



Fire Protection Training

Procedures Handbook 4300

TOOLS & EQUIPMENT

TOPIC: Types of Fire Service Jacks

TIME FRAME: 1 Hour

LEVEL OF INSTRUCTION:

BEHAVIORAL OBJECTIVE:

Condition: A written quiz

Behavior: The student will identify the three types of fire service jacks and list the advantages of each.

Standard: With a minimum of 70% accuracy

MATERIALS NEEDED:

- Screw jack
- Ratchet jack
- Hydraulic jack
- Chalkboard, chalk, and eraser
- Audio-visual aids and equipment

REFERENCES:

- IFSTA, Essentials of Fire Fighting, 2nd Edition, Chapter 7
- IFSTA Fire Service Rescue Practices, 5th Edition, Chapter 2

PREPARATION: The fire service utilizes a variety of tools during emergency operations. Some tools are used almost daily, while others may only be used twice a year. The jack is one of these less frequently utilized tools. However, when a heavy object/load must be moved/raised, the jack is one of the first tools applied. Firefighters must be thoroughly familiar with this tool if they are to use it effectively.



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TYPES OF SERVICE JACKS

PRESENTATION	APPLICATION
<p>I. FUNCTION/PURPOSE</p> <p>A. Jacks are Designed to Lift or Move an Object or Weight by Employing Mechanical Advantage</p> <p>B. Mechanical Advantage is Simply a Method by which Work Power is Increased</p> <p>II. TYPES OF JACKS</p> <p>A. A Wide Variety of Jacks are Available</p> <p>1. Ratchet jacks</p> <p>a. Nomenclature</p> <p>(1) Base</p> <p>(2) Loading point(s)</p> <p>(3) Shaft</p> <p>(4) Ratchet mechanism</p> <p>(5) Toggles</p> <p>(6) Handle lever</p> <p>b. One of the most common</p> <p>(1) Bumper jack as an example</p>	<p>What is the purpose of a jack?</p> <p>What is mechanical advantage?</p> <p>Cite examples: Bumper jacks, hi-lift jacks, etc.</p> <p>Hold up/display</p>



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PRESENTATION	APPLICATION
<ul style="list-style-type: none"> (b) Collapse to small size (c) Will fit into small openings (d) Often operated with a rod rotating/turning the screw <ul style="list-style-type: none"> (i) Danger of slipback is minimal <p>(2) Bar jack</p> <ul style="list-style-type: none"> (a) Threaded vertical core moving in a housing (b) Usually stronger than a scissor jack (c) Operated by physically turning the core <ul style="list-style-type: none"> (i) Danger of slipback is almost eliminated 	
<p>3. Hydraulic jacks</p> <p>a. Nomenclature</p> <ul style="list-style-type: none"> (1) Base (2) Load point(s) (3) Shaft (4) Lever/handle (5) Hose/couplings (6) Reservoir <ul style="list-style-type: none"> (a) Often considered the most useful of the three types 	<p>Hold up/display</p>



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PRESENTATION	APPLICATION
<p>(b) Employs the "piston" and "lever" to attain mechanical advantage</p> <p>(c) The lever operates a piston, which moves fluid through various sizes of chambers to develop pressure</p> <p>(d) This pressure is applied to a core which moves up or down within the housing</p>	<p>Diagram on board</p>
<p>III. USES</p> <p>A. Vehicle rescue</p> <ol style="list-style-type: none"> 1. Lift/pull/spread 2. Move pedals/steering wheel 3. Stabilize (with cribbing) <p>B. Building Collapse</p> <ol style="list-style-type: none"> 1. Lift 2. Move 3. Stabilize (with cribbing) 	<p>In what type of emergency situations could a jack be utilized?</p> <p>List on board</p> <p>Have students cite other uses</p>



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PRESENTATION	APPLICATION
<ul style="list-style-type: none"> C. Forcible Entry <ul style="list-style-type: none"> 1. Pry 2. Lift D. Agriculture Rescue <ul style="list-style-type: none"> 1. Pry 2. Lift 3. Move E. Trench/Excavation Rescue <ul style="list-style-type: none"> 1. Stabilize/shore 2. Stabilize (with cribbing) 	
<p>IV. SAFETY CONSIDERATIONS WHEN SELECTING</p> <ul style="list-style-type: none"> 1. Rated capacity of jack <ul style="list-style-type: none"> a. Stated on jack in form of plate/stencil/stamp b. Expressed in pounds or tons c. Estimate must be made of the load to which a jack is applied 2. Type of work to be performed <ul style="list-style-type: none"> a. Life threatening vs. routine operations b. Stable vs unstable environment c. Direction of movement d. Size of working space 	<p>Hold up and display</p>



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TYPES OF SERVICE JACKS

SUMMARY:

Situations will arise that require the use of jacks to lift, move or hold heavy objects. Jacks develop mechanical advantage and can be categorized into three general types: ratchet, screw, and hydraulic. Jacks have various applications usually centered around rescue operations.

EVALUATION:

A written quiz.

ASSIGNMENT:

To be determined by instructor(s).