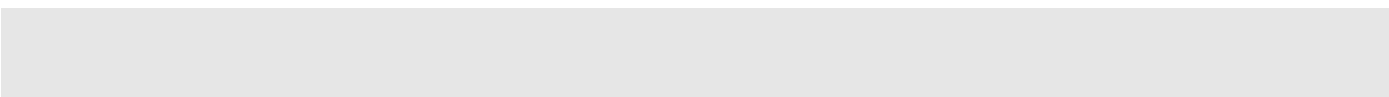




# SERVICE MANUAL RDM SERIES INDEX DRIVES MODEL 80RDM



**"WARNING"**

This is a controlled document. It is your responsibility to deliver this information to the end user of the CAMCO indexer.  
Failure to deliver this, could result in your liability for injury to the user or damage to the machine.  
For copies of this manual call your Customer Service Representative 800/645-5207.

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## *INTRODUCTION*

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This service manual pertains to the disassembly and assembly of CAMCO's 80RDM Index Drive.

The Manual is to be used in conjunction with the General Service Manual which describes the lubrication and general maintenance of CAMCO Index Drives.

An illustration of the index drive is included in this manual. The procedures in this manual reference the item numbers of this illustration.

Also included is a complete Bill of Materials for your convenience in identifying and ordering spare or replacement parts.

Some users of index drives have the facilities and trained personnel to accomplish service repair. You must determine the extent to which intricate servicing should be done in your facility. When in doubt, CAMCO recommends that CAMCO trained serviceman make the repairs.

## *WARNINGS AND CAUTIONS*

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Statements in this manual preceded by the words *WARNING* or *CAUTION* and printed in italics are very important. We recommend you take special notice of these during service or repair.

### *WARNING*

Means there is the possibility of personal injury to yourself or others.

### *CAUTION*

Means there is the possibility of damage to the CAMCO unit.

## *OIL SEAL REMOVAL*

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The only repair possible without disassembly of the index drive is replacement of oil seals. To remove oil seals, drill a number of holes into the case of the seal. The seal may then be removed with a pointed tool. Be sure to remove all metallic chips created during the drilling of removal holes. A new seal may be installed as outlined in the "Oil Seal Installation Recommendations" section of the "General Service Manual".

## *SPARE PARTS KIT*

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CAMCO offers a Spare Parts Kit for all CAMCO index drive models CAMCO builds. These kits include oil seals, bearings, shims and cam followers. These are components that will most likely require replacement during repair of your index drive.

A complete list of components supplied in the Spare Parts Kit can be found in the parts list located in the rear of this manual. The asterisk behind the item number indicates those parts supplied with the Spare Parts Kit.

## *BEFORE STARTING*

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Before starting disassembly of your CAMCO unit you should read and review the following instructions. These provide important information on parts and procedures necessary to successfully complete your repair.

Comply with all Warnings and Cautions.

Read the "Trouble Shooting Guide" section of your "General Service Manual" before disassembling CAMCO units. CAMCO recommends returning defective equipment for inspection and repair whenever possible.

CAMCO uses Loctite to secure all screws and setscrews. If you encounter a fastener that is difficult to remove, apply heat to the screw and remove while still warm.

## DISASSEMBLY

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### 1. GENERAL

- A. Remove all accessory equipment such as clutches, reducers, sprockets, etc. If equipped with a CAMCO Reducer, see disassembly instruction pertaining to this reducer prior to removal from unit.

### 2. CAM ACCESS PLUG AND LUBE REMOVAL

- A. To remove the plug (32), drill a hole into the plug.
- B. The plug may then be removed with a pointed tool. Be sure to remove all chips created during the drilling of removal holes.
- C. At this time the entire unit should be flushed with a solvent to remove grease from the cam compartment.

### 3. OPTIONAL STATIONARY OUTPUT SHAFT REMOVAL

- A. Remove the four screws (31).
- B. Tap optional stationary output shaft (24) free of housing (1).
- C. Remove quad ring (10) and o-ring (18) from stationary output shaft (24).

### 4. OPTIONAL OUTPUT SHAFT PLUGS REMOVAL

- A. To remove the optional output shaft plug (30), drill a hole into the plug.
- B. The plug may then be removed with a pointed tool. Be sure to remove all chips created during the drilling of removal holes.
- C. Insert a soft drive thru the output shaft and tap out plug (29).

