

**GH-24, GH-30, GH-45, GH-60  
Operations Manual**



**Correct handling and maintenance is absolutely necessary.  
Read the following instructions for installation and operation carefully.**

1-800-837-2503  
851 Industrial Drive  
Wapakoneta, Ohio 45895  
[www.flexarminc.com](http://www.flexarminc.com)  
[flexarm@flexarminc.com](mailto:flexarm@flexarminc.com)



## Index

3 .....	Warranty
4 .....	Safety Operations
5 .....	Technical Details
7 .....	Machine Drawing
8 .....	Installation
12 .....	Tap Lubricator System
13 .....	Multi-Use Head
14 .....	Programmable Depth Stop
17 .....	Operating Instructions
19 .....	Torque Settings for Tap Holders
20 .....	Arms Parts Diagrams/Parts Lists
32 .....	Gearbox Parts Diagram/Parts List
34 .....	Multi-Head Parts Diagram/Parts List
36 .....	Semi-Tap Lubricator Parts Diagram/Parts List
38 .....	Mechanical Depth Stop Diagram
39 .....	Electrical Diagrams/Parts Lists
42 .....	Hydraulic Diagram/Parts List
44 .....	Power Pack Diagrams/Parts List/Specifications
50 .....	Hydraulic Cylinder Replacement
53 .....	Hydraulic Gearbox Disassembly
54 .....	Maintenance
59 .....	Trouble Shooting
63 .....	Alignment Check List

## **Limited Warranty**

A **new** FlexArm has a 3 year limited warranty on parts and labor. This warranty does not apply to a FlexArm determined to have been misused or abused, improperly maintained, or having defects attributed to the use of non-genuine repair parts.

**Original** pressure cylinders have a 3 year limited warranty from the date of purchase. When replacing one of the pressure cylinders, make sure not to scratch, mar, or nick the shaft or tube on either the old cylinder being replaced or the new cylinder being installed. All warranty cylinders must be returned to Midwest Specialties for evaluation. The warranty is void if the cylinder to be evaluated shows signs of scratches or nicks on the cylinder shaft or tube. Damaged cylinders cannot be returned to the manufacturer for warranty claims. **Replacement cylinders carry a limited 1 year warranty from the date of purchase.**

Pneumatic motors have a 3 year limited warranty (warranted to be free of defects in material and workmanship from the date of purchase). This warranty does not apply to the following (perishable) components:

- filters
- blades/vanes
- O-rings
- springs

This warranty is void if it has been determined that the motor was misused, abused or improperly maintained.

FlexArm is not responsible for a customer's air quality. We supply the basic tools and offer a coalescent filter option for those who have experienced excessive moisture and water. The responsibility for clean, dry air falls upon the individual shop. Any pneumatic motor coming in for evaluation or repair with rusted components will not get warranty coverage because this is considered improper maintenance.

**Once the original warranty expires, repaired Motors and Arms carry a limited 60 day warranty from the date of the repair.**

Tap Holders and Helicoil components are considered perishable tooling and therefore do not carry a warranty. However, Size 2 through Size 4 Tap Holders may be reworked depending of the severity of the damage or wear. Please contact FlexArm for a return authorization and the holders can be evaluated.

The warranty is void if changes to the FlexArm or motor, or attempts to repair it or its components are made without the expressed authorization of FlexArm, Inc.  
The warranty is based on normal usage which would be the equivalent of a 40-hour work week.

For technical assistance or questions concerning the proper care and maintenance of the FlexArm unit or the pneumatic/hydraulic motors, please contact **FlexArm at 800-837-2503.**

**Safety Operations: Read this First**

- Read the entire unit manual before operating.
- Wear eye protection when operating this equipment.
- Do not wear jewelry or loose clothing when operating.
- Tie hair back before operating machine.
- Do not wear gloves when operating this equipment.
- Do not use damaged, frayed, or deteriorated air hoses or fittings.
- Removing the tool or weight from the arm will allow the arms to extend rapidly, possibly causing damage or injury.
- Keep hands clear of the motor chuck and tap when actuating the motor.
- Keep hands free of pinch points on the unit when operating.
- Perform regular maintenance according to the manual, including filling the motor lubricator with correct oil and greasing the motor gears.
- Do not alter or modify the motor or unit.
- Periodically inspect for damage, loose hardware or anything irregular.
- Read the FlexArm warranty page before performing any maintenance or repairs.
- Do not exceed the torque or weight limitations for the unit. Doing so will void the warranty and possibly cause damage or injury.
- It is imperative that the table or mounting surface be lagged to the floor and secure before installing the FlexArm Hydraulic Tapping Machine.
- If the Hydraulic Tapping Machine is going to be lifted with a crane, please call FlexArm for special instructions.
- FlexArm is not responsible for accident or injury resulting from the misuse of this unit or for use other than originally designed and intended.

**Caution: Always secure the work piece to the table before operating the machine!**

**This machine is designed for tapping, chamfering, and light reaming of holes.**

**Safety Standards**

The oil hose pipes can tolerate at least 250 Bar, and have a breakage of pressure above 350 Bar. The necessity of maximum pressure is from 100 to 120 Bar and the safety valve doesn't permit excess of 140 Bar, these must be replaced every 10 years or if some malfunction is detected by others with similar characteristics. The pieces must be firmly held in place to avoid breakage of taps or these striking the operator. The operator doesn't have to wear special clothes but protection glasses must be worn. When the machine is installed, connect it to the ground clamp system before operating. For every adjustment to this machine, the master switch must be disconnected and the work carried out by electricians.

Please Contact FlexArm with any questions or concerns about the installation of the FlexArm hydraulic tapping machine at 800-837-2503

**Technical Details - GH-24**

Electric Motor.....	5.5 HP
The Best Maximum Pressure.....	120 Bar
Security Maximum Pressure.....	140 Bar
Minimum threaded capacity.....	#6
Maximum Threaded Capacity.....	7/8"
RPM.....	100-500 RPM
Oil Tank Capacity.....	9 Gallons
Voltage in Knobs.....	24 Volts
Max Torque.....	78 Ft/Lbs

**Technical Details - GH-30**

Electric Motor.....	5.5 HP
The Best Maximum Pressure.....	120 Bar
Security Maximum Pressure.....	140 Bar
Minimum Threaded capacity.....	#6
Maximum Threaded Capacity.....	1-1/4"
RPM.....	140-500 RPM
Oil Tank Capacity.....	9 Gallons
Voltage in Knobs.....	24 Volts
Max Torque.....	188/63 Ft/Lbs

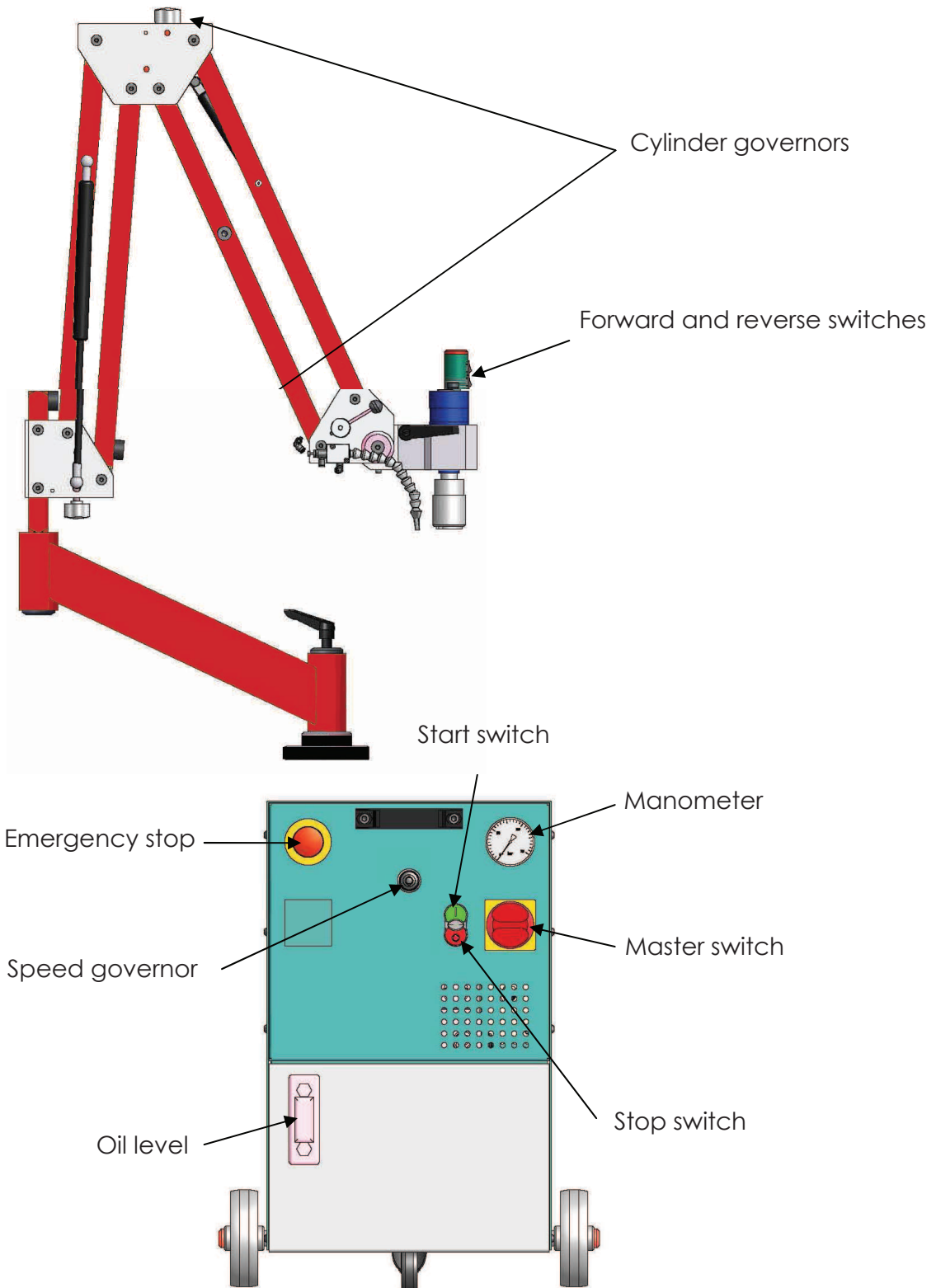
**Technical Details - GH-45**

Electric Motor.....	5.5 HP
The Best Maximum Pressure.....	120 Bar
Security Maximum Pressure.....	140 Bar
Minimum Threaded capacity.....	1/4"
Maximum Threaded Capacity.....	1-1/2"
RPM.....	110-500 RPM
Oil Tank Capacity.....	9 Gallons
Voltage in Knobs.....	24 Volts
Max Torque.....	325/63 Ft/Lbs

**Technical Details - GH- 60**

Electric Motor.....	5.5 HP
The Best Maximum Pressure.....	120 Bar
Security Maximum Pressure.....	140 Bar
Minimum Threaded capacity.....	1/4"
Maximum Threaded Capacity.....	2"
RPM.....	55/275 RPM
Oil Tank Capacity.....	9 Gallons
Voltage in Knobs.....	24 Volts
Max Torque.....	811/162 Ft/Lbs

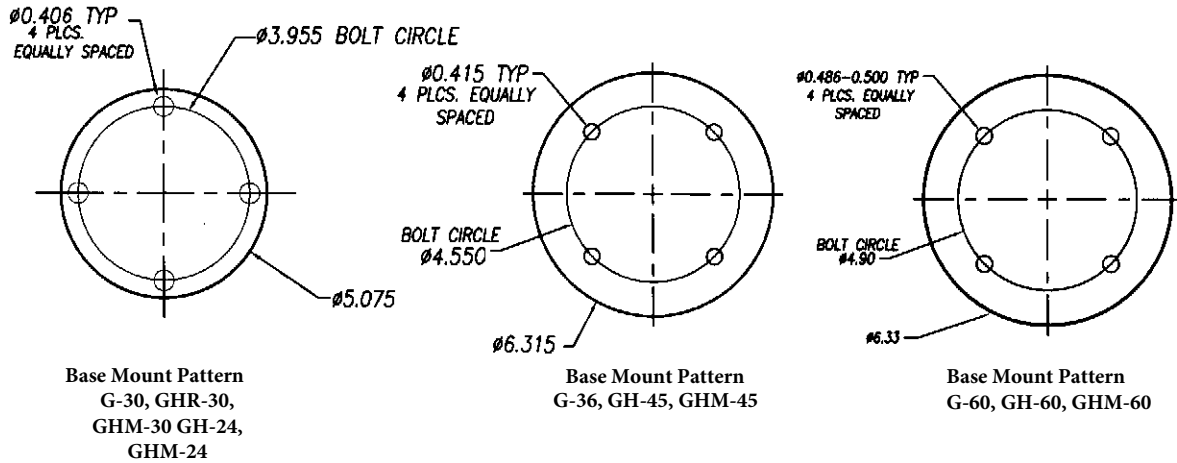
## Machine drawing



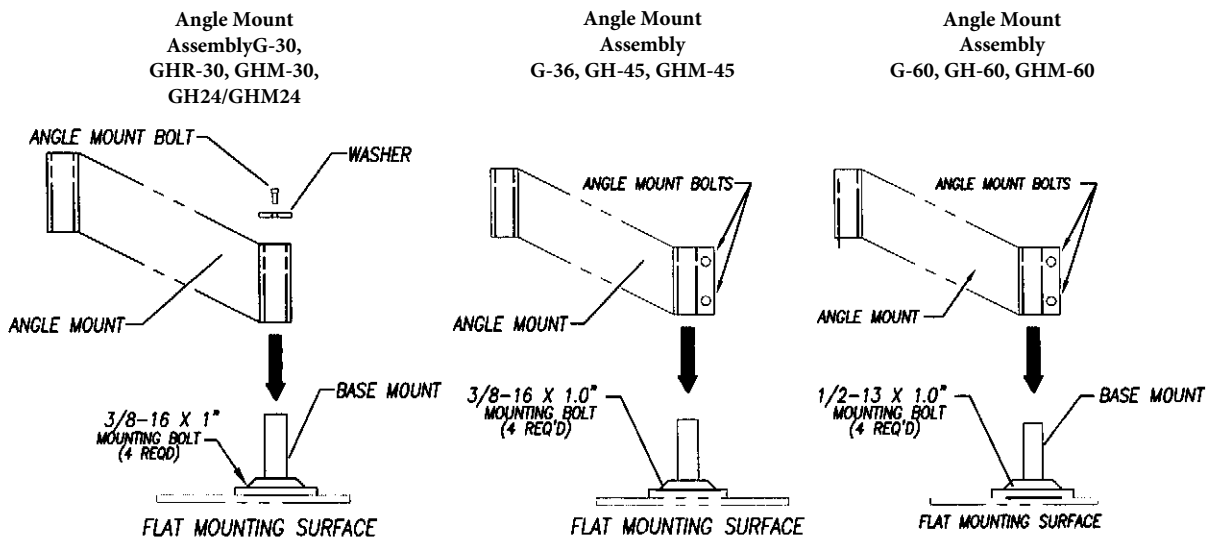
- 1) NEVER CHANGE GEARS WHILE THE MOTOR IS RUNNING
- 2) It may be necessary to manually rotate the chuck slightly to fully align the gear knob with the proper number on the gearbox.

## Installation

- 1) Drill and tap 4 bolt holes on a flat, smooth table or work bench. Use 3/8-16x1" bolts for the GhH-24, GHR-30, & GH-45 units. Use 1/2-13x1" bolts on the GHR, & GHM-60 units.  
(See Base Mount diagram below)



- 2) Secure the base mount and apply a light coating of grease to the base mount shaft. Slide the angle mount onto the shaft of the base mount and secure the angle before inserting the FlexArm! (See Angle Mount Assembly Diagram Below)



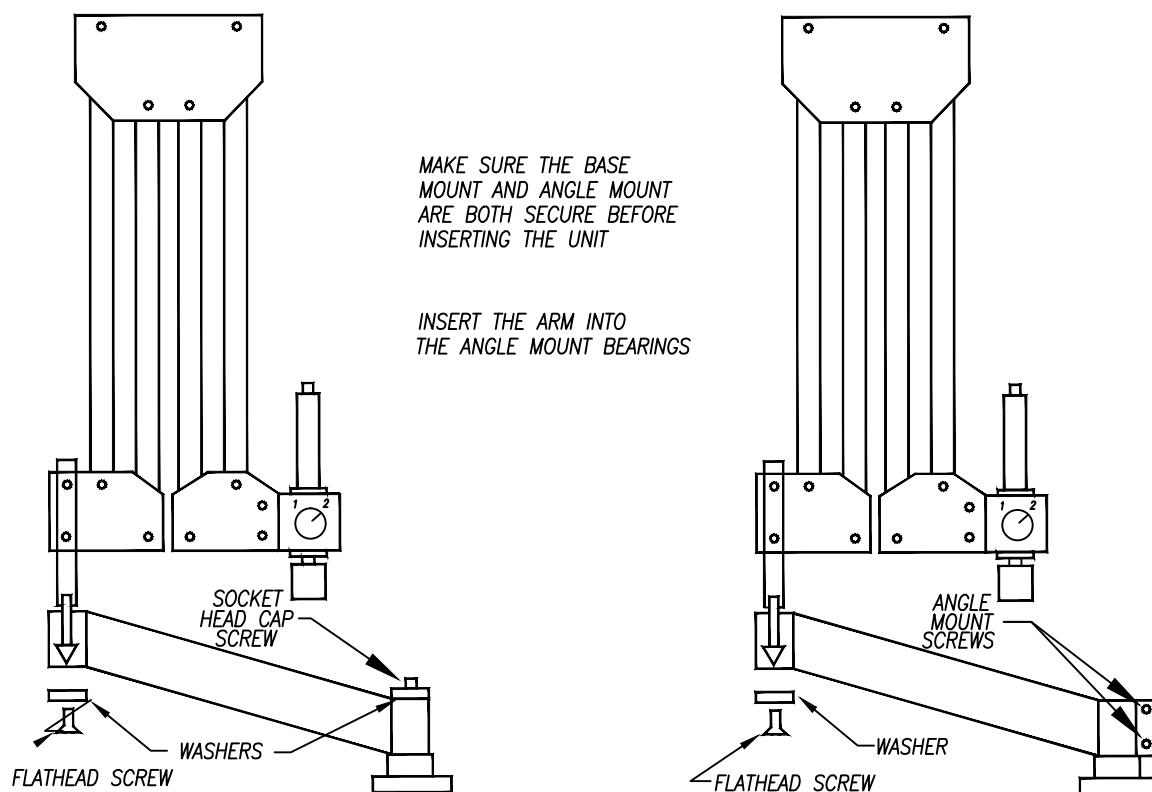


## Installation

3.) Secure the angle mount by placing the washer on top of the lower bore and tightening the angle mount bolt securely into the base mount (for a GH-24, GH-30, GH-45, GH-60.)

