

## 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.

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## Instructions for putting into use

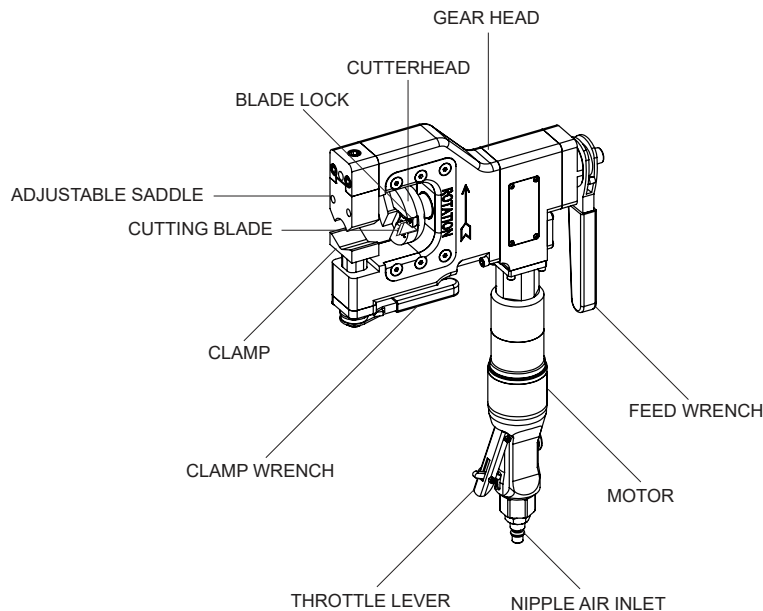
### Unpacking

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, 35 cfm (990 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 950 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
- Feed Assembly
- Clamp Assembly
- Adjustable Saddle Assembly
- Cutterhead Assembly
- Motor Assemblies (either pneumatic, electric or battery)
- Air Hose (or batteries & charger)
- 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 supply 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.)

**Gear Head**

- Rotates cutterhead.
- Axially moves on mandrel

**Cutterhead**

- Rotates and holds the cutting blades.
- Three sizes available (2-1/4", 2-1/2" & 3")

**Blade lock**

- Holds cutting blade to cutterhead.

**Adjustable saddle**

- Centers tool on tube or pipe outside diameter.
- Available in many sizes.

**Cutting blade**

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

**Clamp**

- Secures tool to tube or pipe outside diameter.

**Clamp wrench**

- Actuates the clamping mechanism.

**Throttle lever**

- Locking throttle lever requires deliberate action by the operator to activate the tool.
- Actuating lever starts tool.
- Release of lever 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 or battery)

**Feed wrench**

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

## Selection of proper tooling

### Adjustable saddle

1. Measure the outside diameter of the tube or pipe and pick the corresponding fixed saddle and secure it to the tool.

### Cutterhead selection

1. Measure the outside diameter of the tube or pipe.
2. Select the cutterhead that either matches the outside diameter or is at least one size larger than the outside diameter.
3. Size are: 1-3/4", 2", 2-1/4" or 2-1/2"

## 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: 3/8" and 5/8". 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

### Adjustable saddle installation

1. Remove adjustable saddle fastening screw.
2. Align adjustable saddle on gear head assembly.
3. Insert adjustable saddle fastening screw through lower housing, thread into adjustable saddle and tighten with provided hex wrench.

### Cutterhead removal and installation

1. Remove cutterhead screw.
2. Select the cutterhead you want to install and align cutterhead mounting screw hole up with the cutterhead shaft.
3. Insert the cutterhead mounting screw and tighten. Be sure that the cutterhead seats evenly on the cutterhead shaft.

### 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 cutterhead 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

## Mounting the tool to the work

1. Using the feed wrench, retract the cutterhead all the way back (this moves cutterhead away from the clamp saddles).
2. Position the tool on the tube or pipe so the tube end fits between the fixed and adjustable saddles while keeping the cutting blade away from the work.
3. Turn the clamp wrench so the adjustable saddle squeezes the tube between it and the fixed saddle.
4. Be sure cutterhead 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. Release the throttle lever (or switch). This will stop the tool.
6. Disconnect the power supply.
7. Release the clamp wrench and remove the tool from the work.

**Tool limits****Size limits**

1. Minimum outside diameter is 1/2"
2. Maximum outside diameter is 3"
3. Maximum wall thickness, 5/8" 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

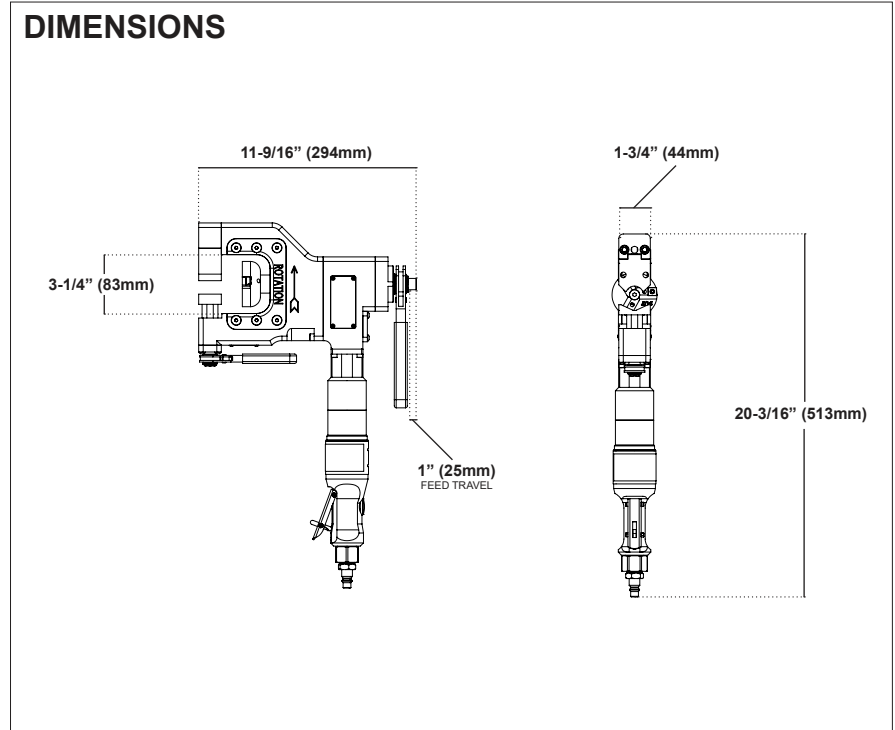
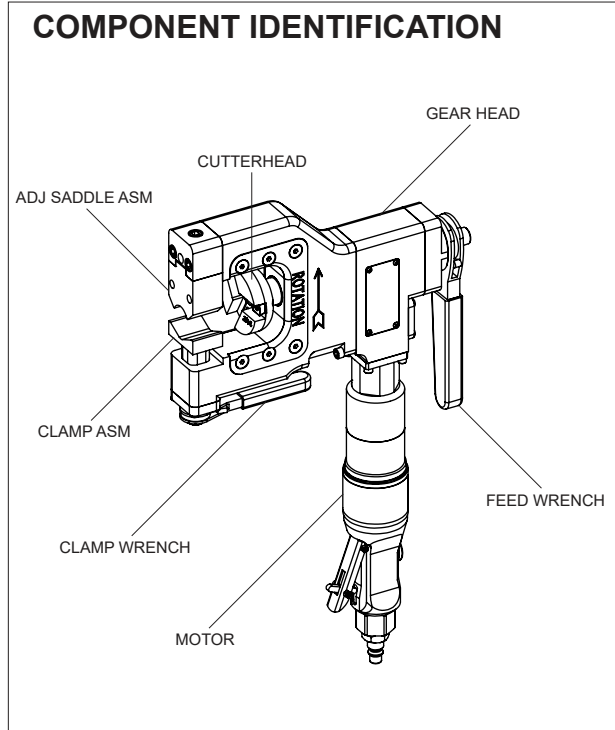
1. Factory service, return the tool to the Factory address listed below.
2. Agent service, if applicable return tool to the Agent listed below.
  - a. If unsure of Agent contact the factory.

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## ASSOCIATED PARTS

BLADES: *G-SERIES*

DRIVE OPTIONS: *PNEUMATIC, ELECTRIC, BATTERY*



## POWER SPECS

	PN	ELEC	BATT
OUTPUT POWER	1.07 HP	950 W	1100 W
POWER DRAW	90 PSI	120 V	120 V (CHARGER)
VOLUME	35 CFM	≥ 15 AMP	18 V - 5.2 AH
OUTPUT POWER	787 W	950 W	1100 W
POWER DRAW	6.2 BAR	230 V	230 V (CHARGER)
VOLUME	990 LT/MIN	≥ 10 AMP	18 V - 5.2 AH
CUTTERHEAD SPEED	114 RPM	14-58 RPM	43 RPM

## HANDLING SPECS

	PN	ELEC	BATT
WORK WEIGHT (lb)	20	22	21
SHIP WEIGHT (lb)	40	46	46
SHIP DIMS (in)	7 X 21 X 25	8 X 18 X 33	8 X 18 X 33
WORK WEIGHT (kg)	9	10	10
SHIP WEIGHT (kg)	18	21	21
SHIP DIMS (mm)	178 X 533 X 635	203 X 457 X 838	203 X 457 X 838

## PACKAGING ASSEMBLIES

**PART #:** CC04-CF-01

**DESCRIPTION:** CASE ASM, CF (PN)

ITEM #	QTY	PART #	DESCRIPTION
1	1	CC04	CASE, CC04
2	1	FP-CC04-04	FOAM, CF (PN)
3	1	FP-CC04-01	FOAM, TOP
5	1	MLB.02	LBL, MILLHOG
6	1	FLB.01	LBL, FLAG

**PART #:** CC01-CF-01 **NON-CURRENT MODEL (USE CC04-CF-01)**

**DESCRIPTION:** CASE ASM, CF (PN)

ITEM #	QTY	PART #	DESCRIPTION
1	1	CC01	CASE, CC01
2	1	FP-CC01-04	FOAM, CF (PN)
3	1	FP-CC01-01	FOAM, TOP
5	1	MLB.02	LBL, MILLHOG
6	1	FLB.01	LBL, FLAG

**PART #:** CC05-CF-01

**DESCRIPTION:** CASE ASM, CF (ELEC/BATT)

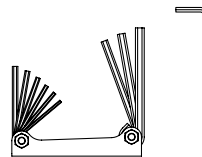
ITEM #	QTY	PART #	DESCRIPTION
1	1	CC05	CASE, CC05
2	1	FP-CC05-05	FOAM, CF (ELEC/BATT)
3	1	FP-CC05-01	FOAM, TOP
5	1	MLB.02	LBL, MILLHOG
6	1	FLB.01	LBL, FLAG

