

# OPERATION AND PARTS MANUAL



## **MODEL MB25HD REBAR BENDER (PORTABLE ELECTRIC)**

Revision #0 (04/05/10)

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**THIS MANUAL MUST ACCOMPANY THE EQUIPMENT AT ALL TIMES.**

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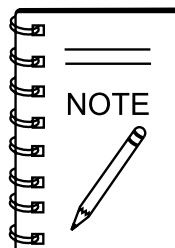
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## MB25HD REBAR BENDER

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***Specification and part number are subject to change without notice.***

# PARTS ORDERING PROCEDURES

## Ordering parts has never been easier! Choose from three easy options:

Effective:  
January 1<sup>st</sup>, 2006



### Order via Internet (Dealers Only):

Order parts on-line using Multiquip's SmartEquip website!

- View Parts Diagrams
- Order Parts
- Print Specification Information



If you have an MQ Account, to obtain a Username and Password, E-mail us at: [parts@multiquip.com](mailto:parts@multiquip.com).

To obtain an MQ Account, contact your District Sales Manager for more information.

Goto [www.multiquip.com](http://www.multiquip.com) and click on **Order Parts** to log in and save!

Use the **internet** and qualify for a **5% Discount** on *Standard orders* for all orders which include complete part numbers.\*

Note: Discounts Are Subject To Change



### Order via Fax (Dealers Only):

All customers are welcome to order parts via Fax.

**Domestic (US) Customers dial:**

1-800-6-PARTS-7 (800-672-7877)

**Fax** your order in and qualify for a **2% Discount** on *Standard orders* for all orders which include complete part numbers.\*

Note: Discounts Are Subject To Change



**Order via Phone: Domestic (US) Dealers Call:**  
1-800-427-1244

### Non-Dealer Customers:

Contact your local Multiquip Dealer for parts or call 800-427-1244 for help in locating a dealer near you.



**International Customers** should contact their local Multiquip Representatives for Parts Ordering information.

## When ordering parts, please supply:

- |   |  |
|---|--|
| <input type="checkbox"/> Dealer Account Number                                | <input type="checkbox"/> Specify Preferred Method of Shipment:                         |
| <input type="checkbox"/> Dealer Name and Address                              | <input checked="" type="checkbox"/> UPS/Fed Ex <input checked="" type="checkbox"/> DHL |
| <input type="checkbox"/> Shipping Address (if different than billing address) | <input type="checkbox"/> Priority One <input checked="" type="checkbox"/> Truck        |
| <input type="checkbox"/> Return Fax Number                                    | <input type="checkbox"/> Ground  |
| <input type="checkbox"/> Applicable Model Number                              | <input type="checkbox"/> Next Day  |
| <input type="checkbox"/> Quantity, Part Number and Description of Each Part   | <input type="checkbox"/> Second/Third Day  |

### NOTICE

All orders are treated as *Standard Orders* and will ship the same day if received prior to 3PM PST.

WE ACCEPT ALL MAJOR CREDIT CARDS!

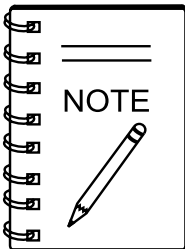


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## FOR YOUR SAFETY AND SAFETY OF OTHERS!

Safety precautions should be followed at all times when operating this equipment. Failure to read and understand the Safety Messages and Operating Instructions could result in injury to yourself and others.



This manual has been developed to provide complete instructions for the safe and efficient operation of this equipment.

Before using this equipment ensure that the operating individual has read and understood all instructions in this manual.

## SAFETY MESSAGE ALERT SYMBOLS

The three Safety Messages shown below will inform you about potential hazards that could injure you or others. The Safety Messages specifically address the level of exposure to the operator, and are preceded by one of three words: **DANGER**, **WARNING**, or **CAUTION**.

### **DANGER**

You **WILL** be **KILLED** or **SERIOUSLY INJURED** if you **DO NOT** follow these directions.

### **WARNING**

You **CAN** be **KILLED** or **SERIOUSLY INJURED** if you **DO NOT** follow these directions.

### **CAUTION**

You **CAN** be **INJURED** if you **DO NOT** follow these directions.

## HAZARD SYMBOLS

Potential hazards associated with the operation of this equipment will be referenced with Hazard Symbols which appear throughout this manual, and will be referenced in conjunction with Safety Message Alert Symbols.

### **WARNING — Respiratory Hazards**



**ALWAYS** wear approved respiratory protection when required.

### **CAUTION — Rotating Parts Hazards**



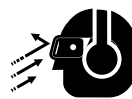
**NEVER** operate equipment with covers or guards removed. Keep fingers, hands, hair and clothing away from all moving parts to prevent injury.

### **CAUTION — Accidental Starting Hazards**



**ALWAYS** place the equipment ON/OFF switch in the OFF position when the equipment is not in use.

### **CAUTION — Eye and Hearing Hazards**



**ALWAYS** wear approved eye and hearing protection.

### **CAUTION — Equipment Damage Hazards**

Other important messages are provided throughout this manual to help prevent damage to your equipment, other property, or the surrounding environment.

# RULES AND REGULATIONS

## **WARNING — Read This Manual**

Failure to follow instructions in this manual may lead to serious injury or even **DEATH!** This equipment is to be operated by trained and qualified personnel only! This equipment is for industrial use only.

### GENERAL SAFETY

- **DO NOT** operate or service this equipment before reading this entire manual.
- This equipment should not be operated by persons under 18 years of age.
- **NEVER** operate this equipment without proper protective clothing, shatterproof glasses, steel-toed boots and other protective devices required by the job.



- **NEVER** operate this equipment when not feeling well due to fatigue, illness or when under medication.
- **NEVER** operate this equipment under the influence of drugs or alcohol.



- **NEVER** use accessories or attachments that are not recommended by Multiquip for this equipment. Damage to the equipment and/or injury to user may result.
- Manufacturer does not assume responsibility for any accident due to equipment modifications. Unauthorized equipment modification will void all warranties.
- Whenever necessary, replace nameplate, operation and safety decals when they become difficult to read.
- **ALWAYS** check the equipment for loosened threads or bolts before starting.
- **MAINTAIN** equipment is a safe operating condition at all times.
- **KEEP** bystanders, children, and visitors away while operating the equipment. Distractions can cause loss of control.

- **DO NOT** wear loose clothing or jewelry. Contain long hair. Keep hair, clothing, and gloves away from moving parts. Rotating parts can cause injury if contacted.

- **ALWAYS** keep work area clean and free of foreign matter and debris. Also keep work area well lit.

- **NEVER** operate the equipment in an explosive atmosphere or near combustible materials. An explosion or fire could result causing severe **bodily harm or even death.**



- **DO NOT** overreach. Keep proper footing and balance at all times.

- **NEVER** leave the equipment unattended. When not in use, before servicing, and when changing accessories, always unplug the equipment from the power source.

- **USE** this equipment for its intended purpose only.

- **KEEP** equipment clean for better and safer performance. Keep handles dry, clean, and free from oil and grease.

- **INSPECT** the equipment after each use. Replace any damaged or worn parts immediately. Do not use equipment if defective.

- If a malfunction occurs, immediately unplug the equipment from the power source and correct the problem. If problem cannot be corrected, contact the nearest MQ service center.

- **ALWAYS** store the equipment in a clean, dry location out of the reach of children.

### EMERGENCIES

- **ALWAYS** know the location of the nearest **fire extinguisher.**



- **ALWAYS** know the location of the nearest **first aid kit.**



- In emergencies, **always** know the location of the nearest phone or **keep a phone on the job site.** Also know the phone numbers of the nearest **ambulance, doctor** and **fire department.** This information will be invaluable in case of emergency.



# RULES AND REGULATIONS







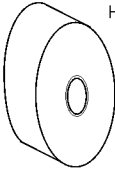
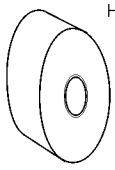
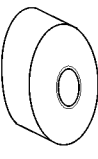
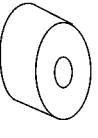
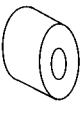
## ELECTRICAL SAFETY

- **ALWAYS** test the **POWER** switch on the equipment before operating. The purpose of this switch is to shut down the power.
- **NEVER** use a extension cord that is frayed or damaged where the insulation has been cut.
- **NEVER** carry the equipment by its power cord or disconnect it by yanking the cord from the power outlet.
- **ALWAYS** make certain that the proper extension cord has been selected for the job. See Extension Cord Gauge Selection Table.
- **NEVER** allow power cord to *lay in water*.
- **NEVER stand in water** while operating the equipment.
- When connecting the unit to a power receptacle, make sure the receptacle circuit is connected to either a GFCI receptacle or a receptacle protected by a 20 amp circuit breaker.
- When plugging the unit into a power receptacle, check the nameplate for the correct operating voltage. Operating the rebar bender at the wrong voltage will damage the electrical components. **ALWAYS** read the nameplate before applying power.
- This unit is equipped with a 3-prong male power plug. **DO NOT** use a 2-prong adapter when plugging into a wall outlet. This will defeat the purpose of the ground circuit. If the plug does not fit into the receptacle, contact a qualified electrician to install a 3-conductor wall receptacle (outlet).
- Avoid body contact with grounded surfaces such as pipes, radiators, ranges and refrigerators. There is an increased risk of electrical shock if your body is grounded.
- **DO NOT** expose the hydraulic power unit to rain or wet conditions. Water entering the power unit will increase the risk of electrical shock.
- When operating the unit outdoors, be sure to use the appropriate outdoor extension cord. This type of extension cord reduces the risk of electrical shock.
- **ALWAYS** remove the AC power cord from the power source before performing any service or maintenance on the unit. This preventative safety measure reduces the possibility of accidental starting.
- When operating near an arc welder, it is important the both the unit and the welding equipment be connected to the same earth ground. If they are not, server damage to the unit, particularly to the power cord could occur. Personal injury may also occur.

