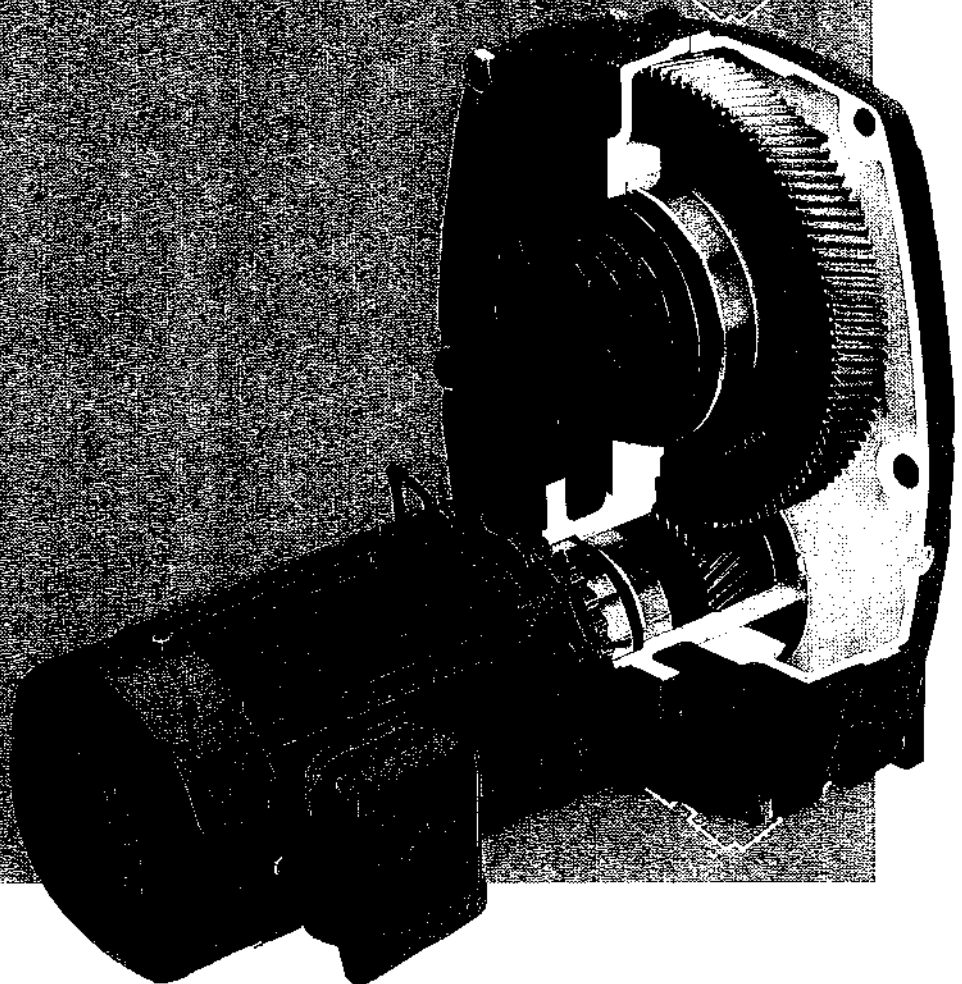


# SM-BUDDYBOX

## Operating and Maintenance Manual

**NEW! Shaft-Mount  
Reducers and Gearmotor**

**THE  
AVAILABLE  
SOLUTION**



**SUMITOMO**  
SM-BUDDYBOX SHAFT MOUNTED CYCLO GEARMOTOR

# POWER TO START A REVOLUTION

The revolutionary SM-BUDDYBOX combines the proven strength & durability of the SM-CYCLO speed reducer with the convenience of shaft mounting.

