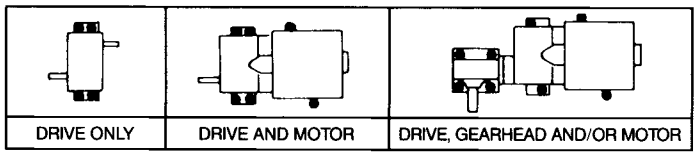
ZERO-MAX INSTRUCTION AND PARTS BOOKLET

FOR ZERO-MAX DRIVES, MOTORS AND GEARHEADS

INSTALLATION

MOUNTING

After you have determined your torque and know your load will not overload the ZERO-MAX, the drive, motor and/or gearhead should be firmly bolted to a **flat** surface. If you have only the ZERO-MAX drive, mount the drive to the flat surface through the (4) mounting slots in the base of the drive. If the ZERO-MAX drive is being used with a gearhead and/or motor, the unit serving as the ultimate output drive (the gearhead if one is present or the drive) should be mounted firmly through all mounting holes and the units behind it should be mounted through at least 1 mounting hole on each side of the unit. Shims may have to be used for proper alignment.



DRIVE ONLY	DRIVE AND MOTOR	DRIVE, GEARHEAD AND/OR MOTOR

CONNECTION TO INPUT AND OUTPUT SHAFTS

For direct coupling to the input or output shaft, align the two shafts to be coupled carefully and use a good **flexible** coupling. When using pulleys or sprockets, mount them as close to the ZERO-MAX housing as possible and avoid excessive tension.

OPERATING TEMPERATURES

The normal heat rise over ambient specifications is as follows:

MODEL	WITHOUT MOTOR		WITH STANDARD MOTOR	
E	40° C	72° F	40° C	72° F
JK	40° C	72° F	50° C	90° F
Y	40° C	72° F	—	—
QX	40° C	72° F	—	—
ZX	40° C	72° F	—	—

STARTING

Care should be exercised when starting the ZERO-MAX under load and in high speed positions. When possible, accelerate slowly or add load slowly for best results. It is better to start with the ZERO-MAX control lever at the zero setting and move the lever to the desired speed when possible, instead of starting and stopping the motor driving the ZERO-MAX. The motor can be run with the ZERO-MAX at zero indefinitely without harm to the motor, or the ZERO-MAX.

ZERO-MAX DRIVES WITHOUT MOTOR

When a ZERO-MAX drive is supplied without a motor, the following chart gives the minimum and maximum input power ratings to be used. Use the minimum for low speed applications. Use the maximum if the drive is to be operated over the entire speed range.

	INPUT POWER					
	MINIMUM			MAXIMUM		
MODEL	H.P.	Nm	Kw	H.P.	Nm	Kw
E	⅛	6.12	.093	⅓	16.32	.248
JK	¼	12.24	.186	⅓	16.32	.248
Y & QX	½	24.48	.373	¾	36.72	.560
ZX	1	48.96	.746	1½	73.44	1.120

We suggest using 1800 rpm split-phase or capacitor start motors for best results. Recommended maximum input speed for the drives is 2000 rpm.

SPEED CHANGE

To change speed on units **with lever control,** turn the red speed control knob counterclockwise to unlock, move the lever to the desired speed setting and twist the knob clockwise to lock it. Speed may be changed at any time, running or not.

On units **with screw control,** change the speed by rotating the speed control screw to any desired position at any time. No lock is required on the screw control.

Your ZERO-MAX drive may vary in speed with change in load. This is due to parts flexing within the drive and is not the result of slippage. At very low speed settings the output shaft may stop rotating as load is added until the speed control lever is repositioned. If speed change from changing load is detrimental to your application contact the factory or your ZERO-MAX representative for suggestions. IF OPERATION AT SPEEDS CLOSE TO ZERO IS REGULARLY AND FREQUENTLY REQUIRED, REDUCE INPUT SPEED OR TAKE AS MUCH REDUCTION AS POSSIBLE ON THE OUTPUT, OR BOTH.