| Extension Cord Gauge Selection |       |                        |         |         |         |         |         |         |         |          |
|--------------------------------|-------|------------------------|---------|---------|---------|---------|---------|---------|---------|----------|
| Ampere Rating Range            | Volts | Length of Cord in Feet |         |         |         |         |         |         |         |          |
|                                | 115V  | 25 Ft.                 | 50 Ft.  | 100 Ft. | 150 Ft. | 200 Ft. | 250 Ft. | 300 Ft. | 400 Ft. | 500 Ft.  |
|                                | 230V  | 50 Ft.                 | 100 Ft. | 200 Ft. | 300 Ft. | 400 Ft. | 500 Ft. | 600 Ft. | 800 Ft. | 1000 Ft. |
| 0 - 2                          |       | 18                     | 18      | 18      | 16      | 16      | 14      | 14      | 12      | 12       |
| 2 - 3                          |       | 18                     | 18      | 16      | 14      | 14      | 12      | 12      | 10      | 10       |
| 3 - 4                          |       | 18                     | 18      | 16      | 14      | 12      | 12      | 10      | 10      | 8        |
| 4 - 5                          |       | 18                     | 18      | 14      | 12      | 12      | 10      | 10      | 8       | 8        |
| 5 - 6                          |       | 18                     | 16      | 14      | 12      | 10      | 10      | 8       | 8       | 6        |
| 6 - 8                          |       | 18                     | 16      | 12      | 10      | 10      | 8       | 6       | 6       | 6        |
| 8 - 10                         |       | 18                     | 14      | 12      | 10      | 8       | 8       | 6       | 6       | 4        |
| 10 - 12                        |       | 16                     | 14      | 10      | 8       | 8       | 6       | 6       | 4       | 4        |
| 12 - 14                        |       | 16                     | 12      | 10      | 8       | 6       | 6       | 6       | 4       | 2        |
| 14 - 16                        |       | 16                     | 12      | 10      | 8       | 6       | 6       | 4       | 4       | 2        |
| 16 - 18                        |       | 14                     | 12      | 8       | 8       | 6       | 4       | 4       | 2       | 2        |
| 18 - 20                        |       | 14                     | 12      | 8       | 6       | 6       | 4       | 4       | 2       | 2        |

# SPECIFICATIONS

| TABLE 1. SPECIFICATIONS |                                 |                     |
|-------------------------|---------------------------------|---------------------|
| Model                   | MB25HD                          |                     |
| Capacity                | Ø6(1/4") - Ø25(1"), No.2 - No.8 |                     |
| Range of Bends          | 0° - 180°                       |                     |
| Motor                   | Single Phase, 115 V, 60 Hz, 15A |                     |
| Standard Equipment      | Roller - 3                      | Allen Wrench - 2    |
|                         | Collar - 5                      | Open-End Wrench - 1 |
|                         | Waterproof Cover - 1            | Screwdriver - 1     |
|                         | Tool Box - 1                    | Foot Switch - 1     |

| TABLE 2. SIZE OF ROLLERS AND COLLARS |  |   |   |   |   |   |
|--------------------------------------|--|---|---|---|---|---|
| REBAR DIAMETER                       | No. 8<br>1-inch<br>(25.4mm)  | No. 7<br>7/8-inch<br>(22.2mm)   | No. 6<br>3/4-inch<br>(19.0mm)   | No. 5<br>5/8-inch<br>(15.9mm)   | No. 4<br>1/2-inch<br>(12.7mm)   | No. 3<br>3/8-inch<br>(9.52mm)   |
| ROLLER DIAMETER                      | <br>H25<br>DIA. 2.00"<br>(51 MM)  | <br>H22<br>DIA. 2.82"<br>(72. MM)/OPTION | <br>H19<br>DIA. 3.62"<br>(92.0 MM) | <br>H16<br>DIA. 5.43"<br>(138 MM) | <br>H13<br>DIA. 6.00"<br>(154 MM)/OPTION | <br>H10<br>DIA. 6.62"<br>(168 MM)/OPTION |
| COLLAR DIAMETER                      | <br>H25<br>DIA. 4.92"<br>(125 MM) | <br>H22<br>DIA. 4.32"<br>(110 MM)        | <br>H19<br>DIA. 3.73"<br>(95 MM)   | <br>H16<br>DIA. 2.20"<br>(56 MM)  | <br>H13<br>DIA. 1.81"<br>(46 MM)         |   |

**NOTE:** Roller NO. H25 and Collar No. H25 are factory installed on the bender.

## GENERAL INFORMATION

The **MQ MB25HD Rebar Bender** is designed to be used as a portable on-site rebar bender, capable of bending in-place rebar to approved American Concrete Institute (ACI) radius. Labor time and injuries are greatly reduced from manually bending rebar. The MB25HD is capable of bends up to 180°.

The MB25HD comes standard with 3 rollers and 5 collars which can be used in different combinations to match the diameter of the rebar to be bent.

The MB25HD comes with a foot switch which can start the bending procedure with a push of the pedal instead of pressing the start button.

An emergency button is available to immediately stop the machine when something goes wrong during bending. The roller then returns to the starting position.

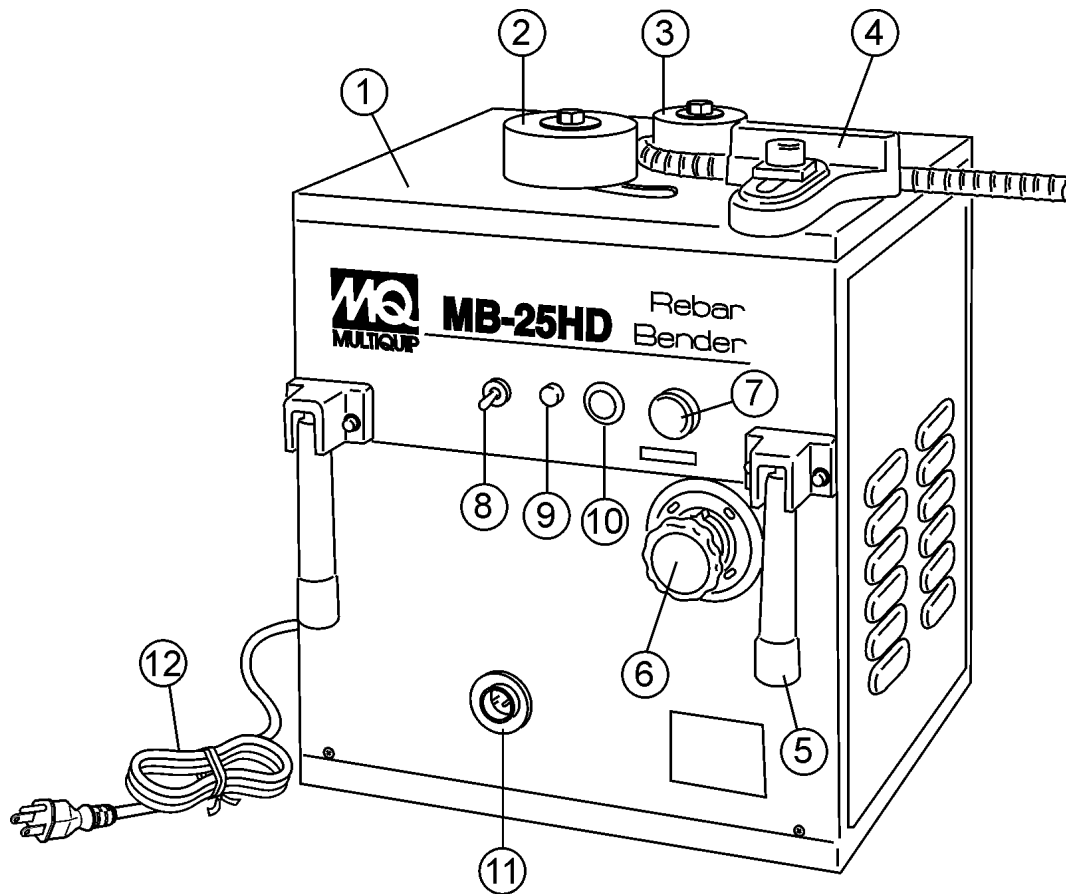


Figure 1. MB25HD Components

Figure 1 shows the components of the MB25HD Rebar Bender. These components are described below.

1. **Table** — Holds the roller, collar, stopper and the rebar to be bended.
2. **Roller** — Works in combination with the collar depending on the diameter of the rebar to bend.
3. **Collar** — Works in combination with the roller depending on the diameter of the rebar to bend.
4. **Stopper** — Holds the rebar in place when bending.
5. **Handle** — Used to lift the rebar bender.
6. **Angle Select Dial** — Sets the angle that the rebar is going to be bent.
7. **Emergency Stop Switch** — Stops the rebar bending and moves the roller back to the starting position.
8. **Power Switch** — Turns the power of the rebar bender on or off.
9. **Pilot Lamp** — Indicates rebar unit is on.
10. **Start Switch** — Starts the bending process.
11. **Connector (for foot switch)** — Connects to the foot switch to start the machine with a push of the pedal.
12. **Power Cord** — Connect to a 120V, 60 Hz receptacle.

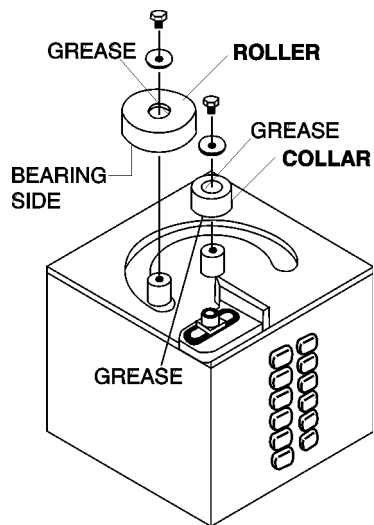
## SELECTION AND INSTALLATION OF ROLLER AND COLLAR

### **WARNING**

Keep fingers from the bending area. Moving parts can cause serious injury.

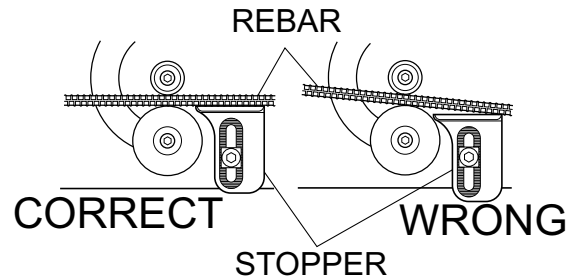
Do not drop anything into the machine from the bending area as this may damage the machine.

1. Select the roller and corresponding collar to match the diameter of the rebar to be bent. See Table 2 for the different combinations.
2. Apply multi-purpose grease to the roller.
3. Install the collar and the roller as shown in Figure 2.



