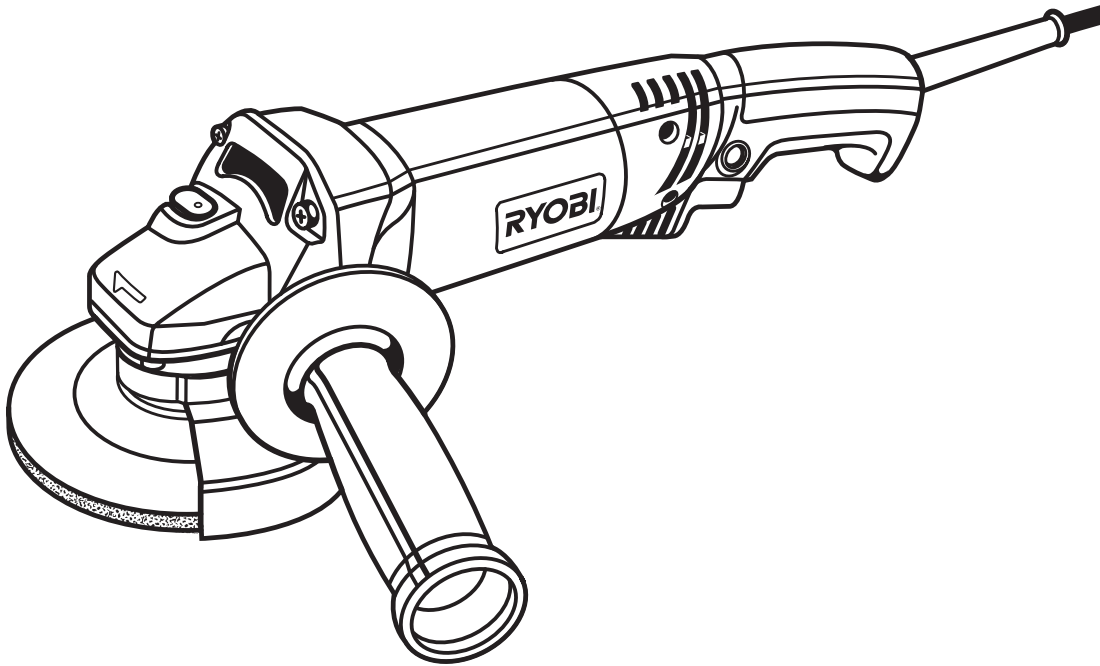


# RYOBI<sup>®</sup> OPERATOR'S MANUAL

## 4-1/2 in. (115 mm) Angle Grinder

### Model AG451 / Double Insulated



SPECIFICATIONS:	
Grinding Wheel Capacity	4-1/2 in. (115 mm)
Rating	120 volts, 60Hz, AC only
No Load Speed	11,000 RPM
Amperes	5.5 Amperes
Net Weight	4.6 lbs. (2.1 kg.)

#### THANK YOU FOR BUYING A RYOBI ANGLE GRINDER.

Your new angle grinder has been engineered and manufactured to Ryobi's high standard for dependability, ease of operation, and operator safety. Properly cared for, it will give you years of rugged, trouble-free performance.

**⚠ CAUTION:** Carefully read through this entire operator's manual before using your new angle grinder.

Pay close attention to the Rules for Safe Operation, Warnings, and Cautions. If you use your grinder properly and only for what it is intended, you will enjoy years of safe, reliable service.

Please fill out and return the Warranty Registration Card so that we can be of future service to you.

Thank you again for buying Ryobi tools.

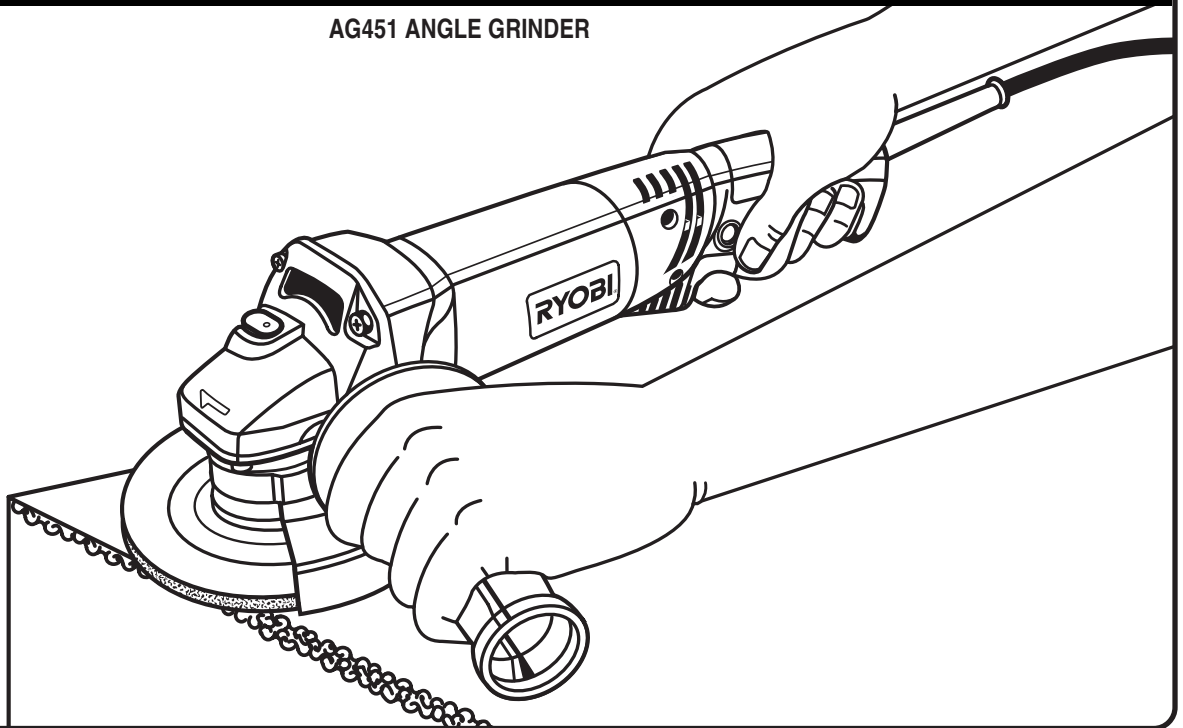
**SAVE THIS MANUAL FOR FUTURE REFERENCE**

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## TYPICAL APPLICATION

AG451 ANGLE GRINDER



### WARNING:

Always use the guard that accompanied the grinder. Comply with mounting and use instructions and warnings found in the manual for the grinder and ANSI B7.1. Failure to heed these warnings can result in wheel breakage and serious personal injury. For more information on ANSI Standards, contact the American National Standards Institute, Inc., 11 West 42nd Street, 13th Floor, New York, NY 10036.

