTING USE**

When towing a vehicle with a car carrier using a tow bar or wheel lift, always use auxiliary towing lights, which are stop, tail and turn signal lights to the trailing end of the towed vehicle and operated as part of the towing vehicle light system. Never use the towed vehicle's headlights.

## **D. TOW BAR/WHEEL LIFT USE**

Hook-up of a wheel lift on a car carrier is essentially the same as with a tow truck with a few exceptions. The car carrier should be positioned about 2 1/2 feet from the vehicle to be towed. After loading, the wheel lift should be positioned so that there is just enough room between the bed and the vehicle to allow for turns. Always check to be sure the hold-down locks on the bed are engaged.

For hook-up with a tow bar, you must begin with the tow bar in its uppermost position. The carrier should be positioned 2 1/2 feet from the end of the vehicle. The carrier bed is moved rearward to clear the hold-down locks and tilted until the tow bar is even with the vehicle's bumper. The tow bar is then extended until it touches the

bumper. Attach the towing chains. If the tow bar does not have towing straps, the bumper of the towed vehicle must be protected.

Once the hook-up is complete, tilt the carrier bed back to normal. Pay particular attention to the position of the towing chains and the tow bar during this procedure. Move the bed forward so the hold-down locks are engaged. Position the tow bar so that there is just enough distance between the vehicle and the bed to allow for turns. The lifted wheels must clear the ground at least 4 inches for sling equipment and 10 inches for wheel lift. Be sure the back of the towed vehicle has sufficient ground clearance. **Always use safety chains.**

If the tow vehicle has a wheel lift designed tow bar, use the wheel lift mechanism as described herein for the light duty tow truck.

#### **IV. MOTORCYCLE TOWING AND HAULING**

There Are three types of motorcycle tows -- breakdowns, accidents and impounds -- with each being handled differently:

A **breakdown** tow is normally a simpler tow because the customer is there with the keys and is usually willing to be of assistance when needed. These tows can be handled with a trailer, ramp on a tow truck stinger or with one of the many cycle carts that are available for towing cycles on rollbacks. There are also a couple of different

mechanisms designed to install in service pickups which allow for easy loading and transport.

On a breakdown tow, the cycle is usually pushed or winched in proximity to the towing equipment with the front wheel going into a formed channel with a stop at the front to hold it upright. Normally, you put the bike in gear and let it rest on the kickstand temporarily. Small straps are available to go around the handlebars into which you can hook your ratchet straps. Put the left strap on the handlebar first and leave it somewhat loose; then do the right side. Tighten down both straps until the cycle sets straight up which will pick the cycle off the kickstand. Cycles are to be towed on their suspensions not their kickstands. This will prevent both frame and kick stand damage. Usually, two additional straps are attached and tightened on the rear of the cycle. Ideally, these straps will be hooked to pull down and/or rearward. On longer trips, the tie-downs should be checked periodically.

**Accident** tows are generally handled with a tow truck or rollback. With a tow truck, the cycle can be picked up with two straps off the boom with the wheels of the cycle tied to the wheel lift crossbar to keep the cycle from swinging. If you have a wheel lift that doesn't lock, you will have to chain the crossbar so it doesn't pivot. The front strap on a boom tow is usually run under the front of the frame between the tank and the forks. The second strap is generally run through or under the rear suspension commonly in front of the rear wheel. A severely wrecked cycle could be laid on a rollback or trailer and properly secured.

**Impound** tows are usually the toughest because neither the keys nor the owner are with the cycle. Most cycles are locked with fork locks, which adds to the difficulty of the tow. You may be able to push the cycle a short distance but you will be making a tight circle. Go-jacks under the front wheel, work well with an extra helper to push a cycle in position to pick up. There are some creative adapters for a go-jack to make it a one-man operation. As cycles get more sophisticated they become harder to handle.

Anytime you are impounding any type of cycle, make sure you check it out very closely and have the officer log any damage before you start loading the vehicle. Be especially careful of any after-market chrome or accessories.

To further complicate the cycle towing business, you have three-wheelers, side cars, and trailers to contend with. A tri-cycle can be anywhere from cycle engine power to half of a full-size car powered by the original car drive train.