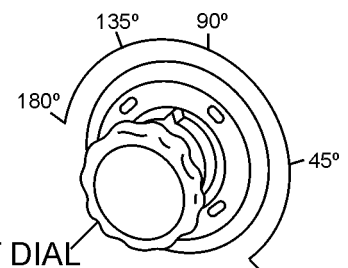
**Figure 2. Roller and Collar Installation**

4. When using a roller with a bearing, bearing must face downward.
5. When using a collar with a bearing, bearing must face downward.
6. To prevent the roller and the collar from coming off, attach the washer securely with the bolt.
7. Position the stopper so that rebar to be bent is parallel to the front of the stopper and tighten the rebar securely in place. If the rebar is not parallel to the front, the bending angle will be incorrect. See Figure 3.



**Figure 3. Stopper Position**

8. Rotate the Angle Select Dial to the desired angle that the rebar is to be bent (Figure 4).

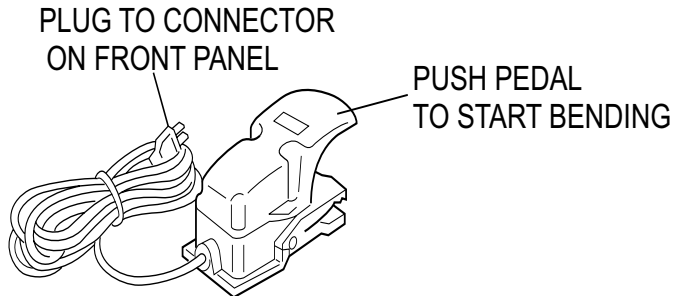


**Figure 4. Selecting the Bending Angle**

9. Plug the power cord into a proper single-phase power source. Make sure that the rebar bender is properly grounded.
10. Turn the power switch on.
11. Hold the rebar firmly and press the Start Switch. This will engage the clutch and the roller to bend the rebar.
12. After the rebar is bent to the desired angle, the roller will automatically spring back to the starting position.

## USING THE FOOT SWITCH

Instead of the Start Switch, the Foot Switch can be used to start the bending process. See Figure 5.

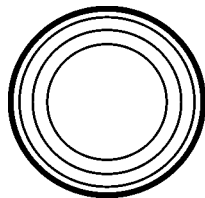


**Figure 5. Starting with the Foot Switch**

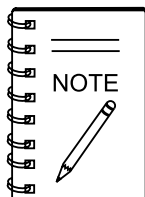
1. Insert the plug of the foot switch to the Foot Switch Connector on the front panel of the rebar bender.
2. Press the pedal on the foot switch to start bending.
3. When the bending angle is achieved, the roller will automatically spring back to the start position.

## EMERGENCY STOP SWITCH

1. To stop the rebar bender immediately in case anything goes wrong in the bending process, press the Emergency Stop Button (Figure 6). The roller on the rebar bender will immediately stop and return to the start position.



**Figure 6. Emergency Stop Switch**



It is not necessary to press the pedal continuously while bending. Once the pedal is pressed bending will start and pedal can be released.

### **WARNING**

The roller goes back to start position very quickly after bending because of the spring mechanism. Keep away from the machine until the roller is completely back in the start position to prevent any injury.

### **DANGER**

During operation of this rebar bender, there exists the possibility of **electrocution, electrical shock or burn**, which can cause **severe bodily harm** or even **DEATH!**

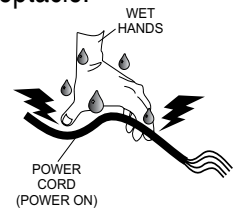


To avoid these hazards:

**NEVER** use damaged or worn cables when plugging the rebar bender into an AC power receptacle.

**NEVER** grab or touch a live power cord with wet hands.

**NEVER** stand in water and touch a live power cord.



## REMOVING STEEL DEBRIS

1. To remove steel debris from the machine, tilt it and clear all debris from the outlet.

### WARNING

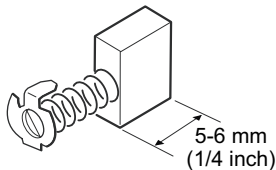
Do not let debris or rust accumulate inside the machine as this could lead to malfunction of the machine.

## REPLACING CARBON BRUSHES

### WARNING

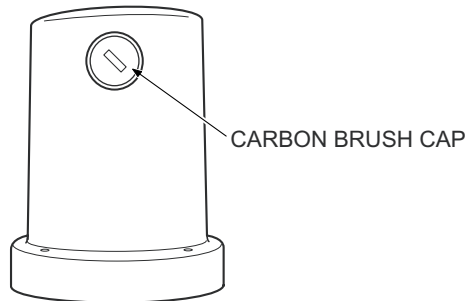
Unplug unit from power source before replacing carbon brushes.

When the carbon becomes less than 5 or 6 mm (1/4 inch) the motor force deteriorates because of low rectification (Figure 7). The carbon brushes need to be replaced.



**Figure 7. Carbon Brush Size**

1. Make sure that the power plug is not connected to the power source.



**Figure 8. Replacing Carbon Brushes**

2. Remove the rear panel and the bottom plate of the machine so that the outer frame of the motor is visible (Figure 8).
3. Remove the carbon brush cap of the motor outer frame using a standard screwdriver.
4. Replace the carbon brushes with new ones.
5. Put back the cap and reinstall the rear and end panels of the machine.

**⚠ WARNING**

Unplug unit from power source before troubleshooting.

**TABLE 4. TROUBLESHOOTING**

| SYMPTOM   | POSSIBLE PROBLEM  | SOLUTION                                       |
|---|---|--|
| Steel bar will not end because of clutch slipping.    | Is clutch worn out?   | Replace clutch.                                |
|   | Is there an abnormal voltage drop?                            | Check cause of abnormal voltage drop.          |
|   | Are steel bars too hard?                                      | Use steel bars with correct hardness.          |
| Motor and clutch do not work while the current is on. | Are dust deposits on magnet switch contact?                   | Polish magnet switch.                          |
|   | Is magnet switch contact worn out?                            | Replace magnet switch.                         |
|   | Is lead wire disconnected?                                    | Connect lead wire.                             |
|   | Is electric motor weak or defective?                          | Replace or repair motor.                       |
| Irregularity in bending angles.                       | Is the stopper improperly positioned or not tightened enough? | Correct positioning and tightness of stopper.  |
|   | Is there an irregularity in the steel bar hardness?           | Use steel bars with correct hardness.          |
| Abnormal noise from motor.                            | Are armature cooling vanes broken or deformed?                | Replace a defective armature and its bearings. |
|   | Are armature bearings worn out?                               | Replace with new bearings.                     |
|   | Is armature out of balance?                                   | Replace with a new armature.                   |
| Power output motor is not sufficient.                 | Are carbon brushes worn out?                                  | Replace with new ones.                         |
|   | Is insulation of coils broken?                                | Replace armature or motor.                     |
|   | Is there a drop in voltage?                                   | Check the cause of the voltage drop.           |

# EXPLANATION OF CODE IN REMARKS COLUMN

The following section explains the different symbols and remarks used in the Parts section of this manual. Use the help numbers found on the back page of the manual if there are any questions.

## NOTICE

The contents and part numbers listed in the parts section are subject to change **without notice**. Multiquip does not guarantee the availability of the parts listed.

## SAMPLE PARTS LIST

| NO. | PART NO. | PART NAME           | QTY. | REMARKS             |
|-----|----------|---------------------|------|---------------------|
| 1   | 12345    | BOLT.....           | 1    | INCLUDES ITEMS W/%  |
| 2%  |          | WASHER, 1/4 IN..... |      | NOT SOLD SEPARATELY |
| 2%  | 12347    | WASHER, 3/8 IN....  | 1    | MQ-45T ONLY         |
| 3   | 12348    | HOSE .....          | A/R  | MAKE LOCALLY        |
| 4   | 12349    | BEARING .....       | 1    | S/N 2345B AND ABOVE |

## NO. Column

**Unique Symbols** — All items with same unique symbol

(@, #, +, %, or >) in the number column belong to the same assembly or kit, which is indicated by a note in the “Remarks” column.

**Duplicate Item Numbers** — Duplicate numbers indicate multiple part numbers, which are in effect for the same general item, such as different size saw blade guards in use or a part that has been updated on newer versions of the same machine.

## NOTICE

When ordering a part that has more than one item number listed, check the remarks column for help in determining the proper part to order.

## PART NO. Column

**Numbers Used** — Part numbers can be indicated by a number, a blank entry, or TBD.

TBD (To Be Determined) is generally used to show a part that has not been assigned a formal part number at the time of publication.

A blank entry generally indicates that the item is not sold separately or is not sold by Multiquip. Other entries will be clarified in the “Remarks” Column.

## QTY. Column

**Numbers Used** — Item quantity can be indicated by a number, a blank entry, or A/R.

A/R (As Required) is generally used for hoses or other parts that are sold in bulk and cut to length.

A blank entry generally indicates that the item is not sold separately. Other entries will be clarified in the “Remarks” Column.

## REMARKS Column

Some of the most common notes found in the “Remarks” Column are listed below. Other additional notes needed to describe the item can also be shown.

**Assembly/Kit** — All items on the parts list with the same unique symbol will be included when this item is purchased.

Indicated by:

“INCLUDES ITEMS W/(unique symbol)”

**Serial Number Break** — Used to list an effective serial number range where a particular part is used.

Indicated by:

“S/N XXXXX AND BELOW”

“S/N XXXX AND ABOVE”

“S/N XXXX TO S/N XXX”

**Specific Model Number Use** — Indicates that the part is used only with the specific model number or model number variant listed. It can also be used to show a part is NOT used on a specific model or model number variant.

Indicated by:

“XXXXX ONLY”

“NOT USED ON XXXX”

**“Make/Obtain Locally”** — Indicates that the part can be purchased at any hardware shop or made out of available items. Examples include battery cables, shims, and certain washers and nuts.

**“Not Sold Separately”** — Indicates that an item cannot be purchased as a separate item and is either part of an assembly/kit that can be purchased, or is not available for sale through Multiquip.