## HAND TOOL SETS

**PART #:** 300-01

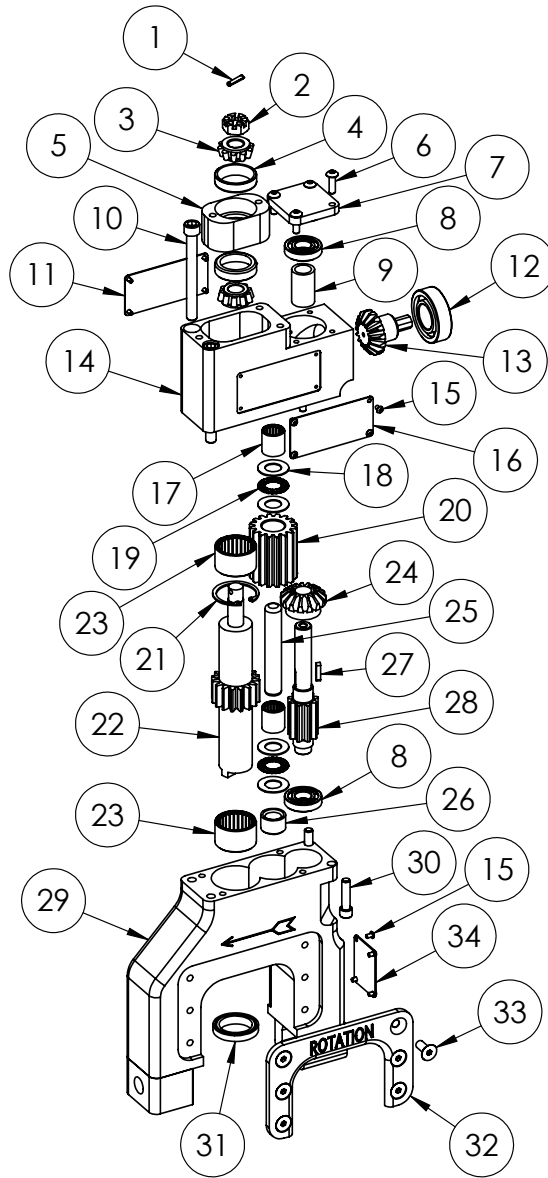
**DESCRIPTION:** HAND TOOL SET, 01

ITEM #	QTY	PART #	DESCRIPTION
1	1	285-0516	AWS (5/64 - 1/4)
2	1	280-0808	HEX KEY (1/8)



**PART #:** CF-201-01

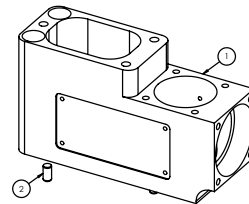
**DESCRIPTION:** GEAR HEAD ASM, CF



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**PART #:** CF-21-01  
**DESCRIPTION:** UPPER HOUSING ASM

ITEM #	QTY	PART #	DESCRIPTION
1	1	CF-21	UPPER HOUSING
2	4	133-4606	DP (3/16 X 3/8)



PART #: CF-201-01

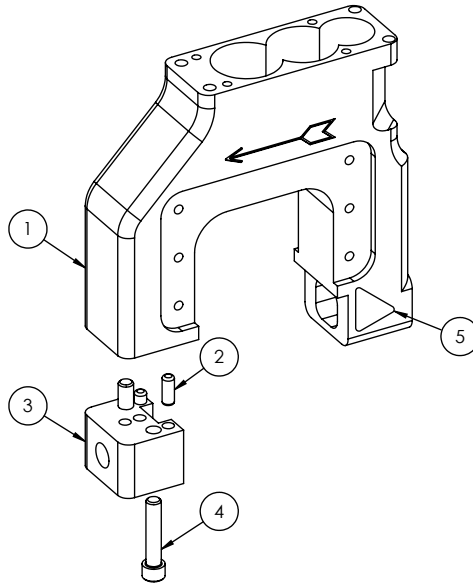
DESCRIPTION: GEAR HEAD ASM, CF

ITEM #	QTY	PART #	DESCRIPTION
1	1	134-4310	SSP (1/8 X 5/8)
2	1	CF-10	CASTLE NUT
3	2	313-007A	BEARING CONE
4	2	313-007B	BEARING CUP
3 & 4	2	313-007	TAPERED ROLLER BEARING ASM
5	1	CF-18	FEED BEARING HOUSING
6	4	111-1610	BHCS (10-24 X 5/8)
7	1	CF-16	BEARING CAP
8	2	312-030	BALL BEARING
9	1	CF-17A	BEARING SPACER
10	2	110-2248	SHCS (5/16-18 X 3)
11	1	NP-220	NAME PLATE (CF)
12	1	311-007	BALL BEARING
13	1	G-56	DRIVE BEVEL GEAR
14*	1	CF-21-01	UPPER HOUSING ASM
15	12	111-0803	BHCS (4-40 X 3/16)
16	1	NP-100	NAME PLATE (ESCO)
17	2	316-007	RADIAL ROLLER BEARING
18	4	318-002A	THRUST WASHER
19	2	318-002B	THRUST BEARING
18 & 19	2	318-002	THRUST BEARING ASM
20	1	CF-29	IDLER GEAR
21	1	200-131	INTERNAL RETAINING RING
22	1	CF-24	CUTTERHEAD SHAFT
23	2	316-008	RADIAL ROLLER BEARING
24	1	G-45	DRIVEN BEVEL GEAR
25	1	133-5248	DP (1/2 X 3)
26	1	CF-31	BUSHING
27	1	G-44	KEY
28	1	CF-32	DRIVE SHAFT
29*	1	CF-33-01	LOWER HOUSING ASM
30	2	110-2016	SHCS (1/4-20 X 1)
31	1	CF-34	SEAL
32	2	CF-51A	SUPPORT PLATE
33	12	112-2010	FHCS (1/4-20 X 5/8)
34	1	NP-110	NAME PLATE (WARNING)

\*CF-33-01 EXPLODED VIEW DRAWING SHOWN ON NEXT PAGE

**PART #:** CF-33-01

**DESCRIPTION:** LOWER HOUSING ASM



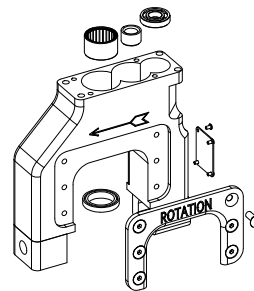
ITEM #	QTY	PART #	DESCRIPTION
1	1	CF-33B	LOWER HOUSING
2	3	133-4812	DP (1/4 X 3/4)
3	1	CF-38A	HOUSING ADAPTER BLOCK
4	2	110-2224	SHCS (5/16-18 X 1-1/2)
5	2	CFLB-02	LBL, PINCH POINT

**NOTE:** THIS LOWER HOUSING ASSEMBLY DESIGN APPLIES TO C-HOGS PRODUCED 6/8/2022 AND LATER. NEW DESIGN ALLOWS FOR FINE TUNING ALIGNMENT COMPONENTS DURING MANUFACTURING, ELIMINATING ANY POSSIBLE ISSUES WITH DRIVE-LINE TOLERANCE STACK UPS.

## LOWER HOUSING REPLACEMENT KIT

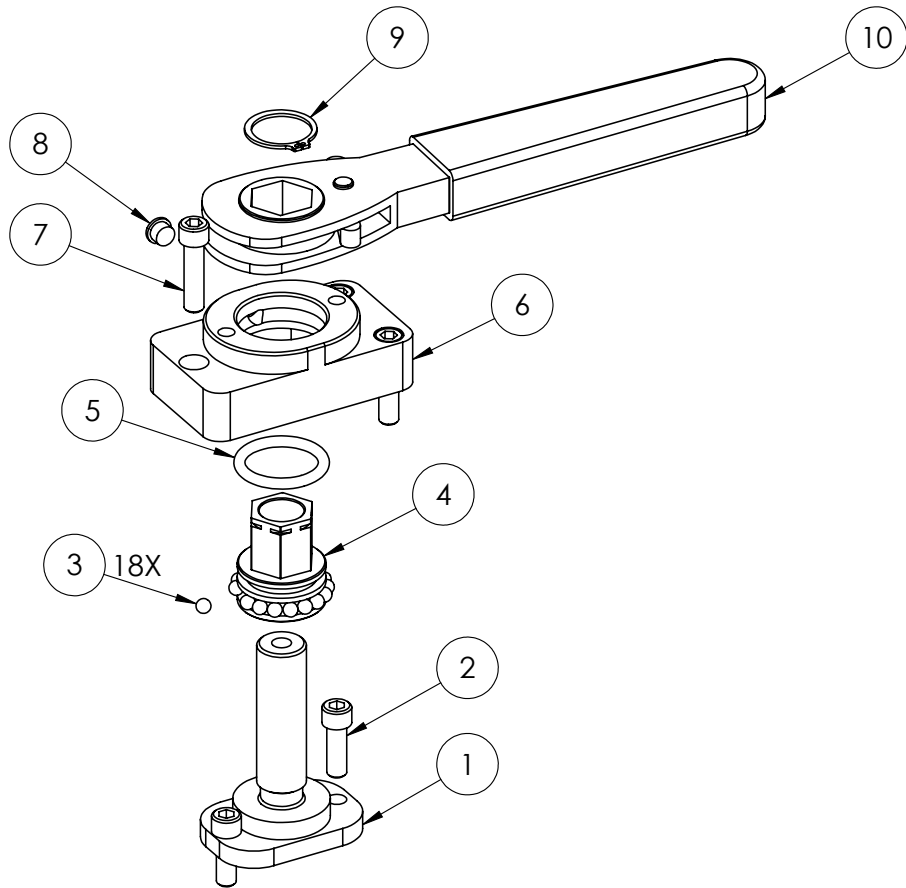
DUE TO THE CALIBRATION ASPECT OF THE LOWER HOUSING FOR THE C-HOG, THIS PART MUST BE BUILT AND TESTED AT THE FACTORY TO ENSURE ALIGNMENT AND FITMENT. FOR FACTORY OR FIELD REPLACEMENT OF THE LOWER HOUSING, PLEASE USE THE KIT NUMBER BELOW. A LIST OF PARTS INCLUDED WITH THIS KIT ARE LISTED.

