

HAND & POWERED TOOLS PROGRAM

PURPOSE / SCOPE

Tools are such a common part of our lives that it is all too easy to forget that they may pose serious hazards. As an employer, Winger Companies, herein referred to as Winger, is responsible for the safe condition of tools and equipment used by employees. Employees must learn to recognize the hazards associated with different types of tools and the safety precautions necessary to prevent those hazards from occurring. Our employees also have the responsibility of properly using and maintaining those tools.

BASIC SAFETY PRECAUTIONS

- ✚ Our employees will be trained in the use of all required tools. They should understand any potential hazards as well as the safety precautions required when using tools.
- ✚ Use the right tool for the job. Do not use a tool that was not designed for a task you are about to do. Substituting an improper tool increases the chance of hurting yourself and others, and also contributes to poor quality work. Always select the proper sized tool.
- ✚ Appropriate personal protective equipment, (e.g., safety goggles, gloves, etc.), should be worn due to hazards that may be encountered while using portable power tools and hand tools.
- ✚ Always follow the manufacturer's instructions when using any tool.
- ✚ If safety devices (guards) are provided with the tool, they must be maintained in good working order and used.
- ✚ Avoid wearing neck chains, rings, watches and other jewelry that might become snagged in tools, machines and other moving equipment.
- ✚ Floors must be kept as clean and dry as possible to prevent accidental slips with or around dangerous hand and portable power tools.
- ✚ Around flammable substances, sparks produced by iron and steel hand tools can be a dangerous ignition source. Where this hazard exists, spark-resistant tools made from brass, plastic, aluminum, or wood will be provided for safety.
- ✚ All tools must be inspected and be in good working condition before used.
- ✚ Remove any damaged tools immediately from use, and report them to your supervisor.
- ✚ Position yourself so that a tool that falls or slips won't cause an injury to you or your co-employee. Keep yourself out of the "line of fire".
- ✚ Carry tools with sharp edges away from your body.
- ✚ Do not leave tools lying around to prevent tripping hazards and/or damage to the tool.
- ✚ Pick up your tools and clean them off before storing them after each task.

HAND TOOLS

Hand tools are non-powered, and they may include anything from axes to wrenches. The greatest hazards posed by hand tools result from misuse and improper maintenance.

POTENTIAL HAZARDS (EXAMPLES)

- ✚ Cuts, abrasions, amputations, and punctures. If hand tools are designed to cut or move metal and wood, remember what a single slip can do to fragile human flesh.
- ✚ Using a chisel as a screwdriver may cause the tip of the chisel to break off and fly, potentially hitting the user or other employees.

- ✚ If a wooden handle on a tool such as a hammer is loose, splintered, or cracked, the head may fly off and potentially strike the user or other employees.
- ✚ A wrench might slip if its jaws are dirty, oily, or sprung.
- ✚ Impact tools such as chisels, wedges, or drift pins are unsafe if they have mushroomed heads. The heads might shatter on impact, sending sharp fragments flying.
- ✚ Using the same tool in the same way all day long, day after day, can stress human muscles and ligaments known as repetitive motion injuries. Carpal tunnel syndrome, (inflammation of the nerve sheath in the wrist), and injuries to muscles, joints and ligaments are increasingly common if the wrong tool is used, or the right tool is used improperly. Injury from continuous vibration can also cause numbness or poor circulation in hands and arms.
- ✚ Flying chips of wood or metal are a common hazard, often causing needless eye injuries.
- ✚ Tools can slip, fall from heights, or even be thrown by careless employees, causing severe injuries.
- ✚ Iron or steel hand tools may produce sparks that can be an ignition source around flammable substances. Where this hazards exists, spark-resistant tools made of non-ferrous materials should be used where flammable gases, highly volatile liquids, and other explosive substances are stored or used.

