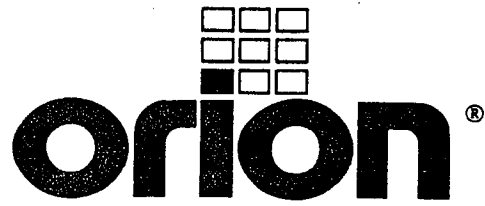


STRETCHWRAPPERS

2270 Industriel, Montreal (Laval) Canada H7S 1P9 / Tél.: (514) 667-9769 Fax: (514) 667-6320



INSTRUCTION MANUAL

Thank you for choosing ORION stretch-wrapping equipment. It is a wise choice which will benefit your company now and in the future.

ORION uses a unique combination of functional, rugged steel structure and sophisticated control systems to offer equipment high in durability and low in maintenance requirements. Our advanced control systems mean that ORION equipment can be operated safely and efficiently without the need for special operator expertise.

Please read this manual carefully and keep it handy. Following these simple operating instructions will insure the safe and efficient performance of this machine while simple maintenance procedures will guarantee a long and productive life of the equipment.

NOTICE:

Our manual covers standard features of the machine. Certain options may not be fully covered due to their unique application.

In order to acquire more information about custom made features of your machine and to provide quicker service, the following information is required when making an inquiry:

- 1) **MODEL**
- 2) **SERIAL NUMBER** 083682
- 3) **SUBASSEMBLY (see PART LIST)**

SAFETY:

ORION'S stretch wrappers should be operated with caution and common sense as any other industrial equipment. To prevent injury and / or electrical shock, careful operation of the machine and awareness of its many automatic functions is required.

Note: All electrical power and compressed air must be disconnected prior to performing any inspection, maintenance or repair work.

ORION PACKAGING INC.

ORION MODEL M-66
Spiral Semi-Automatic Heavy Duty Wall Mount Rotary Tower

Maximum Load Size:	52"W x 52"L x 80"H (Recommended) 56"W x 56"L x 84"H (Theoretical)*
Weight Capacity:	Unlimited (Floor Loaded)
Utilities:	115/1/60 20 Amp Service
Rotary Tower:	All Structural Steel Easy Access to All Components Steel Tube Matrix Design
Tower Drive:	20" Diameter Ring Bearing Tower Support Chain/Sprocket Gear Drive 0 - 12 RPM Variable Tower Speed 1/2 HP DC/SCR Drive Electronic Soft Start Positive Tower Alignment Feature
Control Features:	Reliable Relay Logic Control System Safety Stop Photocell Electronic Film Force Control End of Cycle Film Force Release Separate Top and Bottom Wrap Selectors Variable Speed Film Carriage Control Auto-Height Photocell with On/Off Switch Film Carriage Raise/Lower Switch Tower Jog Pushbutton Spiral Up or Up/Down Cycles NEMA 12 Electrical Enclosure
Film Delivery:	20" Orion MultiStretch Power Prestrech Electronic Film Tension Control End of Cycle Film Force Release Full Authority Film Dancer Bar #40 Chain & Sprocket Stretch Ratio Control 1/3 HP DC/SCR Film Drive Low Wrap Feature (Minimum 3")
Film Carriage Drive:	#50 Roller Chain Carriage Lift 1/3 HP Elevator Drive Motor Variable Speed CR Control Precision Cam Follower Tracking
Structural Features:	Wall or Beam Mounting Design All Structural Steel Construction 6" x 12 lb./ft. "H" Beam Mast
Estimated Shipping Weight:	1,250 lbs.
*THEORETICAL MAY INCREASE OPERATOR DIFFICULTY IN PROPER LOAD PLACEMENT, AND REFLECTS MAXIMUM FILM WEB HEIGHT ATTAINABLE.	

MACHINE UNLOADING INSPECTION & INSTALLATION

UNLOADING

Machine can be easily unloaded and transported by a forklift with a minimum capacity of 2500 lbs.

1. Carefully insert the forks into the lifting tubes to the maximum possible depth. Depending on the model, a forklift access may be either at the turntable end of the machine frame, the tower end or both. In case of the mongoose machine or the conveyor, enter the forks under the frame.
2. Lift the machine (or other part of system) only to the necessary height to move it with no bouncing or friction on the floor.
 - 2a. On the mongoose machines use the brackets welded on the top part of the machine.
3. Sit the machine down assuring uniform contact with the floor which is necessary to ensure correct and smooth operation.
 - 3a. Mongoose type machines (M66, M67) have to be attached on the bracket or on the stand (collapsible or anchored to the floor). The M55 has it's own supporting frame which allows the machine to stand independently.

INSPECTION

1. Remove all packing and supporting additions - these may include the blocks under the carriage and the restraining bar over the table.

NOTE: when removing the stretchwrap film covering the machine, care must be taken not to cut any of the electrical wires and rubber covering on the multistretch rollers.

2. Perform a visual inspection of the electrical and mechanical parts for loosened joints and / or broken connections. Any suspected shipping damage must be reported immediately to the freight carrier.

Items that are vulnerable to damage and must be inspected are as follows:

- motors and transmissions
- junction boxes
- electrical conduits
- proximity and limit switches
- photocells

3. Check under the turntable (H - series models only) to ensure that there is no crippling of the movable parts i.e. casters, center axle or drive assembly.

4. Verify the following:

- turntable or rotary arm drive system to confirm that the reducer to drive the chain is snug and properly aligned
- verify the wires tight conduits for crushed sections or loose fittings
- verify the carriage to be sure that it is correctly aligned with the tower and verify the tension on the lift chain
- verify all the dials and knobs on the control panel for smooth action.

MACHINE INSTALLATION

After the visual inspection has been completed the electrical power and the compressed air may be connected as specified on the diagrams supplied with the machine.

An electrical diagram is provided with each machine in the envelope attached to the panel box.

ASSEMBLY PROCEDURE

The structural frames of the machine have to be installed on a levelled floor. Locate the main wrapper section into its final position, keeping the tower assembly* away from any traffic.

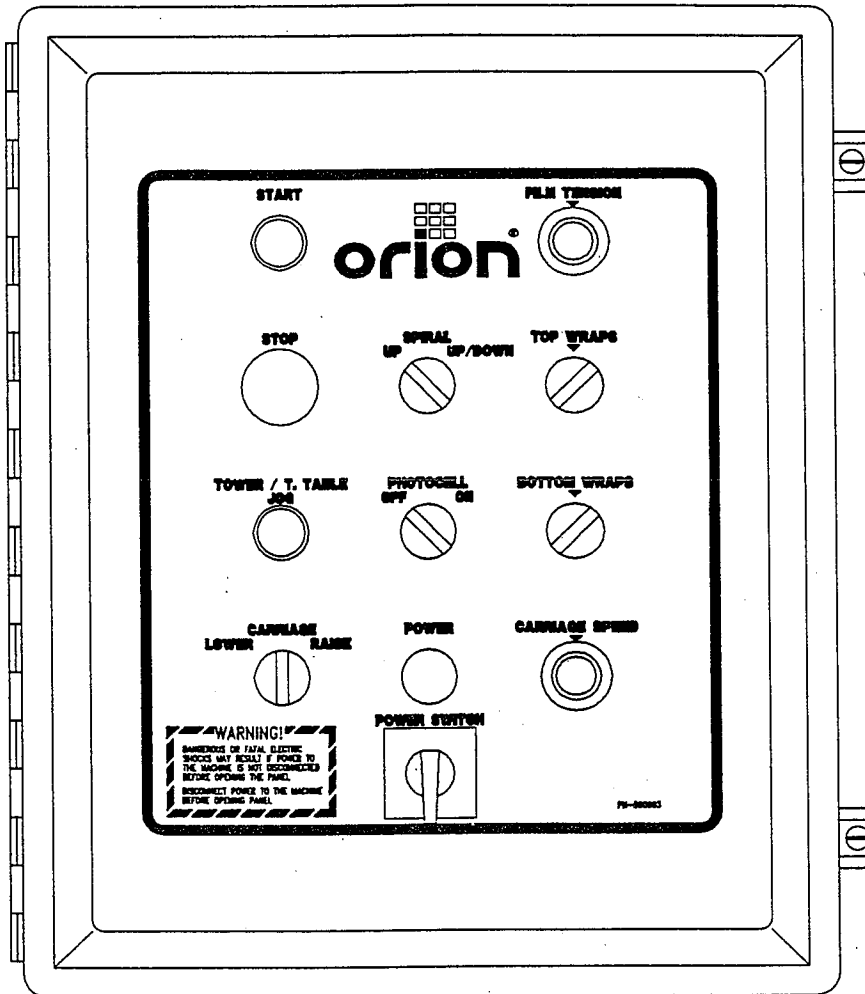
The wrapper mainframe section must be bolted to the floor by the 1/2" concrete floor anchors (leg & shield or expandable type).

Conveyor sections (where applicable) have to be positioned, levelled** and bolted to the floor. Any wiring which has been disconnected to facilitate transport is marked with a number located on the junction box to which the wiring must be reconnected. It allows identification of the proper position of the infeed and outfeed conveyor sections. Any wire run that appears too short or long may indicate that the position of the mechanical components is incorrect. Verify the status of all assemblies before proceeding.

CAUTION: improper placement and alignment of the conveyor section(s) and/or electric photocells may lead to equipment malfunction and damage.

* The tower deviation from vertical must not exceed 1/4" on the distance of 10 feet (angle: 0 degrees 6').

** In the case of the conveyors, the roller deviation from the horizontal must not exceed 1/16 "on the distance 52" (angle: 0 degrees 4').



CONTROL PANEL

In case of the free standing panel (console) place it adjacent to the system and anchor firmly to the floor. Connect the liquid tide (rigid conduit) to the main junction box located on the wrapper main frame next to the tower (or tower home position in case of mongoose). The wires have to be matched properly on both sides.

CYCLE CONTROLS

The control panel layout is custom designed for each particular installation, however, common standard controls have been employed.

CAUTION: before proceeding be familiar with the EMERGENCY button and all functions, switches and pushbuttons.

POWER SWITCH

The Power Switch has two settings:

ON - connects a power source to the machine (voltage depends on the machine type - see electrical diagram provided with the machine).

OFF - disconnects the power source.

START AND STOP SWITCHES (EMERGENCY STOP)

The START switch is used to start the cycle once the load is on the turntable (or under the rotary arm). The cycle may be stopped at anytime by pressing the STOP button.

NOTICE: In case of emergency, use the STOP button which interrupts all the machine electrical circuits (except multistretch drive). If the STOP pushbutton is pressed in the middle of the cycle, the carriage and turntable may be returned to their home position by using the jog buttons before restarting the cycle.

SPIRAL WRAP SWITCH

The SPIRAL WRAP switch has two positions:

UP - in this position the cycle will end after completing the specified number of top wraps, therefore, the machine will only wrap the load once, going up.

UP/DOWN - in this position the cycle will be completed after the load is wrapped in both the up and down directions.

NOTE: TOP WRAP FIRST (OPTIONAL)

The carriage raises faster at the beginning of the cycle to wrap the top of the load (see electrical diagram provided with the machine).

CARRIAGE CONTROL SWITCH

The CARRIAGE CONTROL switch is a three position switch with the following settings:

RAISE - raises the carriage until the top limit switch on the tower is activated.

LOWER - lowers the carriage until the bottom limit switch on the tower is attained.

The switch is normally positioned in the middle where the carriage remains stationary. Turning the switch to the RAISE or LOWER will activate the carriage to move in its respective direction.

TURNTABLE (ROTARY TOWER) JOG

The turntable (rotary tower) jog switch is a pushbutton which will rotate the turntable (rotary arm) in a clockwise direction (as viewed from the top) when the switch is held depressed. When the switch is released the turntable (rotary tower) will stop. The switch is inoperative during the wrap cycle.

PHOTOCELL SWITCH

The photocell switch has two settings:

ON - when turned ON, the photocell instructs the carriage to stop and begin the top wraps sequence once the top of the load is reached. The carriage will always stop at the top of the load regardless of its height. The photoswitch position on the track can be adjusted in order to make the carriage pass the top of the load and overlap the top.

OFF - when turned OFF, the photocell is inoperative and the carriage will stop when the top limit switch has been activated.

FILM TENSION

Film tension may be adjusted using the film tension control knob. It has a range of tension from 0 to 10 (0 to 4 the low range, 4 to 8 the most usefull range for most of the films used by our customers, 8 to 10 as a very high range which may break some films).

NOTE: Lighter loads may require lower tension settings then heavier loads.

Film tension is controlled through the dancer bar system. Occasionally the feed back proximity sensor may need some adjustment. Adjustment of feed back is shown on drawing # 001

Adjustment instructions:

- remove the carriage cover
- unbolt the two nuts holding the proximity switch -item # 1
- turn the proximity switch - item # 2 until the moment when the motor starts to turn (or hums)
- tighten on the nuts securing the proximity switch.

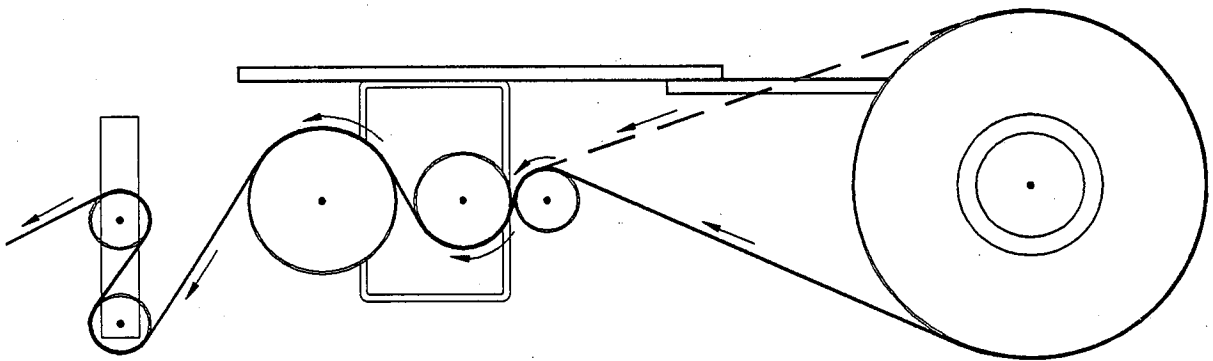
NOTE: The condition in which the motor hums but does not turn must be maintained even after all elements are tightened. If not, the adjustment procedure must be repeated.