The angle mount bolts must be tightened securely or the machine will not maintain perpendicularity

4.) Insert the rear pin of the unit into the upper bore and bearing of the angle mount. The rear pin may not slide through both bearing sets- use the flathead cap screw to help pull the unit completely through the bottom bearing.



5) Remove any straps holding the arms together and adjust the counter balance of the arm. This will eliminate the possibility of the arm striking the operator when it is positioned at its lowest point. (See Counter Balance Adjustment Section on page 8)

# INSTALLATION

## COUNTER BALANCE ADJUSTMENT

6. Both front and rear arms adjust to meet operators preference:

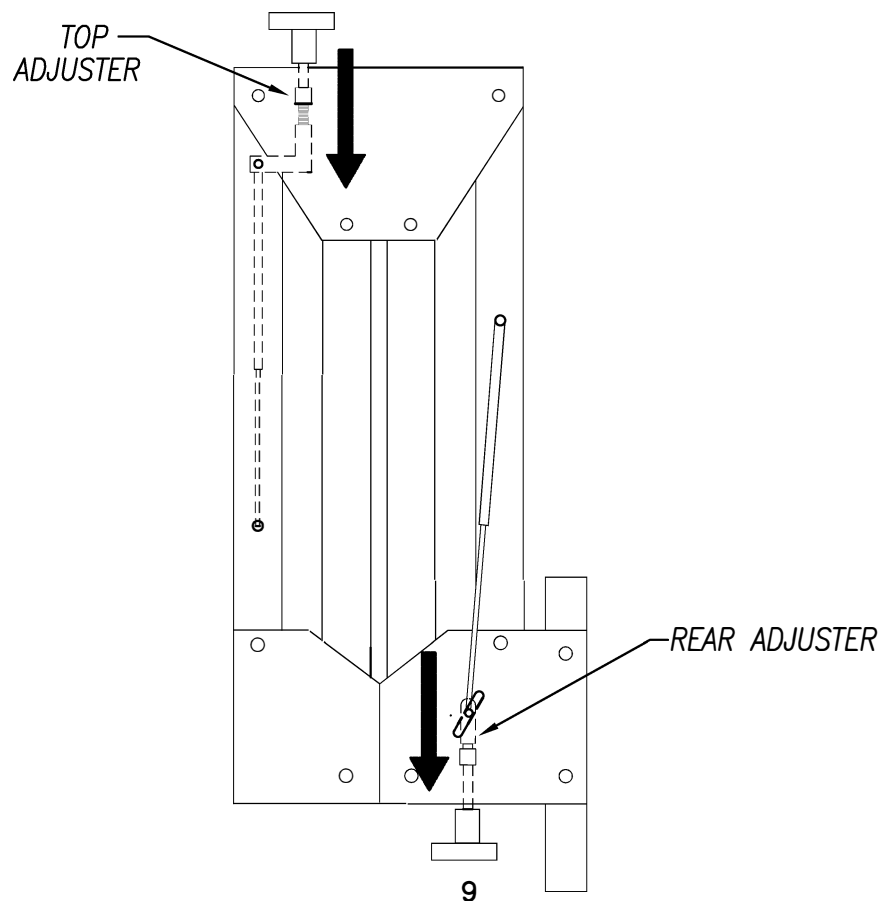
- a. To retract completely to vertical (closed) position; or
- b. To maintain angular (open) position.

NOTE: The adjusters are between the plates in either location.

7. Turn the handles to adjust the cylinder strength: (GH-60 & GHM-60 has no top handle, use a wrench to turn the adjusting bolt)

NOTE: EXTENDING THE ARMS WILL MAKE IT EASIER TO TURN THE ADJUSTER HANDLES.

- a. Moving the adjuster downward will increase reaction in the rear arm and increase extension on the front arm.
- b. Moving the adjuster upward will decrease reaction on the rear arm and decrease extension on the front arm.



# INSTALLATION

## ELECTRICAL

8. Connect the machine to a grounded, 3 phase electric supply. The circuit should be protected with a 20 amp circuit breaker if the unit is wired for 480v and 30 amp if it is wired for 220v. The unit is shipped with a sticker on the back of the power pack indicating what voltage it is pre wired for.

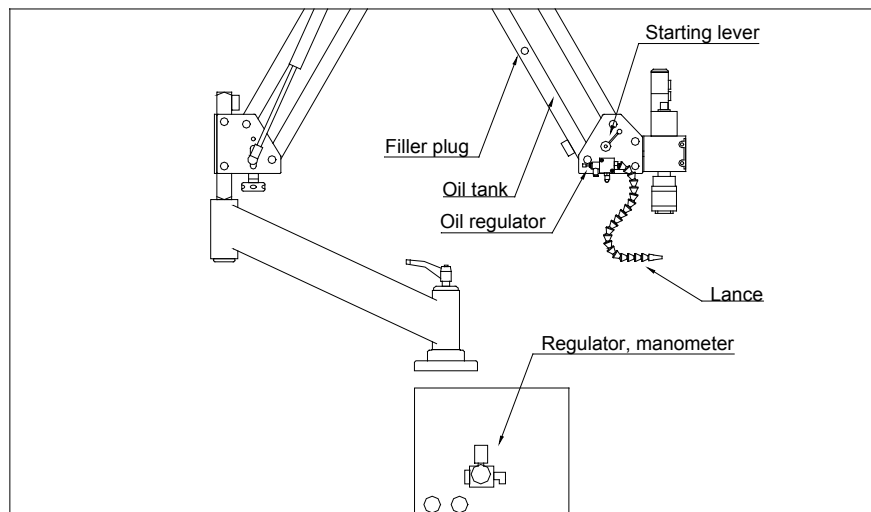
**CAUTION:** When making repairs to this unit, always disconnect the main power supply.

Refer to page 39 for diagram\*

## **Use of tap lubricator system**

**Caution! Don't use corrosive oil, it can damage the plastic valves of the system.**

- Connect air inlet and pneumatic tube to the regulator-manometer which is adjusted in our factory.

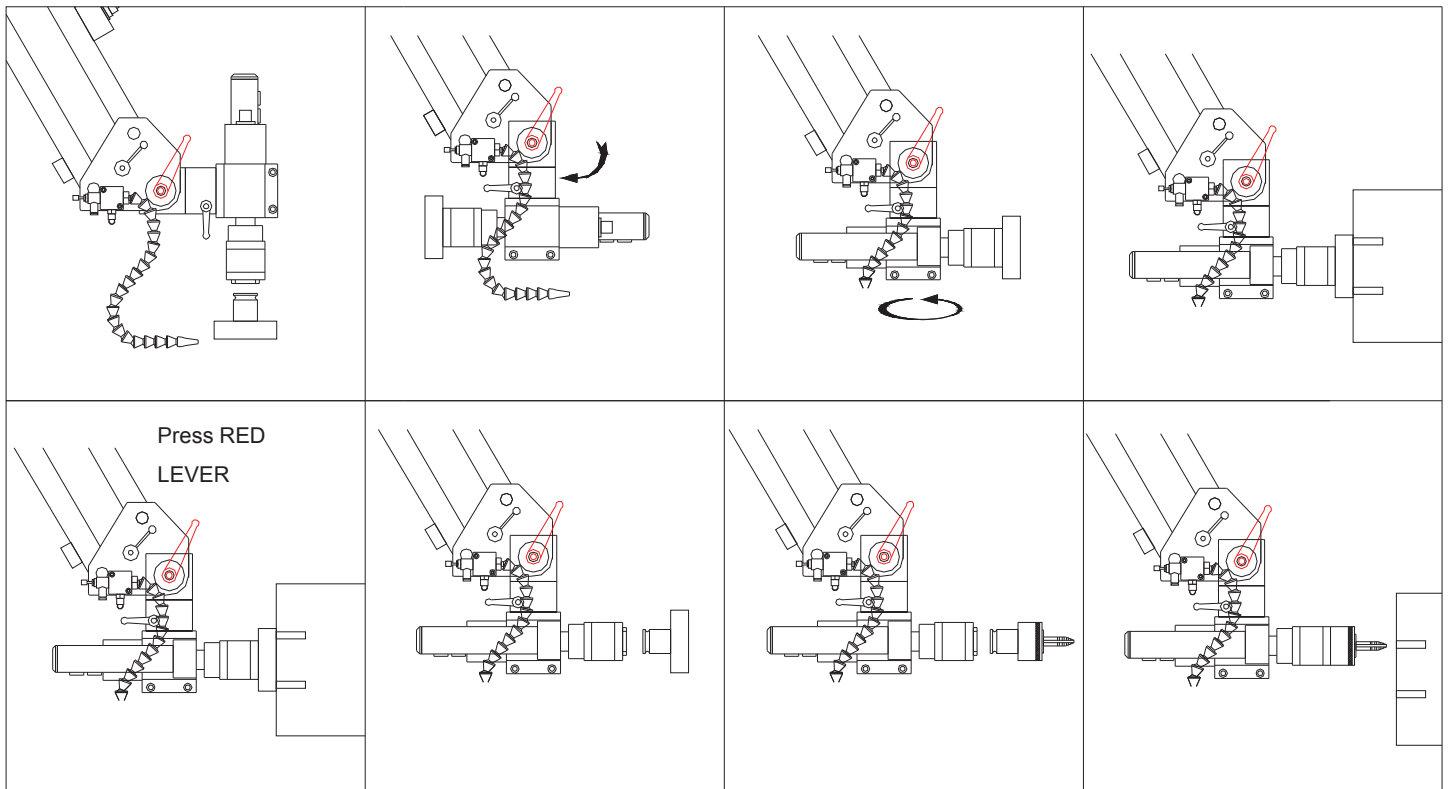


- Fill oil tank located in front lower arm. Uncover filler plug and add tapping oil until it's full.
- Press and hold the starting lever, until you see atomized oil. At first use, it will take a while for oil to prime in the system. In later uses it will begin to flow immediately.
- Adjust the flow of oil by using the regulator mounted behind the start lever.
- Use of tap lubricator system can be done before, during and after tapping.

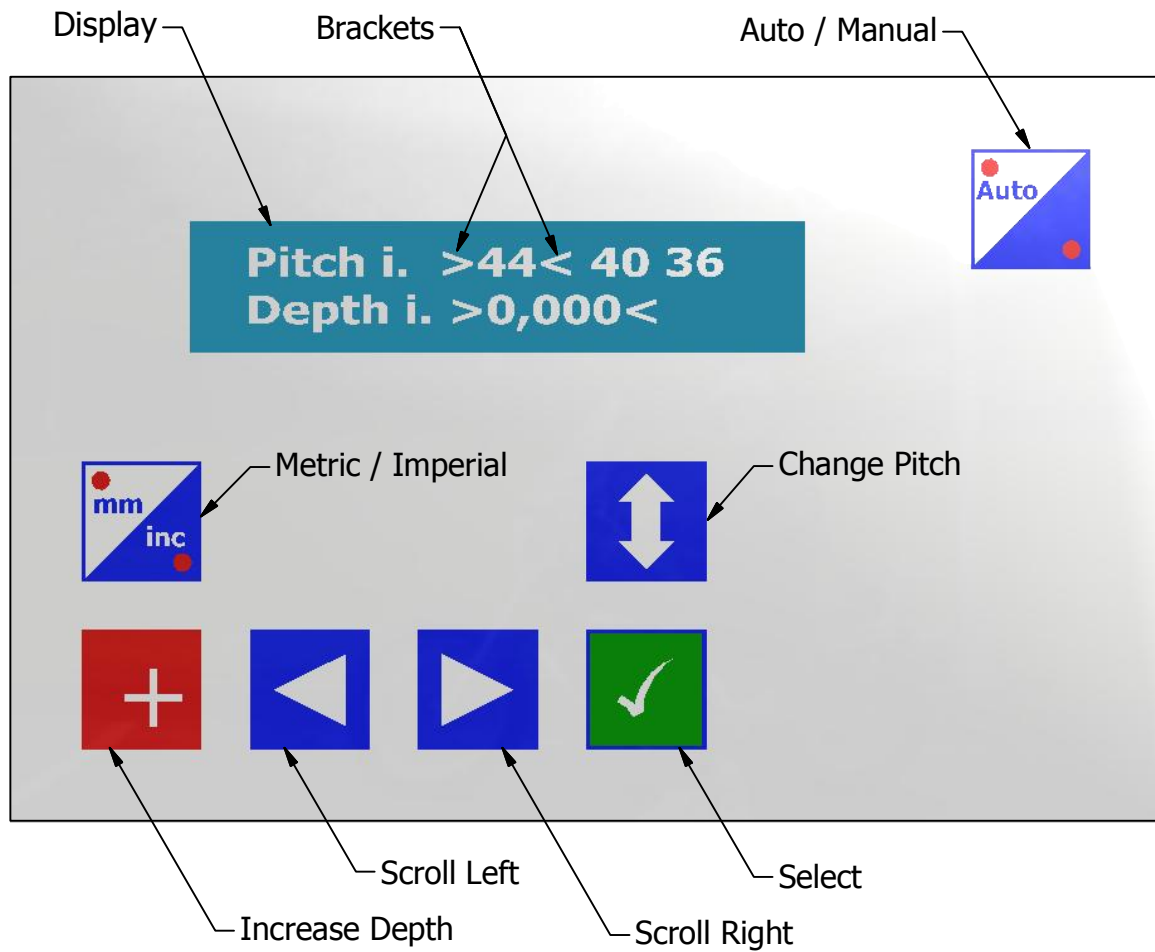
## Use of the multi-position head

FlexArm models that are equipped with a multi-position head.

- Loosen the large lever to adjust the position of the tapping head between vertical and horizontal tapping. Loosen the small lever to adjust the head position from right to left.
- Before tapping, check that the small lever isn't fixed, since it must be loose for tapping and the large lever is tightly fixed after aligning with the work piece.
- When returning the head to the vertical tapping position, remember that both levers must be tightly fixed to tap.

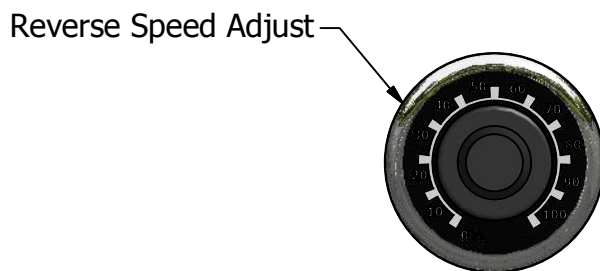
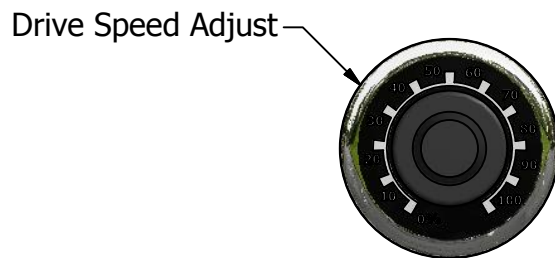
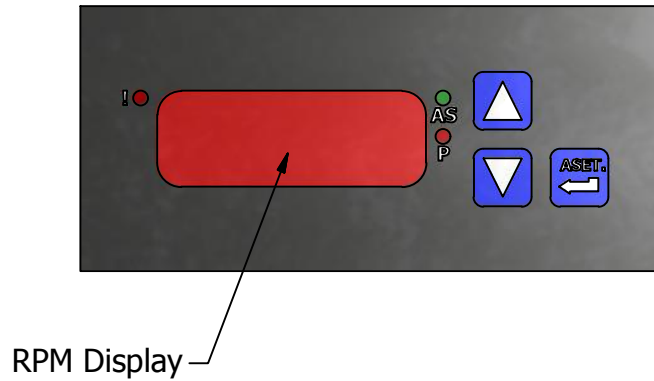


## Programmable Depth Stop



- Press and hold select button to program pitch and depth.
- Brackets will flash when ready to program.

## Drive/Reverse Speed Adjustment

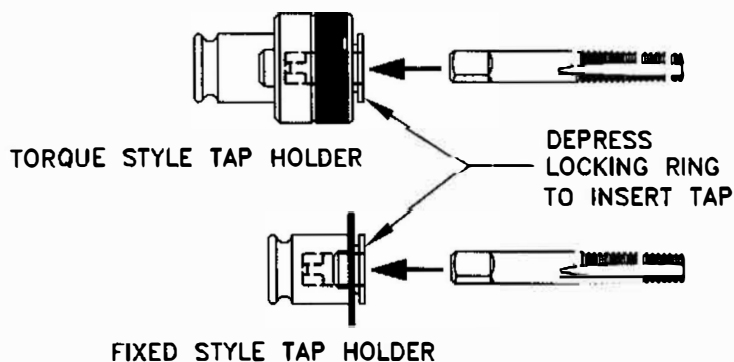


-RPM Display defaults to display Drive speed.

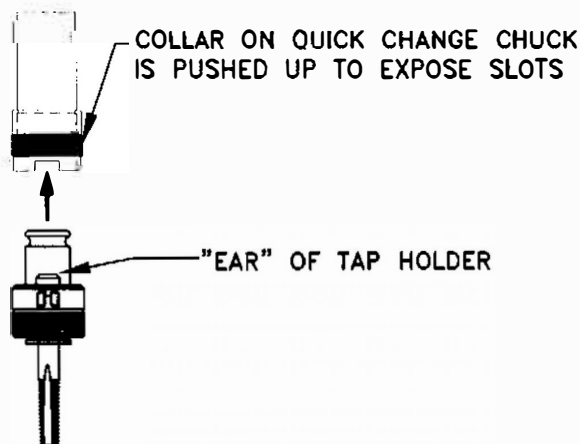
-To adjust Reverse speed, Reverse button must be pressed as speed is adjusted.

# OPERATING INSTRUCTIONS

- 1) Always wear safety glasses and use proper safety precautions when operating this unit. Gloves are not recommended when operating this machine.  
CAUTION: ALWAYS SECURE THE WORK PIECE TO THE TABLE BEFORE OPERATING THIS MACHINE.
- 2) Select the correct tap holder for the tap size required. Insert the tap into the holder by depressing the locking ring. Seat the top square into the tap holder; release the locking ring.



- 3) Push up on the collar of the quick change chuck before inserting the tap holder.
- 4) Insert the tap holder into the quick change chuck. Turn the holder until the "ears" of the holder locate the slots of the chuck. Push up to lock the holder into position,



- 5) Position the hydraulic motor vertically above the hole being tapped. There can be no obstruction that interferes with the downward path of the tap holder or prohibits the tap from completing the required thread depth.
- 6) Actuate the hydraulic motor by depressing the forward button and gently guide the tap down to the hole (typically use lower gear, slow speed, for larger tap sizes).



