05.2016

INSTRUCTION BULLETIN

& MAINTENANCE MANUAL

FOR CTD MODEL CM60/CDM60

CTD MODEL NO: _____

CTD SERIAL NO: _____

MANUFACTURE DATE: _____

DISTRIBUTOR PURCHASED THROUGH:

(IF ANY) _____

CTD MACHINES
2382 East 48th Street
Vernon, CA 90058
Tel (213) 689-4455 • FAX (213) 689-1255
World Wide Web: http://www.ctdsaw.com
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Machine Requirements:

MODEL NO:_____ SERIAL NO:_____

Cutting Capacities

Model CM60

90° Straight Cut:
4"(102mm) High x 10" (267mm) Wide

45° Mitre:
4" (102mm) High x 7-1/4" (184mm) Wide

90° Front to Back/45° Compound:
2-5/8"" (67mm) High x 10" (254mm) Wide

Pneumatic Requirements: (if applicable) 1 CFM per 10 strokes at 75 PSI (.043 cubic meters at 5.4 kg/cm2)

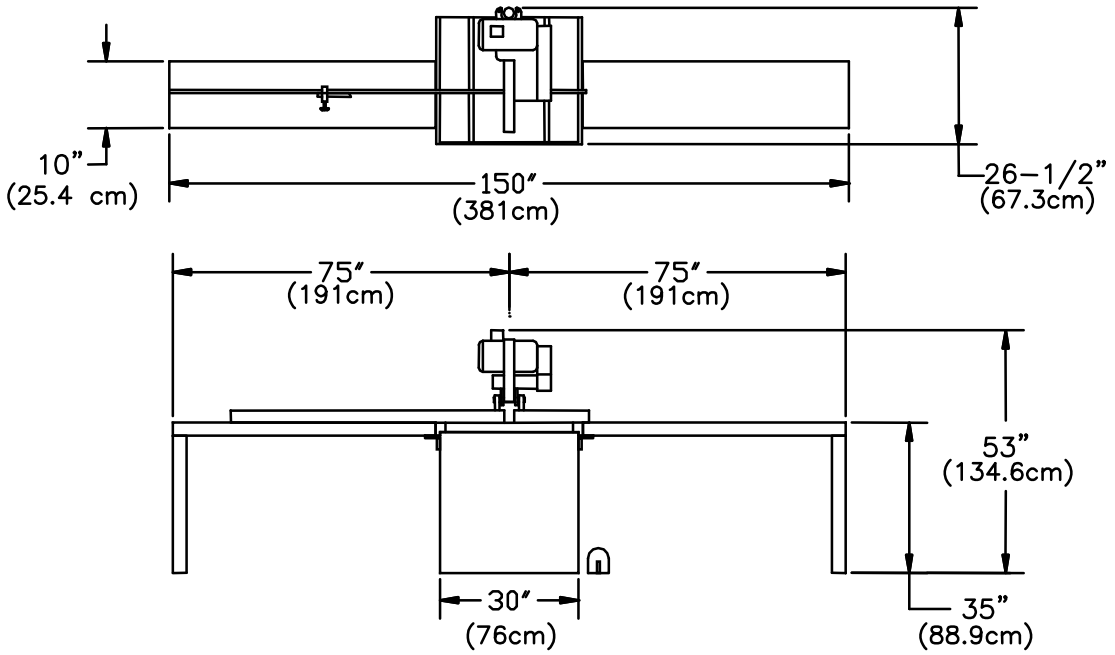
Dust Collection Requirements: 1100 CFM at each 4" and 5" outlet

Electrical Requirements: Based on one motor per machine

Motor Size	Required Amperage	Breaker Needed
3 H.P., 3 Phase 230 Volt	8.2 amps	30 amp
3 H.P., 3 Phase 460 Volt	4.1 amps	20 amp
5 H.P., 3 Phase 230 Volt	13.2 amps	40 amp
5 H.P., 3 Phase 460 Volt	6.6 amps	20 amp

Cutting Tool Requirements: Heavy, rigid plate 16" blades: .120 to .130 plate

Space Requirements



Installation and Set Up:

The CTD saw you have purchased is designed to cut wood, aluminum, plastic and steel, with of course the proper blade and conditions. For the material you are cutting, please refer to the cutting instructions for each material type. The CM60 uses a NEMA 182T Frame 3 H.P., or NEMA 184T Frame 5 H.P. 1725 RPM, 60 Hertz TEFC Motor. CTD uses a speed-up so that the blade will run at approximately 12,000 SFPM on a 16" blade.

IMPORTANT: Before operating saw, please be sure to read the **"SAFETY INSTRUCTIONS TO THE OPERATOR"** (see Page No. 7).

Note: The floor stand must be shimmed, leveled and bolted to the floor, or framed in to eliminate vibration. Use holes provided in bottom of floor stand. All machines have been completely assembled at the factory, then disassembled for shipment.

Assembly of Floor Stand, Support Tables and Measuring Gages:

Standard Machine—The standard model has been completely assembled. Fences are set at the centerline of the blade (see Diagram "B" on Page No. 4). Adjust fences forward if necessary for your particular material. The machine base must be level. The incoming material and outgoing material must lay flat on the machine base (see Diagram "F" on Page No. 10).

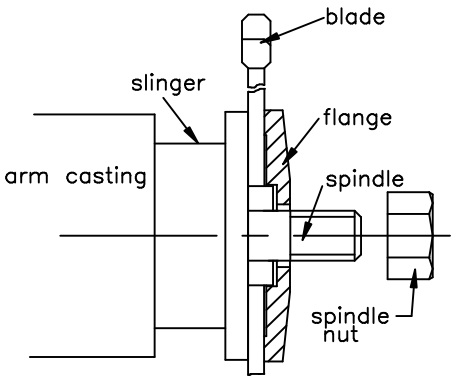
Floor Stand— The Floor Stand must be shimmed and leveled, and if necessary bolted to the floor to eliminate vibration.

Blade Installation:
Before setting blades on spindle, *always shut off or disconnect air supply*. With **Motor <u>OFF</u>** and **Power Disconnected**, open blade guard door, exposing spindle assembly. Loosen wing nut on bottom of blade guard strap and swing down. Slightly lower arm casting exposing spindle nut and flange.

Blade Installation (continued):
1. Remove Spindle Nut, P/N 9B1P44 and Outer Flange, P/N 90M03. If necessary, hold blade in hand with rag or lower blade into a piece of wood, and loosen spindle nut by pushing down on a 15/16" wrench.
2. Place blade on spindle with tips pointing down. Make sure Slinger (inner flange), P/N 60M03 and blade surface are ***clean*** before putting blade on spindle. This is a critical surface and is ground within .0005 flatness. Any debris or dust will wear this surface. Wipe both surfaces (blade and slinger) with a clean rag.
   A. The blade must **ALWAYS** rotate to the rear of the machine on the underside of the blade (see Diagram "D"). ***Always check rotation before cutting a piece of material.***
3. Replace Outer Flange, P/N 90M03 and nut as before and tighten (refer to Diagram "C"). Pull up with 15/16" wrench. Do not over-tighten. Snugging the blade is all that is necessary.
4. Replace Blade Guard Cover Assembly as before making sure Lower Blade Guard covers blade.

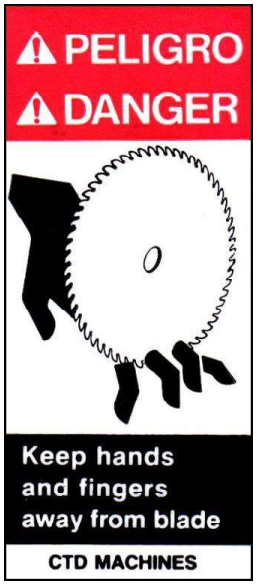
If blades were purchased from CTD, your machine has been set with your blades. If not, blade diameters may vary. Check to see if the blade contacts the base or disc in the down position. If repositioning is necessary, adjust down stop bolt located under Arm casting, P/N 6C001L or R.

<u>Diagram "C"</u>



*These machines are general purpose in their design, therefore the **<u>user</u>** should attach any additional guarding to the blade guard or table base if the cutting application causes **unsafe blade exposure.***

This label is attached to the blade guard. ***Never put hand or fingers near or under the moving blade.*** *Use a piece of wood to remove short pieces from saw.*



Electrical Installation:

The CTD CM60 uses 3 H.P. three phase 1725 RPM, 60 HZ TEFC (totally enclosed fan cooled) motors on a NEMA 182T or 184T Frame. CTD uses a speed up drive so that the blade will run at approximately 2900 RPM.

Electrical installation should be performed by a qualified and certified electrician. It is highly recommended that a *lock-out* or *disconnect switch* be located close to the machine between your main electrical panel and the machine. This disconnect switch is used to shut off power to the machine and should be used whenever the blades are changed, or at any time the machine is serviced and the blade is exposed. A Magnetic Starter can and should be provided as an optional accessory. The starter protects the motor from overheating and will not allow the motor to restart itself after power outages or undervoltage situations. (OSHA requires the *USER* to install.)

