

**CITY OF CHICAGO FIRE DEPARTMENT
FIRE ENGINEER PROMOTIONAL PROCESS**



**STUDY GUIDE FOR THE
WRITTEN EXAMINATION AND PROFICIENCY TEST**

September 16, 2016

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INTRODUCTION

This Study Guide is designed to assist you in preparing for the Written Examination and Proficiency Test components of the Chicago Fire Department Fire Engineer Promotional Process. The goal of the Fire Engineer Promotional Process is to select individuals who are qualified to perform the duties and responsibilities of a Fire Engineer in the Chicago Fire Department. The Written Examination and Proficiency Test are opportunities to demonstrate your capabilities, specifically your knowledge of Department orders, directives, SOPs, training materials, and other resources, as well as your ability to apply this information to job-related situations while operating a fire engine.

The Study Guide provides general suggestions and tips for helping you study for the Fire Engineer Promotional Process as well as specific information about the test formats, materials, and instructions that you will be asked to follow during the Written Examination and Proficiency Test administration. Additionally, the Study Guide contains information about the types of questions that will be included in the various promotional process components. It is to your advantage to review these instructions and information about the types of items, so that you are familiar with them before the day of the Written Examination and the subsequent Proficiency Test.

In addition to the information about the promotional test components and related study tips, this Guide provides the following appendices containing important information about the Fire Engineer job and components of the Promotional Process:

- **Appendix A** contains a list of critical job tasks for the Fire Engineer job.
- **Appendix B** contains a list of knowledge areas, skills, abilities, and other characteristics that are important for performing the Fire Engineer job.
- **Appendix C** contains the Recommended Reading List of important reference materials that may be included in components of the Fire Engineer Promotional Process.
- **Appendix D** contains a copy of the previous *2006 Fire Engineer Written Examination* and the Answer Key from that exam.
- **Appendix E** contains the *2009 Spartan/Crimson Gladiator Classic Custom Pumper Operation and Maintenance Manual* for the engine that will be used in the Proficiency Test.

All of the information included in this Study Guide was developed based on extensive analysis of the Fire Engineer job in the Chicago Fire Department. Activities included interviews and observations with CFD Fire Engineers, collection of job analysis data from current Fire Engineers, analysis of the data, and subsequent review with Department subject matter experts and senior command personnel. The lists of critical tasks and important knowledge, skills, abilities, and other characteristics that resulted from the current Fire Engineer job analysis are presented in Appendices A and B. You should review this information to become familiar with the duties and related requirements that will be the focus of the Written Examination and the Proficiency Test.

For test preparation purposes, you should refer to the Recommended Reading List in Appendix C for the reference materials with which you are expected to be familiar for the Fire Engineer Written Examination and Proficiency Test. The materials on the Recommended Reading List are listed as they are categorized on the Chicago Fire Department SharePoint website and can be obtained electronically from that site.

All test materials, questions, exam procedures, and scoring criteria were developed based on discussion and review of these materials and their application to the Fire Engineer job duties with subject matter experts and senior command personnel in the Chicago Fire Department. It is to your advantage to have studied the materials on the Recommended Reading List, have a working knowledge of the information contained in these materials, and be able to apply the relevant knowledge to realistic situations that Fire Engineers encounter on the job. In addition, you should be familiar with the types of instructions, questions, test equipment, and scenarios that will be included in the Written Examination and the Proficiency Test. Relevant information about each promotional process component is provided in the following sections of this Study Guide.

The City wants each candidate for Fire Engineer to have an equal opportunity to demonstrate his or her capabilities. We encourage you to use the materials in this Study Guide to help you prepare for the Written Examination and Proficiency Test, and we believe that you will find this information useful in helping you to do your best. Studying these materials carefully will increase the likelihood of your success on the testing components of the Fire Engineer Promotional Process.

OVERVIEW OF THE FIRE ENGINEER WRITTEN EXAMINATION

The Written Examination component of the Fire Engineer Promotional Process presents questions relating to knowledge that is required in situations that are encountered by Fire Engineers on the job. You will be asked to apply your knowledge of relevant policies, procedures, formulas, and other resources to respond to multiple-choice questions about realistic job situations. The Written Examination presumes that you are knowledgeable about Department orders, directives, SOPs, training materials, Engineer reference manuals, and so forth, but does not require experience in having performed the Fire Engineer job.

WRITTEN EXAMINATION FORMAT

The Test Question Booklet for the Written Examination will contain all of the instructions, background information about the test scenarios, and the multiple-choice test questions. The questions are presented in several sections, some of which are intended to reflect a “day in the life” of a CFD Fire Engineer in a fictional Chicago Fire Department Engine Company. You will answer the questions from the perspective of a Fire Engineer who must respond to the various events and issues that arise during the work day. Therefore, some of the test questions may be related to the same incident or event, and the information may build from one question to the next. Other questions may address stand-alone issues. You should respond to each question by applying your knowledge to the situation and context presented.

All of the test items in the Written Examination are multiple-choice questions, which present four answer choices (A, B, C, D). You will select the one correct answer to each question based on the information provided in the question and the related background information and instructions. You will be given a separate answer sheet on which to record your responses to all of the questions.

YOUR ROLE

In the Written Examination, you will be placed in the role of a newly promoted Fire Engineer who is assigned as a Relief Engineer in fictional Chicago Fire Department Engine Companies at different times of the year and days of the week. Each section of the exam will cover a different tour of duty, and the related test questions emerge from activities that occur during the course of the work day. As the Fire Engineer, you will carry out relevant duties, including inspecting the apparatus, hoses, and equipment, driving the engine, responding to incidents, assisting with training, communicating with the company officer and other members, and so forth. You will respond to multiple-choice questions that assess your ability to recall knowledge from memory and apply it to the situations presented in the Written Exam.

Note: In order to fully assess the knowledge areas required for performing CFD Fire Engineer duties, the fictional tours of duty presented in the Written Examination may simulate more activities/incidents than would typically occur during a normal work day. However, all test scenarios and questions reflect realistic situations that, as a Fire Engineer, you may encounter during performance of related duties and responsibilities.

PRACTICE MATERIALS

You may use the *2006 Fire Engineer Written Examination* (provided in Appendix D) to practice answering the types of questions that will be included in the 2016 Written Exam. The 2006 Answer Key is also provided in Appendix D.

VERY IMPORTANT NOTES:

The previous exam is provided **only** to give all candidates similar information about the general exam format and the types of test items that may be included, although the current Written Examination may differ in some ways. Please be aware that the 2006 test questions and answer key are presented exactly as they were developed for use 10 years ago. They have **not** been re-reviewed to check for accuracy in 2016. Many additional CFD directives have been issued since the 2006 exam was administered, and some of the directives on which 2006 test questions were based may now be rescinded or replaced by more current directives. The 2016 Written Examination is based on current CFD policies, procedures, etc., as documented in the reference materials in the current Recommended Reading List (provided in Appendix C).

INSTRUCTIONS FOR THE WRITTEN EXAMINATION

This section of the Study Guide provides general instructions that you will be asked to follow during the Written Examination administration, including information about the test materials, timing, and completion of the answer sheet. Additional information related to test administration practices may be provided by the proctor on the day of testing.

WRITTEN EXAMINATION MATERIALS

The Written Examination will be administered in one testing session. Actual test time is expected to be between 3 to 4 hours, with additional time for check-in, instructions, etc. At the beginning of the session, you will be given the following materials:

- Printed instructions for you to follow along as the proctor reads the instructions for the Written Examination and instructs you on how to complete the identification information on the test materials
- A Test Question Booklet that contains the questions for all sections of the Written Examination
- Hose records for the engines in particular sections of the exam to be used as reference for specific test questions
- A separate answer sheet that will be used to record your responses to the questions in each section of the exam

GENERAL INSTRUCTIONS

The Written Examination of the Fire Engineer Promotional Process focuses on your ability to apply knowledge and use information that is required to respond to situations encountered on the job as a Fire Engineer. Please listen closely and follow along with these instructions as they are read aloud.

TEST QUESTION BOOKLET

The Test Question Booklet for the Fire Engineer Written Examination contains all of the multiple-choice test questions for the entire exam. The questions are divided into separate sections, which represent separate tours of duty for different engine companies. You will have one total time limit (likely 3-4 hours) to complete all of the test questions in all sections of the Written Examination.

Each multiple-choice test question in the Written Examination has four response options, labeled A, B, C, and D. You are to select the **one** correct answer to each question. You will then mark your answers to the test questions on the separate answer sheet.

Use of calculators is **not** allowed during the examination. You are allowed to write, draw, or make notes or calculations in the Test Question Booklet as needed. However, all of your answers must be recorded on the separate answer sheet. You will **not** be given credit for anything written in the test booklet.

ANSWER SHEET

On the answer sheet, there are numbered rows of answer spaces corresponding to the numbers of the items in each section of the Written Exam. For each question, you will find the row of answer spaces with the same number as the question in the Test Question Booklet, and fill in the space that is labeled with the same letter as the answer you choose.

The multiple-choice answer sheet is a two-ply carbonless form. The top and bottom copies of the form are identical. ***You will be able to take the bottom copy with you when you leave the testing session, so that you have a record of your test responses.*** When you mark your answers to the test questions on the top copy of the answer sheet, your marks will be transferred onto the bottom copy.

Please note that if you decide to change an answer that you have marked already, you must ***erase the top copy cleanly*** and then fill in the answer space for your new answer. If two circles for the same question are filled, your answer will automatically be counted as wrong.

Also note that ***the bottom copy will not erase.*** You will need to lift up the top copy and cross out your old answer on the bottom copy. To avoid smudging the bottom copy when you erase a mark on the top copy, you should move either sheet so that the bottom copy is not directly underneath the mark you intend to erase.

QUESTION-SPECIFIC INSTRUCTIONS

HOSE RECORDS

Some of the questions in the Written Examination require you to refer to the engine's hose record to determine the number of feet in a length of hose. In each section of the exam that follows a specific Engine Company, you will be given a mock-up of a hose record that is specific

to that particular engine. Be very careful to refer to the correct hose record when you are responding to questions in each section of the exam.

When using the information in the hose records to determine the feet of hose in a leadout for a particular scenario, hose length (butt) numbers will be given as either:

- left on the engine, which means that hose length (butt) number is still in the hose bed (i.e., it is the first hose length that is not being used); or
- connected to the engine, which means that hose length (butt) number is the last one that is being used in the layout.

FIELD HYDRAULICS CALCULATIONS

Some of the questions in the exam ask about the proper engine discharge pressure for various leadouts. All answers to these questions have been calculated using the field hydraulics (flow memory) method that is endorsed by the Chicago Fire Department and presented in the Engineer's Manual.

Note: Because pump pressure gauges are typically marked in 10 psi increments, the accepted method of determining the proper engine discharge pressure is to round the calculated result to a multiple of 10 psi. The decision to round down or round up depends on whether a hand line or a master stream is being charged.

- Discharge pressures for hand lines are rounded down to the nearest 10 pound increment. For example, if the calculated engine discharge pressure for a hand line is 87 psi, the result is rounded down and reported as 80 psi. This is the pressure that would be set on the pump mechanism.
- Discharge pressure for master streams are rounded up to the nearest 10 pound increment. For example, if the calculated engine discharge pressure for a master stream is 87 psi, the result is rounded up and reported as 90 psi. This is the pressure that would be set on the pump mechanism.

You should follow this method for questions that require discharge pressure calculations in the Written Examination. For hand lines, round calculated pressures **down** to the nearest 10 pound increment, and for master streams, round calculated pressures **up** to the nearest 10 pound increment.

IMPORTANT POINTS TO REMEMBER

- Mark only **one** answer on the answer sheet for each multiple-choice test question.
- Plan your time. You may find it helpful to answer the easy questions first, then go back and consider the questions you skipped.
- Check often to be sure that the number next to the row of answer spaces you are marking on your answer sheet matches the number of the question in your test booklet. This is especially important if you skipped any questions.
- Make sure that you fill in the answer space completely to indicate your answer. Thoroughly erase any answers you want to change or any marks you make by mistake on the top copy of the answer sheet. You also will need to cross out any answers that you change on the bottom copy of the answer sheet
- When you finish each section of the exam, go on to the next section immediately.
- If you have time available after you finish, review the questions and your answers. Make sure that: (a) you have answered all the questions, and (b) you have marked your answers appropriately on the separate answer sheet.
- Your score will be based on the total number of questions answered correctly. ***It is to your advantage to answer every question, even if you need to guess.***

TIMING OF THE WRITTEN EXAMINATION

Once the test instructions are finished, the proctor will tell you when to open the Test Question Booklet and begin the exam. You will have a total amount of time (estimated to be 3-4 hours) to complete all of the questions in all sections of the Written Examination. The overall time limit will be set with the intention that candidates should be able to complete all of the test questions. You do not need to complete the sections in order. You may choose to start with any section you wish. Once you complete a section, go on to another section immediately.

You will be given warnings by the proctor when you have 2 hours, 1 hour, and 15 minutes left in the testing session. However, you will need to plan and manage your time to allow you to complete the all of the questions in all sections of the Written Examination with the time limit.

If you finish before time is called, you may go back and check your work in any sections of the exam. When you are finished, please raise your hand to indicate to the proctor that you are ready to be processed for check-out. Candidates who are still in the room when exam stop time has been called will be processed according to instructions announced at that time.

PREPARATION STRATEGIES FOR THE WRITTEN EXAMINATION

This section of the Study Guide provides general information about studying approaches and reading techniques, as well as suggestions to help you prepare for the Fire Engineer exams.

PREPARING TO STUDY

LEARNING STYLES

People have different learning styles. For example, **visual learners** understand things best when they create physical or mental pictures that enable them to “see” the material they are trying to learn. **Auditory learners** understand things best when they read aloud information or talk through solutions, enabling them to “hear” the material they are trying to learn. **Tactile kinesthetic learners** understand things best when they write out notes or recopy information, which enables them to “touch” the material they are trying to learn. Depending on your learning style, some study methods may be more effective for you than others. Most people learn best using a combination of some or all of the following techniques. Consider which are likely to work best for you.

- Highlight important points to remember. Emphasize key phrases or ideas that will easily trigger your recall of the information.
- Use flashcards to memorize and quiz yourself on factual information or definitions.
- Draw pictures, diagrams, or flow charts of abstract ideas or problems or hose layouts.
- Visualize the document containing the information and its placement on the page when trying to remember specific facts.
- Read aloud information that you are trying to remember. Repeat important points several times.
- Dictate important concepts into a recorder and play the recording back to yourself. As you listen, stop the recording to expand orally on these concepts with new ideas or information.
- Take notes and outline reference materials as you read. Recopy your notes and outlines and fill in additional or missing information.
- Jot down ideas for solutions to problems as they occur to you. Refer to your notes to expand on these ideas, and write out your complete thoughts.
- Write out potential test questions in the formats that will be used in the exam. Then write out your answers. Go back to the study materials to verify that your answers are correct and complete.
- Ask yourself practice questions about the material and rehearse your answers out loud.

No matter what your learning style, using a multi-sensory approach as much as possible, including seeing (read), hearing (repeat orally), touching (write out), and doing (practice quizzes), will help reinforce your memory of the material.

STUDY APPROACHES

There are also different approaches that you may take for studying your materials. Some individuals prefer to study by themselves, while others accomplish more by studying in groups. The following table outlines some of the advantages and disadvantages of various approaches that you may want to consider.

Study Approach	Advantages	Disadvantages
Individual	<ul style="list-style-type: none"> • Work at your own pace and schedule • May have better focus/concentration without other people around you • Allows you to focus on strengthening personal weaknesses 	<ul style="list-style-type: none"> • No opportunity to ask others questions • Must gather and organize study materials on your own • Need to be very self-disciplined and self-motivated
One-on-One	<ul style="list-style-type: none"> • Other person may be able to answer your questions • You can verbally “quiz” each other • Share the responsibility of gathering study materials and taking notes • Fewer problems of coordinating schedules than with a larger study group • Scheduled meetings help motivate you to study 	<ul style="list-style-type: none"> • Limited to one other person’s knowledge • Need to coordinate schedules • Partner might learn/study at a different pace and slow you down or speed ahead without you • You may be tempted to talk about other things and put off studying
Study Group	<ul style="list-style-type: none"> • More people for you to learn from • Group members can quiz one another • More people to share the responsibility of gathering study materials, organizing, and taking notes • Scheduled meetings help motivate you to study 	<ul style="list-style-type: none"> • Slower learners may slow down the group • Faster learners may speed ahead without you • The temptation to talk about other things can take away from study time • More difficult to coordinate schedules of others • Greater chance of conflict in bigger groups

You may find that a combination of approaches works best. Even if you join a study group or work with a study partner, you will probably need to spend some time reading, taking notes, or reviewing materials on your own. Once you have identified the approach or combination of approaches that is right for you, you should arrange your study schedule accordingly so that you can make the most effective use of your time.

COLLECTING MATERIALS

It is important that you locate **all** materials that are on the Recommended Reading List for the Fire Engineer Promotional Process.

- Refer to the Recommended Reading List, which includes important reference materials that were used to develop the Written Examination and the Proficiency Test. (A copy of the Recommended Reading List is included in Appendix C of this guide.)

It is to your advantage to be as familiar as possible with all of the reading materials listed in Appendix C, so that you can recall and/or locate the reference information easily. The sooner you begin to study, the more time you will have to absorb the necessary information. Feel free to ask knowledgeable members of the Department to answer any questions you may have about obtaining the materials on the Recommended Reading List.

SCHEDULING

A key to test preparation is setting a study schedule that is suitable for you. Consider the following guidelines when planning your study schedule.

- Begin your test preparations early. The more time you have to study the materials, the better prepared you will feel come test time. Preparing early also will allow you time to resolve any concerns that may come up while you are studying. Ask the appropriate people to clarify any questions you have about the content of the reference materials.
- Given the amount of material to be learned before the test, schedule your test preparation realistically. It may help to make a list of all the activities you must complete before the test and prioritize them, allotting more time to those topics that are most important or that you find difficult to learn.
- Allow sufficient time to accomplish each study activity, decide when each activity best fits into your routine, then try to stick to your schedule from day to day. Keep in mind that if you are studying with a group, you will need to coordinate schedules with all group members to allow everyone to participate.
- Plan your schedule so that you study challenging and important topics when you can devote the most time and energy. For example, some people find that they accomplish more by studying in the morning, while others prefer to study at the end of the day. Consider the timing of your study schedule and daily routine to determine what works best for you.

HOW TO READ EFFECTIVELY WHEN STUDYING

READING STYLES

When you read for different reasons, your method of reading should be different depending on the context. For example, you might skim the newspaper quickly to pick out the important or interesting features. You might proofread every word of a memo you wrote to look for typos, without really concentrating on the message. Or you might read a contract you are about to sign slowly and intently to be sure you understand its meaning. In this same way, certain methods of reading promote learning and memorizing information. The following tips can help you to read effectively when studying for a test.

PREVIEW THE MATERIAL

Before actually reading, look over the entire document (including the Table of Contents if one is available) to see what it is about and how it is organized. Read introductory **and** summary sections first. Having an overview of the general topics in mind and a sense of how they are related or presented will help you understand the details of the information as you read. This preview also will give you a good idea of how long it will take to read the document.

READ ACTIVELY

Read when you feel alert. Be realistic about how much material you can read in one session. You will not retain as much information if you try to read too much at once. Take a short break if you find you are not concentrating, and come back to your reading with refocused energy.

Divide the material into logical and manageable sections. Before reading each section of your study materials, flip through the section and look at the headings to preview what the section is about. Read the first sentence and ask yourself what that section is trying to convey. Then read the entire section with the goal of discovering this information.

Mark the material as you read. This may include underlining or highlighting the text and making notes in the margins or on a separate piece of paper. Underlining or highlighting should be used to emphasize key points. When reviewing, you can easily use these points to recall information. Notes should be used to (a) indicate where particular details are discussed, (b) summarize information, (c) outline a passage, or (d) write comments to yourself.

Think like people in the job you are testing for. As you read, try to apply the information you are studying to the types of situations encountered by individuals in the CFD Fire Engineer job. Think about how the information applies to the types of decisions and actions that are common for Fire Engineers.

Ask yourself questions about the material. Instead of just trying to memorize information, question yourself about it as you read, asking Why, How, What if, etc. For example, when reading about a procedure that is followed in a particular situation, try asking yourself, “Why is that procedure used in that situation?” “What would happen if the procedure was not used?” “What other situations require the same procedure?” This technique will help you to understand the information from a variety of perspectives and help you recognize when it applies to different circumstances.

Work within your attention span. If you find yourself daydreaming, worrying, or thinking about other things, take a short break and come back ready to study again. Read difficult materials or do difficult study tasks first. Reward yourself with the easier reading or tasks later in the study session. Vary tasks within lengthy study sessions. For example, read new material, then work on outlines or notes, then develop practice items, then review previously studied materials, and so forth.

DEVELOPING PRACTICE TEST QUESTIONS

Whether you are studying on your own or working with a study group, developing and using practice test questions about the orders, directives, SOPs, training materials, manuals, or other references can be an effective way of learning the material that you are studying. As noted, Appendix D in this guide provides the *2006 Fire Engineer Written Examination* and answer key that may be used as example practice questions, to the extent that the information is still accurate in 2016. However, you (and your study partner or other group members) can develop your own practice test questions while you are reading the sources on the Recommended Reading List (refer to Appendix C). Then, use the practice questions later to test yourself (and each other) on your understanding of the materials you studied. For this technique to be most useful, some tips for developing good practice test questions are provided below:

- As you are reading the study materials, mark the sections that seem most relevant for practice test questions. Think about the typical situations and duties that Fire Engineers are involved in (refer to Appendix A) and the knowledge areas, skills, abilities, and other characteristics (refer to Appendix B) that are important for Fire Engineers to perform the job effectively.
- When developing practice questions, use the multiple-choice format shown for the practice questions included in this guide. For the Written Examination, each practice question should have a stem, which provides information about the situation and presents the actual question. Each question should be followed by four answer choices, including the correct (or most effective) response and three incorrect (or less effective) alternatives.

- Try to write practice questions in a variety of ways. Some items may ask questions about the information (e.g., procedures, actions, discharge pressures, communications, etc.) as directly stated in Department directives and other reference materials.
- Another effective way to write practice questions for learning purposes is to ask about the information you are testing in the form of an on-the-job scenario. Many of the previous exam questions (refer to Appendix D) are presented in this format, and the 2016 Written Examination questions will be similar. By setting up a realistic Fire Engineer situation and applying your knowledge to the situation, you are testing how well you actually understand the information presented in the study materials. Reading and understanding the materials at a deeper level will generally help you to perform better on the Written Examination (and on the job) than simply memorizing the words.

PREPARING FOR TESTING

It is only natural to feel nervous before taking an examination. The good news is that there are some things you can do to help when studying for and taking the examination. Below are some tips for helping to control test anxiety.

BEFORE THE TEST

- Create and use a study schedule – do not leave everything until the last minute.
- Gather the materials for the exam early in your studying process, so that you do not spend any time worrying about whether you have everything you need.
- Get the support of your family and friends so they can allow you time to study and make you feel good about your abilities.
- Check in with your study partner, study group, or others you know who are preparing for the exam to share knowledge, questions, and support.
- Eat well and get a good night's sleep before the test. If you are tired or hungry, your concentration will be affected and so will your test performance.
- Have all of the materials you need to bring with you to the testing session ready to go (i.e., notice to report, photo identification).
- Make sure you know the exact location and time of the test. Allow yourself plenty of time to arrive, park, use the restroom, find your seat, and compose yourself.
- Go into the test with a positive attitude, determined to do your best. Focus on your abilities, rather than worry about what you might not know.
- Try not to discuss the test with other people once you arrive. Generally, this only increases everyone's anxiety.

AT THE START OF THE TEST

- Listen carefully to all of the test administrator's instructions and follow them step-by-step. If you are working ahead of the instructions, you may miss important information.
- Follow **ALL** instructions given by the test administrator or proctor, including instructions about handing out and collecting materials, breaks, restroom procedures, etc. **Failure to do so may disqualify you from the promotional process.**
- You will be asked to preview the Written Examination materials (e.g., Test Question Booklet, answer sheet, hose records) as part of the instructions. This will allow you to notice missing or duplicate pages. Notify the proctor if you find anything wrong with your test materials at this time.
- Ask questions at the appropriate times if you are unsure about any directions or procedures.

DURING THE TEST

- Take slow, deep breaths as needed before and during the exam to help yourself remain calm.
- Read all of the Written Examination materials carefully to make sure you don't miss anything.
- It is to your advantage to answer every question in the Written Examination, even if you have to guess.
- The time limit is set with the intent that most candidates should be able to finish. However, monitor your time. Do not spend excessive amounts of time thinking about any one question. If you must, skip a question and come back to it at the end.
- Make sure that you mark your answers to the questions in the correct spaces when using the separate answer sheet. Be especially careful if you skip any questions to mark the next answer on the proper line of the answer sheet.
- Follow the directions about erasing and changing your answers on the top and bottom copies of the answer sheet. Answer spaces with multiple circles filled in for one question will be counted as incorrect.
- Pay attention to your own work, not to what is going on around you. If you are wondering how other people are doing or how far they have gotten, you are wasting valuable time.
- And finally, keep this in mind – if you are prepared for the test and know the materials, you have every reason to be confident!