REVERSE MODELS

Reverse is accomplished on the ZERO-MAX Models E3 and JK3 through a special reversible clutch which is shifted by moving a reverse lever through an arc to achieve clockwise, neutral or counterclockwise output shaft rotation. The drives can be reversed when input is turning **but it's best to bring the drive output to zero prior to reversing. At the same speed control setting, output speed will be different in one direction than the other, unless the input rotation direction is changed at the same time that the drive is reversed.**
The reverse control can be used as a clutch giving neutral at any speed setting with the output shaft free to be turned manually in either direction. **It is best to move the speed control lever to zero before reengaging reversible drives.**

LUBRICATION

Drives: The ZERO-MAX drive runs on oil and is filled at the factory with ZERO-MAX No. 400 lubricant (Chevron Delo 100 Motor oil SAE 40). If ZERO-MAX No. 400 lubricant (Chevron Delo 100) is not available from your ZERO-MAX distributor or service station use Mobil-Delvac 1140. In an emergency use a good grade of SAE 40 detergent motor oil. All new and rebuilt units will be filled with sufficient oil for any mounting arrangement.

Gearheads: All gearheads are filled with proper amount and kind of lubricant when shipped from the factory, but the oil level should be checked periodically to be sure the case is at least ½, but not over ⅔ full. If for any reason additional lubricant is required, use ZERO-MAX No. 600 lubricant (Mobil 600W or equivalent).

Motors: Check lubrication requirements found on the back of each motor. For special ambient conditions consult the factory for recommendations.

The proper quantity of lubricant when refilling the drives or gearheads is as follows:

MODEL	LUBRICANT QUANTITY OUNCES	LITERS
E1, 2, 41 and 42	13	.385
E3	15	.444
JK1, 2, 41 and 42	18	.533
JK3	20	.592
Y	43	1.273
QX1, 2, 41 and 42	95	2.812
ZX1, 2, 41 and 42	150	4.440
W1, W2, W3 and W4	7	.207
S5, S6 and S7	16	.474

ASSEMBLY INSTRUCTIONS – MOTOR NUMBERS M3 thru M49

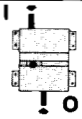
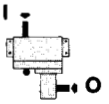
Please follow these basic instructions for assembly:

TOOL NEEDED: A No. 1 Phillips Head screwdriver with a shank at least 10" long.

THESE ZERO-MAX MOTOR POWER BLOCKS ARE DESIGNED FOR USE WITH MODELS E AND JK ZERO-MAX DRIVES.

STEP I To properly assemble a ZERO-MAX MOTOR POWER BLOCK to a Zero-Max DRIVE POWER BLOCK, follow these instructions carefully. When unpacking the motor from its shipping carton, be sure all parts are included: 1 – motor; 1 – nylon gear; 2 – 10-32 machine screws; and 1 – 8-32 machine screw. Inspect for any apparent shipping damage. (See Fig. 1)

STEP II Zero-Max Drives have a preferred direction of input rotation relative to output rotation. See separate motor wiring directions.

Look In Direction Of Arrow To Determine Rotation I — Input O — Output	Standard		Parallel Shaft Gearhead		Right Angle Gearhead	
						
With Output Rotation of	CCW	CW	CCW	CW	CCW	CW
Recommended Input Rotation Is	CW	CCW	CW	CCW	CW	CCW

STEP III Insert the nylon gear onto the input shaft of the Zero-Max Drive matching the internal flat in the gear to the external flat on the shaft. Tap lightly with a soft hammer on the center portion of the gear, being careful not to strike the gear on the gear teeth. The gear will be in place when it is 17/32" from the drive case disregarding the bead and the boss. (See Fig. 2)

STEP IV Slide the motor onto the drive being sure that the gear on the input shaft of the drive meshes with the gear in the motor. Insert the 8-32 screw through the lip on the top front of the motor into the drive. Do NOT tighten at this time.