PART#	DESCRIPTION
<b>CF-33-01RK</b>	<b>LOWER HOUSING REPLACE KIT</b>
CF-33-01	(1) LOWER HOUSING ASM
312-030	(1) BALL BEARING
CF-31	(1) BUSHING
316-008	(1) RADIAL ROLLER BEARING
CF-51A	(2) SUPPORT PLATE
112-2010	(12) FHCS (1/4-20 X 5/8)
NP-110	(1) NAME PLATE (WARNING)
111-0803	(4) BHCS (4-40 X 3/16)
CF-34	(1) SEAL
LA-1	(3) CALIBRATION HOUR



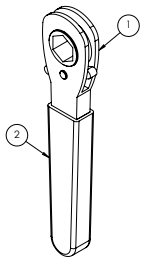
**PART #:** CF-202-01

**DESCRIPTION:** FEED ASM



\* **PART #:** G-50  
**DESCRIPTION:** WRENCH ASM

ITEM #	QTY	PART #	DESCRIPTION
1	1	G-50B	WRENCH
2	1	G-50A	GRIP



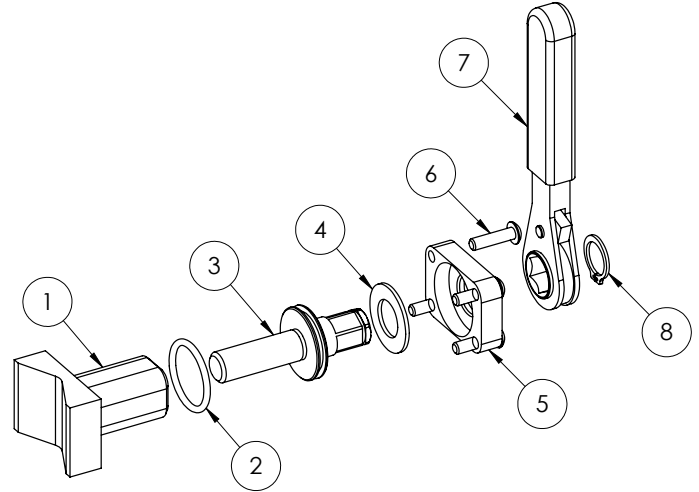
ITEM #	QTY	PART #	DESCRIPTION
1	1	CF-09	FEED THREAD
2	2	110-2012	SHCS (1/4-20 X 3/4)
3	18	G-29	BEARING BALL
4	1	CF-04	FEED KNOB
5	1	230-210	O-RING
6	1	CF-06A	FEED KNOB HOUSING
7	3	110-2016	SHCS (1/4-20 X 1)
8	1	G-54	BALL RETAINER SCREW
9	1	210-081	EXTERNAL RETAINING RING
10*	1	G-50	WRENCH ASM

**PART #: CF-203-01**

**DESCRIPTION: CLAMP ASM (HR)**

**NOTE:** HIGH RANGE CLAMP ASSEMBLY IS USED FOR TUBE/PIPE OD OF 7/8" AND LARGER

ITEM #	QTY	PART #	DESCRIPTION
1	1	CF-42	SADDLE CLAMP (HR)
2	1	230-120	O-RING
3	1	CF-45	SADDLE CLAMP SCREW (HR)
4	1	CF-44	THRUST WASHER
5	1	CF-47	SADDLE CLAMP PLATE
6	4	111-1612	BHCS (10-24 X 3/4)
7*	1	G-64	WRENCH ASM
8	1	211-059	EXTERNAL RETAINING RING

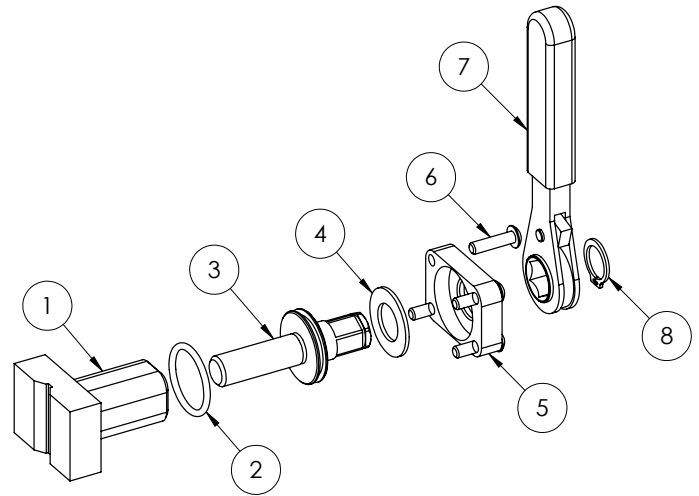


**PART #: CF-203-02**

**DESCRIPTION: CLAMP ASM (LR)**

**NOTE:** LOW RANGE CLAMP ASSEMBLY IS USED FOR TUBE/PIPE OD OF 7/8" AND SMALLER

ITEM #	QTY	PART #	DESCRIPTION
1	1	CF-42A	SADDLE CLAMP (LR)
2	1	230-120	O-RING
3	1	CF-45A	SADDLE CLAMP SCREW (LR)
4	1	CF-44	THRUST WASHER
5	1	CF-47	SADDLE CLAMP PLATE
6	4	111-1612	BHCS (10-24 X 3/4)
7*	1	G-64	WRENCH ASM
8	1	211-059	EXTERNAL RETAINING RING



**NOTE:** TO CONVERT CLAMP ASSEMBLIES (LOW RANGE TO HIGH RANGE/HIGH RANGE TO LOW RANGE) INCLUDE ITEMS 1, 2 & 3. THE SADDLE CLAMPS (CF-42 & CF-42A) HAVE DIFFERENT THREADS AND THEREFORE CANNOT BE SWAPPED OUT UNLESS ACCOMPANIED BY THE CORRECT SADDLE CLAMP SCREW. ALSO BE SURE TO CHECK ITEM 5 FOR ANY SIGNS OF WEAR (MAY ALSO NEED REPLACING IF TOOL IS REGULARLY OVER-TIGHTENED).

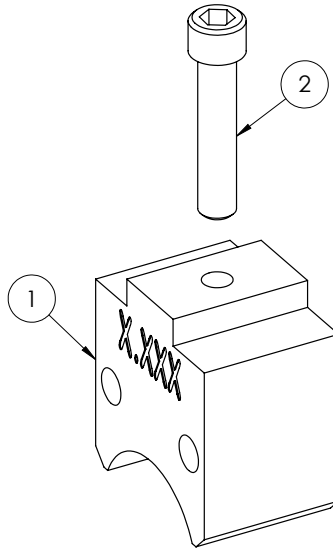
\* **PART #: G-64**  
**DESCRIPTION: WRENCH ASM**

ITEM #	QTY	PART #	DESCRIPTION
1	1	G-64B	WRENCH
2	1	G-64A	GRIP

**PART #: CF-41A-01**

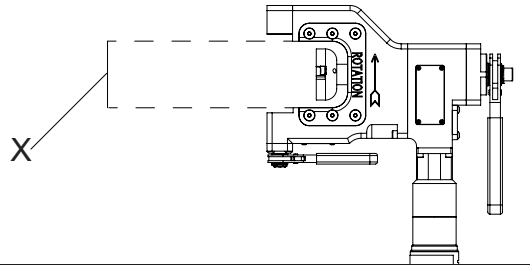
**DESCRIPTION: SADDLE ASM**

**NOTE:** CF-41A, STATIONARY SADDLE HAS A RADIUS THAT IS MACHINED TO FIT THE O.D. OF THE TUBE/PIPE THAT THE C-HOG IS BEING CLAMPED TO. WHEN ORDERING CF-41A-01 OR CF-41A, BE SURE TO SPECIFY THE OD MEASUREMENT, SO THAT THE STATIONARY SADDLE CAN BE MADE TO FIT YOUR APPLICATION PROPERLY. THE STATIONARY SADDLE WILL WORK WITH BOTH LOW RANGE AND HIGH RANGE CLAMP ASSEMBLIES.



ITEM #	QTY	PART #	DESCRIPTION
1	1	CF-41A	STATIONARY SADDLE
2	1	110-2224	SHCS (5/16-18 X 1-1/2)

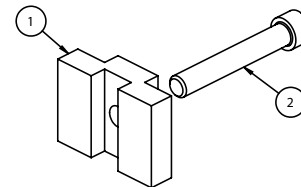
**NOTE:** OLDER MODEL C-HOGS HAVE A SMALLER RANGE OF UP TO 2-1/2" OD, COMPARED TO THE CURRENT VERSION THAT GOES UP TO 3". IF YOUR C-HOG IS A 2-1/2" VERSION, USE PART NUMBER CF-41 WHEN ORDERING STATIONARY SADDLES. SEE ILLUSTRATION TO DETERMINE WHAT SIZE MACHINE YOU HAVE. PLEASE CONTACT US WITH ANY QUESTIONS.



X = 2.75", USE PART # CF-41  
 X = 3.25", USE PART # CF-41A

**NOTE:** THIS PIECE IS FOR ADAPTING THE OLD STYLE CF-41 STATIONARY SADDLES SO THAT THEY CAN BE USED WITH THE CURRENT 3" HOUSINGS.