# SUGGESTED SPARE PARTS

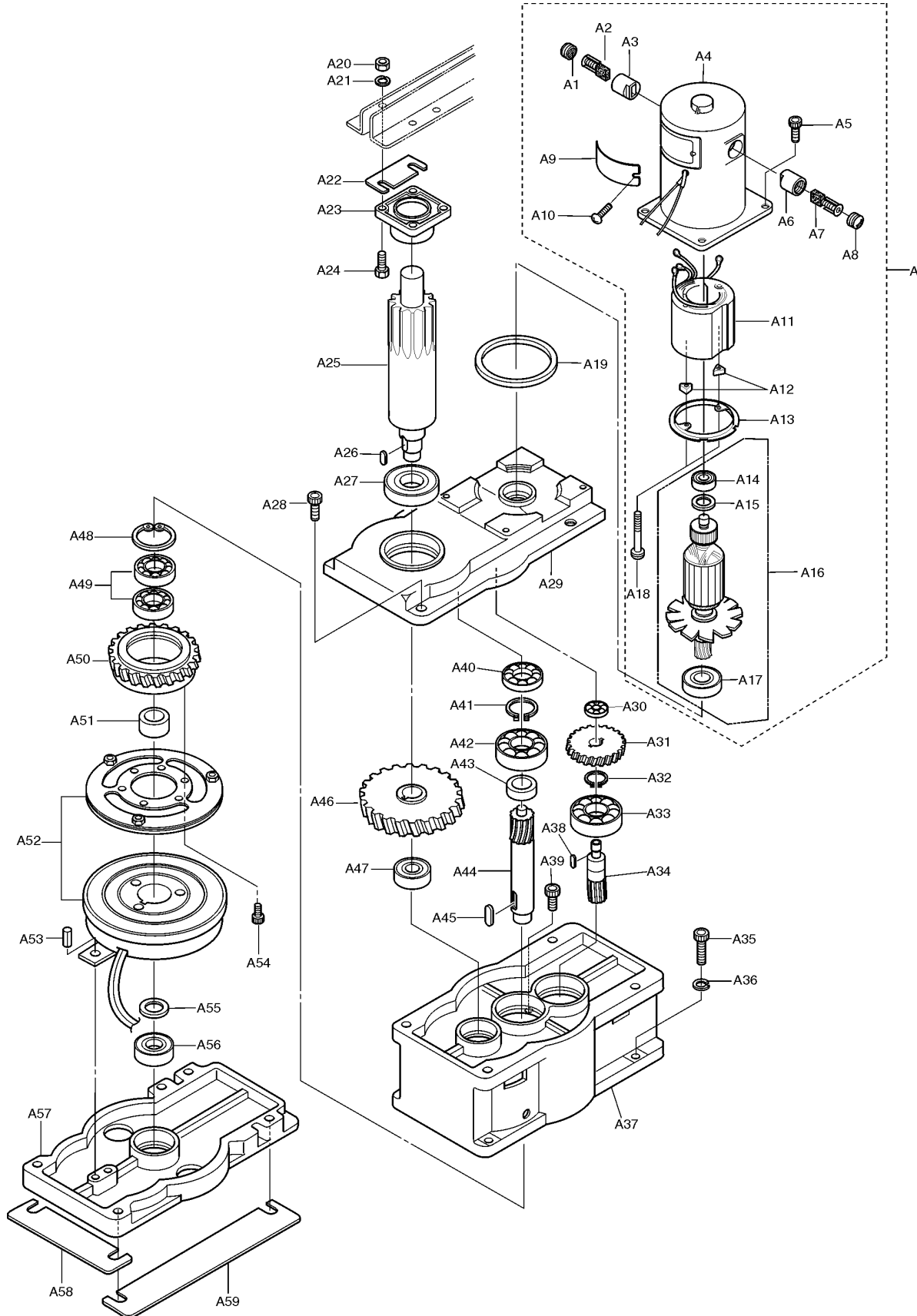
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## MB25HD REBAR BENDER

*1 to 3 Units*

| Qty.   | P/N        | Description       |
|--------|------------|-------------------|
| 2..... | M5CBC65D00 | .....HOLDER CAP   |
| 2..... | M5CBS65D00 | .....CARBON BRUSH |

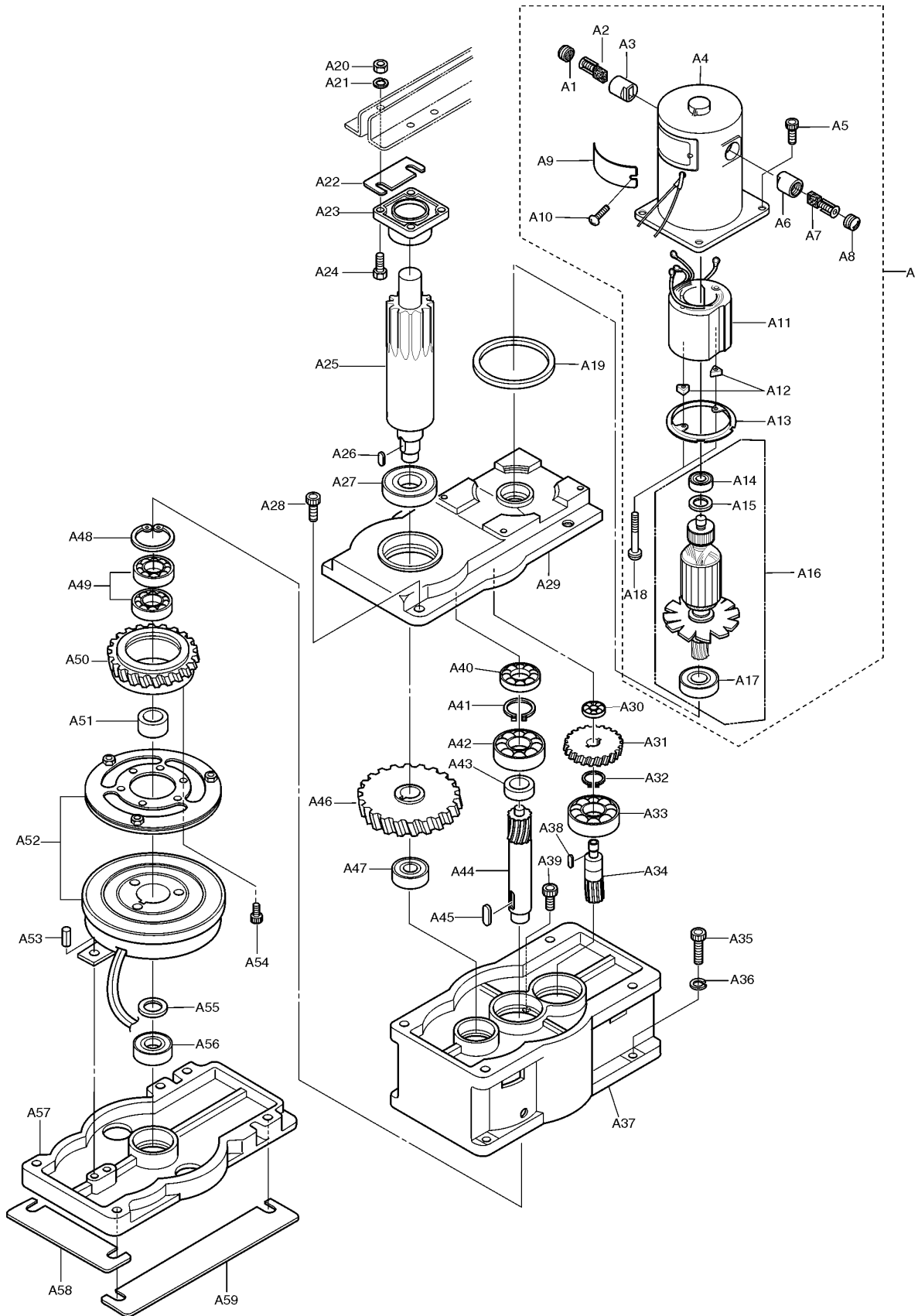
# MB25HD — CASE ASSEMBLY



## MB25HD — CASE ASSEMBLY

| <b>NO.</b> | <b>PART NO.</b> | <b>PART NAME</b>            | <b>QTY.</b> | <b>REMARKS</b>         |
|------------|-----------------|-----------------------------|-------------|------------------------|
| A          | M5M0115V00      | MOTOR ASSY., 115V .....     | 1           | INCLUDES ITEMS W/#     |
| A1#        | M5CBC65D00      | CARBON BRUSH CAP            | 1           |                        |
| A2#        | M5CBS65D00      | CARBON BRUSH .....          | 1           | INCLUDES ITEM A7 (SET) |
| A3#        | 6070020         | CARBON BRUSH HOLDER         | 1           |                        |
| A4#        | M5T2059400      | MOTOR CASE                  | 1           |                        |
| A5#        | M5HB0520M0      | BOLT HB 5X20                | 4           |                        |
| A6#        | 6070020         | CARBON BRUSH HOLDER         | 1           |                        |
| A7#        | M5CBS65D00      | CARBON BRUSH .....          | 1           | INCLUDES ITEM A2 (SET) |
| A8#        | M5CBC65D00      | CARBON BRUSH CAP            | 1           |                        |
| A9#        | C5T4225600      | HALF OPEN COVER             | 1           |                        |
| A10#       | H9XR0410M0      | BOLT XR 4X6                 | 2           |                        |
| A11#       | M5STR65D00      | STATOR, 115V                | 1           |                        |
| A12#       | 6077110         | TRIANGLE WASHER             | 2           |                        |
| A13#       | 6077070         | FAN GUIDE                   | 1           |                        |
| A14#%      | M5B608ZZ00      | BALL BEARING 608ZZNC        | 1           |                        |
| A15#%      | M5T4248200      | WASHER, ARMATURE            | 1           |                        |
| A16#       | M5AM115V00      | ARMATURE, 115V .....        | 1           | INCLUDES ITEMS W/%     |
| A17#%      | M5B6201Z00      | BALL BEARING 6201ZZNC       | 1           |                        |
| A18#       | M5XR051100      | BOLT W/LOCK WASHER XR 5X110 | 4           |                        |
| A19        | M5T4230400      | MOTOR RING                  | 1           |                        |
| A20        | M5NM101M00      | NUT NM10                    | 4           |                        |
| A21        | M5SW1001M0      | WASHER SW10                 | 4           |                        |
| A22        | 3300080         | LINER (PILLOW BLOCK)        | 2           |                        |
| A23        | M5UCF20500      | PILLOW BLOCK UCF205         | 1           |                        |
| A24        | M5SB1030M0      | BOLT SB 10X35               | 4           |                        |
| A25        | 3600380         | SHAFT WITH GEAR             | 1           |                        |
| A26        | 3701200         | KEY FOR SHAFT WITH GEAR     | 1           |                        |
| A27        | M5B6006Z00      | BALL BEARING 6006Z          | 1           |                        |
| A28        | C5HB0830M0      | BOLT HB 8X30                | 4           |                        |
| A29        | M5T2073300      | MOTOR BASE                  | 1           |                        |
| A30        | H9B6080000      | BALL BEARING 608            | 1           |                        |
| A31        | C5T4217900      | GEAR NO.2                   | 1           |                        |
| A32        | M5SNR20S00      | STOP RING S20               | 1           |                        |
| A33        | M5B6204Z00      | BALL BEARING 6204Z          | 1           |                        |
| A34        | M5T4329800      | GEAR NO.3                   | 1           |                        |
| A35        | M5HB084500      | BOLT HB 8X50                | 4           |                        |
| A36        | C5SW0801M0      | WASHER SW8                  | 4           |                        |
| A37        | M5T2073400      | GEAR CASE                   | 1           |                        |
| A38        | M5K0404060      | KEY FOR GEAR NO.3           | 1           |                        |
| A39        | M5HB082500      | BOLT HB 8X25                | 1           |                        |
| A40        | C5B6202000      | BALL BEARING 6202           | 1           |                        |