STEP V Using the 10" Phillips Head screwdriver, insert the two 10-32 screws through the bottom front corner holes of the motor into the holes in the rear bottom corner of the drive. Do NOT tighten at this time.

STEP VI Making sure that the Drive and Motor are flush with each other, tighten the 8-32 screw on top. Now tighten the two 10-32 screws on the bottom. (See Fig. 3)

STEP VII The final assembly is now complete and ready for installation. Ground the motor and turn on. If assembly seems noisy, let it run for a few minutes to allow the gears to work together. If the assembly continues to produce excessive noise after several minutes of operation, loosen and tighten the screws again in different order. If the Drive is noisy at maximum speed, the direction of motor shaft rotation may be wrong. (See STEP II.)

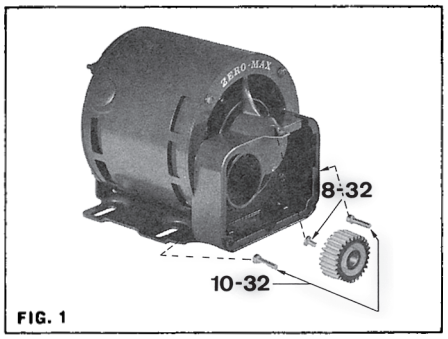
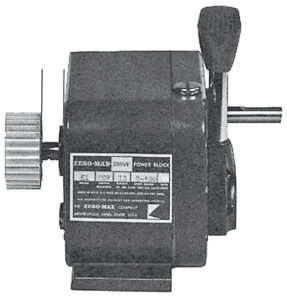
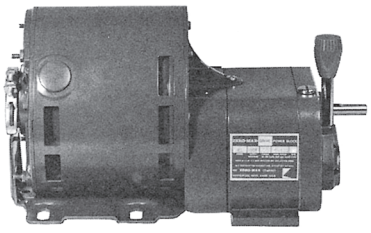
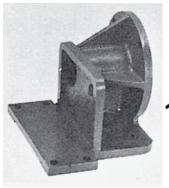


FIG. 1

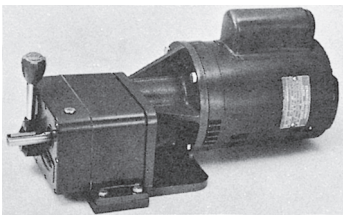

FIG. 2

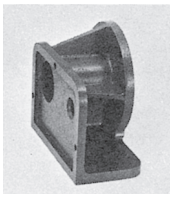

FIG. 3

ASSEMBLY INSTRUCTIONS – C-FLANGE ADAPTERS

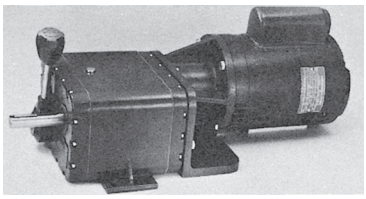

Adapter CFY

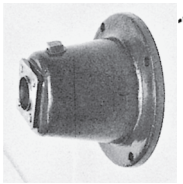
Slide the flexible coupling on the drive shaft and motor shaft. Bolt motor to adapter, tighten coupling set screws through access in adapter. Place the adapter on a flat mounting surface and drill four mounting holes. Bolt the Model "Y" and adapter in place.


Model Y Drive, CFY adapter & ½ HP 56 frame C-face motor

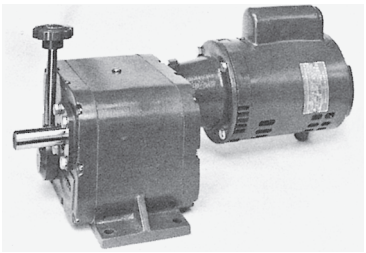

Adapter CFQ

To assemble, bolt the adapter to the drive, slide the flexible coupling on the drive shaft and motor shaft. Bolt the motor to the adapter. Tighten coupling set screws through the access provided. Place the entire assembly on a flat surface and bolt in place.