# RULES FOR SAFE OPERATION

The purpose of safety symbols is to attract your attention to possible dangers. The safety symbols, and the explanations with them, deserve your careful attention and understanding. The safety warnings do not by themselves eliminate any danger. The instructions or warnings they give are not substitutes for proper accident prevention measures.

SYMBOL

MEANING



**SAFETY ALERT SYMBOL:**

Indicates danger, warning, or caution. May be used in conjunction with other symbols or pictographs.



**DANGER:** Failure to obey a safety warning will result in serious injury to yourself or to others. Always follow the safety precautions to reduce the risk of fire, electric shock and personal injury.



**WARNING:** Failure to obey a safety warning can result in serious injury to yourself or to others. Always follow the safety precautions to reduce the risk of fire, electric shock and personal injury.



**CAUTION:** Failure to obey a safety warning may result in property damage or personal injury to yourself or to others. Always follow the safety precautions to reduce the risk of fire, electric shock and personal injury.

**NOTE:**

Advises you of information or instructions vital to the operation or maintenance of the equipment.

## DOUBLE INSULATION

Your power tool is double insulated. This means you are separated from the tool's electrical system by two complete sets of electrical insulation. This extra layer of insulation is intended to protect the user from electrical shock due to a break in the wiring insulation. All exposed metal parts are isolated from the internal metal motor components with protecting insulation. Double insulated tools do not need to be grounded.



**WARNING:**

The double insulated system is intended to protect the user from shock resulting from a break in the tool's internal wiring. Observe all normal safety precautions related to avoiding electrical shock.

## IMPORTANT

Servicing of a tool with double insulation requires extreme care and knowledge of the system and should be performed only by a qualified service technician. For service we suggest you return the tool to your nearest **RYOBI AUTHORIZED SERVICE CENTER** for repair. When servicing use only identical Ryobi replacement parts.



**WARNING:**

Do not attempt to operate this tool until you have read thoroughly and understand completely all instructions, safety rules, etc. contained in this manual. Failure to comply can result in accidents involving fire, electric shock, or serious personal injury. Save operator's manual and review frequently for continuing safe operation, and instructing others who may use this tool.



**WARNING:**



The operation of any angle grinder can result in foreign objects being thrown into your eyes, which can result in severe eye damage. Before beginning power tool operation, always wear safety goggles or safety glasses with side shields and a full face shield when needed. We recommend Wide Vision Safety Mask for use over eyeglasses or standard safety glasses with side shields. Always wear eye protection which is marked to comply with ANSI Z87.1.

# RULES FOR SAFE OPERATION



## WARNING:


Read and understand all instructions. Failure to follow all instructions listed below, may result in electric shock, fire and/or serious personal injury.

## SAVE THESE INSTRUCTIONS

### Work Area

- **Keep your work area clean and well lit.** Cluttered benches and dark areas invite accidents.
- **Do not operate power tools in explosive atmospheres, such as in the presence of flammable liquids, gases, or dust.** Power tools create sparks which may ignite the dust or fumes.
- **Keep bystanders, children, and visitors away while operating a power tool.** Distractions can cause you to lose control.

### Electrical Safety

- **Double insulated tools are equipped with a polarized plug (one blade is wider than the other). This plug will fit in a polarized outlet only one way. If the plug does not fit fully in the outlet, reverse the plug. If it still does not fit, contact a qualified electrician to install a polarized outlet. Do not change the plug in any way.** Double insulation  eliminates the need for the three wire grounded power cord and grounded power supply system.
- **Avoid body contact with grounded surfaces such as pipes, radiators, ranges and refrigerators.** There is an increased risk of electric shock if your body is grounded.
- **Don't expose power tools to rain or wet conditions.** Water entering a power tool will increase the risk of electric shock.
- **Do not abuse the cord. Never use the cord to carry the tools or pull the plug from an outlet. Keep cord away from heat, oil, sharp edges or moving parts. Replace damaged cords immediately.** Damaged cords increase the risk of electric shock.
- **When operating a power tool outside, use an outdoor extension cord marked "W-A" or "W".** These cords are rated for outdoor use and reduce the risk of electric shock.

### Personal Safety

- **Stay alert, watch what you are doing and use common sense when operating a power tool. Do not use tool while tired or under the influence of drugs, alcohol, or medication.** A moment of

inattention while operating power tools may result in serious personal injury.

- **Dress properly. Do not wear loose clothing or jewelry. Contain long hair. Keep your hair, clothing, and gloves away from moving parts.** Loose clothes, jewelry, or long hair can be caught in moving parts.
- **Avoid accidental starting. Be sure switch is off before plugging in.** Carrying tools with your finger on the switch or plugging in tools that have the switch on invites accidents.
- **Remove adjusting keys or wrenches before turning the tool on.** A wrench or a key that is left attached to a rotating part of the tool may result in personal injury.
- **Do not overreach. Keep proper footing and balance at all times.** Proper footing and balance enables better control of the tool in unexpected situations.
- **Use safety equipment. Always wear eye protection.** Dust mask, non-skid safety shoes, hard hat, or hearing protection must be used for appropriate conditions.

### Tool Use and Care

- **Use clamps or other practical way to secure and support the workpiece to a stable platform.** Holding the work by hand or against your body is unstable and may lead to loss of control.
- **Do not force tool. Use the correct tool for your application.** The correct tool will do the job better and safer at the rate for which it is designed.
- **Do not use tool if switch does not turn it on or off.** Any tool that cannot be controlled with the switch is dangerous and must be repaired.
- **Disconnect the plug from the power source before making any adjustments, changing accessories, or storing the tool.** Such preventive safety measures reduce risk of starting the tool accidentally.
- **Store idle tools out of reach of children and other untrained persons.** Tools are dangerous in the hands of untrained users.
- **Maintain tools with care. Keep cutting tools sharp and clean.** Properly maintained tools with sharp cutting edges are less likely to bind and are easier to control.
- **Check for misalignment or binding of moving parts, breakage of parts, and any other condition that may affect the tool's operation. If damaged, have the tool serviced before using.** Many accidents are caused by poorly maintained tools.

