

INSTALLATION & OPERATIONS MANUAL

FlexArm Assembler:

Models:

CVA-20 & FAV-14-20

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WARNINGS & CAUTIONS FOR SAFE OPERATION

- READ THE MOTOR MANUAL AND UNIT MANUAL BEFORE OPERATING
- WEAR EYE PROTECTION WHEN OPERATING THIS MACHINE
- DO NOT WEAR JEWELRY, LOOSE CLOTHING OR LONG HAIR WHEN OPERATING
- DO NOT WEAR GLOVES WHEN OPERATING THIS MACHINE
- TURN OFF THE AIR SUPPLY BEFORE ADDING OIL TO THE FILTER
- TURN OFF THE AIR SUPPLY BEFORE PERFORMING ANY MAINTENANCE OPERATIONS
- HEARING PROTECTION IS RECOMMENDED
- DO NOT USE DAMAGED, FRAYED OR DETERIORATED AIR HOSES AND 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 CLEAR OF PINCH POINTS ON THE UNIT WHEN OPERATING
- PERFORM REGULAR MAINTENANCE ACCORDING TO THE MANUALS – INCLUDING FILLING THE MOTOR LUBRICATOR WITH THE 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 PURCHASED. (SEE PAGE 5) DOING SO WILL VOID THE WARRANTY AND POSSIBLY CAUSE DAMAGE OR INJURY.

FLEXARM

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 - springs
- blades/vanes - O-rings

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

Midwest Specialties 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 Midwest Specialties 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 Midwest Specialties Inc.

The warranty is based on normal usage which would be the equivalent of a 40hr work week.

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

TORQUE AND WEIGHT LIMITATIONS

Model Number	Max Motor Torque		Working Range		Max Tool Weight	
	Ft Lbs	Nm	Inches	Cm	Lbs	Kg
OCVA-24	7	9.5	13-36	33-91	7	3.2
CVA-10	10	13.6	8-28	20-71	10	4.5
FAV-14	10	13.6	19-37	48-94	10	4.5
FAV-18	10	13.6	21-46	53-117	10	4.5
FAV-24	10	13.6	30-57	76-145	10	4.5
CVA-20	20	27.1	8-28	20-71	12	5.4
FAV-14-20	20	27.1	19-37	48-94	15	6.8
CVA-30	30	40.7	8-28	20-71	12	5.4
FAV-14-30	30	40.7	19-37	48-94	15	6.8
A-32	50	68	11-34	28-86	12	5.4
OCVA-M-60	50	68	19-43	48-109	12	5.4
S-36	80	109	14-51	36-130	25	11.3
B-19	100	137	1-42	3-107	35	15.9
M-60	80	109	22-76	56-193	14	6.4
RNR-20	120	163	15-72	38-183	50	22.7
G-30	150	204	20-76	51-193	50	22.7
G-36	400	542	20-78	51-198	50	22.7
G-60	800	1085	20-84	51-213	60	27.2

Exceeding the weight and Torque Limitations will void the factory warranty

Installation

- 1) Drill and tap 3/8-16 bolt holes on a flat smooth table or work bench.
If mounting on a wood surface, use comparable carriage bolts.
(See Figure 1.)