**PART #: CF-41B**  
**DESCRIPTION: SADDLE ADAPTER ASM**

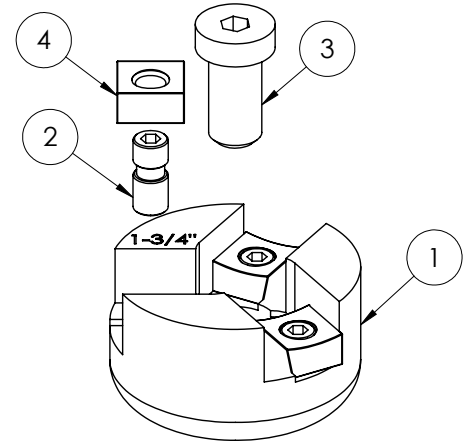


ITEM #	QTY	PART #	DESCRIPTION
1	1	CF-41B-01	SADDLE ADAPTER
2	1	110-2232	SHCS (5/16-18 X 2)

**PART #: CF-35**

**DESCRIPTION: CUTTERHEAD ASM, 1-3/4**

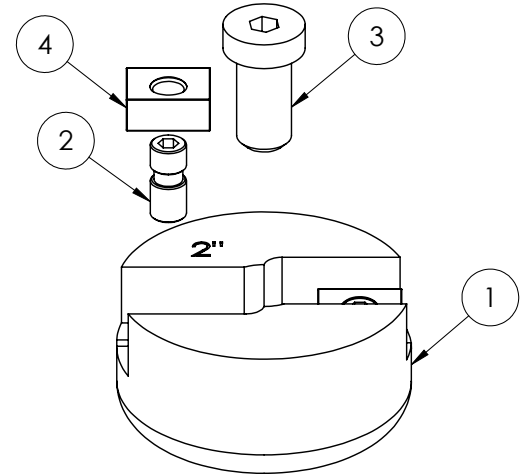
ITEM #	QTY	PART #	DESCRIPTION
1	1	CF-35_PART	CUTTERHEAD, 1-3/4
2	3	G-21	COMBINATION SCREW
3	1	113-2412	LHCS (3/8-16 X 3/4)
4	3	TW-22B	BLADE LOCK, 1/2



**PART #: CF-35A**

**DESCRIPTION: CUTTERHEAD ASM, 2**

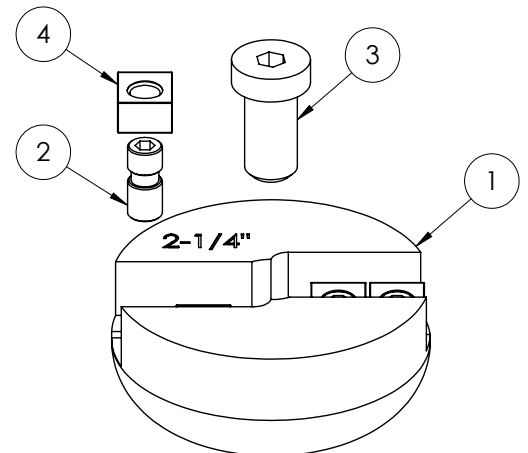
ITEM #	QTY	PART #	DESCRIPTION
1	1	CF-35A_PART	CUTTERHEAD, 2
2	2	G-21	COMBINATION SCREW
3	1	113-2412	LHCS (3/8-16 X 3/4)
4	2	G-22A	BLADE LOCK, 9/16



**PART #: CF-35B**

**DESCRIPTION: CUTTERHEAD ASM, 2-1/4**

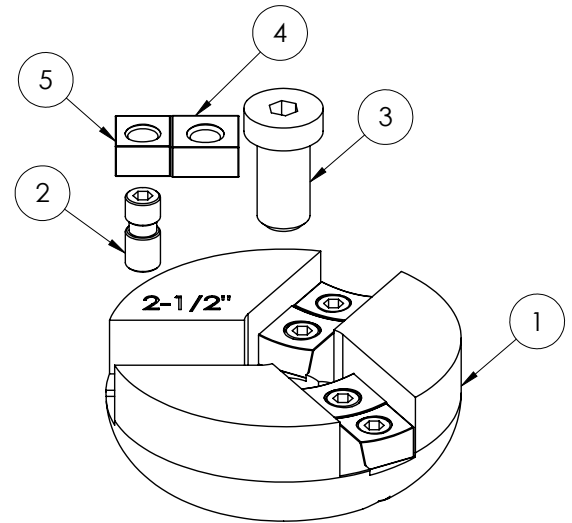
ITEM #	QTY	PART #	DESCRIPTION
1	1	CF-35B_PART	CUTTERHEAD, 2-1/4
2	4	G-21	COMBINATION SCREW
3	1	113-2412	LHCS (3/8-16 X 3/4)
4	4	G-22	BLADE LOCK, 3/8



**PART #: CF-35C**

**DESCRIPTION: CUTTERHEAD ASM, 2-1/2**

ITEM #	QTY	PART #	DESCRIPTION	PRICE/ea.
1	1	CF-35C_PART	CUTTERHEAD, 2-1/2	\$ --.--
2	6	G-21	COMBINATION SCREW	\$ 6.00
3	1	113-2412	LHCS (3/8-16 X 3/4)	\$ 2.01
4	3	TW-22B	BLADE LOCK, 1/2	\$ 20.00
5	3	G-22	BLADE LOCK, 3/8	\$ 20.00

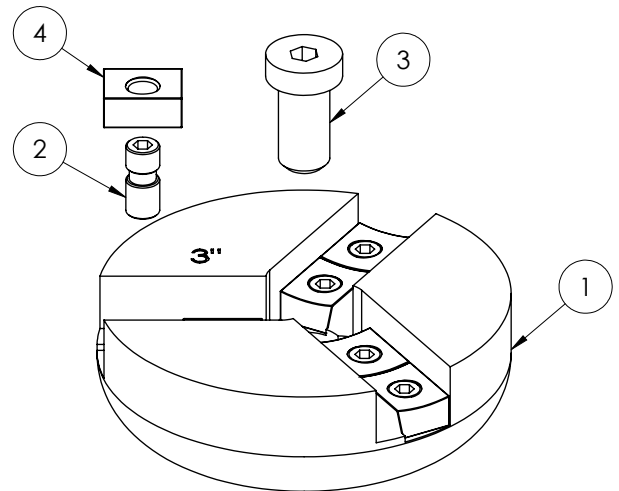


**PART #: CF-35D**

**DESCRIPTION: CUTTERHEAD ASM, 3**

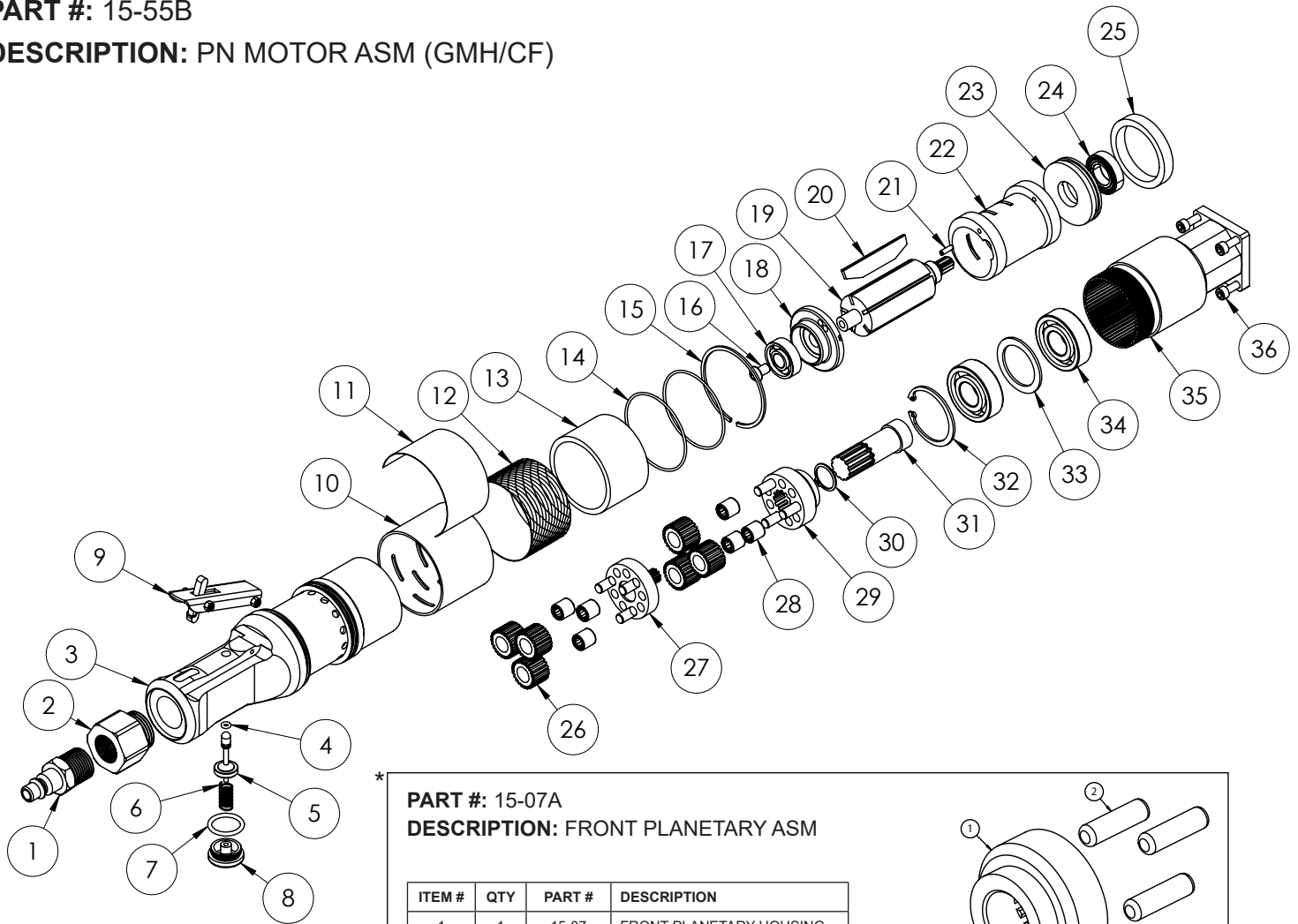
ITEM #	QTY	PART #	DESCRIPTION
1	1	CF-35D_PART	CUTTERHEAD, 3
2	6	G-21	COMBINATION SCREW
3	1	113-2412	LHCS (3/8-16 X 3/4)
4	6	G-22A	BLADE LOCK, 9/16

**NOTE:** CANNOT BE USED ON 2-1/2" C-HOGS. SEE CLAMP ASSEMBLY SECTION FOR DETAILS ON VERIFYING YOUR C-HOG VERSION.



**PART #:** 15-55B

**DESCRIPTION:** PN MOTOR ASM (GMH/CF)



**PART #:** 15-07A  
**DESCRIPTION:** FRONT PLANETARY ASM

ITEM #	QTY	PART #	DESCRIPTION
1	1	15-07	FRONT PLANETARY HOUSING
2	3	133-4814	DP (1/4 X 7/8)

**PART #:** 15-11A  
**DESCRIPTION:** REAR PLANETARY ASM

ITEM #	QTY	PART #	DESCRIPTION
1	1	15-11	REAR PLANETARY HOUSING
2	3	133-4814	DP (1/4 X 7/8)

**PART #:** 15-21A  
**DESCRIPTION:** THROTTLE LEVER ASM

ITEM #	QTY	PART #	DESCRIPTION
1	1	15-21	THROTTLE LEVER
2	1	15-23	SAFETY
3	1	15-22	SPRING
4	2	110-8125SS	SHCS (M3-0.5 X 22)
5	2	176-056SS	LOCK NUT (M3-0.5)