Electrical Installation of Power to Starter by a Qualified Electrician:

All wiring from the motor to the starter has been completed and tested at the factory several times. The voltage has been clearly tagged. *DO NOT CONNECT ANY VOLTAGE THAT IS **DIFFERENT** THAN THE TAGGED VOLTAGE, AS THIS MAY CAUSE SEVERE DAMAGE AND DANGER.* Consult the factory if any changes are needed.

Bring power lines to the top of the Magnetic Starter. Use dust proof connectors if available.

Single Phase Motors:

Connect leads to L1 (line 1) and L2 for single phase motors. (See Wiring Diagram for Single Phase Motors below.) Green ground wire must be grounded to enclosure. If using type "SO" wire and plug, use a romex connector through starter box and a grounded plug. *Be sure to check rotation*. The blade must rotate down and to the rear on the underside of the blade (see Diagram "D" on Page No. 5).

Three Phase Motors:

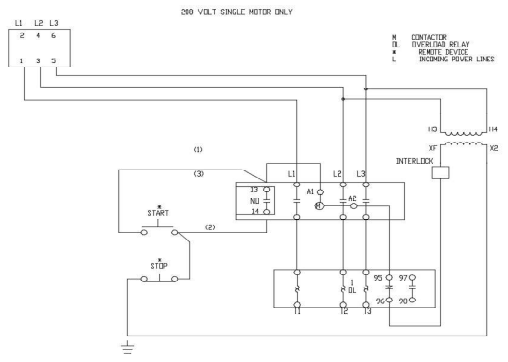
Connect incoming power line leads to L1 (line 1), L2 and L3. (See Wiring Diagram for Three Phase Motors below). Green ground wire must be grounded to enclosure. *Be sure to check rotation* as polarities may be different. The blade must rotate down and to the rear on the underside of the blade (see Diagram "D" on Page No. 5).

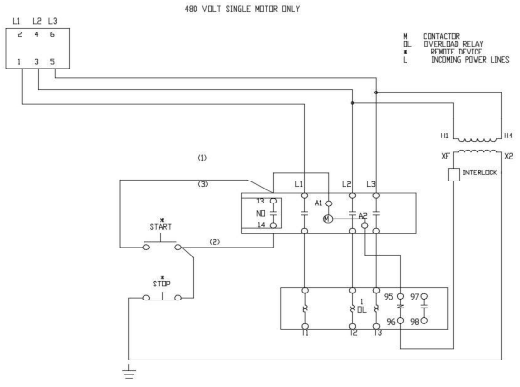
If a change in rotation is necessary, reverse any two of the incoming power wires. *Example: If the blades are running backwards and incoming wires are connected White L1, Black L2, Red L3, switch the Black wire with the Red so that Black is connected to L3 and Red is connected to L2. This will change the motor to rotate properly.*

Motor Load Amperes

Motor Size	220 Volt	440 Volt	
3 H.P., 3 Phase	7.4 amps	3.7 amps	
5 H.P., 3 Phase	13.2 amps	6.6 amps	amps

Wiring Diagram for Magnetic Starter





Safety Instructions to the Operator:

1. *KNOW YOUR CTD SAW.* Read this instruction manual carefully. Learn the operation, application, and limitations, as well as the specific potential hazards peculiar to this machine.
2. Avoid accidental starting. Make sure switch is **OFF** before plugging in power cord. A Magnetic Starter is provided as an optional accessory to give the operator added protection. (OSHA required by user.)
3. *Always* use a plug equipped with a ground.
4. *Always* keep blade guard in place. Do not wire-up or chain-up, so that blade is exposed.
5. Be sure all unnecessary tools are removed from machine before turning on power.
6. Use safety goggles. Also use a face or dust mask if operation is dusty.
7. Support work. To maintain control of work at all times, it is necessary that material be level with cutting surface.
8. Wear proper apparel. Do not wear loose clothing or jewelry. Do not wear a tie or gloves. These items can get caught in the moving parts of the machine.
9. Do not over-reach. Keep your proper footing and balance at all time.
10. Maintain your machine in top condition. Use proper blades. Clean machine weekly for proper maintenance.
11. Keep work area clean. Cluttered areas, benches and slippery floors invite accidents.
12. Avoid dangerous environments. Keep work area well illuminated.
13. Wear ear protection if exposed to long periods of very noisy shop operations.
14. Keep visitors away. All visitors should be kept a safe distance from work area.
15. Do not force the machine. The saw will do a better job and be safer to operate at the speed for which it was designed. Forcing the saw can be very hazardous to the operator.
16. Use recommended accessories. Use of other accessories may be hazardous. Use this instruction manual or consult CTD for the proper accessories available.
17. Do not drown the blade using a steady stream of coolant when cutting non-ferrous materials. Only spray the work to cool it.
18. Be sure to use the proper blade for the particular material to be cut.
19. Disconnect power cord before adjusting, servicing, and before changing belts, or for installing accessories.
20. Safety is a combination of operator *COMMON SENSE* and *ALERTNESS* at all times when the machine is being used.
21. ***WARNING!!!*** *DO NOT ALLOW FAMILIARITY (GAINED FROM FREQUENT USE OF YOUR SAW) TO DULL YOUR AWARENESS!! ALWAYS REMEMBER THAT A CARELESS FRACTION OF A SECOND IS SUFFICIENT TO INFLICT SEVERE INJURY!!*

How to operate the CM60 Single Cut-Off Saw:

Before operating the machine, please read the "SAFETY INSTRUCTIONS TO THE OPERATOR" above. Other important information and features need to be learned before operating the machine.

Rotation:

The blade must rotate to the rear of the machine on the underside of the blades (see Diagram "D" on Page No. 5).

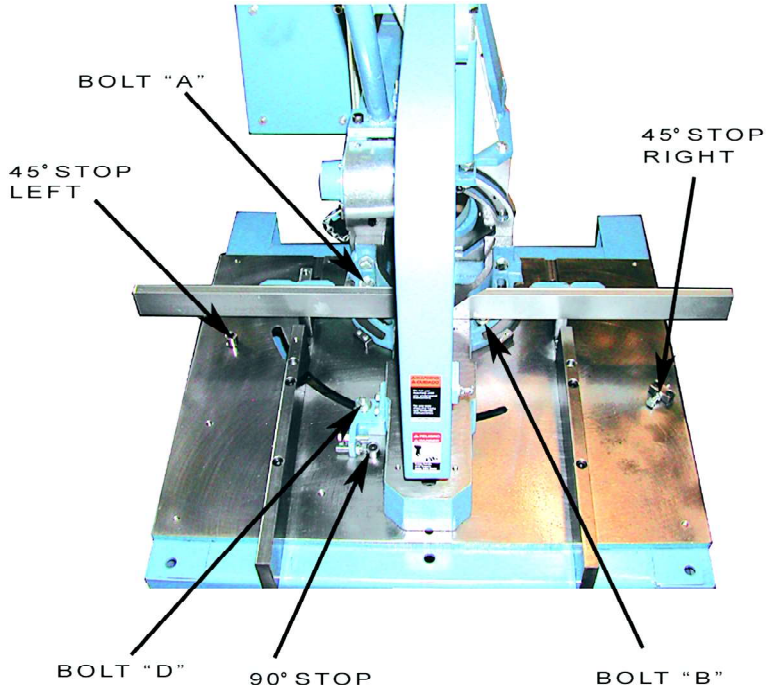
Blade Guard:

The blade and belt drive are enclosed. When the saw arm is lowered, the upper main blade guard remains fixed. The blade continues through the work as the blade exits the lower part of the main blade guard. The lower strap covering the slot remains in place. ***NEVER remove any blade guard part, exposing the blade.*** *These machines are general purpose in their design, therefore the user* should attach additional guarding to the blade guard or table base if his cutting applicationcauses **unsafe blade exposure.**

Instructions for Model CM60:

To Change Angle for Mitre:

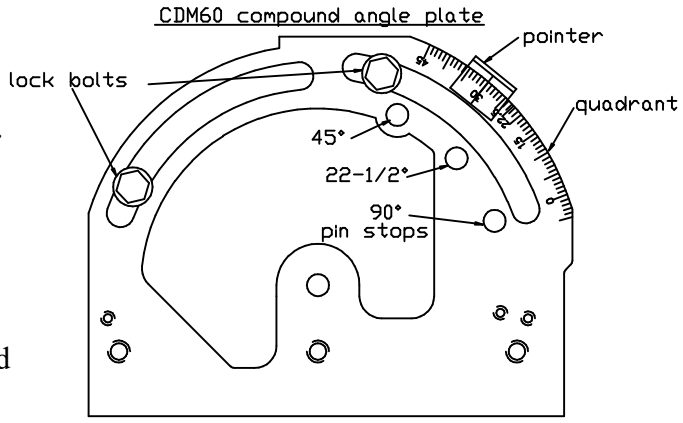
1. To change miter angle on machine to the left, locate lock down bolts (Bolts A, B, & D) and loosen with a 9/16" box wrench.
2. Remove left horizontal material support by removing 3/8x16 socket cap screws. Manually rotate top base to the left to desired degree setting, aligning angle mark with zero block. 45° and 90° stops are provided.
3. To change miter angle to the right, remove the horizontal material support on right side and the 90 degree stop, using the proper allen wrench. Move bolt "A" from the tapped hole in the front of slot to rear tapped hole in the same slot. Move bolt "B" from the tapped hole in the rear of slot to the tapped hole in the front of slot. Manually rotate top base to the right to the desired degree setting, aligning angle mark with zero block.
4. Tighten lock down bolts A, B, & D. If you desire to mitre beyond 45° to the right, then 45° stop must be removed.
5. Fences will require adjustment front to back and side to side, so they will not be hit or cut by the blade. Adjust as necessary.