**TAPER GRIP BUSHING\***

Bushing in full engagement through length of the bore - can be installed from either side

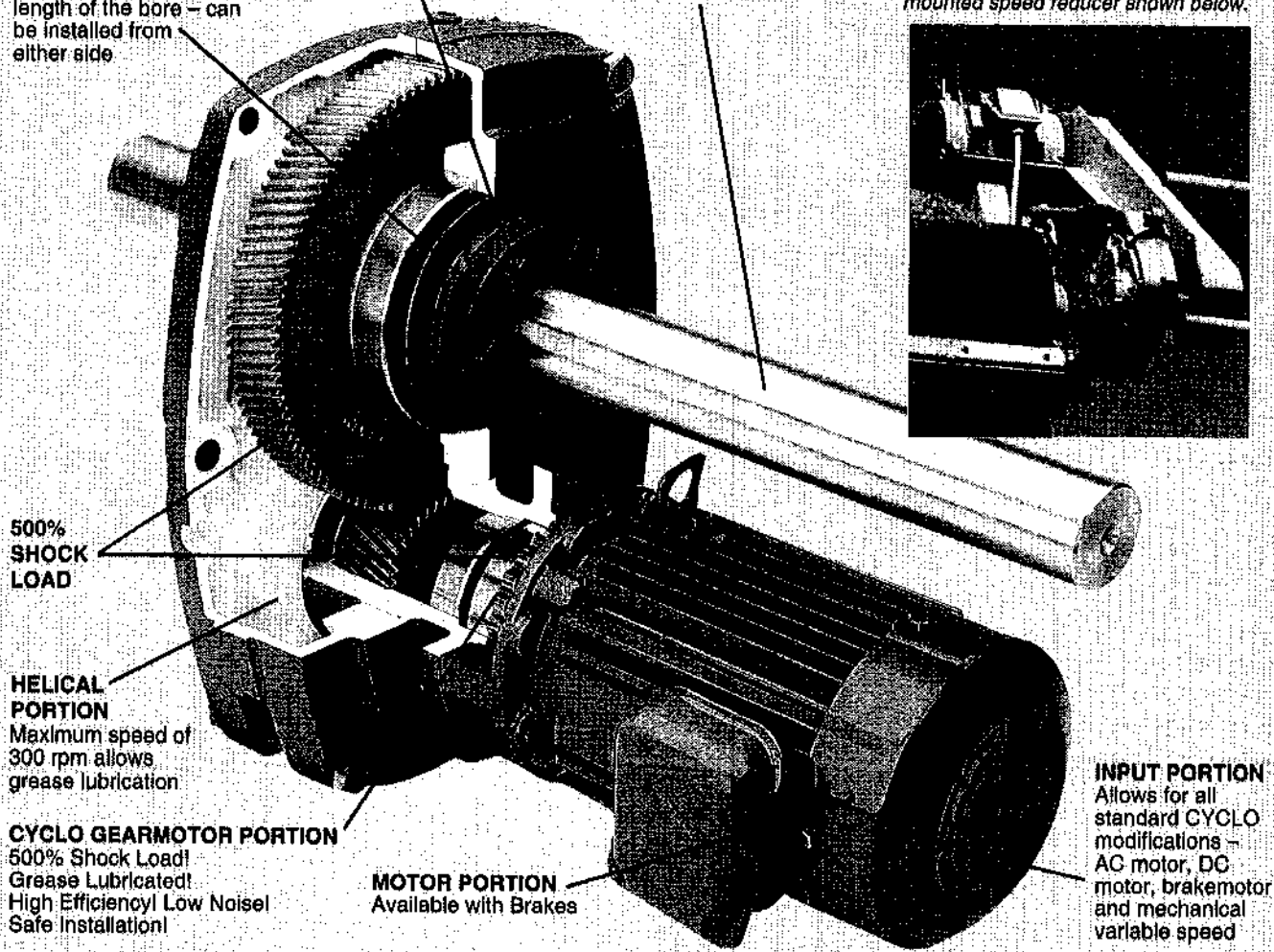
**NO KEY WAY**

Reducer can be assembled to any shaft

**NO SHAFT MODIFICATION**

Several tapered bushings are available to accommodate several shaft sizes

*The new Sumitomo SM-Buddybox reduces noise, wobble and the potential risks associated with the "high liability" conventional shaft mounted speed reducer shown below.*



**500% SHOCK LOAD**

**HELICAL PORTION**

Maximum speed of 300 rpm allows grease lubrication

**CYCLO GEARMOTOR PORTION**

500% Shock Load!  
Grease Lubricated!  
High Efficiency! Low Noise!  
Safe Installation!