TO LOAD THE FILM....

The film roll can be loaded on the mandrel of the carriage from either end of the roll. When using tacky film, please verify that the inward tacky surface of the film is inward on the load.

1. Disconnect power (turn off power switch).
2. Put the roll of film on the mandrel and press down to insure penetration of spikes into the card board center of the film roll.
3. In the case of automatic machines, install the film cap on top of the roll to prevent upward movement.
4. Introduce the roping end of the film between the shafts of all rollers (as shown on the dwg.) and pull to pass it around all three rollers (pressure roller and both rubber rollers).
5. Pass the film between the two dancer (aluminium) rollers (in certain applications the film has to be passed around one or two additional position aluminium rollers).
6. When the film feeding is completed - turn the power switch ON
7. Peel off the first few winds of the film (multistretch will run due to displacement of the dancer roller) and fix the film end onto the load or into the clamp mechanism (if machine is fully automatic).


The system is now ready to begin the first wrapping cycle.
Proceed to page titled SYSTEM START UP.



WARNING:

DISCONNECT POWER BEFORE FEEDING FILM

**FILM FEEDING PATTERN
FOR "M" SERIES CARRIAGE**



SYSTEM START-UP

Notice: It is advisable to test-run the equipment with several pallet loads before make the attempt to wrap with film. Please position a worker at the EMERGENCY STOP push button.

Start up of the machine (system) may determine the need for the adjustment of:


- pallet sensor eyes (automatic systems only)
- load height stop photoswitch (on the carriage)
- conveyor acceleration/deceleration
- turntable speed & jog speed
- turntable speed acceleration/deceleration
- turntable home position (rotary tower home position)
- film tail treatment devices (automatic systems).



MACHINE WRAPPING TEST

Before the test procedure adjust the wrapping cycle parameters i.e. top wraps, bottom wraps, height photocell on/off, film tension, carriage speed (those two parameters may be adjusted during the wrapping cycle).

When there is no photocell, verify the top limit switch position.



MACHINE MAINTENANCE

REDUCER OIL CHANGE

On the reducing transmission, after the first week all external cap screws and plugs should be checked for tightness. It is recommended to change the oil every six months or 25000 hours of operation, whichever ever comes first. When adding oil, the transmission should never be filled above the oil level mark indicated, because leakage and overheating may occur. Below is a list of the type of lubricant that should be used:

Manufacturer	Lubricant
American Oil CO.	American Cyl Oil no:196-L
Cities Service Oil Co.	Citgo Cyl.Oil 100-5
Gulf Oil Corp.	Gulf Senate 155
Mobil Oil Corp.	Mobil 600 W Suerr Cyl.Oil
Philips Oil Co.	Andes S 180
Texaco Inc.	624+650T Cyl.Oil
Shell Oil Co.	Velvata Oil J82
Union Oil Of Cal.	Red Line Worm Gear Lube 140

MOTOR MAINTENANCE

An occasional inspection of the brushes should be made in order to establish a wear rate. Replacement brushes should be installed before old brushes wear to 9/16" long, measured on the long side. After replacing brushes run the motor near rated speed for at least 1/2 hour with no load to seat the new brushes.

Failure to properly seat the new brushes may cause commutator damage and rapid wear of the new brushes. If the commutator becomes rough, scored or out of shape, a competent motor shop should disassemble the motor and resurface the commutator. With every third brush change, have a competent motor shop resurface the commutator and blow the carbon dust out of the motor.




CHAIN MAINTENANCE


To clean the chain, wipe it with an oily cloth every month. If the environment is very dusty or damp, it may be necessary to clean it more often.

With time the chain will tend to stretch. A loose elevator and turntable (rotary arm) chain should be tightened at the chain tensioner, or by moving the reducer on the mounting plate.

CAM FOLLOWER MAINTENANCE

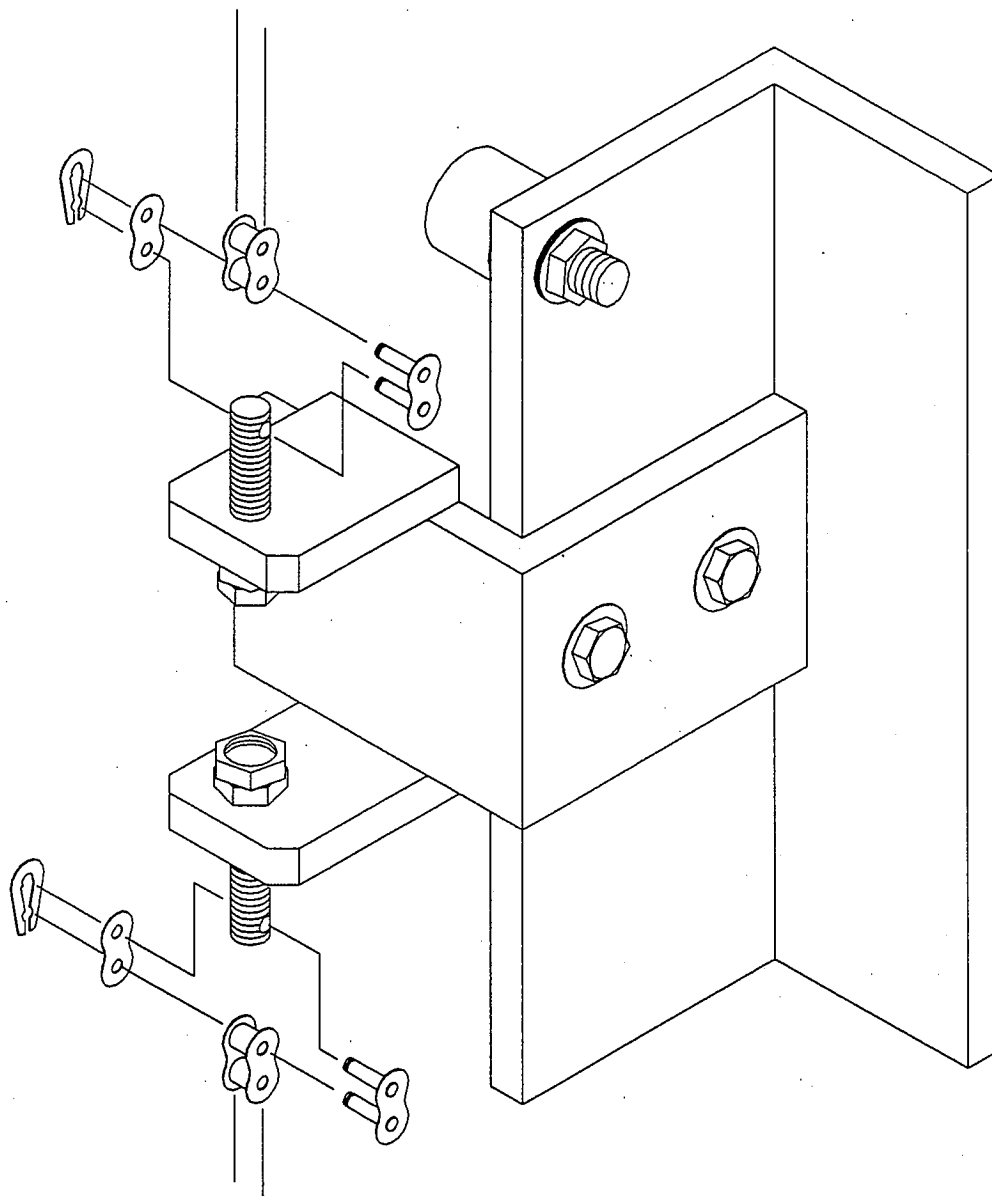


The cam followers behind the carriage have deep grease pockets and do not need frequent relubrication. The portion of the tower on which the cam followers run, should be cleaned and regreased every 300 hours of operation. If the machine operates in a dusty or corrosive environment the tower should be relubricated more often.



ATTENTION:

**WHEN MOUNTING THE CARRIAGE LIFT CHAIN,
PLEASE ENSURE, THAT THE CONNECTING
LINK'S PIN IS INSERTED FROM THE TOWER SIDE**



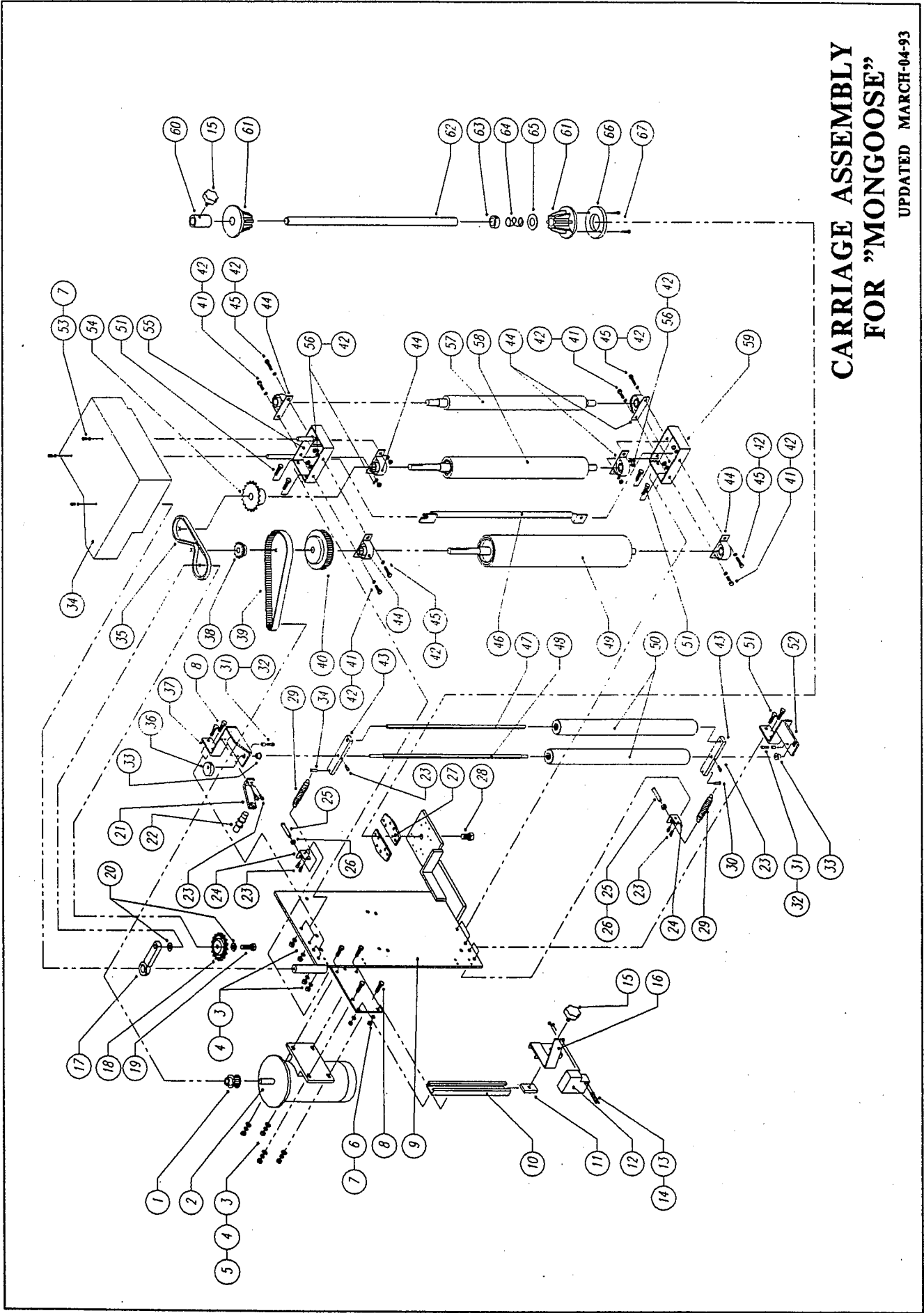
CHAIN TENSIONER ASSEMBLY

**SEMI-AUTOMATIC
STANDARD ASSEMBLY
PART LIST**

Note :

*** Quantity listed in order of part number**

**** The names given to the parts are generic**



**CARRIAGE ASSEMBLY
FOR "MONGOOSE"**

UPDATED MARCH-04-93

MONGOOSE STANDARD CARRIAGE ASS'Y

PART LIST

updated March-08-93

ORION			
NO.	PART NO.	DESCRIPTION	Q-TY
1.	011283	TIMING BELT PULLEY	1
2.	010059	ELECTR. MOTOR, F/20" FILM	1
	010036	ELECTR. MOTOR, F/30" FILM	1
3.	011128	HEX NUT	8
4.	011390	SPRING WASHER	8
5.	010948	FLAT WASHER	4
6.	012689	HEX NUT	1
7.	011393	SPRING WASHER	4
8.	012752	HEX HEAD SCREW	4
9.		BACK PLATE F/20" FILM	1
		BACK PLATE F/30" FILM	1
10.	401119	PHOTOCELL CHANNEL F/20" FILM	1
	401371	PHOTOCELL CHANNEL F/30" FILM	1
11.	011153	CHANNEL GUIDE	1
12.	011495	PHOTOCELL	1
13.	012754	PAN PHILL SCREW	2
14.	012726	HEX NUT	2
15.	010092	KNOB	1
16.	012090	PHOTOCELL BRACKET L.H. ASS'Y	1
	012091	PHOTOCELL BRACKET R.H. ASS'Y	1
17.	011142	CHAIN TENSIONER	1
18.	011297	IDLER SPROCKET	1
19.	012482	HEX HEAD SCREW	1
20.	012584	FLAT WASHER	2
21.	240022	PROXIMITY SENSOR BRACKET	1
22.	011470	PROXIMITY SENSOR	1
23.	010257	SOCKET HEAD CAP SCREW	5
24.	401962	SPRING BRACKET	2
25.	012755	CLEVIS PIN	2
26.	000000	CLEVIS PIN SPACER	2
27.	010049	BRAKE PADS	2
28.	011366	HEX HEAD SCREW	1
29.	401320	TENSION SPRING	2
30.	401374	CLEVIS PIN	2
31.	012586	SOCKET HEAD SHOULDER CAP SCREW	2
32.	010946	PLASTIC HOSE	2
33.	010058	BRONZE BUSHING	2
34.	011755	CARRIAGE COVER	1
35.	010583	CHAIN	1
36.	011477	PROXIMITY SENSOR CAM	1
37.	240021	TOP DANCER ROLLER BRACKET	1
38.	010975	DRIVE SPROCKET	1
39.	011151	TIMING BELT	1
40.	011003	PULLEY	1
41.	012723	HEX HEAD SCREW	4