To Compound CM60 Saw Head:

1. Locate compound lock bolts on compound angle plate. Using a 3/8" Allen Wrench (see Diagram "H"). Loosen lock bolts.
2. Remove dowel pin from 90° position, located in pivot bracket.
3. Manually move saw head to desired compound degree setting by aligning pointer on degree quadrant. There are positive pin stops at 90° vertical, 22-1/2° and 45° compound. Tighten lock bolts.

Diagram "H"



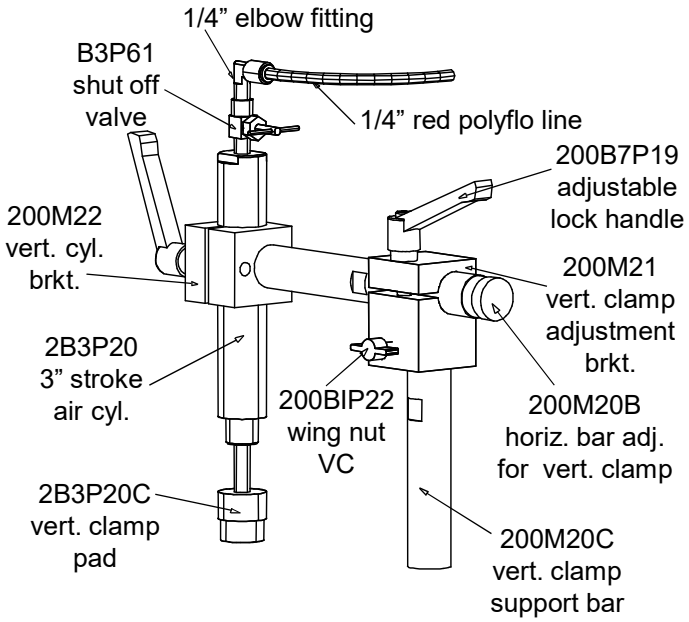
Hand Operated Machines and Cutting Speed:
The blade is rotating at approximately 2900 RPM. When moving the blade through the material, the blade must ***NEVER*** be allowed to dwell in the work. If fine finishes are required:
1. Use a sharp blade. **Do Not Force the Cutting Action,** causing the motor to stall.
2. Use a ***constant, even pressure*** when cutting through material.

Spring Return:
Each sawhead is equipped with a drawbar return spring. The function of the spring is to return the sawhead to the rest position upon release of the handle. **Do not adjust the spring pressure.** If the spring breaks, **Replace It Immediately!** *Make sure spring is attached properly and* **Never use a hand operated machine without the return spring in place.**

Clamping and Work Slippage:
The work must never be allowed to move or vibrate as it is being cut. When the work is positioned against a stop, it **must be clamped** either by hand holding or by pneumatic air clamps. **Never allow unclamped work between the blade and the stop, as the blade can grab the material and throw it—thereby causing damage to the blade, the machine, and possibly harming the operator.**

CTD offers both Horizontal and Vertical Clamps. The Horizontal Clamp pushes the material backwards against the rear fence and is mounted in the keyways of the base. A Vertical Clamp holds the material down, against the table base and is mounted through and on top of the fence bracket. Both clamps are offered as optional extras and are highly recommended. If you purchased your machine with an Air Downfeed of the saw, the clamps are actuated prior to activating saw head by depressing the Foot Valve. An Anti-Tie Down, Two Hand Control drives down the sawhead. If clamps are purchased using a hand operated machine, then the clamps will move into position by pulling the saw head down slightly. This releases the Automatic Valve (AV) to supply air to the clamps. **Be careful not to overtighten clamp cylinder bracket** on the cylinder. This will cause irregular function of the cylinder.

CM60 Vertical Clamp Assembly



Cutting the Material:
The material to be cut (both the incoming pieces and the cut pieces) must lay flat on the table base, or the blade may bind the material. ***THIS CAN DAMAGE THE BLADE OR THROW THE CUT PIECE OUT OF THE SAW, POSSIBLY HARMING THE OPERATOR*** (see Diagram "F").

Diagram "F"

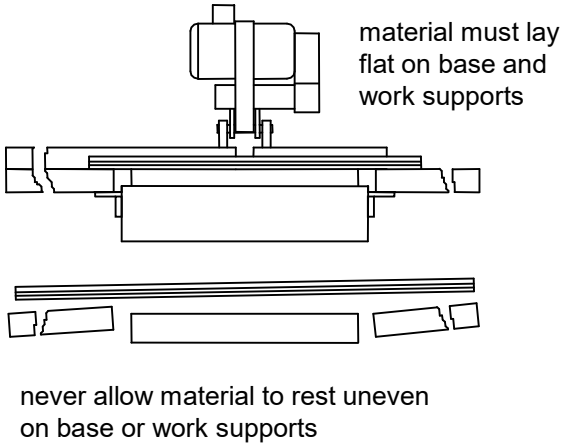
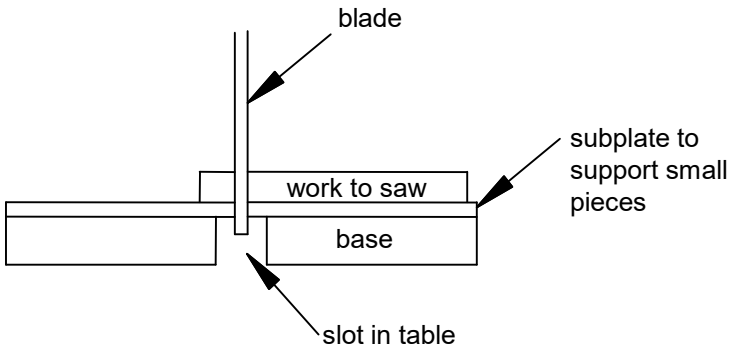


Diagram "G"



Check your material for squareness using a 90 degree square. Material that is out of square will move when it is cut, causing irregular mitres. (See **"Irregular Mitres"** on Page No. 16.) Additional tooling may be required.Consult factory for more information.

Removing Material From the Blade:
If the machine is stalled while cutting, immediately shut saw off and disconnect power. ***NEVER*** *attempt to free the blade while the motor is still on.* If a piece is bound on the blade, do not attempt to raise the blade out of the material. Instead, tap the piece down on both sides of the blade with light pressure until the piece has freed the blade.

Cutting Wood:
While wood is generally soft and simpler to cut than aluminum, it requires that the material be held in place as the blade passes through the material. CTD suggests using a Carbide Blade with Alternate Top Bevel (AT) for lighter wood sections and picture frame mouldings. This type of blade gives the finest of finishes. No *ONE* blade will cut all materials perfectly. High laquers or mica mouldings require a special modified blade for best results. Consult factory. *Never use a* ***wood*** *blade to cut* ***aluminum***, as it will chip and fracture the carbide tips of the blade.

Cutting Aluminum:
As with cutting any material, it is important that aluminum be clamped properly. Precision blades are required for accurate cutting. CTD suggests and uses a Triple Chip Grind on all its non-ferrous Carbide Blades. When cutting aluminum, or other non-ferrous materials, it is essential that the blades be lubricated with a Sawblade Lubrication System or other blade lubricating system for the finest finish. See "**Sawblade Lubrication System"** on Page No. 11 for more details.

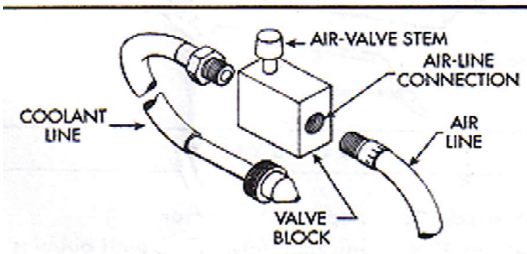
Abrasive Cutting:
When abrasive cutting, cut at the fastest speed rate the motor will allow. *Do not stall the motor*. Blade will glaze as a result of too slow a feed rate, or too hard a composition. Abrasive blades may break due to movement of the work, twisting of the blades, or glazing of the cutting edge. Seldom do abrasive blades break because of too fast a feed rate. The thinnest section of material should be presented to the blade. *For example, when cutting 1" x 2" stock, stand the piece up so the 1" edge is cut.* Abrasive blades have the tendency to wander when lengths of less than 1/2" are cut. The burr will normally be heaviest on the cut piece. To eliminate this condition, the cut pieces should be clamped.

