Crime Scene Technical Procedures Manual

Escondido Police Department
Forensic Services Unit

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1. SCOPE

The purpose of the *Crime Scene Procedures Manual* is to establish guidelines for processing and examining a crime scene. These guidelines shall apply to all Forensic Services Unit (FSU) personnel (Specialists) assigned to process or examine crime scenes. The methods and procedures are described in a general sense and do not reflect all the variations and combinations of services, nor do these guidelines impose a set procedure to be followed in every crime scene, as each scene is unique and will utilize more or less resources at each scene.

For the purposes of this manual, a crime scene may be defined as any site or location identified by a law enforcement agency, which requests the Escondido Police Department Forensic Services Unit to respond. Evidence is defined as any material, substance, or item, which is transferred from one individual to another, or left at a crime scene.

2. BACKGROUND

All crime scenes are unique and the *Crime Scene Procedures Manual* provides a framework of available procedures that may be utilized for the examination of crime scenes. The procedures ensure the following:

- Proper crime scene processing and documentation
- Physical evidence is detected using appropriate methods
- Proper handling and collection of physical evidence
- Proper handling and processing of evidence submitted by non-Specialists (i.e.: Assisting outside agency or EPD Officers)

3. SAFETY PRECAUTIONS

The *FSU Safety Manual* is the primary resource for the safe handling of evidence, and the materials and equipment associated with the collection of physical evidence. Specialists will follow the safety rules and procedures outlined in the FSU *Safety Manual* and the *Crime Scene Procedures Manual*. The following checklist is a reminder of safety concerns associated with crime scene work.

Safety Checklist

- Evaluate the scene and any safety concerns. Use appropriate proper safety and protective equipment when entering and processing a crime scene.
- The scene may be the source of contamination including body fluids, tissue, and human remains. Handle all biological materials as if they contain bloodborne pathogens (e.g., hepatitis, HIV, etc.).
- The routes of bloodborne pathogen exposure are inhalation, ingestion, skin, eye and mucous membrane contact. Protect these parts of your body through the use of personal protective equipment (e.g., protective clothing, face mask/shields, eye protection, shoe covers, gloves, boots, etc.).
- Change gloves when they are contaminated or prior to handling additional evidence.
- Do not eat, drink, smoke or apply makeup inside the crime scene.
- Be aware of sharp objects such as hypodermic needles, razors, knives, broken glass, nails and exposed or cut metals.
- Ensure proper ventilation if required.
- Search confined spaces with a flashlight and/or mirror prior to inserting the hands.
- Proper eye protection should be worn during the application of chemicals or when using the alternate light source.
- Be familiar with the Safety Data Sheets (SDS's) for chemicals which are being used for processing; use appropriate protective equipment.
- Use caution when handling firearms; always consider a weapon as LOADED. Unless specialized training is received, the officer in charge of the scene should be responsible for handling any firearms and rendering them safe for documentation and collection at a crime scene.
- Do not touch or remove any suspected explosive device.
- Stay AWARE of what is going on around you and stay ALERT.
- Specialists will not be left unattended while at a crime scene to ensure their safety.

4. MATERIALS REQUIRED

Required materials are detailed in procedures.

5. STANDARDS AND CONTROLS

Standards and controls are detailed in applicable procedures.

6. PROCEDURE

6.1. EVALUATING THE CRIME SCENE

Upon arrival at the crime scene, Specialists will make contact with either the detective/officer who requested the crime scene processing services, with the detective/officer assigned to oversee or manage the crime scene, or the victim (or person designated by the victim).

6.1.1. INFORMATION EXCHANGE

During contact with the detective or officer in charge of the crime scene, Specialists should obtain the following information:

- Agency case number assigned to the investigation.
- Type of investigation.
- Exact location of the scene(s).
- Lead detective name.
- Name(s) of victim(s) and personal information, if needed.
- Any other relevant information to assist with crime scene examination (example: Vehicle information or additional crime scene locations)
- Information relating to personnel who have entered the scene prior to your arrival who have knowledge of the scenes original condition.

6.1.2. SCENE PROCESSING REQUEST OR SPECIFIC DIRECTIONS

- Each crime scene investigation is unique, and as such, the establishment of a clear and direct method of communicating scene information is required.
- Specialists will discuss with the detective, or officer in charge of the crime scene, information regarding the type of investigation that is under way. Any relevant information regarding the processing of the scene and any specific scene-processing directions or evidence collection should be made known prior to scene entry.

- In any crime scene investigation, new or additional information may be developed from outside the scene by the investigating agency. When new or additional information is developed concerning the crime scene, the agency should communicate that information to the Specialist. This new or additional information may cause the Specialist to make changes in scene processing, such as expanding to other areas and additional items of evidence, or narrowing the scope of the scene and items of evidence.
- Specialists may develop additional information while processing the scene that may support the agency's theory or may be in conflict with statements made by individuals involved in the investigation. In either case, the Specialist advises the detective or officer in charge of the crime scene of findings so the agency can proceed with its investigation.

6.1.3. PRELIMINARY SURVEY (CRIME SCENE WALK-THROUGH)

A preliminary survey or walk-through of the crime scene with the detective or officer in charge should take place after the exchange of information. Before entering the crime scene, be sure that a crime scene log has been established and that appropriate times are logged for Specialists. A secure and safe pathway into and away from the scene should be selected. When possible, this pathway should preserve the scene from possible contamination and should avoid the pathway used by the subject. During this walk-through, Specialists will do the following:

- Evaluate the crime scene to help in formulating a plan for processing the scene and the collection and preservation of evidence.
- Evaluate the crime scene to establish the proper perimeter size to ensure that the scene is protected.
- Make appropriate notes of the scene, evidence located within the scene and the condition of the evidence.
- Determine if any additional equipment or personnel are needed to process the scene (e.g., blood-spatter analysis, alternate light sources, etc.).

- Confer with the detective or officer to determine what potential evidence needs to be recorded, recovered, and what processing will occur at the scene.
- Evaluate the variety of possible evidence at the crime scene. If it is outside the scope of the Specialist, outside assistance may be requested.
- Document and collect any fragile evidence that may be destroyed due to a variety of situational and environmental factors.

6.2. DOCUMENTING THE CRIME SCENE

Crime scene documentation consists of the following four methods:

- Notes
- Photographs/video
- Sketches/diagrams
- Reports

Each method serves to memorialize the condition of the crime scene, and what the Specialist observed and did at the scene. Physical evidence is documented through a combination of these methods prior to touching and/or collecting the evidence.

Note forms have been created and may be used by Specialists to assist with documenting the crime scene. The note forms can be located on department computers: Worksheets

6.2.1. CRIME SCENE PHOTOGRAPHY

Crime scene photography is one of the most important duties that Specialists perform. Detailed photographs ensure that the crime scene is accurately depicted and may provide details beyond those found in the scene notes. Photography of the scene and evidence is one of the first procedures performed at a scene. This generally occurs after the note-taking process has begun.

Take the photographs so that the area and items of evidence will be identified and oriented with other areas in the overall scene as first observed upon arrival to the scene.

- Location may be established through photographs of street signs, addresses or other geographical information.
- Take overall photographs of the exterior of the crime scene.

- Take overall photographs of the interior of the crime scene.
- The technique used at crime scenes is primarily a three-step process:
    - A long or wide-angle view, sometimes referred to as an establishing shot.
    - A medium or midrange view which focuses on particular objects, areas or evidence items, in relation to other items or areas in the scene.
    - A close-up view that clearly shows what the item is, its condition and its position at the scene.
    - Close up photographs for examination and/or analysis must include a scale and be photographed with the camera lens parallel to the plane of the evidence item.

- **Evidence**: Photograph all evidence in its current location. If an evidence item has been moved, do not attempt to place it back to be photographed. If the Specialists are notified the evidence was moved from its original location, a detailed note may be made.
    - Evidence may be marked with placards consisting of numbers/letters, or cards which have been marked identifying the evidence being photographed. When using markers, take a photograph of the object or area with and without the marker.

- **Close-up photographs:** Close-up photographs may be taken of a small item, such as a bloodstain, hair, fiber or fingerprint in blood. For a close-up photograph, the item should be photographed at least twice, once with a scale (ruler) and at least once without a scale with the camera lens parallel to the plane of the evidence item.

- **Deceased Body:** If there is a deceased body present overall photos should be taken from all sides. Additional mid-range photos should be taken of the body. When possible, take close-up photos of wounds or injuries. Once the body has been removed, photograph the area where the body had been located.

- **Aerial Photographs:** If possible, aerial photographs should be taken of outdoor scenes. Recent satellite photos may be utilized for overall scene location photos.

- **Vehicle Photography:** Vehicle photography should include but is not limited to the following photographs: the vehicle recovery location, associated landmarks, photos taken at a distance from the vehicle, all four sides of the vehicle, identifying information such as license plate and VIN, tire(s)-sidewall and tread, pertinent point of view, the interior of the vehicle, the trunk and contents, under the hood, any items of evidence/property identified or recovered from the vehicle.

- **Dwelling Photographs:** Initial photographs of dwellings should be taken from a distance. This photograph should incorporate a landmark, such as: intersections with street signs, business sign which includes addresses on the sign, business sign lacking address information, address information on structures, address information on mailboxes, utility poles/boxes (light, power, telephone) with address information on the pole/box, and when address numbers are unavailable, milepost markers.

