



INSTRUCTION MANUAL

RIM Tach™ 8500

Digital Tachometer

Designed for use in

**1.125-inch to 2.875-inch Outer Diameter
Thru-Shaft Applications**



Lake Shore Cryotronics, Inc.
64 East Walnut St., Westerville, Ohio 43081-2399 USA
Fax: (614) 891-1392
Telephone: (614) 891-2243

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LIMITED WARRANTY

Lake Shore Cryotronics, Inc. (henceforth Lake Shore), the manufacturer, warrants this product for a period of twelve (12) months from the date of shipment. During the warranty period, under authorized return of component parts to Lake Shore freight prepaid, the company will repair, or at its option replace, any part found to be defective in material or workmanship, without charge to the Owner for parts, service labor, or associated customary shipping cost. Replacement or repaired parts will be warranted for only the unexpired portion of the original warranty.

This warranty is limited to Lake Shore products purchased and installed in the United States. This same protection will extend to any subsequent owner during the warranty period. It does not apply to damage caused by accident, misuse, fire, flood or acts of God, or from failure to properly install, operate, or maintain the product in accordance with the printed instructions provided.

THIS WARRANTY IS IN LIEU OF ANY OTHER WARRANTIES, EXPRESSED OR IMPLIED, INCLUDING MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE, WHICH ARE EXPRESSLY EXCLUDED. THE OWNER AGREES THAT LAKE SHORE'S LIABILITY WITH RESPECT TO THIS PRODUCT SHALL BE SET FORTH IN THIS WARRANTY, AND INCIDENTAL OR CONSEQUENTIAL DAMAGES ARE EXPRESSLY EXCLUDED.

WARRANTY RETURN POLICY

If you experience any technical problems with Lake Shore's products, please contact our Technical Support Department at (614) 891-2243 from 8:00 A.M. to 5:00 P.M. Eastern Standard Time (EST), Monday through Friday. Please be ready to provide your customer number, item description, serial number, invoice number, date of purchase, and the specifics of the problem.

A representative will attempt to solve your problem over the telephone by running a few diagnostics. If it is determined by our representative in conjunction with the Customer that the product requires to be returned to Lake Shore's factory for warranty repair, a Return Goods Authorization (RGA) number will be issued. For control purposes, only those items identified with an RGA number may be returned to Lake Shore. Please make sure that the RGA number is clearly marked on the shipping label. Packages missing an RGA number cannot be accepted by our Receiving Department and must be returned to the sender freight COD. Ship returned products to Lake Shore PRE-PAID and insured for its full value.

EXPRESS SERVICE IS OFFERED ON ALL WARRANTY REPAIRS WHERE A RGA NUMBER HAS BEEN ISSUED. IF THE SAME WARRANTY PART THAT IS BEING RETURNED IS IN STOCK, LAKE SHORE WILL IMMEDIATELY SHIP OUT A NEW REPLACEMENT PART, INVOICE THE REPLACEMENT PART AND ISSUE A CREDIT INVOICE WHEN THE RGA NUMBER WARRANTY PART IS RECEIVED AT LAKE SHORE AND IS CONFIRMED TO BE A WARRANTY REPAIR. LAKE SHORE WILL EXPRESS SHIP THE PRODUCT PRE-PAID, USING THE SAME METHOD BY WHICH THE WARRANTY PART WAS SHIPPED TO LAKE SHORE, (i.e., IF THE RGA WARRANTY PART WAS SHIPPED OVERNIGHT, LAKE SHORE WILL SHIP IN THE SAME MANNER).

TRADEMARK ACKNOWLEDGMENT

Many of the designations used by manufacturers and sellers to distinguish their products are claimed as trademarks. Where those designations appear in this manual and Lake Shore was aware of a trademark claim, the designations have been printed in initial capital letters and the ™ or ® symbol used.

RIM Tach™ is a trademark of Lake Shore Cryotronics, Inc.

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FOREWORD

PURPOSE AND SCOPE

This manual contains operation and limited service instructions for the Lake Shore RIM Tach™ 8500 Digital Tachometer. The RIM Tach™ 8500 was designed, assembled, and manufactured in the United States of America by Lake Shore Cryotronics, Inc.

We welcome your comments concerning this manual. Although every effort has been made to keep it free of errors, some may occur. When reporting a specific problem, please describe it briefly and include the manual part number, the paragraph/figure/table number, and the page number. Send your comments to Lake Shore Cryotronics, Inc. Attn: Technical Publications, 64 East Walnut Street, Westerville, Ohio 43081.

HARDWARE COVERED

The various RIM Tach™ 8500 configurations are detailed on the B page of this manual (following the title page). The RIM Tach™ 8500 is available in the following pulse counts: 60, 64, 75, 120, 128, 150, 240, 256, 300, 480, 512, 600, 960, 960Z (Index), 1024, 1024Z (Index), 1200, 1200Z (Index). Through shaft bore sizes available include 1.125 inches through 2.875 inches. Single and second isolated electrical outputs are available. Finally, line driver and open collector interface outputs are available.

Throughout the text, the hardware is commonly referred to as the RIM Tach™ 8500. When it is necessary to be specific, the specific parameter will be used. For example, if a heading reads "Description," the information is good for all models. If a heading reads "Bore Size (2.875 Inch Only)," the information is only good for the designated model.

HOW TO USE THIS MANUAL

User information is presented in the following chapters. Chapter 1 provides an introduction to the RIM Tach™ 8500. Chapter 2 provides mechanical and electrical installation instructions. Finally, limited service information and a renewal parts list is provided in Chapter 3. The Table of Contents at the front of the manual lists all paragraph headings and their associated page number. Also included is a complete List of Illustrations and Tables.

GENERAL INSTALLATION PRECAUTIONS

The following are general safety precautions that are not related to any specific procedure and therefore do not appear elsewhere in this publication. These are recommended precautions that personnel should understand and apply during the installation phase.

Keep away from live circuits. Installation personnel shall observe all safety regulations at all times. Turn off system power before making or breaking electrical connections. Regard any exposed connector, terminal board, or circuit board as a possible shock hazard. Components which retain a charge shall be discharged only when such grounding does not result in equipment damage. If a test connection to energized equipment is required, make the test equipment ground connection before probing the voltage or signal to be tested.

Do not install or service equipment alone. Personnel shall not under any circumstances reach into or enter any enclosure for the purpose of servicing or adjusting the equipment without immediate presence or assistance of another person capable of rendering aid.

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CHAPTER 1

INTRODUCTION

1.0 GENERAL

This chapter provides an introduction to the Lake Shore RIM Tach™ 8500 Digital Tachometer designed for Thru-Shaft Applications. RIM stands for Rugged, Interchangeable, and Magnetic. A description of the RIM Tach™ 8500 is provided in Paragraph 1.1. Specifications are provided in Paragraph 1.2.

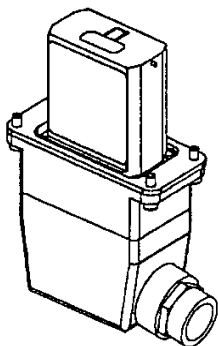
These instructions do not claim to cover all details of variation in equipment or to provide for every possible contingency or hazard to be met in connection with installation, operation, and service. Should further information be desired or should particular problems arise which are not covered sufficiently for the purchaser's purposes, please contact Lake Shore Cryotronics, Inc., or one of its designated representatives.