Cutting Plastic:
Plastic can be cut as easily as wood on the 200R Series Saws. However, because of its elastic properties, the material can deflect as the blade passes through. Therefore, it is important to clamp the material as close as possible to the blade and support it by use of fixtures. CTD offers Horizontal and Vertical clamps for this application (see Page No. 9). Additional tooling may be required. CTD offers special modified blades for cutting plastics.

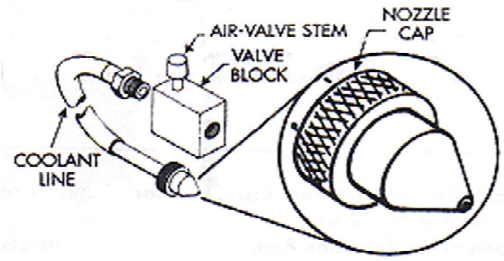
Combination Blades:
Any combination blade is basically an aluminum cutting blade. Significant blade life in between sharpenings will be lost if a blade is used for cutting both aluminum and wood. The amount of production for either wood or aluminum should be the determining factor in the assessment of the particular blade type to be used. Please consult factory.

Sound Levels:
During normal running of the machine without cutting the typical sound range will be between 60-85 db. Due to the wide variety of blades available, CTD cannot warrant that maximum allowable OSHA sound limits can be met--particularly during the cutting cycle.

Sawblade Lubrication System:
The Sawblade Lubrication System is used when cutting aluminum or other non-ferrous materials. This system normally uses a Water Soluble Oil mixture of *10 parts water to one part oil*. The system operates by syphoning the lubrication up the line to the spray nozzle. Any air leak will cause inconsistent fluid flow to the spray nozzle. ***BE SURE*** your fluid is free from chips and other debris. A fluid container supplied with the machine contains a One-Way Check Valve, Part No. B3P96 at the end of the clear fluid line. This check valve helps to hold the lubrication in the line. However, after a couple of minutes the lubrication or oil will back-flow into the container. Priming of the system may be necessary if the machine has been standing without use. The system may be shut off by closing the toggle valve next to the vacuum pump. The fluid must be clean or the Vacuum Pump will clog.



1. Connect air-line hose to valve block on Coolant Tank.
2. Recommended air pressures: Higher preferred 60 to 125 psi



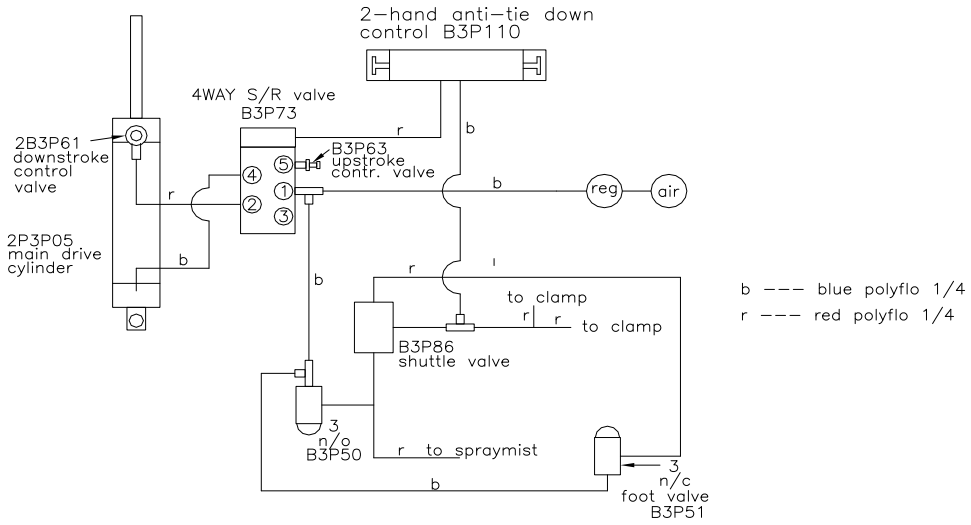
1. Open Air-Valve approximately one full turn.
2. Close Nozzle Cap until snug at end of Coolant Line, then open Nozzle Cap about 1/4 turn until a fine pin-point spray develops.
3. Once spray is coming out of nozzle final adjustment can be made by turning either or both the Air-Valve knob & Nozzle Cap.
4. The best method of testing the mist spray is to direct the spray into the palm of your hand, and when the spray is frigid cold, it has been properly adjusted.

CTD Bio Lubrication System:
The CTD biodegradable lubrication system operates by pulse spraying a minute amount of biodegradable lubricant directly on to the saw teeth of the blade in time-measured increments. The majority of the lubricant then dissipates with the heat of the cutting action. Chips coming off the blade are hot and dry, and are more easily collected. (See specific instructions included with system.)

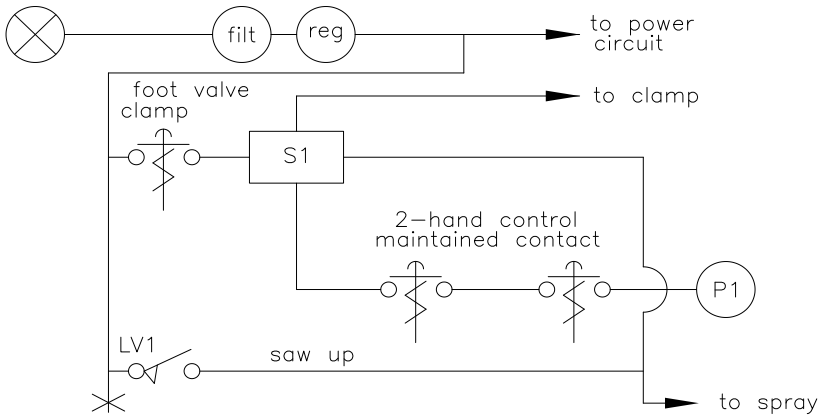
Model CM60 Air/Pneumatic System:

The air pneumatic system on the CM60 is simple to use and understand, and easy to operate.
The main components of the air system are shown below in the Air Circuit Piping Diagram.
The system operates using a Two-Hand Anti-Tie Down Control for safety. Included with the Air Pneumatic System are the main drive Cylinder and Valves, an Air Filter/Regulator/Lubricator, and one Vertical Pneumatic Clamp. The Vertical Clamp is actuated prior to the activation of the saw head via a Foot Valve, P/N B3P53E, (recommended for safety) which in turn energizes the Two-Hand Control. Note: Pressure must be maintained on the Foot Valve until Two-Hand activation. The system will not allow unclamped material to be cut. The two hand buttons must be depressed at the same time for the saw head to travel downwards. The system operates first by depressing the Foot Valve, P/N B3P53E. This gives a signal to the Shuttle Valve, P/N B3P86, to allow air to pass to the Two Hand Anti-Tie Down Control, P/N B3P110. By depressing both palm buttons simultaneously (at the same time), a signal is given to the main 4-Way Control Valve, P/N B3P73 to change direction—allowing air to pass to the main drive Cylinder, P/N B3P306. The Cylinder pushes the saw head down. The speed of descent is controlled by the Speed Control Valve, P/N B3P60 located on the Cylinder. By releasing the Two-Hand palm buttons, air is shut off to the main 4-Way Valve, it shifts direction and the main drive cylinder reverses.

Air Circuit Piping Diagram



Air Schematic

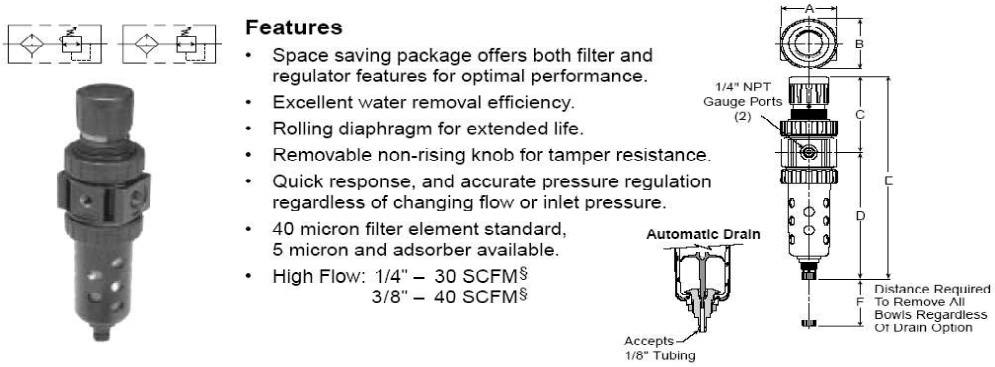


Air Supply:
The air supply must be turned off and all electrics disconnected before making adjustments on the power feed. A working pressure of 75 PSI (pounds per square inch at 5.4 kg/cm2) is required. An industrial-type compressor of at least 3 CFM (cubic feet per minute) is recommended. An additional 3 CFM is required for Spray Mists. A conveniently located valve should be supplied by the user to shut off the air line. **Arms should be raised or lowered *by hand* when setting up machine.** The machine must use clean, filtered air. The speed of descent of the saw head will vary if the air pressure varies. An Air Filter/Regulator/Lubricator is essential.