    - Photographs of the entry point used by the suspect into the scene shall be photographed, if it can be determined. If the exit point used by the suspect is different than the entrance, this area shall be photographed also.
    - The interior of the scene should be photographed from all four corners. Photographs of rooms and other interior areas should be taken from typical observation points using the wide angle setting of the lens when necessary.
    - Evidence will be photographed in the scene to show the relative positions of the items of evidence located in the scene.

- **Subject Photographs:** Photographs of subjects may include the following: frontal and profile photographs of the head and shoulders, full-length frontal photograph of the body, full-length right and left side photographs, full-length back photograph, backs and palms of the hands, any injuries, marks, scars, tattoos or identifying features.

- **Biological Evidence:** Some biological evidence which is not easily identified with the naked eye may be visualized with chemical enhancement or observed with an alternate light source. If biological evidence is located in this manner, preservation through photography and collection should be considered.

- **Other Photography:** Other specialty photography may be requested by a detective. This may include nighttime photography, aerial photography, etc. Please apply your training and knowledge of photography to best document the scene as requested.

6.2.2. CRIME SCENE DIAGRAMMING

Crime scene diagrams serve to establish spatial relationships, provide an overall scene view, and assist with the preparation of demonstrative aides for court proceedings. It is up to the discretion of the lead detective if a rough sketch/diagram should be created. The final crime scene sketch is generally computer generated by Specialists.

<u>General Considerations:</u>

- A rough sketch may or may not include measurements.
- Use of survey equipment may be requested and utilized (such as FARO or Total Station).
- Sketches/diagrams should contain the following information on the drawing:
  - Case number, date, Name and ID #, scene location, description of sketch
  - Legend – defines labels/icons used in the sketch/diagram
  - Scale disclaimer – indicates that the diagram is not drawn to scale.
  - Orientation – identifies the sketch in relation to compass direction

6.2.2.1. SKETCHING

Types

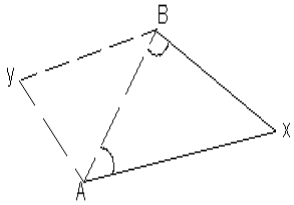
A sketch is the simplest and most effect way to present distance measurements. There are four types of sketching that may be used to depict a crime scene:

- *Overhead View (Bird's Eye View)* – most common type of sketching. Usually one viewpoint and depicts objects on horizontal surface (resembles a floor plan).
- *Exploded Sketch* – combines the Overhead View of the horizontal surfaces of the room with "laying down" of a wall or walls to depict evidence on the vertical surfaces.
- *Elevation View* – depicts a side view of a vertical structure.
- *Three-dimensional (3D) View* – made using a computer software program.

Measurements for Sketching

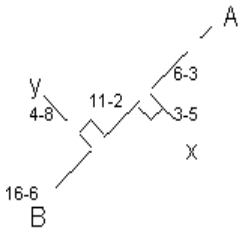
All measurements taken at crime scenes are approximate records of distance, angles, and location; they are not exact findings. Measurement methods such as triangulation, baseline and coordinate are commonly used at crime scenes.

Triangulation Method: Measures the relative distance of an evidence item using two fixed permanent objects within the crime scene. The measurements are taken from each fixed point to the location of the evidence item.



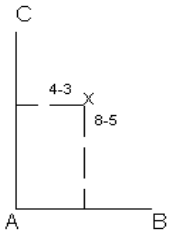
TRIANGULATION - Two fixed points (A & B) in a scene are selected and the distance between them is measured, thus establishing a base line. Either distance or angular measurements are then made to objects (X & Y) in the scene from each of these two points. Dashed lines indicate measuring the lengths of base line and the two sides. Solid lines indicate measuring the angles the two sides make with the base line.

Baseline Method: Measurement requires right angles (90 degrees) from a fixed line. If an outdoor scene, the baseline may have to be fixed with a stake or some permanent marker at both ends.



RECTANGULAR COORDINATES **(Base Line)** - The simplest form of rectangular coordinate system. Using a straight line between two known points (A&B), items are measured along the line and perpendicular from the line. Inside or outside of a house, this line can be a straight wall. Outdoor scenes can use a string or long measuring tape as the reference or base line.

Coordinate Method: Measuring the distance to an object from two perpendicular objects, such as walls.



RECTANGULAR COORDINATES **(Grid)** - Measure the distance of items from two perpendicular base lines. This technique is particularly appropriate in a room with perpendicular walls or outdoors with perpendicular streets.

Laser measuring systems may be used to collect measurements. GPS may be used to record an approximate location. The use of a laser, a tape measure, or a GPS device does not result in measurements that are significant to a testing result. As such, these devices do not require calibration in order to use them at crime scenes.

6.2.3. CRIME SCENE NOTES

Crime scene notes identify specific actions upon arrival, and provide a clear and detailed record of all observations and actions taken while in the scene. Crime scene notes are typically documented on approved crime scene processing forms. In general, crime scene notes include the following information:

- Call out information (e.g., requestor, date, time, location)
- Case information (e.g., agency case number, offense, detective/officer, subject(s), victim(s), etc.)

- Scene arrival and departure date/times; individuals contacted at the scene
- Observations
- Examinations and results (e.g., latent print processing, presumptive blood testing, etc.)
- Description of evidence collected and their disposition
- Chain of Custody information

6.2.4. CRIME SCENE REPORTS

A forensic services report is used to report crime scene activities. The requirements for preparing a forensic services report are found in the Quality Assurance Manual – *Section 7.3 "Inspection Reports"* and Section 7.4 *"Inspection Reports and Certificates".*

Contents of a Crime Scene Report:

Specialists will prepare a report outlining their participation in a crime scene investigation. A crime scene report should include the following:

- Date(s) and location(s) of crime scene(s)
- Include time of arrival and departure.
- A narrative of the actions taken at the crime scene that pertain to the documentation, detection, and collection of physical evidence at the scene.
    - Include details and results of processing techniques performed on scene (e.g., latent prints, blood testing, etc.).
- Listing and Description of Evidence
- Description of evidence and identifiers used to label evidence in photographs, diagrams and notes.
- Disposition of Evidence
- Provide information about who retains custody of the evidence items.
- Name and job title of person authoring the report.
- Signature of person authoring the report.

Technical Review:

All crime scene reports will be subjected to a technical review and administrative review. See Section 7 "Verification" in the Latent Print Technical Procedures Manual. During a technical review, field notes, photographs, sketches and diagrams are reviewed. Signatures of the technical and administrative reviewers are required before final submission of the report.

6.3. EVIDENCE COLLECTION

One of the most important duties at a crime scene is the collection of physical evidence. In order to collect evidence, an understanding of what evidence is and the role it will play in the investigation is imperative. Physical evidence is any object that can establish that an event or series of events has occurred and that may provide a link between persons, places and/or items.

Collecting evidence should begin after proper documentation has been completed. It is recommended that the evidence most likely to be destroyed or degraded be collected first. Each evidence item should be packaged separately to protect it from cross-contamination and from being damaged during transport.

The chain of custody will be established whenever the Specialist takes custody of evidence at a crime scene, or when evidence is received during the crime scene investigation. The Specialist will note the date, time and location that all evidence was collected. All evidence will be properly inventoried, described, marked, and packaged.

6.3.1. EVIDENCE COLLECTION

The evidence collection process should be performed in a systematic and careful manner. The evidence collection sequence may be based on the following information:

- The scene location: inside, outside, within a vehicle, etc.
- The condition of the evidence: either fragile or stable.
- Weather conditions which might affect the scene or evidence within.
- Scene management considerations which may alter or contaminate the evidence.
- Additional processing techniques that may need to be conducted at the scene with specialized personnel.

Appropriate equipment should be used when collecting evidence. Collection equipment that may come into contact with evidence should be sterile and/or unused. The following is an example of some of the equipment that may be used in the evidence collection process:

- Gloves
- Forceps
- Tweezers
- Scalpels
- Swabs
- Paper bags
- Envelopes
- Plastic bags
- Cardboard / plastic boxes
- Butcher paper
- Hand tools
- Containers with lids

6.3.2. EVIDENCE MARKING AND PACKAGING

All evidence collected at a crime scene, or received during a crime scene investigation, is inventoried and packaged prior to leaving the scene to prevent loss or cross-contamination. Proximal containers will be labeled with the item identifier.

6.4. LATENT PRINT EVIDENCE

Latent print development techniques will follow generally accepted methods and be determined by conditions at the scene. Factors to be considered may include, but are not limited to, environmental conditions, surface texture and compositions, matrix, availability of processing materials and the nature of the case.

An evaluation of scene processing in lieu of transporting to the laboratory should include considerations, such as possible damage or loss of latent print evidence during packaging and transportation, and the value of additional processing techniques available at the laboratory. The on-scene processing with fingerprint powders of items with non-porous surfaces, that may have latent print evidence which could easily and inadvertently be damaged during packaging and transport,

is encouraged. It is recognized that the determination to process items for latent print evidence at the scene versus transporting items to the laboratory for processing involves many factors and considerations. It is left to the discretion of the Specialist to determine and proceed with the most appropriate methods for the preservation and documentation of the evidence in each case.

