



USER MANUAL



DISCONNECT POWER SUPPLY BEFORE SERVICING



UNDERSTAND ALL INSTRUCTIONS BEFORE USING

ESCO Tool Guarantee

Guarantee: The manufacturer guarantees its products to be free from defects in material or workmanship for a period of one year from date of shipment from its factory. Said guarantee will not apply if equipment is used in conditions of service for which it is not recommended. The manufacturer is not responsible for damage to its products through improper use, physical damage, poor operating practice, or normal wear.

If any device is found unsatisfactory under the guarantee, the buyer must notify ESCO Tool in writing and after receipt of shipping instructions, buyer must return it directly to ESCO Tool, 75 October Hill Road, Holliston, MA 01746, USA, shipping charges prepaid. Such equipment will be replaced or put in satisfactory operating condition, free of all charges except transportation. The correction of any factory defect by repair or replacement by the manufacturer shall constitute fulfillment of all obligations to the purchaser. Manufacturer's guarantee is void if unauthorized repairs are made to its products.

Manufacturer shall not be liable for consequential damage in case of failure to meet the conditions of any guarantee or shipping schedule, nor will claims for labor, loss of profit, repairs, or other expenses incidental to replacement be allowed.

No other representations, guarantees or warranties, expressed or implied, are made by the manufacturer in connection with the manufacture and sale of its equipment.

Hold Harmless Agreement

Customer agrees to defend, indemnify and hold ESCO Tool, its owners, agents, officers, and/or employees free and harmless from and against any and all claims, liabilities, losses, costs and out of pocket expenses (including attorney's fees) arising out of, or in connection with the ESCO Tool equipment, its use or transportation, or out of operations conducted by customer, its agents, employees, contractors, representatives, guests or invitees, including, but not limited to, active and/or passive negligence.

CONTENTS

INSTRUCTION FOR PUTTING IN TO USE	1
UNPACKING.....	1
POWER SUPPLY.....	1
ILLUSTRATED DESCRIPTION OF FUNCTION.....	1
LIMITATION ON AMBIENT CONDITIONS.....	1
LIST OF CONTENTS.....	2
SAFETY PRECAUTIONS	2
PRECAUTIONS AND USE OF PERSONAL PROTECTIVE EQUIPMENT.....	2
SPECIAL SAFETY PRECAUTIONS.....	2
EXPLANATION OF SYMBOLS.....	3
DISCLAIMER.....	3
OPERATING ERGONOMICS.....	3
OPERATING INSTRUCTIONS	3
IDENTIFICATION OF OPERATING CONTROLS AND THEIR USE.....	3
SELECTION OF PROPER TOOLING.....	4
<i>CLAMP RIB SELECTION</i>	4
<i>CUTTING BLADE SELECTION</i>	4
INSTALLATION OF PROPER TOOLING.....	5
<i>CLAMP RIB INSTALLATION</i>	5
<i>TOOL POST POSITIONING</i>	5
<i>CUTTING BLADE REMOVAL AND INSTALLATION</i>	5
<i>ADJUSTABLE TOOL POST INSTALLATION AND USE</i>	5
MOUNTING THE TOOL TO THE WORK.....	5
POWER CONNECTION.....	6
OPERATION OF TOOL.....	6
TOOL LIMITS.....	6
<i>SIZE LIMITS</i>	6
<i>MATERIAL LIMITS</i>	6
MAINTENANCE AND SERVICING	7
REGULAR CLEANING AND LUBRICATION.....	7
USER SERVICE.....	7
SERVICING BY MANUFACTURER OR AGENT.....	7
CLAMP RIB CHART / QUICK REFERENCE	9
ASSEMBLY DRAWINGS	9
PACKAGING.....	10
GEAR HEAD.....	11
MANDRELS.....	13
DRAW RODS.....	13
CLAMP RIBS.....	14
TOOL POST.....	16
MOTORS.....	17
SPRING HANGER.....	25
GEAR BOX.....	25
ADJUSTABLE TOOL POST.....	26
AIR HOSE.....	27
TOOLING.....	29

Instructions for putting into use

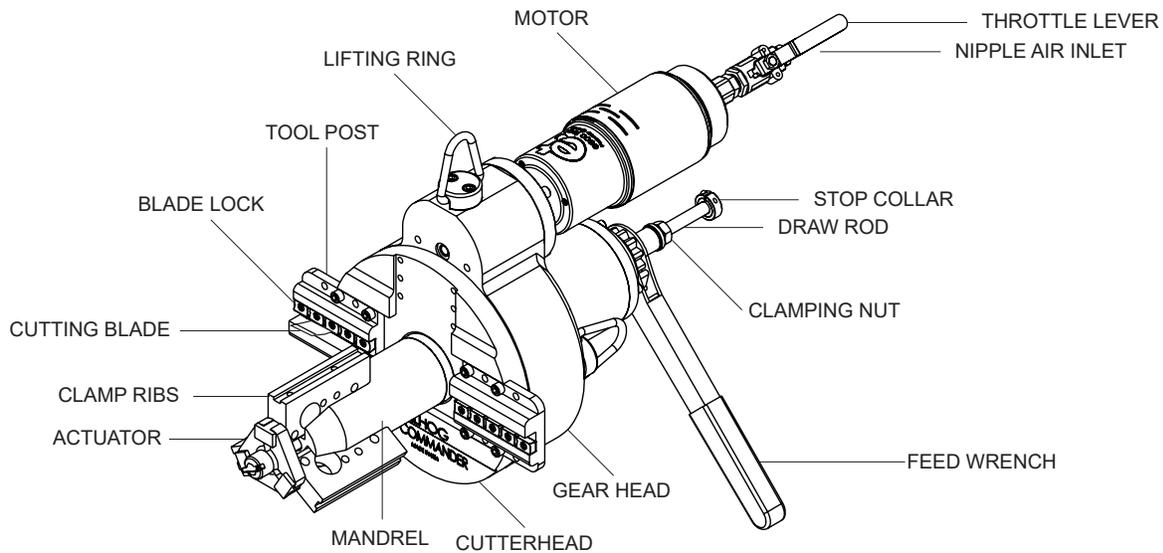
Unpacking

1. Use caution when handling the tool, cutting blades are sharp. Typically they are protected, however, exposed blades can cause injury.
2. Clean any excess oil, grease or rust preventative from the surface of the tool.

Power supply

1. Recommended air pressure, 90 psi (6.2 bar)
2. Recommended air volume, 95 cfm (2690 lt/min.)
3. Clean moisture free air is essential for trouble free operation.
4. Oil laden operating air should be used. Use a light weight air tool motor oil (s.a.e.10).
5. A hose whip with filter and lubricator is provided with each tool. Be sure air filter is clean and lubricator is full before use.
6. For electric motors
 - a. Rated Voltage 230/120v ac
 - b. Power input 2400 w
 - c. Frequency 40-60 Hz

Illustrated description of function



Limitation on ambient conditions

1. In damp, moist or humid air, extra precaution must be taken in order to provide the tool with moisture free, oil laden air.
2. In temperatures below 32 degrees Fahrenheit (0 Celsius) a lubricant with antifreeze, such as Marvel Air-Tool Oil, must be used.
3. Do not use the electric motor in wet or excessively humid ambient conditions.

List of contents

- Gear Head Assembly
- Mandrel Assembly
- Draw Rod Assembly
- Clamp Wrench Assembly
- One or more Clamp Rib sets
- Two tool Post Assemblies
- Motor Assembly (either pneumatic or electric)
- Air Hose Assembly (not included with electric tools)
- Hand Tool Set
- User Manual
- Case Assembly

Safety precautions

Precautions and use of personal protective equipment

1. Power tools are not insulated for coming into contact with electric power sources.
2. Tool must not be used in an explosive atmosphere.
3. Do not use tool in a manner other than stated. Use other than stated in the instructions is forbidden.
4. For air powered tools, use valved, quick connect couplers to avoid an unrestrained compressed air hose after disconnecting.
5. Use care regarding the drawing in or trapping of long hair, loose clothing, etc.
6. Cover all exposed skin before operating. Cutting blades are sharp and produce hot chips. Both can cause injury.
7. Do not connect power source until tool is securely fastened to the pipe or tube.
8. Use caution when handling, disconnect power source before removing from work, changing blades, performing maintenance or breaking down.
9. Personal protective garments should include but not be limited to...
 - a. Safety glasses
 - b. Work gloves
 - c. Work boots, or shoes
 - d. Protective clothing
 - e. Hearing protection when operator is exposed to long periods of use
10. Have all nearby persons wear safety glasses with side shields.

Special safety precautions

1. Always disconnect power supply before installing or changing cutting blades, securing to pipe or tube, adjusting, moving or breaking machine down.
2. Do not modify or defeat safety devices.
3. Cutting blades are sharp and can cause serious injury. Use caution when handling.
4. Chips can be hot and sharp. Be careful when clearing from tool.
5. Moving and stationary parts can pinch or cause serious injury. Pay extra attention to rotating cutting blades as they cannot be adequately guarded.
6. During use, machinery may separate, lurch or fall.

Explanation of symbols



Caution (refer to accompanying documents).



Safety glasses must be worn.



Protective gloves, cutting blades and chips can be hot and sharp.



Work boots, or shoes



Protective clothing



Hearing protection



Pinch points

Disclaimer

1. If the equipment is used in a manner not specified by ESCO Tool, the protection provided by the equipment may be impaired.

Operating ergonomics

1. Tool must be mounted at a reasonable working height.
2. Tool may be used in any orientation.
3. Operator must be in a position not to be injured as the machinery may separate, lurch or fall. Operator must have both feet on a stable platform. Reaching or leaning is not acceptable operating ergonomics.

Operating Instructions

Identification of operating controls and their use

(All tools have similar manner controls except as noted.)

Feed wrench

- Used to advance and retract the cutting blade from the work.

Clamping nut

- Actuates the clamping mechanism.
- Uses an included wrench to actuate.

Actuator

- Holds and aligns the clamp ribs and pads with mandrel.

Tool post

- Rotates and holds the cutting blades.

Throttle lever

- Activates the tool.
- Rotate lever inline with motor starts tool.
- Rotate lever perpendicular to motor stops tool.

Nipple air inlet

- Accepts valved quick connect coupler for connecting air supply.
- Always disconnect air supply before installing, changing or securing blades, adjusting, moving, or breaking down.

Motor

- Provides power to the gear head.
- Pneumatic, electric and hydraulic.

Gear Head

- Rotates cutterhead.
- Axially moves on mandrel.

Cutterhead

- Holds tool posts and rotates.

Cutting blade

- Consumable item, available in many sizes and configurations.
- Purpose: to machine end preparations on tube or pipe.

Blade lock

- Holds cutting blade to tool post.

Clamp ribs

- Secures tool to tube or pipe inside diameter.
- Available in many sizes, see accompanying clamp rib chart.

Mandrel

- Provides torque acceptance for entire tool.
- Allows axial movement of tool.
- Provides point of rotation for cutterhead.

Draw rod

- Connects the actuator to the clamp mechanism.

Stop collar

- Secures the draw rod assembly to the tool.

Selection of proper tooling**Clamp rib selection**

1. Measure inside diameter of tube or pipe. Or using the outside diameter and minimum wall thickness, calculate the inside diameter.
2. Using the inside diameter and the accompanying clamp rib chart, select the proper clamp rib set.
3. Please see clamp rib assembly drawings section for reference.