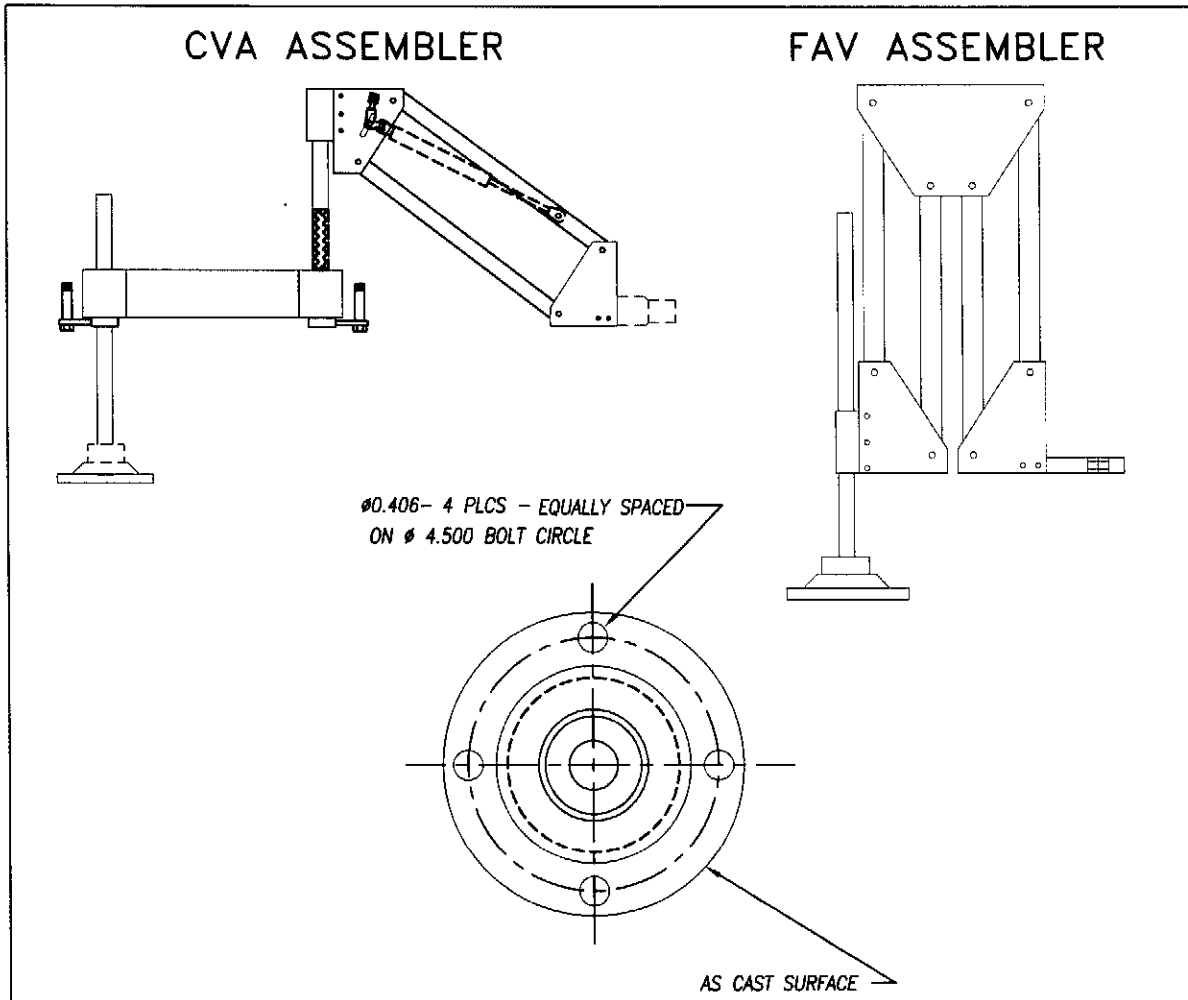


Figure1
Profile and Base Mount Diagrams for
FAV-14-20 and CAV-20

- 2) Secure the base mount with (4) 3/8-16X1" bolts.
- 3) Adjust the collar on the post of the base mount to reach the desired height for the unit.
- 4) Slide the unit into place.
- 5) The unit is counterbalanced at the factory to accommodate the required tool weight. If adjustments are needed, see the Counterbalance Adjustments sheet enclosed for the instructions on changing the counterbalance
- 6) If the unit is ordered with an air motor, check the air line connections to make sure the hose has not come loose from the press-to-release fittings during shipping. The hose must be completely pushed into the fittings to lock in under pressure.
- 7) SEE FILTER/LUBRICATOR DIAGRAM IN THE PARTS SECTION OF THE MANUAL.

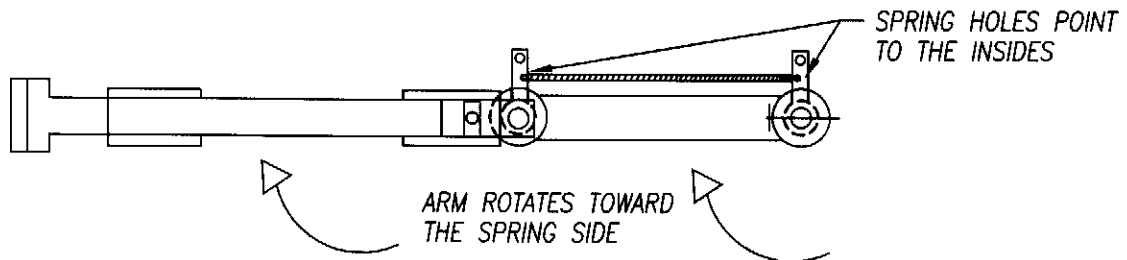
If the unit is ordered with a filter/lubricator, install a 1/4 NPT air fitting into the left port (filter side) and attach a 1/2" ID, 100 psi. incoming air line to the fitting.

a) Fill the lubricator bowl approximately 3/4 full by removing the fill plug screw on the top of the lubricator and pouring oil into the filter port. Use only a quality ISO VG-32 type hydraulic or spindle oil. Never use Marvel Mystery Oil, synthetic air tool oil, or similar products. Do not permit the oil level to be lower than the end of the siphon tube in the lubricator bowl.

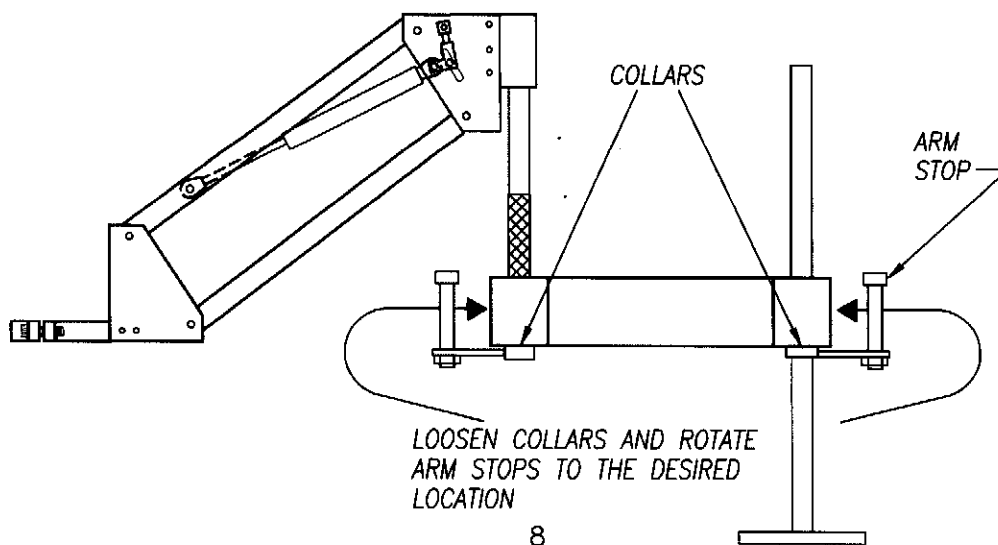
b) With the air motor running, slowly adjust the lubricator so 1-3 drops of oil are dispensed per minute through the tube on top of the lubricator dome sight. Clockwise turns decrease the flow and counter-clockwise turns increase the flow. SMC brand lubricators use the dome sight as the flow adjuster. NOTE: It may be necessary to open the flow valve considerably before the oil starts to drip. Then slowly close the valve until the drip rate of 1-3 drops per minute is achieved.