FR:
An Air Filter/Regulator is installed ahead of the air inlet to the machine. This system helps prevent foreign material from entering the system. It also provides lubrication in the air supply which helps prevent valves and cylinders from sticking. The FR is comprised of three different components.

1. The Air Filter Bowl is located on the left side and is provided with an automatic drain. This collects and then releases foreign matter and condensation collected by the air filter.
2. The Pressure Regulator, which is located on top of the air filter, controls the amount of air pressure allowed into the system. An operating pressure of 75 PSI @ 5.4 kg/cm2 is required. (This is set at the factory.)

Air Filter/Regulator



Trouble Shooting the Pneumatic System for Downfeed of Saw Head:
If the Air Feed no longer has smooth action, check the Downstroke Control Valve, P/N B3P60. If there is no Speed Control, replace with Part No. B3P60. If air is leaking from the bottom of the cylinder, replace Cylinder with Part No. B3P306.

4-Way Valve:
The 4-Way Valve is the main control, five port valve located on the Air Feed Unit. If the saw is sticking in the up or down position, the spool located in the valve probably is not shifting from side to side as necessary. This condition is caused by unclean air passing through the system. The internal parts become gummed up, and the air pressure can no longer shift the spool. A broken spring in the valve is another common cause. A 4-Way Valve Repair Kit, P/N B3P76 is available for the valve.

Air Hold Down Clamps for the Material:
Both Horizontal or Vertical Air Clamps are available and can be purchased as an optional accessory. These clamps pneumatically hold the material in place when the saw blades are cutting the material. If clamps are not purchased, the operator *MUST HAND HOLD THE MATERIAL*. The clamps are controlled by a 3-Way Valve mounted on the bottom of the Power Feed Unit. When the machine is in the rest position, the Upstroke Stud contacts the 3-Way Valve, LV1. As soon as the Foot Valve is tripped, the clamps move into position. A manual shut-off for the clamps is provided should you not want to use the clamps for a particular material.

Foot Valve:
The Foot Valve, P/N B3P53E actuates the clamps into position. Once the Foot Valve is depressed, the Two Hand Anti-Tie Down Control is energized and ready to activate. As soon as the Two-Hand Control buttons are depressed, your foot can be removed from the Foot Valve. The clamp pressure will be maintained by Limit Valve #1, P/N B3P50.

Speed Control of Blade Movement:
The downstroke speed of the blades is controlled by the Speed Control Valve, P/N 2B3P61 located in the upper port of the main drive Cylinder, P/N 2B3P05. Adjust as required for best finish. The Upstroke Control Valve, P/N B3P63 is located in port No. 5 of the main control Valve, P/N B3P73. Simply loosen nut on machine screw (10-32 thread) and adjust *in* to slow down, or *out* to speed up.

Preventative Maintenance:

The 200R Series machines and CM325R are relatively easy machines to operate and maintain. Following is a weekly check list of General Maintenance items. The best preventative maintenance advice is to *CLEAN THE MACHINE DAILY*, especially around the pivot points on the machine.

Lubrication and Adjustments of Bearings:
NO LUBRICATION OR ADJUSTMENTS ARE REQUIRED. All CTD cut-off saws are assembled using sealed, prelubricated ball bearings. The spindle and pivot assembly are constructed using preloaded belleville springs. These springs eliminate the need for adjustments of bearings and also greatly increase the life of the bearings.

General Maintenance Weekly Check List:
Always disconnect electrical power and air supply.
1. Keep machine clean—especially around pivot bracket and pivot bearings.
2. Blow off and clean around the cylinder
3. Check Air Filter Bowl for water and condensation build up.
4. Remove any scrap pieces and dust build up from inside floor stand (if purchased).
5. Check monthly;
   A. For excessive belt wear
   B. Make sure motor pulley set screws are tight.

Repair and Service:

Always use CTD factory authorized replacement parts and consult factory before making any repairs or adjustments which may be unclear.

Fence Alignment and 45° Angle Adjustment of Blades for CM60:

All machines are preset at the factory for perfect 90° and 45° mitre cuts. If any adjustments are necessary;

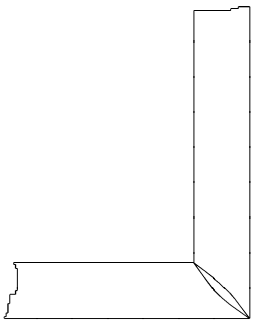
1. Check alignment of fences—left to right as shown in Diagram "E" on Page No. 8. Use a two foot steel scale or quality precision straight edge and lay flat on table base. Butt edge against fence bracket and long measuring gage (if purchased). Touch the outside corner of the straight edge. If one side of the straight edge pulls away from the fence, then the long fence gage is not in alignment with the left Fence, P/N 600M19.
2. Loosen 3/8-16 lock nut on Left Fence Bracket, P/N 200C05 and Fence Support Angle, P/N BF16. Clean all surfaces of dirt or dust, and re-assemble as before (see Diagrams "A" & "B" on Page No. 4).
3. Re-align right fence to left fence with your straight edge. Once you are sure both fences are in alignment, you now have a reference point to check your 45° mitre.

If adjustments of the 45° mitre settings are necessary, you will need a precision draftsman's triangle. Check the 45° mitre by placing the triangle against the left fence and then sliding it over to contact the plate of the Carbide Blade. Touch the triangle against the steel plate of the blade—not against the tips. If an adjustment is necessary:

A. Loosen the lock nut on the adjusting screw (1/4-20 x 1 machine screw), that locks through the 45° stop bolt.
B. Adjust 1/4-20 screw until blade plate aligns perfectly with precision triangle. Now, tighten the screw and nut. It is not necessary to move the 45° stop bolt.

Irregular Mitres:

Irregular mitre cuts are almost always caused by out-of square material. Check your material with a 90° square and a straight edge. Material that has a high spot on the bottom will move, or roll forward as it is being cut (even with pneumatic hold down clamps), thereby causing the blade to cut more on the inside of the moulding than the outside. Another cause of irregular mitre cuts is too thin a blade plate thickness. Blade plate thickness should be .095 to .110 on 12" blades. Blades will find the easiest avenue to cut through material, and sometimes the blade plate will distort when cutting heavier sections. The drawing is an example of a cut when blade plate is too thin for the material being cut.



Other Repairs:

See specific areas within the manual for additional information on repairs and maintenance.

CM60 Spindle Assembly and Bearing Installation Instructions:

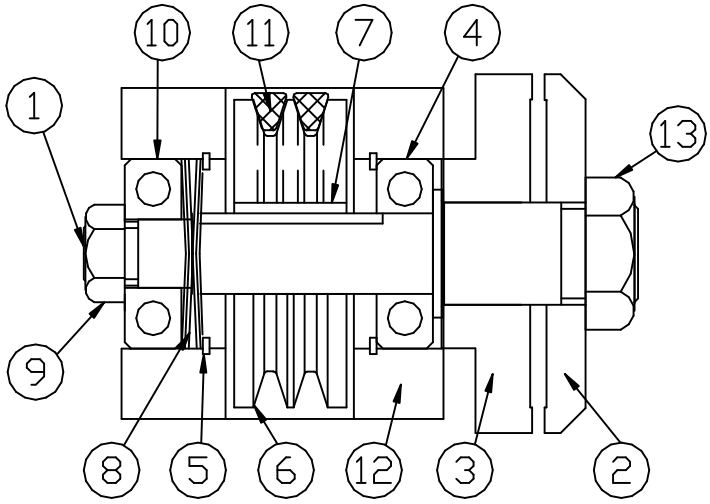
Refer to spindle diagram on following page.