Cutting blade selection

1. Measure the wall thickness of the tube or pipe.
2. Select a blade that is wider than the wall thickness.
3. Standard blade widths are: 1/2", 3/4" & 1". Consult factory for other widths.
4. Cutting blade configuration should be matched to your welding specification.
5. Consult factory for special applications such as: counter boring, seal weld removal, "J" preps, etc.

Installation of proper tooling

Clamp rib installation

1. Remove stop collar. Using draw rod wrench, feed the draw rod assembly from mandrel.
2. Slide clamp ribs over the draw rod with the T end of the clamp rib towards the actuator.
3. Insert the clamp rib into the slots on the actuator.
4. Inspect springs or bands, replace if stretched or damaged.
6. Reassemble, insert draw rod assembly into mandrel and feed it into place using the draw rod wrench. Reinstall the stop collar.

Tool post positioning

1. Position the tool posts on the cutterhead so that it overlaps the wall thickness of the pipe being machined.
2. Align the tool post mounting screw holes with the cutterhead.
3. Using the tool post mounting screws, evenly tighten. Be sure that the tool post seats evenly.

Cutting blade removal and installation

1. Loosen blade lock screw(s), do not remove. If more than one blade lock screw has to be loosened they should be loosened evenly.
2. Cutting blade must be moved to the outside of the tool post for removal.
3. Insert new cutting blade from the outside of the cutterhead and align so that the blade fully covers the tube or pipe wall.
4. Be sure to tighten all blade lock screws.

Adjustable tool post installation and use

1. Mount assembly to cutterhead.



2. Install blade and adjust blade to the desired location.



3. Lock carriage in position.



4. Bevel.



Mounting the tool to the work

1. Using the feed wrench extend the mandrel all the way forward (this moves clamp ribs away from tool post).
2. Retract the mandrel two rotations of the feed wrench.
3. Insert the clamp rib portion of the tool into the end of tube or pipe.
4. While positioning the cutting blade away, at least 1/4" from the work, tighten the draw rod wrench.
5. Be sure tool post can rotate freely, without coming into contact with the tube or pipe, when first starting tool.

Power connection

1. Use only the air hose supplied with the tool.
2. This hose has a valved quick connect coupler which will hold back all air that is in the supply hose.
 - a. This feature allows the air supply to be safely removed from the tool at any time.
3. Connect the air supply.
4. For electric tools, be sure to connect the tool to a properly grounded outlet and, if using an extension cord, be sure that the extension cord is properly sized for the application. Failure to properly size an extension cord can result in personal injury and/or harm to the electric motor.

Operation of tool

1. Engage the throttle lever (or switch) this will activate the tool.
2. Using the feed wrench, advance the cutting blade towards the work.
3. Use a steady constant feed, creating a continuous chip.
 - a. Using a constant feed allows the heat generated by the cutting action to be removed by the chip. Heat buildup is a primary failure mode for cutting tools.
 - b. Engaging a rotating cutting blade with the work surface without feed (rubbing), creates excessive heat buildup.
4. When the desired end prep is accomplished, quickly reverse the feed wrench by reversing the directional pawl, and retract the cutting blade from the work.
5. Close the throttle lever (or switch). This will stop the tool.
6. Disconnect the power supply.
7. Release the clamping nut and remove the tool from the work.

Tool limits**Size limits**

1. Minimum inside diameter is 3-3/4".
2. Maximum outside diameter is 14".
3. Maximum wall thickness, 1-1/4" with standard tooling.
4. Extremely thin walls may require special tooling to prevent deformation of diameter.

Material limits

1. Difficult materials may require the following to maximize blade life.
 - a. Lubrication such as cutting oils, soluble oils, soapy water, plain water, etc.
 - b. Slow the speed of air motor, using a valve on the air supply.
 - c. Multiple cutting blades to balance the tool.
 - d. Vary feed rate, often times difficult materials respond to a heavy feed.

Maintenance and servicing

Regular cleaning and lubrication

1. Hose whip, filter and lubricator
 - a. Inspect filter element by removing nut from end of filter assembly.
 - b. If the filter is dirty or plugged, replace it using filter repair kit.
 - c. Remove filler plug from lubricator and be sure the adjusting screw is set half way between open and closed.
 - d. Fill lubricator, use a light weight air tool motor oil (s.a.e. 10).
 - e. For electric tools, inspect the cord for damage. If any damage is noted, the cord should be replaced.
2. Gear housing grease
 - a. Grease gear head after every two hundred hours of use.
 - b. Use grease NLGI # 2.
3. Lubrication for storage
 - a. Before putting the tool away, fill air inlet with a liberal amount of air tool oil and actuate motor momentarily. This will distribute oil to internal motor parts, preventing rust build up.
 - b. Wipe tool down using soft cloth removing all dirt, grease, oil and chips.
 - c. Lightly coat tool with rust preventive.

User service

1. A qualified air tool technician can provide all service for this machine.
 - a. Factory service or assistance is always available, contact us at the numbers below.
 - b. Complete drawings and parts lists are provided in section six.
 - i. No special tools are required to perform complete service.

Servicing by manufacturer or agent

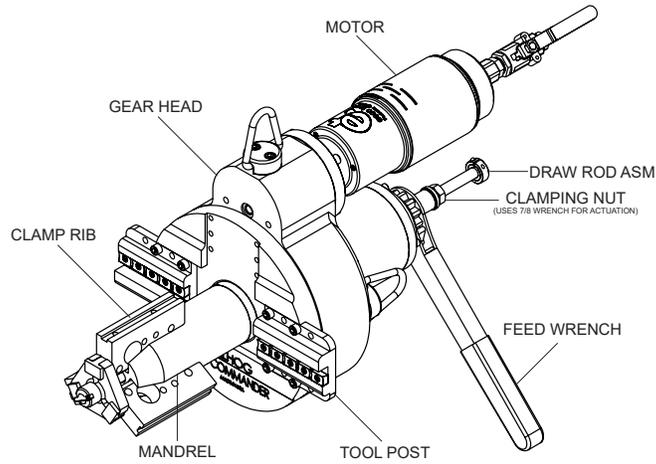
1. Factory service, return the tool to the factory address listed below.
2. Agent service, if applicable return tool to the agent listed below.
 - a. If unsure of Agent contact the factory.

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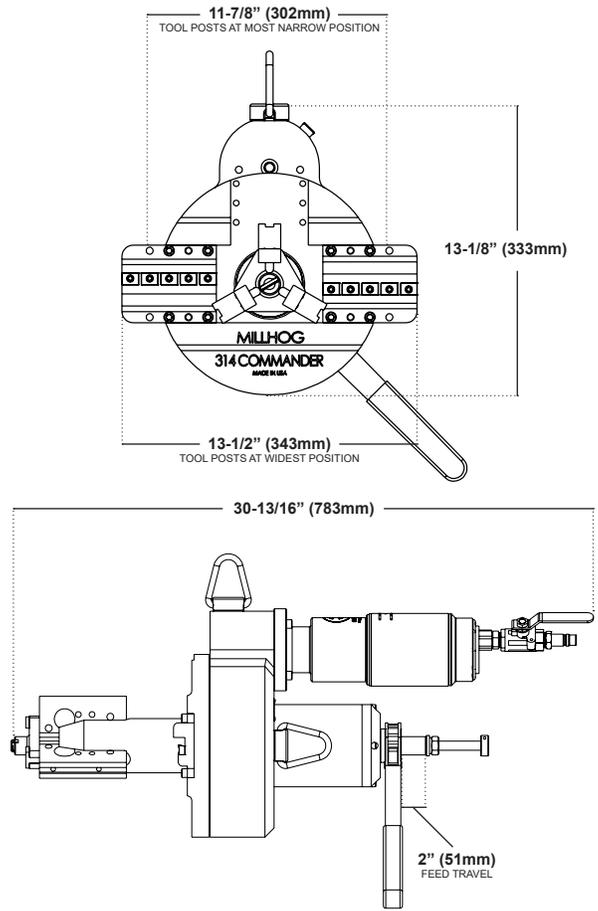
ASSOCIATED PARTS

BLADES: *M-SERIES*
 CLAMP RIBS: *C-RIBS*
 DRIVE OPTIONS: *PNEUMATIC, ELECTRIC, HYDRAULIC*

COMPONENT IDENTIFICATION



DIMENSIONS



CLAMP RIB CHART

MANDREL	CLAMP RIB ASM	I.D. RANGE (IN)	I.D. RANGE (MM)
C-37 (MANDREL, 3)	C-01	3.75 - 4.5	95.3 - 114.3
	C-02	4.375 - 5.25	111.1 - 133.4
	C-03	5.125 - 6.0	130.2 - 152.4
	C-04	5.875 - 6.8	149.2 - 172.7
	C-01 & C-05	6.75 - 7.562	171.5 - 192.1
	C-02 & C-05	7.437 - 8.25	188.9 - 209.6
	C-03 & C-05	8.125 - 8.938	206.4 - 227.0
	C-04 & C-05	8.875 - 9.7	225.4 - 246.4
	C-01 & C-06	9.687 - 10.5	246.1 - 266.7
	C-02 & C-06	10.375 - 11.125	263.5 - 282.6
	C-03 & C-06	11.0 - 11.812	279.4 - 300.0
	C-04 & C-06	11.75 - 12.5	298.5 - 317.5
	C-03 & C-07	12.4 - 13.25	315.0 - 336.6
C-04 & C-07	13.125 - 14.0	333.4 - 355.6	

POWER SPECS

	PN	ELEC	HYD
OUTPUT POWER	3.0 HP	2400 W	5.0 HP
POWER DRAW	90 PSI	120 V	1500 PSI
VOLUME	95 CFM	≥ 20 AMP	5 - 10 GPM
OUTPUT POWER	2207 W	2400 W	3678 W
POWER DRAW	6.2 BAR	230 V	102 BAR
VOLUME	2690 LT/MIN	≥ 15 AMP	30.3 - 45.4 LT/MIN
CUTTERHEAD SPEED	12	6.5 - 22.5 RPM	1 - 11 RPM

HANDLING SPECS

	PN	ELEC	HYD
WORK WEIGHT (lb)	89	91	93
SHIP WEIGHT (lb)	200	202	204
SHIP DIMS (in)	15 X 17 X 32	15 X 17 X 32	15 X 17 X 32
WORK WEIGHT (kg)	40	41	42
SHIP WEIGHT (kg)	91	92	93
SHIP DIMS (mm)	381 X 432 X 813	381 X 432 X 813	381 X 432 X 813

PACKAGING ASSEMBLIES

PART #: CC09-CM-01

DESCRIPTION: CASE ASM, CMH

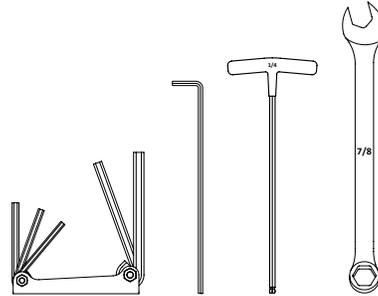
ITEM #	QTY	PART #	DESCRIPTION
1	1	CC09	CASE, CC05
2	1	FP-CC09-02	FOAM, CMH
3	1	FP-CC09-01	FOAM, TOP
4	1	CRLB-C-01	LBL, CLAMP RIB (CMH)
5	1	MLB.02	LBL, MILLHOG
6	1	FLB.01	LBL, FLAG