STRATEGIES FOR MULTIPLE-CHOICE TESTS

All sections of the Written Examination include multiple-choice test questions. Each multiple-choice item presents a question with four response alternatives. You are to choose the **one** alternative that is the correct answer to the question. Keep the following tips in mind when you are taking a multiple-choice test:

- Never choose an alternative based on the frequency or pattern of your previous responses. Do not assume that the correct answers follow any sequence or pattern, or that the response alternatives (A, B, C or D) are used in equal numbers.
- **Be sure to read every alternative.** Even if one of the first responses is the alternative you believe to be correct, one of the others may be better or more specifically correct.
- Eliminate alternatives you know are wrong. You can cross them out in the Test Question Booklet (not on the answer sheet). This will help you to focus on the remaining alternatives. If two or more alternatives seem correct or equally good, compare them to determine what makes them different. Evaluate these differences in relation to the specific wording of the question.
- Watch for words like **not**, **but**, and **except**. These words indicate that you should look for the alternative that (a) makes the completed statement false, (b) is the exception to the rule, or (c) incorrectly answers the question.
- Also watch for words like **always**, **never**, and **only**. These words indicate that you should look for the alternative that is accurate 100 percent of the time, without exception.
- Also watch for words like **first**, **initial**, **minimum**, and **maximum**. These words indicate that several of the response alternatives may be correct things to do in the situation, or several of the response alternatives may fall within a range of correct options. However, you should look for the alternative that meets the standard indicated in the question (e.g., the *first* thing you should do, or the *maximum* allowable discharge pressure).
- If you are not sure about any of the response alternatives, use logical reasoning to rule out as many alternatives as you can. Then, choose between the remaining alternatives. Guess if you must.
- If you cannot rule out any response alternatives, first reactions often tend to be correct. Change your answer only if information remembered later or a strong hunch indicates that your first guess is wrong. If you do change your answer, be sure to erase your initial answer completely.
- Do not spend too much time on any one question. If you do not know the answer, make a question mark (?) next to it in the Test Question Booklet (not on the answer sheet) and then mark your best guess on the answer sheet. There is no penalty for guessing in the Written Examination. If you have time at the end, go back to reconsider questions with answers that you guessed.

OVERVIEW OF THE FIRE ENGINEER PROFICIENCY TEST

PROFICIENCY TEST PROCEDURES

The Proficiency Test component of the Fire Engineer promotional process will require you to demonstrate your ability to operate an actual CFD front-line pumper to charge hose lines as you would if you were a Fire Engineer at an actual firefighting incident. The Proficiency Test will consist of a series of problems of the type that may be encountered on the fireground. You will be given specific instructions and information about the problem presented in each scenario. Then, you will be expected to take the appropriate steps and operate the engine pump panel controls to properly charge the line(s) as ordered for each scenario.

TEST SCHEDULING AND LOCATION

You will be scheduled for and given a Notice to Report for the Proficiency Test component of the Fire Engineer promotional process as you leave the Written Examination. Please be sure to read and follow the instructions on the Notice to Report carefully. Re-scheduling will not be permitted, and late arrivals to the test location will not be admitted. ***Be sure to report as scheduled!***

The Proficiency Test will be held at the CFD Satellite Training Annex adjoining the quarters of Engine Company 63 (1440 E. 67th Street). When reporting for the test, candidates should park in the lot on the east side of the facility. Please enter the building through the front door of the training annex (west end of building) rather than through Engine 63's quarters. Upon arrival, candidates will be checked in for the examination.

TESTING CONDITIONS AND APPAREL

The Proficiency Test will simulate real-world conditions that Fire Engineers encounter on the job. ***Real pumpers will be used, and real water will be pumped and discharged.*** The Proficiency Test will be held outdoors during winter months in Chicago. As when responding to real fire incidents on the job, you will have to deal with variables such as time of day, lighting, and weather conditions while performing operations during the Proficiency Test. As a result, the conditions under which candidates take the test will vary. Environmental conditions, such as weather, time of day, lighting, etc., will be treated as irrelevant for testing purposes.

Candidates are instructed to report to the Proficiency Test in their prescribed work uniform. Because water will actually be pumped and discharged during the test administration, and due to the fact that the weather conditions will vary, ***it is recommended that candidates***

also bring their turnout gear. Wearing turnout gear is optional, but keep in mind that large amounts of water will be flowing at the test site, and candidates may have to operate the pumper while standing in water. For this reason, candidates are **advised to bring their boots, firecoat, and gloves** to the Proficiency Test.

TEST ADMINISTRATION PERSONNEL

The Proficiency Test will be conducted under the overall supervision of the City's test administration contractor. That firm will provide proctors who will assist candidates with check-in procedures, provide up-front instructions and materials, monitor test scheduling, and so forth. During the actual examination, candidates will be lead through the specific instructions and testing procedures by assessors who are specially trained by the test developer to administer the Proficiency Test scenarios. While you are being tested on the different scenarios, your performance will be monitored by three individuals serving in the following roles:

- One individual will serve as the **Examiner** and provide all of the test instructions and specific information about the leadouts requested in each scenario. This individual will play the role of your Company Officer while providing you with the instructions. This individual also will observe and record your performance, as required for scoring of the Proficiency Test.
- A second individual will serve as the **Controller** and observe your performance during the testing scenarios. This individual will record the actions you take in charging and shutting down the lines, as ordered, and document related readings, calculations, directions verbalized, and so forth, as required for scoring of the Proficiency Test.
- A third individual will serve as the **Safety Officer**. Because front-line pumpers will be in use, the potential exists for candidates to take actions that could threaten the safety of others or damage the apparatus. The Safety Officer will be a trained Fire Engineer who will monitor the actions of candidates to ensure that they do not inadvertently do something that could result in a danger to others or damage to the equipment. In the event that a candidate begins to take an action that could lead to such a situation, the Safety Officer will inform the Controller, who will then immediately instruct the candidate to stop. ***If instructed to stop, you must do so immediately in order to avoid a dangerous situation!***

Note: The Safety Officer also will be responsible for performing actions in the cab of the engine (e.g., engaging the pump) that are required to operate the pumper during the testing scenarios. More information about this function is provided in the Proficiency Test instructions in the next section of this study guide.

PROFICIENCY TEST SET-UP

Below is a description of the CFD front-line pumper that will be used during the Proficiency Test. Because the scenarios used in the Proficiency Test will vary across candidates, information also is provided about the standard set-up of the engine for all scenarios and the guidelines that will need to be followed about discharge ports used, hose sizes, etc., to comply with the leadouts that are specified in the different scenarios.

ENGINE APPARATUS AND EQUIPMENT

The Proficiency Test will be administered using actual CFD front-line pumpers equipped with electronic pressure governors. All candidates will be tested using the same make and model of equipment, as follows:

- Spartan/Crimson Gladiator Classic Custom Pumper
- Equipped with Hale Fire Pump Model QTWO 150-23S (two-stage centrifugal pump)

Prior to testing, you should become familiar with information about this apparatus and equipment provided in the *2009 Spartan/Crimson Gladiator Classic Custom Pumper Operation and Maintenance Manual* (a copy is provided in Appendix E). You also should seek out opportunities for hands-on practice operating the pump panel and becoming familiar with the layout, function, and controls for this specific apparatus and equipment.

Note: You will not be given instructions on how to operate the apparatus/equipment during the test administration process or time to practice on the day you take the Proficiency Test.

STANDARD EQUIPMENT SET-UP AND GUIDELINES

The Proficiency Test is an assessment of your ability to effectively and efficiently charge and shut down the leadouts ordered by a Company Officer on the fireground. During the Proficiency Test, all candidates will be presented with three scenarios that present realistic fireground problems. In the role of the Fire Engineer, you will need to make calculations and operate the pumper to provide appropriate discharge pressures for the leadouts specified by the Company Officer in each scenario. Due to the large number of candidates expected to take the Proficiency Test and the duration of the testing period, a number of variations on the three basic scenarios were developed to ensure that no candidates will know which specific leadouts they will be asked to execute prior to testing. The test developer worked with subject matter experts in the Chicago Fire Department to create scenarios variations that are of equivalent difficulty for all candidates.

During the Proficiency Test administration, you will have the specific instructions and information about the fireground problems presented in writing and verbally read to you by the Examiner playing the role of the Company Officer. The information will include the specific layouts requested, including the hose sizes, nozzles, and discharge ports to be used. You will then be expected to operate the pumper to deliver water through the designated port(s) at the appropriate discharge pressure(s) within a reasonable period of time.

Because multiple engines will be in use during the Proficiency Test, a large amount of water will be discharged at the exam administration site. To control the flow and pooling of discharged water, hose lines will be fed into large storm drains. As a result, the leadouts described by the Examiner will not be the same as the equipment set-up that you will actually see. Note that candidates will be examined on the basis of the leadouts described to them, not the actual lines into or from the apparatus. If the leadout presented by the Examiner indicates the discharge line is of a particular size and connected to a particular discharge port, a hose line of that size will actually be connected to that port. However, it may not be the same length or have the same nozzle or appliance connected to it as that described in the scenario. You must use the information provided in scenario to make the appropriate calculations and operate the pump panel controls to achieve the appropriate discharge pressures.

PROFICIENCY TEST EVALUATION

Candidate performance on the Proficiency Test will be evaluated in large measure on the ability to calculate the appropriate discharge pressures for the leadout(s) presented in the scenarios and to properly charge and shutdown the lines as ordered. A checklist has been developed for use in recording the actions that you take during the Proficiency Test. The checklist will be completed by the Examiner and Controller during the test administration, and it will be sent to the test developer for scoring based on the scenario-specific guidelines developed with CFD subject matter experts and senior management personnel. The scoring guidelines include point values associated with important actions that candidates must take to successfully implement the leadouts and shut-down procedures associated with each scenario. Such actions include:

- Using a hose record to determine the length of hose in the specified leadout
- Identifying correct intake and discharge ports to be used in the scenario
- Determining when it is appropriate to send water at safe pressure(s)
- Calculating the appropriate discharge pressure to send based on the leadout
- Verbalizing (saying out loud) the calculated discharge pressure and the target pressure (rounded up or down, as appropriate)
- Manipulating the pump panel controls to achieve and maintain the appropriate discharge pressure(s) as indicated by the gauge readings

- Accomplishing the task (i.e., sending water for the specified leadout) within the time limit allowed
- Verbalizing instructions to the Safety Officer at points needed to perform necessary operations inside the cab of the engine (i.e., engage the pump) or during shut-down operations (i.e., open specific drains)
- Following procedures to send water and perform shut-down in the prescribed order, to the extent that timing of certain steps or actions is important

The Proficiency Test scenarios will mimic real fireground constraints with respect to time. That is, water must be sent within a reasonable period of time to ensure the safety of the company members and an effective attack on the fire. The time frames set for the scenarios are realistic, and part of your score will be based on your ability to send water within the specified time frame. However, you will not receive a higher score for doing it faster (e.g., sending water within 1 minute rather than the 2 minute time limit).

INSTRUCTIONS FOR THE PROFICIENCY TEST

This section of the Study Guide provides general instructions that you will be asked to follow during the Proficiency Test administration. On the date of testing, the assessor will give you written and verbal instructions about the fireground problems, requested leadouts, and other relevant information about the specific scenarios during the test administration. Additional information related to test administration practices may also be provided by the proctor on the day of testing.

The test instructions (such as those shown below) will be provided to you in writing and read aloud to you by the Examiner at the start of the Proficiency Test. If you have any questions, you should ask them to be sure you understand all of the instructions. Questions will be answered by repeating information contained in the instructions to ensure all candidates are given the same information during test administration.

PRELIMINARY INSTRUCTIONS

The Fire Engineer Proficiency Test includes a series of three scenarios that represent common fireground situations encountered by Engineers.

- One scenario involves a Single Line Leadout
- One scenario involves Quick Water with Two Line Leadouts
- One scenario involves Master Steam and Hand Line Leadouts

For the Proficiency Test, you will be a Relief Engineer working today with a fictitious Engine Company. The Examiner will act as the Company Officer and give you specific directions about the leadouts requested and other relevant instructions at each stage of the fireground scenarios. Be sure to listen to the instructions carefully.

For testing purposes, assume that today it is 45 degrees outside, which does not require cold weather operations procedures. Also assume that when you inspected the engine at the beginning of the shift, you found that the front soft suction is inoperable. Therefore, the engine is set up so that water intake from the hydrant is hooked up to the Officer's side intake. To use hydrant water, you will need to walk around to the Officer's side to open that intake port.

At the start of each scenario, the tank will be full. For scenarios that require the use of tank water first, you will be told when the hydrant water becomes available.

The hoses used for all of the leadouts described in the Proficiency Test will be connected to any three of the following discharge ports during all of the scenarios:

- Cross-lay #1
- Engineer's side #1
- Engineer's side #2
- Rear discharge #3
- Officer's side #4

You will be told which specific discharge ports the hoses are connected to on the date of the exam. You should not open any of the other discharge ports during the test.

Take a minute to familiarize yourself with the pump panel. Please ensure the pump panel's controls are in the position that you would like to have them when starting a run.

When we start the fireground scenarios, your responsibility as the Engineer is to implement the leadouts ordered by the Company Officer. You must ensure that you understand the leadout instructions and then provide water through the appropriate discharge port at the proper pressure within a reasonable time. You will be told the time limits for each scenario.

You may wish to talk out loud as you work through the scenarios to indicate what actions you are taking or to help you remember the steps. For testing purposes, there are several points in each scenario when you will be required to verbalize (say out loud) specific information. First, the Safety Officer will work the controls in the engine cab, so you must verbalize any instructions that you need to give to the Safety Officer (for example, to engage the pump or to open a drain). You also need to verbalize instructions or information that you would give to others (such as the Hydrant Person or the Company Officer) who you would be communicating with if these were actual fireground scenarios. Finally, it is very important that you verbalize to the Examiner the actual calculations and the target pressures (rounded up or down, as appropriate) that you are intending to send at each point when you send water for a specific leadout.

Do you have any questions about these instructions?

Please let me know when you are ready to begin.

SCENARIO-SPECIFIC INSTRUCTIONS

At the beginning of each Proficiency Test scenario, you will be presented with the specific instructions for that leadout and/or shut-down. Again, instructions will be provided in writing and verbally by the Examiner. Examples of the instructions are provided below.

EXAMPLE LEADOUT INSTRUCTIONS

Your engine is the first responding company to the scene of a fire. You pull up and place the apparatus appropriately to attack the fire. At this time, you are already connected to the hydrant, and you have a positive source of water flowing to the engine. *(Or you may be instructed to use tank water first.)*

As your Officer, I direct the use of *(hose size, nozzle, discharge port will be given here)*. The hose length (butt) number (either left on the engine or connected to the engine) is # *(you will be given the number for reference in the hose record)*. When I give the signal, you must determine the appropriate pump discharge pressure and charge the line within 2 minutes and 15 seconds.

Remember to verbalize any instructions you would give to others, and tell me the actual calculations and target pressures you are intending to send at each point when you send water.

Are you ready? Begin.

EXAMPLE SHUT-DOWN INSTRUCTIONS

You are now done with operations for this incident. The Company Officer tells you to shut down. Please take the steps necessary to put the engine back in service and return the panel controls in the position you would like to have then when beginning your response to the next fireground scenario. You must verbalize instructions to the Safety Officer for steps that require actions taken in the cab. You have 2 minutes to complete the shutdown procedures.

Are you ready? Begin.

PREPARATION STRATEGIES FOR THE PROFICIENCY TEST

In order to do well on the Proficiency Test, there are two things that candidates must be able to do. The first is to understand the leadouts being described and to calculate the necessary discharge pressures. If you have prepared well for the Written Examination, this aspect of the Proficiency Test should not present a significant new challenge.

The second thing candidates must be able to do is to operate the pumper in order to effectively and efficiently charge and shutdown the lines ordered by the Company Officer. If you are not already familiar with the theory and procedures for fire pump operation, now is the time to prepare. You should study the related materials (listed in the Recommended Reading List in Appendix C) and practice developing or using related knowledge and skills.

OPERATING A PUMPER

HANDS-ON EXPERIENCE

Candidates should become familiar with the CFD approved procedures for pump operations. For most leadouts, there is a sequence of events that must be followed in order to operate the pumper appropriately. Candidates also should take steps to gain hands-on experience working a pumper. If you work in a house with an engine, talk with the Engineer and study the apparatus closely. Become familiar with the location of the various gauges, valves, and controls, and the function of each. Learn the location of all the intake and discharge ports. Learn about the electronic pressure governor and how it affects pump operations. And most importantly, work the pumper and learn how to properly charge and shutdown one or more lines. Speak with your Company Officer about obtaining training on pump operations.

SIMULATION AND GROUP PRACTICE

In all likelihood, candidates will not be able to practice on real pumpers as much as they might like. You should take opportunities to talk with current and former Fire Engineers about other methods of practice they used and ways they prepared for the proficiency examination component. In the past, some candidates created full-size cardboard mock-ups of the pump panels with the gauges, valves, and controls drawn in the proper locations. They then practiced using the cardboard display panels and went through the motions of opening the intake and discharge ports, and throttling up the engine. Although this approach does not provide a true hands-on experience of working the pumper, it helps to train candidates in the sequence and motions that are necessary to operate a real pumper. This approach is best done with a small group of fellow candidates so that several people can provide feedback on the simulated

performance. For each practice round, one person can describe the leadout to the candidate at the panel. The candidate should then quickly calculate the proper discharge pressure and then go through the motions as though he/she were actually opening the appropriate valves and setting the proper discharge pressures. The candidate would benefit from verbalizing what he/she is doing at each step of the process, so that the others can provide constructive feedback on his/her performance, especially during the early stages of preparation. It is also important to practice verbalizing the information that will be required during the actual exam, such as the calculated and target discharge pressures, instructions to the Safety Officer about engaging the pump and opening drains, and providing any other information that an Engineer would communicate to others during fireground operations, such as the Hydrant Person or the Company Officer who may be inside the fire structure.

Your group should speak with others who have taken previous Fire Engineer proficiency tests to get an idea of the kinds of leadouts that were used and then generate a set of your own with which you can practice. Vary the hose size, hose lengths, nozzles and appliances used in the leadouts. Practice using single lines, multiple lines charged and shut down simultaneously, and multiple lines charged and shut down sequentially. Also practice using different elevations and connectors.

CONTROLLING ANXIETY

Some candidates experience anxiety when they take the Proficiency Test. In most cases, the anxiety stems from wanting to do well, but fearing that they will make a mistake while being observed. Below are some techniques that you can use to help control test anxiety.

PRACTICE, PRACTICE, PRACTICE...

Working with a group of fellow candidates who are observing you while you put the pumper (or cardboard mock-up) to work will help to acclimate you to that situation and lessen the anxiety you might otherwise feel. It is better to make a mistake in front of your practice group, when the consequences aren't serious and you still have time to learn from any mistakes that might be made. Your group can give you feedback and guidance to correct the mistake. And the more you practice, the more proficient you will become. Studies have suggested that performing well-learned behaviors in front of others actually improves the quality of the performance. Practice until the sequence and motions of operating the pumper are well-learned and automatic. This will give you greater confidence and decrease the likelihood of experiencing anxiety during the actual Proficiency Test administration.

VISUALIZATION

Another technique to improve performance and control anxiety is one often used by professional athletes and performers. While lying down or resting in an easy chair, they allow their body to relax by first taking a series of slow, deep breaths. Once relaxed and comfortable, they visualize themselves going through the motions, step by step, of their target activity (e.g., hitting a baseball, performing on stage). The goal is to visualize doing the activity effectively and flawlessly. Doing this repeatedly over several sessions helps to create a very clear mental picture of what good performance looks like. When called upon to actually carry out the activity, mind and body tend to work in coordination to achieve it. Try doing this to prepare for the Proficiency Test. Visualize yourself approaching the pumper in a confident and assured manner, listening to the leadouts being described by the Company Officer, quickly and accurately calculating the discharge pressures, and smoothly and flawlessly charging and shutting down the lines as ordered. Mentally go through the whole process step by step, from the time your name is called for testing, through to the point that you complete the Proficiency Test. Take your time and be very specific in your visualization: don't just form a big picture of yourself operating at the pump panel. Rather, visualize yourself doing each of the steps (e.g., verbalizing instructions to open the intake valve, checking the hose record book, making the calculations, opening the proper discharge port, throttling up, checking the gauges) in proper sequence from beginning to end.

MOCK TEST SESSION

Candidates in the practice group should hold mock Proficiency Tests. Try to mimic the real test situation as closely as possible. The candidate should be dressed in the appropriate turnout gear, and escorted to the pump panel. The individual taking the role of the Examiner should describe a leadout, then the candidate should take the necessary steps to properly and quickly charge the line(s). The individual serving as the Controller should closely monitor and record the candidate's actions, but not provide any feedback at this point. The candidate should verbalize (say out loud) the information that will be required during the actual exam. This information includes any instructions he/she would give to the individual serving as the Safety Officer about engaging the pump and opening drains. It also includes verbalizing the calculated and target discharge pressures that will be sent after making the appropriate calculations. And finally, the candidate should verbalize any other information that an Engineer would communicate to others during fireground operations, such as the Hydrant Person or the Company Officer who may be inside the fire structure. The Controller should record the intended discharge pressures as well as the actual discharge pressures achieved from reading the pressure shown on the appropriate gauge at the end of the time limit for each scenario.

Throughout the mock test session, the Examiner should present three different leadout scenarios. In between scenarios, instruct and observe the candidate shutting down and taking the steps necessary to put the engine back in service to be ready for the next scenario. Once the entire simulation is terminated, at this point, the group of individuals who observed the candidate might wish to provide feedback regarding what the candidate did well and what, if anything, could be improved. Following this procedure should help to make the real Proficiency Test seem much more familiar and less threatening than might otherwise be the case.

SUCCESS TIPS FOR TAKING THE PROFICIENCY TEST

Keep these valuable test-taking rules in mind, and try to put them into practice on the day of the Proficiency Test, to help you do your best.

TIP 1: BE CALM AND CONFIDENT

Remaining calm and confident will help you think clearly, keep your composure, and perform at your best while working your way through the testing scenarios. Each time a scenario is presented, take a deep breath and calmly work your way through it just like you practiced. Speak clearly when you verbalize instructions, discharge pressures, or other information. Present what you know in a confident manner.

TIP 2: MAKE SURE YOU UNDERSTAND THE DETAILS

Listen carefully. Be sure that you understand the scenario instructions and each part of the problem that is presented. Think about exactly what you are being asked to do before taking action. If you are unsure you heard the leadout correctly or you want to confirm any details, you may ask the Examiner to repeat it.

TIP 3: DO NOT READ INTO THE ASSESSORS' BEHAVIOR

It is important not to focus too much attention on the reaction of the assessors (i.e., the Examiner, Controller, and Safety Officer) while you are taking the Proficiency Test. Focusing on their reactions may make you more nervous and distract you from listening carefully to the scenarios or responding effectively to the problems. After you complete each scenario, do not be concerned that the assessors may not say anything or show any expression on their faces. To be fair to all candidates, they are instructed not to give any indication as to how candidates are doing on the test. You should not expect any feedback from them at all. In general, be professional in all of your interactions with the assessors. Treat them as you would treat your Company Officer and the other members of your company. Make eye contact, listen carefully, and speak directly to them.

TIP 4: THINK AND RESPOND AS A FIRE ENGINEER

The purpose of the promotional process – both the Written Examination and the Proficiency Test – is to determine your level of knowledge, skill, and ability in areas that are crucial for effective performance as a Fire Engineer. When responding to the testing scenarios, assume the role of an Engineer and respond as the individual who is responsible for properly charging the lines that will allow the other company members to perform their work safely and effectively. Assume a professional presence and demonstrate your ability to turn your knowledge into effective action while performing the Engineer's important job duties.

SCORING INFORMATION

The test administrators will be responsible for distribution, collection, and handling (e.g., copying, storing) of all Written Examination and Proficiency Test materials. The Written Examination will be scored by the test development consultants, based on the scoring key developed with CFD subject matter experts and results from candidate challenges to test items. During the Proficiency Test administration, the trained assessors will be responsible for documenting candidates' actions and other relevant information (verbalized instructions, discharge pressures, time limits, etc.) on the checklist that was developed with CFD subject matter experts. The checklists will be sent to the test administration consultants for scoring.

Because of the number of candidates expected to participate in the Fire Engineer Promotional Process and the need to verify the accuracy of scanning and scoring routines, Written Examination scoring will **not** occur on site at the testing location. You will be able to keep a copy of your Written Examination answer sheets on the day of testing. Due to the number of days that will be required to conduct the Proficiency Test for all candidates, scoring will not be completed and final results will not be available until after the last candidates have been tested.

You will be asked to provide identification information on the test administration materials for both components of the examination process (e.g., answer sheet and test booklet cover for Written Examination and checklist for the Proficiency Test). This procedure will verify that you received all of the test materials and allow your responses for all components of the Fire Engineer Promotional Process to be matched in order to calculate your total score.

NOTE: Candidate name information is removed from the test materials that are sent to the test development consultants for scoring. At no time during the scoring process will any of the test scorers or employees of the City of Chicago see any candidate's name associated with any individual Written Examination or Proficiency Test response.

Each test will be scored based on scoring criteria established by the test developer, working with subject matter experts and senior command personnel in the Chicago Fire Department. Your final Promotional Process score will be the total points you obtain for all questions on the Written Examination, all scenarios in the Proficiency Test, and your allocated seniority points.

APPENDIX A
FIRE ENGINEER CRITICAL JOB TASKS

**City of Chicago Fire Department
2016 Fire Engineer Promotional Process**

List of Critical Tasks

A. Morning Equipment Check

1. Upon reporting for duty, notifies Company Officer of arrival and follows proper relief procedures (e.g., PPE, radio, SCBA, Air Purifying Respirator and canister inspections) in order to assume responsibilities for the shift.
2. At the beginning of the tour of duty, becomes familiar with the status of apparatus, hose, appliances, and nozzles by requesting an oral description of the activities during the previous tour of duty from the off-going Engineer and/or by reviewing the journal entries from previous shifts in order to identify and correct problems that may affect engine operations.
3. Inventories and verifies hose, appliances, and nozzles on the apparatus against the Engineer's hose record book to ensure all equipment is present, functional, and properly stored, and that the apparatus is fully equipped.
4. Inspects condition of the apparatus (e.g., fuel level, other fluid levels, air brake function, lights, tire pressure, booster tank water level, presence of water in the pump, physical damage, air pressure, all equipment secured) by conducting a visual walk-around and takes corrective action as necessary in order to ensure the apparatus is fully prepared for duty.
5. When applicable for the apparatus, conducts battery test (i.e., checks gauge), maintains diesel exhaust regeneration system, and maintains apparatus air brakes (i.e., bleeds lines to release moisture/condensation, if required) at 0800 and 2000 hours to ensure safe and proper functioning of the apparatus.
6. Inspects apparatus mounted radio(s) and portable radio to ensure proper operation, zone/channel selection, and scan list setup necessary to effectively transmit, receive, and relay information in accordance with Chicago Fire Department guidelines.
7. Verifies location and method of operation of all controls when working with unfamiliar apparatus (e.g., new or replacement apparatus, relief assignment) in order to ensure quick and accurate apparatus and pump operations.
8. Familiarizes self with all tools and equipment and their compartments or storage locations on the apparatus.
9. Exercises all valves and drains to verify and ensure proper operation.
10. Starts apparatus, drives onto apron, and allows the engine to warm up to operating temperature to ensure the apparatus is operating properly and is prepared for responses to calls for service.
11. Conducts morning pump test by checking relief valve or electronic pressure governor operation, automatic shut-off switch, road-to-pump switch, transfer valve position, condition of intake ports and screens, foam proportioning system, etc., and takes action as necessary and appropriate for the season, in order to ensure that the apparatus is fully prepared.