It is suggested that replacement spindle assemblies be purchased from CTD before disassembling. Old spindles can be returned for bearing replacement and slinger refacing for a nominal fee. The CM60 spindle assembly provides for a "slip-fit" between the outer races of the bearing and the housing or arm casting, and a "press-fit" between the inner race and the spindle. Great care must be taken with ball bearings or the life of the bearings will be reduced. To remove the spindle assembly;

1. Remove belt guard and loosen motor.
2. Remove Pulley Nut #9 by holding spindle pulley, or by holding the slinger with special clamp wrench or strap wrench (consult factory). Loosen jam nut on spindle to the end of threads, but leave jam nut on spindle.
3. Loosen set screws in pulley.
4. With jam nut on end of spindle thread (to protect threads), gently tap jam nut *towards slinger side* using a *lead* or *rubber* mallet. The spindle assembly will begin to move out of the spindle housing. Remove jam nut when assembly is almost out. Spindle Assembly, consisting of Spindle #1, Slinger #3, and Bearing #4 will come out of housing. Pulley #7 will slide out of housing when spindle assembly is removed. Bearing on jam nut side will slide out of housing.
5. Replace bearings or belts as necessary. If you purchased spindle assembly replacement, go to No. 10.
6. Bearing on blade side is press fit on spindle. If bearing on the blade side must be replaced, an arbor press must be used to disassemble the bearing and the slinger from the spindle. ***Great care must be used in disassembling*****,** or the spindle will be scored or stripped by the slinger. Before pressing apart, scribe a line on the face of the spindle and the slinger, so that they will be re-assembled in exactly the same position in relation to each other.
7. Press off slinger and bearing from spindle.
8. Press new bearing onto spindle, making sure spindle is square to the bore.
9. Replace slinger, as above, making sure score lines match.
10. Bearing on jam nut side will slide out of housing. To re-install spindle in spindle housing, take Spindle #1 (with Slinger #3 and Bearing #4) and slowly insert into housing.
11. Place Pulley #7 and Pulley Key #8 in center of housing with key in broached keyway. Belts must be around pulley and through housing.
12. From jam nut side of housing, place Belleville Springs #9 into housing. Be careful they are inserted correctly as shown in diagram.
13. Now, place bearing in housing and on spindle, being careful that bearing goes into housing square.
14. Replace pulley jam nut on spindle threads. Holding spindle pulley, or slinger with special clamp wrench or strap wrench, slowly tighten jam nut. This will cause bearing to slowly push into housing. Tighten thoroughly.
15. Tighten set screws in pulley.
16. The face of Slinger #3 must be checked to make sure the face (next to the blade) is running true. If it is not running true, it should be refaced. To reface, use the side of a surface grinder wheel. Dress the face of the slinger by rotating spindle in bearings slowly against the direction of the surface grinding wheel.
17. Place belts around motor pulley and tighten.
18 .Check alignment of motor and spindle pulley with a straight edge.

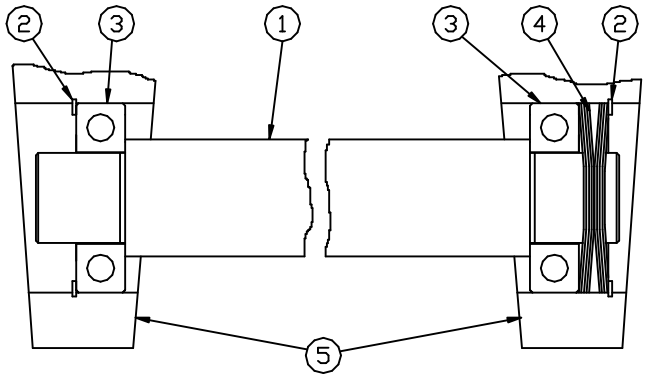
CM60 Spindle Assembly

No.	Description	Part No.
1	Spindle	90M01
2	Flange	90M02
3	Slinger	60M03
4	Bearing, Slinger side	9B2P04
5	Snap Ring (2 required)	9B2P06
6	Spindle Pulley	2B4P27
7	Pulley Key	2BM23
8	Belleville Spring (4 req.)	2B2P06
9	Jam Nut	9B1P43
10	Bearing, Jam Nut side	9B2P03
11	3VX600 Drive Belt	4B4P3V600
12	Arm Casting	6C001
13	Spindle Nut	9B1P44



Pivot Assembly for Model CM60

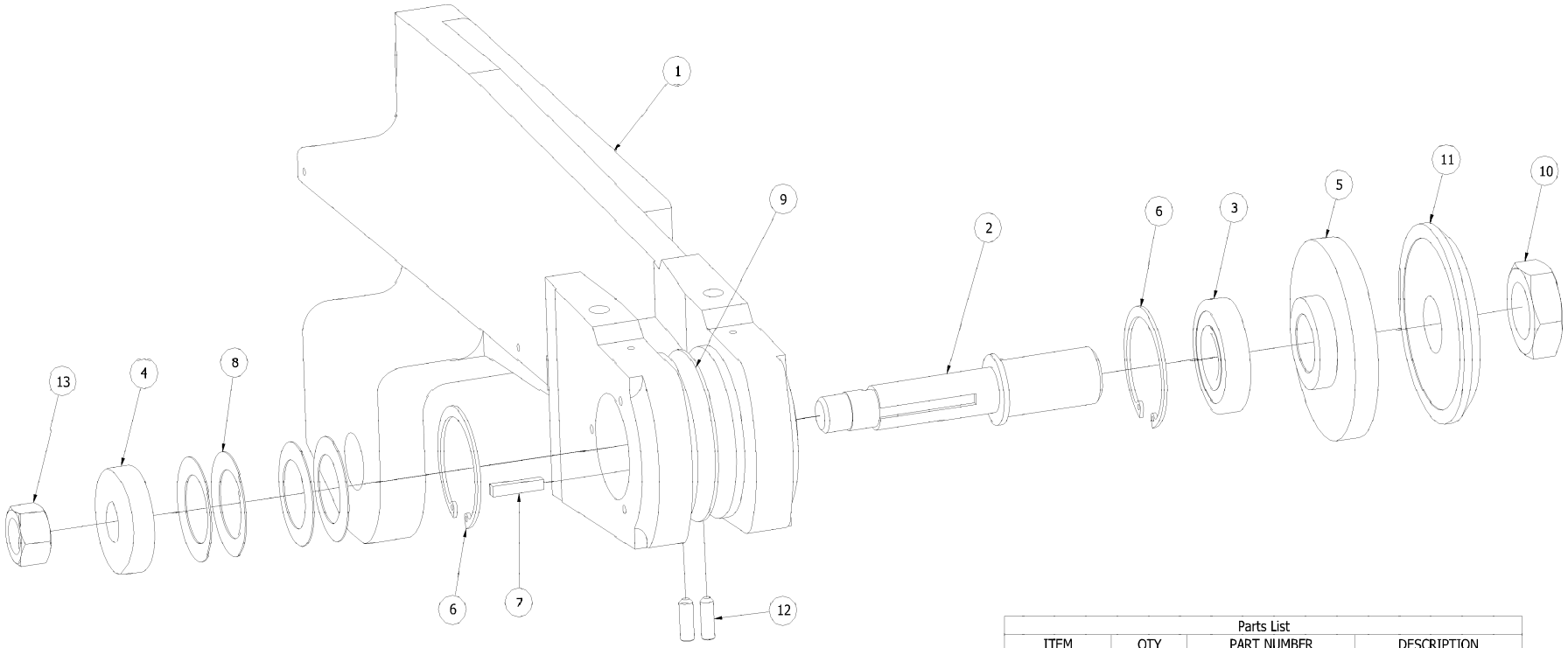
No.	Description	Part No.
1	Pivot Shaft	6M14
2	Snap Ring (2 required)	2B2P06
3	Bearing (2 required)	2B2P05
4	Belleville Spring (8 required)	2B2P07
5	CDM60 Pivot Bracket	6C002



Parts for Air Pneumatic System for CM60

Part No.	Quantity	Description
B3P110	1	2-Hand Anti Tie Down Control Assembly
B3P306	1	Air Cylinder (drive for saw head)
B3P60	1	Flow Control Valve (speed of saw down)
B3P73	1	4-Way Spring Return Valve (main control valve)
B3P50	1	3-Way Normally Open (N/O) Valve (controls accessory items SM and VC)
B3P86	1	Shuttle Valve
B3P63	1	Upstroke Valve (speed of saw up)
157P73	1	Rubber Bumper
B3P54A	1	FR Unit with Auto Drain
6F004R/L	1	Motor Mount Plate
6M80	2	Cylinder Support Studs
6M16	1	Cylinder Clevis Rear/or mount
4BF101	1	Auto Valve Bracket
6M82	1	Power Feed Cylinder Support Bar
15M75	1	Cross Bar Cylinder
B3P51 (FV)	1	3-Way Normally Closed (N/C) Foot Valve
15M26	1	Cylinder Clevis, Rod
4BM94	1	Hydro Mount Cylinder