HAND TOOL SETS

PART #: 300-04

DESCRIPTION: HAND TOOL SET, 04

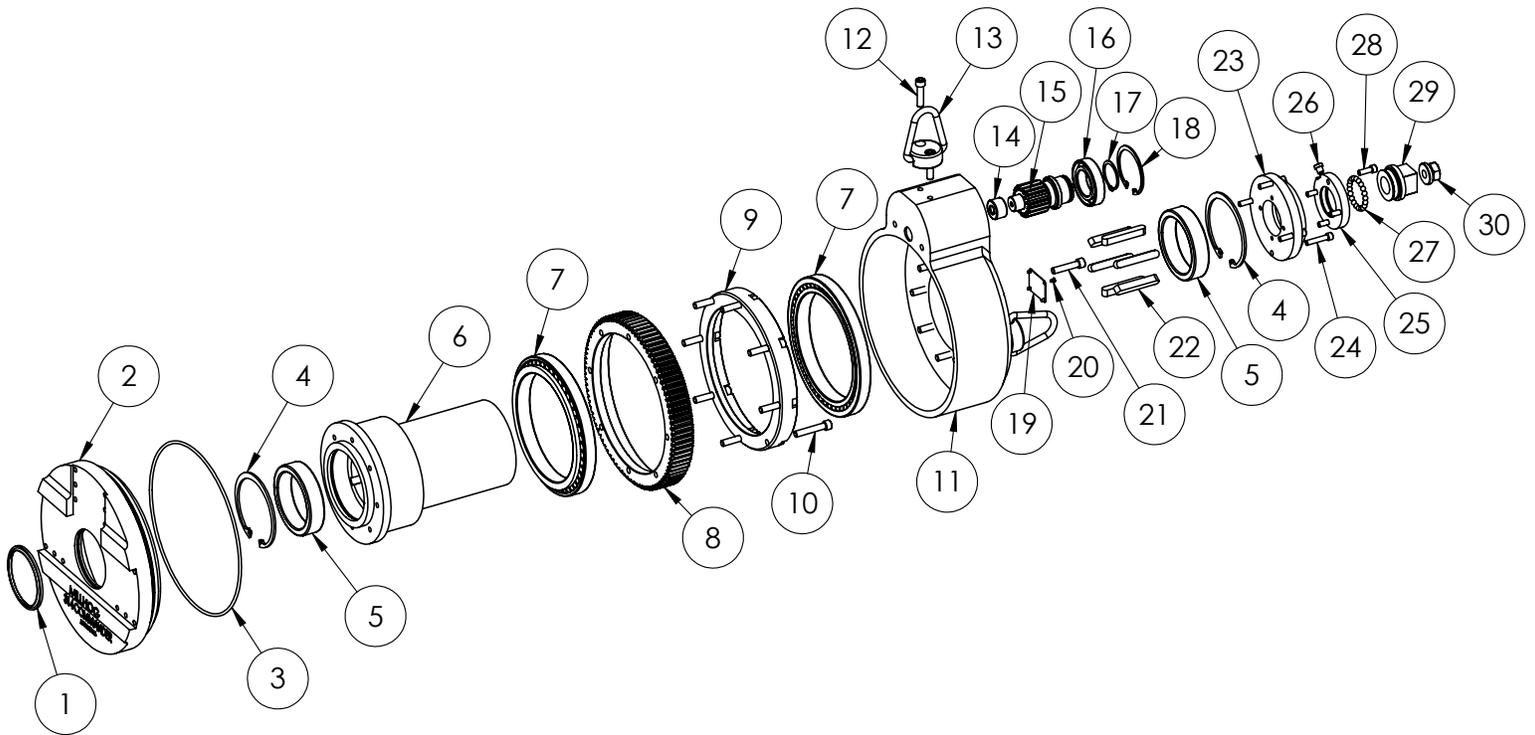
ITEM #	QTY	PART #	DESCRIPTION
1	1	285-1224	AWS (3/16 X 3/8)
2	1	280-1010	HEX KEY (5/32)
3	1	282-0016	BET-H HEX (1/4)
4	1	293-5656	CW (7/8 X 7/8)



PART #: C-201-01

DESCRIPTION: GEAR HEAD ASM, CMH

NOTE: CLAMPING ACTION USES 293-5656 COMBO WRENCH TO ACTUATE DRAW ROD AND RIBS. THIS WRENCH IS PART OF THE HAND TOOL SET THAT IS INCLUDED WITH THE TOOL AND ATTACHES TO P-12, DRAW ROD NUT (1/2-13).



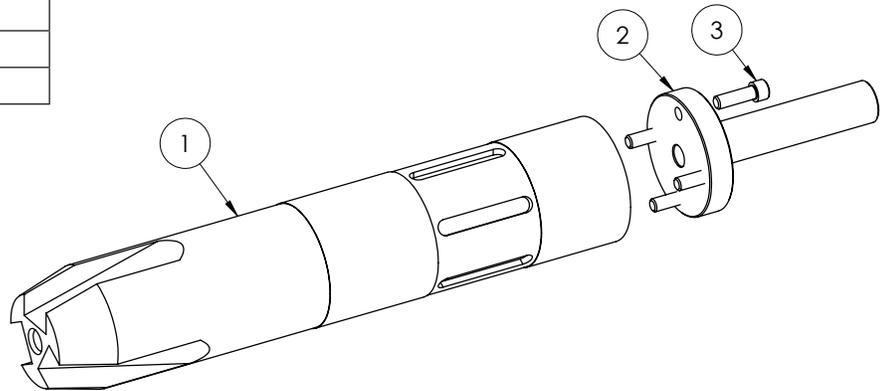
PART #: C-201-01**DESCRIPTION:** GEAR HEAD ASM, CMH

ITEM #	QTY	PART #	DESCRIPTION
1	1	C-56	SEAL
2	1	C-51	CUTTERHEAD
3	1	230-258	O-RING
4	2	200-375	INTERNAL RETAINING RING
5	2	C-43	MANDREL SUPPORT
6	1	C-47	SLEEVE
7	2	313-011	TAPERED ROLLER BEARING ASM
8	1	C-44	DRIVEN GEAR
9	1	C-41	SPACER
10	8	110-2228	SHCS (5/16-18 X 1-3/4)
11	1	C-25	HOUSING
12	6	110-2220	SHCS (5/16-18 X 1-1/4)
13	3	C-57	LIFT HOOK
14	1	316-009	RADIAL ROLLER BEARING
15	1	C-21	DRIVE GEAR
16	1	311-011	BALL BEARING
17	1	211-137	EXTERNAL RETAINING RING
18	1	200-244	INTERNAL RETAINING RING
19	1	NP-110	NAME PLATE (WARNING)
20	4	111-0803	BHCS (4-40 X 3/16)
21	8	110-2224	SHCS (5/16-18 X 1-1/2)
22	6	C-36	KEY
23	1	C-32	FEED PLATE
24	4	110-2020	SHCS (1/4-20 X 1-1/4)
25	1	C-28	BALL RETAINER
26	1	P-44	BALL RETAINER SCREW
27	20	H-49	BEARING BALL
28	1	110-2012	SHCS (1/4-20 X 3/4)
29	1	C-26	FEED KNOB
30	1	P-12	DRAW ROD NUT (1/2-13)

PART #: C-37A

DESCRIPTION: MANDREL ASM, 3

ITEM #	QTY	PART #	DESCRIPTION
1	1	C-37	MANDREL, 3
2	2	C-34	FEED THREAD
3	4	110-2216	SHCS (5/16-18 X 1)

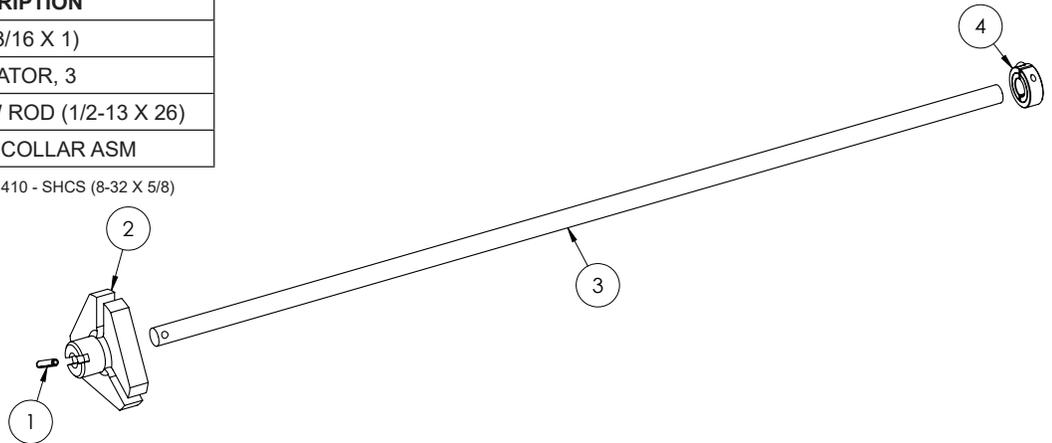


PART #: C-11-01

DESCRIPTION: DRAW ROD ASM, 3

ITEM #	QTY	PART #	DESCRIPTION
1	1	134-4616	SSP (3/16 X 1)
2	1	C-11	ACTUATOR, 3
3	1	C-14	DRAW ROD (1/2-13 X 26)
4	1	M-55	STOP COLLAR ASM

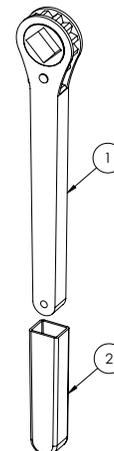
*REPLACEMENT SCREW FOR M-55 STOP COLLAR ASM IS 110-1410 - SHCS (8-32 X 5/8)



PART #: B-28

DESCRIPTION: WRENCH ASM

ITEM #	QTY	PART #	DESCRIPTION
1	1	B-28B	WRENCH
2	1	H-39A	GRIP

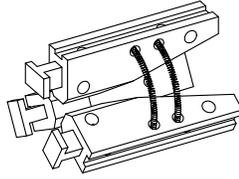


C-RIB/PAD ASSEMBLIES

PART #: C-01

DESCRIPTION: CLAMP RIB ASM (3.750-4.500)

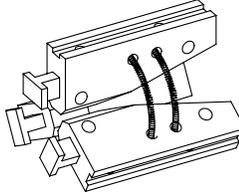
QTY	PART #	DESCRIPTION
3	C-01_PART	CLAMP RIB
2	C-13	SPRING



PART #: C-02

DESCRIPTION: CLAMP RIB ASM (4.375-5.250)

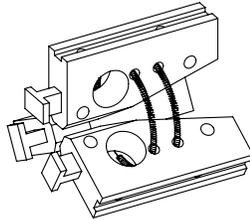
QTY	PART #	DESCRIPTION
3	C-02_PART	CLAMP RIB
2	C-13	SPRING



PART #: C-03

DESCRIPTION: CLAMP RIB ASM (5.125-6.000)

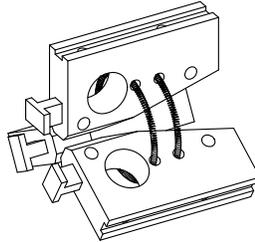
QTY	PART #	DESCRIPTION
3	C-03_PART	CLAMP RIB
2	C-13	SPRING



PART #: C-04

DESCRIPTION: CLAMP RIB ASM (5.875-6.800)