- 8) SMC filters are equipped with an auto drain and will automatically remove water from the filter bowl.
- 9) Always wear safety glasses and use proper safety precautions when operating this unit. Gloves are not recommended when operating this machine.

ADJUSTING THE ARM ROTATION ON THE CVA



THE SPRING CAN BE PLACED ON EITHER SIDE OF THE UNIT — DEPENDING ON OPERATOR PREFERENCE. IN ORDER TO USE THE SPRING ON THE OPPOSITE SIDE, THE ARM STOPS MUST BE SWITCHED SO THAT THE SPRING HOLES ALWAYS REMAIN POINTING TO THE INSIDES.



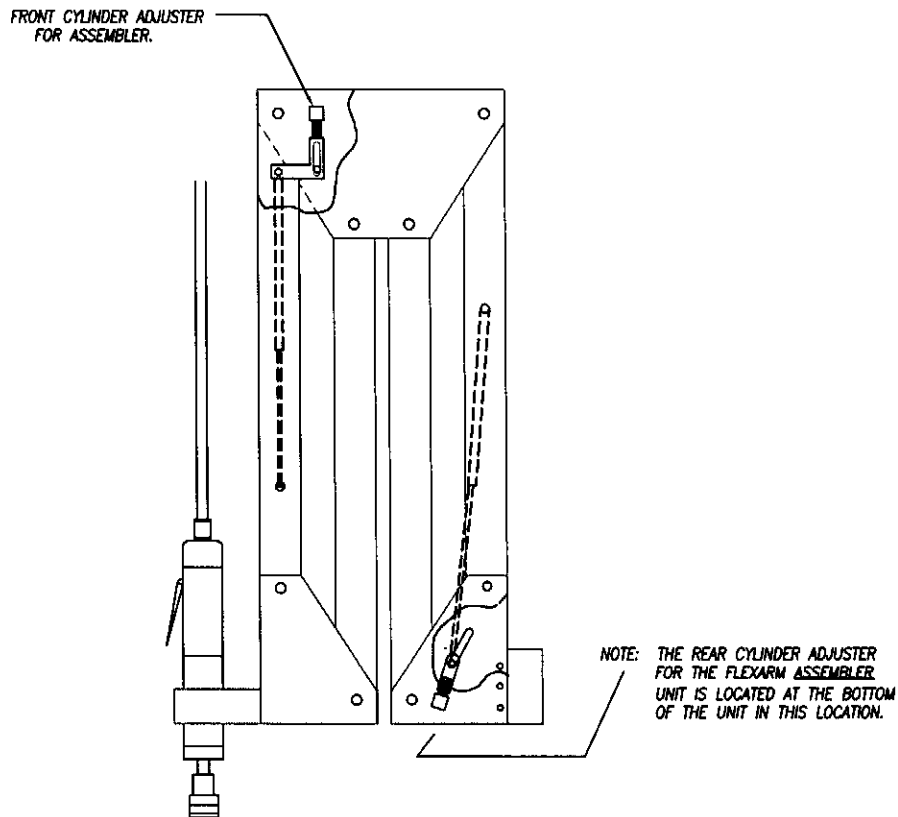
Counterbalance Adjustments

To adjust the counterbalance of the arm, turn the adjuster screw located between the top plates and rear plates (CVA's will only have one adjuster and FAV's will have two). This will move the dowel pin up or down in the plate slot.

- 1) For light weight tools and accessories, decrease cylinder pressure by moving the dowel pin towards the top of the slot.
- 2) For heavy tools and accessories, increase cylinder pressure by moving the dowel pin towards the bottom of the slot.

NOTE:

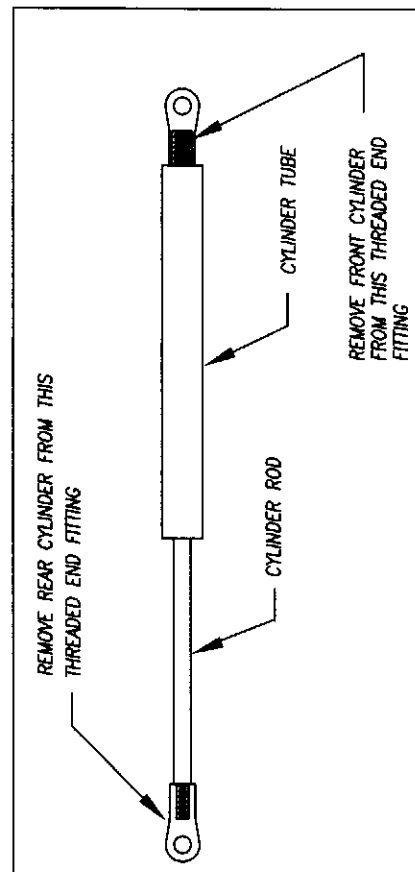
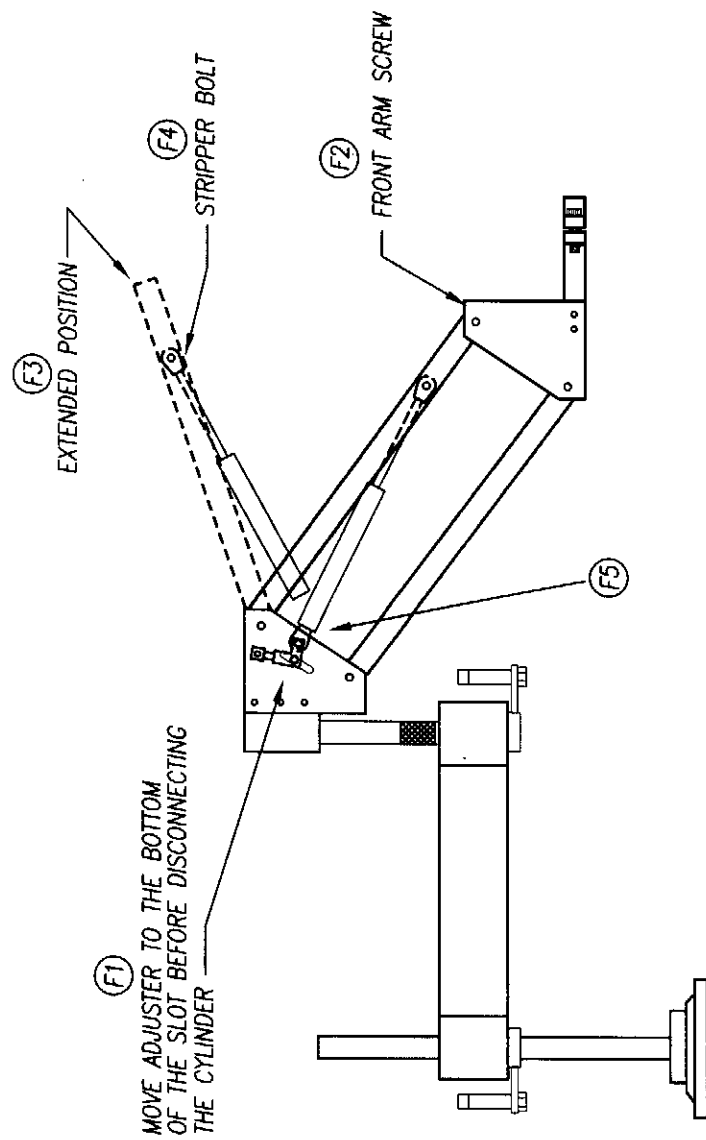
The ideal counterbalance will hold the tool just above the work piece when not being used. Once the operator releases the tool, the arm should lift up slightly and remain in place for the next operation.