### 5. OUTPUT SHAFT/FOLLOWER WHEEL REMOVAL

- A. Turn the unit over and remove the eight screws (20).
- B. Remove output bearing retainer (6) and shims (12) from housing (1).

NOTE: Keep shims (12) with retainer (6). You will be asked to reinstall or replace with the same shim thickness during assembly.

- C. Remove quad seal (9) from output bearing retainer (6).
- D. Remove follower wheel (2) from housing (1).
- E. Remove shims (11).

NOTE: Keep shims (11) with follower wheel (2). You will be asked to reinstall or replace with the same shim thickness during assembly.

### 6. OPTIONAL THRU HOLE TUBE REMOVAL

- A. Remove thru hole tube (8).
- B. Remove seal (25) from housing (1).

### 7. INSPECTION OF CAM FOLLOWERS

Inspect followers for damage or radial looseness. It should not exceed 0.001 inch. Do not confuse radial looseness with axial endplay. Endplay will be from 0.03 to 0.06 inch as a normal condition. If it exceeds 0.06 inch, it may require replacement.

NOTE: Generally, followers are replaced as added insurance against eventual failure.

## 8. FOLLOWER REMOVAL

- A. Apply heat to setscrews (26) and remove the setscrews while still warm.
- B. Threaded holes have been provided in the ends of the follower for ease of removal. Use a slide hammer or a simple self made pull tool. The self made pull tool consists of a short piece of round tubing large enough to clear the follower diameter and a small flat bar with a clearance hole large enough to insert a capscrew of equal thread size as the follower pull hole. Slip the tube over the follower, place the bar over the tube and thread the capscrew into the follower. Tightening the capscrew will remove the follower.
- C. Check the follower holes for roundness. These holes may be elongated due to overloads and jams.

## 9. OUTPUT SHAFT/FOLLOWER WHEEL BEARING REMOVAL

- A. Apply heat to screws (21) and remove the screws with washers (22) while still warm.
- B. Remove bearing (7) from follower wheel (2).

## 10. INPUT SHAFT/CAM REMOVAL

- A. Rotate the input shaft (4) and inspect all parts for wear or damage. Endplay in the input shaft is not permissible.
- B. Matchmark cartridges (5) relative to the housing (1). These must be reinstalled in the same side and position since they are eccentric.
- C. Drill out the roll pin from both bearing cartridges (5).

- D. Remove four screws (16) from one of the bearing cartridges (5).
- E. Tap on the opposite end of the input shaft (4) to loosen bearing cartridge (5). Remove the cartridge and shims (13).

NOTE: Keep shims with bearing cartridge. You will be asked to reinstall or replace with the same shim thickness during assembly.

- F. Remove four screws (16) from remaining bearing cartridge (5).
- G. Tap on the opposite end of the input shaft (4) to loosen bearing cartridge (5). Remove the cartridge and shims (13).

NOTE: Keep shims with bearing cartridge. You will be asked to reinstall or replace with the same shim thickness during assembly.

- H. Remove input shaft (4) from housing (1).

## 11. INPUT SHAFT/CAM DISASSEMBLY

- A. Use a wheel puller to remove bearing cones (14) from input shaft (4).
- B. Remove spacer (27) from input shaft (4).
- C. Place the input shaft vertically on an arbor press. Block cam (3) and press the input shaft out of the cam.

NOTE: This procedure can be accomplished by driving the input shaft out of the cam with a soft faced hammer if an arbor press is not available.

- D. Remove key (23) from input shaft (4).
- E. Remove input bearing cups (15) from cartridges (5) with a pulley puller, by prying, or drilling and tapping for jack screws.

## ASSEMBLY

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### 1. PRIOR TO ASSEMBLY

- A. Clean and deburr all parts before reassembling.
- B. Follow tightening torque and loctite recommendations as outlined in the "General Service Manual".

### 2. INPUT SHAFT/CAM REASSEMBLY

- A. Install key (23) on input shaft (4).
- B. Apply anti-seize lubricant to both input shaft (4) and the bore of cam (3).
- C. Preposition the cam on the shaft so that the keyway in the cam lines up with key (23).
- D. Use an arbor press to press the shaft into the cam.
- E. Install spacer (27) on shaft (4).
- F. Apply anti-seize lubricant to both input shaft (4) and the bores of bearing cones (14).
- G. Use an arbor to press bearing cones (14) onto input shaft (4).