## **V. LIGHT DUTY RECOVERY**

### **A. BE AWARE OF POTENTIAL PROBLEMS**

Before beginning this chapter with instructions, let us become aware of safety and review what can go wrong during the recovery process:

1. Onlookers are always in potential danger if too close to the scene...take time to move them to safety before you begin.
2. Equipment, debris, hazardous materials, slick pavement are potentially dangerous if in the path of where you are working...take time to clear before you begin.
3. Equipment, chains and cable/wire rope can break...be aware and have a plan
4. The vehicle can roll in the process of recovery...be alert and prepared.
5. The tow truck can shift during recovery...be alert and prepared
6. Fire and explosions can happen...be alert
7. You can receive incorrect directions to the scene...stay in touch with the dispatcher and make adjustments.

**B. ARRIVING AT THE SCENE**

Planning for a recovery should begin the minute you pull onto the scene. There are three sets of formulas which are helpful and any one you choose can help guide you in planning for your recovery:

<b><u>5 P's</u></b>	<b><u>Scene</u></b>	<b><u>Recover</u></b>
Park	Survey	Reconnoiter area
Protect	Calculate	Estimate resistance/calculate
Police	Explain	Obtain answer

<u>5 P's</u>	<u>Scene</u>	<u>Recover</u>
Plan	No's	Verify solution
Pull	Execute	Erect rigging
		Recheck rigging
		Ready for recovery

After notifying dispatch of your arrival , park safely and out of the way, and checking with the officer or incident manager at the scene, you should perform a walk around inspection of the scene to “size up” the casualty. During the walk around inspection there are certain things on the vehicle to be recovered that should be checked before planning your recovery:

**Check:**

tire	leaks (gas or antifreeze)
springs	battery
frame	old damage to vehicle
cross member	

Decide on the placement of the recovery unit. Check where the points of attachment will be. Do a layout of the equipment to assure you will have everything you need to perform the recovery. Identify the path the recovery will take and assure that it is clear of debris and people. Try to help alleviate traffic problems.



The following is a list of equipment which may be needed for recovery:

- Alloy chain and recovery chain, 8 and 12 feet long with grab hooks, shortener chain.
- Snatch blocks
- Tool box with hand tools
- Fire extinguisher
- First aid kit
- Reflectors and cones
- Broom, shovel, pick axe, sledge hammer and pry bar
- Rope and wire rope
- Scotch blocks
- Hardwood block
- Work gloves
- Anchor shackle

As you lay out equipment always keep the cables parallel. **WARNING: Insure that all hook tips are facing up in the event of failure.** Before starting the pull, pick up all loose tools in the recovery area because they become flying projectiles. Close all doors on the recovery vehicle so as not to compromise the structural integrity of the unit.

### C. PLANNING THE RECOVERY

In planning the recovery, you need to calculate the load to accomplish the job. The recovery formula is as follows:  $TL=R\pm G+D$

**Total Load = Rolling Resistance plus (+) or minus (-) Grade plus (+) Damage (drag)**

**TL** is the total load, **R** is the rolling resistance, **G** is the gradient and **D** is the damage (drag).

Damage Resistance:

No damage (D)=0

½ damage (D)=1/3 weight of towed vehicle

Full damage (D)=2/3 weight of towed vehicle

Estimates of damage value are subjective. For example, one broken wheel or locked brake on a four-wheel vehicle might be considered ¼ damaged, or approximately 1/6 of the weight of the towed vehicle.

Rolling resistance is the ground condition where the vehicle is being recovered.

Surface	% of weight needed to move vehicle
Ice	3-5%
Hard road	10%
Gravel	20%

Grass	15%
Mud	50%
Mud (wheel depth)	100%
Mud (fender depth)	200%
Mud (body depth)	300%
Sand	25%

Grade resistance: As the vehicle is pulled up a grade, this resistance is added to the rolling resistance. Its magnitude depends on the slope of the grade. As the grade steepens, more of the vehicle's total weight must be overcome. Downhill subtract the grade. **WARNING:** When doing a downgrade pull make sure the vehicle does not run into your tow truck.

### Grade

0 = 0%      30 = 50%  
 15 = 25%    45 = 75%

You must know the approximate weight of the vehicle you are recovering to determine the amount of pull that will be required. Refer to the manufacturer's manual to determine the weight of the vehicle. You must also consider the weight of the load if the vehicle is a loaded van or truck. If the surface is softer than a roadway, it will cause resistance that must be factored in. The slope or grade of the recovery

path may cause positive or negative resistance and must be utilized in determining the amount of pull required. The amount of resistance caused by the wheels that will not roll on the vehicle to be recovered has to be determined.