# MB25HD — CASE ASSEMBLY (CONTINUED)

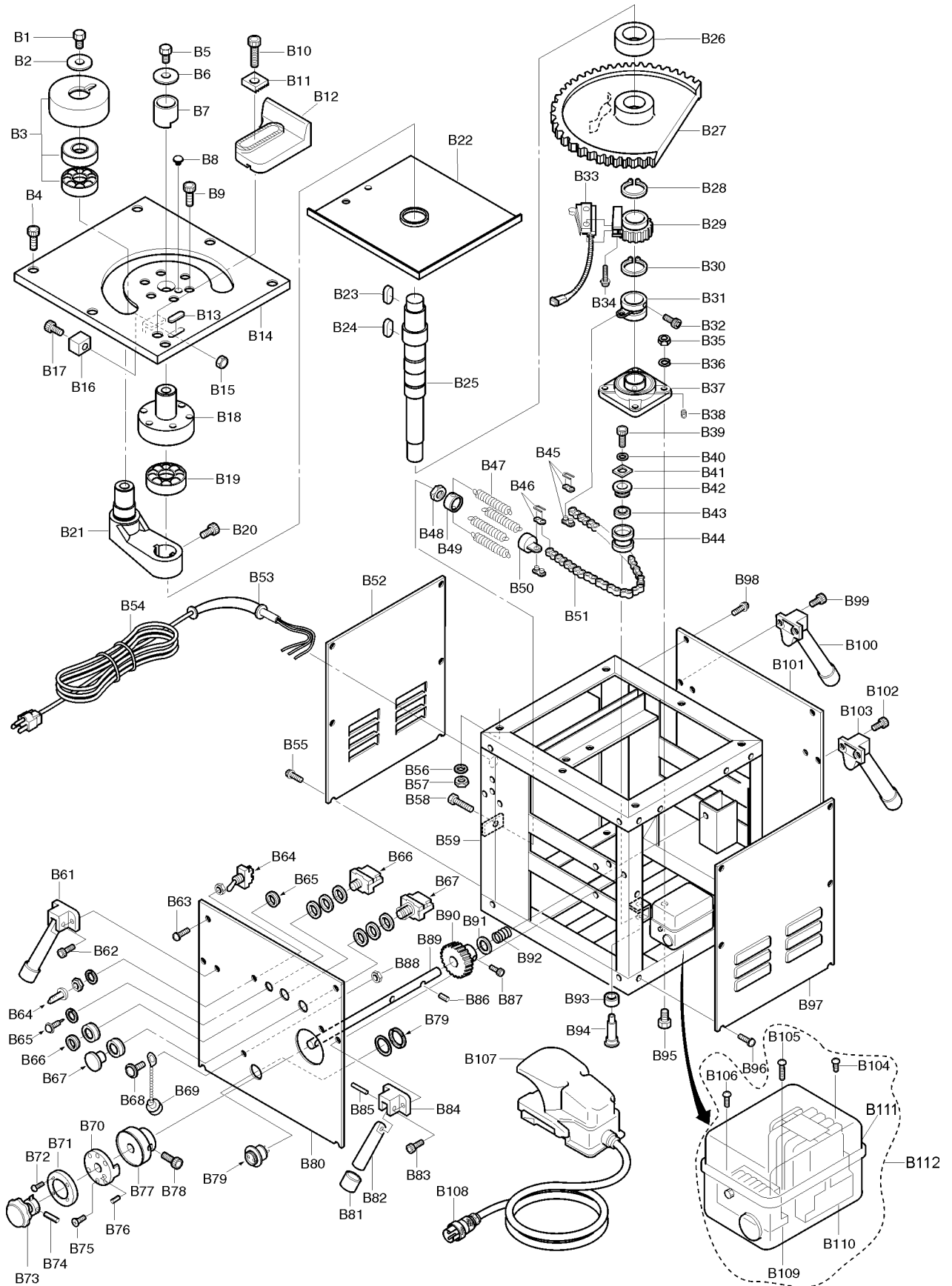


## **MB25HD — CASE ASSEMBLY (CONTINUED)**

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| <b><u>NO.</u></b> | <b><u>PART NO.</u></b> | <b><u>PART NAME</u></b>   | <b><u>QTY.</u></b> | <b><u>REMARKS</u></b> |
|-------------------|------------------------|---------------------------|--------------------|-----------------------|
| A41               | 7410040                | STOP RING S24             | 1                  |                       |
| A42               | M5B6205Z00             | BALL BEARING 6205Z        | 1                  |                       |
| A43               | 3503500                | COLLAR NO.1 FOR GEAR NO.5 | 1                  |                       |
| A44               | 3601890                | GEAR NO.5                 | 1                  |                       |
| A45               | M5K0707300             | KEY FOR GEAR NO.5         | 1                  |                       |
| A46               | 3602180                | GEAR NO.6                 | 1                  |                       |
| A47               | M5B6004000             | BALL BEARING 6004Z        | 1                  |                       |
| A48               | M5SNR47H00             | STOP RING H47             | 1                  |                       |
| A49               | M5B6005Z00             | BALL BEARING 6005Z        | 2                  |                       |
| A50               | M5T4330000             | GEAR NO.4                 | 1                  |                       |
| A51               | M5T4329600             | COLLAR NO.2 (CLUTCH)      | 1                  |                       |
| A52               | M5CLMMC500             | MAGNET CLUTCH (MMC-5)     | 1                  |                       |
| A53               | M5SRP05260             | SPRING PIN SRP5530        | 1                  |                       |
| A54               | 7513000                | BOLT HB 6X10              | 6                  |                       |
| A55               | M5T4336300             | LINER B                   | 1                  |                       |
| A56               | M5B6004000             | BALL BEARING 6004Z        | 1                  |                       |
| A57               | M5T2073500             | GEAR CASE COVER           | 1                  |                       |
| A58               | 3300100                | LINER S (GEAR CASE COVER) | 2                  |                       |
| A59               | 3300090                | LINER L (GEAR CASE COVER) | 2                  |                       |