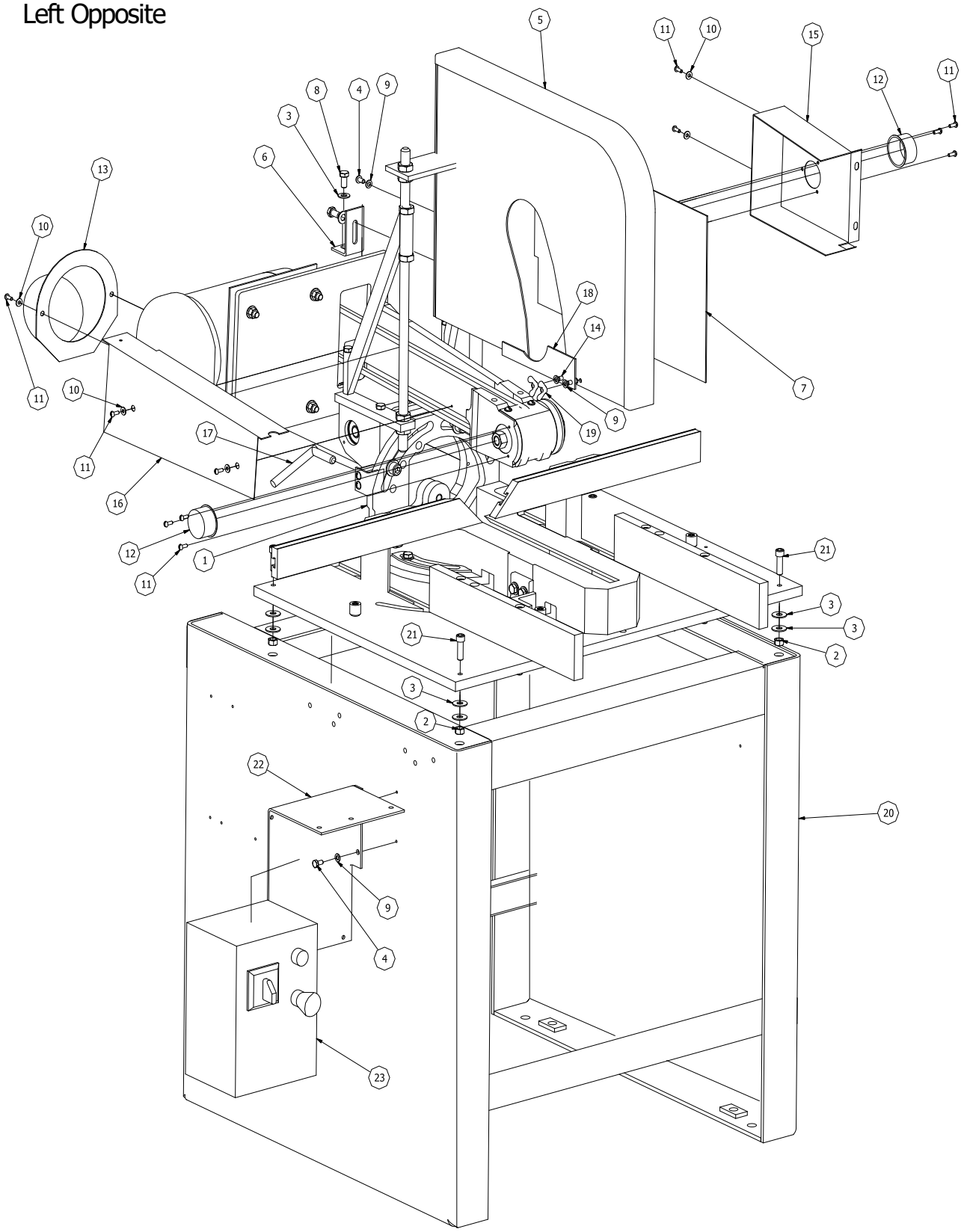
CDM60 & CM60 Right Spindle Assembly



Parts List			
ITEM	QTY	PART NUMBER	DESCRIPTION
1	1	6C001R	Arm, Rt.
2	1	90M01R	Spindle, Rt.
3	1	9B2P04	Bearing, Slinger Side
4	1	9B2P03	Bearing, Jam Nut Side
5	1	60M03	Slinger
6	2	9B2P06	Snap Ring
7	1	2BM23	Pulley Key
8	4	9B2P05	Belleville Spring
9	1	2B4P27	Spindle Pulley
10	1	9B1P44R	Spindle Nut, Rt.
11	1	90M03	Flange
12	2	1/4-20 x 3/4 Set Screw	Pulley Set Screw
13	1	151P16L	Jam Nut, Lt.

CM60/CDM60 Blade Guard Exploded View

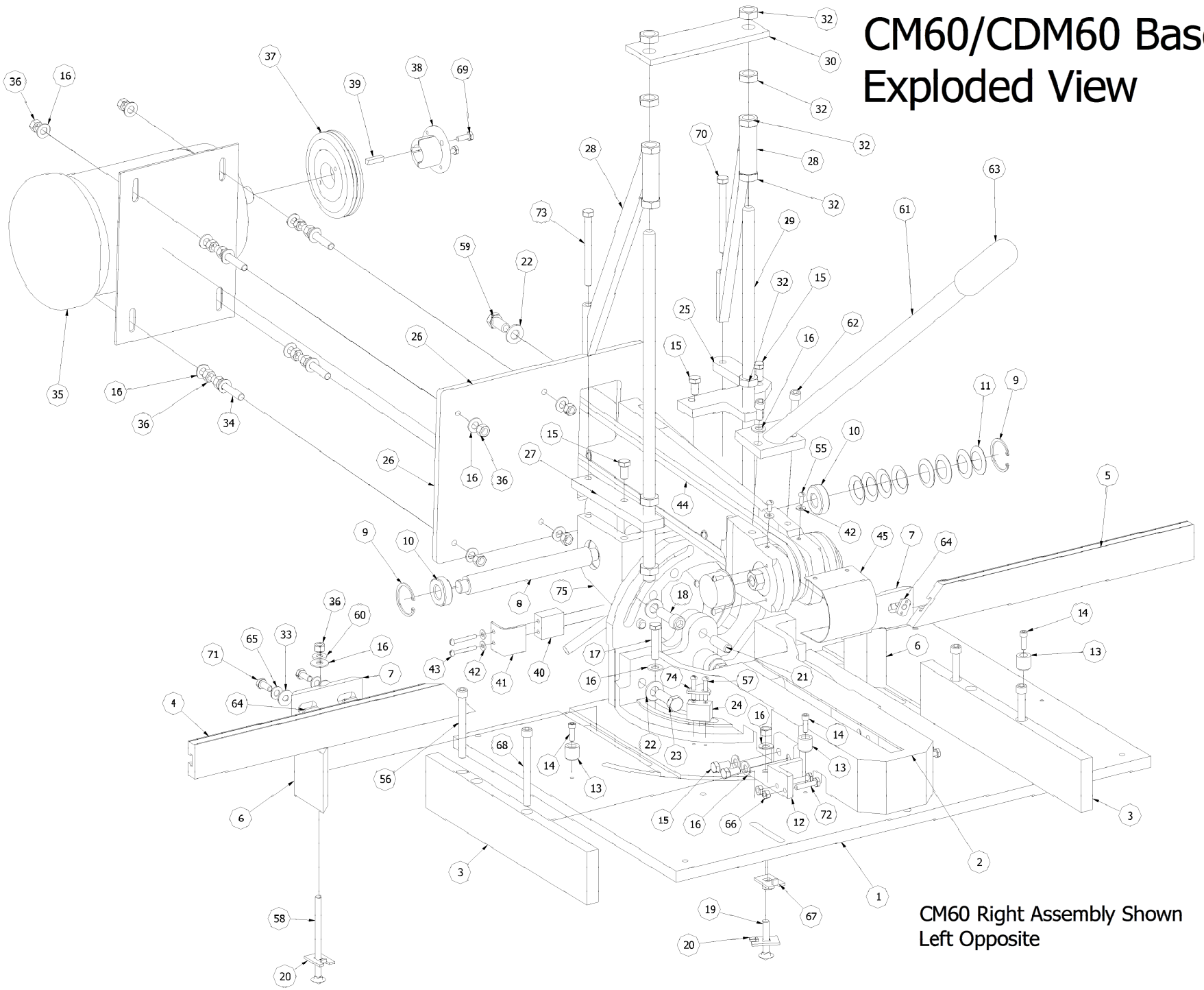
CM60 Right Assy. Shown
Left Opposite



CM60/CDM60 Blade Guard Parts List

Parts List					
ITEM	QTY	PART NUMBER	DESCRIPTION	CM60	CDM60
1	1	6M11R/L	Compound Angle Plate, Rt or Lt.	X	X
2	4	3/8-16 Hex Nut	3/8-16 Hex Nut	X	
3	10	3/8 USS Washer	3/8 USS Washer	X	X
4	3	1/4-20 x 1/2 Hex Bolt	Mag. Starter Bracket Locking Bolt	X	
5	1	6E09R/L	Blade Guard Assy. Rt or Lt.	X	X
6	1	6F41	Blade Guard Aligmnt. Angle	X	X
7	1	6F05R/L	Blade Guard Door, Rt or Lt.	X	X
8	1	3/8-16 x 1 Hex Bolt	Blade Guard Angle Locking Bolt	X	X
9	5	1/4 USS Washer	1/4 USS Washer	X	X
10	6	#10 Washer	#10 Washer	X	X
11	12	10-32 x 1/2 Slotted Rd. Head Mach. Screw	10-32 x 1/2 Slotted Rd. Head Mach. Screw	X	X
12	2	6D7P08	Motor & Spindle Shaft Cover	X	X
13	1	6F45	5" Rear Dust Outlet	X	X
14	2	1/4-20 x 3/4 Pem Stud	Blade Guard Strap Locking Stud	X	X
15	1	60F12R/L	Rear Belt Guard, Rt or Lt.	X	X
16	1	60F15R/L	Front Belt Guard, Rt or Lt.	X	X
17	1	6F24	Compound Pin	X	X
18	1	6F07B	Bottom Blade Guard Strap	X	X
19	2	1/4-20 Wing Nut	1/4-20 Wing Nut	X	X
20	1	41F06	Floor Stand	X	
21	4	3/8-16 x 1.25 Socket Head Screw	Base Locking Screw	X	
22	1	BF96	Magnetic Starter Bracket	X	X
23	1	B5P3h3Q230V/DM/CH	3HP3Ph 208/230V Mag. Starter	X	X