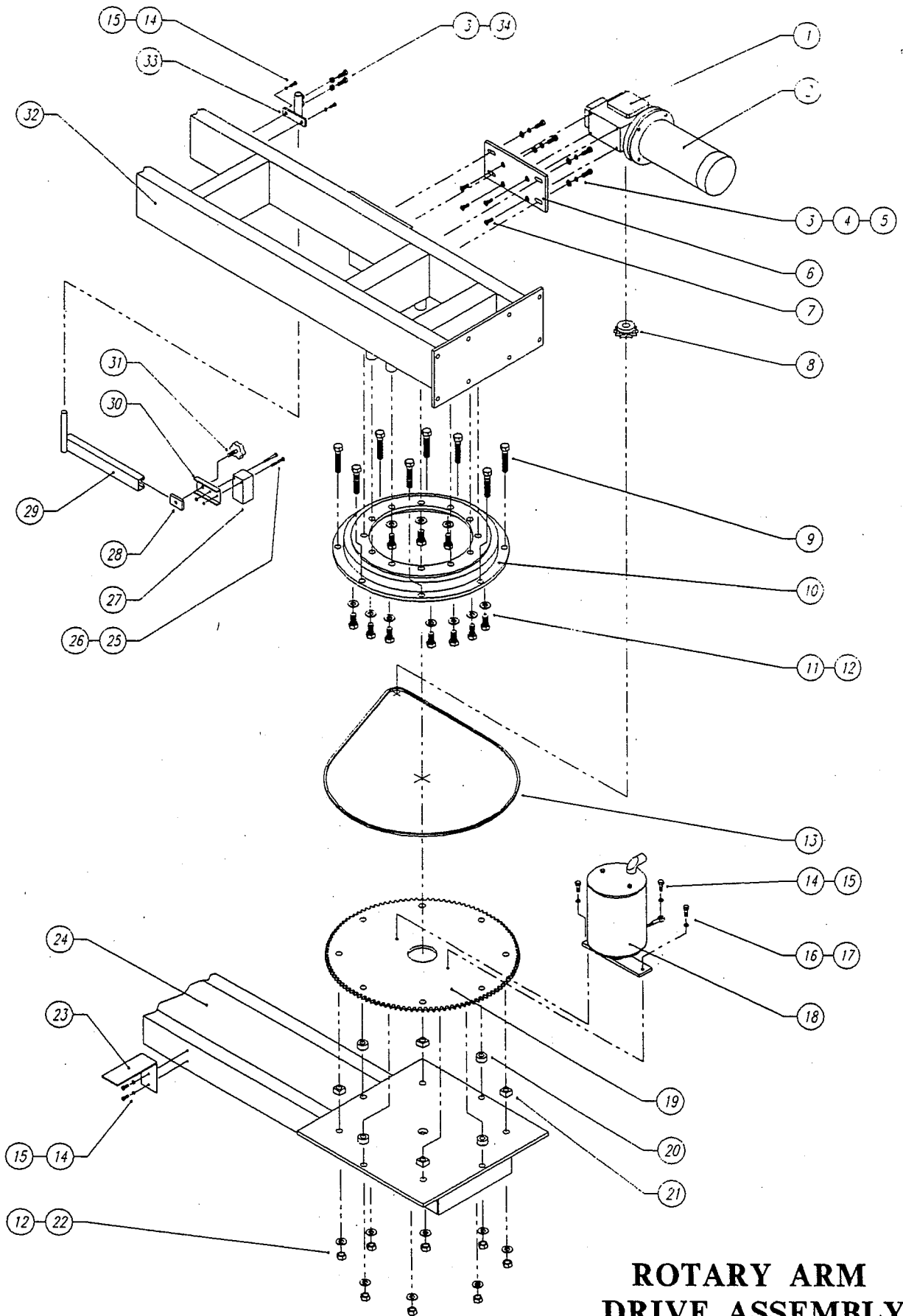
42.	012725	FLAT WASHER	16
43.	401358	LEVER	2
44.	010427	PILLOW BLOCK BEARING	6
45.	012757	HHS 5/16 UNC, 1 1/4" LG.	4
46.	011412	SAFETY BAR F/20" FILM	1
	011413	SAFETY BAR F/30" FILM	1
47.	011419	SHORT SHAFT F/20" FILM	1
	011420	SHORT SHAFT F/30" FILM	1
48.	011421	LONG SHAFT F/20" FILM	1
	011422	LONG SHAFT F/30" FILM	1
49.	011406	RUBBER ROLLER 4" DIA. F/20" FILM	1
	011407	RUBBER ROLLER 4" DIA. F/30" FILM	1
50.	011371	DANCER ROLLER F/20" FILM	2
	011431	DANCER ROLLER F/30" FILM	2
51.	010293	HEX HEAD SCREW	4
52.	230537	BOTTOM DANCER ROLLER BRACKET	1
53.	012049	PAN PHILL SCREW	3
54.	011454	DRIVE SPROCKET	1
55.	240929	TOP BRACKET	1
56.	012751	5/16 UNC NUT	10
57.	011410	PRESSURE ROLLER 1 3/4" DIA. F/20" FILM	1
	011411	PRESSURE ROLLER 1 3/4" DIA. F/30" FILM	1
58.	011408	RUBBER ROLLER 2.66" DIA. F/20" FILM	1
	011409	RUBBER ROLLER 2.66" DIA. F/30" FILM	1
59.	230470	BOTTOM BRACKET	1
60.	400626	TOP SPOOL HOLDING TUBE	1
61.	010838	BOTTOM SPOOL	2
62.	012766	MANDREL SHAFT F/20" FILM	1
	012767	MANDREL SHAFT F/30" FILM	1
63.	010052	COLLAR	1
64.	010891	COMPRESSION SPRING	1
65.	010199	FLAT WASHER	1
66.	010887	MANDREL BRAKE DISK	1
67.	010886	SPIKE	2

MONGOOSE ROTARY ARM DRIVE ASS'Y

PART LIST

updated April-13-93

ORION			
NO.	PART NO.	DESCRIPTION	Q-TY
1.	010093	REDUCER	1
2.	010036	ELECTRICAL MOTOR	1
3.	010293	HEX HEAD SCREW	6
4.	011390	SPRING WASHER	4
5.	012672	FLAT WASHER	4
6.	011157	REDUCER BASE	1
7.	012693	FLAT SOCKET CAP SCREW	4
8.	010435	SPROCKET	1
9.	012929	HEX HEAD SCREW	8
10.	400064	BEARING	1
11.	010329	HEX HEAD SCREW	12
12.	012930	FLAT WASHER	20
13.	010009	CHAIN	1
14.	012475	HEX HEAD SCREW	5
15.	011393	SPRING WASHER	5
16.	010382	HEX HEAD SCREW	2
17.	012724	SPRING WASHER	2
18.	400924	SLIP RING ASS'Y	1
19.	401984	SPROCKET	1
20.	270060	SPACER	4
21.	400578	SPACER (THREADED)	4
22.	012846	HEX NUT	8
23.	400050	PROXIMITY SWITCH ACTUATOR	1
24.	401890	ROTARY ARM-TOWER	1
25.	012690	PAN PHILL SCREW	2
26.	012726	HEX NUT	2
27.	010739	PROXIMITY SWITCH	1
28.	010091	CHANNEL GUIDE	1
29.	260973	PROXIMITY SWITCH CHANNEL	1
30.	012694	PROXIMITY SWITCH HOLDER	1
31.	010092	KNOB	1
32.	400848	DRIVE SIDE FRAME	1
33.	260970	PROXIMITY SWITCH STAND	1
34.	012477	HEX NUT	2



ROTARY ARM DRIVE ASSEMBLY

UPDATED APR-12-93

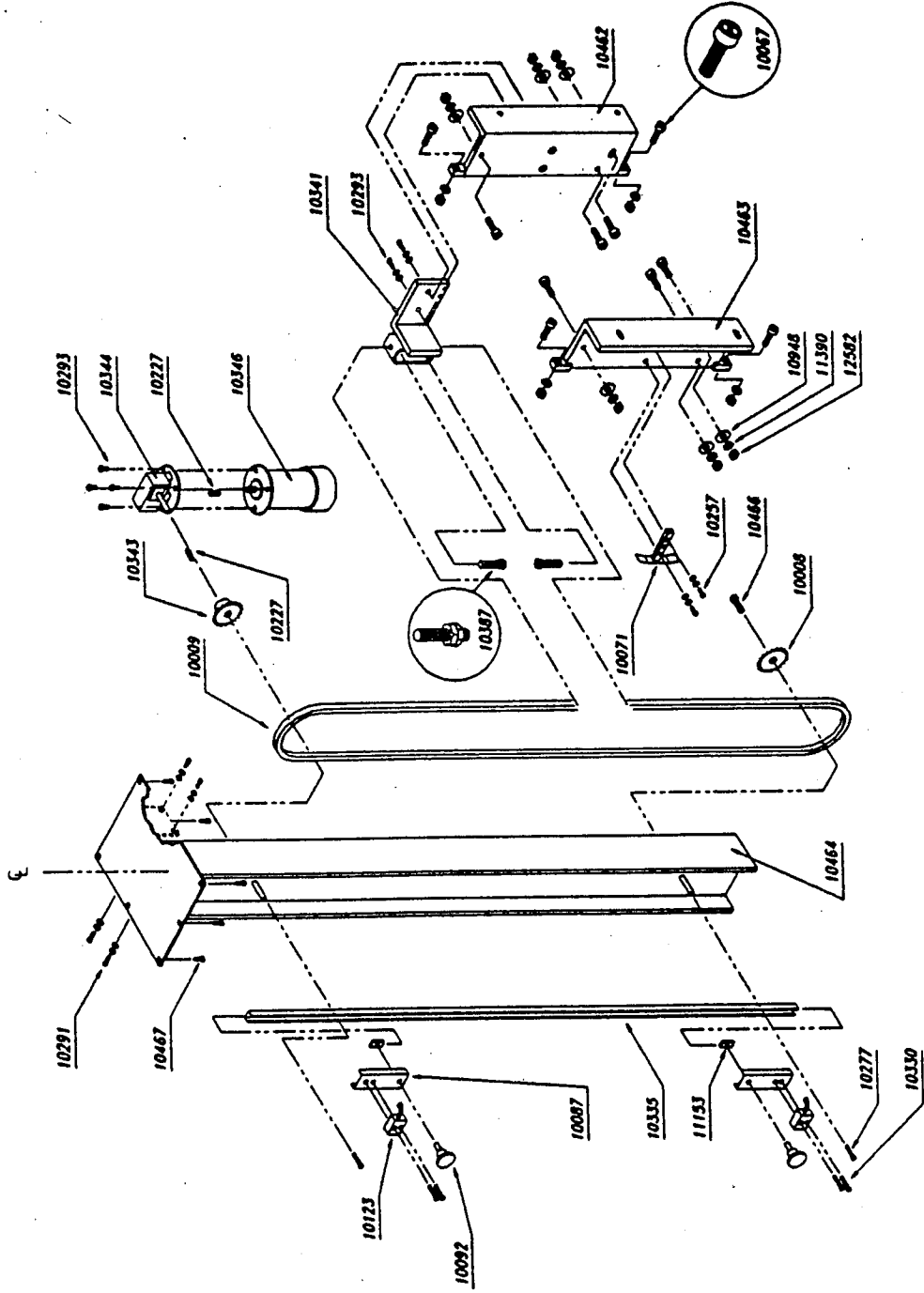
MONGOOSE ROTARY TOWER ASS'Y

PART LIST

updated April-30-93

ORION PART NO.	DESCRIPTION	Q-TY
10008	SPROCKET	1
10009	CHAIN	1
10067	CAM FOLLOWER	10
10071	LIMIT SWITCH ACTUATOR	1
10087	LIMIT SWITCH BRACKET	2
10092	KNOB	2
10123	LIMIT SWITCH	2
10257	SCREW	2
10277	SCREW	2
10291	SCREW	4
10330	SCREW	2
10335	CHANNEL	1
10341	CHAIN TENSIONER	1
10343	SPROCKET	1
10344	REDUCER	1
10346	ELECTR. MOTOR	1
10387	CHAIN TENSION SCREW	2
10462	RIGHT CARRIAGE HOLDER	1
10463	LEFT CARRIAGE HOLDER	1
10464	TOWER	1
10466	SCREW	1
10467	SCREW	8
10948	FLAT WASHER	6
11153	CHANNEL GUIDE	2
11390	SPRING WASHER	10
12582	HEX NUT	10

ROTARY TOWER ASS'Y



ELECTRICAL BOARDS' CHART FOR ORION STRETCHWRAPPERS

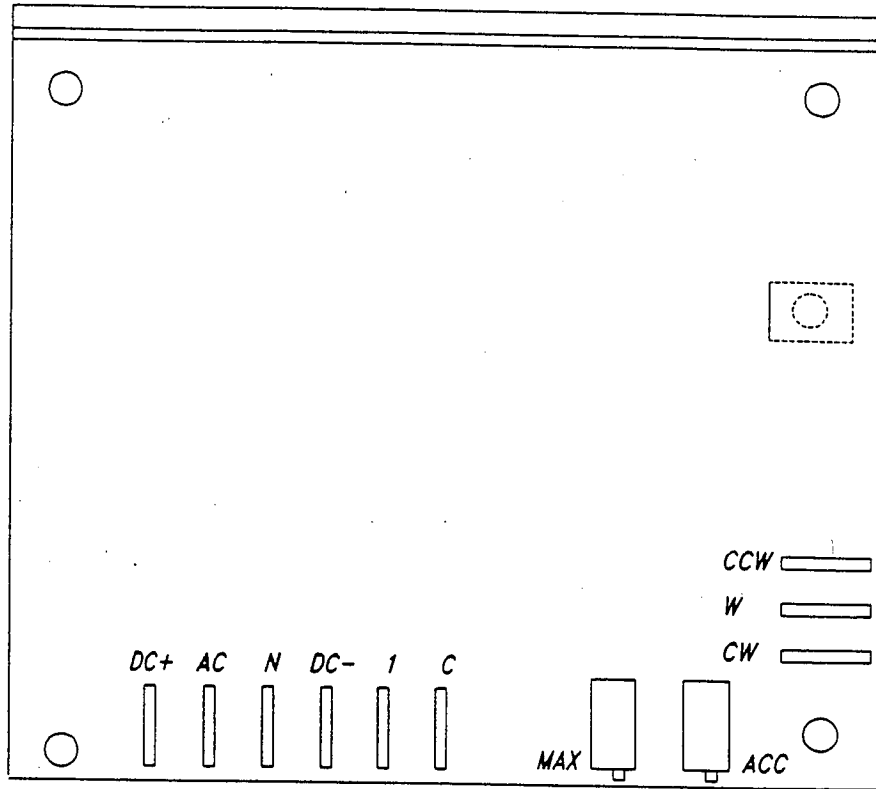
	168-4	168-A	336-6 & 7	750 MX	850 M	850 C	155-3	850 D
L-77, H-77		X					X	X
M-77		X				X	X	X
M-67		X	X			X	X	
M-67 PA		X	X		X		X	
M-67 DEMO		X	X		X		X	
M-66, L-66, H-66		X	X		X		X	X
M-57		X	X			X	X	
M-55, L-55, H-55		X	X		X		X	
M-44, L-44, H-44	X	X	X	X			X	
*M-44,*L-44,*H-44	X	X	X	X				