**EXAMPLE:** Truck = 18,000 lbs. upright

R = Grass            D = 0            G = 45 Degrees

R (2,700) + (13,500) + D (0) = 16,200 lbs. Or TL

The following factors will help in determining where to position the recovery unit. The length of winch cable you have will determine how far the tow truck can be placed from the vehicle to be recovered. The surface area around the tow truck must be firm enough to support the unit during winching. Obstacles that may be in the recovery path and where anchor points may be located will also influence where the recovery vehicle will be placed. Determine where the final location of the casualty for hook-up should be and place the tow truck to allow for this position.

Information gathered from the walk around inspection and recovery formula will determine the position of the recovery unit. In positioning your tow truck, you want to make the tow truck **work for you not against you.**

## **VI. PERFORMING THE RECOVERY**

**Safety is the most important aspect of the recovery!**

- A. Clear area
- B. Check and recheck rigging
- C. Establish communications
  - 1. Be sure that all personnel involved in the recovery understand the plan
  - 2. Use hand signals or radio communications they enhance the efficiency and safety of the recovery
- D. Complete winching operation
- E. Break down rigging
- F. Set towing and recovery vehicle for hook-up of casualty

**Scotch blocks** are used for stability during a recovery. Hands on experience will teach you when and where this equipment should be used. The requirements will vary with each recovery.

A **Deadman** can switch direction or increase the winching power and reduce load on the towing and recovery unit.

**Snatch blocks** increase the total load capability of cables by providing mechanical advantage. Snatch blocks increase the total load capability of the recovery unit and also provide directional change when it is needed. You can significantly increase the winch capacity of your tow truck by using snatch blocks.

A single snatch block used to best advantage would give the effect of connecting two lines to the load or is a two-part line. Each of these two parts would share the load equally. The tension on each part would be reduced to  $\frac{1}{2}$  the tension of a single line. The use of additional snatch blocks would further divide and reduce the line pull tensions when properly used.

Take care that you are not misled about the use of snatch blocks. Not all uses reduce line tension. In some cases, they merely change the direction of pull on the line without changing the tension on the line.

Where snatch blocks are used to reduce line tension, always study the application in light of the information previously provided. One way to help avoid errors in estimating tension on the lines is to note the number of snatch blocks that are used. Each line part connected to the load will support an equal share of the load. Determine what that share is by dividing the number of line parts connected to the load into the total load.

Avoid a **run away casualty** or opposite roll of the casualty...to avoid a run away of the casualty in a roll over, place the transmission of the vehicle to be recovered in gear and set the brakes. You may want to block the tires or use an additional truck to help control the roll over. To prevent an opposite roll always take precautions against load shifting that will cause the vehicle to continue to roll after being

uprighted. Position your tow truck at a distance from the casualty that will allow room for the vehicle to be uprighted. You may also want to consider uprighting the vehicle away from the tow truck if conditions permit. If the vehicle to be recovered is located on a slope toward the truck, you must roll the vehicle away from the tow truck. You may need to use an additional truck to control the roll over.

The nylon or daycron fabric used in **vehicle recovery straps** has immense strength and elasticity for its comparative size, however, it is comprised of a soft agent that is easily weakened by careless use that could result in cutting some of the fibers. When all of the fibers can work together, they are very strong. If some are cut, the remaining fibers must carry the load, reducing the overall capacity of the entire strap.

When attaching the strap to the vehicle to be recovered, avoid putting the loop eye of the strap on a sharp surface or allowing the strap to rub against a sharp surface. Position protective material between it and any sharp or protruding edges.

**Warning: remember that straps have very different safe loads depending on whether you use them as a vertical lift, a choker or a basket. When you order, tell the supplier what you want to do with the straps and rely on his expert advice.**

Like any tool, proper maintenance is necessary to ensure long life for your nylon webbing vehicle recovery strap. During its use, the strap is subject to water, dirt,

mud, snow, ice, sunlight and chemical contaminants. The nylon is resistant to alkaline compounds; dacron is resistant to acids and neither will absorb water or mud. However, these elements can cause damage if care is not taken. Tiny particles of sand and grit can lodge between the fibers of the strap and can actually cut them as the strap is stretched and flexed. Grease, oil, gasoline, and other solvents can also weaken the fibers. **Check for the most up to date maintenance instructions in the use of straps from manufacturers' manual.**

Although there are several factors that determine the amount of pull that your tow truck can produce, the determining factor is the **winch cables**. The winches and booms can withstand loads that are greater than the load limit of a single line winch cable. This is the reason it is important to learn how snatch blocks can be used to give mechanical advantage and increase the load capacity of the winch cable. To find proper points of attachment of the winch cables, use manufacturer's manual. Each make of vehicle will have different attachment points.