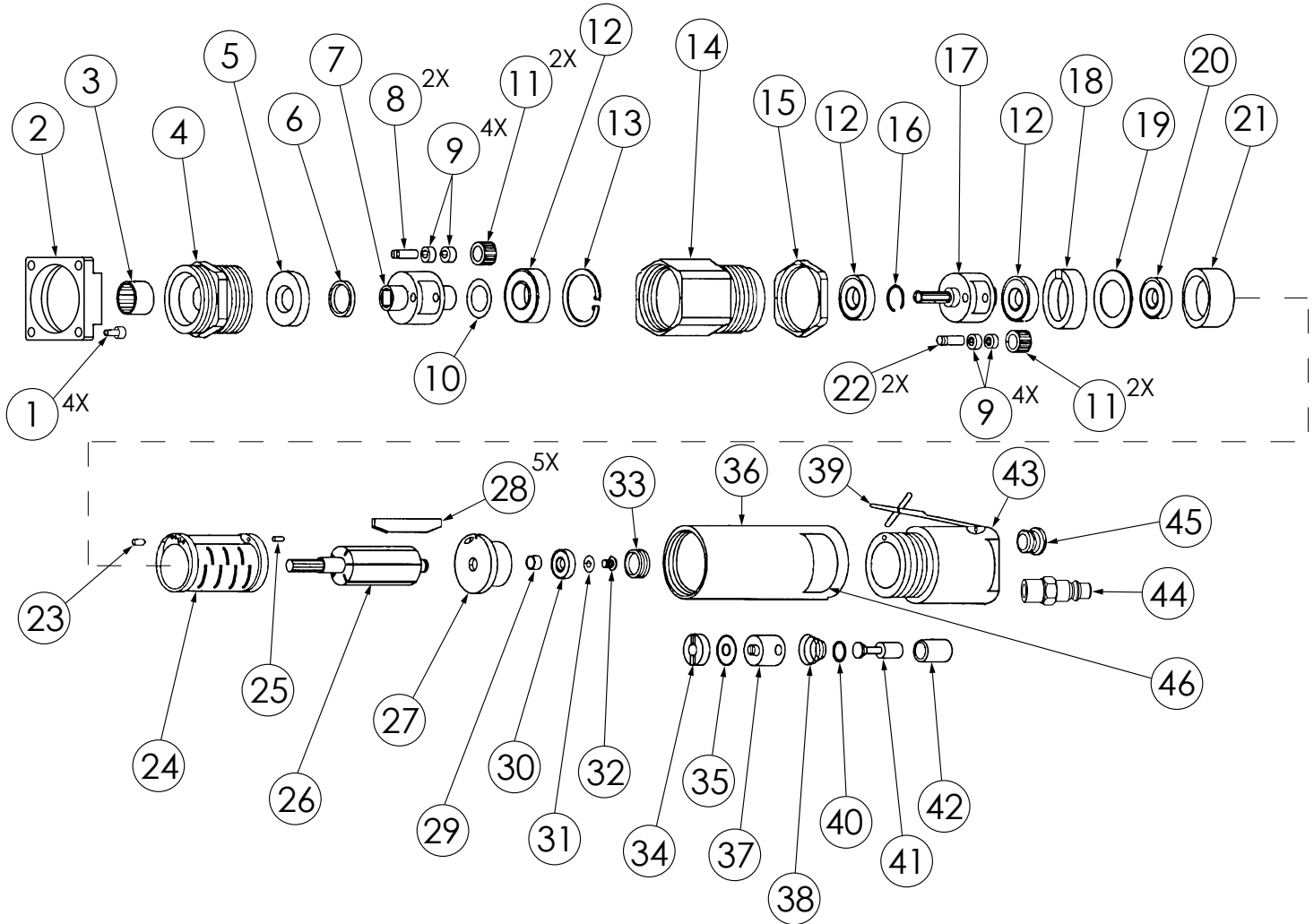
PART #: 15-55B

DESCRIPTION: PN MOTOR ASM (GMH/CF)

ITEM #	QTY	PART #	DESCRIPTION
1	1	355-5052	NIPPLE (3/8 X 1/2 NPT)
2	1	15-24	FILTER ADAPTER
3	1	15-25	THROTTLE HOUSING
4	1	230-006	O-RING
5	1	15-31	VALVE
6	1	15-32	SPRING
7	1	230-016	O-RING
8	1	15-34	END CAP
9*	1	15-21A	THROTTLE LEVER ASM
10	1	15-48	SILENCER BODY
11	1	CFLB-01	LBL, WARNING
12	1	15-47	SCREEN
13	1	15-49	MUFFLER FELT
14	2	230-033	O-RING
15	1	15-46	SPLIT RING
16	1	115-6110SS	FBHCS (M6-1 X 10)
17	2	311-004	BALL BEARING
18	1	15-36	REAR END PLATE
19	1	15-40A	ROTOR
20	1	15-42	ROTOR BLADES (SET OF 5)
21	1	134-8110	SSP (3 X 10)
22	1	15-39	CYLINDER
23	1	15-43A	FRONT END PLATE
24	1	311-041	BALL BEARING
25	1	15-44	SPACER
26	6	15-10	SATELLITE GEAR
27*	1	15-11A	REAR PLANETARY ASM
28	6	316-004	RADIAL ROLLER BEARING
29*	1	15-07A	FRONT PLANETARY ASM
30	1	211-062	EXTERNAL RETAINING RING
31	1	15-03	OUTPUT SHAFT
32	1	200-150	INTERNAL RETAINING RING
33	1	15-02	WASHER
34	2	311-018	BALL BEARING
35	1	15-50	GEAR HOUSING (GMH/CF)
36	4	110-1608	SHCS (10-24 X 1/2)

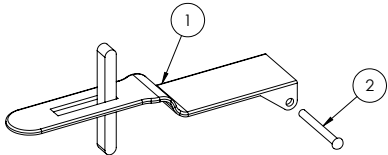
**PART #: 24-150**

**DESCRIPTION: PN MOTOR ASM (GMH/CF)**



\* **PART #: 24-134A**  
**DESCRIPTION: THROTTLE LEVER ASM**

ITEM #	QTY	PART #	DESCRIPTION	PRICE/ea.
1	1	24-134	THROTTLE LEVER	\$ 65.35
2	1	24-145	RIVET	\$ 1.35



ITEM #	QTY	PART #	DESCRIPTION
1	4	110-1608	SHCS (10-24 X 1/2)
2	1	G-58	MOTOR ADAPTER (GMH/CF)
3	1	316-006	RADIAL ROLLER BEARING
4	1	24-101	GEAR HOUSING
5	1	24-102	NYLON WASHER
6	1	24-103	SPACER

PART #: 24-150

DESCRIPTION: PN MOTOR ASM (GMH/CF)

ITEM #	QTY	PART #	DESCRIPTION
7	1	24-107	TOP GEAR SPIDER
8	2	24-104	PIN
9	8	24-105	BEARING
10	1	24-108	WASHER
11	4	24-106	TOP GEAR
12	3	311-014	BALL BEARING
13	1	200-125	INTERNAL RETAINING RING
14	1	24-111	GEAR HOUSING
15	1	24-112	HOUSING END NUT
16	1	24-114	EXTERNAL RETAINING RING
17	1	24-115	LOWER GEAR SPIDER
18	1	24-118A	BEARING SLEEVE
19	1	24-119	WASHER
20	1	311-003	BALL BEARING
21	1	24-121	TOP PLATE
22	2	24-116	PIN
23	1	134-4206	SSP (3/32 X 3/8)
24	1	24-122	CYLINDER
25	1	134-4208	SSP (3/32 X 1/2)
26	1	24-123	ROTOR
27	1	24-124	END PLATE
28	1	24-127	ROTOR BLADES (SET OF 5)
29	1	24-128	BUSHING
30	1	311-001	BALL BEARING
31	1	167-008	TOOTH LOCK WASHER
32	1	24-131	TRUSS SCREW
33	1	24-132	RETAINING NUT
34	1	24-138	RETAINING SCREW
35	1	24-139	RUBBER GASKET
36	1	24-133	MOTOR HOUSING
37	1	24-140A	FLOW CONTROL
38	1	24-141	SPRING
39*	1	24-134A	THROTTLE LEVER ASM
40	1	230-007	O-RING
41	1	24-143	FLOW VALVE
42	1	24-144	VALVE BODY
43	1	24-135	THROTTLE HOUSING
44	1	355-5048	NIPPLE (3/8 X 1/4 NPT)
45	1	24-136	MUFFLER
46	1	CFLB-01	LBL, WARNING

**ELECTRIC AND BATTERY MOTOR ASSEMBLIES**

ELECTRIC MOTOR ASSEMBLIES ARE SOLD COMPLETE WITH THE GEAR DRIVE ASSEMBLY AND THE ELECTRIC MOTOR SUB ASSEMBLY BUT CAN ALSO BE PURCHASED SEPERATELY. BOTH 110V AND 220V MOTORS, AS WELL AS BATTERY MOTOR, ATTACH TO THE ELECTRIC MOTOR GEAR DRIVE ASSEMBLY. THIS MAKES CHANGING OUT THE MOTOR SUB ASSEMBLY EASY ENOUGH TO DO IN THE FIELD WHILE REDUCING COST OF REPAIR.

TO PURCHASE ELECTRIC MOTOR ASSEMBLIES (MOTOR SUB ASSEMBLY AND GEAR DRIVE TOGETHER) PLEASE USE THE FOLLOWING PART NUMBERS.