**MOTOR PORTION**  
Available with Brakes

**INPUT PORTION**

Allows for all standard CYCLO modifications - AC motor, DC motor, brakemotor and mechanical variable speed

This revolutionary new concept in shaft mounted gearmotors - the SM-BUDDYBOX from Sumitomo Machinery Corporation - is safer, quieter and requires less maintenance than any conventional shaft mount.

Designed for easy installation, the SM-Buddybox eliminates the need for mounting foundations, fabrication, shaft modification, "V" belts, chains and guards. Maintenance and downtime are virtually eliminated.

CONTACT US TODAY FOR FREE PRICE AND SELECTION GUIDE

**SUMITOMO** MACHINERY CORP. OF AMERICA

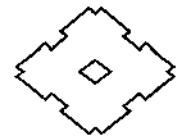
Power Transmission Products

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**STOCKING and ASSEMBLY**

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- Dallas, TX
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- Vancouver, Canada
- Monterrey, Mexico



# INSTALLATION

The Taper-Grip Bushing is designed to give an easy on, easy off fit to the shaft for assembly and maintenance while providing a firm grip to the shaft in operation. The Taper-Grip Bushing may be fitted from either end of the hub; you should ensure that adequate access for proper tightening of the screws is available.

**Note:** Satisfactory performance depends on proper installation; therefore, all instructions in this manual must be carefully followed.

## Fitting the Reducer on the Shaft

1. Check the size and condition of the shaft to which the reducer will be fitted. Permissible shaft tolerances are given in Table 1 below.
2. Ensure that all mating surfaces of the Hub, the inside and outside diameters of the Taper-Grip Bushing and the shaft are free from burrs and corrosion. Clean each surface with a solvent to remove all traces of grease and oil.
3. Lightly oil each screw and insert into the Taper-Grip Bushing flange; ensure that these screws do not protrude beyond the rear face.
4. Insert the face keys of the Thrust Collar into the slots on the hub and centralize. Screw the Taper-Grip Bushing into the hub in a clockwise direction until the flange contacts the thrust collar.
5. Unscrew the Taper-Grip Bushing until the screws are aligned with the pockets in the face of the thrust collar and a gap of 1 mm (minimum) exists between the flange and thrust collar. This may be easier if one of the screws is removed and the pocket viewed through the threaded hole. Hand tighten all screws into the pockets.
6. Slide the reducer onto the shaft at least as far as the counter bore in the Taper-Grip Bushing. Gradually tighten each screw, in turn, to the torque levels shown in Table 2.
7. If the shaft extends beyond the counter bore, grease fill the cavity to prevent a build-up of

corrosion on the shaft end which may affect subsequent removal of the reducer.

8. Install the Torque Arm on the reducer by removing the appropriate lower bolt. Retighten the bolt to the torque value given in Table 3.
9. Install the Torque Arm Fulcrum on a rigid support so that the torque arm will be at a right angle to a line between the mounting hole and the output shaft.
10. All units are shipped without oil. Ensure that the appropriate amount and type of lubricant have been added before starting the drive. Lubrication details are given in Table 4.
11. After the reducer has been running for 20 to 30 hours, retighten the screws to the appropriate torque values given in Table 2. Screw torques should be subsequently checked at normal service intervals (i.e., every six months).