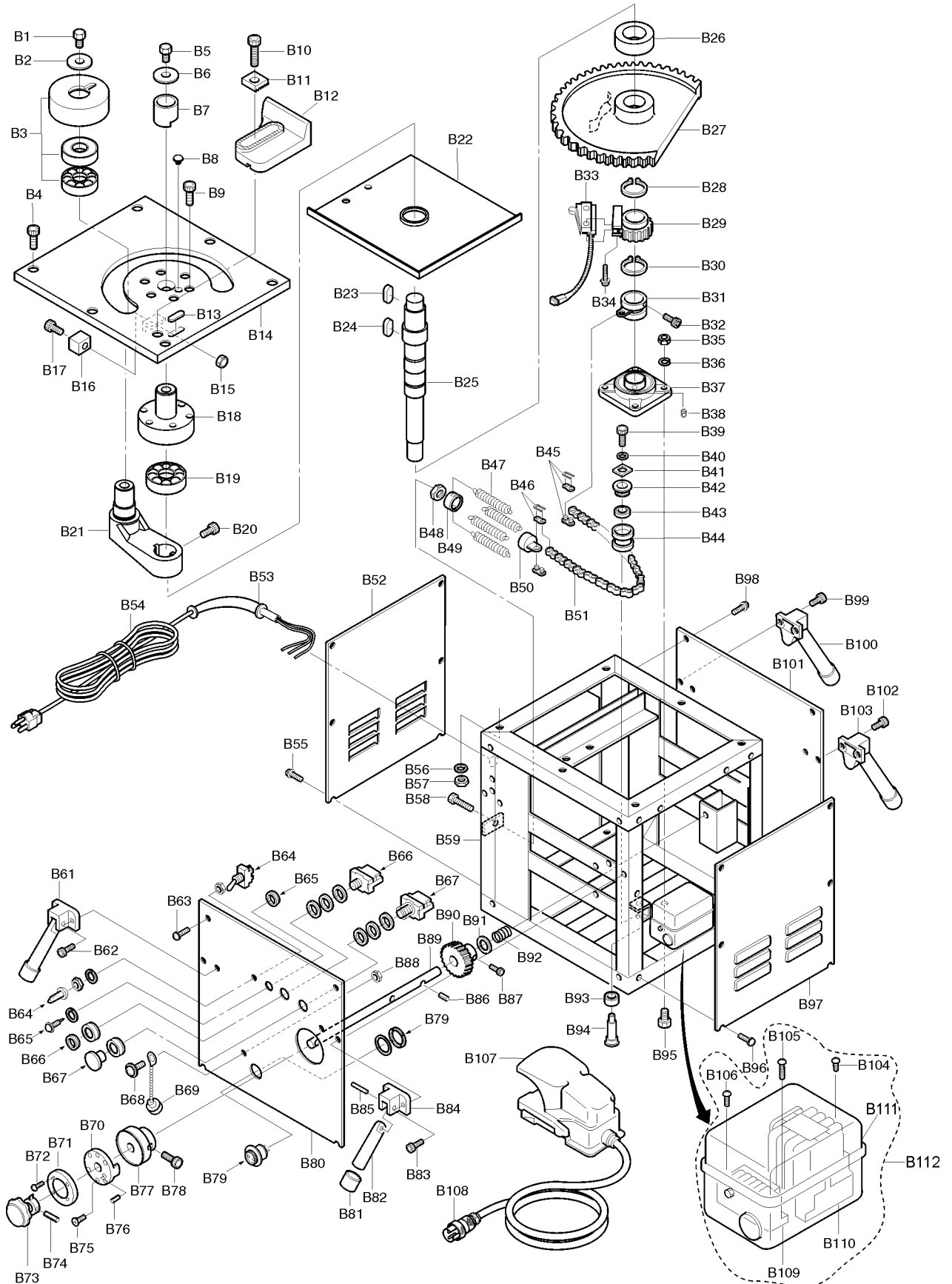
# MB25HD — HOUSING ASSEMBLY



## MB25HD — HOUSING ASSEMBLY

| <u>NO.</u> | <u>PART NO.</u> | <u>PART NAME</u>          | <u>QTY.</u> | <u>REMARKS</u> |
|------------|-----------------|---------------------------|-------------|----------------|
| B1         | M5SB122000      | BOLT SB12520              | 1           |                |
| B2         | M5T4273800      | WASHER A                  | 1           |                |
| B3         | 9000850         | ROLLER NO.10 (ø168) ..... | 1           | .....OPTION    |
| B3         | 9000870         | ROLLER NO.13 (ø154) ..... | 1           | .....OPTION    |
| B3         | 9000840         | ROLLER NO.16 (ø138)       | 1           |                |
| B3         | 9000850         | ROLLER NO.19 (ø92)        | 1           |                |
| B3         | 9000880         | ROLLER NO. 22 (ø72).....  | 1           | .....OPTION    |
| B3         | 3150570         | ROLLER NO. 25 (ø51)       | 1           |                |
| B4         | 014212030       | BOLT, 12X30               | 1           |                |
| B5         | 012012020       | BOLT, 12X20               | 1           |                |
| B6         | M5T4273800      | WASHER A                  | 1           |                |
| B7         | 3505750         | COLLAR NO.13 (ø46)        | 1           |                |
| B7         | 3505740         | COLLAR NO.16 (ø56)        | 1           |                |
| B7         | 3505730         | COLLAR NO.19 (ø95)        | 1           |                |
| B7         | 3505720         | COLLAR NO.22 (ø110)       | 1           |                |
| B7         | 9000890         | COLLAR NO.25 (ø125)       | 1           |                |
| B8         | M5T4266000      | PIN                       | 1           |                |
| B9         | M5HB102500      | BOLT HB 10X25             | 6           |                |
| B10        | M5HB205000      | BOLT HB 20X50             | 1           |                |
| B11        | M5T4267800      | WASHER B                  | 1           |                |
| B12        | M5T42640N1      | STOPPER                   | 1           |                |
| B13        | M5K1008500      | KEY FOR STOPPER           | 1           |                |
| B14        | M5T4331400      | TABLE                     | 1           |                |
| B15        | M5NM080100      | NUT NM8                   | 1           |                |
| B16        | M5T4269700      | SHOCK ABSORBER            | 1           |                |
| B17        | C5HB0830M0      | BOLT HB8530               | 1           |                |
| B18        | M5T4273600      | ATTACH PIN                | 1           |                |
| B19        | M5B6308Z00      | BALL BEARING 6308Z        | 1           |                |
| B20        | C5HB0830M0      | BOLT HB8530               | 1           |                |
| B21        | 9000230         | ARM                       | 1           |                |
| B22        | M5T4331900      | DUST PLATE                | 1           |                |
| B23        | M5K1208440      | KEY FOR GEAR WHEEL        | 1           |                |
| B24        | M5K1208440      | KEY FOR GEAR WHEEL        | 1           |                |
| B25        | M5T43289N1      | OUTPUT SHAFT              | 1           |                |
| B26        | M5T4338100      | BUSHING                   | 1           |                |
| B27        | 9000740         | GEAR WHEEL                | 1           |                |
| B28        | M5SNR45S00      | STOP RING S45             | 1           |                |
| B29        | M5T43308N2      | SPIRAL GEAR B             | 1           |                |
| B30        | M5SNR40S00      | STOP RING S40             | 1           |                |
| B31        | M5T44829N1      | CHAIN FITTING COLLAR      | 1           |                |

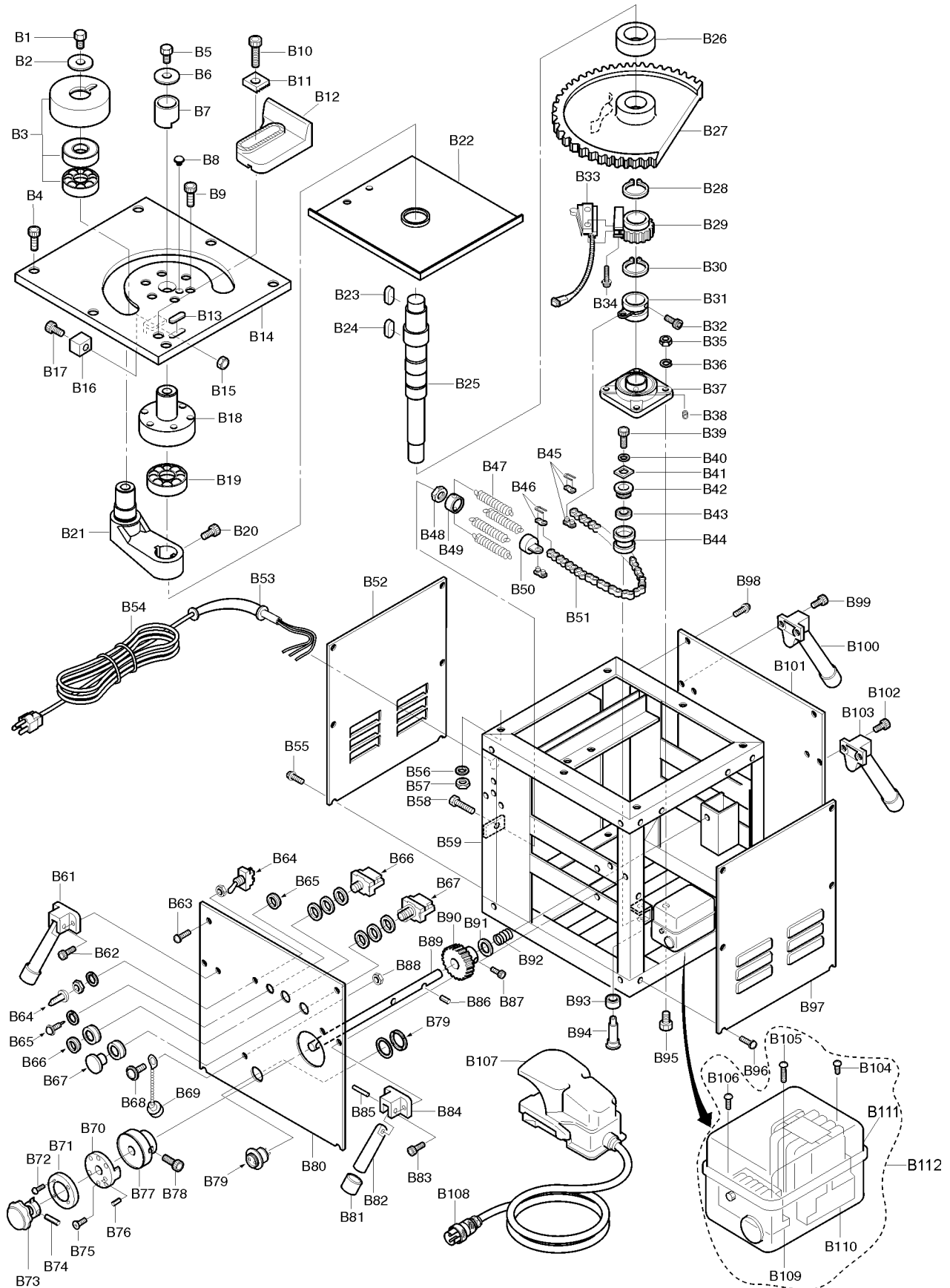
# MB25HD — HOUSING ASSEMBLY (CONTINUED)



## MB25HD — HOUSING ASSEMBLY (CONTINUED)

| <u>NO.</u> | <u>PART NO.</u> | <u>PART NAME</u>           | <u>QTY.</u> | <u>REMARKS</u> |
|------------|-----------------|----------------------------|-------------|----------------|
| B32        | M5HB082500      | BOLT HB8525                | 1           |                |
| B33        | M5AZ714100      | LIMIT SWITCH               | 1           |                |
| B34        | 7538140         | BOLT W/WASHER, LOCK XR4530 | 2           |                |
| B35        | M5NM120100      | NUT NM12-1                 | 4           |                |
| B36        | M5SW1201M0      | WASHER SW12                | 4           |                |
| B37        | M5UCF20700      | PILLOW BLOCK UCF-207       | 1           |                |
| B38        | 7521000         | BOLT HS858                 | 2           |                |
| B39        | 7513010         | BOLT HB6512                | 1           |                |
| B40        | H9SW060100      | WASHER SW6                 | 1           |                |
| B41        | 7651000         | PLAIN WASHER M6            | 1           |                |
| B42        | M5T4464900      | BEARING WASHER             | 1           |                |
| B43        | 7101040         | BALL BEARING 6002Z         | 1           |                |
| B44        | M5T44598N1      | CHAIN ROLLER               | 1           |                |
| B45        | 6600100         | JOINT LINK SET             | 1           |                |
| B46        | 6600100         | JOINT LINK SET             | 1           |                |
| B47        | M5T4484000      | RETURN SPRING C            | 4           |                |
| B48        | 7700100         | NUT NM12-3                 | 1           |                |
| B49        | M5T4481200      | RETURN SPRING FITTING A    | 1           |                |
| B50        | M5T4481300      | RETURN SPRING FITTING B    | 1           |                |
| B51        | M5T4484500      | ROLLER CHAIN B             | 1           |                |
| B52        | M5T4332800      | PANEL B                    | 1           |                |
| B53        | H9Y8411000      | RUBBER BUSHING             | 1           |                |
| B54        | H9EC115V00      | CORD WITH PLUG (UL)        | 1           |                |
| B55        | M5XR0410M0      | BOLT W/WASHER, LOCK XR4510 | 6           |                |
| B56        | M5SW1201M0      | WASHER SW12                | 6           |                |
| B57        | M5NM120100      | NUT NM12                   | 6           |                |
| B58        | M5SB127000      | BOLT SB12570               | 1           |                |
| B59        | M5T1048000      | FRAME                      | 1           |                |
| B60        | 8103030         | TOOL BOX                   | 1           |                |
| B61        | 90003000        | HANDLE SET                 | 1           |                |
| B62        | C5HB0830M0      | BOLT HB8530                | 2           |                |
| B63        | M5XR0410M0      | BOLT W/WASHER, LOCK XR4510 | 4           |                |
| B64        | C5ST52K000      | TOGGLE SWITCH              | 1           |                |
| B65        | M5BN564000      | PILOT LAMP                 | 1           |                |
| B66        | M518331N00      | START SWITCH               | 1           |                |
| B67        | M518920N00      | EMERGENCY STOP SWITCH      | 1           |                |
| B68        | 7538000         | BOLT W/WASHER, LOCK XR358  | 1           |                |
| B69        | M5HS25RC00      | FOOT SWITCH CONNECTOR CAP  | 1           |                |
| B70        | 3503600         | ANGLE SELECT GUIDE A       | 1           |                |
| B71        | M5T4334200      | ANGLE DIAL PLATE           | 1           |                |