## OPERATING INSTRUCTIONS

- 7) EXERT ONLY ENOUGH DOWNWARD PRESSURE TO START THE TAPPING PROCESS. The tap will engage itself and follow the hole. When tapping a through hole, remember that the tap will protrude on the bottom side of the work piece; make sure there is sufficient clearance below the work piece to allow the tap to break through and not hit the work surface. Use a torque style tap holder when tapping blind or bottom holes. The built-in safety clutch on this holder will ratchet and stop the tap from turning when the tap has reached the bottom of the hole.
- 8) When the hole is completely tapped, release the forward button and actuate the reverse button to change the rotation of the hydraulic motor and remove the tap from the hole.

DO NOT PUSH OR PULL ON THE MOTOR AS THE TAP IS TAPPING THE HOLE OR BACKING OUT OF IT! THIS RESULTS IN POOR THREAD QUALITY, OVERSIZED THREADS, AND BROKEN TAPS!

- 9) To change tap holders, release the tap holder by pushing up on the collar of the quick change chuck.

## ADJUSTING TAP HOLDER TORQUE SETTINGS

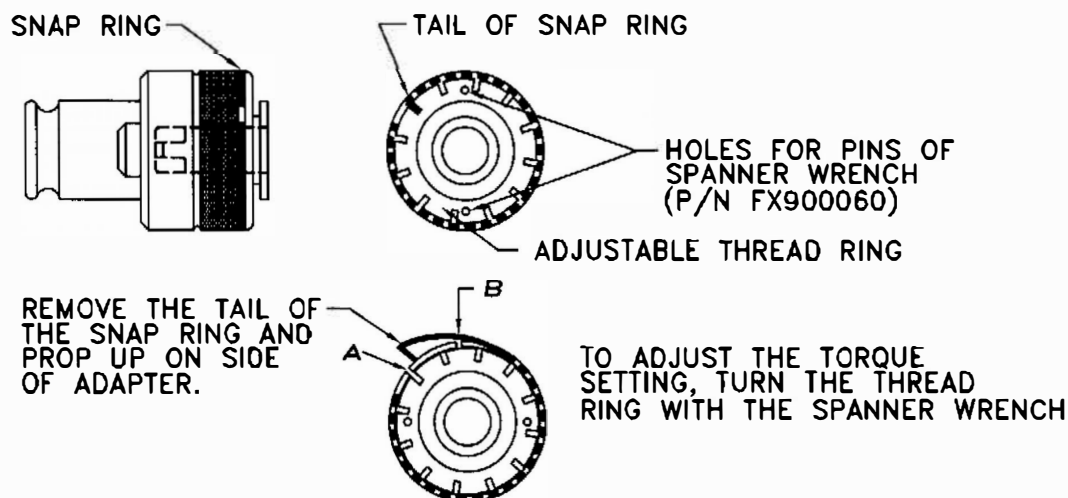
The torque adapters are factory preset near the standard break torque limits developed for each tap size. The break torque limit protects the tap when blind or bottom holes in mild steel (approximately 229 BHN or 25RC) When the tap reaches the bottom of the hole, resistance will cause the torque holders safety clutch to ratchet and stop the tap from turning, over-torquing and ultimately breaking.

When tapping hardened steel (above 40 RC), stainless steel, or other tough alloys, an increase in the factory torque settings may be required in order to drive the tap the full depth of the hole. When using the torque adapters to tap soft materials or plastics, a decrease in factory torque setting prevents the tap from over torquing after it reaches the bottom of the hole (see "Torque Requirements for Tapping" page of this manual).

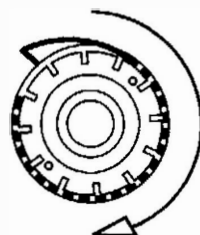
# OPERATING INSTRUCTIONS

There are two lock positions (see holes at positions A and B in the diagram) on the outside diameter of the adapter designed to hold the tail of the snap ring. These two positions permit an adjustment range from one half to a full notch on the threaded ring. The tail of the snap ring must be inserted in the hole at either position and through a notch on the thread ring in order to lock in the adjusted torque setting.

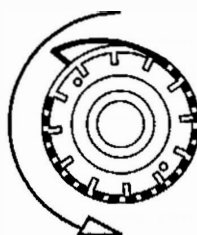
**CAUTION:** Never adjust the torque setting more than one (1) notch at a time. Adverse tapping conditions and broken taps may result.



**NOTE:** AFTER TURNING THE THREAD RING A FULL NOTCH, REINSERT THE TAIL OF THE SNAP RING IN THE ORIGINAL HOLE (POSITION A). IF A LESSER ADJUSTMENT IS NEEDED, TURN THE ADJUSTING THREAD RING HALF THE DISTANCE BETWEEN THE THREAD RING'S NOTCHES. ROTATE THE SNAP RING AND INSERT THE TAIL IN THE HOLE LOCATED AT POSITION B.



TO INCREASE TORQUE SETTING - TURN THREAD RING CLOCKWISE



TO DECREASE TORQUE SETTING - TURN THREAD RING COUNTER-CLOCKWISE

# OPERATING INSTRUCTIONS

## Torque Settings For Tap Holders

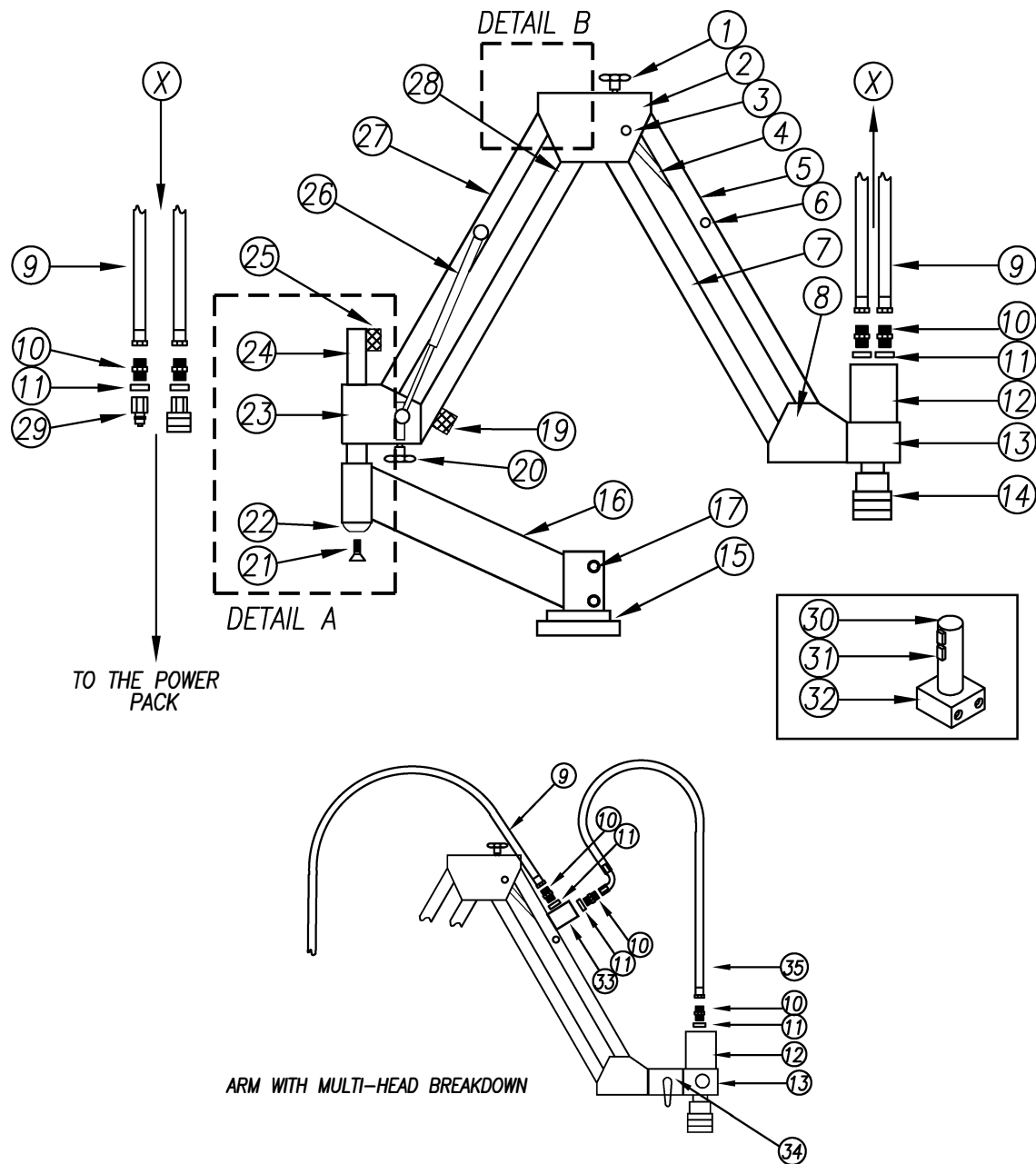
Approximate values for mild steel

			LOW	<b>NOM</b>	HIGH
SIZE	ANSI-INCH	METRIC	IN-LB	IN-LB	IN-LB
1	0			5.0	
1	2			9.0	
1	4			12.0	
1	6	M3.5	13.0	15.0	17.0
1	8	M4	14.7	17.0	19.3
1	10	M5	26.9	31.0	35.1
1	12		43.3	50.0	56.7
1	1/4	M6	60.7	70.0	79.3
1	5/16	M8	92.0	100.0	108.0
1	3/8	M10	138.0	150.0	162.0
1,2	7/16		230.0	250.0	270.0
1,2	1/2	M12	327.5	340.7	354.0
1,2	9/16	M14	327.5	340.7	354.0
1,2	5/8	M16	327.5	340.7	354.0

			LOW	<b>NOM</b>	HIGH
SIZE	ANSI-INCH	METRIC	FT-LBS	FT-LBS	FT-LBS
2,3	3/4		56.0	65.0	74.0
2,3	13/16	M20	67.0	78.0	88.0
2,3	7/8	M22	78.0	90.0	102.0
3	15/16	M24	102.0	118.0	133.0
3	1	M25	125.0	145.0	164.0
3	1-1/8	M27	176.0	203.0	230.0
3	1-1/4	M30	201.0	231.0	262.0
3	1-3/8	M33	301.0	347.0	393.0
4	1-1/2	M36	313.0	362.0	410.0
4	1-5/8	M39	307.0	354.0	401.0
4	1-3/4	M42	564.0	651.0	738.0
4	1-7/8		483.0	506.0	574.0
4	2	M48	784.0	904.0	1025.0

			LOW	<b>NOM</b>	HIGH
SIZE	NPT	METRIC	FT-LBS	FT-LBS	FT-LBS
2	1/4		35.0	41.0	46.0
2,3	3/8		44.0	51.0	57.0
2,3	1/2		100.0	116.0	131.0
3	3/4		125.0	145.0	164.0
3	1		213.0	246.0	279.0
4	1-1/4		282.0	325.0	369.0
4	1-1/2		351.0	405.0	459.0

# GH24/ GHM-24 GHR-30 & GHM-30 PARTS DIAGRAM



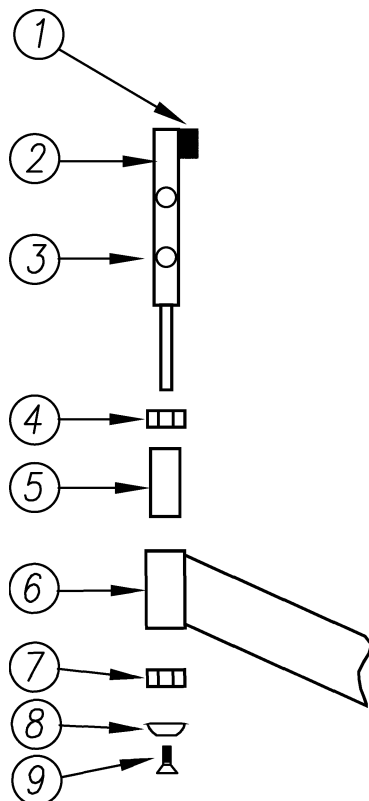
**GH-24/GHM-24 GHR-30 & GHM-30 ARM PARTS LIST**

Item No:	Part No:	Description:	QTY Used
1	G30-0021	TOP ADJUSTER (STRAIGHT)	1
2	G30-0022	TOP PLATE (SPECIFY RIGHT OR LEFT HAND)	2
3	G30-0027	CYLINDER SCREW, HEXHEAD	1
4	S_____N	FRONT CYLINDER (SHORT STYLE) SPECIFY NEWTONS	1
5	G30-0023	ARM, FRONT (GHR-30)(NO BEARINGS/PINS SEE DETAIL B)	1
5	G30-0023B	ARM, FRONT (GHM-30)(NO BEARINGS/PINS SEE DETAIL B)	1
6	G30-0024	CYLINDER PIN, FRONT (WITH 2 SCREWS)	1
7	G30-0025	ARM CNTR FRT (NO BEARINGS/PINS SEE DETAIL B)	1
8	G30-0026	FRONT PLATE (GHR)(SPECIFY RH OR LH)	2
8	G30-0065	FRONT PLATE (GHM)(SPECIFY RH OR LH)	2
9	G30-0057	HOSE 13 FT	2
10	G30-0062	FITTING	4
11	PPI-022	WASHER	4
12	G30-0067	HYDRAULIC MOTOR WITH KEY	1
13	G30-0131	GEAR BOX	1
14	G30-0511	QUICK CHANGE CHUCK	1
15	G30-0032	BASE MOUNT	1
16	G30-0033	ANGLE MOUNT (NO BEARINGS/SPACER SEE DETAIL A)	1
17	G30-0038	ANGLE MOUNT BOLT	2
19	G30-0013	BUMPER FOR ARMS	1
20	G30-0036	BOTTOM ADJUSTER	1
21	G30-MS005	ANGLE MOUNT SCREW, FLAT HEAD	1
22	G30-0034	ANGLE MOUNT WASHER WITH COUNTERSINK	1
23	G30-0037	REAR PLATE (SPECIFY RIGHT OR LEFT HAND)	2
24	G30-0035	REAR PIN	1
25	G30-0013	BUMPER FOR REAR PIN	1
26	L_____N	REAR CYLINDER (LONG STYLE) SPECIFY NEWTONS	2
27	G30-0040	ARM, REAR (INCLUDES BEARINGS & PINS)	1
28	G30-0025B	ARM CENTER REAR (WITH BUMPER)(INC BEARINGS & PINS)	1
29	G30-0018/512	FITTINGS, 3/8 QUICK CONNECT MALE & FEMALE SET	1

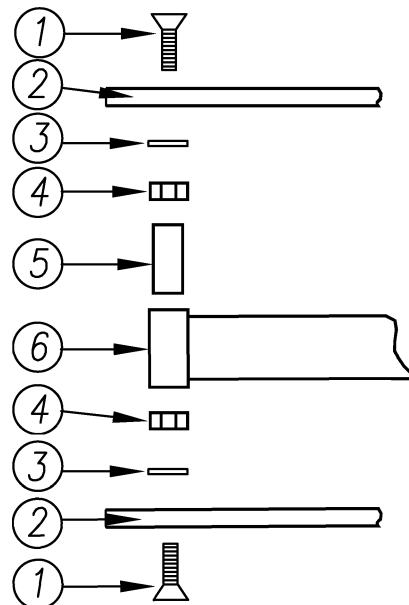
**GH-24/GHM-24, GHR-30 & GHM-30 ARM PARTS LIST**

Item No:	Part No:	Description:	QTY Used
30	G30-0509	CONTROL HANDLE WITH GASKET, BUTTONS AT THE TOP	1
	G30-0642	SCREW FOR CONTROL HANDLE	2
31	G30-0051	SWITCH FOR HANDLE FWD OR REV	2
32	G30-0650	HANDLE SUPPORT WITH RETANGULAR GASKET & SCREWS	1
33	G30-0060	MANIFOLD BLOCK FOR FRONT ARM	1
34	G30-0133	MULTI-POSITION HEAD COMPLETE	1
35	G30-0061	HOSE 3/8 DIA BLUE WITH FEMALE ENDS	2
	G30-0671	ELECTRIC CORD FROM FWD/REV TO POWER PACK	1
	G30-0612A	ELECTRIC CONNECTOR 4 PIN MALE/FEMALE SET	1

PART DIAGRAM  
DETAIL A



PART DIAGRAM  
DETAIL B  
(view from the top)



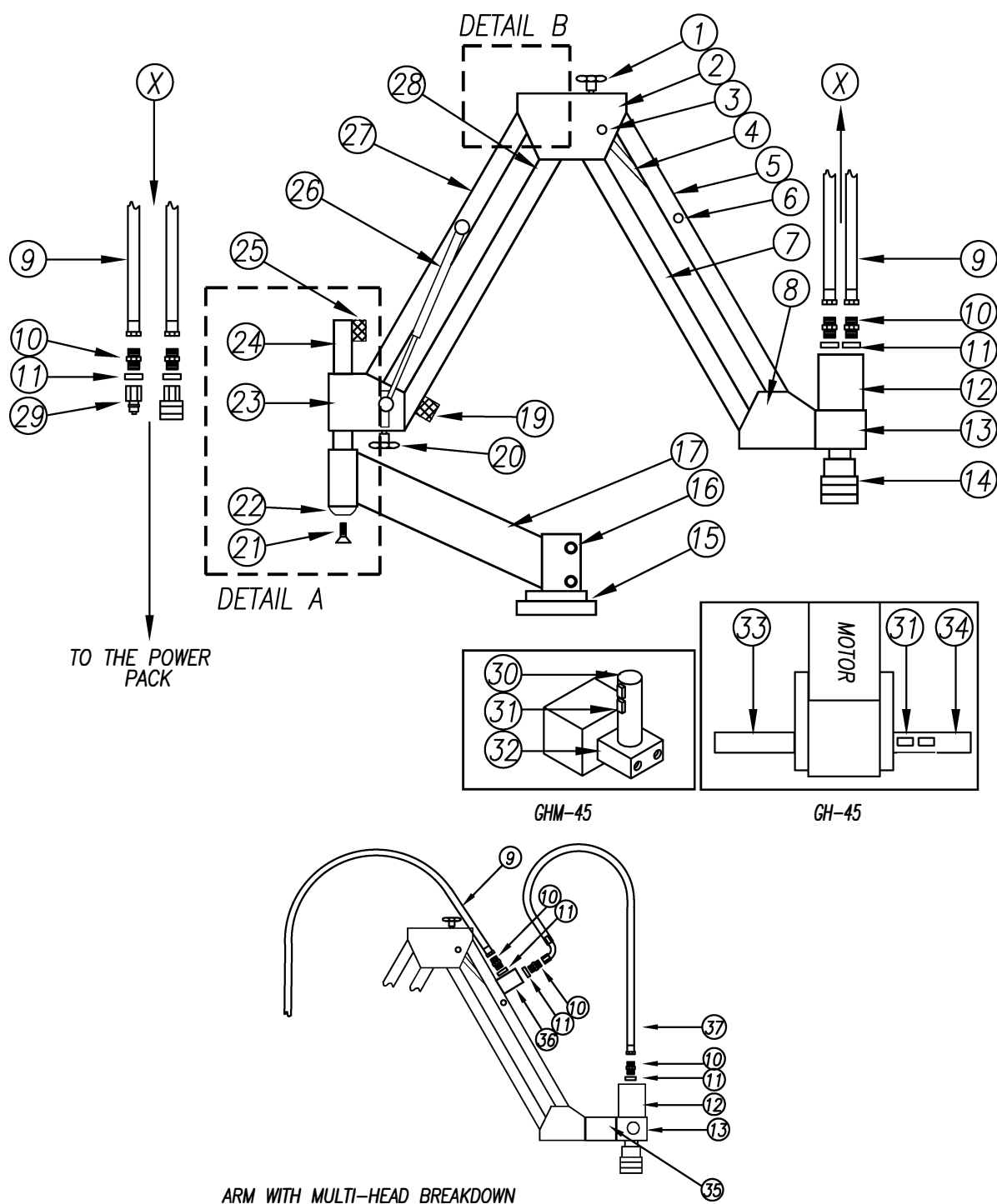
**GH-24/GHM-24, GHR-30 & GHM-30 ARM PARTS LIST**  
**FOR DETAIL A**