TO AVOID POTENTIAL INJURIES, FOLLOW THESE SAFETY PROCEDURES

- ✚ Use the right tool for the job. Do not use your wrench as a hammer. Do not use a screwdriver as a chisel, etc. Get the right tool in the right size for the job.
- ✚ Do not use broken or damaged tools, dull cutting tools, or screwdrivers with worn tips.
- ✚ Cut in a direction away from your body.
- ✚ Make sure your grip and footing are secure when using tools.
- ✚ Carry tools securely in a tool belt or box. Do not carry tools up ladders. Use a hoist or rope.
- ✚ Keep close track of tools when working at heights. A falling tool can seriously injure a co-employee.
- ✚ Pass a tool to another person by the handle; never toss it to them.
- ✚ Use the right personal protective equipment for the job. Follow company instructions for selecting and using safety eyewear, safety toed shoes, gloves, hard hats, etc.
- ✚ Never carry sharp or pointed tools such as a screwdriver in your pocket.
- ✚ Select ergonomic tools for your work task when movements are repetitive and forceful.
- ✚ Be on the lookout for signs of repetitive stress. Early detection might prevent a serious injury.
- ✚ Always keep your tools in top condition. A dull blade or blunt point can lead to injury.
- ✚ Store tools properly when you finish work.
- ✚ Individuals must not hold tools that will be struck while a second person swings a striking device. Either a tool-holder must be used which extends the handle of the tool such that the person holding it is outside the range of impact of the striking device, or the tool must be secured so that it is not required for a person to hold it.
- ✚ The user of the tool must ensure that there are no obstructions in the line of fire of the arc of the striking device.
- ✚ Wrenches and hand tools must be kept free of oil and dirt to prevent slippage.
- ✚ Pipe stands must have a safety mechanism, such as a lock washer, to prevent the upper part of the jack from falling into the stand. They must also have their capacity clearly labeled on the stand.
- ✚ Employees using saw blades, chisels or other tools, should direct the tools away from aisle areas and away from other employees working in close proximity.

CHAIN FALLS, COME-ALONGS, LEVER HOISTS

- ✚ Ensure there is a safety latch on the hook.
- ✚ Check the hook for cracks.
- ✚ Make sure the capacity is clearly labeled on the lifting device. Do not exceed this capacity.
- ✚ Also consider the capacity of the structure used to support the lifting device.
- ✚ Do not “two block” a lifting device. You can easily exceed the unit’s capacity and weaken the gears. If gears are stripped, you can drop the load.

- ✚ When lifting loads using two or more hoists, use care in operating the hand chain so that it is pulled on-line with the sheave. The angle of lift must not exceed 30 degrees with vertical. This is one of the few chain fall angle lifts allowed.
- ✚ A come-along may be used for horizontal positioning, not lifting.
- ✚ If more than one cable is to be used in a lift, shackle the cables together and then place the shackle in the lifting hood.

CUTTING TOOLS

- ✚ Personal pocket knives are not to be used on a job site by a Winger employee. Proper cutting tools and cut resistant gloves will be issued to each employee for cutting tasks.
- ✚ Employees who carry knives or cutting tools with them on the job should keep them in sheaths or holders.
- ✚ Cutting tools with sharp edges should never be left lying where they may cause injuries. When stored they should be kept with their edges guarded or sheathed.
- ✚ Never store sharp, heavy tools overhead or in a place where they could fall and injure someone.
- ✚ Keep your eyes on the object that you are cutting, keeping your hands and body clear of the path of your cutting stroke.
- ✚ Keep your cutting tools sharp. Tools with dull edges are dangerous because they may slip off the material and cause a serious hand injury.
- ✚ A handle guard/hilt on knives and other cutting tools can prevent the hands from slipping onto the blade.
- ✚ Hacksaw blades should be adjusted and tightened in the frame to prevent buckling and breaking, but not too tight to break off the pins that support the blade. Install the blade with the teeth pointing forward.
- ✚ When cutting with a hacksaw, apply pressure on the forward stroke only. Lift the saw slightly and pull back in the cut lightly to protect the teeth. If the blade is twisted or too much pressure is applied, the blade may break and cause injury to fingers/hands.
- ✚ Snips should be heavy enough to cut sheet metal easily so that an employee needs only one hand on the snips and can use the other hand to keep the edges of the cut material pulled aside. The material should be well supported before the last cut is made so that the cut edges do not pinch against the hands.
- ✚ Snips are designed for either straight or circular cuts. Those used for thicker sheet metal and harder materials have longer handles than those used for cutting thin, softer materials.
- ✚ Wear cut resistant gloves to prevent hand cuts or scratches due to handling sharp edges.
- ✚ Do not use hand snips to cut wire. Wire cutting pliers are more suited for the job.