Latent prints and elimination prints collected by Specialists are considered evidence and will conform to evidence marking, handling and storage requirements.

6.4.1. PHOTOGRAPHY OF LATENT PRINTS

Any developed latent print or visible ridge detail may be photographed before being lifted or packaged. A scale and case identifiers should be included in the photograph.

6.4.2. LIFTING OF LATENT PRINTS

Any developed latent or visible print which is on an appropriate surface for lifting should be lifted using tape and placed on an appropriately colored fingerprint card. The card should be marked with the case number, date, initials or name of specialist, location, and should include a sketch of the item or surface to indicate from where the lift was taken. Hinge lifters, gel-lifters and other methods of lifting may be used when deemed appropriate.

6.5. BIOLOGICAL EVIDENCE

Specialists may search a crime scene or individuals for suspected biological evidence (e.g., blood, semen, saliva). When suspected biological evidence is identified on an item, the entire item may be collected or a sample may be collected for biological analysis. In general, the preferred order of collection for biological evidence is:

- Entire item
- Cut the biological material out of the substrate (e.g., stain cutting from mattress)
- Swab biological material (swabbing)
- Scraping of biological material (usually bloodstains)

6.5.1. PACKAGING BIOLOGICAL EVIDENCE

Biological evidence items should be packaged in paper. Flakes of blood or scrapings are best packaged in paper bindles, then placed in a small envelope and sealed. Swabs are best packaged in their own container (e.g., plastic end covers, paper sleeves, etc.) then placed into another outer envelope or bag.

6.5.2. BIOLOGICAL EVIDENCE COLLECTION

The swabbing collection technique is the most common recovery method of biological evidence in a dried or liquid state. Best practice techniques include the following:

Dried Material Collection Technique

1. With gloved hands, slightly moisten the swab with distilled water. The swab should be damp but not overly wet.

2. Thoroughly rub the stained area using a single moistened swab for a small stain and multiple swabs for a large stain. When only a small amount of the stain is available, concentrate as much of the stain as possible on the tip of the swab.

3. Package swab with plastic end covers or small envelope.

Liquid Material Collection Technique

1. When suspected biological evidence is found on clothing or other absorbent surfaces, transport it to the FSU in an appropriate container. Use paper wrapping (e.g., butcher paper, paper bags, etc.) to prevent contamination during the transfer. This will protect bloodstain patterns and prevent cross-contamination between stains on one item. The item should be air-dried thoroughly in a drying locker and packaged in a container suitable for dried evidence.

2. If the suspected biological evidence is in a liquid form on a fixed surface that cannot be transported (e.g., concrete floor), the substance should be recovered using the following collection techniques:
   - Swab
     1. With gloved hands swab the liquid material, allowing the swab to absorb as much of the substance as possible.

Multiple swabs should be obtained when a large quantity is available.

2. Package the swab inside an appropriate container.
3. Collect a substrate/control sample from an unstained area using the same techniques, when needed.

- Pipet

1. With gloved hands, pipet the liquid material into a container to collect as much of the substance as possible.
2. Properly package the container (e.g., padded manila envelope).

6.5.3. BIOLOGICAL EVIDENCE DOCUMENTATION

Each separate area sampled on one item should be given a unique identifier and packaged separately. (For example, one sample from a gun grip is packaged in a small envelope, labeled "A". One sample from the gun trigger is packaged in small envelope, labeled "B". The two individual small envelopes ("A" and "B") can be packaged together in one large envelope and be given one derivative item number) Label the outer packaging with a complete description of the contents and seal with tape.

6.5.3.1. BLOOD EVIDENCE

Presumptive Testing for Blood

Phenolphthalein and Hemastix Reagent Strips are presumptive blood testing methods that may be used at crime scenes. Refer to the manufacturer's instruction for procedure. Presumptive test results for stain(s) and controls (positive and negative) are recorded in case notes. When a bloodstain is in very limited quantities, it is not necessary to perform a presumptive test prior to collection.

Bloodstain Collection

If the stain is wet, allow it to air dry OR swab the stain and allow the swab to air dry. Each swab package should be labeled with case number, item #, stain # (if applicable), initials and date. Avoid cross contamination.

6.5.3.2. CONTACT DNA EVIDENCE

Method of Collection

1. Collect the entire item or
2. Swab the item

6.5.4. USE OF ALTERNATIVE LIGHT SOURCE TO AID IN STAIN IDENTIFICATION

6.5.4.1. SCOPE

This procedure covers the use of an ALS to help locate possible stains of biological origin and/or fingerprints for collection, additional testing and identification.

6.5.4.2. BACKGROUND

An alternate light source (ALS) may be used to facilitate the visualization and detection of body fluids (e.g. saliva, semen, sweat or urine) and/or fingerprints at a crime scene. Upon illumination by the ALS at a specific wavelength, a biological stain and/or fingerprint may emit fluorescence which can be observed. Following collection, stains can be further characterized through presumptive and/or confirmatory testing. Fingerprints can be developed/enhanced, documented and/or collected for possible identification.

6.5.4.3. SAFETY PRECAUTIONS

1. Wear personal protective equipment (e.g., lab coat, gloves, mask, eye protection) when carrying out standard operating procedures.
2. Use ALS in a dark room.

3. Goggles must be worn when viewing items under ALS.
4. Never point the ALS directly at the eyes or skin.
5. All evidence can potentially contain biological fluids. Therefore, all evidence must be treated as a biohazard and the appropriate precautions observed.

6.5.4.4. MATERIALS REQUIRED

1. ALS
2. Colored Goggles (orange, red, or yellow depending on the Head Assembly)

6.5.4.5. STANDARDS AND CONTROLS

- The Positive and Negative Controls are tested prior to use. These results will be recorded in casework documentation.
- A black latent lift card with fluorescent powder is tested as a Positive Control. This control should exhibit a fluorescent glow when viewed between the 254 nm and 525 nm wavelengths with orange goggles.
- A clean, black latent lift card is tested as a Negative Control. This control should not exhibit a fluorescent glow when viewed with the same wavelength selected for the positive control and with orange goggles.

6.5.4.6. PROCEDURE

1. Attach the Head Assembly. (Wavelength selection should be based on the possible substrate and/or evidence suspected (i.e. body fluids/fingerprints) and should be indicated in case notes. If unsure of substrate/biological fluid, go through all wavelengths available.)
2. Plug ALS into power outlet.
3. Darken the room completely.
4. Put on appropriate goggles.
5. Press the On/Off button to activate the ALS (located on the back of the ALS unit).

6. Search the items/areas for fluorescence of possible biological fluid stains (e.g. fingerprints, saliva, semen, sweat, or urine). **NOTE: Be aware that blood will not fluoresce; however, it may appear as a darker area when viewed with the ALS.**
7. Vary the intensity of the light emitted using the intensity turn knob.
8. Vary the angle and distance of the light source in relation to the items/areas being search.
9. Repeat the search with an alternate wavelengths as appropriate.
10. Mark any fluorescent areas using tape, marker or some other identifier for further testing.
11. When the examination is complete, turn off the ALS, remove assembly head and place in appropriate drawer, and unplug the ALS.

6.5.5. COMMENTS

Insufficient sample quality and/or quantity could limit the development of a positive reaction.

It should be noted that there are a variety of body fluids and substances which also fluoresce under the alternate light source. This procedure is an effective tool for locating stains to be more thoroughly tested and either included or eliminated as possible sources of DNA.

6.6. TRACE EVIDENCE AND FIRE SCENE EVIDENCE

6.6.1. HAIR AND FIBER EVIDENCE

Methods of Collection

1. Tape Lifts
   - Examples include Lint Rollers/sheets, tape, gel lifts, etc.
2. Hand Picking
   - Use tweezers or similar tool to collect trace evidence. This technique should be used when the evidence can become dislodged or lost in transit. Small trace items may be packaged in bindles, tape/gel lifts, or suitable enclosed container to prevent loss.

6.6.1.1. TRACE EVIDENCE (Hair, fibers, paint, metal fragments, vegetation, etc.)

When a Specialist encounters obvious items of trace evidence, it should be documented and recovered immediately thereafter depending upon the conditions at the scene and stability of the item of evidence.

Specialists will attempt to recover trace evidence at a crime scene, from a person, or from evidence recovered at the scene. If trace evidence is found, it should be photographed in place, and documented in the Forensic Specialist's laboratory notes to include the following:

- The location that the evidence was recovered from
- The type of material
- The amount of material, or if only a sample was taken
- The condition of the evidence, (i.e. wet, powder, etc.)
- If controls or standards are obtained, the location should be documented

Forensic Services personnel should use the following sequence as a guide to search for and collect trace evidence:

- Visual – Search using available light, oblique lighting using hand held lights, and alternative light sources. If trace evidence is observed the evidence can be retrieved with forceps or with gloved fingers. Care should be taken to prevent damage or stretching of the evidence during the retrieval process.
- Adhesive Lift – An adhesive bearing substrate such as tape can be firmly patted over areas suspected of containing trace evidence causing the material to adhere to the sticky surface. Do not overload the tape. Tape lifts are typically placed on a transparent backing (clear plastic sheet). This protects against contamination and permits samples to be easily viewed.
- Paper bindle or container – A paper bindle or container can be utilized to collect the trace evidence.