Item No:	Part No:	Description:	QTY Used
1	G30-0013	BUMPER FOR REAR PIN	1
2	G30-0035	REAR PIN	1
3	G30-0001	SCREW FOR REAR PIN, FLATHEAD	1
4	G30-0055	BEARING FOR ANGLE	1
5	G30-0056	BEARING SPACER FOR ANGLE	1
6	G30-0033	ANGLE MOUNT (NO BEARINGS OR SPACER)	1
7	G30-0055	BEARING FOR ANGLE	1
8	G30-0034	ANGLE MOUNT WASHER WITH COUNTERSINK	1
9	G30-MS005	ANGLE MOUNT SCREW, FLATHEAD	1

**GH-24/GHM-24,GHR-30 & GHM-30 ARM PARTS LIST**  
**FOR DETAIL B**

Item No:	Part No:	Description:	QTY Used
1	G30-0001	ARM SCREW, FLATHEAD	2
2	G30-0022	TOP PLATE (SPECIFY RIGHT OR LEFT HAND)	2
3	G30-0003	ARM WASHER	2
4	G30-0004	ARM BEARING	2
5	G30-0005	BEARING SPACER (ARM PIN)	1
6		ARM (SEE MASTER LIST)	1

## GH-45 & GHM-45 PARTS DIAGRAM





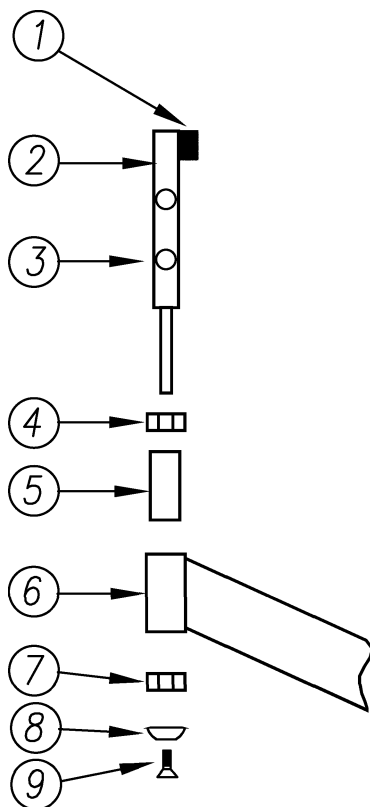
GH-45 & GHM-45 ARM PARTS LIST

Item No:	Part No:	Description:	QTY Used
1	G45-0501	TOP ADJUSTER	1
2	G45-0502	TOP PLATE (SPECIFY RIGHT OR LEFT HAND)	2
3	G45-0123B	UPPER CYLINDER CLEVIS	1
4	L_____N	FRONT CYLINDER (LONG STYLE) SPECIFY NEWTONS	1
5	G45-0503	ARM, FRONT (GH-45) (NO BEARINGS/PINS SEE DETAIL B)	1
5	G45-0503M	ARM, FRONT (GHM-45)(NO BEARINGS/PINS SEE DETAIL B)	1
6A	G45-0123A	LOWER CYLINDER CLEVIS (SQUARE)	1
6B	G45-0125	CYLINDER PIN WITH SNAP RINGS	1
7	G45-0521	ARM CNTR FRT (NO BEARINGS/PINS SEE DETAIL B)	1
8	G45-0512	FRONT PLATE (GHR)(SPECIFY RH OR LH)	2
8	G45-0554	FRONT PLATE (GHM)(SPECIFY RH OR LH)	2
9	G30-0057	HOSE 13 FT	2
10	G30-0062	FITTING	4
11	PPI-022	WASHER	4
12	G30-0067	HYDRAULIC MOTOR WITH KEY	1
13	G45-0130	GEAR BOX	1
14	G30-0511	QUICK CHANGE CHUCK	1
15	G45-0513	BASE MOUNT	1
16	G45-0126	ANGLE MOUNT SCREW, SOCKET HEAD CAP	2
17	G45-0514	ANGLE MOUNT (NO BEARINGS/SPACER SEE DETAIL A)	1
19	G45-0520B	BUMPER FOR ARMS	1
20	G45-0516	BOTTOM ADJUSTER	1
21	G30-MS005	ANGLE MOUNT SCREW, FLAT HEAD	1
22	G45-0515	ANGLE MOUNT WASHER WITH COUNTERSINK	1
23	G45-0519	REAR PLATE (SPECIFY RIGHT OR LEFT HAND)	2
24	G45-0128	REAR PIN	1
25	G45-0520C	BUMPER FOR REAR PIN	1
26	L_____N	REAR CYLINDER (LONG STYLE) SPECIFY NEWTONS	2
27	G45-0522	ARM, REAR (INCLUDES BEARINGS & PINS)	1
28	G45-0521B	ARM CENTER REAR (NO BEARINGS/PINS SEE DETAIL B)	1
29	G30-0018/512	FITTINGS, 3/8 QUICK CONNECT MALE & FEMALE SET	1
30	G30-0509	CONTROL HANDLE WITH GASKET, BUTTONS AT THE TOP	1

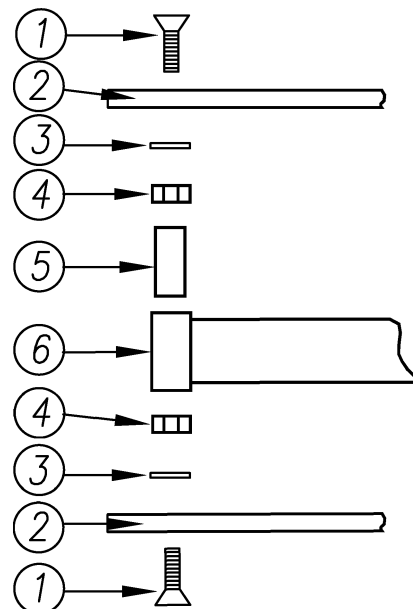
GH-45 & GHM-45 ARM PARTS LIST

Item No:	Part No:	Description:	QTY Used
31	G30-0051	SWITCH FOR HANDLE FWD OR REV	2
32	G45-0649	HANDLE SUPPORT WITH RETANGULAR GASKET & SCREWS	1
33	G45-0630	SOLID HANDLE	1
34	G45-0631	CONTROL HANDLE WITH GASKET, BUTTONS AT THE BOTTOM	1
35	G45-0129	MULTI-POSITION HEAD COMPLETE	1
	G30-0633	LEVER (SMALL) FOR MULTI-HEAD	1
	G30-0634	LEVER (LARGE) FOR MULTI-HEAD	1
36	G30-0060	MANIFOLD BLOCK FOR FRONT ARM	1
37	G30-0061	HOSE 3/8 DIA BLUE WITH FEMALE ENDS	2
	G30-0671	ELECTRIC CORD FROM FWD/REV TO POWER PACK	1
	G30-0612A	ELECTRIC CONNECTOR 4 PIN MALE/FEMALE SET	1

PART DIAGRAM  
DETAIL A



PART DIAGRAM  
DETAIL B  
(view from the top)



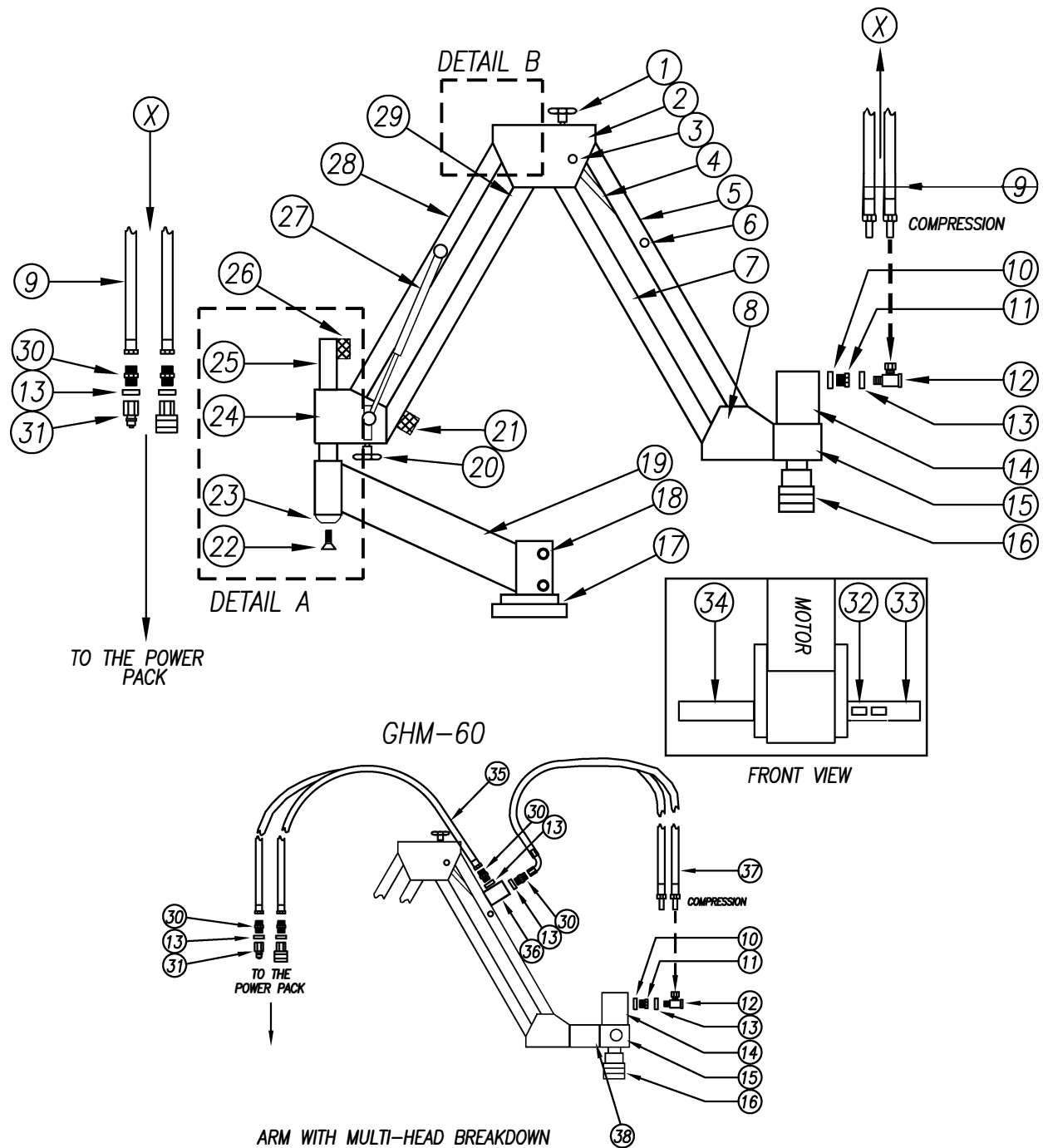
**GH-45 & GHM-45 ARM PARTS LIST**  
**FOR DETAIL A**

Item No:	Part No:	Description:	QTY Used
1	G45-0520C	BUMPER FOR REAR PIN	1
2	G45-0128	REAR PIN	1
3	G45-0127	SCREW FOR REAR PIN, FLATHEAD	1
4	G45-0526	BEARING FOR ANGLE	1
5	G45-0527	BEARING SPACER FOR ANGLE	1
6	G45-0514	ANGLE MOUNT (NO BEARINGS OR SPACER)	1
7	G45-0526	BEARING FOR ANGLE	1
8	G45-0515	ANGLE MOUNT WASHER WITH COUNTERSINK	1
9	G30-MS005	ANGLE MOUNT SCREW, FLATHEAD	1

**GH-45 & GHM-45 ARM PARTS LIST**  
**FOR DETAIL B**

Item No:	Part No:	Description:	QTY Used
1	G45-0127	ARM SCREW, FLATHEAD	2
2	G45-0502	TOP PLATE (SPECIFY RIGHT OR LEFT HAND)	2
3	G45-0523	ARM WASHER	2
4	G45-0524	ARM BEARING	2
5	PM 0190	BEARING SPACER (ARM PIN)	1
6		ARM (SEE MASTER LIST)	1

## GH-60 & GHM-60 PARTS DIAGRAM



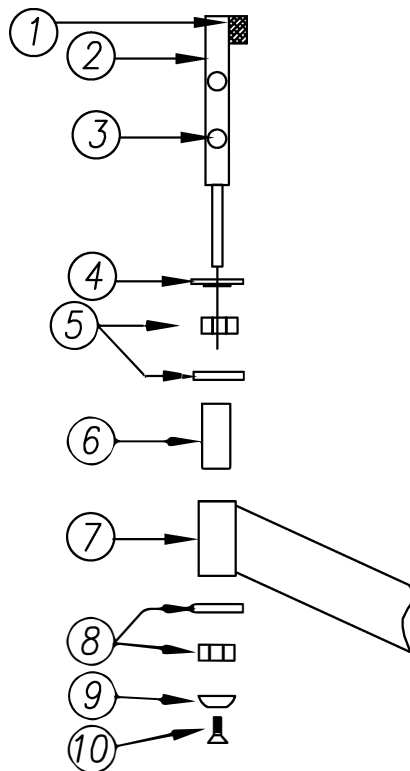
GH-60 & GHM-60 ARM PARTS LIST

Item No:	Part No:	Description:	QTY Used
1	G60-0499	TOP ADJUSTER	1
2	G60-0682	TOP PLATE (SPECIFY RIGHT OR LEFT HAND)	2
3	G45-0123B	UPPER CYLINDER CLEVIS	1
4	L-1500N	FRONT CYLINDER	1
5	G60-0683	ARM, FRONT (GH-60)(NO BEARINGS/PINS SEE DETAIL B)	1
5	G60-0683B	ARM, FRONT (GHM-60)(NO BEARINGS/PINS SEE DETAIL B)	1
6A	G60-0123A	LOWER CYLINDER CLEVIS (SQUARE)	1
6B	G60-0124	CYLINDER PIN WITH SNAP RINGS	1
7	G60-0684	ARM CNTR FRT (NO BEARINGS/PINS SEE DETAIL B)	1
8	G60-0685	FRONT PLATE (GHR)(SPECIFY RH OR LH)	2
8	G60-0686	FRONT PLATE (GHM)(SPECIFY RH OR LH)	2
9	G60-0068	HOSE 13 FT	2
10	PPI-040	WASHER	2
11	G60-0508	FITTING, REDUCER	2
12	G60-0504	FITTING, SWIVEL	2
13	PPI-0022	WASHER	4
14	G60-0551	HYDRAULIC MOTOR WITH KEY	1
	G60-0750	COVER HYDRAULIC MOTOR	1
15	G60-0132	GEAR BOX SINGLE KEY WAY	1
	G60-0133	GEAR BOX DUAL KEY WAY	1
16	G60-0543	QUICK CHANGE CHUCK SINGLE KEY WAY	1
	G60-0544	QUICK CHANGE CHUCK DUAL KEY WAY	1
17	G60-0687	BASE MOUNT	1
18	G45-0126	ANGLE MOUNT SCREW, SOCKET HEAD CAP	2
19	G60-0688	ANGLE MOUNT (NO BEARINGS/SPACER SEE DETAIL A)	1
20	G60-0500	BOTTOM ADJUSTER	1
21	G60-0520D	ARM BUMPER	1
22	G30-MS005	ANGLE MOUNT SCREW, FLAT HEAD	1
23	G60-0689	ANGLE MOUNT WASHER WITH COUNTERSINK	1
24	G60-0690	REAR PLATE (SPECIFY RIGHT OR LEFT HAND)	2
25	G60-0691	REAR PIN	1
26	G60-0520E	BUMPER FOR REAR PIN	1
27	L-1500N	REAR CYLINDER	2

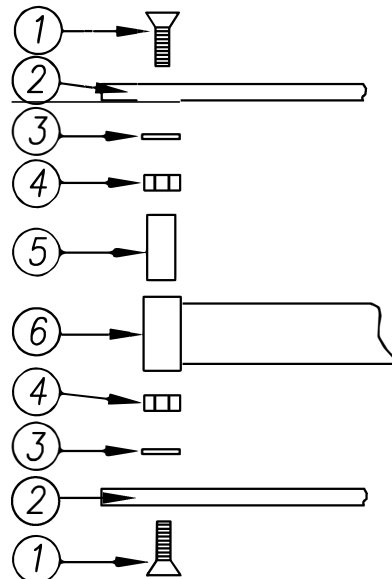
**GH-60 & GHM-60 ARM PARTS LIST**

Item No:	Part No:	Description:	QTY Used
28	G60-0692	ARM, REAR (NO BEARINGS/PINS SEE DETAIL B)	1
29	G60-0693	ARM CENTER REAR (NO BEARINGS/PINS SEE DETAIL B)	1
30	G30-0062	FITTING	1
31	G30-0018/512	FITTINGS, 3/8 QUICK CONNECT MALE & FEMALE SET	1
32	G30-0051	SWITCH FOR HANDLE FWD OR REV	2
33	G45-0631	CONTROL HANDLE WITH GASKET, BUTTONS AT THE BOTTOM	1
34	G45-0630	SOLID HANDLE	1
35	G30-0057	HOSE 3/8 DIA X 13 FT	2
36	G30-0060	MANIFOLD BLOCK FOR FRONT ARM	1
37	G60-0063	HOSE 3/8 DIA BLUE WITH MALE & FEMALE ENDS	2
38	G60-0134	MULTI-POSITION HEAD COMPLETE	1
39	G30-0509	CONTROL HANDLE WITH GASKET, BUTTONS AT THE TOP	1
	G30-0671	ELECTRIC CORD FROM FWD/REV TO POWER PACK	1
	G30-0612A	ELECTRIC CONNECTOR 4 PIN MALE/FEMALE SET	1
40	G45-0649	HANDLE SUPPORT WITH RECTANGULAR GASKET & SCREWS	1