**City of Chicago Fire Department
2016 Fire Engineer Promotional Process**

List of Critical Tasks

12. Secures apparatus, places on charge, and attaches exhaust system when available, after completing the morning equipment checks.
13. Test drives spare or unfamiliar apparatus, with the supervision of the Company Officer, to become familiar with apparatus, so as to be fully prepared for driving and operational responsibilities.
14. Notes any construction or other occurrences (e.g., street closings, hydrant shutdowns) that may affect operations during the tour of duty by requesting information from others and by reviewing journal entries in order to develop alternate routes, as necessary, for use when responding to calls for service.
15. Familiarizes self with company personnel assignments (e.g., who has hydrant duty) during roll call in order to be able to quickly provide information to the appropriate Firefighter(s) during incident responses.
16. Prepares SCBA face piece for use by sanitizing, visually inspecting for damage, and physically testing for a tight seal when worn, in order to comply with departmental regulations and to ensure its readiness and effectiveness for use if required.
17. Participates in morning air mask drill when ordered to do so by visually inspecting, physically testing, and donning and doffing the SCBA equipment in order to comply with departmental regulations and ensure readiness for use.
18. Informs the Company Officer of the results of the morning check by describing the status of the apparatus and its readiness.
19. Records all hose changes and hose replacements by updating the Engineer's hose record book and informs the Company Officer of any changes made in order to keep the Company Journal and Company Hose Record up to date.
20. Reviews maps, talks to Company Officer and other personnel, monitors road construction, water shut-offs, and unusual building occupancies (e.g., hospitals, schools, nursing homes) in still district in order to maintain/develop familiarity with the area and to facilitate effective response to alarms.
21. Monitors equipment, tools and supplies in work areas of the physical plant (e.g., hose tower, basement, apparatus floor) to ensure items are functional and properly stored and these areas are clean for the safety of members and effective accomplishment of duties assigned by the Company Officer.

B. Incident Response

22. Monitors alarm terminal and speakers while in quarters to verify type and location of alarm, time received, and other responding units.

**City of Chicago Fire Department
2016 Fire Engineer Promotional Process**

List of Critical Tasks

23. Reports to apparatus promptly when alarm is received to ensure a quick response and to verify all compartments are closed, all charging equipment is unplugged and secured, and equipment carried on the exterior of apparatus is secured.
24. Verifies that all company personnel are seated and properly belted before moving the apparatus by waiting for the "all clear" signal from the Company Officer in order to help ensure the safety of personnel while in transit.
25. Drives the apparatus to the incident site, obeying all Chicago Fire Department and other applicable guidelines and procedures for safe operation of apparatus during emergency operations.
26. Upon arrival, locates the apparatus as ordered by the Company Officer in order to obtain desired position for access to the incident site and water source.
27. Prepares apparatus for pumping by following Chicago Fire Department procedures (e.g., switch from road to pump, switch to rear radio operation) in order to begin pump panel operations.
28. Implements appropriate course of action as ordered by the Company Officer (e.g., quick water, lead-outs, foam, Siamese connections), so that the appropriate water pressures can be delivered.
29. Works with hydrant person to connect to the appropriate hydrant based on the nature of the incident and the lead-out ordered by the Company Officer in order to rapidly provide the appropriate stream for control of the incident.
30. Informs the hydrant person when the engine is prepared to receive water through the use of portable radios, hand signals, or other type of signal in order to initiate and provide an uninterrupted flow of water to company personnel and to minimize the potential for damage to the engine.
31. Adjusts the engine discharge pressure appropriately based on hose lead-out, nozzle type and size, and appliance in order to ensure safety and fire fighting effectiveness.
32. Observes all necessary safety precautions during incident operations (e.g., securing hose to apparatus using Engineer's hitch, setting relief valve, chocking wheels) to help ensure the safety of equipment and all company personnel, including self.
33. Monitors communications during incidents for any transmissions and responds by relaying information or taking other actions as directed.
34. Remains alert for potential problems by monitoring incident operations and progress and informs the Company Officer when situations occur (e.g., potential loss of water, fire communication) which could threaten the safety of Firefighters or the control of the incident.
35. Monitors all gauges (e.g., oil pressure, water discharge pressure, compound gauge, engine temperature, fuel level, tachometer) during engine operations to ensure efficient operation and to identify and correct or report problems, as appropriate, if they occur.

**City of Chicago Fire Department
2016 Fire Engineer Promotional Process**

List of Critical Tasks

36. Keeps track of all equipment assigned to apparatus when at an incident site (e.g., nozzles, hose, fittings) in order to safeguard against theft and to help ensure that any equipment borrowed by other companies will be returned upon termination of the incident.
37. Assists in the performance of other duties as may be ordered when engine is not in operation in order to contribute to effective, coordinated efforts at the incident site.
38. At the termination of the incident, assists in the recovery and inventory of all company tools, equipment, and hose; monitors the bedding of hose; and updates the Engineer's record book accordingly (e.g., date, location, nozzles used, damaged hose) in order to prepare the apparatus for return to service.
39. Reports the condition of the apparatus, appliances, nozzles, fittings, intake strainers, and hose to the Company Officer at the close of each pumping operation in order to keep the officer informed of the engine's response capability.
40. Upon return to quarters, pauses upon entry for exhaust system to be attached, secures the apparatus (i.e., applies maxi-brake), and places on charge.
41. Upon return to quarters, re-inspects the apparatus, conducts an inventory of all hose and all pump-related equipment (e.g., fittings, nozzles), takes corrective action (appropriate for the season) as required (e.g., fills booster tank), and updates the Engineer's and Company's hose record to ensure readiness of the apparatus.

C. Apparatus Maintenance, Equipment Tests, and Training Exercises

42. Conducts tests (e.g., back-flushing pumps, nozzles, hydrant hook-ups, visual inspection of hard suction hose gaskets and swivels, drafting capability, hose pressure tests) as scheduled to ensure the proper functioning of all equipment.
43. Completes daily engine work as scheduled by thoroughly cleaning and inspecting the apparatus and performing routine maintenance as required in order to keep the apparatus fully prepared.
44. Exchanges apparatus at the repair shop, including hooking up to hydrant and testing functionality before accepting new apparatus, in order to ensure operational readiness.
45. Assists in training company personnel in pump operations and in driving apparatus, as directed by the Company Officer, in order to maintain operational readiness and ensure coordinated efforts by fire fighting personnel during incident operations.
46. Performs other duties as may be ordered by the Company Officer (e.g., apparatus inventories) in order to ensure operational readiness and effective functioning of the fire fighting company.

APPENDIX B

FIRE ENGINEER

IMPORTANT KNOWLEDGE AREAS, SKILLS,

ABILITIES, AND OTHER CHARACTERISTICS

**City of Chicago Fire Department
2016 Fire Engineer Promotional Process**

List of Important Knowledge, Skills, Abilities, and Other Characteristics

Knowledge Areas

1. Knowledge of Departmental requirements for the care and use of hose sufficient to properly clean, bed, inventory, and determine the serviceability of hose on the apparatus in order to ensure usefulness during pumping operations.
2. Knowledge of Chicago Fire Department standard engine operation policies and procedures sufficient to start and operate the apparatus, verify pumping system operational readiness, and determine that equipment is fully prepared for responding to alarms.
3. Knowledge of Departmental policies and procedures necessary to prepare and maintain the apparatus for effective operation appropriate for the season (e.g., cold/sub-zero temperatures).
4. Knowledge of Departmental policies and procedures regarding equipment required to be carried on apparatus sufficient to recognize and conduct an accurate inventory of fittings, nozzles, appliances, AFFF foam, Class A foam, foam educators, foam proportioning systems, engineer safety hitches, wheel chocks, etc.
5. Knowledge of the various types of fire engines currently in use within the Chicago Fire Department sufficient to safely, effectively, and efficiently operate and utilize the apparatus available to the Company during the tour of duty.
6. Knowledge of the self-contained breathing apparatus (i.e., SCBA) sufficient to allow for the proper inspection, maintenance, sanitation, donning, and doffing of the breathing apparatus in order to ensure safe and effective personal use.
7. Knowledge of the Air Purifying Respirator (APR) and respirator canister sufficient to ensure its readiness for use in the event it is required during an incident response.
8. Knowledge of Chicago Fire Department approved publications (e.g., Emergency Response Guide, General Orders, SOPs, Training Bulletins/Academy Notes) sufficient to safely and effectively perform the activities expected of all uniformed members of the Chicago Fire Department during incident operations.
9. Knowledge of the responsibilities and standard operating procedures for Fire Engineers sufficient to effectively contribute to company operations during incident responses and ensure the safety of equipment and personnel.
10. Knowledge of basic tactics necessary to assist the Company Officer during incident operations and during training of company personnel in the performance of Fire Engineer and related duties in order for all members to contribute effectively to coordinated incident control efforts.
11. Knowledge of radio and mobile data computer operation and procedures necessary to effectively transmit, receive, and relay information in accordance with Chicago Fire Department guidelines.

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2016 Fire Engineer Promotional Process**

List of Important Knowledge, Skills, Abilities, and Other Characteristics

12. Knowledge of policies and procedures governing the driving of fire apparatus and transportation of company personnel necessary to comply with Chicago Fire Department guidelines and State laws.
13. Knowledge of Departmental policies and procedures related to apparatus placement at incident scenes for the safety of on-scene operations.
14. Knowledge of engine pumping operations at a level sufficient to quickly, effectively and efficiently operate the pump and send water at the proper pressure through the appropriate lines during incident operations.
15. Knowledge of nozzle pressures, rates of flow for appliances and nozzles, and field hydraulics necessary to accurately calculate and set the appropriate engine discharge pressure for various hose lead outs, appliances, and nozzles during incident operations.
16. Knowledge of water supply operations (booster tank, water grid system, engines-in-line, drafting, intakes, etc.) to obtain a sufficient source of water for effective engine pumping operations.
17. Knowledge of how to hook up to and determine the designations of Siamese connections for installed fire protection systems in assigned still districts at a level necessary to quickly and effectively supply the system in the event of an emergency response to those locations.
18. Knowledge of the procedures necessary to perform required tests of the apparatus, pumping equipment, and hose and ensure their serviceability.
19. Knowledge of basic apparatus maintenance sufficient to perform preventative maintenance and detect, report, and document problems with the apparatus (e.g., wheels, braking system) as required by the Chicago Fire Department.
20. Knowledge of the specific layout of streets within the assigned still and box district and the general layout of streets within the City of Chicago, necessary to drive the apparatus and transport company personnel efficiently and safely to and from incidents.
21. Knowledge of policies and procedures governing the exchange of and acceptance of a new apparatus at the repair shop.
22. Knowledge of duties and responsibilities related to high-rise incident operations, including the use of three-stage pumps.

**City of Chicago Fire Department
2016 Fire Engineer Promotional Process**

List of Important Knowledge, Skills, Abilities, and Other Characteristics

Skills and Abilities

1. **Analytical Thinking and Problem Solving:** Applying knowledge and experience to select, organize, and logically process relevant information to solve problems; comparing information to determine inconsistencies; identifying and recognizing problems and facts; gathering information in a systematic manner; accurately perceiving relationships among issues and problems; recognizing complexities.
2. **Accuracy and Attention to Detail:** Paying attention to critical activities or instructions and the various details of work (e.g., accurately read and interpret engine gauge readings and hose record book notes); completing work that is thorough and within established standards of accuracy and precision; ensuring accuracy of documentation (e.g., recording information on forms or in Engineer's hose record book); comparing and verifying numbers on equipment (e.g., hoses) against numbers recorded in records.
3. **Mathematical Ability:** Performing basic mathematical calculations (i.e., addition, subtraction, multiplication, and division); calculating appropriate engine discharge pressures for all lead-outs; selecting and using appropriate formulas; understanding relationships between numbers.
4. **Judgment and Decision Making:** Making timely and sound decisions, even under conditions of uncertainty; assessing and managing risks; determining the appropriate courses of action in specific situations; recognizing when assistance is needed.
5. **Learning:** Learning the required knowledge of the job (e.g., procedures, work methods, specific techniques, policies, technical knowledge) through training; keeping up-to-date on technical knowledge and skills related to work; seeking opportunities to learn new things; soliciting advice and feedback from appropriate people; learning from experience and modifying behavior as needed.
6. **Map Reading:** Reading city, street, or area maps in order to identify and navigate to a specific geographical location.
7. **Mechanical Aptitude:** Understanding basic physical and mechanical principles; understanding machinery and equipment operations; recognizing applications for tools; identifying symptoms and locating problems in equipment from various cues.
8. **Memory:** Remembering orientation in buildings; recalling details of techniques, apparatus and equipment, building structures, plans, and incidents; recognizing faces and objects; recalling relevant policies, procedures, and regulations and the situations in which they apply.
9. **Reading Comprehension:** Understanding and interpreting written information (e.g., Department Orders, policies and procedures, training materials, codes and regulations).

**City of Chicago Fire Department
2016 Fire Engineer Promotional Process**

List of Important Knowledge, Skills, Abilities, and Other Characteristics

10. **Sensory Alertness:** Remaining alert or vigilant and react to infrequent, but important, events, circumstances, or specific details within a stream of information (e.g., alarms, radio transmissions); observing conditions at scenes and being alert for changes in conditions; using various senses to obtain information under conditions of stress and danger.
11. **Spatial Sense:** Sensing direction, distance, and heights; perceiving relative orientation of objects (e.g., uphill, downhill, placement of apparatus, setting ladders).
12. **Verbal Communication:** Communicating orally (both in person and over the radio) at a level necessary to convey information to others (e.g., status and serviceability of engine apparatus and pumping equipment) and to understand information communicated orally from others (e.g., personnel assignments, instructions during incident operations, training); articulating thoughts and ideas to individuals or groups in a manner which is accurate, logically complete, and easy to understand; interpreting what is said in the context of the situation.

Personal Characteristics

13. **Adaptability:** Being flexible in response to different environments, shifting priorities, or ambiguous situations; adjusting plans as incidents occur and conditions evolve; changing direction quickly when necessary; working different assignments as required.
14. **Approachability:** Being accessible and participating in the everyday give-and-take activities of the fire house; fostering the timely flow of quality information between one's self and others.
15. **Cope with Danger:** Coping with the job's physical dangers (e.g., fighting fires; working in low or no visibility conditions; dealing with fire, smoke, falling debris, slippery surfaces).
16. **Dependability:** Following through on assignments without prompting; maintaining a good attendance record; arriving promptly and prepared for work; requiring minimal supervision; conscientious about work performance.
17. **Desire to Help People:** Wanting to be of service to the community; showing concern for others; demonstrating a sincere interest in helping people; willing to work under conditions that can be hazardous, dirty, emotional, exhausting, or otherwise challenging.
18. **Initiative:** Anticipating a need and initiating or taking independent action when appropriate; actively influencing events rather than demonstrating passive acceptance of the outcome; advising others of status and problems.
19. **Interpersonal Relations:** Developing and maintaining a cooperative working relationship with a wide variety of people; relating to individuals in an open, accepting, and sincere manner; building trusting relationships with peers, supervisors, and members of the community; identifying and readily understanding the feelings and motives of others; seeking out and trying to understand differing perspectives and opinions.

**City of Chicago Fire Department
2016 Fire Engineer Promotional Process**

List of Important Knowledge, Skills, Abilities, and Other Characteristics

- 20. Multi-Tasking:** Handling multiple demands at once; dealing with interruptions and crisis situations by responding appropriately, competently, and in a timely manner.
- 21. Open-Mindedness:** Treating people fairly regardless of individual differences; remaining impartial and unbiased in the face of rejection or hostility; giving consideration to others' ideas or opinions; maintaining a sense of humor and a realistic perspective; not allowing emotions to drive decisions; accepting of criticism without taking correction personally.
- 22. Perseverance:** Staying with a task or assignment, despite obstacles or lack of enthusiasm, until the desired outcome is achieved or is no longer reasonably attainable.
- 23. Personal Integrity:** Being consistent with one's principles, values, statements, and behaviors; building trust and credibility with others through demonstrated honesty and commitment to ethical values; accepting responsibility for one's own decisions and actions in the face of challenge or adversity.
- 24. Preparedness and Organization:** Setting priorities and planning for routine activities and emergency responses; being familiar with the location and operation of all equipment on the apparatus; coordinating the work activities of one's self and others to make efficient and situationally appropriate use of time and resources.
- 25. Professional Orientation and Commitment:** Remaining firm in one's allegiance to the Department's core values and remaining faithful in pursuit of the Department's mission despite obstacles or opposition; setting high standards for personal and others' job performance; following Department policies and regulations and supporting their intent and value; demonstrating positive regard for one's career and the firefighting profession.
- 26. Self-Confidence/Awareness:** Demonstrating security in own capabilities and convictions; acting with certainty in difficult or new environments; projecting a positive self-image; willing to voice concerns or handle situations without being easily intimidated; understanding own strengths, weaknesses, limitations, values, motives, and preferences and how these impact own behavior and others.
- 27. Stress Tolerance:** Remaining calm and even-tempered when confronted with a dangerous, chaotic, or emotionally charged situation; maintaining level of performance under pressure, opposition, frustration, or crisis.
- 28. Team Orientation:** Carrying own fair share of the work load; putting individual ambitions or desires aside for the achievement of group goals; willing to fit into the existing environment; showing respect for the chain of command and others' superior knowledge and experience.
- 29. Work Ethic:** Looking for opportunities to pitch in wherever needed; giving full effort to every task assigned; displaying a strong desire to do things well; striving to do better than expected.

**City of Chicago Fire Department
2016 Fire Engineer Promotional Process**

List of Important Knowledge, Skills, Abilities, and Other Characteristics

Physical Abilities

- 30. Strength:** The strength to perform the Fire Engineer Raise (i.e., remove and throw a 24 foot extension ladder by oneself) and to drag lengths of hose from the apparatus and to connect them to the side and rear ports of the engine while wearing full bunker gear.
- 31. Manual Dexterity:** The ability to use hands and fingers grasp, hold, turn, and otherwise manipulate objects and controls (e.g., manipulate pump panel controls, operate switches, and tie safety hitches).
- 32. Visual Acuity:** The ability to see detail at various distances (e.g., normal reading distance, beyond arm length) and under both normal and adverse conditions (e.g., reading pump panel gauges and dials in low illumination).
- 33. Hearing:** The ability to hear and recognize the normal range of sounds in terms of loudness, pitch, tone, patterns or rhythms, or duration.
- 34. Driving:** The ability to drive the fire apparatus at a level necessary to safely and effectively transport the engine and company personnel under various weather and traffic conditions and in accordance with Departmental and State guidelines during both emergency and routine operations, including operation of related controls (e.g., lights, siren).
- 35. Equipment Operation:** The ability to operate tools and equipment and communication systems required to complete job duties.

APPENDIX C
RECOMMENDED READING LIST FOR
2016 FIRE ENGINEER PROMOTIONAL PROCESS

**City of Chicago Fire Department
2016 Fire Engineer Promotional Process
Recommended Reading List**

GENERAL ORDERS		
Name	Title	Effective Date
Department Vehicle Accident Policy	GO 16-008	8/31/2016
Maintenance and Use of Protective Hoods	GO 16-005	8/2/2016
Structural Firefighting Protective Gear	GO 16-004	7/22/2016
Department Uniform and Grooming Regulations	GO 16-001	3/4/2016
Personnel Accountability System Tags	GO 14-006	9/18/2014
Floor Watch	GO 14-003	4/11/2014
Out of Service-Limited Service-Special Duty Procedures	GO 14-002	4/11/2014
Standard Operating Procedures	GO 13-019	9/3/2013
Code of Professional Conduct of the Chicago Fire Department	GO 13-007	4/4/2013
Department Radio Communications	GO 12-008	11/29/2012
Utilization of Seat Safety Belts	GO 07-010	9/17/2007
Portable Radio Security-Loss of Portable Radio	GO 06-011	7/17/2006
Mandatory Use of Self-Contained Breathing Apparatus (SCBA) and Personal Alert Safety System (PASS)	GO 06-006	5/25/2006
Incident Command	GO 04-002	9/21/2004
Incident Command	GO 03-004	10/1/2003
Protective Pouch for the Self-Contained Breathing Apparatus Face Piece	GO 01-004	9/30/2001
Face Pieces for the MSA Self-Contained Breathing Apparatus	GO 01-002	9/30/2001
Standard Engine Operations	GO 93-013	8/18/1993
Care, Maintenance, Use and Bedding Hose	GO 93-012	8/18/1993
Fire Engineer, Bureau of Fire Suppression and Rescue	GO 93-011	8/18/1993
Badge and Cap Device Policy	GO 92-006	3/23/1992
Utilization of Fire Department Form 2 and 2A	GO 91-016	11/8/1991

OPERATIONS ORDERS		
Name	Title	Effective Date
FS&R Staging Area Communications	OO 16-004	2/11/2016
Cold Weather Sub-Zero Operations	OO 16-001	1/12/2016
Air Purifying Respirator (APR)	OO 15-006	7/14/2015
Orange Nylon Webbing for Engineers Safety Hitches	OO 15-004	6/10/2015
Exhaust Extraction System	OO 14-012	9/18/2014
Use of Phonetic Alphabet in Verbal and Radio Communications	OO 14-010	8/20/2014
Decon Hydrant Caps	OO 12-011	4/3/2012
Three (3) Stage High-Pressure Pumper	OO 06-018	11/27/2006
MABAS Interoperable Water Supply Fittings	OO 06-009	7/21/2006
Fire Response on Limited Access Roadways	OO 02-002	7/17/2002

**City of Chicago Fire Department
2016 Fire Engineer Promotional Process**

Recommended Reading List

LOGISTICS ORDERS		
Name	Title	Effective Date
MSA Air Cylinders	LO 16-003	4/20/2016

SAFETY BULLETINS		
Name	Title	Effective Date
Opening Apparatus Door Into Traffic	SB. 16-003	8/31/2016
SCBA Waist Strap-Belts	SB. 14-001	2/1/2014
DPF Diesel Particulate Filter Aftertreatment System	SB. 09-006	11/1/2009
Safe Driving - Intersection Hazards	SB. 08-006	11/1/2008
Protective Hoods	SB. 07-006	12/1/2007
Fire Hydrant Safety	SB. 07-004	7/24/2007

STANDARD OPERATING PROCEDURES		
Name	Title	Effective Date
SOP Definitions	See separate SharePoint section	
Mayday Procedures at Working Fires and Fire Training Exercises	S.O.P. 102.00	1/1/2014
Emergency Alert Procedures	S.O.P. 103.00	1/1/2014
Emergency Evacuation	S.O.P. 104.00	1/1/2014
Personnel Accountability Report (PAR) Procedures	S.O.P. 105.00	1/1/2014
Rubbish-Dumpster Fires	S.O.P. 202.00	11/1/2013
Electrical Pole and Pole-Mounted Transformer Fires	S.O.P. 203.00	2/1/2014
Fire Hydrant Operations at an Emergency	S.O.P. 204.00	10/22/2015
Prairie (Brush) Fires	S.O.P. 205.00	11/15/2013
Automobile Fires	S.O.P. 206.00	11/1/2013
Defensive Operations	S.O.P. 207.00	6/25/2015
Residential Garage Fires SOP	S.O.P. 208.00	2/1/2014
Basement Fires	S.O.P. 260.00	11/15/2013
Blitz Attack	S.O.P. 263.00	8/15/2015
In-Line Engine Operations	S.O.P. 290.00	12/1/2015
Active Shooter Incidents	S.O.P. 406.00	2/18/2016
Natural Gas Leak Investigations	S.O.P. 507.08	11/24/2014
Multi-agency Incident Response Procedures - Rev. 1	S.O.P. 601.00	1/7/2016
Backing-Reversing Department Vehicles	S.O.P. 702.00	2/1/2014
Downed Electrical Lines	S.O.P. 703.00	4/1/2014

**City of Chicago Fire Department
2016 Fire Engineer Promotional Process
Recommended Reading List**

FS&R LESSON PLANS (ITR)		
Name	Title	Effective Date
Engineer's Raise	LADD-002	

DRILL MANUALS		
Name	Title	Effective Date
Guzzler	Engine Ops 08-001	
Emergency Threaded Hydrant Ports	Engine Ops 11-002	
Speedswivel	Engine Ops 12-001	
Engineers Safety Hitch	Engine Ops 15-001	6/1/2015
Water Supplied to Auxiliary Apparatus and Equipment	Engine Ops 15-002	12/8/2015
In-Line Engine Operations 16-001	Engine Ops 16-001	3/30/2016
Millennium Mask	Multi-Co Ops 12-002	
Drivers Training	Multi-Co Ops 13-005	
Basement Fires (14-001)	Multi-Co Ops 14-001	

QUICK DRILLS		
Name	Title	Effective Date
Standpipe Swivel	QD Aug 2001	8/1/2001
Emergency Vehicle Operation	QD Feb 2003	2/1/2003
M 500 Torch Thawing Device	QD Jan 2003	1/1/2003
Proper Cleaning and Disinfecting of the SCBA Unit	QD Jan 2004	1/1/2004
MSA SCBA PASS Alarm	QD Jul 2002	7/1/2002
Pump Ops	QD July 2002	7/1/2002
Interstate Incident Response	QD July 2004	7/1/2004
Arial Pipe Operations	QD Jun 2003	6/1/2003
MSA SCBA Review	QD Mar 2002	3/1/2002
Engine Nozzles	QD May 2001	5/1/2001
Radio Procedures on Fire Ground	QD Nov 2003	11/1/2003
Apparatus Placement and Communication for a Still Alarm	QD Nov 2003	
Hydrant Wrenches	QD Sep 2001	9/1/2001
On a Hydrant	QD Sep 2002	

**City of Chicago Fire Department
2016 Fire Engineer Promotional Process
Recommended Reading List**

SPECIAL DIRECTIVES		
Name	Title	Effective Date
Acceptance of Department Apparatus-Vehicles	SD 08-001	1/29/2008
SCBA and RIT Pack Enhancements	SD 06-003	11/7/2006
MSA SCBA Revised Cleaning and Disinfecting	SD 02-002	12/27/2002
Department On-Scene Radio Communications	SD 98-001	5/15/1998

TRAINING BULLETINS		
Name	Title	Effective Date
TB 1987-07 What You Should Know		
TB 1990-01 Apparatus Placement and Water Supply		
TB 1991 Hard Suction Hookups		
TB 1992-06 Proper Leadout AFFF Foam Application		
TB 1993-09 General Procedures at Hydrants		
TB 1993-09 Hydraulic Formulas		
TB 1993-09 Special Nozzles		
TB 2000-01 High Pressure Hydrants		

MANUALS (MISC.)		
Name	Title	Effective Date
Air Purifying Respirator Manual		
Defensive Driving Manual 1992 <i>Specific sections only:</i> Speed and Right-of-Way Privilege Intersection Accidents	Defensive Driving Manual 1992	1/1/1992
Engineers Manual		
Illinois Rules of the Road		
Illinois Rules of the Road Class_B Non-CDL		
Radio Manual XTS-5000R		
SCBA Manual		
<i>2009 Spartan/Crimson Gladiator Classic Custom Pumper Operation and Maintenance Manual</i>	NOTE: This document is not on SharePoint, but is provided in Appendix E of this Study Guide.	