Model "QX" Drive, CFQ Adapter & ¾ HP 56 frame C-face motor


Adapter CFZ

Bolt the adapter to the drive. Install flexible coupling on motor shaft and tighten set screw. Bolt the motor to the adapter. Tighten coupling set screw on drive shaft through the access provided. Place the entire assembly on a flat surface and bolt in place.


Model ZX Drive, ZXI adapter & 1½ HP 56 Frame C-Face motor

ZERO-MAX SERIES "S" AND "W" GEARHEADS MAY BE USED WITH BOTH "E" AND "JK" MODEL DRIVES. FOR FINAL SPEED RANGE AND TORQUE CAPACITY, SEE LABEL ON SIDE OF GEARHEAD.

SERIES "W" GEARHEAD

ASSEMBLY INSTRUCTIONS

Tool needed: A Phillips Head screwdriver.
INSPECT AND CHECK TO SEE ALL PARTS ARE INCLUDED (SEE FIG. 1)

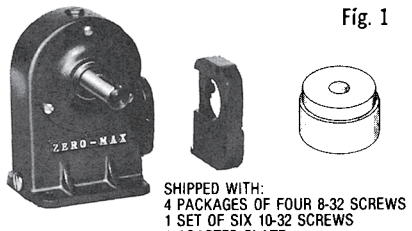
STEP I Using a Phillips Head screwdriver remove Zero-Max drive case screws, Nos. 1, 4, and 6 as shown in Fig. 2.

STEP II Select the package of screws which matches the Zero-Max Drive Model number used. You will be using 3 of the 4 screws supplied.

STEP III Attach the adapter plate to the front of the Zero-Max drive case with the three screws selected in Step II above by inserting them in drive case holes 1, 4, and 6. Then slip alignment tool onto output shaft of drive (with smaller dia. facing drive). Make sure smaller dia. pilots in corresponding bore in the adapter plate (the larger dia. of the alignment tool should sit flush with the adapter plate). Seat the screws firmly but do not over-tighten or you may bind the inner mechanism of the drive. After tightening, alignment tool should be free to spin in adapter bore (if not, realignment is necessary). Remove alignment tool.

STEP IV Line up the red dot on the gearhead input section with the flat on the Zero-Max output shaft. Do not remove grease from bore. Gently slip the gearhead over the drive shaft twisting slightly until both slide together. When together, rotate the gearhead so its shaft is at a 3, 6, 9 or 12 o'clock position and insert 2 10-32x¾" screws through the gearhead flange and into the adapter plate. Tighten the screws so they are evenly and equally seated.

Fig. 1



SHIPPED WITH:
4 PACKAGES OF FOUR 8-32 SCREWS
1 SET OF SIX 10-32 SCREWS
1 ADAPTER PLATE
1 ALIGNMENT TOOL

Fig. 2

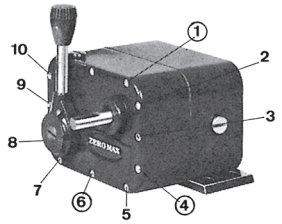
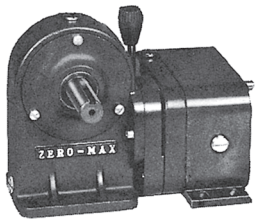


Fig. 3



SERIES "S" GEARHEAD

ASSEMBLY INSTRUCTIONS

Tool needed: A Phillips Head screwdriver.
INSPECT AND CHECK TO SEE ALL PARTS ARE INCLUDED (SEE FIG. 10)

STEP I Using a Phillips Head screwdriver remove Zero-Max drive case screws, Nos. 1, 4, 6, and 8 from Zero-Max drive. (See Fig. 11)

STEP II Select the package of screws which matches the Zero-Max Drive Model number used.

STEP III Attach the adapter plate to the front of the Zero-Max drive case with the four screws mentioned in Step II above by inserting them in drive case holes 1, 4, 6, and 8. Then slip alignment tool onto output shaft of drive (with smaller dia. facing drive). Make sure smaller dia. pilots in corresponding bore in the adapter plate (the larger dia. of the alignment tool should sit flush with the adapter plate). Seat the screws firmly but do not over-tighten or you may bind the inner mechanism of the drive. After tightening, alignment tool should be free to spin in adapter bore (if not, realignment is necessary). Remove alignment tool.