NOTE: CAMCO recommends heating the bearing cone with a heat gun, if available, prior to installation onto the shaft.

### 3. OUTPUT SHAFT/FOLLOWER WHEEL REASSEMBLY

- A. Apply anti-seize lubricant to both follower wheel (2) and the bore of bearing (7).
- B. Install bearing (7) onto follower wheel (2) until seated.
- C. Install screws (21) with washers (22) using loctite thread locking liquid as recommended in the "General Service Manual".

**CAUTION:** *Be sure to press the follower in straight as damage to the follower and wheel could occur if improperly aligned during installation.*

- D. Align the notch on the stud of follower (19) with the tapped hole for setscrew (26). Press in the follower using an arbor press.

NOTE: 1/2 inch diameter followers must be pressed in until the face of the follower is 0.522 inch above the face of follower wheel (2).

- E. Install set screw (26) using loctite thread locking liquid as recommended in the "General Service Manual".
- F. Install remaining followers (19) in the same manner.

### 4. INSTALLING NEW BEARING CUPS

- A. Coat the outside of bearing cups (15) and the bores of cartridges (5) with an anti-seize lubricant.
- B. Use an arbor to press the bearing cups into the cartridges.

### 5. SETTING INPUT SHAFT/CAM BEARING PRELOAD

- A. Position housing (1) on a work bench with the bore for plug (32) facing down and the bore for follower wheel (2) toward you.
- B. Install one cartridge (5) in the same side and position as disassembled (See matchmark instructions of Output Shaft/Follower Wheel Removal). Be sure to install the same exact shims or equivalent thickness as was removed during disassembly.
- C. Install and tighten screws (16).
- D. Insert the input shaft/cam (4) into housing (1) so that orientation of shaft is the same as before disassembly.
- E. Install remaining cartridge (5) in the same position as disassembled (See matchmark instructions of Output Shaft/Follower Wheel Removal). Be sure to install the same shims or equivalent thickness as was removed during disassembly.
- F. Install and tighten screws (16).

- G. Rotate the shaft and check preload. There should be no endplay and a small amount of drag should be felt from preloading the bearings. Add or remove shims as necessary to obtain this condition. In rare instances it may be necessary to remachine the cartridge if all shims have been removed and endplay still exists.

NOTE: The same amount of shims (13) should be added or removed from both cartridges (5) to retain its position in housing (1).

## 6. OUTPUT SHAFT/FOLLOWER WHEEL INSTALLATION

- A. Position housing (1) on a work bench with the bore for plug (32) facing down and the bore for follower wheel (2) toward you.
- B. Rotate input shaft/cam (4) until the dwell portion of the cam is downwards (facing the bore for the follower wheel).
- C. Install the same exact shims (11) or equivalent thickness as was removed during disassembly.
- D. Place the output shaft/follower wheel (2) on the work bench with followers (19) facing down.
- E. Inspect the face of output shaft/follower wheel (2). Locate the holes for bolts (21). One of these holes has an extra hole right next to it. This extra hole must be located at the 6 o'clock position when the output shaft/follower wheel is installed in housing (1).
- F. Insert the output shaft/follower wheel (2) down thru the opening of housing (1).
- G. Install output bearing retainer (6) with shims (12). Be sure to install the same exact shims as determined in step 5.
- H. Install and tighten screws (20).

## 7. SETTING CAM

**CAUTION:** *This mechanism is designed to operate with adjacent followers in close contact along their entire width with the surface of the cam during dwell period (Period where no follower motion is observed). Unless this condition is achieved by proper installation, the mechanism will not transmit its rated load, and furthermore, serious damage to the cam and output shaft will occur.*

- A. Apply "Prussian Blue" to the entire cam track.

**IMPORTANT:** *The following procedure is very important and can be difficult if not performed by trained and experienced serviceman.*

- B. Rotate the input shaft/cam (4) slowly with a small handcrank to ensure that:

1. Both followers (19) are in contact with the cam rib in dwell. Look for a uniform bluing pattern.

If not, loosen screws (16) and rotate tops of cartridges (5) until both followers are in contact. Tighten screws (16).

2. You do not encounter unusual resistance in motion. The bluing pattern should be fairly uniform from side to side during motion.