# RULES FOR SAFE OPERATION

- **Use only accessories that are recommended by the manufacturer for your model.** Accessories that may be suitable for one tool, may become hazardous when used on another tool.

## Service

- **Tool service must be performed only by qualified repair personnel.** Service or maintenance performed by unqualified personnel could result in a risk of injury.
- **When servicing a tool, use only identical replacement parts. Follow instructions in the Maintenance section of this manual.** Use of unauthorized parts or failure to follow Maintenance Instructions may create a risk of electric shock or injury.

## Specific Safety Rules for Grinders

- **Always use proper guard with grinding wheel.** A guard protects operator from broken wheel fragments.
- **Accessories must be rated for at least the speed recommended on the tool warning label.** Wheels and other accessories running over rated speed can fly apart and cause injury.
- **Hold tool by insulated gripping surfaces when performing an operation where the tool may contact hidden wiring or its own cord.** Contact with a "live" wire will make exposed metal parts of the tool "live" and shock the operator.
- **Grinding wheel and guard must be securely attached** as described in this operating manual before connecting the grinder to a power source.
- **Grinding wheels must be stored in a dry place.**
- **Before attaching the grinding wheel,** inspect it for visible defects. If cracked, chipped, or warped, do not install it.
- **Do not overtighten the clamp nut** on the grinding wheel. Excessive tightening can cause the wheel to crack during operation
- **Make sure that the guard is in good condition** and securely installed before operating grinder.
- **Do not clamp the grinder in a vise or use as a fixed grinder.**
- **Never turn on the grinder** with the grinding wheel or any rotating parts touching the workpiece.
- **Use only grinding wheels in compliance** with ANSI standard B7.1 and rated greater than 11,000 RPM.
- **Do not use the grinder if the disc flange or clamp nut is missing** or if the spindle is bent.
- **Always hold the grinder securely with two hands** while working and at all times when it is running.
- **Never cover the air vents in the motor housing** with your hands while operating the grinder.
- **Hold the tool away from your body** while it is running. Keep your hands away from the abrasive attachments.
- **Dust and waste materials should not be allowed to build up in the workshop.** Hot metal sparks could start a fire.

- **Do not enlarge or alter the center hole** of the grinding wheel as this could result in breaking it.
- **Use only the normal grinder surface.** Never use the side or upper surfaces for cutting.
- **Keep the tool and its handle dry, clean, and free from oil and grease.** Always use a clean cloth when cleaning. Never use brake fluids, gasoline, petroleum-based products, or any strong solvents to clean your tool.

## Additional Rules for Safe Operation

- **Know your power tool.** Read operator's manual carefully. Learn its applications and limitations as well as the specific potential hazards related to this tool. Following this rule will reduce the risk of electric shock, fire, or serious injury.
- **Always wear safety glasses with side shields.** Everyday eyeglasses have only impact resistant lenses; they are **NOT** safety glasses.
- **Protect your lungs.** Wear a face or dust mask if the operation is dusty.
- **Protect your hearing.** Wear hearing protection during extended periods of operation.
- **Inspect tool cords periodically** and if damaged, have repaired at your nearest authorized service center. Stay constantly aware of cord location.
- **Check damaged parts.** Before further use of the tool, a guard or other part that is damaged should be carefully checked to determine that it will operate properly and perform its intended function. Check for alignment of moving parts, binding of moving parts, breakage of parts, mounting, and any other conditions that may affect its operation. A guard or other part that is damaged should be properly repaired or replaced by an authorized service center. Following this rule will reduce the risk of electric shock, fire, or serious injury.
- **Do not abuse cord. Never carry tool by cord or yank it to disconnect from receptacle. Keep cord from heat, oil and sharp edges.** Following this rule will reduce the risk of electric shock or fire.
- **Make sure your extension cord is in good condition.** When using an extension cord, be sure to use one heavy enough to carry the current your product will draw. A wire gage size (A.W.G.) of at least **16** is recommended for an extension cord 100 feet or less in length. A cord exceeding 100 feet is not recommended. If in doubt, use the next heavier gage. The smaller the gage number, the heavier the cord. An undersized cord will cause a drop in line voltage resulting in loss of power and overheating.
- **Inspect for and remove all foreign objects from workpiece before grinding.** Following this rule will reduce the risk of serious personal injury.

# RULES FOR SAFE OPERATION

- **Drugs, Alcohol, Medication.** Do not operate tool while under the influence of drugs, alcohol, or any medication. Following this rule will reduce the risk of electric shock, fire, or serious injury.
- **Keep hands away from grinding area.** Following this rule will reduce the risk of serious personal injury.



## WARNING:

Run wire brush at operating speed for at least one minute before applying to workpiece. Never stand in line with the brush. Always use guard on grinder with wire wheel brush accessory. Failure to heed this warning can result in serious personal injury.

- **Save these instructions.** Refer to them frequently and use them to instruct others who may use this tool. If you loan someone this tool, loan them these instructions also.



## WARNING:

Some dust created by power sanding, sawing, grinding, drilling, and other construction activities contains chemicals known to cause cancer, birth defects or other reproductive harm. Some examples of these chemicals are:



- lead from lead-based paints,
- crystalline silica from bricks and cement and other masonry products, and
- arsenic and chromium from chemically-treated lumber.

Your risk from these exposures varies, depending on how often you do this type of work. To reduce your exposure to these chemicals: work in a well ventilated area, and work with approved safety equipment, such as those dust masks that are specially designed to filter out microscopic particles.

## SAVE THESE INSTRUCTIONS

# SYMBOLS

**Important: Some of the following symbols may be used on your tool. Please study them and learn their meaning. Proper interpretation of these symbols will allow you to operate the tool better and safer.**

SYMBOL	NAME	DESIGNATION/EXPLANATION
V	Volts	Voltage
A	Amperes	Current
Hz	Hertz	Frequency (cycles per second)
W	Watt	Power
min	Minutes	Time
~	Alternating Current	Type or a characteristic of current
$n_0$	No Load Speed	Rotational speed, at no load
	Class II Construction	Designates Double Insulated Construction tools
.../min	Revolutions or Reciprocation Per Minute	Revolutions, strokes, surface speed, orbits etc. per minute
	Safety Alert Symbol	Indicates danger, warning or caution. It means attention!!! Your safety is involved.