6.6.2. FIRE SCENE EVIDENCE

Method of Collection and Packaging

- Use collection containers that are air tight and appropriately sized for the evidence they will contain.
- Cans and heat sealed bags appropriate for fire debris should **only be filled up to 75% or less** to allow for air space. Avoid cross contamination.
- Cans are preferred for objects that have sharp edges.
- Heat sealed bags can be used for bulky or soft sided objects.
- Glass jars with Teflon lids may be used to collect approximately 2 mL of questioned liquid.

Additionally, where possible, collect an unburned control sample of the same material for comparison purposes. Typically, these control samples will be found under furniture and in areas protected from fire.

6.7. SHOE IMPRESSION EVIDENCE

A subject may be associated to a crime scene by impressions left behind by the subject's footwear. A comparison of the crime scene impressions/imprints can result in the identification of a shoe. Impressions can be found in soil, on counters, tile floors, doors, paper, etc. The evidentiary value of a comparison usually depends upon the quality of the impression and the manner in which it was recorded and collected.

6.7.1. Photography of Shoe Impression Evidence

As with all evidence, overall photographs should be taken showing the impressions/imprints in relation to other features of the scene. Photography is a valuable way of collecting impression evidence for later comparison.

It is critical that distortions are minimized by adhering to the following:

- The scale should be at the same level as the pattern for proper focus. Care should be taken not to cover any part of the impression.
- It is recommended to take multiple photos of each impression of interest with a detachable flash or flashlight at an oblique angle and from several positions.
- The photographs should contain identifiers in addition to a scale.

- The camera should be directly over the impression (on a tripod) with the film plane parallel to the impression.
- The entire impression should be captured in one frame; fill the frame with the impression and scale. Note that overlapping photos may be taken for best digital resolution.

6.7.2. CASTING SHOE IMPRESSION EVIDENCE

After photography, casting may be performed to document the impression in 3-D form. The decision to cast is affected by the soil conditions. Impressions in fine soil are candidates for casting. Coarse and rocky soils are sometimes not good candidates for casting.

Method for Casting Shoe Impressions

1. To make a cast, add the appropriate amount of water to the bag and close the top. The bag containing the casting powder can be used to mix and pour the casting material.
2. Follow the mixing instructions on the label of the casting material for best results.
3. Pour casting material outside the impression and direct flow evenly into the impression. If the casting material does not flow completely into the impression, the top surface of the casting material may be agitated to help it flow.
4. The cast should be marked with case information: case number, item number, date, initials, and if needed, orientation. Do not remove any soil adhering to the cast after recovery. Package cast in a cardboard box to protect against breakage and to allow for continued drying of casting material.

6.7.3. LIFTING SHOE IMPRESSION EVIDENCE

Residue and/or impressions in dust are best collected by lifting, or by collecting the entire item.

Lifting Methods

- Gelatin Lifters: black gel lifters are recommended for dust impressions
- Electrostatic dust lifter / Stat-lift: follow manufacturer instructions.
- Tape/adhesive lift: used for powdered impressions

6.7.4. ENHANCING SHOE IMPRESSIONS

All impressions should be photographed first before enhancement is attempted.

6.7.4.1. SHOE IMPRESSIONS IN BLOOD

Chemicals may be used to enhance imprints in blood. Examples are Leuco crystal violet (LCV), Amido Black, and Blue Star®.

6.7.4.2. WET RESIDUE OR GREASE/OIL IMPRESSIONS

Impressions of light grease or oily substances may be enhanced with the use of standard fingerprint powder.

6.8. TIRE AND TRACK IMPRESSION EVIDENCE

A comparison of the crime scene impressions may result in the identification of a tire or track. Impressions can be found in soil and other surfaces and substrates. The evidentiary value of a comparison usually depends upon the quality of the impression/imprint and the manner in which it was recorded.

6.8.1. PHOTOGRAPHY OF TIRE IMPRESSION EVIDENCE

The procedures described for the photography of shoe impression evidence should be applied, with the following additional considerations:

- A series of overlapping photos should be taken with a measuring tape in place for re-creation of the track(s).
- The photos should be taken with the camera lens parallel to the track.
- The scale should be next to the track, not covering the track, and if possible on the same plane as the bottom surface of the track.
- A minimum of 8 feet of tire track should be photographed, if possible.
- A high birds-eye photograph may assist in reconstructing movement.

6.8.2. CASTING OF TIRE IMPRESSION EVIDENCE

The procedures described for the casting of shoe impression evidence should be applied, however the casts will be much larger, therefore a greater amount of casting material is recommended.

6.8.3. OTHER RESIDUE TIRE IMPRESSIONS

Tire impressions may result from a deposit/transfer of material such as dirt, mud or oil. These impressions should be photographed, and a lift may be attempted with casting material.

If an impression is made on a physical item, submit the entire item if possible.

Tire impressions in blood should follow the enhancement techniques outlined for the enhancement of shoe impression evidence.

6.8.4. TRACK MEASUREMENTS

The **track width** of a vehicle is the distance between the center of the tire mounted on one side to the center of the tire on the opposite side (the front and rear wheel widths may be different).

The **wheelbase** of a vehicle is the distance between the center of the front axle to the center of the rear axle.

If possible, collect the measurements of the track width and the wheelbase.

6.9. TOOL MARK EVIDENCE

A tool mark is any impression, scratch, gouge, cut or abrasion made when a tool is brought into contact with an object leaving a mark.

6.9.1. PHOTOGRAPHY OF TOOL MARK EVIDENCE

Overall and close-up photographs should be taken of the tool mark. Examination quality photographs should include a scale. Photographs should show item number and orientation.

6.9.2. MEASUREMENTS OF TOOL MARK EVIDENCE

Measurements should be taken to document the tool mark in relationship to the ground and/or other fixed objects.

6.9.3. CASTING OF TOOL MARK EVIDENCE

If possible, submit the entire item that has the tool mark on it. If an item cannot be submitted for tool mark examination, a cast should be made using a flexible casting material such as Mikrosil. Casting should be properly packaged.

Tool marks and tools should be packaged separately and in a way to prevent any additional damage from occurring.

6.10. FIREARM EVIDENCE

Treat all firearms as if they are loaded. Firearms should be rendered safe before transporting or processing.

Firearms should be rendered safe before being handled by a Specialist.

Nomenclature:

- This terminology will be used to describe all firearms evidence in notes and reports.

- **Cartridge:** A single unit of ammunition consisting of the case, primer, propellant and projectile(s). The description of a cartridge should include the manufacturer and cartridge designation. This information is normally stamped on the head of the cartridge (i.e., one Winchester-Western .38 Special cartridge). The description of the cartridge may also include a description of the bullet (i.e., one Winchester-Western .38 Special cartridge with a round nose, lead bullet).

- **Bullet:** A bullet is a non-spherical projectile for use in a rifled barrel. The shape of a bullet may be included in its description (i.e., round nose, wadcutter, semi-wadcutter, hollow point, etc.). A description of the outer surface of a bullet may be included in this description (i.e., lead, copper coated, semi-jacketed, full metal jacket, etc.). When a cartridge is fired, a fired cartridge case is generated. Its description should include the manufacturer and the cartridge designation (i.e., one Winchester-Western .38 Special fired cartridge case, one Federal .25 Auto fired cartridge case, one Remington 9mm Luger fired cartridge case, etc.). Do not use "slug" for bullet. Do not use "spent" for fired. Do not use "live round" for cartridge. Do not use "casing" for cartridge case.

- **Shot Shell:** A cartridge containing projectile(s) designed to be fired in a smooth bore, shoulder firearm. This can also be a sabot type slug rounds fired in a rifled shotgun barrel. The designation of a shotshell should include the manufacturer and gauge (i.e., one Remington 12 gauge shotshell). The description of a shotshell may include a description of the projectile(s) (i.e., one Federal 20 gauge shotshell with #6 shot, one Remington 12 gauge shotshell with a rifled slug, etc.). **Shot** are small spherical projectiles loaded in shotshells.

- **Column Wad:** A column wad is a wad between the powder and projectile(s). A cup wad is a separator between the powder and projectile(s) of very shallow cup design. When loaded with lips down, a cup wad acts to help seal powder gases and thus protect the rear of the shot column. A shot protector wad is a plastic cup designed to hold the shot and thus reduce shot deformation during barrel travel. A shot collar is a plastic or paper insert surrounding the shot and thus reducing shot deformation during barrel travel.