## Removing the Reducer from the Shaft

1. Ensure that the reducer is supported and cannot fall free when the grip of the Taper-Grip Bushing is released.
2. Release each screw gradually until they are free from the pockets of the thrust collar.
3. If the Taper-Grip Bushing does not self release, give the flange a sharp tap with a mallet to break free the taper. This will free the reducer from the shaft.
4. Hand-tighten two screws against the thrust collar before attempting to slide the reducer off the shaft. This will stop the hub from pulling up the opposite taper flanks of the Taper-Grip Bushing and prevent it from relocking on the shaft as the reducer is removed.
5. Slide the reducer from the shaft. If corrosion or paint prevents the reducer from sliding off the shaft, it is possible to utilize two of the screw holes to secure a puller plate to the bushing.

**Table 1 — Permissible Shaft Tolerance**

Shaft Dia.	Tolerance
3/4" - 1 1/2"	+0 - .005"
1 3/8" - 2"	+0 - .006"
2 1/4" - 3 1/2"	+0 - .007"
3 3/4" - 4 1/2"	+0 - .008"

**Table 2 — Taper-Grip Screw Tightening Torques**

Size	Screw Size Qty. & Code	Screw Torque lb. ft.
A	6 X M12 942727	37.5
B	6 X M12 942727	37.5
C	6 X M16 942735	94
D	6 X M20 942740	180
E	6 X M20 942740	180

**Table 3 — Case Bolt Tightening Torques**

Size	A	B	C	D	E
Torque (lb. ft.)	37	59	59	37 & 59*	37 & 59*

\* Torque arm case bolts only

# REPLACEMENT OF PARTS — Helical Gear Case

## Important

Using standard tools the reducer can be dismantled and reassembled. Cleanliness is most important to prevent the entry of dirt into the bearings and other parts of the reducer. A tank of clean solvent, an arbor press and equipment for heating gears and bearings should be available for shrink-fitting these parts onto the shafts.

## Procedure

1. Wash all removable dirt from the assembly.
2. Remove the Cyclo Unit from the Adaptor.
3. Remove the Case Bolts: items 33 and 38.
4. Remove the Cover Screws and Cover from the Input Cartridge: items 14, 15, 17.
5. Remove the Taper-Grip Bushing from the Output Hub: items 9, 10, 11.
6. Using a soft-faced mallet drift the Output Hub (3) and the Cartridge (12) evenly (avoiding the pins in the input shaft) to separate the case halves. Use soft spacers to pack out the case until the left-hand half is removed. The cartridge should abut with the right-hand gear case to permit removal of the output assembly from its bearing housing. Care should be taken not to damage the output gear (6) or the cartridge (12) during this operation.
7. Drift out the Cartridge Assembly, taking care not to damage the pins.
8. The Output Assembly may be stripped as required using bearing pullers, Snap-ring Pliers and a Press.
9. The Cartridge Assembly may be stripped in the following way.
10. Remove Screws and Clips: 29, 31, as appropriate.
11. Support the Cartridge Adaptor Flange on the press table, and using suitable protection for the shaft (20), press it from the Cartridge (12). Care must be taken to prevent the shaft assembly from dropping during this operation.
12. The Bearings, Pinion and Spacers can be removed using a three-legged puller.

Lip-type oil seals are used. Great care should be taken during dismantling and reassembly to avoid damage to the rubbing surfaces. Any burrs or damage to these surfaces must be carefully removed.

Any keyway or item which may damage seals should be masked with a smooth adhesive tape during assembly.

## Ordering Parts

When ordering parts for a reducer the following should be specified.

The reducer size, serial number, part code number and description, the quantity required. The Part Number, Code and Description can be found on the 'Code Numbers for Individual Parts' page.

It is strongly recommended that when a Pinion or Gear is replaced, the mating Gear or Pinion is replaced also. It is recommended that the whole output assembly be replaced as a unit to ensure undamaged bearings and rubbing surfaces.