1.1 DESCRIPTION

The RIM Tach™ 8500 is a high performance and reliable Digital Tachometer, designed to provide position and velocity feedback from both AC and DC electric motors with pulse counts ranging from 60 through 1200 pulses per revolution. Designed for NEMA 180 through 500 diameter AC or DC motor frames, the RIM Tach™ 8500 utilizes rugged ductile iron casting construction, provides interchangeable sensor modules, and a magneto-resistive technology capable of withstanding the harshest industrial environments. This to ensure you get precise and consistent digital motor speed feedback.

The Lake Shore RIM Tach™ 8500 is mounted directly to the motor frame and utilizes a patent pending, heavy-duty, one piece, magneto-resistive sensor module with encapsulated surface mount electronics. The encapsulation provides resistance to water, oil mist, dirt, high temperatures, and other harsh environments. The sensor module includes a 10-pin quick connector requiring only a screwdriver for final electrical installation. The non-contact magneto-resistive sensor and rugged magnetized pulse wheel are designed and machined to function properly without any adjustments when assembled to Type C Face (8.5-inch diameter) motor frames and accessory mounts. There are no bearings to fail or requirements for flexible couplings since the magnetized pulse wheel assembly is attached directly to the shaft.

The RIM Tach™ 8500 provides precise, reliable speed signals for many monitoring and control applications, and is a standard feedback device for AC and DC variable speed drives. The unit is bidirectional providing square wave outputs. The RIM Tach™ 8500 components meet the following performance requirements.



Sensor Module. The sensor module has been engineered to provide a non-contact sensor and electronics in one interchangeable hermetically sealed package. Each module generates A and B signals in quadrature and each of their complements (marker pulse optionally available). This rugged, highly reliable module provides transient and noise suppression, reverse polarity protection and can utilize DC power from +5 to +15 Volts.

SAFETY SUMMARY

High current, voltage, and rotating parts can cause serious or fatal injury. The use of electric machinery, like all other uses of concentrated power and rotating equipment, may be hazardous. Installation, operation, and maintenance of electric machinery should be performed by qualified personnel, in accordance with applicable provisions of the National Electrical Code and sound local practices. Failure to comply with these precautions or with specific warnings elsewhere in this manual violates safety standards of design, manufacture, and intended use of the instrument. Lake Shore Cryotronics, Inc. assumes no liability for the customer's failure to comply with these requirements.

Rotating Machinery

Avoid contact with rotating parts. Avoid by-passing or rendering inoperative any safety guards or protection devices. Avoid extended exposure in close proximity to machinery with high noise levels. Use proper care and procedures in handling, lifting, installing, operating and maintaining the equipment.

Before Installation

Safe maintenance practices with qualified personnel is imperative. Before starting maintenance procedures, be positive that, (1) equipment connected to the shaft will not cause mechanical rotation, (2) main machine windings have been disconnected and secured from all electrical power sources, and (3) all accessory devices associates with the work area have been de-energized. If high potential insulation test is required, procedures and precautions outlined in NEMA standards MG-1 should be followed.

Grounding

Failure to properly ground the frame of the machine can cause serious or fatal injury to personnel. Grounding of the machine frame and stricture should be in accordance with the National Electrical Code and consistent with sound local practices. Check wiring diagram before connecting power.

Do Not Operate in An Explosive Atmosphere

Do not operate the instrument in the presence of flammable gases or fumes. Operation of any electrical instrument in such an environment constitutes a definite safety hazard.

Keep Away From Live Circuits

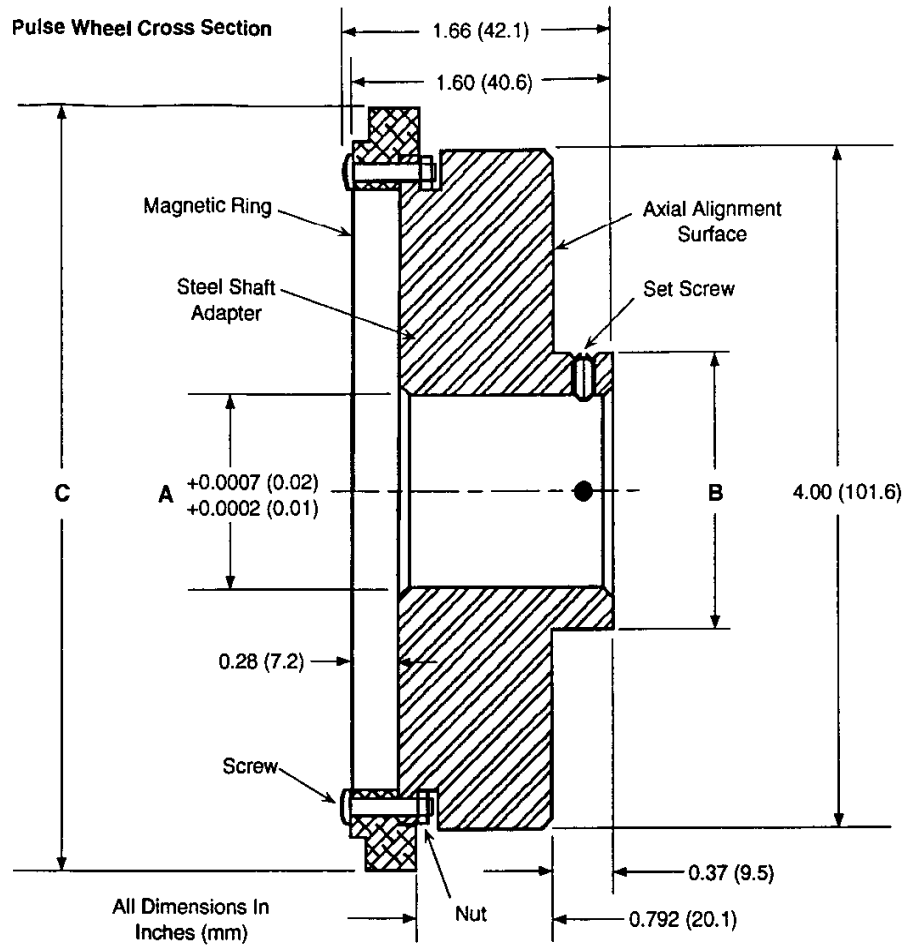
Operating personnel must not remove instrument covers. Component replacement and internal adjustments must be made by qualified maintenance personnel. Do not replace components with power cable connected. To avoid injuries, always disconnect power and discharge circuits before touching them.

Do Not Substitute Parts Or Modify Instrument

Because of the danger of introducing additional hazards, do not install substitute parts or perform any unauthorized modification to the instrument. Return the instrument to an authorized Lake Shore Cryotronics, Inc. representative for service and repair to ensure that safety features are maintained.

Dangerous Procedure Warnings

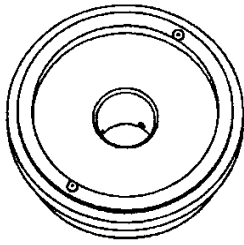
A WARNING heading precedes potentially dangerous procedures throughout this manual. Instructions in the warnings *must* be followed.