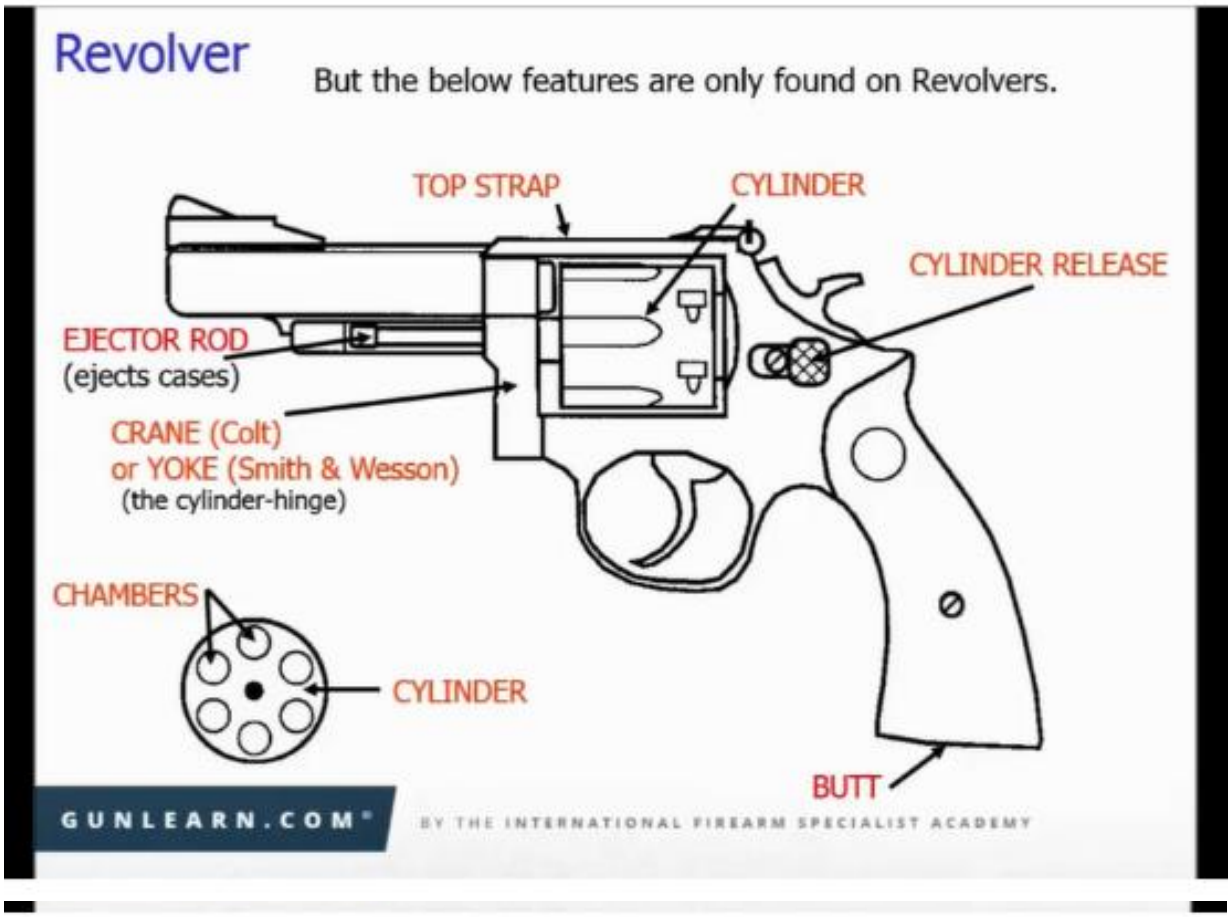
Unloading Firearms:

- Request assistance from a member of EPD Range Staff or an EPD Officer who is familiar with the particular weapon. If nobody is available, see below for rendering a weapon safe. **NOTE:** The Supervisor of the Firearms Training Unit may be called anytime day or night to arrange for a firearms expert to assist with the investigation.

- Due to the immense variety of firearms, it is impossible to describe the proper method to disarm each type of weapon. The following section lists procedures that work safely for unloading many weapons; however, it is by no means all encompassing. In some circumstances i.e. Officer involved shootings, homicides, and assault with a deadly weapon, it may be safer to transport the weapon as found rather than attempting to unload it.

- When handling any firearm, upon picking it up, it should immediately be pointed in a safe direction and your finger should remain off of the trigger. A safe direction is a location where, if the firearm were to fire, the projectile would not impact a living organism and there is a little likelihood a ricochet could occur and strike a living organism.

Revolvers:

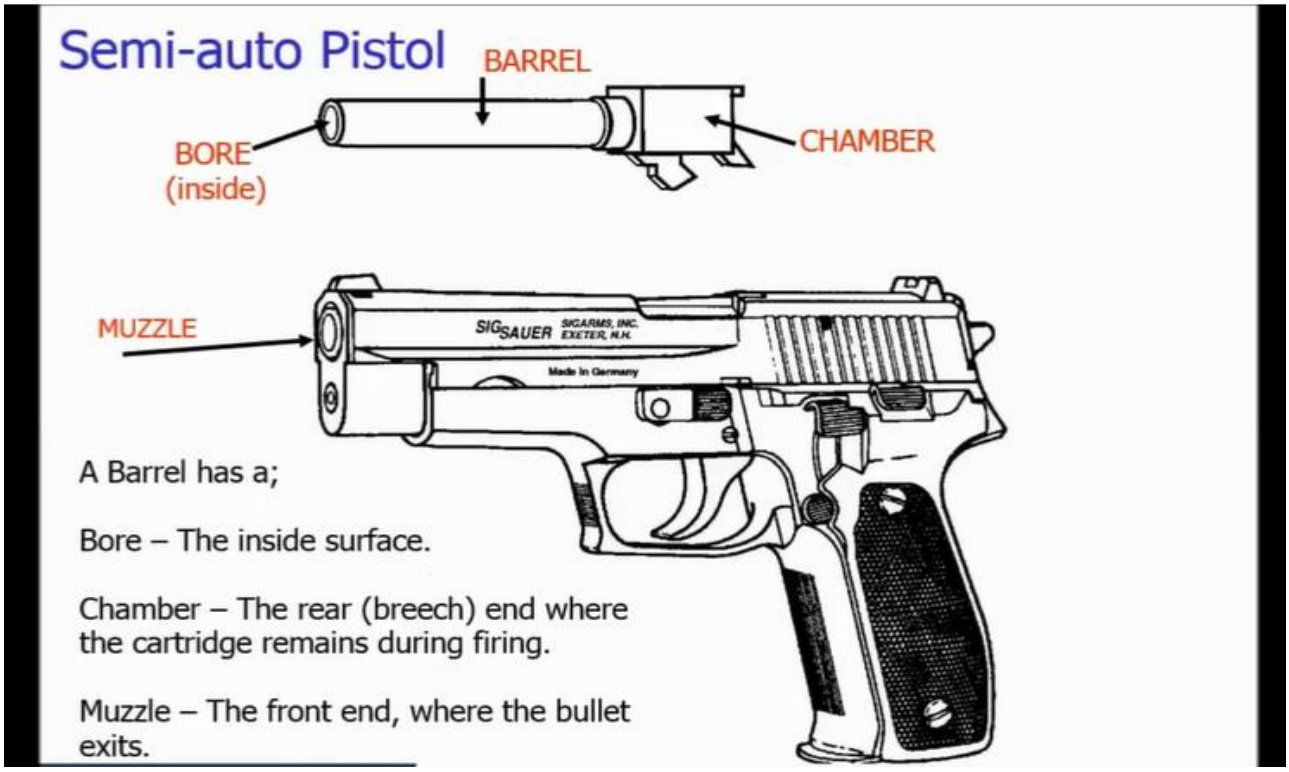


- **Point the firearm in a safe direction and keep your finger off the trigger.**
- If cocked, place thumb on the hammer and carefully press the trigger, allowing the hammer to move slowly forward. (Caution: the hammer is under spring tension. Be ready for the hammer to be forced toward the firing pin. Keep fingers out of the space between the hammer and firing pin.) Ease the hammer down to its resting position.
- Mark the position of the cylinder by drawing a line along both sides of the top strap.
- Open the cylinder for unloading.
- Always photograph the cylinder in the orientation found, and prepare a drawing and make notes about the position of every fired and unfired cartridge. Number the cylinder position in a clockwise fashion from the hammer position as viewed from the rear of the firearm.

- Always place the cartridges or fired cartridge cases in individual containers that are numbered to correspond to the respective chambers from which they were removed. These items should be handled in a manner to preserve any trace or fingerprint evidence. The cartridges should then be packaged together in a paper bag, envelope, or cardboard box. Place identifying information on this packaging.

- Place the firearm in an appropriate package and mark the package with identifying information.