QTY	PART #	DESCRIPTION
3	C-04_PART	CLAMP RIB
2	C-13	SPRING



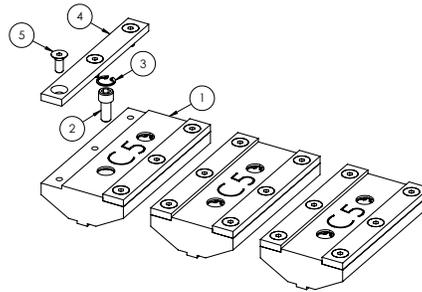
PART #: C-05

DESCRIPTION: CLAMP PAD SET

NOTE: C-05 CLAMP PAD SET INCLUDES (3) CLAMP PAD ASSEMBLIES. QUANTITIES LIST IN CHART BELOW ARE FOR EACH CLAMP PAD ASSEMBLY. TO PURCHASE AN INDIVIDUAL CLAMP PAD ASSEMBLY (NOT AS A SET) USE PART # C-00-05

PART #: C-00-05
DESCRIPTION: CLAMP PAD ASM

ITEM #	QTY	PART #	DESCRIPTION
1	1	C-05_PART	PART, CLAMP PAD
2	2	110-2212	SHCS (5/16-18 x 3/4)
3	2	200-056	INTERNAL RETAINING RING
4	2	C-10	PAD CORNER
5	6	112-2010	FHCS (1/4-20 X 5/8)



ASSEMBLY DRAWINGS - CLAMP RIBS

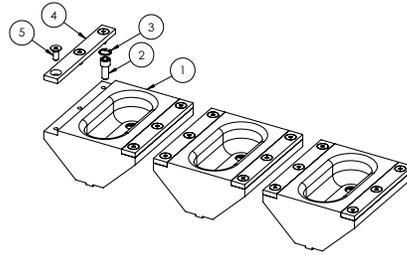
PART #: C-06

DESCRIPTION: CLAMP PAD SET

NOTE: C-06 CLAMP PAD SET INCLUDES (3) CLAMP PAD ASSEMBLIES. QUANTITIES LIST IN CHART BELOW ARE FOR EACH CLAMP PAD ASSEMBLY. TO PURCHASE AN INDIVIDUAL CLAMP PAD ASSEMBLY (NOT AS A SET) USE PART # C-00-06

PART #: C-00-06
DESCRIPTION: CLAMP PAD ASM

ITEM #	QTY	PART #	DESCRIPTION
1	1	C-06_PART	PART, CLAMP PAD
2	2	110-2212	SHCS (5/16-18 X 3/4)
3	2	200-056	INTERNAL RETAINING RING
4	2	C-10	PAD CORNER
5	6	112-2010	FHCS (1/4-20 X 5/8)



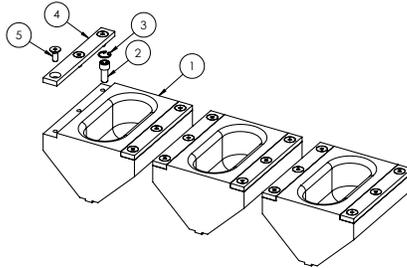
PART #: C-07

DESCRIPTION: CLAMP PAD SET

NOTE: C-07 CLAMP PAD SET INCLUDES (3) CLAMP PAD ASSEMBLIES. QUANTITIES LIST IN CHART BELOW ARE FOR EACH CLAMP PAD ASSEMBLY. TO PURCHASE AN INDIVIDUAL CLAMP PAD ASSEMBLY (NOT AS A SET) USE PART # C-00-07

PART #: C-00-07
DESCRIPTION: CLAMP PAD ASM

ITEM #	QTY	PART #	DESCRIPTION
1	1	C-07_PART	PART, CLAMP PAD
2	2	110-2212	SHCS (5/16-18 X 3/4)
3	2	200-056	INTERNAL RETAINING RING
4	2	C-10	PAD CORNER
5	6	112-2010	FHCS (1/4-20 X 5/8)

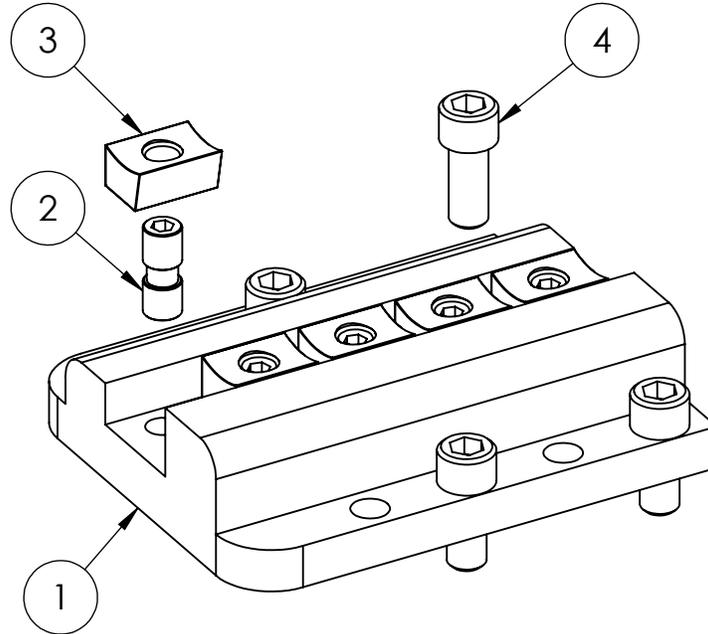


RIB KITS

PART #: CRK-01-07

DESCRIPTION: C-RIB KIT (C-01 - C-07)

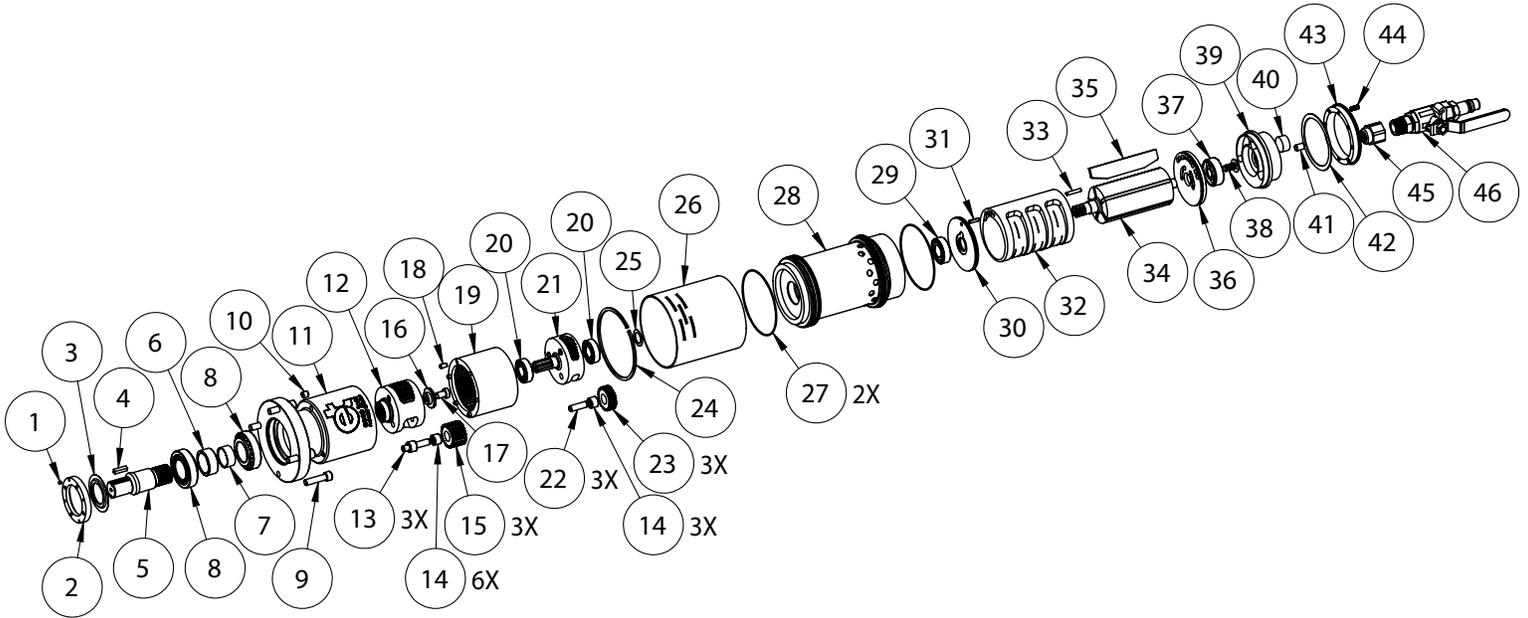
ITEM #	QTY	PART #	DESCRIPTION
1	1	C-01	CLAMP RIB ASM (3.750-4.500)
2	1	C-02	CLAMP RIB ASM (4.375-5.250)
3	1	C-03	CLAMP RIB ASM (5.125-6.000)
4	1	C-04	CLAMP RIB ASM (5.875-6.800)
5	1	C-05	CLAMP PAD SET
6	1	C-06	CLAMP PAD SET
7	1	C-07	CLAMP PAD SET

PART #: C-52**DESCRIPTION:** TOOL POST ASM

ITEM #	QTY	PART #	DESCRIPTION
1	1	C-52_PART	TOOL POST
2	5	H-23	COMBINATION SCREW
3	5	H-22C	BLADE LOCK, 3/4
4	4	110-2212	SHCS (5/16-18 X 3/4)

PART #: 30-100-01

DESCRIPTION: PN MOTOR ASM (CMH/DMH)



* **PART #:** AHB-320
DESCRIPTION: BALL VALVE ASM (1/2)

ITEM #	QTY	PART #	DESCRIPTION
1	1	AHB-320A	BALL VALVE (1/2)
2	1	353-5252	TH'D COUPLER (1/2 X 1/2)
3	1	355-5252	NIPPLER (1/2 X 1/2 NPT)

ITEM #	QTY	PART #	DESCRIPTION
1	4	130-5806	SHSS (4 X 6)
2	1	30-02	ADJUSTING NUT
3	1	30-04	SEAL
4	2	45-05A	KEY
5	1	30-03	DRIVE SHAFT

PART #: 30-100-01

DESCRIPTION: PN MOTOR ASM (CMH/DMH)