* - PROCESSOR

PA - POSITIVE ALIGNMENT

DEMO - DEMO PACKAGE

336-7 - REPLACES 336-6

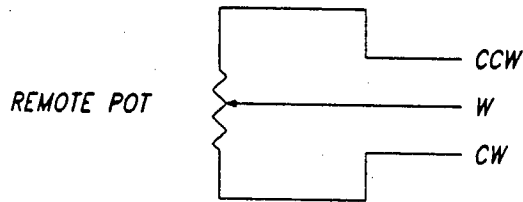


DC+: ARMATURE CONTROL.
 AC: AC INPUT - LINE.
 N: AC INPUT - NEUTRAL.
 DC-: ARMATURE CONTROL.
 1: CONTROL - LINE.
 C: CONTROL - COMMON.

POTENTIOMETERS:

MAX: MOTOR SPEED ADJUSTMENT.
 ACC: ACCELERATION ADJUSTMENT.

NOTE: INPUTS W & CW ARE SHORTED IN CONVEYOR MOTOR CONTROL



850D SINGLE SPEED DC
MOTOR CONTROL BOARD

TURNTABLE & TOWER MOTOR CONTROL BOARD ADJUSTMENTS

66 & 55 SERIES EQUIPMENT (850M Board)

INTRODUCTION

The 850M Motor Control Board is a DC/SCR drive that is used in 66 & 55 series Orion stretch wrapping equipment. The following calibration instructions apply to all 66 & 55 series turntable and rotary tower type machinery, but it will be important to note specific reference to your particular Orion model for best calibration results.

The 850M board features two selectable pre-set speeds 1 & 2, and four potentiometers, marked 1, 2, A and D.

The instructions are in the suggested order of adjustment, and are intended to be made after installation of the board in the control enclosure. Please refer to **the attached sketch of the board** for identification of the adjustment points.

INSTALLATION

The unit is equipped with an aluminum chassis, which serves as a heatsink. This should be oriented with the printed circuit board in a vertical plane for optimum convection cooling.

Connections are to .250" quick-disconnect terminals. Standard units require 120 VAC supply. AC line attaches to terminals AC1, AC2. Motor Armature attaches to terminals DC+, DC-. The standard unit is suitable for permanent magnet shunt style DC motors with 90 V armature rating, rated at up to 1HP.

ADJUSTMENTS

Acceleration: (RV3) The pot marked A is the control for the acceleration or electronic soft start feature.

For an initial setting, turn the A pot fully counter clockwise (CCW) (until a faint clicking sound is heard), and then approximately 2 turns or revolutions clockwise (CW). CW adjustment of this potentiometer softens the start and lengthens the time required for the turntable/tower to reach it's preset speed. CCW quickens the start and decreases the time for the turntable/tower, to reach it's preset speed.

Speed Control: (RV1) The pot marked 1 controls the turntable/ tower jog speed1.

Simply activate the turntable/tower jog function, adjusting the jog speed (pot 1) as the tower/turntable rotates. This should be set for approximately 2-3 R.P.M... Please note that this setting should be made with a load on the turntable (turntable type models only). A CW turn increases jog speed, while CCW decreases jog speed.

Speed Control: (RV2) The pot marked 2 is the control for the high speed2 for the turntable/tower during the wrap cycle once acceleration is complete.

This speed can be as high as 12 R.P.M.; however you should note that if it is set to high, you may see chopping of the current to the turntable/tower drive motor which will cause pulsating half speed operation of the turntable/tower drive itself. If this is seen, please decrease the setting of pot 2, until it is no longer in effect.

For best calibration results, it is recommended that you make this adjustment while the machine is in cycle. After starting a wrap cycle set the film carriage speed control to the "0" (minimum) position. This will prevent the film carriage from rising and completing its cycle. Then simply adjust the high speed (pot 2) as the tower/turntable rotates. A CW turn increases speed, while a CCW turn decreases speed.

1 Speed Control 1 = Turntable/Tower Jog Speed

Selected by a 120 VAC signal applied from terminal (1) to (C)

2 Speed Control 2 = Turntable/Tower High Speed

Selected by a 120 VAC signal applied from terminal (2) to (C)

Deceleration: (RV4) The pot marked D is the deceleration control. Functionally, it is the opposite of acceleration, except that it is a more critical setting in that our machine logic requires that we decelerate from speed 2 to speed 1 during the course of the final revolution of the turntable/tower before shutoff.

For an initial setting, start with the D pot set fully CCW. Then, cycling the machine, observe the transition to jog speed at the end of the cycle, prior to the stop of the turntable/tower at home position. Gradually increase the D pot setting (CW) until the turntable/tower only jogs approximately 1/8 to 1/4 revolution before reaching home position. CW adjustment of this potentiometer quickens the stop and shortens the deceleration time required for the turntable/tower to settle to its preset jog speed. While CCW softens the stop and lengthens the time required for the turntable/tower to settle to its preset jog speed.

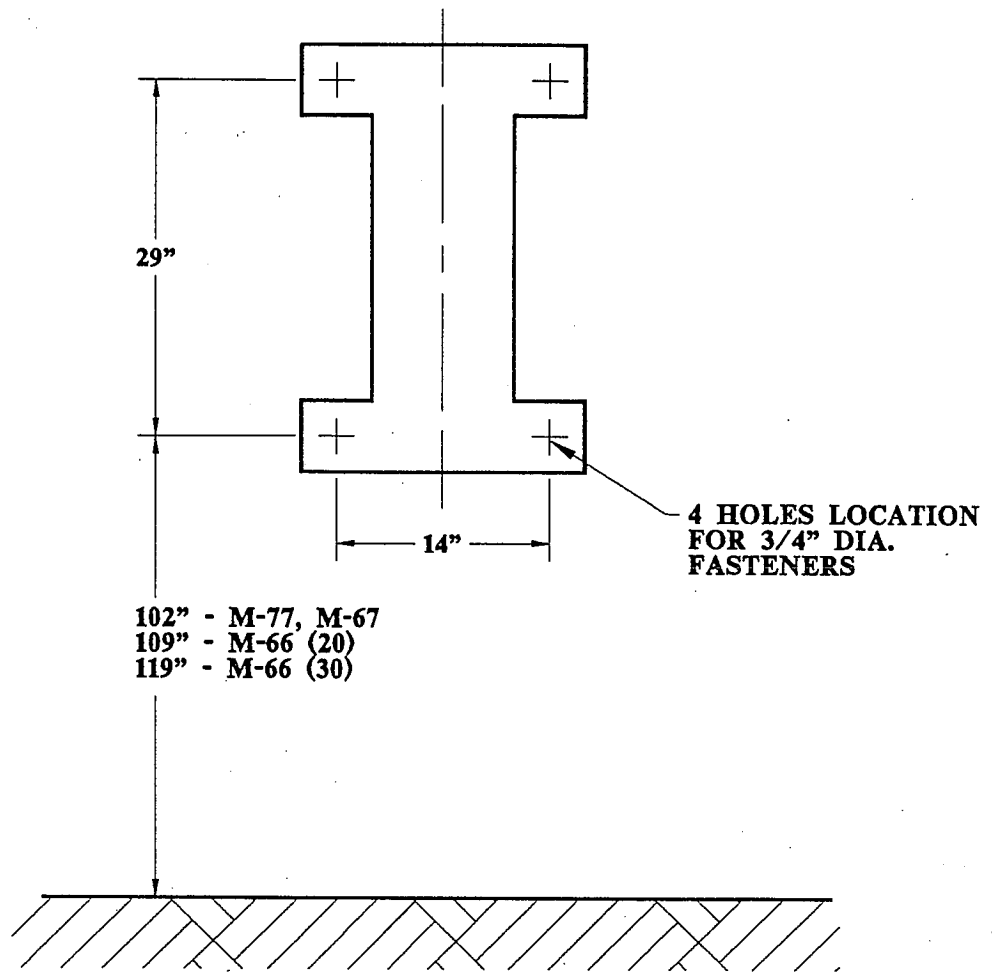
Thus the deceleration control is important in that if the deceleration time is too short, we will prematurely reach jog speed and jog an excessive amount of time to the home position before shutoff.

Conversely if the deceleration time is set too long, the turntable/tower will not settle to the jog speed and thus will be going too fast to align properly and momentum will take the turntable/tower beyond home position. As you can imagine, any time the wrap speed is changed, you will need to make a corresponding change in the setting of the pot marked D for deceleration.

TROUBLE SHOOTING & REPAIR

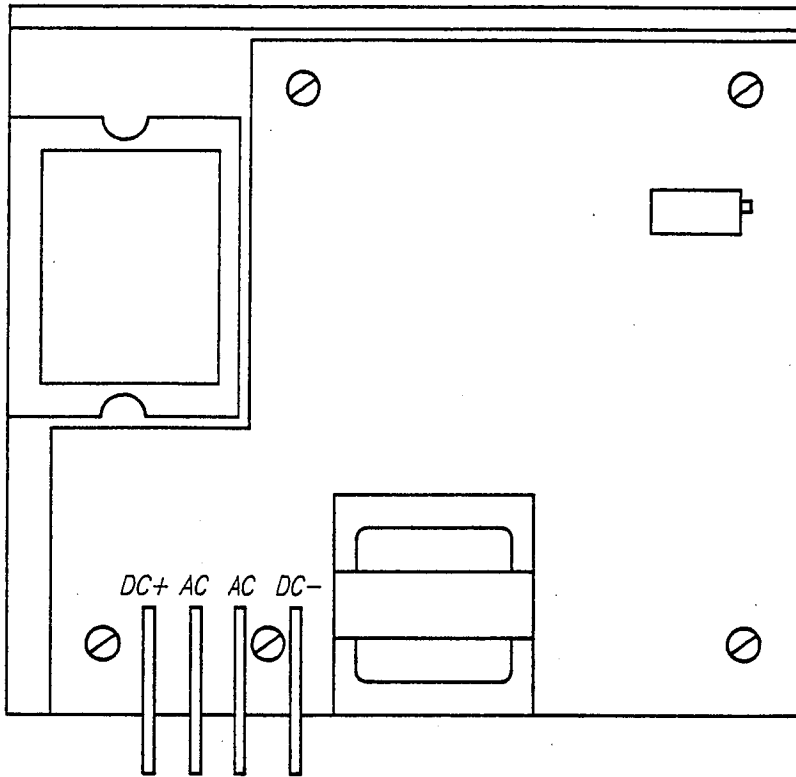
In most cases repair will require parts replacement. If user intends to, and is equipped to perform repairs, spare parts are available from Orion Parts & Service.

Damage is usually evident visually on the 850M board. Replacing the obviously damaged board frequently restores operation. However if damage is not evidently visible, swapping boards will determine if the board is at fault.

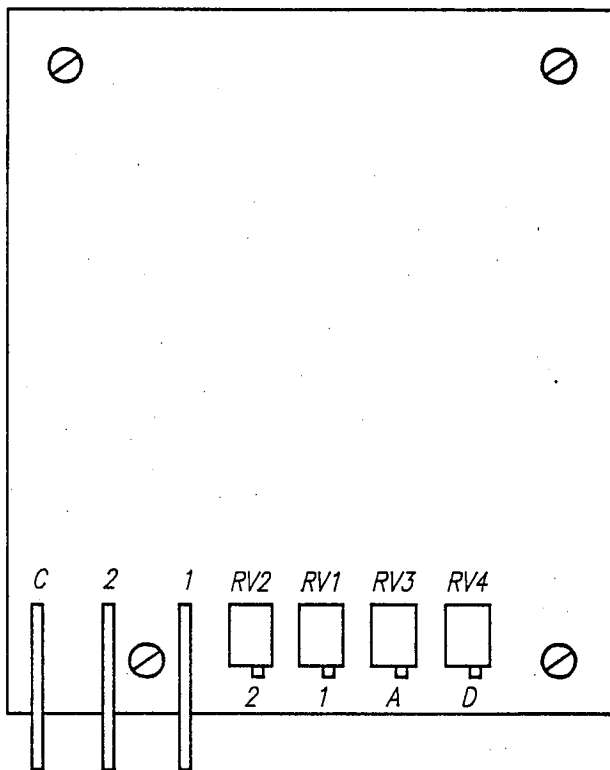


MODEL		ASSUMED FIXING MOMENT	ASSUMED FIXING FORCES
MONGOOSE	CARRIAGE		
M-67 M-77	20"	6 000 LBS/FT 72 000 LBS/IN 830 KG/M	2 483 LBS 1 130 KG
M-66	20"	7 500 LBS/FT 90 000 LBS/IN 1 040 KG/M	3 100 LBS 1 410 KG
M-66	30"	8 300 LBS/FT 99 600 LBS/IN 1 150 KG/M	3 435 LBS 1 560 KG