**PART #:** GE-110B

**DESCRIPTION:** ELEC MOTOR ASM, 110 (GMH/CF)

**PART #:** GE-220B

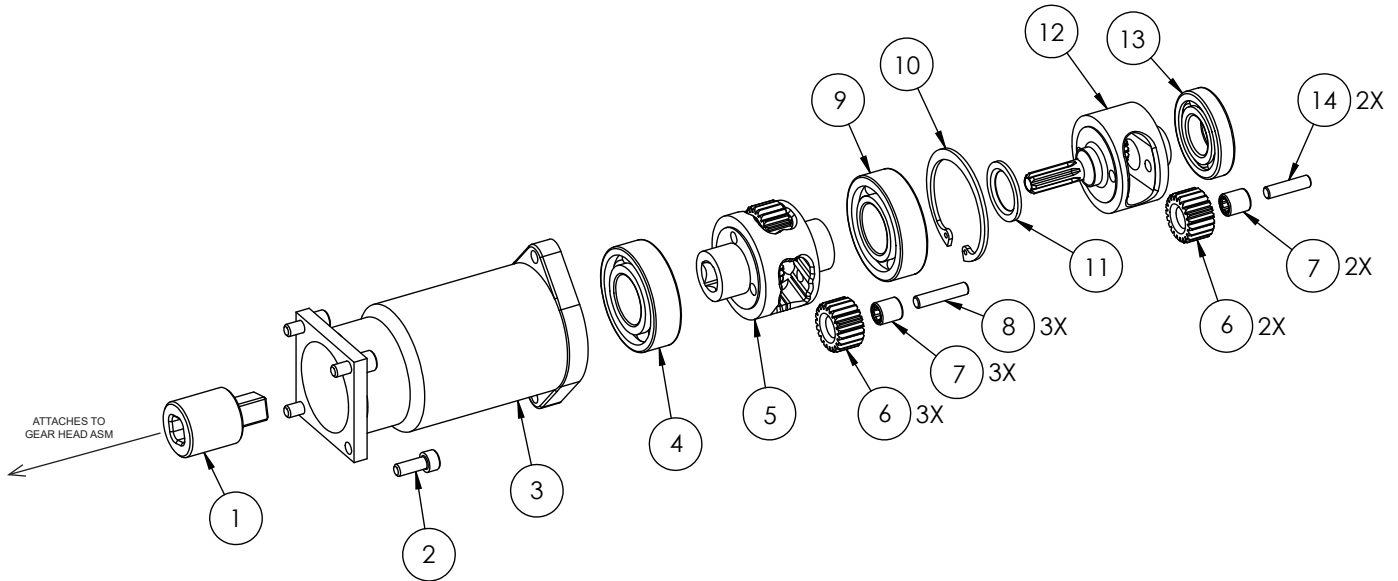
**DESCRIPTION:** ELEC MOTOR ASM, 220 (GMH/CF)

**PART #:** GB-18A

**DESCRIPTION:** BATT MOTOR ASM, 18 (GMH/CF)

**PART #:** G-105-01

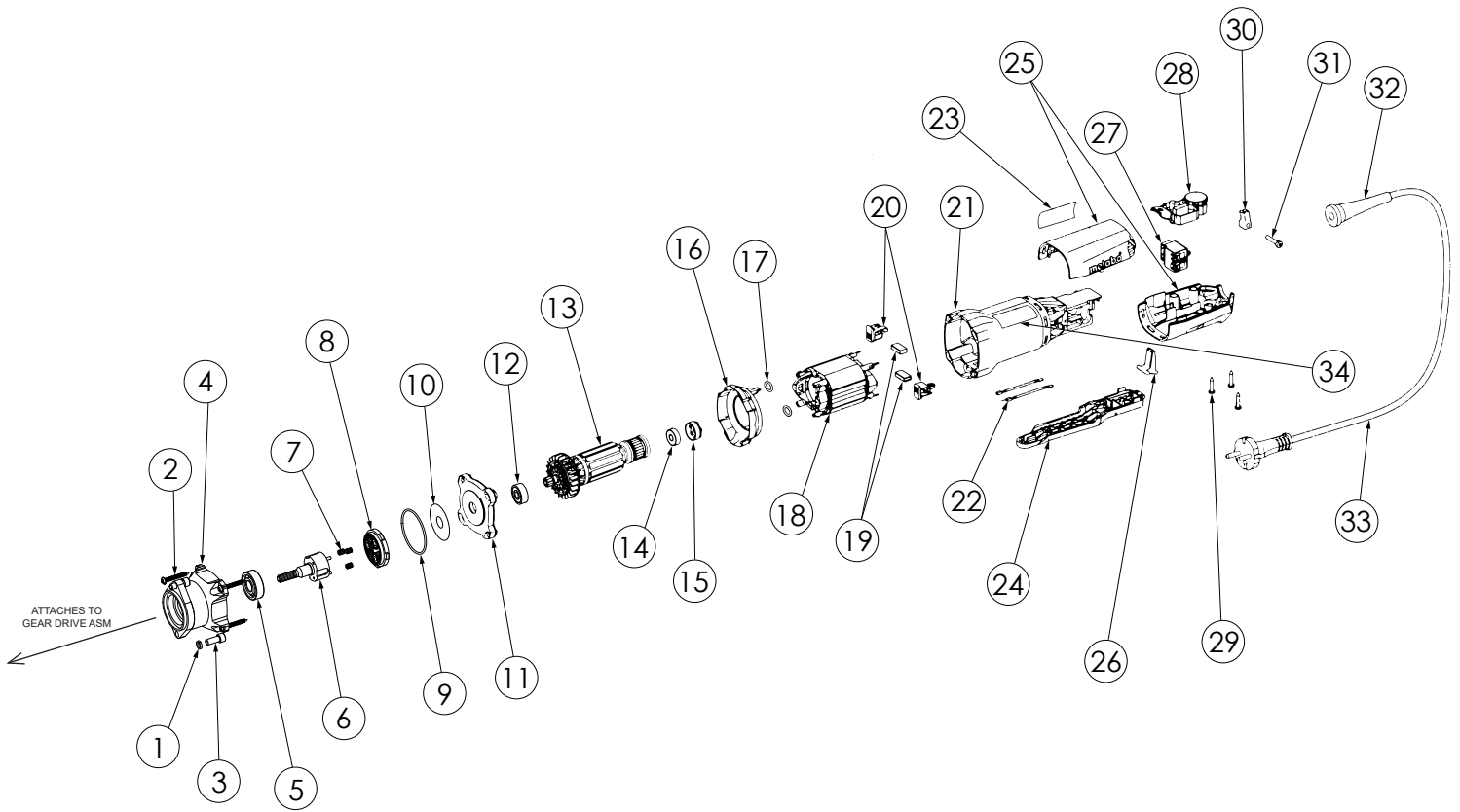
**DESCRIPTION:** GEAR DRIVE ASM (GMH/CF)



ITEM #	QTY	PART #	DESCRIPTION
1	1	EG-09	ADAPTER SHAFT
2	4	110-1608	SHCS (10-24 X 1/2)
3	1	18-02C	GEAR HOUSING (GMH/CF)
4	1	311-007	BALL BEARING
5	1	18-04	GEAR SPIDER
6	5	18-07	GEAR
7	5	316-002	RADIAL ROLLER BEARING
8	3	133-4614	DP (3/16 X 7/8)
9	1	311-006	BALL BEARING
10	1	200-165	INTERNAL RETAINING RING
11	1	18-10	SPACER
12	1	18-11	GEAR SPIDER
13	1	312-031	BALL BEARING
14	2	133-4612	DP (3/16 X 3/4)

PART #: EM-110B

DESCRIPTION: ELEC MOTOR SUB ASM, 110



**PART #:** EM-110B**DESCRIPTION:** ELEC MOTOR SUB ASM, 110

ITEM #	QTY	PART #	DESCRIPTION
1	2	166-031	LOCK WASHER
2	4	EG-01	HOUSING SCREW
3	2	110-2010	SHCS (1/4-20 X 5/8)
4	1	EG-02	HOUSING
5	1	311-014	BALL BEARING
6	1	EG-03	PLANET CARRIER DRIVE
7	3	EG-05	NEEDLE ROLLER & CAGE
8	1	EG-06	GEAR SET
9	1	230-134	O-RING
10	1	EM-66	BUTTING WASHER
11	1	EM-19	BEARING FLANGE
12	1	311-002	BALL BEARING
13	1	EM-01-110	ARMATURE, 110
14	1	EM-11	BALL BEARING
15	1	EM-12	RUBBER BUSHING
16	1	EM-13A	BAFFLE
17	2	EM-98	O-RING
18	1	EM-02-110	FIELD COIL, 110
19	1	EM-27	CARBON BRUSHES (SET OF 2)
20	1	EM-26	BRUSH & HOLDER (SET OF 2)
21	1	EM-08A	MOTOR HOUSING
22	2	EM-07	STRAND COMPLETE
23	1	EM-35-110A	RATING PLATE
24	1	EM-09A	SHIFT LEVER COMPLETE
25	1	EM-15A	MOTOR CAP (2 PART)
26	1	EM-10A	PIVOTING SWITCH
27	1	EM-25	SWITCH
28	1	EM-24-110	ELECTRONIC UNIT, 110
29	3	EM-16	FILLISTER HEAD SCREW
30	1	EM-05	CABLE CLIP
31	1	EM-06	FILLISTER HEAD SCREW
32	1	EM-04A	CABLE SLEEVE
33	1	EM-03-110	CABLE W/ UL-CSA-PLUG, 110
34	1	EMLB-01	LBL, WARNING

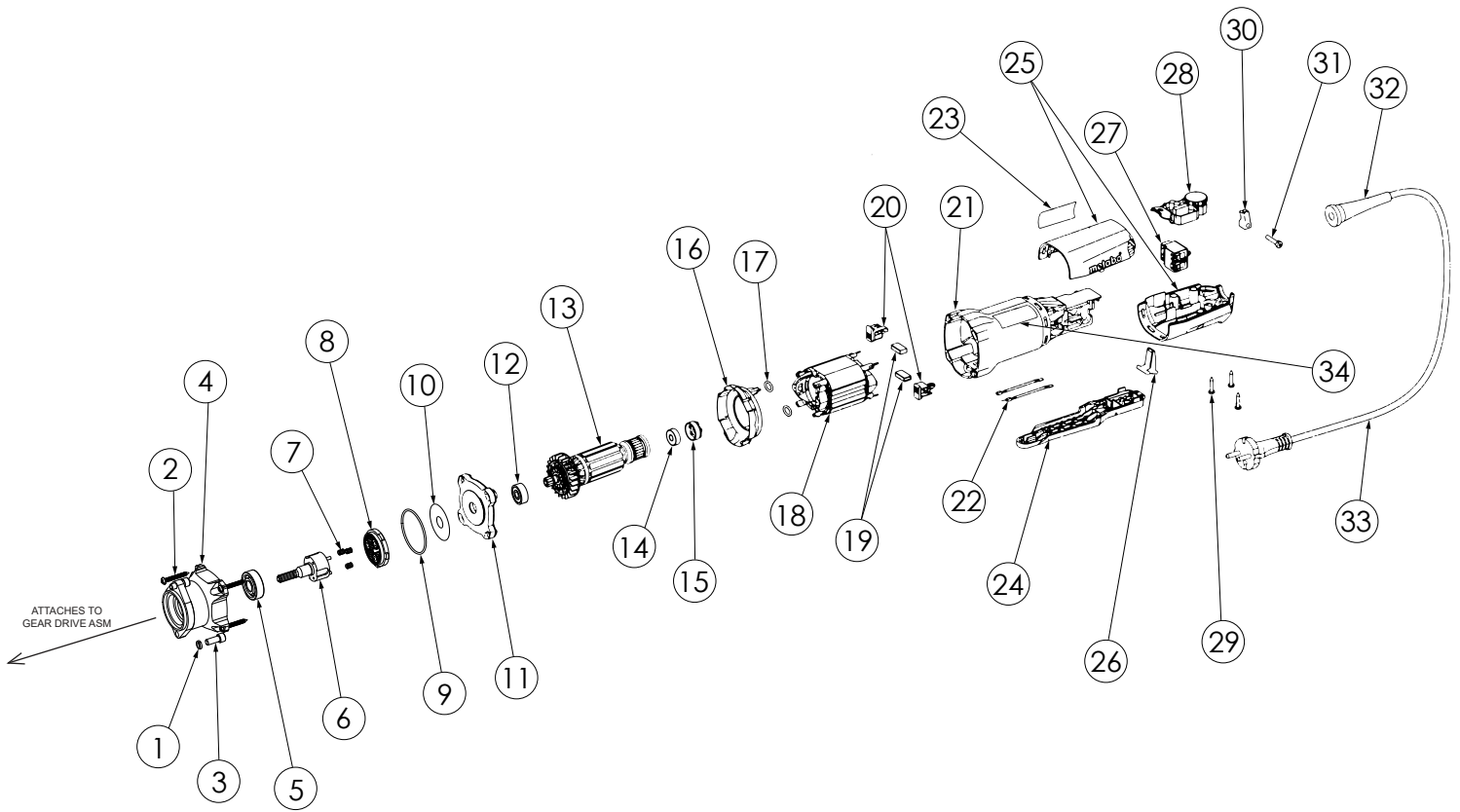
**NOTE:** FOR IN-HOUSE REPAIRS/RENTAL DAMAGES ONLY... PART # EM-110B-01 CAN BE USED TO REPLACE ITEMS (6 - 33) IN THE CASE THAT ITEMS (1 - 5) ARE IN STRONG WORKING ORDER. THIS ITEM CANNOT BE SHIPPED.