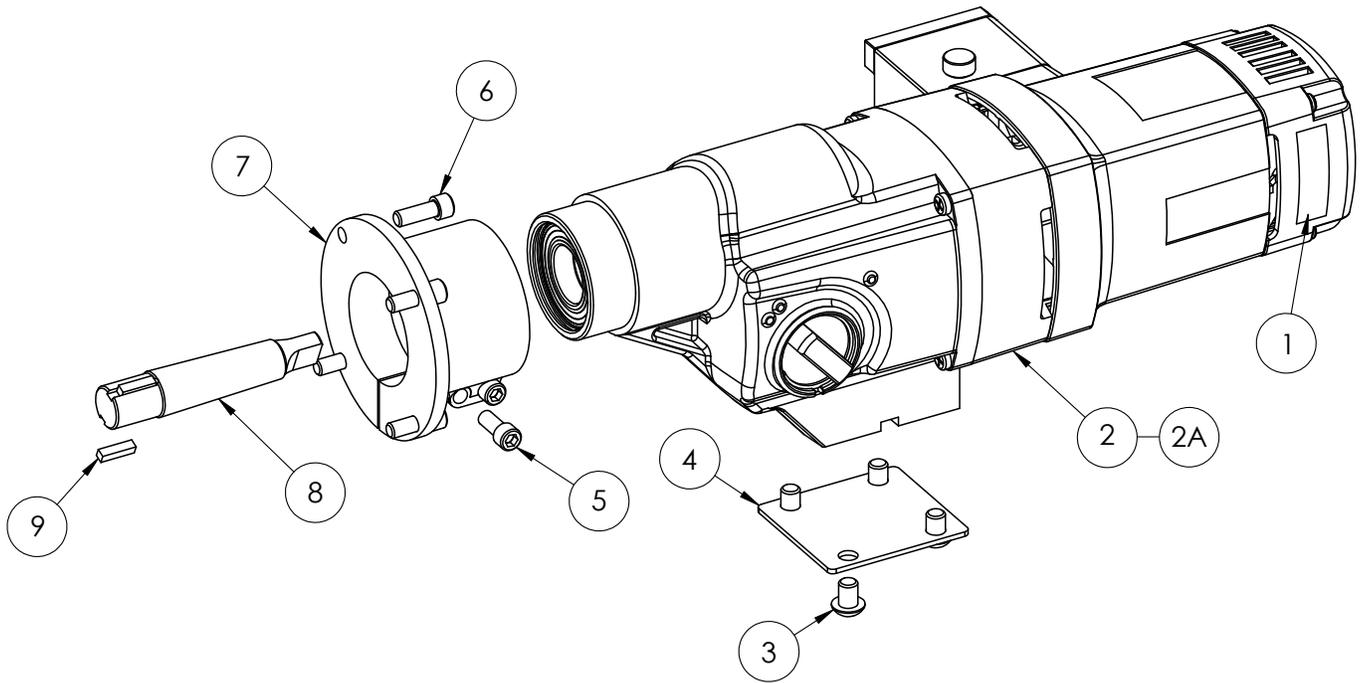
ITEM #	QTY	PART #	DESCRIPTION
6	1	30-06	SPACER
7	1	30-07	SPACER
8	2	313-013	TAPERED ROLLER BEARING ASM
9	4	110-2220	SHCS (5/16-18 X 1-1/4)
10	3	130-6408	SHSS (M8 X 8)
11	1	30-10	FLANGE GEAR HOUSING
12	1	30-13	PLANETARY GEAR SPIDER
13	3	133-8540	DP (M8 X 40)
14	9	316-017	RADIAL ROLLER BEARING
15	3	30-15	PLANETARY GEAR
16	1	30-17	RETAINER WASHER
17	1	113-6412	LHCS (M8 X 12)
18	6	133-8310	DP (M5 X 10)
19	1	30-12	GEAR HOUSING
20	2	311-034	BALL BEARING
21	1	30-22	PLANETARY GEAR SPIDER
22	3	133-8525	DP (M8 X 25)
23	3	30-21	PLANETARY GEAR
24	1	30-24	EXPANSION RING
25	1	30-30	SPACER
26	1	30-25	EXHAUST SHIELD
27	2	230-043	O-RING
28	1	30-28	CYLINDER HOUSING
29	1	311-035	BALL BEARING
30	1	30-32	END PLATE
31	1	134-8214	SSP (M4 X 14)
32	1	30-36	CYLINDER
33	1	133-8225	DP (M4 X 25)
34	1	30-34	ROTOR
35	1	30-33	ROTOR VANES (SET OF 5)
36	1	30-37	END PLATE
37	1	311-023	BALL BEARING
38	1	115-6310	FBHCS (M8-1.25 X 10)
39	1	30-41	INLET FLANGE
40	1	30-46	PLUG
41	1	130-6412	SHSS (M8 X 12)
42	1	30-43	REAR WASHER
43	1	30-44	RETAINER FLANGE
44	8	130-6008	SHSS (M5 X 12)
45	1	30-47	INLET ADAPTER
46*	1	AHB-320	BALL VALVE ASM (1/2 X 1/2)

PART #: EM-00-05

DESCRIPTION: ELEC MOTOR ASM, 110 (CMH/DMH)

PART #: EM-00-06

DESCRIPTION: ELEC MOTOR ASM, 220 (CMH/DMH)



FOR OLDER MODEL ELECTRIC MACHINES...

EL-00-01 & EL-00-02 PRECEDED THE PREVIOUSLY USED MOTOR, PCD-110 & PCD-220, STARTING IN SUMMER OF 2018. FOR CUSTOMERS LOOKING TO UPGRADE TO THE NEWER 20 AMP MOTOR, ITEMS 2-6 FROM THE ABOVE DRAWING ARE THE SAME AS THE PARTS THAT YOUR MACHINE CAME WITH. UNLESS THESE ITEMS ARE IN NEED OF REPLACEMENT, PURCHASING THE MOTOR SUB ASSEMBLY IS ALL THAT IS REQUIRED TO UPGRADE. PLEASE NOTE THAT THE NEWER ELECTRIC MOTOR ASSEMBLY WILL NEED TO BE REMOVED IN ORDER TO FIT INSIDE THE ORIGINAL CASE.

PCD-110 AND PCD-220 ARE STILL STOCKED FOR PARTS AND SUPPORTED FOR REPAIRS THROUGH OUR FACTORY. PLEASE SEE PAGE XX FOR PARTS BREAK DOWN.

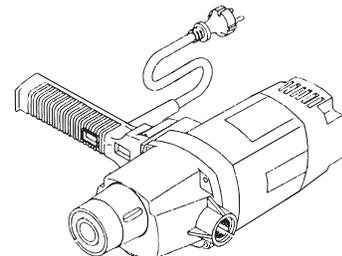
NOTE: OLDER MODEL ELECTRIC COMMANDER KITS THAT USED PCD-110 & PCD-220 WERE SOLD WITH CD-GB GEAR BOX ASM. THIS WAS TO ENSURE SUSTAINED TORQUE REQUIREMENTS AND HIGH SPEED FAN ROTATION IN ORDER TO KEEP THE MOTOR COOL DURING LONG PERIODS OF USE. EL-00-01 & EL-00-02 HAVE A BUILT IN GEARBOX AND THEREFORE DO NOT REQUIRE CD-GB GEARBOX ASM FOR STANDARD USE.

PART #: PCD-110 (NON-CURRENT)

DESCRIPTION: ELEC MOTOR SUB ASM, 110-15

PART #: PCD-220 (NON-CURRENT)

DESCRIPTION: ELEC MOTOR SUB ASM, 220-15



PART #: EM-00-05

DESCRIPTION: ELEC MOTOR ASM, 110 (CMH/DMH)

PART #: EM-00-06

DESCRIPTION: ELEC MOTOR ASM, 220 (CMH/DMH)

ITEM #	QTY	PART #	DESCRIPTION
1	1	EMLB-01	LBL, WARNING
2*	1	EL-00-01	ELEC MOTOR SUB ASM, 110-20
2A*	1	EL-00-02	ELEC MOTOR SUB ASM, 220-20
3	4	111-2408	BHCS (3/8-16 X 1/2)
4	1	EM-01-05	NAME PLATE (20A-CMH/DMH)
5	2	110-2212	SHCS (5/16-18 X 3/4)
6	4	110-2214	SHCS (5/16-18 X 7/8)
7	1	CDE-02	ADAPTER HOUSING (CMH/DMH)
8	1	CDE-01	ELEC MOTOR COUPLER (CMH/DMH)
9	2	48-05A	KEY