If a patch of bluing is worn off the outside of the cam rib on one side of the cam and not the other, remove cartridges (5) and shift shims (13) from one cartridge to the other to shift the cam 0.002 to 0.005 inches in the direction of the worn side. Do not overshift the cam or knocking will occur.

3. There should be no looseness in any dwell.  
  
If there is, loosen screws (16) and rotate tops of cartridges (5) to slightly preload the loosest dwell. Tighten screws (16).
  4. There should be even preload in different motions.  
  
If not, remove output shaft/follower wheel (2) and adjust shims (11) to move the output shaft/follower wheel (2) in or out.
- C. Matchmark cartridges (5) with housing (1) to retain proper adjustment.
- D. Final assemble cartridges (5) as follows:
1. Remove one cartridge (5) and shims (13).
  2. Apply Mobilith AW-2 Grease in bearing cup (15).
  3. Install o-ring (28) on cartridge (5).
  4. Install shims (13) on cartridge (5).
  5. Apply a bead of silicone around the flange of bearing cartridge (5).
  6. Apply a dab of silicone to the holes in housing (1) for screws (16).
  7. Install cartridge (5), install screws (16), align matchmarks to obtain proper cam setting and tighten screws (16).
  8. Remove opposite cartridge (5) and shims (13).
  9. Apply Mobilith AW-2 Grease to bearing cone (15).
  10. Install o-ring (28) on cartridge (5).
  11. Install shims (13) on cartridge (5).
  12. Apply a bead of silicone around the flange of bearing cartridge (5).
  13. Apply a dab of silicone to the holes in housing (1) for screws (16).
  14. Install cartridge (5), install screws (16), align matchmarks to obtain proper cam setting and tighten screws (16).
  15. Drill a hole through each cartridge (5) and into housing (1) and install a roll pin to prevent the cartridge from rotating.
8. OIL SEAL INSTALLATION
- A. Install new oil seals (17) as described in the "General Service Manual".
9. OPTIONAL THRU HOLE TUBE INSTALLATION
- A. Position thru hole tube (8) in the bore of housing (1) and tap into output shaft/follower wheel (2).  
  
NOTE: One end of the thru hole tube (8) has a larger OD. The larger OD must be installed into output shaft/follower wheel (2).
  - B. Install new oil seal (25) into housing (1) as described in the "General Service Manual".
10. OPTIONAL STATIONARY OUTPUT SHAFT INSTALLATION
- A. Install quad ring (10) and o-ring (18) on stationary output shaft (24).
  - B. Tap optional stationary output shaft (24) into housing (1).
  - C. Install the four screws (31).

11. OPTIONAL OUTPUT SHAFT PLUGS  
INSTALLATION

- A. Position the optional output shaft plug (30) in the bore of housing (1) and tap into place until flush with the housing surface.
- B. Position plug (29) in its bore of housing (1) and tap into place until flush with the housing surface.

12. LUBRICATION

- A. Fill the cam chamber of housing (1) (level with the sidewalls) with Mobilith AW-2 grease.
- B. Position the two plugs (32) in their bores of housing (1) and tap into place until flush with the housing surface.

## ***HOW TO ORDER PARTS***

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Please refer to parts list shown in this manual. This parts list is for a standard index drive. If you feel your unit is nonstandard or you are in doubt, you should contact CAMCO Customer Service at (312) 459-5200 and request a Bill of Material for your specific unit based on serial number. CAMCO maintains records on all units for a period of ten years.

You may order parts per the standard Bill of Material even if your unit is nonstandard. CAMCO's order entry people will review the closed order file based on the following information and supply you with the correct part.

### **REQUIRED INFORMATION**

1. Original purchase order number (if available)
2. Customer name (original purchaser of drive)
3. Model number (located on name plate)
4. Serial number (located on name plate)
5. Approximate date of purchase.

TO ORDER PARTS contact CAMCO "Order Entry Department" Wheeling, Illinois  
Phone (847) 459-5200 or FAX #847-459-3064

- A. Describe the parts required and the 14 digit part number as listed in the Standard Bill of Materials or a Special Bill of Materials pertaining to your unit. State if you are using a Standard or Special bill of material.
- B. Give as much of the above required information as possible.