**City of Chicago Fire Department
2016 Fire Engineer Promotional Process
Recommended Reading List**

ACADEMY NOTES		
Name	Title	Effective Date
Burping the Pump	AN Dec 2002	12/1/2002
Alternate Method to Feed a Standpipe System	AN Fall 2004	
Applying Foam	AN Fall 2004	
Operating From High Pressure Hydrants	AN Jan 2000	1/1/2004
In Line Operations	AN Jan 2004	1/1/2004
Back Flushing of Fire Pumps	AN Jun 2000	6/1/2000
Water Hammer in Mains	AN Spring 2004	3/1/2004
Combination Sprinkler and Standpipe System Riser	AN Spring 2008	3/1/2008

ENGINEER REFERENCE GUIDES		
Name	Title	Effective Date
Allison Transmission - Checking Fluids		12/23/2014
Cummins Regeneration Quick Reference Guide		12/23/2014
Detroit Diesel Regeneration Quick Reference.png		12/23/2014
Field Hydraulics - Quick Reference Guide		12/23/2014
FoamLogix Operating Procedures		12/23/2014

APPENDIX D
2006 FIRE ENGINEER WRITTEN EXAMINATION AND ANSWER KEY

Room #: _____



Chicago Fire Department

Fire Engineer Promotional Examination

November 18, 2006

I agree that this test booklet contains Instructions and 100 questions presented on pages 1 through 48. Page 48 is a large foldout sheet which does not list any questions, but does contain the hose record for an engine company described in the examination.

Print Name: _____

Signature: _____

Social Security Number: _____ - _____ - _____

FIRE ENGINEER PROMOTIONAL EXAMINATION

General Instructions

Testing Policies

Before beginning the test session, please listen closely to the following general testing policies:

1. No books, note papers, calculators, cameras, recording devices, or other test aids may be used during testing. If you have any of these items, please put them on the floor under your seat. Your desk should be cleared of all materials except your Department photo I.D., answer sheet, test booklet, and pencils. Please keep your Notice to Report and fingerprint card on the floor under your seat.
2. If you have a cell phone or pager, please turn it off now. Cell phones and pagers must be removed from your person and placed on the floor under your seat at this time.
3. As a reminder, you must use Number 2 pencils to mark the answer sheets. If you need a new pencil during the testing, raise your hand and a proctor will bring you a pencil.
4. Smoking, eating, and drinking are **not** allowed in the testing room.
5. No talking may take place during testing.
6. You will **not** be allowed to use the restroom during the test instructions. Restroom passes will not be issued 10 minutes before the end of testing. If you must use the restroom during testing, please raise your hand and wait to be assisted by one of the proctors before leaving. The proctor will collect all of your test materials and your City ID and give you a restroom pass. Be aware that the test is timed, and you will **not** be allowed any additional test time to make up for time spent in the restroom.
7. A summary of the Restroom Pass Policy and the Conduct Policy is taped to the top of your desk. Failure to follow directions or to stop when time is called may result in your test being invalidated.

Answer Sheet Instructions

General Information Section

You will now complete the top portion of the answer sheet. Again, use only a Number 2 pencil. Print your last name in the boxes under the heading "Last Name." You should print one letter per box. Start at the left column and work your way to the right. If your last name is longer than 14 letters, only use the first 14 letters. After you have printed your last name, fill in the appropriate circles of the letters that correspond to the letters in the boxes above them. If you have not filled out bubble sheets like this before, please raise your hand and a proctor will assist you.

After printing your last name and filling in the appropriate circles, print your first name in the boxes marked "First Name" and your middle initial in the box marked "MI." Then fill in the circles below the boxes that correspond to the letters you wrote.

Next, write your social security number in the area marked "Social Security Number." Begin with the column on the left and put one number in each box. Then carefully fill in the appropriate circle under each number.

In the area marked "Exam", print **FIRE ENGINEER**. Next, in the area marked "Exam Number", print the following numbers: **0 8 7 3 3**. Begin with the column on the left and put one number in each box. Then carefully fill in the appropriate circle under each number. Again, the Exam Number is 0 8 7 3 3.

Marking Your Answers to the Test Questions

The Fire Engineer Promotional Examination consists of 100 test items. Each item includes a question and four answer options. You are to select the *best* answer to the question from among the four options available. You will use the scantron answer sheet to record your answers to the 100 multiple choice questions on this test.

The answer sheet contains 150 answer spaces in six columns. Each answer space consists of a question number and four small circles with a letter (*A, B, C* or *D*) printed inside each. Each column has 25 answer spaces. The answer spaces are numbered **down** the page within each column, **not across** the page. Record your answers for

questions 1 through 25 in the first column, 26 through 50 in the second column, 51 through 75 in the third column, and 76 through 100 in the fourth column. No answers should be marked in the last two columns. Be sure to mark your answer for each test question in the appropriate space.

To mark your answers, blacken in the circle that contains the letter of the answer you have chosen for each item. As you go through the test, be sure the number on the answer sheet matches the question number you are working on in the test booklet. **If you skip a question, be sure to skip the corresponding number on your answer sheet.** Mark only one answer per question. Double marked answers will be counted as wrong. The MARKING INSTRUCTIONS box in the middle of your answer sheet provides additional guidelines about how to mark your answer.

Read each question and each of your answer options carefully before choosing your answer. Be sure to choose the **best** option from among those listed. Remember, you must use only a Number 2 lead pencil to fill in the circles. The answer sheet is a two-page carbonless form. The top and bottom copies of the form are identical. The top copy is the original and will be kept by the proctor at the end of the testing session. You will be given the bottom copy when you leave the testing session so that you have a record of your test responses.

When you mark your answers to the test questions on the top copy of the answer sheet, your marks will be copied onto the pink bottom copy. Note that if you decide to change an answer you have already marked, you must erase the answer on the top copy completely and fill in the circle for your new answer. However, the **bottom copy will not erase**. You will need to lift up the top copy and cross out your old mark on the bottom copy. To avoid smudging the bottom copy when erasing a mark on the top copy, move either sheet so that the bottom copy is not directly underneath the mark you intend to erase. Be sure to completely erase your mark on the top copy; do not cross it out. If two circles for the same question are filled, your answer will automatically be counted as wrong.

You are allowed to mark, write or make notes in the test booklet as needed. However, **all** of your answers **must** be recorded on the answer sheet. You will **not** be given credit for any answers recorded in the test booklet.

Examination Overview

This examination consists of four sections. Three of the sections present a series of events which occur during the course of three separate tours of duty for three engine companies. The first section follows Engine Company 132 during a tour of duty in February, the second section follows Engine Company 156 during a tour of duty in May, and the third section follows Engine Company 148 during a tour of duty in July. The fourth section consists of a set of questions that are not sequentially connected to one another.

Several questions in the examination ask the proper engine discharge pressure for various leadouts. All answers to these questions have been calculated using the field hydraulics (flow memory) method. This is the method endorsed by the Chicago Fire Department, and presented in the Engineer's Manual.

Because pump pressure gauges are typically marked in 10 PSI increments, the accepted method for determining the proper discharge pressure is to round the calculated result to a multiple of 10 PSI. The decision to round down or round up depends on whether a hand line or a master stream is being charged.

- Discharge pressures for hand lines are **rounded down** to the nearest 10 PSI increment. For example, if the calculated discharge pressure for a hand line is 87 PSI, the result is rounded down and reported as 80 PSI. This is the pressure that would be set on the pump mechanism.
- Discharge pressures for master streams are **rounded up** to the nearest 10 PSI increment. For example, if the calculated discharge pressure for a master stream is 187 PSI, the result is rounded up and reported as 190 PSI. This is the pressure that would be set on the pump mechanism.

Important Note: A few questions consist of leadouts from the Engineer's side hose bed, where the 2½-inch hose is connected to a 1¼-inch SOP which is attached to the wye and 100 feet of 1¾-inch hose. In leadouts where the wye is not used for its intended purpose (i.e., used with one line, rather than two lines), there is no turbulence created in the divider, and consequently, no need to factor friction loss for the wye. **In leadouts where the divider is not used for its intended purpose, disregard the 10 PSI loss for the divider.**

Important Points to Remember

- Mark only **one** answer for each question.
- Check often to be sure that the number next to the row of circles you are marking on your answer sheet matches the number of the question in your test booklet.
- Make sure that you fill in the circle completely to indicate your answer. Thoroughly erase any answers you want to change or any marks you make by mistake.
- When you finish one Section, go on to the next Section **immediately**.
- **Keep track of your time.** Do not spend too much time or get stuck thinking about one question. Answer the easy questions first, then go back and consider further the questions you skipped.
- If you have extra time available at the end, review the questions and your answers. Make sure that: (a) you have answered all the questions, and (b) you have marked your answers appropriately on the answer sheet. Please remain seated and do not distract those candidates who are still working.

You will have 3 hours to answer the 100 multiple choice questions. Your score is based on the total number of questions you answer correctly. Work quickly and accurately and do the best you can until time is called. You will be given a warning when you have 1 hour, 15 minutes and 5 minutes of test time remaining. If you finish early, please review your work. After you are finished, please raise your hand to indicate to the proctor that you are ready to be processed for check-out. You are not required to stay for the entire 3 hours. Candidates who are still in the room when Exam Stop Time has been called will be processed one by one. Further instructions will be announced at that time.

DO NOT TURN THE PAGE UNTIL YOU ARE INSTRUCTED TO DO SO

SECTION 1

Introduction

The first section of the examination describes the activities of Engine Company 132 as it goes about its operations during the course of one tour of duty. Engine Company 132 is quartered with Truck Company 68 and Ambulance 98. These companies are members of Battalion 26 and are under the command of Battalion Chief Francis Green.

The personnel working on Engine Company 132 on this tour of duty are as follows:

Engine Company 132

- Lieutenant Steve Zane
- Engineer Alan Steel (Relief)
- Firefighter Nathan Debski
- Firefighter Grace Fisk
- Candidate Firefighter Juan Cruz

All questions in Section 1 of this examination refer to the activities of Engine Company 132 on this particular tour of duty. Please note that it is not necessary to memorize the names of its members as they will be listed at the top of each page.

ENGINE COMPANY 132 PERSONNEL AND ASSIGNMENTS			
• Lieutenant Zane		• Firefighter Fisk	(Heel Man)
• Engineer Steel	(Relief)	• Candidate Firefighter Cruz	(Hydrant)
• Firefighter Debski	(Pipe)		

Today is February 21, a Wednesday. The temperature this morning is 24° F., but is expected to quickly drop to a -3° F. It is overcast and the wind is gusting to speeds of 10 MPH. Engineer Steel is working today for the assigned engineer on Engine 132, a 2002 Spartan Luverne Gladiator pumper, with a rated capacity of 1500 GPM. Engr Steel arrives in quarters at 0700 hours and reports to Lieutenant Zane. This is Engr Steel's first tour of duty with Engine 132.

Engr Steel introduces himself to the off-going engineer, and asks about the activities during the previous tour of duty. He reviews the company journal to familiarize himself with the activities of the company before beginning the morning apparatus check.

1. Engr Steel checks the fuel gauge on the apparatus to insure that the fuel level in the engine complies with Departmental requirements. What is the **minimum** acceptable range of fuel levels that Engr Steel should maintain in the apparatus during this tour of duty?
 - A. $\frac{1}{4}$ to $\frac{1}{2}$ full
 - B. $\frac{3}{8}$ to $\frac{5}{8}$ full
 - C. $\frac{1}{2}$ to $\frac{3}{4}$ full
 - D. $\frac{5}{8}$ to $\frac{7}{8}$ full
2. The off-going Engineer had informed Engr Steel that the company had just returned from a fire. While conducting an inventory of the equipment on the engine, which of the following **should** be located on the front bumper?
 - A. Gate valve
 - B. Hydrant wrench
 - C. Storz wrenches
 - D. Storz fitting (4½-inch male x 4-inch Storz)

ENGINE COMPANY 132 PERSONNEL AND ASSIGNMENTS			
• Lieutenant Zane		• Firefighter Fisk	(Heel Man)
• Engineer Steel	(Relief)	• Candidate Firefighter Cruz	(Hydrant)
• Firefighter Debski	(Pipe)		

3. Because the engine had been used at a fire incident, Engr Steel decides to check the intake screen on the front suction. The coupling is very tight. What is recommended by IFSTA for loosening the coupling on the soft suction?
 - A. Block of wood
 - B. Rubber mallet
 - C. Brass mallet
 - D. Lead mallet

4. Engr Steel also checks to insure that each of the 2½-inch hose beds have the proper nozzles connected, per Departmental policy. When checking the Officer's 2½-inch hose bed, what nozzle should he expect to find connected to the hose?
 - A. 1¼-inch SOP
 - B. 1¼-inch Street Pipe
 - C. 250/50 Adj. Fog Nozzle
 - D. SM-30F Automatic Nozzle

5. As he continues his inspection, he verifies that all equipment is in place. Which fitting is carried on the gate valve for convenience?
 - A. 4½-inch male to Storz
 - B. 4½-inch male to 4½-inch female
 - C. 4½-inch female to Storz
 - D. 4½-inch double female CFD

ENGINE COMPANY 132 PERSONNEL AND ASSIGNMENTS

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|----------------------|----------|------------------------------|------------|
| • Lieutenant Zane | | • Firefighter Fisk | (Heel Man) |
| • Engineer Steel | (Relief) | • Candidate Firefighter Cruz | (Hydrant) |
| • Firefighter Debski | (Pipe) | | |

6. Engr Steel walks around the apparatus to check its condition. He notices some damage to the rig that appears to have been caused by a vehicle accident. No accident had been mentioned by the off-going Engineer, nor had one been noted in the company journal. He is aware that an accident report will need to be submitted, and informs Lt Zane of the damage. What class accident would this be?
- A. Class 1
 - B. Class 2
 - C. Class 3
 - D. Class 5
7. Since the rig had been out during the previous tour, what else should Engr Steel inspect on the rig?
- A. Check for spare gloves and dry clothing
 - B. Check for frozen drains, discharge ports and intake ports
 - C. Check for leaking hose butts
 - D. Insure the booster tank is empty
8. Engr Steel pulls the rig onto the apron and allows the engine to warm up. While performing the morning apparatus pump check, Engr Steel hears the ejector valve operate on the air tanks. This indicates that the air pressure in the tanks is at what level?
- A. 80 PSI
 - B. 100 PSI
 - C. 120 PSI
 - D. 150 PSI

ENGINE COMPANY 132 PERSONNEL AND ASSIGNMENTS

• Lieutenant Zane		• Firefighter Fisk	(Heel Man)
• Engineer Steel	(Relief)	• Candidate Firefighter Cruz	(Hydrant)
• Firefighter Debski	(Pipe)		

9. Candidate Firefighter Cruz approaches and introduces himself to Engr Steel. He is very eager to learn about engine operations, and is curious about the electronic pressure governor. He asks how much the engine speed increases when the electronic pressure governor is in the **RPM** mode, and the **INC** button is briefly pressed. What is the correct response for Engr Steel to give CFF Cruz?
- A. 25 RPM
 - B. 50 RPM
 - C. 100 RPM
 - D. 200 RPM
10. CFF Cruz then asks Engr Steel how much pressure increase occurs when the **INC** button is briefly pressed while the electronic pressure governor is in the **Pressure** mode. What is the correct response for Engr Steel to give to CFF Cruz?
- A. About 4 PSI
 - B. About 8 PSI
 - C. About 10 PSI
 - D. About 20 PSI
11. As he performs the morning pump check, Engr Steel checks the transfer valve. What is the required position of the transfer valve during **this** tour of duty?
- A. RPM
 - B. Pressure
 - C. Volume
 - D. Engineer's preference

ENGINE COMPANY 132 PERSONNEL AND ASSIGNMENTS			
• Lieutenant Zane		• Firefighter Fisk	(Heel Man)
• Engineer Steel	(Relief)	• Candidate Firefighter Cruz	(Hydrant)
• Firefighter Debski	(Pipe)		

12. The outside temperature is dropping rapidly. After completion of the morning equipment check, Engr Steel goes to the kitchen to get some coffee and warm up. FF Debski complains that the kitchen is cold. Engr Steel inspects the radiators and finds newspapers on top of several of the units. What is permissible to place on top of radiators in quarters?
- A. Nothing
 - B. Pan of hot water
 - C. Pan of cold water
 - D. Wet gloves
13. While warming up with his cup of coffee, Engr Steel reviews a map of Engine 132's response area. Within what boundaries must an engineer maintain current knowledge of streets, buildings, hydrant locations and hazards?
- A. Still District only
 - B. Still and Box Alarm district
 - C. Engine's Battalion
 - D. Engine's District assignment
14. Before Engr Steel can finish his coffee, an alarm is sounded for a car fire on the expressway. Lt Zane and the members of Engine 132 quickly enter the cab and secure their seatbelts. When may Engr Steel put the apparatus in gear and in motion?
- A. When Engr Steel believes it is safe to proceed
 - B. When the Firefighters seated in the crew cab give the OK signal to proceed
 - C. When Engr Steel hears the two buzzer signals to proceed
 - D. When Lt Zane gives the order to proceed

ENGINE COMPANY 132 PERSONNEL AND ASSIGNMENTS

- | | |
|---|--|
| <ul style="list-style-type: none">• Lieutenant Zane• Engineer Steel (Relief)• Firefighter Debski (Pipe) | <ul style="list-style-type: none">• Firefighter Fisk (Heel Man)• Candidate Firefighter Cruz (Hydrant) |
|---|--|

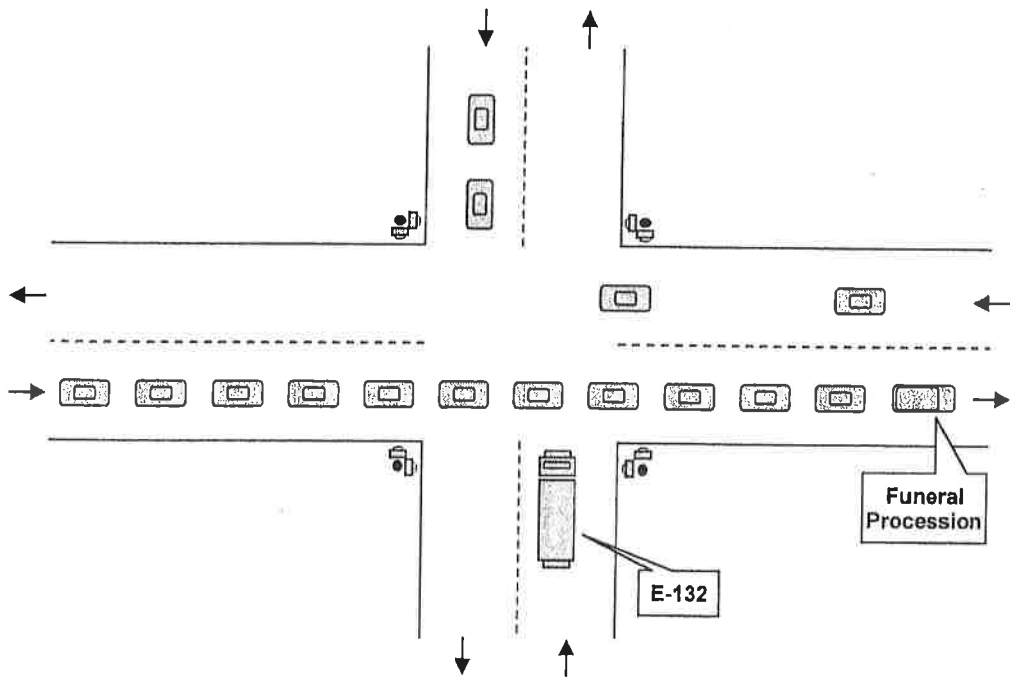
15. Upon entering the expressway, the apparatus is traveling at 40 MPH. How does traveling at this speed impact the stopping distance as compared to traveling at 30 MPH?
- A. Stopping distance is unaffected
 - B. Stopping distance nearly doubles
 - C. Stopping distance increases by inverse proportion to speed increase
 - D. Stopping distance is only minimally affected by a 10 MPH increase in speed
16. Engine 144 is also responding to the auto fire. Engine 132 goes down onto the expressway, while Engine 144 stays up top. Upon arrival on the scene, Engine 132 leads out 200 feet of 1 $\frac{3}{4}$ -inch crosslay hose with the 150/75 Adj. Fog Nozzle. What is the appropriate discharge pressure for Engr Steel to send with this leadout?
- A. 80 PSI
 - B. 90 PSI
 - C. 100 PSI
 - D. 120 PSI
17. Following Lt Zane's orders, the initial attack on the auto fire is made using water from the booster tank. While operating from the booster tank, how long can Engr Steel supply the 150/75 Adj. Fog Nozzle operating at the correct pressure with the pipe fully opened and in continuous use?
- A. Approximately 2 min, 50 sec
 - B. Approximately 3 min, 0 sec
 - C. Approximately 3 min, 20 sec
 - D. Approximately 3 min, 40 sec

ENGINE COMPANY 132 PERSONNEL AND ASSIGNMENTS

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|----------------------|----------|------------------------------|------------|
| • Lieutenant Zane | | • Firefighter Fisk | (Heel Man) |
| • Engineer Steel | (Relief) | • Candidate Firefighter Cruz | (Hydrant) |
| • Firefighter Debski | (Pipe) | | |

18. The auto fire is quickly extinguished and Lt. Zane places the company back in service. While returning to quarters, Lt Zane notes that the temperature has now dropped below 0° F., and reminds company members to take precautions to guard against frostbite and to insure equipment operability. Before arrival at the fire house, the Company is dispatched to a still and box. En route to the alarm, Engine 132 encounters a lengthy funeral procession as cross traffic. According to the Illinois Rules of the Road, what is the proper action that should be taken by Engr Steel in this situation?

- A. Pass the procession if it can be done in a safe manner
- B. Emergency vehicles are required to stop for the procession
- C. Signal lead car to stop, then proceed
- D. Proceed through the procession on response, pausing or stopping for safety



ENGINE COMPANY 132 PERSONNEL AND ASSIGNMENTS

- | | | | |
|----------------------|----------|------------------------------|------------|
| • Lieutenant Zane | | • Firefighter Fisk | (Heel Man) |
| • Engineer Steel | (Relief) | • Candidate Firefighter Cruz | (Hydrant) |
| • Firefighter Debski | (Pipe) | | |

The following is a portion of the Hose Record for Engine 132. It represents the position, length numbers, and hose lengths for the 2½-inch hose beds. Use this hose record to answer Question 19, below.

Engineer's Side 2½-Inch Hose Bed			
Hose Bed Position	Hose Length Number	Feet in Hose Length	Total Hose Footage
16			
15			
14	281	50	700
13	231	50	650
12	215	50	600
11	244	50	550
10	255	50	500
9	308	50	450
8	299	50	400
7	300	50	350
6	280	50	300
5	248	50	250
4	278	50	200
3	304	50	150
2	327	50	100
1	212	50	50

Officer's Side 2½-Inch Hose Bed			
Hose Bed Position	Hose Length Number	Feet in Hose Length	Total Hose Footage
16			
15			
14	216	50	700
13	295	50	650
12	317	50	600
11	303	50	550
10	214	50	500
9	353	50	450
8	208	50	400
7	315	50	350
6	262	50	300
5	286	50	250
4	257	50	200
3	309	50	150
2	301	50	100
1	220	50	50

19. Upon arrival at the still and box, Chief Green orders Engine 132 to protect the exposure in sector 3. The firefighters lead out from the Officer's side hose bed and Engr Steel attaches length #315 to discharge port #4. What is the correct discharge pressure for Engr Steel to send for this leadout?

- A. 80 PSI
- B. 90 PSI
- C. 100 PSI
- D. 110 PSI

ENGINE COMPANY 132 PERSONNEL AND ASSIGNMENTS			
• Lieutenant Zane		• Firefighter Fisk	(Heel Man)
• Engineer Steel	(Relief)	• Candidate Firefighter Cruz	(Hydrant)
• Firefighter Debski	(Pipe)		

20. Engr Steel decides to utilize the side intake port when making the connection to the apparatus. Why is this decision appropriate under these conditions?
- A. 6-inch side intakes are air operated, and less likely to freeze
 - B. 6-inch discharge ports are air operated, and less likely to freeze
 - C. 6-inch front intake is manually operated, and less likely to freeze
 - D. 6-inch side intakes are manually operated, and less likely to freeze
21. After the incident is effectively mitigated, pumping operations are shut down. CFF Cruz begins to quickly turn the stem on the hydrant to shut off the water supply. Engr Steel instructs CFF Cruz to close the hydrant more slowly in order to prevent a water hammer in the system. To what level can the pressure in water mains rise if a hydrant is closed too rapidly?
- A. 75 PSI
 - B. 100 PSI
 - C. 150 PSI
 - D. 200 PSI
22. Upon returning to the fire house, Engr Steel prepares to back the rig into quarters. What procedure should be used to safely open the overhead door?
- A. A member of Engine 132 will assume control of the overhead door
 - B. Open the overhead door with the remote control device
 - C. Sound the air horn to signal the member on watch to open the overhead door
 - D. Radio the house personnel to open the overhead door

ENGINE COMPANY 132 PERSONNEL AND ASSIGNMENTS

• Lieutenant Zane		• Firefighter Fisk	(Heel Man)
• Engineer Steel	(Relief)	• Candidate Firefighter Cruz	(Hydrant)
• Firefighter Debski	(Pipe)		

After company members have cleaned up and had lunch, Lt Zane convenes company school. He tells Engr Steel that he likes to offer relief engineers the opportunity to lead the training session so that his company can learn from the experiences of those who have served in other parts of the City. Based on the morning's expressway incident, Engr Steel decides to focus on foam leadouts.