## **VII. SOURCES**

Light/Medium Duty Towing and Recovery Manual, Towing and Recovery Association of America, November 1993.

Towing and Recovery With Light Duty Equipment, Units 1,3,4,5,6,7: International Institute of Towing and Recovery, University of Georgia, 1989.

The Official CDL Guide, FLI Learning Systems, January 1990.

Federal Motor Carrier Safety Regulations, US Department of Transportation, April 1994.

Hook-Up With Success, Towing and Recovery Association of America, 1989.

# National Driver Certification Study Guide

## Category V. - Equipment

I.	CHAINS.....	V-1
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## I. CHAINS

For the purpose of clear understanding, TIE DOWN CHAINS are defined as used on all four corners of a car carrier or rollback. The V bridle on a rollback is not considered part of the tie down system. SAFETY CHAINS are defined as a second restraint for towed vehicles used for conventional tow trucks both on wheel lifts and slings to prevent separation of the tow vehicle and the towed vehicle in case of primary system failure.

A wide variety of chains are available, but not all are recommended for towing. The National Association of Chain Manufacturers has a system for identifying chain which is comprised of a letter and number system. The letter identifies the manufacturer while the number represents the chain's grade or strength rating. **YOU SHOULD NEVER USE A CHAIN WHICH DOES NOT HAVE SUCH A GRADE INDICATION.** Chain is marked on a link approximately every foot of chain.

There are four types of chain most commonly used in towing. The types of chain widely recommended for towing are high test and alloy welded chain.

1. Proof coil, #3, is not heat treated and is an extremely low grade of chain. **IT IS NOT RECOMMENDED FOR USE IN TOWING.** The safe working load for 3/8 inch Proof Coil chain is 2,650 pounds.

2. High Test, #4, is not heat treated but is suitable for most light duty towing. It should NOT be used for recovery. The safe working load for 3/8 inch High test chain is 5,400 pounds.

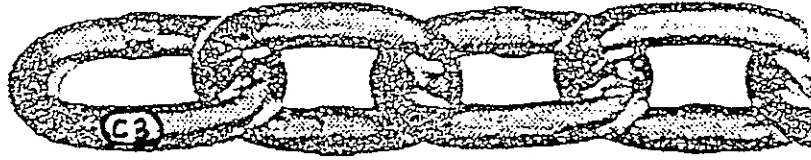
3. Transport, #7, is a high quality heat treated chain. Although it is not approved for overhead lifting, it is widely used in the towing industry. The safe working load for 3/8 inch Transport chain is 6,600 pounds. This is the type of chain manufacturers recommend.

4. Alloy, #8, is a heat treated chain that is stronger than Transport. It is the only OSHA approved chain for overhead lifting. The safe working load for 3/8 inch Alloy chain is 7,100 pounds.

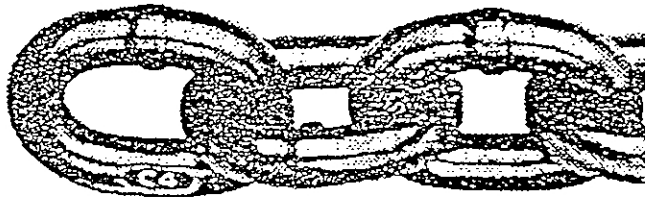
Safe use of chains requires that you:

1. Never exceed the working load limit of chain.
2. Always inspect chain to assure it is not kinked, twisted or damaged. Look for defects and damage prior to every use.
3. Do not jerk the load. Start off pull slowly.
4. Do not incorporate in the chain any hook, ring or shackle that has a working load limit less than that of the chain.
5. Use wood blocks to protect chains from sharp edges when necessary.