# ELECTRICAL

## EXTENSION CORDS

When using a power tool at a considerable distance from the power source, use an extension cord heavy enough to carry the current that the tool will draw. An undersized extension cord will cause a drop in line voltage, resulting in a loss of power and causing the motor to overheat. Use the chart provided below to determine the minimum wire size required in an extension cord. Only round jacketed cords listed by Underwriter's Laboratories (UL) should be used.

Length of Extension Cord	Wire Size (A.W.G.)
Up to 25	16
26 to 50	14
51 to 100	12

When working with the tool outdoors, use an extension cord that is designed for outside use. This is indicated by the letters **WA** on the cord's jacket.

Before using an extension cord, inspect it for loose or exposed wires and cut or worn insulation.

## ELECTRICAL CONNECTION

Your grinder has a precision built electric motor. It should be connected to a **power supply that is 120 volts, 60Hz, AC only (normal household current)**. Do not operate this tool on direct current (DC). A substantial voltage drop will cause a loss of power and the motor will overheat. If your tool does not operate when plugged into an outlet, double-check the power supply.

### CAUTION:

Keep the cord away from the work area and position the cord so that it will not be caught on materials or other objects during grinding.

# UNPACKING

With the exception of the side handle and accessory wheels, your angle grinder has been shipped completely assembled.

- Carefully remove the grinder and accessories from the box. Make sure that all items listed in the packing list are included.
- Inspect grinder carefully to make sure no breakage or damage has occurred during shipping.
- If any parts are damaged or missing, call 1-800-525-2579 to obtain replacement parts before attempting to operate grinder.
- Do not discard the packing material until you have carefully inspected and satisfactorily operated grinder.

## PACKING LIST

Angle Grinder with Guard  
Carrying Case  
Grinding Wheel (1)  
Wire Wheel Brush (1)  
Abrasive Mop Disc (1)  
Side Handle  
Wrench  
Operator's Manual  
Warranty Registration Card

### WARNING:

If any parts are missing, do not operate your grinder until the missing parts are replaced. Failure to do so could result in possible serious personal injury.

# FEATURES

## KNOW YOUR ANGLE GRINDER

Before attempting to use your grinder, familiarize yourself with all operating features and safety requirements.

See Figure 1.

Make sure all grinding wheels and recommended accessories are in accordance with listed specifications for this tool. For example, do not use grinding wheels that are rated at less than 11,000 RPM.

### Guard

A protective guard has been provided on your grinder. It deflects sparks and metal chips during use.

### Heavy Duty Motor

Your angle grinder has a powerful motor with sufficient power to handle tough grinding jobs that require heavy duty performance.

### Side Handle

The side handle provided, stabilizes your grinder and must be used during all operations. In addition to maintaining safe control during use, the side handle also provides convenient ease of operation for the operator.

### Spindle Lock Button

The spindle lock button secures the spindle so that only one wrench is needed to change the grinding wheel.

### Switch with Lock-on Feature

Your grinder has a conveniently located switch. It also has a lock-on feature that allows the grinder to be locked in the on position when continuous operation for extended periods of time is required.

## APPLICATIONS

(Use only for the purposes listed below)

- Grinding metals.
- Sanding wood or metal surfaces.
- Wire brushing rusted or painted surfaces.



### WARNING:

Do not allow familiarity with your grinder to make you careless. Remember that a careless fraction of a second is sufficient to inflict severe injury.

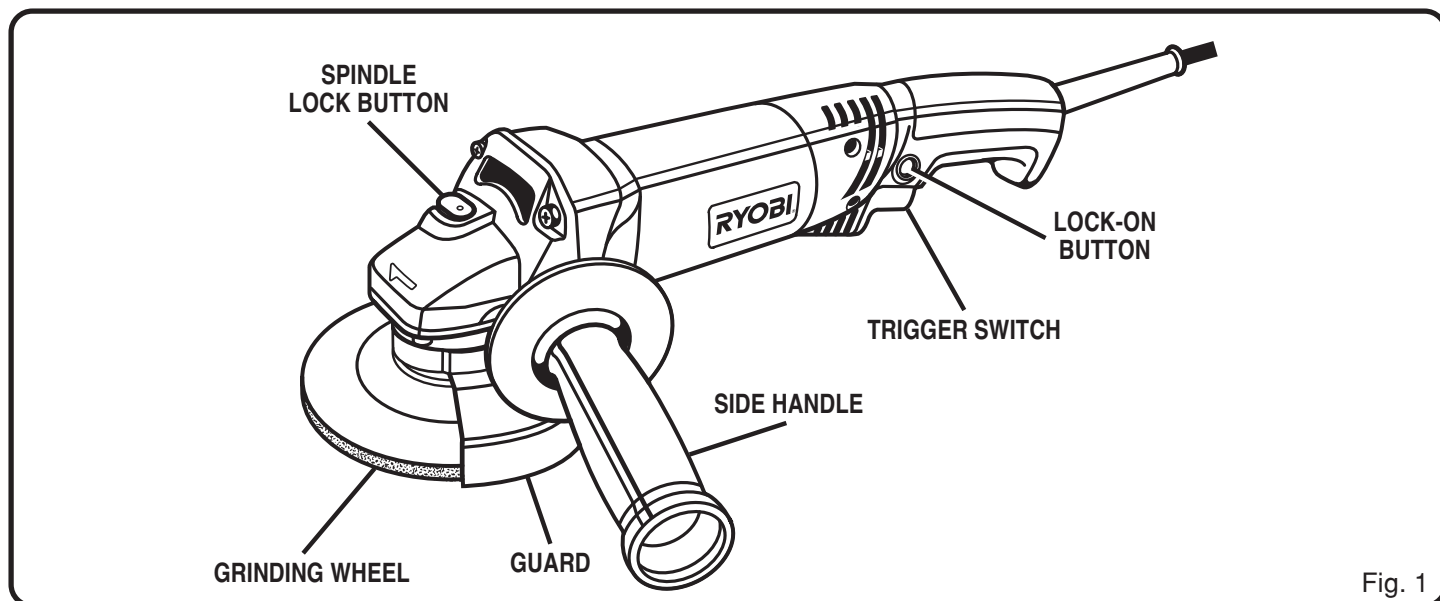


Fig. 1

# ASSEMBLY



### WARNING:

Your grinder should never be connected to power supply when you are assembling parts, making adjustments, installing or removing grinding wheels, or when not in use. Disconnecting your grinder will prevent accidental starting that could cause serious injury.