Adjusting the Counterbalance for the Front Arm

CVA-20 FRONT CYLINDER REPLACEMENT

- F1. Adjust front cylinder turning socket head screw on the adjuster until the pin reaches the lowest position in the slot of the plates.
- F2. Hold the front arm securely. Remove the arm screws on the front plates so that the front arm is free and access to the front cylinder can be made.
- F3. Once the screws are removed, slowly guide the front arm up to the fully extended position as indicated on the diagram. This removes all tension from the cylinder.
CAUTION: Care must be exercised when taking the arm apart!
- F4. Remove the stripper bolt attaching the cylinder to the arm. Do not lose the (2) spacers that keep the cylinder centered in the arm.
- F5. Unscrew the cylinder tube, by hand, from the end fitting attached to the adjuster.
- F6. Remove the end fitting from the tube 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.
- F7. Using both hands, screw the tube end of the new cylinder into the end fitting attached to the adjuster. It is only necessary to get the cylinder hand tight – do not over tighten.
- F8. Replace the stripper bolt and the (2) spacers, attaching the cylinder to the arm.
- F9. Reassemble the front arm and plates with the front arm screw. Be certain that all fasteners are secured.



FAV-14-20
CYLINDER REPLACEMENT INSTRUCTIONS
(Refer to the Cylinder Replacement Diagram)

Replacement pressure cylinders installed by the customer have a 30 day 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.
NOTE: The warranty is void if the cylinder to be evaluated shows signs of scratches or nicks on the cylinder shaft or body.

REAR CYLINDER REPLACEMENT

- R1. Turn the socket head cap screw on the bottom adjuster until the dowel pin reaches the bottom of the slot on the rear plate (counter clockwise direction)
- R2 Raise the two front arms to the fully extended position
- R3, While supporting the front arms, remove the rear arm screws on the top plates, as indicated in the diagram, so that the rear arm is free and access to the rear cylinder can be made.

CAUTION: Carefully lower and place the front portion of the FlexArm on the work surface after the rear arm screws have been removed. Care must be exercised when taking the arm apart.

- R4. Remove the shoulder bolt attaching the cylinder to the arm. Note that there is a spacer on either side of the cylinder tube "end fitting" to center the cylinder in the arm slot. Do not lose these spacers.!
- R5. Unscrew the old cylinder from the "end fitting" attached to the rod end of the cylinder. Leave the old cylinder "end fitting" and adjuster in between the plates, you will reuse them.

CAUTION: You will have to wrap a towel or rubber matting around the cylinder rod to remove it and also to tighten the new cylinder. Dents or scratches on the cylinder rod will cause the nitrogen gas to leak, leading to the need for another cylinder and voiding any warranty.