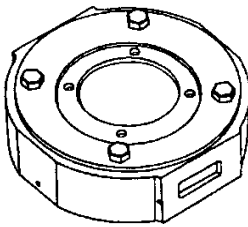
Option No.	A	B	C		
			480 PPR	512 PPR	600 PPR
T01	1.125" (28.58)	1.625" (41.28)			
T02	1.375" (34.93)	1.875" (47.63)			
T03	1.625" (41.28)	2.125" (53.98)			
T04	1.875" (47.63)	2.375" (60.33)			
T05	2.000" (50.80)	2.500" (63.50)	4.49" (114.1)	4.80" (121.8)	5.62" (142.8)
T06	2.125" (53.98)	2.625" (66.68)			
T07	2.250" (57.15)	2.750" (69.85)			
T08	2.375" (60.33)	2.875" (73.03)			
T09	2.500" (63.50)	3.000" (76.20)			
T10	2.875" (73.03)	3.375" (85.73)			

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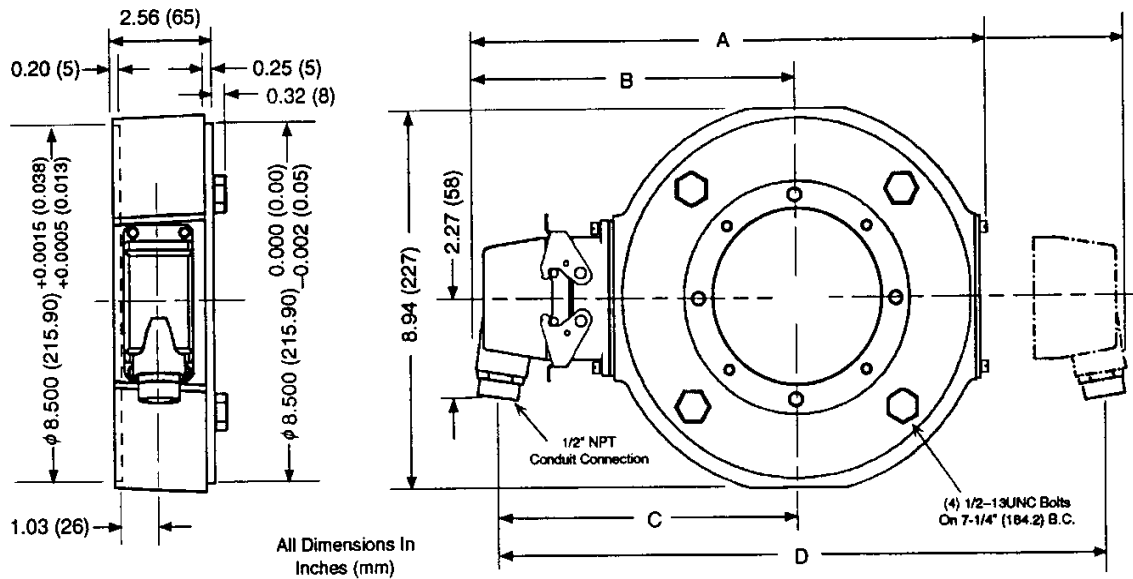
Figure 1-2. RIM Tach™ 8500 Thru-Shaft Pulse Wheel Physical Dimensions



Pulse Wheel Assembly. The magnetized pulse wheel assembly is manufactured using a rugged material capable of withstanding hot, wet, and dirty environments. The heavy-duty magnetic ring is imprinted with alternating north and south poles providing higher pulse counts than the traditional and more expensive gear toothed wheels. These higher resolutions give greater accuracy and more precise speed control in your application.



Rugged Enclosure. The enclosure is constructed of ductile iron casting. This ensures maximum strength and endurance for possible exposure to acid wash down in pulp and paper applications. Drain holes have been provided for maximum drainage flexibility in different mounting positions. The enclosure has been universally machined to accommodate all sensor modules, regardless of the pulse count desired.



PULSES/REV. COUNT	SINGLE CHANNEL				DUAL CHANNEL			
	A	B	C	D	A	B	C	D
960, 480, 240, 120, 60	12.22 (310)	7.64 (194)	7.11 (181)	—	15.28 (388)	7.64 (194)	7.11 (181)	14.21 (361)
1024, 512, 256, 128, 64	12.37 (314)	7.79 (198)	7.26 (184)	—	15.58 (396)	7.79 (198)	7.26 (184)	14.51 (367)
1200, 600, 300, 150, 75	12.78 (325)	8.21 (208)	7.67 (195)	—	16.41 (417)	8.21 (208)	7.67 (195)	15.34 (390)

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Figure 1-1. RIM Tach™ 8500 Thru-Shaft Enclosure/Sensor Physical Dimensions

CHAPTER 2

INSTALLATION

2.0 GENERAL

This chapter contains information and instructions pertaining to installation of the Thru-Shaft RIM Tach™ 8500 Digital Tachometer. Included are inspection and unpacking guidelines in Paragraph 2.1. Mechanical installation procedures are introduced in Paragraph 2.2. The motor facing and shaft procedures is detailed in Paragraph 2.3. Pulse wheel installation is detailed in Paragraph 2.4. Enclosure installation is detailed in Paragraph 2.5. Pulse wheel axial position is detailed in Paragraph 2.6. An optional alternate method for pulse wheel axial position check is provided in Paragraph 2.7. Sensor module installation is detailed in Paragraph 2.8. Quick release connector installation is detailed in Paragraph 2.9. Painting considerations are provided in Paragraph 2.10. General electrical installation procedures are provided in Paragraph 2.11. Finally, instructions for returning equipment to Lake Shore are provided in Paragraph 2.12.

2.1 INSPECTION AND UNPACKING

Inspect shipping container for external damage. All claims for damage (apparent or concealed) or partial loss of shipment must be made in writing to Lake Shore within five (5) days from receipt of goods. If damage or loss is apparent, please notify the shipping agent immediately.

Open shipping container and locate the packing list. The packing list is included to simplify checking that all components, accessories, and manual were received. Please use the packing list to check off each item as the unit is unpacked. Inspect for damage. Lake Shore recommends that the shipping container be retained for future shipping, storage, or return to factory purposes.

If there is damage to any equipment in transit, be sure to file proper claims promptly with the carrier and insurance company. Please advise Lake Shore Cryotronics of such filings. In case of parts shortages, advise Lake Shore immediately. Lake Shore cannot be responsible for any missing parts unless notified within 60 days of shipment. The standard Lake Shore Cryotronics, Inc. Warranty is included on the A Page (immediately behind the title page) of this manual.

2.2 MECHANICAL INSTALLATION

To save time in installation, the RIM Tach™ 8500 has been designed as a thin-line package. The RIM Tach™ 8500 utilizes a modular construction which permits the user to configure the unit as a one or two output tachometer. Sensor modules are universal and interchangeable. If one output requires replacement, simply remove four screws, and replace with a new sensor module. No electrical adjustment or alignment is required. Also, you never have to remove the RIM Tach™ 8500 enclosure from the motor. Other devices such as brakes or gear reducers mounted from the RIM Tach™ do not have to be removed. After unpacking the unit and verifying receipt of the items listed on the packing list, you may proceed with mechanical installation.