STEP IV Line up the red dot on the gearhead input section with the flat on the Zero-Max output shaft. Do not remove grease from bore. Gently slip the gearhead over the drive shaft twisting slightly until both slide together. When together, rotate the gearhead so it matches the drive and insert 6 4"x10-32 screws through the gearhead flange and into the adapter plate. Tighten the screws so they are evenly and equally seated.

Fig. 10



SHIPPED WITH:
4 PACKAGES OF FOUR 8-32 SCREWS
1 SET OF SIX 10-32 SCREWS
1 ADAPTER PLATE
1 ALIGNMENT TOOL

Fig. 11

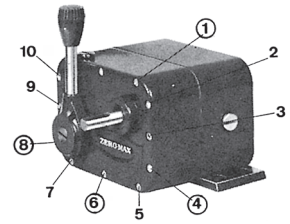
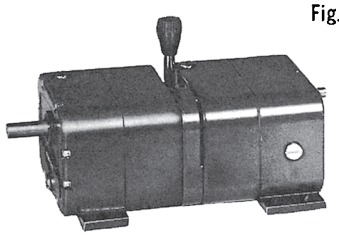


Fig. 12



PARTS LIST

BE SURE TO SPECIFY MODEL NUMBER, MFG. CODE, DIAMETER, LENGTH, PART NO., ETC. WHEN ORDERING REPLACEMENT PARTS. WHEN POSSIBLE SEND PART BEING ORDERED TO AVOID CONFUSION.

DRIVES

PART DESCRIPTION	Part No. For Drive Models E & JK	Part No. For Drive Model Y	Part No. For Drive Model QX	Part No. For Drive Model ZX
Input Shaft Seal	D550100	D554500	D552500	D555100
Output Shaft Seal	D550100	D554400	D552500	D555200
Case Gasket	D549900	D554300	D552100	D554600
Knob and Pin Assembly	D651200	D687300	D680300	D723500
Reverse Knob	D650000	—	—	—
Case Screws (specify length & size)	—	D456900	D456800	D464300
Input Shaft Gear	D619500	—	—	—
Gearhead Adapter	D964500	—	—	—
Control Lever Assembly (complete)	D669600	D694100	D723100	D723200

C-FLANGE ADAPTER

PART DESCRIPTION	PART NO.
Flexible Coupling-Y	D980300
Flexible Coupling-QX	D968900
Flexible Coupling-ZX	D987000
Sleeve only for Y/QX	D981000
Sleeve only for ZX	D981400

For parts not listed write factory for a quotation. A $40.00 minimum billing applies to all parts orders.

MOTORS

PART DESCRIPTION	PART NO.
Motor Gear *	D619400
10-32 Adapter Screw (2)	D452900
8-32 Adapter Screw (1)	D459600

*Prior to 1982, models M3, M9, M48 and M49 used D619300 with ⅝" bore and double flat. During 1982 change was made to D619400 with ½" bore and single flat for **ALL** motors.

SERIES "S" GEARHEADS

PART DESCRIPTION	PART NO.
Input Seal	D551100
Output Shaft Seal	D551100
Gasket	D553400
Case Screws	D457200
Adapter Plate-S	D964500
Alignment Tool	D989900

SERIES "W" GEARHEADS

PART DESCRIPTION	PART NO.
Input Seal	D553200
Output Shaft Seal	D552500
Gasket	D553100
Case Screws	D458300
Adapter Plate-W	D964500
Alignment Tool	D989900

MANUFACTURING CODE

A manufacturing date code is stamped on Zero-Max Drive and Gearhead Cases above the label. The first letter indicates the year (K being 1970), the second letter indicates the month (A is January, B is February, etc.). Always give the date code when requesting service or ordering parts.

Note: For a listing of Distributors outside the U.S.A., see our website or contact Zero-Max.

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