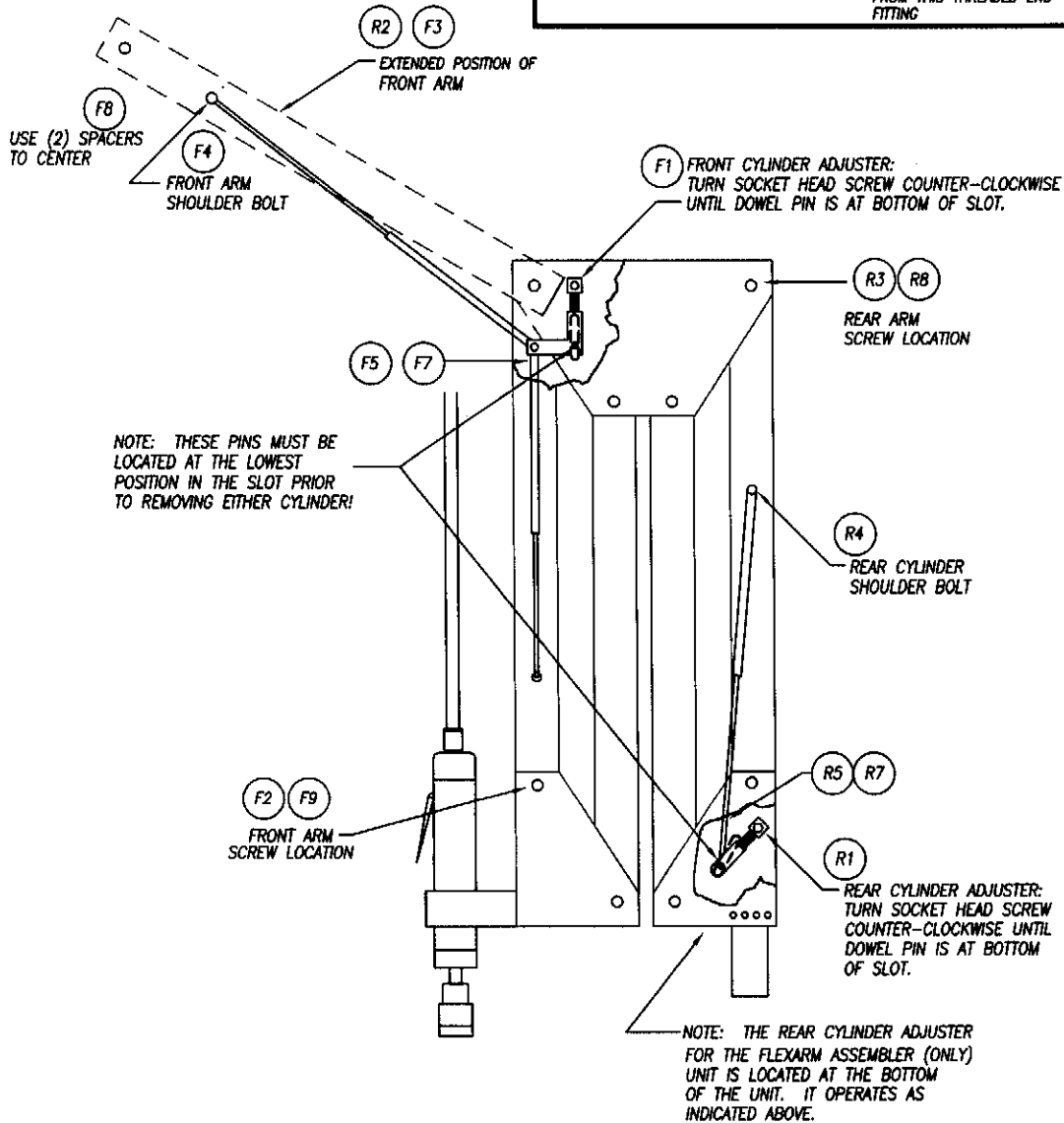
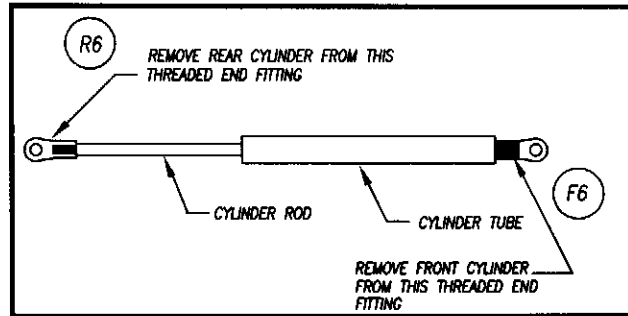
- R6. Remove the "end fitting" from the rod end of the new cylinder. Use care not to damage or scratch the cylinder rod.
- R7. Screw the new cylinder into the "end fitting" attach to the bottom adjuster. Replace the shoulder bolt and put one spacer on each side of the "end fitting" on the tube end of the cylinder. FAILURE TO USE THE SPACERS MAY CAUSE PREMATURE CYLINDER WEAR AND POSSIBLE CYLINDER FAILURE.
- R8. Reassemble the rear arm and plates with the rear arm screws. Be certain that all fasteners are secured with loctite 242.

FAV-14-20 FRONT CYLINDER REPLACEMENT

- F1. Adjust front cylinder turning socket head screw on the adjuster until the pin reaches the lowest position in the slot of the plates.
- F2. Hold the front arm securely. Remove the arm screws on the front plates so that the front arm is free and can be slowly extended to access the cylinder.
- F3. CAUTION: once the screws are removed, the arm will want to kick upward! Guide the arm upward to the full extension and the pressure should be off the cylinder.
- F4. Remove the stripper bolt attaching the cylinder to the arm. Do not lose the (2) spacers that keep the cylinder centered in the arm.
- F5. Unscrew the cylinder tube, by hand, from the end fitting attached to the adjuster (see cylinder replacement diagram). Leave the old cylinder "end fitting" and the adjuster between the plates, you will reuse them.
- F6. Remove the end fitting from the tube 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.
- F7. Using both hands, screw the tube end of the new cylinder into the end fitting attached to the adjuster. It is only necessary to get the cylinder hand tight - do not over tighten.
- F8. Replace the stripper bolt and the (2) spacers, attaching the cylinder to the arm. FAILURE TO USE THE SPACERS MAY CAUSE PREMATURE CYLINDER WEAR AND POSSIBLE CYLINDER FAILURE.
- F9. Reassemble the front arm and plates with the front arm screw. Be certain that all fasteners are secured with loctite 242.

CAUTION!!

EXERCISE EXTREME CARE WHEN FRONT ARM SCREWS ARE REMOVED FROM BOTH FRONT PLATES. TENSION STILL EXISTS EVEN WHEN THE ADJUSTER HAS BEEN TAKEN TO THE LOWEST LEVEL, AND CAN CAUSE THE ARM TO SPRING OUT WITHOUT WARNING!