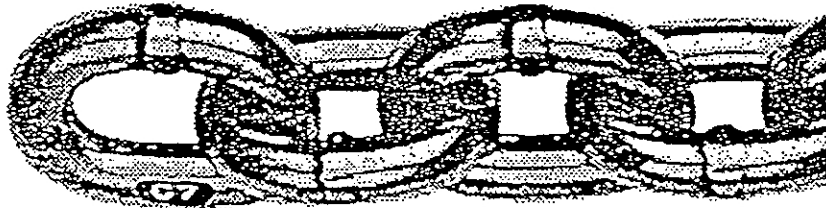
# CHAIN TYPES



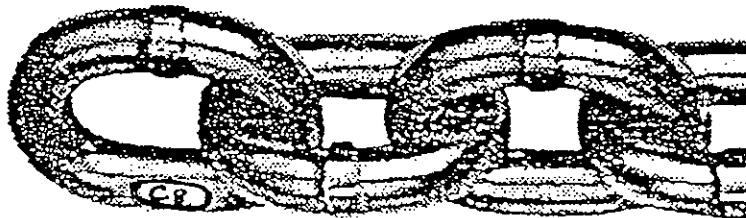
System 3, Proof Coil Chain



System 4, High Test Chain



System 7, Transport Chain



System 8, Cam-Alloy Chain

## II. HOOKS

A. T-Hooks are attachment devices used on most cars manufactured after 1980.

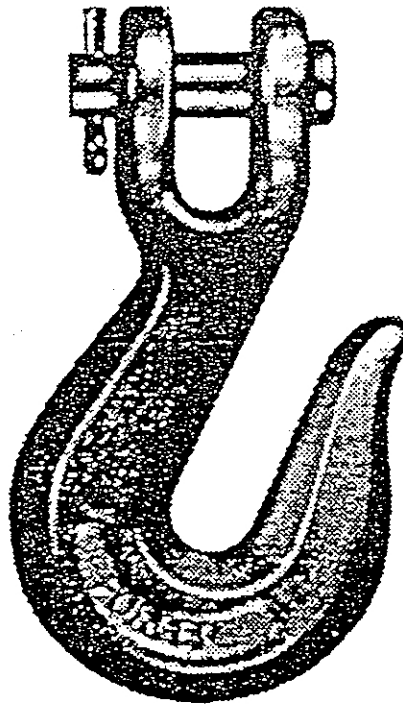
Those cars come equipped with holes or slots to accommodate T-Hooks.

B. J-Hooks are used with conventional tow trucks either using a tow sling or a tow bar and on car carriers. J-Hooks are used on older or smaller cars, pick-up trucks and vans. As they have no holes provided specifically for them, they are normally placed behind the lower control arms of a disabled vehicle's suspension or connected to the real axle. **J-Hooks should always be attached so that the load is applied to the bend or throat of the hook.** Placing a load on the tip of a hook could cause it to bend.

C. Grab Hooks are used with safety chains and with some tow hook-ups. They are meant for use when a chain is being wrapped around something and they should always be made of alloy. The Grab Hook is hooked onto the chain itself and is interlocked. **Grab Hooks are not designed to be hooked onto the structure of a vehicle.**

D. Cable Hooks are weighted and if broken will usually drop to the ground. Here again a Cable Hook is usually made of alloy.

473-S, 473-BK, 473-A  
CLEVIS GRAB HOOKS



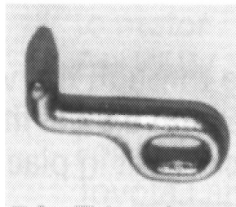
## NEW EQUIPMENT

T-hooks are attachment devices used on most cars manufactured after 1980. Those cars come with holes or slots to accommodate T-hooks.

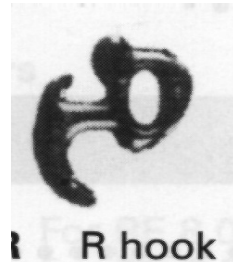
R-hooks are modified T-hooks and can be inserted into a T-hook slot.

S-hooks are small J-hooks, and they, too can be inserted into a T-hook slot.

A hook cluster includes the R-hook, the T-hook and a mini J-hook.



11-7A T hook



11-7B R hook



11-7C Mini J hook      \$ 1.99  
Grade 70



11-7CL Hook cluster      \$19.99  
This cluster includes the R hook,  
T hook and a mini J hook



E. The less commonly used hooks include R-Hooks which are modified T-Hooks and S-Hooks which are small J-Hooks. Both R and S Hooks can be inserted into T-Hook slots.