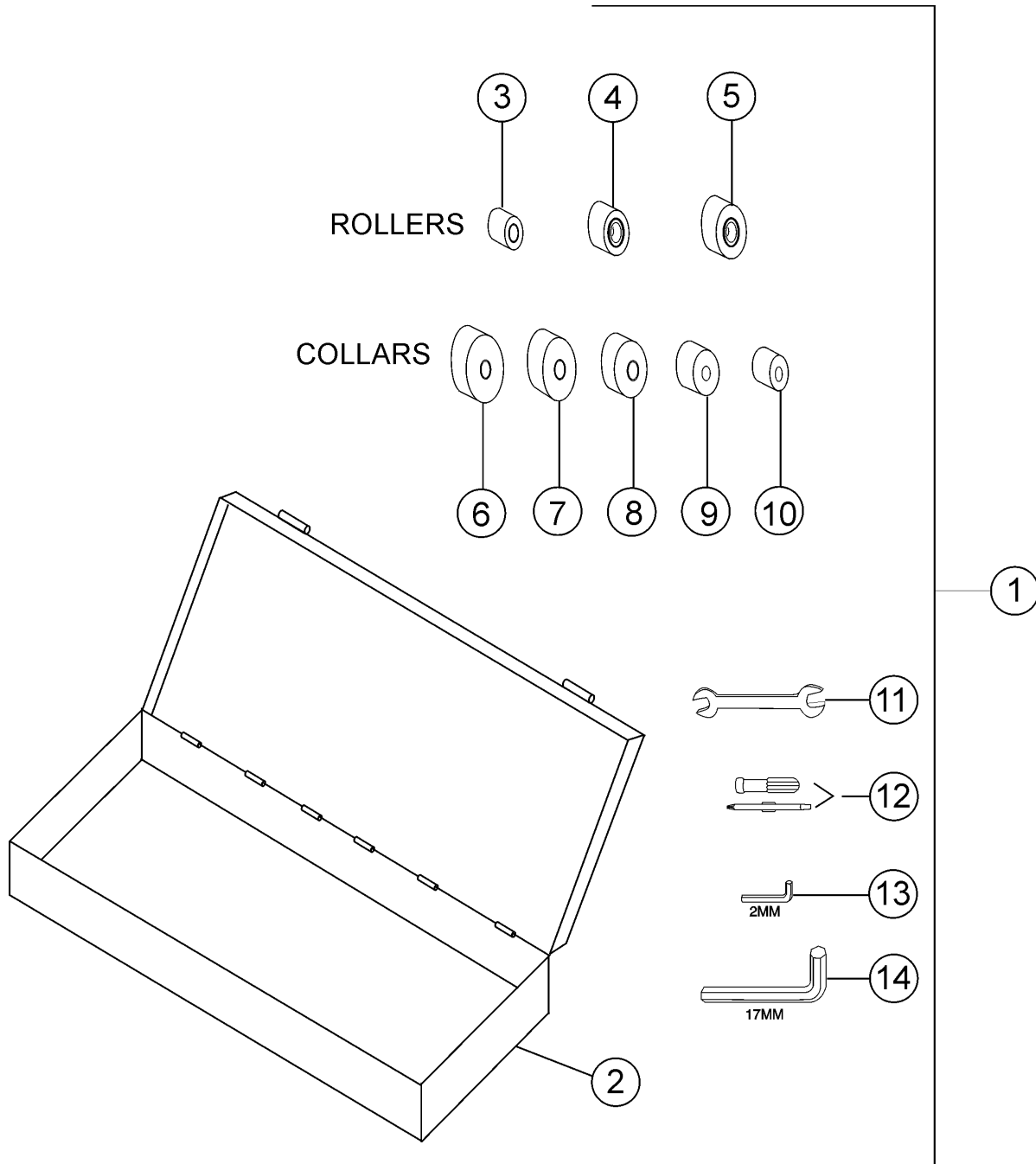
# MB25HD — HOUSING ASSEMBLY (CONTINUED)



## MB25HD — HOUSING ASSEMBLY (CONTINUED)

| <u>NO.</u> | <u>PART NO.</u> | <u>PART NAME</u>                | <u>QTY.</u> | <u>REMARKS</u>     |
|------------|-----------------|---------------------------------|-------------|--------------------|
| B72        | H9XR0410M0      | BOLT XR456                      | 4           |                    |
| B73        | M5T4328300      | ANGLE SELECT KNOB               | 1           |                    |
| B74        | MSRP054000      | SPRING PIN SRP5540              | 1           |                    |
| B75        | 7540020         | BOLT XF 5X15                    | 2           |                    |
| B76        | 7810040         | SPRING PIN SRP 4X16             | 2           |                    |
| B77        | 3503610         | ANGLE SELECT GUIDE B            | 1           |                    |
| B78        | M5HB082500      | BOLT HB 8X25                    | 1           |                    |
| B79        | M5SCNH3002      | FOOT SWITCH CONNECTOR F         | 1           |                    |
| B80        | 3302320         | PANEL A                         | 1           |                    |
| B81        | M5HDLCP272      | RUBBER CAP (ø27.2)              | 1           |                    |
| B82        | M5T4269000      | HANDLE                          | 1           |                    |
| B83        | C5HB0830M0      | BOLT HB 8X30                    | 2           |                    |
| B84        | M5T42272N1      | HANDLE BRACKET                  | 1           |                    |
| B85        | M5SRP10350      | SPRING PIN SRP10X36 (STAINLESS) | 1           |                    |
| B86        | M5SRP05260      | SPRING PIN SRP 5X25             | 1           |                    |
| B87        | M5HB082000      | BOLT HB 8X20                    | 1           |                    |
| B88        | 7700020         | NUT NM3                         | 1           |                    |
| B89        | M5T43284N1      | ANGLE SELECT BAR                | 1           |                    |
| B90        | M5T4330700      | SPIRAL GEAR A                   | 1           |                    |
| B91        | M5WM160100      | WASHER WM16                     | 1           |                    |
| B92        | M5T4328800      | COIL SPRING                     | 1           |                    |
| B93        | 7101040         | BALL BEARING 6002Z              | 1           |                    |
| B94        | M5T4459900      | ROLLER SHAFT                    | 1           |                    |
| B95        | M5SB123500      | BOLT SB 12X35                   | 4           |                    |
| B96        | M5XR0410M0      | BOLT W/WASHER, LOCK XR4510      | 6           |                    |
| B97        | M5T4332800      | PANEL B                         | 1           |                    |
| B98        | M5XR0410M0      | BOLT W/WASHER, LOCK XR4510      | 4           |                    |
| B99        | C5HB0830M0      | BOLT HB 8X30                    | 2           |                    |
| B100       | 90003000        | HANDLE SET                      | 1           |                    |
| B101       | M5T4332900      | PANEL C                         | 1           |                    |
| B102       | C5HB0830M0      | BOLT HB 8X30                    | 2           |                    |
| B103       | 90003000        | HANDLE SET                      | 1           |                    |
| B104#      | 7538090         | BOLT W/WASHER, LOCK XR 5X10     | 1           |                    |
| B105#      | 7538160         | BOLT W/WASHER, LOCK XR 5X25     | 1           |                    |
| B106#      | 7538190         | BOLT W/WASHER, LOCK XR 5X15     | 1           |                    |
| B107       | M5KOKUSFM1      | FOOT SWITCH ASSEMBLY            | 1           |                    |
| B108       | M5SCH3002P      | FOOT SWITCH CONNECTOR           | 1           |                    |
| B109#      | M5OPR10900      | RECTIFIER                       | 1           |                    |
| B110#      | 6200410         | MAGNET SWITCH                   | 1           |                    |
| B111#      | M5MGSWBOX0      | MAGNET SWITCH BOX               | 1           |                    |
| B112       | M5SK20ASSY      | MAGNET SWITCH ASSEMBLY .....    | 1           | INCLUDES ITEMS W/# |