## ON WARRANTY

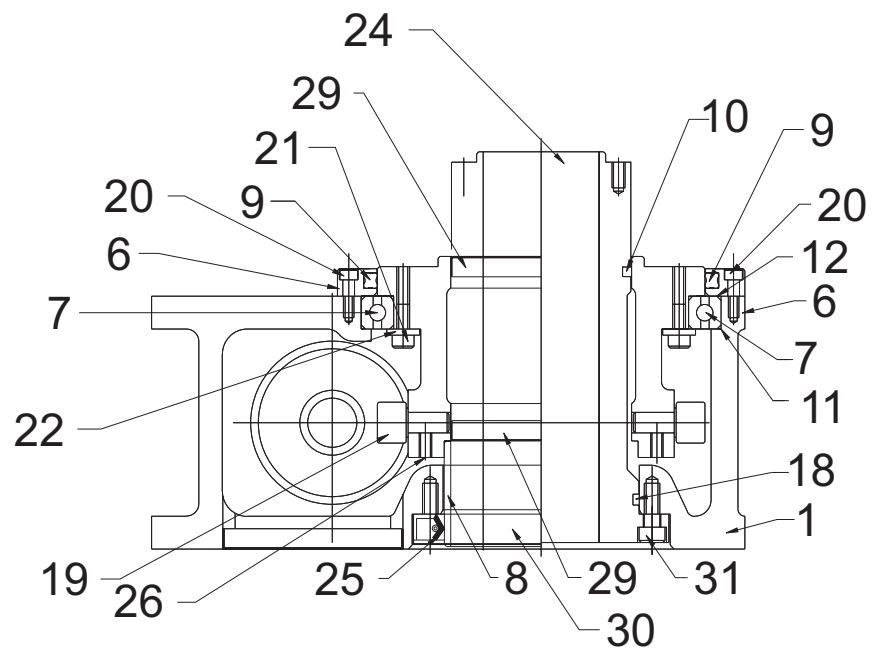
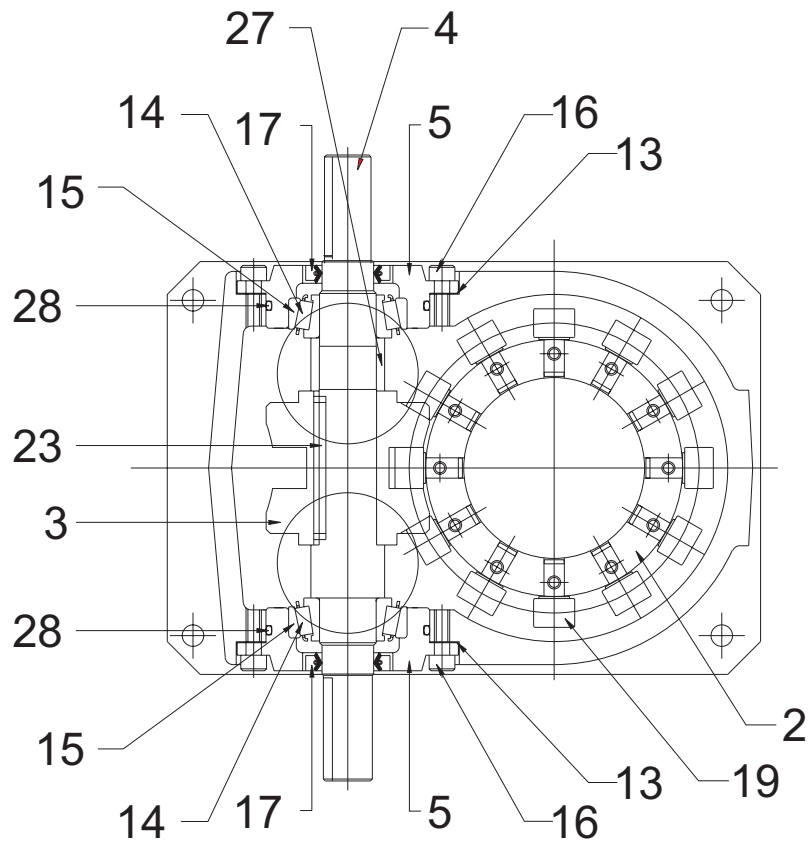
Replacement parts CAMCO will send freight prepaid via practical means.

CAMCO will issue a "Returned Material Authorization Number" (RMA#) for the return of defective parts for inspection. CAMCO will bill customer for repair parts. When inspection of returned parts has been completed and determined to be a warranty problem, CAMCO will issue a credit to the customer for the repair parts and freight charges.

