

# IMPORTANT!

## OPERATION AND MAINTENANCE INSTRUCTIONS FOR INDEX DRIVES



### I. GENERAL

1. The information listed below applies to all models of **Industrial Motion Control, LLC (IMC) Camco- and Ferguson-brand Index Drives.**
2. The input and output shafts can be rotated in either direction.

### II. LUBRICATION:

1. Proper attention to lubrication is of the utmost importance. IMC Index Drives are shipped without oil in the housings and before operating under power, the housings should be filled to proper oil level on sight glass with MOBIL GEAR 630, OMALA 220, MOBIL SHC 634 or an SAE 90 EP Gear Oil (meeting the MIL-L-2105E Specification and API Service Classification GL5) or equivalent. Consult the General Service Manual or the unit-specific manual for your unit for additional information.

The sight glass, fill plug and magnetic drain plug have been installed at the factory in locations that will provide internal lubrication to all bearings according to the mounting arrangement specified at the time of the order.

2. Some units have output bearings requiring regular lubrication. These bearings have grease fittings and should be lubricated every 1000 hours with light chassis grease through the fitting provided. Do not over-lubricate these bearings as excess grease will be forced into the oil reservoir.

Output bearings without grease fittings are splash lubricated from the oil reservoir.

3. Under normal conditions, the overload clutch will not require lubrication on a scheduled basis but the overload clutch should be tested at least once every 6 months to be sure it is functioning properly. To do this the output member (sprocket, dial, pulley, shaft etc.) should be locked by mechanical means, then attempt to hand crank the reducer input shaft (or input shaft of the index drive if no reducer is used). By locking the output member the clutch should trip during index of the drive. If the clutch does not function, a follower wheel or cam could break during normal operation. Therefore, the clutch should be taken apart, as outlined in the "Clutch Installation, Operation and Maintenance Instruction Manual", (Note all warning and cautions) cleaned and a light coat of Mobil AW-2 should be applied to the drive plate and mating surface of the clutch body. Also, lubricate the spring pockets with a light film of grease.

**CAUTION:** Heavy lubrication in the spring pockets may lock the plunger, due to hydraulic pressure, preventing the clutch from disengagement. In dusty, corrosive, high humidity, contaminants or wash down environments, lubrication (as outlined above) should take place at least once every six (6) months or sooner if required.

**GREASE PACKED BEARINGS:** bearings used in IMC Index Drives require no additional maintenance. The bearings that are not lubricated by partial submersion in

oil are packed with a high quality bearing grease. However, bearings that are not lubricated as above require grease lubrication.

Grease fittings and internal retainers are furnished as required. They should be greased with NGLI #3 bearing grease at least once a month. Do not over-lube since the excess lubricant will eventually fall into the indexer oil reservoir.

### III. INSTALLATION AND OPERATION:

1. IMC Index Drives should be mounted in a sturdy foundation and maximum size holding bolts should be used to secure the unit in place.
2. Extreme care should be taken to insure that all connections to both the input and output shafts are properly aligned and tight. There should not be any loose keys, set screws, couplings, etc.

Whenever possible taperlock types of connections or bolted flanges should be used to insure tight connections.

3. The connection between the input shaft and the input drive should be tight.
  - a. Loose V-belts, chains or backlash in gears will cause rotational pulsations of the camshaft (input shaft).
  - b. Constant speed of the input shaft is necessary to produce the true generated motion in the index cam.
  - c. A flywheel on the input shaft to store up kinetic energy or shaft mounted gear reducer with minimum backlash will insure a constant speed of the camshaft.
4. Overload protection should be provided at the output.

### IV. MAINTENANCE:

1. When operated at rated speeds, IMC Index Drives require very limited maintenance. The oil level in the housing should be checked periodically to insure that it is at proper level. Under normal operating conditions the oil should be changed once a year.

**CAUTION:** An oil change is required every 2000 hours of operation, or every six months which ever occurs first.

Where operating conditions are severe, such as rapid rise and fall in temperature of the indexer housing (which is accompanied by sweating of the inside walls with a resulting formation of sludge), where operation is in moist and dusty atmosphere and contaminations can be drawn in through the breather plug, or in the presence of chemical fumes, it may be necessary to change the oil in intervals of one to three months.

**NOTE:** The magnetic drain plug should be visually inspected at the time for metallic chips that might indicate failure of one of the internal components.

2. Cam Followers should be checked every 8000 hours for excessive radial looseness. If radial play exceeds 0.0005" at a 6" radius, the cam followers should be replaced.