*EL-00-01A & EL-00-02A EXPLODED VIEW DRAWING SHOWN ON NEXT PAGE

PART #: EL-00-01

DESCRIPTION: ELEC MOTOR SUB ASM, 110-20

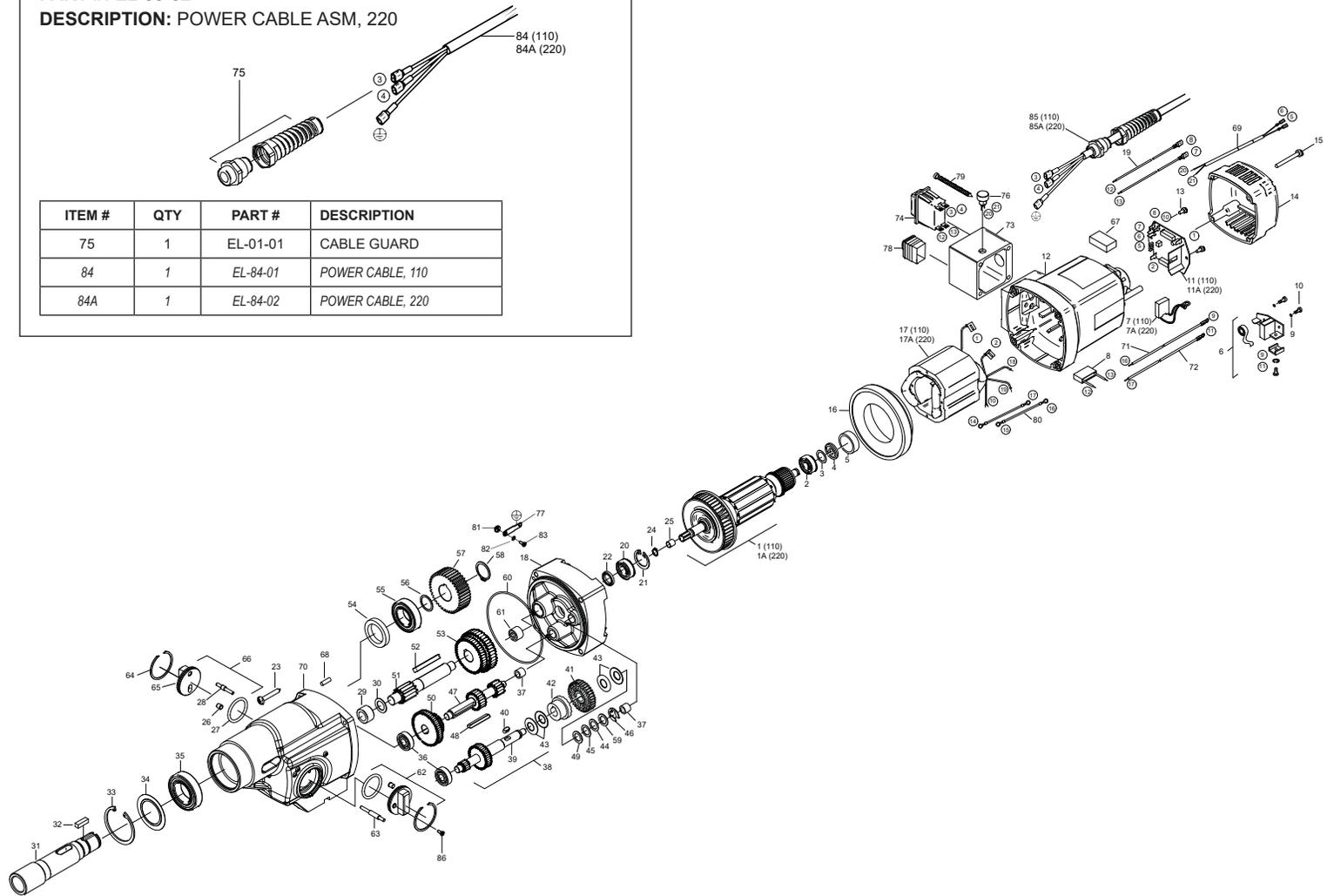
PART #: EL-00-02

DESCRIPTION: ELEC MOTOR SUB ASM, 220-20

* **PART #: EL-85-01**
DESCRIPTION: POWER CABLE ASM, 110

PART #: EL-85-02
DESCRIPTION: POWER CABLE ASM, 220

ITEM #	QTY	PART #	DESCRIPTION
75	1	EL-01-01	CABLE GUARD
84	1	EL-84-01	POWER CABLE, 110
84A	1	EL-84-02	POWER CABLE, 220



ITEM #	QTY	PART #	DESCRIPTION
1	1	EL-01-01	ARMATURE, 110
1A	1	EL-01-02	ARMATURE, 220
2	1	311-037	BALL BEARING

PART #: EL-00-01
DESCRIPTION: ELEC MOTOR SUB ASM, 110-20

ITEM #	QTY	PART #	DESCRIPTION
3	1	EL-03-01	SEAL RING
4	1	EL-04-01	MAGNETIC DISK
5	1	EL-05-01	BEARING CAP
6	2	EL-06-01	BRUSH HOLDER
7	2	EL-07-01	BRUSH, 110
7A	2	EL-07-02	BRUSH, 220
8	1	EL-08-01	CONDENSER
9	4	EL-09-01	LOCK WASHER
10	4	EL-10-01	SCREW
11	1	EL-11-01	CIRCUIT BOARD, 110
11A	1	EL-11-02	CIRCUIT BOARD, 220
12	1	EL-12-01	MOTOR HOUSING
13	2	EL-13-01	SCREW
14	1	EL-14-01	CAP
15	4	EL-15-01	SCREW
16	1	EL-16-01	AIR GUIDE RING
17	1	EL-17-01	FIELD COIL, 110
17A	1	EL-17-02	FIELD COIL, 220
18	1	EL-18-01	END SHIELD
19	2	EL-19-01	WIRE
20	1	311-039	BALL BEARING
21	1	EL-21-01	INTERNAL RETAINING RING
22	1	EL-22-01	SHAFT SEAL RING
23	4	EL-23-01	SCREW
24	1	EL-24-01	EXTERNAL RETAINING RING
25	1	EL-25-01	BEARING RING
26	2	EL-26-01	THRUST PAD
27	2	EL-27-01	O-RING
28	1	EL-28-01	SWITCH WHEEL SHORT
29	1	EL-29-01	RADIAL ROLLER BEARING
30	1	EL-30-01	DISC
31	1	EL-31-01	WORK SPINDLE
32	1	EL-32-01	KEY
33	1	EL-33-01	INTERNAL RETAINING RING
34	1	EL-34-01	DISC
35	1	311-038	BALL BEARING
36	2	311-036	BALL BEARING
37	2	EL-37-01	NEEDLE SLEEVE
38	1	EL-38-01	CLUTCH COMPLETE
39	1	EL-39-01	INTERMEDIATE SHAFT 1
40	1	EL-40-01	FITTING KEY
41	1	EL-41-01	CLUTCH WHEEL
42	1	EL-42-01	COUPLING HALF

PART #: EL-00-02
DESCRIPTION: ELEC MOTOR SUB ASM, 220-20

ITEM #	QTY	PART #	DESCRIPTION
43	4	EL-43-01	SPRING WASHER
44	1	EL-44-01	FITTING WASHER
45	1	EL-45-01	FITTING WASHER
46	1	EL-46-01	LOCK WASHER
47	1	EL-47-01	INTERMEDIATE SHAFT 2
48	1	EL-48-01	KEY
49	1	EL-49-01	PRESSURE WASHER
50	1	EL-50-01	GEAR BLOCK
51	1	EL-51-01	INTERMEDIATE SHAFT 3
52	1	EL-52-01	KEY
53	1	EL-53-01	GEAR BLOCK 2
54	1	EL-54-01	SHAFT SEAL RING
55	1	311-008	BALL BEARING
56	1	EL-56-01	WASHER
57	1	EL-57-01	SPINDEL WHEEL
58	1	EL-58-01	EXTERNAL RETAINING RING
59	1	EL-59-01	PRESSURE WASHER
60	1	EL-60-01	O-RING
61	1	EL-61-01	NEEDLE SLEEVE
62	1	EL-62-01	SWITCH BUTTON LONG
63	1	EL-63-01	SWITCH WHEEL LONG
64	2	EL-64-01	CIRCLIP
65	2	EL-65-01	SWITCH BUTTON
66	1	EL-66-01	SWITCH BUTTON SHORT
67	1	EL-67-01	CONTACT WASHER
68	1	EL-68-01	PIN PLUG
69	1	EL-69-01	WIRE
70	1	EL-70-01	GEARBOX HOUSING
71	1	EL-71-01	BRUSH HOLDER WIRE 1
72	1	EL-72-01	BRUSH HOLDER WIRE 2
73	1	EL-73-01	SWITCH BOX
74	1	EL-74-01	SWITCH ETA 20A
76	1	EL-76-01	POTENTIOMETER
77	1	EL-77-01	GROUND CONNECTOR
78	1	EL-78-01	PLUG
79	4	EL-79-01	SCREW
80	2	EL-80-01	CONNECTING WIRE
81	1	EL-81-01	LOCKING NUT
82	1	EL-82-01	TOOTH LOCK WASHER
83	1	EL-83-01	LENS HEAD SCREW
85*	1	EL-85-01	POWER CABLE ASM, 110
85A*	1	EL-85-02	POWER CABLE ASM, 220
86	1	110-2008	SHCS (1/4-20 X 1/2)

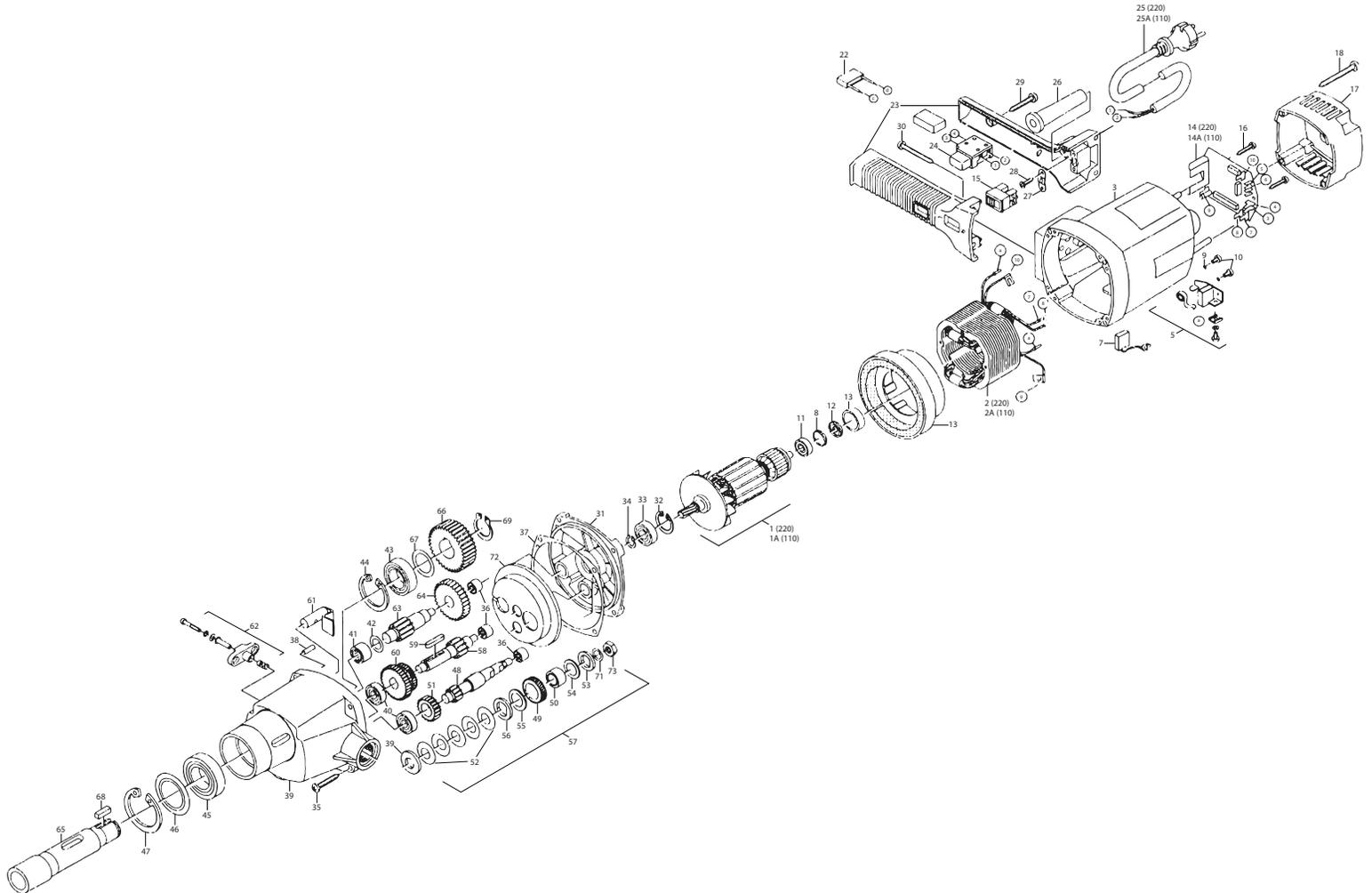
PART #: PCD-110 (NON-CURRENT)

DESCRIPTION: ELEC MOTOR SUB ASM, 110-15

PART #: PCD-220 (NON-CURRENT)

DESCRIPTION: ELEC MOTOR SUB ASM, 220-15

NOTE: COMMANDER AND DICTATOR MILLHOGS THAT WERE SOLD WITH PCD-110/PCD-220 CAME WITH THE CM-GB GEAR BOX ASM. DUE TO THE TORQUE CAPACITY OF THIS MODEL ELECTRIC MOTOR, CM-GB GEAR BOX ASM IS REQUIRED FOR PROPER FUNCTION.