## INSTALLING THE SIDE HANDLE

See Figure 2.

- Unplug your grinder.

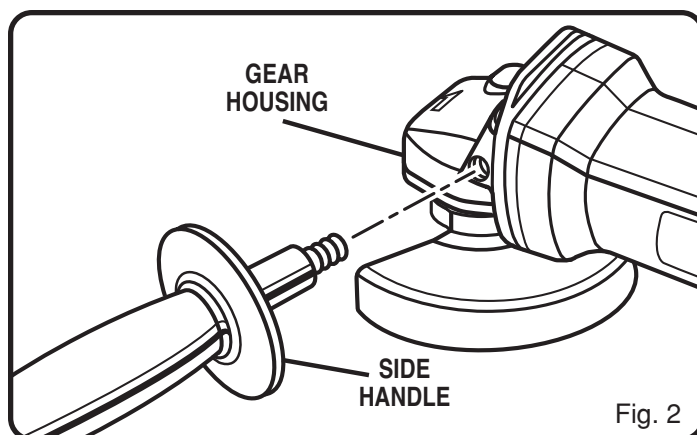


Fig. 2



# ASSEMBLY

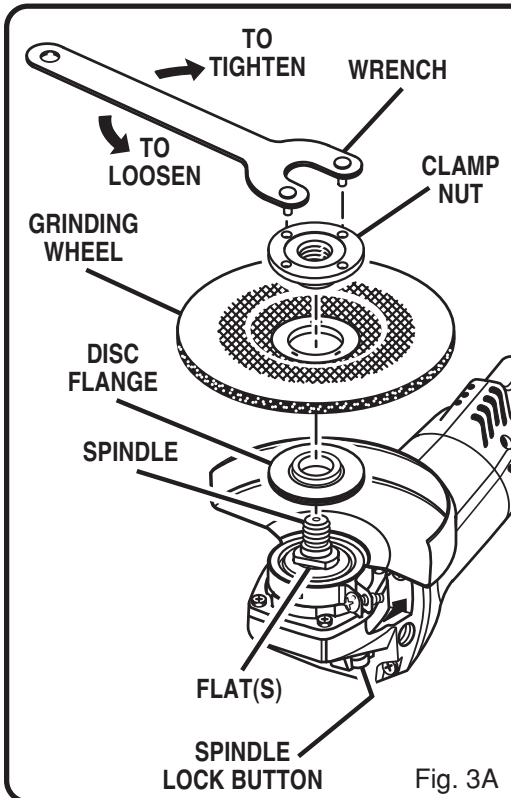


Fig. 3A

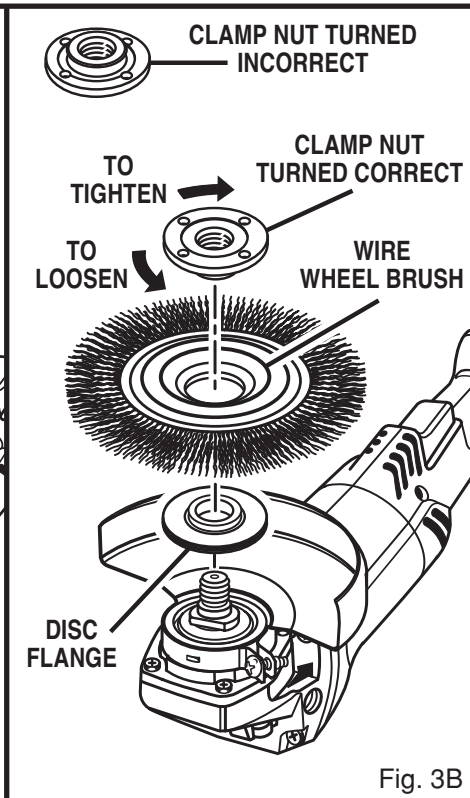


Fig. 3B

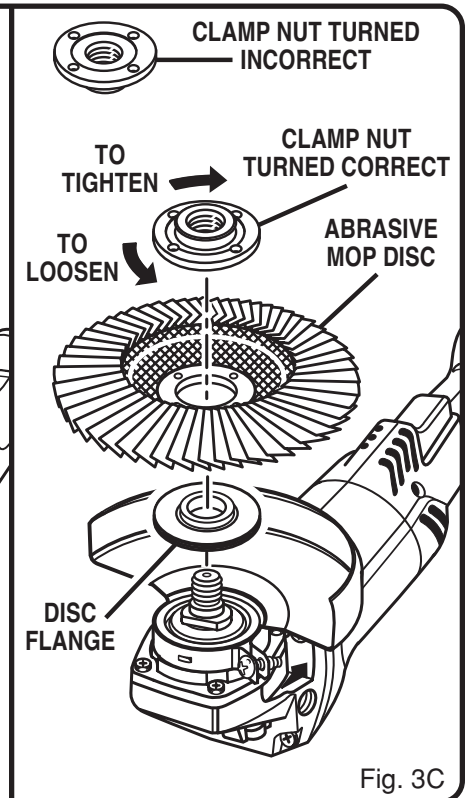


Fig. 3C



## WARNING:

Failure to unplug your grinder could result in accidental starting causing serious injury.

- Install the side handle by screwing it into the side of the gear housing.  
**Note:** The handle can be installed on either the left or right side of the grinder, depending on operator preference. It must always be used to prevent loss of control and possible serious injury.
- Tighten side handle securely.

## INSTALLING ACCESSORY WHEELS

See Figures 3A, 3B, and 3C.

- Unplug your grinder.



## WARNING:

Failure to unplug your grinder could result in accidental starting causing serious injury.

- Your grinder is shipped with the disc flange and clamp nut attached to the spindle.
- Depress spindle lock button and rotate clamp nut until spindle locks. To prevent damage to the spindle or spindle lock, always allow motor to come to a complete stop before engaging spindle lock.
- Loosen and remove clamp nut from spindle. **Do not** remove disc flange.
- Make sure flats on the bottom of disc flange are engaged with flats on spindle.

- Place the accessory wheel over the spindle.



## WARNING:

Always install grinding wheel and abrasive mop disc with the depressed center against the disc flange as shown above. Failure to do so will cause the grinding wheel to crack when tightening the clamp nut. This could result in serious personal injury because of loose particles breaking off and being thrown from the grinder. Do not overtighten.