Hooks come in the same grade as chains. Any attachments used with chains should be of the same type, grade and size as the chain being used. If a lower grade of attachment is used, then the capacity of the chain is lowered to that of the attachment. In other words, a chain is only as strong as its weakest link or attachment.

### **III. SNATCH BLOCKS**

Snatch blocks can greatly increase the capacity of a wrecker. They have three important uses on the wrecker:

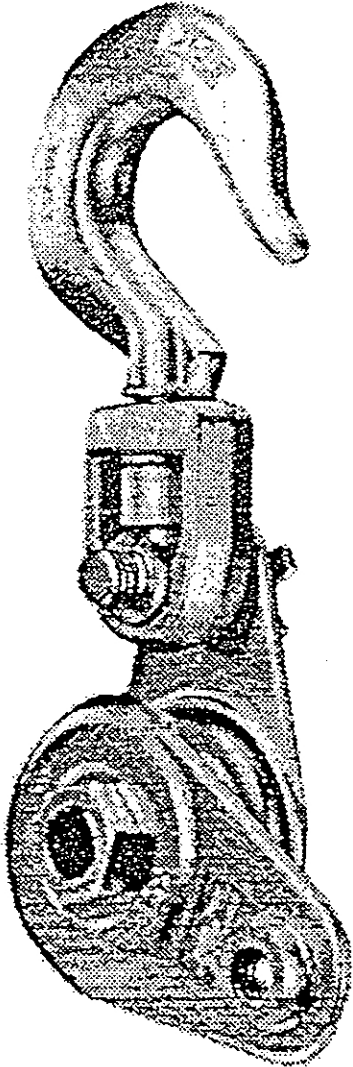
To reduce tension on cables

To increase the pulling capacity of the winch

To change the direction of pull

Cable can be rigged with a single snatch block to create a two-part line. Each line will reduce by 1/2 the tension on each line. If the snatch block is moving with the load it is reducing tension; if it is not moving, it is changing the direction of the pull. You should always use snatch blocks to reduce cable tension when lifting loads that would exceed the working limits of your winch cables.

HEAVY, DROP SIDE SNATCH BLOCKS



Snatch blocks also have a rating place and show the safe working limit or the maximum load that should be applied to the block. Most light duty wreckers use snatch blocks of either 3 or 4 tons and are used with cables from 3/8" to 1/2" in diameter.

#### **IV. CABLE/WIRE ROPE**

There are two types of cable: Steel Core and Hemp Core.

A steel core is an independent wire rope core and is normally made of seven strands. A strand core usually made of seven or 13 wires, is sometimes used. A steel core is more resistant to crushing and adds strength. A steel core is also needed when excessive heat in the use of the rope will char a fiber core.

A fiber core is constructed of vegetable fiber such as jute. However, manmade fibers are seeing increased use because they have properties not found in natural fibers. Fiber core offers some advantages not found in steel core, for example, it acts as a cushion for the steel strands during operation. The fiber core is saturated with lubricant before manufacturing, therefore, it acts as an internal self-lubricant for the wire rope.

In the towing industry, two types of wire rope are most popular.

6x19 (six wires of 19 strands) each because it has strength and toughness with moderate flexibility.

6x37 (six wires by 37 strands) because it also has high strength and toughness, but is very flexible.

The single most commonly used rope is hemp core 3/8" 6x19 which has a safe working load of 3,500 pounds.

In an effort to attain the best characteristics of both 6 x 19 and 6 x 37 wire rope manufacturers have offered a "new" classification of cable to the towing industry: "6 x 25" wire rope offers the resistance to crushing that the "37" class of cable was susceptible to, and yet it offers the increased flexibility that towing and recovery operators and the manufacturers of towing equipment are demanding from wire rope products. This product allows use of smaller diameter sheave wheels in the boom ends of recovery units, and is able to perform well under the demands of the smaller diameter winch drums found on many of today's carriers and tow trucks. And, the use of snatch blocks with smaller diameter sheave wheels do not impose upon the more flexible cable.