BOLTS PLACEMENT FOR MONGOOSE INSTALLATION



DC+: ARMATURE CONTROL
 AC: AC INPUT
 AC: AC INPUT
 DC-: ARMATURE CONTROL

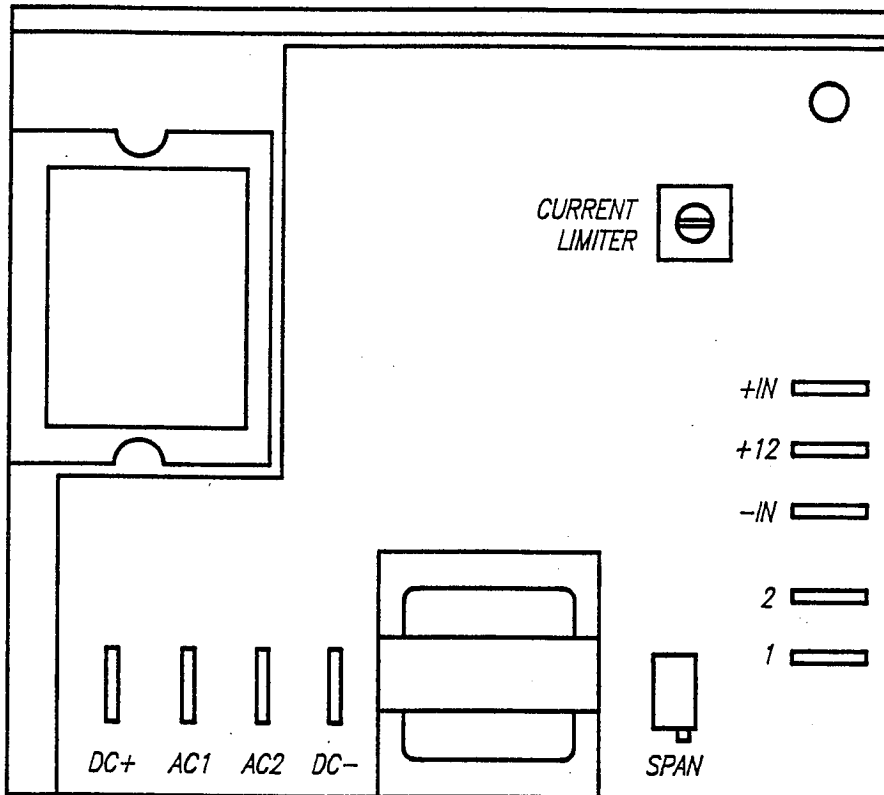


C: COMMON
 2: SPEED CONTROL (HIGH)
 1: SPEED CONTROL (LOW)

POTENTIOMETERS:

2: HIGH SPEED ADJUSTMENT
 1: LOW SPEED ADJUSTMENT
 A: ACCELERATION ADJUSTMENT
 D: DECELERATION ADJUSTMENT

850M 2 SPEED DC
 MOTOR CONTROL BOARD



DC+: ARMATURE CONTROL

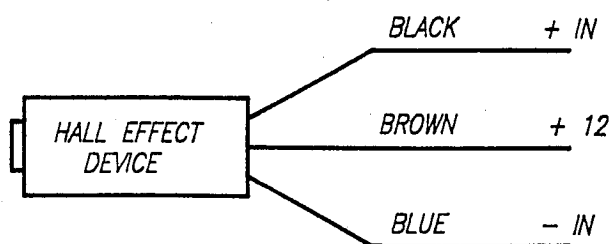
AC1: AC INPUT

AC2: AC INPUT

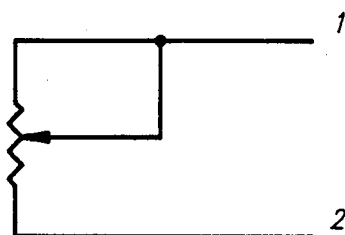
DC-: ARMATURE CONTROL

POTENTIOMER

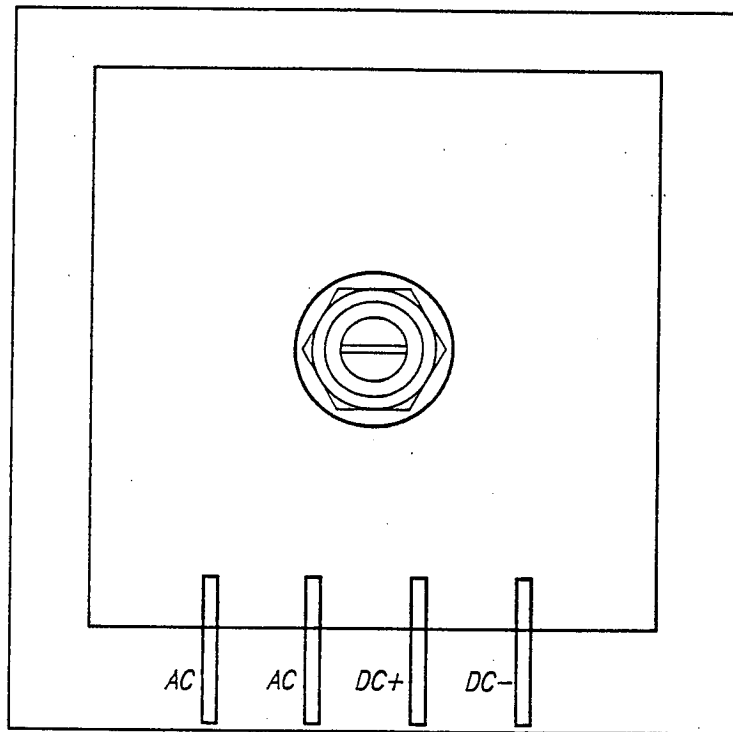
SPAN: HALL EFFECT SENSITIVITY CONTROL



FILM TENSION ADJUSTMENT
REMOTE POTENTIOMETER



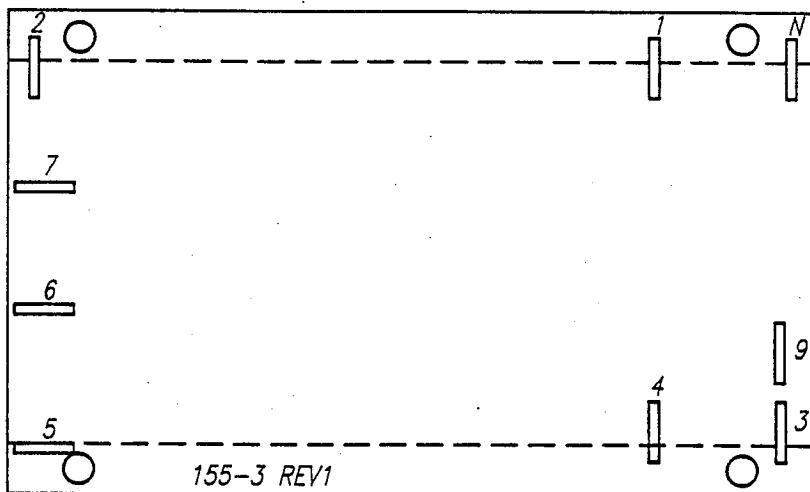
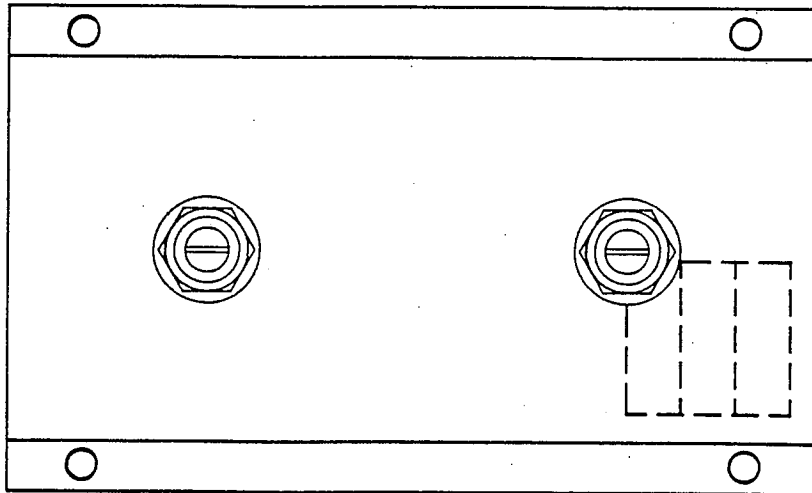
336-6
MULTISTRETCH BOARD



AC: AC INPUT
AC: AC INPUT
DC+: ARMATURE CONTROL
DC-: ARMATURE CONTROL

168-A

CARRIAGE SINGLE SPEED BOARD



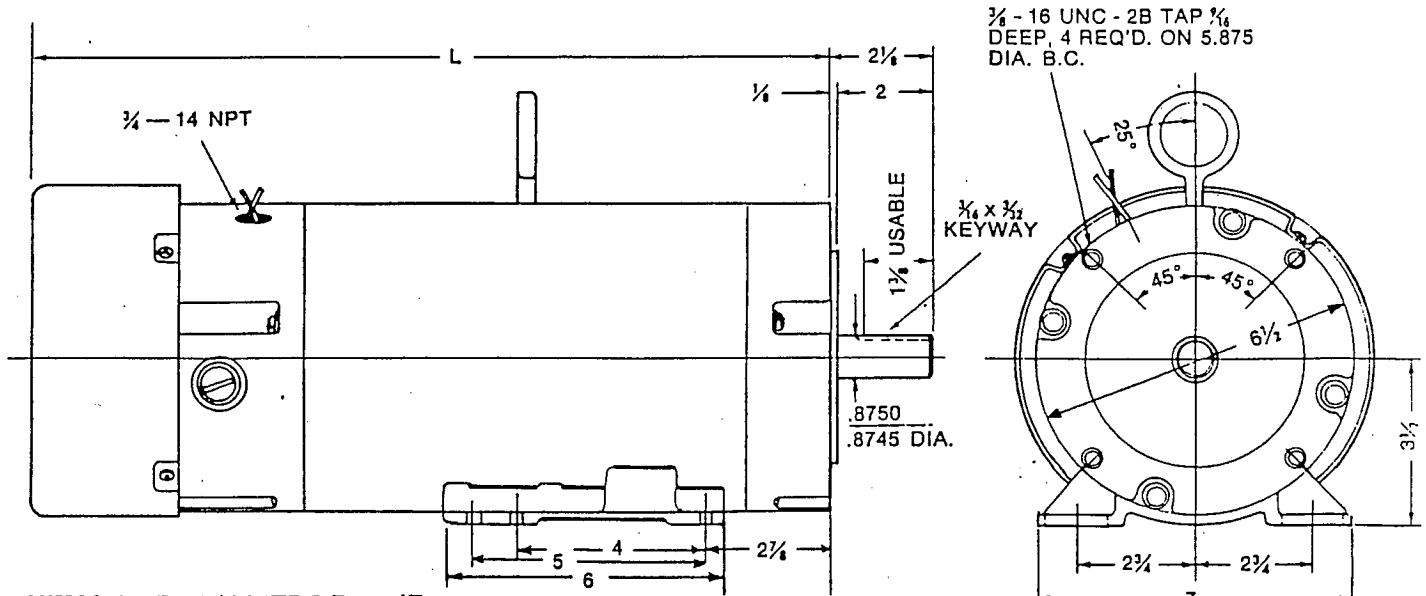
- | | |
|---------------|---------------|
| 1: AC INPUT | 7: OUTPUT B/W |
| 2: AC INPUT | 8: N/A |
| 3: COUNT | 9: COMMON |
| 4: RESET | N: NEUTRAL |
| 5: OUTPUT | |
| 6: OUTPUT T/W | |

155-3
COUNTER BOARD

APPENDIX

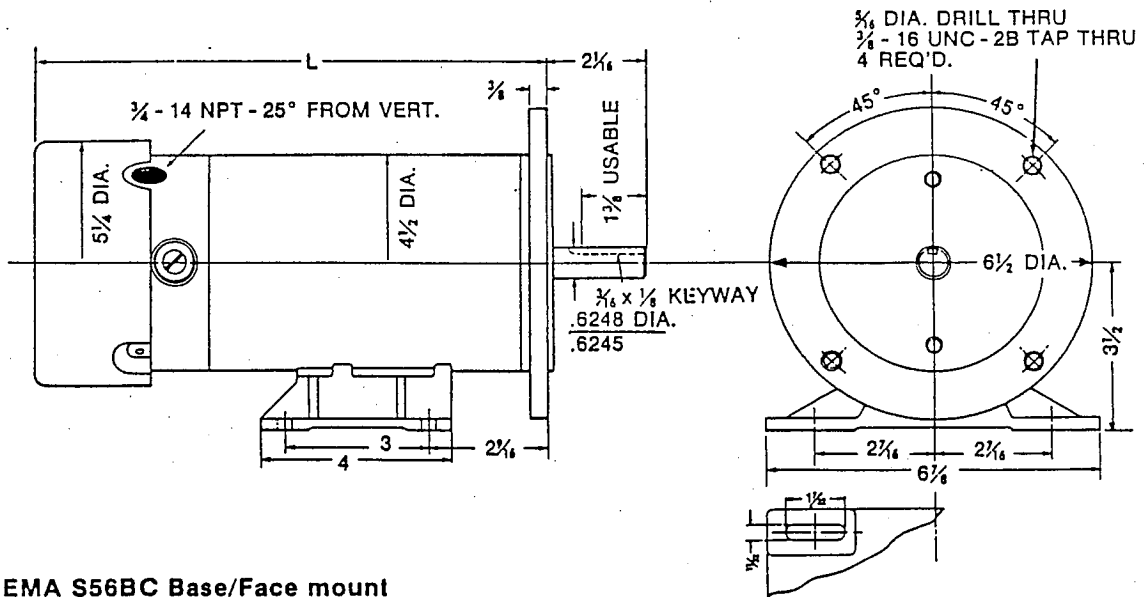
Motor dimensions

TEFC P/M motor



NEMA 143TBC/145TBC Base/Face mount

H.P.	RPM	VOLTS	AMPS	L	DUTY
1.5	1800	180	8.2	15 1/2	CONT.
2	1800	180	11.6	16 1/2	CONT.



NEMA S56BC Base/Face mount

180 V.

H.P.	RPM	VOLTS	AMPS	L	DUTY
1/2	1725	180	2.8	10 3/4	CONT.
3/4	1725	180	3.5	12 3/4	CONT.
1	1725	180	5.35	14 3/4	CONT.