- To install grinding wheel and wire wheel brush: Thread the clamp nut on the spindle with the flat side of nut facing up. Fit raised, small diameter portion of the clamp nut into the hole in the wheel and finger tighten. See figures 3A and 3B.
- To install abrasive mop disc: Thread the clamp nut on the spindle with the flat side of nut facing down. Finger tighten. See figure 3C.
- Depress the spindle lock button and rotate the wheel clockwise until the spindle locks in position.
- Securely tighten the clamp nut with the wrench provided. Do not overtighten.



## WARNING:

Wire wheel brush bristles will bend during use and show their direction of rotation. When reusing the wire wheel brush, always mount it to rotate in the same direction as in prior use. Failure to heed this warning can result in bristle breaking and extreme vibration of the wire wheel brush that could result in serious personal injury.

# ADJUSTMENTS



## WARNING:

Before connecting your grinder to power supply, always check to be sure switch is not in **lock-on** position. Failure to do so could result in accidental starting of your grinder resulting in possible serious injury.

## GUARD LOCATION

The guard on your grinder should be correctly installed depending on which side the handle is mounted. **Never use your grinder without the guard correctly in place.** Figures 4-6 show correct and incorrect locations of the guard.



## WARNING:

Never place the guard so that it is on front of the grinder as shown in figure 6. This could result in serious injury because sparks and loose particles thrown from the grinding wheel would be directed toward the operator. Always place the guard in the correct location as shown in figures 4 and 5.

# OPERATION



## WARNING:

- Always wear safety glasses and keep guard in place when grinding.
- Hot metal sparks from metal grinding can cause a fire. Avoid spark contact with flammable materials such as saw dust or clothing.
- Grinding wheels must be free of fissures and cracks. Fissures and cracks can cause a grinding wheel to shatter resulting in possible serious injury. Thoroughly inspect a new grinding wheel before it is installed on the grinder.
  1. Use a wooden hammer for the inspection.
  2. Using the hammer, lightly tap all around the wheel, carefully listening to the resulting sounds.
  3. Any places with fissures or cracks will result in a different sound.

Do not use a wheel containing fissures or cracks.

When installing a new grinding wheel, a no load revolution test of approximately one minute must be carried out with the grinding wheel facing a safe direction, i.e. away from people or objects.



## DANGER:

**Never attach a wood cutting or carving blade of any type to this angle grinder. It is only designed for grinding, sanding, or wire brushing.** Use for any other purpose is not recommended and creates a hazard which will result in serious injury.

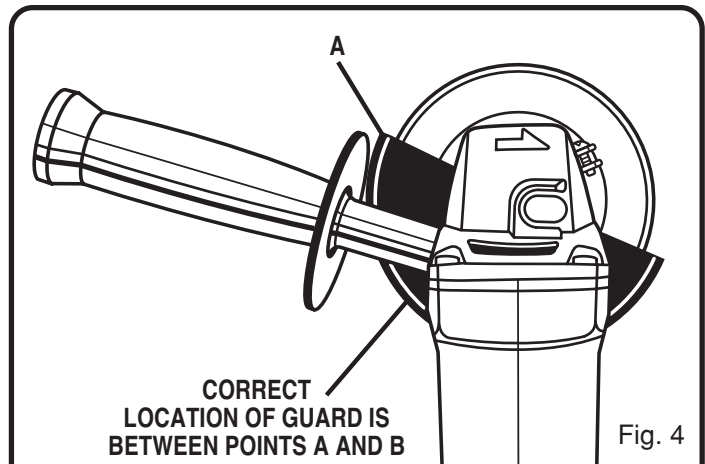


Fig. 4

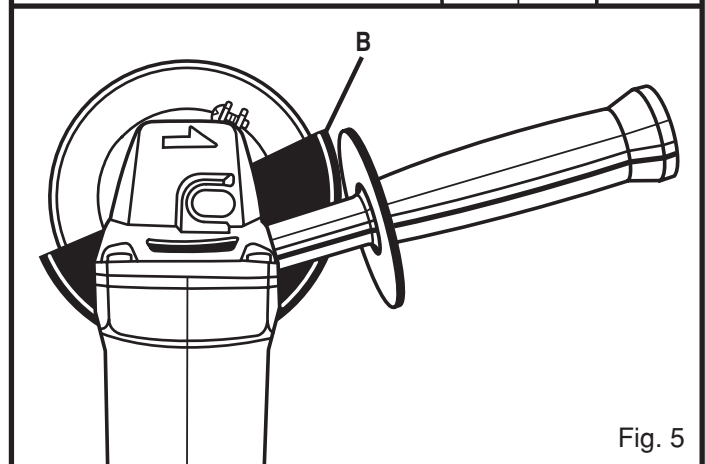


Fig. 5

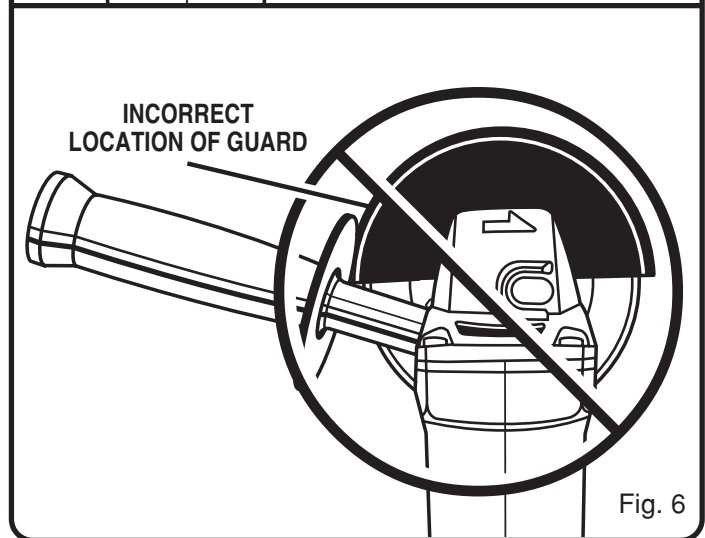


Fig. 6



## WARNING:

Do not attempt to operate this tool until you have read thoroughly and understand completely all instructions, safety rules, etc. contained in this manual. Failure to comply can result in accidents involving fire, electric shock, or serious personal injury. Save operator's manual and review frequently for continuing safe operation, and instructing others who may use this tool.