1.2 SPECIFICATIONS

The RIM Tach™ 8500 specifications are listed as follows:

Electrical Specifications:

Resolution:	60, 64, 75, 120, 128, 150, 240, 256, 300, 480, 512, 600, 960, 960Z, 1024, 1024Z, 1200, 1200Z PPR
Frequency Response:	Minimum 120 kHz
Pulse Code:	Incremental, marker
Output Phases:	A phase, B phase: 90° phase gap; Z phase: Once per rev (1024 PPR and greater only)
Pulse Duty Cycle:	50 ± 15% (within defined mechanical specifications)
Quadrature Accuracy:	90° ±22°
Output Type:	High Speed, Differential Driver, Peak Currents of 3A
Rise and Fall Time:	Less than 350 ns @10,000 pf (typical)
Current Consumption:	45 mA typical plus line driver load
ESD Protection:	2 kV

Mechanical Specifications:

Nominal Pulse Wheel Diameter:	4.49, 4.79, and 5.61 inches
Maximum Operational Speed:	7,000 RPM (120 kHz)
Nominal Air Gap:	0.016 ±0.008 inch
Shaft Axial End Play:	Up to ±0.050 inch
Enclosure Configuration:	8.5-Inch Diameter 180 TC Motor Face or accessory flange to meet NEMA MG1-4 standards
Enclosure Material:	Ductile Iron Casting

Environmental Specifications:

Operational Temperature:	-40° to +80° C
Operational Humidity Range:	Minimum of 90%
Chemical Resistance:	Salt Spray, Most Solvents, Mild Acids and Bases
Vibration:	Minimum 18 g's RMS, 5-2000 Hz
Shock (Sensor Module):	1 meter drop tested, min 30 g's Shock Spectrum

Interface Specifications:

Power:	+5.0 to +15.0 VDC
Output:	Differential output swinging between Vcc - 0.6 V and Ground
Connector:	EPIC or T&B 10 pin, H-BE Type, double latching hood, 1/2 inch NPT fitting
Cable:	22 - 14 AWG, 6 conductor (8 conductor for Index Modules)

Specifications subject to change without notice.

2.4 PULSE WHEEL ASSEMBLY

To prepare the pulse wheel assembly for installation, perform the following steps. See Figure 2-2.

CAUTION

Caution must be used when handling the pulse wheel assembly. The surface of the pulse wheel outer rim is sensitive to scratches and impacts. The magnetic properties of the pulse wheel material can also be distorted or erased by exposure to strong magnetic fields.

1. Remove pulse wheel assembly from packaging.
2. Leave protective red rubber band in place over pulse wheel.
3. Place assembly over the end of the shaft. The wheel side with the two set screws should be toward the outside, away from motor.

CAUTION

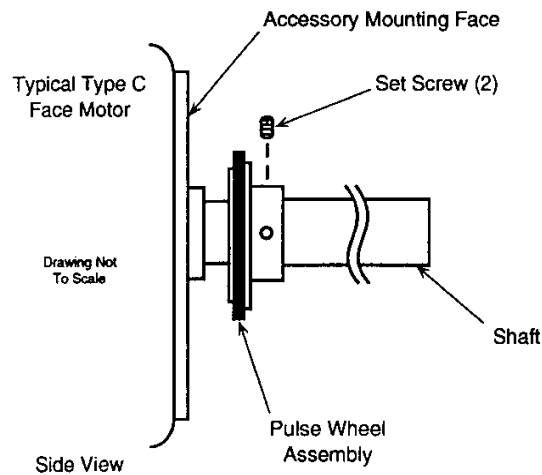
Be sure the set screws in the adapter are retracted so that they will not interfere with the shaft while mounting the unit.

4. Slide assembly on the shaft until there is about a 1 inch gap left between inner face of pulse wheel and motor facing. It may be necessary to lightly tap the assembly to get it all the way on. The 1 inch gap is not a critical measurement.

CAUTION

Tap on the steel hub; not on the silver-colored aluminum magnetic wheel.

5. If you have already drilled set screw locating holes, align unit to holes and tighten set screws to a nominal 15 inch-pounds. If you will not be using set screw locating holes or wish to use alternate method of adding them, just leave assembly in place and continue to Paragraph 2.5.



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Figure 2-2. Pulse Wheel Assembly

2.3 MOTOR FACING AND SHAFT

To prepare the motor facing and shaft for installation, perform the following steps. See Figure 2-1.

1. Clean outer rim and surface of motor facing and shaft of paint, grease, dirt and other debris where RIM Tach™ 8500 unit contacts motor or accessory. Also ensure that mating surfaces have not been damaged and that unit will fit squarely on motor.

CAUTION

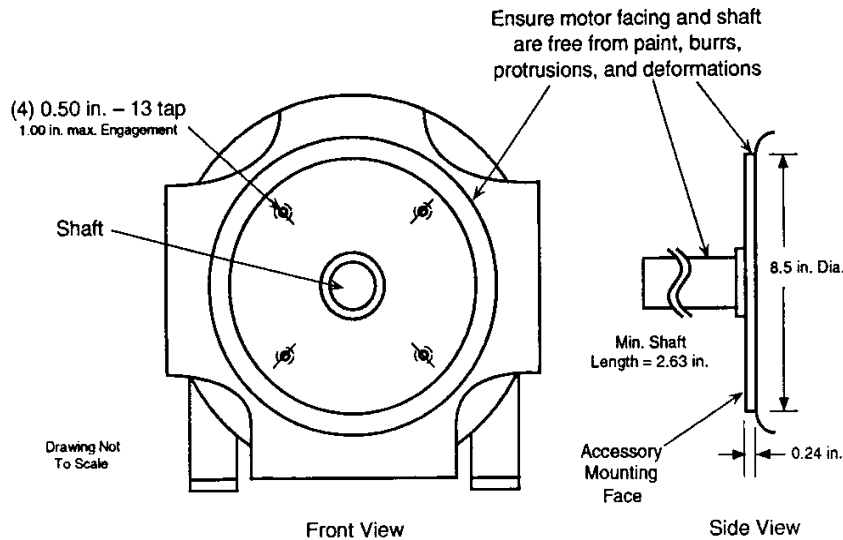
Ensure there is no paint, burrs, protrusions, or deformations on the motor facing or shaft. If the enclosure does not fit squarely on the motor facing, the alignment between the sensor module and the magnetic pulse wheel may be degraded.

2. Apply a thin layer of corrosion preventative or oil to motor facing and shaft to aid assembly and provide some corrosion protection.

NOTE

Good attachment of the pulse wheel is essential during rapid acceleration or de-acceleration of the shaft. The installer may elect to drill the set screw holes before installing the enclosure. Alternatively, the installer may elect to install the enclosure, measure, then remove the enclosure before drilling. Continue with Steps 3 thru 5 if electing to predrill set screw holes. If not, proceed to Paragraph 2.4 and continue with the installation procedure. Drilling instructions will be provided again in Paragraph 2.6.

3. The pulse wheel assembly uses two set screws to hold the unit in place. These holes are at 90 degrees to each other and located 2.316 ± 0.005 inches from the motor facing.
4. Locate these holes by use of appropriate measuring equipment.
5. Use standard 17/64 inch bit to drill a hole that is 0.09 to 0.11 inches deep from the tangent point of the shaft (point of first contact of the drill to the shaft) to the bottom of the hole. Do this for both holes.



C-85T-IM-2-1

Figure 2-1. Typical 8.5 Inch Diameter Type C Face Motor

2.6 PULSE WHEEL ASSEMBLY AXIAL POSITION ADJUSTMENT

If the pulse wheel is not lined up and no pre-drilled holes are required, use the following procedure to adjust the position of the Pulse Wheel Assembly. See Figure 2-4.