SCREWDRIVERS

- ✚ Do not hold the work in one hand while using the screwdriver with the other. If the screwdriver slips out of the slot you are likely to receive a gash on your hand.
- ✚ Do not use a screwdriver with rounded edges or tips; it will slip and cause damage to the work or yourself.
- ✚ Do not use a screwdriver to determine if an electrical circuit is live.
- ✚ Do not use a screwdriver for prying, punching, chiseling, scoring, or scraping.
- ✚ Use a screw-holding screwdriver to get screws started in awkward, hard-to-reach areas.
- ✚ Use an offset screwdriver in close quarters where a conventional screwdriver cannot be used.
- ✚ Use a ratchet-type screwdriver for speed and comfort when a great number of screws are to be driven.
- ✚ Do not use pliers on the handle of a screwdriver to get extra torque/turning power. A wrench should only be used on the square shank of a screwdriver that is specifically designed for that purpose.
- ✚ Do not expose a screwdriver blade to excessive heat as it may reduce the hardness of the blade.
- ✚ Do not use a screwdriver with a split or broken handle.
- ✚ Keep the screwdriver handle clean; a greasy handle can cause an accident.
- ✚ A screwdriver should never be used as a prying tool. If it is overstressed in this manner, the blade might break and create a flying particle hazard.

WRENCHES

- ✚ Never push a wrench - pull it toward you for better control and safety.
- ✚ Keep your wrenches clean for a firm grip.
- ✚ Use box-end wrenches for torquing applications.
- ✚ Never use a pipe extension or other form of “cheater” to increase the leverage of these wrenches.
- ✚ Always select a wrench with an opening that fits the nut exactly. Otherwise the wrench could slip causing a potential injury.
- ✚ Always use a “striking-face” box wrench or heavy-duty box or socket wrench to free a “frozen” nut or bolt. Use of penetrating oil is also recommended.
- ✚ Never expose any wrench to excessive heat which may reduce the hardness of the metal and may ruin the tool.
- ✚ Do not grind wrenches to change their shape.
- ✚ The safest wrench is a box or socket type, especially on hex nuts and fittings. Always use a straight handle wrench, rather than offset handle wrench when conditions permit.
- ✚ Do not use an open-end wrench on a “frozen” nut or to final tighten a nut. Use a box-end or socket wrench; they are stronger.
- ✚ Always make certain the nut or bolt head is fully seated in the jaw opening of a wrench.
- ✚ Never use a hammer on any wrench other than a “striking-face” wrench that is specifically designed for that purpose. Always wear eye protection.
- ✚ Never use open-end wrenches with spread, nicked, or battered jaws or box-end wrenches with rounded or damaged points. Replace wrenches with bent handles.
- ✚ Ratcheting box-end wrenches should not be used in heavy-duty applications.
- ✚ There are special wrenches designed for the type of service their names imply; (e.g., electronics, tappet, ignition, set screw, etc.). Use them only for their intended purpose.

POWER TOOLS

GENERAL SAFETY PRECAUTIONS

Ignoring safety precautions with power tools can cause injuries. Injuries may include:

- ✚ Contact with points of operation, such as saw blades.
- ✚ Electrical shock, fire, or explosion.
- ✚ Eye injuries from flying chips, dust, or shavings.
- ✚ Dropping a tool on a body part or straining too hard to lift a heavy tool.

Power tools can be hazardous when improperly used. Power tool users should observe the following general safety precautions:

- ✚ Stay alert, watch what you are doing, and use common sense when operating a power tool. A moment of inattention while operating proper tools may result in serious personal injury.
- ✚ Choose the right power tool for the job. The correct power tool will do the job better and safer at the rate for which it was designed.
- ✚ Use the power tool, accessories and tool bits etc., in accordance with the manufacturer’s instructions, taking into account the working conditions and the work to be performed. Use of the power tool for purposes other than those intended could result in a hazardous situation.
- ✚ Always wear the proper protective equipment (PPE) when using power tools.
- ✚ Do not operate power tools in explosive atmospheres, such as in the presence of flammable liquids, gases, or dust. Power tools can create sparks which may ignite dust or fumes.
- ✚ Always inspect power tools prior to use.
- ✚ Carry power tools by their handles, not their cords or hoses.
- ✚ Never yank the cord or the hose to disconnect it from a receptacle.
- ✚ Be sure all power cord insulation is intact and undamaged.
- ✚ Never cut off the grounding prong on a 3-prong plug. Place 3-pronged plugs only in 3-prong outlets.