# OPERATION



## CAUTION:

Never cover air vents. They must always be open for proper motor cooling.

## SWITCH

See Figure 7.

To turn your grinder on, depress the trigger switch. Release the trigger switch to turn the grinder off.

## LOCK-ON FEATURE

See Figure 7.

Your grinder has a **lock-on** feature that is convenient when continuous operation for extended periods of time is required. To lock-on, push the trigger switch, push in the lock button located on the side of the handle, then while holding the lock button pushed in, release the trigger switch. To release the lock, depress the trigger switch and release it.

## GRINDING, SANDING, BRUSHING

See Figure 8.



## WARNING:

Inspect wire wheel brush before each use. Never use one that is rusted, damaged or not marked for a minimum speed of 11,000 RPM. Failure to heed this warning can result in serious personal injury.

**Always** carefully select and use grinding wheels that are recommended for the material to be ground. Make sure that the minimum operating speed of any accessory wheel selected is not less than 11,000 RPM. The grinding wheel provided with your grinder is suitable for grinding welds, preparing surfaces to be welded, grinding structural steel, and grinding stainless steel.

The wire wheel brush is suitable for removing paint or rust from metal surfaces. The abrasive mop disc is suitable for sanding flat metal or wood surfaces.

Secure all work before beginning any operation. Secure small workpieces in a vise or clamp to a workbench.



## DANGER:

Never use your grinder with the guard removed. It has been designed for use only with the guard installed. Attempting to use grinder with guard removed will result in loose particles being thrown against the operator resulting in serious personal injury.



## WARNING:

Never use your grinder without wearing eye protection. Following this rule will reduce the risk of serious personal injury.

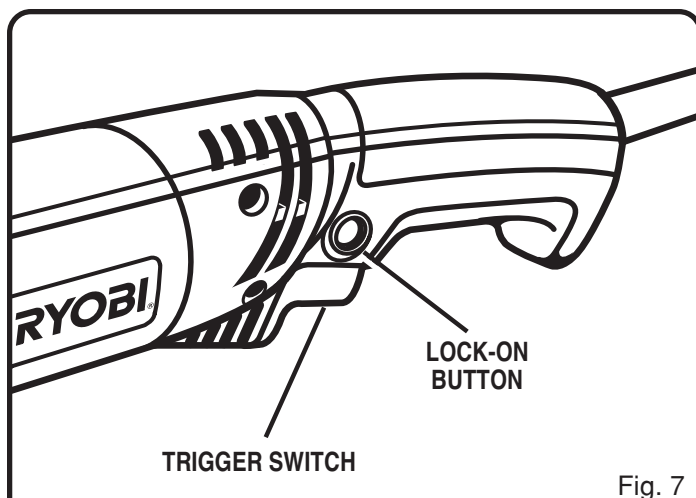


Fig. 7

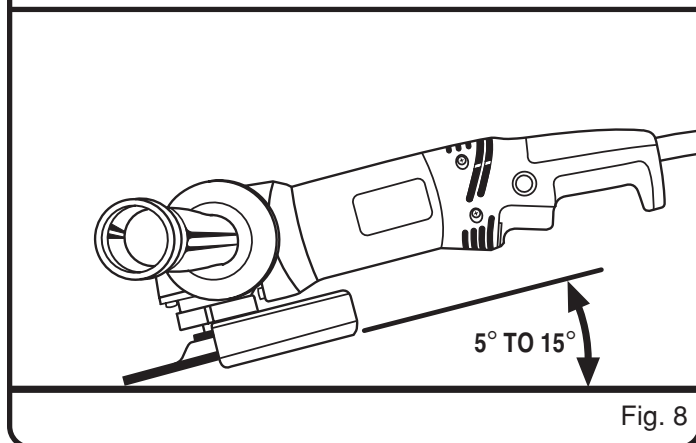


Fig. 8

The key to efficient operation begins by controlling the pressure and surface contact between the grinding wheel and workpiece. Flat surfaces are ground at an acute angle, normally between 5 to 15 degrees.

For maximum control, hold the grinder in front and away from you with both hands, keeping the grinding wheel clear of the workpiece. Start your grinder and let the motor and grinding wheel build up to full speed. Gradually lower grinder until the grinding wheel contacts the workpiece.

For best results keep the grinder tilted at an angle from 5 to 15 degrees and continuously moving at a steady, consistent pace. Move the grinder back and forth or up and down over the work area. Keep the grinder moving so that an excessive amount of material is not removed from one area. If the grinder is held in one spot too long, it will gouge and cut grooves in the workpiece. If the grinder is held at too sharp an angle, it will also gouge the workpiece because of concentration of pressure on a small area.

Use just enough pressure to keep the grinder from chattering or bouncing. Heavy pressure will decrease its speed and put a strain on the motor. Normally the weight of the tool alone is adequate for most grinding jobs. Use light pressure when grinding jagged edges or loose bolts where there is the potential for the grinder to snag on the metal edge.

Lift the grinder away from the workpiece before turning your grinder off.

# OPERATION

## **WARNING:**

In normal wire brushing operations, the material being removed and brush bristles will fly off (up to 50 or more feet) with considerable force. The potential for serious injury exists. To protect against this hazard, operators and others in the work area must wear protective clothing and safety goggles, or full face shields worn over safety glasses with side shields.

# MAINTENANCE

## GUARD REPLACEMENT

See Figure 9.

After extended use, the guard may become worn and need adjustments or replacing. If you drop your grinder and damage the guard it may also be necessary for you to replace it.

**PROCEED AS FOLLOWS WHEN REPLACEMENT IS REQUIRED:**

- **Unplug your grinder.**

## **WARNING:**

Failure to unplug your grinder could result in accidental starting causing serious injury.

- Remove and reassemble parts as shown in figure 9.
- Depress spindle lock button and rotate clamp nut until spindle locks.
- Using the wrench provided, loosen and remove clamp nut from spindle.
- Remove accessory wheel and disc flange.
- Using a screwdriver, loosen the clamp screw until the guard can be adjusted or removed.
- If you are making adjustments, rotate the guard to its correct position as shown in figures 4, 5, and 9, then retighten clamp screw securely. **Never use your grinder without the guard in place and properly adjusted.** See Figures 4 and 5.