23. Engr Steel begins by discussing the in-line eductor leadout. As an example of when the in-line eductor leadout may be ordered, Engr Steel presents the situation of an overturned tanker leaking from the saddle tanks. To illustrate the foam leadout, he draws a diagram on the blackboard. The leadout has 200 feet of 4-inch hose, with 50 feet of 2½-inch hose and the prescribed 1¾-inch hose with the 150/75 pipe. What is the appropriate discharge pressure for this leadout?

- A. 120 PSI
- B. 150 PSI
- C. 160 PSI
- D. 200 PSI



24. Engr Steel explains that when using the in-line foam eductor, engineers must seriously consider placing a particular device on the pump panel in a specific setting in order to efficiently obtain the desired discharge pressure. What **device** should be in what **setting** to efficiently obtain the desired discharge pressure?

- A. Transfer valve set to Pressure position
- B. Transfer valve set to Volume position
- C. Electronic pressure governor set to Volume mode
- D. Electronic pressure governor set to RPM mode

ENGINE COMPANY 132 PERSONNEL AND ASSIGNMENTS

• Lieutenant Zane		• Firefighter Fisk	(Heel Man)
• Engineer Steel	(Relief)	• Candidate Firefighter Cruz	(Hydrant)
• Firefighter Debski	(Pipe)		

25. Engr Steel highlights steps taken to help insure the safety of personnel, and tells the company members that all hose must be secured with an approved knot while water is discharging from individual ports on an engine. What is the name of this approved knot?
- A. Approved Engineer's water knot
 - B. Approved Engineer's sling
 - C. Approved Engineer's running bowline
 - D. Approved Engineer's safety hitch
26. FF Debski asks if the deck gun can be used for foam operations. Engr Steel indicates that it can be, but tells the company members that a specific nozzle must be used. Which of the following nozzles is carried on some engine companies for use on the deck gun for major foam applications?
- A. 150/75 Adj. Fog
 - B. 250/50 Adj. Fog
 - C. HF-350 Adj. Fog
 - D. SM-30F Adj. Fog
27. Lt Zane indicates that he would like to have a drill on foam leadouts in the near future. He asks Engr Steel to explain how to make foam for training purposes. What should be added to 5-gallons of water to make training foam?
- A. ½ gallon of AFFF
 - B. 1 gallon of AFFF
 - C. 1 pint of dish detergent
 - D. 1 gallon of dish detergent

ENGINE COMPANY 132 PERSONNEL AND ASSIGNMENTS

- | | |
|---|--|
| <ul style="list-style-type: none">• Lieutenant Zane• Engineer Steel (Relief)• Firefighter Debski (Pipe) | <ul style="list-style-type: none">• Firefighter Fisk (Heel Man)• Candidate Firefighter Cruz (Hydrant) |
|---|--|

28. At the close of company school, Lt Zane informs the members that the work schedule calls for changing the 4-inch hose today. As the hose is removed from the bed, CFF Cruz asks Engr Steel how often hose must be changed, since the officer's side 2½-inch hose was changed the previous week. How frequently is all hose on the rig required to be changed?
- A. At least once a month
 - B. At least twice a month
 - C. At least once a week
 - D. At least on the Captain's shift
29. After all 4-inch hose has been removed from the rig, company members prepare to bed the hose. CFF Cruz is unsure of the proper procedure for bedding hose and asks Engr Steel where should the bedding of the hose begin? What is the correct answer for Engr Steel to give?
- A. Left side of the hose bed
 - B. Center of the hose bed
 - C. Right side of the hose bed
 - D. Non-directional hose: it does not matter
30. As Engr Steel directs the 4-inch hose change, he asks CFF Cruz how many turns are necessary to connect and disconnect the Storz fittings from one another. According to IFSTA, what is the correct response to the question?
- A. ¼ turn
 - B. ⅓ turn
 - C. ½ turn
 - D. ¾ turn

ENGINE COMPANY 132 PERSONNEL AND ASSIGNMENTS

- | | | | |
|----------------------|----------|------------------------------|------------|
| • Lieutenant Zane | | • Firefighter Fisk | (Heel Man) |
| • Engineer Steel | (Relief) | • Candidate Firefighter Cruz | (Hydrant) |
| • Firefighter Debski | (Pipe) | | |

31. While changing the 4-inch hose, Engr Steel instructs CFF Cruz to make new folds in the hose. What is the benefit of creating new folds in 4-inch hose?

- A. Increases room in the hose bed
- B. Improves water flow
- C. Decreases number of layers in the hose bed
- D. Increases the life span of hose

The following is a portion of the Hose Record for Engine 132. It represents the position, length numbers, and hose lengths prior to the hose change. Use this hose record to answer Question 32, below.

4-Inch Hose Bed			
Hose Bed Position	Hose Length Number	Feet in Hose Length	Total Hose Footage
14	96	50	700
13	117	50	650
12	111	50	600
11	114	50	550
10	112	50	500
9	107	50	450
8	97	50	400
7	102	50	350
6	130	50	300
5	124	50	250
4	120	50	200
3	99	50	150
2	129	50	100
1	123	50	50

Front Bumper	
Hose Length Number	Feet in Hose Length
125	50
119	50
115	50

32. After the 4-inch hose is changed, what lengths will be on the bottom of the bed?

- A. 125, 119, 115
- B. 96, 117, 111
- C. 123, 129, 99
- D. 97, 102, 130

ENGINE COMPANY 132 PERSONNEL AND ASSIGNMENTS

• Lieutenant Zane		• Firefighter Fisk	(Heel Man)
• Engineer Steel	(Relief)	• Candidate Firefighter Cruz	(Hydrant)
• Firefighter Debski	(Pipe)		

33. As Engr Steel reviews the hose record and inventory, he notices two lengths of 4-inch hose that have not been used in a long time. He reports the situation to Lt Zane, noting that all hose must have water passed through it periodically to insure it continues to be usable. At a minimum, how frequently must all hose have water passed through it?

- A. Once a month
- B. Once every 6 weeks
- C. Once every 3 months
- D. Once every 6 months

34. Shortly after completion of the hose change, Engine 132 is dispatched to a still alarm. En route to the location, the apparatus is involved in a minor accident with no significant damage to the rig. What accident classification does not require termination of the response to this alarm?

- A. Class 2B
- B. Class 3
- C. Class 4B
- D. Class 5

ENGINE COMPANY 132 PERSONNEL AND ASSIGNMENTS

- | | | | |
|----------------------|----------|------------------------------|------------|
| • Lieutenant Zane | | • Firefighter Fisk | (Heel Man) |
| • Engineer Steel | (Relief) | • Candidate Firefighter Cruz | (Hydrant) |
| • Firefighter Debski | (Pipe) | | |

35. Upon arrival at the incident, Engine 132 connects to a hydrant with a blue colored flange. The color identifies the size of the main and its potential delivery capability. What does the blue colored flange reference?
- A. Hydrants off of 6-inch and 8-inch mains that are supported at least within 600 feet
 - B. Hydrants off of 12-inch to 16-inch mains
 - C. Hydrants off of mains larger than 16 inches in diameter
 - D. Hydrants off of dead end mains, or intermediate hydrants on long unsupported mains
36. The incident has become a 2-11 fire. BC Green orders Engine 132 to feed Tower Ladder 15, which is using a 2-inch tip. 100 feet of 4-inch hose is led out to the Tower Ladder, which is operating at an elevation of 50 feet. What is the proper discharge pressure for Engr Steel to set for this operation?
- A. 120 PSI
 - B. 150 PSI
 - C. 160 PSI
 - D. 170 PSI
37. BC Green now orders the Firefighters to lead out 400 feet of 2½-inch hose from the engineer's side to sector 2. Engineer Steel notices that the wye and the 100 feet of 1¼-inch hose have been disconnected. What is the proper engine discharge pressure for Engr Steel to set for this leadout?
- A. 110 PSI
 - B. 120 PSI
 - C. 130 PSI
 - D. 140 PSI

ENGINE COMPANY 132 PERSONNEL AND ASSIGNMENTS

- | | | | |
|----------------------|----------|------------------------------|------------|
| • Lieutenant Zane | | • Firefighter Fisk | (Heel Man) |
| • Engineer Steel | (Relief) | • Candidate Firefighter Cruz | (Hydrant) |
| • Firefighter Debski | (Pipe) | | |

38. The structure is fully involved, and BC Green orders an evacuation. Engr Steel is aware that a series of short air horn blasts are used to signal the evacuation order. For how long a period should Engr Steel sound the series of short air horn blasts?

- A. 20 seconds
- B. 30 seconds
- C. 50 seconds
- D. 60 seconds

39. After the fire is extinguished, Engine 132 begins picking up. CFF Cruz is assisting in bedding the hose, but is having difficulty reattaching the 1¼-inch SOP. Engr Steel notices burrs on the thread. According to IFSTA, what should be used to remove the burrs or abrasions from the thread surface?

- A. 3-corner file
- B. Rat tail file
- C. Emery cloth
- D. Wire brush

End of Section 1
Continue to next section

SECTION 2

Introduction

The second section of the examination describes the activities of Engine Company 156 as it goes about its operations during the course of one tour of duty. Engine Company 156 is quartered with Truck 64 and Ambulance 154. These companies are members of Battalion 31 and are under the command of Battalion Chief George Kniles.

The personnel working on Engine Company 156 on this tour of duty are as follows:

Engine Company 156

- Captain Michael Garza
- Engineer Lisa Reid (Relief)
- Firefighter Henry Kirk
- Firefighter Nicholas Sanz
- Firefighter Jimmy Coy

All questions in Section 2 of this examination refer to the activities of Engine Company 156 on this particular tour of duty. Note that it is not necessary to memorize the names of its members as they will be listed at the top of each page. Use of a hose record is not required for this section of the examination.

ENGINE COMPANY 156 PERSONNEL AND ASSIGNMENTS		
• Captain Garza	• Firefighter Sanz	(Heel Man)
• Engineer Reid	• Firefighter Coy	(Hydrant)
• Firefighter Kirk	(Pipe)	

Today is May 12, a Saturday. The temperature this morning is 64° F., warming to a high of 77° F. by midday. It is a clear, sunny day with light winds. Engineer Reid is the newly assigned engineer on Engine 156, a 2002 Spartan Luverne Gladiator pumper, with a rated capacity of 1500 GPM. Engine Company 156's still district encompasses a high-rise district.

40. Newly assigned Engineer Reid arrives in quarters at 0630 to relieve the off-going Engineer. After what time may Engr Reid officially relieve the off-going Engineer?

- A. 0630 hours
- B. 0645 hours
- C. 0700 hours
- D. 0800 hours

41. Engr Reid completes the morning check on the apparatus and equipment. She was informed by the off-going engineer that the weekly pump test is scheduled for this day. After receiving permission from Captain Garza, Engr Reid connects to a hydrant and performs the pump test. What is the maximum discharge pressure that should be set when conducting a pump test?

- A. 100 PSI
- B. 120 PSI
- C. 150 PSI
- D. 200 PSI

ENGINE COMPANY 156 PERSONNEL AND ASSIGNMENTS

• Captain Garza	• Firefighter Sanz	(Heel Man)
• Engineer Reid	• Firefighter Coy	(Hydrant)
• Firefighter Kirk	(Pipe)	

42. Engr Reid is aware that fire pumps are required to be back flushed regularly for maintenance. The pump should also be back flushed after certain operations, or after certain conditions are encountered during pumping operations. All of the following specify conditions when the pump should be back flushed, except one. Which of the following is **not** a reason for back flushing fire pumps?

- A. After a drafting operation
- B. When sediment from a water main or other pieces of debris slipped past intake screens
- C. When hydrants used during an operation were first thoroughly flushed and flowing clean water from their ports
- D. When the water exiting the tip during a deck gun operation appeared to be clouded, dirty or rust colored

43. Capt Garza informs Engr Reid that the company's still district includes several high pressure hydrants. **At or above** what pressure is a hydrant considered to be a high pressure hydrant?

- A. 45 PSI
- B. 50 PSI
- C. 55 PSI
- D. 60 PSI

ENGINE COMPANY 156 PERSONNEL AND ASSIGNMENTS		
• Captain Garza	• Firefighter Sanz	(Heel Man)
• Engineer Reid	• Firefighter Coy	(Hydrant)
• Firefighter Kirk	(Pipe)	

44. Engr Reid moves to the bunkroom to stow her belongings, and finds FF Sanz making his bed. It is warm in the bunkroom and FF Sanz asks Engr Reid to turn the air conditioning on. Engr Reid is aware that there is a designated time period during which the air conditioning is allowed to be on in quarters. What is the date on which air conditioning can be first used during each calendar year?
- A. May 10th
 - B. May 15th
 - C. May 21st
 - D. May 30th
45. Engine 156 is dispatched to a still and box in a high-rise building. The OEMC informs Engine 156 that they are the 3rd due Engine at the incident. What are the duties or role of the 3rd arriving engineer at a high-rise still and box alarm?
- A. Coordinate appropriate tools and equipment to be carried in, and safeguard extra air bottles
 - B. Stand by the apparatus and function as the secondary radio communication until the arrival of the Command Van
 - C. Assist and assume task of Lobby Control and become a Scribe/Runner for the Incident Commander
 - D. Assist the engineer of the 1st Engine in connecting to the proper Siamese standpipe connection, and then connect to a 2nd standpipe connection

ENGINE COMPANY 156 PERSONNEL AND ASSIGNMENTS		
• Captain Garza	• Firefighter Sanz	(Heel Man)
• Engineer Reid	• Firefighter Coy	(Hydrant)
• Firefighter Kirk	(Pipe)	

46. Prior to arrival at the incident, the OEMC informs Capt Garza that Engine 156 is now designated as the 4th Engine. Engr Reid reports to the Command Van to assist the personnel working there. Upon arrival of the Plans Chief, what should Engr Reid immediately do unless otherwise directed?
- A. Report to Lobby Control
 - B. Report back to her Engine
 - C. Acknowledge her intentions on Channel #1
 - D. Monitor the apparatus radio in the scan mode and relay all communications from the Incident Commander to the OEMC
47. Engine 156 is ordered to sector 3 to lead out to the 6th floor of the high-rise. As the engineer of the 4th arriving engine, what connection must now be made to the hydrant?
- A. 50 feet of LDH from the engine to the hydrant port
 - B. 50 feet of LDH from the engine to each hydrant port
 - C. 150 feet of LDH from the engine to the hydrant port
 - D. Soft suction from the engine to the hydrant port
48. Engr Reid connects two leadouts of 2½-inch hose, each 100 feet in length, to the standpipe Siamese. There is a confirmed fire on the 6th floor. Capt Garza calls via the fireground channel and informs Engr Reid they have connected 200 feet of 2½-inch hose and are ready for the water. What is the correct discharge pressure for Engr Reid to send?
- A. 140 PSI
 - B. 150 PSI
 - C. 160 PSI
 - D. 170 PSI

ENGINE COMPANY 156 PERSONNEL AND ASSIGNMENTS		
• Captain Garza	• Firefighter Sanz	(Heel Man)
• Engineer Reid	• Firefighter Coy	(Hydrant)
• Firefighter Kirk	(Pipe)	

49. The Incident Commander radios to alert all companies that an interior floor is weakening and orders an immediate evacuation. Engine 156 is ordered to feed Aerial Tower 15, flowing 1000 GPM, operating at 60 feet elevation, and supplied with 50 feet of 4-inch hose. What is the correct discharge pressure for Engr Reid to send?

- A. 160 PSI
- B. 170 PSI
- C. 180 PSI
- D. 190 PSI

50. As Engr Reid begins her pumping operation, she is aware of the rate of flow. At what percentage of pumping capacity must the transfer valve be set to Volume?

- A. Over 40%
- B. Over 50%
- C. Over 60%
- D. Over 70%

The still and box is struck out, and Engine 156 is ordered to pick up and return to quarters. After all members have had the opportunity to clean up, Capt Garza convenes company school and congratulates Engr Reid on her performance during the incident. As the newest member of Engine 156, he questions Engr Reid about her previous experiences working in a high-rise district. She responds that today was her first exposure to high-rise operations. Capt Garza then decides to hold company school on high-rise incident response in order to help familiarize Engr Reid with other aspects of high-rise operations.

ENGINE COMPANY 156 PERSONNEL AND ASSIGNMENTS		
• Captain Garza	• Firefighter Sanz	(Heel Man)
• Engineer Reid	• Firefighter Coy	(Hydrant)
• Firefighter Kirk	(Pipe)	

51. Capt Garza points out that Engine 156 tends to be the 2nd arriving engine at high-rise incidents in their district. As the 2nd due engine, the company has specific responsibilities. What is the initial responsibility upon arrival on scene of the Engineer of the 2nd engine?

- A. Report to the Command/Communications Van to assist with radio communications unless otherwise directed by the Incident Commander
- B. Monitor the apparatus radio in the scan mode and relay all communications from the Incident Commander to the OEMC
- C. Connect two 2½-inch hose lines into the Siamese and charge the lines to the highest point in the system
- D. Connect to a 2nd standpipe and stand by the engine to await further orders from the Incident Commander

52. Capt Garza presents an example of a frequently encountered situation for Engine 156. The company is 2nd due to a confirmed fire in an occupied 15-story residential high-rise building. The Communications Van is on the scene directing communications. What is the next task which should be taken care of by the Engineer of the 2nd engine in this situation?

- A. Stretch a 4-inch line into the sprinkler system
- B. Report to the Command Van to assist as a scribe/runner
- C. Assist the Engineer of the 1st arriving engine in connecting to the proper Siamese standpipe connection
- D. Prepare to provide an alternative water source

ENGINE COMPANY 156 PERSONNEL AND ASSIGNMENTS		
• Captain Garza	• Firefighter Sanz	(Heel Man)
• Engineer Reid	• Firefighter Coy	(Hydrant)
• Firefighter Kirk	(Pipe)	

53. Capt Garza then presents a situation in which Engine 156 is dispatched to a fire in a 16-story high-rise. He adds that the fire floor is undetermined at the time of arrival. Under this situation, to which floor should the engineer charge the system?

- A. 8th Floor
- B. 12th Floor
- C. 15th Floor
- D. 16th Floor

54. Occasionally upon arrival, Capt Garza notes that the engineer finds that the swivels don't rotate on the building standpipe Siamese. He asks Engr Reid how she would attempt a connection to the Siamese if this situation is encountered in the event of a fire. What is the approved method to connect to a building Siamese when the swivels on the Siamese don't rotate?

- A. Wind the hose butt clockwise approximately 5 turns, then connect
- B. Secure the 2½-inch line to an alternate zone and notify command of zone used
- C. Use a 2½-inch male to Storz and connect to LDH
- D. Use a 2½-inch double male and a 2½-inch double female to connect to the Siamese

ENGINE COMPANY 156 PERSONNEL AND ASSIGNMENTS

• Captain Garza	• Firefighter Sanz	(Heel Man)
• Engineer Reid	• Firefighter Coy	(Hydrant)
• Firefighter Kirk	(Pipe)	

55. Capt Garza also points out that Engine 156 is often dispatched by the OEMC to respond to a box alarm outside of the company's still district. As a result, the engineer is often not committed to pumping operations. What should Engineers who are not committed to pumping operations (i.e., Box, 2-11) do at high-rise incidents?

- A. Report to Command Van
- B. Report to Lobby Command Chief
- C. Report to OEMC
- D. Remain with the engine

56. Capt Garza then presents another frequently encountered situation. Engine 156 is dispatched to a fire in a warehouse. Upon arrival, company members lead out 100 feet of 4-inch hose into the sprinkler system. The hydrant man hooks up to the hydrant and sends the water to the rig. Frequently, additional sprinkler heads activate every few minutes. What is the minimum discharge pressure that should be maintained in this situation?

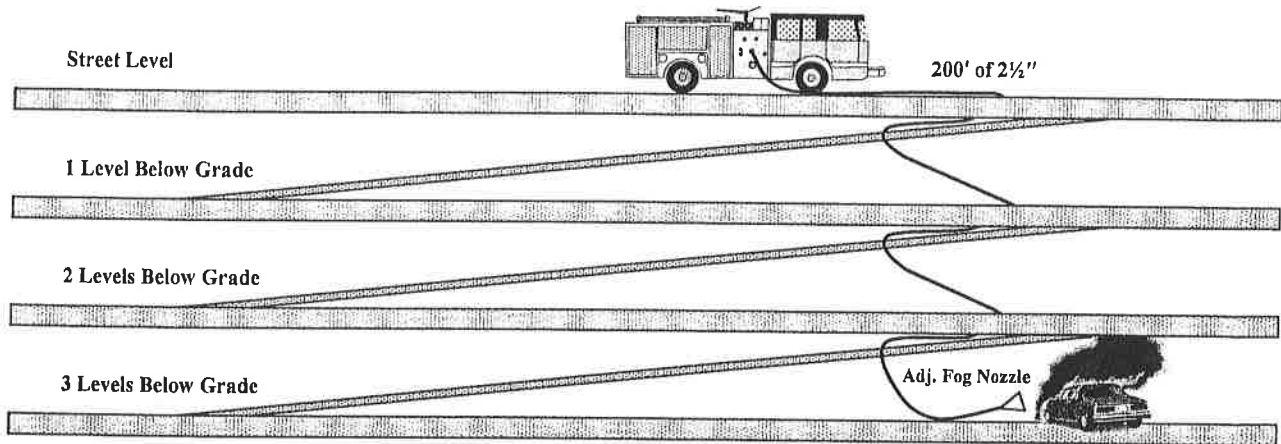
- A. 80 PSI
- B. 100 PSI
- C. 110 PSI
- D. 120 PSI

ENGINE COMPANY 156 PERSONNEL AND ASSIGNMENTS

- | | | |
|---------------------------|--------------------|------------|
| • Captain Garza | • Firefighter Sanz | (Heel Man) |
| • Engineer Reid | • Firefighter Coy | (Hydrant) |
| • Firefighter Kirk (Pipe) | | |

57. Later that afternoon, Engine 156 is dispatched by the OEMC to an auto fire in the third level below grade in a parking garage. Firefighters lead out 200 feet of 2½-inch hose with an Adj. Fog Nozzle from the Officer's side hose bed. What is the correct discharge pressure for this leadout?

- A. 60 PSI
- B. 70 PSI
- C. 80 PSI
- D. 90 PSI



58. Battalion Chief Kniles orders a joint drill on aerial pipe operations with both Engine 156 and Truck 64. FF Kirk asks Engr Reid how much 3-inch hose will be used for this operation. What is the correct response for Engr Reid to give to FF Kirk?

- A. 50 feet
- B. 100 feet
- C. 150 feet
- D. 200 feet

ENGINE COMPANY 156 PERSONNEL AND ASSIGNMENTS

• Captain Garza	• Firefighter Sanz	(Heel Man)
• Engineer Reid	• Firefighter Coy	(Hydrant)
• Firefighter Kirk	(Pipe)	

59. Truck 64 sets up its aerial pipe using a 1½-inch tip. BC Kniles instructs Engine 156 to lead out two lines to cover exposures, and a third line to supply the aerial pipe operation. If the supply line to the aerial pipe is properly charged, how many gallons per minute is Engr Reid supplying to the aerial pipe?

- A. 500 GPM
- B. 600 GPM
- C. 800 GPM
- D. 1000 GPM

60. FF Kirk asks why the 1½-inch tip is the largest tip that can be used for aerial pipe operations. What is the correct answer for Engr Reid to give to FF Kirk?

- A. Residual pressure will drop to 0 PSI
- B. Back pressure exceeds discharge pressure
- C. A larger flow would result in red-line friction loss in the 3-inch hose
- D. The pressure required to supply a greater flow rate is over 200 PSI

End of Section 2
Continue to next section

SECTION 3 Introduction

The third section of the examination describes the activities of Engine Company 148 as it goes about its operations during the course of one tour of duty. Engine Company 148 is quartered with Squad 8. These companies are members of Battalion 28 and are under the command of Battalion Chief Lyle Nesper.

The personnel working on Engine Company 148 on this tour of duty are as follows:

Engine Company 148

- Lieutenant Gerald Lu
- Engineer David Amos (Relief)
- Firefighter Paul Baccos
- Firefighter Adam Roberts
- Candidate Firefighter Clarence Clarke

All questions in Section 3 of this examination refer to the activities of Engine Company 148 on this particular tour of duty. Note that it is not necessary to memorize the names of its members as they will be listed at the top of each page. Use of a hose record is not required for this section of the examination.

ENGINE COMPANY 148 PERSONNEL AND ASSIGNMENTS			
• Lieutenant Lu		• Firefighter Roberts	(Heel Man)
• Engineer Amos	(Relief)	• Candidate Firefighter Clarke	(Hydrant)
• Firefighter Baccos	(Pipe)		

Today is July 26, a Thursday. The temperature this morning is 76° F., with a high expected around 84° F. It is a clear, very dry, sunny day, with high winds. Engineer Amos is the relief engineer on Engine 148, a 2002 Spartan Luverne Gladiator pumper, with a rated capacity of 1500 GPM.

Engineer Amos reports for duty at Engine 148. He reports to Lieutenant Lu, reviews the company journal to familiarize himself with the activities on the previous tour of duty, then speaks with the off-going engineer, Engr Casey. Engr Casey informs Engr Amos that the company currently has a spare rig. After relieving Engr Casey, Engr Amos performs the morning check of the apparatus and equipment, and finds the rig in good working order and all equipment in place.