# LUBRICATION

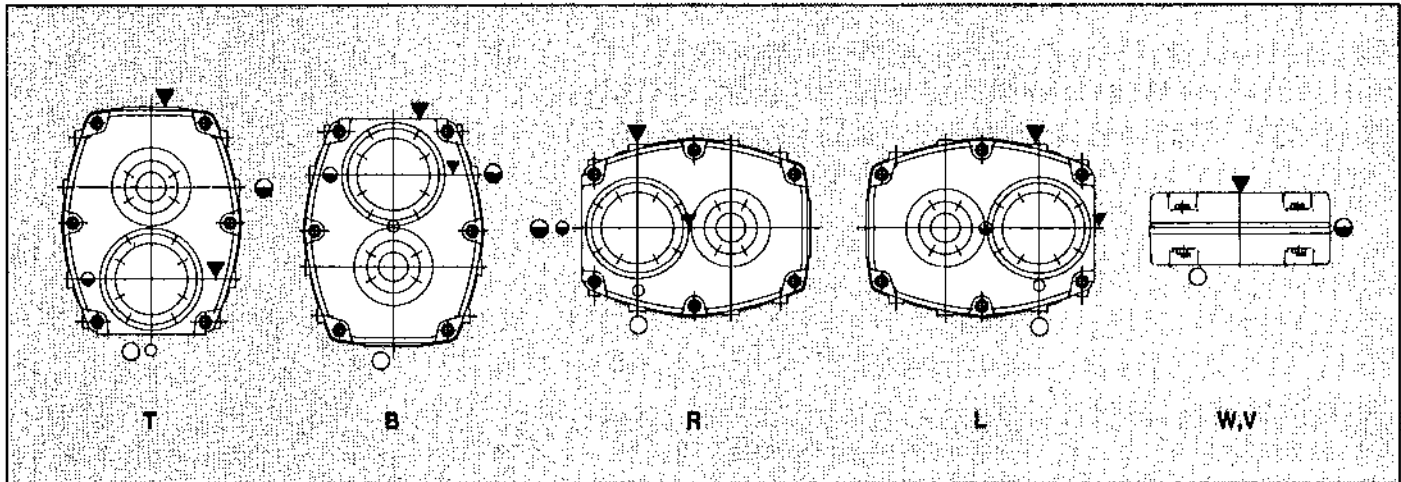


Buddybox reducers and gearmotors are shipped without oil. Before running they should be filled with the appropriate amount of the correct lubricant as shown in the tables, dependent on the mounting position — see below.

## LEGEND

OIL FILLER	▼
OIL LEVEL PLUG	●
DRAIN	○

## MOUNTING POSITION



### 4a. Oil quantity

Always fill to oil level plug position.

The following quantities are for guidance only.

(Gallon)