**Note:** Be sure the tabs on the guard are seated in the groove in the bearing cap.

- If you are replacing the guard, loosen the clamp screw until the guard can be removed from the bearing cap.
- Place the new guard on the shoulder of the bearing cap. See Figure 9.

**Note:** If the new guard will not fit, loosen the clamp screw until they slide over the bearing cap.

- Rotate guard to the correct position as shown in figure 9.
- Tighten clamp screw securely.

**Note:** Be sure the tabs on the guard are seated in the groove in the bearing cap.

- Reassemble disc flange, grinding wheel, and clamp nut. Refer to "INSTALLING THE ACCESSORY WHEELS" instructions on page 9.
- Securely tighten the clamp nut with the wrench provided.

## **WARNING:**

When servicing use only identical Ryobi replacement parts. Use of any other parts may create a hazard or cause product damage.

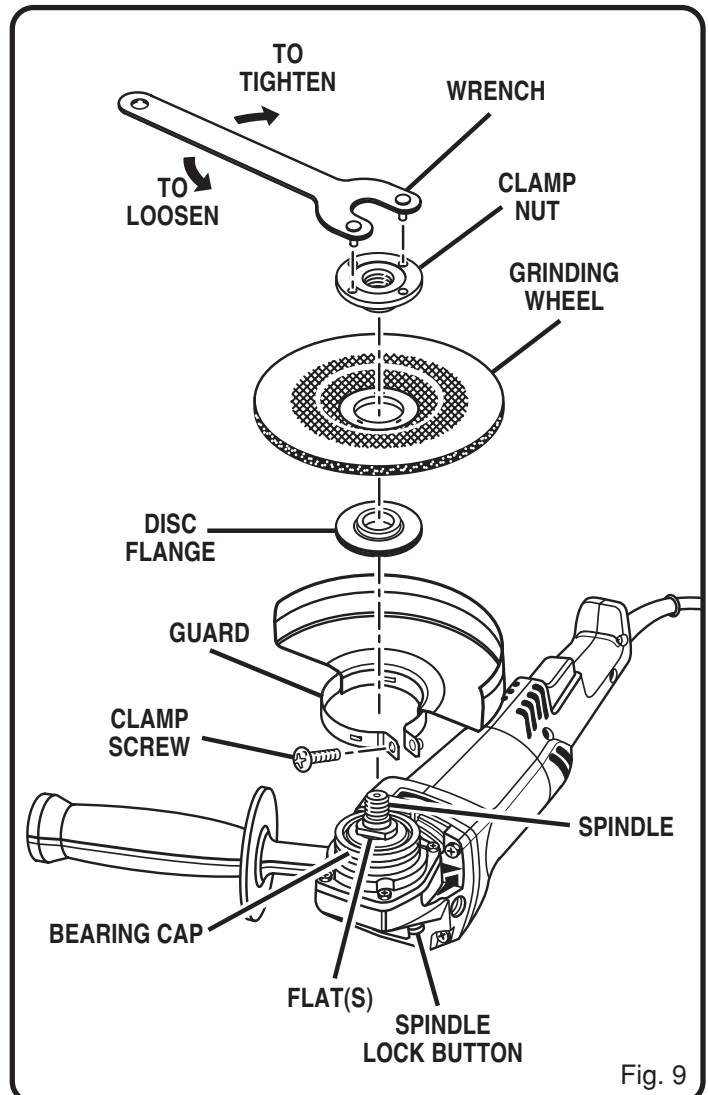


Fig. 9

# MAINTENANCE

## GENERAL

Avoid using solvents when cleaning plastic parts. Most plastics are susceptible to damage from various types of commercial solvents and may be damaged by their use. Use clean cloths to remove dirt, carbon dust, etc.



### WARNING:

Do not at any time let brake fluids, gasoline, petroleum-based products, penetrating oils, etc. come in contact with plastic parts. They contain chemicals that can damage, weaken, or destroy plastic.



### WARNING:

The double insulated system is intended to protect the user from shock resulting from a break in the tool's internal wiring. Observe all normal safety precautions related to avoiding electrical shock.



### WARNING:

Always wear safety goggles or safety glasses with side shields during power tool operation or when blowing dust. If operation is dusty, also wear a dust mask.

## LUBRICATION

All of the bearings in this tool are lubricated with a sufficient amount of high grade lubricant for the life of the unit under normal operating conditions. Therefore, no further lubrication is required.



# OPERATOR'S MANUAL

## 4-1/2 in. (115 mm) Angle Grinder

### Model AG451 / Double Insulated

#### EXTENSION CORD CAUTION

When using a power tool at a considerable distance from a power source, be sure to use an extension cord that has the capacity to handle the current the tool will draw. An undersized cord will cause a drop in line voltage, resulting in overheating and loss of power. Use the chart to determine the minimum wire size required in an extension cord. Only round jacketed cords should be used.

When working with a tool outdoors, use an extension cord that is designed for outside use. This is indicated by the letters "WA" on the cord's jacket.

Before using any extension cord, inspect it for loose or exposed wires and cut or worn insulation.

\*\* Ampere rating

(on tool data plate) 0-2.0 2.1-3.4 3.5-5.0 5.1-7.0 7.1-12.0 12.1-16.0

Cord Length	Wire Size (A.W.G.)					
25'	16	16	16	16	14	14
50'	16	16	16	14	14	12
100'	16	16	14	12	10	—

**⚠ CAUTION:** Keep the extension cord clear of the working area. Position the cord so that it will not get caught on workpiece, tools, or other obstructions while you are working with a power tool.

*\*\*Used on 12 gauge - 20 amp circuit.*

#### • SERVICE

Now that you have purchased your tool, should a need ever exist for repair parts or service, simply contact your nearest Ryobi Authorized Service Center. Be sure to provide all pertinent facts when you call or visit. Please call 1-800-525-2579 for your nearest Ryobi Authorized Service Center. You can also check our web site at [www.ryobitools.com](http://www.ryobitools.com) for a complete list of Authorized Service Centers.

#### • MODEL NO.

The model number of your tool will be found on a plate attached to the motor housing. Please record the model number and serial number in the space provided below.

- MODEL NUMBER AG451
- SERIAL NUMBER \_\_\_\_\_

#### RYOBI TECHNOLOGIES, INC.

1428 Pearman Dairy Road Anderson SC 29625  
 Post Office Box 1207 Anderson SC 29622  
 Phone 1-800-525-2579  
[www.ryobitools.com](http://www.ryobitools.com)

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