61. Shortly after completing the morning equipment check, the Company is ordered to Fleet Management to pick up its assigned apparatus. When receiving the apparatus, Engr Amos should perform all of the following activities, except one. Which activity is he **not required** to perform when receiving an engine from the Department of Fleet Management?
- A. Conduct company school on apparatus
 - B. Make a visual inspection
 - C. Conduct a road test
 - D. Conduct an operational field test

ENGINE COMPANY 148 PERSONNEL AND ASSIGNMENTS			
• Lieutenant Lu		• Firefighter Roberts	(Heel Man)
• Engineer Amos	(Relief)	• Candidate Firefighter Clarke	(Hydrant)
• Firefighter Baccos	(Pipe)		

- | | | | |
|----------------------|----------|--------------------------------|------------|
| • Lieutenant Lu | | • Firefighter Roberts | (Heel Man) |
| • Engineer Amos | (Relief) | • Candidate Firefighter Clarke | (Hydrant) |
| • Firefighter Baccos | (Pipe) | | |
62. The driver from the Department of Fleet Management uses the grab bar at the rear of the rig to climb onto the rear step. As he steps up, his foot slips off the rear step and he falls, cutting his hand on the edge of the 2½-inch hose bed in the process. The injury is not serious, but Engr Amos finds blood on the hose bed and the rear step after the driver is treated. How should the affected areas be cleaned?
- A. Soap and hot water, then rinse and dry
 - B. Wash with germicide and clean water, then rinse and dry
 - C. Cold water rinse
 - D. Apply hand antiseptic and allow to air dry
63. Lieutenant Lu accepts the apparatus, and Engr Amos supervises the bedding of the hose. After returning to quarters, Engr Amos cleans up the basement/utility room as required by Departmental policy. How often must the basement/utility room be cleaned?
- A. Daily
 - B. Once a week
 - C. Twice a week
 - D. Monthly
64. Lt Lu asks Engr Amos to assist with a drill on fire hydrant inspection. Engr Amos explains to the company members that a test is performed by fully opening the hydrant before removing any caps and checking for leaks in the barrel, bonnet, flange, and other locations. What kind of pressure test is this?
- A. Static
 - B. Flow
 - C. Residual
 - D. Atmospheric

ENGINE COMPANY 148 PERSONNEL AND ASSIGNMENTS			
• Lieutenant Lu		• Firefighter Roberts	(Heel Man)
• Engineer Amos	(Relief)	• Candidate Firefighter Clarke	(Hydrant)
• Firefighter Baccos	(Pipe)		

65. CFF Clarke is on the hydrant and asks Engr Amos how many turns are needed to open it. How many turns of the stem are recommended by the Water Department when opening a hydrant?

- A. 8 full turns
- B. 10 full turns
- C. 12 full turns
- D. 13½ turns

66. After the drill, CFF Clarke is interested in learning about engine operations, and asks Engr Amos about the electronic pressure governor. He asks what happens when the **Preset** button is depressed. Engr Amos explains that when set in the **Pressure** mode, the pump will automatically maintain engine pressure at a preset level. When the electronic pressure governor is in **Pressure** mode, what pressure will display on the main pump pressure gauge after the **Preset** button is pressed?

- A. 80 PSI
- B. 100 PSI
- C. 125 PSI
- D. 150 PSI

ENGINE COMPANY 148 PERSONNEL AND ASSIGNMENTS			
• Lieutenant Lu		• Firefighter Roberts	(Heel Man)
• Engineer Amos	(Relief)	• Candidate Firefighter Clarke	(Hydrant)
• Firefighter Baccos	(Pipe)		

67. CFF Clarke notes that the electronic pressure governor has two modes, and asks what happens if the **Preset** button is depressed when operating in the **RPM** mode. Engr Amos responds by stating that when set in the **RPM** mode, the governor will automatically maintain engine speed at a preset level. When the electronic pressure governor is in the **RPM** mode, what RPM will be shown on the digital display after the **Preset** button is pressed?

- A. 700 RPM
- B. 800 RPM
- C. 900 RPM
- D. 1000 RPM

68. The OEMC dispatches Engine 148 for a still alarm. En route, Engr Amos encounters a congested intersection where drivers are defiant and irresponsible. According to the CFD Defensive Driving manual, how should Engr Amos travel through the intersection during the emergency response?

- A. Sound the air horn rapidly while occupying any lane available
- B. Surrender the right-of-way privilege when necessary
- C. Record vehicle license numbers and forward to Chicago Police Department
- D. Sound multiple, short blasts on the air horn and continue to move forward slowly, nudging other vehicles as necessary

ENGINE COMPANY 148 PERSONNEL AND ASSIGNMENTS

• Lieutenant Lu		• Firefighter Roberts	(Heel Man)
• Engineer Amos	(Relief)	• Candidate Firefighter Clarke	(Hydrant)
• Firefighter Baccos	(Pipe)		

69. Upon arrival, Lt Lu observes fire in a large scrap yard along the river. Engr Amos positions the apparatus according to Lt Lu's order, and engages the pump before exiting the cab. In which of the following situations is this procedure acceptable?
- A. When in-line operations are required
 - B. When drafting operations are established
 - C. When a hard suction hose hookup is to be utilized
 - D. When a quick water attack will be utilized
70. When operating from the booster tank, which of the following tips can be properly supplied when used on the deck gun?
- A. $1\frac{3}{8}$ -inch
 - B. $1\frac{1}{2}$ -inch
 - C. $1\frac{3}{4}$ -inch
 - D. 2-inch
71. Engr Amos is anticipating making the transition from tank supply to hydrant supply for the pumping operation. What mode should he select on the electronic pressure governor?
- A. Parallel/Volume Mode
 - B. Parallel/Series Mode
 - C. Pressure mode
 - D. RPM Mode

ENGINE COMPANY 148 PERSONNEL AND ASSIGNMENTS			
• Lieutenant Lu		• Firefighter Roberts	(Heel Man)
• Engineer Amos	(Relief)	• Candidate Firefighter Clarke	(Hydrant)
• Firefighter Baccos	(Pipe)		

72. Lt Lu has ordered a quick water attack on the fire and Engr Amos monitors the pump panel for problems. Prior to securing a positive source of water, he notices a sign of cavitation. Which one of the following is an indication of cavitation when operating from the booster tank?
- A. Positive pressure reading on the compound gauge
 - B. Vacuum pressure reading on the compound gauge
 - C. Increase in engine speed without an increase in discharge pressure
 - D. Increase in engine speed with an increase in discharge pressure
73. The quick water attack is quickly depleting the booster tank, and a positive supply of water has not yet been obtained. Per orders from Lt Lu, CFF Clarke is connecting a supply line. Using 150 feet of 4-inch hose to a hydrant, with static pressure of 30 PSI on a 12-inch water main, what is the maximum GPM that can be expected to be available for fire attack?
- A. 400 GPM
 - B. 550 GPM
 - C. 850 GPM
 - D. 1000 GPM
74. The fire is beginning to spread, and Lt Lu orders that the $1\frac{3}{8}$ -inch tip currently on the deck gun be removed and replaced with the $1\frac{3}{4}$ -inch tip since the pump now has a positive source of water. What is the change in flow rate on a smooth bore master stream with every $\frac{1}{8}$ -inch increase in nozzle diameter?
- A. 50 GPM
 - B. 100 GPM
 - C. 150 GPM
 - D. 200 GPM

ENGINE COMPANY 148 PERSONNEL AND ASSIGNMENTS			
• Lieutenant Lu		• Firefighter Roberts	(Heel Man)
• Engineer Amos	(Relief)	• Candidate Firefighter Clarke	(Hydrant)
• Firefighter Baccos	(Pipe)		

75. The high winds and dry conditions are now causing the fire to spread rapidly through the scrap yard. Engine 148 is currently discharging 800 GPM. Generally, what is a good rule of thumb regarding the setting of the transfer valve?

- A. Pump in pressure/series when discharge pressure is under 150 PSI
- B. Pump in volume/parallel when required discharge is over 50% of pumper capacity
- C. Pump in pressure/series when the electronic pressure governor encounters water in the pump chamber
- D. Pump in pressure/series when transfer valve detects a dry pump

76. Lt Lu has observed that the smoke from the fire has taken on an unusual color. A worker at the scrap yard has identified the name of the product that appears to be burning. Lt Lu calls Engr Amos on the fireground and relays the name of the product to him. Where in the Emergency Response Guide (ERG) should Engr Amos look for the product name?

- A. Blue pages
- B. Green pages
- C. Orange pages
- D. Yellow pages

ENGINE COMPANY 148 PERSONNEL AND ASSIGNMENTS

- | | | | |
|----------------------|----------|--------------------------------|------------|
| • Lieutenant Lu | | • Firefighter Roberts | (Heel Man) |
| • Engineer Amos | (Relief) | • Candidate Firefighter Clarke | (Hydrant) |
| • Firefighter Baccos | (Pipe) | | |

77. Engr Amos looks up the product in the ERG, and notices that the name is highlighted. He immediately informs Lt Lu of the Haz Mat danger, who then requests a box alarm and a Level I Haz Mat. Engr Amos is aware of the need to find the recommended isolation distance for the product. Where in the ERG should Engr Amos look for the product isolation distance?

- A. Blue pages
- B. Green pages
- C. Orange pages
- D. Yellow pages

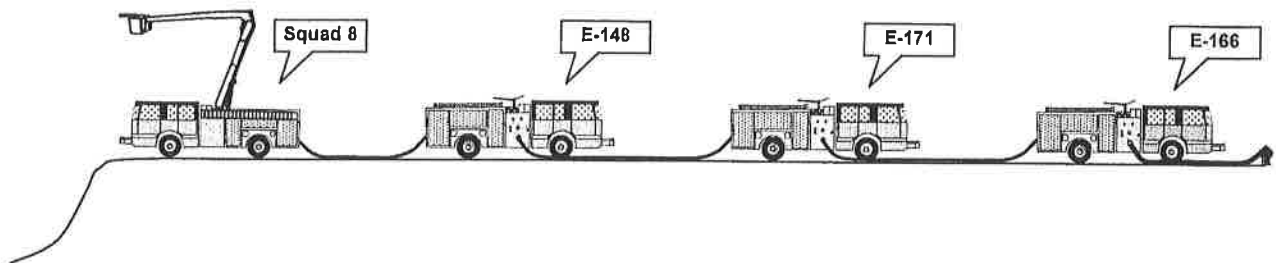
Engr Amos locates the appropriate isolation distance and immediately relays the information to Lt Lu. The company pulls back. Engr Amos moves the rig up wind and up hill from the fire. Squad 8 quickly responds and positions the snorkel. Engine 148 sets up to supply the snorkel. Battalion Chief Nesper is now on the scene and requests a 2-11 and a Level II Haz Mat.

ENGINE COMPANY 148 PERSONNEL AND ASSIGNMENTS

- | | | | |
|----------------------|----------|--------------------------------|------------|
| • Lieutenant Lu | | • Firefighter Roberts | (Heel Man) |
| • Engineer Amos | (Relief) | • Candidate Firefighter Clarke | (Hydrant) |
| • Firefighter Baccos | (Pipe) | | |

78. BC Nesper calls for an in-line operation and designates Engine 148 as the attack pumper. Engr Amos replaces the 1 $\frac{3}{4}$ -inch tip on the deck gun with the 1 $\frac{3}{8}$ -inch tip. Engine 166 is designated as the supply engine for the in-line operation, and is connecting to the hydrant. BC Nesper orders Engine 171, the relay engine, to lead out 200 feet of 4-inch hose to Engine 148. Before sending water to the receiving engines, what does the Engineer of Engine 166 need to know from Engr Amos?

- A. Length of leadout
- B. Residual pressure on Attack engine
- C. Residual pressure on Supply engine
- D. Gallons per Minute needed



79. Engr Amos intends to deliver 1500 GPM onto the fire. The Safety Officer reminds Engr Amos that only one engine has the option of selecting either the RPM or Pressure mode on the electronic pressure governor. Which of the engines in an in-line operation has the option to select either mode on the electronic pressure governor?

- A. Supply engine
- B. Attack engine
- C. Relay engine
- D. Engine with blow-off line

ENGINE COMPANY 148 PERSONNEL AND ASSIGNMENTS			
• Lieutenant Lu		• Firefighter Roberts	(Heel Man)
• Engineer Amos	(Relief)	• Candidate Firefighter Clarke	(Hydrant)
• Firefighter Baccos	(Pipe)		

80. Which engines are required to secure blow-off lines in an in-line operation?

- A. All Attack engines
- B. All Receiving engines
- C. All Supply engines
- D. All engines involved in the in-line operation

81. Engine 166 is now operating as a source of supply pumper to Engine 171 and Engine 148 in an in-line operation. Engr Amos informs Engine 166 that he needs 1500 GPM to supply the snorkel and operate the deck gun. As pumps are engaged, discharge gates are opening, and operating pressure reached for the needed water, what should the minimum reading be on the compound gauges of the receiving engines (i.e., Engine 171 and Engine 148)?

- A. 10 PSI
- B. 20 PSI
- C. 70 PSI
- D. 100 PSI

82. Engr Amos knows from training with Squad 8 that he must send 175 PSI to the base of the snorkel when using a 2-inch tip, and add nothing for elevation. What is the required discharge pressure necessary to supply the snorkel through 50 feet of 4-inch hose?

- A. 175 PSI
- B. 180 PSI
- C. 190 PSI
- D. 200 PSI

ENGINE COMPANY 148 PERSONNEL AND ASSIGNMENTS			
• Lieutenant Lu		• Firefighter Roberts	(Heel Man)
• Engineer Amos	(Relief)	• Candidate Firefighter Clarke	(Hydrant)
• Firefighter Baccos	(Pipe)		

83. Engr Amos hears over the radio that the fire boat is approaching. He watches as the fire boat sets up for pumping operations. The fire boat soon begins to discharge a large volume of water through its turrets onto the fire. For the first minute of pumping, the water being discharged from the turret is rust colored. How often should water be passed through all turrets and nozzles on the fire boat?

- A. Each day
- B. Each week
- C. Twice a month
- D. Each month

84. With the aid of all the fire companies involved, the fire in the scrap yard is quickly brought under control. Engine 148 picks up and returns to quarters. The company members clean up after battling the scrap yard blaze and then eat their dinner. FF Roberts has 1st watch, and goes to bed immediately after his meal. When he awakes to take his watch, he encounters Engr Amos and informs him that the temperature in the locker room is very cold. He asks what the lowest permissible temperature setting is for the air conditioning. What is the correct response for Engr Amos to give to FF Roberts?

- A. 69° F
- B. 72° F
- C. 68° F
- D. 78° F

End of Section 3
Continue on to next section

SECTION 4

Introduction

The fourth section of the examination consists of set of questions that are not presented in the form of a scenario. Some of the questions in this section of the examination refer to the Hose Record for Engine 188. Engine 188's Hose Record is located on page 48, the last page of the test booklet. It is designed to be folded out so that it is readily available while answering questions which reference it. You will only need the Hose Record to answer questions 97 through 100.

85. What is a CFD pumper's rated capacity when the transfer valve is set to Pressure?

- A. $\frac{1}{8}$ of rated capacity
- B. $\frac{1}{3}$ of rated capacity
- C. $\frac{1}{2}$ of rated capacity
- D. $\frac{3}{4}$ of rated capacity

86. Engr Jordan is pumping 250 GPM through 2½-inch hose. It is a smooth bore nozzle, at 50 PSI nozzle pressure. What is the diameter of this pipe?

- A. 1-inch
- B. 1½-inch
- C. 1¼-inch
- D. 1⅜-inch

87. Engine 128 is dispatched to a 4-11 alarm. The Command Van orders the company to sector 3 for a multiversal leadout. The Firefighters stretch 400 feet of 4-inch hose into the multiversal. The Engineer has secured a hydrant with two lengths of hard suction hose. What is the proper discharge pressure using the 2-inch tip on the multiversal?

- A. 170 PSI
- B. 180 PSI
- C. 190 PSI
- D. 200 PSI

88. A drill is being conducted using two engines to perform an aerial operation with Tower Ladder 110. Tower Ladder 110 is using a 1¾-inch tip, at 60 feet elevation. Engine 179 is using 100 feet of 2½-inch hose, and Engine 153 is also supplying 100 feet of 2½-inch hose. Both Engineers are feeding Tower Ladder 110. What is the correct discharge pressure for each Engineer to send?
- A. 175 PSI
 - B. 180 PSI
 - C. 190 PSI
 - D. 200 PSI
89. Engineer Roach is conducting his morning equipment check and finds the 150/50 Adj. Fog Nozzle attached to 100 feet of 1¾-inch hose connected to the wye on the 1¼-inch SOP. If only the 2½-inch horseshoes are led out with the 1¾-inch hose, what is the correct discharge pressure?
- A. 80 PSI
 - B. 100 PSI
 - C. 110 PSI
 - D. 120 PSI
90. Engine Company 214 is responding to a still alarm and has an accident at an intersection involving two other vehicles. The officer of the engine company is injured, and the response is terminated. What class accident should be reported to the OEMC?
- A. Class 1A
 - B. Class 2A
 - C. Class 2B
 - D. Class 3B

91. Engineer Roach is detailed to Engine 133 for the day. Tower Ladder 164 is housed with Engine 133. Engineer Roach questions Firefighter Nick of Tower Ladder 164 as to what size tip is used most often on the tower ladder. Firefighter Nick's response is that it is the 1¾-inch tip. As they are talking, both rigs are dispatched to a still in a factory. Upon arrival, the Battalion Chief orders Tower Ladder 164 to work in sector 4, with Engine 133 supplying it. What is the minimum discharge pressure Engineer Roach can send before calculating his final discharge pressure?

- A. 80 PSI
- B. 120 PSI
- C. 135 PSI
- D. 150 PSI

92. You are the 3rd engine on a still and box at a large factory. The Chief orders your rig to feed Truck 318 for aerial pipe operations. Your Firefighters stretch 100 feet of 4-inch hose to the base of the truck. The Truck Officer informs you they are operating with a 1½-inch tip 50 feet in the air. What is the correct discharge pressure to send?

- A. 130 PSI
- B. 150 PSI
- C. 160 PSI
- D. 170 PSI

93. Engine 164 is pumping at a 2-11 alarm. Engr Larsen is ordered to charge an 1½-inch aerial pipe leadout, supply water to an 1¾-inch tip on a multiversal leadout, and a 2½-inch Fog Nozzle directed on an exposure. When all leadouts are properly charged, how many gallons per minute will Engine 164 be flowing?
- A. 1200 GPM
 - B. 1300 GPM
 - C. 1350 GPM
 - D. 1450 GPM
94. Engine 155 leads out 150 feet of 2½-inch hose with the 1¼-inch SOP attached to the wye connected to 100 feet of 1¾-inch hose with the SM-30F automatic nozzle. What is the correct discharge pressure for this leadout?
- A. 110 PSI
 - B. 120 PSI
 - C. 130 PSI
 - D. 140 PSI
95. Engine 155 has been working in sector 1 with a 1½-inch tip on a multiversal. The Incident Commander orders a change to a 2-inch tip on the multiversal to increase the flow to 1000 GPM. Engine 155 already has 200 feet of 4-inch hose into the Siamese of the multiversal. To assist in the operation, the Incident Commander orders Engine 173 to also lead out 200 feet of 4-inch hose into the same multiversal. What is the proper discharge pressure for Engine 173 to send once the connection is made?
- A. 120 PSI
 - B. 110 PSI
 - C. 170 PSI
 - D. 150 PSI

96. Engine 191 leads out 200 feet of 2½-inch hose with the 1¼-inch SOP attached to the wye connected to 100 feet of 1¾-inch hose with the 150/75 Adj. Fog Nozzle. What is the correct discharge pressure for this leadout?

- A. 80 PSI
- B. 100 PSI
- C. 110 PSI
- D. 120 PSI

The next 4 questions reference the hose record for Engine 188 found on page 48. The hose record folds out so that it can be viewed while responding to these questions. Fold out the hose record now before proceeding to answer the following questions.

97. If Engine 188 leads out its entire bed of 2½-inch hose on the Officer's side, what will the total hose footage be?

- A. 600 feet
- B. 623 feet
- C. 663 feet
- D. 700 feet

98. Engine 188 has been ordered to lead out the Engineer's side 2½-inch hose bed for a fire. Engr Martel is calculating the friction loss and looks to see what hose butt is left on the rig. He notices that hose position #9 is still in the bed. How many lengths of 2½-inch hose did Engine 188 lead out?

- A. 6
- B. 7
- C. 8
- D. 10

99. Engine 188 has led out 100 feet of 2½-inch hose from the Officer's side as an exposure line in sector 4. A second line off the Engineer's side is led out with 200 feet of 2½-inch hose and a 1¼-inch SOP. A third line off the Engineer's side is led out using 150 feet of 2½-inch hose. What is the next length number of 2½-inch hose on the Engineer's side available for use?

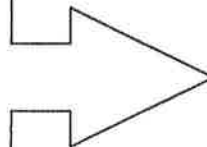
- A. #216
- B. #259
- C. #292
- D. #301

100. Engine 188 is in the wash down phase at a still in a bungalow. Length #289 from the Engineer's side is connected to discharge port #1. The Officer informs you they are attaching an additional 100 feet of 1¾-inch hose to the other side of the wye. Both 100 foot leads off the wye are using 150/75 pipes. What is the proper discharge pressure to send for this leadout?

- A. 120 PSI
- B. 130 PSI
- C. 140 PSI
- D. 150 PSI

End of Examination

**The hose record for Engine 188 is presented on the foldout sheet.
Fold the sheet out now so that it is available for use while
answering questions 97 through 100 in Section 4. Do NOT use this
hose record to answer questions in Section 1 of the test booklet.**



ENGINE 188 HOSE RECORD

Engineer's Side 2½-Inch Hose Bed			
Hose Bed Position	Hose Length Number	Feet in Hose Length	Total Hose Footage
16			
15	300	40	725
14	275	50	685
13	277	50	635
12	210	50	585
11	302	50	535
10	312	35	485
9	215	50	450
8	259	50	400
7	301	50	350
6	226	50	300
5	205	50	250
4	289	50	200
3	245	50	150
2	251	50	100
1	298	50	50

Officer's Side 2½-Inch Hose Bed			
Hose Bed Position	Hose Length Number	Feet in Hose Length	Total Hose Footage
16			
15	252	37	700
14	209	40	663
13	213	33	623
12	296	50	590
11	241	50	540
10	278	50	490
9	291	50	440
8	292	40	390
7	216	50	350
6	324	50	300
5	305	50	250
4	350	50	200
3	314	50	150
2	283	50	100
1	294	50	50

4-Inch Hose Bed			
Hose Bed Position	Hose Length Number	Feet in Hose Length	Total Hose Footage
16			
15			
14	119	50	700
13	136	50	650
12	125	50	600
11	114	50	550
10	126	50	500
9	133	50	450
8	129	50	400
7	116	50	350
6	140	50	300
5	123	50	250
4	109	50	200
3	130	50	150
2	124	50	100
1	121	50	50

Crosslay #1			
Hose Bed Position	Hose Length Number	Feet in Hose Length	Total Hose Footage
4	108	50	200
3	123	50	150
2	113	50	100
1	106	50	50

Crosslay #2			
Hose Bed Position	Hose Length Number	Feet in Hose Length	Total Hose Footage
4	100	50	200
3	101	50	150
2	107	50	100
1	116	50	50

Front Bumper	
Hose Length Number	Feet in Hose Length
108	50
112	50
97	50

**2006 Fire Engineer Examination
Written Test Answer Key**

Following Review of Item Challenges

Item	Key
1	C
2	D
3	B
4	C
5	C
6	D
7	B
8	C
9	A
10	A
11	C
12	A
13	A & B
14	D
15	B
16	D
17	C
18	D
19	C
20	D
21	D
22	A
23	D
24	A
25	D
26	C
27	C
28	A
29	C
30	B
31	D
32	A
33	D
34	C

Item	Key
35	C
36	D
37	C
38	B
39	A
40	C
41	A
42	C
43	Dropped
44	B
45	D
46	Dropped
47	D
48	A
49	C
50	D
51	B
52	D
53	D
54	D
55	B
56	B
57	A
58	B
59	B
60	C
61	A
62	B
63	A
64	A
65	B & C
66	B
67	D
68	B

Item	Key
69	D
70	A
71	C
72	C
73	C
74	B
75	B
76	A
77	B & C
78	D
79	A
80	B
81	B
82	C
83	B
84	D
85	C
86	B
87	C
88	C & D
89	A
90	B
91	B
92	D
93	C
94	D
95	A
96	B
97	D
98	C
99	B
100	C

APPENDIX E
OPERATION AND MAINTENANCE MANUAL FOR THE ENGINE
USED IN THE PROFICIENCY TEST



CRIMSON FIRE
A Spartan Company

2009
SPARTAN/CRIMSON
GLADIATOR CLASSIC
Custom Pumper



OPERATION
and
MAINTENANCE
MANUAL

ACKNOWLEDGMENT

This manual is provided to you, the Engine Company members, by the Chicago Fire Department and covers Operational and Maintenance Procedures which need to be thoroughly understood and practiced, thereby ensuring both SAFE and EFFICIENT operation of your apparatus.

Applicable expertise from the manufacturers, Spartan Motors, Inc., Crimson Fire Apparatus Company, LTD., and Hale Fire Pump Division of IDEX Corporation, has been provided herein.

Basic, essential daily preventive maintenance items such as fluid checks of cooling system, crankcase, fuel, power steering, the checking of tire condition, emergency lights and warning devices, while not specifically addressed, are nevertheless normal maintenance procedures.

DEFECTS ARE TO BE REPORTED, WORK ORDERS ARE TO BE OBTAINED FROM THE DEPARTMENT OF FLEET MANAGEMENT.

Where any conflicts or differences may occur from previous apparatus operational guides or procedures, this manual shall prevail on this particular apparatus.

TAKE CARE OF IT, DON'T ABUSE IT, AND IT WILL TAKE CARE OF YOU.

Chicago Fire Department
Division of Training

INTRODUCTION

The 2009 Spartan/Crimson Custom Pumper has been manufactured following nearly two years of effort by representatives of the Chicago Fire Department and the Department of Fleet Management. The goal was to develop a design which best serves the needs of the Fire Department and more importantly, those individuals who operate the apparatus.

Numerous issues were addressed in creating the final design of these pumpers which included overall size, maneuverability, safety and comfort of personnel, compartmentalization, pumping efficiency, hose bed configuration, as well as improved visual and audible warning devices. The Department of Fleet Management specified chassis components, which ensure a more durable and reliable apparatus to cope with the severe duty which our apparatus is subjected to on a daily basis.