MAINTENANCE

Monthly lubrication is adequate. Do not allow the rear mount to become contaminated by dirt or foreign materials. If contamination occurs, clean the bore of the rear mount and the shaft of the rear post thoroughly. Lubricate the post through the grease fitting on the rear mount.

Periodically check/tighten all fasteners and hardware

TROUBLESHOOTING

- 1) The arm does not balance nor adjust to support the tool weight:
 - a) Replace worn cylinder
 - b) The unit was counterbalanced for a specific weight when purchased: when changing tools, it may be necessary to change cylinders to accommodate the new tool weight. Contact factory service for proper replacement cylinder information
- 2) The arm movement is too stiff:
 - a) Check fasteners and hardware; they cannot be overtightened.
 - b) Adjust the arm stop; it should turn freely. (See figure 1)
 - c) Dirt or foreign material may have built up in the arm pivot points; use an air gun to blow all foreign materials out of these locations.
 - d) Check counterbalance adjustment.

CYLINDER REPLACEMENT PARTS

The cylinder Part Number for your unit is screen-printed in white or is printed on a paper label on the black barrel of the cylinder. The cylinder number is prefixed by "C-16" and is followed by 5 digits. When ordering replacement cylinders, please provide the complete "C-16" number taken from the cylinder on your unit.

Midwest Specialties will only warrant Filter/Lubricators that utilize an ISO Viscosity Grade 32 type hydraulic oil, comparable hydraulic, light, non detergent oil or ISO 32 Spindle oil. (EP oils are acceptable as long as they are ISO VG-32). Do not use synthetic oils.

The Filter/Lubricator will perform satisfactorily using compatible misting type petroleum based oils, with a viscosity range of 100 to 200 SUS at 100 degrees Fahrenheit and a minimum aniline point of 200 degrees Fahrenheit. Do not use oils with adhesives, compounded oils containing solvents, graphite, detergents or anti-wear additives.

Harmful Compressor Oils & other Materials

Compressor Oils:

Cellulube No. 150 & 220	Phrano
Haskel No. 568-023	Pydraul AC
Houghton & Co. Oil No. 1120, 1130, & 1055	Sears Regular Motor Oil
Houtosafe 1000	Sinclair Oil "Lily White"
Krano Oil	Skydrol
Keystone Penetrating Oil, No. 2 & 500	Tenneco Anderol No. 495 & 500

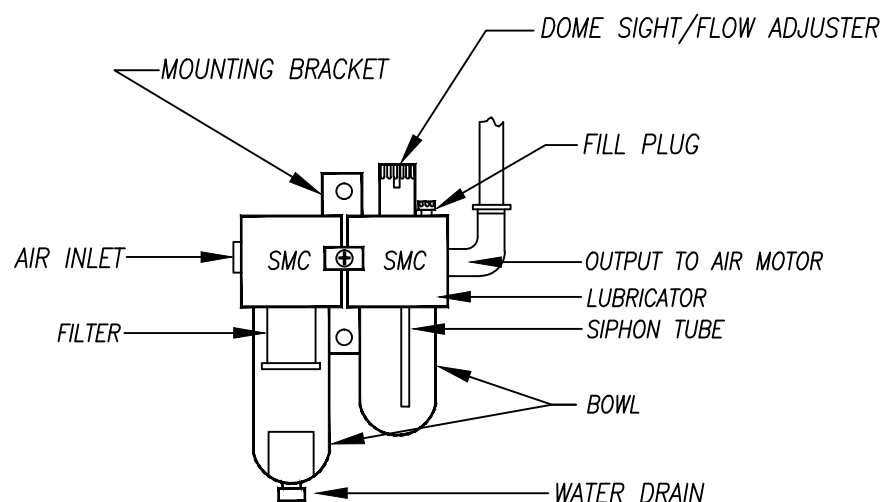
Harmful Substances:

Atlas Perma-Guard	Burna-N
Crylex #5 Cement	Eastman 910
Garlock 98403 (polyurethane)	Keystone penetrating oil No. 2
Kano Kroil	Loctite Teflon sealant
Loctite 271, 290, 601	National Compound N11
Minnesota Rubber 366Y	Parco 1306 Neoprene
Nylock VC-3	Petron PD287
Permabond 910	Stauffer Chemical Fyrquel 150
Prestone	Stillman SR 513-70 (neoprene)
Stillman SR 269-75 (polyurethane)	Telar
Tannergas	Tilton
Vibra-Tite	Zerex

Because all substances harmful to polycarbonate cannot be listed, consult a Mobay Chemical or General Electric office for further information.