# MB25HD — TOOL BOX AND TOOLS ASSEMBLY

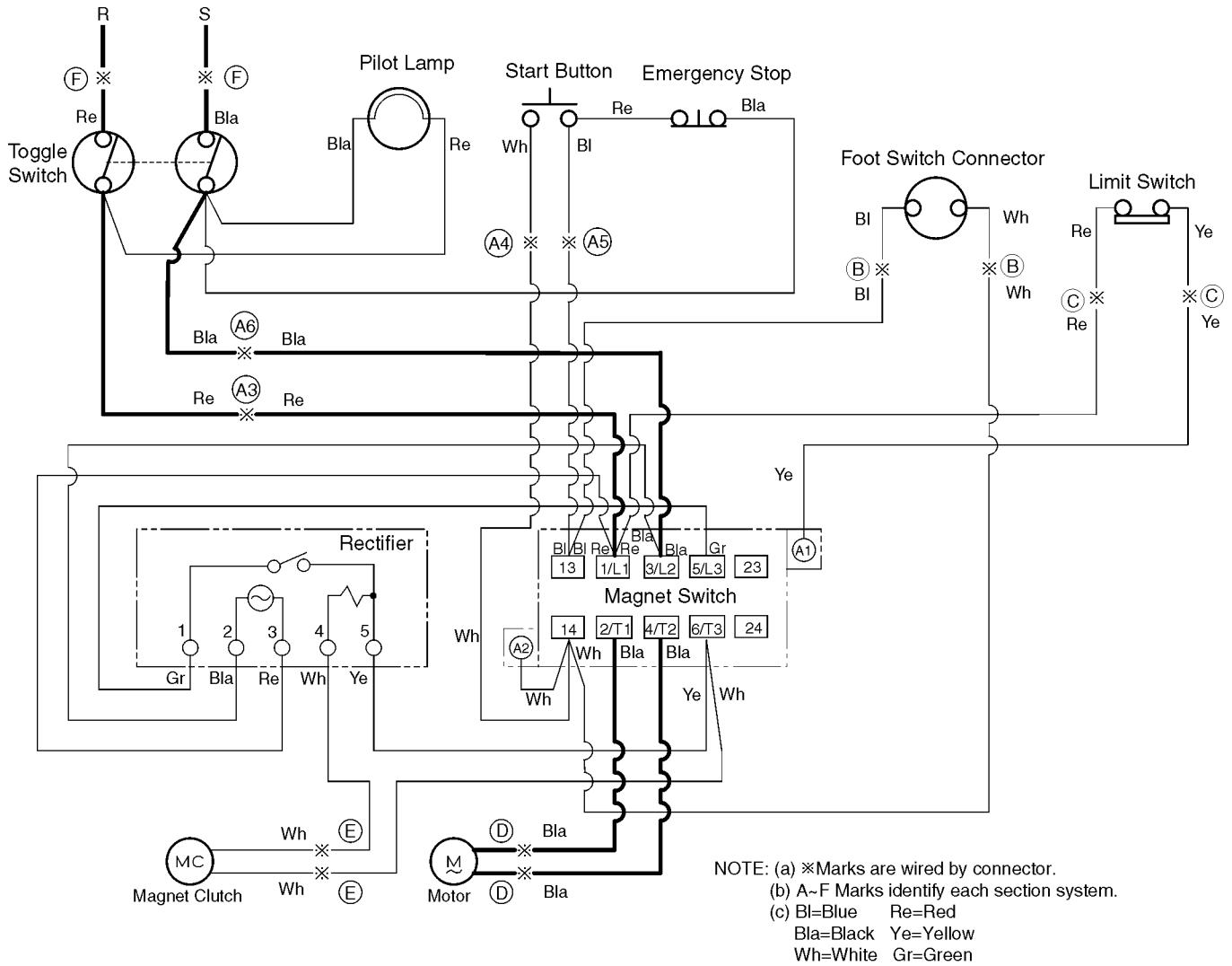


## MB25HD — TOOL BOX AND TOOLS ASSEMBLY

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| <u>NO.</u> | <u>PART NO.</u> | <u>PART NAME</u>          | <u>QTY.</u> | <u>REMARKS</u>     |
|------------|-----------------|---------------------------|-------------|--------------------|
| 1          | 9010060         | TOOL BOX SET.....         | 1           | INCLUDES ITEMS W/# |
| 2*         | 8103030         | TOOL BOX                  | 1           |                    |
| 3          | 3150570         | ROLLER NO. 25 (ø51)       | 1           |                    |
| 4          | 9000850         | ROLLER NO.19 (ø92)        | 1           |                    |
| 5          | 9000840         | ROLLER NO.16 (ø138)       | 1           |                    |
| 6          | 9000890         | COLLAR NO.25 (ø125)       | 1           |                    |
| 7          | 3505720         | COLLAR NO.22 (ø110)       | 1           |                    |
| 8          | 3505730         | COLLAR NO.19 (ø95)        | 1           |                    |
| 9          | 3505740         | COLLAR NO.16 (ø56)        | 1           |                    |
| 10         | 3505750         | COLLAR NO.13 (ø46)        | 1           |                    |
| 11*        | 8201020         | OPEN END WRENCH 17 X19 MM | 1           |                    |
| 12*        | 8201510         | SCREWDRIVER               | 1           |                    |
| 13*        | 8200020         | ALLEN WRENCH M2           | 1           |                    |
| 14*        | 8200120         | ALLEN WRENCH M17          | 1           |                    |

# MB25HD — WIRING DIAGRAM



# TERMS AND CONDITIONS OF SALE — PARTS

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## PAYMENT TERMS

Terms of payment for parts are net 30 days.

## FREIGHT POLICY

All parts orders will be shipped collect or prepaid with the charges added to the invoice. All shipments are F.O.B. point of origin. Multiquip's responsibility ceases when a signed manifest has been obtained from the carrier, and any claim for shortage or damage must be settled between the consignee and the carrier.

## MINIMUM ORDER

The minimum charge for orders from Multiquip is \$15.00 net. Customers will be asked for instructions regarding handling of orders not meeting this requirement.

## RETURNED GOODS POLICY

Return shipments will be accepted and credit will be allowed, subject to the following provisions:

1. A Returned Material Authorization must be approved by Multiquip prior to shipment.
2. To obtain a Return Material Authorization, a list must be provided to Multiquip Parts Sales that defines item numbers, quantities, and descriptions of the items to be returned.
  - a. The parts numbers and descriptions must match the current parts price list.
  - b. The list must be typed or computer generated.
  - c. The list must state the reason(s) for the return.
  - d. The list must reference the sales order(s) or invoice(s) under which the items were originally purchased.
  - e. The list must include the name and phone number of the person requesting the RMA.
3. A copy of the Return Material Authorization must accompany the return shipment.
4. Freight is at the sender's expense. All parts must be returned freight prepaid to Multiquip's designated receiving point.

5. Parts must be in new and resalable condition, in the original Multiquip package (if any), and with Multiquip part numbers clearly marked.
6. The following items are not returnable:
  - a. Obsolete parts. (If an item is in the price book and shows as being replaced by another item, it is obsolete.)
  - b. Any parts with a limited shelf life (such as gaskets, seals, "O" rings, and other rubber parts) that were purchased more than six months prior to the return date.
  - c. Any line item with an extended dealer net price of less than \$5.00.
  - d. Special order items.
  - e. Electrical components.
  - f. Paint, chemicals, and lubricants.
  - g. Decals and paper products.
  - h. Items purchased in kits.
7. The sender will be notified of any material received that is not acceptable.
8. Such material will be held for five working days from notification, pending instructions. If a reply is not received within five days, the material will be returned to the sender at his expense.
9. Credit on returned parts will be issued at dealer net price at time of the original purchase, less a 15% restocking charge.
10. In cases where an item is accepted, for which the original purchase document can not be determined, the price will be based on the list price that was effective twelve months prior to the RMA date.
11. Credit issued will be applied to future purchases only.

## PRICING AND REBATES

Prices are subject to change without prior notice. Price changes are effective on a specific date and all orders received on or after that date will be billed at the revised price. Rebates for price declines and added charges for price increases will not be made for stock on hand at the time of any price change.

Multiquip reserves the right to quote and sell direct to Government agencies, and to Original Equipment Manufacturer accounts who use our products as integral parts of their own products.

## SPECIAL EXPEDITING SERVICE

A \$35.00 surcharge will be added to the invoice for special handling including bus shipments, insured parcel post or in cases where Multiquip must personally deliver the parts to the carrier.

## LIMITATIONS OF SELLER'S LIABILITY

Multiquip shall not be liable hereunder for damages in excess of the purchase price of the item with respect to which damages are claimed, and in no event shall Multiquip be liable for loss of profit or good will or for any other special, consequential or incidental damages.

## LIMITATION OF WARRANTIES

No warranties, express or implied, are made in connection with the sale of parts or trade accessories nor as to any engine not manufactured by Multiquip. Such warranties made in connection with the sale of new, complete units are made exclusively by a statement of warranty packaged with such units, and Multiquip neither assumes nor authorizes any person to assume for it any other obligation or liability whatever in connection with the sale of its products. Apart from such written statement of warranty, there are no warranties, express, implied or statutory, which extend beyond the description of the products on the face hereof.

Effective: February 22, 2006

# OPERATION AND PARTS MANUAL

## HERE'S HOW TO GET HELP

PLEASE HAVE THE MODEL AND SERIAL  
NUMBER ON-HAND WHEN CALLING

### **UNITED STATES**

#### ***Multiquip Corporate Office***

18910 Wilmington Ave. Tel. (800) 421-1244  
Carson, CA 90746 Fax (800) 537-3927  
Contact: mq@multiquip.com

#### ***Mayco Parts***

800-306-2926 Fax: 800-672-7877  
310-537-3700 Fax: 310-637-3284

#### ***Service Department***

800-421-1244 Fax: 310-537-4259  
310-537-3700

#### ***MQ Parts Department***

800-427-1244 Fax: 800-672-7877  
310-537-3700 Fax: 310-637-3284

#### ***Warranty Department***

800-421-1244, Ext. 279 Fax: 310-537-1173  
310-537-3700, Ext. 279

#### ***Technical Assistance***

800-478-1244 Fax: 310-631-5032

### **MEXICO**

#### ***MQ Cipsa***

Carr. Fed. Mexico-Puebla KM 126.5 Tel: (52) 222-225-9900  
Momoxpan, Cholula, Puebla 72760 Mexico Fax: (52) 222-285-0420  
Contact: pmastretta@cipsa.com.mx

### **UNITED KINGDOM**

#### ***Multiquip (UK) Limited Head Office***

Unit 2, Northpoint Industrial Estate, Tel: 0161 339 2223  
Global Lane, Fax: 0161 339 3226  
Dukinfield, Cheshire SK16 4UJ  
Contact: sales@multiquip.co.uk

### **CANADA**

#### ***Multiquip***

4110 Industriel Boul. Tel: (450) 625-2244  
Laval, Quebec, Canada H7L 6V3 Tel: (877) 963-4411  
Contact: jmartin@multiquip.com Fax: (450) 625-8664

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This manual MUST accompany the equipment at all times. This manual is considered a permanent part of the equipment and should remain with the unit if resold.

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