PART #: PCD-110 (NON-CURRENT)
DESCRIPTION: ELEC MOTOR SUB ASM, 110-15

ITEM #	QTY	PART #	DESCRIPTION
1	1	PCD-01	ARMATURE, 220
1A	1	PCD-01A	ARMATURE, 110
2	1	PCD-02	FIELD COIL, 220
2A	1	PCD-02A	FIELD COIL, 110
3	1	PCD-03	MOTOR HOUSING
4	1	PCD-04	AIR GUIDING RING
5	2	PCD-05	CARBON BRUSH HOLDER
7	1	PCD-07	CARBON BRUSH (SET OF 2)
8	1	PCD-08	DISK
9	1	PCD-09	SPRING DISK 34
10	2	PCD-10	SCREW
11	1	311-037	BALL BEARING
12	1	PCD-12	MAGNET RING
13	1	PCD-13	BEARING SEAL
14	1	PCD-14	CIRCUIT BOARD, 220
14A	1	PCD-14A	CIRCUIT BOARD, 110
15	1	PCD-15	REVERSER
16	2	PCD-16	SCREW
17	1	PCD-17	MOTOR CAP
18	4	PCD-18	SCREW
22	1	PCD-22	CONDENSOR
23	1	PCD-23	SIDE HANDLE
24	1	PCD-24	SWITCH
25	1	PCD-25	CABLE, 220
25A	1	PCD-25A	CABLE, 110
26	1	PCD-26	CABLE SLEEVE
27	1	PCD-27	LOCKING FLANGE
28	2	PCD-28	SCREW
29	1	PCD-29	SCREW
30	4	PCD-30	SCREW
31	1	PCD-31	END SHIELD
32	1	PCD-32	SAFETY RING 28/1.2
33	1	PCD-33	BEARING
34	1	PCD-34	SAFETY RING
35	4	PCD-35	SCREW
36	1	PCD-36	NEEDLE SLEEVE
37	1	PCD-37	SEAL
38	4	PCD-38	PIN
39	1	PCD-39	GEARBOX HOUSING
40	1	311-036	BALL BEARING
41	1	PCD-41	NEEDLE BEARING
42	1	PCD-42	NEEDLE BEARING DISK
43	1	311-008	BALL BEARING
44	1	PCD-44	LOCKING RING

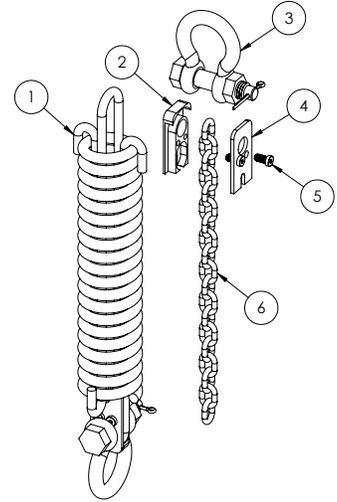
PART #: PCD-220 (NON-CURRENT)
DESCRIPTION: ELEC MOTOR SUB ASM, 220-15

ITEM #	QTY	PART #	DESCRIPTION
45	1	311-039	BALL BEARING
46	1	PCD-46	BALL BEARING DISK
47	1	PCD-47	LOCKING RING
48	1	PCD-48	INTERMEDIATE SHAFT 1
49	1	PCD-49	COUPLING WHEEL
50	1	PCD-50	GEAR SLEEVE
51	1	PCD-51	INTERMEDIATE WHEEL 1
52	5	PCD-52	SPRING WASHER
53	1	PCD-53	WASHER
54	1	PCD-54	WASHER
55	1	PCD-55	CLUTCH WASHER
56	1	PCD-56	WASHER
57	1	PCD-57	COUPLING
58	1	PCD-58	INTERMEDIATE SHAFT 2
59	1	PCD-59	KEY
60	1	PCD-60	CLUSTER GEARS
61	1	PCD-61	COUPLING BOLT
62	1	PCD-62	GEAR SWITCH
63	1	PCD-63	INTERMEDIATE SHAFT 3
64	1	PCD-64	INTERMEDIATE WHEEL 2
65	1	PCD-65	WORK SPINDLE
66	1	PCD-66	SPINDLE WHEEL
67	1	PCD-67	FITTING DISK
68	1	PCD-68	KEY
69	1	PCD-69	LOCKING RING
71	1	PCD-71	DISK SPRING
72	1	PCD-72	GREASE CHAMBER
73	1	PCD-73	NUT
74	1	PCD-74	NEEDLE BEARING DISK

PART #: CD-SH

DESCRIPTION: SPRING HANGER ASM (CMH/DMH)

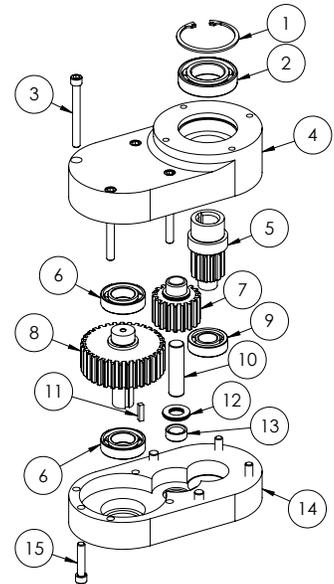
ITEM #	QTY	PART #	DESCRIPTION
1	1	CD-40	SPRING
2	2	CD-41	BRACKET BASE
3	2	CD-44	SHACKLE
4	2	CD-42	BRACKET CAP
5	4	113-2008	LHCS (1/4-20 X 1/2)
6	1	CD-43	CHAIN (19 LINKS)



PART #: CD-GB

DESCRIPTION: GEAR BOX ASM (CMH/DMH)

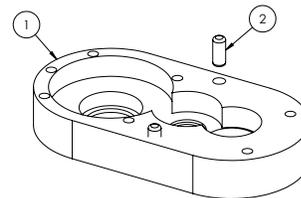
ITEM #	QTY	PART #	DESCRIPTION
1	1	200-244	INTERNAL RETAINING RING
2	1	311-011	BALL BEARING
3	4	110-2248	SHCS (5/16-18 X 3)
4	1	CD-22	HOUSING
5	1	CD-31	GEAR
6	2	311-008	BALL BEARING
7	1	CD-27	IDLER GEAR
8	1	CD-29	GEAR
9	1	311-007	BALL BEARING
10	1	CD-32	IDLER PIN
11	2	48-05A	KEY
12	2	318-002	THRUST BEARING ASM
13	2	CD-35	BUSHING
14*	1	CD-37-01	HOUSING ASM
15	3	110-2224	SHCS (5/16-18 X 1-1/2)



*

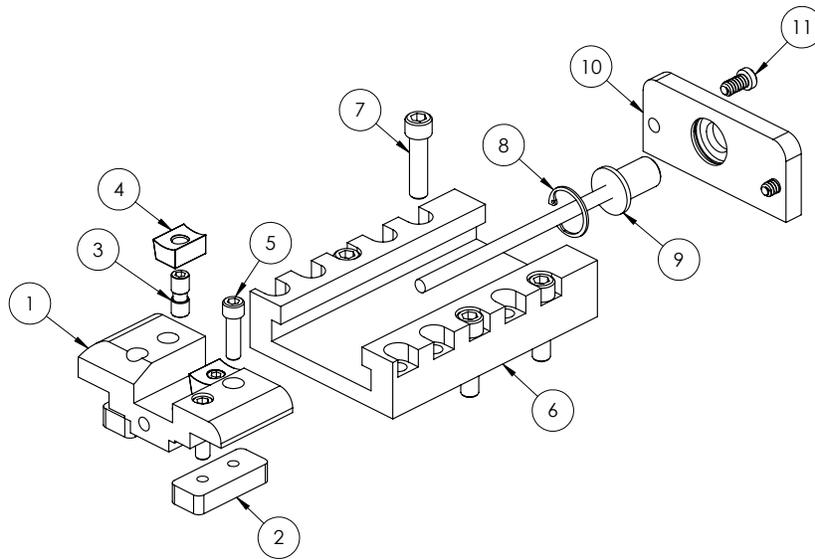
PART #: CF-37-01
DESCRIPTION: HOUSING ASM

ITEM #	QTY	PART #	DESCRIPTION
1	1	CD-37	HOUSING
2	2	133-5014	DP (3/8 X 7/8)



PART #: D-57

DESCRIPTION: ADJ TOOL POST ASM



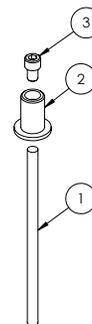
ITEM #	QTY	PART #	DESCRIPTION
1	1	D-57H	CARRIAGE
2	2	D-57F	STOP
3	2	H-23	COMBINATION SCREW
4	2	H-22C	BLADE LOCK, 3/4
5	4	110-2014	SHCS (1/4-20 X 7/8)
6	1	D-57A	BASE
7	4	110-2220	SHCS (5/16-18 X 1-1/4)
8	1	200-087	INTERNAL RETAINING RING
9*	1	D-57J	FEED SCREW ASM
10	1	D-57B	REAR PLATE
11	2	113-2008	LHCS (1/4-20 X 1/2)

*

PART #: D-57J

DESCRIPTION: FEED SCREW ASM

ITEM #	QTY	PART #	DESCRIPTION
1	1	D-57E	THREADED ROD
2	1	D-57C	ADJUSTMENT KNOB
3	1	110-2006	SHCS (1/4-20 X 3/8)

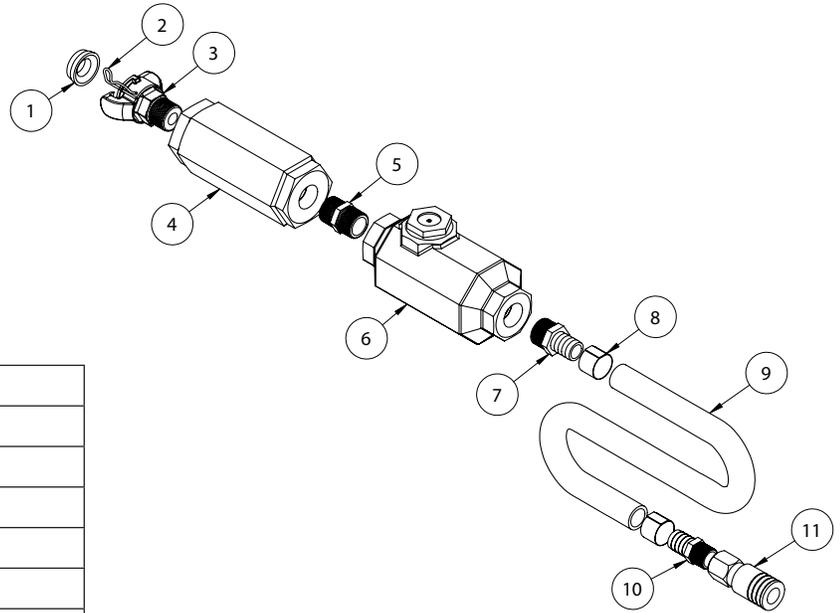


AIR HOSES AND FITTINGS

ASSEMBLY DRAWINGS - AIR HOSES

PART #: AH-204

DESCRIPTION: HOSE ASM, 3/4 (1/2 CPL)



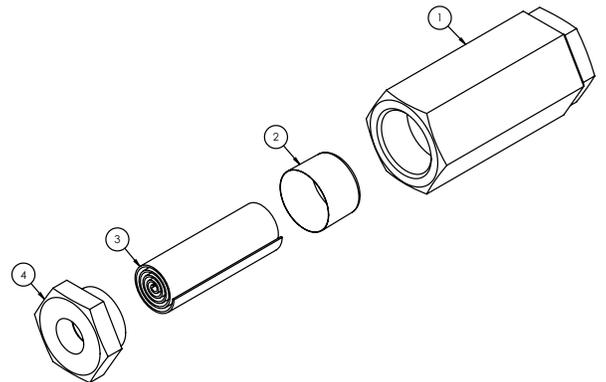
ITEM #	QTY	PART #	DESCRIPTION
1	1	AHW-304	SEAL
2	1	AHW-306	SAFETY PIN
3	1	AHB-305	CHICAGO FITTING, 3/4
4*	1	AHB-307	FILTER ASM
5	1	353-5454	TH'D COUPLER (3/4 X 3/4)
6*	1	AHB-311	OILER ASM
7	1	350-5454	HOSE BARB (3/4 X 3/4 NPT)
8	2	AHW-313	HOSE CLAMP (1-1/4 ID)
9	6	340-075	HOSE (3/4 X 12)
10	1	350-5452	HOSE BARB (3/4 X 1/2 NPT)
11	1	352-5252	Q-C COUPLER (1/2 X 1/2)