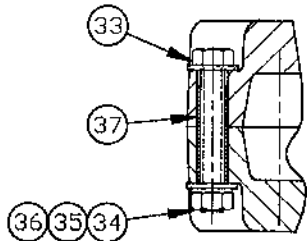
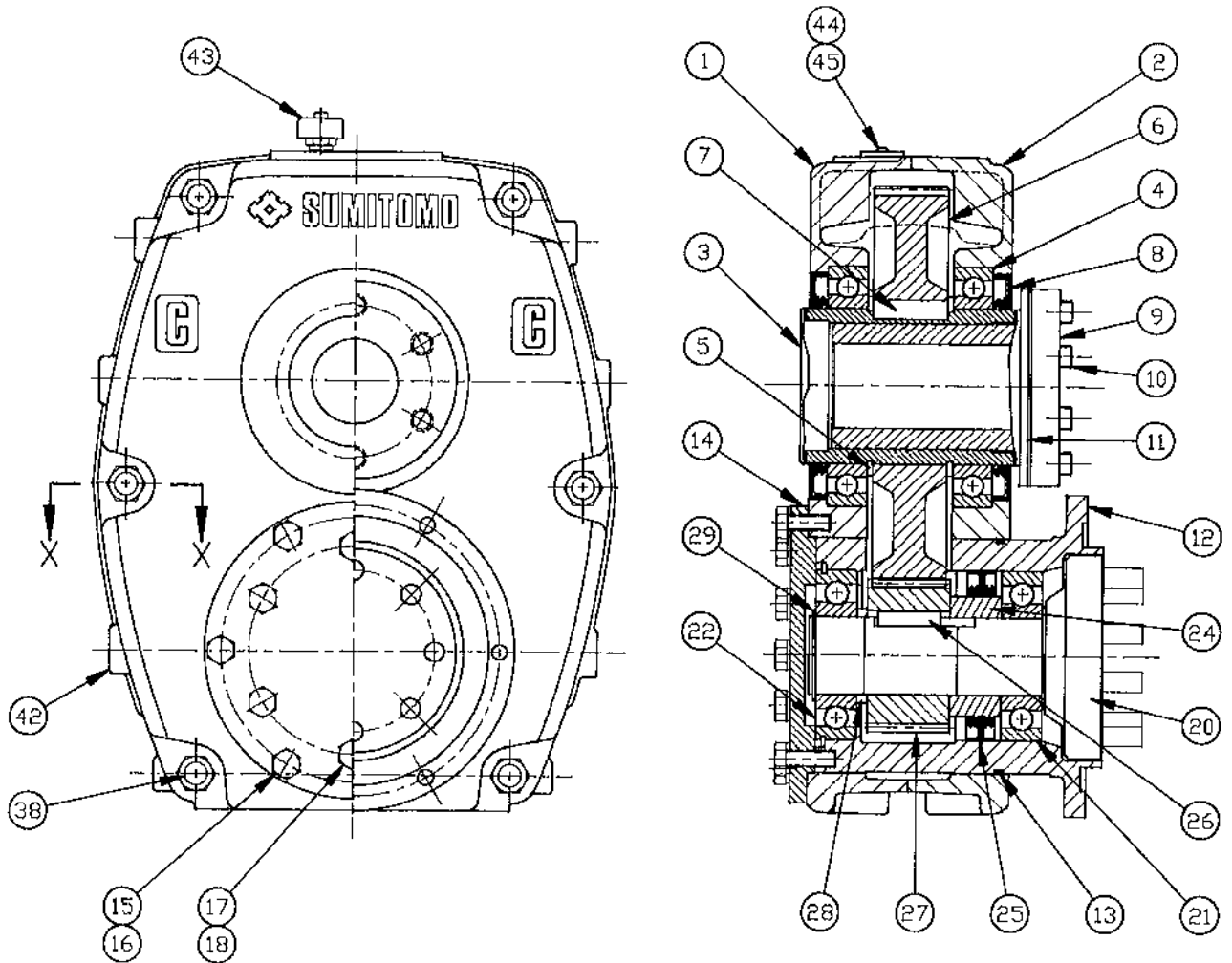
Buddybox Size	Oil Quantity — gear			
	Pos. T	Pos. B	Pos. R,L	Pos.W,V
A3100	0.5	0.5	0.4	0.5
A3105	0.5	0.5	0.4	0.5
A310H	0.5	0.5	0.4	0.5
B3110	0.75	0.7	0.5	0.7
B3115	0.75	0.7	0.5	0.7
B311H	0.75	0.7	0.5	0.7
C3140	1.25	1.4	0.9	1.0
C3145	1.25	1.4	0.9	1.0
C3155	1.25	1.4	0.9	1.0
C315H	1.25	1.4	0.9	1.0
D3160	2.0	3.0	1.5	1.9
D3165	2.0	3.0	1.5	1.9
D316H	2.0	3.0	1.5	1.9
E3170	2.75	3.8	2.3	3.2
E3175	2.75	3.8	2.3	3.2

Consult factory if grease lubrication of gear portion is requested.