90 V.

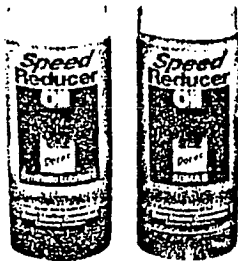
H.P.	RPM	VOLTS	AMPS	L	DUTY
1/2	1725	90	5.35	10 3/4	CONT.
3/4	1725	90	8.1	12 3/4	CONT.
1	1725	90	10.6	14 3/4	CONT.

Lubrication

REDUCERS MAY BE FILLED TO THE PROPER LEVEL AT THE FACTORY WITH AGMA No. 8 compounded oil. AFTER INSTALLATION OF THE BREATHER PLUG, UNIT IS READY FOR USE. Before installing breather plug, refer to instruction tag and determine proper position according to reducer mounting.

We recommend an initial oil change after 250 hours of operation, then every six months or every 2500 hours of service under Class I Service. If fluctuating temperatures, humid, dirty or corrosive environment, oil changes should be made more frequently. Frequency can be established by oil sample analysis.

KEEP YOUR OIL CLEAN



Doerr Electric replacement oil

To order oil, request:

Doerr part no. 00019001 — synthetic AGMA #7EP
(-40°F to 150°F)

Doerr part no. 00019101 — AGMA #8 (50°F to 125°F)

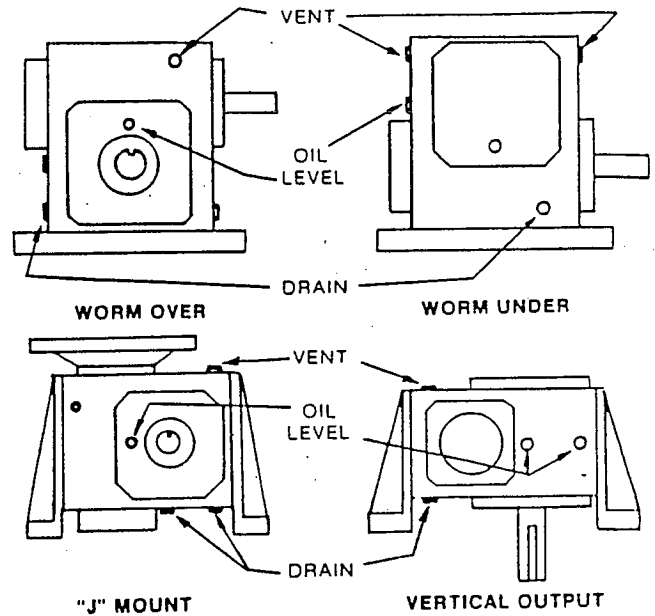
Oil is packed 12 one quart bottles per carton, minimum ship one carton.
Contact DEC Service Dept. for order information.

OIL CAPACITIES*

UNIT TYPE	UNIT SERIES				
	133	175	208	262	325
Worm Over	14	20	27	49	84
Worm Under	17	22	28	49	73
Vertical Output	10	15	20	37	63
"J" Mount	13	18	23	38	63

*Capacities in approximate ounces. On double reduction units determine capacity of both primary and secondary reducers.

OIL LEVELS*



*On double reduction units fill and vent each unit to levels shown.



MAINTENANCE INSTRUCTIONS

STANDARD REDUCERS SERIES 133, 175, 206, 262, 325

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MAINTENANCE INSTRUCTIONS FOR STANDARD REDUCERS

Series 133, 175, 206, 262 and 325

INTRODUCTION

The following instructions apply to standard Worm Gear Reducers. When ordering parts or requesting information specify all information stamped on the reducer nameplate. The nameplate will also identify the type of lubricant to be used.

EQUIPMENT REQUIRED

In addition to standard mechanic's tools, the following equipment is required: arbor press, wheel puller, torque wrench, dial indicator, seal driver, bluing, Permatex No. 2 and Permatex No. 3, snap ring pliers for internal and external rings.

GENERAL INSTRUCTIONS

Housings — Clean external surfaces of reducer before removing seal cages and end covers to prevent dirt from falling into the unit. Record mounting dimensions of accessories for reference when reassembling. If it is necessary to remove the reducer from its operating area, disconnect all connected equipment and lift reducer from its foundation.

Seals — Replacement of all seals is recommended when a unit is disassembled. However, if seals are not to be replaced, protect seal life by wrapping shaft with thin, strong paper coated with oil or grease before removing or replacing seal case assembly. Clean the shaft but do not use any abrasive material on the shaft surface polished by the seal.

CAUTION

If the reducer is painted, extreme care should be taken to mask the shaft extensions and rubber surface of the seals. Paint on the shaft adjacent to the seal or on the seal lip will cause oil leakage.

TO CHANGE OUTPUT SHAFT DIRECTION

To change the hand of a unit from left hand to right hand, or vice versa, the following instructions apply:

1. Remove drain plug and drain oil from unit.
2. Remove end cover and seal cage cap screws; then while supporting output shaft remove end cover and shims from the unit.
3. Remove output shaft and seal cage together from extension side.

NOTE: Keep shims with their respective seal cage and end cover.

4. Insert seal cage, shims and sub-assembly into the housing from the side opposite from which they were removed. Insert seal cage cap screws and tighten with light pressure.
5. Assemble end cover and shims. Insert end cover cap screws and tighten with light pressure.
6. Turn high speed shaft in both directions to see that gear train is running freely.
7. Cross tighten seal cage and end cover cap screws to torques listed in Table 1.

TABLE 1. CAPSCREW TIGHTENING TORQUE

Capscrew Diameter	1/4 - 20 UNC	5/16 - 18 UNC	3/8 - 16 UNC
Torque (in. lbs.) Dry	96	204	360

UNIT DISASSEMBLY, PARTS SERVICE, AND ASSEMBLY

Disassembly:

1. Remove drain plug and drain oil from unit.
2. Low speed shaft (gear shaft) removal:
 - A. Remove end cover and seal cage cap screws.
 - B. With a firm hold on the output extension remove end cover and shims.
 - C. Carefully slide output shaft assembly and seal cage out extension side.
 - D. Slide seal cage off low speed shaft using caution to prevent damage to seal lips.
 - E. Wire or tie the shims to their mating end cover and seal cages. They will be available for reference when assembling the unit.
3. High speed shaft (worm shaft) removal:
 - A. Position unit with input shaft down. With a small chisel make a groove in the stamped steel cover opposite the shaft extension. Pry cover off.

- B. Remove internal snap ring from housing bore.
- C. Reposition the housing with the worm shaft horizontal. Using a plastic hammer gently tap on the end of the shaft extension to feed worm shaft assembly through housing and out.

Parts Service:

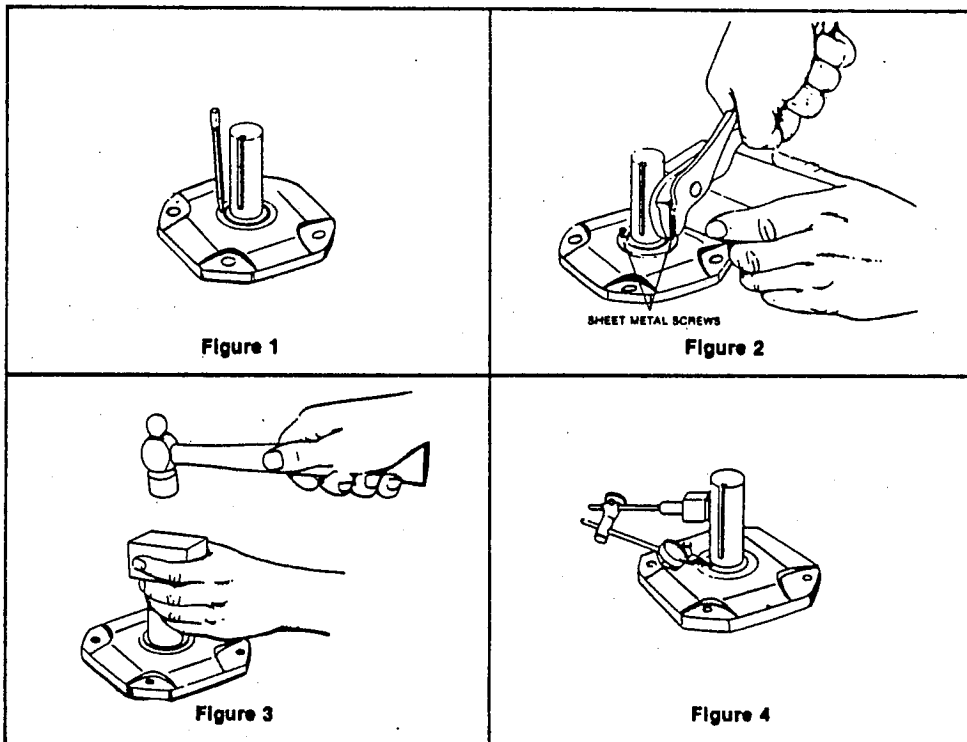
- 1. **Housing** — Clean inside of housing with kerosene or solvent and then dry.
- 2. **Seal cages and end cover** — Remove dirt from joint faces, wipe clean and dry.
- 3. **Air vent** — Wash in kerosene, blow clean and dry.
- 4. **Seals** — To replace seals without dismantling reducer refer to steps C through F below. To replace seals when the entire reducer is dismantled and coupling hubs, sprockets, pulleys, pinions, keys, etc. have been removed the following instructions apply:

NOTE: Replacement of all seals is recommended when a unit is disassembled.

Caution

New seals will leak if the seal lips or if seal's rubbing surface on the shaft has been altered. Protect seal lips at all times. Clean the shaft but do not use any abrasive material on the shaft surface polished by the seal.

- A. Block up seal cages and press or drive out seal.
- B. Remove old sealing compound from seal seat in cage if it is present. If a seal with rubber coating on the outside diameter is used, no Permatex is necessary. If no rubber coating is on seal outside diameter, coat seal cage bore with Permatex No. 3 or equivalent immediately before assembly.
To prevent possible damage to seal lips, do not reassemble seals until high speed and low speed shafts have been reassembled to the housing. Then see steps E and F below.
- C. See Figures 1 through 4—To replace seals without dismantling reducer, proceed as follows:



Caution

Do not damage shaft; new seals will leak if seal contacting surface is marred. Use punch and place two or more holes in steel casing of seal, Figure 1. (The steel casing may be rubber coated) Insert sheet metal screws, leaving the heads sufficiently exposed so they can be pried up or grasped with pliers, Figure 2. Do not drill holes because chips may get into the unit.

- D. Work seal loose. Be careful to keep all metal or dirt particles from entering unit. Remove old sealing compound from seal seat if it is present. Also remove burrs and sharp edges from shaft. Clean with rag moistened with solvent. Do not use abrasive material on shaft seal contacting surface.

Caution

E. Protect seal lips when handling; seal leakage will result if these are damaged. If a seal with rubber coating on the outside diameter (O.D.) is used; no Permatex is necessary. If no rubber coating is on seal O.D., coat seal cage bore with Permatex No. 3 or equivalent. Coat seal lips with oil and carefully work seal into position. Before sliding seal into position, protect seal lips from shaft keyway edges by wrapping shaft with thin, strong paper coated with oil. Position garter spring toward the inside of the unit. Place a square faced pipe or tube against the seal O.D. and drive or press seal until fully seated as shown in Figure 3. Do not strike seal directly.

- F. For best performance, seat the seal square with shaft within .005" at 180°. Check with dial indicator as shown in Figure 4, Page 2, or with a straight edge and feelers, or square and feelers. To straighten a cocked seal, place tubing over the seal and tap the tube lightly at a point diametrically opposite the low point on the seal. DO NOT strike seal directly.

5. Bearings —

- A. Wash all bearings in clean kerosene and then dry.
B. Inspect bearings carefully and replace those that are worn or questionable.
NOTE: Replacement of all bearings is recommended.
C. Use a wheel puller or press to remove worm shaft bearings. Apply force to inner race only — not to cage or outer race.
D. Use a wheel puller or press to remove output bearing inner races.
E. New seal cages and end covers must be used when replacing output bearings. Output bearing outer races must be pressed in square and seated completely.
F. To replace output bearing inner races and all input bearings, heat bearings in an oil bath or oven to maximum of 290 degrees F (143 degrees C). Slide high speed shaft bearings onto the oiled shaft until seated against the shoulder or snap ring of the shaft. Slide low speed shaft bearings onto the oiled shaft against the gear spacer.
G. Thoroughly coat all bearings with lubricating oil.

6. Worm, gear and shafts

- A. Worm and high speed shaft—since all worms are integral with the high speed shaft, any wear or damage to the worm will necessitate replacing both.
B. Press shaft out of bronze worm gear. To reassemble gear and low speed shaft, freeze shaft or heat gear. Do not exceed 200 degrees F (93 degrees C). Insert key into shaft keyway and press shaft into oiled gear bore. The short hub of the gear must be assembled toward snap ring on the shaft.
NOTE: It is advisable to replace both the worm and worm gear should either of the assemblies require replacement.

Unit Reassembly:

1. Preliminary

- A. Check to see that all worn parts have been replaced, gear and bearings coated with oil and all parts cleaned. Remove all foreign matter from unit feet. The feet must be flat and square with each other.
- B. Before starting to reassemble reducer, add old shims or replace with new shims of equal thickness.

2. High Speed Shaft (Worm Shaft) Assembly

- A. Lubricate bearing bores of housing and insert high speed shaft sub-assembly from opposite extension end into housing until seated against shoulder in bore. Tap the end of the shaft lightly with a plastic hammer to feed bearings through bores.
- B. Lock high speed sub-assembly in housing bore with lock ring.
- C. Coat outside diameter of stamped steel end cover with Permatex No. 2 and press into high speed bore opposite extension end until flush with housing. If steel endcover is rubbercoated then no Permatex is necessary.

3. Low Speed Shaft (Gear Shaft) Assembly

- A. Determine output shaft direction.
- B. Assemble low speed shaft assembly, seal cage, and end cover with shims on both seal cage and end cover. Torque cap screws to torques listed in Table 1. Rotate the input shaft to seat output bearings.
- C. Moving the shaft back and forth by hand, check axial float with dial indicator as shown in Figure 5. Axial float must be .0005-.003 with .0005 being the absolute minimum. Do not preload bearings. If the axial float is not as specified add or subtract required shims under end cover.