Semiautomatic Handguns:



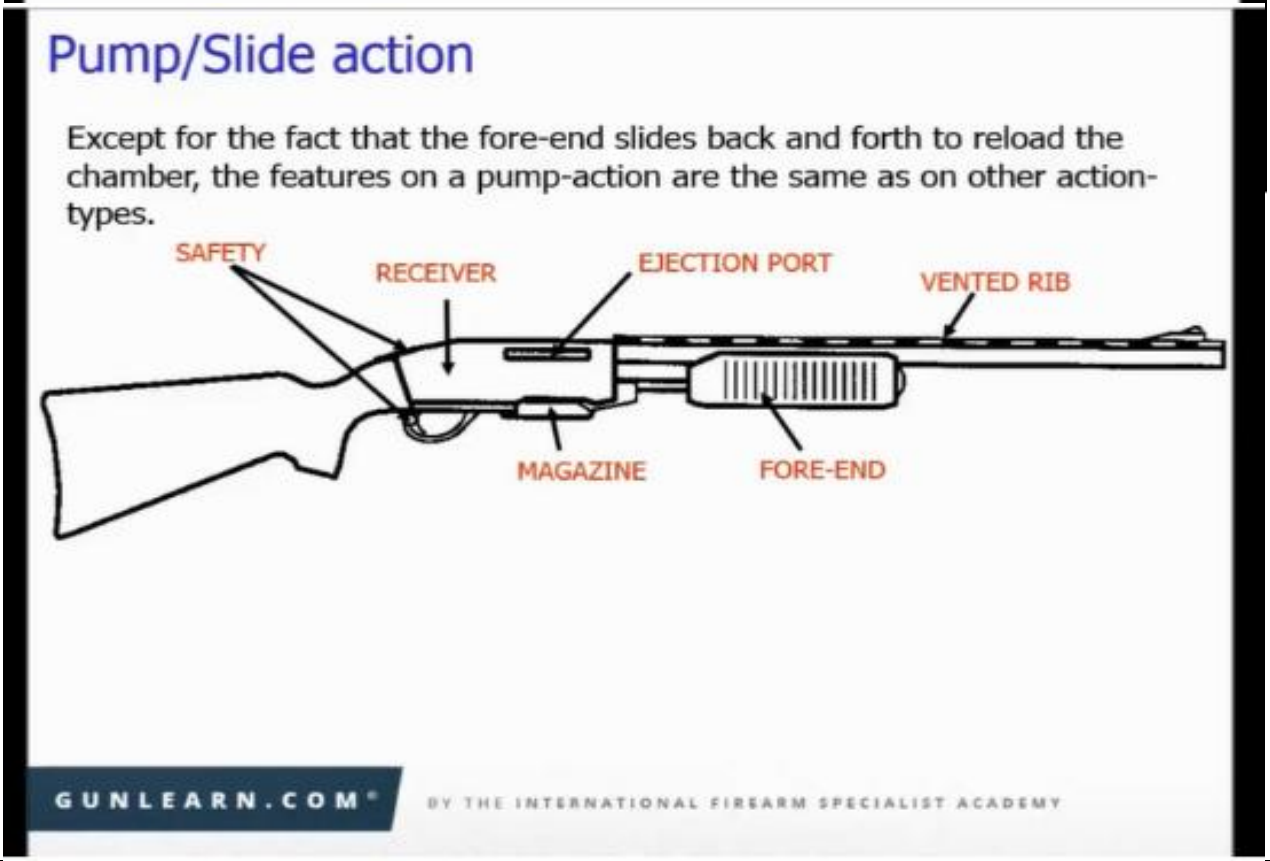

Semi-auto Pistol
For manually locking the slide to the rear.
SLIDE CATCH LEVER
FRAME
TRIGGER
DECOCKING LEVER
For safely de-cocking the hammer.
GUNLEARN.COM®
BY THE INTERNATIONAL FIREARM SPECIALIST ACADEMY

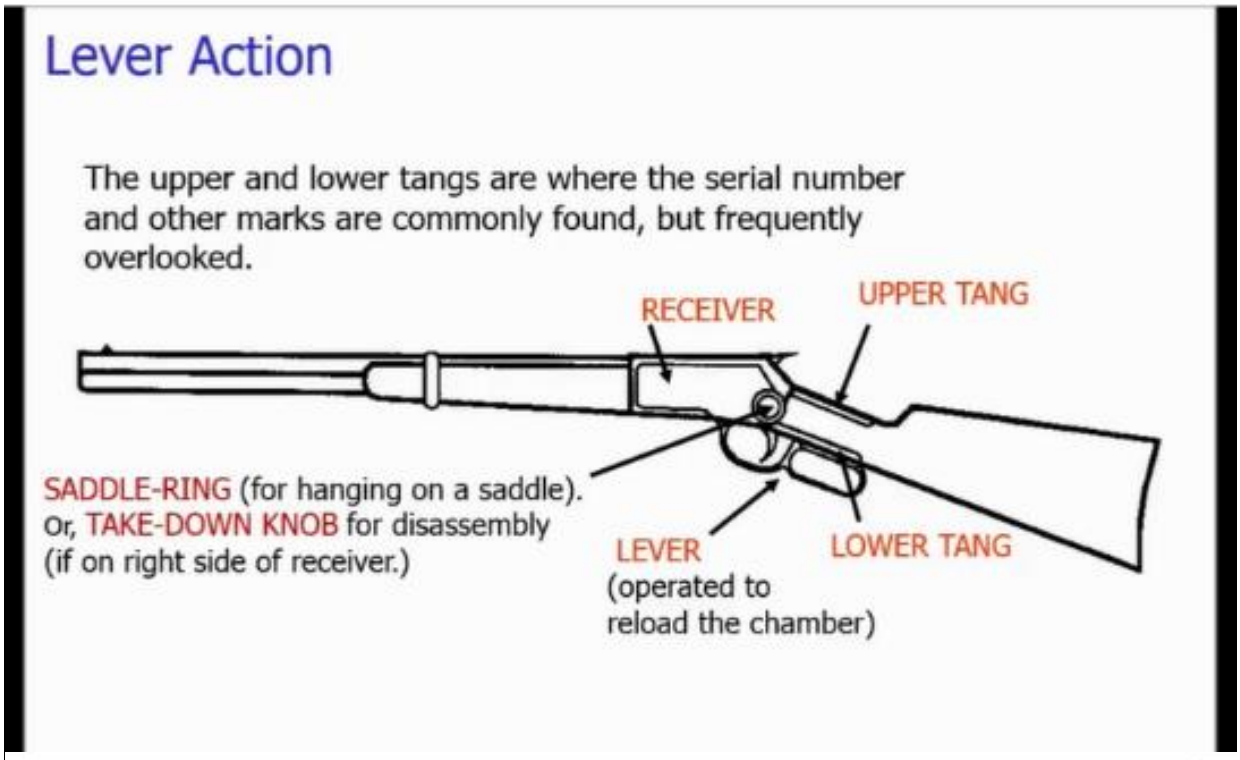

Semi-auto Pistol
Includes the breech-face and encases the barrel.
SLIDE
Empty cases are ejected here during firing.
EJECTION PORT
HAMMER
Strikes the firing-pin.
TAKE-DOWN LEVER
Enables disassembly of the gun.
GUNLEARN.COM®
BY THE INTERNATIONAL FIREARM SPECIALIST ACADEMY

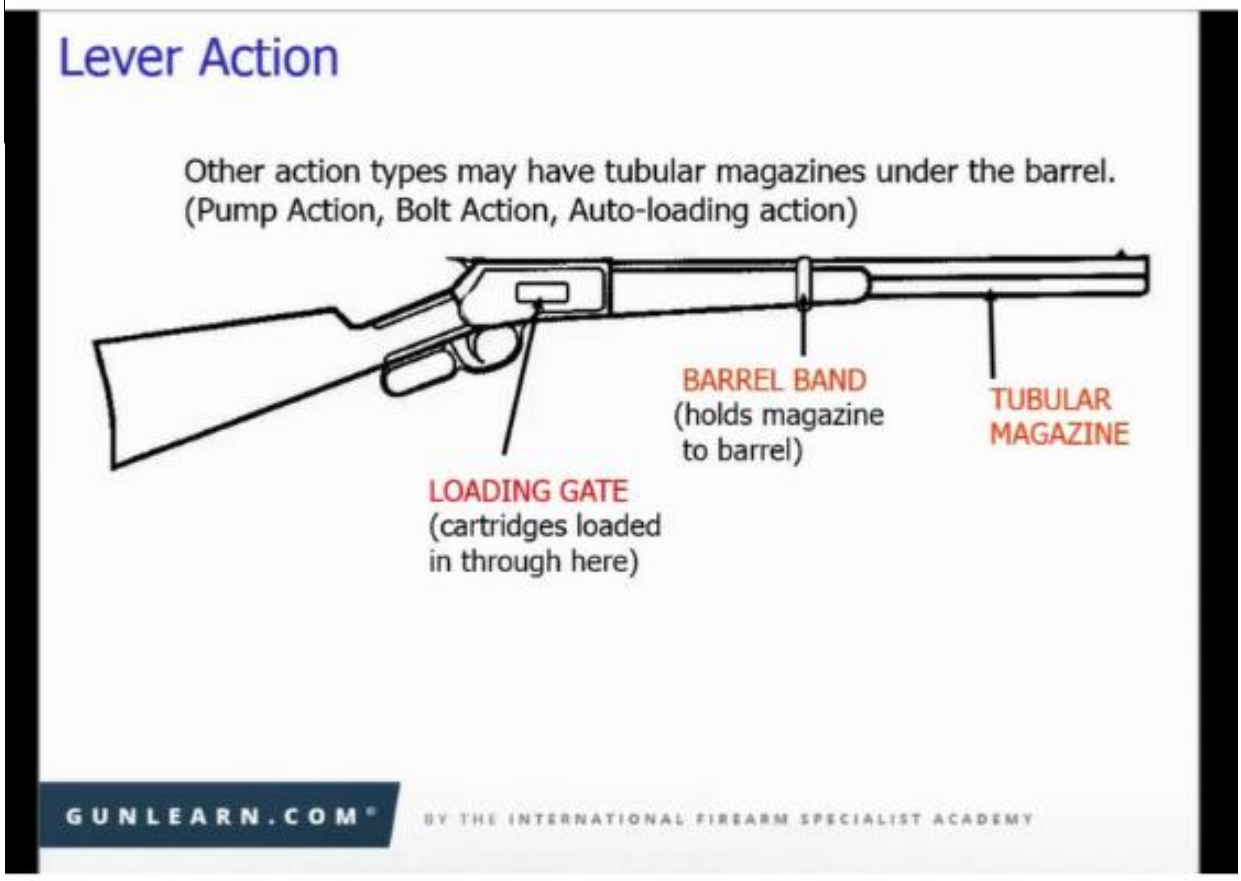
- **Point the firearm in a safe direction and keep your finger off the trigger.**