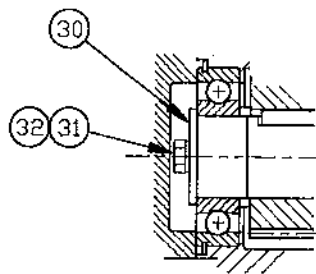
### 4b. Recommended Lubricants for SM Buddybox

Ambient Temp.	14°F-32°F (-10°C-0°C)	32°F-95°F (0°C-35°C)	95°F-122°F (35°C-50°C)
Viscosity @ 40°C (104°F) cSt	61.2 - 74.8	90 - 165	198 - 506
ISO Viscosity Grade	68	100 - 150	220 - 460
AGMA Viscosity Grade	2EP	3EP 4 EP	5EP 7EP
Viscosity @ 100°F (38°C) cSt	284 - 347	417 - 765	916 - 2719

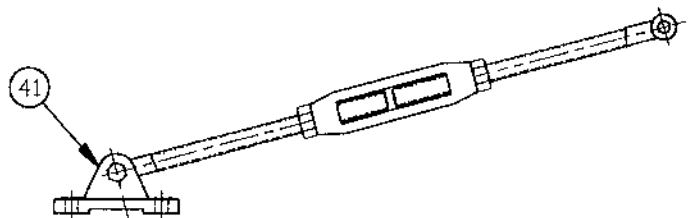
# PARTS IDENTIFICATION — Helical Gear Case



SECTION X-X  
THRU' CASE BOLT



DETAIL SHOWING SHAFT  
RETAINING PLATE ON  
'A' UNIT ONLY.



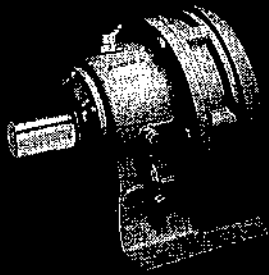
# CODE NUMBERS



REF	DESCRIPTION	QTY	A CODE	B CODE	C CODE	D CODE	E CODE
0	ASSEMBLY		036A0001	036B0001	036C0001	036D0001	036E0001
1	LH CASE	1	036A6001	036B6001	036C6001	036D6001	036E6001
2	RH CASE	1	036A6002	036B6002	036C6002	036D6002	036E6002
3	OUTPUT HUB	1	036A6003	036B6003	036C6003	036D6003	036E6003
4	OUTPUT BEARING	2	0941353	0941354	0941355	0941356	0941357
5	OUTPUT SNAP RING	2	0944190	0944191	0944192	0944171	0944172
6	OUTPUT GEAR	1	016E6026	016F6026	016G6026	016H6026	016J6026
7	OUTPUT KEY	1	016E6027	016F6027	016G6127	016H6027	016J6027
8	OUTPUT SEAL	2	0946309	0946310	0946311	0946312	0946313
9	TAPERGRIP BUSH	1	AS REQ	AS REQ	AS REQ	AS REQ	AS REQ
10	BUSH SCREW	6	0942881	0942881	0942890	0942900	0942900
11	THRUST PLATE	1	016E6146	016F6146	016G6146	016H6146	016J6146
12	CARTRIDGE	1	036A6012	036B6012	036C6012	036D6012	036E6012
13	CARTRIDGE O RING	1	0946423	0946424	0946425	0946426	0946427
14	RETAINING COVER	1	036A6014	036B6014	036C6014	036D6014	036E6014
15	COVER/CASE SCREWS	6	0943750	0943751	0943763	0943762	0943772
16	LOCKWASHER	6	0943871	0943871	0943872	0943872	0943873
17	COVER/CARTRIDGE SCREWS	6	0943750	0943751	0943762	0943761	0943772
18	LOCKWASHER	6	0943871	0943871	0943872	0943872	0943873
19							
20	INPUT SHAFT	1	036A6020	036B6020	036C6020	036D6020	036E6020
21	INPUT RH BEARING	1	0941430	0941351	0941037	0941042	0941018
22	INPUT LH BEARING	1	0941100	0941087	0941106	0941086	0941091
23	SNAP RING	1					
24	SEAL SPACER	1	036A6024	036B6024	036C6024	036D6024	036E6024
25	INPUT SEAL	2	0946307	0946308	0946309	0946327	0946311
26	INPUT KEY	1	036A6026	036B6026	036C6026	036D6026	036E6026
27	INPUT PINION	1	036A6027	036B6027	036C6027	036D6027	036E6027
28	INPUT SPACER	1			036C6028	036D6028	036E6028
29	INPUT SNAP RING	1		0944183	0944187	0944188	0944173
30	INPUT RETAINING PLATE	1	036A6030				
31	RETAINING PLATE SCREW	1	0943750				
32	LOCKWASHER	1	0943871				
33	CASE BOLT	6	0943844	0943858	0943858	0943846	0943846
34	NUT	6	0943812	0943813	0943813	0943812	0943812
35	LOCKWASHER	6	0943872	0943873	0943873	0943872	0943872
36	PLAIN WASHER	4	0943822	0943823	0943823	0943822	0943822
37	HOLLOW DOWEL	2	036A6037	036B6037	036B6037	016E7004	016E7004
38	TORQUE ARM CASE BOLT	2				0943858	0943858
39	NUT	2				0943813	0943813
40	LOCKWASHER	2				0943873	0943873
41	TORQUE ARM ASSY	1	016F8053	016F8053	016F8053	016H8053	016H8053
42	PIPE PLUG	6	016A7036	016A7036	016A7036	0942393	0942393
43	BREATHER PLUG	1	016A8037	016A8037	016A8037	016A8037	016A8037
44	NAMEPLATE	1	036A6044	036A6044	036A6044	036A6044	036A6044
45	HD SCREW	2	0944230	0944230	0944230	0944230	0944230
46							
47							
48							
49							
50							
51							
52							
53							
54							