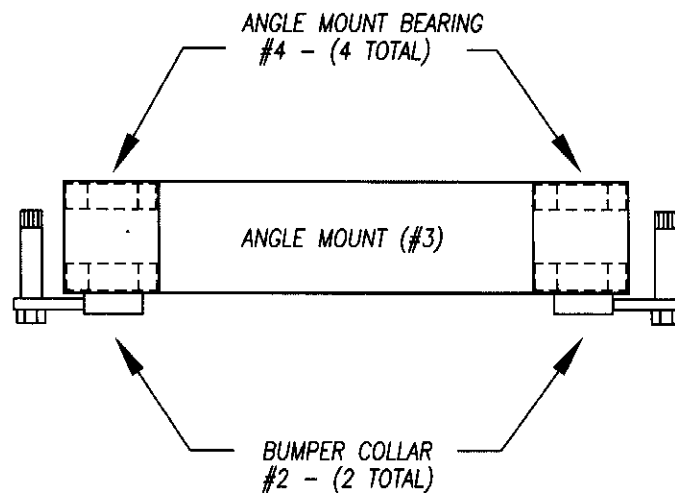
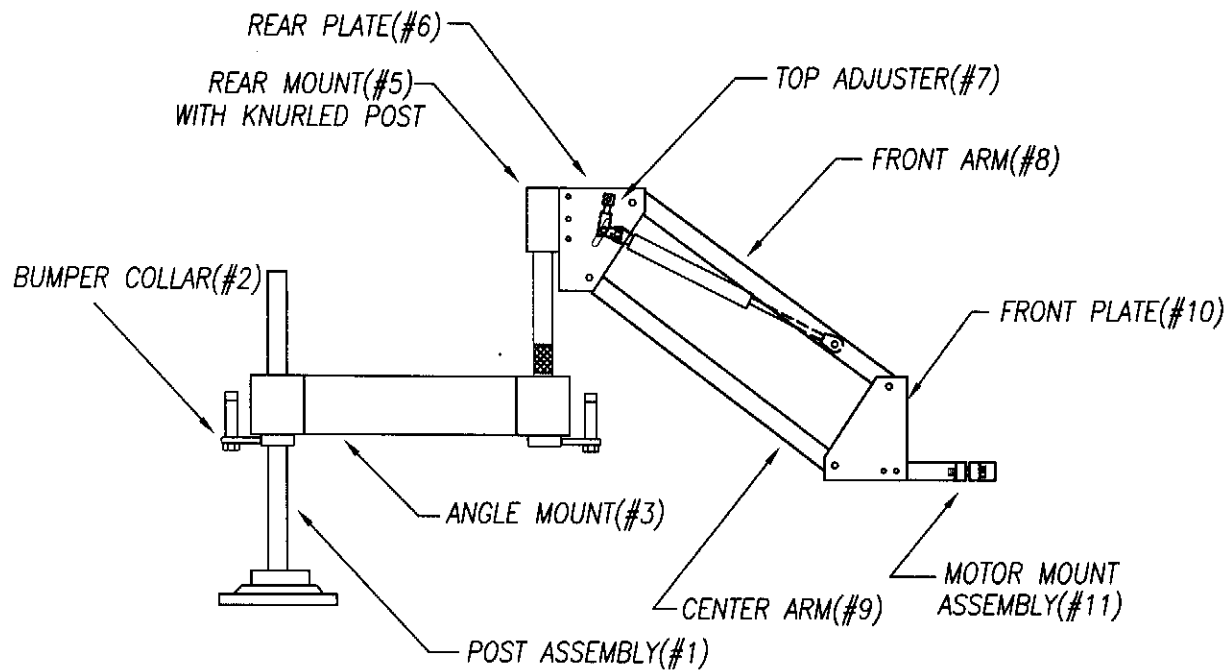
Midwest Specialties has the following oil available in one gallon capacity:
EP Hydraulic Oil 32 (light), 135-165 SUS@100 degrees Fahrenheit. The part number is EP-32.

SMC FILTER/LUBRICATOR



Part No:	Description:
420001	FILTER BOWL KIT (INCLUDES POLY BOWL, METAL GUARD, O RING, AND AUTO DRAIN)
420002	FILTER ELEMENT (5 MICRON)
420003	O-RING FOR BOWL (FOR FILTER OR LUBRICATOR SIDE)
420004	MOUNTING BRACKET & FRONT CLAMP (WITH 2 O-RINGS, 2 SCREWS)
420005	O-RING FOR MOUNTING BRACKET (2 REQ.)
420007	LUBRICATOR BOWL KIT (INCLUDES BOWL, GUARD & O-RING)
420008	DOME SIGHT
420009	FILL PLUG
420000	FILTER ASSEMBLY (COMPLETE HALF)
420006	LUBRICATOR ASSEMBLY (COMPLETE HALF)
	MISCELLANEOUS ITEMS
LB-2000	TAP LUBRICANT, 1 GALLON
EP-32	HYDRAULIC OIL, 1 GALLON (AIR MOTOR)
0391	FILTER/LUBRICATOR (COMPLETE ASSEMBLY WITH HOSE FITTING)
0390	FILTER/LUB WITH GAUGE (COMPLETE ASM WITH HOSE FITTING)