1. Slide pulse wheel assembly until the alignment surface of the unit is even with recess in face of enclosure. See Figure 1-2 for a detailed drawing of the pulse wheel assembly.
2. Use a straight edge to check it.
3. Loosen two set screws and slide pulse wheel along the shaft until the recess and wheel surfaces are aligned to within ± 0.010 inch.
4. Tighten two set screws to a nominal 15 inch-pounds.

If the pulse wheel is not lined up and pre-drilled holes are desired, use the following optional procedure to locate (or relocate) set screw holes in the shaft.

NOTE

If pre-drilled screw holes turn out to be incorrectly placed, new screw holes must be drilled. New holes may be drilled plus or minus the error distance from the old holes.

1. Leaving one of set screws tightened, remove other set screw and use a punch to mark position of set screw hole on shaft.
2. Replace and tighten set screw. Remove other set screw and use a punch to mark position of that set screw hole on shaft.
3. Remove enclosure and pulse wheel.
4. Use standard 17/64 inch drill to drill a hole that is 0.09 to 0.11 inches deep from tangent point of shaft (point of first contact of drill to shaft) to bottom of hole. Do this for both holes.
5. Re-assemble pulse wheel and tighten set screws to a nominal 15 inch-pounds.
6. Reassemble enclosure onto motor facing.
7. Insert four enclosure mounting bolts and tighten to 60 foot-pounds.

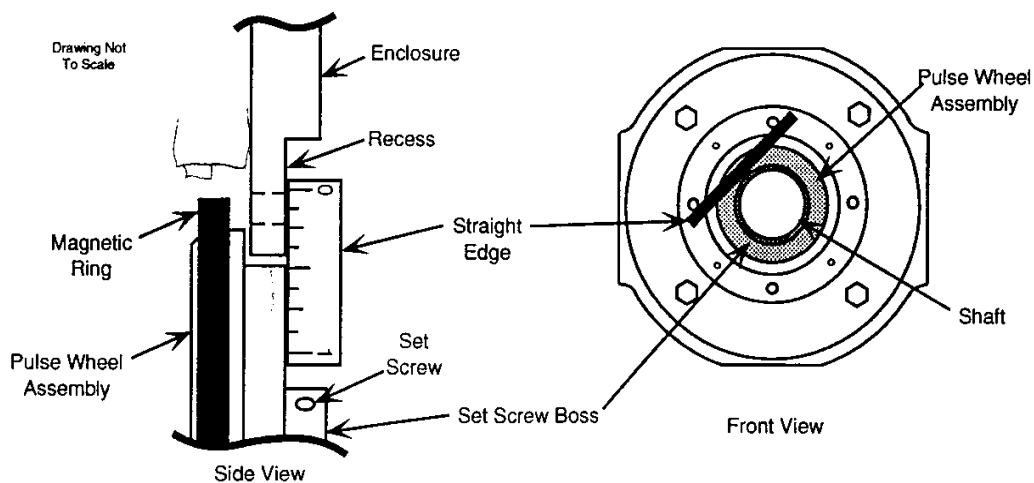


Figure 2-4. Pulse Wheel Alignment Check Using Straight Edge

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2.5 ENCLOSURE INSTALLATION

To prepare the enclosure for installation, perform the following steps. See Figure 2-3.

CAUTION

Do not attempt to mount or dismount the enclosure with sensor probe module(s) installed. Remove all sensor modules until enclosure mounting is complete.

1. Remove red rubber band from pulse wheel. If test fitting enclosure, leave rubber band in place until final enclosure mounting.
2. Insert 2 or 4 1/2-13 threaded rods (not supplied) approximately 5 inches long into the motor face. The rods support the weight of the enclosure during installation, permit better alignment to the motor, and prevent the Pulse Wheel from being damaged.
3. Remove enclosure from packaging.
4. Determine which of two orientations of enclosure is best for this application (Sensor Modules horizontal or vertical).

CAUTION

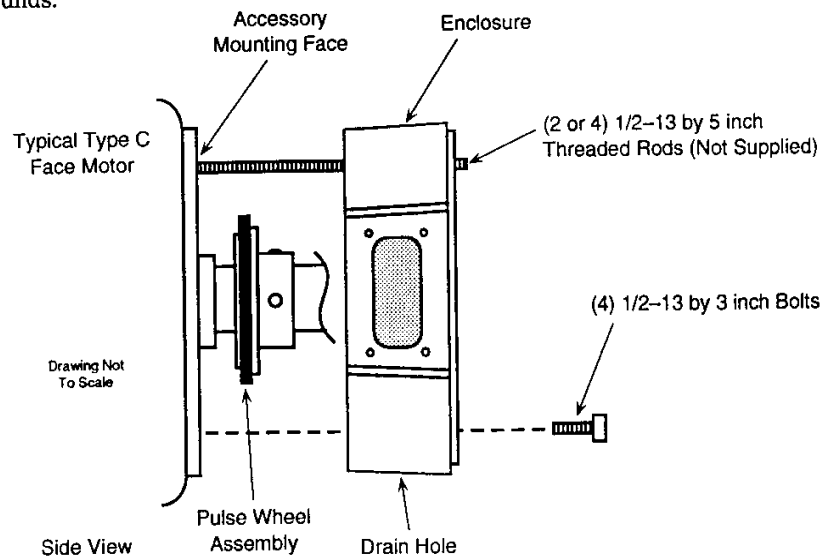
Ensure that one of two drain holes is at bottom of the enclosure. If not, rotate the unit 180 degrees.