## V. ADDITIONAL HINTS:

1. Cam followers with radial looseness indicate wear and should be replaced immediately. Axial play of the follower outer shell on the stud is normal.
2. Cracked or broken cam followers indicate overloading – replace followers and check for malfunction of overload protection. When installing new followers, care should be taken to push only on the center of the stud head and not on the flange of the stud. The stud should be lubricated and carefully aligned when it is pressed into the hole.
3. Backlash at any station indicates worn or damaged cam followers.
4. Any binding on rotation of the input shaft is an indication of broken cam followers.
5. Contact your nearest IMC representative for assistance if necessary

## VI. TROUBLESHOOTING GUIDE:

IMC recommends that only technicians experienced in index drives maintenance make repairs. A full year warranty is given on any unit rebuilt by IMC.

If the customer must rebuild the unit themselves, they should refer to the individual service manual that applies to their model index drive. They should follow step-by-step procedures for disassembly and assembly as described in these manuals. Cautions and warnings should also be followed.

NOTE: IMC will not warrant any unit rebuilt by the customer.

### **SYMPTOM: INDEXER APPEARS INACCURATE**

1. Check if unit stops in dwell. See the assembly drawing for your unit for keyway position in dwell. Also refer to the cycle cam and limit switch function in the General Service Manual.
2. Is the output shaft backlash-free in dwell? Be sure to disconnect all other devices from the indexer output including an output overload clutch. All indexers must be backlash-free in dwell (see SYMPTOM: Looseness in Dwell).
3. How is the accuracy being checked? IMC uses a computer controlled checking machine to check each index against a theoretical perfect index. Contact the factory for assistance. IMC keeps inspection reports for units with special accuracy (units required to be within closer tolerances than the standard).

### **SYMPTOM: LOOSENESS IN ONE DWELL**

1. Followers are worn and need replacing.
2. Follower wheel is damaged and needs rework or replacement.

### **SYMPTOM: LOOSENESS IN EACH DWELL**

1. Camshaft is loose in bearings. Check for end play in input shaft. Adjust shims on bearing caps. See individual service manual for pre-load setting procedures.
2. Cam is loose on shaft. Usually repaired at the factory.
3. Cam is broken. (This rarely happens and is an indication of an overload application or a jam.)

4. Unit was very heavily overloaded and all bearings loosened up. Factory rework required.
5. All followers are worn. Rebuilding by factory is best remedy.
6. Output shaft to follower wheel connection is loose. Factory repair is recommended.
7. Customer output member connection loose. Tighten output member and dowel in place.

### **SYMPTOM: INDEXER IS NOISY**

1. Check to see if output is backlash-free in dwell.
2. Check for excess looseness in motion. Cam or follower could be broken.
3. Is the noise from the reducer rather than the indexer?
4. Occasionally, variable speed D.C. controls cause the input to pulsate and create noise. Adjust the Internal Resistance Compensation within control.
5. Are the input and output connections backlash free?
6. Is the unit overloaded? Loads can change over a period of time due to wear.
7. Is the unit support (base) rigid?
8. The unit could be overheated and have loose pre-load.
9. Is there sufficient oil in the unit? Is oil used consistent with IMC specifications? (See Index Drive Lubrication).

### **SYMPTOM: PREMATURE WEAR ON FOLLOWERS**

1. Actual forces on the unit could be greater than calculated due to loose input or output.
2. Lack of oil or wrong oil used (See Lubrication section of Index Drive Service).
3. Frequent or severe overloads.
4. Improper input systems (where there is not a constant velocity input) will cause an erratic output or excessive output vibration. This will result in forces several times higher than calculated (see input recommendations).
5. Defective cam or follower wheel assembly.

### **SYMPTOM: OUTPUT MOVEMENT IS ERRATIC AND VIBRATING**

1. Input does not run at a constant velocity. The prime objective of a good input connection to an Index Drive is to maintain a constant shock free velocity (see input recommendations). Motor running too slowly could also cause an erratic output.
2. Output connections loose, flexing, or winding up. Check all connections (see recommended output connections).
3. Excessive friction drag on output. Disconnect indexer and investigate friction torque.
4. Unit is overloaded due to excessive speed or loads. Contact your Sales agent to check data sheet application loads and speeds. Decrease speed.
5. Unit could be internally damaged. Check other symptoms.
6. Unit support is not rigid. Check rigidity of index drive mount with an indicator. Stiffen support or decrease speed.