Considerable input was provided by field personnel, which included officers, engineers, firefighters, and firefighter/paramedics. While it is virtually impossible to design the perfect apparatus, every attempt was made to include those features desired by the majority of individuals involved in the process.

The new 2009 Spartan/Crimson Custom Pumper incorporates the best features of previous apparatus plus new innovations, which are available from the fire apparatus industry to provide the safest and most efficient pumper design possible. It is the hope of all involved that this apparatus will meet or exceed the needs of all personnel who operate it.

This manual is provided to assist those individuals assigned to drive and operate the 2009 Spartan/Crimson Custom Pumper. It is each Engineer's responsibility to read and understand the information and instructions contained within this manual prior to operating the equipment.

CHASSIS

Manufacturer: Spartan Motors, Incorporated

Model: Gladiator Classic

Cab Construction: Aluminum

Components:

- Detroit Series 60 - 12.7 Liter, 350 HP Turbo charged electronic diesel engine.
- Allison, Model HD4060 electronic 5-speed automatic transmission with 4th gear lock-up.
- Switchable transmission retarder.
- Rockwell anti-lock brake system.
- 4-wheel disc brakes
- Self-leveling rear axle air suspension system.
- 6 maintenance-free gel-cell batteries with jumper studs.
- GOODYEAR, Radial-Unisteel TD tires;
- 315 x 80R 22.5 - FRONT
- 11R x 22.5 - REAR
- 63 Gallon fuel tank.
- Racor fuel-water separator.
- Robert Shaw automatic chassis lubrication system.
- Wabco 1200 heated air dryer with moisture ejector.
- Hale FoamLogix 3.3 System
- LifeGuard SRS Side Roll Protection System
- DPF (Diesel Particulate Filter) Aftertreatment System
- Redundant Lighting Circuit Switch
- Emergency Pump Shift

Cab Features:

- Hydraulic/electric cab raise, with manual backup pump
- Scene lights on both sides of cab
- Heated side-view mirrors
- Auto-eject 110 volt shore-line connector with battery condition meter
- Code 3 light bar
- FEDERAL *METEOR* white oscillating light below windshield
- Chicago-style reinforced front bumper with two (2) air horns and FEDERAL Electronic Q2 siren with 200-watt speaker.
- Load Manager lighting system
- Built in electric air compressor and battery conditioner

CAPACITIES

GROSS VEHICLE WEIGHT RATING	44,000 lbs. Front axle capacity - 20000 lbs. Rear axle capacity - 24000 lbs.
FUEL CAPACITY:	63 Gallons
CRANKCASE CAPACITY:	38 U.S. Quarts Crankcase oil type - 15W40, API Classification CF4/SG
COOLANT CAPACITY:	55.5 U.S. Quarts - 50/50 mixture of Ethylene Glycol and water, which meets GM specifications
POWER STEERING:	7 U.S. Quarts - DEXRON III
TRANSMISSION:	39 U.S. Quarts - TRANSYND
FIRE PUMP:	Hale 1500 G.P.M. Two-stage Pump Model - Q-TWO 150-23S Pump lubricant: SAE - 90 Gear oil - 3 Quarts
BOOSTER TANK:	500 Gallons
FOAM TANK:	30 Gallons
TIRE PRESSURES:	FRONT - 130 P.S.I. REAR - 120 P.S.I.

APPARATUS DIMENSIONS

TRAVEL HEIGHT:	10 Feet - 0 Inches
BODY WIDTH:	8 Feet - 3 Inches (including rub rails) 9 Feet - 7 Inches (mirror to mirror)
LENGTH:	30 Feet - 6 Inches
TOTAL LENGTH:	31 Feet - 4 Inches (front tow hooks to end of ladder)
WHEELBASE:	168 Inches
REAR OVERHANG:	7 Feet - 11 Inches

PUMPER BODY

Manufacturer:	Crimson Fire Apparatus Co., LTD.
Construction:	Stainless Steel with Aluminum roll-up compartment doors
Booster Tank:	Booster tank is constructed of Polypropylene and is "L" shaped to provide for a lower hose bed height
Features:	

- Reinforced hose bed cover with elastic band fastener
- 2 - hose bed dividers, both of which are adjustable
- Lift-off tray for 1¾" hose above 4" hose bed
- Rear compartment for folding attic ladder
- Hinged pump gauge access panel
- Automatic pump cooler
- AKRON - Model 3426 fixed-mount deck gun w/stream shaper and 1-3/8", 1½", 1¾", & 2" stacked tips
- Automatic drain valves on deck gun and cross-lay beds which automatically open when pressure to these discharges drop to 5 PSI or less
- Two upper deck storage areas for foam containers, brooms, shovels, traffic cones, and other miscellaneous items
- AIR BLOWOUT system to assist in expelling water from discharge piping when draining pump in cold weather
- Two spotlights, one at each rear corner of the apparatus. One is equipped with a spot lamp and the other has a flood lamp for scene lighting at rear of apparatus
- Automatic compartment lights in all doors and compartments

FIRE PUMP

Manufacturer: Hale Products Division of Idex Corporation

Model: QTWO 150-23S

Type: Two-stage centrifugal

Rated Capacity: 1500 Gallons per minute

1500 G.P.M. @ 150 PSI - - 1450 Engine RPM (nominal)

1500 G.P.M. @ 165 PSI - - 1500 Engine RPM (nominal)

1050 G.P.M. @ 200 PSI - - 1600 Engine RPM (nominal)

750 G.P.M. @ 250 PSI - - - 1400 Engine RPM (nominal)

Pump Shift: Hale Model VPS, air powered, cab controlled

Transfer Valve: Manual type, gear driven, pump panel-mounted control

Pump Cooler: Automatic thermostatically controlled pump cooler

Engine Cooler: Full-time (non-switchable) Engine Cooler

Discharges: Four 2½" (2) Engineer's side, (1) Officers side, (1) right rear
Two 4" (1) officers side, (1) left rear
One 3" top mounted deck gun
Two 1½" cross-lays above pump compartment

Foam Discharges: Two Cross-lay#1
Officers side right rear – Discharge # 4

Suction Inlets: Two - 6", one on each side of apparatus equipped with manually operated valve
One - 5", with swivel elbow on front bumper and operated with air switch on pump panel
One - 4", located on lower right side of rear of apparatus and operated with air switch on pump panel
One - 3", Tank to pump inlet line

PREVENTIVE MAINTENANCE OF PUMP

Pump Gear Box:

Use SAE 90 Weight Gear Oil. Check oil level on the front of the pump gear case at the plug marked "OIL LEVEL". Oil level should be up to the bottom of the of the plug opening. Level should be checked monthly. While checking gear box oil level, look for evidence of water contamination as indicated by a milky appearance of oil. If contamination is noted, obtain a work order from the Department of Fleet Management.

Auto Lube Bearing:

Check oil level annually. Oil should be up to the top of the reservoir. Use SAE-EP 90 Wt. Gear oil. Oil fill is located on top of Auto lube Bearing on the top front of the pump housing (small hex-key plug).

Pump Primer:

Oil-less priming pump, environmentally friendly priming system, which requires NO reservoir. Consequently, there is no siphon-break hole to check.

Transfer Valve:

Clean gears and re-lubricate with dry lubricant every six-month. Operate daily.

Valve Linkages:

Clean push-pull rods and re-lubricate with dry lubricant every six months. Lubricate valve rod pivot points with a light oil every six months.

Pump Shift:

Lubricate the shift cylinder (located behind the pump panel, under the pump) at least once a year by squirting a few drops of light cylinder oil into the shift cylinder.

Tank to Pump:

Should be kept in the closed position until needed.

GENERAL PREVENTIVE MAINTENANCE

General daily preventive maintenance checks begin with essential fluid levels for safe and reliable operation of the apparatus. Engine oil dipstick, engine oil fill and windshield solvent can be checked and added in the drop down portion of the front grille. A secondary motor oil dipstick is located on the right side of the motor and is only accessible with the cab raised.

ENGINE OIL:

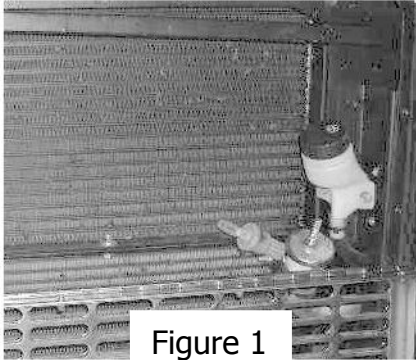


Figure 1

Use multi-grade **SAE - 15W-40** motor oil with the proper API classification performance code for diesel engines. The dipstick is located as shown in **Figure 1**. Crankcase capacity is 38 U.S. Quarts. The crankcase oil level should normally be checked after the engine has been OFF for at least 10 minutes to allow proper drainage back to the crankcase.

TRANSMISSION:

Use **TRANSYND** transmission fluid. You must tilt the cab to access the dipstick. Capacity is 39 U.S. Quarts. Because the transmission oil cools, lubricates, and transmits hydraulic power, it is important that the proper oil level be maintained at all times. If the oil level is too low, the converter and clutches will not receive an adequate supply of oil - if the oil level is too high, the oil will aerate, the transmission will overheat, and oil may be expelled through the breather or dipstick tube. **(A transmission diagnostic guide is included at the back of this manual, which outlines procedures for utilizing the shifter keypad to check the transmission status through a series of diagnostic codes.)**

WARNING! WHEN CHECKING THE TRANSMISSION OIL LEVEL, BE SURE THE BRAKES ARE SET AND PROPERLY ENGAGED, AND THE WHEELS CHOCKED.

TRANSMISSION FLUID LEVEL CHECK:

Normal transmission fluid level check can be performed using the diagnostic checks as outlined in the information sheet provided at the back of this manual. However, if the dipstick is used, the following procedure is to be followed:

COLD CHECK:

- The only purpose of the COLD CHECK is to determine if the transmission has enough oil to be safely operated until a HOT CHECK can be made.
- Park the vehicle on a level surface and apply the brake as specified above.
- Run the engine for at least ONE minute. Shift to DRIVE (D) and then to REVERSE (R), then shift to NEUTRAL (N) and allow the engine to idle.
- After wiping the dipstick clean, check the oil level. If the oil level is within the COLD RUN band, the level is satisfactory until the oil is hot enough to perform a HOT RUN check. If the level is not within the COLD RUN band, add or drain as necessary to bring the level to within the COLD RUN band.

HOT CHECK:

- Operate the transmission in DRIVE range until normal TRANSMISSION operating temperature is reached. (140-220°F)
- Park on a level surface, shift to NEUTRAL (N), apply the parking brake, chock wheels and allow the engine to idle.
- After wiping the dipstick clean, check the oil level. Safe operating level is anywhere within the HOT RUN band on the dipstick.
- If the level is not within this band, add or drain as necessary to bring the level to within the HOT RUN band.

POWER STEERING:

Use Dexron III. Power steering fluid can be checked only when cab is raised. Remove the cap from the power steering reservoir and check the dipstick. If necessary, fill until the proper level is obtained.

FRONT AXLE HUBS:

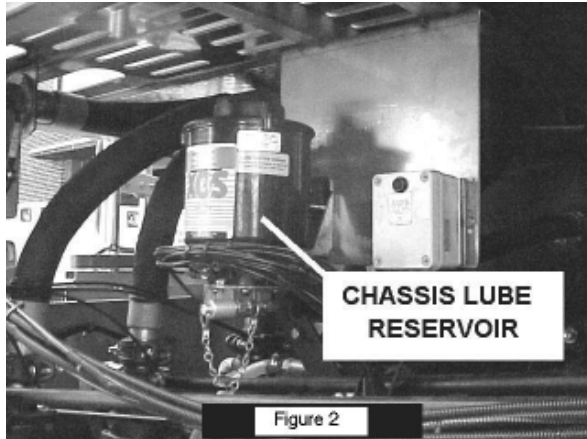
Check for presence and level of 90 Weight gear oil lubricant in each front wheel hub. If lubricant is not visible or is low, obtain a work order. There is a strap across the fill plug, which prevents filling by field personnel.

COOLANT:

The cooling system uses a 50/50 mixture of ethylene glycol antifreeze and water. The system holds about 52 U.S. Quarts. Check coolant bottle as shown in **Figure 1** for proper level. The radiator has a sight glass, which is visible only with the cab fully tilted and the radiator cap is accessible only with the cab tilted. Wait until the engine has cooled if it becomes necessary to remove the radiator cap to add coolant.

CHASSIS LUBE SYSTEM:

The automatic chassis lubrication system pump and reservoir are located in the upper front of the pump compartment, immediately below the cross-lay hose beds. While it is not the responsibility of the engineer to refill the reservoir, the lubricant level should be checked at least **ONCE EACH WEEK** and a work order obtained when it is less than one-quarter full.



The **chassis lube reservoir** shown in **Figure 2** can be checked by lowering the hinged gauge panel on the left side of the apparatus, by removing the upper portion of the pump panel on the right side of the apparatus, or when the cab is tilted. The reservoir is transparent to provide for simplified checking of the fluid level

AIR SYSTEM:

An air hose connection is located below the driver's door, above the step. This air hose connection is provided as an **AIR INLET Figure 10** only, to be used in the event the apparatus must be towed and there is inadequate air pressure to release the parking brake.

An **AIR OUTLET** is located on the pump operator's panel to the left of the large side pump intake. This outlet is equipped with an air hose quick connect fitting and a shut-off valve.

Check for operation of ejector valve on air dryer when compressor tops **off air tanks at approximately 120 PSI**. Check air tanks periodically for evidence of moisture. Drain air weekly, with shore-line connected to apparatus to test operation of auxiliary air compressor. If the auxiliary air compressor operates frequently when the apparatus is in quarters, a leak should be suspected and a work order may be required to locate and repair the leak.

CAB CONTROLS

UPPER DASHBOARD:



Figure 3

Figure 3 shows the upper portion of the dashboard with the main gauges used to monitor vehicle performance. Below is a list of these gauges.

1. Fuel Level Gauge
2. Filter Minder (Air Filter Restriction)
3. Tachometer with Digital Engine Hour Meter
4. **Speedometer with Digital Odometer/Trip Meter**
5. 4 in 1 Gauge
 - Coolant Temperature
 - Battery Voltage
 - Oil Pressure
 - Transmission Fluid Temperature
6. Primary and Secondary Air Pressure System Gauges



Figure 4

Figure 4 shows the systems warning light cluster located in the lower portion of the upper dashboard. The various lamps will illuminate briefly when the ignition switch is first turned on.

LOWER DASHBOARD:



Figure 5

1. Master Battery Switch
2. Ignition Switch
3. Engine Start Button
4. "Road to Pump" Switch with Green "Pump Engaged" Lamps

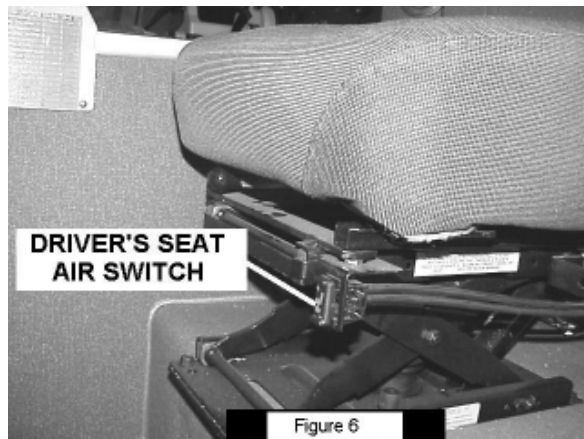


Figure 6

Figure 5 shows the lower portion of the dashboard assembly. Below is a list of the controls located on the lower portion of the dashboard.

The driver's seat has several adjustments to meet the preferences of each driver. Shown in **Figure 6** is the air switch used to adjust the support for the driver, which can be adjusted to the driver's weight. The seat can be moved forward or back as required and the backrest can be tilted as desired. There is also a lumbar control for the backrest.

The upper forward section of the motor doghouse serves as a mounting for several controls for the both the engineer and the officer. The items shown in **Figure 7** are listed below.

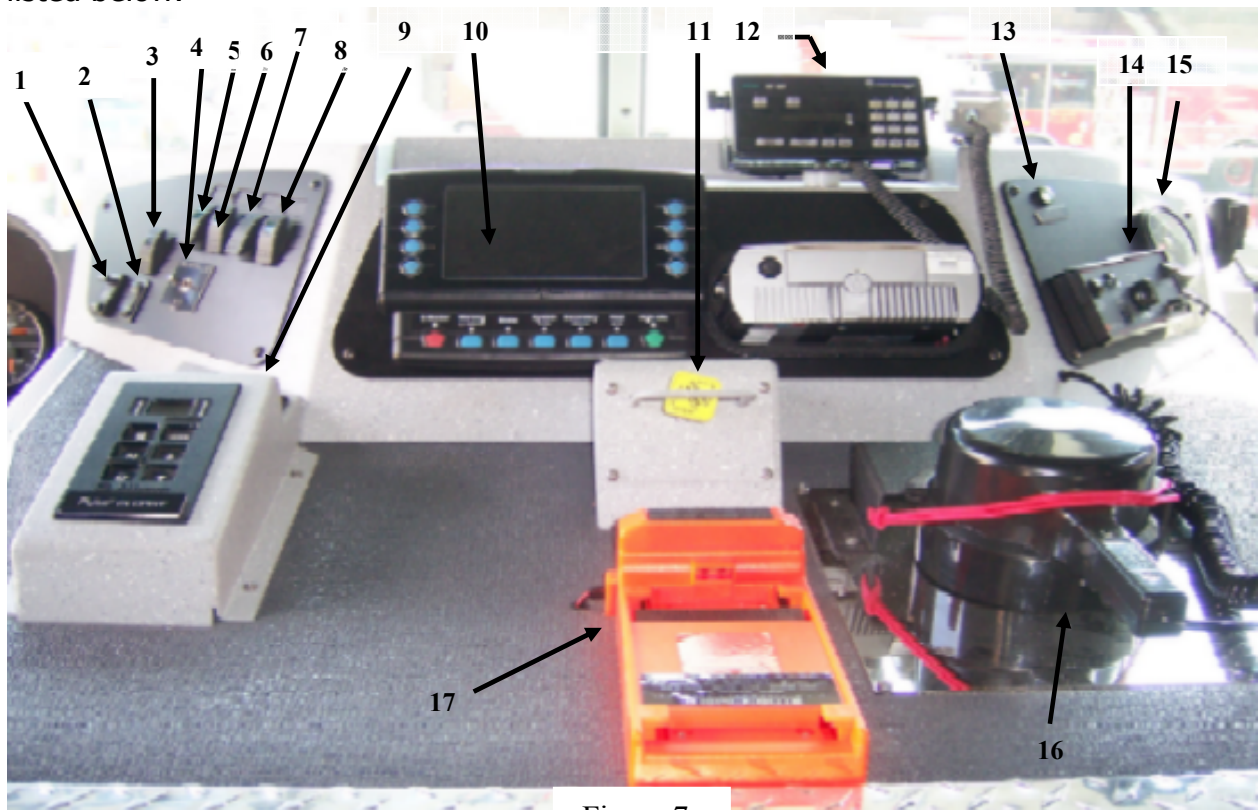


Figure 7

1. Windshield wiper switch
2. Panel light dimmer switch
3. Headlight switch
4. **3-Way Amber LED** Warning light switch: Left=sequences left, Center=Random flash, Right=sequences right
5. Retarder switch
6. Heated mirror switch
7. Horn / Siren / Air Horn switch
8. Mud/Snow Traction
9. Transmission Keypad shifter
10. Multi-Plex Vista Screen
11. **Parking Brake**
12. Radio
13. Retarder "ON" light
14. Siren control
15. Officer's speedometer
16. Spot Light
17. Flashlight

OFFICER'S SIDE DASHBOARD:

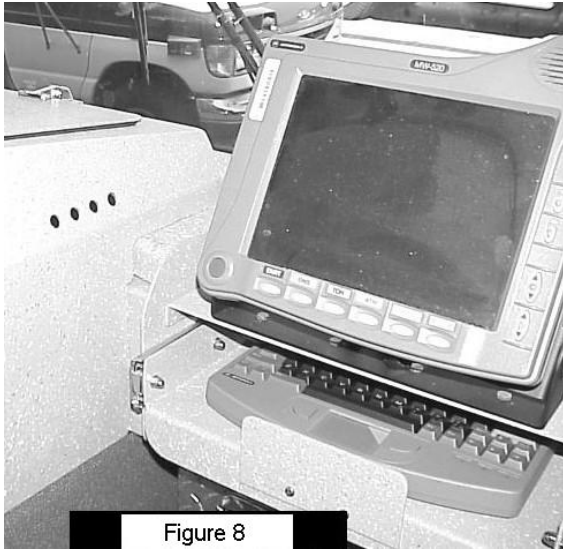


Figure 8

The M.D.C. is mounted directly in front of the Officer's seat where the glove box would normally be located **Figure 8**. A special module was designed for mounting the M.D.C. which includes a slide-out tray for the keyboard.

The siren control module is located on the engine doghouse immediately to the left of the officer's seat **Figure 7**. The Federal EQ2B siren is an electronic siren, which accurately emulates the sound of the electro-mechanical Q2 siren that is by far, the most popular siren in use by the Fire Service throughout the USA. Because the siren is an electronic design with an amplifier and speaker, it also has a PA function with a separate microphone from the radio microphone. The unit can be set to function in the PA mode or a choice of siren mode functions and includes an electronic horn switch. Because the siren takes several seconds to wind-down in the wail or manual functions, a "Brake" switch is provided to silence the speaker in less than two seconds. To operate the siren from the officer's siren foot pedal or the horn button on the steering column, the mode function switch on the siren control head must be set to the "MANUAL" function.

MISCELLANEOUS CAB FEATURES:

Mounted in the ceiling of the cab interior, directly to the rear of the windshield defroster unit, is a warning light to indicate an open cab or compartment door. This is a bright red LED light, which flashes rapidly when a cab or compartment door is still open whenever the parking brake is released.

Just to the rear of the open door warning light is a dome light with two map lights, which are switched independent of the dome light.

Above each cab door is a combination white and red dome light. The red light can be used to provide minimal illumination in the cab without distracting the driver.

A small on-board air compressor is mounted on the cab floor behind the driver's seat. This compressor ensures adequate air pressure when an alarm is received. It should be tested weekly by deliberately draining the apparatus air supply. This can be accomplished by repeatedly pumping the air brake pedal with the motor shut off.

A **battery conditioner/charger** is mounted on the cab floor under the rearward facing jump seat. The **battery conditioner is provided to ensure that the apparatus batteries are maintained with sufficient charge to start the apparatus motor** while in quarters, offsetting the constant draining of the batteries by the **M.D.C.** and **G.P.S. systems**. AC power to the battery conditioner is provided by the shore-line.

The ALS compartment, located behind the officer's seat, is equipped with AC outlets to provide power for charging ALS equipment. Power for these outlets is provided by the shore-line.

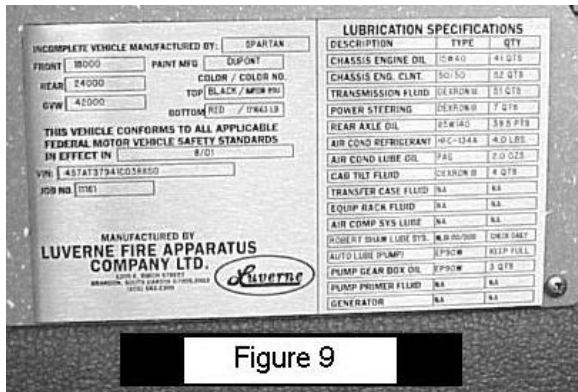


Figure 9

A specification plate is mounted on the **engineers' sun visor inside the cab**. The specification plate **Figure 9** lists the **axle ratings, G.V.W.R., paint codes and Vehicle Identification Number**. Also listed are the **various fluids for the apparatus and their capacities** to serve as a reference for the operator as well as service personnel.

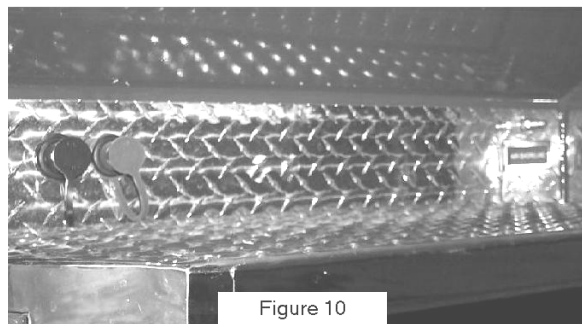


Figure 10

Figure 10 shows the battery jumping terminals located immediately below the driver's door. The terminals are protected with **rubberized, color-coded caps (red-positive and black-negative)**. The jumping terminals can be used if the apparatus must be **jump-started** or to **use the apparatus batteries to jump-start another vehicle**. **Also pictured is the previously mentioned Air Inlet**.

A large white scene light is mounted on each side of the cab exterior for illuminating the work area on the sides of the apparatus. Each scene light has its own switch mounted on the switch panel on the engine doghouse.

PUMP AND PUMP CONTROLS



Figure 11

The Hale QTWO-23S pump **Figure 11** installed in this apparatus was designed to meet or exceed the performance requirements specified by the Chicago Fire Department. Working closely with the pump and apparatus manufacturers, Department representatives attempted to develop a design which provides superior flow characteristics for L.D.H. discharges, a deck gun design that provides maximum versatility, and a user-friendly pump panel configuration.

An additional intake is provided on the rear of the apparatus in response to requests from numerous field personnel.

The main goal in configuring the pump operators' panel was to place the operating handle/control and discharge gauge for each discharge as close to the actual discharge port location as possible. This enables the operator to quickly locate the appropriate control and gauge.

The **large hand-wheel for controlling the L.D.H. discharges** is required due to the size of the valve supplied to control these discharges. A return to the use of the horizontal sliding discharge handles for the side mounted 2-1/2" discharge ports was specified as the design provides ease of regulating the hand-lines most often connected to these discharges.