- ✚ When a temporary power source is used for construction, a GFCI (Ground Fault Circuit Interrupter) should be used.
- ✚ Be sure your extension cord is properly wired and in good electrical condition. Always replace a damaged extension cord or have it repaired by a qualified person.
- ✚ Protect your extension cords from sharp objects, excessive heat and damp or wet areas.
- ✚ Do not expose power tools to rain or wet conditions. Water entering a power tool will increase the risk of electric shock.
- ✚ Keep cords off the floor, so they do not become tripping hazards.
- ✚ Unplug or disconnect tools when not in use, before servicing, and when changing accessories such as blades, bits and cutters.
- ✚ Secure work with clamping devices, freeing both hands to operate the tool.
- ✚ Avoid accidental startup. Ensure the switch is in the off-position before plugging in. The employee should not hold a finger on the switch button while carrying a plugged-in tool.
- ✚ Maintain power tools with care. Check for misalignment or binding of moving parts, breakage of parts and any other condition that may affect the power tool's operation. Properly maintained tools, with sharp cutting edges are less likely to bind and are easier to control.
- ✚ Remove all damaged power tools from use immediately. Tag them as "DEFECTIVE TOOL" or "DO NOT USE" and return them to the tool crib or your foreman. Many accidents are caused by poorly maintained power tools.
- ✚ Follow manufacturer's instructions for lubricating and changing accessories.
- ✚ Remove any adjusting key or wrench before turning the power tool on. A wrench or a key left attached to a rotating part of the power tool may result in personal injury.
- ✚ Do not overreach. Keep proper footing and balance at all times. This enables better control of the power tool.
- ✚ Wear the proper apparel. Loose clothing or jewelry can become caught in moving parts.
- ✚ Tie back long hair that could get caught in a point of operation.
- ✚ Store tools properly when they're not in use.

SPECIFIC PRECAUTIONS

TOOL GUARDS

Hazardous moving parts of a power tool need to be safeguarded. For example, belts, gears, shafts, pulleys, sprockets, spindles, drums, fly wheels, chains, or other reciprocating, rotating, or moving parts of equipment must be guarded if such parts are exposed to contact by employees.

Tool guards are installed to protect the operator from the hazards presented by the following components:

- ✚ Point of operation.
- ✚ In-running nip points.
- ✚ Rotating parts.
- ✚ Flying chips and sparks.

Safety guards must never be removed when a tool is being used. For example, portable circular saws must be equipped with guards. An upper guard must cover the entire blade of the saw. A retractable lower guard must cover the teeth of the saw, except when it makes contact with the work material. The lower guard must automatically return to the covering position when the tool is withdrawn from the work.

OPERATING CONTROLS AND SAFETY SWITCHES

The following hand-held power tools must be equipped with a momentary contact on-off control switch; drills, tappers, fastener drivers, horizontal, vertical and angle grinders with wheels larger than 2 inches in diameter, disc

and belt sanders, reciprocating saws, saber saws, and other similar tools. These tools also may be equipped with a lock-on control, provided that a single motion of the same finger or fingers that turn it on can accomplish turnoff.

The following hand-held power tools may be equipped with only a positive on-off control switch; platen sanders, disc sanders with discs 2 inches or less in diameter; grinders with wheels 2 inches or less in diameter; routers, planers, laminate trimmers, nibblers, shears, scroll saws and jigsaws with blade shanks ¼ inch wide or less.

Other hand-help power tools such as circular saws having a blade diameter greater than 2 inches, chain saws, and percussion tools without positive accessory holding means must be equipped with a constant pressure switch that will shut off the power when the pressure is released.

POWER TOOL CATEGORIES

ELECTRIC TOOLS

Employees using electric tools must be aware of several dangers; the most serious is the possibility of electrocution.

Among the chief hazards of electric-powered tools are burns and slight shocks that can lead to injuries. An electrical shock can also cause a person to fall off a ladder or other elevated work surface.