**PART #:** EM-110B-01

**DESCRIPTION:** ELEC MOTOR, 110 (REPLACE ONLY)

**PART #:** EM-220B

**DESCRIPTION:** ELEC MOTOR SUB ASM, 220



**PART #:** EM-220B**DESCRIPTION:** ELEC MOTOR SUB ASM, 220

ITEM #	QTY	PART #	DESCRIPTION
1	2	166-031	LOCK WASHER
2	4	EG-01	HOUSING SCREW
3	2	110-2010	SHCS (1/4-20 X 5/8)
4	1	EG-02	HOUSING
5	1	311-014	BALL BEARING
6	1	EG-03	PLANET CARRIER DRIVE
7	3	EG-05	NEEDLE ROLLER & CAGE
8	1	EG-06	GEAR SET
9	1	230-134	O-RING
10	1	EM-66	BUTTING WASHER
11	1	EM-19	BEARING FLANGE
12	1	311-002	BALL BEARING
13	1	EM-01-220	ARMATURE, 110
14	1	EM-11	BALL BEARING
15	1	EM-12	RUBBER BUSHING
16	1	EM-13A	BAFFLE
17	2	EM-98	O-RING
18	1	EM-02-220	FIELD COIL, 220
19	1	EM-27	CARBON BRUSHES (SET OF 2)
20	1	EM-26	BRUSH & HOLDER (SET OF 2)
21	1	EM-08A	MOTOR HOUSING
22	2	EM-07	STRAND COMPLETE
23	1	EM-35-220A	RATING PLATE
24	1	EM-09A	SHIFT LEVER COMPLETE
25	1	EM-15A	MOTOR CAP (2 PART)
26	1	EM-10A	PIVOTING SWITCH
27	1	EM-25	SWITCH
28	1	EM-24-220	ELECTRONIC UNIT, 220
29	3	EM-16	FILLISTER HEAD SCREW
30	1	EM-05	CABLE CLIP
31	1	EM-06	FILLISTER HEAD SCREW
32	1	EM-04A	CABLE SLEEVE
33	1	EM-03-220	CABLE W/ PLUG, 220
34	1	EMLB-01	LBL, WARNING

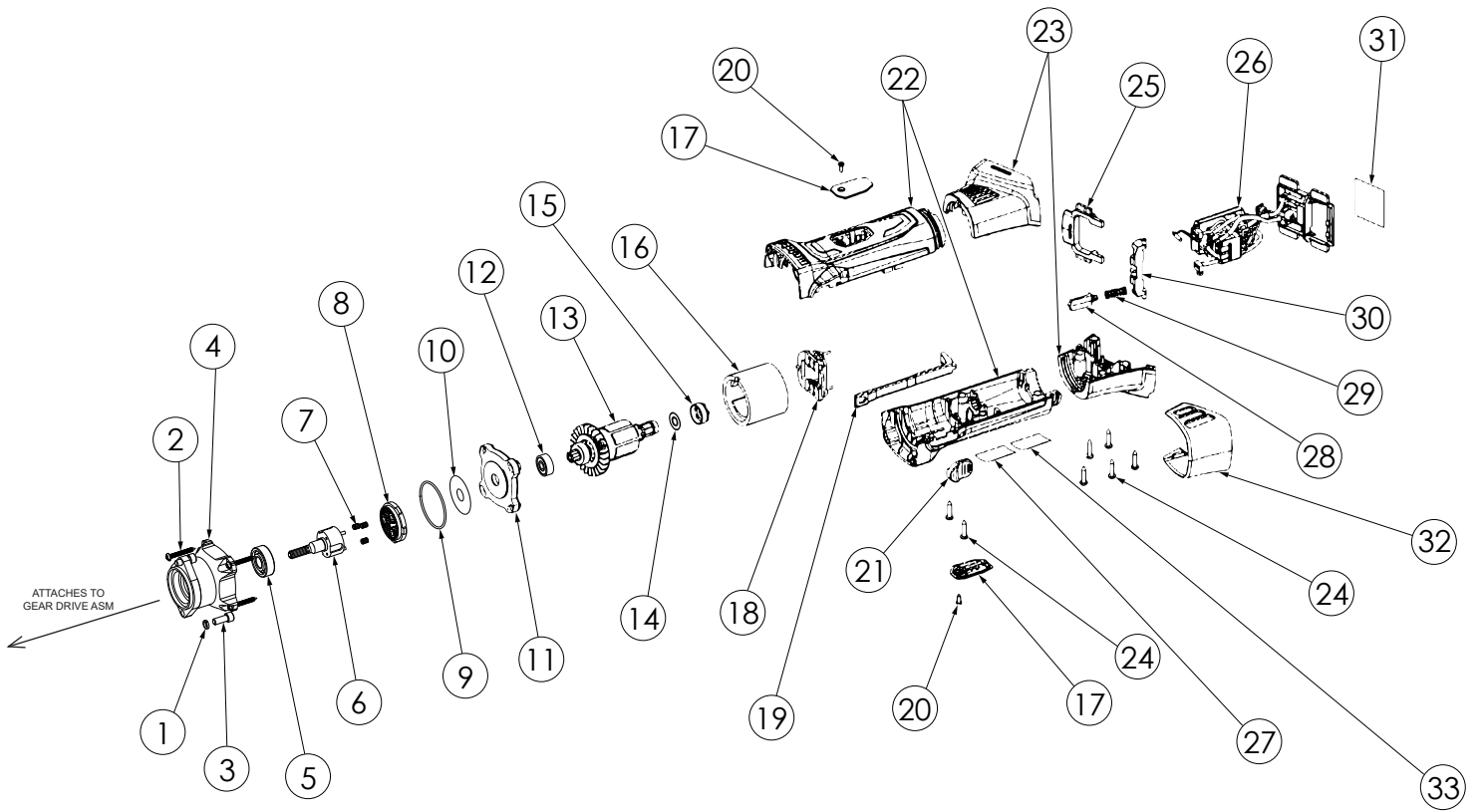
**NOTE:** FOR IN-HOUSE REPAIRS/RENTAL DAMAGES ONLY... PART # EM-220B-01 CAN BE USED TO REPLACE ITEMS (6 - 33) IN THE CASE THAT ITEMS (1 - 5) ARE IN STRONG WORKING ORDER. THIS ITEM CANNOT BE SHIPPED.

**PART #:** EM-220B-01

**DESCRIPTION:** ELEC MOTOR, 220 (REPLACE ONLY)

PART #: EB-18A

DESCRIPTION: BATT MOTOR SUB ASM, 18



**PART #: EB-18A**

**DESCRIPTION: BATT MOTOR SUB ASM, 18**

ITEM #	QTY	PART #	DESCRIPTION
1	2	166-031	LOCK WASHER
2	4	EG-01	HOUSING SCREW
3	2	110-2010	SHCS (1/4-20 X 5/8)
4	1	EG-02	HOUSING
5	1	311-014	BALL BEARING
6	1	EG-03	PLANET CARRIER DRIVE
7	3	EG-05	NEEDLE ROLLER & CAGE
8	1	EG-06	GEAR SET
9	1	230-134	O-RING
10	1	EM-66	BUTTING WASHER
11	1	EM-19	BEARING FLANGE
12	1	311-002	BALL BEARING
13	1	EB-01	ARMATURE, 18
14	1	EB-19	WASHER
15	1	EB-06	RUBBER BUSHING
16	1	EB-02	FIELD COIL, 18
17	2	EB-10	BRUSH COVER
18	1	EB-03	BRUSH HOLDER
19	1	EB-13	SWITCH ROD
20	2	EB-11	FILLISTER HEAD SCREW
21	1	EM-10	SWITCH DEADMAN
22	1	EB-05	MOTOR HOUSING
23	1	EB-08	HOUSING
24	7	EM-16	FILLISTER HEAD SCREW
25	1	EB-17	SWITCH SLIDE
26	1	EB-04	ELECTRONIC UNIT, 18
27	1	EB-36	WARNING LABEL
28	1	EB-14	INDEX BOLT
29	1	EB-15	PRESSURE SPRING
30	1	EB-16	LOCKING PIECE
31	1	EB-23	RATING PLATE
32	1	EB-30	FILTER
33	1	EBLB-01	LBL, WARNING

**NOTE:** FOR IN-HOUSE REPAIRS/RENTAL DAMAGES ONLY... PART # EB-18A-01 CAN BE USED TO REPLACE ITEMS (6 - 33) IN THE CASE THAT ITEMS (1 - 5) ARE IN STRONG WORKING ORDER. THIS ITEM CANNOT BE SHIPPED.