PART DIAGRAM  
DETAIL A



PART DIAGRAM  
DETAIL B  
(view from the top)



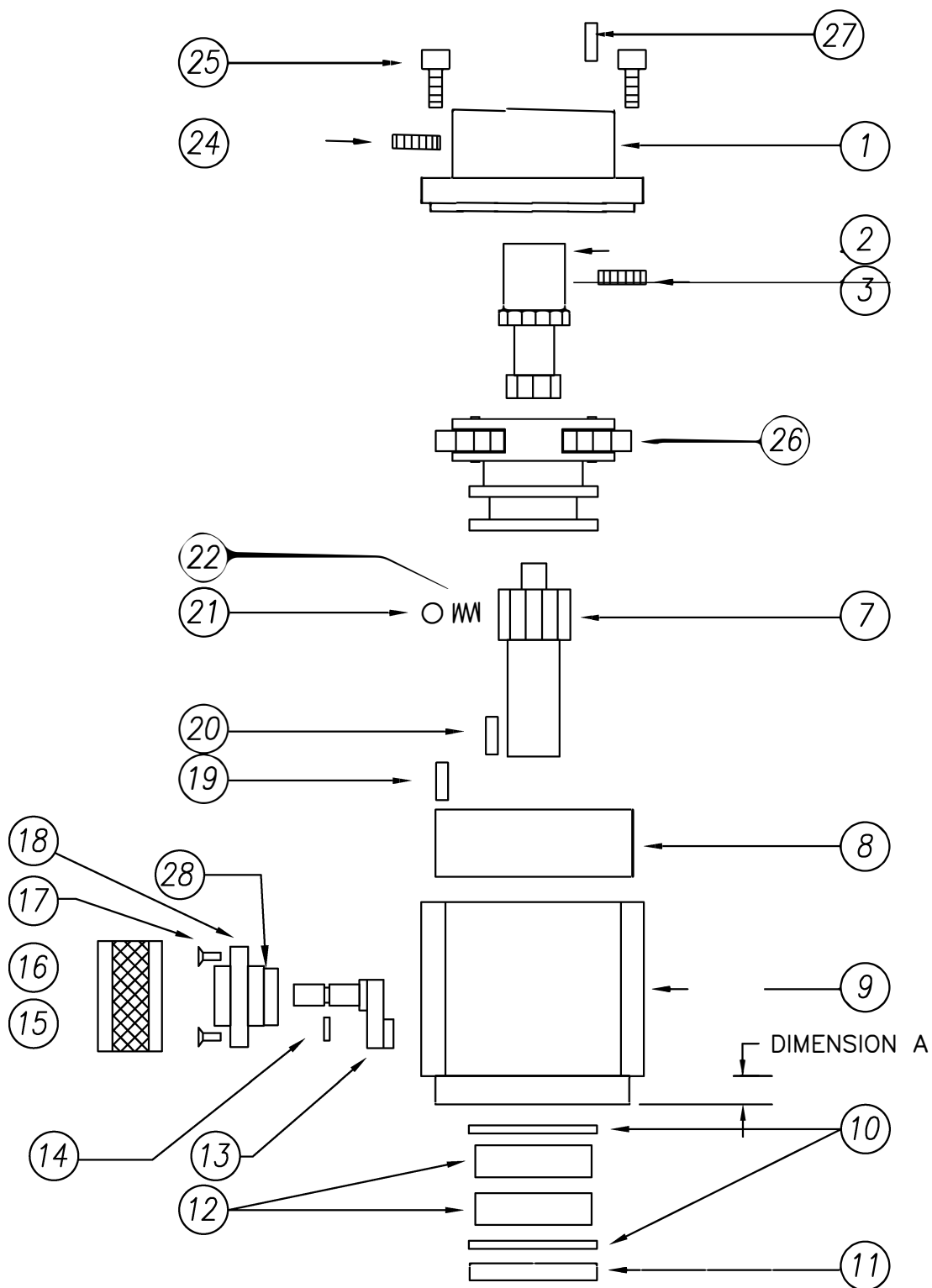
**GH-60 & GHM-60 ARM PARTS LIST**  
**FOR DETAIL A**

Item No:	Part No:	Description:	QTY Used
1	G60-0520E	BUMPER FOR REAR PIN	1
2	G60-0691	REAR PIN	1
3	G60-MS003	SCREW FOR REAR PIN, FLATHEAD	1
4	G60-0413	WASHER TOP OF ANGLE AT REAR PIN	1
5	G60-0071	BEARING & CUP	1
6	G60-0072	BEARING SPACER	1
7	G60-0688	ANGLE MOUNT (NO BEARINGS OR SPACER)	1
8	G60-0071	BEARING & CUP	1
9	G60-0689	ANGLE MOUNT WASHER WITH COUNTERSINK	1
10	G30-MS005	ANGLE MOUNT SCREW, FLATHEAD	1

**GH-60 & GHM-60 ARM PARTS LIST**  
**FOR DETAIL B**

Item No:	Part No:	Description:	QTY Used
1	G60-MS003	ARM SCREW, FLATHEAD	2
2	G60-0682	TOP PLATE (SPECIFY RIGHT OR LEFT HAND)	2
3	G60-0075	ARM WASHER	2
4	G60-0073	ARM BEARING	2
5	G60-0074	BEARING SPACER (ARM PIN)	1
6		ARM (SEE MASTER LIST)	1

## 2 SPEED GEARBOX – PARTS DIAGRAM



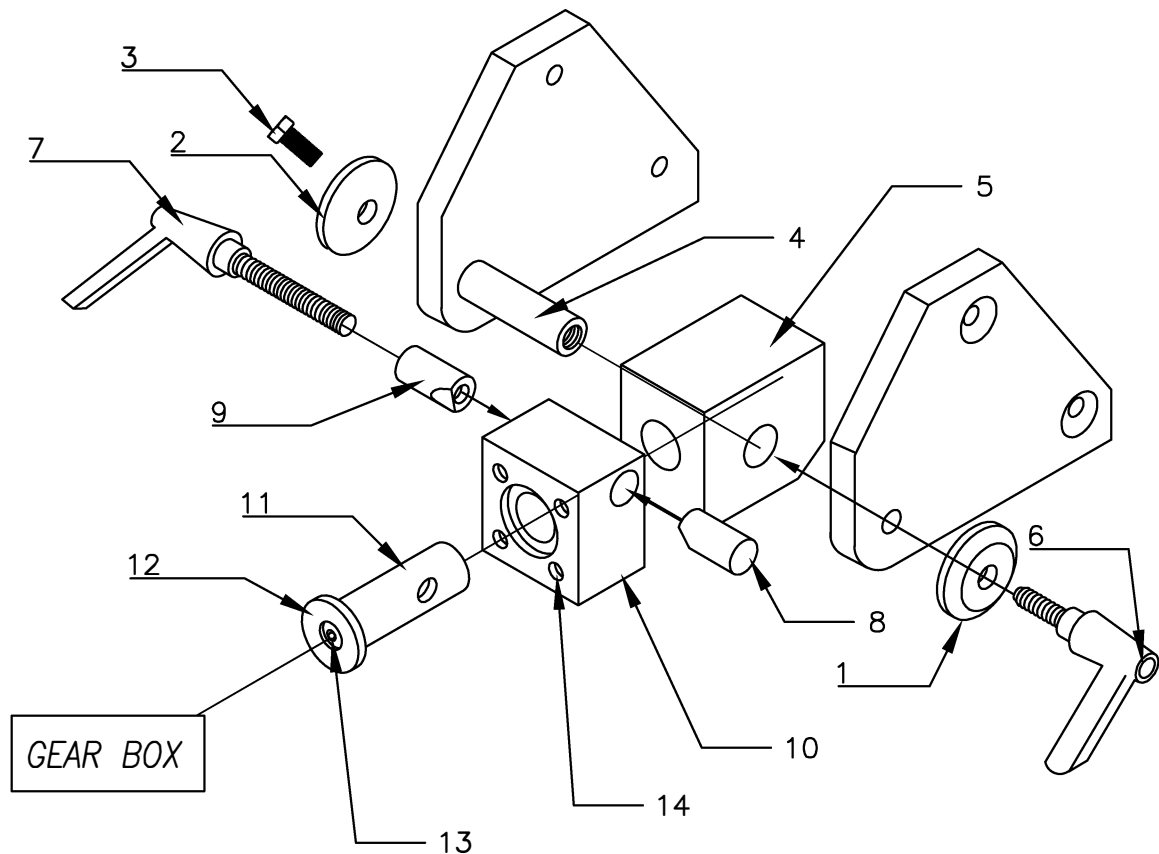


## 2 SPEED GEARBOX – PARTS

Item No:	Part No: GHR-30 GHM-30	Part No: GH-45 GHM-45	Part No: GH-60 GHM-60	Part No: GH-60 GHM-60	Description:	QTY Used
	NA	NA	.596	1.296	DIMENSION A	NA
	SINGLE	SINGLE	SINGLE	DUAL	NO OF KEYS ON SPINDLE	
1	2GB-001	3GB-001	4GB-001	4GB-001	GEAR BOX FLANGE	1
2	2GB-002	3GB-002	4GB-002	4GB-026	DRIVE GEAR	1
3	2GB-003	3G-B003	4GB-003	4GB-003	SET SCREW	1
7	2GB-007	3GB-007	4GB-007	4GB-031	DRIVE SPINDLE	1
8	2GB-008	3GB-008	4GB-008	4GB-032	RING GEAR	1
9	2GB-009	3GB-009	4GB-009	4GB-033	HOUSING	1
10	2GB-010	2GB-010	2GB-010	4GB-034	SNAP RING	2
11	2GB-011	2GB-011	2GB-011	4GB-035	BEARING SEAL	1
12	2GB-012	2GB-012	2GB-012	4GB-036	BEARING	2
13	2GB-013	3GB-013	4GB-013	4GB-044	GEAR SELECTOR (HI/LOW)	1
14	2GB-014	3GB-014	4GB-014	4GB-014	O RING	1
15	2GB-015	2GB-015	4GB-015	4GB-015	SET SCREW	1
16	2GB-016	2GB-016	4GB-016	4GB-016	DIAL KNOB	1
17	2GB-017	3GB-017	4GB-017	4GB-017	FLAT HEAD SCREW	2
18	2GB-018	3GB-018	4GB-018	4GB-045	SELECTOR ADAPTER	1
19	2GB-019	3GB-019	4GB-019	4GB-037	ROLL PIN	1
20	2GB-020	2GB-020	2GB-020	4GB-038	KEY FOR SPINDLE	1 OR 2
21	2GB-021	2GB-021	2GB-021	2GB-021	BALL	1
22	2GB-022	2GB-022	2GB-022	2GB-022	SPRING	1
24	2GB-024	2GB-024	NONE	NONE	SET SCREW	1
25	2GB-025	2GB-025	4GB-025	4GB-025	SOCKET SCREW	4
26	2GB-026	3GB-026	4GB-042	4GB-043	CARRIER ASSEMBLY	1
27	1GB-020	2GB-020	2GB-020	360410	KEY (MOTOR TO DRIVE GEAR)	1
28	NONE	NONE	NONE	4GB-046	O RING	

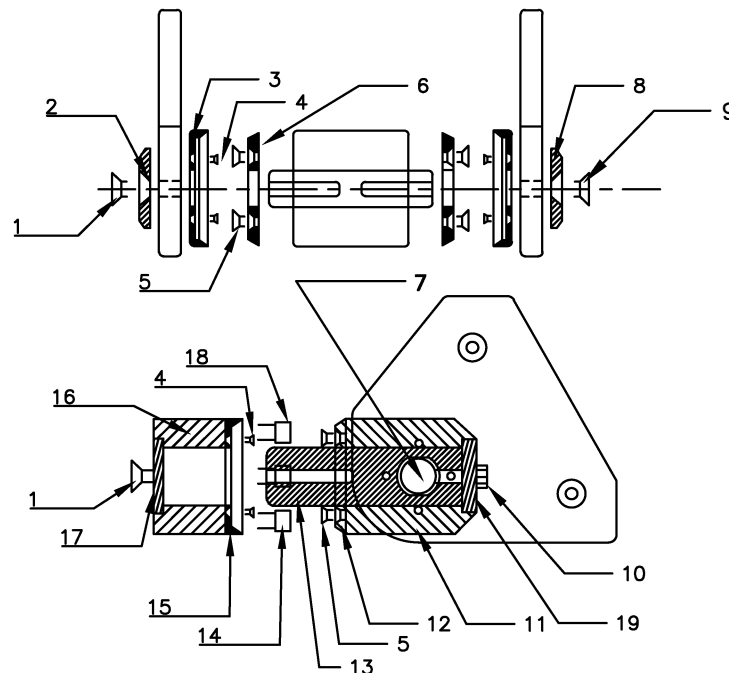
REV 1-17-14

# GHM-24 MULTI-HEAD – PARTS



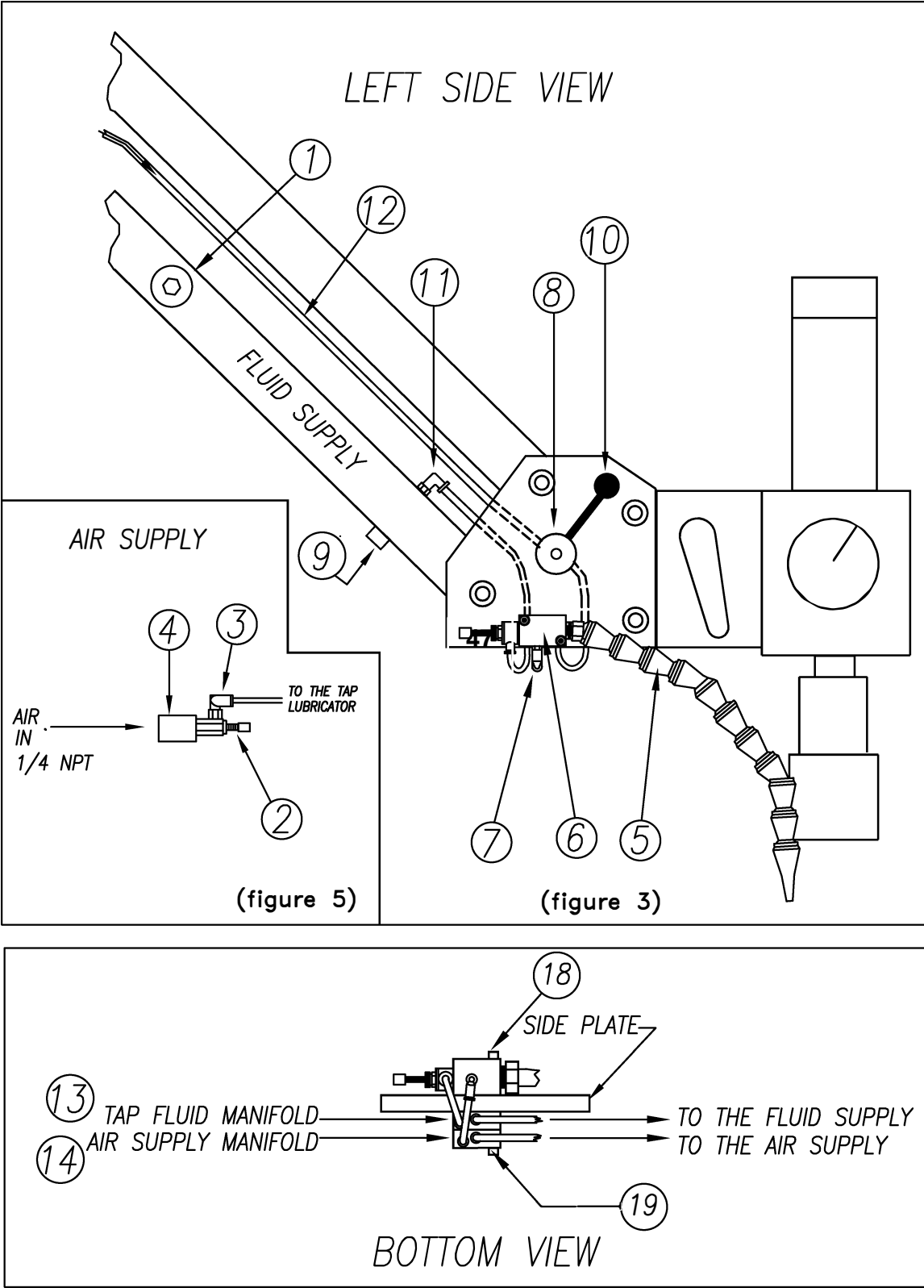
Item No:	Part No:	Description:	QTY Used
1	G30-0031	WASHER WITHOUT COUNTER SINK	1
2	G30-0034	WASHER WITH COUNTER SINK	1
3	G30-MS005	SCREW FLAT HEAD	1
4	G30-0700	LATERAL PIN	1
5	G30-0701	REAR ALUMINUM BLOCK	1
6	G30-0634	LEVER (LARGE) FOR MULTI-HEAD	1
7	G30-0633	LEVER (SMALL) FOR MULTI-HEAD	1
8	G30-0702	THREADED BRAKE (BRASS)	1
9	G30-0703	SPACER BRAKE (BRASS)	1
10	G30-0704	FRONT ALUMINUM BLOCK	1
11	G30-0705	CENTER PIN	1
12	G30-0706	WASHER FRONT WITH COUNTERSINK	1
13	G30-0707	SCREW	1
14	G30-0708	SOCKET HEAD CAP SCREW	4