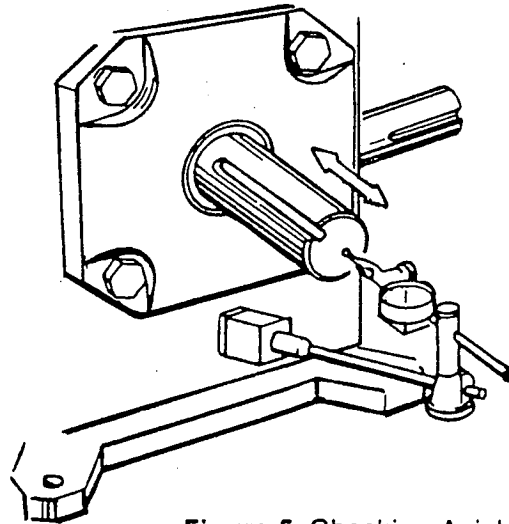


Figure 5 Checking Axial Float

- D. Remove output shaft with seal cage and apply bluing to entire worm thread. Worm thread must be clean of oil. Reassemble output shaft and seal cage with output key facing up.
- E. Use a rag to apply hand pressure to the output shaft and rotate the high speed shaft until output key is down. Return output shaft to original position by reversing rotation. Remove output shaft and seal cage to inspect contact. Compare with Figure 6. If contact is not correct move assembly in the direction shown in Figure 6 by adding shims to the side to which the arrow points after removing them from the opposite side. Repeat steps D and E until contact pattern is correct.
- F. Recheck axial float with dial indicator.
- G. When contact pattern is correct tighten seal cage and end cover cap screws to torques listed in Table 1 page 1.

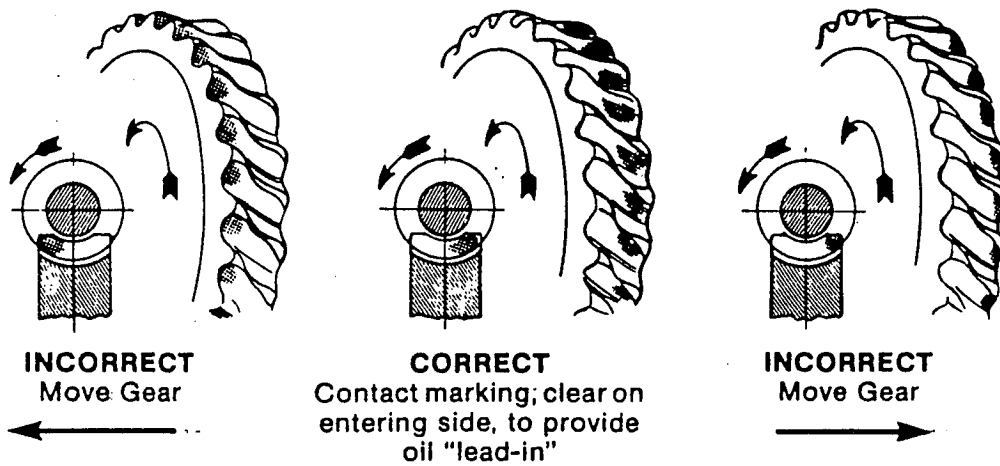


Figure 6 Gear Contact Pattern

4. **Seals** — To reassemble seals to unit, see Parts Service Steps 4E and 4F, page 3.

5. **Motorized Coupling Adapter**

Certain mounting dimensions should be adhered to when removing motor and coupling assembly for service. When ordering replacement coupling halves (metal gear), specify correct bore diameter. See Table 2 for mounting dimensions and available bore sizes.

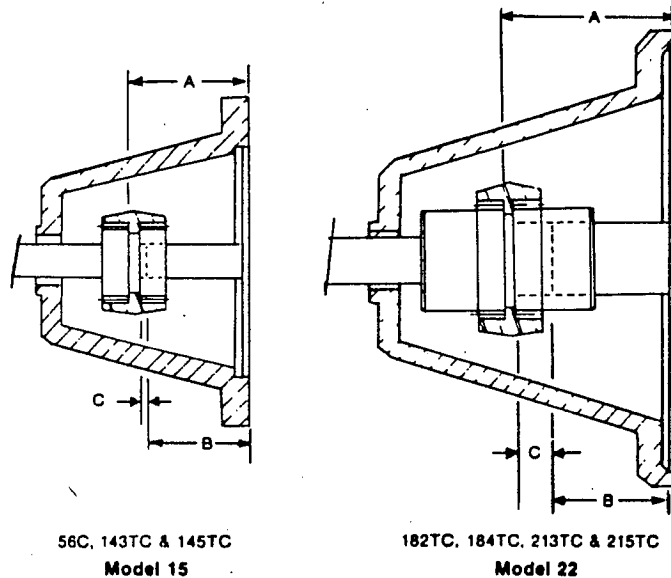


Figure 7 Motorized Coupling Adaptor

TABLE 2. COUPLING ADAPTOR DATA

"C" COUPLING MOUNTING DATA

N.E.M.A. Frame No.	Mounting Dimensions		
	Reducer A ± 1/64	Motor B ± 1/64	C
56C	2 5/16	2 1/16	1/16
143TC	2 5/16	2 1/8	—
145TC	2 5/16	2 1/8	—
182TC	3 5/16	2 5/8	1/2
184TC	3 5/16	2 5/8	1/2
213TC	3 5/16	3 1/8	—
215TC	3 5/16	3 1/8	—

BORE SIZES AVAILABLE

MODEL 15		MODEL 22	
Bore	Kwy.	Bore	Kwy.
.500	None	—	—
.500	1/8 x 1/16	—	—
.625	3/16 x 3/32	.625	3/16 x 3/32
.750	3/16 x 3/32	.750	3/16 x 3/32
.875	3/16 x 3/32	.875	3/16 x 3/32
—	—	1.125	1/4 x 1/8
—	—	1.375	5/16 x 5/32

6. Final Inspection

- A. Turn gear train over by hand as a final check.
- B. Re-install reducer and accessories.

CAUTION: Discard motor key. Use only special key provided with reducer. Failure to use special key will make assembly impossible.

- C. Fill reducer with the recommended oil to proper level. See Fig. 8 for standard oil levels. (Type of oil recommended — see nameplate).
- D. Spin test for three minutes and check for noise, leakage, and rapid temperature rise.

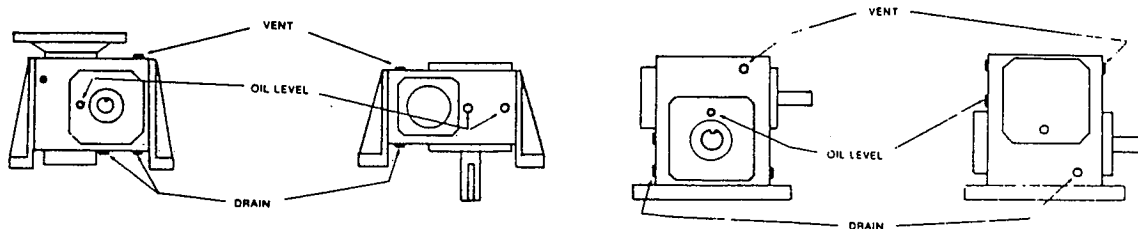


Figure 8 Standard Oil Levels

PREVENTATIVE MAINTENANCE

- A. After first week check all external cap screws and plugs for tightness.
- B. Periodically, check oil level when gears are at rest. Add oil if needed. Do not fill above mark indicated by level because leakage and overheating may occur.
- C. Oil changes — For normal operating conditions, change oil every six months or 2500 hours, whichever occurs first. Also if the unit is operated in an area where temperatures vary with the season, change the oil viscosity to suit the temperature. Most lubricant suppliers can test oil periodically and recommend economical oil change schedules.

CAUTION

See nameplate for type of lubricant to be used.

STORED AND INACTIVE UNITS

1. Each unit is shipped with oil that will protect parts against rust for a period of 4 months in an outdoor shelter or 12 months in a dry building after shipment from the factory. Indoor dry storage is recommended.
2. If a unit is to be stored or is to be inactive after installation beyond the above periods, fill the unit completely with oil.

CAUTION

Before starting a stored unit or re-starting an inactive unit, the oil level should be returned to the proper value as indicated by the oil level.

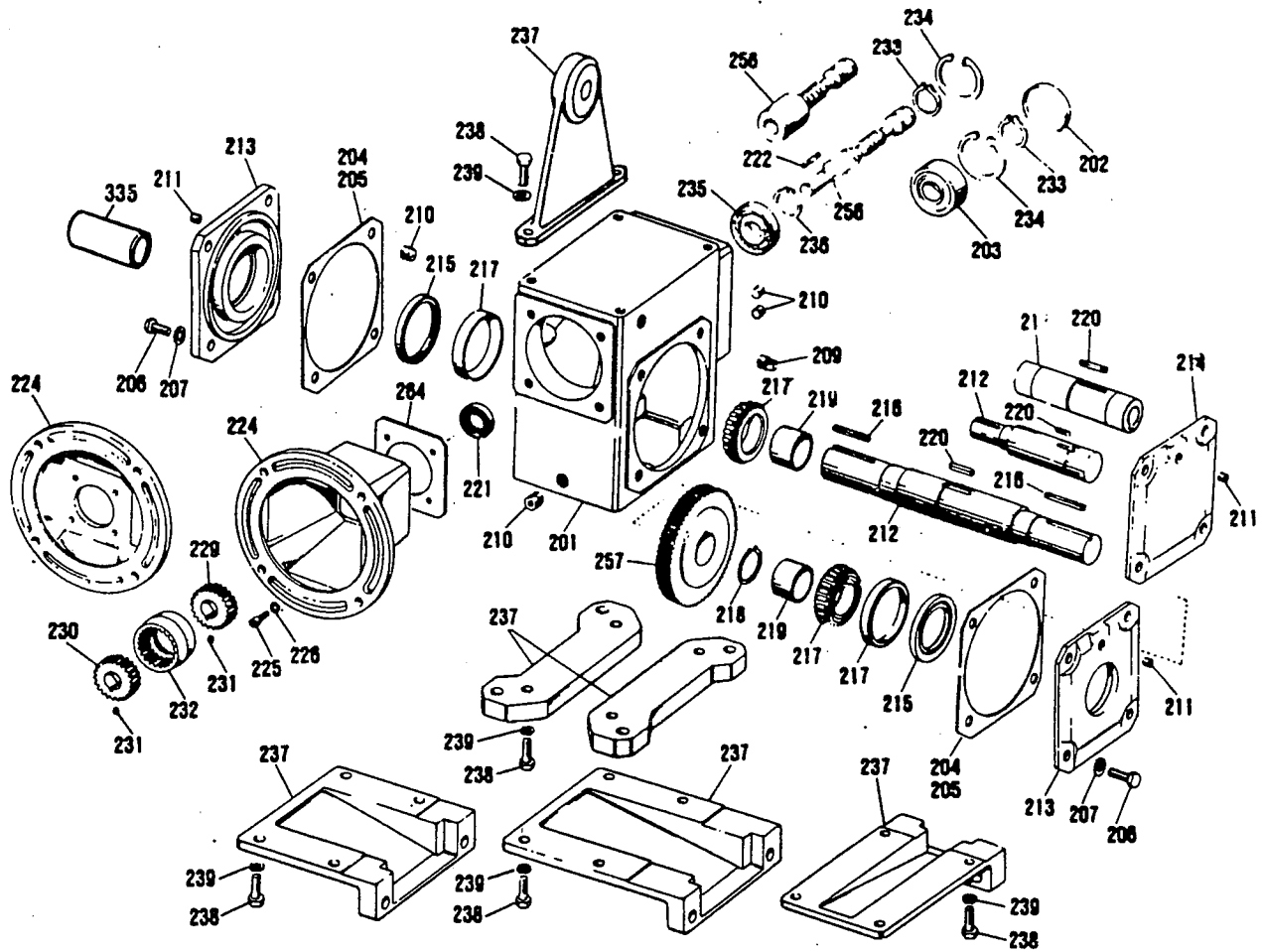
PARTS ORDERING INSTRUCTIONS

When ordering replacement parts first locate the exploded view that corresponds to your Doerr Electric gear reducer. Then determine which parts must be ordered. To order the parts, please provide the following:

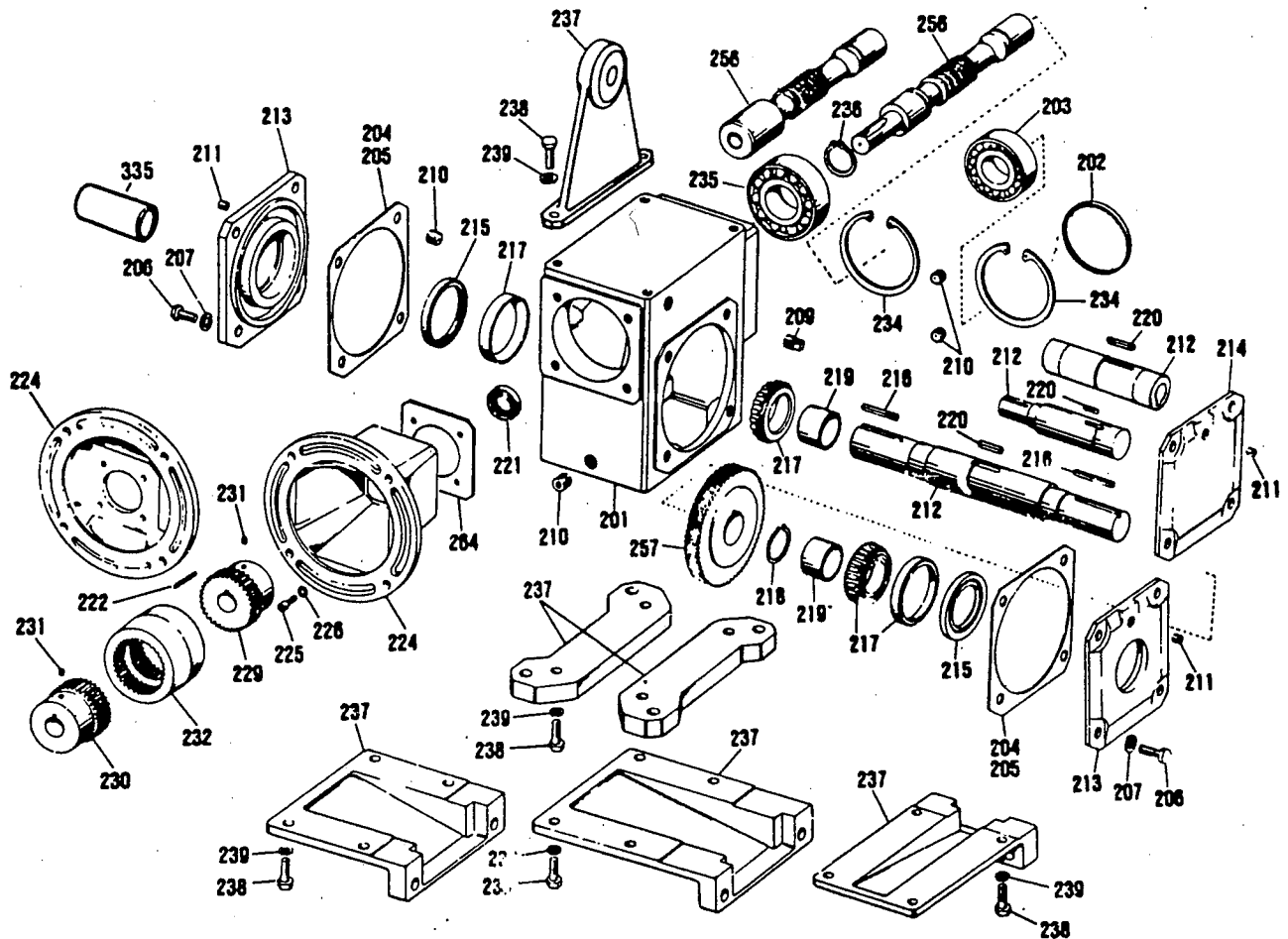
1. Complete Model Number (Nameplate)
2. Item Number (Exploded view and parts list)
3. Part Description (Parts list)

Note that one parts list covers all five exploded views. Although a single item number may refer to the same part on all five exploded views, it is incorrect to assume that these parts are interchangeable. They are not. Therefore, it is imperative that items 1 through 3 above be provided when ordering your parts.