5. Place enclosure on rods and slide on to motor facing.

CAUTION

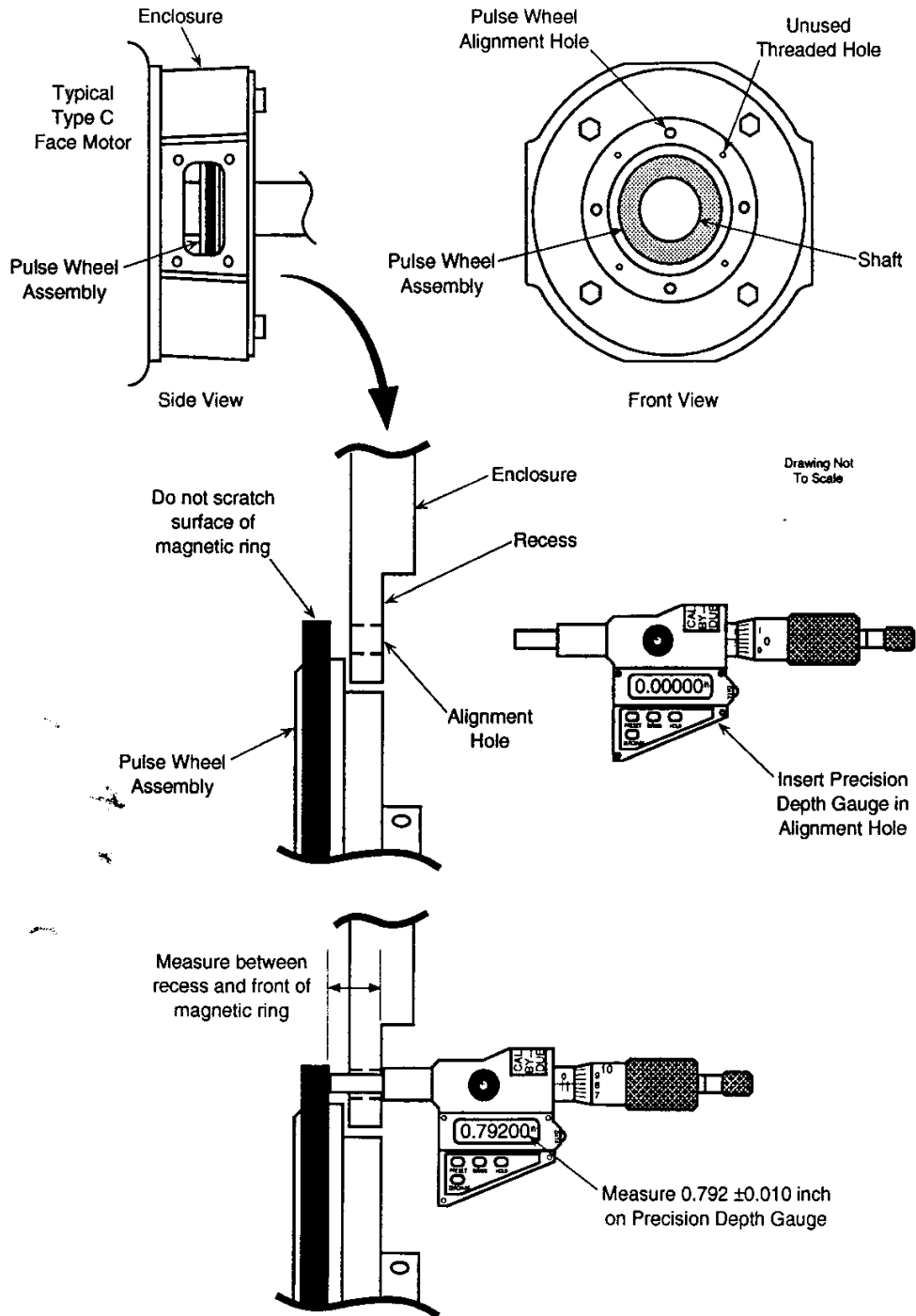
Ensure not to damage the pulse wheel when mounting the enclosure. If the pulse wheel assembly is not far enough down the shaft, continue pushing it on with the enclosure until the enclosure seats.

6. Tap lightly with hand or hammer if needed to start enclosure to slide over motor facing. Make sure clearance holes remain lined up.
7. Remove threaded rods and insert four 1/2-13 x 3 inch mounting bolts. If enclosure has not already seated against motor facing, do so by tightening a first bolt and then bolt on opposite side. Continue alternating and tightening until enclosure is seated. Then tighten all bolts to 60 foot-pounds.



C-85T-IM-2-3

Figure 2-3. Enclosure Installation



C-85T-IM-2-5

Figure 2-5. Optional Pulse Wheel Alignment Check With Depth Gauge

2.7 OPTIONAL PULSE WHEEL ALIGNMENT CHECK

An optional and more accurate pulse wheel alignment check procedure is provided as follows. See Figure 2-5.

1. Locate four 5/16-inch diameter access holes on recessed area in face of enclosure. Access holes are located on a 4.63 diameter Bolt Center (BC).
2. Using a calibrated depth measuring tool (depth gauge, vernier caliper, etc.), measure through access hole to obtain distance between recessed surface on enclosure and aluminum magnetic ring underneath.

CAUTION

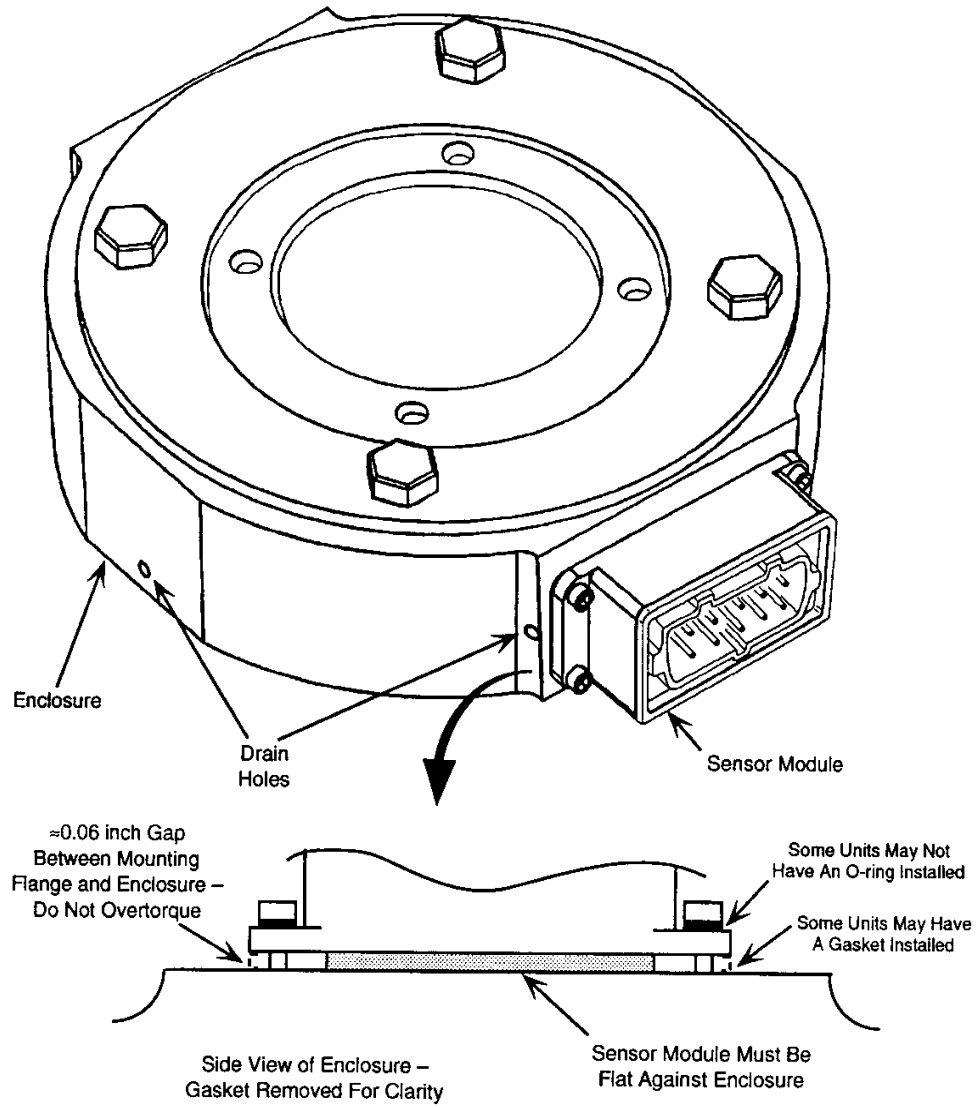
Ensure the gage is measuring the distance to the flat surface of the aluminum magnetic ring and has not engaged the edge of the steel hub or slipped past the edge of the pulse wheel.