To protect the user from shock, tools must either have a three-wire cord with ground and be grounded, be double insulated, or be powered by a low-voltage isolation transformer. Three-wire cords contain two current carrying conductors and a grounding conductor. One end of the grounding conductor connects to the tool's metal housing. The other end is grounded through a prong on the plug. Anytime an adapter is used to accommodate a two-hole receptacle, the adapter wire must be attached to a known grounding source. The third prong should never be removed from the plug.

Double insulation is preferred. The user and the tools are protected in two ways: by normal insulation on the wires inside and by housing that cannot conduct electricity to the operator in the event of malfunction.

Practice the following safety precautions when using electric tools:

- ✚ Operate electric tools within their design specifications.
- ✚ Wear appropriate personal protective equipment (PPE) when using electric tools.
- ✚ Store tools in a dry place when not in use.
- ✚ Do not use electric tools in damp or wet locations.
- ✚ Ensure that cords from electric tools do not present a tripping hazard.

HYDRAULIC POWER TOOLS

When using hydraulic power tools, the manufacturer's recommended safe operating pressure for hoses, valves, pipes, filters, and other fittings must not be exceeded.

All jacks, including lever and ratchet jacks, screw jacks, and hydraulic jacks, must have a stop indicator, and the stop limit must not be exceeded. Also, the manufacturer's load limit must be permanently marked in a prominent place on the jack, and the load limit must not be exceeded.

A jack should never be used to support a lifted load. Once the load has been lifted, it must immediately be blocked up. Put a block under the base of the jack when the foundation is not firm, and place a block between the jack cap and load if the cap might slip.

To set up a jack, make certain of the following:

- ✚ The base of the jack rests on a firm, level surface;
- ✚ The jack is correctly centered;

- ✚ The jack head bears against a level surface; and
- ✚ The lift force is applied evenly.
- ✚ Proper maintenance of jacks is essential.
- ✚ All jacks must be lubricated regularly.

LIQUID FUEL-POWERED TOOLS

Liquid fuel-powered tools usually use gasoline. The most serious hazard with fuel-powered tools comes from fuel vapors that can burn or explode and give off dangerous exhaust emissions.

The employee must be careful to handle, transport, and store the gas or fuel in approved flammable liquid containers and in accordance with proper procedures for handling flammable liquids.

Practice the following safety precautions:

- ✚ Before the tank for a fuel-powered tool is refilled, shut down the engine and allow it to cool in order to prevent accidental ignition of hazardous vapors.
- ✚ If a fuel-powered tool is used inside a closed area, provide effective ventilation and/or personal protective equipment to avoid breathing carbon monoxide or other potentially hazardous fumes.
- ✚ Keep fire extinguishers readily at hand in the work area.

PNEUMATIC TOOLS

Pneumatic tools are powered by compressed air and include chippers, drills, hammers, and sanders. There are several potential hazards that can be encountered when using pneumatic tools, primarily the danger of getting hit by one of the tool's attachments or by the type of the fastener being used with the tool.

Practice the following safety precautions when operating pneumatic tools:

- ✚ Equip all pneumatic tools that shoot nails, rivets, or staples and that operate at pressures more than 100 pounds per square inch with a special device to keep fasteners from being ejected unless the muzzle is pressed against the work surface.
- ✚ Wear the proper eye protection and face shields when using pneumatic tools.
- ✚ Wear proper hearing protection. Noise extremes are another hazard when working with pneumatic tools.
- ✚ Pneumatic tools must be fastened securely to the air hose to prevent them from becoming disconnected. A short wire or positive locking device attaching the air hose to the tool will serve as an added safeguard.
- ✚ Equip all airless spray guns that atomize paints fluids at high pressures (1,000 pounds or more per square inch) with automatic or visual manual safety devices that will prevent pulling the trigger until the safety device is manually released.
- ✚ Take the same precautions with an air hose that are recommended for electric cords since the hose is subject to the same kind of damage from accidental striking and presents similar tripping hazards.
- ✚ Install screens to protect nearby employees from being struck by flying fragments around chippers, riveting guns, staplers, or air drills.
- ✚ Never point compressed air guns toward anyone. Users should never "dead-end" it against themselves or anyone else.

POWERED ABRASIVE WHEEL TOOLS

Powered abrasive grinding, cutting, polishing, and wire buffing wheels create additional safety concerns because they may throw off flying fragments. Abrasive wheel tools must be equipped with guards that:

- ✚ Cover the spindle end, nut, and flange projections.
- ✚ Maintain proper alignment with the wheel.
- ✚ Do not exceed the strength of the fastenings.