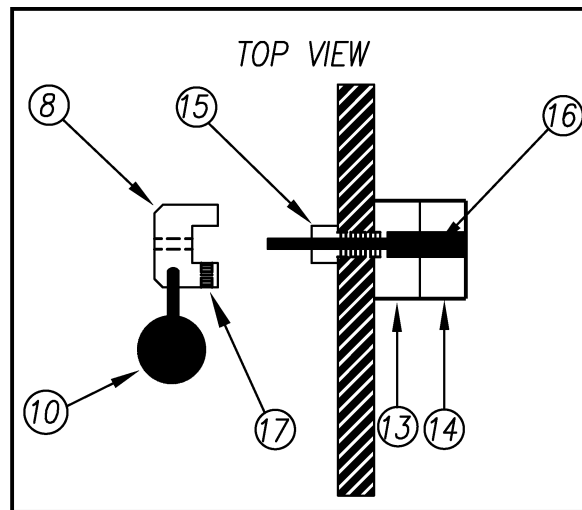
# GHM30,45, &60 Multi-Head Parts



Item No:	GHM 45 Part No:	GHM 60 Part No:	Description:	QTY Used
1	G45-0127	G45-0127	FLAT HEAD SCREW	2
2	G45-0703	G45-0515	WASHER WITH C'SINK	1
3	G45-0706	G60-0403	LATERAL FEMALE BRAKE	2
4	G45-0707	G45-0707	FLAT HEAD SOCKET SCREW	12
5	G45-0708	G45-0708	FLAT HEAD SOCKET SCREW	12
6	G45-0709	G60-0404	LATERAL MALE BRAKE (BRASS)	2
7	G45-0710	G60-0405	LATERAL PIN	1
8	G45-0702	G60-0402	WASHER W/O C'SINK	1
9	G45-0711	G60-0406	HEX HEAD BOLT	1
10	G45-0712	G60-0407	HEX HEAD BOLT	1
11	G45-0713	G60-0408	REAR ALUMINUM BLOCK	1
12	G45-0714	G60-0409	CENTER MALE BRAKE (BRASS)	1
13	G45-0715	G60-0410	CENTER PIN	1
14	G45-0716	G45-0716	SOCKET HEAD CAP SCREW	4
15	G45-0717	G60-0411	CENTER FEMALE BRAKE	1
16	G45-0718	G60-0412	FRONT ALUMINUM BLOCK	1
17	G45-0705	G60-0401	WASHER WITH C'SINK	1
18	G45-0701	G45-0701	SOCKET HEAD CAP SCREW	2
19	G45-0704	G60-0400	WASHER W/O C'SINK	1

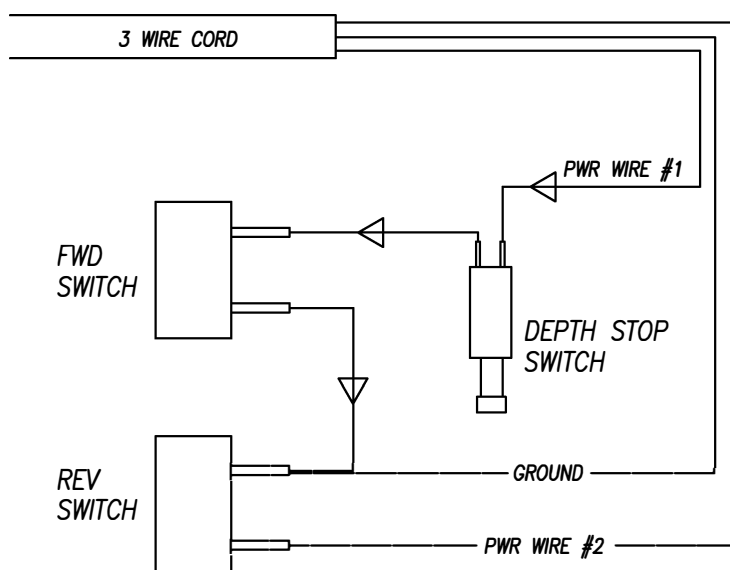
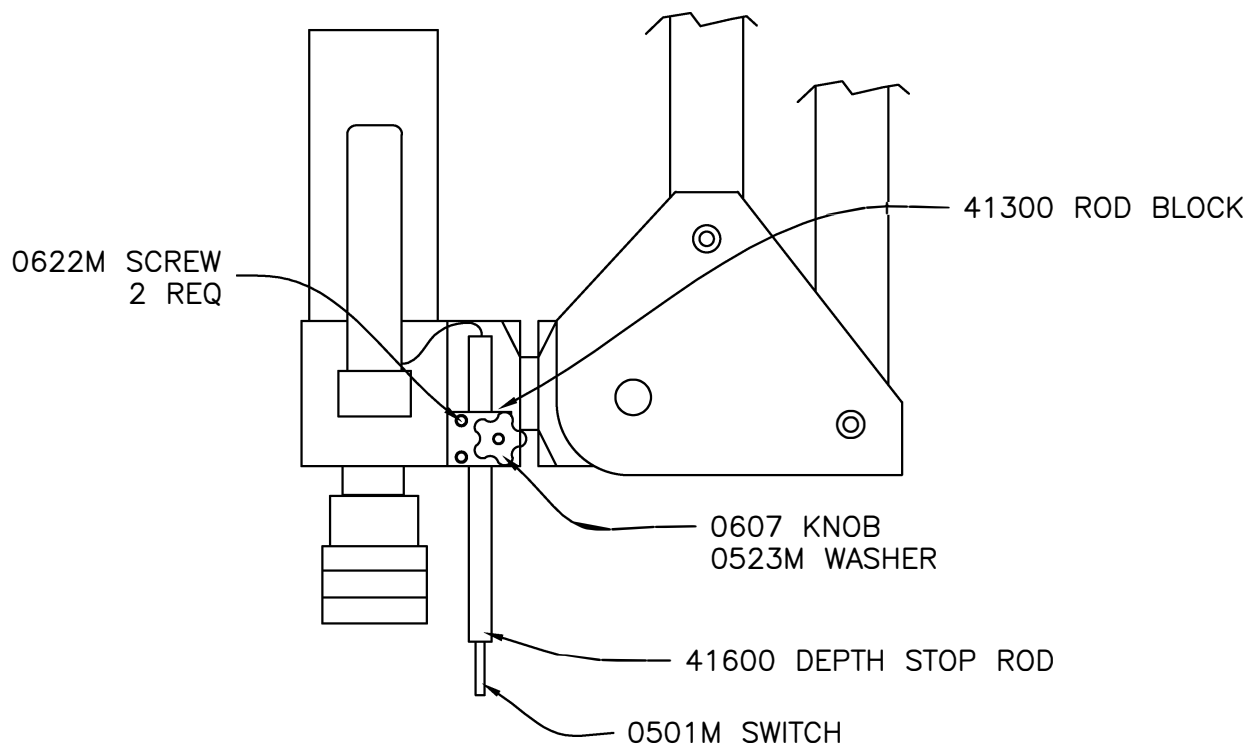
SEMI TAP LUBRICATOR



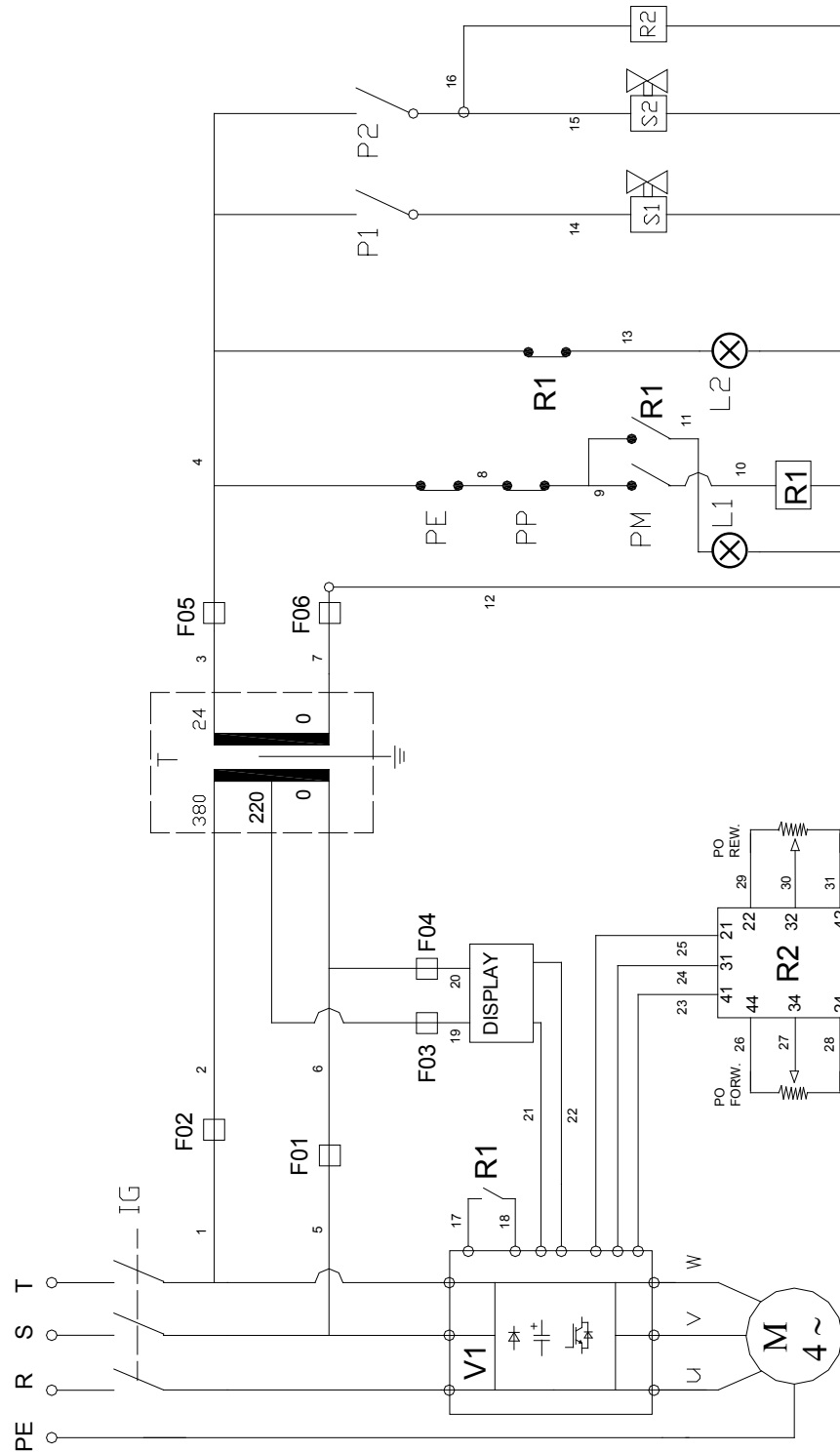
SEMI TAP LUBRICATOR

Item No:	Part No:	Description:	QTY Used
1	RNR 038	FILL PLUG	1
2	LS010	AIR FLOW CONTROL VALVE	1
3	0504M	ELBOW FITTING PUSH-RELEASE	1
4	0515M	MANIFOLD BLOCK	1
5	LS012	NOZZLE (DOES NOT INCLUDE INTERNAL FLUID HOSE)	1
6	LS014	MANIFOLD WITH NOZZLE & INTERNAL FLUID HOSE	1
			1
7	LS013	ELBOW FITTING	1
8	LS001	LEVER SLEEVE	1
9	LS015	FLUID DRAIN PLUG	1
10	LS002	LEVER WITH KNOB	1
11	LS005	ELBOW FITTING FOR ARM	1
12	360033	TUBING BLACK (SOLD PER INCH)	80
13	LS007	FLUID MICRO VALVE (204ma)	1
14	LS006	AIR MICRO VALVE (304ma)	1
15	LS003	FITTING (THREADED INTO PLATE)	1
16	LS004	LEVER AXLE TO STEP	1
17	LS008	SET SCREW FOR LEVER	1
18	LS009	SOCKET HEAD CAP SCREW (SHORT)	2
19	LS016	SOCKET HEAD CAP SCREW (LONG)	2

## Mechanical Depth Stop



## Electric Diagram

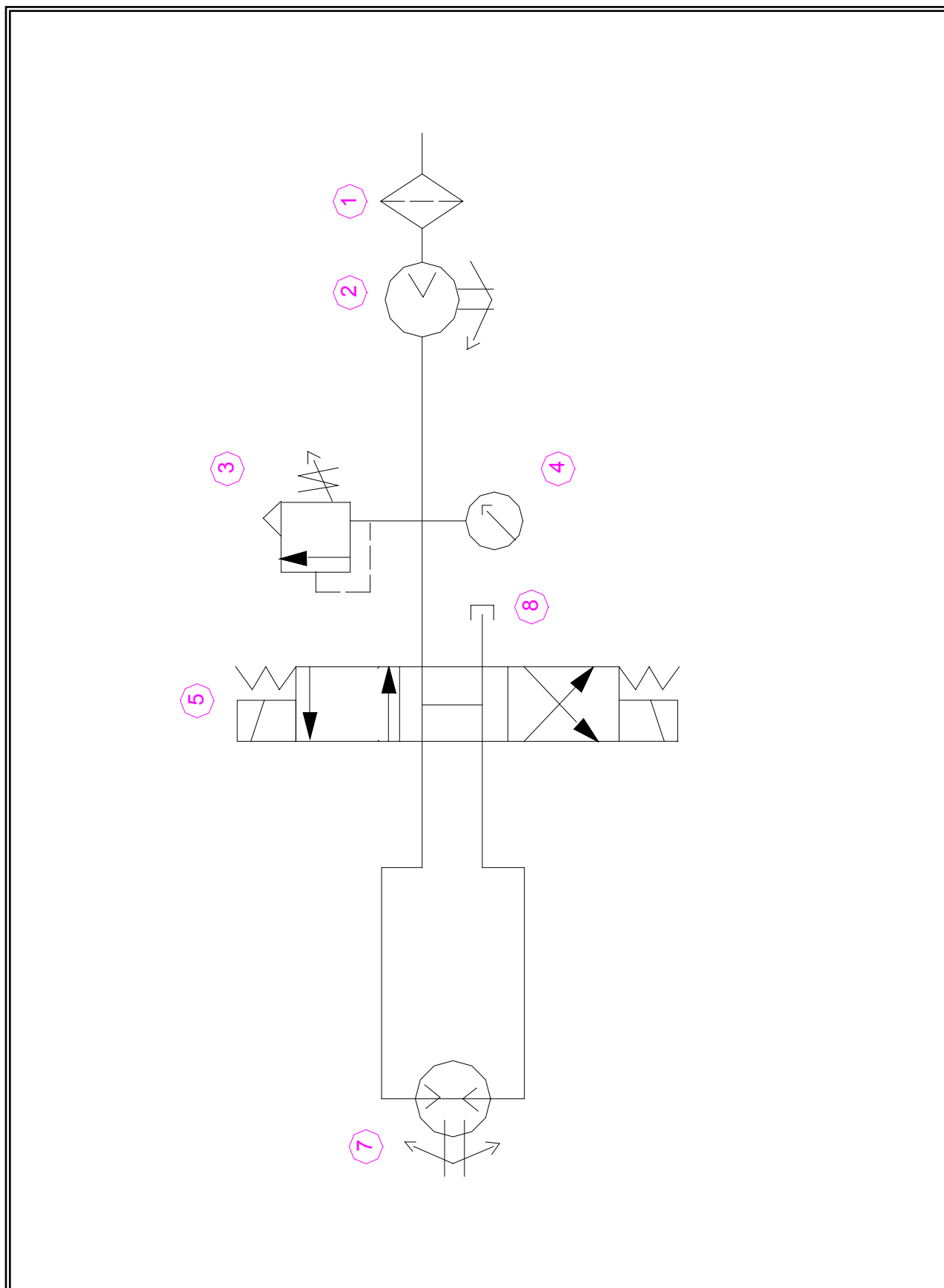


**Electrical parts list**

Nº Pos	Diagram symbol	Type of component	Brand
1	-	Binding clamp 39061	LEGRAND
2	R1	Relay 24v AC	RELECO
3	C1	Relay 24v DC	RELECO
4	F1-F8	Fuse Holder 8,5 x 31,5 25 A	PM
5	F1-F8	Fuse 2ª	PH
6	T	<b>Transformer</b> Type M / NEW is RENNO 200-380-440, 24VAC, 70VA. #200755, Replaces IVALEX	IVALEX
7	PR	Bridge rectifier FB2504	FAGOR
8	IG	Main Switch LE 2-25-1754-NG	SPRECHEN+SCHUN
9	PE	Emergency Stop ZB4 BS 54	TELEMECANIQUE
10	PP	Stop Switch ZB4 BW 34 / Pulsador paro ZB4 BW 34	TELEMECANIQUE
11			TELEMECANIQUE
12	PM	Start switch ZB4 BW 33 / Pulsador marcha ZB4 BW 33	VO
13	P1 – P2	Forward and reverse switches	HARTING
14	-	Connector Han-Kit-3 AGM	OMROM
	V1	Inverter	Weg



		<p><b>#203055</b> Gavazzi multi function timer (<b>Motor Protector</b>) DMB51CM24 for Inverter Packs</p> <p><b>#211083</b> Toscano multi function timer (<b>Motor Protector</b>) TPM-SS-303 <u>for old packs</u> #0037-R</p> <p><b>#200418</b> FUSE, 5-20, 4 AMP, #0022-R</p> <p><b>#203213</b> WEG 480V Inverter Driver CFW500B10O0T4DB20C3H00</p>	
--	--	---	--

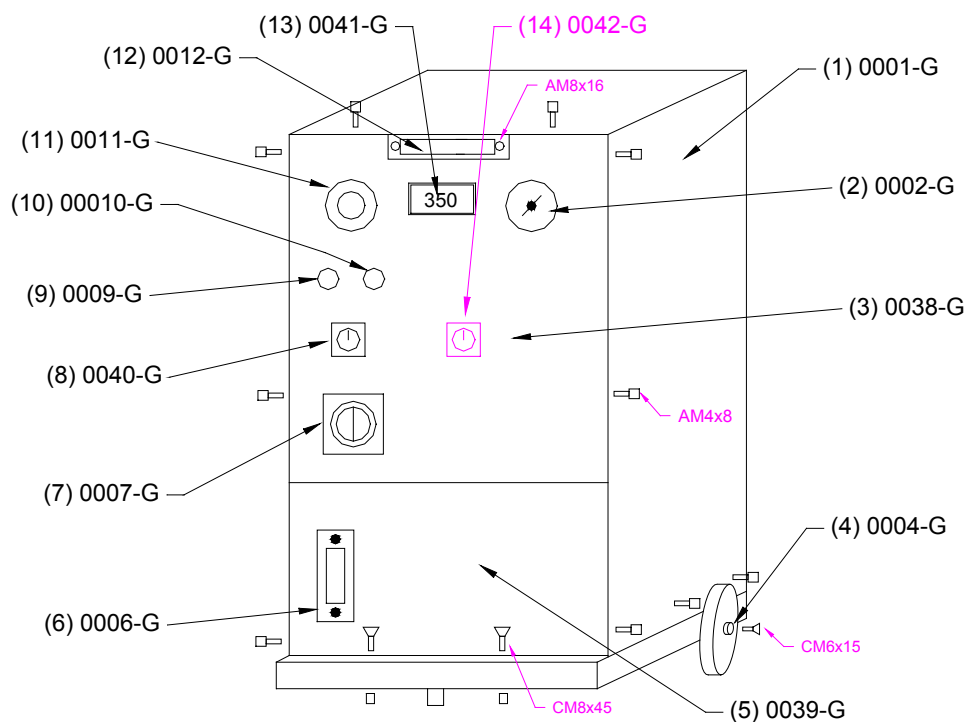
**Hydraulic diagram**

**Hydraulic Diagram parts list**

<b>N° Pos</b>	<b>Type of component</b>	<b>Brand</b>
1	Filter suction	STM
2	Gear pump	SALAMI
3	Base plate with security limiter PB1001MPB TN06+V.SEG.Sal.mixtas 3/8"	ROGIMAR
4	Manometer – D.63MM 1/4" BR/COCHE 213.53063-D (315BAR)	DOR
5	Electrovalve – NG6 4D01 3201 0302 B1GOQ	DENISSON
6		
7	Hydraulic motor 50 cc [100 cc for GH-60]	DANFOSS
8	Oil tank	FlexArm