3. Repeat for all four access holes. Take an average of all four readings.

CAUTION

The range (difference between high and low measurements) of readings should be less than 0.005 inch. If the range of the readings is greater than this, it means the pulse wheel is not perpendicular to the shaft and will appear to wobble during shaft rotation. Tap the edge of the pulse wheel to bring it back in line.

4. The distance between surface of recess in face of enclosure and silver aluminum magnetic ring should be 0.792 ± 0.010 inch. If the measurement does not correspond this depth, then the position of the pulse wheel assembly must be adjusted. Refer to Paragraph 2.6 for information on adjusting axial position of pulse wheel assembly.



C-85E-IM-2-10

Figure 2-6. Sensor Module Installation (Continued)

2.8 SENSOR MODULE INSTALLATION

To install the Sensor Module, perform the following steps. See Figure 2-6.

1. Remove sensor module and mating connector from packaging.

CAUTION

The device is protected from Electrostatic Discharges up to 2000 Volts. Standard ESD precautions should be followed.

2. Separate mating connector from sensor module by releasing two latches.

CAUTION

Use caution when handling the sensor module. The sensor at the end of the module can be easily damaged by sharp objects. The sensor module can be damaged by sudden shocks (dropping, hammer blows, etc.).

3. Insert sensor module into opening in enclosure. The sensor assembly is keyed to ensure proper orientation (blue side goes toward motor facing).
4. Locate four shoulder screws. Some units have o-rings attached to screws. If present, leave o-rings pressing against head of screw.
5. Insert shoulder screws through clearance holes in sensor module and into tapped holes in enclosure. Tighten to a nominal 5 inch-pounds.

CAUTION

Ensure the sensor module lip sits flat against the enclosure. This is done by inspecting the interface between the sensor module. There should be no gap between the lip on the aluminum housing and the enclosure. There will be a gap between the connector housing and the enclosure. Please note that some units may have a gasket installed that will prevent viewing of this area.

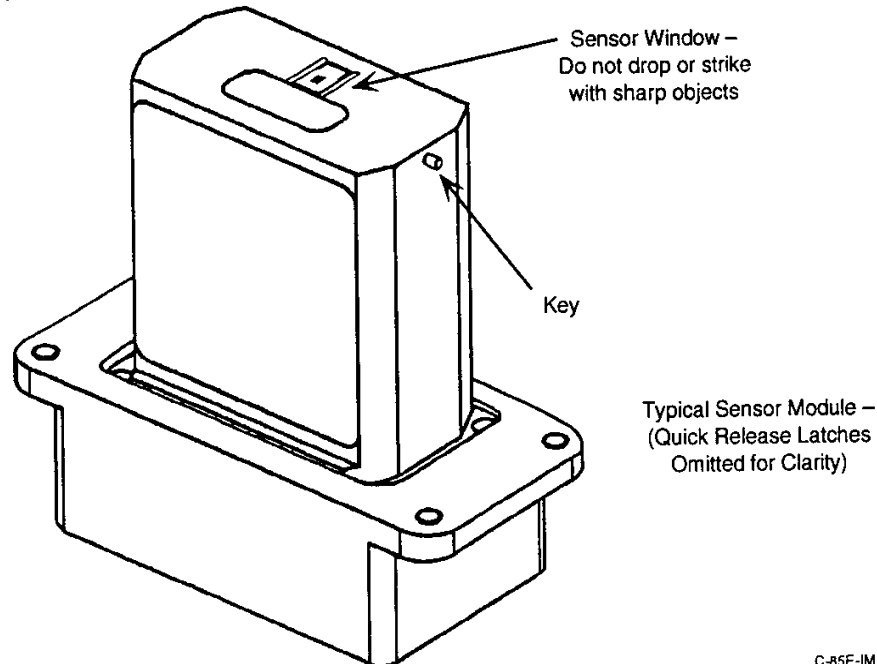
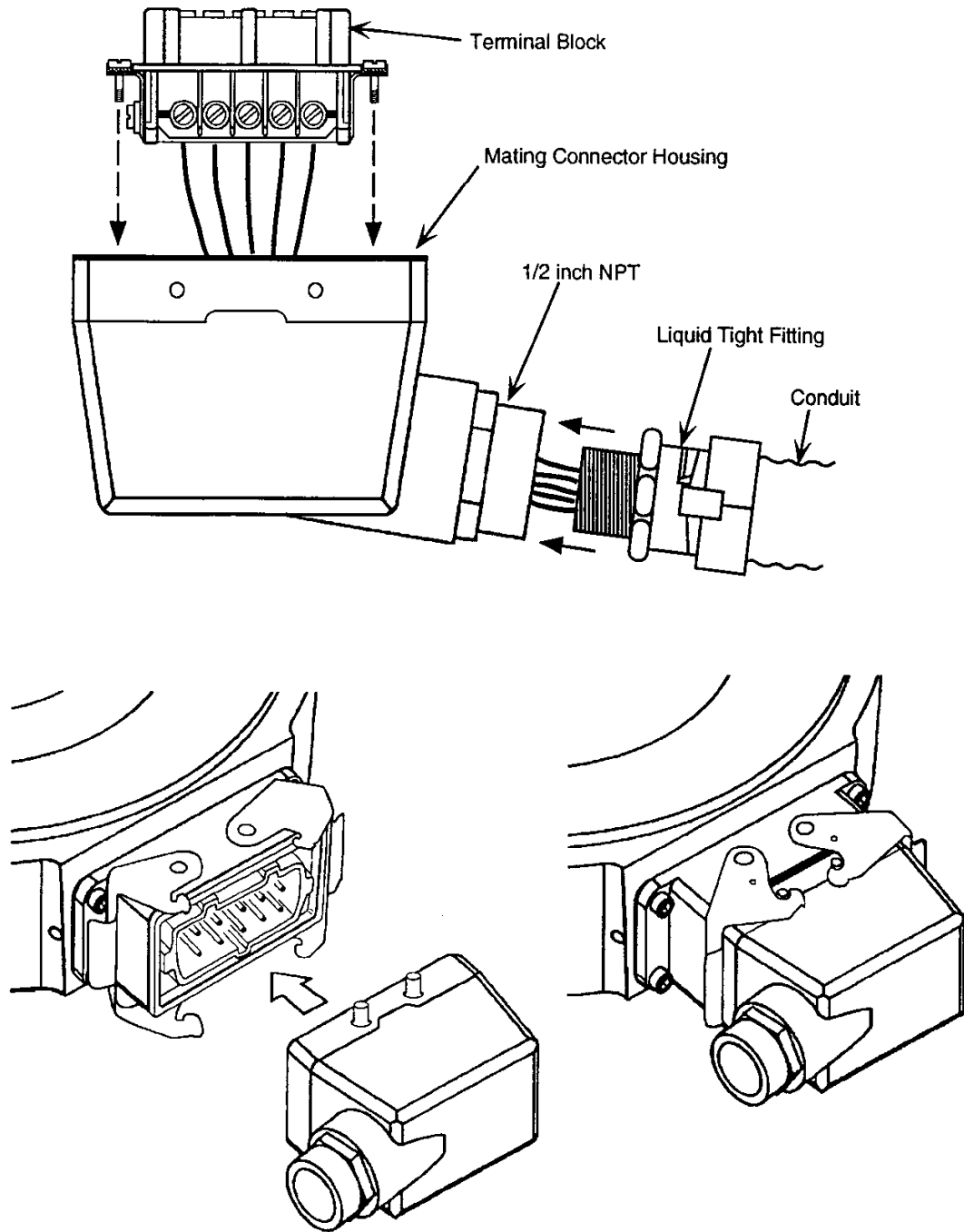


Figure 2-6. Sensor Module Installation

C-85E-IM-2-6



C-85E-IM-2-9

Figure 2-7. Quick Release Connector Installation

2.9 QUICK RELEASE CONNECTOR INSTALLATION

To install the Quick Release Connector, perform the following steps. See Figure 2-7.