These comparisons beg the question: how do the various classes of cable compare in strength, both in standard working load and the breaking strength? For all practical purposes, all of the wire rope classes have the same safe working load

ratings, dependent upon the quality of the steel used in their manufacture! When comparing products from the wire rope industry, the steel used to produce the wire is classified as “P.S.” (Plow Steel), “I.P.S.” (Improved Plow Steel), and “E.I.P.S.” (Extra-Improved Plow Steel). A similar classification would be a fastener (bolts & nuts) classifications; the Grade 3, Grade 5 and Grade 8 bolts and nuts differ in quality and strength in their respective sizes. Therefore, cables of the same diameter, each constructed from Improved Plow Steel, share the same Safe Working Load ratings. Those cables from other classes of steel used in their construction, such as Extra Improved Plow Steel, would also share their similar ratings.

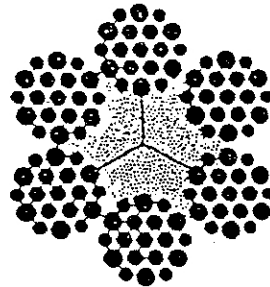
This information should encourage responsible towing company owners and operators to become knowledgeable about the wire ropes/cables found on their equipment. When replacement of those cables are mandated by either wear or breakage, it is imperative that manufacturer’s guidelines and recommendations be followed, and departures from those recommendations should be researched thoroughly. Cables for the towing industry are manufactured domestically, and imported products are available; a knowledgeable and competent owner/operator will choose quality ahead of value, and will follow the recommendations of manufacturers when replacement occurs.

Care must be taken to wind cable tightly and evenly because loose or uneven cable can become crushed, bent or kinked. When a heavy load is lifted the cable can become buried and wedged among other wraps of cable on the drum. This causes damage to the cable and can cause a load to slip. If the cable completely unwinds from the winch, the cable may pull loose from the drum and drop the load. To help prevent this, always maintain a minimum of 4 wraps of cable on a drum.

Cable has attachments or terminations. The best termination is the swage end, in which the cable ends are braided and a sleeve is placed over the end of a cable and pressed together by a special hydraulic press. Wedge sockets and cable clamps and clips are not recommended as there is a tendency to jar loose and cause a load to fall.

The main reason for cable breaking is overloading. By continued variations of stress and vibration, by being bent around sharp corners or by being drawn across sheaves that are too small, cable is worn down. Types of cable damage are wear, fatigue, tensile, and shear. You should constantly inspect cable for wear and for frayed or crushed wires. Particular attention should be paid to pick-up points (or those points that are in contact with drums and sheaves when the initial load of a lift is applied) and end attachments. **Do not try to repair damaged cable. Replace it.**

6 x 19 CLASS WIRE ROPE  
AND  
6 x 19 WARRINGTON WITH FIBER CORE



## **V. LIGHTS**

Tow trucks must be equipped with flashing amber lights which may be seen for a distance of 500 feet. These lights must be used when the vehicle is engaged in “hazardous” operation. You should check your state and local regulations as to when these lights should be flashing as laws vary from state to state.

Tow trucks are also equipped with work lights and rear hook-up lights, which should only be used at the scene. NEVER travel with these lights on.

Tow trucks should have auxiliary towing lights which may be placed on the trailing end of the disabled vehicle that is under tow.

## **VI. RATINGS AND LIMITATIONS**

The load bearing capacity of equipment on a tow truck (cable, chain, hooks and snatch blocks) is rated. Equipment has two ratings: Breaking Strength Rating and Safe Working Load Rating. The Breaking Strength Rating is established by the manufacturer as the weight or load that new equipment can bear without causing damage to itself. The Safe Working Load Rating is the weight or load that equipment can safely bear under normal operation conditions. In all cases, the Safe Working Load Rating is considerably lower than the Breaking Strength Rating. For example, most chain, cable and snatch blocks have safe working load ratings of



either 3 or 4 to 1. This means that the safe working load is either one third or one quarter of the breaking strength rating. A chain with a 3 to 1 rating and a breaking strength rating of 18,000 pounds can, therefore, be used to lift a load of 6,000 pounds. It is important to realize that these are only approximate ratings. Always follow the exact ratings that manufacturers provide with their products.

## **VII. SOURCES**

Light/Medium Duty Towing and Recovery Manual, Towing and Recovery Association of America, 1993.

Field Procedures, International Institute of Towing and Recovery, The University of Georgia, 1989.

Federal Motor Carrier Safety Regulations, US Department of Transportation, 1993.

Driver's Manual for Tow Truck Driver's Endorsement, New York State Department of Motor Vehicles, December 1994.