Angle grinders pose a danger due to “kickback”, where the disc is thrust away from the object it is grinding, which can result in severe cuts to the hands, arms, head, torso and legs. Discs can shatter or explode, sending pieces flying across the work area.

Be sure to follow these safety precautions:

- ✦ Before an abrasive wheel is mounted, inspect it carefully. Sound or “ring-test” the wheel to be sure that it is free from cracks or defects. To ring test, suspend the wheel from its hole, or place it vertically on the floor, and tap it gently with a light tool 45 degrees from the center line and one or two inches from the edge of the wheel. If in good condition, it will give a clear metallic “ping”. The clarity of the “ping”, not the pitch, indicates no cracks or damage. If it sounds cracked or dead, the wheel could fly apart in operation and must not be used. An undamaged wheel will give a clear metallic tone or “ring”.
- ✦ To prevent the wheel from cracking, be sure it fits freely on the spindle. The spindle nut must be tightened enough to hold the wheel in place, without distorting the flange. Care must be taken to assure that the spindle wheel will not exceed the abrasive wheel specifications. Always follow the manufacturer’s recommendations.
- ✦ Due to the possibility of a wheel disintegrating (exploding) during start-up, never stand directly in front of the wheel as it accelerates to full operating speed. On the initial use of a grinding wheel, run the wheel in a protected area for at least one minute before grinding to detect unusual vibration or wheel cracks. The employee should never stand in the plane of rotation of the wheel as it accelerates to full operating speed.
- ✦ All portable grinding tools must be equipped with safety guards to protect employees not only from the moving wheel surface but also from flying fragments in case of breakage.
- ✦ Wear the proper eye protection and face shields when using powered abrasive wheel tools.
- ✦ Wear proper hearing protection. Noise extremes are another hazard when working with powered abrasive tools.
- ✦ Always turn the power off when not in use.
- ✦ Never clamp a hand-held grinder in a vise.
- ✦ Never force the disc at the metal or allow the disc to become trapped in the work piece, as this will cause the disc to break or the grinder to ‘kick back’.
- ✦ The grinder must be marked with its maximum permissible speed. The information supplied with the abrasive wheel should be checked to ensure that the maximum permissible speed is never exceeded when in use.
- ✦ Make sure the wheel hole, threaded or unthreaded, fits the machine arbor properly and that flanges are clear, flat, and of the proper type for the wheel you are mounting.
- ✦ Where possible, keep the work at waist height.
- ✦ Adopt a comfortable stance, with feet apart and well balanced, and a clear view of the job.
- ✦ Stop the grinder at regular intervals for a short break to rest your hands and arms.
- ✦ Place welding screens or tape off work area to protect other employees from flying particles and sparks.
- ✦ Do not use excessive pressure when mounting wheel between flanges. Tighten nut only enough to hold wheel firmly.
- ✦ Always use two hands to operate an angle grinder. One hand should grip the handle and “deadman” switch while the other hand supports the weight of the tool.
- ✦ Keep the grinding disc at a 15 to 30 degree angle to the work.
- ✦ Do not grind soft metals or plastic.
- ✦ Bench grinders must be equipped with “deadman” switches.
- ✦ Set tool rest so that material to be ground is slightly higher than center line of the wheel. The tool rest must be set no greater than 1/8” from the wheel. When the wheel is too small to maintain this dimension, destroy and discard wheel. Failure to keep the rest correctly adjusted can result in a serious accident due to the workpiece becoming jammed between the rest and the wheel. This can cause the workpiece to fly or the wheel to burst.
- ✦ Adjustable tongue must be kept to within ¼” of the wheel.
- ✦ Use a wheel dresser if stone is grooved, irregular, or glazed.

- ✚ Keep hands at least 2 to 3 inches from the grinder. This may mean holding object in a vise and using a portable grinder.
- ✚ Make sure the guard covers over half the wheel and that the guard is between the employee and the work.
- ✚ When resting a tool, make sure the wheel has stopped turning and set grinder on its back. Do not set grinder on the wheel.
- ✚ Ensure no one stands directly in front of the wheel before starting the grinder.

SOURCE CREDITS

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DOCUMENT CONTROL

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