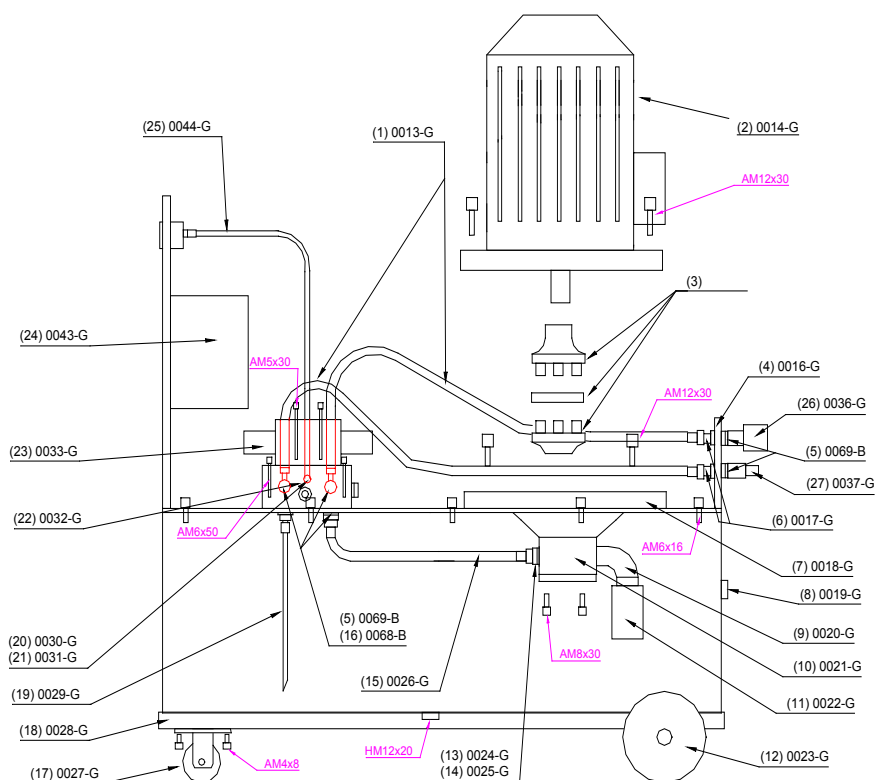
Nº	Name	Ref.
1	Group cap	0001-G
2	Manometer	0002-G
3	Switch pannel	0038-G
4	Wheel setbolt	0004-G
5	Oil tank	0039-G
6	Oil level	0006-G
7	Master switch	0007-G
8	Speed governor	0040-G
9	Start switch	0009-G
10	Stop switch	0010-G
11	Emergency switch	0011-G
12	Hold group	0012-G
13	Digital tachometer	0041-G
14	Speed switch on readout	0042-G

	Allen screw (M8x16)	AM8x16
	Allen screw (M4x8)	AM4x8
	Sunk screw (M6x15)	CM6x15
	Sunk screw (M8x45)	CM8x45



N°	Name	Ref.
1	Hydraulic hose 3/8" (CR/0.650)	0013-G
2	Electir motor 4 HP	0014-G
3	Flexible coupling	0015-G
4	Kit electric connector	0016-G
5	Washer 3/8	0069-B
6	Wall chisel 3/8	0017-G
7	Oil belt	0018-G
8	Delivery tap	0019-G
9	Filter elbow	0020-G
10	Gear pump 12 l.	0021-G
11	Filter suction	0022-G
12	Rear wheels	0023-G
13	Washer 1/2	0024-G
14	Raccord MM3/8-1/2	0025-G
15	Hydraulic hose 3/8" (RR/0.360)	0026-G
16	Raccord MM3/8	0068-B
17	Small wheel	0027-G
18	Chasis	0028-G
19	Discharge pipe	0029-G
20	Washer 1/4	0030-G
21	Raccord manometer	0031-G
22	Base plate with security limitator	0032-G
23	Electrovalve	0033-G
24	Inverter	0043-G
25	Manometer hose	0044-G
26	Hydraulic fitting female 3/8	0036-G
27	Hydraulic fitting male 3/8	0037-G

	Allen screw (M12x30)	AM12x30
	Allen screw (M8x30)	AM8x30
	Drain plug (M12x20)	HM12x20
	Allen screw (M4x8)	AM4x8
	Allen screw (M6x50)	AM6x50
	Allen screw (M5x30)	AM5x30
	Allen screw (M6x16)	AM6x16



## SPECIFICATIONS

### HYDRAULIC OIL

This unit has been factory tested and is shipped with hydraulic oil in the tank. The tank holds a maximum of 9 gallons of hydraulic oil. Check the oil level on the oil level/temperature gauge on the front of the power pack.

## WARNING!

*Do not operate the machine if the oil level is BELOW the RED DOTTED LINES on the oil level/temperature gauge. Do not add oil while the machine is operating. Turn off the machine, disconnect the power supply and allow the unit to cool down to 80° or less before adding more hydraulic oil.*

To add oil, unscrew the cap on the oil tank at the back of the power pack. Using a funnel with a flexible spout, pour the oil slowly into the tank and check the oil level/temperature gauge as it is being added. ***DO NOT FILL ABOVE THE BLACK DOTTED LINES AT THE TOP OF THE OIL LEVEL/TEMPERATURE GAUGE.***

**The following (ISO Grade 46 compatible) hydraulic oils  
are recommended for use in  
the FlexArm Hydraulic Tapping Machines**

<b><i>Brand Name</i></b>	<b><i>Manufacturer</i></b>
<b>ENERGOL HLP 46</b>	BP/VERKOL
<b>DTE 25</b>	MOBIL SHELL
<b>TELLUS 46</b>	CASTROL EXXON
<b>HYPIN AWS 46</b>	GULF TEXACO
<b>NUTO HP 46</b>	
<b>HYDRASIL 46 AW</b>	
<b>RANDO OIL HD 46</b>	

## REMOVING THE COVERS

- 1) Turn off the power supply.
- 2) Remove the two hydraulic lines and the electrical connector from the back of the power pack.
- 3) Remove the socket head cap screws from the top cover plate. The top cover can now be removed.
- 4) To remove the side/back cover start by removing the side door from the power pack cover. The two door pins are held on with e-clips.
- 5) Remove all the socket head cap screws holding the cover onto the power pack. Remove the cover from the power pack being careful not to damage the locking mechanism for attaching the electrical connector.

## CHECKING THE PRESSURE

- 1) Remove the two hydraulic lines from the back of the power pack.
- 2) Turn the flow valve all the way open (counter clockwise)
- 3) Depress either the forward or reverse button on the control handle while reading the bar gage. The setting should be 170 to 180 bar.

## SETTING THE PRESSURE

If after checking the pressure as described above, it is determined that the pressure needs to be adjusted start by:

- 1) Remove the top cover plate.
- 2) Loosen the locking nut on the side of the pressure plate (item 29). Once this nut is loose, you can turn the allen head adjusting screw to set the pressure. (clockwise to increase and counter clockwise to decrease).
- 3) Depress either the forward or reverse button on the taper handle and adjust the pressure while depressing the button to 170 to 180 bar.
- 4) Tighten the locking nut once the pressure has been set.
- 5) Reassemble in reverse order.

## Removing the Forward & Reverse Switch

Remove the forward or reverse switch by carefully inserting a small screwdriver into the short side of the switch. Apply light pressure to pop it out of the handle.

**Note:** If either of the two plastic retainers holding the switch breaks, the switch must be replaced.

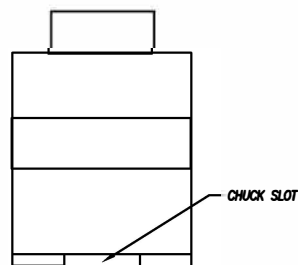
Pull the switch out of the handle. It may be necessary to feed additional wire into the handle to make the switch leads easily accessible. Make sure the covering on the wires remains intact all the way up to the switch.

## REMOVING THE CHUCK

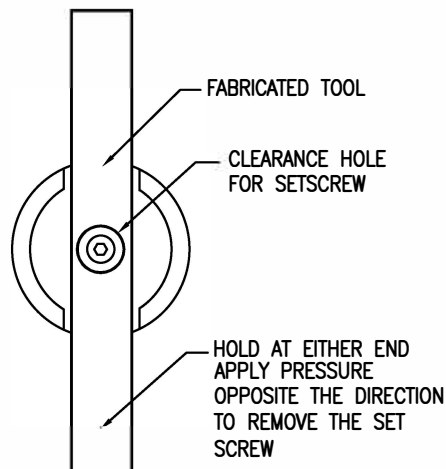
The chuck on the Gh24, GH30 and the GH-45 is held on by a right hand, 8mm, socket head cap screw or hex head bolt. To remove the chuck you must remove this bolt with an allen wrench. However, if you cannot hold the chuck and remove the bolt, you may have to make a tool to assist you. Use a piece of steel having a width slightly less than the width of the slot in the chuck. In the center of the steel, place a hole large enough for the allen wrench or socket extension to go through. This steel will give you the holding leverage necessary to break the bolt free. (See included figure) If the chuck doesn't come off immediately after removing the screw, it may be necessary to gently tap the edge of the chuck with a rubber mallet.

Reassemble the new chuck in the reverse order

*FRONT VIEW OF THE CHUCK*



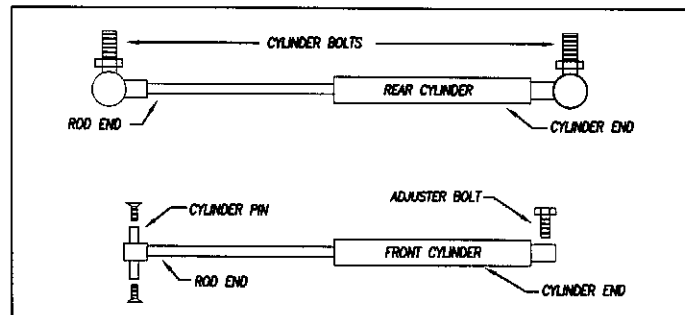
*BOTTOM VIEW  
OF THE CHUCK*



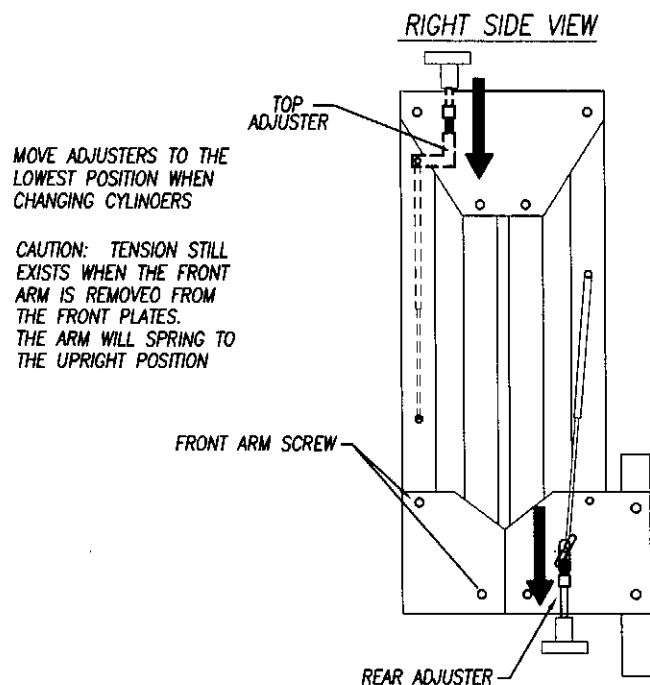
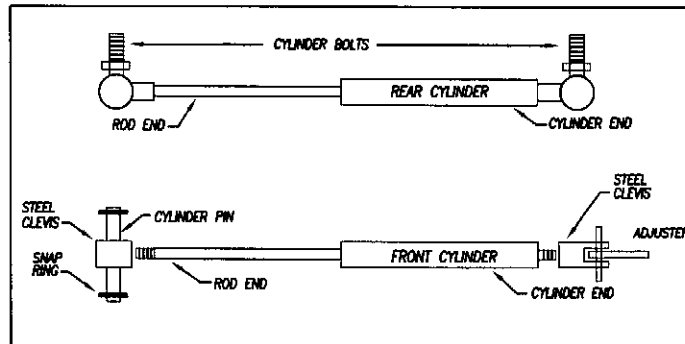


## Hydraulic Cylinder Replacement Diagram

*Models G-30, GHR-30, GHM-30, GH-24, GHM-24*



*MODELS G-36, GH-45, GHM-45, GH-60, GHM-60*



Replacement pressure cylinders have a one year limited warranty from the date of purchase. When replacing one of the pressure cylinders, make sure not to scratch, mar or nick the shaft on either the old cylinder being replaced or the new cylinder being installed. All warranty cylinders must be returned to Midwest Specialties for evaluation. The warranty is void if the cylinder to be evaluated shows sign of scratches or nicks on the cylinder shaft.

## **Hydraulic Cylinder Replacement Instructions:**

### **Rear Cylinder Replacement: (ALL Hydraulic Tappers)**

- 01)** With the FlexArm extended, turn the handle until the adjuster reaches the bottom most position in the slot. This removes all tension from the two cylinders. (having the arm extended makes it easier to turn the adjuster handle)
- 02)** Change only one cylinder at a time (this prevents the unit from falling over)  
Loosen the cylinder bolts that are threaded into the rear arm.
  - \* It is important to remove both the rod end and the cylinder end at the same time to keep the cylinder even and prevent unnecessary pressure if the cylinder should start to angle out.
- 03)** Start both the rod end and the cylinder end of the NEW cylinder at the same time to keep the pressure even when installing.
  - \* Make sure that the rod end of the cylinder is always towards the bottom of the unit, and that the cylinder end is toward the top.
- 04)** After installing ONE cylinder completely, move to the other rear cylinder and repeat steps 2 and 3.

### **Front Cylinder Replacement: (Models G-30, GHR-30, GHM-30, GH-24, GHM-24 ONLY)**

- 01)** With the Front arm partially extended, turn the handle until the adjuster reaches the bottom most position. (having the arm partially extended makes it easier to turn the adjuster handle)
- 02)** Remove the top two bolts on the front plate that keep the front arm attached.
  - \* CAUTION - when the front arm bolts are removed, tension will still exist even though the adjuster has been taken to the lowest level. The front arm will naturally spring to the most upright position.
- 03)** Remove the two allen head screws holding the rod end of the cylinder to the arm.  
Slide the cylinder pin out of the arm, releasing the cylinder.
- 04)** Remove the hex bolt holding the cylinder end of the cylinder to the upper adjuster.
- 05)** Attach the new cylinder starting with the cylinder end first. Use Loctite 242 or 243 on the threads of the hex bolt. Tighten the bolt all the way - then back off 1/4 - 1/2 turn. The hex bolt should not be tight against the cylinder clevis.

**Front Cylinder Replacement:**  
**(Models G-36, GH-45, GHM-45 ONLY)**

- 01)** With the front arm partially extended, turn the handle until the adjuster reaches the bottom most position. (having the arm partially extended makes it easier to turn the adjuster handle)
- 02)** Remove the top two bolts on the front plate that keep the front arm attached  
\* CAUTION - when the front arm bolts are removed, tension still exists even though the adjuster has been taken to the lowest level. The front arm will naturally spring to the most upright position.
- 03)** Remove the two snap rings that hold the cylinder pin to the front arm. Slide the cylinder pin out of the arm, releasing the cylinder.
- 04)** Unscrew the cylinder end of the cylinder from the upper adjuster.
- 05)** Remove the end fitting from the rod end of the old cylinder.
- 06)** Install the end fitting onto the rod end of the new cylinder. Use care not to damage or scratch the cylinder rod. Dents or scratches on the cylinder rod will cause the nitrogen gas to leak, leading to the need for another cylinder.
- 07)** Screw the cylinder end of the new cylinder back into the upper adjuster.
- 08)** Reattach the rod end of the new cylinder into the front arm using the pin and snap rings.

**Front Cylinder Replacement GH-60 ONLY:** (SEE DIAGRAM)

**01)** With the front arm extended in the horizontal position, turn the handle until the top adjuster reaches the bottom most position. (having the arm extended makes it easier to turn the adjuster handle)

**02)** With the arms folded up and strapped, loosen the set screw on the RIGHT front side plate. Remove the two arm screws and two tool mount screws from the same RIGHT plate.

On the LEFT plate, remove the two arm screws only. Then pull the LEFT plate off with the tool mount still attached. (NOTE: do not lose the arm screw washers)

**\* CAUTION - Remove the strap from the arms. When the front arm screws are removed, tension still exists even though the adjuster has been taken to the lowest level. The front arm will naturally spring to the most upright position.**

**03)** Remove the two snap rings that hold the cylinder pin to the front arm. Slide the cylinder pin out of the arm, releasing the cylinder.

**04)** Unscrew the cylinder end of the cylinder from the top adjuster. (see diagram)

**05)** Remove the steel clevis from the rod end of the old cylinder. (see diagram)

**06)** Install the steel clevis onto the rod end of the new cylinder (if the new cylinder comes with a ball clevis this will have to be removed). Use care not to damage or scratch the cylinder rod. Dents or scratches on the cylinder rod will cause the nitrogen gas to leak, leading to the need for another cylinder.

**07)** Screw the cylinder end of the new cylinder back into the top adjuster.

**08)** Reattach the rod end of the new cylinder into the front arm using the pin and snap rings.

**09)** Take the LEFT front plate with the tool mount and reattach the two arm screws.

**10)** Take the RIGHT front plate and reattach the two arm screws and two tool mount screws. Tighten the set screw in the Right front plate.