- These are often found cocked with an intact cartridge in the chamber.
- Place the safety, if present, in the "safe" position. (Caution: some semiautomatic pistols will "decock" when a cocked weapon is placed on "safe." DO NOT place fingers between exposed hammer and slide mechanism).
- Remove the ammunition magazine by depressing the magazine release and pulling the magazine from the pistol. Handle the magazine so as to preserve latent fingerprints and trace evidence. DO NOT remove ammunition from the magazine. NEVER unload the ammunition from the magazine through the mechanical action of the firearm.
- ONLY WHEN THE MAGAZINE HAS BEEN REMOVED should the cartridge be removed from the chamber. If the magazine is in place, removing the chambered cartridge will result in re-chambering a cartridge from the magazine. If the magazine cannot be removed, make the weapon as safe as possible and transport to a qualified firearms expert.
- When the magazine has been removed, eject the chambered cartridge by pulling back on the slide mechanism. (Note: the slide mechanism is under spring tension. Do not place fingers or other objects in the open action.) If present, a slide lock may be engaged to lock the slide action open. VISUALLY INSPECT the receiver to insure that any cartridge has been ejected.
- DO NOT TRY TO CATCH THE CARTRIDGE AS IT COMES OUT OF THE CHAMBER, ALLOW IT TO FALL, PREFERABLY ONTO SOMETHING SOFT SUCH AS A JACKET, TOWEL, ETC.
- Package the firearm (safety lying on, any external hammer down) in a suitable paper bag, envelope, or cardboard box. Place identifying information on the packaging.
- The magazine and cartridge from the chamber should be placed in separate containers (i.e., envelopes) and then packaged together, separate from the firearm. Place identifying information on the packaging.

Single Shot, Double Barrel, Pump Action, Break-open and Lever Action Shotguns and Rifles:




Lever Action
The upper and lower tangs are where the serial number and other marks are commonly found, but frequently overlooked.
RECEIVER
UPPER TANG
SADDLE-RING (for hanging on a saddle).
Or, TAKE-DOWN KNOB for disassembly
(if on right side of receiver.)
LEVER
(operated to reload the chamber)
LOWER TANG


Lever Action
Other action types may have tubular magazines under the barrel.
(Pump Action, Bolt Action, Auto-loading action)
BARREL BAND
(holds magazine to barrel)
TUBULAR MAGAZINE
LOADING GATE
(cartridges loaded in through here)
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- **<u>Point the firearm in a safe direction and keep your finger off the trigger.</u>**

- If an exposed hammer is cocked, use sound gun safety by pointing the weapon down in an appropriate location, place thumb on the hammer and carefully release the trigger. (Caution: the hammer is under spring tension. Be ready for the hammer to be forced toward the firing pin. Keep fingers out of the space between the hammer and firing pin.) Ease the hammer down to its resting position.

- If a safety is present, place in the "safe" position.

- With any exposed hammer un-cocked, the weapon may be opened for inspection, and the cartridge(s) / shotshell(s) removed from the chamber(s). These items should be handled in a manner to preserve any trace or fingerprint evidence. Package and identify appropriately.

- Remove any cartridges / shotshells from the magazine. These items should be handled in a manner to preserve any trace of fingerprint evidence.

- **Avoid unloading these cartridges / shotshells by working them through the action.**

- Independently package cartridges / shotshells and prepare notes according to the respective position of the cartridges / shotshells in the magazine.

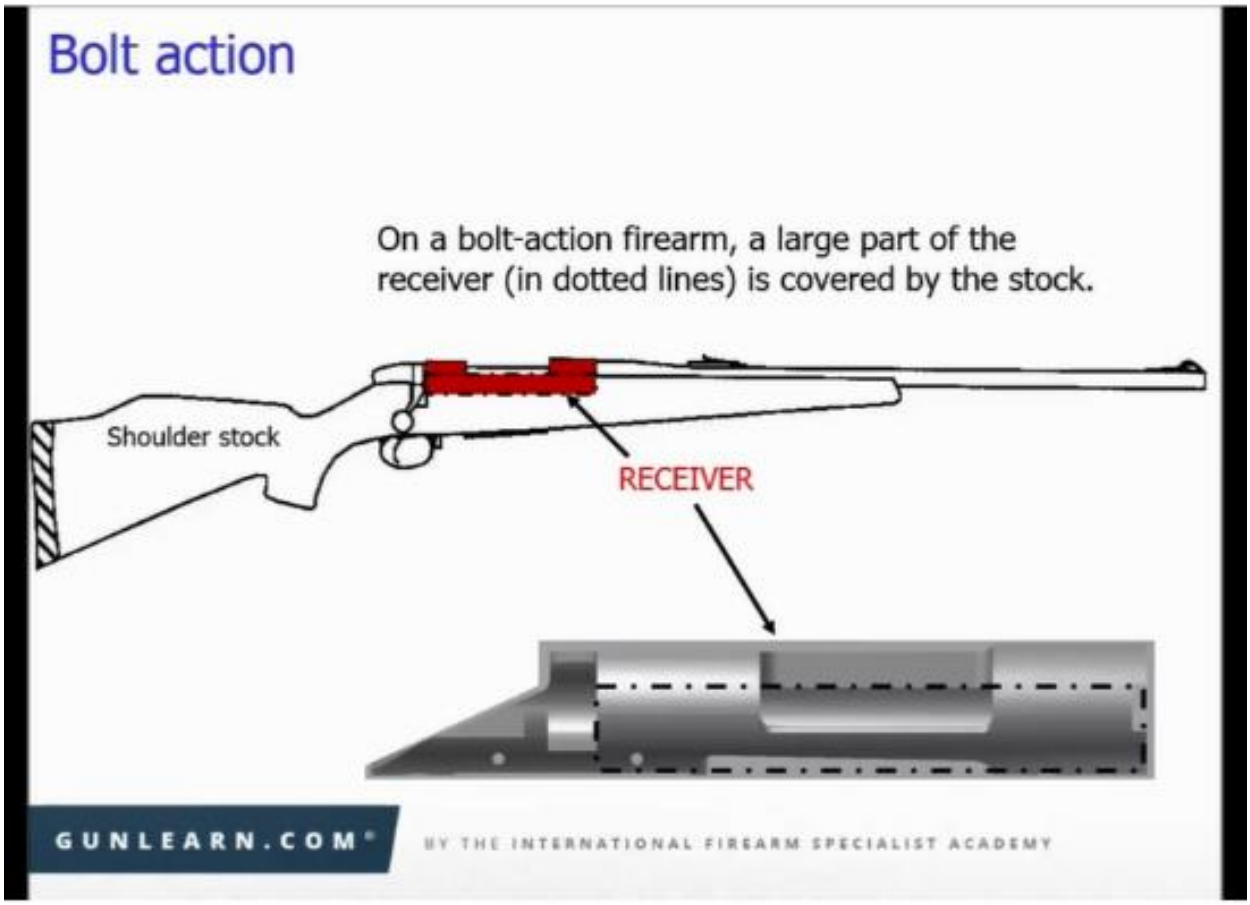
- Cartridges and shot shells should then be packaged together, but independent from the firearm for submission.

- Place the firearm in an appropriate package, and mark the package with identifying information.