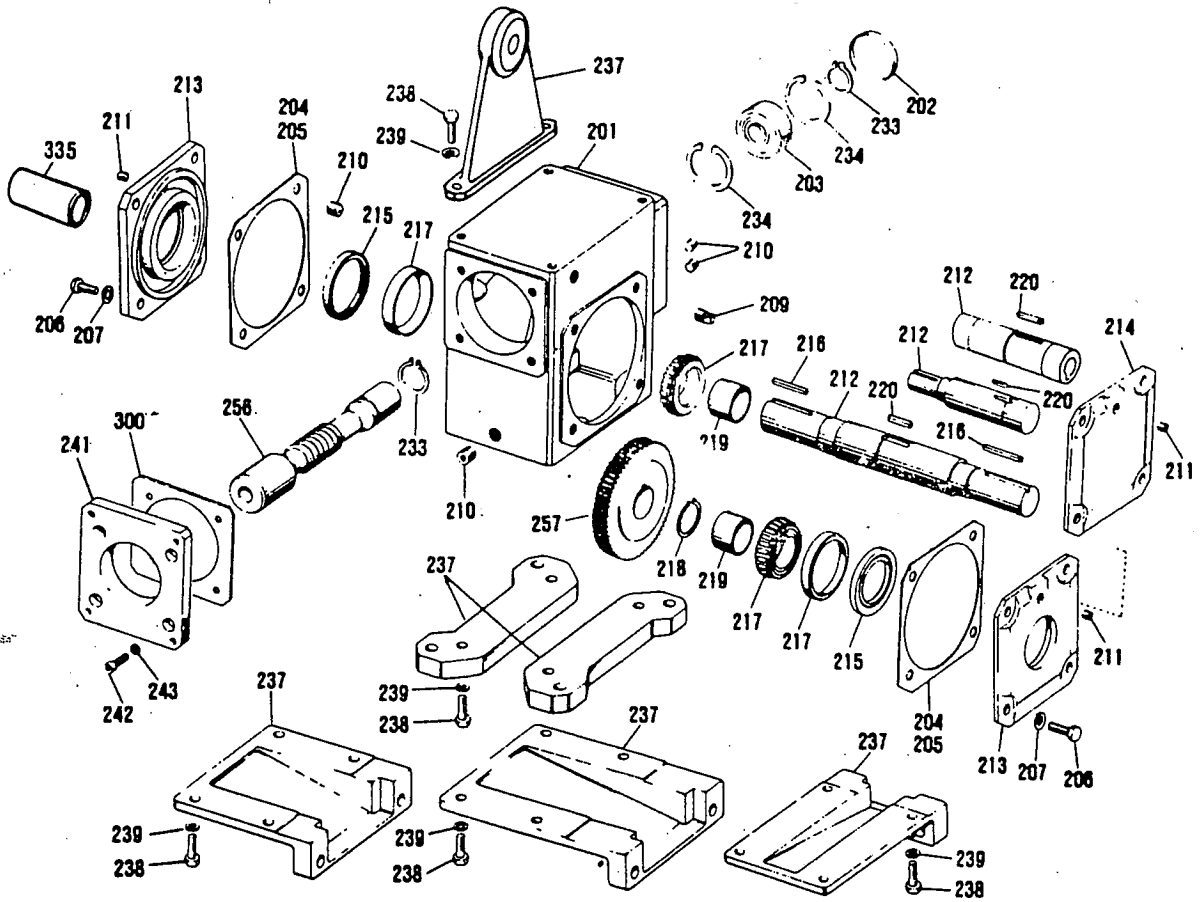
Failure to provide this information will only slow or prevent the processing of your order.



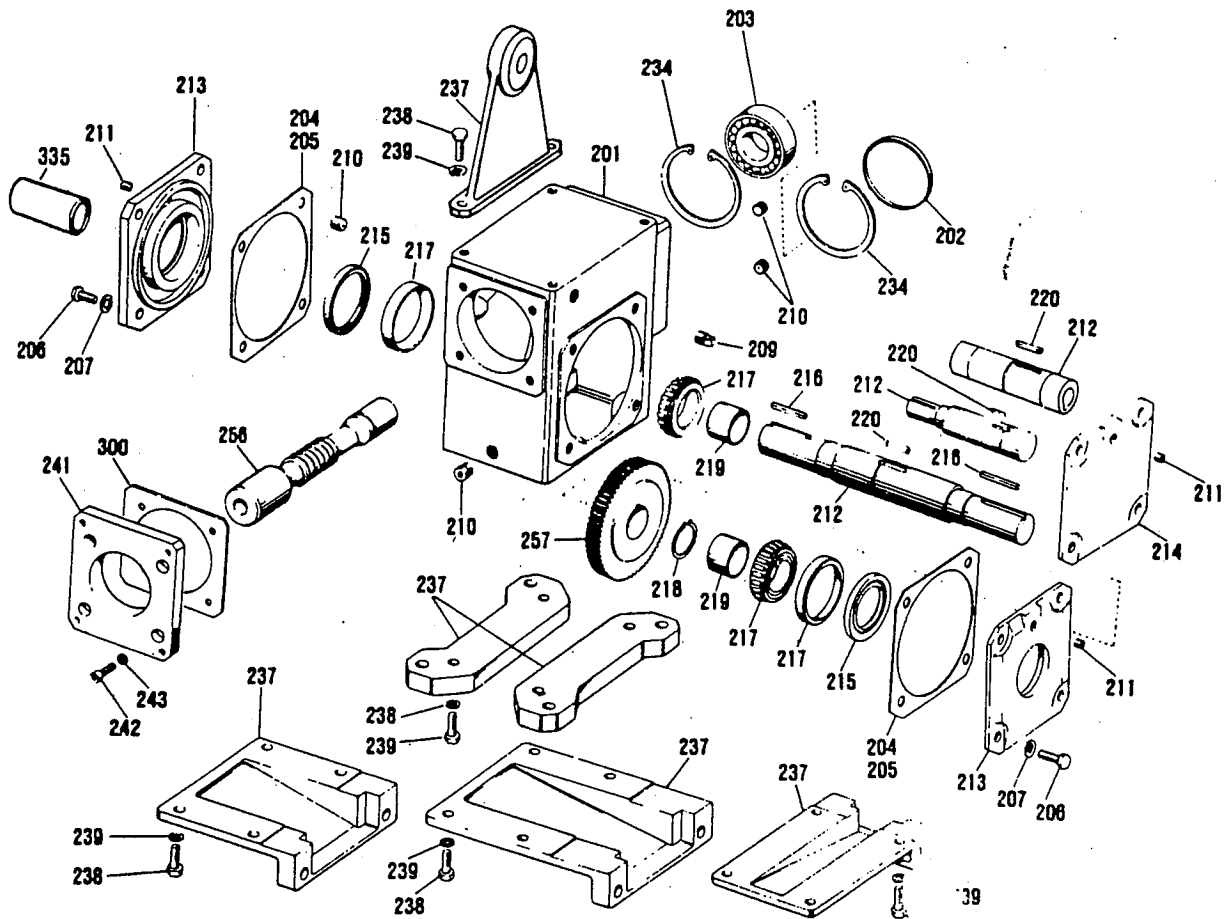
Single Reduction Unit 133, 175, 206 Series



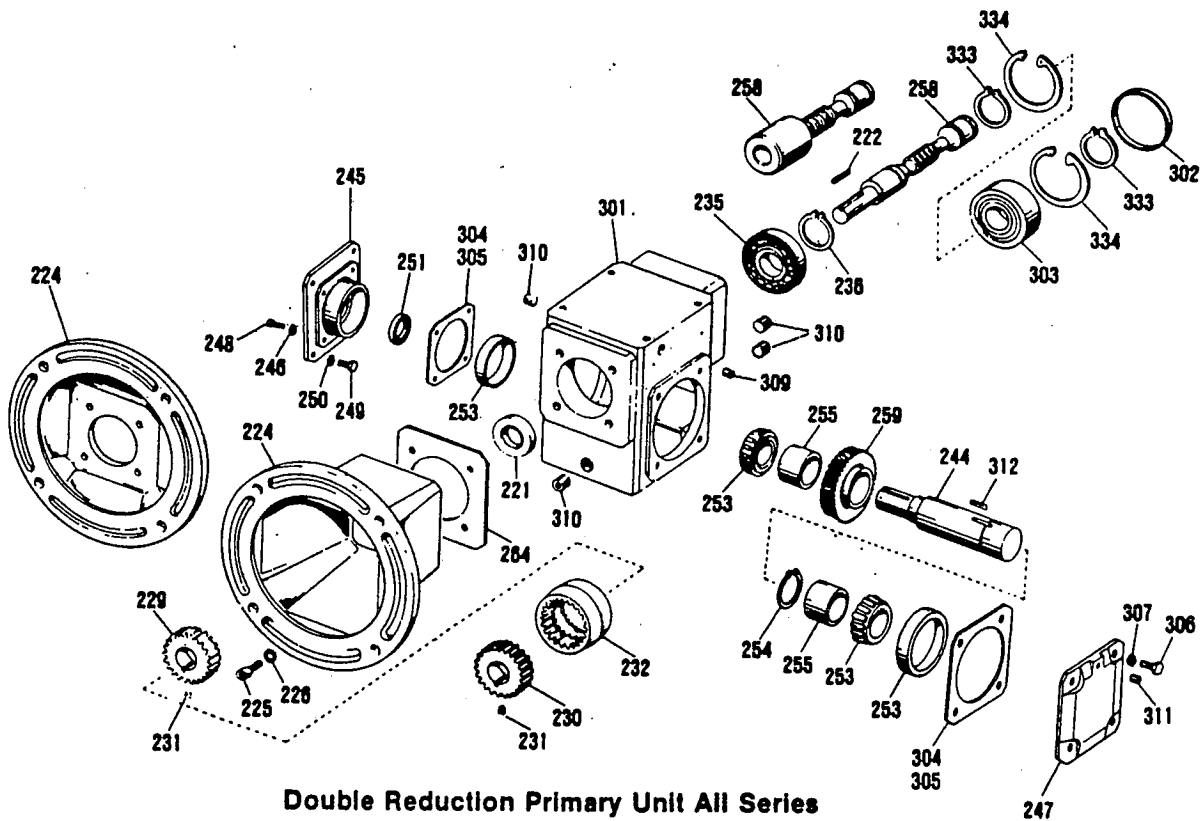
Single Reduction Unit 262, 325 Series



Double Reduction Secondary Unit 133, 175, 206 Series



Double Reduction Secondary Unit 262, 325 Series



Double Reduction Primary Unit All Series

PARTS LIST
(Applies to all exploded views)

ITEM	DESCRIPTION	ITEM	DESCRIPTION	ITEM	DESCRIPTION
201	Housing	229	Coupling Hub (Unit)	255	Spacer
202	End Cover	230	Coupling Hub (Motor)	256	Worm
203	Bearing	231	Setscrew	257	Gear
204	Shim (.019 Thick)	232	Coupling Sleeve	258	Worm
205	Shim (.007 Thick)	233	Lock Ring	259	Gear
206	Capscrew	234	Lock Ring	260	Thrust Plate
207	Lock Washer	235	Bearing	261	Capscrew
209	Vent Plug	236	Lock Ring	264	Gasket
210	Pipe Plug	237	Base	300	Gasket
211	Pipe Plug	238	Capscrew	301	Housing
212	Output Shaft	239	Lock Washer	302	End Cover
213	Seal Cage	241	Secondary Adaptor	303	Bearing
214	End Cover	242	Capscrew	304	Shim (.019 Thick)
215	Oil Seal	243	Lock Washer	305	Shim (.007 Thick)
216	Key	244	Primary Output Shaft	306	Capscrew
217	Bearing	245	Primary Adaptor	307	Lock Washer
218	Lock Ring	246	Lock Washer	309	Vent Plug
219	Spacer	247	End Cover	310	Pipe Plug
220	Key	248	Capscrew	311	Pipe Plug
221	Oil Seal	249	Capscrew	312	Key
222	Key	250	Lock Washer	333	Lock Ring
224	Motor Flange	251	Oil Seal	334	Lock Ring
225	Capscrew	253	Bearing	335	Shaft Cover
226	Lock Washer	254	Lock Ring		

Note: When ordering replacement parts, specify model number, item number, and part description.