CM60/CDM60 Base Exploded View



CM60 Right Assembly Shown
Left Opposite

CM60/CDM60 Base Parts List

Parts List					
ITEM	QTY	PART NUMBER	DESCRIPTION	CM60	CDM60
1	1	60F01	Base Plate	X	
2	1	6C003	Top Base	X	X
3	2	600M25	Material Support Key	X	
4	1	600M19L	Outside Fence, Lt.	X	X
5	1	600M19R	Outside Fence, Rt.	X	X
6	2	600M20	Inside Fence Key	X	X
7	2	200C05	Fence Bracket	X	X
8	1	6M14	Pivot Shaft	X	X
9	2	2B2P06	Snap Ring	X	X
10	2	2B2P05	Pivot Bearing	X	X
11	8	2B2P07	Belleville Spring	X	X
12	1	6M35L/R	Stop Bracket Top Base, Lt. or Rt.	X	X
13	3	6M25	45º Stop	X	X
14	3	1/4-20 x 1 Socket Head Screw	Stop Locking Bolt	X	X
15	5	3/8-16 x 1 Hex Bolt	3/8-16 x 1 Hex Bolt	X	X
16	28	3/8 USS Washer	3/8 USS Washer	X	X
17	2	3/8-16 x 1.75 Hex Bolt	Miter Base Locking Bolt	X	X
18	2	1/2-13 x 1.5 Socket Head Screw	Compound Locking Bolt	X	X
19	2	3/8-16 x 1.75 Carriage Bolt	Stop Bracket Locking Bolt	X	X
20	4	BF19	Tab Washer	X	X
21	1	1/2 x 1.5 Dowel Pin	Compound Pin	X	X
22	6	1/2 Washer	1/2 Washer	X	X
23	3	1/2-13 x 1.5 Hex Bolt	1/2-13 x 1.5 Hex Bolt	X	X
24	2	2DM27	Zero Block	X	X
25	1	6M21A	Brace Base Plate	X	X
26	1	60F04R/L	Motor Mount Plate, Rt. or Lt.	X	X
27	1	6M21B	Brace Support Bar	X	X
28	1	6M21-O	Rear Brace Outside	X	X
29	2	6M80	Guide Support Rod	X	X
30	1	6F09B	Blade Guard Top Cross Bar	X	X
31	1	6F41	Blade Guard Adj. Angle	X	X
32	12	5/8-11 Jam Nut	Brace Locking Nut	X	X
33	4	5/16 USS Washer	5/16 USS Washer	X	X
34	4	30M51	Motor Locking Stud	X	X
35	1	9B6S11	3HP, 3PH Motor	X	X
36	16	3/8-16 Hex Nut	3/8-16 Hex Nut	X	X
37	1	B4P2H3V47	2H3V4.75 Pulley	X	X
38	1	B4PH118	1/8 Bushing	X	X
39	1	1/4 x 1/4 x 1.5 Key	Motor Shaft Key	X	X
40	1	6M49	Compound Pointer Block	X	X
41	1	6M49A	Compound Pointer Angle	X	X
42	4	#10 Washer	#10 Washer	X	X
43	2	10-32 x 1.5 Slotted Rd. Head Mach. Screw	Compound Pointer Angle Locking Screw	X	X
44	2	4B4P3V600	3V600 Belt	X	X
45	1	6F03	Arm Pulley Cover	X	X
55	2	10-32 x 1/2 Slotted Rd. Head Mach Screw	Pulley Cover Locking Screw	X	X
56	2	3/8-16 x 3.5 Socket Head Screw	Support Key Locking Screw	X	
57	4	10-32 x 1.25 Slotted Rd. Head Mach Screw	Zero Block Locking Screw		X
58	2	3/8-16 x 4.5 Carriage Bolt	Fence Key Locking Bolt	X	X
59	3	1/2-13 x 1 Hex Bolt	Motor Mount Plate Locking Bolt	X	X
60	2	3/8 SAE Washer	3/8 SAE Washer	X	X
61	1	6M50	Handle	X	
62	2	3/8-16 x 3/4 Socket Screw	Handle Locking Screw	X	
63	1	4B7P11	Handle Grip	X	
64	4	B1P51618	5/16-18 Tee Nut	X	X
65	4	5/16 SAE Washer	5/16 SAE Washer	X	X
66	4	1/4-20 Hex Nut	1/4-20 Hex Nut	X	X
67	2	BF19B	Tab Washer W/Nut	X	X
68	2	3/8-16 x 4 Socket Screw	Key Locking Screw	X	X
69	3	1/4-20 x 3/4 Hex Bolt	Pulley Locking Bolt	X	X
70	2	3/8-16 x 4 Hex Bolt	Brace Locking Bolt	X	X
71	4	5/16-18 x 3/4 Hex Bolt	Fence Locking Bolt	X	X
72	1	1/4-20 x 1.25 Hex Bolt	1/4-20 x 1.25 Hex Bolt	X	X
73	1	6M21-I	Rear Brace Inside	X	X
74	1	2D7P18	Clear Cursor	X	X
75	1	6C002R/L	Pivot Bracket, Rt. or Lt.	X	x

Parts List for Model CM60

Base and Fences

60F01	Base Plate CM60
6C001L/R	Arm Casting Lt. or Rt.
6C002	Pivot Bracket
6C003	Top Base
6M11L/R	Compound Plate Lt. or Rt.
41F06	Floor Stand
2DM27	Zero Block (2)
6M25	90 & 45 Degree Left Lide Stop (2)
223M44	45 Degree Right Side Stop
200C05	Fence Bracket (2)
600M19L	Left Fence
600M19R	Right Fence
600M20	Fence Key (2)
600M25	Material support Key (2)
6M35L	Stop Bracket Top Base Left
6M35R	Stop Bracket Top Base Right
6M49	Compound Pointer Block
6M49A	Compound Pointer Angle
6F24	Compound Pin
6M80	Guide and Support Rods (2)
6F45	5" Rear Dust Outlet
6M50	Handle (manual only)
6M21A	Rear Base Plate
6M21B	Brace Support Bar
6M21I	Inside Rear Brace
6M21O	Outside Rear Brace

Blade Guard and Belt Guard Parts

6E09L/R	Main Blade Guard Lt or Rt.
6F05L/R	Blade Guard Door Lt. or Rt.
6F07B	Bottom Blade Guard Strap
6F41	Blade Guard Adjustment Angle
6M10	Blade Guard Door Clamp
60F12R	Rear Belt Guard Right
60F15L	Belt Guard Left
60F15R	Front Belt Guard Right

Motors and Drive

9B6S11	3 H.P. Motor (standard)
9B6S22	5 H.P. Motor (optional)
60F04L	Motor Mount Plate Left
60F04R	Motor Mount Plate Right
4BF96	Magnetic Starter Plate
B5P2/3H3Q	3 H.P. Magnetic Starter
B5P7.5 H3Q	5 H.P. Magnetic Starter
B4P2H3V47	Motor Pulley
B4PH118	Motor Pulley Bushing
2B4P27	Spindle Pulley
4B4P3V600	3VX600 Drive Belt (2)
9B7P65	Spindle Wrench

Motor Warranty:

Motors which fail during the warranty period of one (1) year must be returned to an authorized Baldor Service Representative for examination to determine whether the failure was caused by defective manufacturing. In the event a replacement is required before factory examination, a motor will be sold at the list price. If the factory authorizes replacement, CTD will credit customer's account for the replacement cost. All motors are shipped FOB CTD, Los Angeles, CA plant.

Guarantee:

CTD warrants that their cut-off machines and accessories are free from defect of material, workmanship, and title, and are of the kind of quality indicated and described in applicable specifications. The foregoing warranty is exclusive and in lieu of all other warranties, whether written or oral. CTD's obligation under the foregoing warranty is limited to the repair or replacement (at CTD's option) of the part which is defective in materials or workmanship for a period of one (1) year from the date of shipment to the original purchaser of the equipment. CTD's liability to the purchaser, whether for warranties, negligence, or otherwise, shall not in any way include consequential damages, or costs of removing or reinstalling the products. All parts and machines are shipped FOB CTD, Los Angeles, CA plant.

CTD MACHINES

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