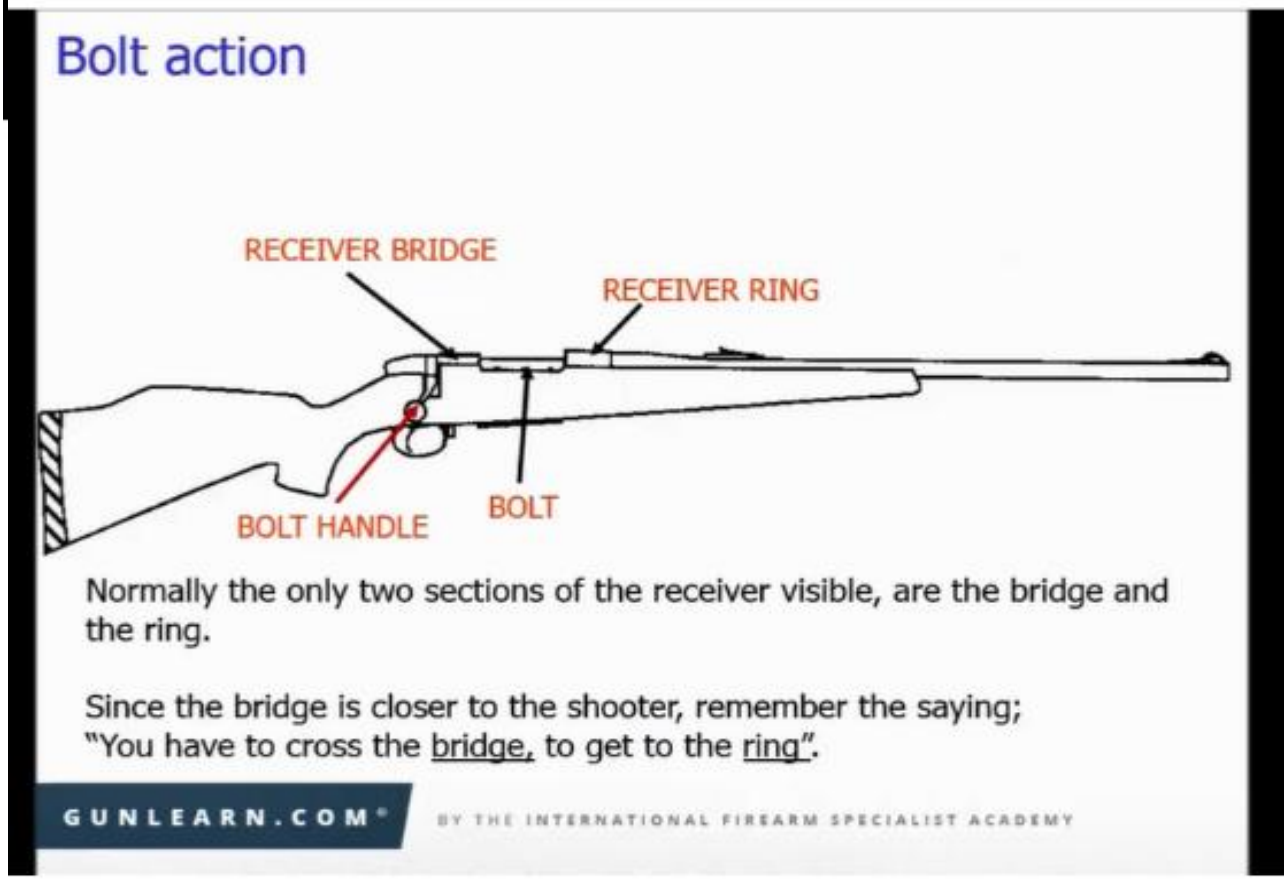
Semiautomatic Rifles/Shotguns:

- These are often found "cocked" with a cartridge in the chamber.
- Place "safety" on and remove the magazine. If the magazine is fixed cartridges can be manually removed from the tubular magazine.
- **Avoid unloading these cartridges / shotshells by working them through the action.**
- ONLY WHEN THE MAGAZINE HAS BEEN REMOVED OR THE CARTRIDGES / SHOTSHELLS HAVE BEEN REMOVED FROM TUBULAR MAGAZINES may you remove the cartridge from the chamber. (If the magazine is in place, removing the chambered cartridge will result in rechambering a cartridge from the magazine.) If the magazine / cartridges / shotshells cannot be removed, make the weapon as safe as possible and transport to a qualified firearms expert.
- When the magazine / cartridges / shotshells have been removed, eject the chambered cartridge by pulling back on the bolt. (Note: the bolt is under spring tension. Do not place fingers or other objects in the open action.) VISUALLY INSPECT the receiver to insure that any cartridge / shotshell has been ejected.

Bolt Action Rifles and Shotguns:




Bolt action
The rest of the features on this action-type are standard with other action-types.
REAR SIGHT
FRONT SIGHT
BARREL
MUZZLE
MAGAZINE FLOOR PLATE
TRIGGER
TRIGGER GUARD
MAGAZINE RELEASE


Bolt action
RECEIVER BRIDGE
RECEIVER RING
BOLT HANDLE
BOLT
Normally the only two sections of the receiver visible, are the bridge and the ring.
Since the bridge is closer to the shooter, remember the saying;
"You have to cross the bridge, to get to the ring".
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- **<u>Point the firearm in a safe direction and keep your finger off the trigger.</u>**
- Remove the magazine. Handle to preserve fingerprints or trace evidence.
- If unable to remove the magazine, remove cartridges / shotshells from the magazine. These items should be handled in a manner to preserve any trace or fingerprint evidence.
- Independently package magazine / cartridges / shotshells. If cartridges / shotshells have been removed from the magazine, prepare notes according to the respective position in the magazine.
- Slide the bolt to the rear, ejecting the chambered cartridge / shotshell. VISUALLY INSPECT the receiver to insure that any cartridge / shotshell has been ejected. Package this item separately from the other cartridges / shotshells and identify appropriately.
- Cartridges and shot shells should be packaged together, but independent from the firearm for submission.
- Place the firearm in an appropriate package and mark the package with identifying information.

General notes on firearms:

- Never clean or fire a gun before submission to the Crime Lab.
- Do not work the mechanism, except to unload a chambered cartridge.
- Never strip (take apart) a gun.
- There may be an impression in grease on the breechblock face that corresponds with the head stamp of the last cartridge case base, which was pressed against it.
- Rough handling may dislodge trace evidence and debris from rifling.
- Never place an object inside the barrel.

6.10.1. DOCUMENTATION AND COLLECTION OF FIREARMS

Inspect the weapon and only collect trace evidence that will be lost in transportation. Do not put anything down the barrel or into the trigger guard. Handle the weapon to avoid destruction of latent print evidence.

Documentation

After collecting the weapon, document the make, model, caliber, serial number, and whether it is loaded/unloaded.

Note: a qualified official, such as the scene officer or investigator, should ensure the weapon is safe before handling, and should be responsible for the unloading process.

If the weapon is a revolver, document the position of the cylinder. This is done by marking on the cylinder on both sides of the back strap before opening. If bullets are removed, you may document the order and position in the cylinder and package in separate envelopes or boxes with identifiers which correspond to their locations.

Depending on the circumstances of the case, a weapon should be handled in one of two ways after the **firearm is pointed in a safe direction with your finger off the trigger**:

1. If the weapon has a removable magazine and is in need of processing, any ammunition still in the magazine should be left in place and the magazine and ammunition packaged separately from the firearm.

2. If the weapon has a removable magazine where the ammunition is not in need of processing, the magazine should be emptied and packaged with the firearm. The ammunition should be packaged separately from the firearm and magazine.

Packaging

Secure the unloaded weapon, with the action open inside a box to prevent movement and with the muzzle direction indicated on the outside of the box. If a box does not contain the appropriate markings (muzzle this end), it must be marked appropriately before booking the item in to the Property and Evidence Division. If the Specialists do not feel qualified to determine the aforementioned conditions they should ask the scene officer to do so. Labeling and or tags on the package should not be on the muzzle end.

6.10.2. BULLETS AND FLIGHT PATH EVIDENCE

Locations of bullets and/or casings should be documented and photographed. In most cases it is best to handle each bullet or casing as a separate item for the purposes of documentation, collection and packaging. For a cluster of casings, packaging them together is acceptable.

Bullets and casings should be packaged with consideration to prevent further damage and/or loss of trace evidence if applicable.

Flight paths may be documented using lasers, rods and/or string methods. The results may be documented by photography and/or by diagram.

6.11. EXIT PROCEDURES

- Conduct a final walkthrough
- Discuss final search needs and any other needs jointly with all personnel for completeness, i.e.:
  - Have you gone far enough in the search for evidence and documentation?
  - Have certain experts been considered for assistance at the scene before it is released (i.e., blood pattern analysts)?
- Contact investigative personnel to brief them on findings and verify if they need a final walk-through.
- Check to insure all evidence is accounted for before departing scene.

- Insure all equipment used in the search is cleaned and gathered.
- Pick up and remove all the trash generated during your search.
- Insure that photographs or video are taken of scene showing final condition after completion of search
- Assure that Specialists are logged out of the crime scene.

6.12. AUTOPSIES

Specialists are requested to attend autopsies. During the autopsy, it is the responsibility of the Specialist to document and collect / receive items of evidence. The Specialist may document the autopsy in the following ways:

- **Photography** – Refer to subject processing photography. This should also include photographs of x-rays, injuries, insects, stages of decomposition, mucus membranes, and any photographs requested by the Medical Examiner or Detective.
- **Evidence collection** – Refer to evidence collection section above. Items of evidence may be collected by the Medical Examiner and then released to the Specialist. Other items, such as fingernail scrapings, major case prints, and oral reference swabs are collected by the Specialist. Please discuss with the Medical Examiner the process for collection / receipt of evidence.

There is a checklist available to assists with the processing of an autopsy. Autopsy Guideline

7. WORKSHEETS

There are multiple worksheets which may be used as notes to document crime scene investigation activities. They are found here:

Crime Scene Forms

8. REFERENCE PROCEDURES

M01 Quality Assurance Manual
M03 Latent Print Development Technical Procedures Manual
M04 Latent Print Analysis Technical Procedures Manual
M05 Safety Manual

9. REFERENCES

Refer to Section 14 – References in the Quality Assurance Manual.

10. REVISION HISTORY

Refer to the QA11 Document Control for revision information.