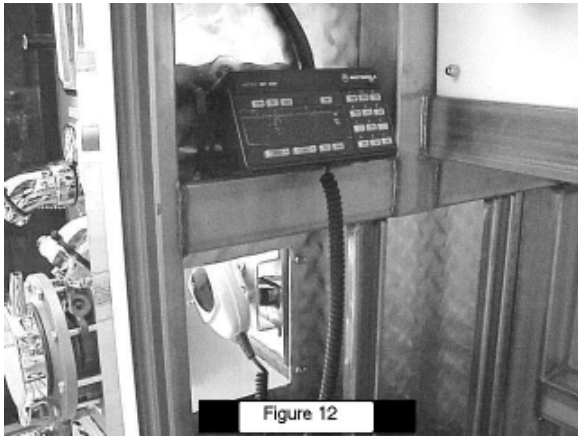


Figure 12

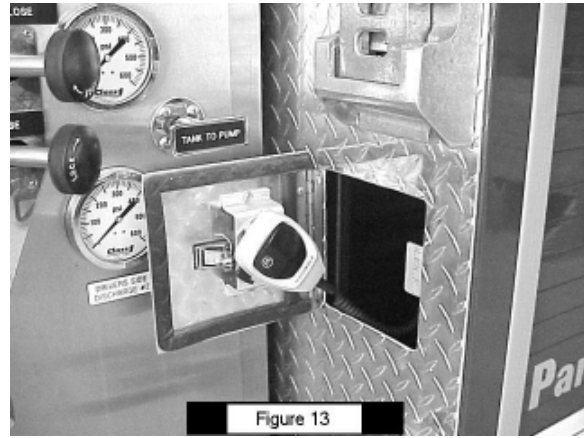


Figure 13

Figures 12 and 13 show the location of the external remote radio control head and microphone. In order to provide a position convenient to the pump operator and yet not vulnerable to the elements, the control head and **microphone are mounted inside the "Engineers Compartment"**. To avoid requiring the door of this compartment to remain open during pumping operations, the microphone is mounted to the inside of a **small door, which can be opened to access the microphone when pumping**. The control head in the compartment need only be accessed when changing the radio channel or adjusting the volume on the external speaker, which is mounted above the pump operators panel.

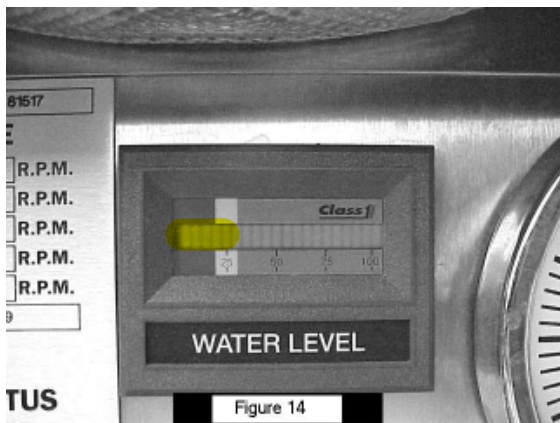


Figure 14

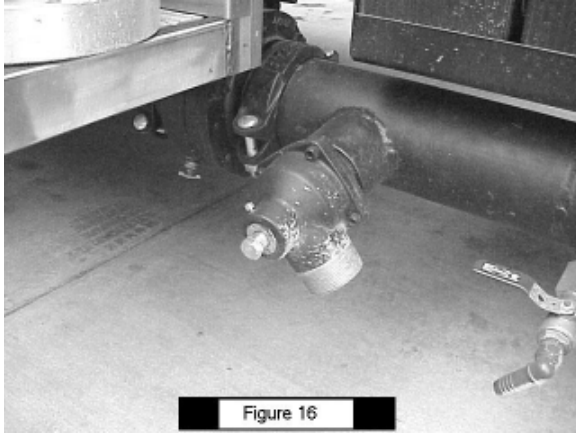
The water level gauge shown in **Figure 14** is located at the top center of the pump operator's panel. The water level is indicated by **20 LED bars** with indicators at each quarter of the scale. As the water level decreases, the LED's shut off from right to left. **At 25% remaining water in the tank, the LED's, which have shut off, will begin flashing to alert the pump operator that the water level is less than 25%.**



Figure 15

The **front and rear suction inlets** to the pump have **air-operated valves**. The front and rear intake switches shown in **Figure 15**, while appearing to be electrical switches, are actually air switches which can be immediately switched from one position to the other. They are **designed to open or close the intake valve slowly as required by N.F.P.A. standards.**

While the operation of this pump is similar to earlier models, there are some new innovations as well as required accessories that should be discussed. The following is a list of these items.



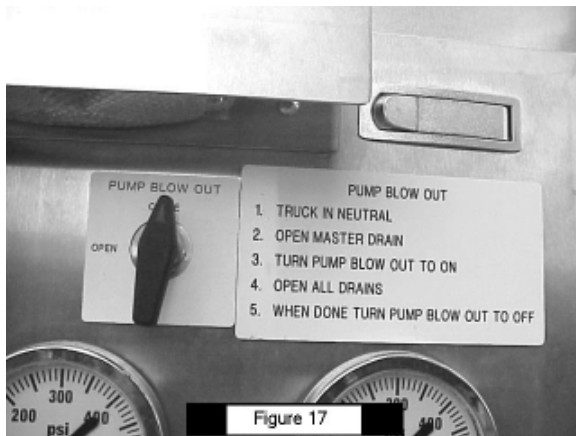
SUCTION RELIEF VALVE:

N.F.P.A. STANDARD 1901 requires that all new pumpers be equipped with an automatic intake pressure relief system. This system helps protect the intake side of the pump from excessive pressures, as may be encountered when working from a wall hydrant or during an in-line operation. Each of the four suction inlets to the pump are equipped with an intake relief valve as shown in **Figure 16**. With an operating range of 75-250 PSI, the intake relief valves on this apparatus are adjusted to open at 125 PSI.

SELF-BLEEDING DRAINS:

The two cross-lay beds and the deck gun are equipped with self-bleeding drains which open automatically when the pressure on these discharges drops below 5 PSI.

AIR BLOWOUT SYSTEM:



The pump is equipped with an air blowout system, which will help to drain the entire pump of water. This will be especially useful during cold weather. The instruction plate is found at the upper right portion of the pump operator's panel as shown in **Figure 17**.

SLOW CLOSE DEVICES:

N.F.P.A. STANDARD 1901 dictates that all intakes/discharges 3" or larger be equipped with slow open/close devices to reduce the likelihood of water hammer when these valves are operated. Therefore, front and rear intakes are so equipped with the air-operated intake valves mention earlier.

The large side intakes are equipped with manually operated valves, which are opened or closed with a hand wheel.

As mentioned earlier, the L.D.H. discharges have hand wheel operated valves, which prevent rapid opening or closing. The deck gun has a valve, which requires extra effort to open or close to comply with this standard.

BLEEDER VALVES ON INTAKES:

The large side intake valves are quipped with bleeder valves on the outboard side of the valve. The front intake has 2 drain valves, one in front and one behind the front axle, and the rear intake has a bleeder valve handle below the rear intake port.

When receiving water into any of these intakes through 4" hose, such as quick water or in-line operations, these bleeders should be left open until a steady flow of water is present before opening the intake valve. This will prevent air from being forced into the pump, which can cause damage.

ELECTRONIC PRESSURE GOVERNOR:

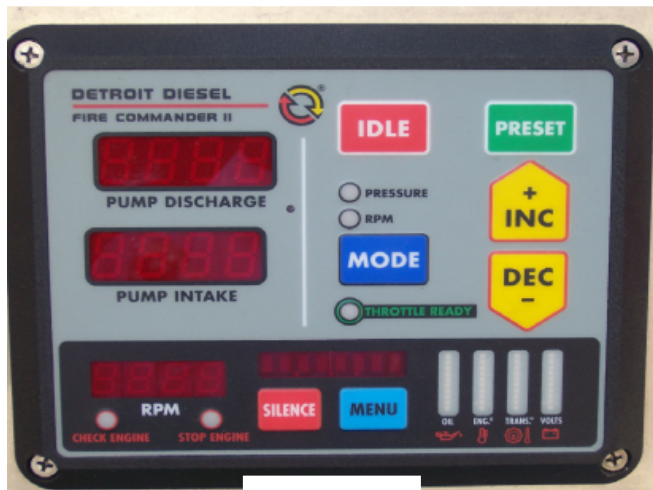


Figure 18

All new engines are being equipped with E electronic pressure governors to control the fire pump. **Figure 18** shows the control panel for the *Fire Commander II*, pressure governor installed on this apparatus. Manufactured by *Class 1*, it is designed to operate pumps powered by *Detroit Diesel* engines.

Earlier apparatus equipped with electronic pressure governors utilized the *Captain* model, which contained the pump controls in one panel and the engine data in a separate panel. The *Fire Commander II*, incorporates both functions into a single unit. The operations of both models are identical with the exception of a few minor differences.

Due to the extensive information required for the safe and efficient operation of the *Electronic Fire Commander II*, a separate manual is being supplied with your new apparatus to assist engineers and certified extra drivers in becoming familiar with this device. It is recommended that a copy of the manual be kept in the apparatus as a reference.

GENERAL OPERATING PROCEDURES

STARTING THE ENGINE:

- \$ Turn ON master battery switch.
- \$ Turn ON ignition switch.
- \$ Engage starter by depressing starter button.

ENGINE SHUT DOWN:

- \$ Transmission in **NEUTRAL** gear.
- \$ **Engage parking brake** or chock wheels.
- \$ **Turn OFF ignition switch.**
- \$ **Turn OFF master battery switch.**

PUMP ENGAGEMENT:

- \$ Bring the vehicle to a **complete STOP.**
- \$ Place the road transmission in **NEUTRAL.**
- \$ **Engage the parking brake** and chock wheels.
- \$ Move the **Pump Shift control** handle from "ROAD", **hesitate briefly in the neutral position**, then into the "PUMP" position.
- \$ The **GREEN "PUMP SHIFT" LIGHT** immediately adjacent to this control will come "ON" indicating a completed shift.
- \$ When ready to immediately discharge water, place the **ROAD transmission** in DRIVE by depressing the "D" button on the keypad shifter.
- \$ The "**PUMP ENGAGED-OK TO PUMP**" indicator light will come ON in about two seconds, again indicating a completed shift. **If the shift does not seem to be completed, repeat the entire procedure.**
- \$ **Check Speedometer, it should read 15-20M.P.H., if not, repeat procedure.**

NOTE:

The accelerator pedal in the cab is inoperative whenever the pump is engaged.

PUMP OPERATION:

It is imperative that the pump operator thoroughly review and understand the operation of the Electronic Pressure Governor before operating the pump. Refer to the *Class 1 Operational Guide* provided with this apparatus before operating the pump.

Before operating the pump, ensure that the **GREEN lamp is illuminated next to the pressure governor panel** and **throttle ready light** is illuminated on the pressure govern panel. These lights confirm that the pump is properly engaged and that the pressure governor is ready to control the pump.

You may now proceed with the pumping operation, following established pump operating procedures and information provided in the *Class 1* Operation Guide.

SHUTTING DOWN THE PUMP:

1. Make certain to press the "IDLE" switch on the Pressure Governor Panel to bring the engine to idle speed and cancel the "PRESSURE" mode operation.
2. Shift ROAD transmission to NEUTRAL.
3. Move the pump shift control lever from the PUMP position, pausing briefly in the NEUTRAL position, then into the ROAD position.
4. Neither GREEN indicator lights should be illuminated at this point.

NOTE:

SINCE MODERN PUMPS DEPEND ON WATER BOTH FOR LUBRICATION AND COOLING PURPOSES, IT IS IMPERATIVE THAT A FLOW OF WATER BE PROVIDED TO THE PUMP. IF IT IS NECESSARY TO TEMPORARILY CEASE PUMPING OPERATIONS, MERELY PUT THE ROAD TRANSMISSION IN NEUTRAL.

DRIVING PROCEDURES

ACCELERATOR PEDAL:

The motor on this apparatus has an electronically controlled fuel system. As a result, the accelerator pedal is an electronic device, which results in an instant response to changes in the position of the pedal. On rougher pavements, the bouncing of the apparatus can cause the driver to fluctuate the position of the accelerator pedal making steady application of power more difficult.

To compensate, it has been found that keeping the heel of the right foot resting on the floor of the cab provides a steadier control of the accelerator pedal.

ROAD TRANSMISSION:

The road transmission is controlled by means of a keypad shifter located on the dashboard, immediately to the right of the driver. When the "D" button is depressed, the transmission will shift into DRIVE and the digital display will show the number "4". This indicates that the transmission will operate from 1st thru 4th gear. This range of gears is recommended for operation on city streets.

When driving on an expressway or the Outer Drive, it may be desirable to shift up to 5th gear. By depressing the "MODE" button, the display will change to "5" and the transmission will operate in 1st thru 5th gear. This procedure can be done whether the vehicle is in motion or stationary. The procedure can be reversed as long as the vehicle speed is less than 50 MPH.

When slippery, snowy, or icy road conditions, or steep grades are encountered, it may be desirable to operate in a lower speed range. By depressing the "MODE" button and then the "DOWN ARROW" button, the display can be changed to 3, 2, or 1 to lower the maximum gear in which the transmission will operate.

MUD/SNOW TRACTION:

The apparatus is equipped with a mud/snow traction feature. This allows you to engage the mud/snow toggle switch by pressing it to the on position and continuing to hold it until you are free to move the apparatus. The mud/snow feature allows the axle to slow down rotation which provides more road traction.

TRANSMISSION RETARDER:

The apparatus is equipped with a transmission retarder, which can be switched on and off. The switch to activate the retarder is located near the engineer's right hand. Once the transmission retarder has been switched to the "ON" position, it illuminates the retarder light located on the officer's side of the dash. **See Figure 7.**

The transmission retarder provides additional braking force to the rear wheels, which considerably extends the service life of the brakes. When switched on, the retarder activates whenever the driver totally releases the accelerator and applies braking action down to approximately 5 MPH.

IT IS THE POLICY OF THE CHICAGO FIRE DEPARTMENT THAT THE RETARDER BE ACTIVATED AT ALL TIMES WITH THE EXCEPTION OF SLIPPERY ROAD CONDITIONS SUCH AS IN RAIN, SNOW, OR ICE.

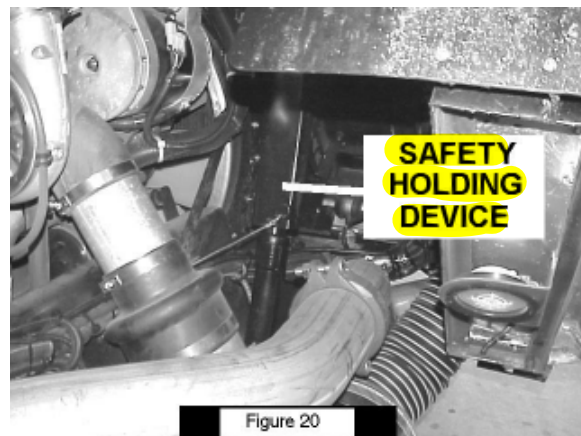
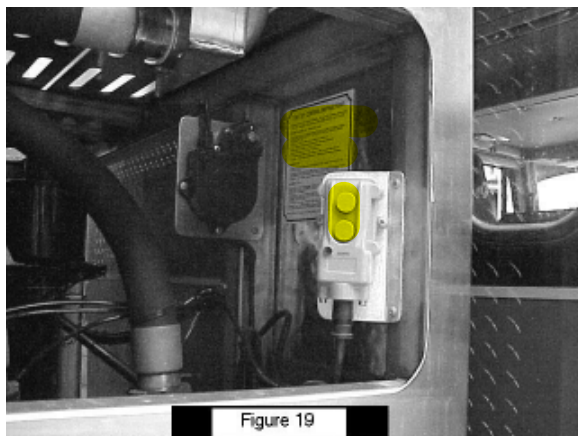
Due to the fact that the braking force applied by the retarder cannot be regulated by the driver, there is a possibility that it can cause the rear wheels to lock under slippery road conditions, causing a loss of vehicle control. The vehicle's anti-lock brake system is designed to automatically disable the retarder when wheel lock-up is detected, however, the manufacturer strongly recommends that the retarder be disabled by the driver whenever road traction is questionable.

A warning plate has been installed just below the transmission keypad shifter to remind the driver to disable the retarder during slippery road conditions.

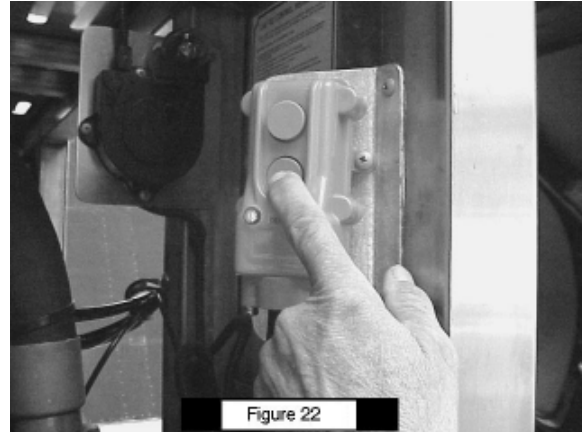
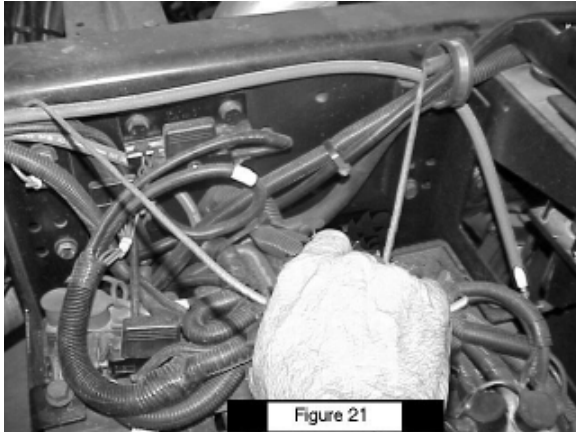
CAB TILT PROCEDURES

CAB TILT:

1. Master Battery Switch "ON".
2. Engine not running.
3. Parking Brake Engaged. (Wheels Chocked)
4. Move the front suction swivel to the FORWARD position.
5. (This usually requires stretching out the soft suction)
6. Check the front bumper area for any other items (including hose butts etc.) that may interfere with the raising of the cab.
7. Check and remove/secure any loose items from within the entire cab area. S.C.B.A. harnesses should be removed from all forward facing seats.
8. Make certain that all doors are secured in the closed position.
9. Make certain that the deck gun is resting in the cradle supplied.
10. Front wheels must be pointed forward.
11. Check for adequate (**15 FEET MINIMUM**) overhead clearance.
12. Remove upper portion of pump panel on officer's side of apparatus to access cab lift controls. **Figure 19**
13. Push and hold electric tilt switch "UP" button until cab tilts and manual safety holding device falls into place. **Figure 20**
14. Push electric tilt switch "DOWN" button until cab rests on the manual safety holding device.

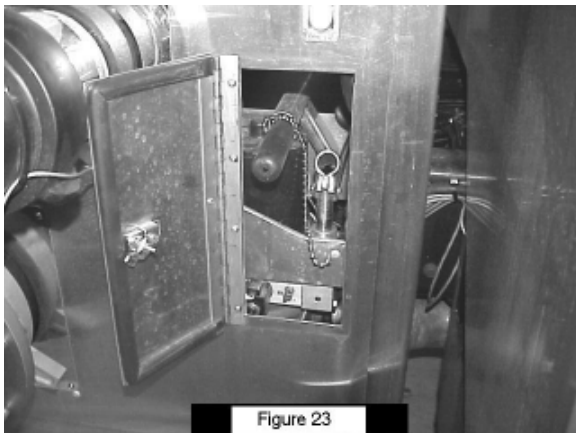


CAB LOWERING:



1. Push electric tilt switch "UP" button to free-up manual safety holding device.
2. Pull cable release with right hand **Figure 21**, (CONTINUE TO HOLD ONLY LONG ENOUGH TO DISENGAGE MANUAL SAFETY). At the same time, with the left hand, push the electric tilt switch "DOWN" button to lower the cab **Figure 22**.
3. After the cab appears to be fully lowered, CONTINUE TO HOLD THIS SWITCH DOWN FOR APPROXIMATELY 5 SECONDS or until red lamp flickers or shuts off.

MANUAL CAB RAISING/LOWERING CAPABILITY



In case of electrical pump failure, the cab may be raised and/or lowered by following the same procedures while providing the necessary hydraulic power via the manual hydraulic jack **Figure 23** provided within a compartment to the right of the L.D.H. discharge port on the officer's side pump panel.

LifeGaurd SRS System:



Figure 24

The apparatus is equipped with the LifeGaurd **SRS system**. Which provides side roll protection for the driver, officer and rear-facing seat behind the driver. **Figure 24**. The system will be activated in any type of rollover crash.

DPF (Diesel Particulate Filter) Aftertreatment System:

The **Diesel Particulate Filter (DPF)** system is set up to reduce the amount of pollution emitted into the air. This is done by maintaining the soot in the catalytic converter and stores it until the build up reaches a certain amount, which will be burned off during the regeneration process. The **Detroit Diesel Electronic Control (DDEC)** will determine when the regeneration process is necessary. It would be highly unlikely that the system would perform an **automatic regeneration** due to the fact that we would probably not keep up a **high rate of speed for approximately 30 – 40 minutes** on any normal run. There is no telling when or how often this may occur, it depends solely on the type of driving the apparatus performs. So that would mean we would probably perform manual regenerations, when it is called for **Figure 25**. While an apparatus is performing a regeneration there should be safety precautions taken, such as assign **a firefighter to maintain an area of at least 5-10 feet** in all direction of the exhaust pipe due to extreme exhaust temperatures **Figure 26**. If during a manual regeneration your apparatus is called for another run, you will stop the regeneration process by releasing the Maxi-brake and placing the apparatus in the drive position. Place the transmission selector in drive this will automatically stop the regeneration process. This would be considered a partial regeneration and it would require you to start a new manual regeneration when you return to quarters and continue the process until regeneration is completed.

Note: The **DPF** system will not activate while the apparatus is in either the **HIGH IDLE** mode or in **PTO** mode.

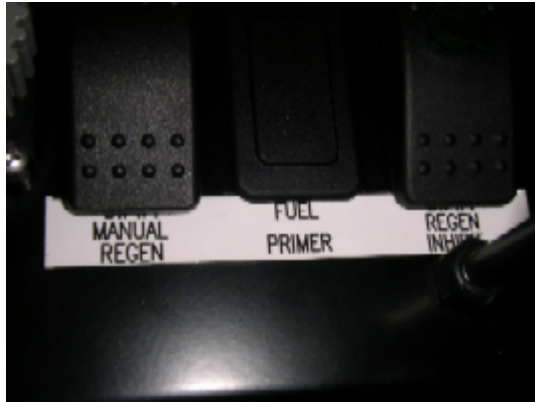


Figure 25

When a manual regeneration is called for, the control switches to perform the manual regeneration can be found under the pump shift PTO box on the lower left side of the steering column.



Solid

Perform a **Parked Regeneration** OR bring vehicle to **highway speeds** to allow for an **Automatic Regeneration**



Flashing

Perform a **Parked Regeneration** OR bring vehicle to **highway speeds** to allow for an **Automatic Regeneration**



Flashing

+



PERFORM A PARKED REGENERATION OR BRING VEHICLE TO HIGHWAY SPEEDS TO ALLOW FOR AN AUTOMATIC REGENERATION



+



+



A PARKED REGENERATION MUST BE PERFORMED - ENGINE SHUTDOWN



Figure 26

While performing the regeneration process the vehicle should be placed in an area where there is sufficient space to release exhaust temperatures that are higher than normal. The exhaust will reach very high temperatures and are dangerous for firefighters and civilians.

Redundant Lighting Circuit Switch:



Figure 27

The redundant lighting circuit switch Figure 27 allows the apparatus to still have emergency lights when all electric power is lost. The switch has a safety rocker, which will automatically turn off when the rocker is in the down position.

Emergency Pump Shift:



Figure 28

The Emergency Pump Shift Figure 28 enables the apparatus to be placed in the pump position in the event the air operated pump shift operation fails. Follow the instruction posted at the side of the Emergency Pump Shift to engage apparatus in pump.

OTHER MISCELLANEOUS ITEMS

WORK LIGHTS:

The apparatus is equipped with work lights at several locations on the body. The pump panels are illuminated by a **switch located on the pump operator's panel.**

The rear tailboard area can be illuminated with work lights operated from a switch on the left side of the rear of the apparatus.

Lights have been installed under the catwalk above the ladders to aid in removal and replacement of the ladders. These lights are operated from a switch located on the right rear of the apparatus.

FOLDING STEPS:

The folding steps installed on the body of this apparatus were positioned to provide the best possible access to the upper portions of the body. Using any other portion of the body or its accessories as stepping surfaces is not only dangerous but can cause damage to equipment.

HARD SUCTION HOSE:

Due to the relative infrequent use of the hard suction hoses, they have been positioned in a location on the apparatus, which has reduced the ease of access when needed. This was done to maximize the use of the hose bed area for its intended purpose.

The recommended method of removing the hard suction hoses from the apparatus is to have personnel climb into the hose bed area, remove the hard suction hoses from their trays and lay them into the hose bed. After climbing down from the hose bed, the personnel can slide the hard suction hoses off the back of the apparatus. This method can be used when only the engineer and the hydrant person are available to perform this task.

If additional personnel are available, the hard suction hoses can be passed off the back of the apparatus immediately upon removal from the tray.

DO NOT ATTEMPT TO PASS THE HARD SUCTION HOSE TO PERSONNEL ON THE GROUND OFF THE SIDE OF THE APPARATUS AS MISHANDLING COULD CAUSE UNNECESSARY DAMAGE TO THE APPARATUS BODY.

REMINDER

ANY DEFECTS FOUND DURING INSPECTIONS OR OPERATIONS MUST BE PROMPTLY REPORTED, AND WORK ORDERS OBTAINED FROM THE DEPARTMENT OF FLEET MANAGEMENT,

WARNING - PER SPARTAN MOTORS, INC.

NO WELDING BY FIELD PERSONNEL ON THIS APPARATUS!

EXTREME DAMAGE WILL RESULT TO THE AUTOMATIC TRANSMISSION ELECTRONIC CONTROLS. DISCONNECTING THE VEHICLE BATTERIES IS NOT SUFFICIENT PREVENTION.

TAKE CARE OF IT, DON'T ABUSE IT, AND IT WILL TAKE CARE OF YOU.

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DIVISION OF TRAINING
ALL RIGHTS RESERVED
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