## HYDRAULIC - Gearbox Disassembly

- 01) Remove the (4) metric socket head cap screws which hold the gearbox cover and motor to the gearbox.
- 02) Remove the motor and cover together.
- 03) Loosen set screw and remove Item 16, (dial switch)
- 04) Remove the two screws, Item 17. Then remove Item 18, selector body (disc).
- 05) Item 13 (selector axle) must be in the neutral position in order to remove the axle itself.  
NOTE: You will have to move the gear set up and down until the axle sits horizontal.  
(SEE DIAGRAM on page 32)
- 06) Remove the chuck
- 07) Once Item 13 is removed, flip the gearbox upside down. Remove Item 20 (axle key) from the spindle.
- 08) You will now have to **press** the shaft (Item 7) and the gear assembly (Items 4,5,6 and 23) out of the gearbox together. (this will keep you from losing the ball and spring (Items 21 and 22)
- 09) **Slowly** remove the shaft (Item 7) from the gear assembly (Items 4,5,6 and 23). Once the ball is exposed the pressure of the spring behind it will push the ball outward.  
NOTE: DO NOT LOOSE THE BALL AND SPRING (Item 21 and 22).
- 10) Reassemble in the reverse order. Make sure to **grease** all components.

# MAINTENANCE

## ***1.) Lubricate the Base Mount:***

The base mount of the FlexArm requires periodic care and maintenance. Monthly lubrication or bi-monthly lubrication is adequate. If it is necessary to remove the unit from the base mount, do not allow the lower bore of the angle mount or the base mount shaft to be contaminated by dirt or foreign materials. If the unit becomes contaminated, clean the lower bore of the angle mount and the shaft of the rear mount thoroughly prior to re-assembly. Lubricate the rear base mount by applying a slight amount of grease to the shaft to prevent premature wear.

## ***2.) Periodically check the bolts throughout the unit for tightness.***

If the bolts have loosened up, use loctite 242 on the threads and reassemble. This should prevent any further problems.

## ***3.) If utilizing a Motor with a Quick Change Chuck:***

### ***Keep both the motor and the chuck free from contamination by cleaning regularly:***

A simple air gun can be used to blow particles and contaminants off of the motor and chuck collar. Make sure to clean inner surface of the chuck as well. If contaminants build up too excessively, it may become necessary to soak the entire chuck into a cleaning solvent or WD-40 type penetrating oil before using the air gun. Doing this regularly will considerably reduce, and may even eliminate, the need to disassemble the quick change chuck to clean it. If, however, the chuck has accumulated so much dirt and grime that disassembly is necessary, follow the procedures given below:

### ***Quick Change Collar with Smooth Collar:***

Slide the collar upward until it locks into the upper most position. The snap ring is located between the chuck body and the collar (on the open end where the tap holders insert). Use an awl or small slotted screwdriver to locate one of the snap ring ends. Rotate the snap ring end until it is positioned in one of the two chuck slots. It can now be carefully lifted upward and by using a circular motion, the ring can be completely removed. The collar can now be removed by depressing the ejector in the center of the chuck body (CAUTION: The collar may eject rapidly. Be careful not to damage the collar or lose the ball bearings, spring, or snap ring). Clean the exposed area of the chuck and reassemble (It may be necessary to depress the ejector in the center of the chuck body to completely slide the collar back into place). Replace the snap ring in the groove on the chuck body.

# MAINTENANCE

## **4.) *Rear Pin Maintenance:***

When the FlexArm is removed from the angle mount, the openings (bores) should be covered. This prevents grinding dust or other foreign materials from finding their way to the interior surface of the bore. The exposed exterior surface on the shaft of the Flex-Arm's rear pin must not come in contact with any foreign material. If the FlexArm is not going to be immediately repositioned in the angle mount, wrap the rear pin with a clean, dry cloth, paper towel or plastic sheet. Prior to reinsertion, inspect the surface and, if needed, thoroughly clean the shaft of the rear pin.

Prevention will insure a long-wearing bearing surface that retains its perpendicularity.

## **5.) *Power Pack Fluid and Filter:***

The Hydraulic Power Pack oil should be changed every 3000 hours of use (approximately). The oil drain plug is located on the bottom of the Power Pack, and the fill plug is located on the rear of the Power Pack (drain plug is a metric hex head bolt, and the fill plug requires a metric allen wrench). The Pump Filter should be changed if loss of power occurs and all other troubleshooting methods have failed..

## **6.) *If utilizing a Unit with a 2 Speed Gearbox:***

The 2 speed gearbox should be checked every 3-6 months, and greased if necessary. Use only Lithium type grease - do not over grease.

# MAINTENANCE

## CHANGING THE HYDRAULIC BASE PLATE

(Refer to Diagram on Page 38)

- 1) Turn off the power supply.
- 2) Remove the two hydraulic lines and the electrical connector from the back of the power pack.
- 3) Remove the side door from the power pack cover. The two door pins are held on with e-clips.
- 4) Remove all the bolts holding the cover onto the power pack (metric, allenwrench)
  - a) Remove the cover from the power pack. Be careful not to damage the locking mechanism for attaching the electrical connector (item #23)
- 5) Remove all the hydraulic hoses going to item #29 (base plate) and #30 (electrovalve).
- 6) Remove the two end pieces from the electrovalve (#30) using a phillips screwdriver.
  - a) Remove the electrovalve (metric, allenwrench)
  - b) Remove the base plate (#29) (metric, allenwrench)
- 7) Clean both the power pack mounting surface and the bottom of the new base plate. ***Place RTV or Silicone on both the power pack mounting surface AND the base plate bottom surface when reinstalling.***
- 8) Reassemble in the reverse order listed - **MAKE SURE not to over-tighten the allen bolts.** There are very few threads in the power pack mounting surface and over-tightening will pull the threads out!
- 9) Set the pressure (bar) after reinstalling items 29, 30, and the hydraulic hoses. (but before reassembling the power pack cover) as follows:
  - a) Make sure the power pack is off. Disconnect both hydraulic lines from the back of the power pack.
  - b) Make sure the electrical cable on the back of the power pack is attached
  - c) Turn the power pack on
  - d) Depress either the forward or the reverse button on the taper handle.
  - e) While holding fwd. or rev. button, check the bar reading on the gage (item #16)  
The bar should be set between 170 and 180.
  - f) To adjust the bar, loosen the locking nut on the side of the base plate. Once this nut is loose, you can turn the allen head adjusting screw to set the pressure (clockwise to increase, and counter-clockwise to decrease).
  - g) Adjust the bar pressure while depressing either fwd. or rev. Do not forget to tighten the locking nut once the pressure has been set.

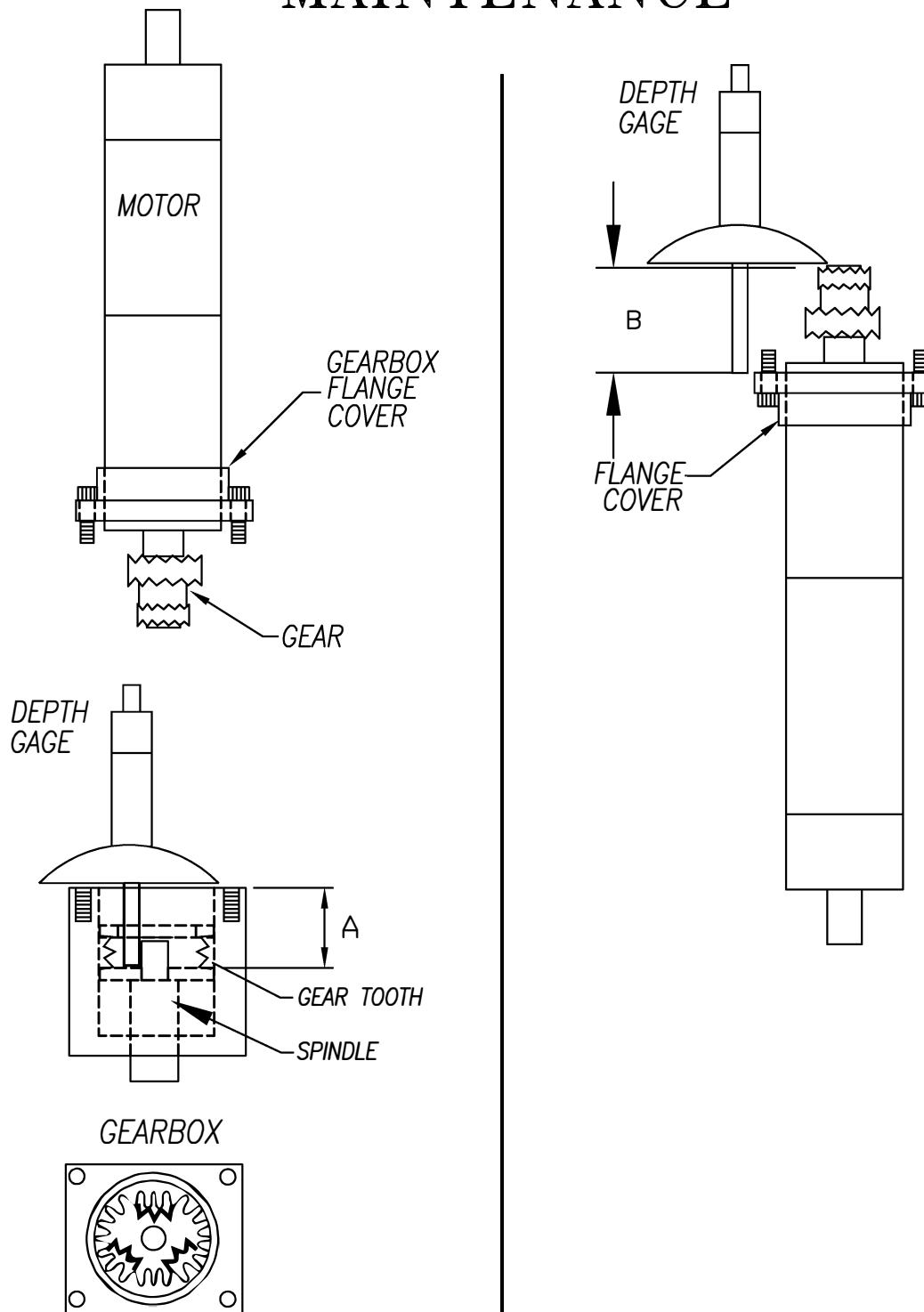


# MAINTENANCE

## HYDRAULIC - Setting the gear

- 01) Remove the (4) metric socket head cap screws which hold the gearbox cover and motor to the gearbox.
- 02) Remove the motor and cover together.
- 03) IF CHANGING OUT THE MOTOR ONLY:
  - A) Remove the motor from the cover.
  - B) Loosen the set screw holding the gear onto the motor shaft. Remove the gear (you may need to use a rubber or hard plastic mallet).
  - C) Remove the key from the keyway of the old motor and place it on the new motor.
- 04) Using a depth gage, measure distance (A) on the included diagram.  
NOTE: The gearbox MUST be in low gear and dimension (A) is the deepest (inside) section of the gearbox (Flat area next to the spindle shaft).  
Once you obtain this reading, subtract off 0.020" and lock the gage.
- 05) If necessary, Re-fasten the motor to the gearbox cover.
- 06) Turn the motor and gearbox cover upside down. Place the key and gear onto the shaft of the motor. Using the present gage setting, set the top of the gear so that the gage pin rests on the flat of the cover (see included diagram, dimension B).  
  
Line up the set screw hole on the gear with the set screw hole on the gear box cover. Place Loctite 243 on the set screw and tighten. (do not over tighten the set screw)
- 07) Grease the gears and gearbox.  
Place the gearbox cover (with the motor & gear) over the gearbox. Turn the entire assembly slightly until it drops into the gearbox. Tighten the (4) screws that hold the gearbox cover on.
- 08) Before attaching the hydraulic lines, place a tap holder (without the tap) into the quick change chuck. Manually turn the holder and chuck to check for gear noise or resistance. Switch the gear speed setting and repeat this process.
- 09) Attach the hydraulic lines the motor and tighten.

# MAINTENANCE



# TROUBLESHOOTING

Refer to the following list of common problems when it appears the FlexArm is not working properly. Most of these are resolvable by in-house technicians or operators. Compare any problems with those given in the examples below. Help is just a phone call away; always contact Factory Service at **800-837-2503** with any questions or concerns about operating the *FlexArm Tapping Machine*.

***1)The tap is not maintaining perpendicularity.***

- a)Check to make sure the angle mount bolt or bolts are tight.
- b)Check the flatness of the surface on which the unit is mounted.
- c)Check the motor mount screws. Make sure they are tight and are holding the motor securely in the mount.
- d)Check the hole being tapped. If the hole is not perpendicular to the surface where the unit is mounted, the hole will not be straight.
- e)Check the run out of the chuck. The chuck and spindle may have been damaged.
- f)Check the part fixture. If the fixture isn't holding the part level or true, the tapped hole will not be straight.
- g)Check the tap and the tap holder. The tap or the holder may be worn and need repair or replacement. Also check that the tap is secure in the holder and held tightly.
- h)Check both the bottom and top surfaces of the base mount and angle mount for excessive wear, nicks, dings, etc., anything that would prevent the unit from sitting level to the mounting surface.

# TROUBLESHOOTING

## ***2)The Unit does not have enough power to drive the tap.***

- a)Check the pressure (bar) by doing the following: Turn off the power supply. Open the flow valve (speed dial) on the power pack to the maximum position by turning counter clockwise as far as possible. Remove the two hydraulic lines from the rear of the power pack (leave the electric line connected). Turn the power pack back on. Depress either the forward or the reverse button on the unit handle. While holding the fwd. or rev. button check the bar reading on the gage (it should read between 170-180).
- b)Check the condition of the tap being used and try a new tap to verify whether the old one is worn out.
- c)Check that both the lubricant and the quantity of lubricant are adequate for the material being worked.
- d)If using a Torque Style tap holder, check the setting and make sure that it matches the chart in the manual. It may be necessary to adjust the holder up a notch (see adjusting the tap holder torque settings - in the manual).
- e)Check the power pack for proper oil level using the sight gage on the front of the power pack. Verify that the oil and filter have been changed in accordance to the maintenance section of the manual.
- f)Check the alignment of : the hole, the part, the fixture, and the surface which the unit is mounted on. Any of these factors can cause the unit to tap a hole that isn't straight or even prevent the unit from tapping the hole.
- g)Verify that the tap capacity of the unit purchased, has not been exceeded.

# TROUBLESHOOTING

**3) *The Motor has stopped running completely:***

- a) Check to see if there is power to the unit.
- b) Check the emergency switch position.
- c) Check the flow control valve setting.
- d) Check the circuit breaker in the electrical box.
- e) Check the fuses in the electrical box.
- f) Check the oil level in the power pack using the sight gage on the front.
- g) Check for loose hydraulic connections or loose wiring.
- h) Check that the motor relay hasn't kicked out.
- i) Check that the reset button tripped (try resetting the button) (see wiring diagram).

**4) *The balls in the tap holder keep breaking.***

- a) Verify that there is no obstruction in the minimum clearance area that is restricting the downward path of the tap holder.
- b ) Verify that the chuck isn't striking the table or another work surface before, during, or after the tapping process.
- c) Check for excessive shavings, grinding dust, etc., that could be getting into the chuck collar and causing premature wear.

The unit has a ***limited warranty*** on parts and labor. This warranty is void if changes to the unit or attempts to repair it or its components are made without the express authorization of FlexArm Inc.

# TROUBLESHOOTING

## **TROUBLE SHOOTING SUGGESTIONS FOR SEMI TAP LUBRICATOR: (REFER TO PARTS LISTING AND DIAGRAM)**

### 01. The lever is actuated but nothing comes out:

- a) You must first determine if the problem is air or fluid. Follow the air line from the pneumatic motor to the air micro valve (LS/006) located between the plates. The air micro valve should be marked 304ma and is located farthest away from the plate it is attached to. Remove the hose and check that air pressure is coming out of the line.
- b) If there is no air pressure, open the air flow control valve (LS/010) located on the top of the pneumatic motor by turning counter clockwise (this increases the air flow). If you still have no pressure the air flow control valve is defective.
- c) If there is air pressure going into the micro valve (LS/006), but no air pressure coming out of the nozzle (LS/012), then the air micro valve is defective or the switch on top of the micro valve is not being depressed far enough to work the valve.

### 02. When the lever is actuated air comes out but no fluid:

- a) Follow the fluid line from the reservoir to the fluid micro valve (LS/007) located between the plates. The fluid micro valve should be marked 204ma and is located closest to the plate it is attached to. Remove the hose and check if fluid is coming out of the line.
- b) If there is no fluid, there is either blockage in the line, a kinked line, or the reservoir is too low to provide adequate fluid.
- c) If fluid flows out of the line, reconnect the tube and move to the fluid flow control valve (LS/014) located on the front side plate. Remove the hose going into the fluid flow control valve and check to see if fluid comes out of the line **WHEN THE LEVER (LS/002) IS ACTUATED.**
- d) If no fluid comes out, the fluid micro valve (LS/007) is defective.
- e) If fluid comes out, reconnect the tube to the fluid flow control valve and try turning the adjustment knob counter-clockwise to increase the flow.. If there is still no fluid coming from the nozzle (LS/012) when the lever is actuated, the fluid flow control valve is defective.

### 03. When the lever is actuated fluid comes out but no air:

SEE STEP 1 ABOVE.

## **Alignment Check List:**

01. How are you checking the unit alignment?
02. What type of table is the FlexArm mounted to? The table must be flat.  
Is the FlexArm moved?
03. Are both the Base Mount AND the Angle Mount completely tightened before any tapping is done?
04. Are all the bolts on the FlexArm tight and secure?
05. Has the FlexArm been dropped or damaged?
06. How is the part being fixtured? The fixture must be parallel to the FlexArm.  
Are the fixtures moved?
07. Is the part fixtured level to the FlexArm Base Mount? The work piece MUST be secure AND level to the FlexArm base.
08. Has the hole in the part been drilled straight? How are you checking the hole alignment? The holes must be perpendicular to the work surface or table.
09. How deep is the hole you are tapping? Is it a blind hole or a through hole?
10. What hole diameter are you drilling? What percentage of thread are you trying to achieve?
11. What size tap are you using? Threads per inch?
12. What type of tap are you using? (Bottom, Lead, Plug, etc.)
13. What brand of type are you using? Is it new?
14. What type of material are you tapping?
15. If you are using a magnet:
  - a. Is the bottom of the magnet free from burrs?
  - b. Is the top of the magnet flange free from burrs?
  - c. Is the rear pin free from burrs (the portion that rides against the flange)?



Correct handling and maintenance is absolutely necessary.  
Read the following instructions for installation and operation carefully.

1-800-837-2503  
851 Industrial Drive  
Wapakoneta, Ohio 45895  
[www.flexarminc.com](http://www.flexarminc.com)  
[flexarm@flexarminc.com](mailto:flexarm@flexarminc.com)