1. Remove four screws that hold terminal block in place from mating connector housing. Remove terminal block from housing.
2. Insert wiring through liquid tight flexible seal and mating connector housing. Leave enough wire exposed to comfortably reach the terminal block.
3. Wire to terminal block according to wire code in Table 2-1. A similar wiring list is attached to enclosure.

Table 2-1. Signal Coding Table

Connector Pin	Signal
1	Common
2	B
3	A
4	Z*
5	No Connection
6	V _{cc} (5-15 VDC)
7	<u>B</u>
8	<u>A</u>
9	<u>Z*</u>
10	No Connection

* Applies only to units with index pulse capability.

4. Replace terminal block in connector housing. Insert and tighten four mounting screws.

NOTE

There are two orientations of the connector hood. The terminal block can be inserted either way so the connector housing points up or down. Choose the direction best for your application.

5. Tighten Liquid Tight fitting on housing.
6. **OPTIONAL:** In some hostile environments, seal between connector body and Sensor Module can be improved by smearing a sealant (silicone grease, etc.) on rubber seals of connector.
7. Mate connector into place on sensor mount and snap two latches into place.
8. If only one sensor is being installed, ensure cover plate is installed over other sensor hole.

CHAPTER 3

SERVICE

3.0 GENERAL

This chapter provides service information for RIM Tach™ 8500 Digital Tachometer designed for Through Shaft Applications. Paragraph 3.1 provides general service information. Paragraph 3.2 provides a list of spare and replacement parts.

3.1 GENERAL SERVICE INSTRUCTIONS

In order to maintain the RIM Tach™ 8500 in good working order, periodically apply a corrosion preventative coating to exposed machine surfaces. The time interval for applying this coating is best determined by individual shop practices. To eliminate friction, the enclosure should periodically be cleaned. The presence of magnetic particles within the enclosure may cause interference in the operation of the unit.

If you experience any technical problems with Lake Shore's products, please contact our Technical Support Department at (614) 891-2243 from 8:00 A.M. to 5:00 P.M. Eastern Standard Time (EST), Monday through Friday. Please be ready to provide your customer number, item description, serial number, invoice number, date of purchase, and the specifics of the problem.

A representative will attempt to solve your problem over the telephone by running a few diagnostics. If it is determined by our representative in conjunction with the Customer that the product requires to be returned to Lake Shore's factory for warranty repair, a Return Goods Authorization (RGA) number will be issued. For control purposes, only those items identified with an RGA number may be returned to Lake Shore. Please make sure that the RGA number is clearly marked on the shipping label. Packages missing an RGA number cannot be accepted by our Receiving Department and must be returned to the sender freight COD. Ship returned products to Lake Shore PRE-PAID and insured for its full value.

Express service is offered on all warranty repairs where a RGA number has been issued. If the same warranty part that is being returned is in stock, Lake Shore will immediately ship out a new replacement part, invoice the replacement part and issue a credit invoice when the RGA number warranty part is received at Lake Shore and is confirmed to be a warranty repair. Lake Shore will express ship the product pre-paid, using the same method by which the warranty part was shipped to Lake Shore, (i.e., if the RGA warranty part was shipped overnight, Lake Shore will ship in the same manner).

2.10 PAINTING CONSIDERATIONS

The enclosure may be painted. Please pay attention to the following considerations.

NOTE

Corrosion preventative grease has been applied to the enclosure. Standard degreasing practices must be followed before applying paint.

- Be careful to not hinder the latches on the connector if the connector is painted.
- If the enclosure is painted before the sensor module(s) is added, be sure to mask off the area where the sensor module(s) will be placed. The module must mate directly to the enclosure with nothing between. Failure to do this will degrade the alignment of the system and may cause it to fail.

2.11 ELECTRICAL INSTALLATION

Electrical connections are made to the sensor module through a standard 1/2 inch NPT liquid tight flexible conduit. The nipple length may be changed to extend the outlet box if desired.

Interconnection cable recommendations are as follows: stranded copper, 22 through 16 gage, braided or foil with drain wire shielding 0.05 μ F maximum total mutual or direct capacitance, outer sheath insulated. Shrink tubing may be placed over any wires bare of insulation. For lengths over 100 feet, use 18 gage or larger, to a maximum of 1000 feet. If shielded twisted pair wire is used, do not cross channels. Keep each pair of complementary channel outputs together in a single twisted pair.

CAUTION

Reversing power and common will not damage the unit. However, application of power to any of the sensor outputs may cause damage.

The sensor module requires 5 to 15 VDC on pin 6 and common on pin 1. Other electrical connections are as listed in Table 2-1.

2.12 RETURNING EQUIPMENT TO LAKE SHORE

If it is necessary to return the unit for repair or replacement, a Return Goods Authorization (RGA) number must be obtained from a factory representative before returning the equipment to our service department. When returning an instrument for service, the following information must be provided before Lake Shore can attempt any repair.

1. Instrument model and serial number
2. User's name, company, address, and phone number
3. Malfunction symptoms
4. Description of system
5. Returned Goods Authorization number

Consult the factory for shipping instructions.

3.2 SPARE AND REPLACEMENT PARTS LIST

The RIM Tach™ 8500 is designed for mounting to any 8.5 inch diameter type C face motor or accessory flange. Pulse wheel mounting and sensor module options must be specified. Use the table below to construct the appropriate model number.

Model Number:
RIM 8.5 [A] [B] [C] [D]

Interface Output Type:		D
Line Driver		LD
Open Collector		OC
Number of Outputs:		C
Single Output		1
Second Isolated Output		2
Shaft Mount Options:		B
Bore Size *	Motor Type	Option No.
1.125 in.	182TC, 184TC, 213C, 215C, 254C	T01
1.375 in.	213TC, 215TC, 254UC, 256UC	T02
1.625 in.	254TC, 256YC	T03
1.875 in.	254TC, 256YC	T04
2.00 in.	254TC, 256YC	T05
2.125 in.	360	T06
2.25 in.	360	T07
2.375 in.	400	T08
2.5 in.	400	T09
2.875 in.	500	T10
	Non-Std. Shaft Sizes	TXX
Pulse Count:		A
60, 64, 75, 120, 128, 150, 240, 256, 300, 480, 512, 600, 960, 960Z (Index), 1024, 1024Z (Index), 1200, 1200Z (Index)		

* Consult factory for other bore sizes not listed.

Spare and Replacement Parts:

Use Table to left to help determine the correct model number for ordering:

Sensor Module:
Model No. = RIM [D] [A]
Example: = RIM LD 240

Pulse Wheel Mounting Options:
Model No. = RIM [B] [A]
Example: = RIM T04 240

Enclosure:
Model No. = RIM 8.5

Mating Connector (10 Pin):
Model No. = RIM C01