**PART #:** EB-18A-01

**DESCRIPTION:** BATT MOTOR, 18 (REPLACE ONLY)

**BATTERY**

**PART #:** EB-100

**DESCRIPTION:** LI-ION BATTERY, 18-5.2Ah

**NOTE:** BATTERIES AND BATTERY KITS CANNOT SHIP AIR-FREIGHT.

**BATTERY CHARGERS**

**PART #:** EB-110

**DESCRIPTION:** BATTERY CHARGER, 110

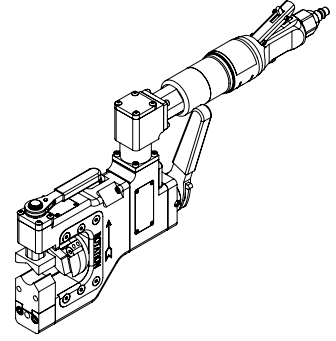
**PART #:** EB-220

**DESCRIPTION:** BATTERY CHARGER, 220

## G-290 - RIGHT ANGLE DRIVE ASSEMBLY

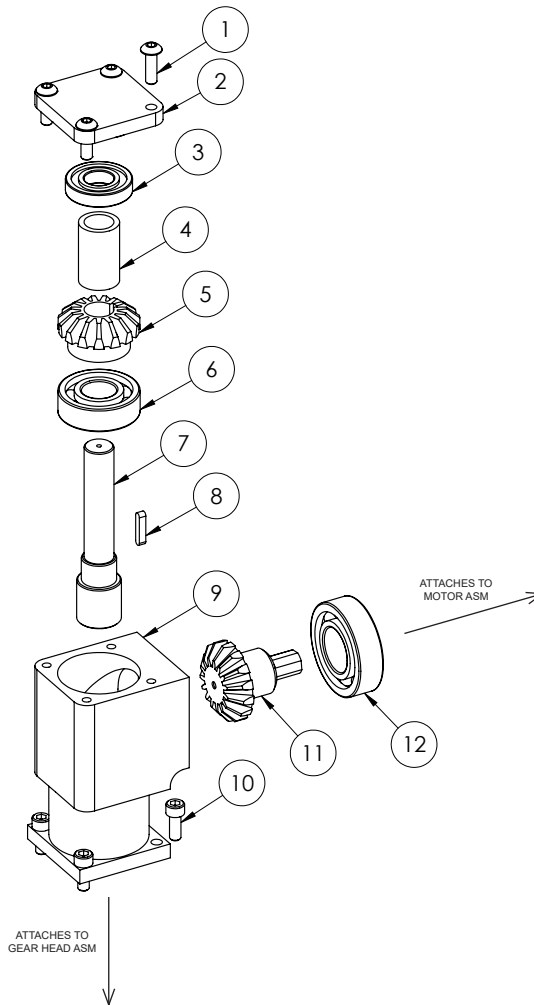
THE G-290 RIGHT ANGLE DRIVE ASSEMBLY ALLOWS FOR MOUNTING ALL C-HOG MILLHOG MOTORS AT A 90° ANGLE FOR APPLICATIONS WITH SPACE RESTRICTIONS. MOTORS CAN BE MOUNTED IN 4 DIFFERENT ORIENTATIONS (BACK, RIGHT, LEFT AND FORWARD). IT IS NOT RECOMMENDED TO ORIENT YOUR MOTOR TOWARDS THE CUTTING ACTION DUE TO SAFETY CONCERNS.

IF SHIPPED ASSEMBLED, THE COMPLETE SETUP WILL REQUIRE NON-STANDARD PACKAGING.



**PART #:** G-290

**DESCRIPTION:** RA DRIVE ASM (GMH/CF)



**PART #:** G-290**DESCRIPTION:** RA DRIVE ASM (GMH/CF)

ITEM #	QTY	PART #	DESCRIPTION
1	4	111-1610	BHCS (10-24 X 5/8)
2	1	CF-16	BEARING CAP
3	1	312-030	BALL BEARING
4	1	CF-17A	BEARING SPACER
5	1	G-45	DRIVEN BEVEL GEAR
6	1	311-017	BALL BEARING
7	1	RA-02	DRIVEN SHAFT
8	1	G-44	KEY
9	1	RA-01	RIGHT ANGLE HOUSING
10	4	110-1608	SHCS (10-24 X 1/2)
11	1	G-56	DRIVE BEVEL GEAR
12	1	311-007	BALL BEARING

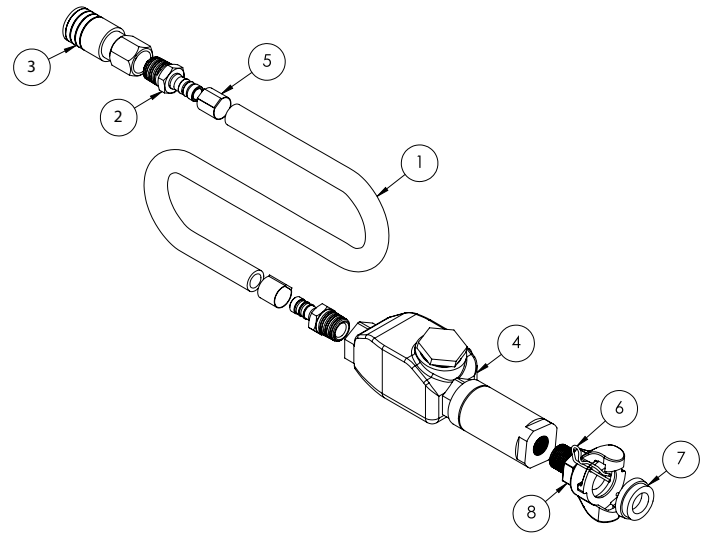
# AIR HOSES AND FITTINGS

## ASSEMBLY DRAWINGS - AIR HOSES

**PART #:** AH-202

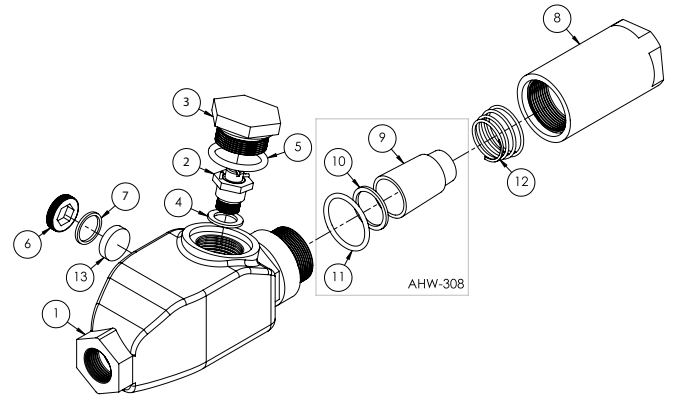
**DESCRIPTION:** HOSE ASM, 1/2 (3/8 CPL)

ITEM #	QTY	PART #	DESCRIPTION
1	6	340-050	HOSE (1/2 X 12)
2	2	350-5252	HOSE BARB (1/2 X 1/2 NPT)
3	1	352-5052	Q-C COUPLER (3/8 X 1/2 NPT)
4*	1	AHW-307A	FILTER & LUBRICATOR ASM
5	1	AHW-313A	HOSE CLAMP (1 ID)
6	1	AHW-306	SAFETY PIN
7	1	AHW-304	SEAL
8	1	AHW-305	CHICAGO FITTING, 1/2



\* **PART #:** AHW-307A  
**DESCRIPTION:** FILTER & LUBRICATOR ASM

ITEM #	QTY	PART #	DESCRIPTION
1	1	AHW-311	LUBRICATOR HOUSING
2	1	AHG-310	OIL ADJ VALVE ASM
3	1	AHG-308	FILLER PLUG
4	1	AHG-311	VALVE GASKET
5	1	230-214	O-RING
6	1	AHG-313	SIGHT DISK LOCK NUT
7	1	AHG-312A	SEAL
8	1	AHW-310	FILTER HOUSING
9	1	AHW-308A	FILTER
10	1	AHW-308B	GASKET
11	1	230-122	O-RING
9, 10 & 11	1	AHW-308	FILTER REPAIR KIT
12	1	AHW-312	SPRING
13	1	AHG-312B	SIGHT DISC



## TOOLING SECTION CONTENTS:

### 1. MILLHOG G-SERIES BLADES

- A. BEVEL BLADES
- B. PEEL BACK BLADES
- C. BORING BLADES
- D. J-BEVEL BLADES
- E. FACING BLADES
- F. REVERSE BEVEL BLADES
- G. TUBE STUB REMOVAL BLADES
- H. TUBE SEAT REMOVAL BLADES

APPLICABLE MODELS:

**GROUND**  
**MONGOOSE**  
**TUBE WEASEL**  
**C-HOG**

### BEVEL BLADES



### PEEL BACK BLADES



### BORING BLADES



### J-BEVEL BLADES



**GJB-1**  
22° J-PREP BLADE TIN  
3/16" / 4.8MM RADIUS  
3/8" / 9.5MM WIDE



**GJB-2**  
22° J-PREP BLADE TIN  
3/16" / 4.8MM RADIUS  
5/8" / 15.9MM WIDE

### FACING BLADES



**GLB-1**  
FACING BLADE TIN  
3/8" / 9.5MM WIDE



**GLB-2**  
FACING BLADE TIN  
5/8" / 15.9MM WIDE

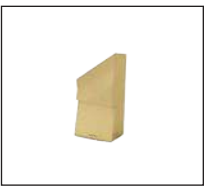


**GLRB-1**  
FACING BLADE TIN  
OD RADIUS  
3/8" / 9.5MM WIDE



**GLRB-2**  
FACING BLADE TIN  
OD RADIUS  
5/8" / 15.9MM WIDE

### REVERSE BEVEL BLADES



**GRBB-1**  
37-1/2° REVERSE BEVEL  
BLADE TIN  
3/8" / 9.5MM WIDE



**GRBB-2**  
37-1/2° REVERSE BEVEL  
BLADE TIN  
5/8" / 15.9MM WIDE

### TUBE STUB REMOVAL BLADES



**GTSR-1**  
30° TUBE STUB REMOVAL  
BLADE HL  
3/16" / 4.8MM RADIUS  
3/8" / 9.5MM WIDE



**GTSR-2**  
30° TUBE STUB REMOVAL  
BLADE HL  
3/16" / 4.8MM RADIUS  
5/8" / 15.9MM WIDE

### TUBE SEAT REMOVAL BLADES



**GTSS-1**  
TUBE STUB REMOVAL  
BLADE HL  
3/8" / 9.5MM WIDE



**GTSS-2**  
TUBE STUB REMOVAL  
BLADE HL  
5/8" / 15.9MM WIDE

### MEMBRANS/OVERLAY INSERT



**MRB-8**  
OVERLAY/MEMBRANE  
INSERT  
8MM WIDE

**et** esco tool®



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