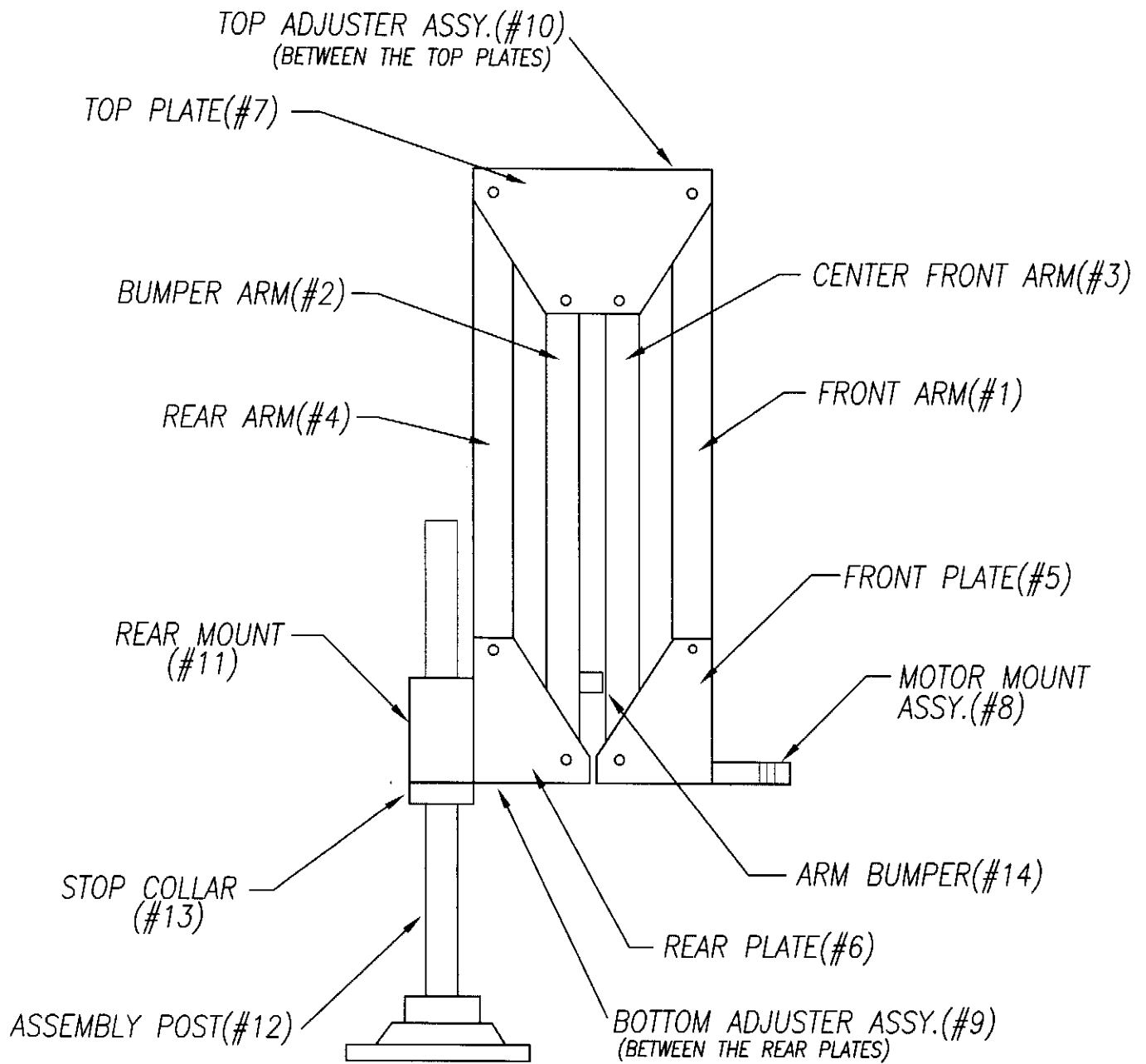
CVA PARTS DIAGRAM



CVA-20 PARTS LIST

Item No:	Part No:	Description:	Quantity Used
1	04400A	POST ASSEMBLY (7/8" DIA ROD & BASE	1
2	0130M	BUMPER COLLAR SET (2-7/8" COLLARS WITH SPRING	1
3	04300	ANGLE MOUNT (WITH 4-7/8" ID BEARINGS)	1
4	0126M	BEARING FOR ANGLE MOUNT (7/8" ID)	4
5	360082	REAR MOUNT WITH KNURLED POST	1
6	07225	TOP RIGHT PLATE	1
	07220	TOP LEFT PLATE	1
7	13300B	TOP ADJUSTER ASSEMBLY	1
8	01865	ARM 14" FRONT	1
9	01855	ARM 14" CENTER	1
10	07210	RIGHT HAND FRONT PLATE	1
	07215	LEFT HAND FRONT PLATE	1
11	360381	2 PIECE V-BLOCK MOTOR MOUNT	1
		PARTS NOT SHOWN	
	0131M	DOWEL PIN, 5/16X2" LONG	1
	0351M	DOWEL PIN, 5/16X5/8" LONG	1
	0352M	CYLINDER SHOULDER BOLT 5/16X1-1/2"	1
	0350M	CYLINDER SPACER	2
	0201M	ARM SCREW M8X45mm WITH M6 NUT	4
	0102M	ARM BUSHING, BRONZE 0.314"IDX1.5" LONG	4
	0347M	REAR MOUNT SCREW 1/4-20X2-3/8	3
	0128M	SPRING FOR BUMPER COLLAR	1
	0391M	FILTER/LUBRICATOR ASSEMBLY	1
	0390M	FILTER/LUBRICATOR WITH REGULATOR & CAGE	1

FAV ASSEMBLER PARTS DIAGRAM



LEFT SIDE VIEW

FAV-14-20 PARTS LIST

Item No:	Part No:	Description:	Quantity Used
1	01850	14" FRONT ARM	1
2	01850	14" BUMPER ARM	1
3	01850	14" CENTER ARM	1
4	01860	14" REAR ARM	1
5	07215 07210	FRONT PLATE LEFT HAND FRONT PLATE RIGHT HAND	1 1
6	07220 07250	REAR PLATE LEFT HAND REAR PLATE RIGHT HAND	1 1
7	06150 06100	TOP PLATE LEFT HAND TOP PLATE RIGHT HAND	1 1
8	360381	2 PIECE V-BLOCK MOTOR MOUNT	1
9	13100B	BOTTOM ADJUSTER ASSEMBLY	1
10	13300B	TOP ADJUSTER ASSEMBLY	1
11	03200	REAR MOUNT WITH 7/8" DIAMETER HOLE	1
12	04400A	POST ASSEMBLY (7/8 DIA ROD & BASE)	1
13	0073M	STOP COLLAR FOR 7/8" DIAMETER SHAFT	1
14	0378M	BUMPER FOR ARM	1
		PARTS NOT SHOWN	
	0131M	DOWEL PIN, 5/16X2" LONG	2
	0351M	DOWEL PIN, 5/16X5/8" LONG	1
	0352M	CYLINDER SHOULDER BOLT 5/16X1-1/2"	2
	0350M	CYLINDER SPACER	4
	0374M	REAR MOUNT SCREW 1/4-20X2-1/2	4
	0201M	ARM SCREW M8X45mm WITH M6 NUT	8
	0102M	ARM BUSHING, BRONZE 0.314"IDX1.5" LONG	8
	0353M	MOTOR MOUNT SCREW 5/16x2-1/2 SHOULDER BOLT	2
	0391M	FILTER/LUBRICATOR ASSEMBLY	1
	0390M	FILTER/LUBRICATOR WITH REGULATOR & CAGE	1