SM-CYCLO



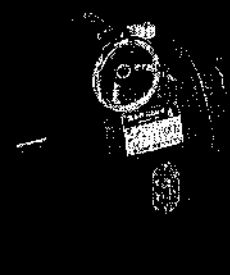
SPEED REDUCER

SM-CYCLO



GEARMOTOR

SM-BEIER DRIVE



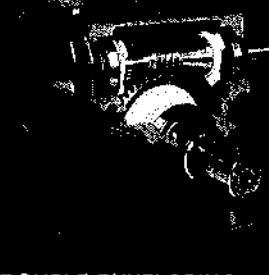
ADJUSTABLE SPEED  
VISCIOUS TRACTION

PARAMAX-7®



PARALLEL SHAFT  
& RIGHT ANGLE REDUCERS

SM-HEDCON



DOUBLE-ENVELOPING  
WORM GEAR REDUCER

SM-ULYSSES



WORM GEAR REDUCER

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ADJUSTABLE SPEED  
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RIGHT ANGLE GEARMOTOR

SMAC-PAC AF-500

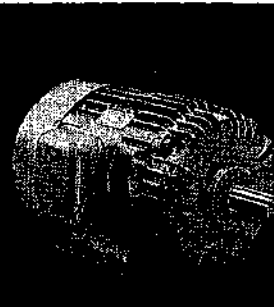


AC INVERTER

BUDDY BOX

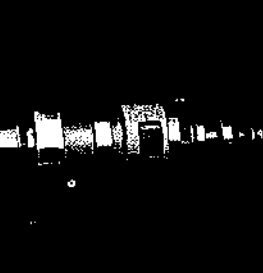


SHAFT MOUNTED  
GEARMOTOR



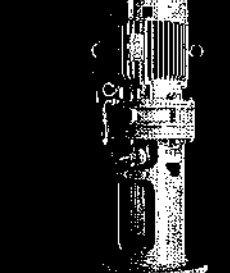
AF MOTOR

SM-COMPOWER



PLANETARY GEAR REDUCER

SM-CYCLO GEARMOTOR



VERTICAL  
MOUNT

SM-CYCLO GEARMOTOR



TORQUE  
LIMITER

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