## ON NON-WARRANTY

Replacement or spare parts, with approved credit, are sent F.O.B. our plant Wheeling, Illinois.

# 80RDM



**PARTS LIST FOR 80RDM INDEX DRIVE (STANDARD CONFIGURATION)**

<b><u>ITEM NO.</u></b>	<b><u>PART NUMBER</u></b>	<b><u>DESCRIPTION</u></b>
1 .....	55D67120001002 .....	HOUSING
	55C67853001002 .....	HOUSING W/180SM ALT
2 .....	55C66919014010 .....	FOLLOWER WHEEL H16 FOLLOWERS
	55C66918034012 .....	FOLLOWER WHEEL H20 FOLLOWERS
3 .....	-----	CAM (SPECIFY NUMBER OF STOPS AND INDEX TIME, CONTACT CAMCO FOR ASSISTANCE)
4 .....	55B66884007002 .....	SHAFT INP DE (W/O REDUCER)
	55C67384007002 .....	SHAFT INP DE (FOR REDUCER)
5 .....	55B66894003002 .....	CART MACH INP OPEN
6 .....	55C66920000000 .....	RETAINER OUTP BRG
7 .....	86A67170000000 .....	BRG KAYDON KD045XPOK
8 .....	55A66959000000 .....	TUBE, THRU HOLE
9 .....	84A67143740000 .....	QUAD RING MINN-R 353-525K
	84A67421740000 .....	QUAD RING VITON (#Q4353-514AD)
	84C65421380000 .....	OIL SEAL C/R 29540 NITRILE
	84A67422410000 .....	OIL SEAL (METRIC) - VITON
10 .....	84A67143480000 .....	QUAD RING NITRILE (FOR STATIONARY OUTPUT ONLY)
11 .....	55B67172018800 .....	SHIM, 0.002 THK RETAINER
	55B67172028800 .....	SHIM, 0.005 THK RETAINER
	55B67172038800 .....	SHIM, 0.010 THK RETAINER
12 .....	-----	CONSULT CAMCO FOR SHIM NUMBER
13 .....	55B67159018800 .....	SHIM INP
	55B67159028800 .....	SHIM INP
	55B67159038800 .....	SHIM INP
	55B67159048800 .....	SHIM INP
14 .....	86D07328090021 .....	BEARING CONE LM 12749
15 .....	86D07328090022 .....	BEARING CUP LM12711
16 .....	95A33040180000 .....	SHCS M6 X 18
17 .....	84C65421040000 .....	OIL SEAL C/R 7915 NITRILE
	84C65421050000 .....	METRIC OIL SEAL C/R 7916
18 .....	84A64420660000 .....	O-RING 70MM X 3 MM NITRILE (FOR STATIONARY OUTPUT ONLY)
19 .....	82C33150010003 .....	CAM FLWR H20
	82C33150060003 .....	CAM FLWR H20
20 .....	95A51910310000 .....	S.H.C.S. M4 X 12
21 .....	95A33040040000 .....	S.H.C.S. M5 X 12
22 .....	95A26021210000 .....	WASHER FLAT 3/16 VLIER 6018
23 .....	018K200 .....	KEY 0.1875 SQ. X 2.00
24 .....	55C66969000000 .....	SHAFT STATIONARY OUTPUT (OPTIONAL)
25 .....	89B67859009100 .....	MTG PLT 180SM ON 450RDM

PARTS LIST FOR 80RDM CONTINUED

<u>ITEM NO.</u>	<u>PART NUMBER</u>	<u>DESCRIPTION</u>
26	95A33041120000	S.S.S. CUP PT. M4 X 8 (USED WITH H16 FOLLOWERS)
	95A33041190000 .....	S.S.S. CUP PT. M5 X 8 (USED WITH H20 FOLLOWERS)
27 .....	55A67131009000 .....	SPACER INPUT, 450RDM
28 .....	84A64420410000 .....	O-RING 60MM X 2.5 MM NITRILE
29 .....	5MA52057000000 .....	BORE PLUG 2.756
30 .....	55A67134000000 .....	BORE PLUG, 3.937 BORE
31 .....	95A33040180000 .....	SHCS M6 X 18



The Driving Force In Automation

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