*AHB-311 EXPLODED VIEW DRAWING SHOWN ON NEXT PAGE

PART #: AHB-307

DESCRIPTION: FILTER ASM

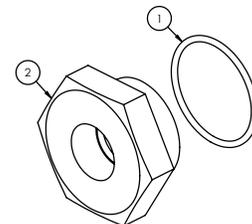
ITEM #	QTY	PART #	DESCRIPTION
1	1	AHB-307A	HOUSING
2	1	AHB-309	SCREEN
3	1	AHB-308	FILTER
4*	1	AHB-307B	CAP ASM



*

PART #: AHB-307B
DESCRIPTION: CAP ASM

ITEM #	QTY	PART #	DESCRIPTION
1	1	230-132	O-RING
2	1	AHB-00-307B	CAP



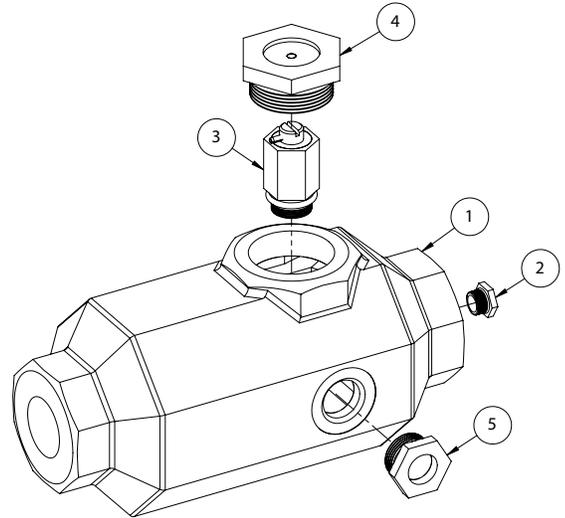
AIR HOSES AND FITTINGS

ASSEMBLY DRAWINGS - AIR HOSES

PART #: AHB-311

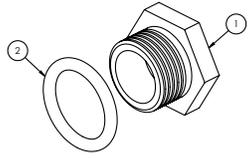
DESCRIPTION: OILER ASM

ITEM #	QTY	PART #	DESCRIPTION
1	1	AHB-311A	OILER HOUSING
2*	1	AHB-315A	CHECK VALVE ASM
3*	1	AHB-314	FEEDER ASM
4*	1	AHB-313A	FILLER CAP ASM
5*	1	AHB-318A	SIGHT WINDOW ASM



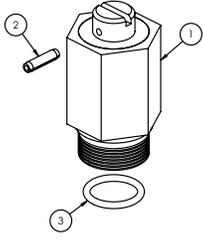
* **PART #: AHB-315A**
DESCRIPTION: CHECK VALVE ASM

ITEM #	QTY	PART #	DESCRIPTION
1	1	AHB-00-315A	CHECK VALVE
2	1	230-012	O-RING



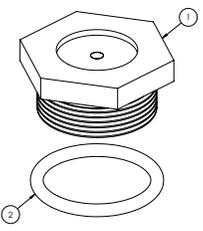
* **PART #: AHB-314**
DESCRIPTION: FEEDER ASM

ITEM #	QTY	PART #	DESCRIPTION
1	1	AHB-00-314	FEEDER
2	1	134-4206	SSP (3/32 X 3/8)
3	1	230-013	O-RING



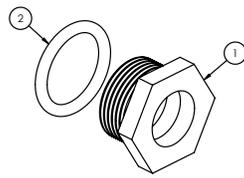
* **PART #: AHB-313A**
DESCRIPTION: FILLER CAP ASM

ITEM #	QTY	PART #	DESCRIPTION
1	1	AHB-00-313A	FILLER CAP
2	1	230-118	O-RING



* **PART #: AHB-318A**
DESCRIPTION: SIGHT WINDOW ASM

ITEM #	QTY	PART #	DESCRIPTION
1	1	AHB-00-318A	SIGHT WINDOW
2	1	230-115	O-RING



M-SERIES BLADES

APPLICABLE MODELS:

WART

MINI

PREPZILLA

COMMANDER

DICTATOR/DICTATOR II

TERMINATOR

BEVEL BLADES

 <p>MBB-1 37-1/2° BEVEL BLADE TIN 1/2" / 12.7MM WIDE</p>	 <p>MBB-2 37-1/2° BEVEL BLADE TIN 3/4" / 19.1MM WIDE</p>	 <p>MBB-3 37-1/2° BEVEL BLADE TIN 1" / 25.4MM WIDE</p>	 <p>MBB-4 37-1/2° BEVEL BLADE TIN 1-1/4" / 31.8MM WIDE</p>	 <p>MBB-5 37-1/2° X 10° COMPOUND BEVEL BLADE TIN 1-1/4" / 31.8MM WIDE</p>	 <p>MBB-6 10° BEVEL BLADE TIN 1" / 25.4MM WIDE</p>
 <p>MBB-7 30° BEVEL BLADE TIN 1/2" / 12.7MM WIDE</p>	 <p>MBB-8 30° BEVEL BLADE TIN 3/4" / 19.1MM WIDE</p>	 <p>MBB-9 30° BEVEL BLADE TIN 1" / 25.4MM WIDE</p>	 <p>MBB-10 30° BEVEL BLADE TIN 1-1/4" / 31.8MM WIDE</p>	 <p>MBB-11T 37-1/2° BEVEL BLADE TIN OD TANGENT 1/2" / 12.7MM WIDE</p>	 <p>MBB-2T 37-1/2° BEVEL BLADE TIN OD TANGENT 3/4" / 19.1MM WIDE</p>

PEEL BACK BLADES

 <p>MBBP-1 37-1/2° PEEL BACK BLADE HL 1/4" / 6.4MM STEP 1/2" / 12.7MM WIDE</p>	 <p>MBBP-1A 37-1/2° PEEL BACK BLADE HL 3/16" / 4.8MM STEP 1/2" / 12.7MM WIDE</p>	 <p>MBBP-1B 37-1/2° PEEL BACK BLADE HL 1/8" / 3.2MM STEP 1/2" / 12.7MM WIDE</p>	 <p>MBBP-1D 37-1/2° PEEL BACK BLADE HL 1/16" / 1.6MM STEP 1/2" / 12.7MM WIDE</p>	 <p>MBBP-2 37-1/2° PEEL BACK BLADE HL 1/4" / 6.4MM STEP 3/4" / 19.1MM WIDE</p>	 <p>MBBP-2A 37-1/2° PEEL BACK BLADE HL 3/16" / 4.8MM STEP 3/4" / 19.1MM WIDE</p>
 <p>MBBP-2B 37-1/2° PEEL BACK BLADE HL 1/8" / 3.2MM STEP 3/4" / 19.1MM WIDE</p>	 <p>MBBP-2D 37-1/2° PEEL BACK BLADE HL 1/16" / 1.6MM STEP 3/4" / 19.1MM WIDE</p>	 <p>MBBP-3 37-1/2° PEEL BACK BLADE HL 1/4" / 6.4MM STEP 1" / 25.4MM WIDE</p>			

BORING BLADES

					
MCB10L-1 10° BORING BLADE TIN 1/2" / 12.7MM WIDE LARGE ID	MCB10L-2 10° BORING BLADE TIN 3/4" / 19.1MM WIDE LARGE ID	MCB10L-3 10° BORING BLADE TIN 1" / 25.4MM WIDE LARGE ID	MCB10S-1 10° BORING BLADE TIN 1/2" / 12.7MM WIDE SMALL ID	MCB10S-2 10° BORING BLADE TIN 3/4" / 19.1MM WIDE SMALL ID	MCB10S-3 10° BORING BLADE TIN 1" / 19.1MM WIDE SMALL ID
					
MCB18L-1 18° BORING BLADE TIN 1/2" / 12.7MM WIDE LARGE ID	MCB18L-2 18° BORING BLADE TIN 3/4" / 19.1MM WIDE LARGE ID	MCB18L-3 18° BORING BLADE TIN 1" / 25.4MM WIDE LARGE ID	MCB18S-1 18° BORING BLADE TIN 1/2" / 12.7MM WIDE SMALL ID	MCB18S-2 18° BORING BLADE TIN 3/4" / 19.1MM WIDE SMALL ID	MCB18S-3 18° BORING BLADE TIN 1" / 25.4MM WIDE SMALL ID
					
MCBSL-1 STRAIGHT BORE 18° TAPER TIN 1/2" / 12.7MM WIDE 3/8" / 9.5MM DEEP LARGE ID	MCBSL-2 STRAIGHT BORE 18° TAPER TIN 3/4" / 19.1MM WIDE 3/8" / 9.5MM DEEP LARGE ID	MCBSL-3 STRAIGHT BORE 18° TAPER TIN 1" / 25.4MM WIDE 3/8" / 9.5MM DEEP LARGE ID	MCBSS-1 STRAIGHT BORE 18° TAPER TIN 1/2" / 12.7MM WIDE 3/8" / 9.5MM DEEP SMALL ID	MCBSS-2 STRAIGHT BORE 18° TAPER TIN 3/4" / 19.1MM WIDE 3/8" / 9.5MM DEEP SMALL ID	MCBSS-3 STRAIGHT BORE 18° TAPER TIN 1" / 25.4MM WIDE 3/8" / 9.5MM DEEP SMALL ID

J-BEVEL BLADES

		
MJB-1 22° BORING BLADE TIN 3/16" / 4.8MM RADIUS 1/2" / 12.7MM WIDE	MJB-2 22° BORING BLADE TIN 3/16" / 4.8MM RADIUS 3/4" / 19.1MM WIDE	MJB-3 22° BORING BLADE TIN 3/16" / 4.8MM RADIUS 1" / 25.4MM WIDE

FACING BLADES

					
MLB-1 FACING BLADE TIN 1/2" / 12.7MM WIDE	MLB-2 FACING BLADE TIN 3/4" / 19.1MM WIDE	MLB-3 FACING BLADE TIN 1" / 25.4MM WIDE	MLB-4 FACING BLADE TIN 1-1/4" / 31.8MM WIDE	MLRB-1 FACING BLADE TIN OD RADIUS 1/2" / 12.7MM WIDE	MLRB-2 FACING BLADE TIN OD RADIUS 3/4" / 19.1MM WIDE

MILLHOG M-SERIES BLADES



MLRB-2
FACING BLADE TIN
OD RADIUS
1" / 25.4MM WIDE

REVERSE BEVEL BLADES



MRBB-1
37-1/2° REVERSE BEVEL
BLADE TIN
1/2" / 12.7MM WIDE



MRBB-2
37-1/2° REVERSE BEVEL
BLADE TIN
3/4" / 19.1MM WIDE



MRBB-3
37-1/2° REVERSE BEVEL
BLADE TIN
1" / 25.4MM WIDE

TUBE STUB REMOVAL BLADES



MTSR-1
30° TUBE STUB REMOVAL
BLADE HL
3/16" / 4.8MM RADIUS
1/2" / 12.7MM WIDE



MTSR-2
30° TUBE STUB REMOVAL
BLADE HL
3/16" / 4.8MM RADIUS
3/4" / 19.1MM WIDE



MTSR-3
30° TUBE STUB REMOVAL
BLADE HL
3/16" / 4.8MM RADIUS
1" / 25.4MM WIDE

TUBE SEAT REMOVAL BLADES



MTSS-1
TUBE SEAT REMOVAL
BLADE HL
1/2" / 12.7MM WIDE



MTSS-2
TUBE SEAT REMOVAL
BLADE HL
3/4" / 19.1MM WIDE



MTSS-3
TUBE SEAT REMOVAL
BLADE HL
1" / 25.4MM WIDE

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